International Exhibition

INVENTCOR

2nd edition

Editor: Corneliu BIRTOK BĂNEASĂ

Posters

16 – 18

DEC 2021

Deva, Romania

online

SCAN ME

www.corneliugroup.ro inventcordeva@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

CORNELIUGROUP ASSOCIATION RESOURCE - INNOVATION

A.R.T.A.

ISBN 978-606-35-0467-9

Editura POLITEHNICA

International Exhibition InventCor - IInd edition

CORNELIUGROUP research-innovation Association in collaboration with **Romanian Association for Alternative Technologies Sibiu - A.R.T.A. Sibiu** organizes online, the **International Exhibition INVENTCOR, IInd edition**

Description: Non-formal educational event for all ages. **INVENTCOR** presents inventions, research projects, products, educational programs, experimental teaching stands of universities, research institutes, multinational companies and private inventors.

The exhibition will also include the **KidsCorner**, **InnovativeART** as well as extensive presentations from various fields: innovation, ecology, health, people's safety, community, intellectual property, automotive and travel.

Objective: The main objective of the International Exhibition INVENTCOR is the importance of developing the creative – innovative spirit, through the involvement of young people.

Site: CORNELIUGROUP association http://corneliugroup.ro/inventcor.html

FB event page: INVENTCOR 2021 https://fb.me/e/3Z3RbY10v

Period & Location: 16-18.12.2021 Online

Motto: **C**reation **O**pportunity **R**ealization

Promo: https://www.youtube.com/watch?v=2M8KxCUqCaM

Hashtag: #InventCOR2021 #CorneliuGroup #PutereaMintiiCreative

Origin: Deva City

INVENTCOR President: Corneliu Birtok Baneasa
https://www.facebook.com/corneliu.birtokbaneasa

Participating Countries: Australia, Brazil, Germany, Hungary, Indonesia, Israel, Malaysia, Moldova, Romania, Serbia, Syria, Sudan, Thailand and Turkey.

Co-organizer:
Romanian Association for Alternative Technologies Sibiu - A.R.T.A. Sibiu
http://artasibiu.ro
https://www.facebook.com/mihail.titu/
mihail.titu@yahoo.com

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

Educational partner:

Polytechnic University of Timisoara
https://www.upt.ro/Universitatea-Politehnica-Timisoara_en.html

Faculty of Engineering Hunedoara
http://www.fih.upt.ro/v4/#

Research and innovation partners:

UPT Center for Innovation and Technology Transfer
https://www.upt.ro/Informatii_inovare-si-transfer-tehnologic_465_ro.html

The General Association of the Engineers in Romania Hunedoara Branch https://www.hunedoara.agir.ro/

Romanian Inventors Forum
http://www.afir.org.ro/

Toronto International Society of Innovation & Advanced Skills
https://www.tisias.org/

Al Amaan Al Mutahida Company - Bagdad, Iraq
www.alamaan-iq.com

The House of Science Deva
https://www.facebook.com/Casa-Stiintei-112843810370259/?ref=page_internal

Media partners

InventCor Categories

A - Energy, Protection of the environment, Biotechnology

B - Architecture, Civil Engineering, Interior architecture, Materials

C - Computer sciences, Electronics, Electricity, Communication, Security

D - Agriculture, Machines and accessories

E - Handmade, Jewellery

F - Teaching methods and material, Books, Sport, Music

G - Medicine, Veterinary medicine

H - Mechanics, Engines, Machinery, Tools

I - Metallurgy, Industrial processes

J - Kids Corner, Games, Toys, Outdoor

K - Automotive, Ships, Aviation, Accessories

L - Innovative ART, Photography, Video, Publicity, Printing, Painting

M - Textiles, Clothing, Fashion

N - Foods, Drinks, Restaurants, Hotels & Spa

O - Health, Cosmetics, Hygiene, Paramedical

P - History and Cultural Studies

Q - Space science, Astronomy

R - Nanotechnology, Advanced materials

A

Energy

Protection of the environment

Biotechnology

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

ELECTRODE AND METHOD FOR FAST ELECTROCHEMICAL DETECTION OF ARSENIC(III) FROM AQUEOUS SOLUTIONS

A

Florica MANEA*, Aniela POP, Anamaria BACIU, Adriana REMEȘ

Politehnica University of Timisoara, Romania, https://www.upt.ro

**e-mail: floricamanea@upt.ro*

Patent no RO 129026 B1, released on 30.10.2020

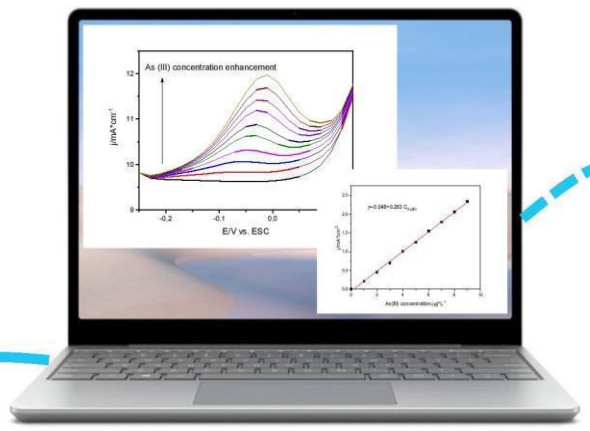
The invention refers to the elaboration of a n electrode and a method for the electrochemical detection of arsenic (III), known as a very toxic pollutant, from aqueous solutions. Also, the working electrode (WE) and the procedure can be applied both for the detection of other pollutants from water (*e.g.*, heavy metals, organic pollutants) and for other applications (*e.g.,* pharmaceutical analysis, food quality control and safety, clinical analysis).The problem solved throught this patent consists on the elaboration of a product and a process based on an electrochemical procedure for fast detection of arsenic (III) from aqueous solutions using an electrode made from relatively inexpensive materials, viable and exhibinting high electroanalytical performances as limit of detection, sensitivity, reproducibility, accuracy.

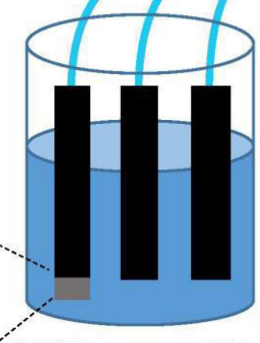
Environmental

Food

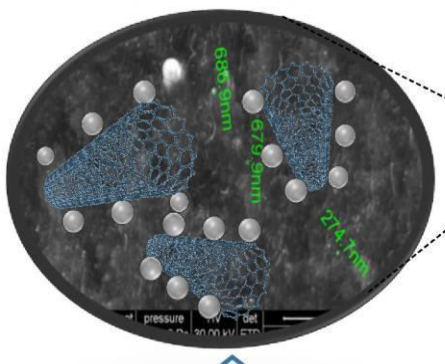
Clinical

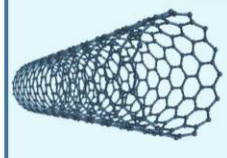
As (III)





Electrode compozition (CNF/Ag)





+ $Ag(NO_3)$

Electrochemical depozition

E = -0.4 V/SCE

t = 60 s

Square-wave voltammetry procedure

Step I. Cathodic reduction: $As^{3+}+3e^- \rightarrow As^0$

working conditions: - applied potential: -0.4 V/SCE

- time: 120 seconds

Step II. Anodic stripping: $As^0 \rightarrow As^{3+}+3e^-$

provides the electrochemical response corresponding to the detection of arsenic (III) at the potential of -0.01 V / ESC by square wave voltammetry application.

- The electrode and the procedure of fast arsenic (III) electrochemical detection from aqueous solutions according to the invention consists on using an electrode, called working electrode (WE), in an assembly together with a counter electrode (CE) and a reference electrode (RE), and based on the anodic stripping method and by applying the square wave voltammetry technique in the presence of a supporting electrolyte for the detection of arsenic (III) from a contaminated water through the electrochemical response of the working electrode in the presence of the target pollutant. The WE is a composite electrode obtained by carbon nanofibers dispersion in an epoxy matrix, followed by the electrochemical modification of the electrode surface with silver particles.
- The process and the electrode for rapid electrochemical detection of arsenic (III) in aqueous solutions according to the invention have the following advantages: very high electroanalytical performances (*i.e.,* limit of detection, sensitivity, reproducibility, accuracy), low costs of materials used for the working electrode construction, long life use (at least 1 year).
- This method allowed determining As(III) concentrations of 5 ppb, 45 ppb and 105 ppb in three groundwater sources form vest side of Romania.

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

3D Porous dimensionally stable anode–integrated particulate electrode-electrochemical filtering system for advanced treatment of cytostatics-containing water (3DSAPECYT)

A

Authors: Florica Manea, Corina Orha, Constantin Adrian Tudoran

Project no. PN-III-P2-2.1-PED-2019-4492, 441PED/2020

The development of improved innovative technology and process for water treatment represents a prerequisite condition within the context of the circular economy, considering its fundamental principles focus on reduce, reuse and recycle in order to close the loops of the water use cycle.

Objectives of the project consists of:

1. Synthesis and characterization of new porous dimensionally stable anodes through spin coating and hydrothermal techniques.

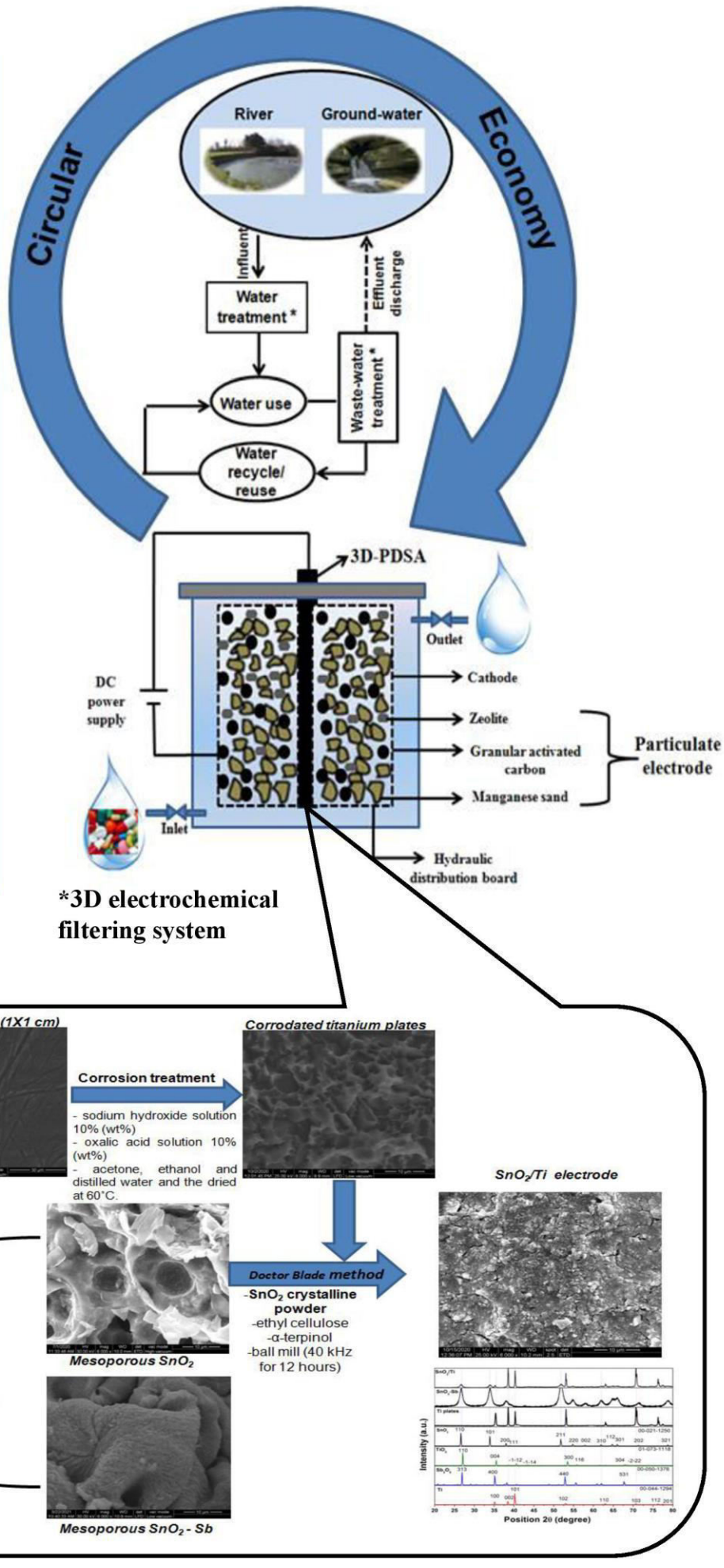
2. Development of new filtering composition within fluidized bed as particulate electrode based on activated carbon (mature technology) / Romanian zeolite (natural material) / manganese sand (depleted filtering waste generated in the drinking water treatment technology using manganese containing groundwater source).

3. Fabrication of an innovative ***three-dimensional (3D) Porous Dimensionally Stable Anode–integrated Particulate Electrode-Electrochemical Filtering System (3D-PDSA-PE-EFS)*** for advanced treatment of cytostatics containing water.

4. Validation and integration of ***3D-PDSA-PE-EFS*** system within advanced surface water treatment technology.

The ***scope*** of the present project is to develop an innovative three-dimensional (3D) Porous Dimensionally Stable Anode–integrated Particulate Electrode-Electrochemical Filtering System (***3D-PDSA-PE-EFS***) for advanced water treatment, which will be validated at the lab-scale for advanced treatment of cytostatics containing water, starting from ***TRL-2*** and reaching ***TRL-4*** in 24 months. The system (***3D-PDSA-PE-EFS***) will be flexible and enable for an advanced treatment of water/wastewater characterized by a wide range of contaminants (organics and inorganics) by combination of advanced electrooxidation process (AEOP) with adsorption/catalysis (A/C) process within one reactor.

Contact: floricamanea@upt.ro; orha.corina@gmail.com ; constantin.tudoran@datcomp.ro



Morpho-structural characterization of 3D-PDSA

DYE-SENSITIZED SOLAR CELL MODULE FOR WAVELENGTH-SELECTIVE PHOTOVOLTAIC GREENHOUSE

Authors: Ursu Daniel , Miclau Marinela, Albulescu Daiana

Project number : PN-III-P2-2.1-PED-2019-2091

A

National Institute of Research and Development for Electrochemistry and Condensed Matter

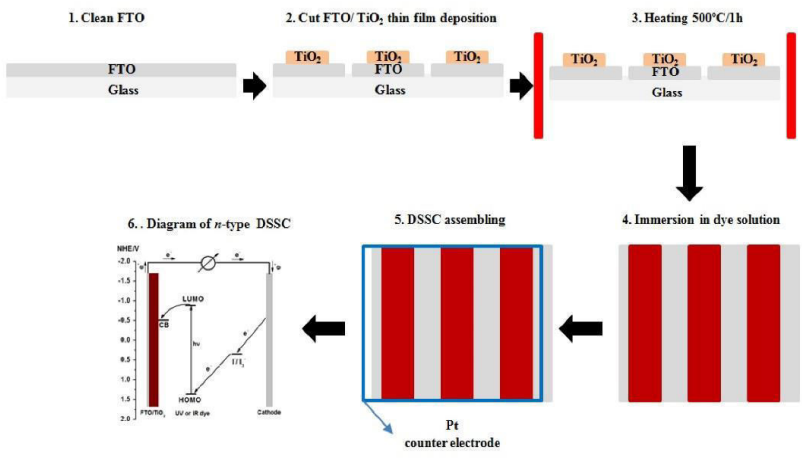
Description

A photovoltaic greenhouse must strike a balance between two contradicting requirements: maximize the flow of photosynthetic active radiation (PAR) which is essential for the growth and photosynthesis of the plants and enhance the production of energy which increases along with the increase in size of the opaque surface of the panels. The greatest challenge of a PV greenhouse is the competition between PV roofs and plants. The main limitations of the integration in greenhouse concern the fact that these PV cells do not transmit sunlight and form a permanent shadow region which has negative effects on production, reducing the crop growth or the amount of biomass.

Simple manufacturing process, the low fabrication cost, flexibility in scaling, low material usage and low light level sensitivity, but mainly the variation in color and transparency of the dye sensitized solar cell (DSSC) are essential characteristics that could make these cells the ideal candidate for greenhouse application. The selection of the color of DSSC given by the dye can act as a plant growth regulator or serve as a photo selective covering adsorbed with dye to manipulate the light spectrum entering the greenhouse.

In this context, the invention proposed to design, build, and test the wavelength-selective solar cell module (DSSC module), as a technically and economically credible alternative concept of a PV roof for PV greenhouses.

Construction of DSSC module



***The working principle** of DSSC involves four basic steps:*

- *Light absorption,*
- *Electron injection,*
- *Transportation of carrier,*
- *Collection of current.*

The following steps are involved in the conversion of photons into current.

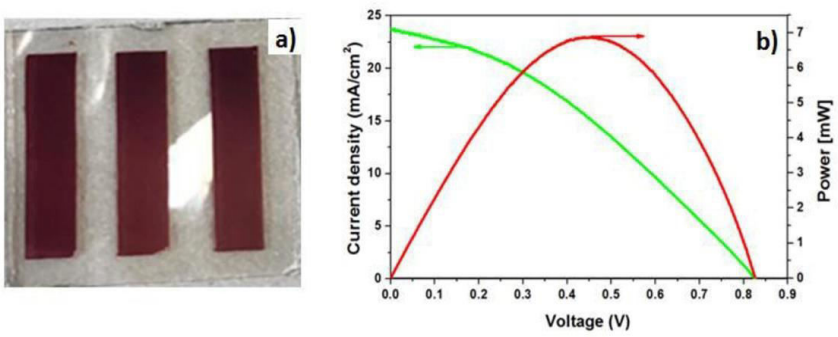
➢ ***This technology could be able to deliver impressive benefits in contrast to conventional PV due to its solar radiation manipulation through the optimum choice of photosensitizer.***

Acknowledgment

This work was supported by a grant of the Romanian National Authority for Scientific Research and Innovation, UEFISCDI, Project No. PN-III-P2-2.1-PED-2019-2091, within PNCDI III.

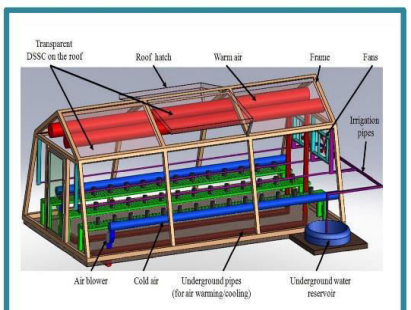
➢ ***Simple manufacturing process, the low fabrication cost, flexibility in scaling, low material usage and low light level sensitivity, but mainly the variation in color and transparency of the dye sensitized solar cell (DSSC),***

➢ ***One of the third generation of PV cells, are essential characteristics that could make these cells the ideal candidate for greenhouse application.***



Our DSSC [original work] (a), Current-voltage and power-voltage characteristics of DSSC fabricated (b)

Future perspectives



The energy independent and combined fully automated greenhouse standalone prototype based on wavelength-selective solar cells (DSSC) [original work]

➢ ***Design, build, test and implementation of efficient and low-cost n-p type DSSC based on TiO_2 and Cu_2O using dyes (synthetic and natural) which absorb in UV and NIR***

➢ ***Design, build, test and the energy independent and combined fully automated greenhouse standalone prototype based on wavelength-selective solar cells (DSSC), as a technically and economically credible alternative concept to present day conventional greenhouses.***

Contact:
danielhoratiu@yahoo.com http://getica.upt.ro
tel:+40766564497

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Piezoelectric/mechanical/thermal energy generator capable of harvesting energy from wind, wave, sun and underwater pressure

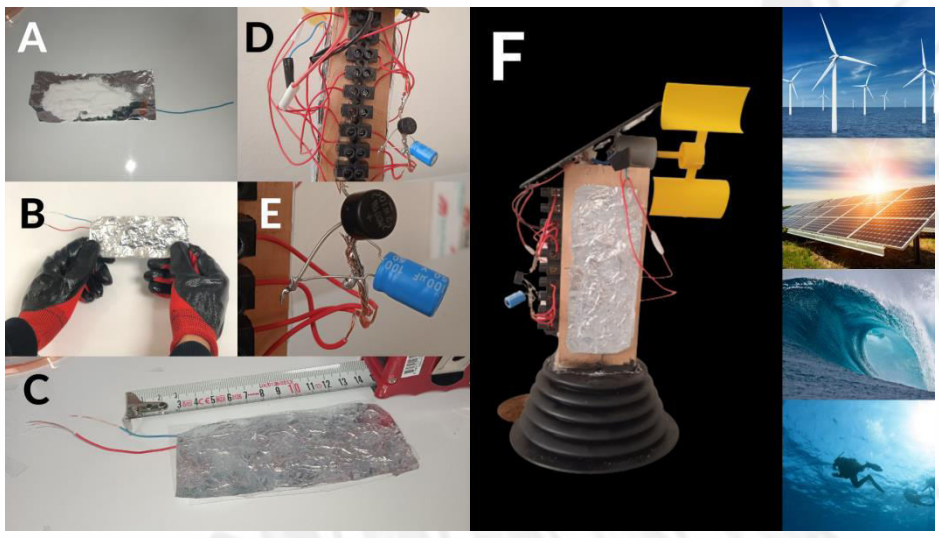
Generator de energie piezoelectric/mecanic/termic capabil să colecteze energie din vânt, valuri, soare și presiunea subacvatică

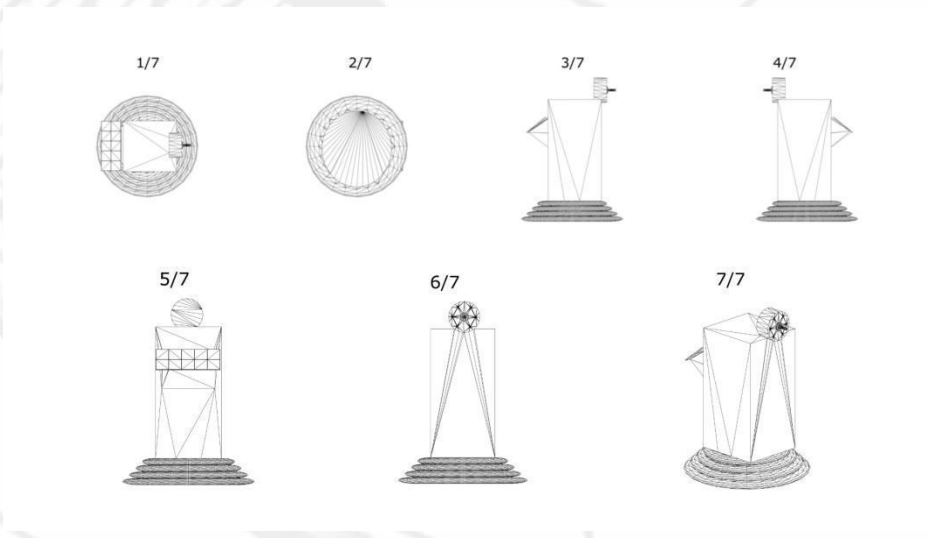
Student Project

Author/s: Kayra Koray YILMAZ**, Furkan Ibrahim TANRIVERDI, Mehmet Ibrahim YURU

A

Piezoelectric/mechanical/thermal generator is an energy harvester that collects energy and turns it into electricity from wind, wave, sun, and underwater pressure. The generator is constructed to sea that can easily collects wave and underwater pressure energy. Wind and wave mechanical movement starts the motor's rotating. Rotation of motor causes the presence of electrons. Solar panels fabricated onto motor harvests thermal energy of the sun. And piezoelectric generators fabricated to faces of the generator's scaffold harvests the potential energy of water pressure. All of the electricity that comes from sources goes to a capacitor to accumulate and store electricity. The invention essentially aims to increase the productivity of energy generators and to provide an alternative method for producing electricity. With higher effectivity of energy, the multifunctional generator will be able to benefit the potential energy sources.





(EN) Figure 1. Potassium sodium tartrate (crystal piezoelectric material) **(A)**. Piezoelectric generator with conductive and insulator layers **(B)**. The size of a piezoelectric generator **(C)**. Terminal box of + and – poles of energy harvesters **(D)**. The capacitor that collects electricity from harvesters **(E).** The piezoelectric-mechanical-thermal energy generator **(F)**. **Figure 2.** Technical drawing of the generator.

(RON) Figura 1. Tartrat de sodiu de potasiu (material piezoelectric cristal) **(A).** Generator piezoelectric cu straturi conductoare și izolatoare **(B)**. Dimensiunea unui generator piezoelectric **(C).** Cutia de borne a stâlpilor + și – ai colectoarelor de energie **(D).** Condensatorul colectează energie electrică de la recoltatoarele **(E).** Generatorul de energie piezoelectric-mecanic-termic **(F). Figura 2.** Desen tehnic al generatorului.

Generatorul piezoelectric/mecanic/termic este un colector de energie care colectează energie și o transformă în electricitate de la vânt, valurile, soarele și presiunea subacvatică. Generatorul este construit pe mare, care poate colecta cu ușurință energia valurilor și a presiunii subacvatice. Mișcarea mecanică a vântului și a valurilor începe să se rotească motorul. Rotirea motorului determină prezența electronilor. Panourile solare fabricate pe motor recoltează energia termică a soarelui. Iar generatoarele piezoelectrice fabricate pe fețele schelei generatorului recoltează energia potențială a presiunii apei. Toată electricitatea care provine din surse merge la un condensator pentru a acumula și stoca electricitate. Invenţia urmăreşte în esenţă creşterea productivităţii generatoarelor de energie şi furnizarea unei metode alternative de producere a energiei electrice. Cu o eficacitate mai mare a energiei, generatorul multifunctional va putea beneficia de potentialele surse de energie.

Contact: kayrakorayyilmaz12@gmail.com | +905530327413**

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

BRAZIL

unioeste

Western Paraná State University

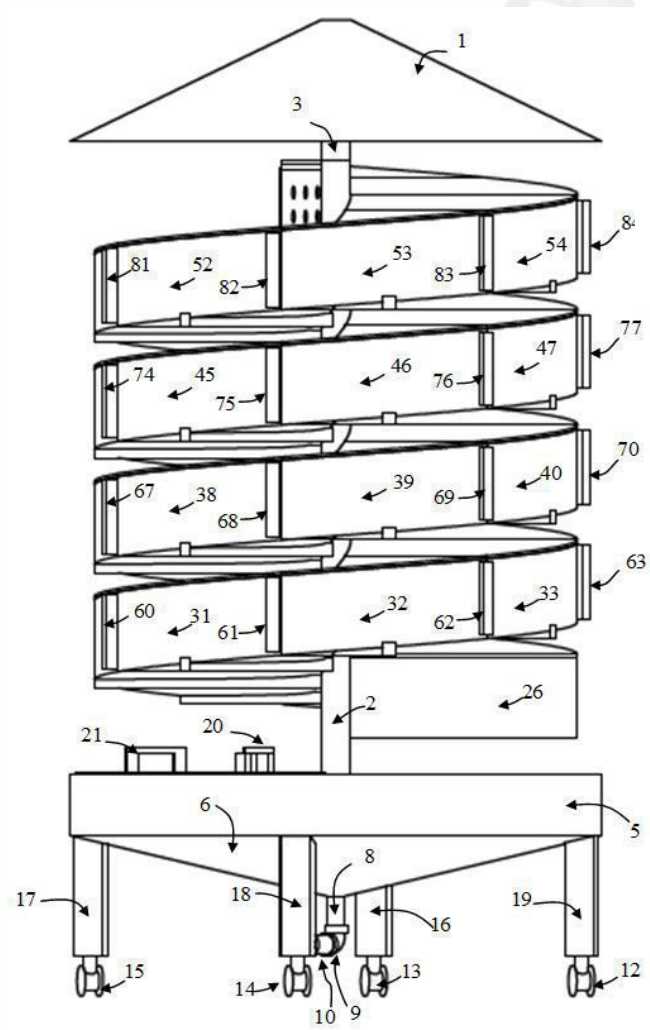
COMPACT MODULAR EQUIPMENT FOR PROCESSING DOMESTIC ORGANIC WASTE

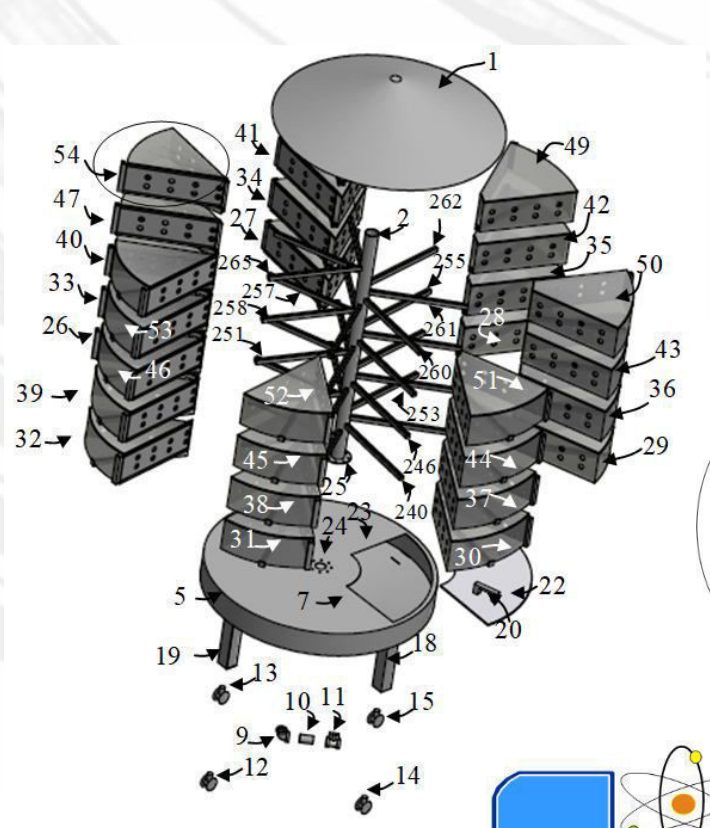
Author/s: Camilo Freddy Mendoza Morejon, Andy Avimael Saavedra Mendoza

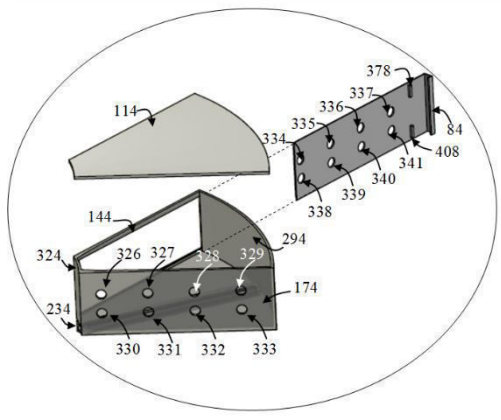
Patent no.: 2017000089/25.04.2017

A

Patent of a Compact modular equipment that, through vermicomposting, enables the transformation of domestic organic waste into value-added products, the main one being humus, liquid biofertilizer and surplus earthworms. The patent's differential lies in the modular characteristic of the vermicomposting cells, in the operation with a daily feeding and processing device, in the complementary devices and in the elements that provide versatility in size and operating capacity, with maximum efficiency and total digestion of organic matter, without the need for periodic maintenance.







Contact: camilo_freddy@hotmail.com
www.unioeste.br/nit
+5545999341190

Building a better world

Research Group on Technological Innovations for Innovative Territorial Development

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Syria

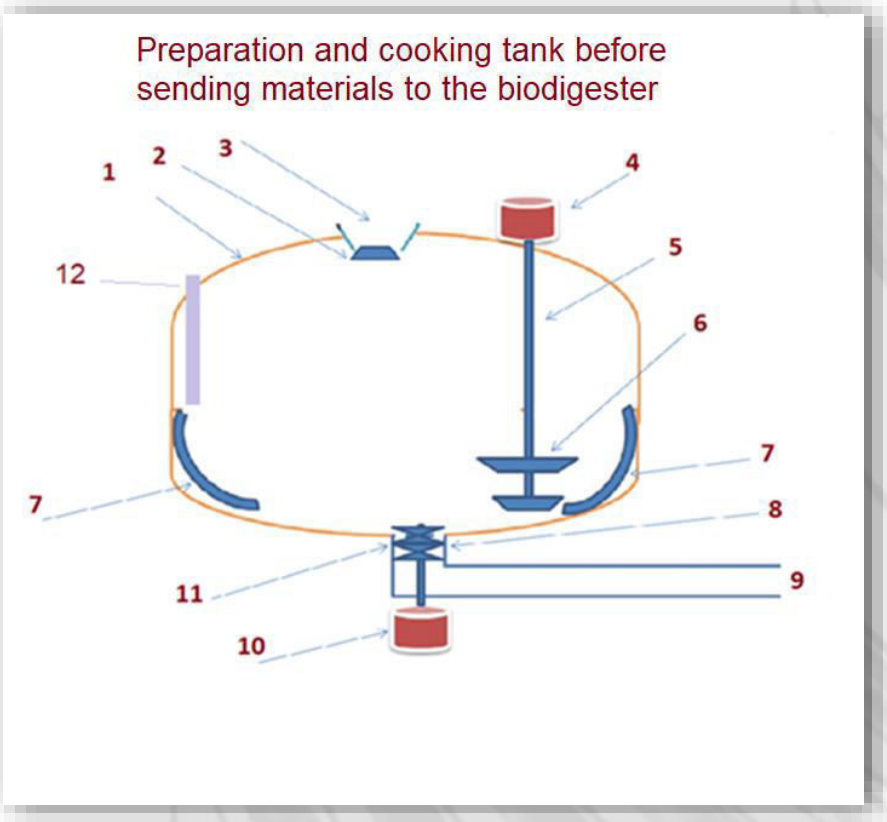
Integrated bio digester

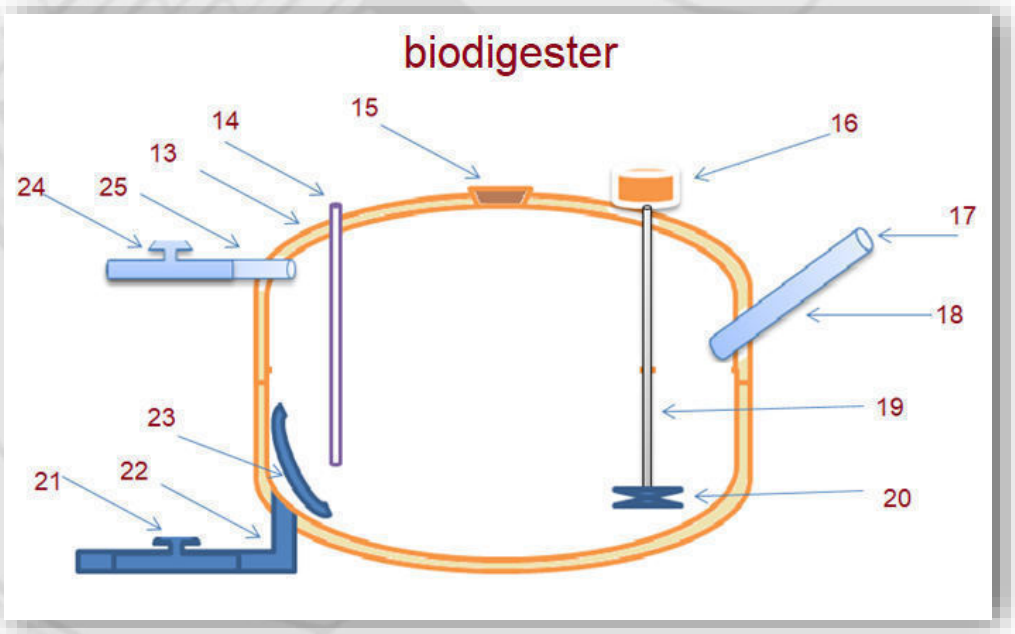
Student Project

Author: Mustafa Ahmad Hamdi
No: 2021070061

A

The integrated bio-digester is a unit for producing compressed pure methane gas using normal, solid and hard organic residues, after preparing it by means of a closed preparation and cooking tank by the thermal cooking process with disassembled materials that help to ripen and sterilize them and increase their surfaces exposed to anaerobic bacteria. Thermal solar, then pumps the components to the main digester empty of oxygen using nitrogen, and the digester is air-conditioned using solar energy according to the ideal temperatures for the growth of anaerobic bacteria.





Preparation and cooking tank:

1- Preparation and cooking tank.
2- The cover of the preparation and cooking tank to enter the raw materials.
3- Raw material entry slot.
4- The motor to stir the ingredients in the preparation and cooking tank.
5- Axle of the mixer.
6- Mixer stir the raw materials.
7- Heat exchanger to heat the components of the preparation and cooking tank.
8- Chop the mature ingredients to pump them to the main bio-digester.
9- Pipe for transferring cooked materials to the main bio-digester.
10- A motor to operate the shredder.
11- Outlet port for cooked ingredients.
12- Sampling tube.
13- Double-walled main bio-digester tank for thermal insulation.
14- Components and gases sampling tube.
15- Maintenance hatch of the main bio-digester.
16- The engine to move the materials inside the bio-digester.
17- The opening of the tube coming from the preparation and cooking tank.
18- The pipeline for transporting the cooked materials coming from the preparation and cooking tanks.
19- Axle transmission between the engine and the mixer.
20- Mixer moving materials inside the bio-digester.
21 - fluid transfer valve.
22- Fluid transfer tube.
23- Heat exchanger for heating or cooling the components of the bio digester.
24- The valve to control the exit of gases from the bio-digester.
25- Gases transfer tube from the bio-digester.

Inventor Mustafa Ahmad Hamdi
Second year of chemistry, Damascus University
Syria Damascus
Mobile&whatsApp:00963953402038
Email: ahmadtaligom@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Institute of Microbiology and Biotechnology, Ministry of Education and Research of the Republic of Moldova

IMB

Biologically active preparation based on yeast biomass from the waste of beer industry

Patent application **No. a 2021 0016, 2021.03.30.**

Authors: CHISELIȚA Natalia, CHISELIȚA Oleg, BEȘLIU Alina, EFREMOVA Nadejda, TOFAN Elena, LOZAN Ana, DANILIȘ Marina

A - Energy, Protection of the environment.

Aim: The elaboration of new biologically active preparation based on yeast biomass from the waste of beer industry

Essence: The invention relates to the field of ecology and microbial biotechnology, in particular to the production of a biologically active natural preparation from yeast biomass from wastes from the beer industry which can be used in various fields, including the livestock sector and the food industry.

Advantage: The preparation, obtained by freezing and thawing of the yeast biomass, autolysis of biomass in sodium phosphate buffer (1:1 ratio) at +45˚C, for 8 hours, containing: proteins - 64,6±2,6%, carbohydrates - 11,7±2,2%, lipids - 0,13±0,02%, ash 13,5±1,4% and is characterized by a high summary contain of essential aminoacids of 55,7 g /100 g of protein. The implementation of the invention will contribute to the diversification of natural biologically active preparations and the efficiency of the processing and recovery of waste from the beer industry, which will significantly reduce their negative impact on the environment.

Field of application: Agriculture and Food Industry, Medicine, Health Care, Cosmetics, Environment , Pollution Control

The research was carried out within the project 20.80009.5107.16, funded by NARD.

Contact: Institute of Microbiology and Biotechnology of Moldova, Chishinau, Academy str., 1, Chiseliță Natalia, tel: +373-22-725524; fax: +373-22-725754; e-mail: chiselita@mail.ru

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Institute of Microbiology and Biotechnology, Ministry of Education and Research of the Republic of Moldova

IMB

Process for extracting mannoproteins from brewer's yeast sediments

Patent application **No. a 2021 0004/2021.01.29**

Authors: BEŞLIU Alina, CHISELIȚA Natalia, CHISELIȚA Oleg, EFREMOVA Nadejda, TOFAN Elena, LOZAN Ana

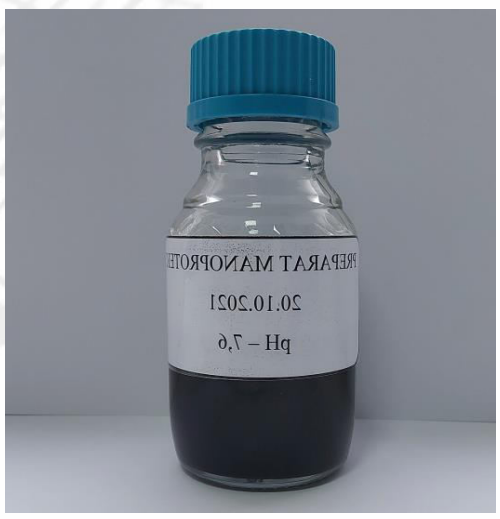
A - Energy, Protection of the environment.

Aim: The invention relates to microbial biotechnologies, in particular to the process of extracting mannoproteins from yeast sediments from waste from the beer industry.

Essence: The process according to the invention includes the use of brewer's yeast biomass (30 g) which is mixed with 30 ml of sodium phosphate buffer (1:1 ratio) then subjected to autolysis at +37°C or +45°C for 8 hours, with periodic stirring, then centrifugea and the process of remaining the sediments with 1N NaOH solution (1: 5 ratio) at +80±5° C for 2 hours, centrifugation at 3500 rpm. For 15 minutes, the alkaline supernatants obtained were sedimented with 96% ethyl alcohol in a volume of 1: 2.

***S.CEREVISIAE* YEAST FROM BEER SEDIMETS**

MANNOPROTEINS FROM BEER YEAST SEDIMENTS



MANNOPROTEIC PREPARATION

Advantage: Elaboration of a process for extraction of mannoproteins from yeast sediments from beer production, which allows obtaining 41,34-44,8% S.U. mannoproteins. use of waste that pollutes the environment, reduction of autolysis time, temperature and amount of ethyl alcohol used.

Field of application: Environment-Pollution Control, Zootechnics, Agriculture, Medicine - Health Care-Cosmetics and Pharmaceutical Industry

The research was carried out within the project 20.80009.5107.16, funded by NARD

Contact: Institute of Microbiology and Biotechnology, 1 Academiei Street, Chisinau Republic of Moldova. Beșliu Alina email: besliu.imb@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

PROCESS FOR MONITORING STABILITY OF ECOLOGICAL DUMPS IN MINING AREAS AND IN URBAN AREAS

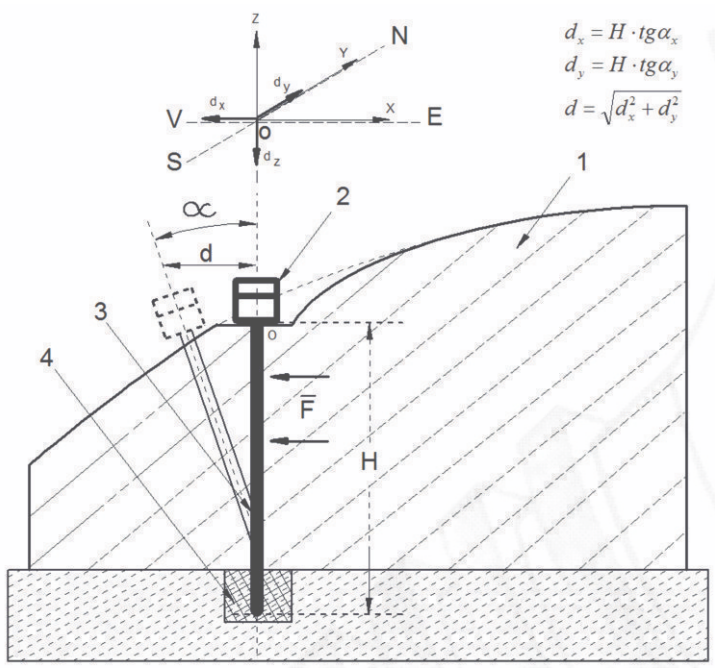
PROCEDEU DE MONITORIZARE A STABILITĂȚII DEPONIILOR ECOLOGICE

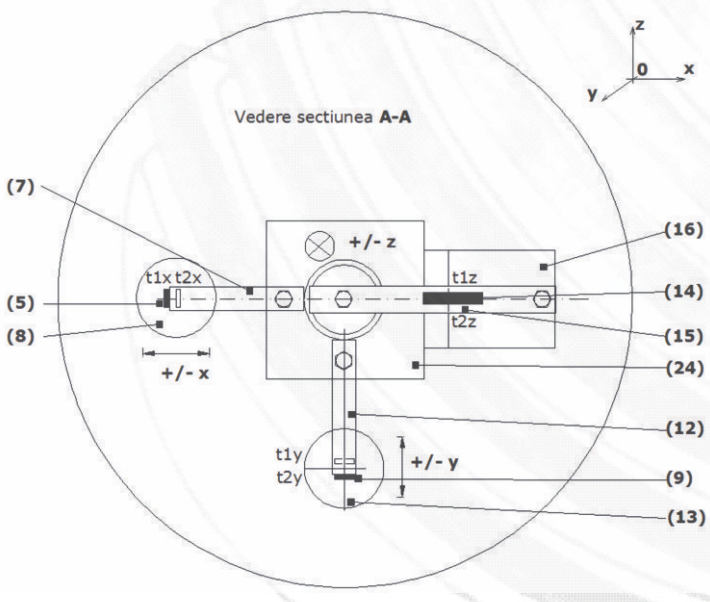
1948 UNIVERSITATEA DIN PETROȘANI

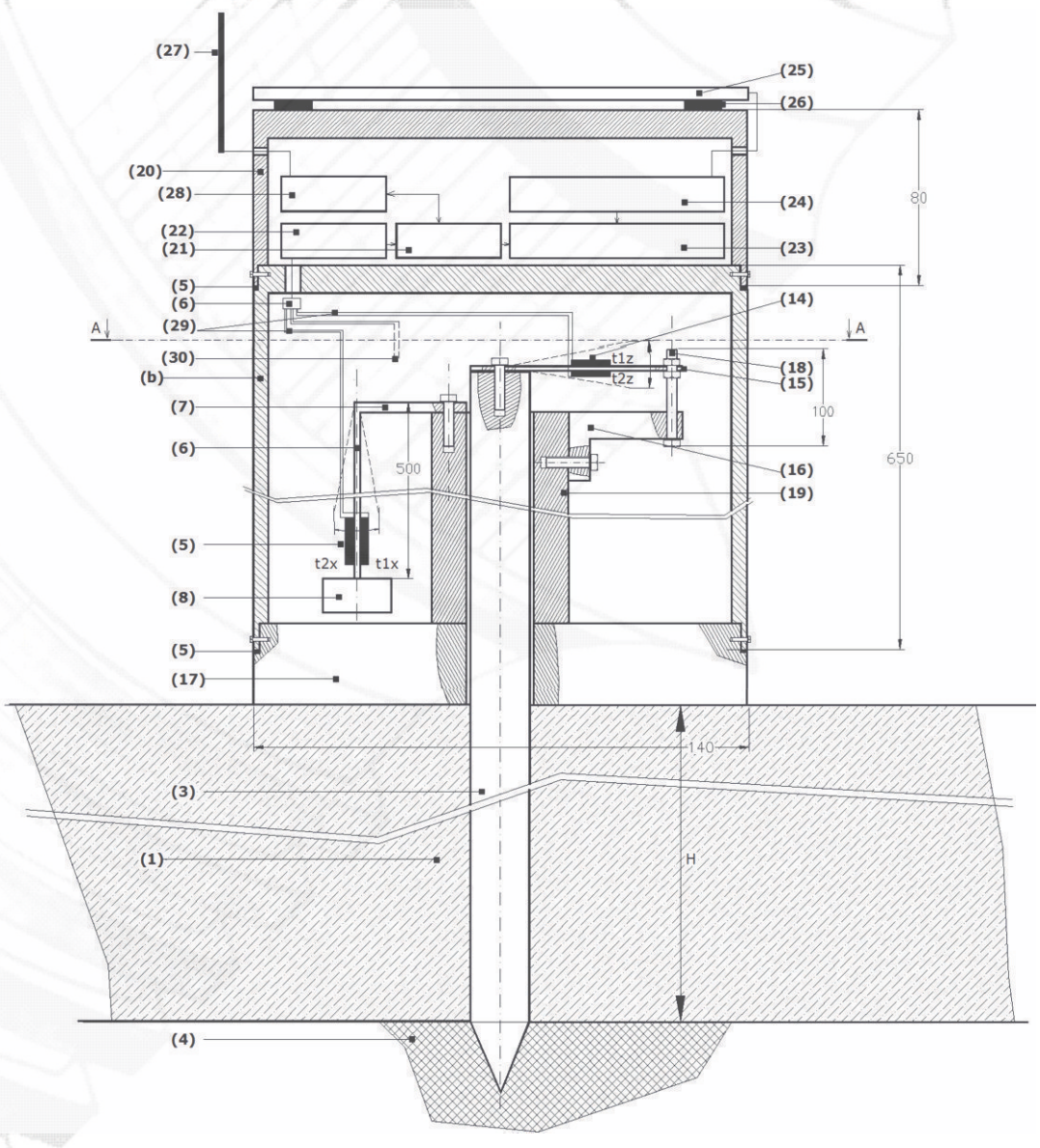
Patent number: OSIM A/00025/17.01.2017, concept
Remus DOBRA,
Mircea RÎȘTEIU, Dragoș PĂSCULESCU

Category
A

The invention refers to a process for monitoring the stability of existing ecological depositories in mining, dump and landfill areas, as well as in urban areas, such as decanting ponds and landfills.







Invenţia se referă la un procedeu de monitorizare a stabilităţii depozitelor ecologice existente în zonele miniere, haldelor şi depozitelor de deşeuri, precum şi în zonele urbane, cum ar fi iazurile de decantare şi gropile de gunoi.

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

Asociația de Cercetare Doctorală Petroșani

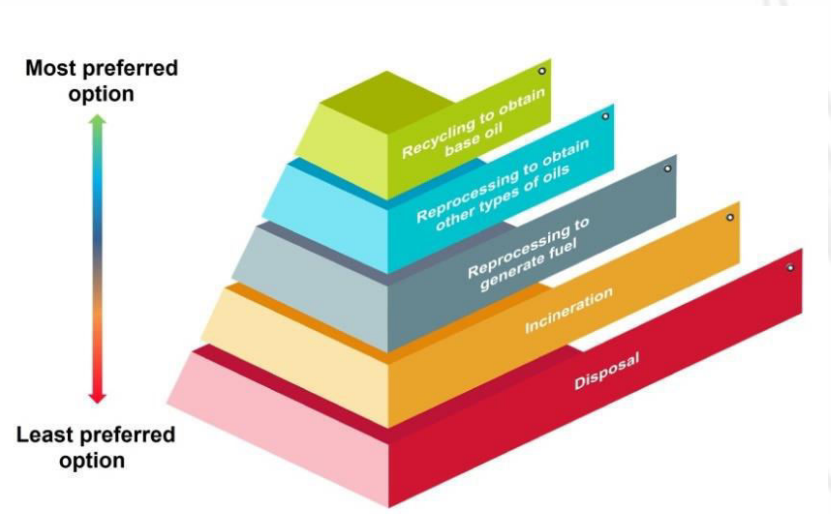
Application of used engine oil in the asphalt pavement industry

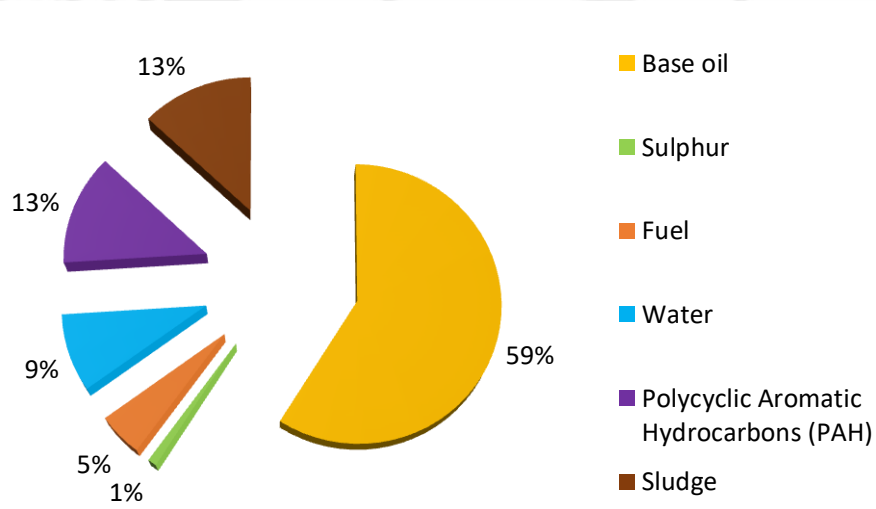
A

Scientific Paper

Authors: Sorin Aurel Rațiu, Maria Laura Benea, Diana Miruna Armioni

The automotive industry presents a number of significant problems at the moment, including the waste it produces. Used engine oil is an eloquent example in this regard, as significant amounts of spent lubricant are generated annually, with a high pollutant potential.





If conventional recycling measures cannot be applied, it is necessary to find alternative management solutions that do not allow the used oil to reach the environment. This article presents a review of the recovery of used engine oil in the asphalt pavement production and rejuvenation industry.

Contact: armionimiruna@yahoo.com, +40740908169

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

MOLDOVA STATE UNIVERSITY
Scientific Research Laboratory
Organic/Inorganic Materials for Optoelectronics
Alexei Mateevici str. 60, Chisinau MD-2009, Republic of Moldova
Tel.: +373 69953854, e-mail: tpotlog@gmail.com

HR EXCELLENCE IN RESEARCH

PHOTOSENSITIZERS FOR PHOTODYNAMIC THERAPY AND PHOTOVOLTAICS

A

RESEARCH PROJECT: # 20.80009.5007.16

AUTHORS: Tamara POTLOG, Ștefan ROBU, Ion LUNGU, Pavel TIULEANU, Vadim FURTUNĂ, Ana POPUȘOI, Galina DRĂGĂLINA, Petru BULMAGA, Nelea POPA, Ion BULIMESTRU, Ion GUȚU, Dumitru RUSNAC, Gleb COLIBABA

APPLICATION FIELD: A - Energy, G- Protection of the environment;
R - Medicine, Veterinary medicine.

AIM: Photodynamic therapy (PDT) is a noninvasive treatment in medicine that utilizes photosensitizers (PSs) to produce highly cytotoxic reactive oxygen species (ROS) (e.g., $^{\bullet}O^{-}_{2}$, H_2O_2, -OH) to kill cancer cells. Dye photosensitizer is also key to photovoltaics. It requires not only a wide range of absorption of sunlight, combined with good absorption properties of materials, but also suitable oxidation–reduction potential, long lifetime of excited states, good photoluminescence, stability, ease of synthesis, and low cost. Tetrapyrrole structures such as porphyrins, chlorins, bacteriochlorins and phthalocyanines with appropriate functionalization have proved its properties as PSs for PDT and transporting materials in solar cells. Therefore, the development of a new photosensitizers based on self-assembly of functionalized metallphthalocyanines (MePc) with amino acids or conjugation to antibodies, peptides, proteins and other ligands with specific cellular receptors highly soluble in non-toxic water/organic solvents, absorption in the (700-800) nm spectral region and long lifetime of excited states is the aim of this project.

SOLUTION:

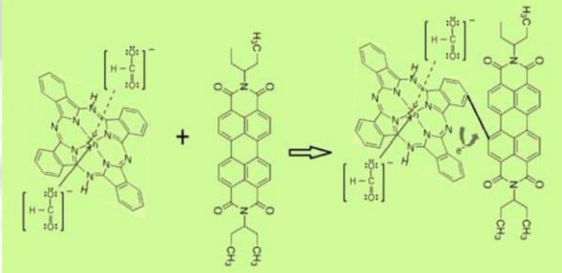
PHOTODYNAMIC THERAPY

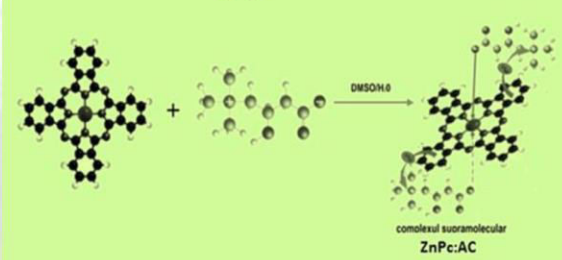
lves chemists, physicists, biologists, engineers and physicians. Chemists, of course, are constantly seeking to design, synthesize, purify and characterize new compounds that can be used as PSs. Many significant advances have been made in PSs design during the last 20 years, and second-, third- and even fourth-generation PSs have been described. Main NOVELTY of the project is development of PSs based on self-assembled of Zinc Phthalocyanine (ZnPc) and Bis-3-Pentyl - PTCDI derivative, ZnPc formulation with (3R)-3-hydroxy-4-(trimethylamino) butanoic acid and grafted ZnPc to binary copolymers N-vinylpyrrolidone (N-VP) with acryloyl chloride (CLAC

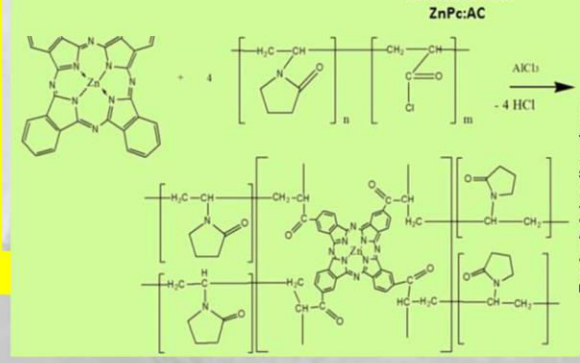
PHOTOVOLTAICS

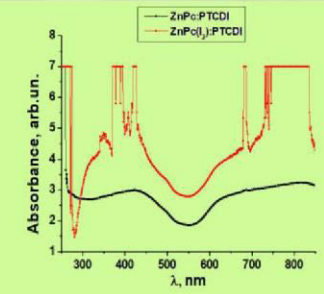
Recently, application of organic semiconductors in photovoltaic devices has acquired new impetus due to the growing interest in solar energy conversion. Organic semiconductors offer low material and fabrication costs with high power conversion efficiency that can possibly outcast existing inorganic solar-cell technologies. Metallphthalocyanines (MePcs) possess planarity, symmetry and electron delocalization that make them a perfect choice to be employed in solar cells. Another main NOVELTY of the project is the synthesis of ITO/PEDOT:PSS/ZnPc:I2/Al Schottky diode devices with open circuit voltage 1.03 V and bulk ZnPc:Bis-3-Pentyl-PTCDI heterojunction solar cells with efficiency of about 2.4%

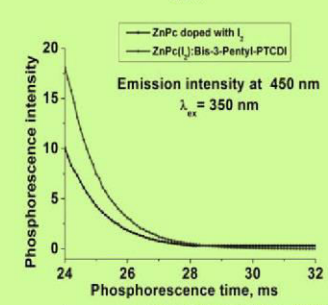
RESULTS OF KNOWLEDGE TRANSFER

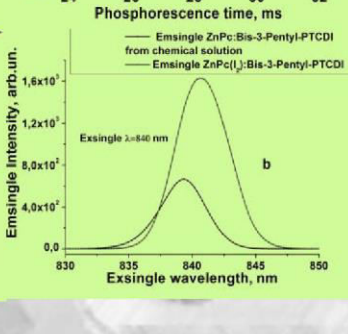






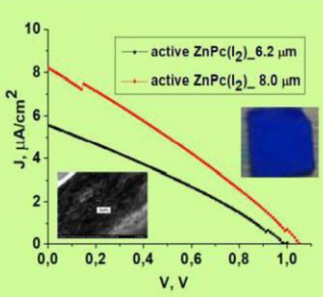


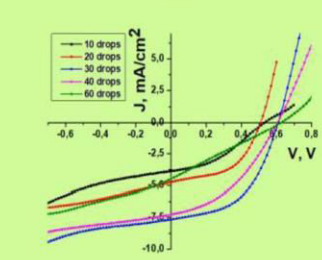


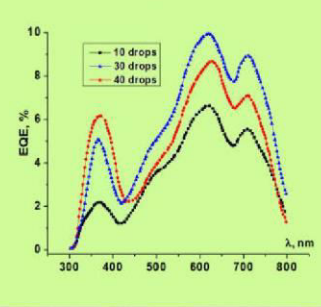


ADVANTAGES:

- Absorbance band in the (700-800 nm).
- The higher values of the open circuit voltage (1.03 V) and the current density (8.2 μA/cm²) than in the case of Schottky diode devices obtained by thermal vacuum evaporation were reached.
- The phosphorescence lifetime values of the ZnPc and ZnPc:Bis-3-Pentyl-PTCDI system were found to be 2.4 ms and 1.1 ms, respectively.
- The best bulk ZnPc: PCDTI photovoltaic device reached an efficiency of about 2.4%
- The singlet oxygen generation abilities of PSs at 840 nm.
- External quantum efficiency is situated between 300 nm and 800 nm wavelengths.







IMPLEMENTATION STAGE: Laboratory.

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

INCD EMC

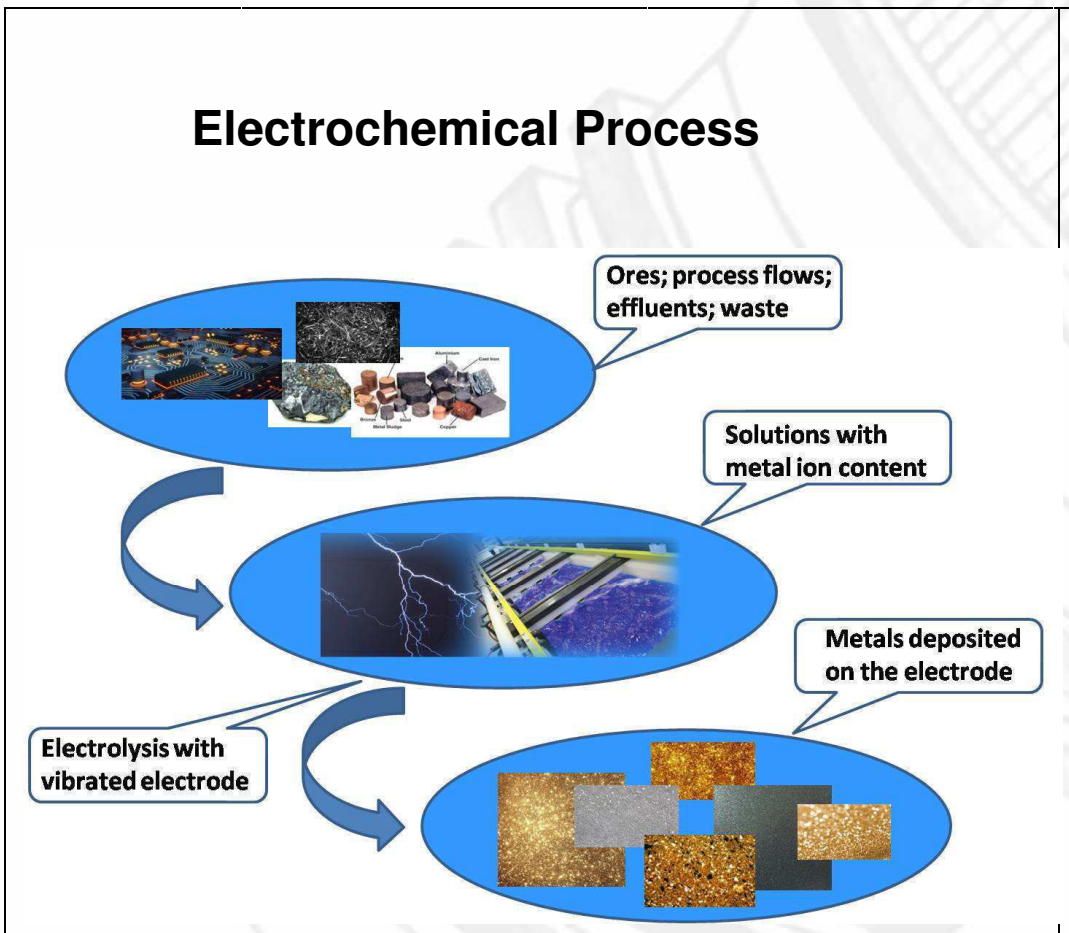
Device for Electrode-Electrolyte Movement by Electrode Vibration

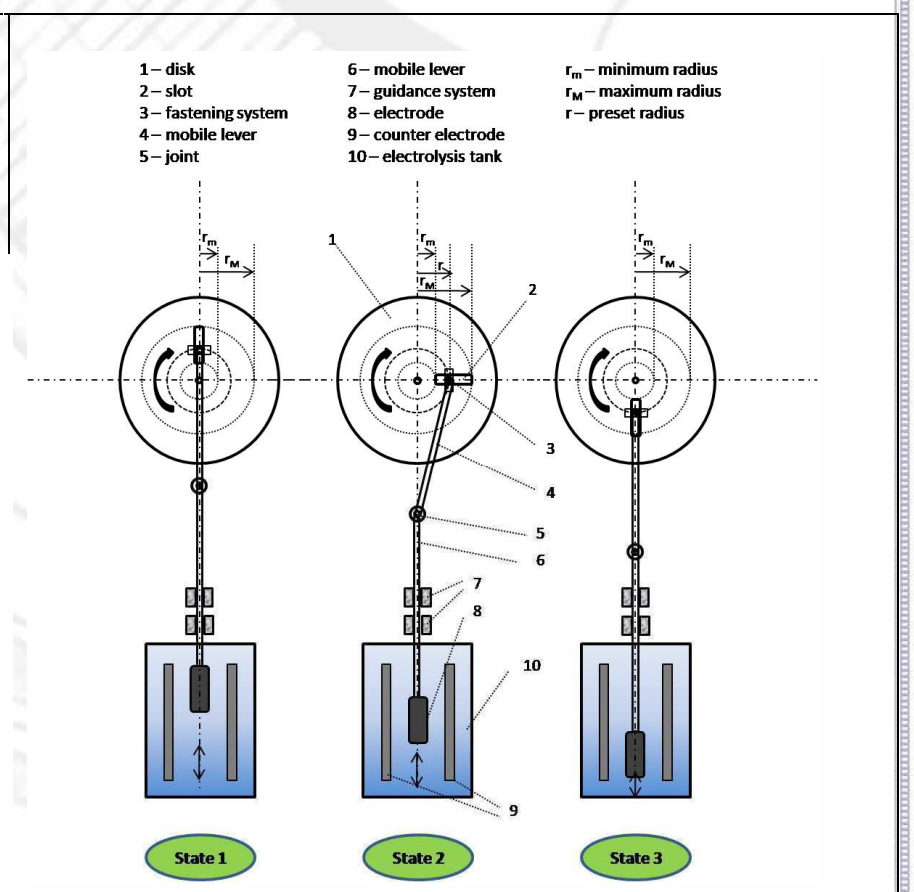
Patent No.127414/2016

A

Authors: Marius C. Mirica, Mirela Ioana Iorga, Ionel Balcu, Nicolae Mirica

The device for electrode-electrolyte movement by electrode vibration, used to remove metal ions from solutions, is provided with a system for **facile adjustment of the amplitude** (A) – by sliding the clamping system – or **the frequency of periodic movement** (ω) – by changing the parameters accordingly the supply current of the electric motor (voltage, current, motor speed). It performs the electrode-electrolyte movement by vibrating the electrode vertically; the move occurs parallel to the active surface, thus **substantially modifying the diffusion limit layer formed at the electrode-electrolyte interface**. The amplitude of the motion, depending on the preset radius (the clamping point on the disc), r, is given by: $A = f(r) = 2r$ where r can be chosen in the interval between r_m (minimum radius) and r_M (maximum radius).





State 1- the highest position of the electrode for the preset radius (clamping point on the disc); **State 2** - the intermediate position of the electrode for the preset radius (clamping point on the disc); **State 3** - the lowest position of the electrode for the preset radius (clamping point on the disc)

This movement reduces the diffusion limit layer at the electrode-electrolyte interface by vibrating the electrode in a plane parallel to the counter electrode, maintaining a constant interelectrode distance, thus ensuring a substantial **increase in ion transport** to and from the electrode surface. As a result, **higher current** and **substance yields** are obtained.

Contact: mirela_iorga@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

FLORA BASARABIEI, vol. III

ISBN: 978-9975-47-192-3

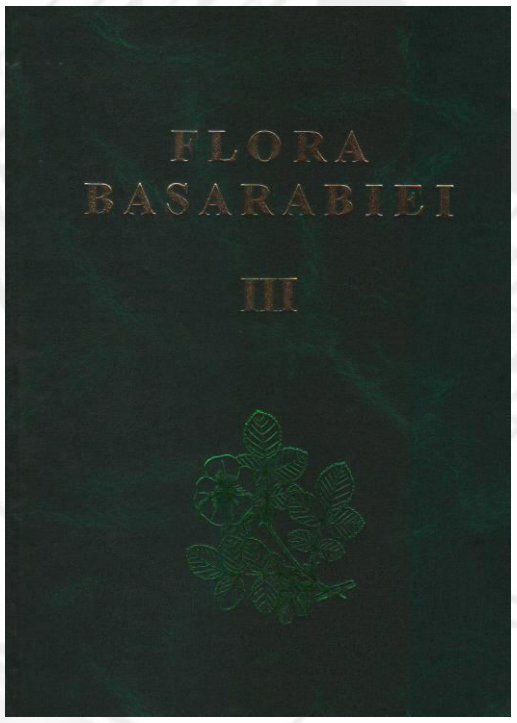
Authors: A. Negru, Valentina Cantemir, V. Chirtoacă, V. Ghendov, Gh. Gînju, Stela Gînju, Olga Ioniţa, A. Istrati, Tatiana Izverscaia, P. Pînzaru, Galina Şabanova, Ana Ştefîrţă, Elena Tofan-Dorofeev

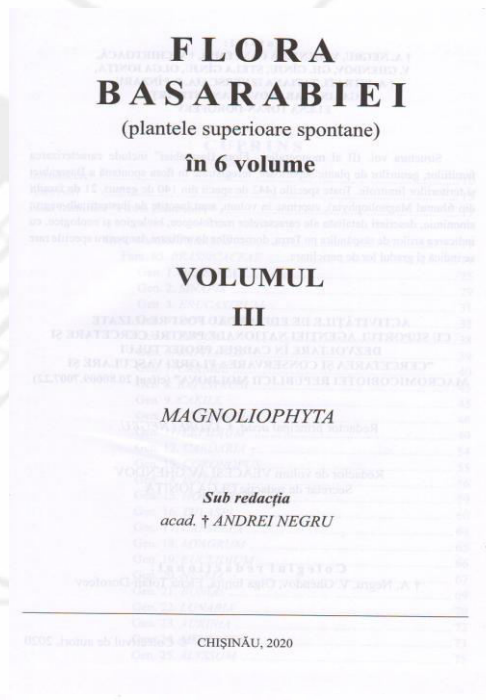
A

The monographic work "Flora of Bessarabia", volume III includes the general characterization of families, genera and species of vascular plants (442 species, 140 genera, 21 families of the Magnoliophyta phylum), recorded in the spontaneous flora of Bessarabia. The species, included in the volume – 624 pages, are accompanied by synonyms, detailed descriptions of morphological, biological and ecological characters, general distribution, areas of use, as well as their original drawings. The conservation status of rare species is also indicated.

The monograph "Flora of Bessarabia" (vol. III) is edited in 1000 hard copies and distributed through the international book exchange of the "A. Lupan" National Library to the main botanical institutions throughout the world, as well as to the educational institutuons of the Republic of Moldova.

The book will serve as a scientific and informational foundation for pupils and students, teachers, in order to carry out training programs, education and conservation of floristic diversity. The monograph will contribute to: the improvement of the legislation regarding the conservation of rare plants; elaboration of the Cadastre of the vegetal world; completion and enrichment of the in vivo collections of the Botanical Garden; development of the activities of education and information of the population regarding the conservation and protection of the environment.



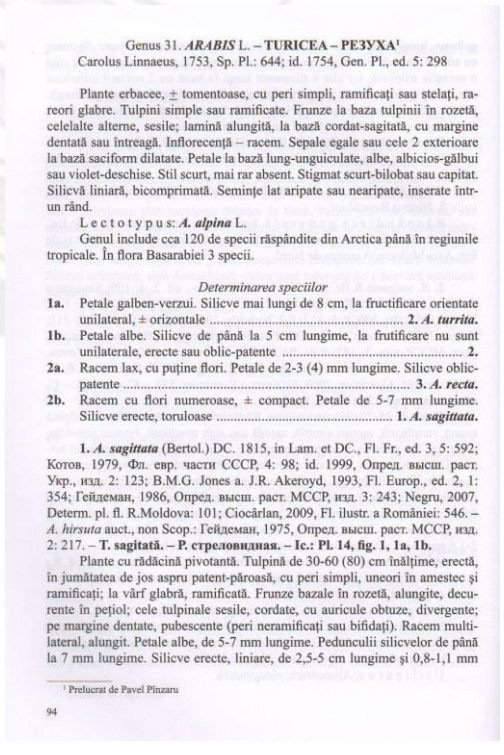

FLORA
BASARABIEI
(plantele superioare spontane)
în 6 volume

VOLUMUL
III

MAGNOLIOPHYTA

Sub redacţia
acad. † ANDREI NEGRU

CHIŞINĂU, 2020


Genus 31. *ARABIS* L. – TURICEA – РЕЗУХА[1]
Carolus Linnaeus, 1753, Sp. Pl.: 644; id. 1754, Gen. Pl., ed. 5: 298

Plante erbacee, ± tomentoase, cu peri simpli, ramificaţi sau stelaţi, rareori glabre. Tulpini simple sau ramificate. Frunze la baza tulpinii în rozetă, celelalte alterne, sesile; lamină alungită, la bază cordat-sagitată, cu margine dentată sau întreagă. Inflorescenţă – racem. Sepale egale sau cele 2 exterioare la bază saciform dilatate. Petale la bază lung-unguiculate, albe, albicios-gălbui sau violet-deschise. Stil scurt, mai rar absent. Stigmat scurt-bilobat sau capitat. Silicvă liniară, bicomprimată. Seminţe lat aripate sau nearipate, inserate într-un rând.

Lectotypus: ***A. alpina*** L.

Genul include cca 120 de specii răspândite din Arctica până în regiunile tropicale. În flora Basarabiei 3 specii.

Determinarea speciilor

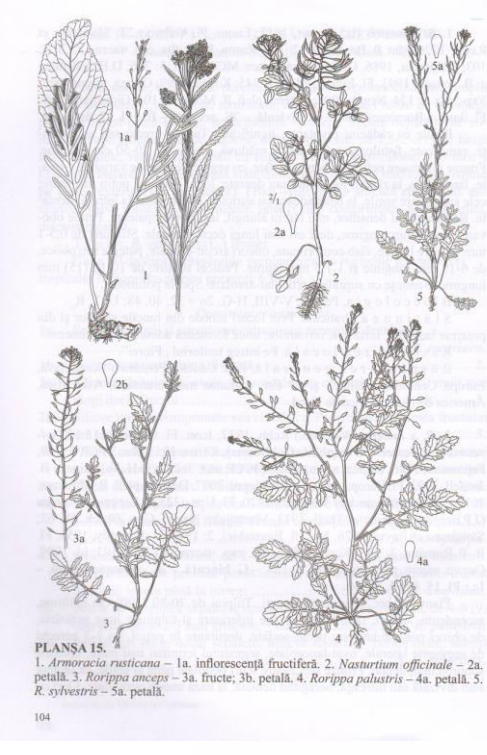
1a. Petale galben-verzui. Silicve mai lungi de 8 cm, la fructificare orientate unilateral, ± orizontale ..... **2. *A. turrita*.**
1b. Petale albe. Silicve de până la 5 cm lungime, la fructificare nu sunt unilaterale, erecte sau oblic-patente ..... **2.**
2a. Racem lax, cu puţine flori. Petale de 2-3 (4) mm lungime. Silicve oblic-patente ..... **3. *A. recta*.**
2b. Racem cu flori numeroase, ± compact. Petale de 5-7 mm lungime. Silicve erecte, toruloase ..... **1. *A. sagittata*.**

1. *A. sagittata* (Bertol.) DC. 1815, in Lam. et DC., Fl. Fr., ed. 3, 5: 592; Котов, 1979, Фл. евр. части СССР, 4: 98; id. 1999, Опред. высш. раст. Укр., изд. 2: 123; B.M.G. Jones a. J.R. Akeroyd, 1993, Fl. Europ., ed. 2, 1: 354; Гейдеман, 1986, Опред. высш. раст. МССР, изд. 3: 243; Negru, 2007, Determ. pl. fl. R.Moldova: 101; Ciocârlan, 2009, Fl. ilustr. a României: 546. – *A. hirsuta* auct., non Scop.: Гейдеман, 1975, Опред. высш. раст. МССР, изд. 2: 217. – **T. sagittată. – Р. стреловидная. – Ic.: Pl. 14, fig. 1, 1a, 1b.**

Plante cu rădăcină pivotantă. Tulpină de 30-60 (80) cm înălţime, erectă, în jumătatea de jos aspru patent-păroasă, cu peri simpli, uneori în amestec şi ramificaţi; la vârf glabră, ramificată. Frunze bazale în rozetă, alungite, decurente în peţiol; cele tulpinale sesile, cordate, cu auricule obtuze, divergente; pe margine dentate, pubescente (peri neramificaţi sau bifidaţi). Racem multilateral, alungit. Petale albe, de 5-7 mm lungime. Pedunculii silicvelor de până la 7 mm lungime. Silicve erecte, liniare, de 2,5-5 cm lungime şi 0,8-1,1 mm

[1] Prelucrat de Pavel Pînzaru

94


PLANŞA 15.
1. *Armoracia rusticana* – 1a. inflorescenţă fructiferă. 2. *Nasturtium officinale* – 2a. petală. 3. *Rorippa anceps* – 3a. fructe; 3b. petală. 4. *Rorippa palustris* – 4a. petală. 5. *R. sylvestris* – 5a. petală.

104

Contacts: gradinabotanicachisinau@gmail.com; v_ghendov@mail.ru; +373 69607791

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

KNIPHOFIA NELSONII Mast.

(TORCH LILY, RED HOT POKER)

'MICUL PRINȚ'

Autors: Irina Sfeclă, Tatiana Sîrbu, Victor Sfeclă

Patent application: MD Nr. 516/12.07.2019

A

Work description: Herbaceous, rosulate, rhizomiferous perennial plant. Its height in the flowering stage is 40-45 cm. The leaves are green, grouped by 12-16 in a rosette, glabrous, linear-canaliculate, hard, erect or arched, 40-50 cm long and 1 cm wide, the margin and the keel are toothed. The inflorescences are spike racemes, conical, of medium density, grouping 115-120 flowers. The flower buds are red or reddish-orange. The flowers are actinomorphic, bisexual, pendulous. The perigon is of trumpet-like shape, consisting of 6 fused tepals, bicoloured (the main colour – yellow, the secondary colour – red). The flowering stage lasts 15-20 days and starts in late May or early June. The plant thrives in full sun and in well drained soil. It is suitable for landscaping, container gardening or for cut flowers.

Socio-economic and technical importance: The Torch Lily variety 'Micul Prinț' was obtained by the method of inducing mutations, using electromagnetic radiation (ɤ-rays). The irradiated biological material was *Kniphofia nelsonii* Mast seeds. Irradiation source - RXM-20 installation. Ionizing source 60 CO with an intensity of 1000 R / min. The variety obtained has shorter plants, with smaller inflorescences and more intense colors of flower buds and flowers. it is recommended for landscaping and It is the first variety of knifofie obtained and registered in the Republic of Moldova.

www.gbni.md gradinabotanicachisinau@gmail.com
irinasfecla@gmail.com tatianaonica17@gmail.com v.sfecla@gmail.com

ÎNIERBAREA TERENURILOR AGRICOLE CA METODĂ DE CONSERVARE A APEI ŞI PROTEJARE A SOLULUI

Ghid practic pentru producătorii agricoli

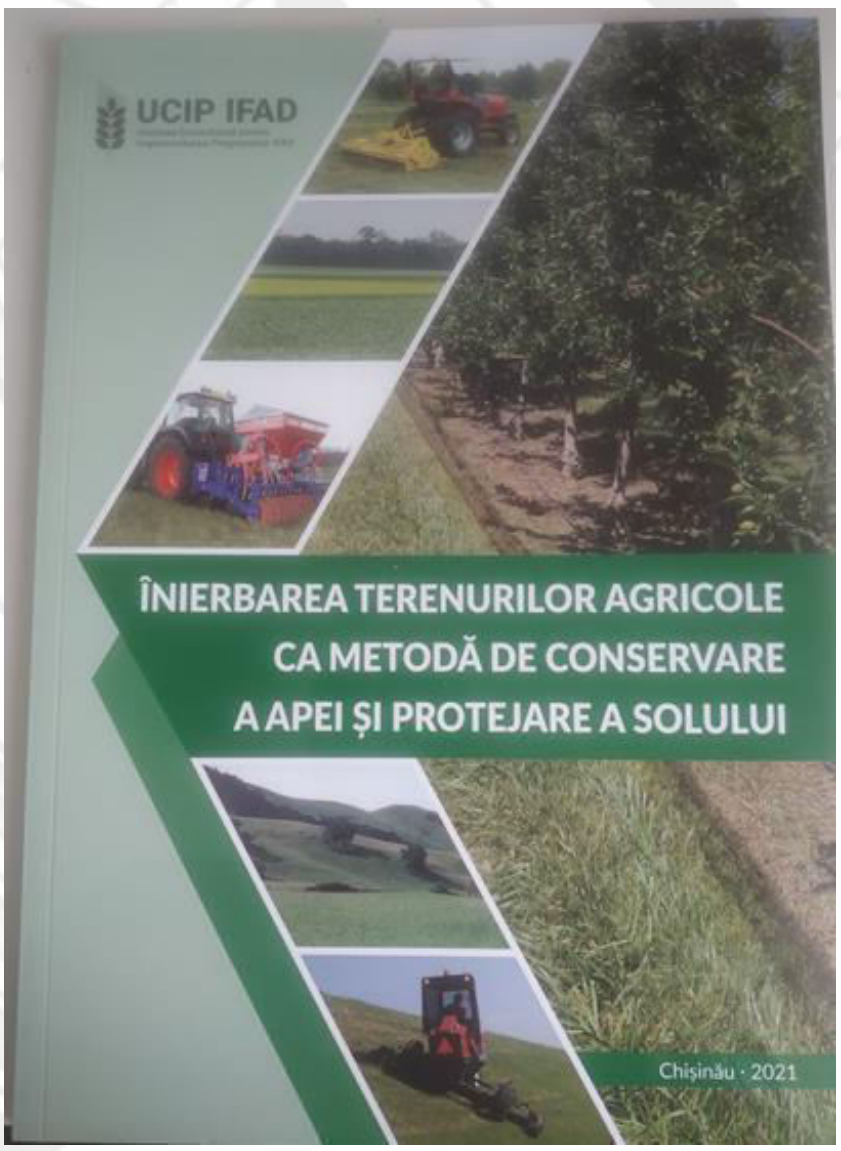
ISBN: 978-9975-87-760-2

Authors: **Dr. Eugeniu REVENCO, Dr. Victor ŢÎŢEI**

A

In the context of climate change, this Guide proposes to farmers practical solutions for the implementation of technological processes for soil water conservation by using cover crops, the creation of protective herbaceous covers on agricultural land with field annual crops, perennial plantations of fruit trees and grapevine, besides it describes the technology of sowing and maintenance of the herbaceous cover on privat and public lands for anti-erosion and soil structure improvement purposes. The guide presents the consequences of soil erosion, salinization, pollution and climate aridization on agricultural land, as well as control methods, techniques of conservation of water resources and soil moisture by planting herbaceous cover crops.

This Guide describes 24 species of perennial herbaceous plants of the botanical families *Asteraceae, Brassicaceae, Fabaceae, Poaceae* with high potential for soil protection and water conservation on agricultural lands and in perennial plantations, land selection procedures and soil preparation methods depending on the land exposure and the type of degradation, technologies and technical means of sowing and maintenance of the herbaceous cover, grassing techniques and maintenance of the herbaceous cover for anti-erosion purposes. The publication is recommended to farmers, scientific and teaching staff, students and master's degree students.



More information: http://www.ucipifad.md/wp-content/uploads/2018/12/Inierbarea-Terenurilor-Agricole-ca-metod%C4%83-de-conservare-a-apei-%C5%9Fi-protejare-a-solului.pdf ; https://www.youtube.com/watch?v=qT7B6vAGhwA

Contact: vic.titei@gmail.com botanicalgardenchisinau@gmail.com

BUNELE PRACTICI DE UTILIZARE A TERENURILOR DEGRADATE ÎN CULTIVAREA CULTURILOR CU POTENŢIAL DE BIOMASĂ ENERGETICĂ

Ghid practic pentru producătorii agricoli

ISBN: 978-9975-87-760-7

Authors: **Dr. Victor ŢÎŢEI, Dr. Ion ROŞCA**

This guide describes the soil degradation processes, the types and categories of degraded lands for rehabilitation and creation of plantations of energy crops, the results of the research on agrobiological features, technological elements of the cultivation of 45 species of annual, biennial and perennial plants from the botanical families *Asteraceae, Brassicaceae, Fabaceae, Hydrophylaceae, Malvaceae, Papaveraceae, Poaceae, Polygonaceae, Rosaceae and Salicaceae*, which possess high potential of energy biomass production, as well as the location of energy crops depending on the type and category of degraded land, the assortment of species and various sowing or planting schemes, land preparation and specific agricultural equipment needed for it, plant care techniques, technologies for harvesting herbaceous and woody crops for energy biomass, methods of processing the biomass into solid biofuels (bales, biomass chips, pellets and briquettes), liquid biofuels (bioethanol and biodiesel) and gaseous biofuel (biomethane).

The creation of industrial plantations with the suggested crops can contribute to diminishing the intensity of land degradation processes and its progressive recovery, will produce energy biomass in an area deficient in firewood sources, offering the possibility of using these crops as honey plants, improving the landscape, creating new jobs and improving the living conditions of rural residents. The publication is recommended to farmers, biofuel producers, scientific and teaching staff, students and master's degree students.

More information: https://www.ucipifad.md/wp-content/uploads/2018/12/Bunele-practici-de-utilizare-a-terenurilor-degradate-%C3%AEn-cultivarea-culturilor-cu-poten%C5%A3ial-de-biomas%C4%83-energetic%C4%83.pdf; https://www.youtube.com/watch?v=T6YpWNWG7tQ

Contact: vic.titei@gmail.com botanicalgardenchisinau@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

NATIONAL R & D INSTITUTE FOR WELDING AND MATERIAL TESTING ISIM TIMIŞOARA

ISIM

Excellence through competence

INSTALLATION FOR WATER DISINFECTION

Patent: A/00067/22.02.2021

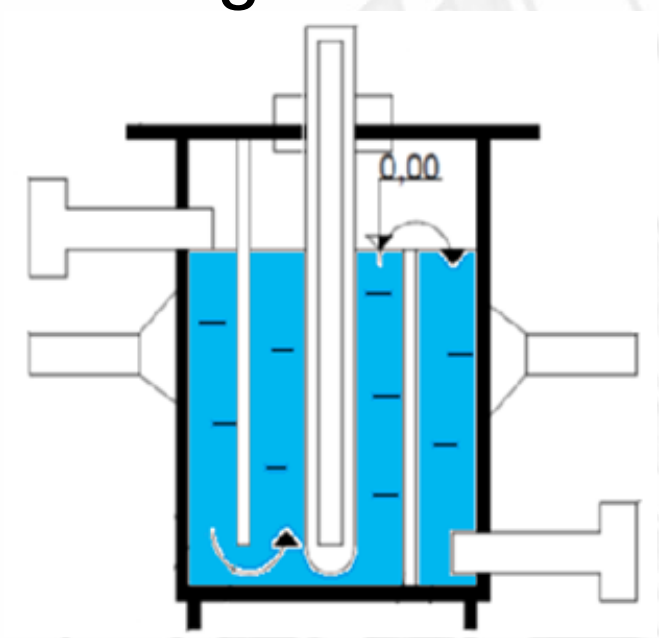
Author/s: PhD student Emilia Dobrin, ISIM Timișoara

A

Category

The installation amplifies the water disinfection process and consists of a sealed container that has positioned and fixed on the outside - four sonotrodes generating sound waves (with a frequency between 35 ÷ 60 kHz at a power of 60 ÷ 2000 W of oscillations) and two UV-C germicidal lamps and two silver plates with a deflector role and antimicrobial properties which are placed inside the container.

Figure 1



Technical data:

- Ultrasonic (US) generator
  - Power 500 W
  - Frequency 20kHz
- Ultraviolet (UV) set
  - Power 160 W/cm² (1m)
  - Length 1554 mm
  - Diameter 15 mm

The technical problem solved by the invention consists in the realization of an installation for increasing the efficiency of the water disinfection process, by combining the effects of irradiation with germicidal lamps, with ultrasonic waves and plates acting as baffles.

Contact: tel:+40 256 491831, fax:+40 256 492797, e-mail: edobrin@isim.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

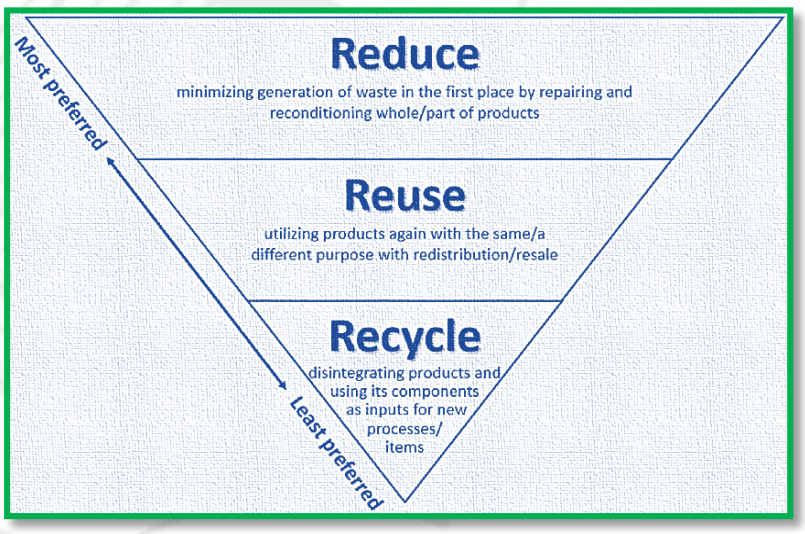
DEVELOPMENT OF COMPOSITE SOLUTIONS WITH RECYCLED TEXTILE WASTE

PhD Thesis

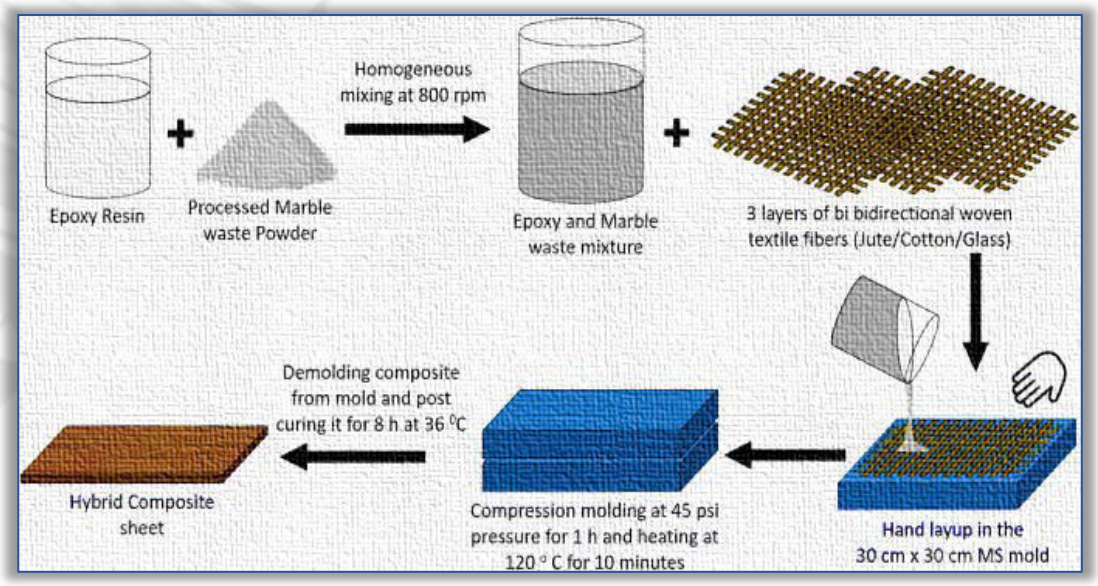
Author/s: Mihai-Paul TODOR, Imre KISS

A

TEXTILE WASTE amounts represent a remarkable issue whether they are produced during production and processing of textile materials, such as production waste and excesses (industrial or pre-consumption), or at the end-of-life of products, once it had been sold and used (post-consumer materials). Whereas pre-consumer textiles can be easier recycled because we know their general composition and sources, post-consumer textiles often consist of different materials that need to be taken apart to be regenerated. PRE-CONSUMER TEXTILES are yarn, fabric and products leftovers (fabric weaving, cut and sew fabric scraps, clothing samples or unsold garments) that are discarded during production. POST-CONSUMER TEXTILES are garments disposed by the wearer after use.



Much of the TEXTILE WASTE is thrown in landfills or incinerated, with a high environmental impact and at great cost. Valuable resources held within the waste are also lost. Having in view that 50% of collected clothing is re-wearable, and the rest could be recycled, a particular attention have to be given to recycling processes for both products and waste, aiming at reintroducing them in a new industrial process, through new manufacturing ways, and so, starting a new life-cycle. The textile reuse and recycling, in general, reduce environmental impact compared to incineration and landfilling. There are different approaches to be used and different ways to identify suitable technologies that could lead product manufacturing towards a remarkable reduction of production costs, while considering recyclable materials as a real and efficient alternative. Among them, there are technologies for waste recovery, which transforms textile waste into secondary raw materials, creating circularity and reducing environmental impact. Studies have shown that different textile waste can be used in COMPOSITE SOLUTIONS. This type of reinforcements has become a major research subject in recent years. This study aims to investigate the COMPOSITE SOLUTIONS with RECYCLED TEXTILE WASTE.



Contact: Imre Kiss/UPT /Faculty of Engineering Hunedoara/Dept. Engineering&Management/imre.kiss@fih.upt.ro

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

UNIVERSITY OF AGRONOMIC SCIENCES AND VETERINARY MEDICINE – BUCUREȘTI

SINTEF Energy Research, Gether AS

ClimaGreen

A

Energy-efficient climate control of a greenhouse for increased productivity

Ovidiu Ionuţ Jerca, Răzvan Ionuț Teodorescu, Liliana Bădulescu, Sorin Mihai Cîmpeanu, Veronica Țiu, Mariana Postamentel, Michael Bantle, Sigurd Sanaan, Helge Gether, Elena Maria Drăghici

Project: COD:RO-NO-2019-0420

ClimaGreen project, addressing the thematic area of 'Energy', will develop and test a new concept for integrating a heat pump at the USAMV Bucharest research greenhouse. The project goal is to optimize the climatic conditions in glasshouses, minimize the energy usage and demonstrate the potential for heightening the overall productivity of greenhouses in general. The basic idea is that integrated heat pumps provides both heating and cooling to the greenhouse, while controlling the relative humidity. Excess heat from the summer season will be thermally stored for winter usage.

ClimaGreen focuses on building social awareness related to the challenges of clean and energy-efficient operations in food production area. The project will develop and demonstrate a sustainable production system and use it further to improve the educational materials, at different levels. Currently the system of cooling/heating with heat pump system are not used in Romania and by the implementation of this project we expect that the system will become more widely known, available and used, bringing economic and environmental benefits. USAMV Bucharest, being the biggest University of agronomic sciences of Romania, will spread the new knowledge and technology developed in this project to students and stakeholders like farmers, the industry, and officials from the Ministry of Agriculture, Ministry of Education and Research, Ministry of Environments, associations.

ACKNOWLEDGMENTS:
„The researchleading to these results has received fundingfrom the NO Grants 2014-2021, under Project contractno. 40／2021”

Contact person: JERCA Ionu '-Ovidiu
e-mail:jerca_ovidiu@yahoo.com

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

University of Agronomic Sciences and Veterinary Medicine – București

A

Management and rational exploitation of plants from the spontaneous flora of the RTF LAG

Georgescu M.I., Săvulescu E., Luchian V., Stănică F., Velcea M.N., Stan A., Cătuneanu I., Frîncu M., Petre A.C., Jerca O.I, Ivan E.Ș., Scorobete A., Butcaru A.C.

The territory of the RTF LAG has an important untapped floristic potential although the area is clean and unpolluted and with a great diversity of plants with curative or aromatic potential

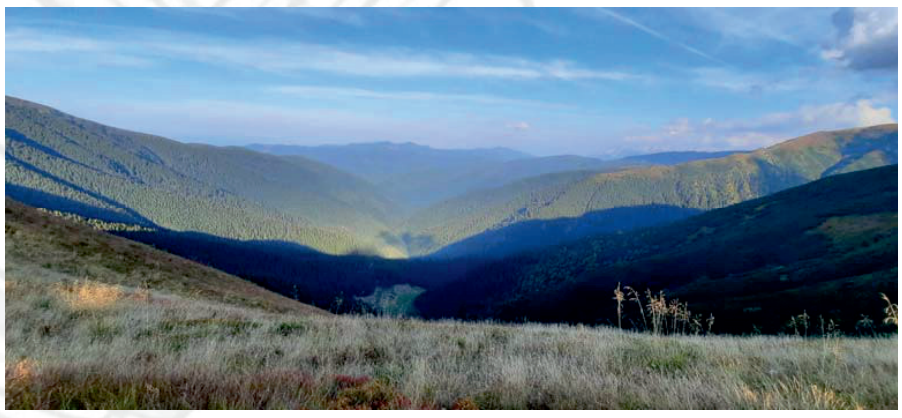
Through the partnership between the Local Public Authority Ocolul Silvic Pădurile Șincii R A and the University of Agronomic Sciences and Veterinary Medicine in Bucharest aims to cooperate in order to research inventory and protect the spontaneous flora in the LAG territory cooperation for the rational collection processing transport storage packaging unitary joint labeling of the resulting products and cooperation for the promotion of this activity and the identification of final customers

O1. Carrying out a study of areas of interest

A Field studies at least on a whole cycle of vegetation inventory and mapping of useful flora by relief units by soil types by zonal or altitudinal vegetation units Checking and completing the results in the second cycle of vegetation
A Carrying out the phytocenotic survey which consists of a succession of observations and determinations made during a vegetation cycle in the field
A Topographic transposition of the phytocenotic survey together with another service provider I
A Checking and completing the results in the second cycle of vegetation

O2. Carrying out specific qualitative and quantitative analyzes from a technical economic perspective

A The qualitative analyzes will be performed by collecting samples of products from the studied plots and transported in fresh form or processed to specialized analysis laboratories
A Analysis of the economic potential of these areas quantitative and qualitative for each useful species according to the previously agreed list and comparative studies of fresh and processed products
A Comparison with other similar products on the market from spontaneous flora culture from Romania or imported I



O3. Elaboration of a study on the sustainable exploitation of resources

A Establishing the optimal harvesting period of plants and fruits fro the spontaneous flora and establishing the optimal recipes for capitalization in order to reach the maximum quality parameters
A Identification of high value added exploitation processingage technologies in order to achieve a rational and sustainable exploitation of existing resources
A Stimulating cooperation in order to create recognized local brands

Acknowledgments: This research was conducted with the support of a contract of the University of Agronomic Sciences and Veterinary Medicine in Bucharest in the project Management and rational exploitation of plants in the spontaneous flora of the RTF LAG funded by PNDR Submeasure Leader

Contact: BUTCARU Ana
E-mail: anabutcaru@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Technical University of Cluj-Napoca

CENTER OF EXCELLENCE IN THE FIELD OF COMPOSITE MATERIAL AT TAPARO SA

Project number: Cod SMIS: 121434

Person in charge: Ciupan Emilia

A –Energy and Protection of the Environment

Description: The main objective of the project is to design an integrated set of technological lines to produce natural fibers and composite materials, for their consolidation into finished products and for the recycling of the resulting waste. The first objective aims to achieve a material research and production base for the composite materials based on vegetable fibers, to consolidate them into finished products specific to upholstered furniture, using the most appropriate technologies and the waste recycling resulting in all phases of transformation of composite into products.

The main achievements brought by the UTCN team in the project are:

1. Identification of the requirements imposed on composite materials intended for upholstered products;
2. Analysis of thermal consolidation technologies of nonwoven material based on natural fibers and thermoplastic fibers;
3. Analysis of the possibilities of recycling and recovery of waste resulting from the thermoforming process;
4. Design of three pilot technological lines of thermal consolidation through: thermoforming (Figure 1), injection (Figure 2) and extrusion (Figure 3);
5. Elaboration of composite materials and their characterization (Figure 4).

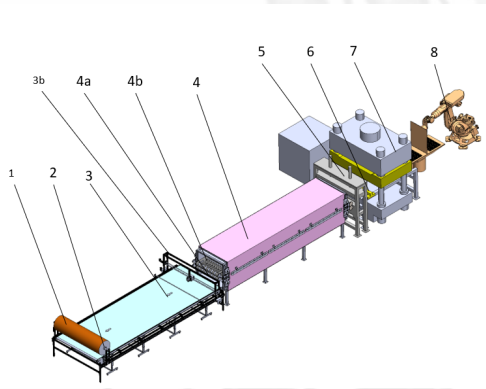


Figure 1. Termoforming line

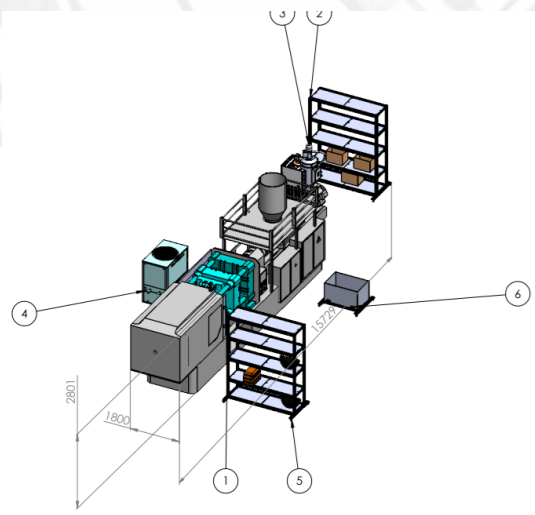


Figure 2. Injection line

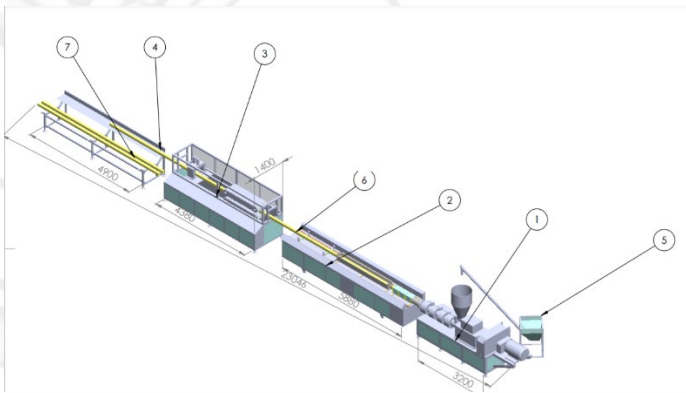


Figure 3. Extrusion line

Figure 4. New composites materials

Contact: emilia.ciupan@mis.utcluj.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

HYDROGEN SULPHIDE WITH SURFACE ACOUSTIC WAVES

Application Patent OSIM, ROMANIA, A/00469, 31.07.2020

Authors: Bogdan-Cătălin Șerban, Octavian Buiu, Cornel Cobianu, Roxana Marinescu

A

FIELD OF INVENTION

- The invention includes the design and manufacturing processes for a new gravimetric hydrogen sulphide (H_2S) sensor, employing carbon nanohorns functionalized with mercapto groups (-SH) and carbonothioyl (-C=S) groups (abbreviated as CNH-SH, **FIG 1**).

ORIGINAL APPROACH

- The H_2S sensor includes a quartz piezoelectric substrate, interdigital transducers and a sensing layer deposited via spin coating (**FIG 2**).
- The sensing layers described in this invention are based on carbon nanohorns subjected to H_2S / He plasma treatment. This type of functionalization ensures the selectivity of nanohorns towards H_2S molecules by grafting sulphur-based groups, such as SH and C = S. At the same time, the optimal degree of derivatization of carbon nanohorns, in order to obtain high sensitivities, can be tuned by changing the plasma power, as well as the exposure time.
- Sensitive layers of the H_2S / He plasma-functionalized nanohorns type interact with the H_2S molecules. The adsorption of the H_2S molecules alter the mechanical and electrical properties of the sensing layer, leading to changes of the propagation rate and frequency of the surface acoustic wave.

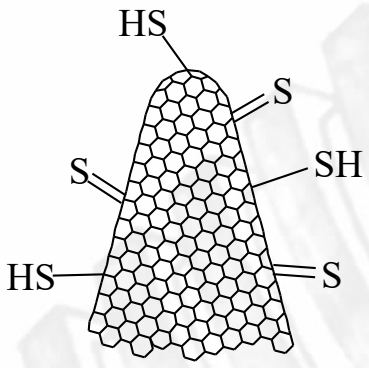


FIG 1 – Structure of CNH-SH

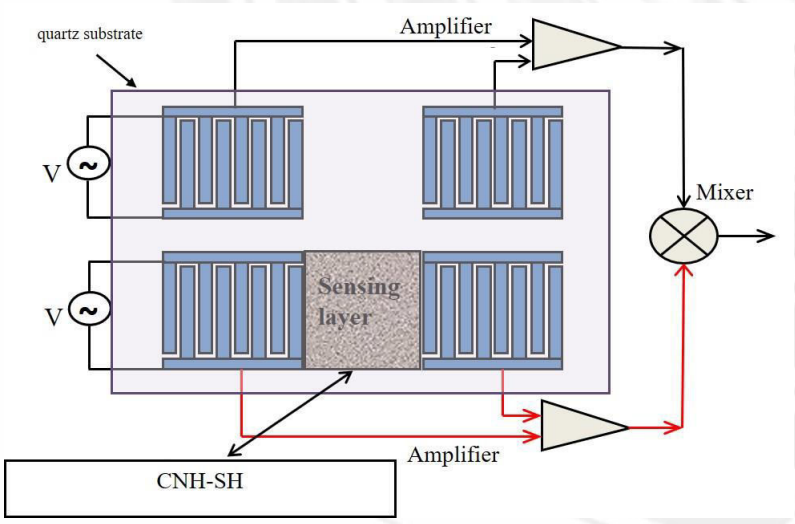


FIG 2 – Structure of the H_2S sensor

SYNTHESIS OF THE SENSING LAYER

The process steps for synthesising the solid-state sensing films based on CNH-SH are shown below:

- Carbon nanohorns, purchased from Sigma Aldrich, are functionalized in H_2S / He plasma (60-40 v/v), with a plasma power of 30 W, at an exposure time of 5 minutes.
- The synthesized CNH-SH is washed with ethanol, acetone and deionized water.
- A dispersion of CNH-SH (10 mg) in 100 mL dimethylformamide is subjected to ultrasonication RT for 12 hours.
- The obtained dispersion is deposited by the spin coating method on the quartz substrate (2000 rpm, for 60 s).
- The obtained film is heated at 120^0C for 30 minutes.
- Steps 4 and 5 are repeated.
- The obtained film is subjected to a final heat treatment, at 200^0C, for 10 minutes.

ADVANTAGES OF THE PROPOSED SENSING LAYERS

- Improved mechanical properties and better processability
- High specific area / volume ratio, affinity for H_2S molecules through van der Waals-type interactions ("mass loading"), as well as a variation of its resistance in contact with H_2S molecules ("electric loading").

Contact: bogdan.serban@imt.ro
www.imt.ro

B

Architecture

Civil Engineering

Interior architecture

Materials

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Universitatea Politehnica Timișoara

2020

PRIMUL VEAC DE ÎNVĂȚĂMÂNT UNIVERSITAR ÎN TIMIȘOARA

PROCESS FOR INTEGRATING THE DRY DEFLECTION BY-PRODUCT INTO THE DENSITY SLAM RECIPE FOR HYDRAULIC TRANSPORT THROUGH PIPE SYSTEMS

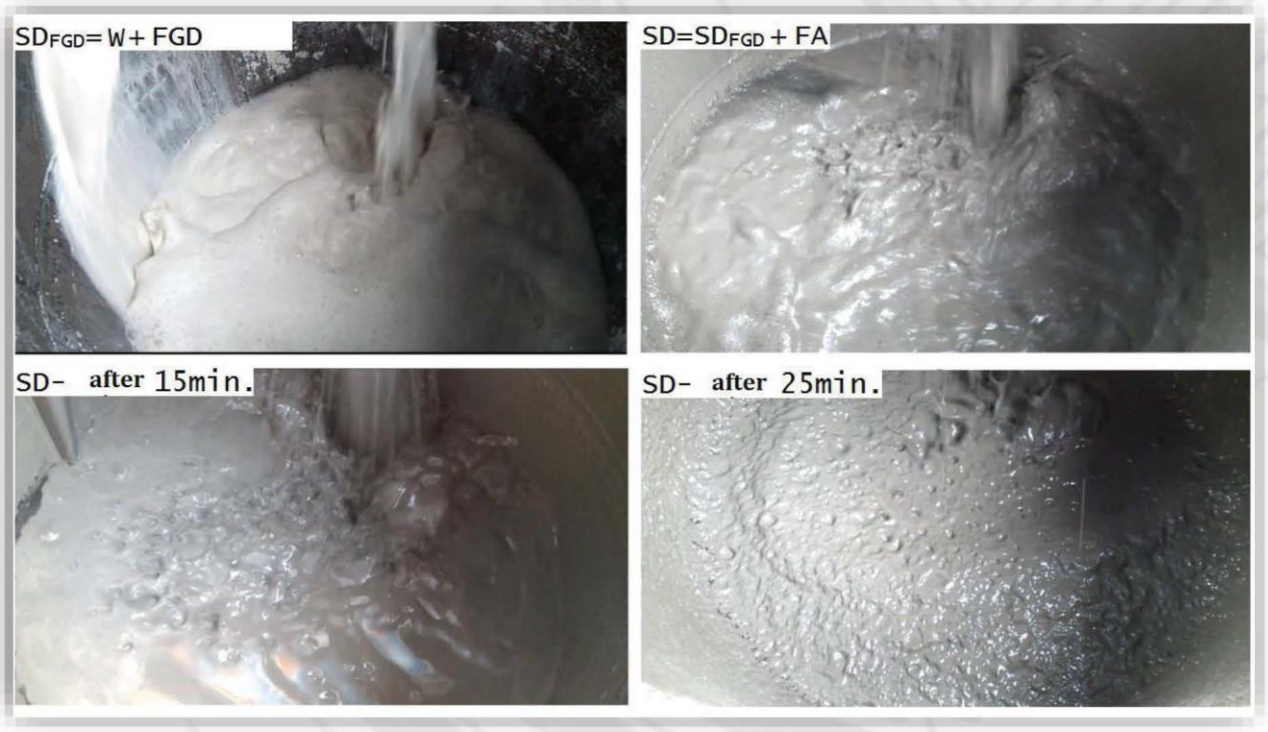
RO 131485 B1 / 27.11.2020

B

Authors: **WÄCHTER Mihail Reinhold, IONEL Ioana, NEGREA Petru**

The invention relates to a process for integrating the by-product resulting from dry desulfurization by applying the dense sludge technology for hydraulic transport through piping systems, as ell the storage in the dump of the desulfurization by-product resulting from the technological process of flue gas treatment related to coal-fired power plants. The field of the invention is that of environmental protection.

The process does not influence the self-hardening properties of dense sludge, prevents the deposition phenomena on the walls of transport pipes, reduces the cost of transport and storage of desulfurization by-product, involves a low implementation cost, has a low energy consumption in operation compared to other methods and does not pollute the environment. Added to this is the outstanding light immunity, which allows for reliable results even outdoors and under suddenly changing lighting conditions. The corrective power of the glasses can also be adapted to the wearer, and the eye tracking glasses can be comfortably worn with contact lenses. With the very short calibration time compared with other options, the glasses can be quickly adapted to the wearer and made ready for use. Once calibrated, the Eye Hyper-Tracking glasses can be used again and again for hours at a time – comfortably and unobtrusively.



AD=additive;
FA=electrofilter fly-ash;
SD=dense sludge;
FGD=by-product of dry desulphurization;
W=water.

Applications: The dense sludge prepared according to the process described according to the invention solves the problem of preparing the dense sludge recipe, which also includes the desulphurization by-product, resulting in a slurry fluid, capable to be hydraulically transported through pipes to the slag and ash depot, specific to coal thermal power plants. According to the experimental results, it is found that the process of integrating the dry desulfurization by-product into the dense sludge preparation recipe according to the invention provides a technological solution for the hydraulic transport of the dense sludge containing dry desulfurization by-product.

Contact: wachter_reinhold@yahoo.com; +40 742 171 963

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Universitatea Politehnica Timișoara

EARTHING ELECTRODE WITH CORROSION RESISTANT CONNECTIONS

B

A/ 00757/28.09.2018

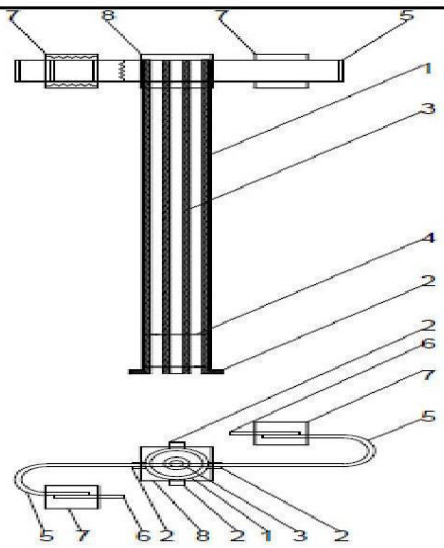
authors: Pavel Ștefan, Ungureanu Daniel-Viorel, Mocan Marian Liviu, Doboși Ioan Silviu, Topală Florin-Ionel

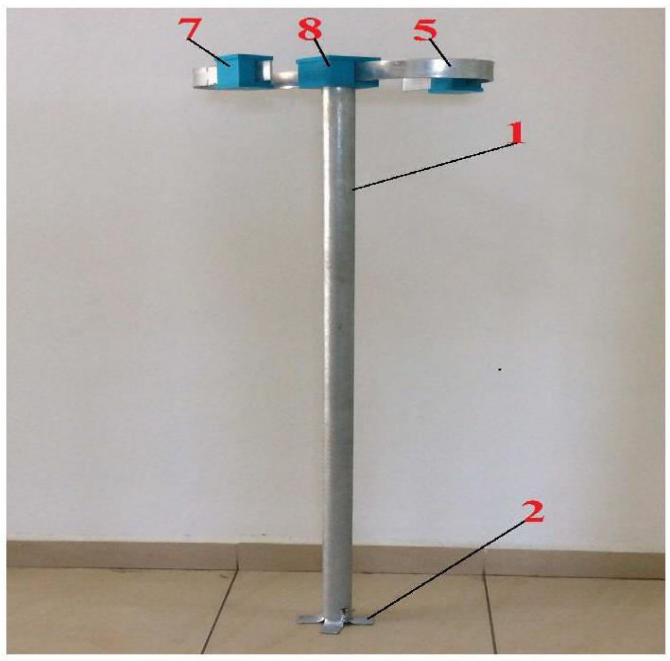
DESCRIPTION

The electrode consists of some concentric tubes, an outer galvanized steel tube, and an inner galvanized steel tube joined to the bottom by welding with a plate, and at the top by a flattened metal plate in the shape of „S", so that the connections are made through the heads of the flattened metal plate through welding with the flattened horizontal metal plate of the earthing installation. The connection are covered with bitumen inside a plastic corrosion protection box and the top of the electrode assembly, the connection area between the electrode's flattened metal plate, and the horizontal earthing installation flattened metal plate has and access zone for periodic checks and measurements.The externally galvanized steel tube provides, at a limited length, at least 4 equidistant longitudinal grooves that allow the material of the tube so that on said tube some wings materialize, transversely on its axis, in the form of a rosette, which defines a larger contact surface of the galvanized steel tube with the soil.

ADVANTAGES

- ***Allows a better contact with the soil;***
- ***Provides through a lower electrical resistance, a better passage and dissipation of the lightning surge through the soil ;***
- ***Provides anticorrosive protection for the horizontal earthing flattened metal plate joining pieces***
- ***Ensures a simpler assembly work so that the possibility of friction with the soil is removed, implicitly the removal of the zinc coating.***





Mobile Pavilion for Rainwater Collection

Phd.eng. Pisleaga Mihaela[1], MAA Arch. Gabriel Aranda[2], Phd.eng. Cristina Capotescu[3]
Polytechnic University of Timisoara, [2] Glomad, [3]Aquatim
mihaela.pisleaga@upt.ro

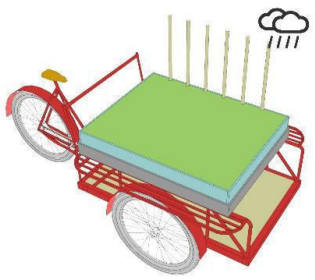
Novelty & Usefulness

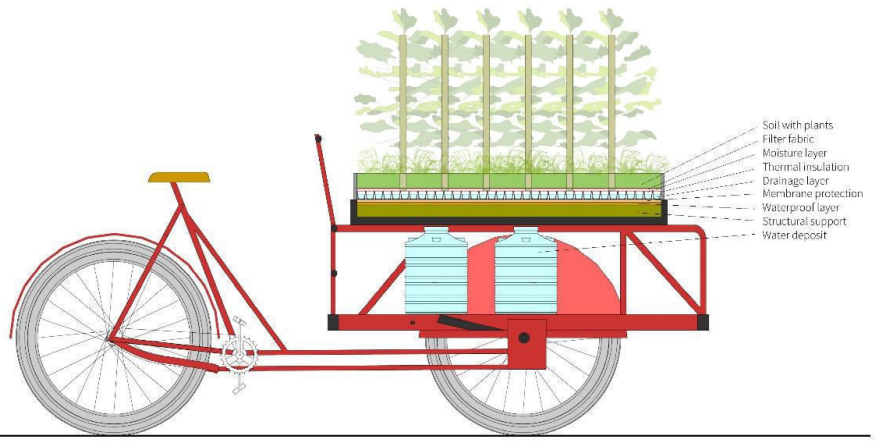
In this period of population growth and in which we can observe the impact of climate change through extreme events, we must, more than ever, take care of natural resources that are not inexhaustible. Rainwater harvesting is used as a way to save money and as a way to take care of the environment. In this context, rainwater harvesting is the easiest way to educate the population about adapting to climate change. Thus, through this mobile rainwater collection stand we propose green solutions for residential buildings (roof, walls) that sensitize the population, understanding the importance of caring for resources, in this case water.

B

Low cost design

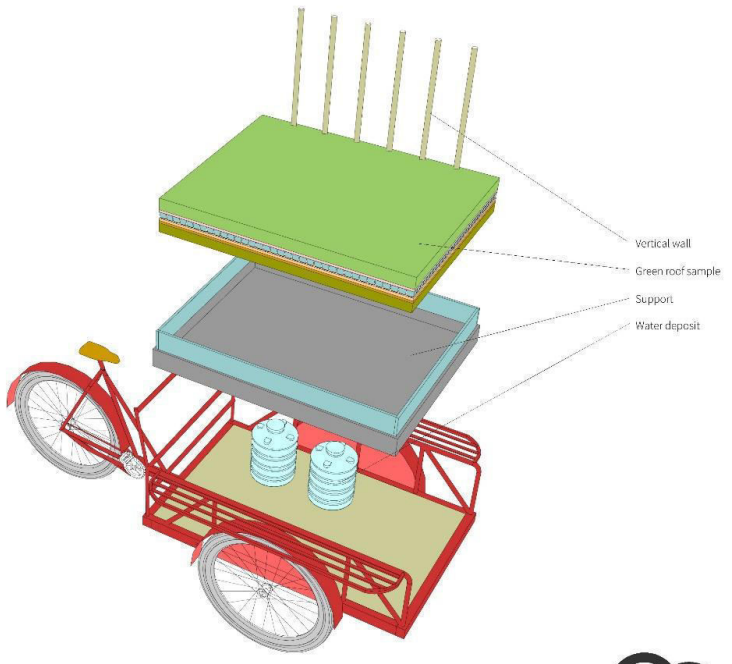
Green roof meets public. The main idea is to adapt a regular 2 wheels bicycle into a cargo bike, 3 wheels. After to adapt a 1 x 1 meter sample of a green roof, and 60 cm height green wall, including all the necessary pipes and water deposit(s), in order to show how all the elements works together. The installation will provide all the necessary information regarding the function of a green roof and wall. Will be an interactive experience between the city dweller and the buildings, promoting good praxis and awareness related with rainwater.





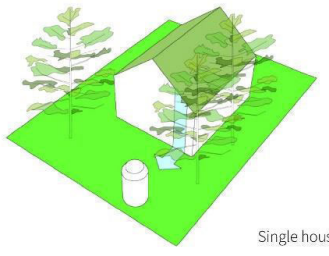
Social and economic impact

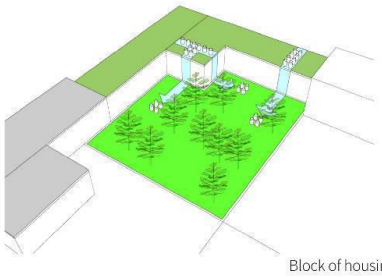
The mobile pavilion has a design that allows placement in public areas without the need for additional fees. In this case, the pavilion will be located in the space of the Faculty of Civil Engineering Timisoara, so that students understand what solutions exist for rainwater collection. In the future, as engineers they will have the ability to understand the importance of green roofs in buildings, especially since there are countries where the legislation imposes the obligation to build green roofs and it is possible that the legislation requires this in Romania.

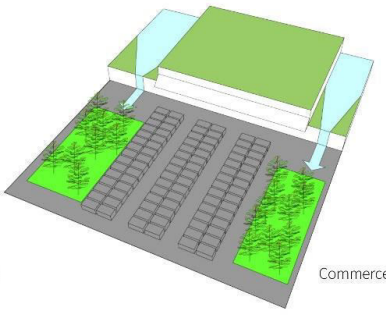


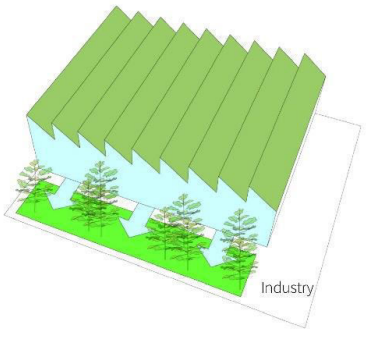
Market opportunities

The construction of green roofs, for buildings, as a solution to adapt to climate change is a current issue, in some countries the legislation still does not clearly specify this aspect. But this is the future, we need green spaces in the urban area and green roofs, for buildings is a solution. The team includes two engineers and an architect, and the market opportunities part consists of consulting on the design and execution of green roofs for new and old buildings.


Single housing


Block of housing


Commerce & Parking


Industry

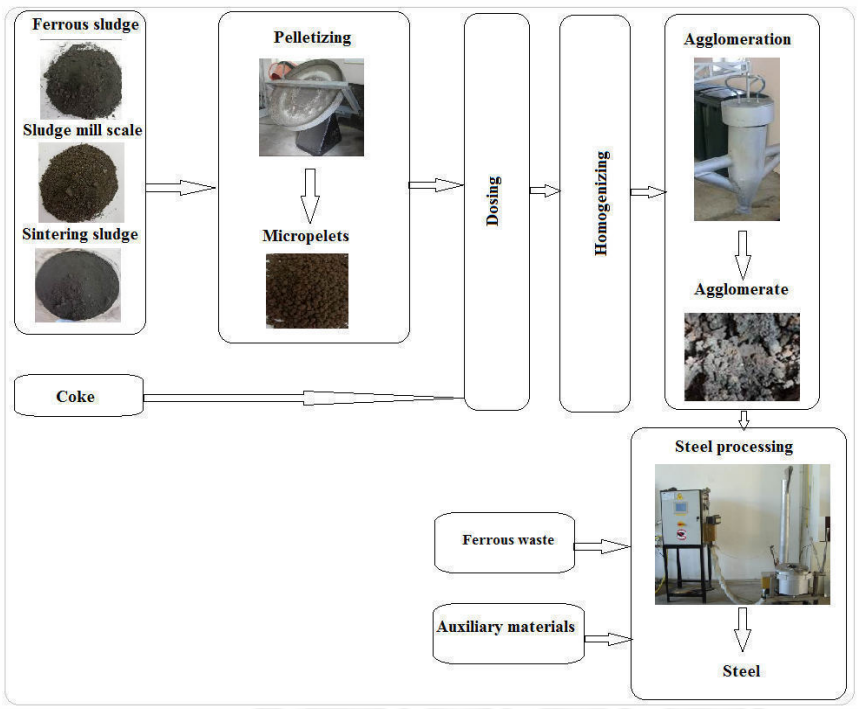
Capitalization of ferrous sludge in the steel industry

PhD Thesis

Author: Oana Lupu, Ana Socalici

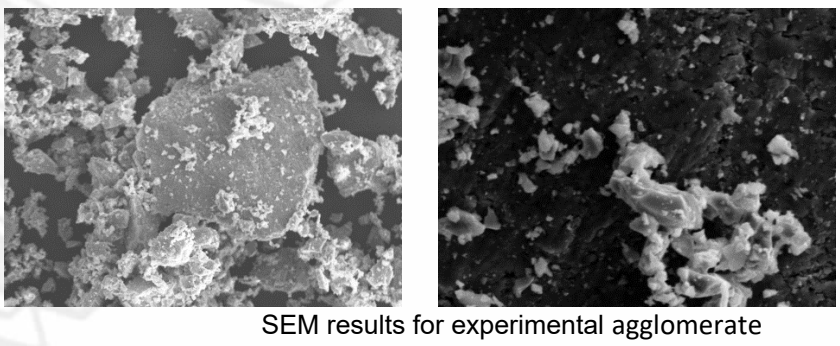
B

The global steel industry used about 2 billion tonnes of iron ore, 1 billion tonnes of metallurgical coal and 570 million tonnes of steel scrap to produce about 1.8 billion tonnes of crude steel. Recycled steel is one of the industry's most important raw materials. In the sustainable future new economic models will maximize the value of raw materials by encouraging practices such as reuse and remanufacturing.



By-products - agglomerate

Waste processing



SEM results for experimental agglomerate

Making better use of iron and steel waste is an important problem, because turning it into by-products, hence economic goods, can lead to rational exploitation of raw materials and energy resources, thus ensuring both the needs of human society and environmental protection. The worldwide strategies of metallurgical developments consist in developing performant technologies in order to reduce emissions while also grow the capability of by-product recovery and recycling.

Contact: oana.lupu@yahoo.com, +40747820535

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Simulating the solidification of brake shoes made of phosphorous cast iron

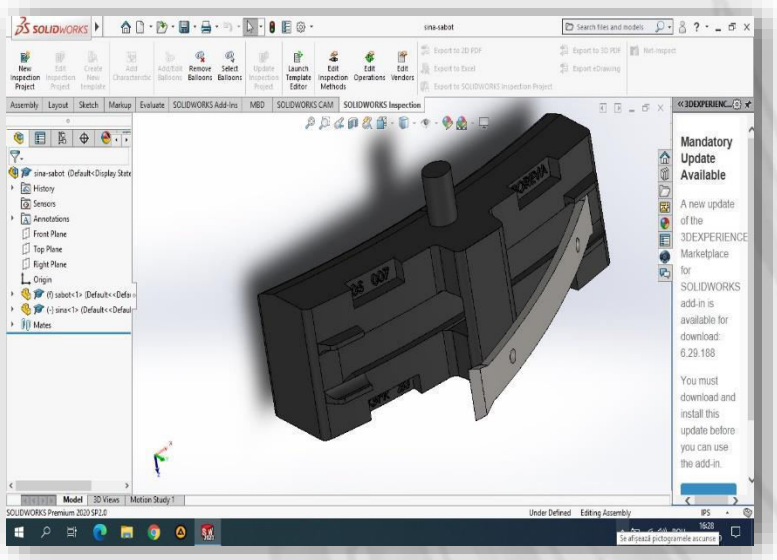
PhD Thesis

Authors: Flavius Bucur, Ana Socalici, Vasile Putan, Ana Josan, Marius Ardelean

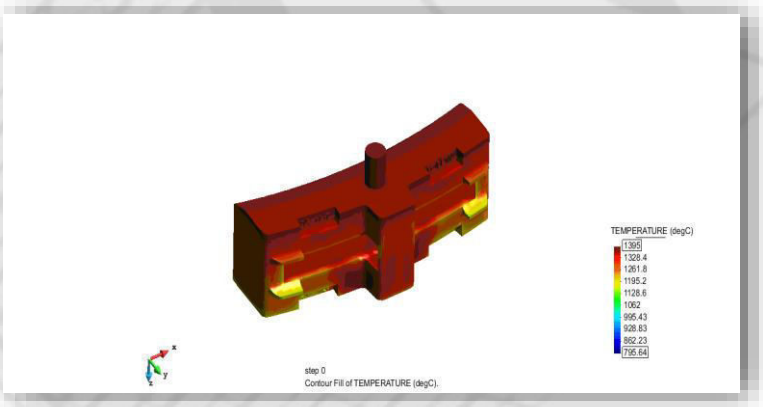
B

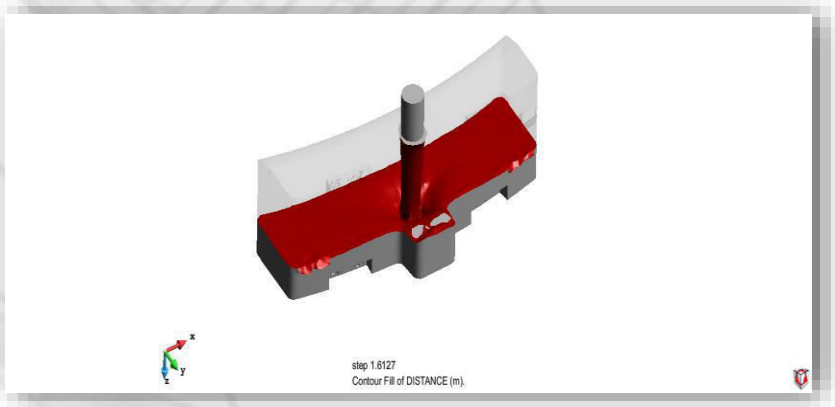
The way that the metallic alloys are cast influences greatly the quality of the cast parts. The process of solidification influences the micro and macro-structure, the compactness, mechanical resistence, dimensional precision and surface quality of the parts. P10 cast irons are mainly used for manufacturing brake shoes for rolling stock.

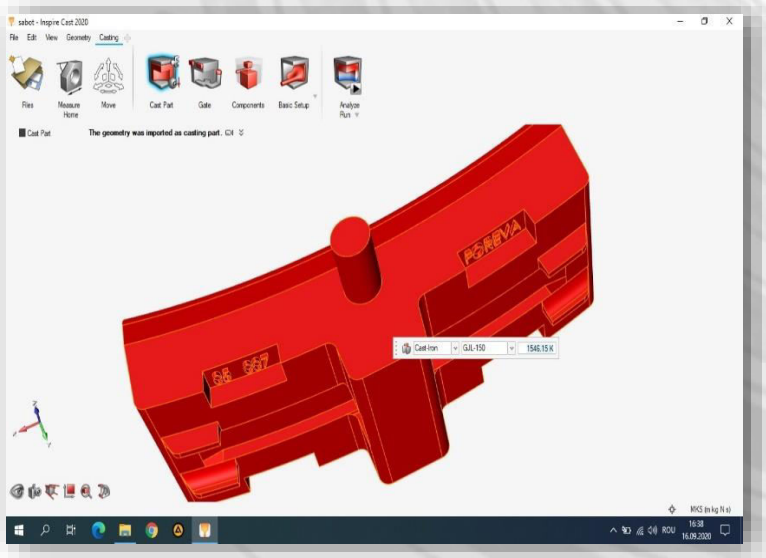
The molding and simulation of the solidification process were done using SolidWorks și Altair Inspire Cast. The solidification process of brake shoes is influenced by construction and technological factors.



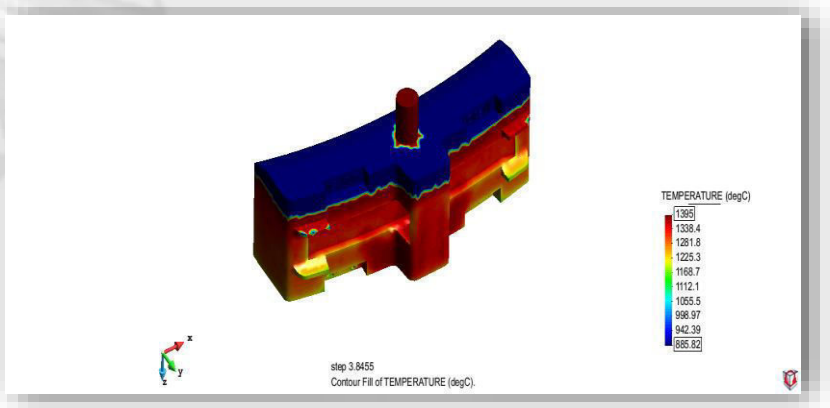
Brake shoe-reinforcement rail ensemble







Choosing the material



The solidification of cast brake shoes is influenced by construction and technological factors, such as cast temperature, the nature of the mold, feeding mode and feeder system. The simulation process provides information about temperatures, porosities, voids, solidification process, and mold behaviour.

Contact: flavius_bucur@yahoo.com, +40743011626

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

DEVELOPMENT OF REINFORCING CONCRETE WITH RECYCLED PLASTIC WASTES

PhD Thesis

Author/s: Andrei-Mihai BACIU, Imre KISS

B

SOLID WASTE is one of the many factors that negatively affect the environment. The PLASTIC is an important type of solid waste with a strong environmental impact, all types of plastic used in daily life becoming, sooner or later, waste. Therefore, increasing consumption of various types of plastic products is one of the most important challenges in environmental protection. From different perspectives, WASTE REUSE is important because it helps to recycle in the production process, reduces environmental pollution, and helps sustain and conserve non-renewable natural resources. On another hand, many constructions require precise techniques and technologies that can utilize a number of new materials. Also, the lightweight building material industry is considered useful in promoting reused materials. In this context, the use of SIMPLE CONCRETE and REINFORCED CONCRETE is somewhat restricted by specific phenomena such as: cracking, fire resistance, shrinkage, shock resistance, wear resistance, durability, etc. For this reason, an improvement in the performance of the concrete can be obtained by adding in their mass of reinforcements dispersed in the form of fibres from different materials. The DISPERSED REINFORCED CONCRETE results in the inclusion of a variable amount of DISCONTINUOUS FIBRES in the concrete mass. These fibres can be of different types and sizes and have different properties. This type of reinforcements has become a major research subject in recent years.

Therefore, using plastic waste in the materials industry is an environmental solution to minimize the proportion of landfills used in waste incineration. REUSING PLASTICS as concrete additives could also redirect old water and soda bottles, the bulk of which would otherwise end up in a landfill. Research has focused on the impact of adding plastic material to fresh and hardened concrete. This study aims to investigate the use of POLYETHYLENE TEREPHTHALATE (PET) WASTES in concrete.

Contact: Imre Kiss/UPT /Faculty of Engineering Hunedoara/Dept. Engineering&Management/imre.kiss@fih.upt.ro

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

Asociația „Justin Capră“

B

Cărămidă refractară, metoda de construcție a unei structuri formată dintr-o multitudine de cărămizi refractare și structura astfel realizată

Tătar Doru

PCT/RO2020/050001 – 49-2019PCT

Noul tip de cărămidă și de structură e o aplicație a bionicii și imită structura corpului unui animal, buretele marin.

Circulația gazelor în regeneratoarele cauperelor, prin canale verticale independente, este înlocuită cu un labirint 3D care conține și canale orizontale de legătură ce unesc toate cele 12 goluri verticale ale oricărei cărămizi din structură.

Laureatul Nobel Richard Feymann a spus că singura problemă încă nerezolvată în fizica clasică e turbionarea. Faptul e confirmat de distanța mare a zonei declarată de tranzienta între regimul de curgere laminar și turbulent (număr Reynolds de la 2000 la 4000), fapt care afectează calculul teoretic al regeneratoarelor.

Prezenta invenție rezolvă problema turbulenței altfel:

- fiecare gaură verticală din fiecare cărămidă a regeneratorului se continuă pe verticală cu una diferită ca volum, ceea ce creează șocuri si discontinuități ale circulației verticale a gazelor;
- fiecare gaură verticală din fiecare cărămidă a regeneratorului se continuă pe orizontală cu una până la patru găuri diferite ca volum prin canale orizontale trasate la nivelul orizontal al fețelor superioare sau/și inferioare ale cărămizii respective.

Ambele aspecte tulbură curgerea verticală a gazelor în canalele respective. În plus, printr-o orientare favorabilă a canalelor orizontale, acestea creează în plan orizontal turbioane în canalele verticale pe care le unesc, ce întrerup liniile de curgere laminară.

Circulația orizontală e provocată de diferențele de presiune dintre canalele verticale astfel unite iar curgerea acestei circulații are loc în sens invers de la fiecare nivel de cărămizi la următorul.

Canalele orizontale contribuie în plus prin suprafața pereților acestora la transferul termic între gaze și materialul refractar.

Avantajele principale sunt:

- garantarea turbionarii gazelor în orice canal vertical al oricărei cărămizi din structură, indiferent de numărul Reynolds sau curba lui D. Sanna;
- suprafața de transfer termic poate fi modificată după nevoi, cu măriri de peste 30% în funcție de zona structurii, fără modificarea porozității structurii sau a masei refractare din soluțiile aplicate actual;
- înlătură consecințele oricărei obturări locale a curgerii prin un canal vertical al structurii față de circulația prin restul acelui canal;
- oferă creșteri de randament tehnologic de peste 8% și performanțe tehnice constante nelimitate în timp, indiferent de tipul de cauper (la care se aplică) și cu costuri similare celor actuale.

Contact person: Tătar Doru
E-mail: acasagalati@gmail.com

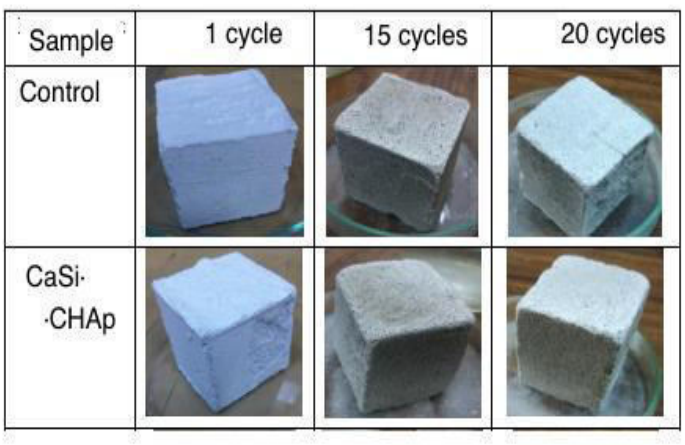
NANOMATERIAL USED TO STRENGTHEN THE DECORATIVE ELEMENTS OF HISTORICAL HERITAGE BUILDINGS AND ITS PREPARATION AND APPLICATION PROCESS

B

Patent Application: 00531/07.09.2021

Author/s: Rodica Mariana Ion, Cristiana Radulescu, Lorena Iancu, Laura Monica Gorghiu, Ramona Marina Grigorescu, Mădălina Elena David, Nelu Ion, Sofia Slamnoiu Teodorescu

The present invention refers to the preparation of a nanomaterial based on SiO_2 and CaO and its application for the consolidation of architectural decorative elements - stuccoes and façade ornaments from historical buildings.



Brushed samples				
Sample	Test sample	consolidated with MgAl-LDH	consolidated with CaAl-LDH	consolidated with CaMgAl-LDH
ΔE*	/	1.1	1.32	2.2
Compressive strenght MPa	8.27	8.66	8.68	8.33
Water absorption %	15.7	15.03	16.5	16.41
Aparent porosity %	31.6	30.22	33.17	32.98

This invention refers to a nanomaterial for the consolidation of architectural decorative elements - stuccoes and façade ornaments, and the refurbishment of the damaged ornamental elements of the historical buildings, at the procedure of its preparation and application, consisting of a mixture of SiO_2 and CaO.

Stucco before treatment

Stucco after Treatment

Effects: Drying and grinding the refurbished parts, strengthening layer, uniformly covering the cracks, crevasses and voids in the surface structure stable in time, thermally stable, on the entire applied surface there is no change in appearance, color, or clarity of dispersion.

Contact: rodica_ion2000@yahoo.co.uk

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Technical University of Cluj-Napoca

METHOD OF OPTIMIZATION OF EXPERIMENTAL DESIGN USING VORONOI DIAGRAMS, APPLIED TO POLYMER CONCRETE

Patent RO135128 (A2) - 2021-07-30

Author: **Ciupan Mihai**

B

The patent application describes a method of optimizing a two or multifactorial experimental design focused on determining the properties of polymer concrete (mineral casting) in order to find the optimum material formulation for a given application in the field of modern machine-tools. The invention solves the problem of maximizing the information regarding one or more of the properties of the material (the dependent variable/s) using only a limited number of tests defined by the independent variables.

An example is given for a two-factorial experimental design where the independent variables are p, the percentage of resin from the total formulation mass, and q, Funk and Dinger's equation coefficient. The method consists of the following steps: choosing the independent variables and their rectangularly shaped value domain, choosing 4 points (C1, C2, C3, C4) in the corners of the rectangle, choosing the remaining n-4 points (C5 to Cn), in a random way on the surface of the rectangle, calculating the Voronoi diagram for the points and then moving points C5 to Cn inside the rectangle until the corner surfaces are all equal to one another (S1=S2=S3=S4) and the inner surfaces are all equal to one another (S5=S6=...=Sn). The experiment is run for each of the conditions and the results are used to build a response surface for E, Young's modulus.

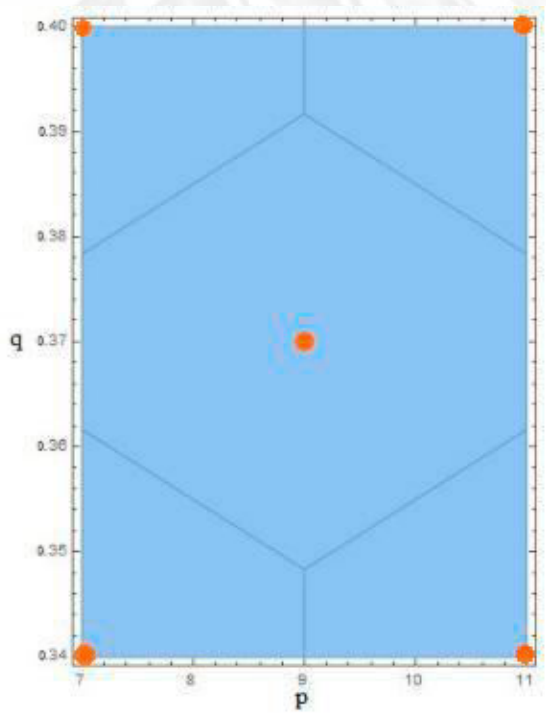


Fig. 1. Voronoi diagram of the (p;q) domain

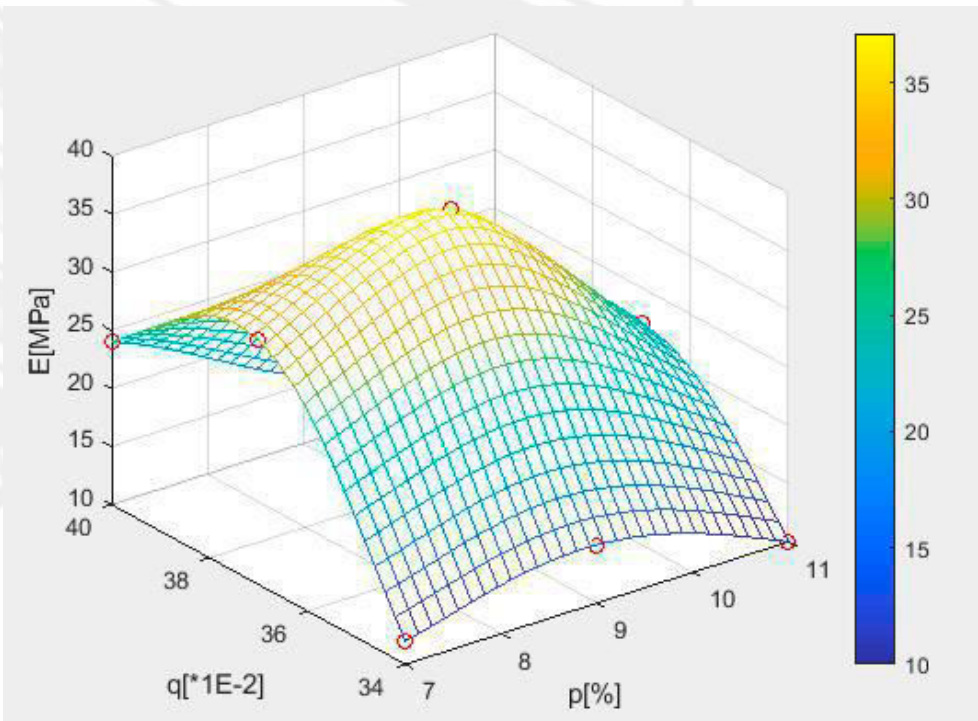


Fig. 2. Response surface E = f(p;q)

Contact: mihai.ciupan@muri.utcluj.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Technical University of Cluj-Napoca

THERMOPLASTIC COMPOSITE SELECTION METHOD FOR POWERING AN AUTOMATIC THERMOFORMING LINE

Patent application: A/10063/2021

Author/s: **Emilia Ciupan, Ioan Filip, Cornel Ciupan, Mihai Ciupan**

B

Composite material 1 from a feed drum 2 is spun on the cutting table 3 then transferred to the furnace 4, where it is heated until it reaches a temperature higher than the melting temperature of the thermoplastic matrix. A feeding mechanism 6 takes the material and transfers it to the forming press 7 where it is consolidated by cooling in a mold. Finally, the consolidated part is taken over by the robotic cell 8, for finishing the contour.

The method involves the division of products into classes with a representative benchmark, then static studies are performed by the finite element method and the minimum wall thickness is determined so as to simultaneously meet the requirements of the permissible safety factor and deformation for each available composite material, after which determine the department cost of the representative part for each available material and select the composite that offers the minimum department cost, and for any other part of the representative part group the FEA analysis will be done only with the material selected for the representative part and the wall thickness will be determined which satisfies the technical restrictions, and then the number of overlapping layers will be determined, and the data that will be transmitted to the automatic thermoforming line.

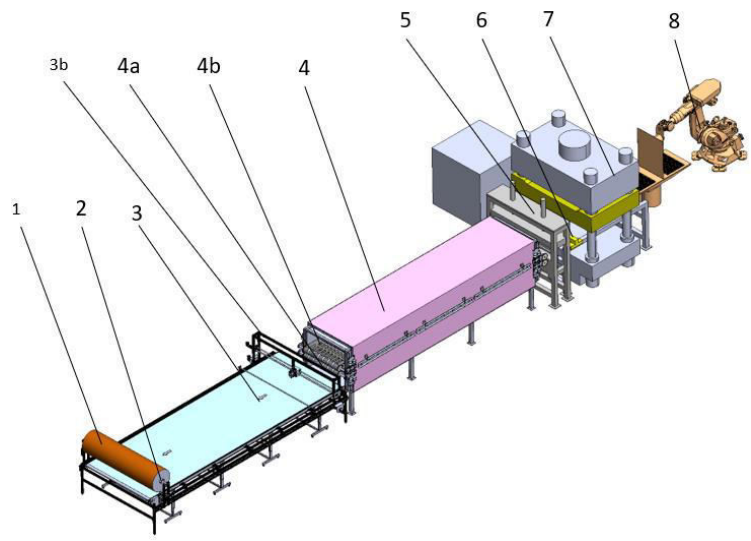


Figure 1

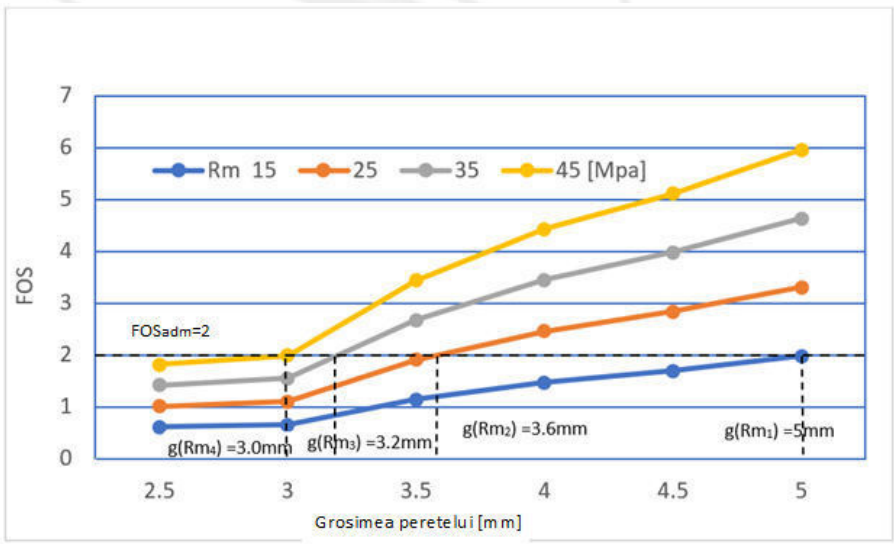


Figure 2

Contact: cornel.ciupan@muri.utcluj.ro

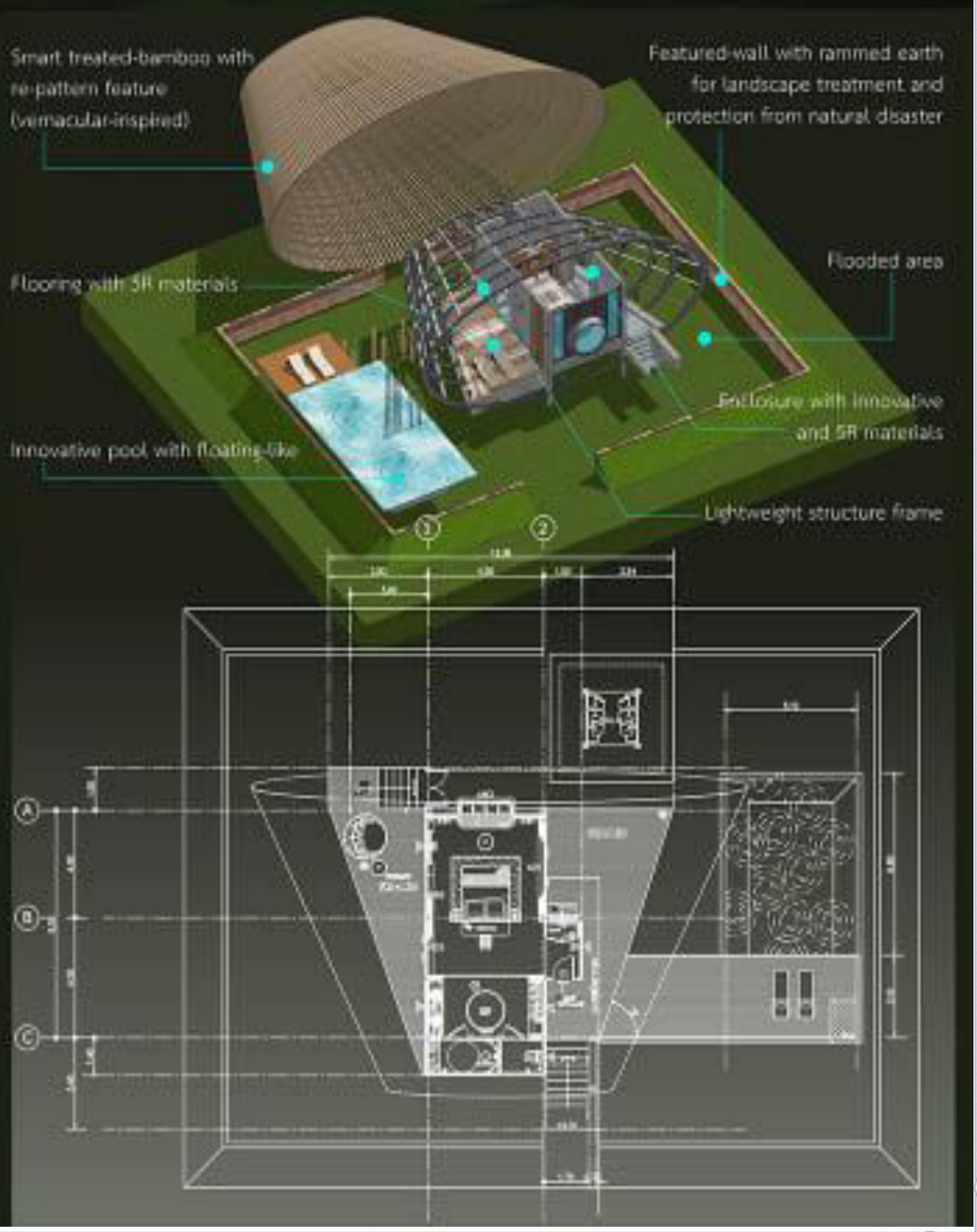
Asst.Prof. Khiensak Seangklieng,PhD,ASA.
Faculty of Architecture and Planning
Thammasat University, Thailand
Email: Khiensak@yahoo.com

B

LCDs *RESORT*

A Smart Architecture with Lightweight Innovation

LCDs RESORT, an innovation of living architecture designed with integrated solution for tourism development based on the Post-COVID19 situation. Design principle is emphasized into material-oriented approach which re-interpreting lightweight innovation of cellular concrete, smart treated-bamboo (vernacular-inspired) and 5R materials (reuse, recycle, reclaimed, re-pattern and re-value) combined with local wisdom of traditional tectonics. The design of resort unit is strongly emphasized the passive aspects with the concept of green and sustainable design as well as the sufficient architecture in the context of climate changes and design for disaster (D4D).



- **Outstanding Characteristics of LCDs Resort:**
  - Research-based design approach
  - Innovation through integration/invention
  - Dry-process construction
  - Quick installation
  - Vernacular/indigenous-inspired
  - Local wisdom/traditional tectonics
  - Non-toxic materials
  - Low-impact/low-cost design solution: LCDs
  - Zero-waste/zero-energy consumption/ zero-carbon emission/zero-carbon footprint

- **Design Contribution:**

  Apply and integrate into resort architecture with LCDs design approach

C

Computer sciences

Electronics

Electricity

Communication

Security

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Universitatea Politehnica Timişoara

INSTALLATION FOR THE EVALUATION OF THE MAGNETIC FIELD EXPOSURE EFFECTS

C

A/ 00336/15.05.2018

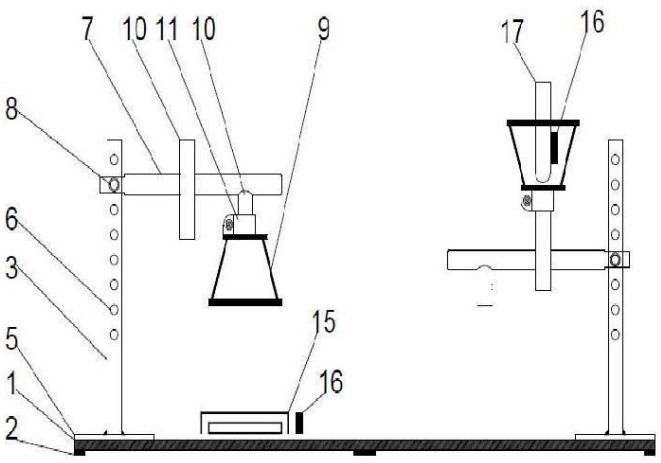
authors: Pavel Ştefan, Lupa Lavinia Afrodita, Mocan Marian Liviu, Ungureanu Daniel-Viorel, Doboşi Ioan Silviu, Moldovan Aurel, Simina Alina Georgiana, Bînzar Alexandru, Suciu Silviu Cristian

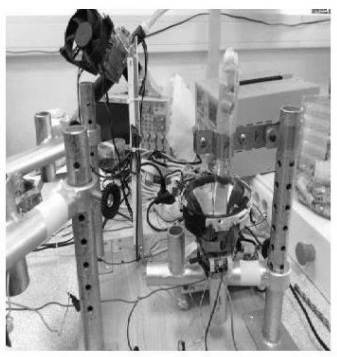
DESCRIPTION

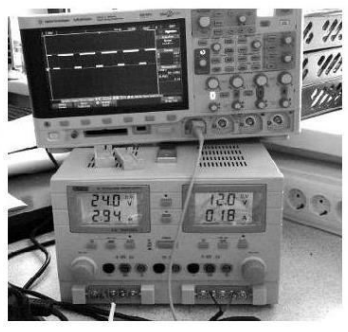
The invention relates to an installation which can be used to evaluate the effects of a oscillating, pulsed, low frequency magnetic, 20÷70 Hz, and adjustable intensity on the cells of a biological sample: extracted tissue, organic fluid, living organism, seeds. The installation according to the invention consists of a support plate on which at least two perpendicular supports are positioned, depending on the number of workstations required to perform the study.On each arm attached to the support it is fixed an inductance, which can be positioned and fixed both in perpendicular plane for approach or distancing of the work sample so as to obtain the desired intensity of the magnetic field, as well as horizontally plane by sliding or (and) by rotation on the mounting support in front of the studied sample. The adjustable power source is controlled by a scheduler and connected to a variable frequency rectangular pulse generator.

ADVANTAGES:

- **Ensures the possibility of performing experiments under controlled exposure conditions;**
- **Allows evluation of the effects of a low frequency magnetic field, 20 ÷ 70 Hz, on the sample cells under specific exposure conditions;**
- **It is a compact, unitary, portable investigation tool and it doesn't require any auxillary measuring and recording equipment;**
- **It provides flexibility in configuration, depending on the investigation needs, simplicity and safety in operation.**







CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Universitatea Politehnica Timișoara

INSTALLATION FOR REMOTE MONITORING OF CORROSION OF THE GROUND CONSTRUCTIONS COATED OR NOT WITH ZINC

C

U/ 00037 03.08.2020

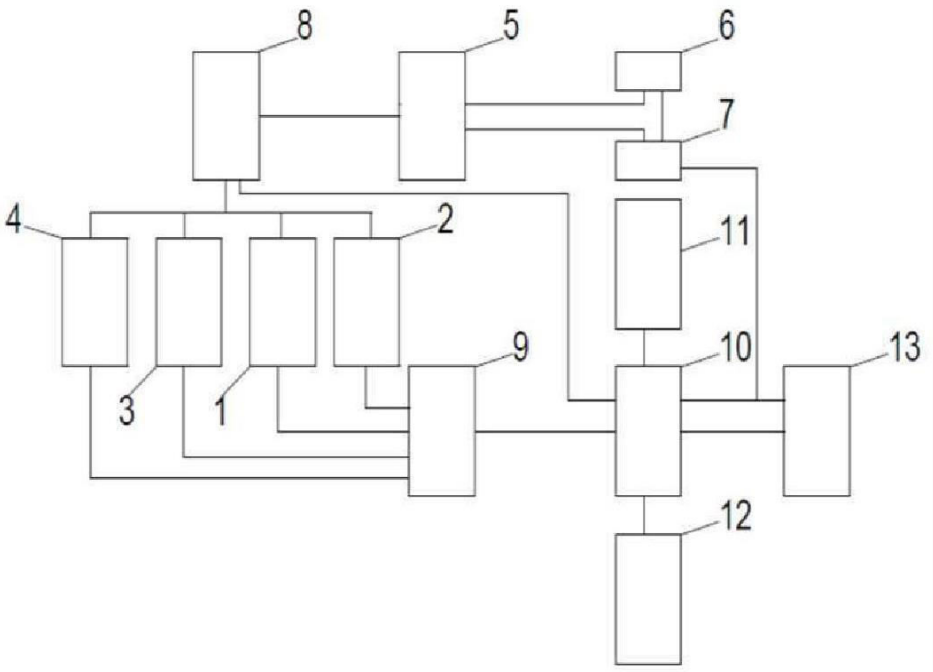
Authors: Pavel Ștefan, Ungureanu Daniel-Viorel, Bînzar Alexandru, Moldovan Aurel

DESCRIPTION

Installation for real-time remote monitoring of ground constructions coated or not with zinc. The technical issue solved by this invention, consists in making an installation for real – time remote monitoring of the coated or no coated ground metal constructions found at predetermined depths and data recording, transmission of the obtained data and archiving it.

ADVANTAGES:

- Ensures remote monitoring of the installation;
- Provides recording, saving, archiving and real-time data transmission;
- Provides remote control.



CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Syria

A mouse that is operated with one foot

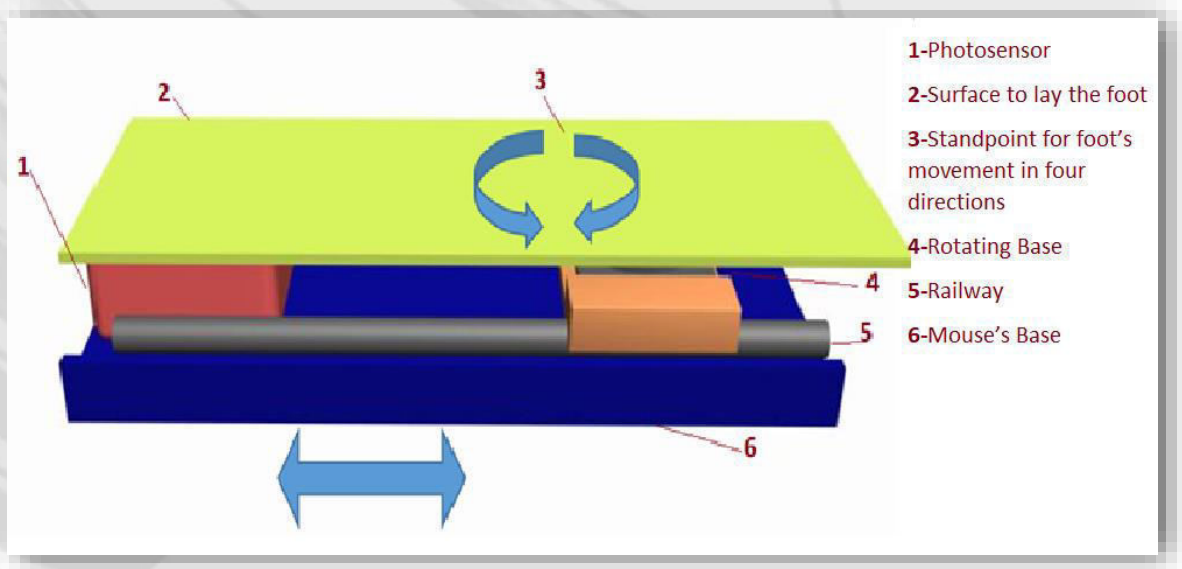
Project

Authors: Issam Hamdi, Tarek Turk

No: 2019050076

C

The one-foot mouse is specifically useful for people with an injury in their upper limbs, whether it is a complete amputation, neurological or vascular weakness or paralysis. The mouse consists of several pieces. The base carries all other pieces, has the electrical part and has two railways on the sides that allows for the upper piece to slide forwards and backwards. At the same time, there is a semi-fixed disc that enables the move towards the left and right. The buttons are pressed by touching a slide on the side of the device, and the electrical signal is transmitted with a cable or wirelessly.



The most important features of this mouse that works with one foot is that it drags and drops without lifting the foot from it.

Syria Damascus
Mobile: 00963944546371
mail: inventor.issam@gmail.com

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

MOLDOVA STATE UNIVERSITY
Scientific Research Laboratories
"ARTIFICIAL INTELLIGENCE AND VIRTUAL & AUGMENTED REALITY "
" BIOLOGICAL SECURITY"
60, Alexe Mateevici str., Chisinau, MD-2009, Republic of Moldova
Tel.: +373 673 155 13
E-mail: v.ungureanu@usm.md web: cercetare.usm.md

HR EXCELLENCE IN RESEARCH

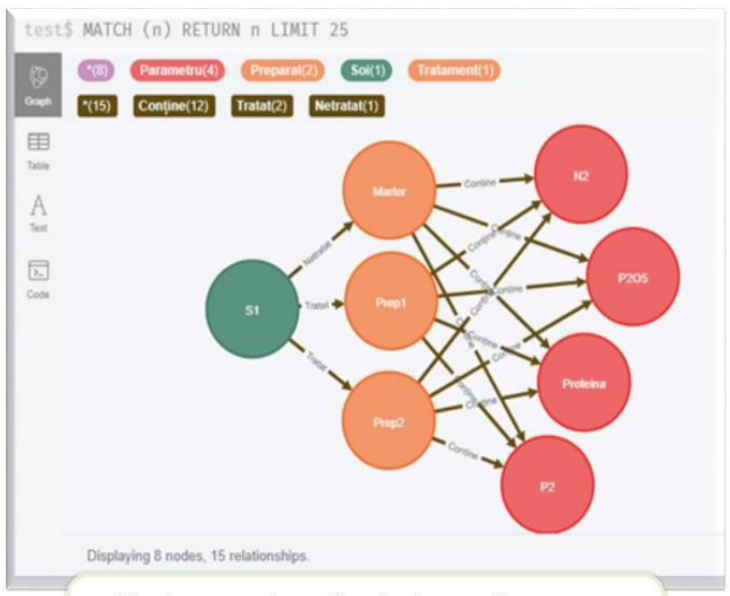
BIOLOGICAL DATA MODELING

AUTHORS: *Ion GANEA, Ana BÎRSAN*

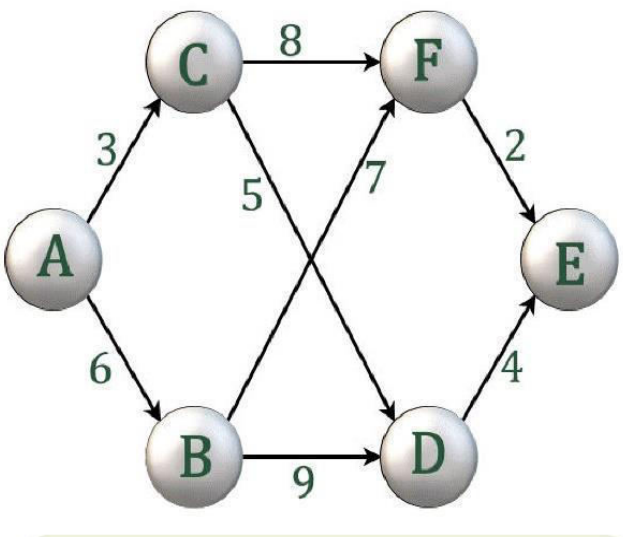
APPLICATION FIELDS: Computer Science, Biology, Agriculture

AIM: Gaining knowledge on the influence of biologically active substances on plant development, productivity and plants adaptation to certain climatic conditions.

SOLUTION: Solving data analysis problems is done by building graphs and analyzing data and information by implementing graph algorithms that provide powerful tools for working with related data used in research. Each algorithm deeply exploring the entities and relationships between them (as causal relationships and associations). *Neo4j* models different types of relationships between entities, using nodes and relationships between data to deduce knowledge from existing relationships and represents relationships from prior knowledge of the data.



Subgraph: Protein, nitrogen and phosphorus content



Shortest path algorithm

ADVANTAGES: Simple and powerful models can be made in graph database systems. Representing connected data is simple. Data analysis is done quickly across a large number of entities. No complex connections between nodes are required to retrieve connected data for analysis. Solutions to complex problems can be obtained quickly. Structured, semi-structured and unstructured problems can all be solved.

IMPLEMENTATION STAGE: Graph models and a database for scientific research were implemented in the biological safety laboratory, State University of Moldova, aimed at obtaining high-yielding soybean crops and adapting plants to climate change.

ACKNOWLEDGMENTS: This research was supported by the PhD project *"MODELS, TECHNIQUES AND PRODUCTS INTELLIGENT DATA ANALYSIS PROGRAM IN PLANT GENETICS".*
Scientific advisor: Professor, PhD. Gheorghe CĂPĂȚÂNĂ

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

iSENTINEL®

EARTHQUAKE INTELLIGENT PROTECTION AND WARNING SOLUTIONS

Author: Mircea MANOLESCU

Patent: 00373/30.06.2020

Category C

Security

Description Intelligent proactive seismic protection and early warning system designed to take decisive actions to prevent those predictable and controllable consequences of an earthquake that endanger people's lives and the integrity of the building, equipment and assets, seconds or tens of seconds before the arrival of the seismic destructive wave.

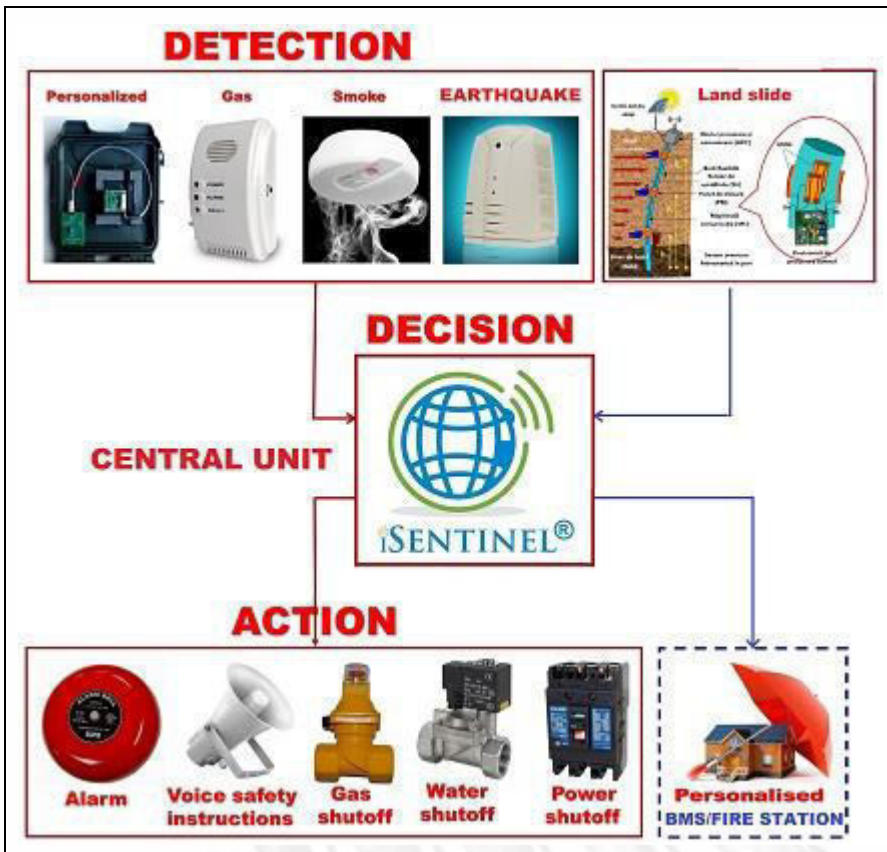


Figure 1 System architecture

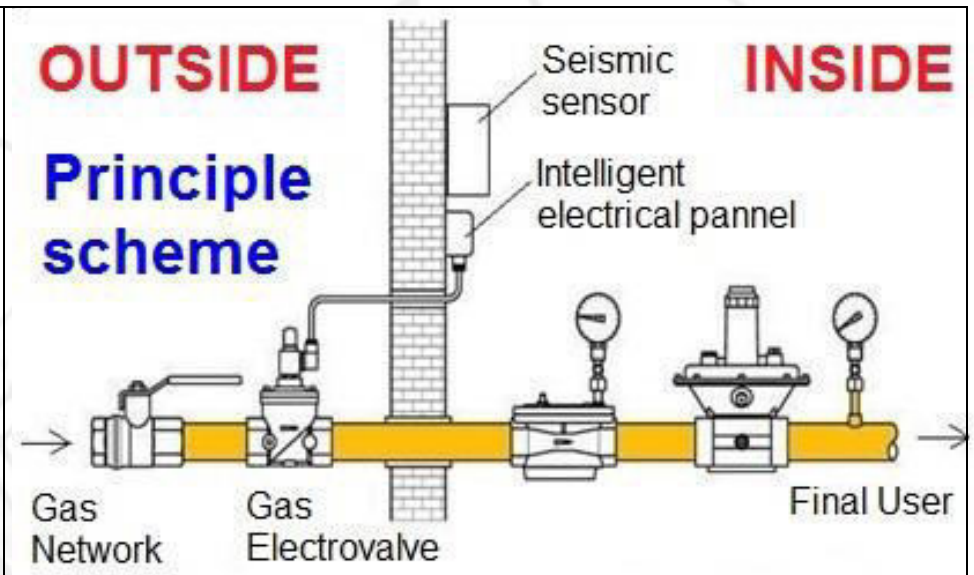


Figure 2 Installation example →

Built on three levels: ***Detection/ Decision/ Action***, the system will save thousands of lives during next major earthquake by both alerting people of the imminence of a major strike and triggering the protection procedure (especially cutting the gas supply before it enters in the building, electricity, water or any personalized protection). Thus it ensures the **life and assets protection** but also the **business continuity** and avoids the accidentally **environmental pollution**.

Integrated protection: connects with existing BMS and Fire Alarm Control Pannel.

Lowers the seismic risk and therefore **the insurance primes** (**the protection pays itself** in about two years, then economise money)

Already implementing in Romania (National Bank of Romania, National Gas Distributor, Bucharest Thermic Agent Distributor, Office Buildings – AVON, IBM etc., Blocks of flats, Schools, Colleges, Universities, Churches, Museums, Family houses, Industry etc.)

Contact:
Mircea MANOLESCU
+40 726 525 595

www.iSentinel.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

PLANNING PROCEDURE BASED ON AN ALGORITHM FOR OPTIMAL TASK DIVISION

PROCEDEU DE PLANIFICARE BAZAT PE UN ALGORITM DE DIVIZARE OPTIMĂ A SARCINILOR DE LUCRU

1948 UNIVERSITATEA DIN PETROȘANI

Patent number: OSIM A/00168/2019, prototype
Andreea Cristina IONICĂ,
Monica LEBA, Raluca Anamaria DOVLEAC

Category C

The invention refers to the development of an algorithm that allows the automatic distribution of work tasks in stages of development using an indicator called Offset, and is based on an iterative development cycle.

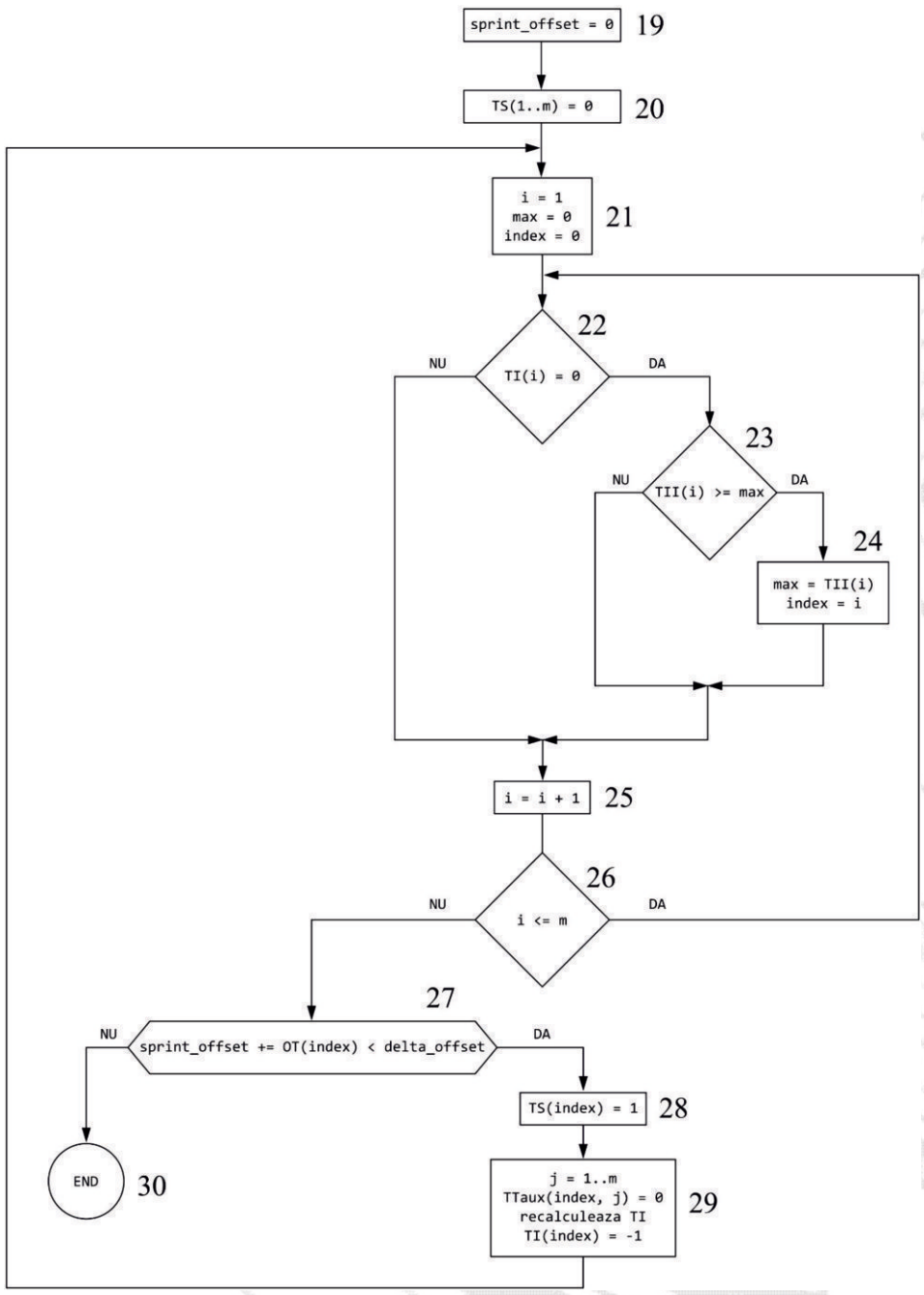


Figure 1. Algorithm

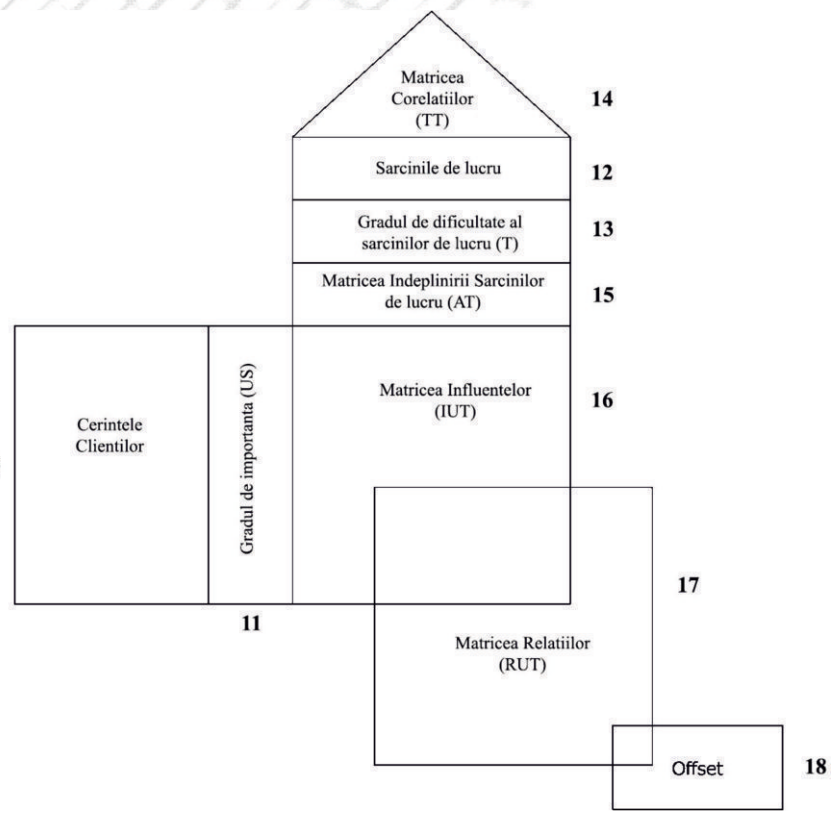


Figure 2. Modified QFD

Invenția se referă la dezvoltarea unui algoritm care permite distribuirea automată a sarcinilor de lucru în stadii de dezvoltare folosind un indicator numit Offset, și se bazează pe un ciclu de dezvoltare iterativ.

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

Asociația de Cercetare Doctorală Petroșani

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

UNDERGROUND POSITIONING AND MONITORING SYSTEM BASED ON VISIBLE LIGHT COMMUNICATION TECHNOLOGY

SISTEM DE POZITIONARE ȘI MONITORIZAREA PERSONALULUI DIN SUBTERAN BAZAT PE TECHNOLOGIA DE COMUNICAȚIE ÎN SPAȚIUL DE LUMINĂ VIZIBILĂ

1948

UNIVERSITATEA DIN PETROȘANI

Patent number: OSIM A00491/2.07.2018, prototype
Simona Mirela RÎUREAN,
Monica LEBA, Andreea Cristina IONICĂ

Category
C

The invention aims to determine the position of the personnel in the underground spaces. The communication is done through a transmission-reception system that uses the visible light of the miner's cap lamp LED.

Invenţia urmăreşte determinarea poziţiei personalului în spaţiile subterane. Comunicarea se face printr-un sistem de transmisie-recepție care folosește lumina vizibilă a LED-ului lămpii capac a minerului.

Asociația de Cercetare Doctorală Petroșani

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

MOBILE MARKETING TOOL BASED ON GAME SPECIFIC TECHNIQUES / GAMIFICATION

INSTRUMENT DE MARKETING MOBIL BAZAT PE TEHNICILE SPECIFICE JOCURILOR/GAMIFICATION

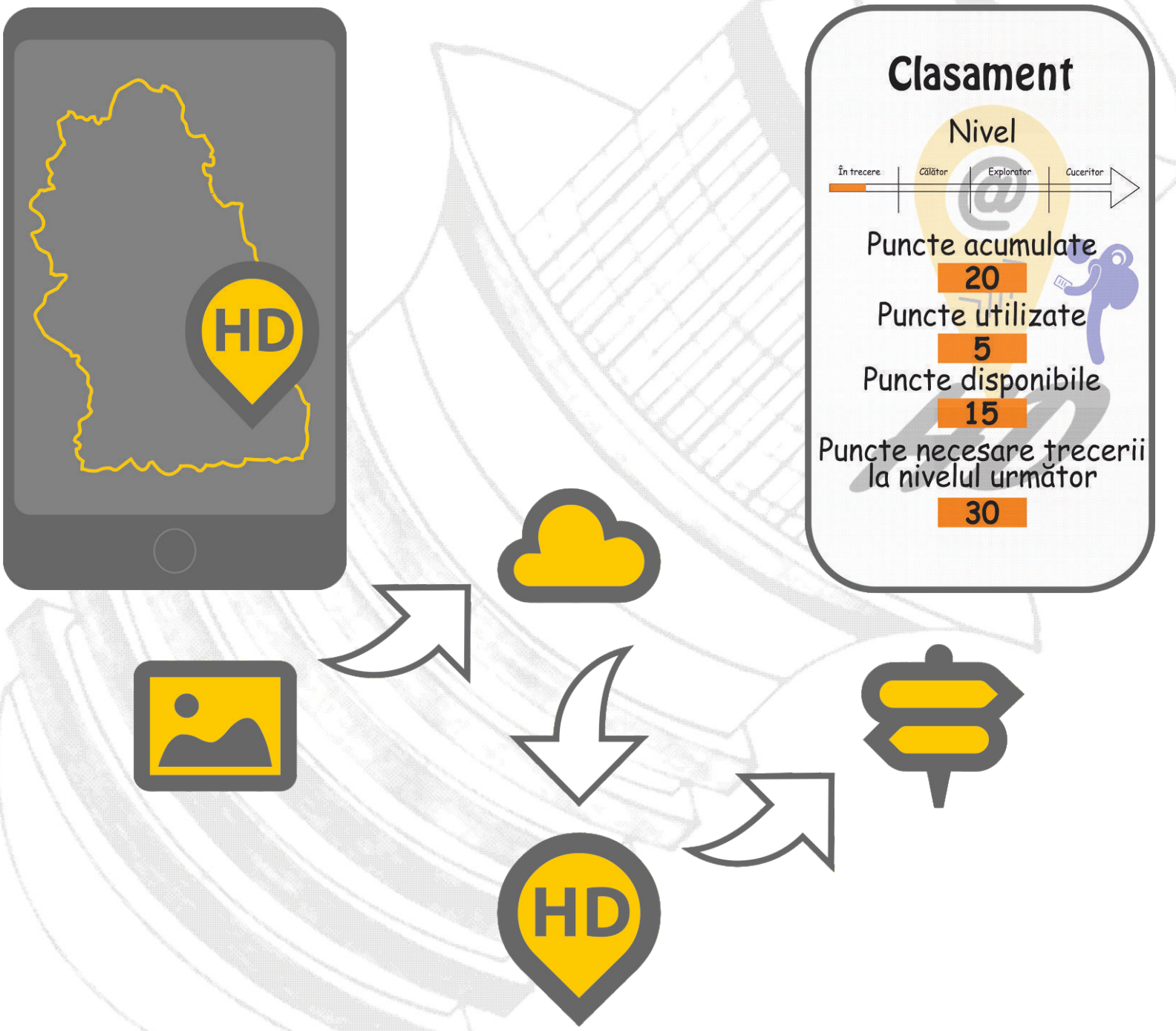
1948 UNIVERSITATEA DIN PETROȘANI

Patent number: OSIM A00088/14.02.2018, prototype

Andreea Cristina IONICĂ,
Monica LEBA, Mihaela ZICA, Simona Mirela RÎUREAN

Category
C

The invention aims to influence consumer behavior, using as a support a mobile application based on game-specific techniques, with the general objective of improving the means of promotion.



Invenția își propune să influențeze comportamentul consumatorului, folosind ca suport o aplicație mobilă bazată pe tehnici specifice jocului, având ca obiectiv general îmbunătățirea mijloacelor de promovare.

Asociația de Cercetare Doctorală Petroșani

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

METHOD AND ALGORITHM FOR ANTICIPATIVE AUTOMATIC PROTECTION AGAINST OVERCURRENTS IN ELECTRIC INSTALLATIONS

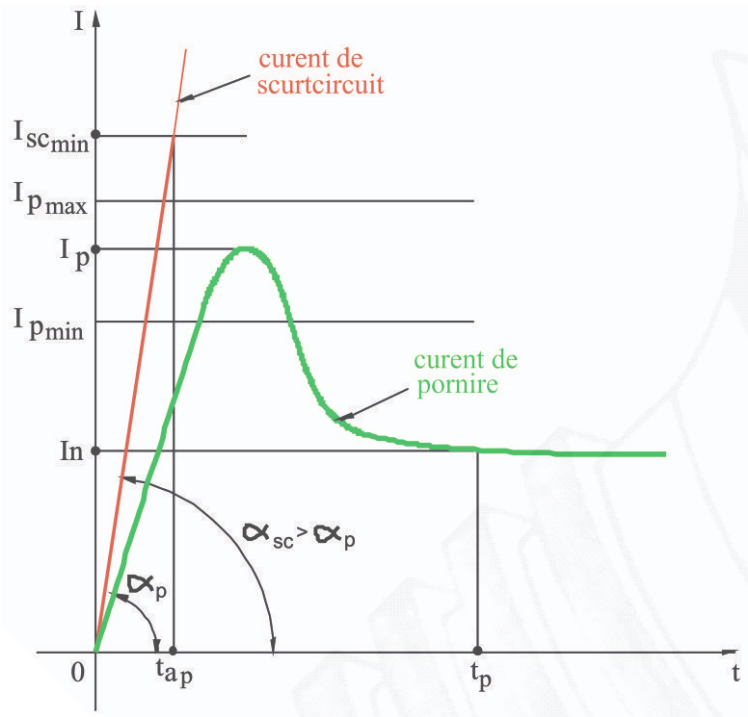
METODĂ ŞI ALGORITM DE PROTECŢIE AUTOMATĂ, ANTICIPATIVĂ, ÎMPOTRIVA SUPRACURENŢILOR DIN INSTALAŢIILE ELECTRICE

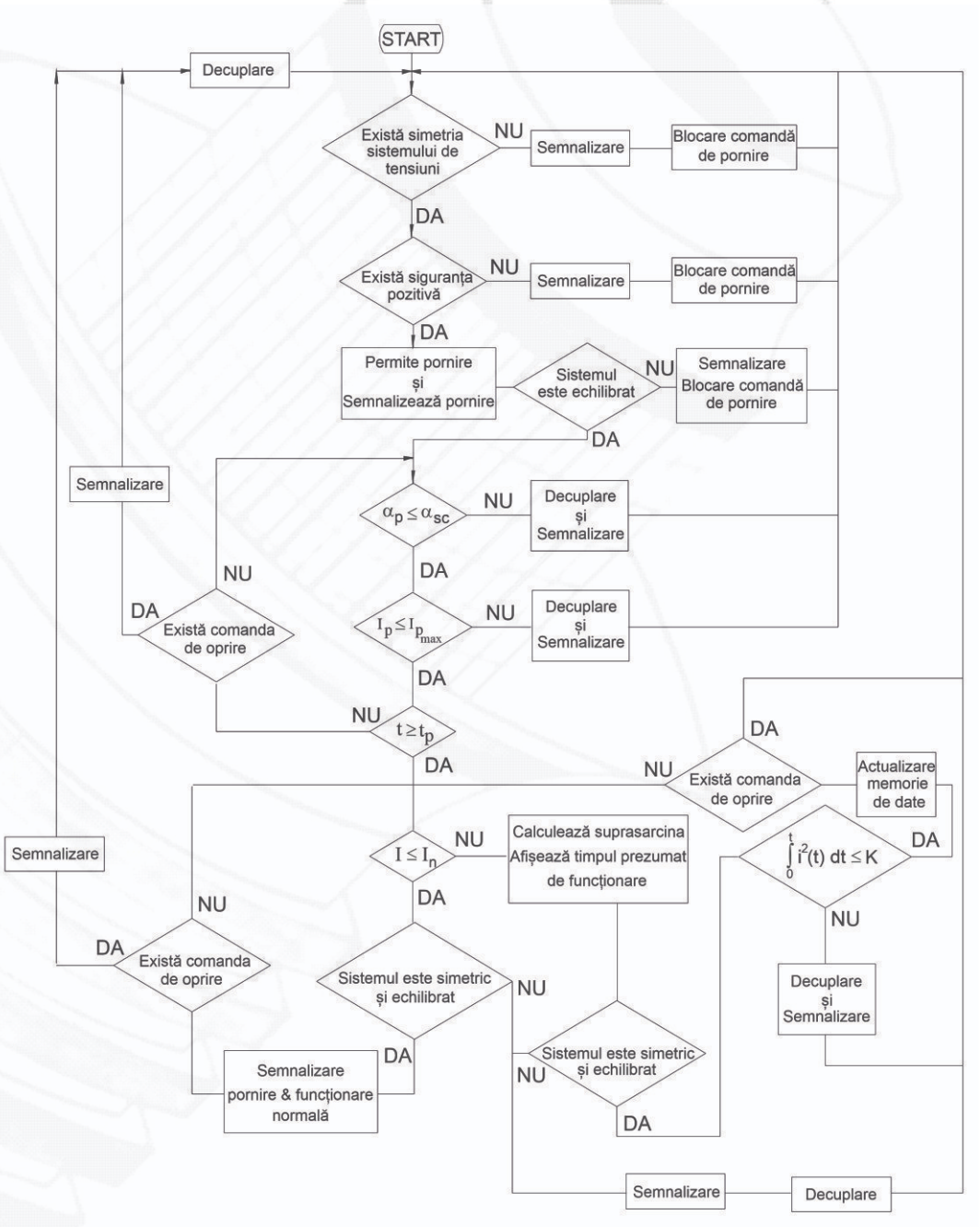
1948 UNIVERSITATEA DIN PETROȘANI

Patent number: OSIM A/00246/07.04.2016, concept
Carol ZOLLER,
Dragoș PĂSCULESCU, Gheorghe MARC, Remus DOBRA

Category
C

The invention has as objective a method, respectively an automatic, anticipatory protection algorithm against over-currents, which can be used in electrical installations of any type.





Invenţia are ca obiectiv o metodă, respectiv un algoritm automat, anticipator de protecţie împotriva supracurenţilor, care poate fi utilizat în instalaţiile electrice de orice tip.

Asociația de Cercetare Doctorală Petroșani

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

METHOD FOR OPERATIVE CONTROL OF SYMMETRICAL COMPONENTS OF THREE-PHASE ELECTRICITY SYSTEMS

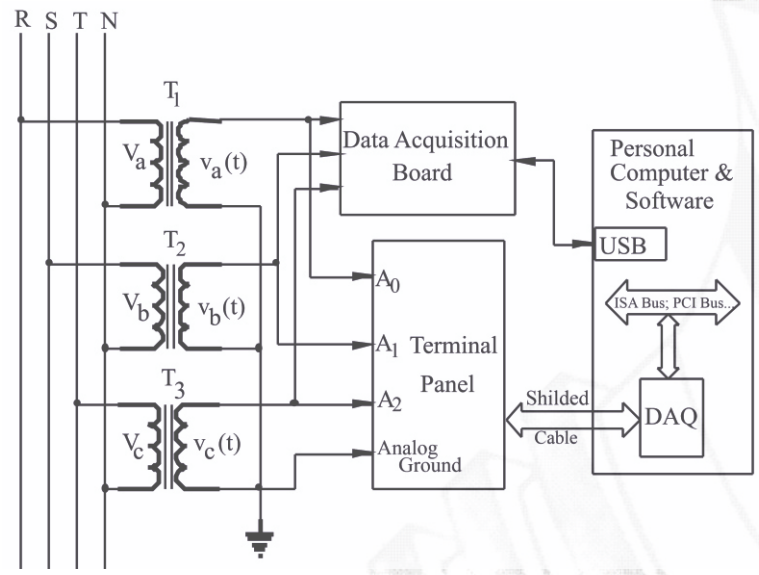
METODĂ DE CONTROL OPERATIV A COMPONENTELOR SIMETRICE DIN SISTEMELE ELECTROENERGETICE TRIFAZATE

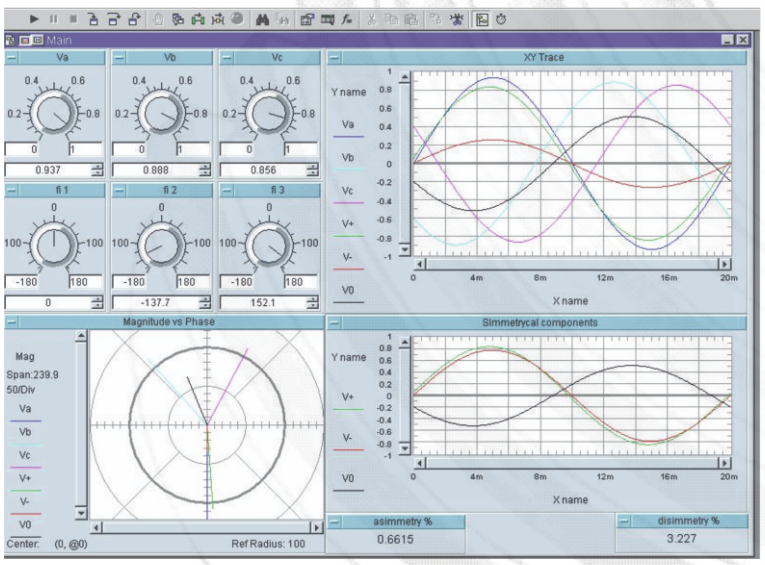
1948 UNIVERSITATEA DIN PETROȘANI

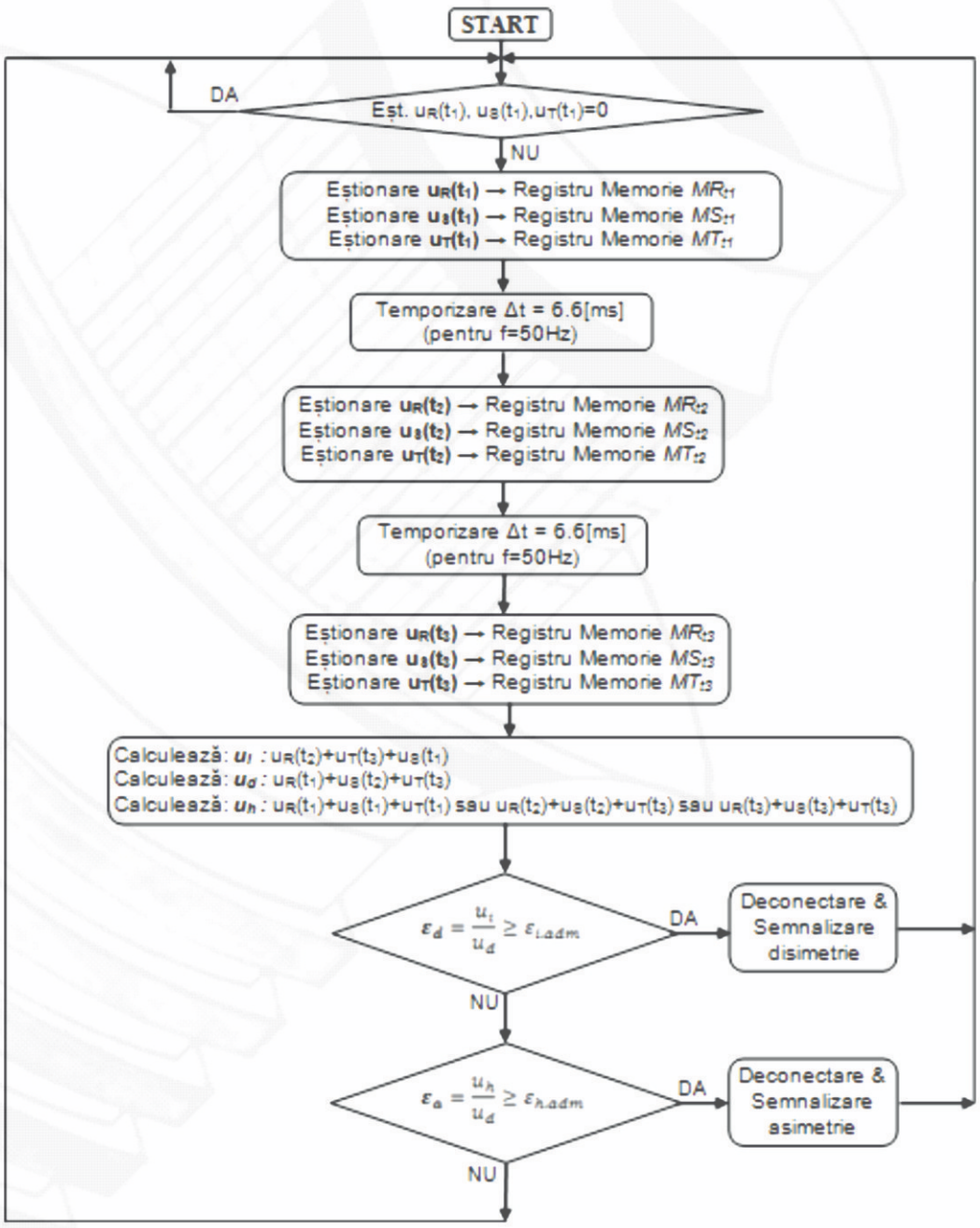
Patent number: OSIM 130884/2017, concept
Carol ZOLLER,
Sorina COSTINAȘ, Remus DOBRA, Gheorghe MARC, Dragoș PĂSCULESCU

Category
C

The invention relates to a method of operative control of symmetrical voltage (or current) components in three-phase sinusoidal power systems.







Invenţia se referă la o metodă de control operativ al componentelor simetrice de tensiune (sau curent) în sistemele de putere trifazate sinusoidale.

Asociația de Cercetare Doctorală Petroșani

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

PROGRAMMABLE BLOCK FOR SHEARER AND CONVEYOR CONTROL IN EXPLOSION-PRONE MINES

BLOC PROGRAMABIL PENTRU COMANDA COMBINEI ȘI TRANSPORTORULUI DIN MINELE CU PERICOL DE EXPLOZIE

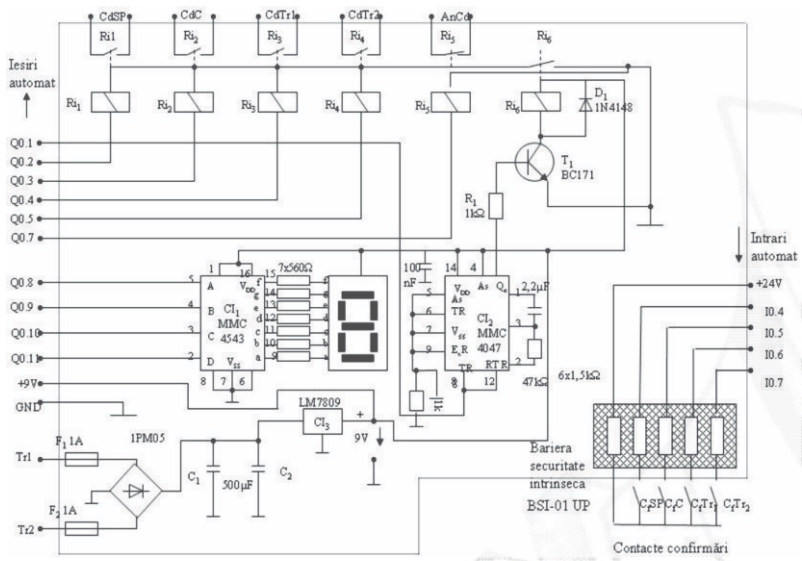
1948

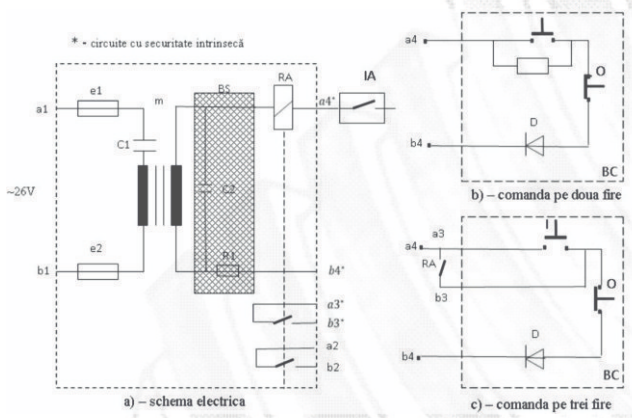
UNIVERSITATEA DIN PETROȘANI

Patent number: OSIM 123641/2015, prototype
Titu NICULESCU,
Dragoș PĂSCULESCU, Florian Sorin RIDZI

Category
C

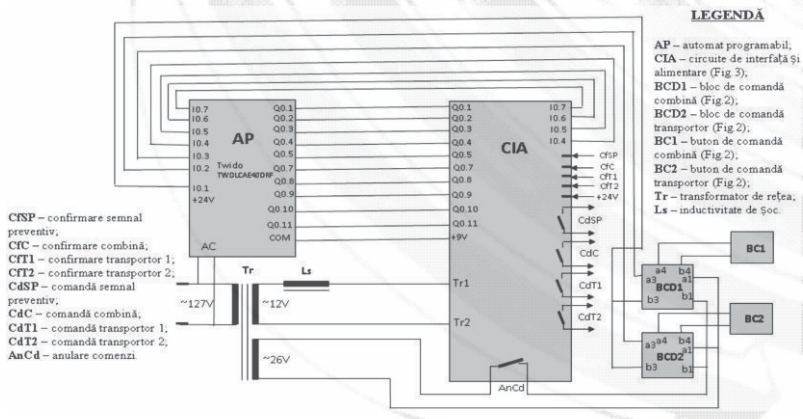
The invention relates to an electronic device with PLC, intended to control the exploitation and transportation processes in underground mining units with explosion hazard.





Legendă

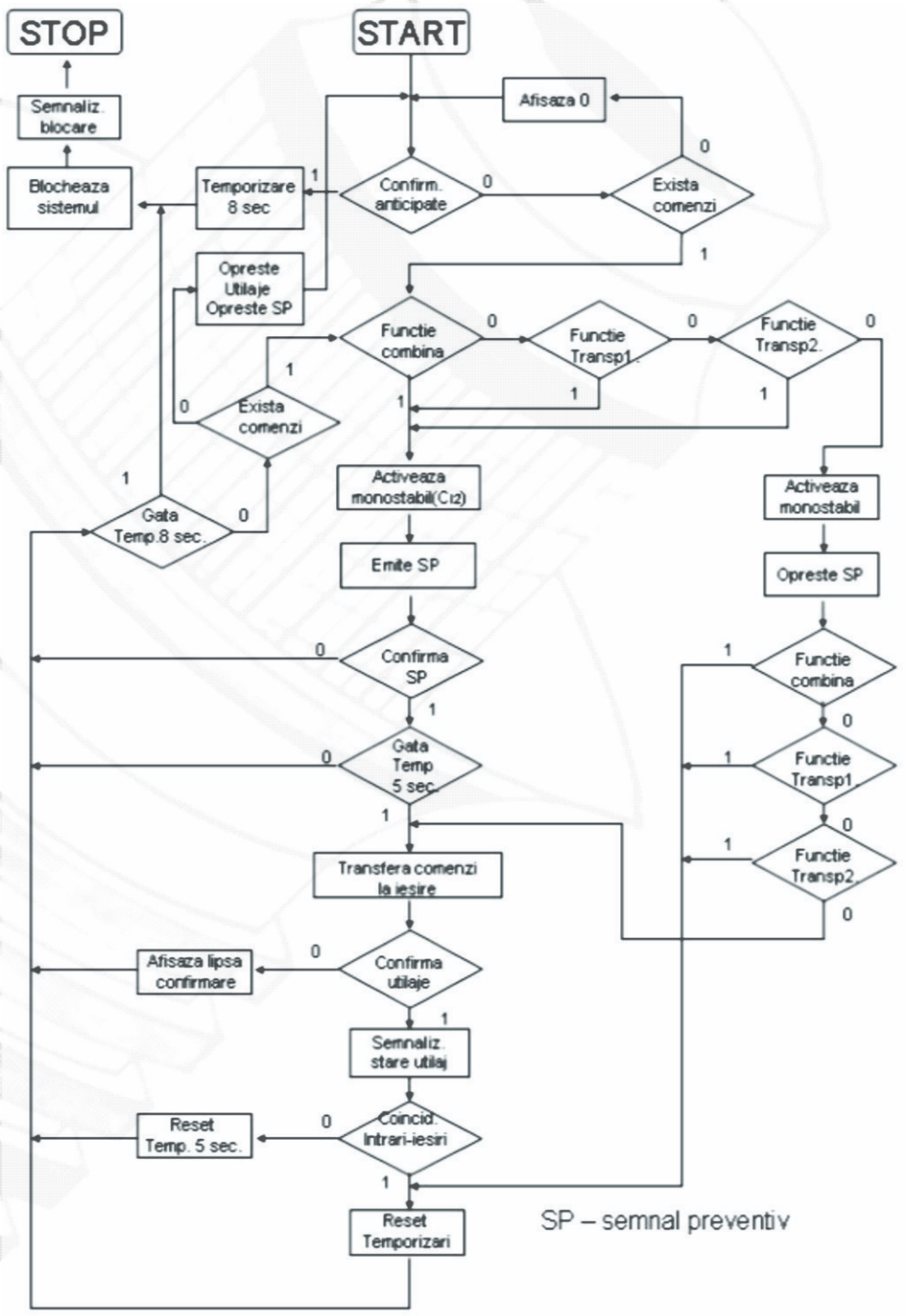
BC - buton de comandă;
I – buton de pornire;
O – buton de oprire;
R– rezistență de automenținere;
D – diodă cap de linie;
IA – contact de interblocaj cu transportorul din aval;
BS – barieră de securitate intrinsecă.



LEGENDĂ

AP – automat programabil,
CIA – circuite de interfață și alimentare (Fig 3),
BCD1 – bloc de comandă combină (Fig.2);
BCD2 – bloc de comandă transportor (Fig.2);
BC1 – buton de comandă combină (Fig.2);
BC2 – buton de comandă transportor (Fig.2);
Tr – transformator de rețea;
Ls – inductivitate de șoc.

CfSP – confirmare semnal preventiv;
CfC – confirmare combină;
CfT1 – confirmare transportor 1;
CfT2 – confirmare transportor 2;
CdSP – comandă semnal preventiv;
CdC – comandă combină;
CdT1 – comandă transportor 1;
CdT2 – comandă transportor 2;
AnCd – anulare comenzi.



Invenţia se referă la un dispozitiv electronic cu PLC, destinat controlului proceselor de exploatare şi transport în unităţile miniere subterane cu pericol de explozie.

Asociația de Cercetare Doctorală Petroșani

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

PROGRAMMABLE BLOCK FOR DELAY-STAGE CONTROL OF CONVEYORS IN EXPLOSION-PRONE MINES

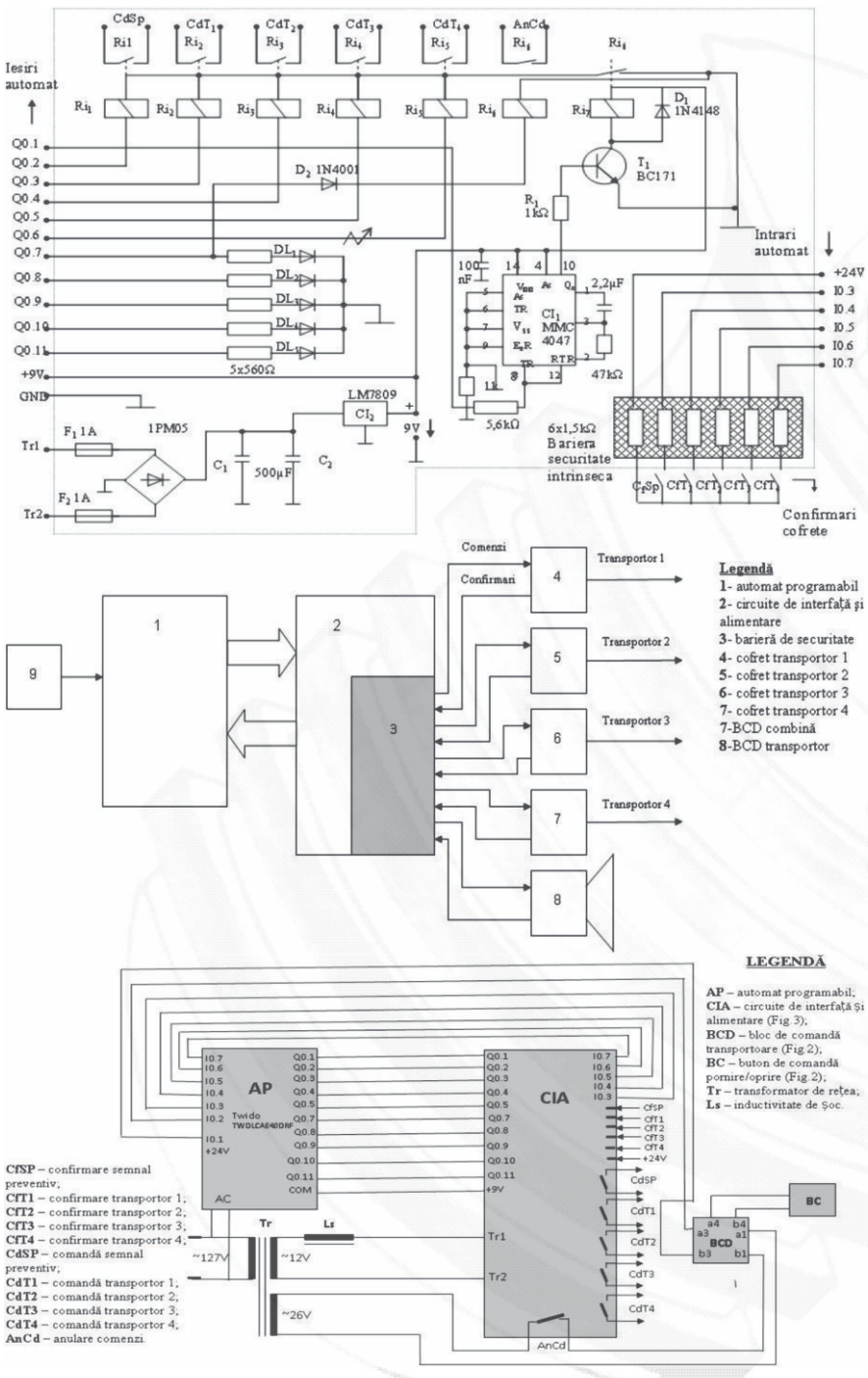
BLOC PROGRAMABIL PENTRU COMANDA ÎN TREPTE TEMPORIZATE A TRANSPORTOARELOR DIN MINELE CU PERICOL DE EXPLOZIE

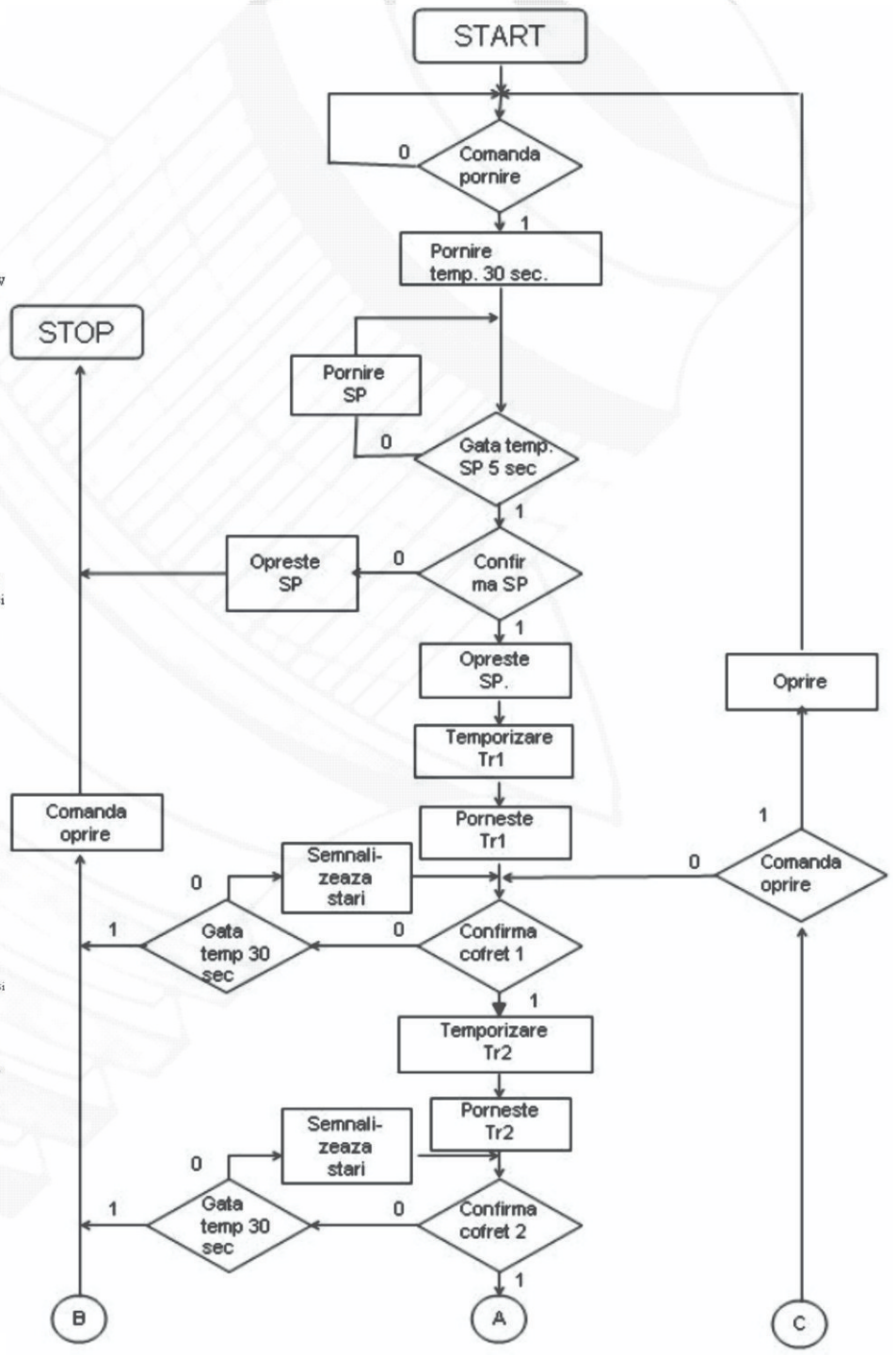
1948 UNIVERSITATEA DIN PETROȘANI

Patent number: OSIM 123640/2015, prototype
Dragoș PĂSCULESCU,
Titu NICULESCU, Florian Sorin RIDZI

Category
C

An electronic device intended to organize the process of exploitation in explosion-prone mining operations, which controls four conveyors, in compliance with the starting order and safety rules specified.





Un dispozitiv electronic destinat organizării procesului de exploatare în operațiuni miniere predispuse la explozie, care controlează patru transportoare, cu respectarea ordinii de pornire și a regulilor de siguranță specificate.

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

Asociația de Cercetare Doctorală Petroșani

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

COLLABORATIVE MIND SENTINELS

1948

UNIVERSITATEA DIN PETROȘANI

PhD student project, prototype
Remus Constantin SIBIȘANU, Monica LEBA

Category
C

The system uses artificial intelligence to manage various terrestrial, aerial and submarine robots, which can be used to collect information from the environment, to collaborate, to transmit information and to learn together. The developed system is useful in applications for exploring unknown areas, search and rescue applications, in agriculture, as well as in alternative communication systems.

Sistemul folosește inteligență artificială pentru a gestiona diferiți roboți tereștri, aerieni și submarini, care pot fi utilizați pentru a colecta informații din mediu, pentru colaborare, transmitere de informații și pentru a învăța împreună. Sistemul dezvoltat este util în aplicații de explorare a zonelor necunoscute, aplicații de tip search and rescue, în agricultură, precum și în sistemele de comunicații alternative celor clasice.

Asociația de Cercetare Doctorală Petroșani

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

ALGORITHM BASED DEVELOPMENT OF PETRILA THEME PARK

PhD student project, prototype
Ionela SAMUIL,
Andreea Cristina IONICĂ, Monica LEBA

Category
C

In view of the functional reconversion of the Petrila mining perimeter, Jiu Valley, a study is developed on the creation of a theme park and the results support the idea that post-industrial tourism is a solution applicable to the area. For the successful development of tourism in an area it is necessary to obtain a positive attitude of the locals, which would increase the chances of success of the zonal reconversion project. In order to obtain the best results, it is necessary that the Petrila Theme Park be established on the basis of the destinations considered to be the most suitable for the buildings proposed for transformation, taking into account the location, positioning and function currently held. In this sense, we have developed and applied a selection algorithm with the help of which the future destinations are allocated for the existing buildings in the Petrila mining perimeter. Thus, obtaining the configuration of the Petrila Theme Park, its development is desired in a form of community-based tourism, a type of development that has often been cited as an alternative to mass tourism so that tourism becomes sustainable.

C 1 - DISPENSAR
- **D1** Spaţiu expoziţie/prezentare
- **D2** Cafeterie
- **D3** Magazin

C 2 – CLĂDIRE PRINCIPALĂ
- **D3** Magazin
- **D4** Spaţiu entertainment
- **D5** Restaurant
- **D6** Cinematograf
- **D7** Muzeu

LEGENDĂ
COD CULOARE — SOLUŢIE
Destinaţie alocată
Destinaţie respinsă

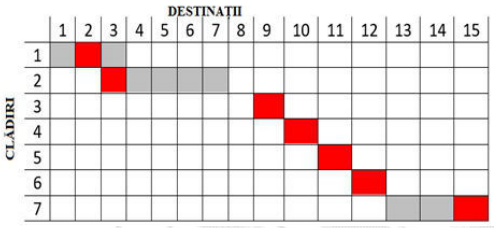
C 3 – CLĂDIRE LÂNGĂ MINA ŞCOALĂ
- **D8** Sală conferinţe
- **D9** Spaţiu educaţie

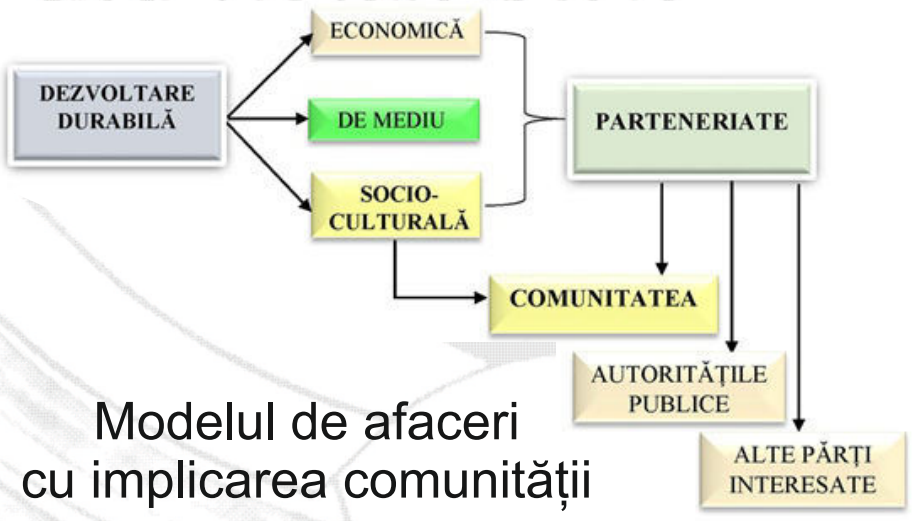
C 4 - MINA ŞCOALA
- **D9** Spaţiu educaţie
- **D10** Mină muzeu

C 5 - ATELIER MECANIC
- **D9** Spaţiu educaţie
- **D11** Atelier mecanic muzeu

C 6 – PUŢ CU SCHIP
- **D12** Puţ schip muzeu

C 7 – PUŢ CENTRU CU TURN
- **D13** Puţ centru muzeu
- **D14** Puţ centru muzeu + restaurant
- **D15** Puţ centru muzeu + spaţiu educaţie





Modelul de afaceri cu implicarea comunităţii

În vederea reconversiei funcţionale a perimetrului minier Petrila, Valea Jiului, este dezvoltat un studiu privind realizarea unui parc tematic iar rezultatele susţin ideea că turismul postindustrial este o soluţie aplicabilă zonei. Pentru dezvoltarea cu succes a turismului într-o zonă este necesară obţinerea unei atitudini pozitive a localnicilor, care ar creşte şansele de reuşită a proiectului de reconversie zonală. Pentru obţinerea celor mai bune rezultate, este necesar ca Parcul Tematic Petrila să fie constituit pe baza destinaţiilor considerate a fi cele mai potrivite pentru clădirile propuse spre transformare, ţinând cont de amplasamentul, poziţionarea şi funcţia deţinută în prezent. În acest sens, am dezvoltat şi aplicat un algoritm de selecţie cu ajutorul căruia sunt alocate viitoarele destinaţii pentru clădirile existente în perimetrul minier Petrila. Fiind astfel obţinută configurarea Parcului Tematic Petrila se doreşte dezvoltarea acestuia într-o formă de turism bazat pe comunitate, tip de dezvoltare care a fost adesea citat ca o alternativă la turismul de masă astfel încât turismul să devină durabil. Cele mai importante realizări în turismul comunitar sunt participarea comunităţii la întregul proces de dezvoltare, redistribuirea beneficiilor economice, în principal în rândul localnicilor, conservarea mediului şi, nu în ultimul rând, conservarea culturii locale.

Contact: **Name of the institution:** University of Petroşani
Address: Universităţii, no. 20
Post code: 332006 City: Petroşani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

NONINVASIVE SYSTEM FOR HUMAN BODY MOTION CAPTURE

1948

UNIVERSITATEA DIN PETROȘANI

PhD student project, prototype
Arun Fabian PANAITE, Monica LEBA

Category
C

This system is using multiple technological elements to capture the motion of the human body. In comparison with the multitude of available systems, the key feature of our system is that it can render the motion in real time (considered a very immediate virtual reproduction). The motion capture system is noninvasive, eliminating special motion capture clothing that consists of sensor networks, or wearable body markers. It is consisting of cameras and infrared emitters, being capable to capture and synthesize the depth of field and distance perception. The cameras are connected to a high-performance computer, capable of reproducing the motion capture, by rigging the motion capture's moving skeleton, to an animated 3D character. The uses of such a system can be employed in multiple domains, where motion capture can be essential to further developments, for instance, in Medicine, Entertainment, Robotics and so on.

Acest sistem folosește mai multe elemente tehnologice pentru a capta mișcarea corpului uman. În comparație cu multitudinea de sisteme disponibile, caracteristica cheie a sistemului nostru este că poate reda mișcarea în timp real (considerată o reproducere virtuală imediată). Sistemul de captare a mișcării este neinvaziv, eliminând îmbrăcămintea specială de captare a mișcării care constă din rețele de senzori sau markeri corporali purtabili. Este format din camere și emițători de infraroșu, fiind capabil să capteze și să sintetizeze percepția adâncimii de câmp și a distanței. Camerele sunt conectate la un computer de înaltă performanță, capabil să realizeze mișcarea capturată, prin manipularea scheletului în mișcare, la un personaj animat 3D. Utilizările unui astfel de sistem pot fi în mai multe domenii, unde capturarea mișcării poate fi esențială pentru dezvoltarea ulterioară, de exemplu, în Medicină, Divertisment, Robotică și așa mai departe.

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

Asociația de Cercetare Doctorală Petroșani

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

CONTRIBUTIONS REGARDING THE USE OF NEURAL HEADSET FOR ARTIFICIAL ARM CONTROL

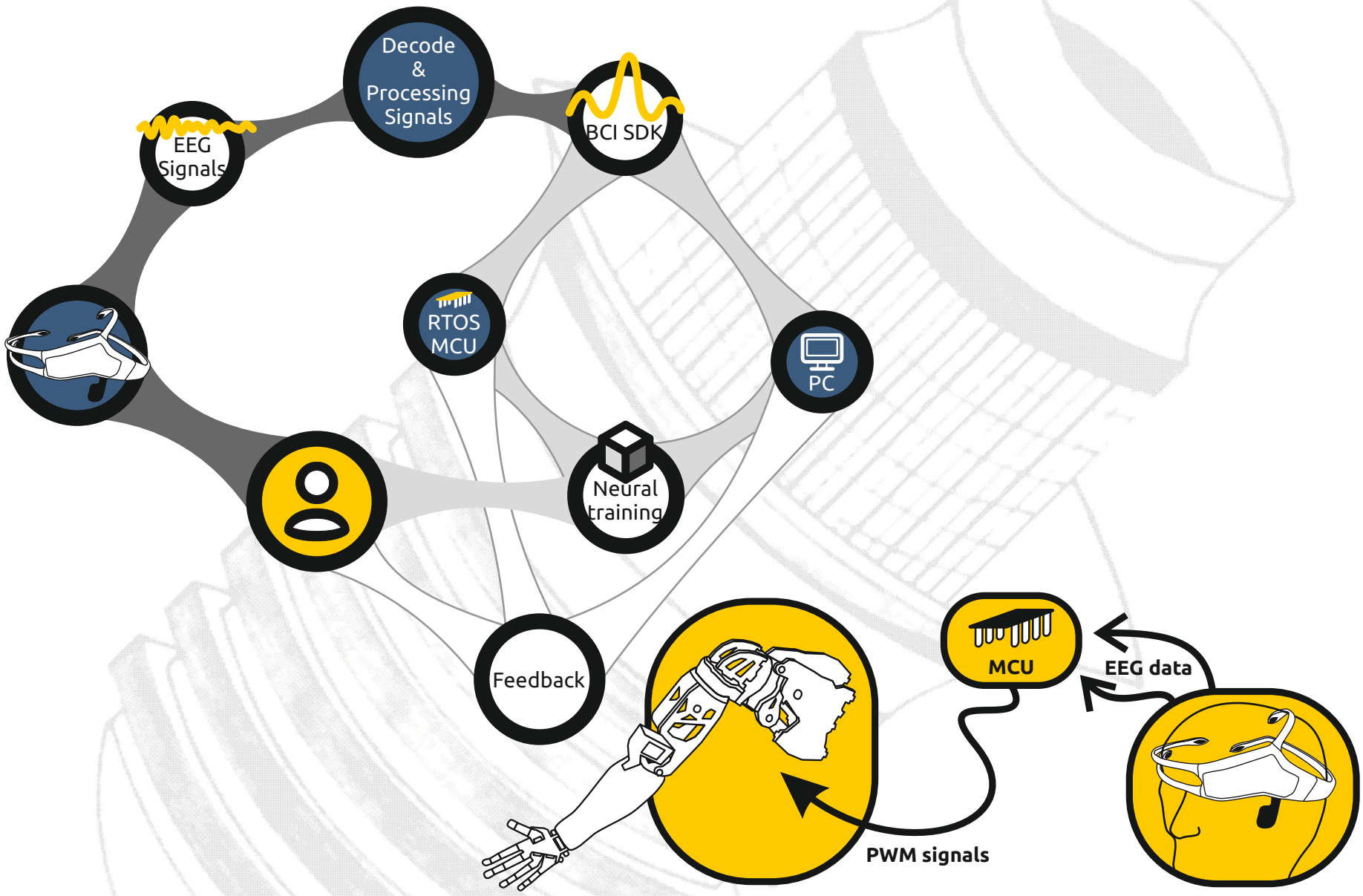
1948

UNIVERSITATEA DIN PETROȘANI

PhD student project, prototype
Sebastian Daniel ROȘCA, Monica LEBA

Category
C

The BCI based on neural interface headset is able to reproduces conscious thoughts of the user using electroencephalography principle to convert brain signals into binary code to be understood by the computer or by a microcontroller with real-time operating system. The functional block diagram of the electroencephalogram signal acquisition and processing system is shown in the figure below. Due to BCI training it can be created a database with all mental patterns of each user resulted from each mental command imagined in part that correspond to a certain revolute motion of kinematic coupling of an 3D printed robotic upper limb prosthetics used for medical purpose or in manipulation of dangerous substance based on the system presented below.



Sistemul BCI bazat pe cască neuronală este capabil să reproducă gândurile conștiente ale utilizatorului folosind principiul electroencefalografiei pentru a converti semnalele creierului în cod binar pentru a fi înțeles de computer sau de un microcontroler cu sistem de operare în timp real. Diagrama bloc funcțională a sistemului de achiziție și procesare a semnalului electroencefalogramei este prezentată în figură. Datorită antrenamentului BCI se poate crea o bază de date cu toate tiparele mentale ale fiecărui utilizator rezultate din fiecare comandă mentală imaginată parțial care corespunde unei anumite mișcări de rotație a unei cuple cinematice a unei proteze robotizate pentru un membru superior imprimată 3D, utilizată în scop medical sau în manipularea unei substanțe periculoase.

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

Asociația de Cercetare Doctorală Petroșani

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

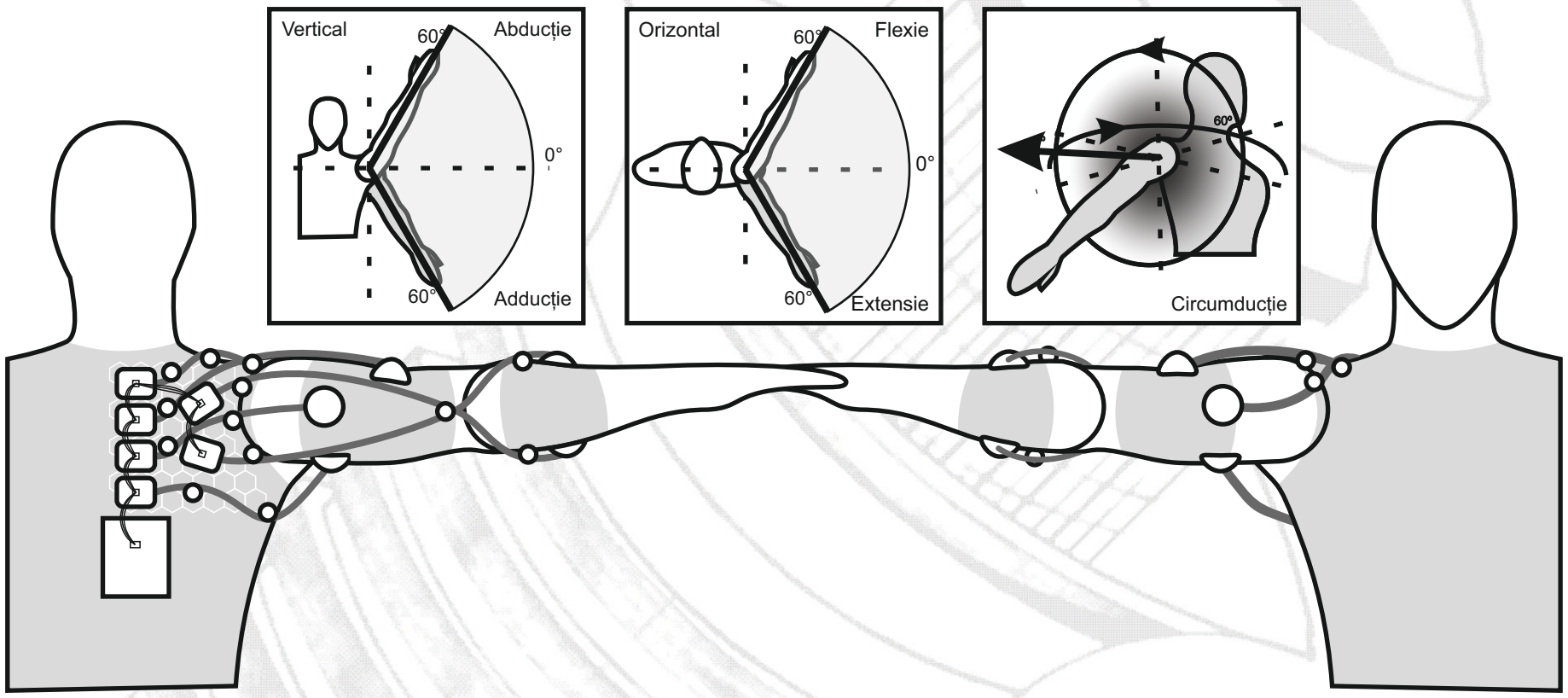
CONTRIBUTIONS TO THE DEVELOPMENT AND CONTROL OF AN EXOSKELETON FOR THE RIGHT ARM

PhD student project, prototype
Marius Leonard OLAR,
Monica LEBA, Remus Constantin SIBIȘANU

1948 UNIVERSITATEA DIN PETROȘANI

Category
C

The purpose of this project is to create an exoskeleton to be worn on a human garment, in the form of a vest, which is autonomous and can be worn by a user along with other personal clothing. This exoskeleton will ensure the mobility of a human upper arm, which has become totally or partially immobile following an accident or medical conditions. It will act on the upper arm, in the shoulder area, leading the arm close to the maximum mobility of a healthy human arm, in the Glenohumeral joint. The control of this exoskeleton can be achieved by several methods, with the help of a neural headset, or vocally by interpreting the commands by artificial intelligence algorithms, voice recognition, using a video camera and an algorithm for recognizing surrounding objects, or physically, by remote control of actions performed by a third party. This exoskeleton can be a medical tool used in treatments for the upper limb mobility recovery, especially the shoulder joint, or a support in the daily life of people with reduced upper limb mobility.



Scopul acestui proiect este realizarea unui exoschelet care să fie montat pe un veșmânt uman, în forma unei veste, care să fie autonom și să poată fi purtat de un utilizator împreună cu alte obiecte de vestimentație personale. Acest exoschelet va asigura mobilitatea unui braț superior uman, care a devenit total sau parțial imobil, în urma unui accident sau a unor afecțiuni medicale. Acesta va acționa în partea superioară a brațului, în zona încheieturii umărului, conducând brațul într-o arie apropiată de maximul mobilității unui braț uman sănătos, în articulația Glenohumerală. Conducerea acestui exoschelet se va putea realiza prin mai multe metode, cu ajutorul unei căști neuronale, sau vocal prin interpretarea comenzilor de către algoritmii de inteligență artificială, de recunoaștere vocală, cu ajutorul unei camere video și a unui algoritm de recunoaștere a obiectelor înconjurătoare, sau fizic, prin telecomandarea acțiunilor realizate de o terță persoană. Acest exoschelet poate fi un instrument medical utilizat în tratamentele de recuperare a mobilității membrelor superioare, în special a articulației umărului, sau un sprijin în viața de zi cu zi, al persoanelor cu mobilitatea membrelor superioare diminuată.

Asociația de Cercetare Doctorală Petroșani

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

A PROTOTYPE FOR THE PROCESS OF PROJECT INTAKE DECISIONS IN NONPROFIT ORGANIZATIONS

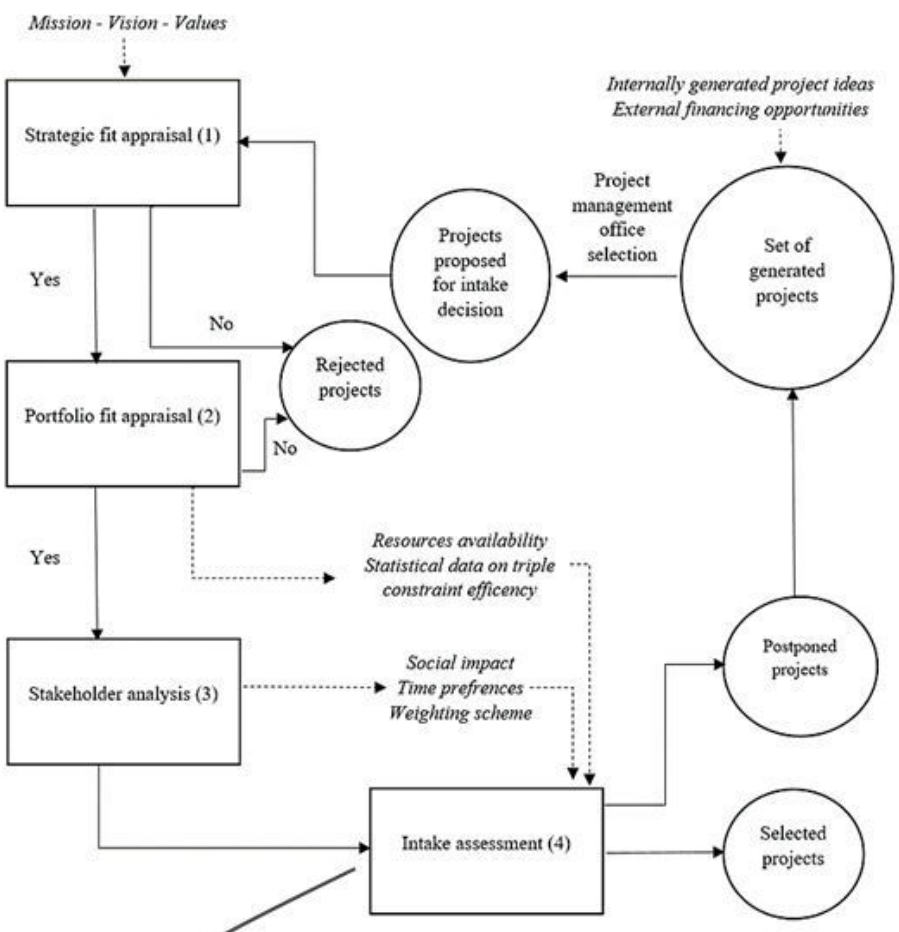
1948

UNIVERSITATEA DIN PETROȘANI

PhD student project, prototype
Ibrian Vasile CĂRĂMIDARU, Andreea Cristina IONICĂ

Category
C

The prototype aims at balancing the triple constraint and stakeholder needs in project intakes for nonprofit organizations. The process handles proposals in four steps, targeting a score function. some projects shall be excluded from the outset, an exclusion which is performed on two levels – the strategic and the portfolio level *(steps (1) & (2))*. A stakeholder analysis – *step (3)* – is required to determine the value the stakeholders put on the alternative project outcomes and their time preference for the outcomes. The *Intake assessment – step (4)* is going to be based on calculating a score function for each proposed project. Starting with the goal of pursuing a value as high as possible of the social result, this has to be conjugated with the causal relationship between deliverables and results, which in their own turn, should take into account the efficiency of deadlines. This function of the intake score for a project – I_i is given by the multiplication of three factors, which can be interpreted as measures of the influence of the three constraints of the projects - purpose, time, budget upon the social value of the project. The factor DR_{ij} is an average of a statistical series of ratios of execution efficiency for deliverables – using a series for deliverables similar to the ones needed in project *i* to obtain the social result *j*. Similarly, expressing the time constraint, the factor TR_{ij} is an average of a statistical series of ratios of deadline efficiency. After the hierarchy of projects is established, according to the value of the intake scores, projects are chosen in descending order until the consumption of the budget available for the strategic planning horizon.



$$I_i = \sum_{j=1}^{m} NSR_{ij} * wt_{ij} * DR_{ij} * TR_{ij}$$

$$NSR_i = \sum_{j=1}^{m} NSR_{ij} = \sum_{j=1}^{m} (r_{ij} - c_{ij}) \qquad wt_{ij} = \frac{\sum_{o=1}^{k} wt_{ijo} * ws_o}{\sum_{o=1}^{k} ws_o}$$

Project	Result	Cost	Net result	Stakeholder	Results weights	Stake-hodler weight	Result	Deliverable efficiency	Time efficiency
Project 1	r11	c11	nsr11	Stakeholder 11	w111	w1	r11	d111	t111
	r12	c12	nsr12		w112	w1		d112	t112
	r13	c13	nsr13		w112	w1		d113	t113
	r14	c14	nsr14		w114	w1		d114	t114
	r15	c15	nsr15		w115	w1		d114	t114

Prototipul urmărește echilibrarea triplei constrângeri și a nevoilor părților interesate în selecția proiectelor în organizații nonprofit. Procesul gestionează propunerile în patru pași, țintind o funcție de scor. Unele proiecte vor fi excluse de la început, excludere care se realizează pe două niveluri – nivelul strategic și cel de portofoliu *(pașii (1) și (2))*. O analiză a părților interesate – *pasul (3)* – este necesară pentru a determina valoarea pe care părțile interesate o acordă rezultatelor alternative ale proiectului și preferința lor de timp pentru rezultate. Evaluarea *în scopul adoptării – pasul (4)* - care se va baza pe calcularea unei funcții scor pentru fiecare proiect propus. Pornind de la scopul vizării unei valori cât mai ridicate a rezultatului social, acesta trebuie conjugată cu relația cauzală dintre livrabile și rezultate, care, la rândul lor, ar trebui să țină cont de eficiența termenelor limită. Această funcție a punctajului de admisie pentru un proiect – I_i este dată de multiplicarea a trei factori, care pot fi interpretați ca măsuri ale influenței celor trei constrângeri ale proiectelor - scop, timp, buget asupra valorii sociale a proiectului. Factorul DR_{ij} este o medie a unei serii statistice de rapoarte ale eficienței execuției pentru livrabile – folosind o serie de livrabile similare cu cele necesare în proiectul *i* pentru a obține rezultatul social *j*. În mod similar, exprimând constrângerea de timp, factorul TR_{ij} este o medie a unei serii statistice de rapoarte ale eficienței termenului limită. După stabilirea ierarhiei proiectelor, în funcție de valoarea punctajelor de adoptare, proiectele sunt alese în ordine descrescătoare până la consumarea bugetului disponibil pentru orizontul de planificare strategică.

Asociația de Cercetare Doctorală Petroșani

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

MOLDOVA STATE UNIVERSITY
Scientific Research Laboratory
Artificial Intelligence and Virtual & Augmented Reality
Alexei Mateevici str. 60, Chisinau, MD 2009, Republic of Moldova
Tel.: +373 69769956; E-mail: *gh_capatana@yahoo.com*

HR EXCELLENCE IN RESEARCH

TABLE OF DISTANCES BETWEEN MENTAL AND BEHAVIORAL DISORDERS IN EPILEPSY

PATENT: Seria O nr. 6807/01.02.2021

AUTHORS: Gheorghe CĂPĂȚÂNĂ, Alexandru POPOV, Mariana BUTNARU

APPLICATION FIELDS: Research and innovation projects.

AIM: Assessing the distances between mental and behavioral disorders in epilepsy (MBDE) using metric spaces developed for this purpose.

SOLUTION: Assessing the distances between mental and behavioral disorders in epilepsy (MBDE) using metric spaces developed for this purpose.

	F05.12	F02.82×2	F07.82	F07.92	F7×1	F06.52	F05.92	F07.02	F06.42	F06.91	F06.81	F06.62	F05.02	F06.12	F06.31	F05.82	F06.92	F06.30	F06.99	F06.32	F06.22	F06.34	F06.82	F06.72	F06.33	F04.2	F06.02	G40
F05.12	0.0	18.8	35.7	40.6	40.2	40.1	36.2	39.5	38.6	35.9	33.4	44.5	40.3	37.3	41.8	41.1	48.8	40.3	53.7	57.6	46.9	63.5	65.2	63.7	66.9	73.4	71.1	100
F02.82×2	18.8	0.0	25.2	31.8	32.4	33.3	35.2	35.8	35.8	36.9	37.4	38.6	39.5	40.1	40.1	40.3	41.0	43.6	45.9	50.3	50.5	54.5	56.4	57.3	58.5	66.8	69.1	94.5
F07.82	35.7	25.2	0.0	9.6	14.6	18.6	24.8	18.2	22.7	25.0	28.9	18.0	31.7	40.4	27.8	32.0	18.6	38.3	25.8	29.9	40.1	34.5	35.1	35.5	37.3	48.7	49.8	77.1
F07.92	40.6	31.8	9.6	0.0	12.2	19.9	26.9	16.0	22.3	24.8	30.0	15.3	35.2	42.2	27.9	35.9	16.4	39.3	22.7	26.7	38.9	31.6	32.0	32.3	33.7	47.0	45.5	76.2
F7×1	40.2	32.4	14.6	12.2	0.0	19.7	28.3	18.6	21.4	25.2	27.9	17.2	36.5	40.1	26.5	36.8	19.7	36.2	22.3	26.3	36.8	29.1	33.7	31.0	33.8	50.1	45.7	75.8
F06.52	40.1	33.3	18.6	19.9	19.7	0.0	18.4	19.2	11.3	17.8	22.4	12.2	25.1	35.1	20.3	23.8	15.0	31.7	18.2	27.0	35.3	31.4	29.5	28.5	29.9	41.2	40.5	65.9
F05.92	36.2	35.2	24.8	26.9	28.3	18.4	0.0	20.9	19.2	13.3	16.6	21.4	15.3	34.9	24.4	14.6	22.6	32.6	29.5	38.6	33.0	44.6	39.7	36.4	41.2	42.1	42.9	67.9
F07.02	39.6	35.8	18.2	16.0	18.6	19.2	20.9	0.0	17.2	15.3	21.4	14.8	28.5	38.0	25.8	28.9	16.8	32.8	20.4	29.7	31.5	33.8	32.0	32.7	33.7	46.1	44.0	74.4
F06.42	38.6	35.8	22.7	22.3	21.4	11.3	19.2	17.2	0.0	12.2	17.0	14.3	26.5	32.6	16.4	25.2	19.2	27.4	20.1	27.0	29.6	33.1	30.7	29.0	31.3	43.7	38.7	67.1
F06.91	35.9	36.9	25.0	24.8	25.2	17.8	13.3	15.3	12.2	0.0	10.0	18.4	21.3	32.5	19.7	21.1	22.1	26.7	26.1	33.2	27.5	39.6	36.9	33.7	37.9	44.1	40.3	70.2
F06.81	33.4	37.4	28.9	30.0	27.9	22.4	16.6	21.4	17.0	10.0	0.0	23.2	24.4	31.1	21.8	23.0	28.3	25.1	31.7	36.5	24.8	43.4	42.6	37.8	43.3	51.0	42.1	73.0
F06.62	44.5	38.6	18.0	15.3	17.2	12.2	21.4	14.8	14.3	18.4	23.2	0.0	29.6	39.0	22.4	28.5	9.6	34.6	14.6	21.6	32.9	27.4	25.0	23.5	25.9	40.8	34.4	65.5
F05.02	40.4	39.5	31.7	35.2	36.5	25.1	15.3	28.5	26.5	21.3	24.4	29.6	0.0	38.8	32.7	8.0	29.0	38.8	35.3	46.5	41.6	50.9	44.7	40.3	46.6	39.5	50.3	67.8
F06.12	37.3	40.1	40.4	42.2	40.1	35.1	34.9	38.0	32.6	32.5	31.1	39.0	38.8	0.0	28.2	38.2	43.2	20.9	44.6	50.0	26.9	55.0	54.7	52.6	55.0	63.0	58.0	84.5
F06.31	41.8	40.1	27.8	27.9	26.5	20.3	24.4	25.8	16.4	19.7	21.8	22.4	32.7	28.2	0.0	31.3	26.3	19.9	28.0	28.3	24.1	36.0	35.6	31.8	35.7	46.7	39.1	67.0
F05.82	41.1	40.3	32.0	35.9	36.8	23.8	14.6	28.9	25.2	21.1	23.0	28.5	8.0	38.2	31.3	0.0	28.4	36.9	34.6	44.9	39.3	49.4	43.0	39.2	45.0	41.2	47.4	65.1
F06.92	48.8	41.0	18.6	16.4	19.7	15.0	22.6	16.8	19.2	22.1	28.3	9.6	29.0	43.2	26.3	28.4	0.0	39.3	12.2	22.4	37.8	25.9	20.8	21.1	22.6	34.7	35.9	61.8
F06.30	40.3	43.6	38.3	39.3	36.2	31.7	32.6	32.8	27.4	26.7	25.1	34.6	38.8	20.9	19.9	36.9	39.3	0.0	40.1	41.6	20.3	46.8	49.4	45.7	49.1	60.9	50.6	78.7
F06.99	53.7	45.9	25.8	22.7	22.3	18.2	29.5	20.4	20.1	26.1	31.7	14.6	35.3	44.6	28.0	34.6	12.2	40.1	0.0	19.9	38.6	19.9	15.5	20.6	15.3	37.2	36.6	61.0
F06.32	57.6	50.3	29.9	26.7	26.3	27.0	38.6	29.7	27.0	33.2	36.5	21.6	46.5	50.0	28.3	44.9	22.4	41.6	19.9	0.0	40.3	13.6	20.3	21.9	19.7	45.8	34.0	62.9
F06.22	46.9	50.5	40.1	38.9	36.8	35.3	33.0	31.5	29.6	27.5	24.8	32.9	41.6	26.9	24.1	39.3	37.8	20.3	38.6	40.3	0.0	47.1	46.5	43.1	46.5	60.1	43.4	76.6
F06.34	63.5	54.5	34.5	31.6	29.1	31.4	44.6	33.8	33.1	39.6	43.4	27.4	50.9	55.0	36.0	49.4	25.9	46.8	19.9	13.6	47.1	0.0	19.2	24.4	17.0	47.4	40.1	63.6
F06.82	65.2	56.4	35.1	32.0	33.7	29.5	39.7	32.0	30.7	36.9	42.6	25.0	44.7	54.7	35.6	43.0	20.8	49.4	15.5	20.3	46.5	19.2	0.0	20.3	7.0	35.2	34.4	53.9
F06.72	63.7	57.3	35.5	32.3	31.0	28.5	36.4	32.7	29.0	33.7	37.8	23.5	40.3	52.6	31.8	39.2	21.1	45.7	20.6	21.9	43.1	24.4	20.3	0.0	19.0	32.0	27.0	48.4
F06.33	66.9	58.5	37.3	33.7	33.8	29.9	41.2	33.7	31.3	37.9	43.3	25.9	46.6	55.0	35.7	45.0	22.6	49.1	15.3	19.7	46.5	17.0	7.0	19.0	0.0	36.1	33.0	53.2
F04.2	73.4	66.8	48.7	47.0	50.1	41.2	42.1	46.1	43.7	44.1	51.0	40.8	39.5	63.0	46.7	41.2	34.7	60.9	37.2	45.8	60.1	47.4	35.2	32.0	36.1	0.0	42.4	45.3
F06.02	71.1	69.1	49.8	45.5	45.7	40.5	42.9	44.0	38.7	40.3	42.1	34.4	50.3	58.0	39.1	47.4	35.9	50.6	36.6	34.0	43.4	40.1	34.4	27.0	33.0	42.4	0.0	48.8
G40	100	94.5	77.1	76.2	75.8	65.9	67.9	74.4	67.1	70.2	73.0	65.5	67.8	84.5	67.0	65.1	61.8	78.7	61.0	62.9	76.6	63.6	53.9	48.4	53.2	45.3	48.8	0.0

ADVANTAGES: Propose metric spaces and evaluate the distances between MBDE (premiere).

IMPLEMENTATION STAGE: Used in: medical practice at the Medical Sanitary Institution, the Public Clinical Hospital of Psychiatry; medical practice at the Republican Clinical Center "*Constructorul*"; development of intelligent support systems for the TPCE; training of doctoral students.

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

MOLDOVA STATE UNIVERSITY
Scientific Research Laboratory
Compared Public Law and e-Governance
Alexei Mateevici street, 60, Chisinau, MD-2009, Republic of Moldova
Tel.: +373 69387887; E-mail: dpc.egov@gmail.com

HR EXCELLENCE IN RESEARCH

THE CURRENT MULTIDIMENSIONAL CONTEXT OF GOVERNANCE AND HUMAN RIGHTS IN MOLDOVA

C

NARD&MSU supported research project # 20.80009.1606.15

AUTHORS: Rodica CIOBANU (coord.), Ion GUCEAC , Elena ARAMA , Andrei NEGRU, Veronica MOCANU, Rodica IORDANOV , Natalia CRĂCIUN , Oleg PANTEA , Svetlana SLUSARENCO

APPLICATION FIELDS: C (Security, Communication)

AIM: Multidimensional analysis of the socio-legal context of the Republic of Moldova in terms of existing good governance practices in order to identify mechanisms for modernizing governance focused on human rights protection.

SOLUTION: Strengthening constitutional values and democracy in order to ensure the transition to modernization and ensuring the balance between the values of freedom and the mutual responsibility of the citizen and the state;

Promoting interinstitutional cooperation and social solidarity, in order to ensure the functioning of the society and to balance the individual-society relationship;

Secure tools for the protection of human rights;

Justice reform and ensuring quality and efficiency through self-government authorities;

Modernization solutions by implementing E-government tools.

Way of usage (elaborated by CIOBANU R.)

Evaluation: Application of diversified methodological tools

→ **Conceptualization** of modernization mechanisms

→ **Validation and implementation** in the governing process

→ **Results:** Achieving governance focused on the protection of human rights

ADVANTAGES:

- ✓ Consolidated theoretical-methodological support;
- ✓ Formulated the core of the modernization route;
- ✓ Tested interinstitutional communication platform;
- ✓ Sectoral problems identified and solutions formulated;
- ✓ 3 modernization mechanisms identified (legal, economic and social);
- ✓ Proposed procedures for evaluating and democratizing governance
- ✓ Offered resilience tools in crisis conditions.

IMPLEMENTATION STAGE: In the university environment, research centres and institutes, for authorities and civil society.

CORNELIUGROUP
research-innovation
association

INVENTCOR

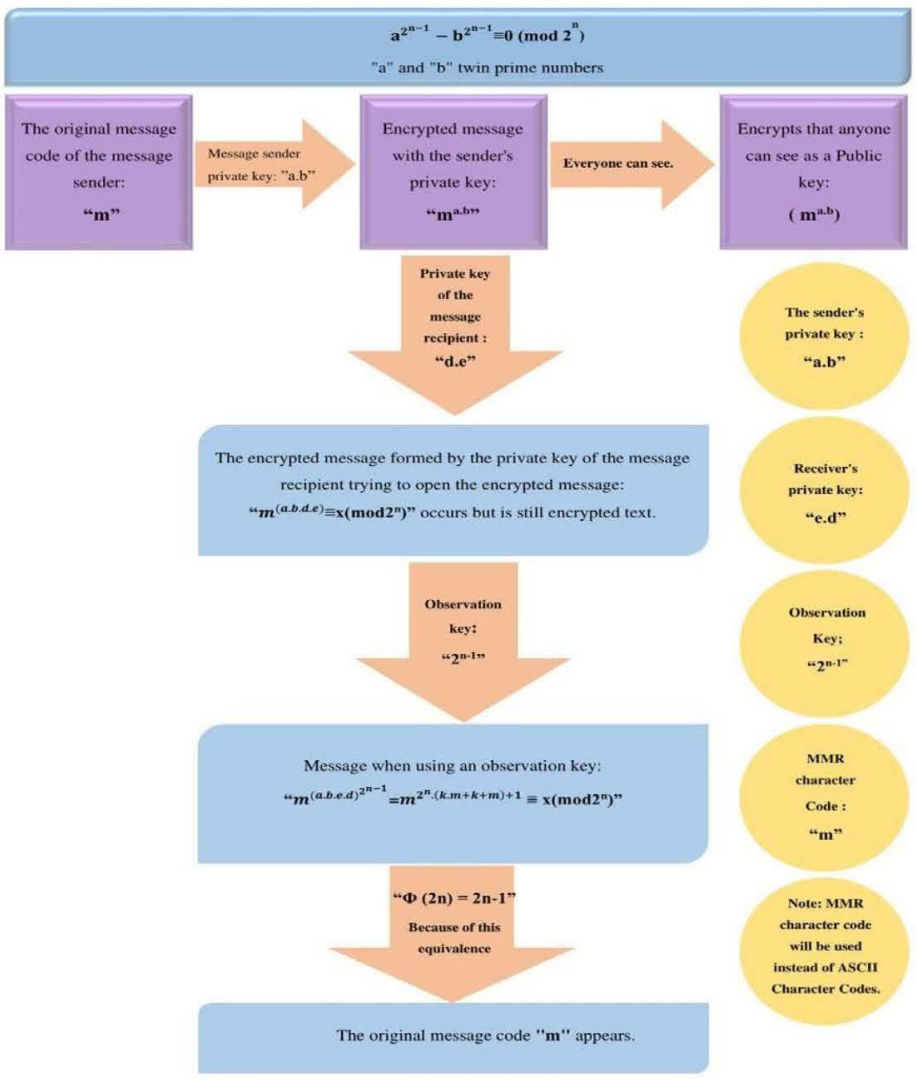
Power of Creative Mind

MMR

MMR ENCRYPTİON ALGORİTHM AND SOFTWARE
Student Project

Author/s:Enes Bedirhan ERDEM

C



In this study, a public key encryption algorithm is tried to be developed. Unlike other public key encryption algorithms, it is desired to create a monitoring key next to the open and closed keys. While creating the algorithm, the equivalence of

$a^{10^{n-1}} - b^{10^{n-1}} \equiv 0 \pmod{10^n}$ is used. Based on this equivalence, algorithms and keys have been created using modular arithmetic rules, Euclidean Algorithm, Euler Theorem, Euler Function, Factoring rules. The first difference of this algorithm from other algorithms is the observation key. In the event that private keys are stolen or cracked, hidden text or data cannot be accessed without a observation key. The second difference is that the receiver's private key, public key and observation key can take infinite values. For now, it is not a problem for the keys to take limited values in other algorithms. However, with the development and speed of the quantum computers, this will be a problem in the future. There are studies that have been successful in this regard. The third difference is that this algorithm has its own character code table. In addition, this algorithm is safer against side channel attacks.

When the equivalence in (11) is generalized, in any number base the force that makes the desired digit of the two digits on the same base the same as the last digit can always be found.

There are two reasons for using twin prime numbers in this algorithm. First, twin prime numbers can take infinite values just like prime numbers. Just as it is difficult to find prime numbers, it is very difficult to find twin prime numbers. The second reason is the number in the mod part is 2. The provision of the Euler Theorem in the algorithm depends on this. Because the Euler Function value of the 2^n number is 2^{n-1}, it must provide the Euler Theorem.

The reason for taking the equivalents used in selecting the numbers "e" and "d" as in (12) and (14); both to make it complex and to use the numbers "a" and "b" in the equivalence found at (11).

The private keys of the sender and the message recipient are taken as "a.b" and "e.d" because it gives the character code immediately in other crosses. For example; in case of receiving the closed key of the message "a.e", "a.d", "b.d", "b.e"; The public key actually becomes the desired character code because m^1 is the remainder. Taking the keys in this way occurred after many attempts.

In fact, it may seem like a disadvantage that the sender's private key is the product of the twin prime numbers and is constant. However, even if private keys are found, it does not make sense without an observation key. Also, the large numerical value of the key is a disadvantage for cracking it.

The reason for performing the operations and creating equivalencies in (13), (15), (17); is for the algorithm to provide. It makes it compulsory to use the observation key. In MMR Encryption Algorithm, the observation key and depending on the observation key, the fact that the sender's private key can get infinite value may cause it to work slowly for now. However, it is thought that when working with quantum computers in the future, it will be very important for the keys to get infinite value.

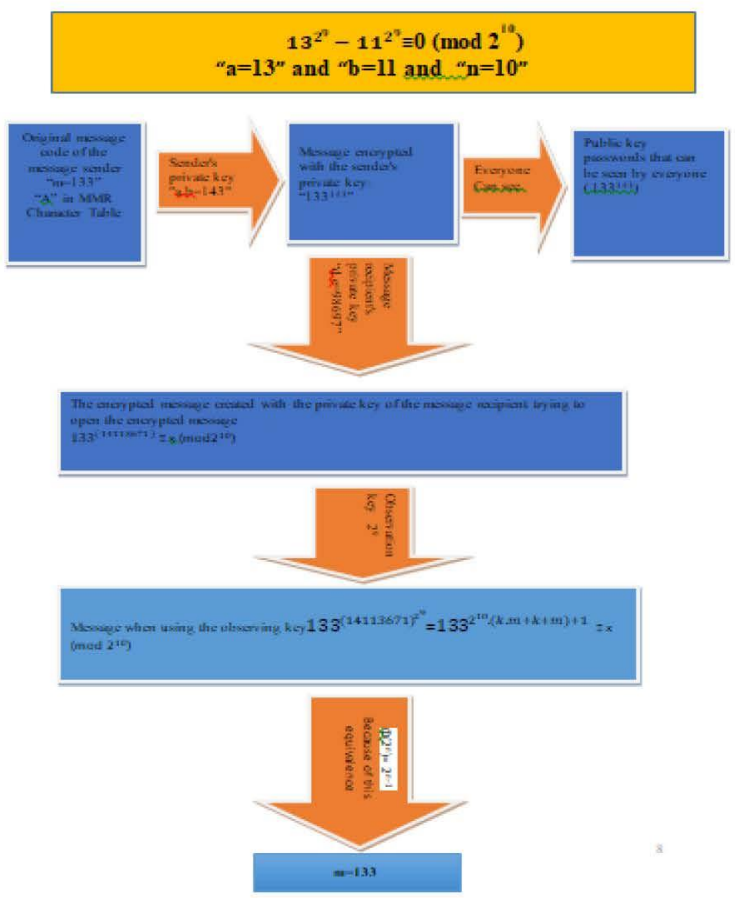
One of the attacks on the RSA Algorithm is the N Number Attack. As a result, N is the product of twoprime numbers. This number can be easily reached with the development of computer technology. For thisreason, it is easy to reach private keys easily. So MMR keys must take infinite value.

Acoustic Crypto Analysis Attack is an attack developed based on the sounds of the computer while it is operating. In private keys with limited value, studies were made to reach the values of these keys from the sounds in the study. Positive results have also been obtained. The infinite value of the keys ensures that this attack can also be prevented.

In short, positive results were obtained in the side channel attacks on the RSA Algorithm. MMR Encryption Algorithm is more advantageous in this regard. The fact that the algorithm depends on the twin prime number and the long keys will provide many advantages in the future.

The reason for not using ASCII Character Codes in this algorithm is that Euler Theorem does not provide. For this reason, MMR Character Code table was created.

In this algorithm, keys may not be made by just changing the number "n". Keys can also be created by changing the twin prime numbers "a" and "b". However, the generated twin prime numbers may not always be easy. It would make more sense to change the software during the update.



Contact: Çubuk Bilim ve Sanat Merkezi

+905413033614

https://cubukbilsem.meb.k12.tr/tema/index.php

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

HC-SR04 ultrasonic distance sensor upgrade for Arduino Bluetooth Car

Student Project

C

Author: Birtok Eugen

Coordinator: Rob Raluca

This paper describes some improvements to the Arduino Bluetooth Car project, a 4x4-powered robot that moves commanded and controlled by an Android application and programmed on the open-source MIT App Inventor platform.

In the construction of this car were necesarry the following parts:

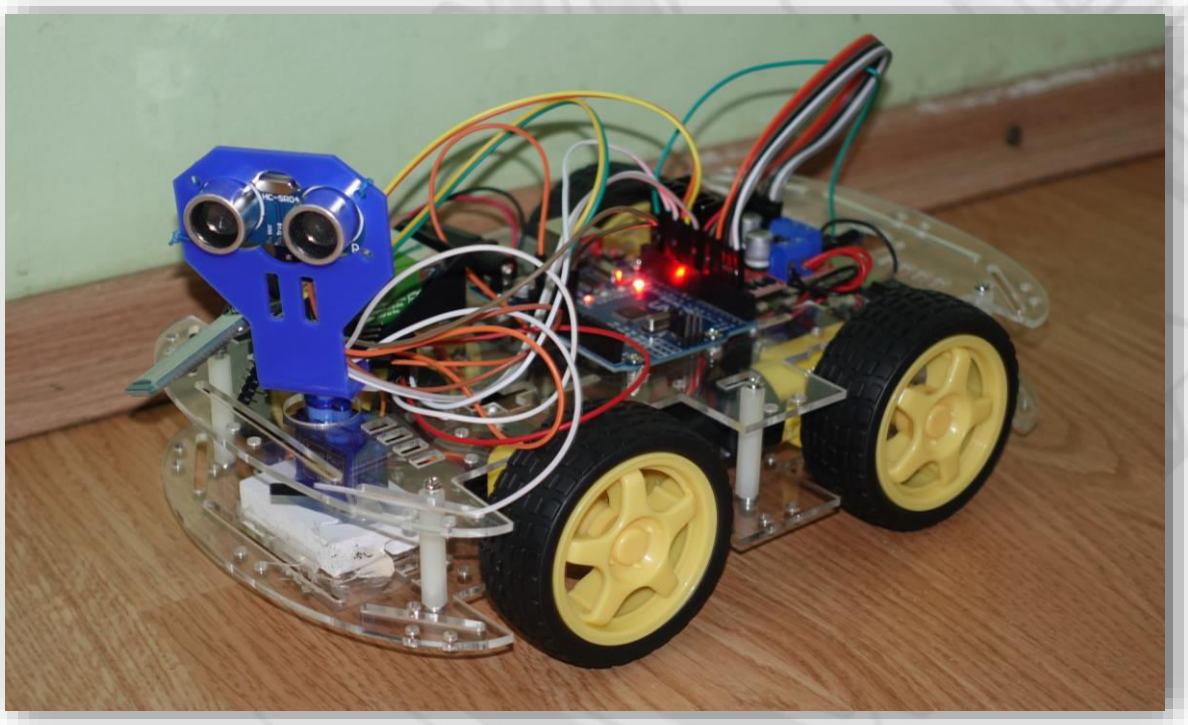
- Arduino Uno development board
- Driver for L298N integrated circuit motors connects to Arduino digital pins.
- HC-05 bluetooth module
- Ultrasonic sensor HC-SR04 (to avoid obstacles)
- SG90 servomotor (for sensor movement at a certain angle)
- DC 12V Battery Pack 6800mAh 12.6V Rechargeable Lithium Battery Pack

Description of the Arduino program

A function has been programmed for each order. Thus, the *Forward () function* sends appropriate logic levels to the input pins in the driver, so that the wheels allow forward movement. To enable communication with the bluetooth module, the *#include <SoftwareSerial.h>* directive in the source code includes retrieving information about the bluetooth transmission in a *switch () structure*. The novelty consists in the implementation of two functions of modifying the engine speed.

Android app description

MIT App Inventor is an open-source web application developed by Google that allows you to create programs for two types of operating systems: Android and iOS. The platform uses a graphical user interface similar to the Scratch programming language, in which the programmer can create objects by drag-and-drop. Following the compilation, an application is created that can be transferred to the mobile device.



HC-SR04 ultrasonic distance sensor

This is the HC-SR04 ultrasonic distance sensor. This economical sensor provides 2cm to 400cm of non-contact measurement functionality with a ranging accuracy that can reach up to 3mm. Each HC-SR04 module includes an ultrasonic transmitter, a receiver and a control circuit. There are only four pins that you need to worry about on the HC-SR04: VCC (Power), Trig (Trigger), Echo (Receive), and GND (Ground). You will find this sensor very easy to set up and use for your next range-finding project!

This sensor has additional control circuitry that can prevent inconsistent "bouncy" data depending on the application.

Contact: eugene_birtok@yahoo.com

CORNELIUGROUP
research-innovation
association

INVENTCOR

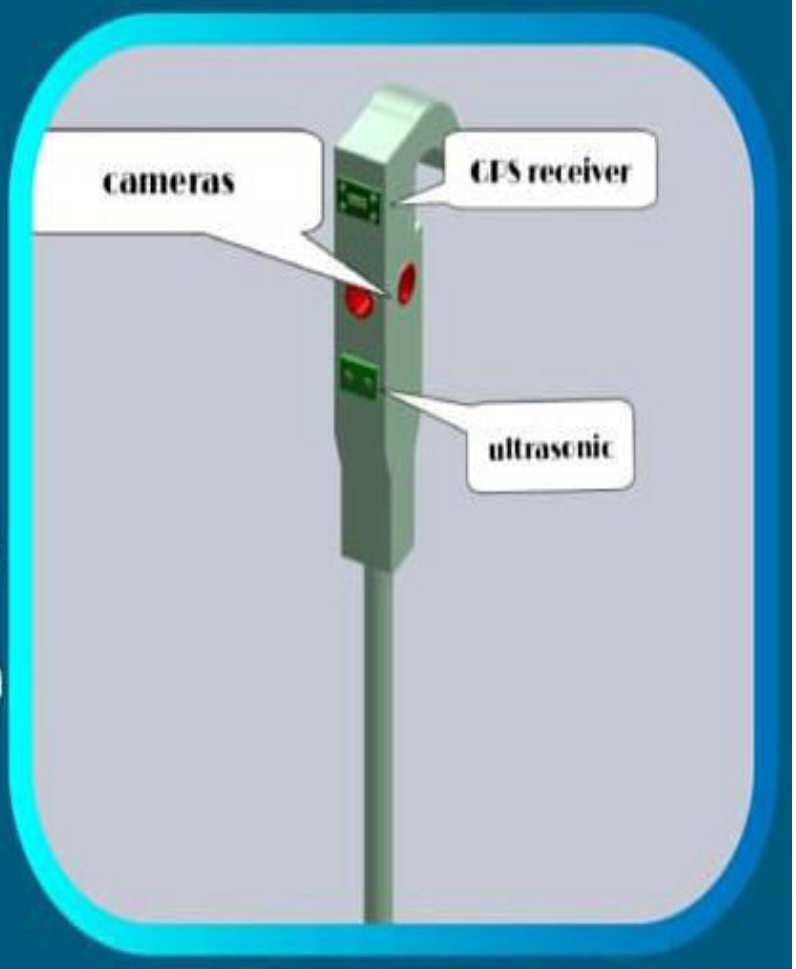
Power of Creative Mind

Hope Stick to Help the Blind Device

C

Device Description:

It is a device that helps the blind person to photograph theenvironment around him and identify things with high accuracy thathelps him to practice his life normally



Functions:

-1 Determine the things people and hazardous surrounding the blind person,
-2 Determine the weather condition and his movement plan for the blind,
-3 Determine the location of the blind for his family in case of his loss,
-4 Tell the blind about his exact location,
-5 The blind can ask the device to call his family or ambulance,32
-6 The device recognize the familial once and facial expressions of the surrounding and tell the blind about that,
-7 Also the device recognize the dangerous people and thieves if theytried to sneak and took something from the blind,
-8 The device read the signs and the advertising board for the blind.

Stick Components:

-1 Censor to measure the weather,
-2 Sensor locator,
-3 Cameras to photograph the patient's surroundings in all directions and tell him what is around him through the headphone,
-4 Headphone,
-5 Microprocessor and betray.

Osman mohamed Osman mohamad(Rihan)
+249 995128086
osmanrihan4@gmail.com

BOUNDARY PILLAR WITH SOLAR PANEL AND FLASHING LIGHT

Autori: Sapta Doru Ioan, Marinut Gabriel Paul, Obrenovici Lavinia Ioana, Strugaru Dragos, Stoianov Alin Ioan, Golcea Julia Daiana

C

Stâlpul de delimitare cu panou solar și lumină intermitentă **este un produs <u>unic</u> fabricat în România**, oferit de Antik S.R.L., are scopul de a asigura atenționarea cu lumină intermitentă și de a restricționa accesul în anumite zone. Fiind un produs bazat pe energie regenerabilă (***energie verde***), acesta nu necesită racordarea la rețeaua de curent pentru a genera lumină, iar acumulatorii interni asigură un regim de bună funcționare timp de **72h după înlăturarea sursei de lumină**. Datorită dimensiunilor reduse, acesta poate fi montat cu ușurință în diverse locații și poate îndeplinii diverse scopuri.

The delimitation pole with solar panel and flashing light **is a unique product made in Romania**, offered by Antik S.R.L., aims to ensure the warning with flashing light and to restrict access in certain areas. Being a product based on renewable energy (***green energy***), it does not require connection to the mains to generate light, and the internal batteries ensure a smooth operation for 72 hours after removing the light source.

Cele mai frecvente utilizări ale acestuia sunt pentru a delimita zonele pietonale de partea carosabilă, sau pentru a împiedica parcarea neregulamentară a autovehiculelor în zonele interzise.

Destinatie:

• Treceri de pietoni nesemaforizate; • Zone pietonale; • Zone Verzi;	• Parcări; • Piețe; • Parcuri;

	Dimensiuni [mm]	Înălțime [mm]	Vopsire	Tip lumină	Sistem electronic
Specificații	80X80	300 / 900	Electrostatic	L.E.D. - Alb	• Acumulator; • Placă de comandă; • Panou fotovoltaic.

S.C. ANTIK S.R.L.
Nume societate : S.c. Antik SRL
Cui : RO15056077
J20/949/2002
Tel : +40 740 222 479
Adresa web: www.scantiksrl.ro

D

Agriculture

Machines and accessories

MINISTERUL EDUCAȚIEI NAȚIONALE ȘI CERCETĂRII ȘTIINȚIFICE

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

D

DESCRIPTIONS

The invention concern's new method and devices for rehabilitation of therapeutic properties of bathing water in lakes by stratified salt concentration. The method is to induce surface water with low salinity concentration under lower layers of water, with a higher salinity concentration in a gravitational continue water flow; water mix, water transportation and diffusion of rehabilitated water on the surface, in the upper layer under the direct osmosis. The method is based on the two principles:

1.principle of communicating vessels

2.principle of direct osmosis

Operation takes place automatically according to the gradient of concentration in the mixing chamber.

UNIVERSITATEA LUCIAN BLAGA DIN SIBIU

METHOD AND DEVICES FOR REHABILITATION OF THERAPEUTIC PROPERTIES OF BATHING WATER IN LAKES BY STRATIFIED SALT CONCENTRATION

AUTHORS: NEDERIŢA Victor; OPREAN Constantin; OPREAN Letiţia; CIUDIN Rodica; TÎŢU Mihail

PATENT No: Patent 125497 - 30.12.2013

ADVANTAGES

Water mixing is done in laminar regime without causing any natural imbalance in the lake. The method is carried out based on exclusive use of natural phenomena without the involvement of artificial sources of energy. The method is environmentally friendly and they do not affect the natural balance of lakes. Other advantages are:

1. novel method for the rehabilitation of water treatment properties of bathing in salt lakes layer with stratified salt concentration.
2. introduction of gravitational water bathing the surface layer of brine flow in the substrate at any depth and rehabilitation of its therapeutic qualities of direct osmosis brine from underground.
3. summer use is organic method without artificial energy sources.

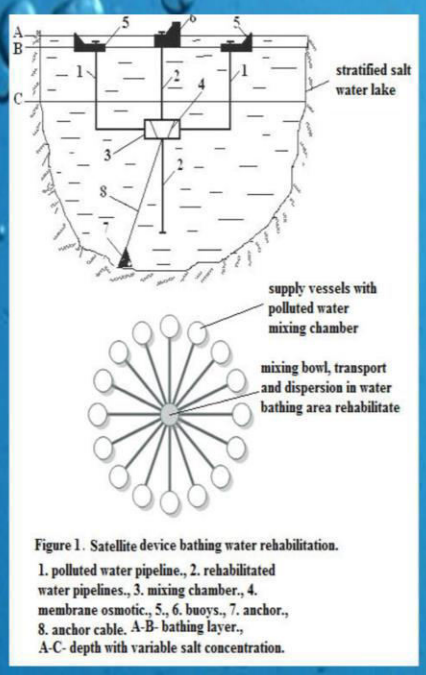


Figure 1. Satellite device bathing water rehabilitation.
1. polluted water pipeline., 2. rehabilitated water pipelines., 3. mixing chamber., 4. membrane osmotic., 5., 6. buoys., 7. anchor., 8. anchor cable. A-B- bathing layer., A-C- depth with variable salt concentration.

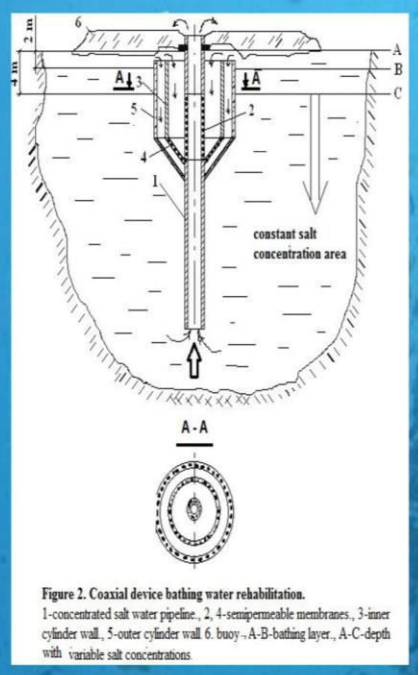
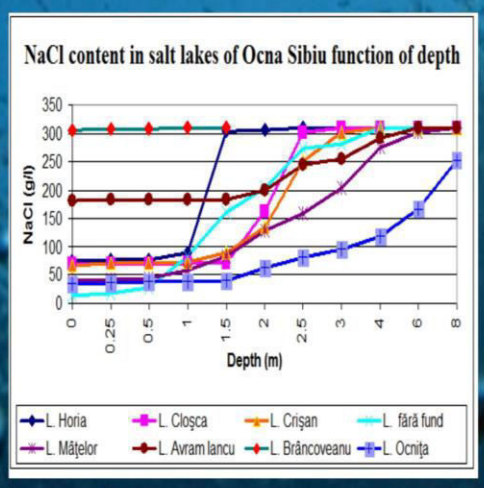
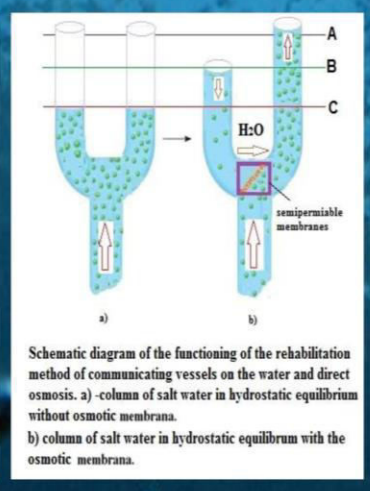


Figure 2. Coaxial device bathing water rehabilitation.
1-concentrated salt water pipeline., 2, 4-semipermeable membranes., 3-inner cylinder wall., 5-outer cylinder wall. 6. buoy., A-B-bathing layer., A-C-depth with variable salt concentrations.





Schematic diagram of the functioning of the rehabilitation method of communicating vessels on the water and direct osmosis. a) -column of salt water in hydrostatic equilibrium without osmotic membrana.
b) column of salt water in hydrostatic equilibrum with the osmotic membrana.

APPLICATIONS

The invention is the result of research carried out under AGRAL / PNCDI the project on "Studies on the complex assessment and recovery solutions for lakes in Ocna Sibiu as a tourist and leisure spa healing" developed during 2004 - 2006 (Research Contract No. 8471. 2004) and one of the technological solutions proposed for the recovery of lakes within the project. Field of use is the water quality rehabilitation curative bathing in salt lakes layer is missing vertical movement of water through water stirring with high concentration by the deep and communicating vessels through direct osmosis.

Contact:
Prof. Dr. Eng. & Ec. Aurel Mihail ŢÎŢU
„Lucian Blaga" University of Sibiu, Faculty of Engineering, Director of PatLib Centre Sibiu, Romania
Tel: +40 744 390 290; Email: mihail.titu@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Institute of Microbiology and Biotechnology, Ministry of Education and Research of the Republic of Moldova

Scientific-Practical Institute of Biotechnologies in Animal Husbandry and Veterinary Medicine, Ministry of Agriculture and Food Industry of the Republic of Moldova

Method of stimulating spermatogenesis at rams out of season

Patent: MD 1460 /2019.03.26

Authors: DARIE Grigore, ROTARI Doina, MAŞNER Oleg, BRADU Nina, RUDIC Valeriu, DJUR Svetlana, CHIRIAC Tatiana, CHISELIȚA Oleg

D - Agriculture, Machines and accessories

Description:

The essence of the invention consists in proposing a new method of stimulating spermatogenesis at rams in out of season period, based on supplementation of the basic feed stock with ZooBioR complex biopreparation obtained from the biomass of the cyanobacteria *Spirulina platensis* CNM-CB-02 in an amount of 0.5 or 5 g per 0.5 kg of feed.

Ration feed	Sperm concentration, billion / ml	% at the blank	volume ejaculate, ml	% at the blank	sperm mobile,%	% at the blank	Spermatozoids with rectelled movements, %	% at the blank
At the beginning of the experiment								
Witness	2,18±0,1	100	0,6±0,04	100	74,4±3,7	100	29,1±2,0	100
+ZooBioR 0,5g	2,82±0,1	129,3	0,9±0,02	150	87,7±2,2	117,9	40,3±2,0	138,5
+ZooBioR 5g	2,48±0,1	113,8	0,9±0,04	150	79,9±2,7	107,4	33,7±2,4	115,8

The technical result of the invention consists in increasing the ejaculate volume by the end of the experiment by 0.3 ml which is 50% relative to the control, the sperm concentration in the ejaculate by 0.3-0.64 billion / ml or 13.8-29.3% versus the control the sperm motility with 7.4-17.9% and the number of sperm with recurrent movements by 15.8-38.5%, compared to the nearest solution, because of the inclusion in the basic ration of rams of ZooBioR complex biopreparations with the following composition per 1 kg of talc: Amino acid and oligopeptide extract - 3.5-5g; Phospholipids - 3.5-5g; Proteoglycans, including sulfated polysaccharides - 3.5-5g; Protein extract - 3.5-5g; Mixoxantophyll - 0.75-1.25g, possessing antioxidant action, stimulating germ epithelium favoring the quantity and quality of biological material collected from rams in the out of season period.

The research was carried out within the project 20.80009.5107.16, funded by NARD, Republic of Moldova.

Field of application: Veterinary, Animal Husbandry.

Contact: Chiselita Oleg, Institute of Microbiology and Biotechnology,
1, Academiei str., MD 2028, Chisinau, email: oleg.chiselita@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Institute of Microbiology and Biotechnology, Ministry of Education and Research of the Republic of Moldova

Scientific-Practical Institute of Biotechnologies in Animal Husbandry and Veterinary Medicine, Ministry of Agriculture and Food Industry of the Republic of Moldova

IMB

ISPBZMV

Process for stimulation and regulation of spermatogenesis at pigs

Patent: MD 1461 /2019.03.26

Authors: DARIE Grigore, CIBOTARU Elena, OSIPCIUC Galina, DJENJERA Irina, RUDIC Valeriu, DJUR Svetlana, CHIRIAC Tatiana, CHISELIȚA Oleg

D - Agriculture, Machines and accessories

Description:

The essence of the invention consists in proposing a new method of stimulation, regulation of spermatogenesis based on the feeding of the sprouts feed with the ZooBioR complex bioproduct, obtained from the biomass of *Spirulina platensis* CNM-CB-02 cyanobacteria, which ensures a constant quantity and quality of the material during the year introduced as an additional component in compound feed for pigs in the amount of 3.3 g per 1 kg of feed for daily administration for 45-50 days during the critical periods of the year.

Season	Volume, ml		Mobility,%		Concentration, ml / ml	
	Witness	Experimental	Witness	Experimental	Witness	Experimental
The autumn	310±10,4	308±4,9	80±0,6	81±0,7	0,16±0,01	0,33±0,01
Winter	324±12,4	314±2,3	81±0,6	84±0,7	0,15±0,01	0,34±0,01
Spring	290±11,8	310±4,9	83±0,6	83±0,7	0,15±0,01	0,36±0,01
Summer	288±10,3	312±2,8	83±0,6	85±0,7	0,16±0,01	0,36±0,02

The technical result of the invention is to increase by 0.17 billion / ml in autumn sperm, 0.19 billion / ml in winter, 0.20 billion / ml in summer, and 0.21 billion / ml in spring versus the closest solution and uniformization due to inclusion in the bovine ration of the ZooBioR complex bioproduct with the following composition per 1 kg of talc: Amino acid and oligopeptide extract - 3.5-5g; Phospholipids - 3.5-5g; Proteoglycans, including sulfated polysaccharides - 3.5-5g; Protein extract - 3.5-5g; Mixoxanthophil - 0.75-1.25g, which possesses antioxidant action and stimulates germ cell epithelial cell multiplication in the spermatogenesis phases.

The research was carried out within the project 20.80009.5107.16, funded by NARD, Republic of Moldova.

Field of application: Veterinary, Animal Husbandry.

Contact: Chiselita Oleg, Institute of Microbiology and Biotechnology,
1, Academiei str., MD 2028, Chisinau, email: oleg.chiselita@gmail.com

Institute of Microbiology and Biotechnology,
Ministry of Education and Research of the Republic of Moldova

Scientific-Practical Institute of Biotechnologies in Zootechnics and Veterinary Medicine, Ministry of Agriculture and Food Industry of the Republic of Moldova

PROTECTIVE MEDIUM FOR PRESERVATION OF RAM SEMEN BY REFRIGEGERATION

Patent application **a 2021 0026/29.04.2021**

Authors: ROTARI Doina, DARIE Grigore, MAȘNER Oleg, IURCU Iulian, DJENJERA Irina, BEȘLIU Alina, CHISELIȚA Natalia, CHISELIȚA Oleg, EFREMOVA Nadejda, TOFAN Elena

D -Agriculture, Machines and accessories

Aim: to elaborate the protective medium for dilution and preservation by refrigeration for ram semen which contribute to longer storage of genetic material.

The description: The invention relates to animal husbandry, veterinary medicine, especially to the protective medium for preservation of ram semen by refrigeration and can be applied for efficient use of native animal genofond. Of particular importance in reproductive biotechnologies are methods of preservation, the utilization of protection media, which serves to dilute, preserve and store sperm at acceptable level.

MANNOPROTEIN PREPARATION

The essence: The new protective medium is proposed for the dilution and preservation by refrigeration of semen obtained from breeders with valuable genetic potential, with the following composition (in % of the volume of medium): sucrose - 6.4%, sodium citrate - 0.6%, egg yolk - 10%, biologically active mannoprotein preparation (500 mg/ml) - 0.6-0.8% and double-distilled water up to 100 ml.

Field of application: Environment-Pollution Control, Zootechnics and Agriculture.

The research was carried out within the project 20.80009.5107.16, funded by NARD

Contact: Institute of Microbiology and Biotechnology, 1 Academiei Street, Chisinau Republic of Moldova. Beșliu Alina email: besliu.imb@gmail.com

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

Institute of Microbiology and Biotechnology, Ministry of Education and Research of the Republic of Moldova

Scientific-Practical Institute of Biotechnologies in Zootechnics and Veterinary Medicine, Ministry of Agriculture and Food Industry of the Republic of Moldova

THE PROCEDURE FOR THE REGULATION OF REPRODUCTIVE FUNCTION OF SOWS

Patent application No. 2021 0027/ 2021.04.29

Authors: PÎRLOG Alisa, CARAPIREA Anatol, DARIE Grigorie, CIBOTARU Elena, MATVIENCO Natalia, BEȘLIU Alina, CHISELIȚA Natalia, CHISELIȚA Oleg, EFREMOVA Nadejda, TOFAN Elena

D -Agriculture, Machines and accessories

Aim: of the present invention consists in the elaboration of the new procedure for the regulation of reproductive function of sows, which ensures the increase of the body mass of the nest at birth, the viability of the piglets and the decrease of the morbidity.

The description: The invention consists in proposing the new procedure for the regulation of reproductive function of sows, with 30 days before the parturition and 10 days after the parturition, based on the supplimentation of basical feed ration with mannoprotein preparation (1 g/100 ml), obtained from the yeast waste from the beer industry in quantity of 10-15 ml per head for daily administration. Positive effects is caused by feed ration supplimentation with the biological active mannoprotein preparation which influence on the animal metabolism.

The technical result: of the invention consist in increasing the number of born alive piglets in calving by 1,6 heads, decreasing the number of stillborn piglets by 1,8 heads, increasing the live mass of the nest by 1,19 kg, and at 21 days - by 0,85 kg compared to the control lot. At the same time, compared to the nearest solution, the number of live piglets at birth increased by 1,5 heads (more by 13,8%), and the number of dead piglets born at birth decreased by 3,2 heads (with 80% less).

Field of application: Agriculture, Zootechnics, Veterinary

The research was carried out within the project 20.80009.5107.16, funded by NARD

Contact: Institute of Microbiology and Biotechnology, 1 Academiei Street, Chisinau Republic of Moldova. Beșliu Alina email: besliu.imb@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

THE INNOVATIVE TECHNOLOGY FOR FOUNDING MELIFEROUS AND ENERGY PLANTATIONS

Patents MD 204, MD 207, MD 208, MD 20190006, MD 20190007

Author: **Victor ŢÎŢEI** D

To face the global crisis, particular attention needs to be paid to the reassessment of the value of neglected and underutilized crops, and to the mobilization and cultivation of new plant species. New cultivars of non-traditional crops created at the "Alexandru Ciubotaru" National Botanical Garden (Institute), Chisinau, registered in the Catalogue of Plant Varieties, patented and in processes of patenting at the State Agency for Intellectual Property (AGEPI) in the Republic of Moldova are intended for the creation of meliferous and energy plantations and the restoration of degraded, eroded and polluted lands that cannot be profitably cultivated with traditional crops.

Virginia mallow ***Sida hermaphrodita*** Rusby, cv. „Energo" patent MD 207

3-5 kg/ha seeds incorporated at a depth of 2-3 cm
sowing period March -April
or 28-40 thousand seedling plants/ha.

Medium-late source of pollen and nectar for bees (July-September)
that makes it possible to obtain 80-120 kg/ha of honey.

Dry biomass potential 20 t/ha with calorific value of 18.6-18.7 MJ/kg,
ash content 1.51 %, the specific density of briquettes 750 kg/m^3,
the specific density of pellets 870 kg/m^3.

Lacy phacelia ***Phacelia tanacetifolia*** Benth., cv. "Melifera" patent MD 208

6-10 kg/ha seeds incorporated at a depth of 2-3 cm
are necessary, sowing period March -April and July-August.

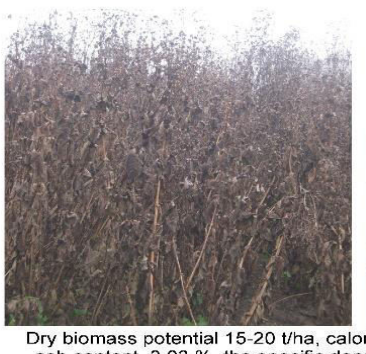
Source of pollen and nectar for bees in early-medium period (May-June) with
400-600 kg/ha potential honey and tardive period (September -Octomber)
with 40-160kg/ha potential honey.

Dry biomass potential 7-9 t/ha, calorific value of 18.1-18.4 MJ/kg,
ash content 2.76 %, the specific density of briquettes 916 kg/m^3,
the specific density of pellets 1070 kg/m^3.

Cup plant ***Silphium perfoliatum*** L. cv. „Vital" patent MD 204

5 –10 kg/ha seeds incorporated at a depth 3-5 cm are
necessary, sowing period April
or 28-40 thousand seedling plants/ha.

Medium-late source of pollen and nectar for bees (July-September) that
makes it possible to obtain 150-220 kg/ha of honey.



Dry biomass potential 15-20 t/ha, calorific value of 18.6-18.7 MJ/kg,
ash content 3.03 %, the specific density of briquettes 882 kg/m^3,
the specific density of pellets 1038 kg/m^3.

Elecampane ***Inula helenium*** L. cv. „Ileana" patent application MD 20190007

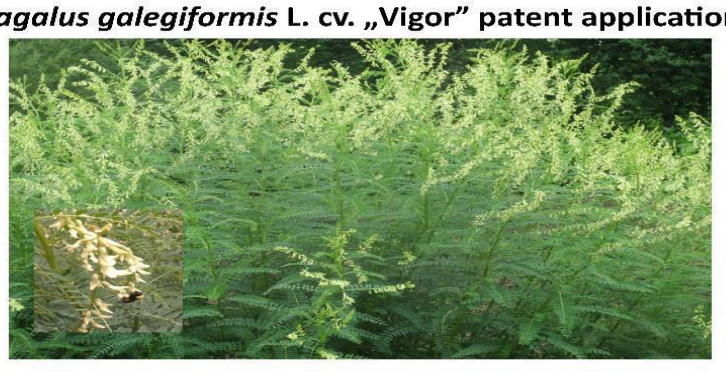
6-10 kg/ha seeds incorporated at a depth of 2-3 cm are necessary, sowing period April
or 40-50 thousand seedling plants/ha.

Medium source of pollen and nectar for bees (June-August)
with honey potential of 70-130 kg/ha.

Dry biomass potential 10-12 t/ha, calorific value of 18.6-18.7 MJ/kg,
ash content 2.76 %, the specific density of briquettes 916 kg/m^3,
the specific density of pellets 988 kg/m^3.

Milkvetch ***Astragalus galegiformis*** L. cv. „Vigor" patent application MD 20190006

8-10 kg/ha scarified seeds incorporated at a depth of
3-4 cm and 30-45 cm between rows are needed.



Early-medium source of pollen and nectar for bees (May-June),
the honey yield is 200-300 kg/ha.

Dry biomass potential 10-15t/ha, calorific value 19.1 MJ/kg,
ash content 3.03 %, the specific density of briquettes 860 kg/m^3,
the specific density of pellets 1074 kg/m^3.

gradinabotanicachisinau@gmail.com
botanicalgardenchisinau@yahoo.com

vic.titei@gmail.com

Financially supported, National Agency for Research and Development of the Republic of Moldova

Project no. 20.80009.5107.02.

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

THE NEW CULTIVAR „MARIA”

OF JERUSALEM ARTICHOKE *HELIANTHUS TUBEROSUS* L.

Institution: **Alexandru Ciubotaru” National Botanical Garden (Institute)** *Chisinau, Republic of Moldova*

Patent **MD 2020.0027**

Author: **Victor ȚÎȚEI**

D

The new cultivar „MARIA” of Jerusalem artichoke, *Helianthus tuberosus* L. has been created by individual breeding of local and introduced plant taxa.in NBGI,, can be used for several purposes: aerial parts as fodder and energy biomass, tubers as feed and by-products of inulin extraction. Melliferous and ornamental

The green mass yield 65-80 t/ha, with 38-43 % leaves content. The biochemical composition and nutritive value of green mass: organic matter 86.9-91.7 %, crude protein 9.8-12.5 %, crude fiber 29.6-36.7%, ADF 34.3-36.9%, NDF 49.6-56.2 %, ADL 5.0-6.5 %, cellulose 29.3-30.4%, hemicellulose 15.3-19.3%, total soluble sugars 23.5-26.2%, digestible dry matter 543-613g/kg, digestible organic matter 524-597g/kg, metabolizable energy 9.77 -10.06 MJ/kg, net energy for lactation 5.79-6.08 MJ/kg, RFV=100-117.

The prepared silage from green mass was characterized by agreeable colour with specific smell, pH 3.85 - 4.37, 89.1% organic matter, 13.2 % crude protein, 30.7 % crude fiber, 32.8% ADF, 52.6% NDF, 3.3% ADL, 29.5 % cellulose, 19.8% hemicellulose, 9.0% total soluble sugars, 60.3% digestible dry matter, 52.2% digestible organic matter, 12.47 MJ/kg digestible energy, 10.23 MJ/kg metabolizable energy, 6.26 MJ/kg net energy for lactation, RFV=112.

The green mass and silage substrates for anaerobic digestion, have optimal C/N ratio, amount of lignin and hemicellulose, biomethane potential varied from 290 to 329 l/kg ODM.

The chopped dry stem biomass have gross calorific value 18.97 MJ/kg and ash content 1.03%, which make them suitable to be used as alternative source of energy: briquettes with 800-848 kg/m^3 specific density and pellets 950 kg/m^3 specific density, as well as substrate for the production of cellulosic ethanol, the theoretical ethanol potential constituted 550-580 l/t dry matter.

The tubers yields 45-53 t/ha, contain 240.2-257.3 g/kg dry matter with 56.7% inulin and 5.1% other carbohydrates, eligible for feed and raw material for the pharmaceutical and food industry.

Melliferous plant available for 20-30 days September –Octomber, with potential 20-40 kg/ha of honey.

The cultivar **„MARIA”** is suitable for the phyto-amelioration and the use of marginal, eroded and polluted lands.

Financially supported, National Agency for Research and Development of the Republic of Moldova Project no. 20.80009.5107.02.

“Mobilization of plant genetic resources, plant breeding and use as forage, melliferous and energy crops in bioeconomy”

vic.titei@gmail.com botanicalgardenchisinau@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Chaenomeles japonica (Thunb.) Lindl. ex Spach *(Japanese dwarf quince)* 'ALEX'

Author/s: ***Roșca Ion, Onica Elisaveta, †Palancean Alexei***.

Project no v2020 0026

D

The shrub grows up to 1 m tall. The flowers are red-orange, with short peduncles and are grouped 2-6 in sessile racemes. The flowering period lasts 20-25 days. The fruits are yellow-green. The average weight of a fruit is 41.9 g. The length of a fruit varies from 45 to 75 mm, the width – 35-45 mm. The surface of the fruit has reddish tinges on the side of the plant facing south. The percentage of mesocarp is about 90%, and the thickness of the mesocarp reaches 1.0-1.2 cm.

The plants prefer sunny places, but can also grow in partial shade, without high demands to the soil. However, the plants that grow on fertile soils are more vigorous and productive. They are highly resistant to pests, pathogens and adverse environmental conditions. Japanese dwarf quince is recommended as a fruit, honey, medicinal, forestry and ornamental plant for landscape architecture.

Contact: roscasilva@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Grădina Botanică Națională (Institut) "Alexandru Ciubotaru" 1950

Aronia melanocarpa (Michx) Elliot

'ALECSANDRINA'

Author/s: ***†Palancean Alexei, Onica Elisaveta, Roșca Ion***

Patent no 249/ 31.12.2017

D

The variety **"Alecsandrina"** is a 1-1.5 m tall shrub, with glabrous stems and simple leaves that turn red in autumn. The leaves are elliptic or ovate to oblong oblanceolate, sharply acuminate or obtuse. Their length varies between 7 and 9 cm. On the upper side, the leaves are green and glossy, and on the lower side – lighter green, glabrous.

Its vegetative stage starts in early spring (march-april), depending on the climate conditions of Moldova. The shoots start growing when buds open and end – in late July or early august. The flowers are white, 1.5 cm in diameter, grouped by 5-25 in glabrous, corymb inflorescences. It blooms in april-may.

Contact: roscasilva@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

IGFPP

"ALEXANDRINA"
rhizogenic interspecific genotype *V. vinifera* (2n=38) x *M.rotundifolia* (2n=40)

„ALEXANDRINA"
genotip interspecific rizogenic *V. vinifera* (2n=38) x *M.rotundifolia* (2n=40)

D

Patent no.342 / 2020.04.03

Authors: *Alexandrov Eugeniu, Botnari Vasile, Gaina Boris*

"Alexandrina" este un soi de struguri pentru vin. Greutatea strugurilor - 600 - 700 g. Conținut de zahăr – 19-20 %. Recoltare posibilă – 15-17 t / ha. Rezistent la filoxera ce poate fi cultivat pe rădăcini proprii, inclusiv în sistemul ecologic. Prezintă o bună creștere și asigură formarea de recolte competitive și în condiții cu temperaturi ridicate peste normele multianuale cu precipitații reduse in timpul verii, pe terenuri cu bonitate scăzută etc.

Crearea plantațiilor cu genotipuri interspecifice rizogene va permite extinderea zonei de cultivare a viței de vie rizogenă spre nord.

"Alexandrina" is a grape variety for wine. Grape weight - 600 - 700 g. Sugar content – 19-20 %. Possible harvest – 15-17 t/ha. Phylloxera resistant and can be grown on its own roots, including in the ecological system, as well as for the extension of the northern limit of vineyards. It shows a good growth and ensures the formation of competitive harvests and in conditions with high temperatures above the multiannual norms with reduced precipitations during the summer, on lands with low creditworthiness, etc.

The creation of plantations of the above-mentioned interspecific genotypes will allow expanding the area of growing rhizogenic grapevine to the north.

Contact: ***IGFPP, Padurii Str. 20, MD 2002, Chisinau, Republic of Moldova***
Tel.: (+373 22) 77 04 47; Fax: (+373 22) 55 61 80; E-mail: institut.gfpp@gmail.com; alexandrov.eugeniu@gmail.com;
Web: www.igfpp.md

AROMA UNICA, THE NEW VARIETY OF *LAVANDULA ANGUSTIFOLIA* MILL., (LAVENDER)

Patent: MD 288/2019.04.30

Authors: **Gonceariuc Maria, Balmus Zinaida**

D
Agriculture

Lavender variety Aroma Unica is a first-generation hybrid (F_1), with a high heterosis effect on a number important quantitative characters, vegetative multiplied with average vegetation period. The Aroma Unica is a variety resistant to frost and winter, to diseases and drought resistant. Plant height is 64 cm. At the density of 10-12 thousand plants per hectare is forms up to 1800-1900 floral stems per plant. The productivity of the variety is 8.9 t/ha of inflorescences containing 1.874 % (60 % humidity) and 5.476% (dry. matter) of essential oil. The productions of essential oil constitute 166.8 kg/ha. The yields of the variety are 19.9 kg/t (of essential oil from the of fresh inflorescences).

REPUBLICA MOLDOVA
Agenţia de Stat pentru Proprietatea Intelectuală

BREVET
PENTRU
SOI DE PLANTĂ
Nr. 288

Eliberat în temeiul Legii nr. 39/2008 privind protecţia soiurilor de plante

Denumirea comună: LEVĂNŢICĂ
Taxonul botanic: *Lavandula angustifolia* Mill.
Denumirea soiului: AROMA UNICA
Titular: INSTITUTUL DE GENETICĂ, FIZIOLOGIE ŞI PROTECŢIE A PLANTELOR, MD
Data acordării: 2019.04.30

Descrierea soiului constituie parte integrantă a prezentului brevet pentru soi de plantă

Director General

CHIŞINĂU

Applications: **Agriculture, perfumery, cosmetics, medicine.**

Advantages: **Resistance to biotic and abiotic factors, high productivity, high quality.**

Contact: IGFPP, Padurii Str. 20, MD 2002, Chisinau, Republic of Moldova
Tel.: (+373 22) 77 04 47; Fax: (+373 22) 55 61 80;
E-mail: institut.gfpp@gmail.com; zinaidabalmus@yahoo.com;
Web: www.igfpp.md

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

IGPPP

Parfum Perfect - a new variety of *Salvia sclarea* L. (Clary sage)

Patent no.:MD 341/2020.04.30

D
Agriculture

Authors: **Gonceariuc Maria, Balmus Zinaida, Cotelea Ludmila, Botnarenco Pantelimon, Butnaras Violeta, Mascovțeva Svetlana**

The variety of *Salvia sclarea* L. Parfum Perfect is a triple hybrid with a constant effect of heterosis on a number of quantitative characters, including the essential oil content. The variety is resistant to drought, frost, winter, diseases. Productivity in 2 years of operation of the plantation: inflorescences: 19.7 t/ha (7.8 t/ha, first year; 11.9 t/ha, second year); essential oil content 1.113-1.154% (dry matter).

The productions of essential oil constitute 60.1 kg/ha (15.6 kg/ha, year I; 44.5 kg/ha, year II).

Efficiency: 3.4 kg of essential oil per ton of inflorescences.

Contact: IGFPP, Padurii Str. 20, MD 2002, Chisinau, Republic of Moldova
Tel.: (+373 22) 77 04 47; Fax: (+373 22) 55 61 80;
E-mail: institut.gfpp@gmail.com; zinaidabalmus@yahoo.com
Web: www.igfpp.md

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

IGFPP

„BERECHET” nou soi de usturoi

„BERECHET” new garlic variety, Allium sativun

D

Patent of varieties no. 362 of 2021.06.30

Authors: BOTNARI Vasile, CHILINCIUC Alexei

Soiul de usturoi BERECHET este de maturitate tardivă, se reproduce vegetativ prin căței și bulbi aeriani. Perioada de vegetație este de 119-134 zile. Plantarea se face toamna. Plantele au o creștere viguroasă, formează tulpini florale și 9-11 frunze de culoare verde închis. Bulbul se caracterizează printr-o densitate formează pronunțată și o durată lungă depăstrare, formă plat-rotunda 35-60 g, este format din 5-7 căței acoperiți cu 4-5 frunze albe, uscate cu dungi violete ușor pronunțate. Inflorescența 32-38 de bulbi aerieni. Culoarea bulbișorilor aerieni este gri-violet, greutatea -3,0-7,0 g. Recolta bulbilor pentru consum alimentar este de 11,2-13,3 t/ha, iar a bulbilor aerian -1,5 - 1,8 t/ha. Soiul este rezistent la temperaturi extreme iarna si vara, tolerant la cele mai frecvente boli.

BERECHET garlic variety is of late maturity, it can be reproduced vegetatively through puppies and seeding of aerial bulbs. The vegetation period is 119-134 days. Planting is done in the fall. The plants have a vigorous growth, form floral stems and 9-11 dark green leaves. The bulb is characterized by pronounced density and long The shelf life, flat-round shape weighing 35-60 g, consists of 5-7 puppies and covered with 4-5 dry white leaves with slightly pronounced purple stripes. The inflorescence forms 32-38 aerial bulbs. The color of the aerial bulbs is gray-purple, weight -3.0-7.0g. The harvest of the bulbs for food consumption is 11.2-13.3 t / ha., And of the aerial bulbs -1.5 - !, 8 t / ha. The variety is resistant to extreme temperatures in winter and summer, tolerant to the most common diseases.

Contact: *IGFPP, Padurii Str. 20, MD 2002, Chisinau, Republic of Moldova*
Tel.: (+373 22) 77 04 47; Fax: (+373 22) 55 61 80;
E-mail: institut.gfpp@gmail.com; vasilebotnari@yahoo.com;
Web: www.igfpp.md

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

IGFPP

PROCESS OF INCREASING SEED GERMINATION AND RESISTANCE OF EUROPEAN BEECH PLANTS

Authors: ELISOVETCAIA Dina, IVANOVA Raisa, MASCENCO Natalia, BOROVSKAIA Alla

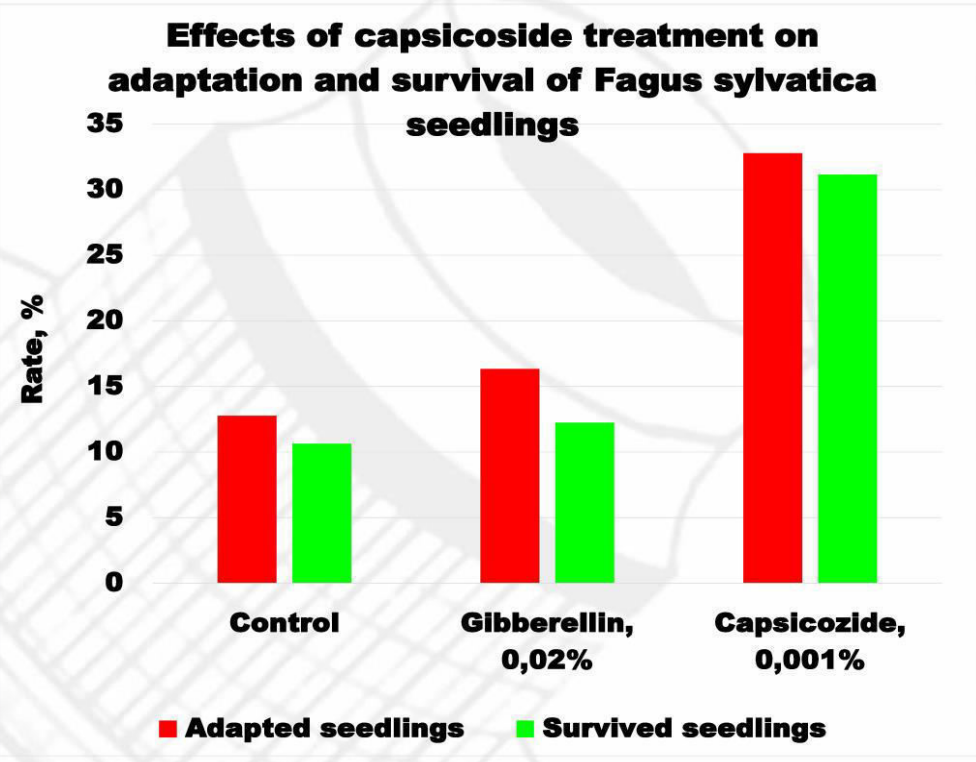
D

Patent: MD-1545

(application number s2020 0103, application date 19.08.2020)

PURPOSE. **Reducing time of seed germination and increasing the resistance of beech seedlings.**

SOLUTION. **The method consists in treating beech seeds with a solution of 0.001% capsicoside for 22-24 hours and then stratifying the seeds at 30% humidity and a temperature of +4-+6°C until germination.**



ADVANTAGES. **The process of seed treatment with capsicoside leads to:**

- **stimulation of daily seed germination by 18.52%;**
- **significant reduction in the period of total seed germination by 20-22 days, which allows for an earlier sowing of germinated beech seeds;**
- **better adaptation of germinated seeds transferred to the soil, the rate of seedling appearance and their survival in the variant with capsicoside treatment was by 2.7-3.0 times higher.**

Contact: **IGFPP, Padurii Str. 20, MD 2002, Chisinau, Republic of Moldova**
Tel.: (+373 22) 77 04 47; Fax: (+373 22) 55 61 80;
E-mail: institut.gfpp@gmail.com; elisovetcaia.dina@gmail.com; web: www.igfpp.md

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

IGPPP

CisGen - new tomato cultivar

Patent: MD 277/ 2018.10.31

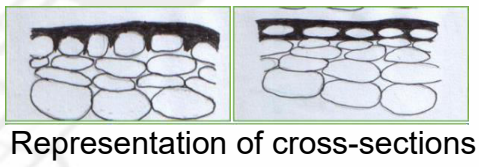
Authors: **Marii Liliana, Bujoreanu Valeriu, Andronic Larisa, Smerea Svetlana, Botnari Vasile, Berzoi Valentina**

D

Tomato cultivar CisGen is created as a result of interspecific hybridization of the Nistru variety and spontaneous form *S. cheesmaniae*. The seeds of hybrid F_1 were irradiated with gamma rays (100Gy), then individual selection has been applied.

Storage duiring 120 days in the room

standard **CisGen**



Representation of cross-sections through tomato exocarp

The plants of **determinate growth type.** The variety with **medium time of maturity.** It is recommended for **seedling and open -field cultivation.** The fruits are small, ovate shape in longitudinal section, without green shoulder (before maturity).
Average fruit weight – 13.5 g. **Shelf life over the storage period :** 25-30 days at room temperature 16-20^{0}C. **Productivity -** Total harvest 34.4-36.9 t/ha.
Type of use – **fresh and processed.**

The thickness of the cuticle, the degree of spread within the fruit, the size and number of layers of hypodermic cells, provides mechanical resistance to the cracking and fruits transporting. The improved shelf-life resulting from thicker pericarp helps in reducing post harvest losses.

The biochemical parameters of the fruits

Total soluble solid	6.80 g%
Sugar	5.84 %
Ascorbic acid	25.37 mg
Total acidity	0.45%
Sugar-acid ratio	8.58-11.96

Contact: IGFPP, Padurii Str. 20, MD 2002, Chisinau, Republic of Moldova

Tel.: (+373 22) 77 04 47; Fax: (+373 22) 55 61 80; E-mail: institut.gfpp@gmail.com; Web: www.igfpp.md; liliana.marii@igfpp.md

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

IGPPP

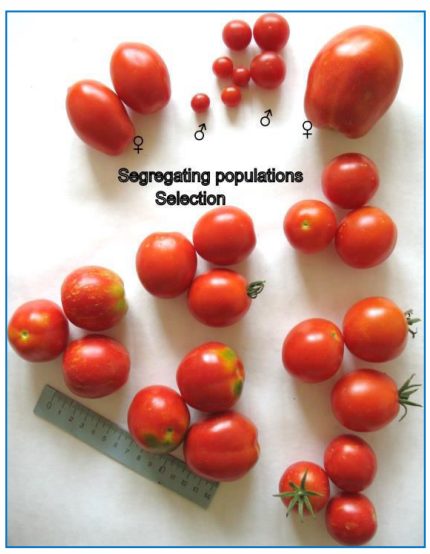
ANONA – new tomato cultivar

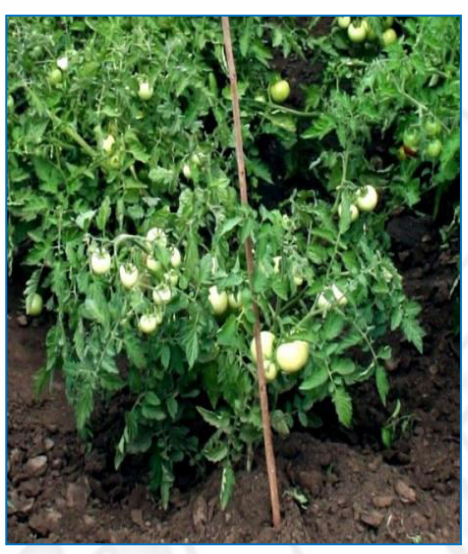
Patent: MD 276. 2018.10.31

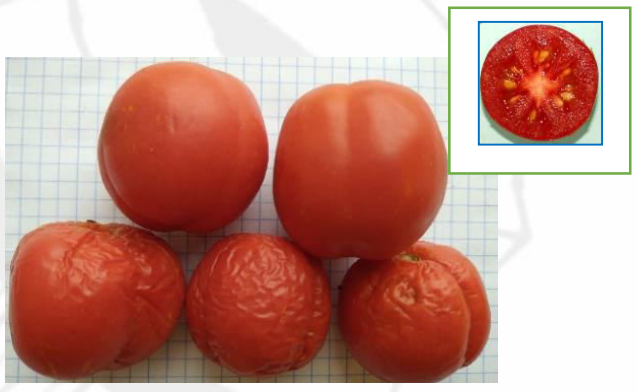
Authors: **Marii Liliana, Bujoreanu Valeriu, Andronic Larisa, Smerea Svetlana, Botnari Vasile**

D

Tomato variety ANONA is created as result of interspecific hybridization of variety Novicioc and *Solanum piminellifolium* L. The seeds of F_1 hybrid were treated with gamma rays (100 Gy). Subsequently individual selection of plants from segregating populations was applied.







Tomato appearance after 120 days of storage under room conditions (September - December).

The variety is with determinant type of growing. The period of ripening is **95-100 days** after seeds germination. The fruits are red and round. Average fruit weight is **29.9 g** - characterized as small to medium. Postharvest shelf - life is **25-30 days** stored at 16-20^{0}C. Total harvest is estimated at **36.23 t/ha**. It is recommended for seedling and open-field cultivation.

The biochemical parameters of the fruits

Total soluble solids	*6.19 g%*
Total sugar	*6.08 g%*
Ascorbic acid	*30.18 mg%*
Total acidity	*0.49 %*

The improved shelf-life resulting from thicker exocarp helps in reducing post harvest losses. The size and number of layers of hypodermic cells, provides mechanical resistance to the cracking and transporting fruits. Tomatoes can be consumed either fresh or processed.

Contact: IGFPP, Padurii Str. 20, MD 2002, Chisinau, Republic of Moldova

Tel.: (+373 22) 77 04 47; Fax: (+373 22) 55 61 80; E-mail: institut.gfpp@gmail.com; Web: www.igfpp.md; liliana.marii@igfpp.md

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

IGPPI

NEW TOMATO VARIETIES
Solanum lycopersicum L.
Exclusiv

D

Patent no.: MD 241/ 2017.08.31

Authors: Mihnea Nadejda, Botnari Vasile, Lupaşcu Galina, Grati Vasile, Saltanovici Tatiana, Mihnea Mihaela

The fruits of the variety *Exclusiv* are medium sized weighing 75-80 g, cylindrical shape. The fruits contain 4.9-5.2% of dry matter, 4.5...4.7% - sugars, 25.0...41.0 mg/% - vitamin C, 0.29...0.37% - acidity. The variety is early ripening with a vegetation period is 100-108 days. In the increased by seeds, the variety ensures a yield of 43.0...59.0 t/ha, while the standard fruit yield is high (93.0%).

Homologated in Republic of Moldova.

ADVANTAGES. **The variety *Exclusiv* harmoniously combines high productivity, good tasting qualities with the resistance to cold and drought. The productivity is high at cultivation through both seeds and seedling transplants.**

APPLICATION DOMAIN: **Agriculture and Food Industry**

IGPPP, Padurii Str. 20, MD 2002, Chisinau, Republic of Moldova
Tel.: (+373 22) 77 04 47; Fax: (+373 22) 55 61 80;
E-mail: institut.gfpp@gmail.com; mihneanadea@yahoo.com

Web: www.igfpp.md

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

IGPPP

NEW TOMATO VARIETIES
Solanum lycopersicum L. FLACARA

Patent, Nr.306 from 2019.08.31

Authors: **SIROMEATNICOV Iulia, BOTNARI Vasile, COTENCO Eugenia, CHIRILOV Elelonora**

D

Description: **The vegetation period is 81-108 days; it is the medium early variety. The fruit is orange color, round-slightly elongated with weigh 48.0-65.0 g, 2-3 seminal lodges. Fruits with high taste qualities, the dry substance content of the fruits is 5.6-6.5%, sugars 5.3-7.6%, ascorbic acid 31.5-41.3 mg/%, titratable acidity 0.34-0.39 mg/%. The total harvest of tomato fruit consists 49.9-52.4 t/ha and standard fruit yield 44.3-49.9 t/ha.**

The variety is productive, resistant to drought. It is recommended for fresh consumption and processing. **Application. Agriculture and Food Industry.**

Contact: IGFPP, Str. Padurii 20, MD 2002, Chisinau, Republic of Moldova

Tel.: +373 69 540 314; +373 22 660419; Fax: (+373 22) 55 61 80;

E-mail: iulia.siromeatnicov@igfpp.md; institut.gfpp@gmail.com

Web: www.igfpp.md

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

IGPPP

New tomato cultivar *(Solanum lycopersicum L)* CIREASCA

Patent no.: **MD 307 / 2019. 08. 31**

D

Author: MAKOVEI Milania

Cireasca – Tomato cultivar, cherry type. Early-ripening variety with a short vegetation period (90 to 97 days). Plant with determinate growth, very compact. The fruits are small, round, smooth, red-intensive, the surface of the epicarp - glossy. The fruit mass is 10 ... 12g with high taste properties. The fruits contain: 4.8 ... 5.2% dry matter, 4.0 ... 4.5% of sugars, 33.0 ... 34.8 mg /% of vitamin C and 0,28…0,38% of acidity. The total yield is 36.7 ... 37.6 t / ha, while the standard fruit yield is high 93…5 – 97%. It is resistant to the most common disease such as *Fusarium, Cladosporium*, *Tomato mosaic virus* and resistant to abiotic stress factors – heat and cold temperatures.

Recommendation

The cultivar Cireasca are recommended for fresh use, for decorating dishes, preserving whole fruits, producing juice and other tomato products.

Application domain - Agriculture (cultivation in private associations farmers and households in individual)

IGFPP, Padurii Str. 20, MD 2002, Chisinau, Republic of Moldova
Tel.: (+373 22) 77 04 47; Fax: (+373 22) 55 61 80; E-mail: institut.gfpp@gmail.com; m_milania@mail.ru
Web: www.igfpp.md

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

SLOT ELECTROLYZER

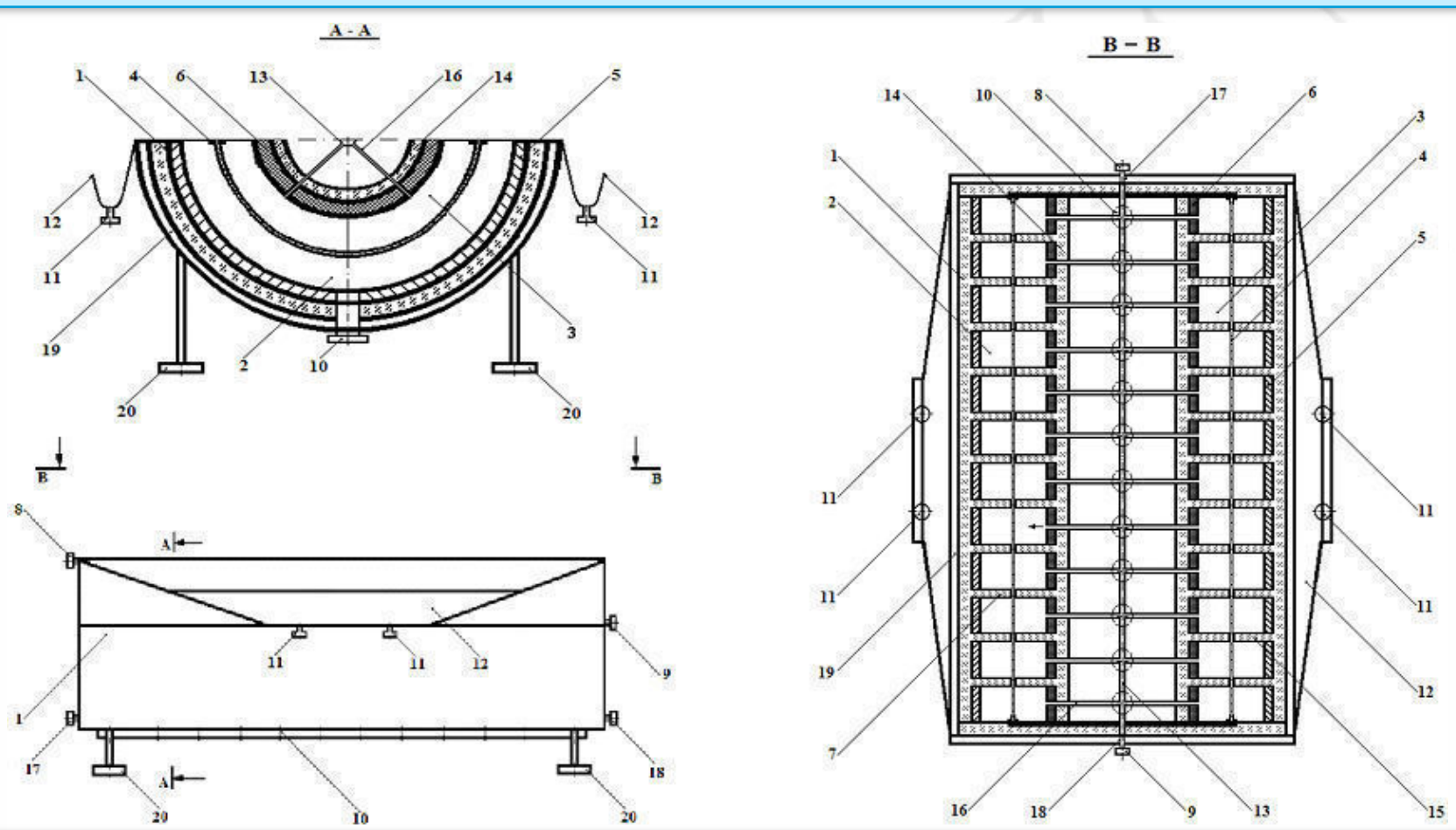
D

Patent, MD 1325 Y

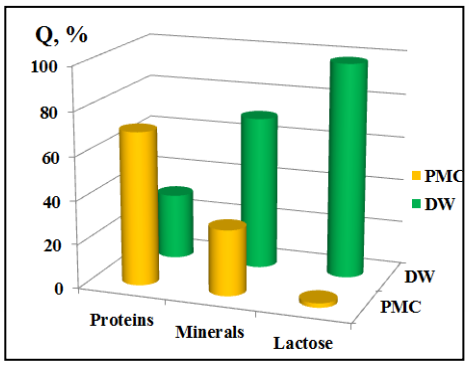
Authors: Mircea Bologa, Elvira Vrabie, Evghenii Maximuk, Irina Paladii, Valeria Vrabie, Tatiana Stepurina, Albert Policarpov, Valeriu Gonciaruc, Catalina Sprincean

Purpose: Slot electrolyzer is proposed that can be used in dairy industry for protein extraction from whey.

Advantages: Wasteless processing of secondary dairy products with the extraction of mineral protein concentrates (PMC) and simultaneous isomerization of lactose in lactulose, which allows the recovery of proteins in PMC with predetermined protein content and increase of the activation surface.



The electrolyzer comprises a dielectric body (1) with slots (7); a cathode (5) is installed on its inner surface; it also has a tubular shaft (13), on which radial pipes (16) are fixed; it is placed into a semi-cylindrical carcass (14) with slots (15); the anode (6), the cathode (5) and the anode chambers (2, 3) are separated by a heterogeneous membrane (4), with an anodic liquid and whey inlets (8, 10) and outlet (9, 11) valves; it also has a cooling jacket (19) and collectors (12).



Electro-fractionation of whey by electrophysical processing (DW - deproteinized whey)

Contacts: *5, Academiei Str., Chisinau, MD 2028, Republic of Moldova.*
Phone: (+373) 69637074 E-mail: vrabie657@yahoo.com

Actinidia species under microscope

Lavinia Mihaela ILIESCU[1, 2], Gabriela Stan[1], Florin STĂNICĂ [1, 2]

[1] Faculty of Horticulture; [2] Research Center for Studies of Food Quality and Agricultural Products

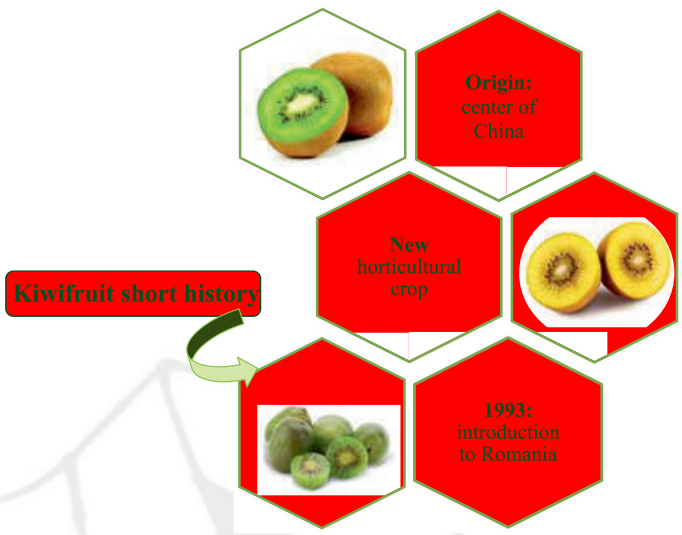
University of Agronomic Sciences and Veterinary Medicine of Bucharest, B-dul Mărăști 59, 011464, București, România

Keywords: *kiwifruit, pollen, flowers, fruit, seeds, leaf*

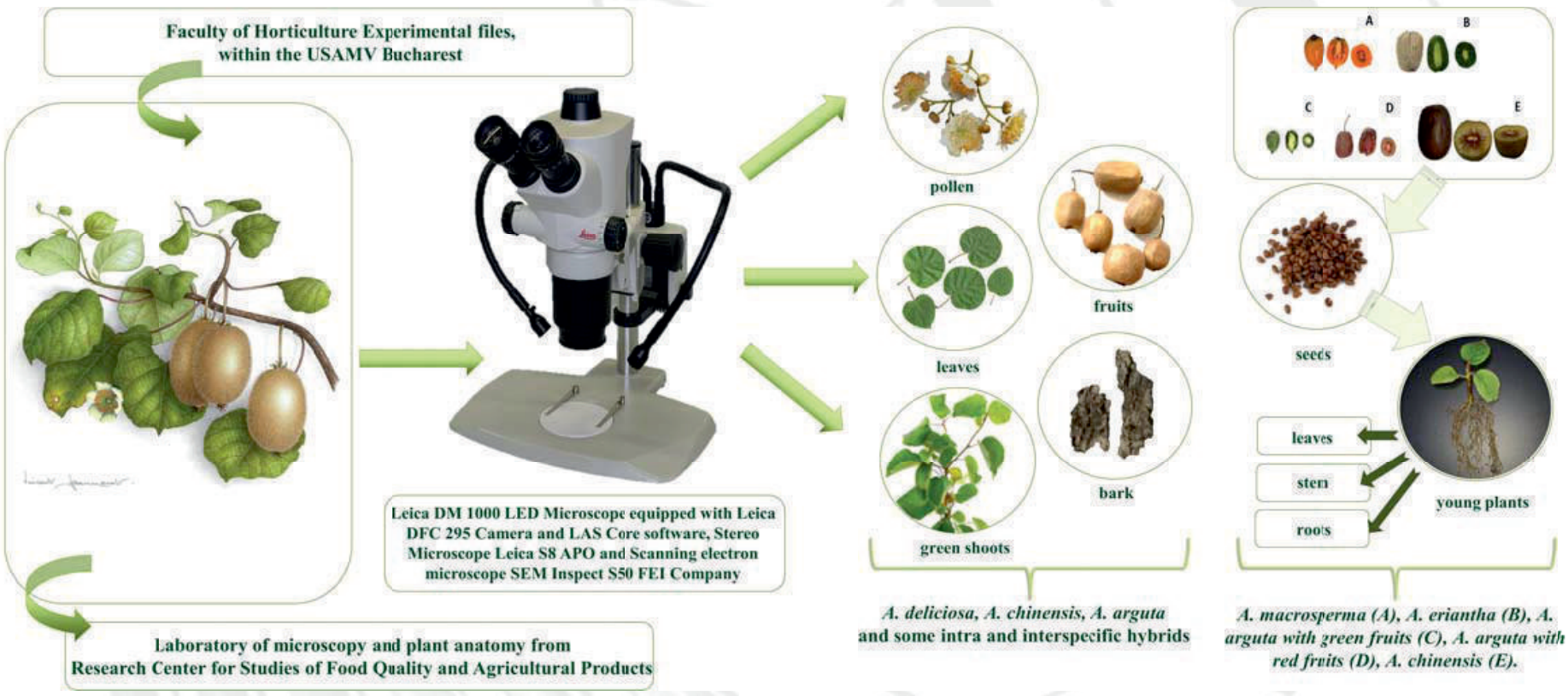
INTRODUCTION

Kiwi is considered a **fuzzy fruit** due to its **multicellular trichomes** found on the epiderma surface. **Trichome morphology** (Zuccherelli, 1994; Huang et al., 1999) and **palynology** (Zhixue et al., 2002) of *Actinidia* genus are investigated over the years. These morphological characteristics and several other (fruits lenticels, presence or absence of lamellate pith), are important in *Actinidia* genus taxonomy, such as species classification on *Leiocarpae*, *Maculatae*, *Strigosae* and *Stellatae* sections (Huang et al., 1999). Also, the anatomical, palynological and trichome structure of Actinidia intra and interspecific hybrids, can provide important information, beside molecular markers, in breeding description of new varieties and in cross compatibility (Huang et al., 1999; Zhixue et al., 2002).

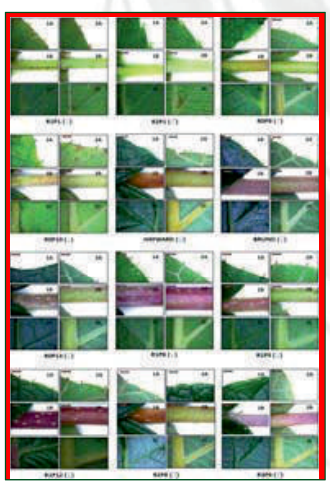
The aim of this paper is to present some original observations made under microscope, regarding the morphology of some kiwifruit species and hybrid genotypes, cultivated in Romania.

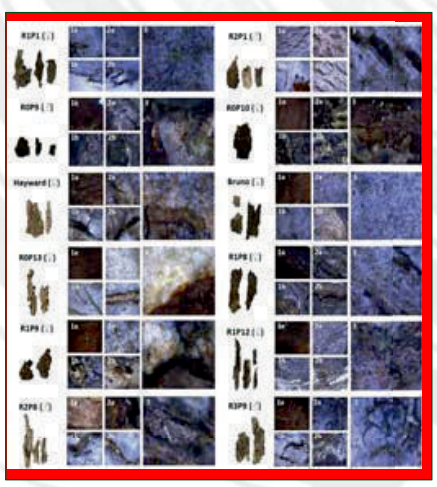


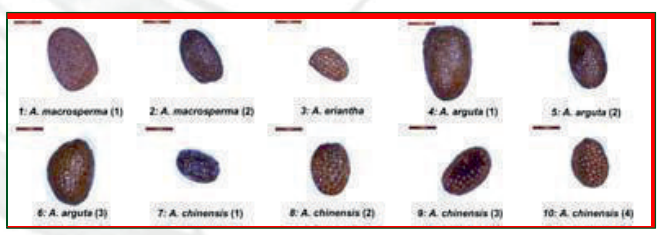
MATERIALS AND METHODS



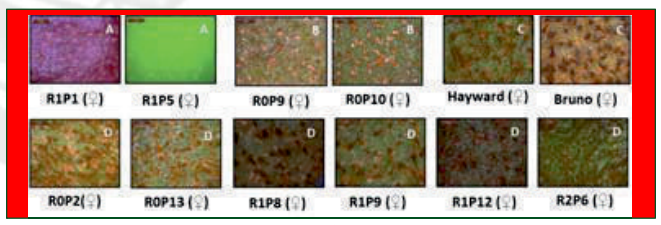
RESULTS AND DISCUSSIONS


leaves

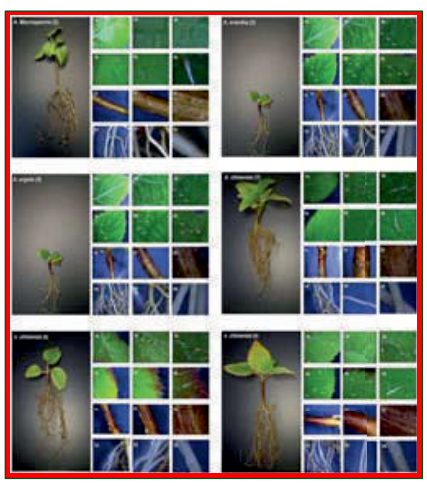

bark



seeds



fruits


young plants

CONCLUSIONS

The results showed how different morphological characters are influenced and defined by different species. Most of the kiwifruit interspecific hybrid genotypes *A. deliciosa* x *A. chinensis* showed similar characters to A. deliciosa, while the *A. chinensis* x A. arguta ones, to A. arguta. Further observations regarding morphological characters among Actinidia species and genotypes are needed to better understand the anatomical differences between their anatomy and to define simple determination/identification keys.

REFERENCES:

Huang, H., Li, J., Lang, P., and Wang, S. (1999). Systematic relationships in Actinidia as revealed by cluster analysis of digitized morphological descriptors. Acta Horticulturae 498: 71-78. DOI: 10.17660/ActaHortic.1999.498.7.

Zhixue, C., Huang, H., and Xingguo, X. (2002). Actinidia in China. China Agricultural Science and Technology Press, Beijing, China, 219-224.

Zuccherelli, G. (1994). L'Actinidia e i nuovi kiwi. Frutticoltura Moderna, Edagricole - Edizioni Agicole, Bologna, Italia.

iliescu_lavinia@yahoo.com

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

University of Agronomic Sciences and Veterinary Medicine – București

D

ADER 1.4.4. Identification, evaluation, testing, development and validation of analysis methods of nutrients and contaminants from inputs usable in organic agriculture

MADJAR Roxana-Maria, BĂDULESCU Liliana, ION Violeta-Alexandra, MOȚ Andrei, DOBRIN Aurora, CONSTANTIN Carmen-Gabriela, BUJOR-NENIȚĂ Oana-Crina, STAN Andreea, BUTCARU Ana Cornelia, NISTOR Ștefania, SCĂEȚEANU Gina, MIHALACHE Mircea, CIOROIANU Traian-Mihai, CIUCU Mihaela, BREZEANU Petre-Marian, IONESCU Nicolaie, CAPRĂ Luiza

WHAT THIS PROJECT PROPOSES TO DO

Although the legislation in force (**Regulation (EC) No 889/2008**) contains fertilizers and soil amendments authorized to be used as inputs in organic farming, currently **there are no standardized working methods** for their analysis, except for those inputs that are also found in Regulation (EC) no. 2003/2003.

The project proposes to solve the current situation regarding the lack of a methodology for identification, evaluation, testing, development and validation of methods for analyzing nutrients and contaminants from inputs usable in organic farming by implementing sensitive detection methods based on state-of-the-art techniques, similar to the European reference laboratories.

OBJECTIVES

O1. Development of methods for the analysis of nutrients and contaminants from inputs usable in organic farming.

O2. Development of a sampling method for the analysis of nutrients / contaminants from inputs usable in organic farming.

O3. Validation of analysis methods developed for nutrients and contaminants analysis from inputs usable in organic farming.

Nutrient analysis
- Macro and microelements - ICP-MS
- Trace elements - ICP-OES
- Elemental analysis - AAS
- Elemental analysis - C, N, S

Contaminant analysis
- Heavy metals - ICP-MS
- Organochlorine pesticides, dioxins, furans - GC-MS
- Triazine pesticides – HPLC

O4. Testing the effectiveness of specific inputs for organic farming.

O5. Development of a good practice guide on the evaluation, testing, development and validation of nutrient and contaminant analysis methods.

WHAT'S NEW?

The project is an innovation for Romania by the fact that it is the first time that a consortium consisting of ***a university, 3 national research and development institutes*** and ***2 research and development stations in the agricultural field*** aims to develop a guide of good practices on evaluation , testing, development and validation of methods for the analysis of nutrients and contaminants and the development of a procedure for certification/attestation of inputs usable in organic farming, so as to have a uniform approach and traceability in their evaluation.

RESULTS

1. Specific validated procedures for the analysis of nutrients and contaminants from inputs usable in organic farming.
2. Evaluation of the effectiveness of specific inputs for organic farming in the experimental fields of fruit trees and fruit bushes, vegetables and field crops.
3. Good practice guide on the evaluation, testing, development and validation of methods for nutrients and contaminants analysis.

BENEFICIARIES

- all **operators** along the food chain: **farmers - processors - consumers**;
- all **authorities and competent bodies** in the field of certification in organic farming;
- the estimated results of the project will substantiate the agri-environment policies developed by MADR and the CAP strategy after 2020, in correlation with the other European partners;
- the **Good practice guide** for evaluation, testing, development and validation of analysis methods of nutrients and contaminants developed in the **project will be made available to the competent authorities** as a tool in the organic farming domain.

COORDINATOR

UASMV Bucharest

PARTNERS

ICPA Bucuresti | ICDP Pitesti | SCDL Bacau | SCDA Pitesti | ICECHIM Bucuresti

This project is funded by the Sectoral Plan for research and development in agricultural field and rural development of the Ministry of Agriculture and Rural Development, for the years 2019-2022, "Agriculture and Rural Development - ADER 2022"

https://www.qlab.ro/ader-1-4-4/
Project director: Roxana MADJAR
E-mail: rmadjar@gmail.com

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

UNIVERSITY OF AGRONOMIC SCIENCES AND VETERINARY MEDICINE – BUCUREȘTI

D

ASSESING THE LIVING WALLS CAPACITY TO REDUCE THE PRESSURE OF PATHOGENS IN URBAN HORTICULTURE

Ivan Elena-Ştefania, Stanciu Ana-Maria

Cod proiect 2021-7/2021.07.19 Contract nr.1278/2021

The OrchardBioWalls project aims to identifynew eco-innovative technologies useful in plant cultivation in urban horticultural ecosystems, bydeveloping a green wall, by adapting a patented device in 2017 for greenhouse crops. It will be tested in an urban fruit ecosystem.The green wall will be located in the experimental fruit field of the Facultyof Horticulture within USAMV Bucharest, at the border between the vineyard and the ecological sector, cultivated with apple and cherry. The research intends to open a new path in urban horticulture, scientificallysubstantiating the effects of using such modular, mobile green walls near urban gardens. Weeklymonitoring of diseases and pests and useful entomofauna will be carried out and the behavior of grass species and other annual/perennial plants used in the construction of the green wall will be monitored. In addition, the reduction of the drift phenomenon of plant protection products will be monitored.

ACKNOWLEDGMENTS:
This work was supported by Competiţia internă de Granturi de cercetare "Joint Junior" a USAMV Bucureşti, sesiunea 2021
Cod proiect 2021-7/2021.07.19 Contract nr.1278/2021

Contact person: Ivan Elena
E-mail: elena.ivan@qlab.usamv.ro

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

USAMV BUCUREȘTI

UNIVERSITY OF AGRONOMIC SCIENCES AND VETERINARY MEDICINE – BUCUREȘTI

D

INNOVATIVE MILD PROCESSING TAILORED TO ENSURE SUSTAINABLE AND HIGH QUALITY ORGANIC FRUIT PRODUCTS

Popa Mona Elena[1], Miteluț Amalia Carmen[1], Popa Elisabeta Elena[1], Drăghici Mihaela[1], Stan Andreea[2], Ion Violeta[2], Bujor Oana[2], Popescu Paul Alexandru[1], Popa Vlad Ioan[2], Guidea-Dănăilă Silvana[1]

[1]University of Agronomic Sciences and veterinary Medicine of Bucharest, Faculty of Biotechnology
[2]University of Agronomic Sciences and veterinary Medicine of Bucharest, Research Center for Studies of Food Quality and Agricultural Products

INTRODUCTION

The global demand for organic processed fruit characterized by high quality, long shelf-life and improved nutritional value is growing due to an increasing interest in a healthier and more environmentally friendly food production. Consumers expect a superior quality compared to conventionally processed foods, such as less pesticide and additives residues, less nutritional/qualitative reduction due to processing operations and a low environmental impact. Nevertheless, the research on the optimization of processing for organic fruit products is still scarce. The main hypothesis of the project is that raw material characteristics, processing and storage conditions for organic fruit products have to be strictly designed to the specificity of each kind of commodity, through the application/implementation of tailored mild processing technologies, with a consumer-driven approach.

MILDsusFRUIT

Main Objective

➢Improve the competitiveness of the organic sector increasing the level of quality sustainability and consumer confidence of organic processed fruit apple citrus and berries products

Specific Objectives

- definition and optimization of mild technologies tailored to each organic raw material in order to increase the stability and functionality of a wide range of organic processed fruit products including minimally processed semi dried and dried ones
- definition and optimization of gentle and more sustainable technologies for tailored extraction and stabilization of functional ingredients developing specific protocols aimed to reduction of waste and valorisation of by products.

ORGANIC FRESH FRUITS

- High nutritional quality
- No pesticides

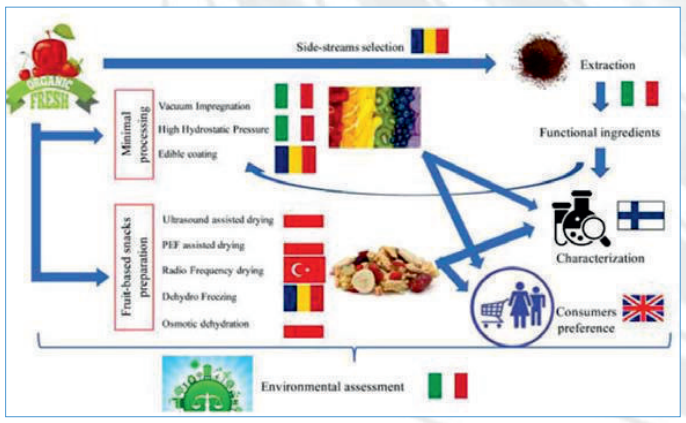
- High perishability
- Reduced range of products

By-products valorization

Application of Mild Processing technologies

NOVEL PROCESSED ORGANIC PRODUCTS

- Increased shelf-life
- Reduced environmental impact
- Increased consumer acceptability
- High nutritional quality
- Wider range of organic products
- Reduction of waste



The project “Towards sustainable and organic food systems” is funded by transnational funding bodies, partners of the H2020 ERA-NETs SUSFOOD2 and CORE Organic Cofund, under the Joint SUSFOOD2/CORE Organic Call 2019

Contact person: Popa Elena
E-mail: elena.eli.tanase@gmail.com

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

University of Agronomic Sciences and Veterinary Medicine – București

D

ProtectGoji - Identification and development of new crop technology tools to support the integrated management of the goji gall mite, *Aceria kuko*

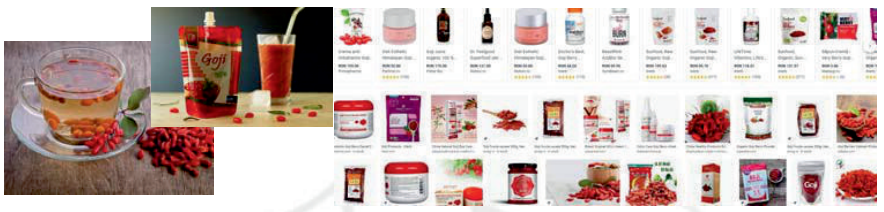
R. Ciceoi, E. Ivan, M. Iordăchescu, V. Ion, A. Butcaru, A Mot, A Petre, O. Venat, V. Luchian, C.A. Mihai, D. Popescu, F. Stănică, M. Georgescu, M. Gutue, M-M Stavrescu-Bedivan, S. Marin, A. Donici, A. Tabacu, R. Pindaru

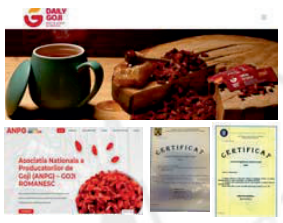
USAMV BUCUREȘTI

CENTRUL DE CERCETARE PENTRU STUDIUL CALITĂȚII PRODUSELOR AGROALIMENTARE

ISTRIȚA

The goji crop is expanding rapidly in Europe to satisfy the increased market demand for organic functional foods with effects in chronic diseases treatment cancer diabetes atherosclerosis etc I





Romania has become in recent years one of the most important growers of goji berry especially for organic production as the species was quite resistant to main pests and diseases The first patented varieties are Kronstadt Anto Erma Transylvania

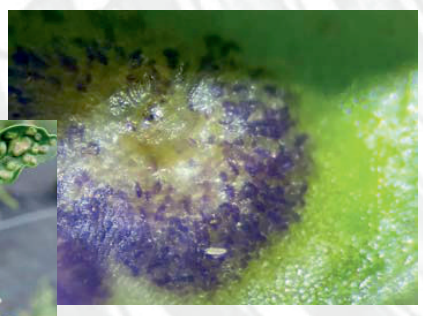
Although recently introduced in Romania goji already has three important pests the brown marmorated stink bug *Halyomorpha halys,* the southern green stink bug *Nezara viridula* and the goji plant mite *Aceria kuko.*

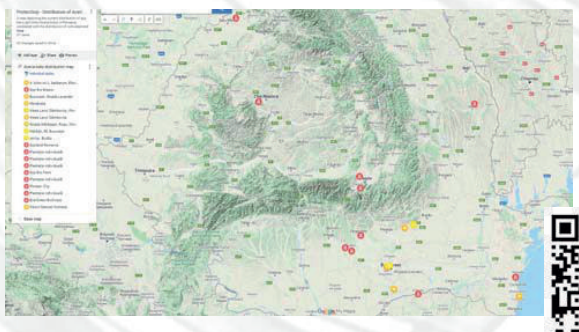
The specific objectives of the project are :

(1) Development of a method to determine the optimal plant protection interventions depending on biological characteristics and climatic conditions

(2) Development of an online open acces real time distribution map of *A. kuko* mite

(3) Development of a rapid method for identification of goji miteresistance using molecular markers





The project will help increasing the awareness of goji producers about the risks of the spread of goji bery gall mite in Romania and support all goji berry interested stakeholders farmers producers hobby gardeners wild fruit pickers biodiversity pasionates etc I to maintain this crop as safe as possible

Acknowledgments:

This research work was carried out with the support of a grant of University of Agronomic Science and Veterinary Medicine of Bucharest project number acronym ProtectGoji withi n IPC

Contact person: CICEOI Roxana
E-mail: roxana.ciceoi@gmail.com

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

UNIVERSITY OF AGRONOMIC SCIENCES AND VETERINARY MEDICINE – BUCUREȘTI

D

BIO CHAR

Engineered vegetal waste-derived biochar for agronomic and environmental benefits

ION Violeta Alexandra, PÂRVULESCU Oana Cristina, BĂDULESCU Liliana Aurelia, MADJAR Roxana Maria, MUȘAT Marian, JERCA Ovidiu, MOȚ Andrei, POPA Vlad Ioan, ILIESCU Lavinia, GRIGORAȘ Claudia, MARIN Sorin Marian, BANIȚĂ Cornel

SCOPE

BIOCHAR project aims at generating a laboratory validated technology for the thermochemical conversion of vegetal wastes, i.e., by slow pyrolysis followed by physical/chemical treatment, into suitable biochar (BC) types that can be subsequently applied for agronomic and environmental benefits

OBJECTIVES

- ❖ production of BC by slow pyrolysis of untreated/chemically treated vegetal waste in a fixed bed reactor under various process conditions
- ❖ production of tailored BC by physical/chemical treatment of pyrolysis BC for further use in specific applications
- ❖ evaluation of pyrolysis BC/treated BC potential to amend the soil and remediate the pollution

OUTCOMES

- ❖ a technology for preparing engineered BC with properties tailored depending on nature and characteristics of waste feedstock, pyrolysis conditions, type and conditions of physical/chemical treatment
- ❖ different types of engineered BC with proved ability to amend the soil and/or adsorb environmental contaminants
- ❖ communications and ISI papers which will disseminate the research results

Coordinator:
PÂRVULESCU Oana Cristina, University POLITEHNICA of Bucharest
Partner:
ION Violeta Alexandra, University of Agronomic Sciences and Veterinary Medicine of Bucharest

„This work was supported by a grant of the Romanian Ministry of Education and Research, CCCDI - UEFISCDI, project number PN-III-P2-2.1-PED-2019-4917, within PNCDI III”

Contact: ION Violeta Alexandra
Email: violeta.ion.phd@gmail.com
Phone: +40 786 365 033
Website: https://www.qlab.ro/biochar/http://biochar.chimie.upb.ro/

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

University of Agronomic Sciences and Veterinary Medicine – București

D

Technology model for pear crop in a circular economy system CIRCULAR-ECO-PĂR

Butcaru A.C., Mihai C.A., Ionescu C.P., Gherasim M.T.

Circular agriculture. Zero-waste. Composting. The circular economy (EC) is a key pillar of the European Green Deal, which provides decisions on the amount of waste produced, its transformation into resources and its reintroduction into the economic circuit. Zero-waste is a holistic approach to waste management, being an alternative solution addressed in recent decades.

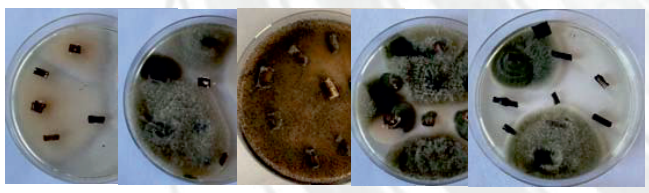
In the project we will apply a fertilization scheme that involves the use of compost obtained from plant material (leaves, residues obtained from mowing the grass, chopped branches, etc. from the orchard and campus) as well as that obtained from composting food residues (local and at the restaurant - university canteen). The use of compost has positive effects on soil microbial activity and nutrient availability, as well as biomass growth and orchard productivity.

Worldwide, the value of pear production has doubled in the last 25 years. In Romania, however, there is a steady downward trend. In recent years, breeding programs have led to the creation of several cultivars with resistance/tolerance to bacterial fire and psylla, which could be included in projects for the establishment of organic orchards. Cultivars such as Euras, Corina, Cristal, Tudor, Romcor and Orizont Andreiești.) or those from the selections from Cluj-Napoca also have special qualities in terms of fruit quality.

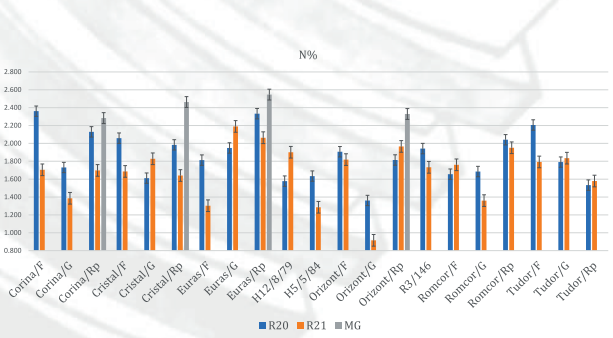
The general project objective consists in creating a model of technology in a circular economy system that can be later transferred to the economic environment, especially to the farms in conversion, respectively ecological.

The specific objectives of the project are:

(1 Determining the influence of applied technology on mycoflora with the identification of specific antagonists;



(2 Determining the influence of technology on the nutritional status of plants and soil quality parameters;



(3 Determining the influence of technology on fruit production and quality;

(4 Determining the impact on the environment and the economic efficiency of the pear fertilization scheme.

The direct results are: composting system, compost produced, composted waste, fertilization scheme correlated with the determinations regarding the C/N ratio, foliar diagnosis, mycoflora screening, soil respiration coefficient. Fruit production and quality complete the study. The economic and environmental impact assessment (LCA, LCCA) will be applied to the proposed fertilization scheme.

Acknowledgments: This work was supported by a grant of the University of Agronomic Sciences and Veterinary Medicine of Bucharest, project number 2021-6/2021.07.17 (CIRCULAR-ECO-PĂR), within Joint Junior Competition 2021 and project FDI-2021-0430

Contact: BUTCARU Ana
E-mail: anabutcaru@gmail.com

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

UNIVERSITATEA DE ȘTIINȚE AGRONOMICE ȘI MEDICINĂ VETERINARĂ – BUCUREȘTI

USAMV BUCUREȘTI

CENTRUL DE CERCETARE PENTRU STUDIUL CALITĂȚII PRODUSELOR AGROALIMENTARE

ISTRIȚA

D

Genetic Analysis Method of Romanian Blueberry Varieties in Order to Identify DNA Sequences with the Potential to Become Specific Markers for Valuable Traits in Plant Breeding. BlueBerryGene

Authors: Mihai C.A., Iordăchescu M., Stănică F., Badea L.M., Bujor N.O.C., Iliescu L.M., Petre A., Pândaru R., Tabacu A., Popescu D., Potor D., Ionescu C.

Email: cosmin.mihai@horticultura-bucuresti.ro I Contract: 1265/30.07.2021 I Budget: 150000 lei

Abstract: Rapid climate changes in recent years are increasingly affecting plant growth and development as well their adaptation to new environmental conditions. Thus, it becomes imperative to create new varieties and hybrids rapidly to cope with changes and meet the growing demands of consumers. To reduce the time required to create new hybrids and valuable varieties worldwide, plant breeders are using molecular methods and techniques more and more. A first step in this direction is the study of the genetic variation of the Romanian varieties to determine the nucleotide sequences responsible for the valuable characteristics that are to be passed on to new varieties and hybrids. Cultivated blueberry (*Vaccinium corymbosum* L.) is a particularly important species from an economic and nutraceutical point of view, due to its high content of anthocyanins and superior antioxidant activities. The aim of the project includes the analysis of the genetic and phenotypic variation of the Romanian cultivated blueberry varieties. PCR-amplified DNA fragments with the potential to become specific markers for valuable traits will be identified.
Cuvinte cheie: blueberry, plant breeding, genetics

Project objectives:

1.Genetic variability study of Romanian blueberry varieties (*Vaccinium corymbosum* L.)
2.Phenotypic variability analysis of Romanian blueberry varieties (*Vaccinium corymbosum* L.)
3.Identification of amplified DNA fragments with the potential to become specific markers for valuable traits in plant breeding

Research Infrastructure

Horticulture Faculty - The didactic and experimental field for integrated fruit growing (2.5 ha) and the Vegetation House of the Faculty of Horticulture are located on the university campus and contain a collection of fruit trees and shrubs varieties and rootstocks (e.g. apple, pear, blueberry, but also novel fruit species) used for studies on the cultivation of blueberries in protected areas in a containerized system, as well as breeding programs: selection of hybrids, plant breeding, etc.

Research Center for Studies of Food Quality and Agricultural Products – Plant molecular biology laboratory: It has the entire infrastructure to perform specific genotyping analyses: precision analytical balance, magnetic stirrer, 3 automated systems for nucleic acid extraction, 3 PCR thermocyclers Eppendorf, 3 horizontal electrophoresis apparatuses, 2 apparatuses for DNA quantification (NanoDrop 1000 spectrophotometer and Qubit 4 fluorometer), etc. **Plant molecular physiology laboratory –** It has equipments such as microbiological hood, cedntrifuge with an option to function at low temperature (4°C), refrigerator and freezer (4°C/-20 °C), deep freezer (-70°C), etc.; **Plant Physiology and HPLC analyses laboratory –** It has equipments for anthocyanins extraction and spectrophotometric analysis, as well as for the determination of polyphenolic extracts antioxidant activity of blueberry: chemical hood, centrifuge, analytical balance, spectrophotometer, ice machine, etc. **Integrated Fruit Growing Laboratory –** It has the infrastructure necessary for phenotyping such as the leaf analysis system (Scanner Epson Expression 11000XL and Software Winfolia), digital rephractometer Kruss DR 301-95, refractometru digital Kruss DR 301-95, digital penetrometer Turoni FR 5120, etc.

Didactic, Research and Development Station for Fruit Growing ISTRI A Established in 1983, the station is one of the most prestigious nurseries in Romania, being located in Buzau County. It consists of the Production part - orchards, Nursery - planting material, Shrubs - demonstration lot.

Contact: MIHAI Cosmin Alexandru
E-mail: cosmin.mihai@horticultura-bucuresti.ro

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

UNIVERSITATEA DE ȘTIINȚE AGRONOMICE ȘI MEDICINĂ VETERINARĂ – BUCUREȘTI

USAMV BUCUREȘTI

CENTRUL DE CERCETARE PENTRU STUDIUL CALITĂȚII PRODUSELOR AGROALIMENTARE

D

Identification of Romanian Cherry Varieties Using an SSR Molecular Markers – Based Method. MicroSatCherry

Autori: Iordăchescu M., Șerban V., Ionescu C.

Contract: 1279/30.07.2021 I Buget: 50000 lei

Abstract: One of the aims of the European Green Deal is to increase biodiversity in agriculture. In order to conserve the local varieties of plants, main sources of biodiversity, as well as biological heritage and sources of germplasm for plant breeders, it is imperative to identify them at the genetic level. Nowadays, modern techniques use molecular markers such as SSR to study genetic diversity and the DNA fingerprinting of the species/varieties of interest. One of the species of fruit trees traditionally grown in Romania is cherry, Romania being one of the top producers of cherries worldwide. The project proposes to identify the cherry varieties present in the USAMV Bucharest collection using a method based on the use of SSR-type molecular markers, finalized by the building of a genotype identification scheme, based on the variety-specific patterns obtained by DNA amplification with SSR primers.

Keywords: sweet cherry, molecular marker, SSR, microsatellite

Project objectives:

1.Genetic variability study for sweet cherry Romanian varieties (*Prunus avium* L.) present in USAMV Bucharest orchard collection

2.Phenotypic variability study for sweet cherry Romanian varieties (*Prunus avium* L.) present in USAMV Bucharest orchard collection

3.Design an identification scheme for sweet cherry Romanian varieties (*Prunus avium* L.) present in USAMV Bucharest orchard collection

Research Infrastructure

Centrul de cercetare pentru studiul calit ii produselor agroalimentare - Research Center for Studies of Food Quality and Agricultural Products – Plant molecular biology laboratory: It has the entire infrastructure to perform specific genotyping analyses: precision analytical balance, magnetic stirrer, 3 automated systems for nucleic acid extraction, 3 PCR thermocyclers Eppendorf, 3 horizontal electrophoresis apparatuses, 2 apparatuses for DNA quantification (NanoDrop 1000 spectrophotometer and Qubit 4 fluorometer), etc. **Plant molecular physiology laboratory –** It has equipments such as microbiological hood, cedntrifuge with an option to function at low temperature (4°C), refrigerator and freezer (4°C/-20 °C), deep freezer (-70°C), etc.; **Integrated Fruit Growing Laboratory –** It has the infrastructure necessary for phenotyping such as the leaf analysis system (Scanner Epson Expression 11000XL and Software Winfolia), digital rephractometer Kruss DR 301-95, refractometru digital Kruss DR 301-95, digital penetrometer Turoni FR 5120, etc.

Faculty of Management and Rural Development – it has the infrastructure necessary for preliminary testing and algorithm validation for designing the varieties' identification scheme, as well as the infrastructure for performing statistical analysis (computers, software, etc.) and for ensuring management activities.

Contact person: IORDĂCHESCU Mihaela
E-mail: mihaela.iordachescu@qlab.usamv.ro

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

USAMV BUCUREȘTI

UNIVERSITATEA DE ȘTIINȚE AGRONOMICE ȘI MEDICINĂ VETERINARĂ – BUCUREȘTI

D

Behaviour of some new Romanian pear disease resistant genotypes cultivated in Bucharest area

Rareș Cosmin PÂNDARU, Florin STĂNICĂ, Ana Cornelia BUTCARU, Cosmin Alexandru MIHAI, Adrian Constantin ASĂNICĂ

University of Agronomic Sciences and Veterinary Medicine, Bd. Mărăşti,nr.59, 011464, Bucharest, Romania

Keywords:. *Pyrus communis,* varieties, rootstock, canopy, Trident, Parallel U, fruits parameters

INTRODUCTION

- In the last 30 years, pears orchards area diminished dramatically in Romania due to several factors, the most important being the sensitivity to some pests (pear psylla - *Cacopsylla pyricola* Förster) and diseases (fire blight - *Erwinia amylovora* Burrill).
- In the same time, the market demand for pears is increasing and the prices are continuously high.
- The aim of this study is to present the behaviour of some new Romanian pear disease resistant genotypes, produced at the Voineşti Research Station for Fruit Growing and planted in the Experimental Orchard of the Faculty of Horticulture within USAMV.

MATERIALS AND METHODS

- Six varieties and three new hybrid selections resistant to scab, grafted on quince CTS 212, pear seedling and self rooted were analysed: Corina, Cristal, Euras, Orizont, Romcor, Tudor, H12/83/79, H5/5/84, R3/146.
- The planting distances varied from 3.0 x 0.8 m, for Parallel U to 3.0 x 1.6 m, for Trident canopy.
- The study presents the comparative biometrical data for each genotype respectively: average tree height, type, number and average length of annual fruiting shoots, trunk cross sectional area. Estimation of yield and fruits characteristics at the harvest moment are detailed.
- The analysis were made in the Research Centre for Study of Food and Agricultural Products Quality, University of Agronomic Sciences and Veterinary Medicine of Bucharest.

Corina
Tree vigour - medium. Resistant to scab. Tolerant to fire blight. Ripening: Oct. - Nov.

Cristal
Tree vigour - medium. Resistant to scab and to fire blight. Ripening: Oct. - Nov.

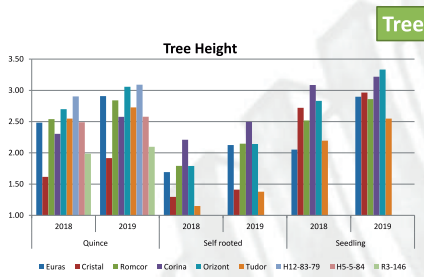
Euras
Tree vigour - medium. Resistant to scab. Tolerant to fire blight and *Psylla* sp.. Ripening: Oct. - April

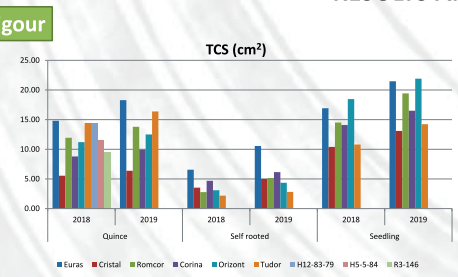
Orizont
Tree vigour - medium. Resistant to scab. Tolerant to *Psylla* sp. Ripening: Dec. – Feb.

Romcor
Tree vigour - middle to strong. Resistant to scab. No fire blight attack symptoms. Tolerant to *Psylla* sp.. Ripening: Oct. – Jan.

RESULTS AND DISCUSSIONS

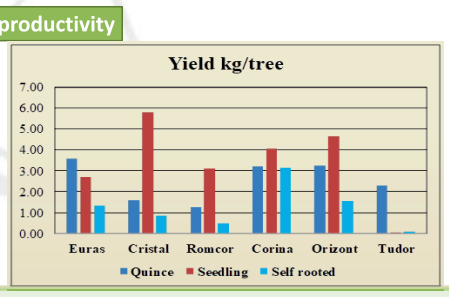
Tree vigour





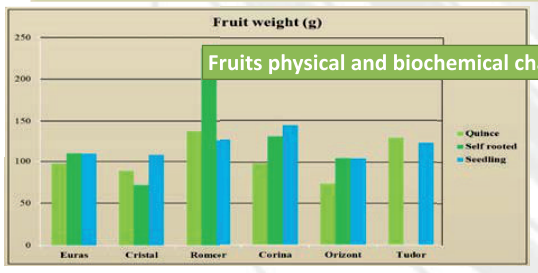
Seadling rootstock led to a higher vigour of plants. Self rooted plants were less vigour. Orizont and Euras on quince, Corina on Selfrooted and Corina with Orizont on seedling prezented the most vigourest plants.

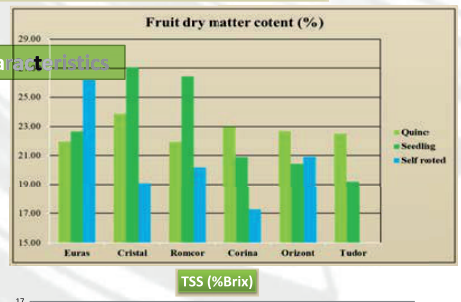
Tree productivity



The highest productivity was recorded on grafted varieties on self seedling and quince. The maximum value was reached on Cristal variety.

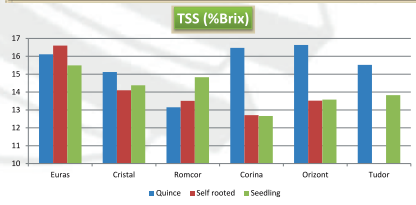
Fruits physical and biochemical characteristics





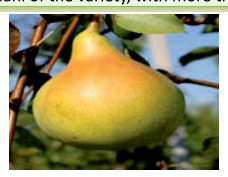
Most varieties have over 100 grams. The Romcor variety recorded the highest weight (240 grams).
High level of total soluble sugars were recorded on quince rootstock grafted plants.

TSS (%Brix)



CONCLUSIONS

- New varieties with genetic resistance to diseases and pests such as: scab, fire blight and *Psylla sp.,* bring the advantage of certain production qualities .
- Self rooted plants presented less vigour than plants grafted on quince and seedling rootstocks .
- Romcor self rooted reached the potentianl of the variety, with more than 200 g/fruit.



- A N R S -Dezvoltare pentru P V
- As nic A., Hoza D., Pomologie , Editura Ceres , Bucuresti .
- Chira C.L., 2005 , Tehnici Hortiviticole Comparatibile cu Mediul Editura Ceres , Bucure ti.
- Cimpoies G., 2018. Pomicultura Special , Chi in u.
- Ghena N., Brani te N., 2003, Cultura Special a Pomilor, Editur Matrix Rom, Bucure ti.
- Gr dinariu G., 2002. Pomicultura Special , Editura Ion Ionescu de la Brad, Ia i.
- Hoza D., 2000, Pomologie, Editura Prahova.

Contact: BUTCARU Ana
E-mail: anabutcaru@gmail.com

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

UNIVERSITY OF AGRONOMIC SCIENCES AND VETERINARY MEDICINE – BUCUREȘTI

D

Patent application A/00304 from 02.06.2020

BIOTECHNOLOGICAL PROTEIC INGREDIENT BASED ON RESIDUAL YEASTS OBTAINED FROM THE VINIFICATION PROCESS

TEODORESCU RAZVAN IONUT, BARBULESCU IULIANA DIANA, DRĂGOTOIU DUMITRU, CÎMPEANU SORIN MIHAI, FRINCU MIHAI, TUDOR VALERICA, MATEI FLORENTINA, MARINESCU SIMONA-IOANA, MATEI PETRUTA MIHAELA, BANITA CORNEL-DANIEL, MARIN MARIAN-SORIN

DESCRIPTION

➢The invention relates to a protein ingredient obtained by a biotechnological process based on residual yeasts resulting from the vinification process.
➢The physico-chemical analyzes performed on the product highlighted the following distribution of nutrients: crude protein (min 3.67% - maximum 22.02%); crude lipids % (min 0.05% - max 1.86); NDF g / 100g (11.95 ± 1.45); ADF g / 100g (5.05 ± 0.76).

APPLICATIONS

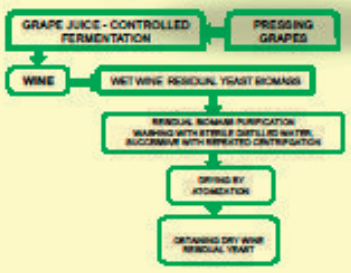
➢The product is suitable to be used in proportions that vary between 2-6% for the formulation of new recipes of combined foods destined to feed various species and categories of animals.
➢Tests carried out on broilers, using the ingredient in the proportions mentioned above, have been visible revealed at a very high level of biological performance specific to this category of animals.

NOVELTY

➢The biotechnological protein ingredient based on residual vinification yeasts showed an antioxidant capacity corresponding to phase II - growth, and period 2mmol / L equiv trolox 12.66-15.71 compared to NC 21-1 S with Antioxidant capacity mmol / L equiv trolox 6.40
➢The combined feeds were manufactured for the two growth phases of the broilers (period 14-28 days, 9-42 days, corresponding to phase III - finishing). For the starter phase (0-13 days) a conventional feed was used.

Combined feed recipes

Ingredient,% The structure of the recipes used in the breeding phase of the broilers (14 - 28 days)	M	B3	B4	Ingredients,% structure of recipes used in the finishing phase of the broilers (29-42 days)	M	B3	B4
Maize	45.00	45.00	45.00	Maize	50.00	50	50
Gluten	5.00	5.00	5.00	Gluten	5.00	5	5
Wheat	10.02	1.72	0.80	Wheat	9.83	1.85	0.72
Soybean meal	31.3	33.05	33.89	Soybean meal	26.18	27.85	28.69
Residual Yeast FN	-	6	-	Residual Yeast FN	-	6	-
Residual yeast TR	-	-	6	Residual yeast TR	-	-	6
Lysine	0.09	0.15	0.13	Lysine	0.18	0.14	0.12
Methionine	0.26	0.26	0.26	Methionine	0.24	0.23	0.24
Threonine	0.05	0.09	0.03	Threonine	0.03	0.01	0.01
Calcium carbonate	1.30	1.28	1.28	Calcium carbonate	1.18	1.16	1.13
Phosphate	1.18	1.49	1.49	Phosphate	1.22	1.26	1.26
Salts	0.16	0.36	0.16	Salts	0.33	0.33	0.33
Oil	3.90	4.48	4.58	Oil	4.97	5.33	5.44
Coline	0.04	0.04	0.04	Coline	0.04	0.04	0.04
Premix A1	1	1	1	Premix A1	1	1	1
Total	100	100	100	Total	100	100	100
- Chemical analysis - theoretical calculation							
Dry substance	87.82	87.88	87.88	Dry substance	87.99	87.93	87.93
Metabolizable energy, kcal / kg	3100.49	3100.72	3100.66	Metabolizable energy, kcal / kg	3202.29	3201.88	3201.44
Crude Protein%	21.5	21.5	21.5	Crude Protein%	19.5	19.5	19.5
Crude fats%	6.22	6.64	6.73	Crude fats%	7.41	7.83	7.73
Cellulose, %	3.70	3.42	3.46	Cellulose, %	3.62	3.23	3.27



ADVANTAGES

By applying the invention, the following advantages are obtained:
➢The biotechnological protein ingredient based on residual vinification yeasts presented a fatty acid content: Σ saturated fatty acids: max 18.56% of Lipids; Σ monounsaturated fatty acids max 19.01% of lipids, Σ polyunsaturated fatty acids 45.67% of lipids;
Important source of Σ omega 3 fatty acids: 4.77% of lipids and Σ omega 6 fatty acids: 41.41% of lipids
➢Recovery of residual biomass, a by-product of winemaking can be used for the manufacture of compound feeds used in dry form as a protein feed ingredient

Acknowledgements
This work was supported by the project 20PFE/2018 "Development of the Center for the superior valorisation of the by-products from the vineyard farms", Program 1 -Development of the National Development Research System, Subprogram 1.2 -Institutional Performance – Institutional Development Projects - Funding Projects for Excellence in Institutional Development Research, PNCDI III.

Contact person: TEODORESCU Răzvan Ionuț
E-mail: razvan.iteodorescu@gmail.com

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

USAMV BUCUREȘTI

UNIVERSITY OF AGRONOMIC SCIENCES AND VETERINARY MEDICINE – BUCUREȘTI

D

PRELIMINARY RESULTS ON PI WATER – USEFUL IN CUTTINGS PROPAGATION

Velcea Marian, Butcaru Ana-Cornelia, Stănică Florin, Moisescu Emilia
University of Agronomic Sciences and Veterinary Medicine of Bucharest

INTRODUCTION

Structured water (Pi water) discovery was made in 1964 by Dr. Akihiro Yamashita, a professor at the Agricultural Department at Nagoya University. He tried to find out why some buds bloom and others do not, and the answer led to the identification of a Fe salt in the buds, active-ferric oxide, which breaks some hydrogen bonds and causes the formation of smaller groups of water molecules. (clusters) with increased biological activity (http://www.ibe-techno.com/en/about_pi/description.html).

Since then, many studies have been done on Pi water in various fields, and today its use is widespread in the medical industry, cosmetics, agriculture, etc. (Attila and Munteanu, 2003).

Pi water is very similar to the liquid in living bodies. According to Shinji Makino's patent, Pi water was created by adding Ferro-ferric salt (Fe_2Fe_3) to water through ceramic balls. When Fe_2Fe_3 is added to ordinary tap water, it quickly breaks down chlorine and suppresses the growth of excessive free radicals; it also breaks down the water cluster to a much smaller size.

Pi water provides the following functions: better hydration, better oxygenation, anti-oxidation effects, Ion-negative effect, the structure of the water molecule (Attila and Munteanu, 2003).

The Japanese inventor Makino Shinji applied for IBE CoLtd for the registration of the patent entitled ”Bioactive agent, pharmaceutical product, cosmetic product, freshness keeping agent, and plant and animal growth-promoting agent”, which was published under number 20110294665. International publications of the same patent in China, Korea, the European Community and the USA are: CN102159222, EP2380578, JPWO2010073642, KR1020110105782, US20110294665.

The patent specifies the production technology of PI water and is the basis for the manufacture of a whole range of Pi water processors produced by the IBE company from Japan. One of the models is COSMO BALANCE Standards (http://www.ibe-techno.com/en/products/water_filter/cb_standard_01.html). It offers 6.0-7.0 l/min at a total capacity of 50,000 l, after which it needs to be completed with patented ceramic granules. Currently, processors are produced in Japan and under license in Korea, China and the USA. In the USA, the AP 560 model (http://www.pi-water.com/new/en_product_ap550.html) is produced with a capacity of 7,000 gallons, at a flow rate of 1 gallon/min.

PI water processors bring changes to the classic technology, ensuring a more severe control of the quality parameters of the technological finishing water, without additional addition of drugs or treatment chemicals (Velcea et al. 2002a, 2002b).

In horticulture, the positive influence of Pi water was studied on the *in vitro* propagation of fig or apple (Gâlă et al. 2003, Stănică et al. 2002), vegetables (Hoza et al. 2002), or ornamentals (Petruș-Vancea and Cochiță-Cosma, 2009). Godeanu et al. (2003), Godeanu et al. (2002) had extended researches on Pi water influences on seeds germination and plant growth on different species.

This study aims to present the preliminary results on an easy to produce and use tool for plant propagation and growth, Pi water studied on edible rose propagation by cuttings.

MATERIAL AND METHODS

The research was conducted in the Research greenhouse, part of the Research Center for Studies of Food and Agricultural Products Quality within USAMV Bucharest.

The biological material consisted of cuttings from three edible roses cultivars from the organic field, 'Crown Princess Margareta', 'Brother Cadfael' and 'Falstaff'.

A three factorial experience, considering water, rose cultivar and rooting hormones as factors, was established (Table 1).

Table 1

The experimental design used for Pi-water testing in rose cutting propagation

Experimental variants			
First factor	Second factor	Third factor	Code
Pi-water	'Crown Princess Margareta'	Radistim	V111
		Simple	V112
	'Brother Cadfael'	Radistim	V121
		Simple	V122
	'Falstaf'	Radistim	V131
		Simple	V132
Normal water	'Crown Princess Margareta'	Radistim	V211
		Simple	V212
	'Brother Cadfael'	Radistim	V221
		Simple	V222
	'Falstaf'	Radistim	V231
		Simple	V232

The research was conducted in the Research greenhouse, part of the Research Center for Studies of Food and Agricultural Products Quality within USAMV Bucharest.

The biological material consisted of cuttings from three edible roses cultivars from the organic field, 'Crown Princess Margareta', 'Brother Cadfael' and 'Falstaff'.

A three factorial experience, considering water, rose cultivar and rooting hormones as factors, was established (Table 1).

Cuttings from rose cultivars were placed in the greenhouse at the end of April 2020 (after field rose pruning), using perlite with a sand substrate (50%-50%), basal heating (23-24°C) and artificial fog. The number of plants per each of the twelve experimental variants varied. Pi water was produced with equipment produced by Nikken for domestic use.

The rooted and viable cuttings were placed in containers under artificial fog for a minimum of seven days, after two months.

The rooted cuttings percentage (the number of cuttings with visible roots to total cuttings per each variant), total viable cuttings (viable cuttings without visible roots to total cuttings number per each variant) and the total number of viable plants after 45 days were the initial evaluated parameters. Total growth (cm) and flower numbers were measured for the viable plants.

Data statistical analysis was performed with Excel (MS Office). Anova one-way test and Excel statistical functions with a significance level $p< 0.05$ were used.

RESULTS AND DISCUSSIONS

Significant differences were observed between Pi water variants and normal water variants. 'Crown Princess Margareta' cultivar cuttings with Pi water treatment presented the highest values for rooting. At 'Brother Cadfael', Pi water combined with rootings hormones and at 'Falstaff' cultivar normal water with Radistim presented the best results on rooting.

Pi water combined with Radistim variants led to the highest percentage for total viable cuttings, 39% for 'Crown Princess Margareta' cultivar, 39% at 'Brother Cadfael' and 41% at 'Falstaff' cultivar.

After 45 days, significant differences between total viable plant variants were registered, Pi water variants being much numerous than normal water ones (Figure 1).

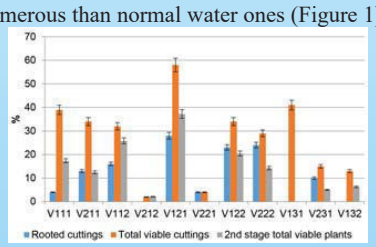


Figure 1. The influence of Pi-water and rooting hormones on the rose cuttings rooting and total viable plants

The biggest average shoot length was at Pi water variants at 'Crown Princess Margareta' and 'Brother Cadfael' and at normal water for 'Falstaff' variants (Figure 2). Several new plants, for all cultivars, presented flowers at the transplantation moment, being a quality parameter for propagation methods.

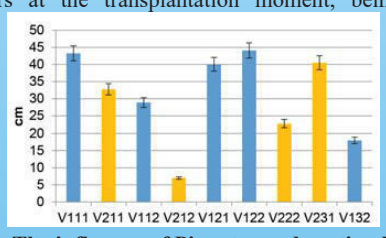


Figure 2. The influence of Pi-water and rooting hormones on the total plant's growth per variants

CONCLUSIONS

Plant propagation by cuttings can include bio stimulatory Pi water, being quite simple to obtain. The preliminary results presented on the three climbing edible roses are promising for further researches.

REFERENCES

1. Attila A., Munteanu L., 2003. *Apa Pi şi aplicaţiile ei. Locul şi rolul apei Pi în societatea modernă*. Simpozionul Internaţional „Apa un miracol” Ediţia a III-a, Bucureşti, 20-21.
2. Gâlă R., Velcea M., Stănică F., Diaconescu O., 2003. *Influenţa apei Pi asupra înmulţirii in vitro a smochinului (Ficus carica L.).* Simpozionul internaţional „Apa un miracol” Ediţia a III-a, Bucureşti, 24-25.
3. Godeanu M., Ciobeica C., Avădanei I., Duţă P., 2003. *Influenţa apei Pi asupra germinării, creşterii şi biosintezei de pigmenţi la unele specii de plante*. Simpozionul Internaţional „Apa un miracol”, Ediţia aIIIa, Bucureşti, 22.
4. Godeanu M., Ghiţă L., Avădanei I., 2002. *Influenţa apei Pi asupra realizării patului germinativ din rumeguş*. Simpozionul Internaţional ”Apa un miracol” Ediţia a II-a, Bucureşti, 12.
5. Hoza G., Velcea M., Petra O., 2002. *Cercetări privind folosirea apei Pi la producerea răsadurilor de castraveţi*. Simpozionul Internaţional ”Apa un miracol” Ediţia a II-a, Bucureşti, 13.
6. Petruș-Vancea A., Cachiță-Cosma D. 2009. *The effect of Pi or Deuterium depleted water on foliar stomata of Saintpaulia ionantha L. exvitroplantlets sprinkled foliar or radicular*. Studia Universitatis “Vasile Goldiș”, Seria Științele Vieții, 19 (2), 309-312.
7. Stănică F., Gâlă R., Velcea M., Diaconescu O., 2002. *Rezultate preliminare privind folosirea apei Pi la microînmulţirea in vitro a unor soiuri de măr*. Simpozionul Internaţional „Apa un miracol” Ediţia a II-a, Bucureşti, 12.
8. Velcea M., Popescu M.N., Duţă P., Bucur C., 2002a. *Franciza Apa Pi, o cale de success în afaceri*. Simpozionul Internaţional ”Apa un miracol” Ediţia a II-a, Bucureşti, 7.
9. Velcea M., Popescu M.N., Duţă P., Bucur C., 2002b. *Proiectul Apa Pi în Romania, o invitaţie la un succes comun*. Simpozionul Internaţional ”Apa un miracol” Ediţia a II-a, Bucureşti, 9.
http://www.ibe-techno. com/en/ products/water_filter/ cb_standard _01 .html
http://www.ibe-techno.com/en/about_pi/description.html
http://www.pi-water.com/new/en_product_ap550.html

Contact: BUTCARU Ana
E-mail: anabutcaru@gmail.com

Asociația CORNELIUGROUP cercetare-inovare
INVENTCOR
Puterea Minții Creative

UNIVERSITY OF AGRONOMIC SCIENCES AND VETERINARY MEDICINE – BUCUREȘTI

D

Research on the production of propagating material and cut flowers of Gerbera in different variants of hydroponic cultivation

Dragoș Emanuel DRĂGHICI, Sorina PETRA, Florin TOMA, Ovidiu Ionuț JERCA
University of Agronomic Sciences and Veterinary Medicine of Bucharest
59 Marasti Blvd, District 1, Bucharest, Romania

INTRODUCTION

The study was made in greenhouses conditions on three gerbera cultivars, 'Dune', 'Blind Date' and 'Balance'. We analyzed the effect of five type of substrates on growth and flowering of gerbera. The types of substrate used were following: peat is acidic both with pH 4 and with pH 5,5 peat with pH 4, peat with pH 5,5, Perlite, 50 % Perlite + 50 %, peat with pH 4.0 and 50% Perlite+ 50 % peat with pH 5.5. *The best results was obtained when we used the substrate 50% Perlite+ 50 % peat with* pH 5.5 *regarding number of flowers, flower height, flower diameter, shoot diameter, showed significant difference among growing media.*

Key words: *Gerbera jamesonii*, substrate, fertilizers, condition of growing

MATERIALS AND METHODS

The experiment was carried in greenhouse conditions at University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania. We used three gerbera cultivars: 'Dune', 'Blind Date' and 'Balance'. The types of substrate used for every cultivars were following: V1 - peat with pH 4; V2- peat with pH 5,5; V3-, perlite 100%; V4 -50 % perlite + 50 %, peat with 4 pH; and V5 - 50% perlite + 50 % peat with pH.5,5 We used 3 plants/replicates on every variant in block randomized. Planting was done in pots with a capacity of 4 L filled with substrate according to experimental variants. We recorded the amount of water and nutrient solution administered, we watched in dynamics the vegetative growth of the plants, the number of leaves and the height as well as the number of flowers formed on the plants. The care work consisted of watering, fertilization, temperature and light monitoring. Plants were fertilized with a same nutrient solution. Electrical conductivity of nutrient solution was 1,6 mS and pH 5.5.

In a period of 8 months, some quality and quantity characteristics of plants and flowers were recorded such as number of leaves, number of flower, flower stem height, flower diameter, stem diameter. All data for growth and flowering parameters were recorded and processed statistical using analysis of variance and means were compared by Duncan's Multiple Range Test (Steel et al., 1996). The temperature from greenhouse was 20-33 °C and relative humidity were 50-60%.

Figure 1. '*Dune*', '*Blind Date*' and '*Balance*'

RESULTS AND DISCUSSIONS

Figure 3. '*Dune*' gerbera plants - in May

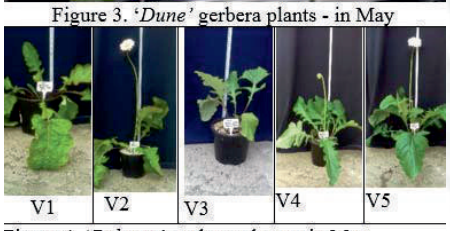


Figure 4. '*Balance*' gerbera plants - in May

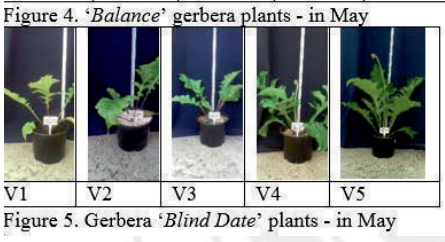


Figure 5. Gerbera '*Blind Date*' plants - in May

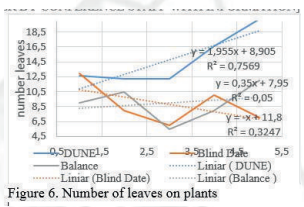


Figure 6. Number of leaves on plants

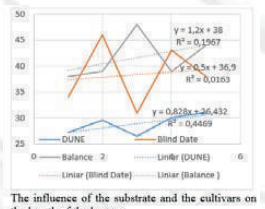
The number of leaves on plant and the percentage differences to the control variant

Type of substrate	'Dune'		'Blind Date'		'Balance'	
	No.	% to control	No.	% to control	No.	% to control
V1	12,6	62,4	13,0	185,7	9,0	75,0
V2	12,3	60,6	8,0	114,3	10,5	87,5
V3	12,2	60,4	6,0	85,7	5,5	45,8
V4	16,6	82,2	10,0	142,9	8,0	66,7
V5	20,2	100,0	7,0	100,0	12,0	100,0

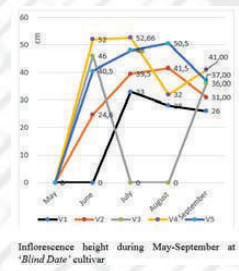
V1- peat pH 4; V2 –Perlite; V3 -50% Perlite+50% peat; V4-50% Perlit+50% turbă; V5 - Peat pH 5,5 (Ct)

The average length of gerbera leaves on cultivars and the percentage compared to the average on variant

Variant	Dune	Blind Date	Balance	Average	Dune	Blind Date	Balance
	cm	cm	cm	cm	%	%	%
V1	27,24	34,00	38,00	**33,08**	82,35	102,78	114,87
V2	29,59	46,00	39,00	**38,20**	77,47	120,43	102,10
V3	26,51	31,00	48,00	**35,17**	75,38	88,14	136,48
V4	30,13	45,00	39,00	**38,04**	79,20	118,29	102,51
V5	**31,11**	**38,00**	**44,00**	**37,70**	**82,51**	**100,79**	**116,70**



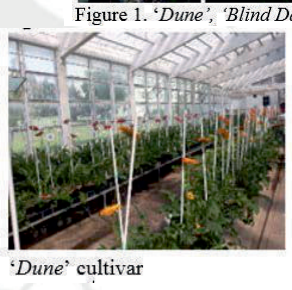
The influence of the substrate and the cultivars on the length of the leaves



Inflorescence height during May-September at '*Blind Date*' cultivar

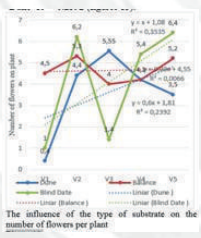
Influence of inflorescence height on varieties and months and type of substrate

Cultivar	Var.	May	June	July	Aug.	Sept.
'Dune'	V1	0	0	0	0	33
'Balance'	V1	17	19	14	12	15,50
'Blind Date'	V1	0	0	33	28	26
'Dune'	V2	54,5	49,75	45,17	49	48,00
'Balance'	V2	0	51	12	54,5	46
'Blind Date'	V2	0	24,6	39,5	41,5	31,00
'Dune'	V3	43	47	45,5	38,5	35,00
'Balance'	V3	29,5	26,5	35	32,5	31,00
'Blind Date'	V3	0	46	0	0	36,00
'Dune'	V4	42	45,2	24	27	31,00
'Balance'	V4	67	36	41	45	40,00
'Blind Date'	V4	0	52	52,66	32	41,00
'Dune'	V5	40,5	46,5	52	60	51,00
'Balance'	V5	41	47,67	46	52,5	46,79
'Blind Date'	V5	0	40,5	48	50,5	37,00

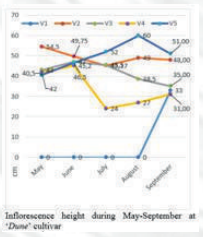


'*Dune*' cultivar

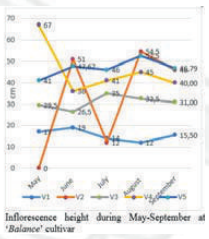
'*Balance*' '*Blind Date*'



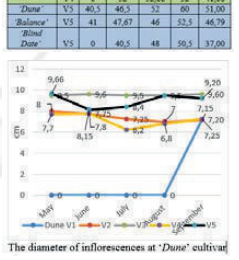
The influence of the type of substrate on the number of flowers per plant



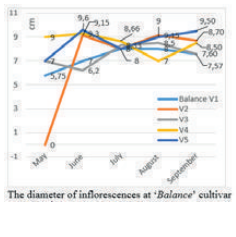
Inflorescence height during May-September at '*Dune*' cultivar



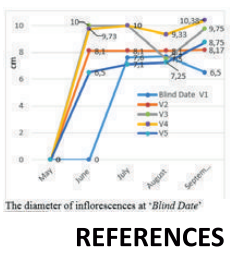
Inflorescence height during May-September at '*Balance*' cultivar



The diameter of inflorescences at '*Dune*' cultivar



The diameter of inflorescences at '*Balance*' cultivar



The diameter of inflorescences at '*Blind Date*'

CONCLUSIONS

The number of leaves on the plants was different depending on the variety and the type of substrate. It was lower in gerbera plants grown on perlite substrate but also in '*Dune*' varieties grown on all types of substrate in the early stages of growth. After 9 months of cultivation, the lowest number of leaves was recorded in the '*Balance*' variety between 5.5 leaves at V3 and 12 leaves at V5. Also, the number of leaves per plant at '*Blind Date*' was lower compared to the '*Dune*' variety. At the '*Dune*' variety we recorded the highest number of leaves at V5 of 20.2 leaves and 12.25 leaves at V2. The length of the leaves varied from cultivar to cultivar. In the '*Dune*' variety the number of leaves was 26.51 cm at V3 and 31.11 cm at V5. The '*Blind Date*' variety presented leaves with a length between 31.00 cm at V3 and 46 cm at V2. In the case of the '*Balance*' variety, the leaf length was the largest between 38 cm at V1 and 48 cm at V3. The number of flowers per plant was relatively constant for the '*Balance*' variety in May-September, being between 4 flowers / plant at V3 and 5.2 flowers / plant at V5. The '*Blind Date*' variety showed the greatest reaction to the type of substrate. The height of the flower stalk was different depending on the variety, but it differed a lot in some varieties depending on the very high temperatures during the summer.

The diameter of the flowers was smaller for the '*Dune*' variety in the case of variant 4 and almost constant for V5. In the 'Balance' variety, the diameter of the flower was 5.75 at V1 and 7.6 cm at V5. Flowers with the largest diameter were obtained from the '*Blind Date*' variety. The culture substrate had influenced the diameter of the flower it varied from one month to another.

REFERENCES

Ahmad Iftikhar, Tanveer Ahmad, Arfan Gulfam And Muhammad Saleem, 2012. Growth and flowering of gerbera as influenced by Various horticultural substrates, Pak. J. Bot., 44: 291-299, Special Issue March.

Aragon, R., Martinez, P.F., Gonzalez, A. 1984. Introducción del cultivo de la gerbera en el sureste de Espata. II Reunion de Ornamentales. SECH : 189-194.

Aung H. Naing, Kyoungsun Lee, Kyoung-Ook Kim, Trinh N. Ai and Chang K. Kim, 2017, Involvement of Sodium Nitroprusside (SNP) in the Mechanism That Delays Stem Bending of Different Gerbera Cultivars, Front. Plant Sci., 28.

Dr ghici Elena Maria, Jerca Ovidiu Ionu ,2017, Culturi horticole f r sol (sisteme tehnologii de cultivare a speciilor legumicole, ed. Granada, ISBN 978-606-997-001-0, pag.269

Toma Florin, Mihaela Ioana Georgescu, Sorina Petra, Diana Zamfir-Vâ c Elena S vulescu, Cristina Rodica M nescu, Vasilica Luchian, Vlad Popa (2017). Research on the influence of fertilization regime on morphological, anatomical and productive characteristics of pelargonium citrosum plants. Scientific Papers-Series B - Horticulture., ISSN 2285-5653 (CD-ROM), ISSN - L 2285-5653, 27-32.

Toma, Florin Mihaela, Georgescu, Sorina Petra, Cristina Manescu.,Cercetari privind efectele regimului de fertilizare asupra particularitatilor decorative si morfo-anatomice ale plantelor de pittospora tobira (2019), Scientific Papers. Series B Horticulture, Volume 1, LXIII, ISSN 2285-5653, Pg. 485-492,

Verma A.K, ,Sindhu S.S, Anshuman Singh, Arvind Kumar, .Chauhan V.B.S, 2019, Conditioning effects of biodegradable superabsorbent polymer and vermi-products on media properties and growth of gerbera, *Ecological Engineering, Volume 132, July 2019, Pages 23-30.*

Yau, P.Y. and Murphy, R.J. (2000). Biodegraded coco peat as a horticultural substrate. *Acta Hort., 517: 275-278.*

Contact: DRĂGHICI Elena
E-mail: draghiciem@yahoo.com

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

UNIVERSITY OF AGRONOMIC SCIENCES AND VETERINARY MEDICINE – BUCUREȘTI

D

CANDIDA PARAPSILOSIS STRAIN BIOSURFACTANTS-PRODUCING, GROWTH AND STIMULATION MEDIUM AND BIOAUGMENTATION PROCEDURE OF EXPANDED PERLIT FOR BIOREMEDIATION OF SOILS CONTAMINATED WITH HYDROCARBONS

Patent No: 133486/27.11.2020

MATEI Sorin, MATEI Gabi-Mirela, DRĂGHICI Elena Maria, SOMĂCESCU Vasile Claudiu

PERLIT PROCEMA

DESCRIPTION

Procedure for immobilizing cells of *Candida parapsilosis* strain YCP124, with biodegradation and biosurfactant synthesis capacities, in the macro- and micropores spaces from expanded perlite granules, spaces saturates with microbial stimulation medium and used as interfaces in biodegradation processes for bioremediation *in situ* or *ex situ* of soils contaminated with petroleum hydrocarbons.

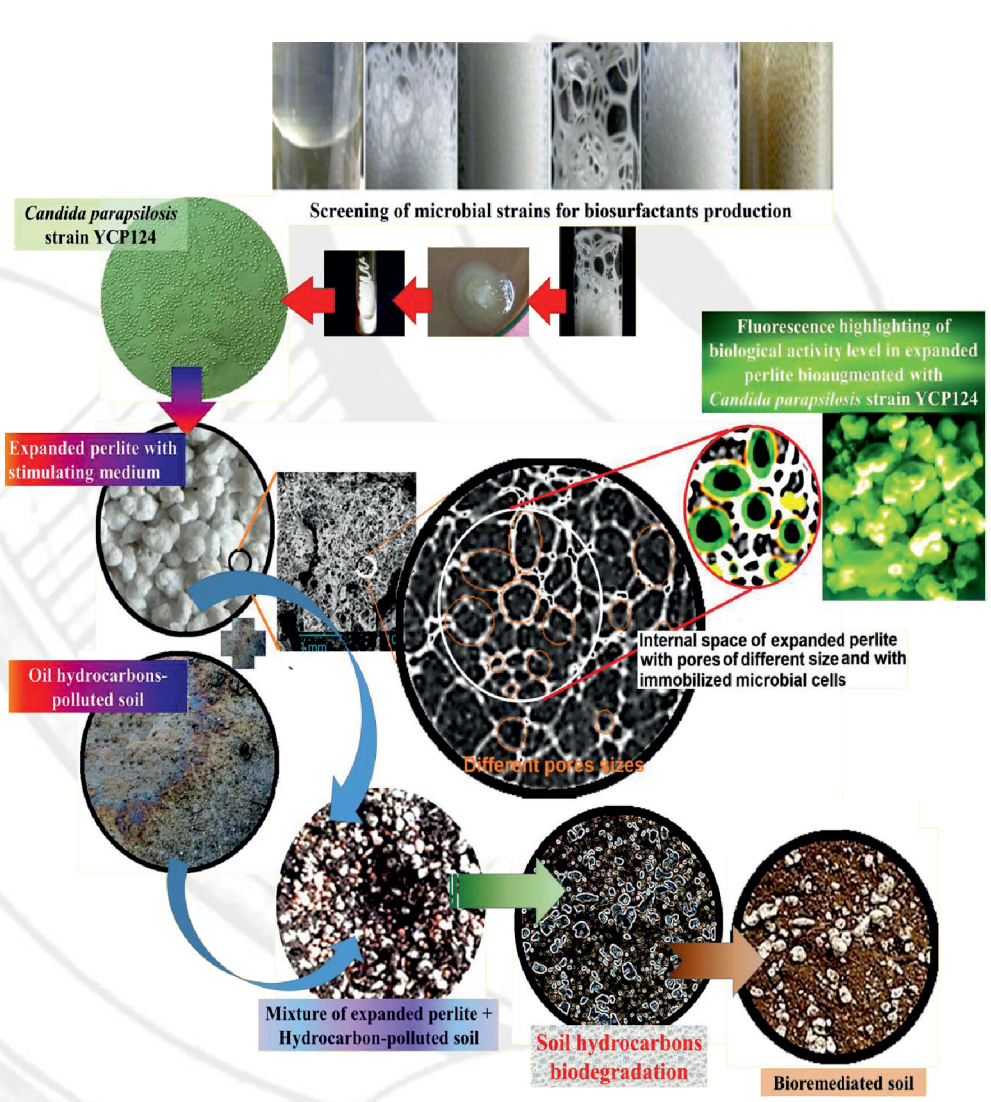
ADVANTAGES

By immobilizing on the natural inorganic porous support, the cells of *Candida parapsilosis* strain YCP124 could provide advantages:

- a metabolism optimized/intensified by the growth and stimulation medium;
- a specific and constant behavior in using hydrocarbons as a source of carbon and synthesis of biosurfactants;
- a constant efficiency for *in situ* or *ex situ* bioremediation of oil-contaminated soils;
- an increased water retention capacity;
- environmental friendly;
- non-toxicity;
- a suitable internal surface area and conditions for interactions;
- an increased buffering and adsorption capacity.

CONCLUSIONS

- Synthesis of biosurfactants provides a mechanism for mobilizing contaminants in soil and increasing their accessibility for microbial populations;
- Allows a good immobilization in the expanded perlite of the strain YCP124 without the use of cross-linking or hydrophobizing agents, low costs, without pre-treatments (solutions) or post-treatments (encapsulation);
- By immobilization, microbial strain cells have high viability, high retention capacity and enzymatic reaction;



- Immobilization of cells in expanded perlite has ecological safety because synthesized biosurfactants allow efficient use of adjacent energy resources, do not affect the soil due to high biodegradability and had low toxicity;
- Inducing an increase in soil microbial biodiversity by using free energy generated by the presence of biodegraded hydrocarbon substrate and secondary metabolites in micro-habitat;
- Optimize bioremediation processes by ensuring buffer of operational parameters in soil, so that they do not become limiting factors during biodegradation processes;

ACKNOWLEDGMENTS:
This work was supported by the Romanian National Authority for Scientific Research, CNDI-UEFISCDI, project number PN-III-P2-2.1_PTE-2016-0084, (40-PTE), acronym ECOREMTEH.

Contact person: SOMĂCESCU Claudiu
E-mail: claudiu.somacescu@procema.ro

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

USAMV BUCUREȘTI

University of Agronomic Sciences and Veterinary Medicine – București

D

Certificate 4942/27.05.2020

Wolfberry variety 'BUCUR' (*Lycium barbarum* L.)

Adrian Asanica, Tudor Valerica, Teodorescu Razvan Ionut, Balan Viorica, Mencinicopschi Claudia Ioana, Iacob Alexandru

Goji (*Lycium barbarum* L.) is a new fruit plant introduced in our country, being of great interest to growers and consumers. Breeding works have led to the selection of the most suitable goji biotypes adapted to our climatic conditions and which have allowed high productivity and fruit quality.

Morphological traits of the Bucur variety

- shows medium-vigorous plants (180-200 cm) with a semi-upstanding habit and good branching.
- has a great capacity of fructification, with inflorescences at most of the nodes.
- Internodes are small (1.5-2 cm).
- It presents short thorns, with a length of approx. 0.5 cm.
- The length of the petiole is short, up to one centimeter.
- The floral button is violet.
- The flower has a small diameter, with greenish sepals.
- The fruit is medium, ovoid, red with slightly rounded tip.
- Fruit ripening is early (early June).
- It is remarkable for its high productivity and sustainability throughout the vegetation period.

Contact person: ASĂNICĂ Adrian, TUDOR Valerica
E-mail: asanica@gmail.com, valericatudor@gmail.com

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

USAMV BUCUREȘTI

University of Agronomic Sciences and Veterinary Medicine – București

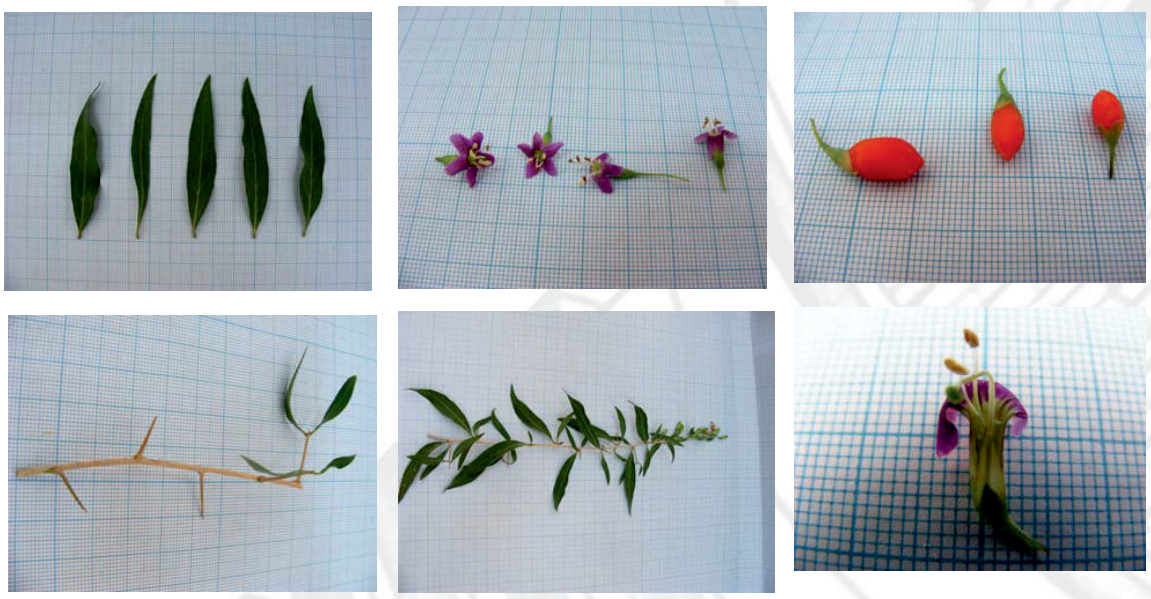
D

Certificate 4943/27.05.2020

Wolfberry variety 'SARA' (*Lycium chinense* Mill.)

Adrian Asanica, Tudor Valerica, Teodorescu Razvan Ionut, Iacob Alexandru

Goji (*Lycium chinense* Mill.*)* is a new fruit plant introduced in our country, being of great interest to growers and consumers.
Breeding works have led to the selection of the most suitable goji biotypes adapted to our climatic conditions and which have allowed high productivity and fruit quality.



Morphological traits of the "Sara" wolfberry variety

- shows very vigorous plants (> 2.5 m) with wiping port, often creating large arcades of fructification.
- Branching ramification is medium.
- Forms long thornes up to 5 cm long.
- Floral buttons are violet, but the number of flowers on the plant is low.
- The floral peduncle is long, and the flower is small, with green sepals and a strongly curved apex curve.
- The leaves are long with a sharp apex and have a very short petiole.
- The fruit is very large, red aniline, oblong, and forms edges and ribs. It has a prominent styling punctuation at the end of the fruit.
- Fructification is medium and inconsistent in the second part of the vegetation.
- The exceptional quality of the fruit remarked it as one of the most desired fruit biotypes for fresh consumption.

Contact person: ASĂNICĂ Adrian, TUDOR Valerica
E-mail: asanica@gmail.com, valericatudor@gmail.com

Asociația CORNELIUGROUP cercetare-inovare
INVENTCOR
Puterea Minții Creative

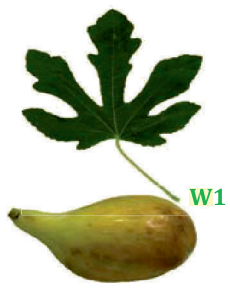
USAMV BUCUREȘTI

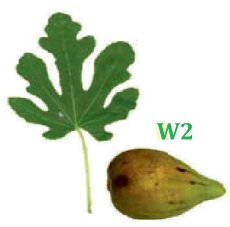
UNIVERSITY OF AGRONOMIC SCIENCES AND VETERINARY MEDICINE – BUCUREȘTI

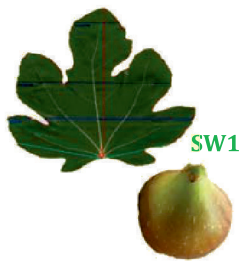
D

Biochemical assessment of some extracts derived from leaves and fruit of *Ficus carica* L.

STĂNICĂ Florin, CONSTANTIN Carmen-Gabriela, BUTCARU Ana-Cornelia, ASĂNICĂ Adrian-Constantin, MIHAI Cosmin-Alexandru

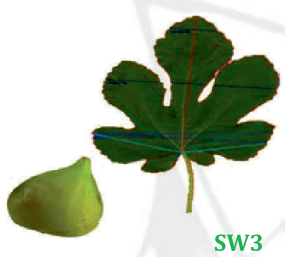






INTRODUCTION

Fig genotypes can be found in Romania spread mainly in the South and West regions with mild climate.
The aim of the current study was to evaluate the total phenolic content (TPC) and free radical scavenging activity of fig fruits and leaves sampled from 10 local genotypes.

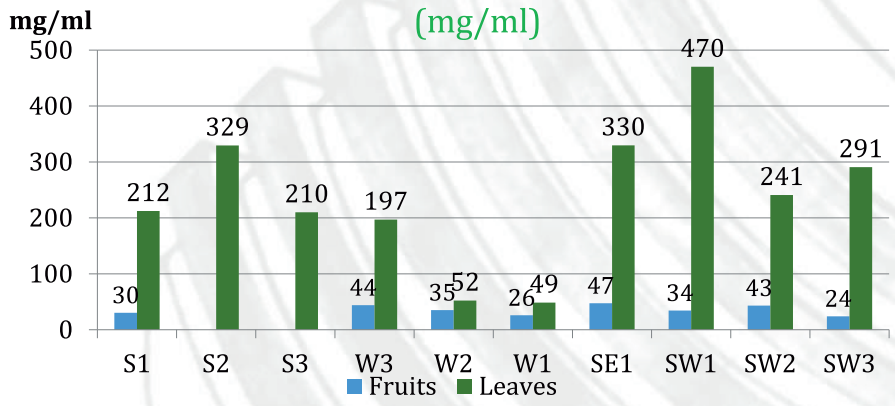


MATERIAL AND METHODS

Ten Romanian fig genotypes have been selected from four different areas: W1-3 from West, SW1-3 from South-West, S1-3 from South and SE1 from South –East. The fruits and leaves samples were subjected to extraction using sonication method on ice bath. Total phenolic content was analyzed by using an adapted method, with Folin-Ciocalteau reagent. Free radical scavenging activity was determined using the free radical 2 2-diphenyl-1-picrylhydrazyl (DPPH) and calculated as Inhibition % (I%).

RESULTS AND DISCUSSION

Fig fruits and leaves total phenolic content (mg/ml)

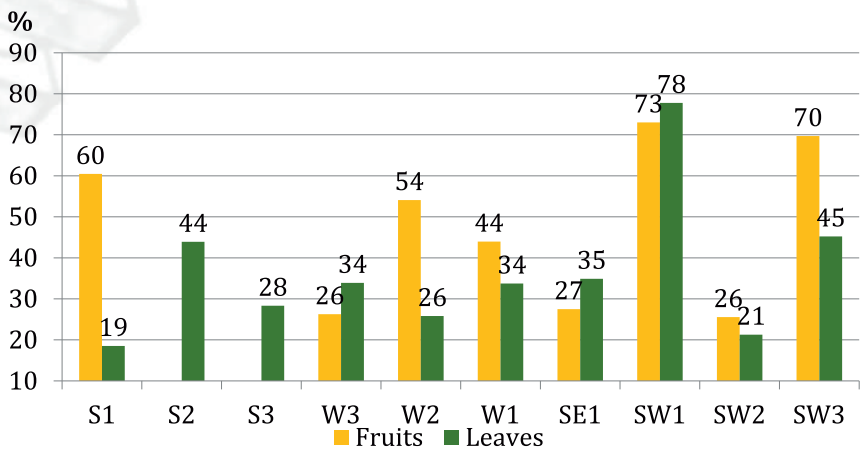


Brown fruits had the highest total phenolic content: SE1, W3, SW2>W2, SW1>S1>W1, SW3.
Leaves from West part of the country (W1-3) had the smallest total phenolic content: W1<W2<W3<S3<S1<SW2<SW3<SE1, S2<SW1.
Fruits had a low total flavonoids content (0.06-0.2 mg/ml).
No correlation was found between the total phenolic content in fruits and leaves. Instead there are correlations between total phenolic content and antioxidant activity for fruits and leaves.

CONCLUSIONS

For the studied fig genotypes, the colour of the fruits influenced the quantity of total phenolic and flavonoids content.
No influence was found on two parameters regarding the region of origin.
Fig leaves had higher total phenolic content than the fruits. Significant differences were noticed between West and South originated samples.

Fig fruits and leaves free radical scavenging activity (%)



Contact: BUTCARU Ana
E-mail: anabutcaru@gmail.com

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

University of Agronomic Sciences and Veterinary Medicine – București

D

Evaluation of some nutritional properties of Chinese jujube (*Ziziphus jujuba* Mill.) fruits organically produced in Bucharest area

Diana Elena DICIANU, Ana Cornelia BUTCARU, Carmen Gabriela CONSTANTIN, Aurora DOBRIN, Florin STANICĂ

University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania

59 Mărăști Blvd, District 1, 011464, Bucharest, Romania

Keywords: Chinese jujube, flavonoid content, free radical scavenging activity, phenolic content, spectrophotometry.

INTRODUCTION

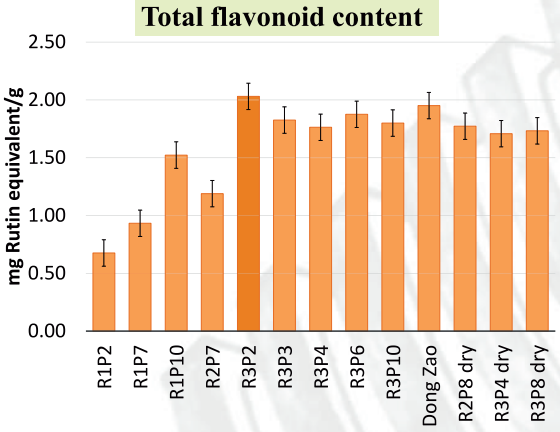
Chinese jujube is one of the most commonly used fruit in Chinese herbal medicine, being considered by the researchers and nutritionists a super fruit in terms of nutrition. In Romania, more than 20 genotypes were introduced from China, in the Experimental Field of the Faculty of Horticulture within the UASVM. This study aims to present several biochemical characteristics of the fruits of Chinese jujube.

MATERIALS AND METHODS

- The analysis were made in the Research Centre for Study of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest.
- Fresh fruits were harvested at the beginning of September until October.
- After morphological measurements, fruits were stored at 2-3□ C and 90-95% relative humidity.
- For analysis hydro alcoholic extracts using 1:10 ratio were used. The extracts were subjected to spectrophotometric analysis.
- Using Folin-Ciocâlteu method and gallic acid equivalent, the total phenolic content of the extracts was determined.
- The flavonoid content was identified using an adapted method based on rutin equivalent.
- The free radical scavenging activity of the extracts was determined using stabile 2,2 diphenyl-1-picrylhydrazyl radical.

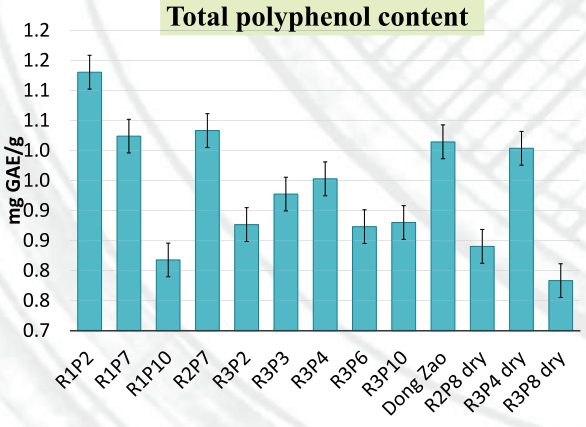
RESULTS AND DISCUSSIONS

Total flavonoid content



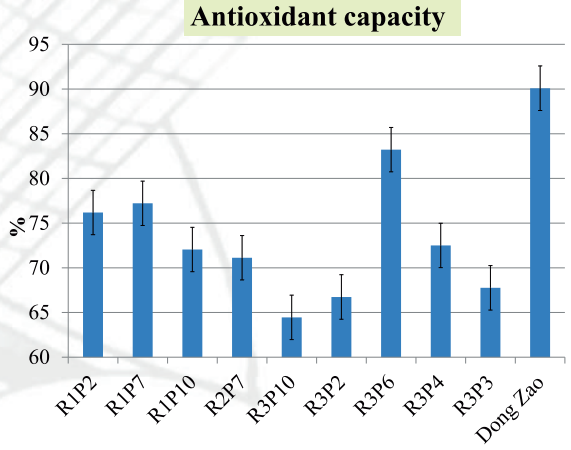
- Of the 12 fresh fruit samples selected, the highest flavonoid content has the genotype R3P2, and the lowest flavonoid content has the R1P2 genotype.
- In dehydrated fruits the highest flavonoid content has the genotype R2P8 and the lowest genotype of R3P4

Total polyphenol content



- The highest amount of total polyphenols is found in the R1P2 genotype and the smallest quantity in the R1P10 genotype.
- The total content of polyphenols in the dehydrated fruits in the largest quantity is found in the R3P4 genotype and the lowest amount in the R3P8 genotype.

Antioxidant capacity



The highest antioxidant capacity has the Dong Zao cultivar and the lowest antioxidant capacity has the R3P10 genotype.

CONCLUSIONS

- Analysis of the biochemical composition of Chinese jujube fruits highlighted the richness of flavonoids, polyphenols and antioxidant capacity
- Among the genotypes studied, Dong Zao cultivated in Bucharest area, known as the best quality fruit for fresh consumption, recorded significant higher values for biochemical parameters than most of the analyzed genotypes.
- Regarding the storage of biologically active compounds, this study has shown that the method of preservation by drying can be an effective method of maintaining the nutritional properties of these fruits by giving the consumer the opportunity to consume them in the off-season.

Contact: BUTCARU Ana
E-mail: anabutcaru@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

MINISTERUL AGRICULTURII ŞI DEZVOLTĂRII RURALE

USAMV BUCUREŞTI

CENTRUL DE CERCETARE PENTRU STUDIUL CALITATII PRODUSELOR AGROALIMENTARE

ADER 7.2.6.

USAMV BUCUREŞTI

EX-TERRA-AVRVM

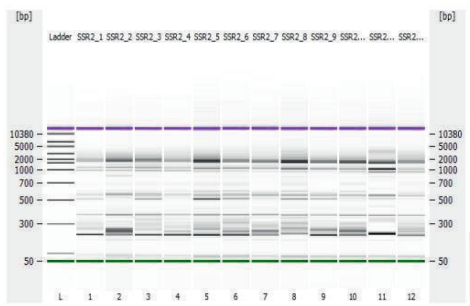
D

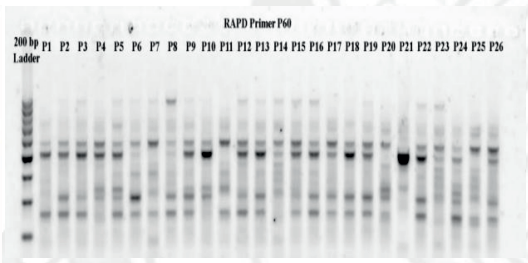
Research on genetic variation, analysed by the next generation sequencing technology - NGS, in vegetable and fruit species of economic interest, for genotyping and database analysis of genetic variations specific to native species

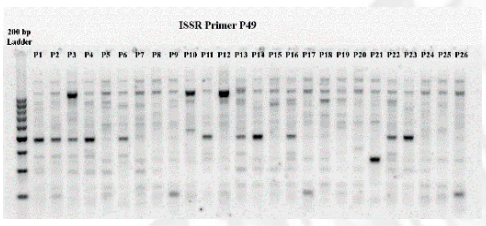
Project

Author/s: UDRIȘTE Anca-Amalia, IORDĂCHESCU Mihaela, BĂDULESCU Liliana

The main objective is the molecular analysis of DNA polymorphism in vegetable and fruit species of interest cultivated in Romania, for their genotyping and identification of new molecular DNA markers, in order to create a database of genetic variations specific to local varieties







Specific objectives:
Selection of valuable genotypes and their characterization based on economically important phenotypic traits; Analysis of the genetic diversity of native vegetable species respectively tomatoes and peppers; Analysis of the genetic diversity of native fruit species, respectively apple and plum; Genotyping by sequencing NGS-next generation sequencing; Identification of SNPs-single nucleotide polymorphisms.

Benefits:

Meetings with horticultural associations in order to capitalize the project results
Presentation of the advantages of using genetic information
Creating a database of genetic variations specific to native species
Maintaining valuable varieties in culture
Increasing the quality of agri-food products

FUNDULEA

ICDP

ROMANIA

Contact: amalia.udriste@qlab.usamv.ro; liliana.badulescu@qlab.usamv.ro

D

Organic vegetables minimal processing technologies used to obtained innovative healthy products – EcoLegDry

Project

Author/s: STAN Andreea, ION Violeta-Alexandra, PETRE Andrei, FRÎNCU Mihai, LAGUNOVSCHI-LUCHIAN Viorica, BADEA Monica

Sustainable development must encompass food production alongside conservation of finite resources and protection of the natural environment so that the needs of people living today can be met without compromising the ability of future generations to meet their own needs (Bruntland Commission, 1987). Therefore, minimal processing of organic vegetables and fruits is a topic addressed more and more often in the recent years, both at national and international scientific community, as well among farmers and processors. Drying and freeze-drying are some of the minimum processing technologies accepted in organic farming. The project aims at obtain organic vegetable chips through minimal processing technologies.

Specific objectives:
Consumers' awareness and acceptance evaluation of vegetable chips; Development and optimization of drying technologies for organic vegetables; Increasing nutritional value of organic vegetable chips by applying freeze-dried powders obtained from aromatic herbs; and Increasing visibility through dissemination and communication

Results:
The following results are expected: optimized minimal processing technology of organic vegetables, innovative organic vegetable chips with high nutritional quality, and large scale dissemination of project results in national/international scientific communities and stakeholders.

Contact: andreea.stan@qlab.usamv.ro

D

Organic post-harvest technologies,
component of complex project:
Increasing the institutional capacity of research-development-innovation in the field of ecological fruit growing

Project

Author/s: STAN Andreea, BĂDULESCU Liliana, FRÎNCU Mihai, CĂTUNEANU Ioana, BUTAC Mădălina, VINTILĂ Marian

The main objective is to increase the institutional RDI capacity in the field of ecological fruit growing of public research organizations consortium. Project EcotehnopomP4 objectives will provide to ecological sector: (a) improved/new organic post-harvest technologies for storing organic fruits in a controlled/modified atmosphere; (b) improved/new organic post-harvest technologies for drying; (c) improved/new organic post-harvest technologies for freezing/ freeze-drying processing; (d) the filing of 2 patent applications for controlled/modified atmosphere storage technology and minimum drying processing on organic fruit; (e) joint CDI – 1 program; (f) dissemination of results and of technologies training guide for beneficiary. Ecotehnopom, component project 4 is implemented in Research Centre for Studies of Food and Agricultural Products Quality - UASVM Bucharest.

Project consortium:
Research Institute for Fruit Growing Pitești-Mărăcineni
Research Institute for Industrialization and Marketing of Horticultural Products "HORTING"
Acknowledgements:
This work was supported by a grant of the Romanian Ministry of Research and Innovation, CCCDI – UEFISCDI, project number PN-III-P1-1.2-PCCDI-2017-0662, within PNCDI III.

Contact: andreea.stan@qlab.usamv.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

UNIVERSITY OF AGRONOMIC SCIENCES AND VETERINARY MEDICINE – BUCUREȘTI

USAMV BUCURESTI

CENTRUL DE CERCETARE PENTRU STUDIUL CALITATII PRODUSELOR AGROALIMENTARE

Sus Org PLUS

CORE organic

D

Freeze dried powders obtained from organic raspberry to be used as natural nutritional/functional ingredients and/or colorants to enhance stability of processed products and as natural colouring and flavouring agents

Project

Author/s: BĂDULESCU Liliana, BUJOR Oana-Crina, Aurora DOBRIN, STAN Andreea, MOȚ Andrei, ION Violeta-Alexandra

The innovation concerns a new natural value added product obtained from organic raspberry in the form of powders in order to increase the nutritional value and shelf life of food products without the use of contentious substances. Organic raspberry powders can be used in food industry as natural nutritional/functional ingredients and/or colorants to enhance stability of processed products and as natural colouring and flavouring agents. The organic raspberry powder was obtained during SusOrgPlus project which is implemented Research Centre for Studies of Food and Agricultural Products Quality - UASVM Bucharest.

The obtained tomato powders are part from expected results of SusOrgPlus project

- **Novel, affordable and smart processing systems for high quality ingredients and highly nutritious dried (and further processed) products**
- **New natural value added products in the form of extracts and powders**
- **Reduced environmental impact by increase of raw material utilisation and development of CO_2 neutral heat pump supported drying systems**
- **Supportive material for the development of a Code of Good Practice**
- **Sound data base and environmental performance, LCA and LCCA evaluation for selected products**
- **Highly qualified graduates who are sensitised to organic food**

Funding

This transnational project is funded via the ERA-net CORE Organic Cofund based on funds from participating countries and funding from the European Union.

Acknowledgements:

"The authors acknowledge the financial support for this project provided by transnational funding bodies, being partners of the H2020 ERA-net project, CORE Organic Cofund, and the cofund from the European Commission."

„This work was supported by a grant of the Romanian Authority for Scientific Research and Innovation, CCCDI - UEFISCDI, project number 4/2018 ERANET-COREORGANIC SusOrgPlus, within PNCDI III."

Contact: BĂDULESCU Liliana
E-mail: lilib_20@yahoo.com

D

Freeze dried powders obtained from organic tomatoes to be used as natural nutritional/functional ingredients and/or colorants to enhance stability of processed products and as natural colouring and flavouring agents

Project

Author/s: BĂDULESCU Liliana, Oana-Crina BUJOR, DOBRIN Aurora, STAN Andreea, MOȚ Andrei, ION Violeta-Alexandra

The innovation concerns a new natural value added product obtained from organic tomatoes in the form of powders in order to increase the nutritional value and shelf life of food products without the use of contentious substances. Organic tomato powders can be used in food industry as natural nutritional/functional ingredients and/or colorants to enhance stability of processed products and as natural colouring and flavouring agents. The organic tomato powders were obtained during SusOrgPlus project which is implemented between 2018-2021 in the Research Centre for Studies of Food and Agricultural Products Quality - UASVM Bucharest.

The obtained tomato powders are part from expected results of SusOrgPlus project

- **Novel, affordable and smart processing systems for high quality ingredients and highly nutritious dried (and further processed) products**
- **New natural value added products in the form of extracts and powders**
- **Reduced environmental impact by increase of raw material utilisation and development of CO_2 neutral heat pump supported drying systems**
- **Supportive material for the development of a Code of Good Practice**
- **Sound data base and environmental performance, LCA and LCCA evaluation for selected products**
- **Highly qualified graduates who are sensitised to organic food**

Funding
This transnational project is funded via the ERA-net CORE Organic Cofund based on funds from participating countries and funding from the European Union.
Acknowledgements:
"The authors acknowledge the financial support for this project provided by transnational funding bodies, being partners of the H2020 ERA-net project, CORE Organic Cofund, and the cofund from the European Commission."
"This work was supported by a grant of the Romanian Authority for Scientific Research and Innovation, CCCDI - UEFISCDI, project number 4/2018 ERANET-COREORGANIC SusOrgPlus, within PNCDI III."

Contact: BĂDULESCU Liliana
E-mail: lilib_20@yahoo.com

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

NATIONAL INSTITUTE FOR RESEARCH - DEVELOPMENT OF MACHINES AND INSTALLATIONS
DESIGNED FOR AGRICULTURE AND FOOD INDUSTRY - INMA
6, Ion Ionescu de la Brad Blv., Bucharest, ROMANIA, 013813, P.O. Box 18
Tel.: +40-21-269.32.49 / 269.32.55, Fax: +40-21-269.32.73, E-mail: icsit@inma.ro, www.inma.ro

COIL ELEMENT FOR CYLINDRICAL SIEVE

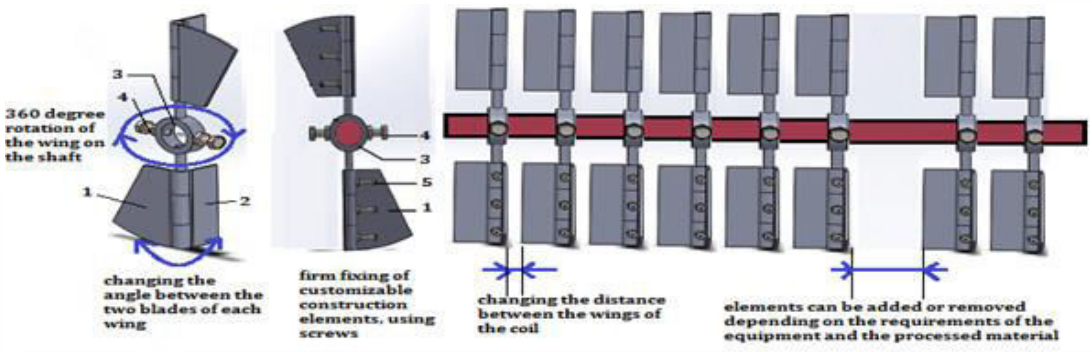
D

Patent Application No. A-00361 / 2021

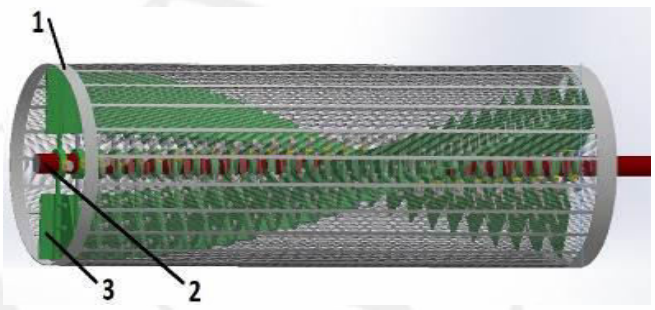
Authors: Costin MIRCEA, Florin NENCIU, Valentin VLĂDUȚ, Lucian Ionel CIOCA

DESCRIPTION:

The invention relates to an innovative subassembly that is placed inside the cylindrical grain separators, in order to improve their performance, called "***Novel coil subassembly for cylindrical sieve***".



The novel subassembly allows versatile operation of the equipment, being able to be converted easily to the form of *a helical coil with variable pitch, a homogenization palette, or grain mixer/agitator*, in order to separate the impurities from the seed mass introduced in the sieve, obtaining qualitative good seeds for sowing or grinding. The innovative element improves the separation process, allows a high level of customization, increases the efficiency and cleaning capacity of cylindrical sieves.



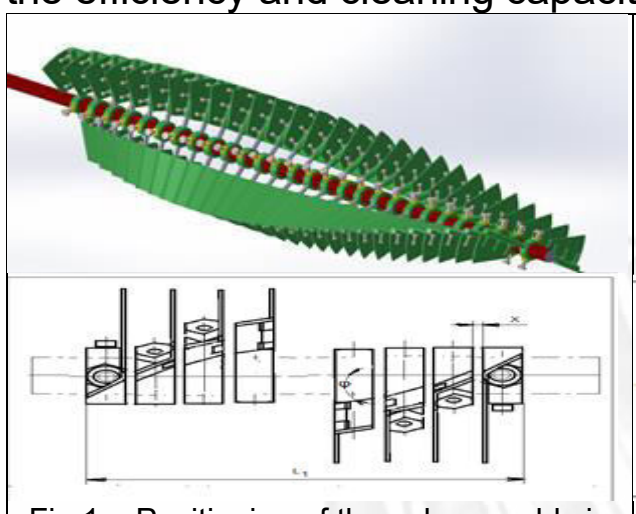


Fig.1 – Positioning of the subassembly in the form of a helical coil

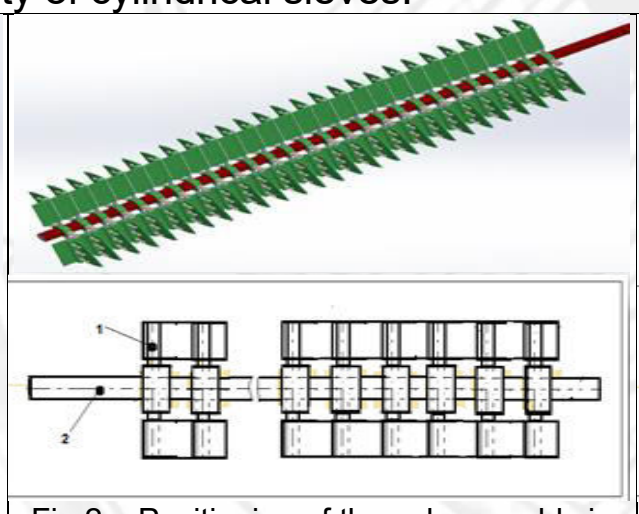


Fig.2 – Positioning of the subassembly in the form of a homogenization palette

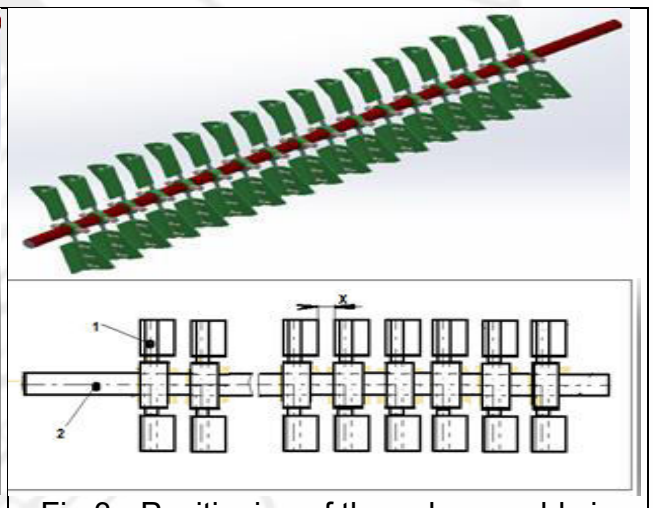


Fig.3 - Positioning of the subassembly in the form of a grain mixer/agitator

The technical problem solved by the invention consists in the design and execution of a versatile subassembly, that can be converted in the form of helical coil with variable pitch (Fig.1), of homogenization palette (Fig.2) or grain mixer/agitator (Fig.3), mounted on an axis inside a rotating cylindrical sieve, which will rotate in the opposite direction of rotation of the sieve, in order to increase the sieve speed, to eliminate the effect of "resting core". In this way there is an improved separation from the seed mass introduced into the sieve of good seeds intended for sowing or grinding, leaving on the sieve only the material, and leading to increased yields and sieving cleaning capacities.

CONCLUSIONS:

- The innovative subassembly positioned inside the rotating cylindrical sieves, presents a high level of versatility and can be quickly modified in the form of a helical coil, homogenization palette or grain mixer/agitator. In addition, the equipment can be customized in an advanced way, by changing the angle between the blades of the elements that make up the subassembly.
- This modification allows the cleaning of cereals with a high content of impurities or with high humidity (a major advantage for rotary sieves).
- The possibility to change the shape of the subassembly allows it to be used for different types of cereals.
- The use of the subassembly in association with the rotating coil, which rotates in the opposite direction to the subassembly leads to an important improvement of the separation efficiency, can increase the processing speed, or the volume of material entering the equipment.

Contact: Florin NENCIU - florin_nenciu2000@yahoo.com

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

NATIONAL INSTITUTE FOR RESEARCH - DEVELOPMENT OF MACHINES AND INSTALLATIONS DESIGNED FOR AGRICULTURE AND FOOD INDUSTRY - INMA
6, Ion Ionescu de la Brad Blv., Bucharest, ROMANIA, 013813, P.O. Box 18
Tel.: +40-21-269.32.49 / 269.32.55, Fax: +40-21-269.32.73, E-mail: icsit@inma.ro, www.inma.ro

ECHIPAMENT PENTRU PROCESARE FIBRĂ DE CÂNEPĂ / *HEMP FIBER PROCESSING EQUIPMENT*

Patent Application No. A-00422 / 2021

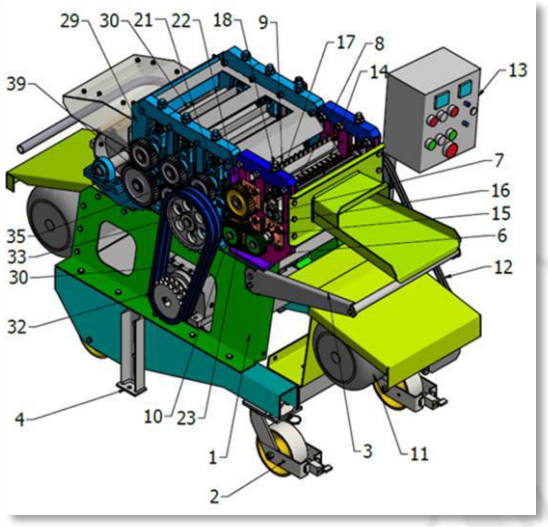
Authors: Gheorghe STROESCU, Mihai OLAN, Anișoara PĂUN, Alexandru ZAICA

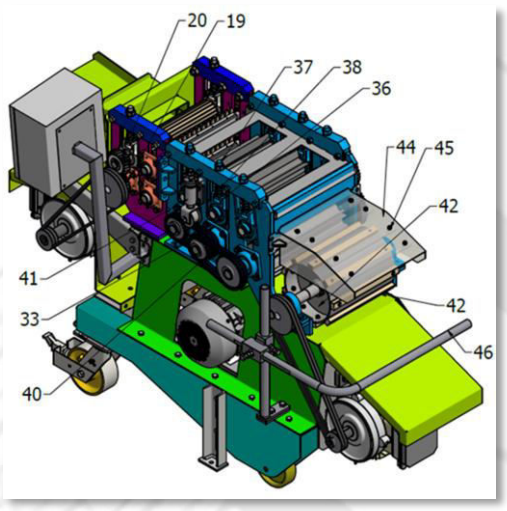
D

DESCRIERE:

Invenția se referă la un echipament destinat prelucrării tulpinilor de cânepă pentru fibră de pe loturile experimentale.

Problema tehnică pe care o rezolvă invenția constă în realizarea unui echipament mobil cu acționare electromecanică care cuprinde un set de 4-6 valțuri pentru prelucrare fibră, dar cuprinde și un set de 4 valțuri care vor realiza defolierea (ruperea) frunzelor de pe tulpini înainte ca acestea să intre în blocul de prelucrare fibră.





MATERIALE ȘI METODA FOLOSITĂ:

Echipamentul este format din suportul (**1**) și are patru roți pentru deplasare (**2**), un mâner (**3**) și două picioare reglabile (**4**) pentru poziționarea acestuia în timpul lucrului. Pe suportul (**1**) se află montat un modul pentru prelucrare tulpini (**5**) ce cuprinde o carcasă (**6**) cu două valțuri (**7**) și (**8**) pentru antrenarea tulpinilor de cânepă și două valțuri (**9**) și (**10**) pentru defolierea tulpinilor. Antrenarea valțurilor se face cu ajutorul unui motor electric (**11**) și o transmisie cu curele trapezoidale (**12**). Motorul este comandat cu ajutorul unui convertizor de frecvență montat în tabloul electric de comandă (**13**). Valțurile au la exterior câte o manta (**14**) pentru antrenarea tulpinilor de cânepă și sunt poziționate cu ajutorul unor lagăre fixe (**15**) și a unora reglabile (**16**), acționate de arcuri reglabile (**17**) și de tije filetate (**18**). Valțurile sunt antrenate de roțile cilindrice (**19**), (**20**), (**21**) și (**22**) iar între cele două perechi de valțuri se folosește transmisia cu lanț Gall (**23**).

Pe același suport și în imediata vecinătate a carcasei cu valțuri pentru defoliere (**6**) se află montată o carcasă (**29**) cu șase valțuri (**30**) care realizează decorticarea tulpinilor de cânepă pentru a obține fibră. Aceste valțuri sunt antrenate simultan cu ajutorul unui motoreductor coaxial (**31**) și o transmisie cu lanț Gall (**32**). Fiecare pereche valțuri se află montată cu ajutorul a două lagăre fixe (**33**) și (**34**) și a două lagăre mobile (**35**) și (**36**) ce sunt reglate cu ajutor unor tije filetate (**37**) și a unor arcuri elicoidale (**38**).

Pentru curățirea finală a fibrei, materialul prelucrat ajunge pe suprafața unui tambur rotativ (**42**) cu baghete de lemn (**43**) care antrenează tulpinile și acestea vin în contact și cu capacul superior (**44**) pe care se află montat alt set de lamele din lemn (**45**) pentru curățirea bucăților lemnoase și de pe suprafața superioară a fibrelor. Acest tambur de curățire este antrenat cu un motor electric (**46**) comandat cu convertizor de frecvență aflat în tabloul de comandă (**13**). Fibra prelucrată este colectată pe suportul reglabil (**47**).

AVANTAJE:

- creșterea gradului de manevrabilitate și reglaje în funcție de soiul și mărimea tulpinilor de cânepă;
- sistem autonom de funcționare și permite reglarea separată a celor trei tronsoane tehnologice cu echipamente specifice pentru fiecare operație tehnologică;
- utilizarea pentru loturi mici de produse cu caracteristici tehnice diferite;
- acces ușor la valțurile de lucru și protecție cu apărători în zonele cu organe cinematice în mișcare de rotație.

Contact: **Mihai OLAN - vibrobloc@yahoo.com**

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

NATIONAL INSTITUTE FOR RESEARCH - DEVELOPMENT OF MACHINES AND INSTALLATIONS DESIGNED FOR AGRICULTURE AND FOOD INDUSTRY - INMA
6, Ion Ionescu de la Brad Blv., Bucharest, ROMANIA, 013813, P.O. Box 18
Tel.: +40-21-269.32.49 / 269.32.55, Fax: +40-21-269.32.73, E-mail: icsit@inma.ro, www.inma.ro

DISTRIBUITOR DE MATERIALE BIOCOMPOZITE ECO-FERTILIZANTE GRANULARE /

GRANULAR ECO-FERTILISING BIOCOMPOSITES SPREADER

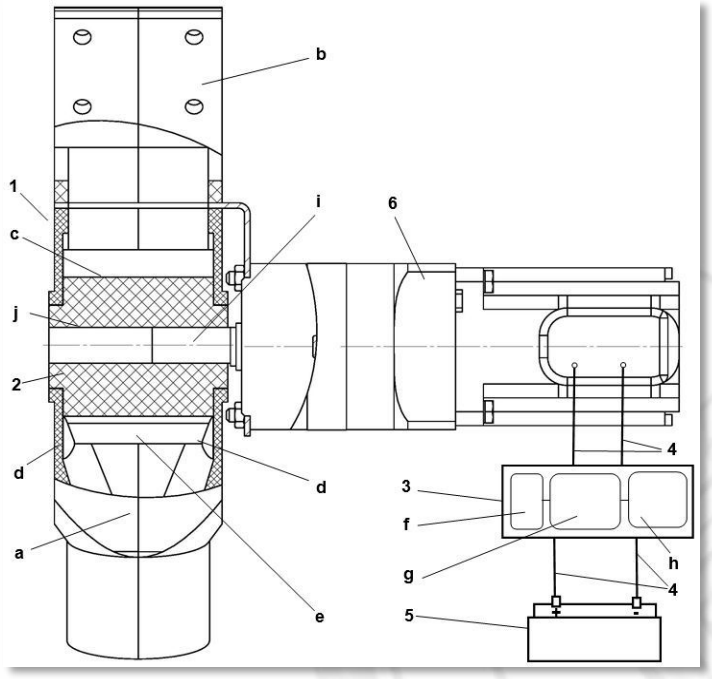
Patent Application No. A-00171 / 2021

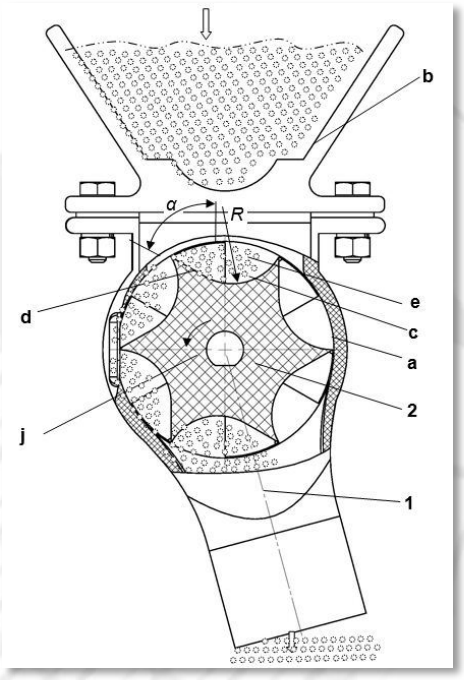
Authors: Eugen MARIN, Dragoș MANEA, Marinela MATEESCU, Stelian GREBLEA, Gabriel GHEORGHE, Mihai CONSTANTINESCU, Ana-Cristina FĂTU

D

DESCRIERE:

Invenția se referă la un distribuitor mecanic, pentru echipamentele de administrat materiale biocompozite eco-fertilizante granulare, utilizat în agricultură în scopul ameliorării, refacerii calității și fertilizării solurilor.





MATERIALE ȘI METODA FOLOSITĂ:

Problema tehnică pe care o rezolvă soluția propusă constă în realizarea unui distribuitor mecanic, pentru echipamentele de administrat materiale granulare, care să asigure dozarea și distribuirea precisă și uniformă a unor materiale biocompozite eco-fertilizante granulare, fără să zdrobească materialul, fără să creeze aglomerări de material în timpul lucrului și să permită curățirea rapidă și eficientă a distribuitorului.

Distribuitorul de materiale biocompozite eco-fertilizante granulare se compune dintr-o cameră de distribuție (**1**), alcătuită din semicarcase (**a**) și suport cutie de fertilizare (**b**), un rotor cilindric (**2**), care include niște alveole speciale (**c**) aranjate pe suprafața circumferențială exterioară cu o rază **R** și un unghi **α** și niște elemente de dirijare (**d**) dispuse lateral, cu un unghi **β** pe fiecare alveolă specială (**c**), dimensionate pentru a distribui un volum de material (**e**) controlat de un controller logic programabil (**3**), cu un touchscreen (**f**), împreună cu un software (**g**) corespunzător și adecvat, o memorie (**h**) pentru stocarea acestui software, inclusiv niște conductoare electrice (**4**) de interconectare cu o sursă de alimentare (**5**), prin reglarea electronică a turației unui motor electric (**6**) prevăzut cu un ax (**i**) în legătură concentrică directă cu un butuc (**j**) al rotorului cilindric (**2**).

AVANTAJE:

- ❑ poate fi utilizată pe orice echipament agricol de administrat materiale granulare, cu adaptări minime;
- ❑ simplitate constructivă;
- ❑ siguranță în funcționare;
- ❑ ușurință de utilizare și performanță;
- ❑ reglajele sunt simple și ușor de efectuat de către un singur operator, fără a utiliza unelte ajutătoare, conducând astfel la reducerea timpului de intervenție pentru modificarea dozelor de administrare.

Contact: **Eugen MARIN - marin_43eu@yahoo.com**

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

NATIONAL INSTITUTE FOR RESEARCH - DEVELOPMENT OF MACHINES AND INSTALLATIONS DESIGNED FOR AGRICULTURE AND FOOD INDUSTRY - INMA
6, Ion Ionescu de la Brad Blv., Bucharest, ROMANIA, 013813, P.O. Box 18
Tel.: +40-21-269.32.49 / 269.32.55, Fax: +40-21-269.32.73, E-mail: icsit@inma.ro, www.inma.ro

TEHNOLOGIE ȘI ECHIPAMENT DE MONITORIZARE ACTIVĂ ȘI COLECTARE A DEȘEURILOR DIN PLASTIC DIN SISTEME ACVACOLE AFLATE ÎN AER LIBER / *TECHNOLOGY AND EQUIPMENT FOR ACTIVE MONITORING AND COLLECTION OF PLASTIC WASTE FROM OUTDOOR ACVACOLE SYSTEMS*

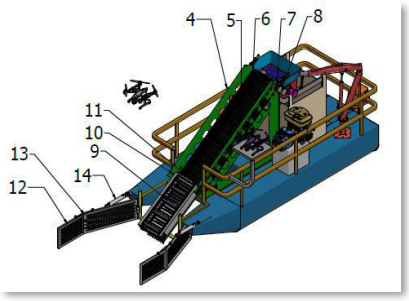
Patent Application No. A-00534 / 2021

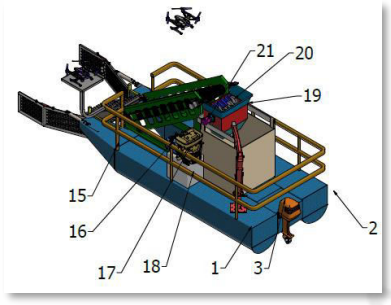
Authors: Valentin VLĂDUȚ, Anișoara PĂUN, Ioan CABA, Iulian VOICEA

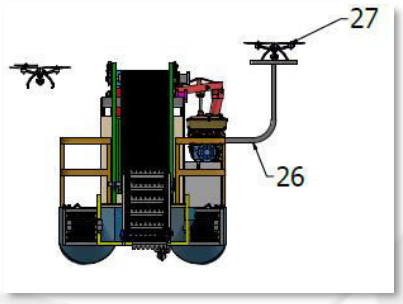
D

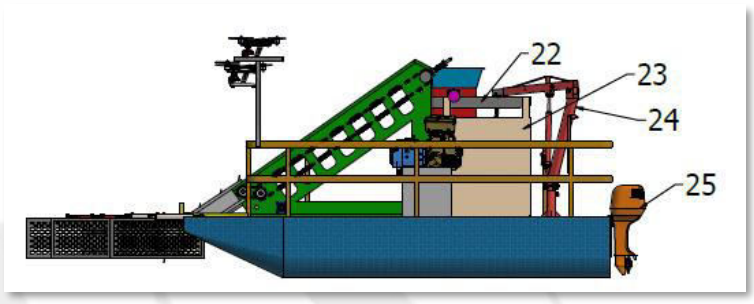
DESCRIERE:

Invenția se referă la un echipament mobil cu monitorizare activă și acționare hidraulică pentru colectarea deșeurilor din plastic de pe suprafața lacurilor de acumulare.









MATERIALE ȘI METODA FOLOSITĂ:

Problema tehnică pe care o rezolvă soluția propusă, conform invenției, constă în realizarea unui echipament mobil autonom, cu monitorizare activă, care să colecteze și să mărunțească deșeurile din plastic și care să fie prevăzut cu o macara hidraulică pentru descărcarea sacilor cu deșeuri tocate și care să realizeze simultan monitorizarea lacului de acumulare înainte și după încheierea operației de depoluare cu ajutorul unui sistem cu dronă dotată cu cameră 6K ultraHD-HDR, pentru fotografierea zonală a suprafeței lacului de acumulare și transmisia datelor în timp real către un dispecerat de prelucrare și stocare a datelor.

Instalația, conform invenției, se compune dintr-o platformă marină ce este construită din două bărci de pescuit (**1**) și (**2**) cu o platformă (**3**) de legătură între acestea și care va susține echipamentul de lucru ce este format dintr-un suport (**4**) ce susține o bandă transportoare (**5**) ce este realizată din plasă împletită și prevăzută cu două lanțuri laterale ce circulă pe două axe (**6**) prevăzute cu roți de lanț și care sunt poziționate cu ajutorul a două lagăre (**7**) cu sistem de reglare. Antrenarea acestei benzi de transport este realizată cu ajutorul unui motor hidraulic (**8**). Tot pe suportul (**4**) se află montată și banda pentru colectare (**9**) al cărei ax de antrenare (**10**) este cuplat cinematic cu banda de transport (**5**) cu ajutorul unei transmisii cu lanț Gall (**11**).

Pentru colectarea deșeurilor din plastic, acest echipament este prevăzut cu două brațe (**12**) care sunt articulate și reglate cu ajutorul unui întinzător (**13**) și acționate cu ajutorul unor cilindri hidraulici (**14**) pentru a crea curenții necesari deplasării deșeurilor de plastic pe direcția benzii de colectare (**9**). Echipamentul este prevăzut cu un gard de protecție (**15**).

Pentru producerea energiei hidraulice necesară motoarelor hidraulice de pe acest echipament, sistemul este prevăzut cu o pompă hidraulică (**16**) antrenată de un motor termic pe benzină (**17**) și un rezervor pentru ulei (**18**).

Pentru mărunțirea deșeurilor din plastic în scopul reducerii volumului de transport, echipamentul pentru colectarea deșeurilor este dotat cu un tocător special (**19**) pentru deșeuri din plastic, ce are în construcție un tambur cu cuțite (**20**) antrenat de un motor hidraulic (**21**). Pe suportul (**4**) se află montate două brațe (**22**) ce vor susține un sac de volum mare (**23**), care după umplere va fi ridicat și descărcat de pe platforma marină cu o macara hidraulică (**24**).

Pentru monitorizarea amplasării deșeurilor și a activității de depoluare acest echipament este dotat cu o masă suport (**26**) și o dronă (**27**), dotată cu cameră ultraHD-HDR, care asigură transmisie radio în timp real până la o distanță de 9 km, având o autonomie de zbor de max. 40 de minute.

AVANTAJE:

- ❑ principalul avantaj este reducerea volumului deșeurilor din plastic colectate și renunțarea la altă ambarcațiune necesară pentru transportul acestora;
- ❑ raportarea în timp real a situațiilor suprafețelor poluate ale lacurilor de acumulare, atât anterioară cât și ulterioară realizării operației de depoluare;
- ❑ creșterea gradului de manevrabilitate și reglare, față de soluțiile tehnice descrise în brevetele menționate mai sus la stadiul tehnicii.

Contact: **Mihai OLAN - vibrobloc@yahoo.com**

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

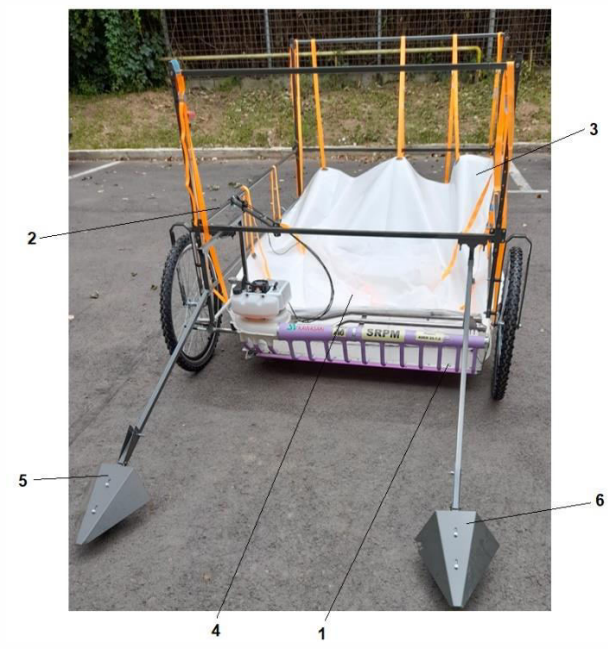
NATIONAL INSTITUTE FOR RESEARCH - DEVELOPMENT OF MACHINES AND INSTALLATIONS DESIGNED FOR AGRICULTURE AND FOOD INDUSTRY - INMA
6, Ion Ionescu de la Brad Blv., Bucharest, ROMANIA, 013813, P.O. Box 18
Tel.: +40-21-269.32.49 / 269.32.55, Fax: +40-21-269.32.73, E-mail: icsit@inma.ro, www.inma.ro

SISTEM TEHNIC DE RECOLTAT PLANTE MEDICINALE – SRPM / *TECHNICAL SYSTEM FOR HARVESTING MEDICINAL PLANTS*

Authors: Adriana MUSCALU(1), Cătălina TUDORA(1), Laurențiu VLĂDUȚOIU(1), Mario CRISTEA(1), Ioan GRIGORE(1), Elena BĂRCANU-TUDOR(2)
(1) **INMA București,** (2) **SCDL Buzău**

D

DESCRIERE:
Sistemul tehnic de recoltat plante medicinale SRPM este destinat optimizării operației de recoltare din cadrul tehnologiilor de cultură ale plantelor medicinale si aromatice, cultivate de fermieri pe suprafețe reduse.



SRPM pregătit pentru experimentări la SCDL Buzău

Fig. 1. Sistemul tehnic de recoltat plante medicinale **SRPM**
1 – cositoare; 2 – cadru cu posibilități de rulare;
3 – suport sac asamblat; 4 – sac colectare;
5 – ridicător plante dreapta; 6 - ridicător plante stânga

MATERIALE ȘI METODA FOLOSITĂ:

Domeniul de utilizare al SRPM se referă la recoltarea unor specii anuale și perene de plante medicinale si aromatice, aparținând unor familii botanice diferite. Pentru obținerea unui material vegetal de calitate, recoltarea se efectuează de regula la momentul optim (înflorirea plantelor). In cazul anumitor specii, partea utilă ce se colectează este reprezentată doar de tulpina cu frunze, în acest caz, recoltarea desfășurându-se pe toata perioada de vegetație a plantelor.

Modelul experimental de Sistem tehnic de recoltat plante medicinale, SRPM se compune dintr-o cositoare instalată pe un cadru cu posibilități de rulare, care susține un sac pentru recoltarea materialului recoltat împreună cu suportul acestuia și ridicătoarele de plante stânga/dreapta (fig.1)

Înaintea începerii operației de recoltare, în vederea unei bune funcționări a echipamentului, se stabilește înălțimea de lucru în funcție particularitățile culturii și ale speciei de plante medicinale si aromatice, și se realizează reglarea echipamentului.

Echipamentul se transportă prin împingere, cu motorul oprit, până la capătul rândurilor de plante medicinale și aromatice ce urmează a fi recoltate. Echipamentul este plasat cu roțile pe direcția rândurilor, "încălecându-le". Roțile vor rula pe intervalul dintre rândurile de plante.

Se pornește motorul, apoi se cuplează aparatul de tăiere. Funcție de condițiile de recoltare (viteza de înaintare dorită, caracteristicile culturii de plante medicinale și aromatice) se acționează comanda „accelerației motorului" până se obține regimul de lucru considerat satisfăcător.

Plantele tăiate de cositoare sunt direcționate de suflantă în sacul de colectare. Aerul iese prin plasa decupării cu care este prevăzut sacul, în timp ce materialul vegetal recoltat este reținut în interior.

AVANTAJE:

- ❑ Manevrabilitate, demontare și transport facile;
- ❑ Calitate ridicată a materialului vegetal recoltat;
- ❑ Posibilitatea reglării înălțimii de lucru, funcție de specia ce se recoltează și condițiile din teren;
- ❑ Posibilitatea utilizării de către micii fermieri, pe suprafețe mici și medii;
- ❑ Preț de cost scăzut.

ACKNOWLEDGEMENT:
Această lucrare este finanțată prin Planul sectorial cercetare-dezvoltare din domeniul agricol și de dezvoltare rurală al Ministerului Agriculturii și Dezvoltării Rurale pe anii 2019-2011, „Agricultura și Dezvoltare Rurală ADER 2022", prin Contractul de finanțare **Nr.25.1.2 / 27.09.2019** pentru proiectul ***ADER-25.1.2: CERCETĂRI PRIVIND REALIZAREA ŞI TESTAREA ECHIPAMENTELOR TEHNICE DE RECOLTAT PLANTE MEDICINALE ŞI AROMATICE, UTILIZATE ÎN EXPLOATAŢIILE DE MICI DIMENSIUNI***

Contact: **dr. ing. Adriana MUSCALU** amuscalis@yahoo.com

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

NATIONAL INSTITUTE FOR RESEARCH - DEVELOPMENT OF MACHINES AND INSTALLATIONS DESIGNED FOR AGRICULTURE AND FOOD INDUSTRY - INMA
6, Ion Ionescu de la Brad Blv., Bucharest, ROMANIA, 013813, P.O. Box 18
Tel.: +40-21-269.32.49 / 269.32.55, Fax: +40-21-269.32.73, E-mail: icsit@inma.ro, www.inma.ro

PROIECTARE MODEL EXPERIMENTAL DE PLATFORMĂ MOBILĂ INTELIGENTĂ DESTINATĂ REALIZĂRII LUCRĂRILOR DE ÎNTREȚINERE A CULTURILOR ÎN SPAȚIILE PROTEJATE - EIIC /

DESIGN OF EXPERIMENTAL MODEL OF AN INTELLIGENT MOBILE PLATFORM INTENDED TO CARRY OUT THE MAINTENANCE WORKS FOR CROPS IN PROTECTED AREAS - EIIC

Patent Application No. A-00640 / 2021

Authors: Dan Cujbescu, Iulian Voicea, Cătălin Persu, Iuliana Găgeanu, Mihai Matache, Gabriel Gheorghe, Dragoș Dumitru

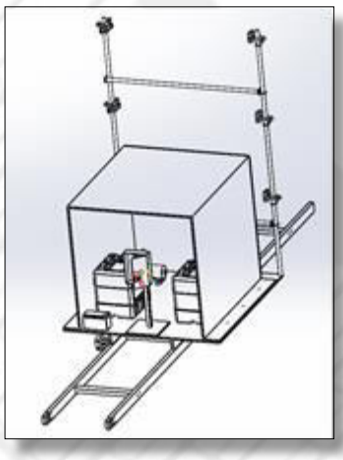
D

DESCRIERE:
Modelul experimental al platformei mobile inteligente EIIC este destinat realizării lucrărilor de întreținere a culturilor în spațiile protejate.

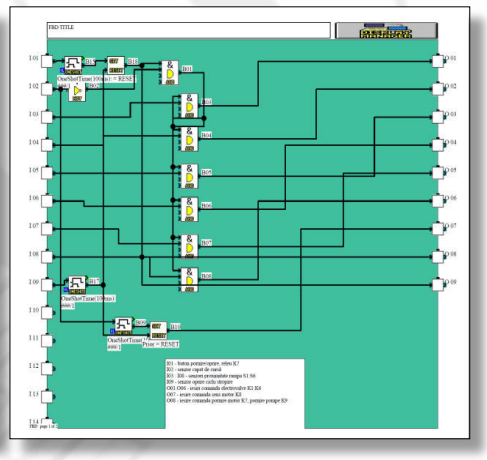
COMPONENȚĂ:
Modelul experimental al platformei mobile inteligente EIIC destinată realizării lucrărilor de întreținere a culturilor în spațiile protejate a fost proiectat pe baza cerințelor tehnice identificate în faza de studiu și corelat cu termenii de referință ai proiectului ADER 25.2.1: "Tehnologii și echipament inteligent pentru creșterea productivității în spații protejate, independente energetic" și are următoarele părți componente:

- cale de rulare;
- cadru platformă mobilă;
- motor curent continuu;
- acumulator semitracțiune;
- role transport;
- două rampe verticale;
- rezervoare substanțe fitosanitare
- sistem de alimentare 12 Vcc;
- PLC de control;
- carcasă protecție.
- sistemul de distribuție a substanțelor fitosanitare

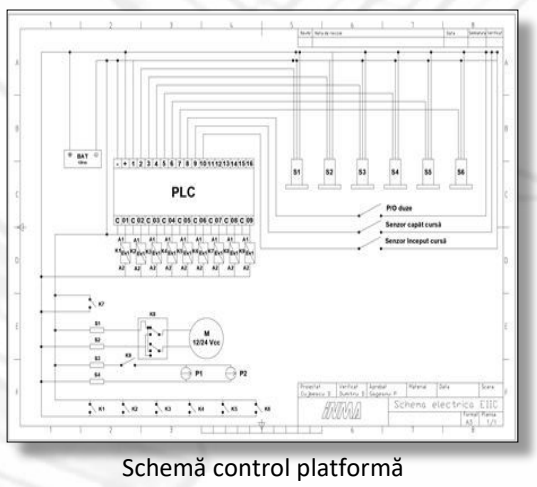
(pompe electrice 12 Vcc, suport portduză și duze calibrate, electrovalve, senzori de proximitate).



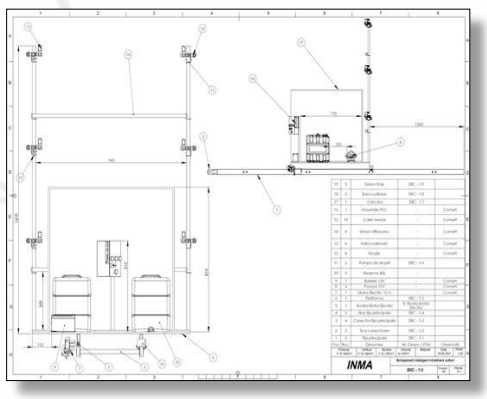
Schema platformei mobile inteligentă EIIC



Schema electrică platformă mobilă inteligentă EIIC



Schemă control platformă mobilă inteligentă EIIC



Desen de execuție model experimental platformă mobilă inteligentă EIIC destinată realizării lucrărilor de întreținere a culturilor în spațiile protejate

PROIECTARE SOFTWARE COMANDĂ ȘI CONTROL PLATFORMĂ MOBILĂ INTELIGENTĂ
Softul de comandă și control al platformei mobile inteligente EIIC este scris în PLC-ul de control în limbajul de programare SW0D5-ALVLS-EUL, produs de Mitsubishi Electric.
Software-ul este construit folosind logica de control cu porți logice virtuale amplasate pe o foaie de control și interconectate între ele. Mărimile de intrare pentru software sunt semnalele primite de la butonul de pornire-oprire, cei 6 senzori de proximitate și senzorii de capăt de cursă.
Mărimile de ieșire sunt reprezentate de ieșirile pe releu ale PLC-ului care vor comanda releele de acționare a electrovalvelor precum și releul de acționare a motorului electric pentru autodeplasarea platformei în ambele sensuri.

ACKNOWLEDGEMENT:
Această lucrare este finanțată prin Planul sectorial cercetare-dezvoltare din domeniul agricol și de dezvoltare rurală al Ministerului Agriculturii și Dezvoltării Rurale pe anii 2019-2022, „Agricultura și Dezvoltare Rurală ADER 2022", prin Contractul de finanțare **Nr. 25.2.1 / 27.09.2019** pentru proiectul ***ADER-25.2.1: "TEHNOLOGII ȘI ECHIPAMENT INTELIGENT PENTRU CREȘTEREA PRODUCTIVITĂȚII ÎN SPAȚII PROTEJATE, INDEPENDENTE ENERGETIC".***

Contact: Dan CUJBESCU - dcujbescu@yahoo.com

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

NATIONAL INSTITUTE FOR RESEARCH - DEVELOPMENT OF MACHINES AND INSTALLATIONS DESIGNED FOR AGRICULTURE AND FOOD INDUSTRY - INMA
6, Ion Ionescu de la Brad Blv., Bucharest, ROMANIA, 013813, P.O. Box 18
Tel.: +40-21-269.32.49 / 269.32.55, Fax: +40-21-269.32.73, E-mail: icsit@inma.ro, www.inma.ro

SISTEM TEHNIC INOVATIV PENTRU RECOLTAREA TULPINILOR DE CÂNEPĂ / *INNOVATIVE TECHNICAL SYSTEM FOR HARVESTING HEMP STALK*

D

Authors: Ancuța NEDELCU, Radu CIUPERCĂ, Ana ZAICA (INMA Bucharest)
Lorena-Diana POPA (SCDA Secuieni)

SUMMARY:
Recent studies have increasingly shown the benefits of using textile from natural fibres, one of them being the fibre derived from industrial hemp (Cannabis sativa L.). For relaunching the hemp crop for fibre, research was carried out for the implementation of a technology for harvesting hemp for stalks applied with an innovative technical system for harvesting hemp stalks with the following parts: stalk cutting device, sheaf binder, loading system and unloading system.

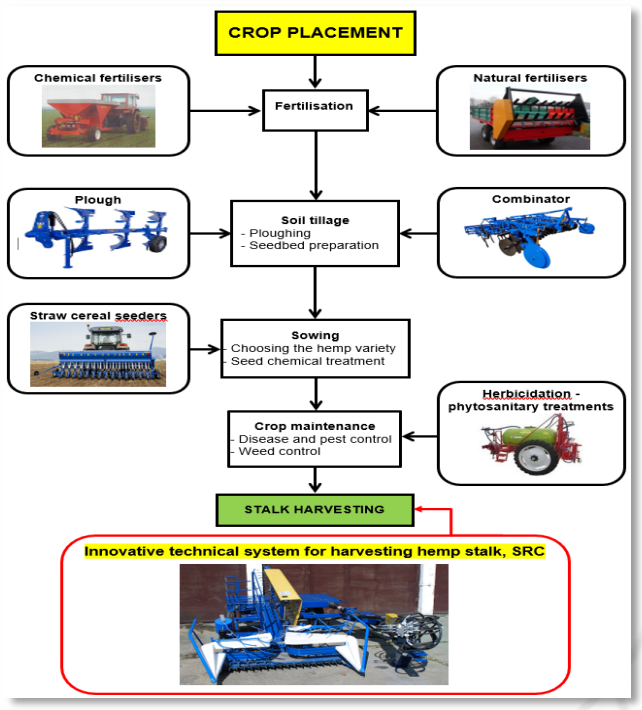


Fig.1 – Fiber Hemp Cultivation Technology

Fig.2 - Innovative Technical System for Harvesting Hemp Stalk SRC-0

INTRODUCTION:

Hemp cultivation has been a traditional practice in Romania, the hemp being one of the oldest technical plants grown in this region.

Technical Hemp (Cannabis Sativa) - is the technical plant with the highest use of all technical plants in the industry, because nothing is thrown away from this plant. Hemp is part of the group of textile plants of great value for human and industrial use. Hemp production for industrial purposes continues to grow worldwide and is currently used for many applications: in constructions (emerging material in the green construction sector, including house insulation), paper manufacturing, animal bedding, fabrics, rope making and also as biofuel.

In Romania, there are favourable conditions for hemp cultivation on most of the territory, and the cultivated areas have increased in recent years; yet, mostly the hemp for seeds has been developed and less for the fibres.

The paper presents a “Technology for Hemp Harvesting for Stalks” (Fig.1) and an “Innovative Technical System for Harvesting Hemp Stalks, SRC-0” (Fig.2).

RESULTS:

The innovative technical system for harvesting hemp stalks will work in aggregate with an agricultural tractor of min. 45 HP and consists mainly of the following assemblies: cutting device, sheaf binder, loading system, unloading system, installation for monitoring the work process and warning the operator in case of equipment malfunctions.

CONCLUSIONS:

- Hemp fibre culture, due to its benefits, is a potential for the relaunch of the natural fibres textile industry and also for crafts and hobbies, that can play a key role in the rural development strategy.
- The proposed innovative technical system for harvesting hemp stalks performs the following operations mechanically: stalk cutting, sheaf binding and placing in a row, helping to reduce losses, eliminating physical effort and increasing the quality of the harvesting work.

This work is financed by the Sectoral Plan for Research – Development in the agricultural and rural development sector, developed by the Ministry of Agriculture and Rural Development for 2019-2022: “*Agriculture and Rural Development – ADER 2022*”, by the Financing Contract no.25.1.1 / 2019 for the project: “*ADER 25.1.1 – Mechanization Technology and Technical System for Hemp Crop Harvesting*”.

Contact: **Ancuța NEDELCU - nedelcu.ancuta@yahoo.com**

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

NATIONAL INSTITUTE FOR RESEARCH - DEVELOPMENT OF MACHINES AND INSTALLATIONS DESIGNED FOR AGRICULTURE AND FOOD INDUSTRY - INMA
6, Ion Ionescu de la Brad Blv., Bucharest, ROMANIA, 013813, P.O. Box 18
Tel.: +40-21-269.32.49 / 269.32.55, Fax: +40-21-269.32.73, E-mail: icsit@inma.ro, www.inma.ro

INSTALAȚIE PENTRU AFÂNARE BIOCOMPOST /
INSTALLATION FOR BIOCOMPOST LOOSENING

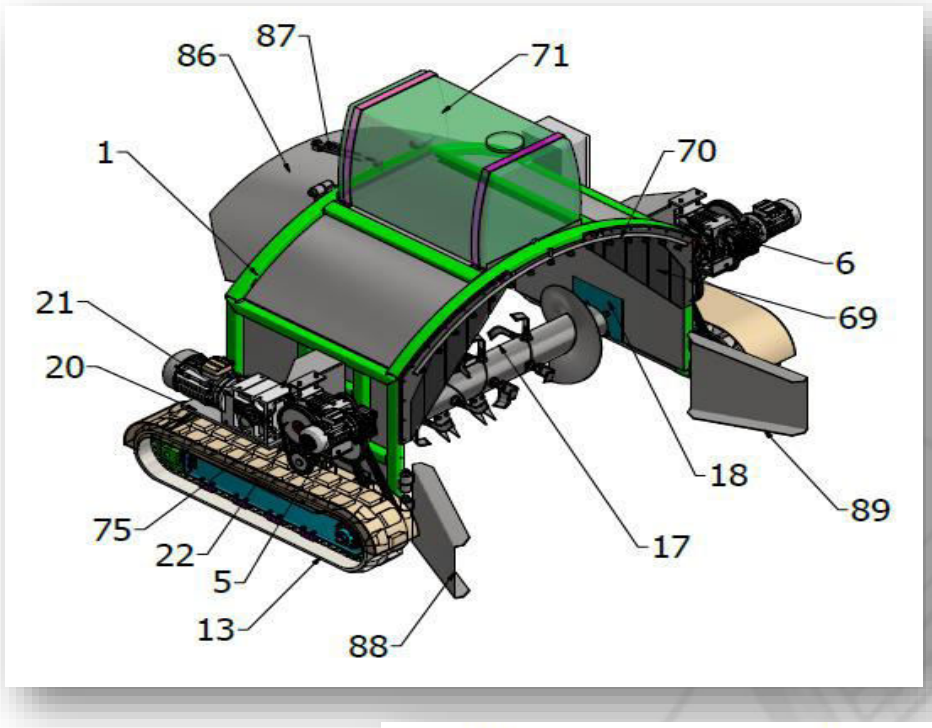
Patent Application No. A-00402 / 2020

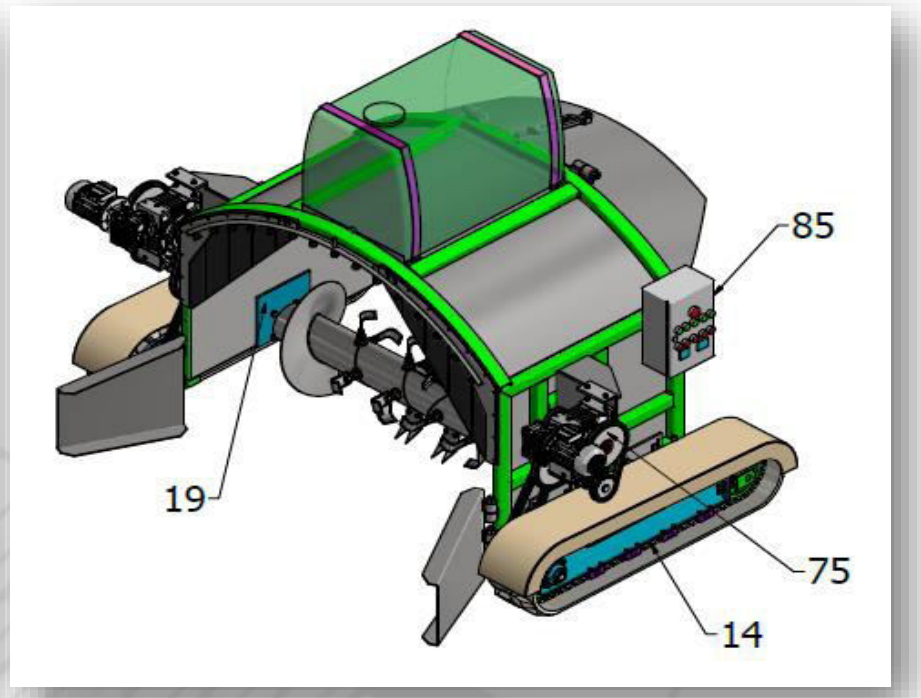
Authors: Anișoara PĂUN, Ioan GANEA-CHRISTU, Mihai MATACHE, Ioan CABA, Evelin LAZA

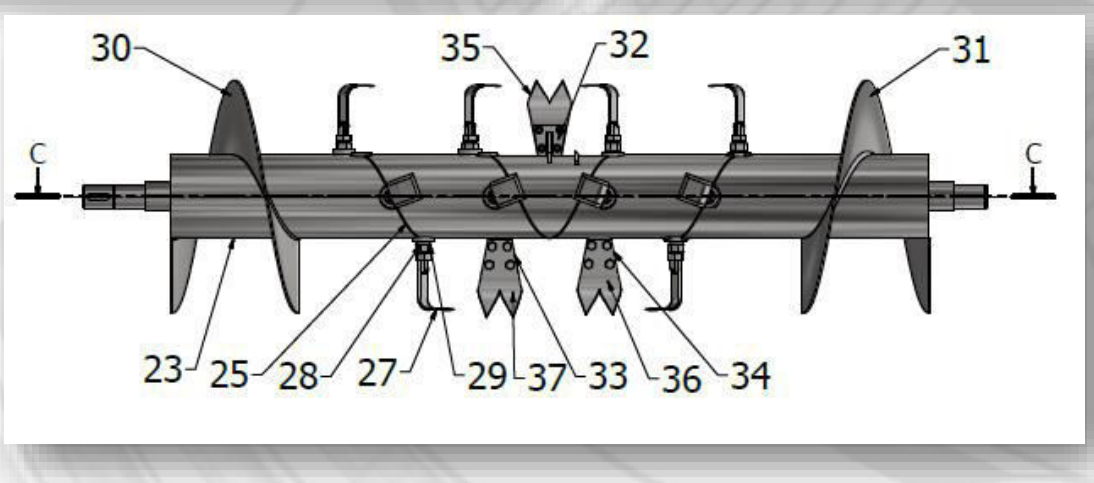
D

DESCRIERE:

Invenția se referă la un echipament mobil cu acționare electromecanică destinat aerării și amestecării biocompostului în unități agricole, pentru valorificarea acestuia ca îngrășământ pentru legumicultură și alte sectoare agricole.







COMPONENȚĂ:

Instalația pentru afânare biocompost este formată din suportul central (**1**) construit din țeavă cu secțiune rectangulară și placat cu tablă zincată (**2**) pe care sunt montate două plăci (**3** și **4**) pentru motoreductoarele dublu melcate (**5** și **6**) care prin intermediul a două transmisii cu lanț (**7** și **8**) vor antrena roțile de lanț (**9** și **10**) montate pe axele (**11** și **12**) a două subansamble de deplasare cu șenile din cauciuc (**13** și **14**). Pe suportul central (**1**) se află montați doi suporți cu găuri de prindere și canale deschise (**15** și **16**) în care se montează tamburul central cu cuțite (**17**) cu ajutorul a două lagăre (**18** și **19**). Tot pe suportul central (**1**) se află montat un suport special (**20**) pentru un motoreductor conico-cilindric (**21**), care prin intermediul unei transmisii cu lanț Gall (**22**) va antrena tamburul central cu cuțite (**17**).

AVANTAJE:

- ❑ principalul avantaj este creșterea gradului de afânare, prin faptul că tamburul cu cuțite are montat pe partea centrală trei cuțite de o formă specială care vor arunca materialul, iar pe părțile laterale are montat câte un set de cuțite cotite, montate pe o spirală elicoidală și rotite cu un anumit unghi;
- ❑ are un sistem autonom de funcționare;
- ❑ realizează viteze diferite de deplasare pentru faza tehnologică de lucru și faza de deplasare și întoarceri.

Contact: **Mihai OLAN - vibrobloc@yahoo.com**

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

NATIONAL INSTITUTE FOR RESEARCH - DEVELOPMENT OF MACHINES AND INSTALLATIONS DESIGNED FOR AGRICULTURE AND FOOD INDUSTRY - INMA
6, Ion Ionescu de la Brad Blv., Bucharest, ROMANIA, 013813, P.O. Box 18
Tel.: +40-21-269.32.49 / 269.32.55, Fax: +40-21-269.32.73, E-mail: icsit@inma.ro, www.inma.ro

INSTALAȚIE INDUSTRIALĂ PENTRU SPĂLAREA TOPINAMBURULUI /

INDUSTRIAL INSTALLATION FOR JERUSALEM ARTICHOKE WASHING

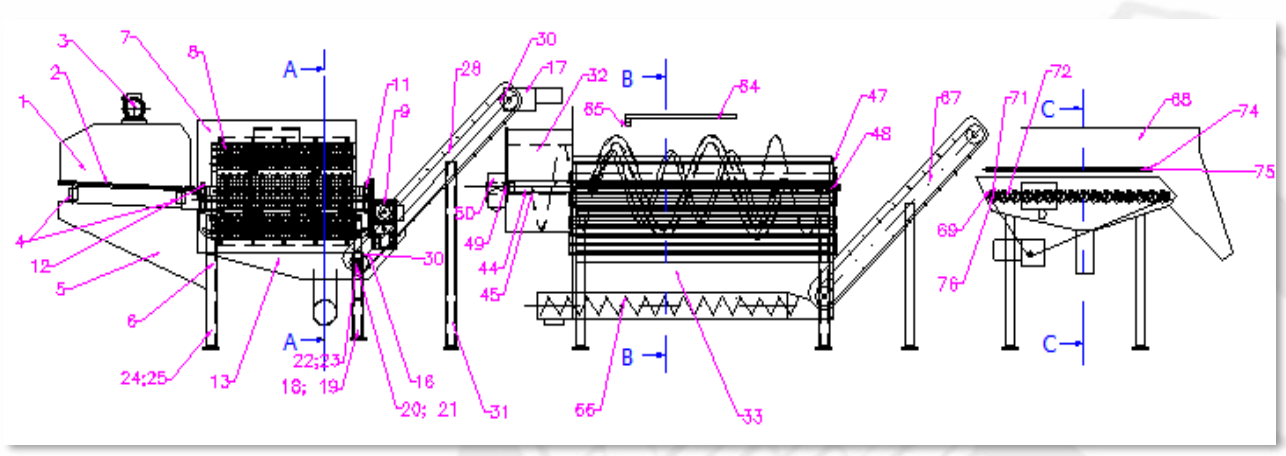
National Patent Application No. A-00891 / 2019
European Patent Application No. 20020460.0 / 2020

Authors: Mihai OLAN[(1)], Valentin VLĂDUȚ[(1)], Anișoara PĂUN[(1)], Iulian VOICEA[(1)], Gigel PARASCHIV[(2)], Diana POPA[(3)], Simona ISTICIOAIA[(3)], Livia APOSTOL[(4)]
[(1)]INMA București, [(2)]UPB București, [(3)]ICDA Secuieni-Neamț, [(4)]IBA București

D

DESCRIERE:

Invenția se referă la o instalație industrială destinată spălării tuberculilor de topinambur în vederea procesării pentru producerea de bioetanol.



MATERIALE ȘI METODA FOLOSITĂ:

Problema tehnică pe care o rezolvă invenția constă în proiectarea unei instalații care cuprinde toate operațiile tehnologice pentru spălarea tuberculilor de topinambur. Deoarece aceștia se recoltează toamna, în sezonul ploios, este necesar ca fluxul tehnologic să cuprindă un grătar vibrant pentru curățire primară de impurități, apoi în zona de înmuiere și prespălare și la sfârșit în zona de spălare finală cu perii cilindrice și clătire.

Toate aceste etape tehnologice asigură spălarea optimă a tuberculilor de topinambur care sunt recoltați împreună cu o cantitate mare de noroi în sezonul de toamnă care este un anotimp ploios.

Instalația industrială este alcătuită din cuva de alimentare **(1)**, ce este prevăzută cu un grătar vibrant **(2)**, acționat cu un motovibrator **(3)**, susținut pe tampoanele de cauciuc **(4)** și care permite separarea impurităților de pământ de pe tuberculii de topinambur înainte ca aceștia să intre în cuva octogonală **(8)** ce este construită din tablă perforată de inox și placată cu cauciuc alimentar pentru evitarea lovirii produselor în timpul rostogolirii, apoi echipamentul de spălare cu perii și echipamentul **(68)** pentru spălare finală și clătire a tuberculilor.

AVANTAJE:

- ❑ este ușor de realizat și de asamblat;
- ❑ devine operațională în timp scurt;
- ❑ are o construcție robustă și sigură ce funcționează fără blocaje;
- ❑ permite spălarea la parametrii stabiliți ai tuberculilor de topinambur.

Contact: **Mihai OLAN - vibrobloc@yahoo.com**

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

NATIONAL INSTITUTE FOR RESEARCH - DEVELOPMENT OF MACHINES AND INSTALLATIONS DESIGNED FOR AGRICULTURE AND FOOD INDUSTRY - INMA
6, Ion Ionescu de la Brad Blv., Bucharest, ROMANIA, 013813, P.O. Box 18
Tel.: +40-21-269.32.49 / 269.32.55, Fax: +40-21-269.32.73, E-mail: icsit@inma.ro, www.inma.ro

ECHIPAMENT SEMIPURTAT DE TOCAT RESTURI VEGETALE LEMNOASE, CU SISTEM DE CUPLARE LA TIRANȚII LATERALI AI TRACTORULUI

SEMIMOUNTED EQUIPMENT FOR CHOPPING WOODEN VEGETABLE REMAINS, WITH COUPLING SYSTEM TO THE TRACTOR'S LATERAL COUPLING BARS

National Patent Application No. A-00744 / 2019

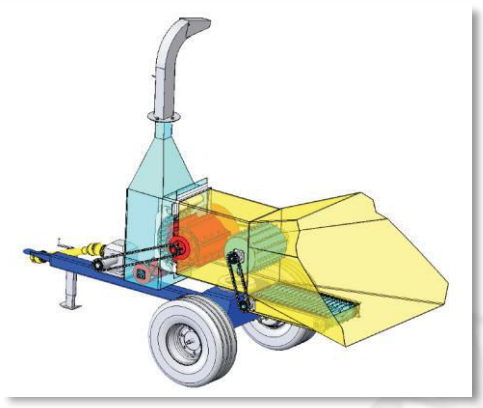
Authors: Lucreția POPA, Vasilica ȘTEFAN

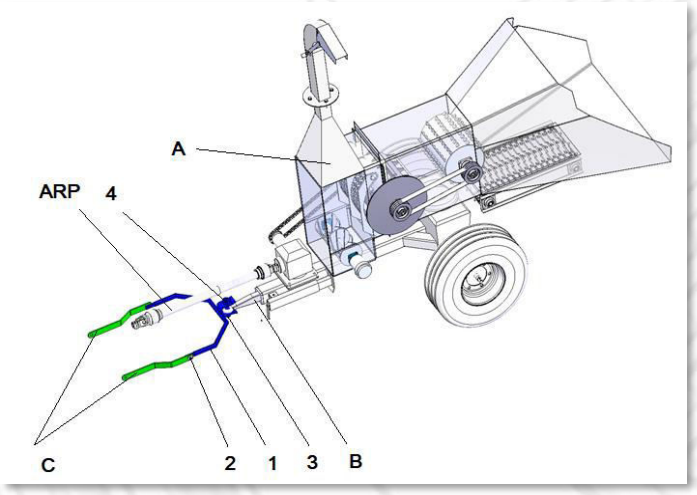
D

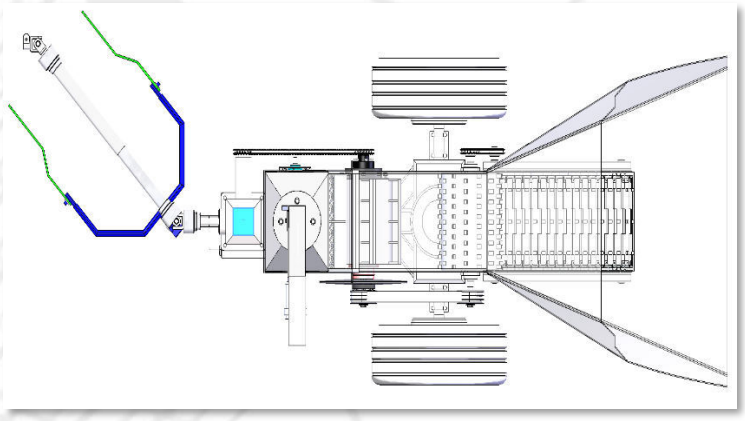
DESCRIERE:

Invenția se referă la un echipament semipurtat, destinat tocării resturilor vegetale lemnoase, prevăzut cu sistem de cuplare la tiranții laterali ai tractorului, în vederea evitării interacțiunii dintre cardan și proțap, în timpul efectuării virajelor la capăt de rând, în timpul lucrului în plantațiile pomicole sau viticole.

Problema tehnică pe care o rezolvă invenția constă în realizarea unui echipament de tocat resturile vegetale lemnoase care să poată lucra în plantațiile pomicole / viticole, cu sistem de cuplare interschimbabil, care să asigure cuplarea la tiranții laterali ai tractorului, și utilizarea ca sursă energetică a tractoarelor care nu au cuplă, conducând la realizarea calitativă a lucrării de tocare a resturilor vegetale lemnoase în plantațiile pomicole / viticole, întoarcerea agregatului la capăt de rând pe un culoar cu rază mică de viraj și protejarea arborelui receptor al prizei de putere (ARP).







COMPONENȚĂ:

Echipamentul, acționat prin ARP de la priza de putere a tractorului, este format dintr-o cuvă cu bandă transportoare și rotor de preluare și transport a materialului spre buncărul de tocare, prevăzut cu rotor de tocare cu cuțite și contracuțit, și este prevăzut cu sistemul de cuplare la tiranții laterali ai tractorului, compus din jugul (**1**), ce asigură prinderea la tiranții laterali ai tractorului în cepurile (**2**), cupla (**3**) și bolțul (**4**), care se cuplează cu proțapul (**B**) ce are în componență ochiul de cuplare și placa sudată la echipamentul (**A**).

Echipamentul de tocare se prinde la tiranții laterali ai tractorului, prin intermediul sistemului de cuplare, iar arborele receptor al prizei de putere face legătura între priza de putere și multiplicator, punând în funcțiune organele de lucru ale echipamentului. Articulația cardanică și bolțul cuplei se află în același plan, iar în viraje cardanul și sistemul de cuplare rămân aliniate în planuri paralele, facilitând întoarcerea agregatului.

AVANTAJE:

- ❑ asigură posibilitatea cuplării la tiranții laterali ai tractorului;
- ❑ contribuie la reducerea razei de viraj a agregatului la efectuarea întoarcerilor la capăt de rând;
- ❑ asigură protecția ARP în timpul lucrului sau al unor manevre greșite;
- ❑ crește gradul de utilizare al tractoarelor care nu au în construcție cuplă;
- ❑ asigură orizontalizarea / înclinarea echipamentului de tocat.

Contact: **Lucreția POPA - lucretia_popa@yahoo.com**

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

NATIONAL INSTITUTE FOR RESEARCH - DEVELOPMENT OF MACHINES AND INSTALLATIONS DESIGNED FOR AGRICULTURE AND FOOD INDUSTRY - INMA
6, Ion Ionescu de la Brad Blv., Bucharest, ROMANIA, 013813, P.O. Box 18
Tel.: +40-21-269.32.49 / 269.32.55, Fax: +40-21-269.32.73, E-mail: icsit@inma.ro, www.inma.ro

ECHIPAMENT DE REALIZAT BRAZDE COMPARTIMENTATE /

EQUIPMENT FOR MAKING INTERRUPTED FURROWS

National Patent Application No. A-00733 / 2019

Authors: Remus OPRESCU, Ioan GANEA-CHRISTU, Valentin VLĂDUȚ, Iulian VOICEA

D

DESCRIERE:

Invenția se referă la un echipament de deschis brazde compartimentate destinat lucrărilor agricole de udare prin brazde discontinue în vederea eficientizării folosirii apei din precipitații pe terenuri cu pante mai mici de 6 grade.

DESCRIPTION:

The invention relates to the equipment for making interrupted furrows intended for agricultural watering works through discontinuous furrows in order to make more efficient the use of rainwater on lands with slopes of less than 6 degrees.

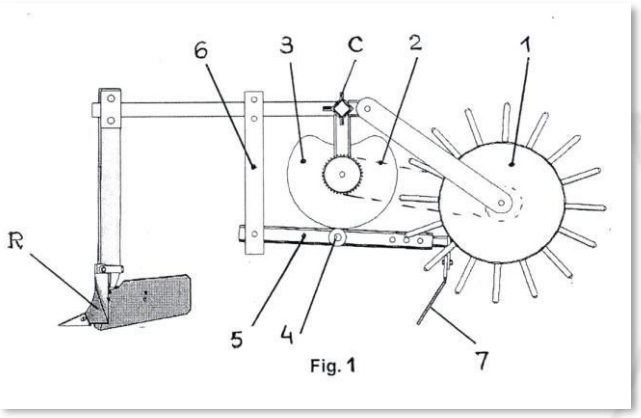


Fig. 1

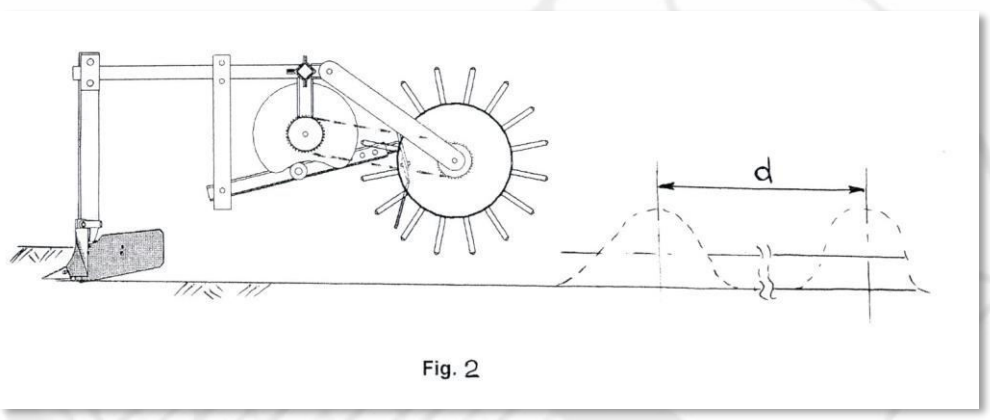
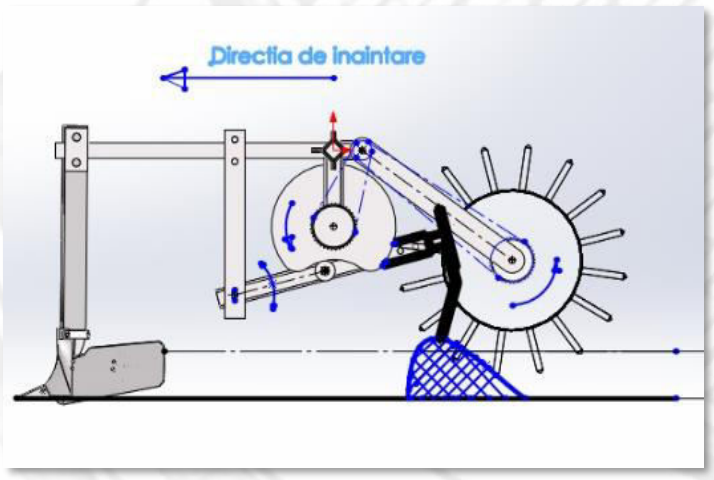


Fig. 2



COMPONENTS:

The equipment for making interrupted furrows consists of a unit mounted on the (**C**) frame of a channel opening machine which may be a ridge plough (**R**), unit composed of a copying wheel (**1**) from the shaft of which the movement is transmitted through the chain (**2**) to the cam (**3**) on which rolls the roller (**4**) of the cam follower (**5**) on which hoe (**7**) is mounted and which is placed on the support (**6**).

During work, the equipment opens the watering channel by means of the ridge plough (**R**), behind which is placed the how (**7**) which performs shaping and compartmentalization (interruption of the furrow) at distances (*d)* predetermined depending on the characteristics of the land by operating the cam (**3**), which moves the cam follower (**5**) causing the how (**7**) to rise, thus the furrow being interrupted from place to place at equal distances.

ADVANTAGES:

- ❑ the quality of the furrows, the shape and size of the plugs with high precision lead to an increase in production per hectare by 20% for agricultural crops, where interrupted furrows are made;
- ❑ high precision in making the plugs in terms of plug spacing;
- ❑ constructive simplicity compared to similar hydraulically operated equipment;
- ❑ low cost price;
- ❑ low energy consumption.

Contact: **Remus OPRESCU - oprescu.remusmarius@gmail.com**

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

NATIONAL INSTITUTE FOR RESEARCH - DEVELOPMENT OF MACHINES AND INSTALLATIONS DESIGNED FOR AGRICULTURE AND FOOD INDUSTRY - INMA
6, Ion Ionescu de la Brad Blv., Bucharest, ROMANIA, 013813, P.O. Box 18
Tel.: +40-21-269.32.49 / 269.32.55, Fax: +40-21-269.32.73, E-mail: icsit@inma.ro, www.inma.ro

DEFLECTOR CU DIRIJARE AUTOMATĂ A FLUXULUI DE AER ȘI SOLUȚIE PENTRU MAȘINILE DE STROPIT ÎN VII ȘI LIVEZI /

DEFLECTOR WITH AUTOMATIC AIR FLOW DIRECTION FOR SPRAYERS MACHINES IN VINEYARDS AND ORCHARDS

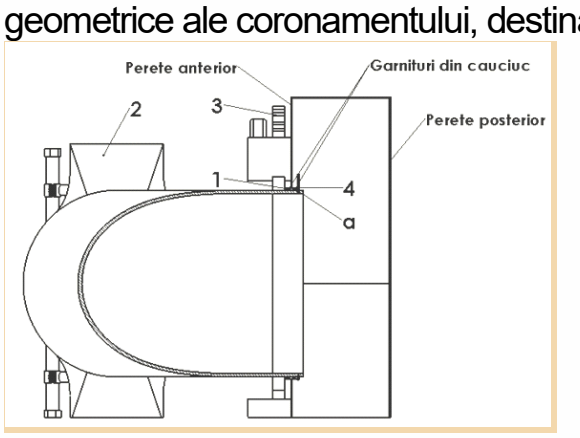
National Patent Application No. A-00708 / 2019

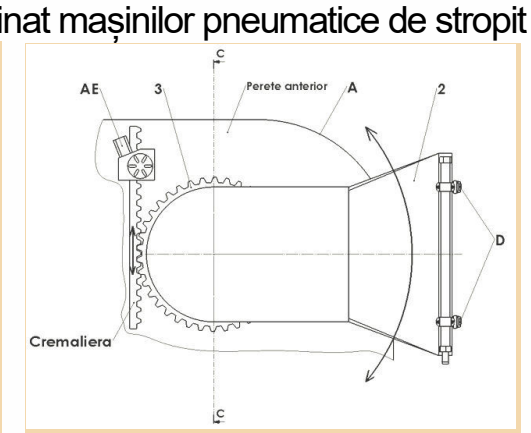
Authors: Dragoș MANEA, Mihai MATACHE, Eugen MARIN, Gabriel GHEORGHE

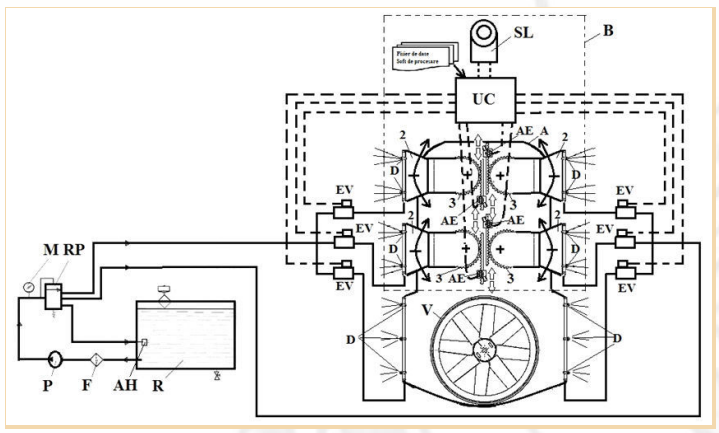
D

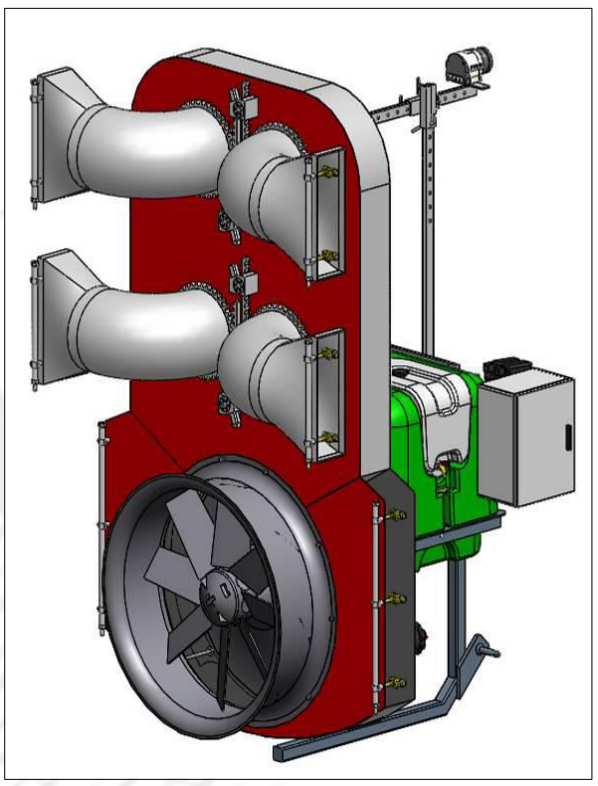
DESCRIERE:

Invenția se referă la un deflector cu dirijare automată a fluxului de aer și a particulelor de soluție în funcție de caracteristicile geometrice ale coronamentului, destinat mașinilor pneumatice de stropit în vii și livezi, echipate cu ventilatoare axiale.









COMPONENȚĂ:

Problema tehnică pe care o rezolvă invenția constă în realizarea unui deflector pentru mașinile de stropit în vii și livezi echipate cu ventilatoare axiale, care să permită dirijarea automată a fluxului de aer purtător de particule de soluție în funcție de caracteristicile geometrice ale coronamentului, astfel încât să minimizeze pierderile prin derivă, să reducă poluarea mediului şi să asigure acoperirea cu soluție a întregului coronament.

Echipamentul rezolvă această problemă tehnică și înlătură dezavantajele menționate, prin aceea că este prevăzut cu niște conducte evazate pe care sunt amplasate niște rampe cu duze de pulverizare și care sunt rotite în timp real de niște actuatori electrici care primesc comanda de la o unitate de procesare și comandă în care rulează un software specializat, care prelucrează coordonatele polare ale multitudinii de puncte ce definesc coronamentul și care sunt citite de un senzor laser amplasat pe mașina de stropit, fluxul de aer purtător de particule de soluție fiind dirijat automat în funcție de caracteristicile geometrice ale coronamentului.

Deflectorul este compus din carcasa A și sistemul automat de dirijare B. Carcasa A este o construcție sudată cu pereți din tablă subțire verticali și paraleli, închisă complet la partea inferioară și la partea superioară și deschisă parțial pe părțile laterale. În zona deschiderilor laterale, pe peretele anterior, sunt fixate rampele cu duze pentru stropitul zonei inferioare a coronamentului. Pereții anterior și posterior au practicată în partea de jos o decupare circulară în care se montează ventilatorul axial al mașinii de stropit. Peretele anterior mai are practicate în plus patru decupări circulare, două în zona mediană și două în zona superioară, dispuse simetric față de axa verticală, decupări în care se sudează bucșele 1 pentru ghidajul conductelor 2. În interiorul bucșelor 1 sunt montate două garnituri din cauciuc în contact și cu conductele 2, cu rol de etanșare. Sistemul automat de dirijare B este alcătuit din senzorul laser SL, unitatea de comandă UC în care rulează un software specializat de procesare date în timp real, actuatorii electrici AE cu cremalieră și conductele 2. O conductă 2 este construită sub forma unui cot la 90°, aplatisat și evazat la unul din capete, iar la celălalt capăt având sudată pe exterior coroana dințată 3 și practicat un canal a în care intră inelul elastic 4 pentru blocarea axială.

Coroana dințată 3 intră în angrenaj cu cremaliera actuatorului electric AE, al cărui corp este fixat pe peretele anterior al carcasei A. Pe capătul evazat al conductei 2 este montată rampa cu duzele D de pulverizare alimentată cu soluție de la instalația de stropit a mașinii și al cărei flux este controlat prin intermediul electrovalvelor EV.

AVANTAJE:

- ❑ diminuează pierderile de soluție prin derivă și implicit poluarea aerului și solului;
- ❑ sporește eficacitatea tratamentelor fitosanitare, prin dirijarea particulelor de substanţă în funcție de caracteristicile geometrice ale coronamentului;
- ❑ utilizează informațiile furnizate de senzorul laser, pentru controlul în timp real al pulverizării

Contact: **Dragoș MANEA -** manea_dragos_05@yahoo.com

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

NATIONAL INSTITUTE FOR RESEARCH - DEVELOPMENT OF MACHINES AND INSTALLATIONS DESIGNED FOR AGRICULTURE AND FOOD INDUSTRY - INMA
6, Ion Ionescu de la Brad Blv., Bucharest, ROMANIA, 013813, P.O. Box 18
Tel.: +40-21-269.32.49 / 269.32.55, Fax: +40-21-269.32.73, E-mail: icsit@inma.ro, www.inma.ro

INSTALAŢIE FOTOVOLTAICĂ REGLABILĂ /

ADJUSTABLE PHOTOVOLTAIC INSTALLATION

National Patent Application No. A-00615 / 2019

Authors: Mihai OLAN, Dragoș MANEA, Anișoara PĂUN, Valentin VLĂDUŢ, Gheorghe STROESCU

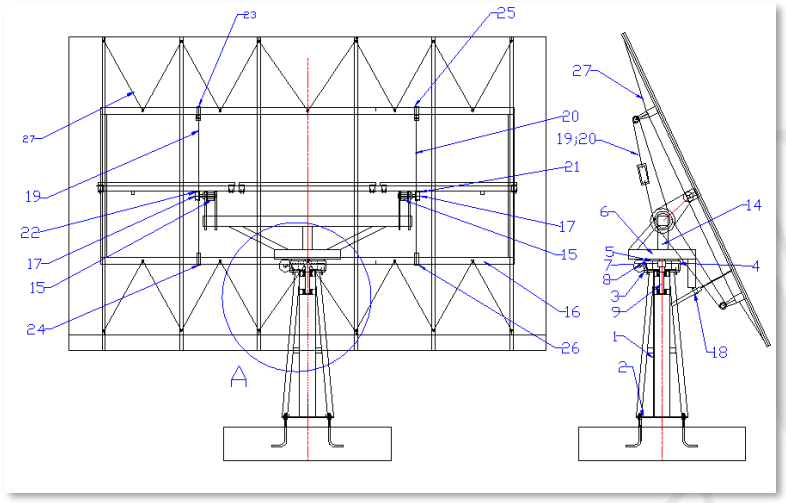
D

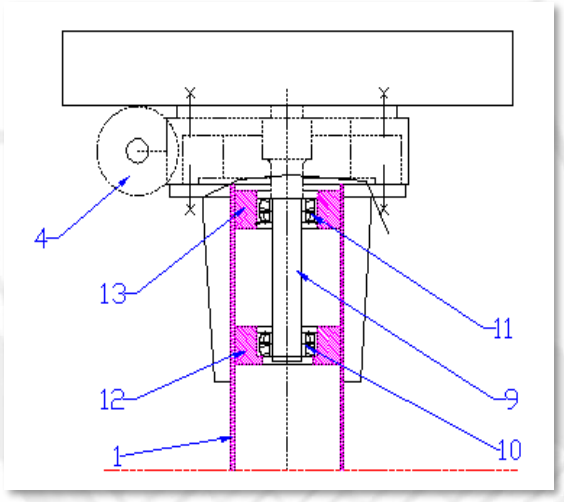
DESCRIERE:

Echipamentul se referă la o instalație fotovoltaică cu reglare automatizată de *tip tracker,* destinată în principal instalațiilor de irigare în agricultură.

Problema tehnică pe care o rezolvă invenția constă în proiectarea unei instalații ce conține toate elementele necesare unui echipament reglabil cu două grade de libertate pentru panouri fotovoltaice, în vederea optimizării randamentului prin reglarea automatizată pe o structură *tip tracker*.

Instalația este formată dintr-un suport reglabil cu două grade de libertate, care asigură rigiditate sporită şi funcțiile necesare pentru reglarea panoului / panourilor în vederea optimizării energetice după poziția soarelui, cu sisteme mecanice de securizare a mecanismelor de reglare la condiții climatice severe (vânt până la 150 km/oră, grindină, furtuni, zăpadă etc.)





COMPONENȚĂ:

Instalația are o structură *tip tracker*, este formată din pivotul central **(1)**, construit din țeavă cu secțiune rotundă sau pătrată, prevăzută la partea inferioară cu placa **(2)** pentru prindere cu prezoane de fundație iar la partea superioară a țevii este sudată flanșa **(3)** pentru prinderea cu șuruburi a motoreductorului melcat **(4)**. Pe partea superioară a reductorului melcat este montată flanșa **(5)** ce susține întregul suport de prindere și înclinare **(6)** a panourilor solare.

Efortul de susținere a construcției dar și forța vântului sunt preluate astfel de reductorul melcat **(4)**, carcasa superioară mobilă **(7)** și angrenajul melcat **(8)** din cadrul motoreductorului **(4)** și apoi transmis către pivotul central **(1)** ce este sudat de flanșa superioară a motoreductorului **(4)** pe care se prinde întregul ansamblu de susținere a panourilor solare.

Deoarece motoreductorul **(4)** are un alezaj de diametru mare, în interiorul acestui motoreductor se află montat un ax central **(9)** ce este lăgăruit cu doi rulmenți cu role butoi **(10)** și **(11)** montați în carcasele **(12)** și **(13)** ce sunt sudate la o anumită distanță în pivotul central **(1)**.

Axul central **(9)** este montat solidar cu flanșa superioară **(5)** ce susține un suport special **(14)**.

Instalația are un sistem de înclinare a panourilor realizat prin intermediul articulațiilor **(15)** montate pe traversa ce este prinsă pe axul central al motoreductorului melcat **(4)** și de care este prins suportul **(16)** tip H cu ajutorul bolțurilor **(17)**.

Pentru înclinarea sistemului cu panouri solare este utilizat un motor electric liniar **(18)** de tip actuator care preia sarcinile la vânt sau furtuni și realizează înclinarea sistemului față de soare și de aceea sunt prevăzute niște transmisii cu cablu metalic **(19)** și **(20)** ce este tensionat și care este rulat pe două role **(21)** și **(22)** montate pe axa de înclinare și câte două seturi de role **(23-24)** și **(25-26)** montate pe suporți de suportul central *tip H*. Astfel, efortul la suprasarcini la vânt sau furtună este preluat de acest sistem de cabluri metalice iar motorul liniar realizează doar funcția de înclinare pentru care este destinat ca scop.

Suportul *tip H* și riglele de prindere a panourilor este prevăzut cu un set suplimentar de țevi **(27)** care au capetele aplatizate, găurite și prinse cu șuruburi de capetele riglelor de susținere a panourilor și suportul H, ce determină creșterea rezistenței întregului suport de panouri la furtuni foarte puternice.

AVANTAJE:

- ❑ este prevăzută cu un ax şi rulment suplimentar pentru a prelua efortul complet static de susținere a ansamblului reglabil și a acţiunii dinamice a forţei vântului, evitând deteriorarea motorului de transmisie;
- ❑ are un sistem pretensionat cu cabluri, pentru a proteja actuatorul cu înclinare verticală de încărcările dinamice (vânt, furtună);
- ❑ are o întărire suplimentară realizată prin procese de deformare plastică, a capetelor grinzilor de sprijin pentru panouri fotovoltaice, pentru a permite creșterea rigidității riglelor de prindere panouri dar la o greutate minimă.

Contact: Mihai OLAN - vibrobloc@yahoo.com

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

NATIONAL INSTITUTE FOR RESEARCH - DEVELOPMENT OF MACHINES AND INSTALLATIONS DESIGNED FOR AGRICULTURE AND FOOD INDUSTRY - INMA
6, Ion Ionescu de la Brad Blv., Bucharest, ROMANIA, 013813, P.O. Box 18
Tel.: +40-21-269.32.49 / 269.32.55, Fax: +40-21-269.32.73, E-mail: icsit@inma.ro, www.inma.ro

RAMPĂ DE UDARE MOBILĂ UNIVERSALĂ /

UNIVERSAL MOBILE WATERING BOOM

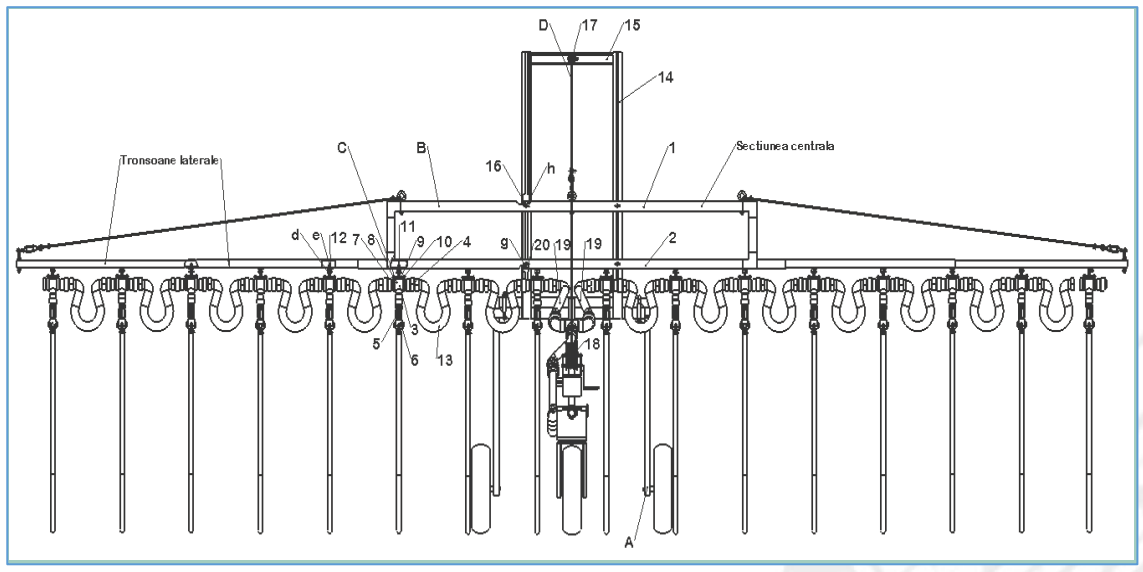
National Patent Application No. A-00566 / 2019

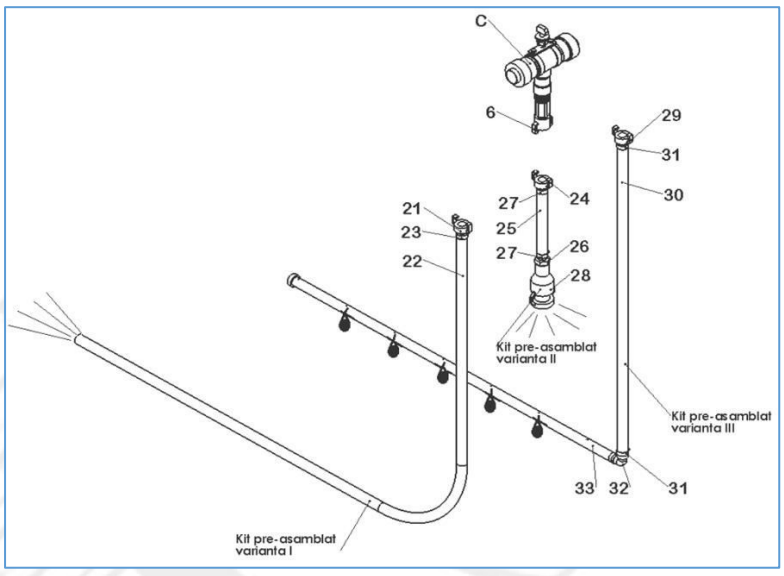
Authors: Dragoş Manea, Marian Popescu, Iulian Drăghici, Ion Murgescu, Gheorghe Şovăială

D

DESCRIERE:

Invenția se referă la o rampă de udare mobilă destinată instalațiilor de irigat cu tambur și furtun, care poate fi utilizată la irigarea tuturor culturilor agricole în câmp deschis, cu talie joasă sau cu talie înaltă, prin diferite metode de irigare: printre rândurile de plante cu flux continuu, prin aspersie, prin picurare.





COMPONENȚĂ:

Rampa de udare mobilă universală este alcătuită din căruciorul (**A**) pentru deplasare, structura (**B**) de susținere pe care se montează / demontează rapid kit-urile pre-asamblate (**C**), de care se pot atașa rapid alte kit-uri pre-asamblate în trei variante (I, II și III) pentru distribuția apei în teren în funcție de metoda de irigare aleasă, precum și din sistemul (**D**) de reglaj al înălțimii de lucru a rampei. În timpul lucrului, rampa de udare este trasă de un furtun care se înfășoară pe un tambur acționat de o turbină hidraulică alimentată cu apă de un sistem de punere sub presiune, sursa de apă putând fi un puț forat, un canal de irigații, un râu sau o rețea subterană cu hidranți. Căruciorul (**A**) cu trei roți cu anvelope are posibilitatea reglării ecartamentului dintre roțile laterale în funcție de distanța dintre rândurile de plante și poate fi ghidat și manevrat cu ușurință datorită roții centrale pivotante. Structura (**B**) de susținere este o construcție din țevi rectangulare, simetrică față de planul longitudinal central al căruciorului (**A**), formată dintr-o secțiune centrală și câte două tronsoane laterale telescopice. Un kit (**C**) este compus din elementul ramificat (**3**), racordurile (**4**) cu filet exterior, regulatorul de debit (**5**) și cupla rapidă cu gheare și filet interior (**6**).

Sistemul (**D**) de reglaj al înălțimii de lucru a rampei este format din doi stâlpi (**14**), traversa (**15**), două culise (**16**), rola (**17**), troliul manual (**18**) cu cablu din oțel, poziționat pe cadrul căruciorului (**A**) și două racorduri flexibile (**19**) pentru apă.

AVANTAJE:

- ❑ poate fi utilizată la aplicarea mai multor metode de irigare a culturilor (irigarea printre rândurile de plante în flux continuu, irigarea prin aspersie și irigarea mobilă prin picurare);
- ❑ distanța dintre liniile de udare sau dintre aspersoare poate fi reglată simplu și rapid, în funcție de distanța dintre rândurile de plante;
- ❑ înălțimea de lucru a rampei poate fi reglată cu ușurință de către un singur operator, rampa putându-se utiliza atât la plantele cu talie joasă cât și la plantele cu talie înaltă

Contact: Dragoș MANEA - manea_dragos_05@yahoo.com

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

NATIONAL INSTITUTE FOR RESEARCH - DEVELOPMENT OF MACHINES AND INSTALLATIONS DESIGNED FOR AGRICULTURE AND FOOD INDUSTRY - INMA
6, Ion Ionescu de la Brad Blv., Bucharest, ROMANIA, 013813, P.O. Box 18
Tel.: +40-21-269.32.49 / 269.32.55, Fax: +40-21-269.32.73, E-mail: icsit@inma.ro, www.inma.ro

MULTIFUNCTIONAL SECTION FOR READING SOIL PARAMETERS

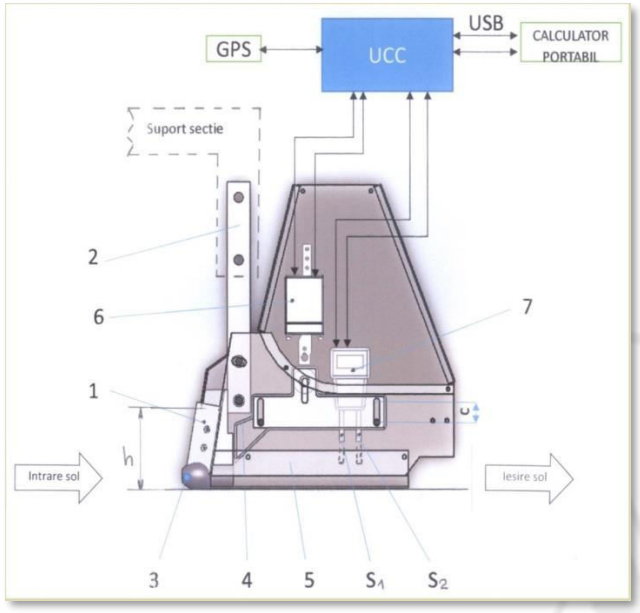
National Patent Application No. A-00501 / 2019
European Patent Application EPO 19020587.2 / 2019

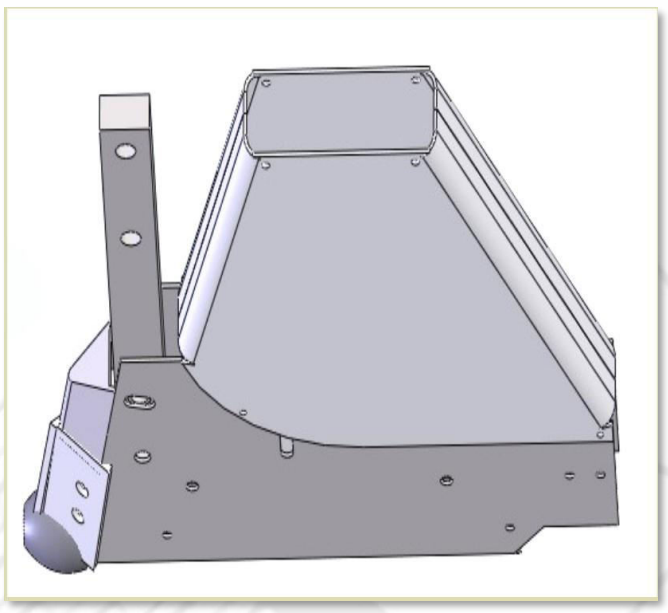
D

Authors: Vergil MURARU, Sebastian MURARU, Nicolae CONSTANTIN,
Cornelia MURARU-IONEL, Ioan GANEA-CHRISTU

DESCRIPTION:

The invention relates to a multifunctional section, which is mounted on a trailed agricultural machine, designed for taking soil samples, reading and computerized recording of soil parameters, for example pH and temperature, as well as GPS coordinates.





CONTENT:

The section consists of the coulter (1) in the shape of a lying “V” , with the tip facing the direction of advance, the support (2) for fixing on the frame, the tube (3) with a spherical head provided with a mouth for taking soil samples, the shutter (4) which stops the soil inside the coulter for reading the parameters and allows the sampling of the soil, the gutter (5) through which the sampled soil flows or is stationary, the linear actuator (6) which acts vertically the shutter (4) between the ends a slide on the stroke (c), the transducer (7) for determining the soil temperature and pH through the sensors (S1) and (S2), mounted in solidarity with the shutter (4), as well as an electronic data processing and storage system (Command and Control Unit - UCC, GPS, laptop, etc.)

During operation, the multifunctional section moves in the soil at a depth (h) so that the dislocated soil for sampling enters and moves through the spherical head tube (3) and the gutter (5). Depending on the ground sampling distance, the UCC, based on the information received from the GPS, triggers the linear actuator (6) which controls the lowering of the shutter (4) and the soil stops in the tube with a spherical head (3). Simultaneously with the stopping of the soil taken in the tube with a spherical head (4), the soil also stops in the gutter (5) , and the transducer (7) which is mounted solidly on the shutter (4) descends into the soil in the gutter (5). The system is maintained in this position long enough to record soil parameters (pH and humidity) through sensors (S1) and (S2) and GPS coordinates in the UCC memory.
After completion of the recording, the shutter (4) rises vertically in the initial selection together with the transducer (7) and a new command for taking the next soil sample is expected. At the end of the working period, the measured parameters are downloaded via the USB interface into the memory of a portable computer for further processing.

ADVANTAGES:

- ❑ increased accuracy of real-time recorded data, along with their geographical location (GPS);
- ❑ possibility to record several categories of data in a single pass;
- ❑ the work process is approximately continuous, without technological interruptions;
- ❑ reduced manufacturing costs by using a simple electric control scheme with actuator;
- ❑ reduced measurement time allows working at higher speeds or increasing the density of the measuring points per unit area.

Contact: **Vergil MURARU - virgil.muraru@gmail.com**

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

NATIONAL INSTITUTE FOR RESEARCH - DEVELOPMENT OF MACHINES AND INSTALLATIONS DESIGNED FOR AGRICULTURE AND FOOD INDUSTRY - INMA
6, Ion Ionescu de la Brad Blv., Bucharest, ROMANIA, 013813, P.O. Box 18
Tel.: +40-21-269.32.49 / 269.32.55, Fax: +40-21-269.32.73, E-mail: icsit@inma.ro, www.inma.ro

SISTEM ȘI METODĂ DE DIRIJARE AUTOMATĂ PENTRU ECHIPAMENTE DE ÎNFIINȚAT PERDELE AGROFORESTIERE /

SYSTEM AND METHOD OF AUTOMATIC STEERING AN AGROFORESTRY EQUIPMENT

National Patent Application No. A-00954 / 2018
European Patent Application No. EPO 19020586.4 / 2018

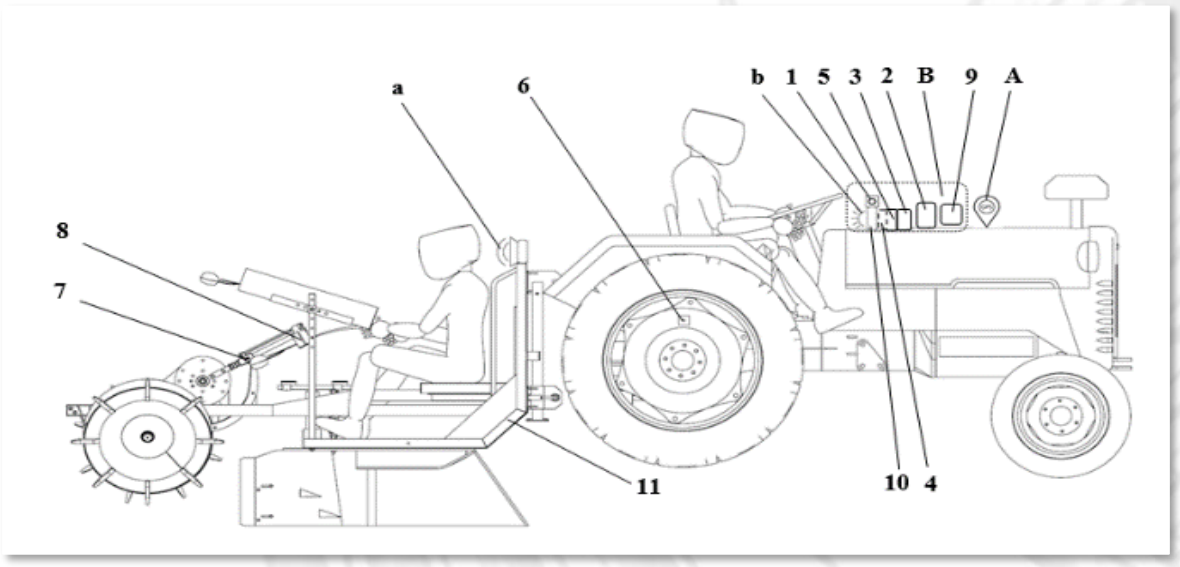
D

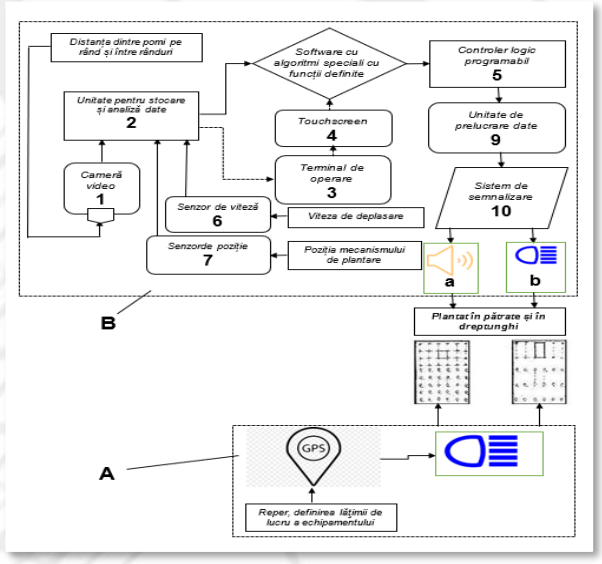
Authors: MARIN Eugen, MATEESCU Marinela, MANEA Dragoș, GHEORGHE Gabriel

DESCRIERE:

Invenția se referă la un sistem destinat conducerii automate pe rând a agregatelor, care sunt formate din tractor agricol pe roți și echipament de plantat, la executarea lucrării de plantare a puieților forestieri în teren prelucrat, în pătrat, respectiv când distanțele sunt egale atât pe rând cât și între rânduri, sau în dreptunghi, când între rânduri distanța este mai mare, iar pe rând distanțele sunt mai mici.

Problema tehnică pe care o rezolvă soluția propusă constă în realizarea unui sistem de dirijare automată pe rând a unui echipament de înființat perdele agroforestiere, simplu și fiabil, astfel încât să se poată realiza plantarea în pătrate, când distanțele dintre rânduri sunt egale cu cele dintre puieții forestieri de pe rând, sau în dreptunghi, când distanțele sunt mai mari între rânduri și mai mici între puieții forestieri de pe rând.





COMPONENȚĂ:

Sistemul de dirijare automată pentru echipamente de înființat perdele agroforestiere este compus din sistemul de ghidare (**A**) bazat pe tehnologia de geolocalizare prin satelit-GPS, sau, când GPS-ul nu este accesibil, din sistemul de ghidare (**B**) alcătuit din camera video (**1**), unitatea pentru stocare și analiză date (**2**) cu algoritmi speciali cu funcții definite, terminalul de operare (**3**) cu touchscreen (**4**) și controlerul logic programabil (**5**), senzorul de viteză (**6**) montat pe tractorul agricol din agregat, senzorul de poziție (**7**) montat pe mecanismul de plantare (**8**), unitatea de prelucrare date (**9**), sistemul de semnalizare (**10**) dotat cu avertizarea acustică (**a**) pe echipamentul de plantat (**11**) și luminoasă (**b**) în cabina tractorului din agregat, astfel încât să se poată realiza plantarea puietului forestier în pătrate sau în dreptunghi.

Metoda de dirijare implementată pe sistem are la bază generarea de către sistemul de ghidare (**A**) bazat pe tehnologia de geolocalizare prin satelit-GPS, pornind de la o linie dreaptă de reper și de la definirea lățimii de lucru a echipamentului, generarea unor linii virtuale care vor fi urmate de către mecanizator în parcela de lucru. În cazul lipsei unui semnal GPS sau capacități limitate de procesare ale sistemului GPS, intervine sistemul de ghidare (**B**), care permite cunoașterea poziției utilajului și menținerea acestuia pe o traiectorie precisă și repetabilă, chiar și în condiții meteo dificile, în funcție de imaginile vizuale preluate de la camera video și celelalte informații primite de la senzori, prelucrate de algoritmii speciali cu funcții definite, stabilește un anumit traseu pe parcela de lucru, orientează echipamentul spre destinația programată și dirijează operatorul pentru a poziționa puietul forestier în mecanismul de plantare, realizând astfel executarea lucrării de plantare a puieților forestieri în teren prelucrat în pătrat, situație în care distanțele sunt egale atât pe rând cât și între rânduri sau în dreptunghi, atunci când între rânduri distanța este mai mare, iar pe rând distanțele sunt mai mici.

AVANTAJE:

- ❑ crește precizia în realizarea lucrării de plantare semimecanizată a puieților forestieri în teren prelucrat;
- ❑ reduce considerabil cheltuielile;
- ❑ conduce la o mai bună calitate a plantării;
- ❑ oferă puieților forestieri condiții mai bune de captare a luminii directe și de distribuție a rădăcinilor în spațiul de nutriție.

Contact: Eugen MARIN - marin_43eu@yahoo.com

E

Handmade

Jewellery

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

MOFT
STUDIO
SRL

Patricia's Handmade Accesories

Handmade creations

Author: Patricia Nelega

E

Patricia's Handmade is a concept based on creativity, sensitivity, passion for everything that art means. The products, unique, are designed for an avant-garde look. Diversity is the strong point of Patricia's Handmade creations from brooches, earrings, decorations to projects for special events: weddings, christenings, anniversaries etc.

All products are customized according to by the preferences of those for whom they are created.

https://www.facebook.com/moftstudio/

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

ATELIERUL LUI BUTONEL

Handmade creations

Author: *SOLDAN ROXANA*

E

It is all about polymer clay, personalized and unique gifts decorated by hand with patience and love. From little pieces of clay to portraits, name tags, movie and cartoons characters, cute animals, appreciation and love messages and so much more. The limit is your imagination!

It takes time, a lot of clay, a good cutter blade, sometimes some pastel colours and a lot of creativity to create the perfect gift, and that makes worth it ☺.

You can see some of my creations in the attached photos and, also, you can see my activity on my Facebook Page : Atelierul lui Butonel and follow me on instagram @atelierulluibutonel.

Contact: *https://www.facebook.com/AtelierulluiButonel/*

F

Teaching methods and material

Books

Sport

Music

SISTEME AUXILIARE ALE AUTOVEHICULELOR RUTIERE

ISBN - 978-606-35-0192-0/2018

F

Authors: Sorin RAȚIU, Vasile ALEXA

The book was conceived in the form of a didactic course supported by a series of practical steps, which would serve as a tool for training the engineering skills needed to understand the existing constructive solutions and the functionality of auxiliary systems of modern road vehicles.

The material is addressed to both students in the faculties and specialists in the field and is a collection of theoretical and practical information to clarify functional and constructive principles that are found in the auxiliary systems that serve road vehicles powered by internal combustion engines.

Starting from the finding of a lack of documentation in Romanian for this field, it was wanted to make available to those interested a solid theoretical material documented and argued, without exaggerating to join a sophisticated mathematical apparatus, so that the understanding of those exposed to be as easy as possible and the text as easy to navigate.

Lucrarea de față a fost concepută sub forma unui suport de curs susținut de o serie de demersuri practice, care să servească drept instrument de formare a deprinderilor inginerești necesare înțelegerii soluțiilor constructive existente în prezent și funcționalității sistemelor auxiliare ale autovehiculelor rutiere moderne. Materialul se adresează atât studenților din cadrul facultăților de profil, cât și specialiștilor în domeniu și reprezintă o colecție de informații teoretice și practice menite să clarifice principii funcționale și constructive ce se regăsesc în componența sistemelor auxiliare ce deservesc autovehiculele rutiere propulsate cu motoare cu ardere internă. Plecând de la constatarea unei oarecare lipse de documentație în limba română pentru acest domeniu, s-a dorit să se pună la dispoziția celor interesați un material teoretic solid documentat și argumentat, fără a exagera în a-i alătura un aparat matematic sofisticat, în așa fel încât înțelegerea celor expuse să fie cât mai facilă, iar textul cât mai ușor de parcurs.

Contact: sorin.ratiu@fih.upt.ro

TRANSMISII MECANICE
APLICATII LA AUTOVEHICULE

F

ISBN - 978-606-35-0394-8/2020

Authors: Camelia Pinca-Bretotean, Corneliu Birtok-Băneasă

The topics covered equally combine the theoretical knowledge of specialty, with the practical ones. The approach of each topic is done in a way logical and allows knowledge of construction, understanding of operation and performing calculations specific to each subassembly studied, from general, the particular. Theoretical aspects are presented in a logical succession, following the connection with the technical problems of interest major. The definition of the sizes and notions used in the paper is made suggestively by computerized figures.

Temele abordate îmbină în mod egal, cunoștințele teoretice de specialitate, cu cele practice.

Abordarea fiecărei teme se face în mod logic și permite cunoașterea construcției, înțelegerea funcționării și efectuarea de calcule specifice fiecărui subansamblu studiat, de la general, la particular.

Aspectele teoretice sunt prezentate într-o succesiune logică, urmărind legătura cu problemele tehnice de interes major.

Definirea mărimilor și a noțiunilor utilizate în lucrare este realizată sugestiv prin figuri computerizate.

Contact: camelia.bretotean@fih.upt.ro

TEHNOLOGII DE FORMARE ȘI TURNARE A PIESELOR METALICE. APLICAȚII PRACTICE

ISBN - 978-606-35-0378-8/2020

Author: Josan Ana

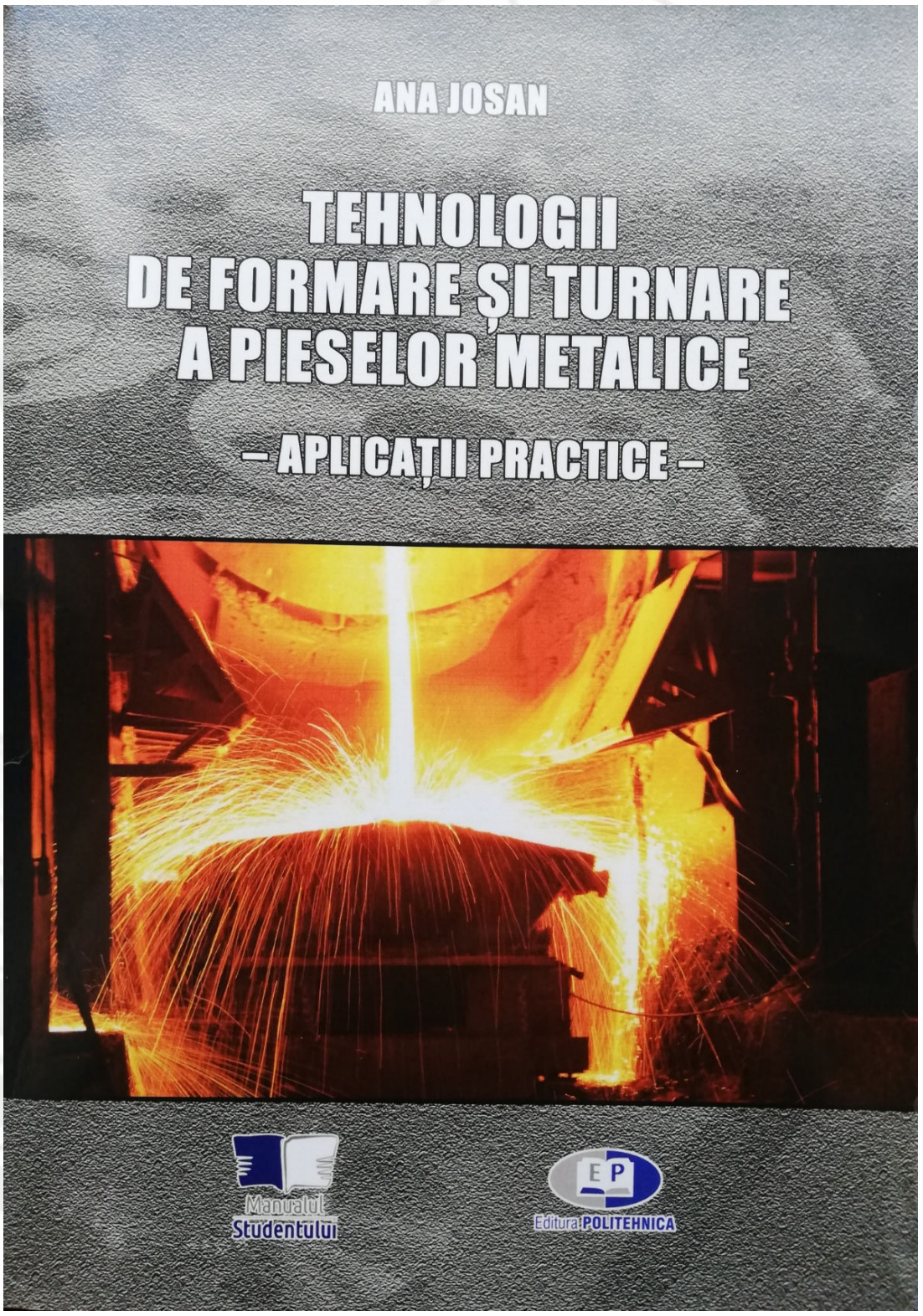
F

The paper Moulding and casting technologies for metallic pieces. Practical applications is addressed mainly to students from different specializations within the Hunedoara Faculty of Engineering and presents practical applications on how to obtain parts by casting. It was designed as a material to serve students as a tool for training the engineering skills needed to understand and solve problems that exist in the field of casting parts for various industries (mechanically, materials, vehicles etc.).

The objective of this paper is to know some practical notions regarding the possibilities of obtaining castings as well as the characteristics of the materials needed to obtain them. Their importance results from the technical-economic characteristics of the production processes, which represent the basic character of the modern industry, constituting the main elements of the contemporary progress.

Being a book that includes theoretical and practical notions, it is a significant help, both for the study of the characteristics of metal alloys and materials used in the process of moulding-casting parts and for the training of future engineers who will work in the fields of liquid alloy and moulding-casting of parts within metallurgical enterprises.

Taking into account the practical examples presented, this material is useful not only for students but also for other categories of specialists working in this field of activity, respectively for technical staff in foundries, design institutes and in the conception / design sectors of enterprises.



Contact: ana.josan@fih.upt.ro

FIABILITATEA ȘI MENTENABILITATEA ENTITĂȚILOR INDUSTRIALE

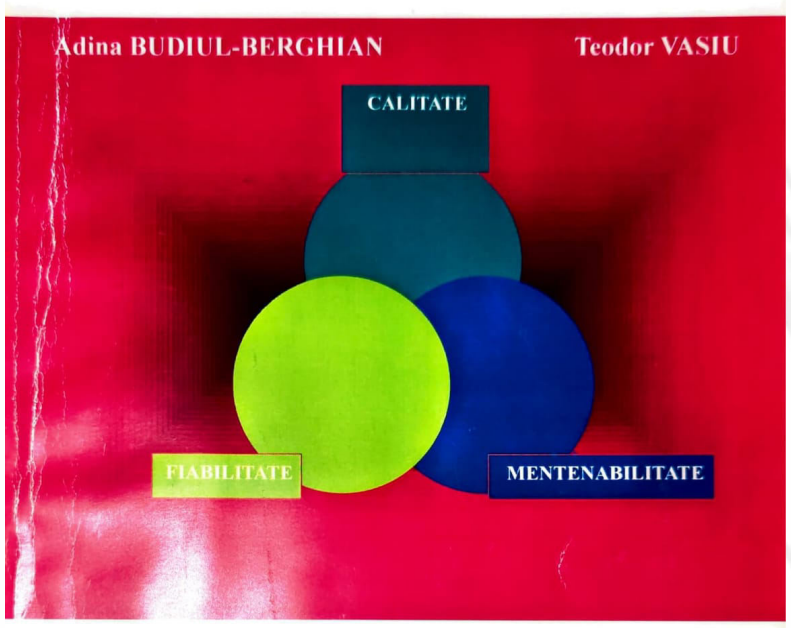
ISBN - 978-973-7646-07-1/2008

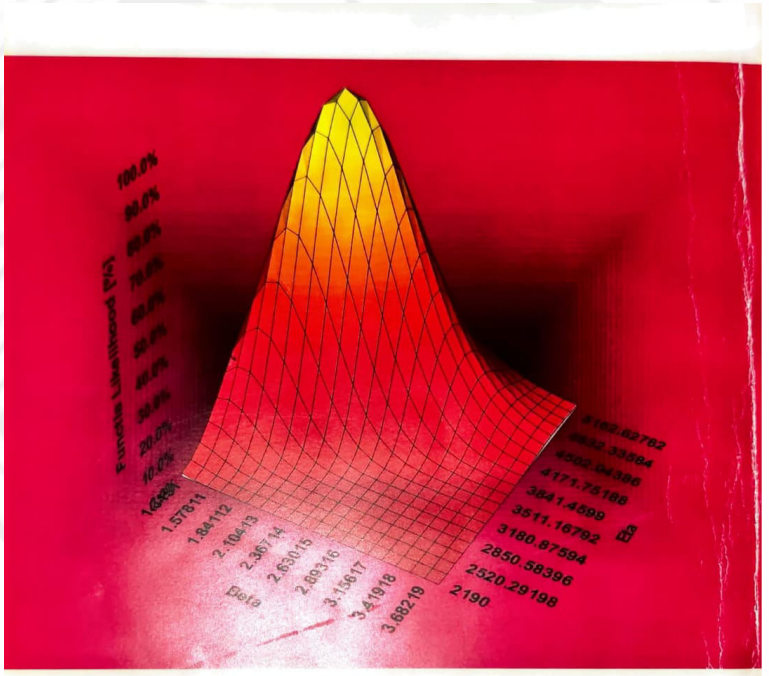
F

Authors: Adina Budiul-Berghian, Teodor Vasiu

The quality of an entity cannot be perceived without extension in time, respectively without understanding and deepening notions of reliability.

The presentation work, in the beginning, some theoretical notions, which is a small part of the mathematical support necessary to know the reliability and maintainability. In the second part of the paper, some applications are stated that are solved by applying the exposed theory.





Some of the experimental data in these applications come from the authors' concerns over the years regarding the study of their operation, respectively the reinstatement of industrial entities and the provision of practical solutions to increase their duration.

The book is addressed primarily to students enrolled in undergraduate studies but may also be useful to those pursuing master's studies.

Contact: adina.budiul@fih.upt.ro

DIA-CVET - Developing Innovative and Attractive CVET programmes in industrial shoe production

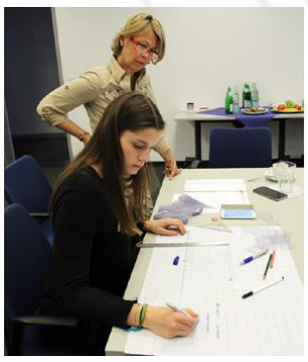
Project number 2020-1-DE02-KA202-007600

Authors: Bogdan Sarghie, Aura Mihai, Arina Seul, Mariana Costea

F

Strengthening CVET is a crucial element of increasing **attractiveness of VET** and assuring its high quality. For this purpose, partners of project will develop, pilot and implement comprehensive courses for 10 spheres of activities of industrial shoe production. As a broader scope the project aims at **transparency at CVET levels** within shoe sector for all stakeholders, especially social partners, companies, and authorities.

Target-groups are colleagues, having been qualified via Initial Vocational Education and Training (IVET) in the sector of industrial shoe production.
Regarding **long-term impact or sustainability**, the project aims additionally at implementing dual CVET-courses for industrial shoemakers in the Romanian and Portuguese VET-systems and to support the reinvigorating of the industrial foreman course in Germany.



Contact: bogdan-theodor.sarghie@academic.tuiasi.ro

www.dia-cvet.eu

Co-funded by the Erasmus+ Programme of the European Union

LEIA - Innovative Training for the Leather Goods sector across Europe

Project number 2019-1-PT01-KA202-060823

Authors: Aura Mihai, Bogdan Sarghie, Arina Seul, Mariana Costea

F

The project envisages to **design, develop and pilot a new profile and training opportunities in ICT and work-based learning** combined with trainers/learners mobility actions, in line with the actual needs of the companies and mainstream it at European and National level, **boosting the sector workforce upskill, promoting the entrepreneurship of new talent designers** and the **development of a new generation of high-skilled leather goods manufacturers**, oriented to **high-end products** to strengthen the high-end leather goods manufacturing across Europe.

Impact expected

- Strengthening of the high-end leather goods production across Europe;
- The enhancement of employability of fashion designers and single entrepreneurs in the field;
- Emergence of a new generation of trainers in advanced learning methodologies;
- The leverage of the level of employment in the sector;
- High level of cooperation among entities across Europe in Leather Goods and VET.

Partners

Contact: aura.mihai@academic.tuiasi.ro

Co-funded by the Erasmus+ Programme of the European Union

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

SciLED - Footwear in the 21st Century

New Skills for the Design of Drastically Improved Comfort, Sustainable, Fashion-oriented and Scientifically-led Footwear Products

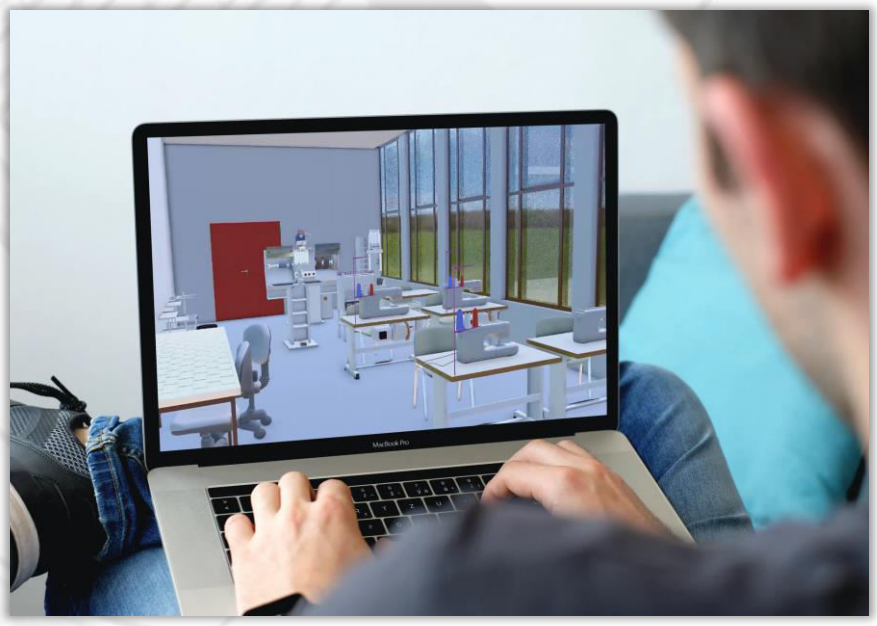
Project number 601137-EPP-1-2018-1-RO-EPPKA2-KA

Authors: Aura Mihai, Bogdan Sarghie, Arina Seul, Mariana Costea

F

The project aims to equip the **footwear sector** with updated **high-level skills** required to meet the increasing **consumer demands** for **personalised, differentiated and sustainable products**, and at the same time, to make the related job openings more attractive to young people with **modern curricula and innovative learning methods**.

Additive Manufacturing



SciLED Digital FabLab

Outcomes

- A new profile in line with European Qualifications Framework and corresponding educational material to produce an improved high-performant product;
- Improved and modernised training modules to support current and future employees;
- Incorporation of new knowledge into the design process in order to provide a scientific basis for drastically improved sustainable and comfortable products;
- A more comfortable, personalised and sustainable footwear in line with a decarbonised economy;
- Enhanced attractiveness of the footwear sector among young workers and innovative learning methods.

Contact: aura.mihai@academic.tuiasi.ro

www.sciled.eu

Co-funded by the Erasmus+ Programme of the European Union

ORIENTĂRI ȘI TENDINȚE ÎN SPORTUL UNIVERSITAR ROMÂNESC

ISBN - 978-606-37-0335-5/2018

Author: Mihaela Popa

F

In Romanian society, sport is an important field in defining the state and capacity for evolution by transforming the social supersystem into interdependence with other systems: political, economic, cultural, educational, defense, public order and national security. University sport manifests itself as a component element that can function as a relatively independent system, because it meets the basic conditions of the system, respectively includes the component elements, internal and external connections, purposes and is integrated into the national system of physical education and sports which shows a relative independence and an accentuated functional interdependence.

We considered that the information structured and adapted to the specifics of the organization and functioning of the university sports segment, studied in systemic and contingent vision will bring an absolutely necessary extra knowledge, which can be capitalized in the processes of professional training and continuous training of workers in physical education and sports university, with effects in improving their organizational activity.

The research includes personal contributions and approaches acquired in 29 years of experience, identifying during 8 chapters issues considered significant from a systemic-integrative perspective respecting the characteristics of an original experimental-applied research.

Contact: mihaelampopa@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Syria

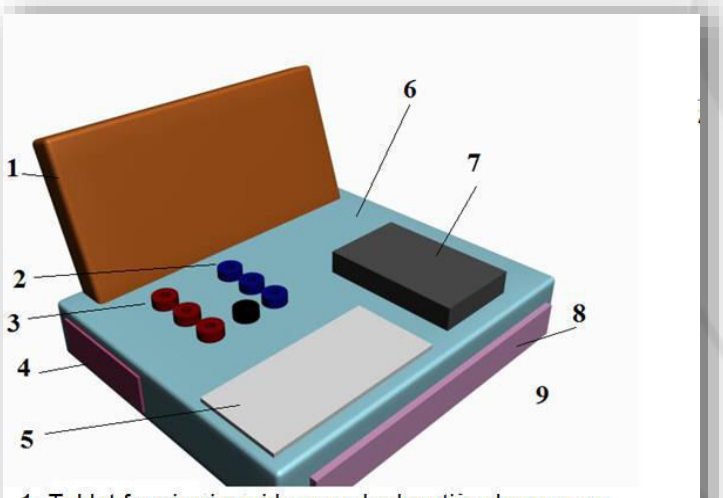
Educational device for checking electronic components

High school Project

Author: Abdulrahman Hamdi
No: 2017070060

F

The invention is a children's educational system consisting of a base on which the electronic elements workout board is mounted, a bread plate, an electronic meter, a continuous multi-voltage electric feed source and a multi-volt electric alternator ,At the bottom of the device there are cards of cardboard or plastic, each card specific to the specific electronic item explained with the diagram of its composition and work and the method of examination. In the base behind the electronic items check board is a special place where a tablet or mobile device is installed to display the film clips of the examined item in addition to the circuit design programs.



1- Tablet for viewing videos and educational programs
2- DC socket
3-AC socket
4-Drawer for electronic components
5-"Bread board" on which electronic components are attached
6-The base that holds the device
7-Avotimeter for checking electronic components
8-Drawer for electronic componets

A device designed to teach children how to check electronic elements and their functions and how they work. The device consists of a base on which a “bread board” is installed, an Avometer, and a DC and AC electric feeding device. At the end of the device’s base there is a special place to install a tablet device used to display the video of electronic parts, in addition to As for circuit programs, there is a tray with cards for each electronic component, in which there is a full explanation of the electronic component and a diagram, in addition to another tray in which all kinds of electronic components are required.

Inventor Abdulrahman Hamdi
High school stage - eleventh grade
Syria Damascus
Mobile:00963930262532
Email: abodyhamdi1234@gmail.com

BAZA ENERGETICĂ ŞI DE MATERII PRIME IN INDUSTRIA DE MATERIALE

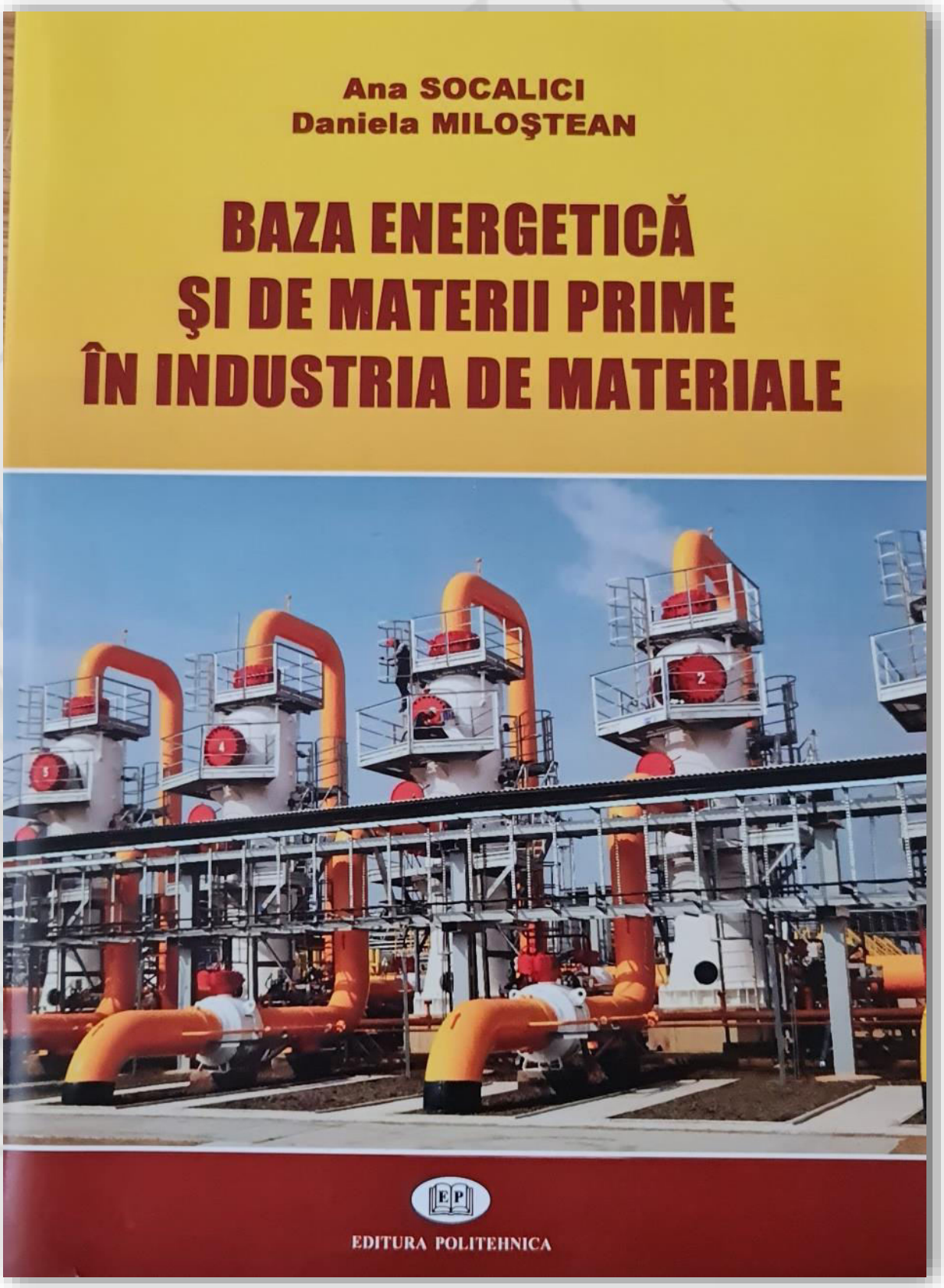
ISBN: 978-606-554-888-6/2014

Author: Ana Socalici, Daniela Miloștean

F

The concept of sustainable development is based on the finding that human civilization is a subsystem of the ecosphere, dependent on the flows of matter and energy within it, on its stability and capacity for self-regulation. Public policies developed on this basis, such as this National Strategy for Sustainable Development of Romania, seek to restore and maintain a rational balance, in the long run, between economic development and the integrity of the natural environment in forms understood and accepted by society.

The book is structured in six chapters, being a useful teaching material not only for students in the specializations of Metallurgical Process Engineering, Materials Processing Engineering, Economic Engineering in Chemical and Materials Industry, Waste Recovery Engineering but also master's students in Engineering and Sustainable Development Management. Materials industry, Advanced materials and technologies for the automotive industry, PhD students who want to specialize in Materials Engineering, respectively engineers in metallurgical units.



Contact: virginia.socalici@fih.upt.ro, +40741192503

Creating an active and collaborative *e-learning resources portfolio* for courses in the field of mechanical engineering

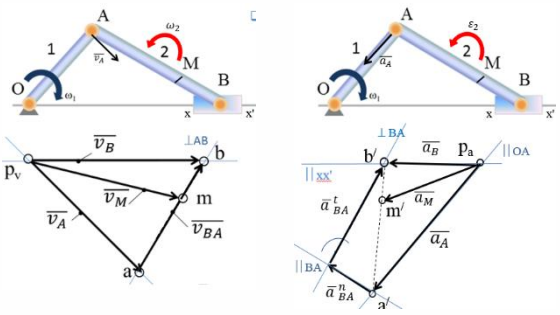
Project

Authors: ALIC Daniela Delia[1)], RACKOV Milan[2)], MILTENOVIC Aleksandar[3)]

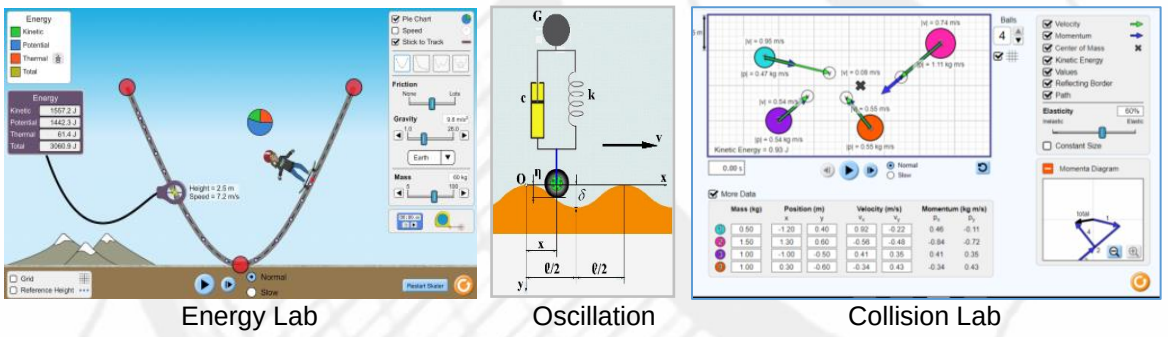
[1)] Politehnica University of Timisoara, Faculty of Engineering Hunedoara, Romania
[2)] University of Novi Sad, Faculty of Technical Sciences, Serbia
[3)] University of Niš, Faculty of Mechanical Engineering, Serbia

F

Description: The project is focused on the creation of an *e-portfolio of learning resources* for topics relevant to the field of mechanical engineering and dedicated to practical use in the current teaching activity in blended learning courses. The main idea consists in providing the users an easy and interactive access to relevant and valuable resources on the desired topic and/or subject. Therefore, our approach is to organize the collection, including multimedia resources and links to websites with online interactive activities, in the form of an e-learning library with free access to various topic. Incorporated in a database type file, the links lead to resources stored in local folders, as well as to external free learning resources accessible through the portfolio interface by keywords, which lead to dedicated information on mechanical engineering topics.



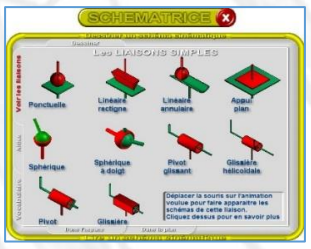
a. Video Tutorials. Velocity and acceleration analysis in rigid body plane motion



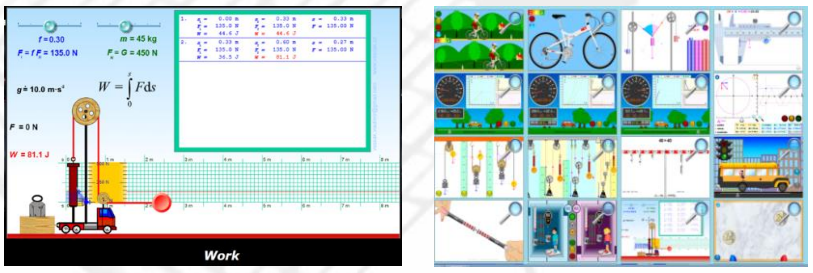
Energy Lab | Oscillation | Collision Lab

b. *PhET* Interactive Simulations (*Open source* https://phet.colorado.edu/)

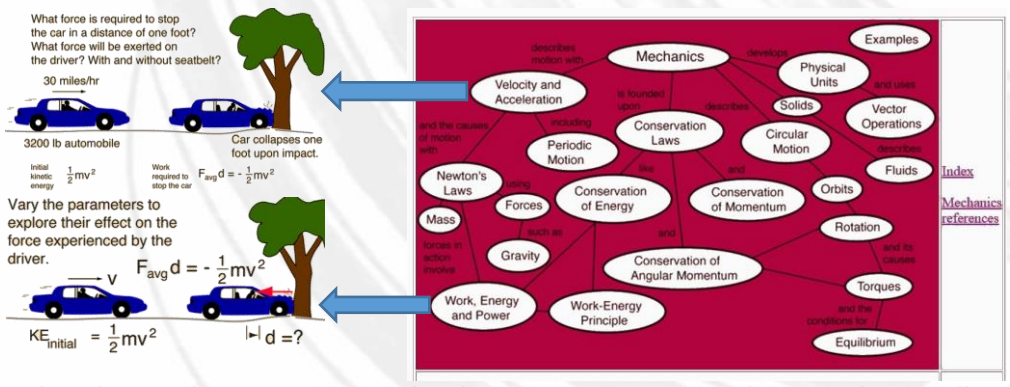
c. *Animated Learning Tools Module*
Educational software *MdSolids*
(https://web.mst.edu/~mdsolids/)



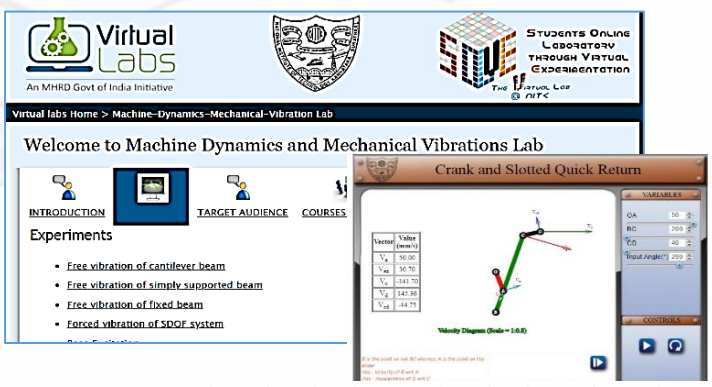
d. Educational software *SCHEMATRICE. Liaisons par animation.*
(https://eduscol.education.fr/sti/ressources_pedagogiques/schematrice)



e. Animations. Simulations. *Interactive Laboratory Works*
(https://www.vascak.cz/data/android/physicsatschool/template.php?f=mech_prace&l=en)



f. Exploration environment for Mechanics concepts. *Focused Interactive Applications* / Example: Forces in Car Crashes / (http://hyperphysics.phy-astr.gsu.edu/hbase/index.html#hph)



g. *Virtual Labs in Mechanical Engineering*
(http://mdmv-nitk.vlabs.ac.in/#)

Figure 1a-g. Teaching resources in the *e-learning resources portfolio* for practical use in blended learning courses

Conclusions:

The survey aiming at investigating the functionality and efficiency of using the e-learning resources portfolio in blended learning courses, performed in the frame of current teaching activities in our interdisciplinary virtual laboratory-classroom, indicate interactivity as well as collaborative advantages. Extremely well received by our users, as a dedicated and useful educational solution which provides in-depth understanding, the project offers the students a tool for managing the training material and improves their critical thinking and problem solving skills by engaging them in the learning process.

Contact:

daniela.alic@fih.upt.ro

FIABILITATEA SISTEMELOR ELECROMECANICE

ISBN 973-9411-23-1/2000

F

Author: Teodor VASIU

The book has an applicative character, being accompanied by tables, diagrams and sheets that cannot be missing in practical uses. Everything written in it is accessible to all those who, in one way or another, meet with the reliability and quality of products or services, starting with students and ending with specialists from all industries.

The first chapter will familiarize you with the notions of quality and reliability.

In the second chapter you will find only as much mathematics as you need to understand how to operate with the quantities that define quality and reliability; along with examples that make understanding easier.

Discrete and continuous distribution laws, logical schemes of reliability, redundancy, structure and boolean functions, Markov processes and others follow.

The last two chapters show how to ensure and control quality and reliability.

Contact:
teodor.vasiu@fih.upt.ro

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

MOLDOVA STATE UNIVERSITY
Scientific Research Laboratory
Compared Public Law and e-Governance
Alexei Mateevici str., 60, Chisinau, MD-2009,
Republic of Moldova
Tel.: +373 69387887; E-mail: dpc.egov@gmail.com

HR EXCELLENCE IN RESEARCH

THE BENCHMARKS TOWARDS THE ESTABLISHMENT OF AN INTERDISCIPLINARY METHODOLOGY IN THE FIELD OF LAW

NARD&MSU supported research project # 20.80009.1606.15

F

AUTHORS: Rodica CIOBANU

APPLICATION FIELDS: Teaching methods and material.

AIM: Theoretical-pragmatic substantiation of the institutionalization of the interdisciplinary methodology in legal research and elaboration of the model of the reconceptualized paradigm of law.

SOLUTION: Structuring the path of paradigmatic reconstruction of law through the reconceptualization of the disciplinary framework of the general theory of law, in order to strengthen its methodological dimensions, by adopting interdisciplinarity;

The development of a new framework for the problematic capitalization of the theory of law, connected to the major trends of postmodern science - the multi-, inter- and transdisciplinary paradigmatic framework - and to the current complex and multivalent reality.

Way of usage (elaborated by Ciobanu R.)

Substantiation:
Inter/ dependencies;
Connections;
Complex approaches.

→

Rationalizatin:
M-I-T axis

→

Evaluation:
Correspondence with methodological principles

→

Aplication:
Ontological;
Epistemological;
Pragmatic;
Axiological;
Educational;

ADVANTAGES: Source of learning and teaching; Solid methodological support for scientific legal research; Support in carrying out projects of legal research; Platform for interdisciplinary dialogue and rapprochement between legal theory and practice; Solutions for streamlining the law and for overcoming crises; Tools for the complex approach of the *person-state-law* configuration axis.

IMPLEMENTATION STAGE: In the university environment, research centres and institutes.

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Corvinorum Ordo Association

Pipers of Transylvania Rock

music project

F

Authors: Mircea Goian, Gerhard Stempel, Alin Bălescu, Stefan Milutinovici, Peter Moynahan

The first and only band in Romania that plays ROCK music with medieval instruments. The group was founded in 2008, by Mircea Goian together with Cornel Jitariu and approaches medieval and traditional music, in an original way, in a way designed especially for the performances that take place in the city squares or in the open spaces next to fortresses or castles.

The oldest songs in the repertoire are in Gaulish (Celtic language) most of the songs from the medieval period, in languages with limited circulation or extinct languages (Galeo-Portuguese, Breton, Sephardic, Tatar, Occitan, Latin) but also in living languages (Romanian, English, German, Polish).

Gerhard Stempel – ***tobe medievale, tapan***

Alin Bălescu – ***cimpoaie, blockflöte, pocket clarinet***

Mircea Goian – ***manager grup - violoncel, hurdy gurdy, percuții***

Stefan Milutinovici – ***cimpoaie, fluiere, rauschpfeife, blockflöte voce, bouzuki***

Peter Moynahan – ***voce, chitară***

Judas Priest medley

In addition to the authenticity of the musical pieces, the group uses copies of historical instruments such as: bagpipes, hurdy gurdy, rauschpfeife, fidula, medieval drums, tapan, blockflöte, archaic percussion instruments - bolla. The costume is made taking into account specific elements from that period. Since the summer of 2019, the band has undergone several changes and presents itself in a new formula, with a richer, more dynamic "sound", a refreshed repertoire and new sets.

In 2020 a new project appears: **Pipers of Transylvania Rock.**

The newest record material "Minnesang" was released in August 2021 along with an impressive collection of promotional materials / souvenirs "merchandise". Medieval instruments used to play rock music reproduce sounds specific to the medieval period on melodic rock lines, thus showing that the music is universal and timeless. We are thus witnessing a project that unites the medieval culture of the VI - XV centuries with that of the XX - XXI centuries.

Contact: goianmircea@yahoo.com

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

URBAN INCD INCERC
MINISTRY OF RESEARCH, INOVATION AND DIGITIZATION
National Institute for Research and Development in Construction, Urban Planning and Sustainable Spatial Development "URBAN-INCERC"

BLOCKCHAIN TECHNOLOGY AND RESEARCH&DEVELOPMENT ACTIVITY

Project

Authors: Mircea-Iosif RUS, Adrian-Victor LĂZĂRESCU, Larissa Margareta BĂTRÂNCEA

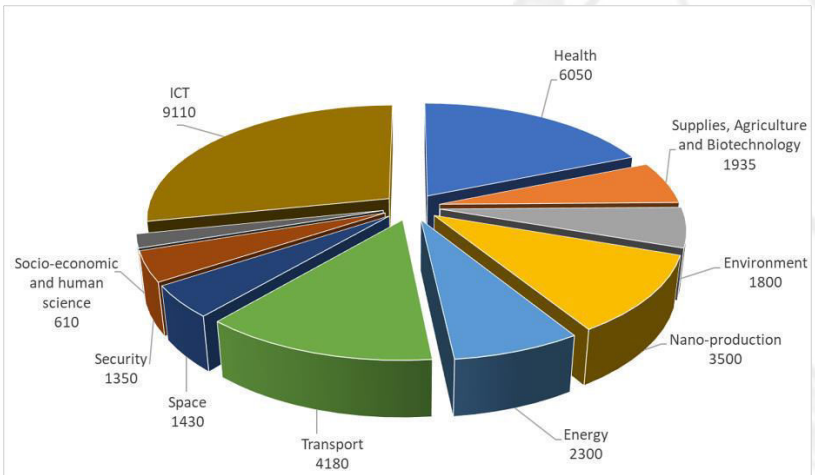
F

Blockchain is a database or register in which user data is stored, but also all operations that take place between users. As the name suggests, blockchain is made up of a series of virtual blocks with a unique identity, called a hash. Within the chain, each block contains information about the hash of the previous block, up to the original block of the string (also called genesis block).

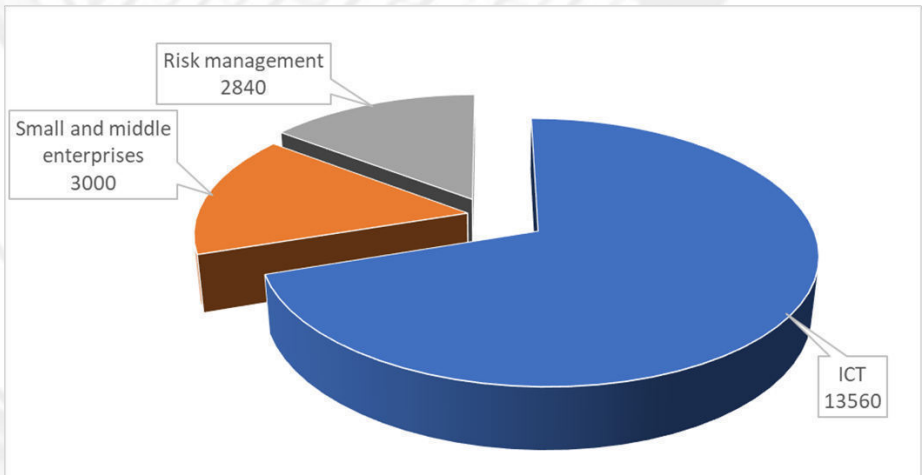
Blockchain technology, which store blocks of information that are distributed across an entire network, are considered to represent a major advance in the field, as they ensure a high level of traceability and security of transactions that take place online.

Blockchain technology has uses in all areas of activity, including research and development. Thus, since 2013, the European Commission has been financing projects in the field of blockchain technology through the research programs of the European Union FP7 and Horizon 2020.

Under the FP7 program, the European Union funded several activities through the following programs: Cooperation, Ideas, People, Capacities, Euratom and JRC. The following sub-programs were funded under the Cooperation program



The Budget of the Cooperation Program (mil. Euros)



The Budget of the Leader in Industrial Sector (mil. Euros)

As can be seen, the Information and Communication Technologies (ICT) sub-program has been allocated the highest value of the total Cooperation program of 32.365 million euros.

Instead, the Horizon 2020 funding program, which followed the FP7 program, came with higher funding values than FP7. Thus, within the Scientific Excellence Program, through the Leader subprogram in the industrial field, ICT activities were also allocated the highest value of 13.557 billion euros:

The European Commission wants to give more visibility to blockchain technology actors and build on existing initiatives, strengthen skills in the field and address the challenges posed by the new paradigm generated by blockchain technology, such as supporting the EU industry, improving processes. economic growth and the creation of a favourable environment for new business models, including in the field of research and development. The creation of a better security system and a better protection of intellectual property are major goals in research and development, especially in the current conditions when many activities in this field take place in the online environment.

Contact: mircea.rus@incerc-cluj.ro

NIRD URBAN-INCERC Cluj-Napoca Branch, 117 Calea Floreşti, 400524, Cluj-Napoca, Romania

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Webcam fixture for online courses

high school project

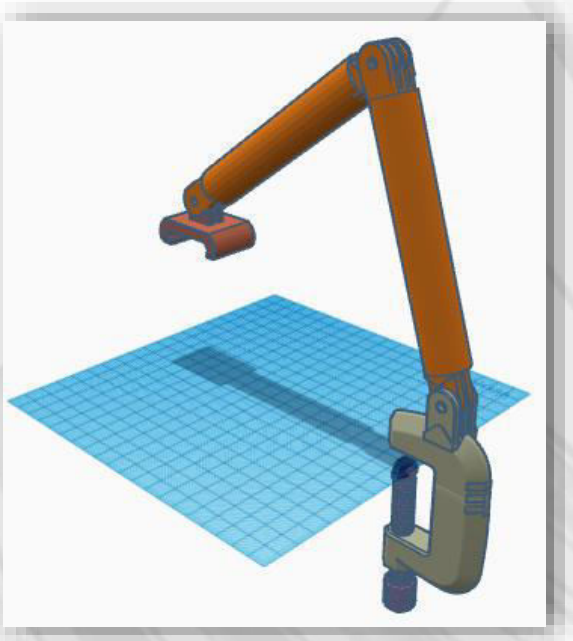
Authors: Sebastian Petrariu (student),
prof. ing. Paul Țoța (coordinator)

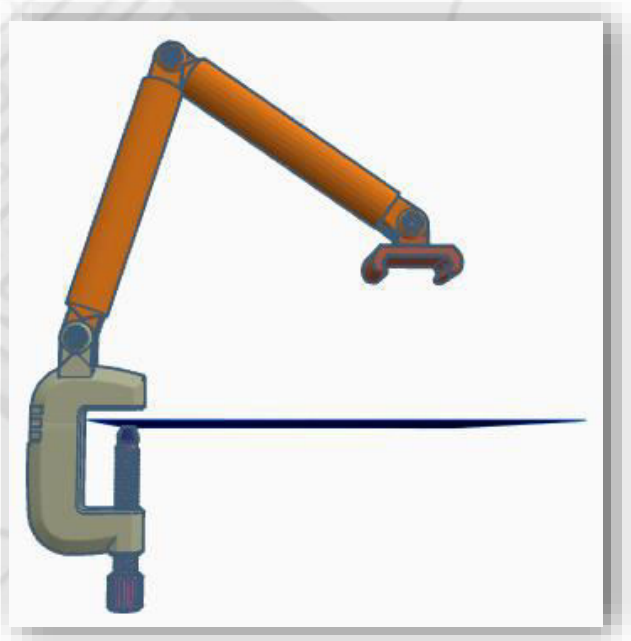
F

Proiectul este un dispozitiv pentru susținerea unei camere web destinat orelor online în contextul situației pandemice actuale.

În prezent, la orele online, elevii îl văd pe profesor și ceea ce acesta scrie pe tablă sau pe o foaie, însă profesorul vede doar chipul elevilor, atunci cand aceștia pornesc camerele dispozitivelor multimedia. Principala problemă a desfășurării cursurilor online în prezent o reprezintă faptul că profesorul nu poate vedea în timp real ceea ce scrie elevul în caiet în timpul orelor de matematică sau fizică pentru a-l putea corecta.

Soluția la această problemă este dispozitivul pentru susținerea camerei web, care se poate fixa de orice masă sau birou de lucru și care permite prinderea unei camere web care să fie orientată spre caietul elevului, astfel încât profesorul să poată vedea ceea ce face elevul, nu chipul acestuia.





The project is a device for supporting a webcam intended for online classes in the context of the current pandemic.

Currently, in online classes, students see the teacher and what he writes on the board or on a piece of paper, but the teacher only sees the students' faces when they turn on the cameras of the multimedia devices. The main problem with online courses today is that the teacher cannot see in real time what the student is writing in the notebook during math or physics classes so that he can correct him.

The solution to this problem is the webcam support device, which can be attached to any desk or work desk and allows a webcam to be attached to the student's notebook so that the teacher can see what the student is doing, not his face.

Contact: paultota@yahoo.com
tel. +40744360376

University of Agronomic Sciences and Veterinary Medicine – București

F

Enhancing practical skills of horticulture specialists to better address the demands of the European Green Deal

Ciceoi Roxana, Arzu Aydar, Rumen Tomov, Székács András

Hort EUGreen project will train European higher education graduates and its teaching staff by enhancing their practical skills in key areas related to Europe Green Deal eg nutritional quality of food pesticid e analysis urban horticulture biodiversity monitoring The aim is to increase the young generations employability and personal development and reduce the growing mismatch with labor market

Partners

Partners
Romania
Universitatea de Ştiinte Agronomice şi Medicină Veterinară din Bucureşti,
University of Agronomic Sciences and Veterinary Medicine of Bucharest

Bulgaria
Lesotekhnicheski Universitet,
University of Forestry, Sofia

Hungary
Magyar Agrár- és Élettudományi Egyetem,
Hungarian University of Agricultural and Life Sciences

Turkey
Zirai Mucadele Merkez Arastirma Enstitusu Mudurlugu,
Directorate of Plant Protection Central Research Institute, Ankara

KA Cooperation for innovation and the exchange of good practi ces
KA Strategic Partnerships for higher education

Why this project?

All over Europe more and more institutions are suffering due to growing m ismatch with labor market Labor markets are rapidly changing due to technologic al advancement greening and ageing workforce Higher education institut ions have the responsibility to reduce this gap and prepare the young generations and foster their employability and personal development

Europe is constantly putting efforts in adapting its policies strategie s and actions to build a safer future for EU citizens The European Green Deal Ha set of EU policy initiatives aims of making Europe climate neutral in by introducin g new legislation on the circular economy building renovation biodiversity farming and innovation

Also the project partners are members of the European Research Alliance Towards a Chemical Pesticidefree Agriculture

Wider scope

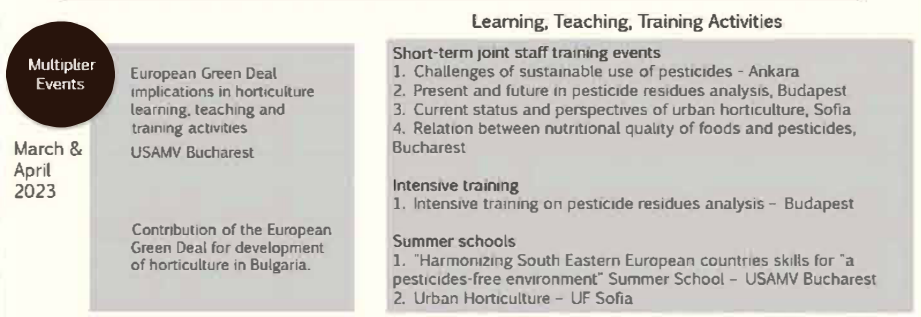
The wider scope is strengthening the capacities of the partner institutions to provide stateoftheart education and training in new emerging topics in horticulture to master students answering to the actual needs of the labor market

General objective

The general objective is to train the staff and students of partner institutions in four new topics such as their knowledge and practical skills in using modern Hcrop technologies increase enough to respond to the real context on the labor market

Projects outputs

- teaching and training materials HTTM delivered to master students in their mother language
- Open Education Resource HOER
- audiovisual materials available online as support for the TT M
- online platform



Target groups

- the teaching and nonteaching staff of our organizations Hminimum people
- the master students Hmin students

To academic staff our goal is to provide them formal and nonf ormal teaching tools and increasing their knowledge skills an d ease the collaboration with other professionals

To master and doctoral students by including new requested by the market topics in the already recognized master programs a nd by enhancing students skills and knowledge in respect of future G reen EU policy we target higher employability chances

Acknowledgments:
The European Commission support for the production of this presentation does not constitute an endorsement of the contents which reflects the views only of the authors and the National Agency and Commission cannot be held responsible for any use which may be made of the information contained therein

Contact person: Ciceoi Roxana
E-mail: roxana.ciceoi@qlab.usamv.ro

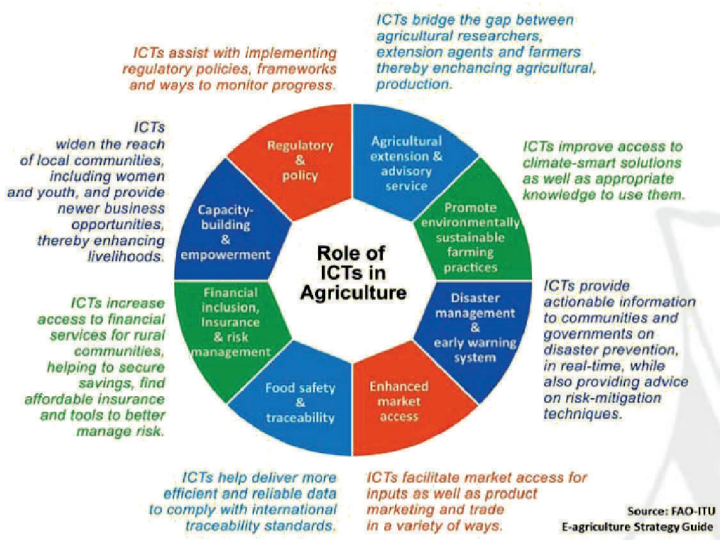
University of Agronomic Sciences and Veterinary Medicine – București

F

Vitalising ICT Relevance in Agriculture Learning (VIRAL)

STĂNICĂ F., BĂDULESCU L.A., ASĂNICĂ A.C., PETICILĂ A.G., VELCEA M., MIHAI C.A., ILINA Ş., ILIESCU L.M., CIOACĂ L., POTOR D., MANEA G., BUTCARU A.C.

Role of ICT in agriculture



SO2: to improve effectiveness and employability of AET graduates

Focusing on employability helps universities **to attract and retain high quality students** and maintain a competitive advantage, while for students employment outcomes form key motivation for pursuing certain education fields. With this in mind VIRAL puts emphasis on:

- **ridging the existing skills gap**: It is important to engage with businesses to facilitate closer correspondence between the skills universities teach and the skills businesses want in the agriculture field.
- **integrating employability into curricula**: in seeking ways to integrate employability-focused moments into curricula VIRAL uses employer relationships as a means of providing meaningful problem-based learning experiences. These are evidenced by organization of hackathons pitching competitions as capacity building tool for HEIs and output for use in industry. New knowledge is also generated through active involvement of students with prospective business operators networking at the hackathons.

Project Aim

Overall project aim of VIRAL to support university and business collaboration UBC I through accelerating the use of ICT across Western Balkans agro-communities. The concept is led by relevant regional AET facilities and based on enabling the use of different ICT solutions/techniques/tools in the classroom and outside of it in order to obtain desired integration of agriculture and it engineering which in effect reinforces UBC across regional agro communities.

SO1: to increase the capacity of HEIs to apply and generate ICT in AET and practice

- Highly educated and skilled agriculture labour force is mandatory to **create share and use knowledge** and so is the case with a vibrant system of **teaching research and innovation** to be able to tap into global knowledge, assimilate and adapt it to the local need.
- Universities responsibility could be better served when **HEIs are current in terms of modern ICT infrastructure and tools**.
- Thus, VIRAL offers a robust **training component for teaching staff students non-formal educator and extension services providers** whereby ICT solutions/techniques/tool are debated and use explained.
- Comprehensive set of training looks into importance/general use of ICT in agriculture, **robotic management software applications drones and GIS**.

SO 3: to boost academic-business cooperation regional platform for sustainability, networking and exchange within agricultural and technological communities

Stemming from successful implementation of the SO 1 and 2 which provide a structured capacity building frame, SO 3 represents a **peak of efforts that build standing formal networking and alliance among ICT and agricultural SMEs with HEIs** in the form of a spin off *EXPO event* and by:

- **providing IT services** appropriate to the needs of regional agro-communities including both AET and producers, increasing their efficiency & sustainability,
- **ever-expanding knowledge base** constructed around a user-friendly knowledge co-creation and transfer in the field that goes both ways from university to business and vice versa,
- **competitive and available agricultural integrated IT solutions** for agricultural business operators, **increasing efficiency and profit-making ability of the sector**.

"The European Commission support for the production of this presentation does not constitute an endorsement of the contents which reflects the views only of the authors, and the National Agency and Commission cannot be held responsible for any use which may be made of the information contained therein".

Co-funded by the Erasmus+ Programme of the European Union

Contact: BUTCARU Ana
E-mail: anabutcaru@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

CHINGI EXPERT

IUBEȘTE SIGURANȚA

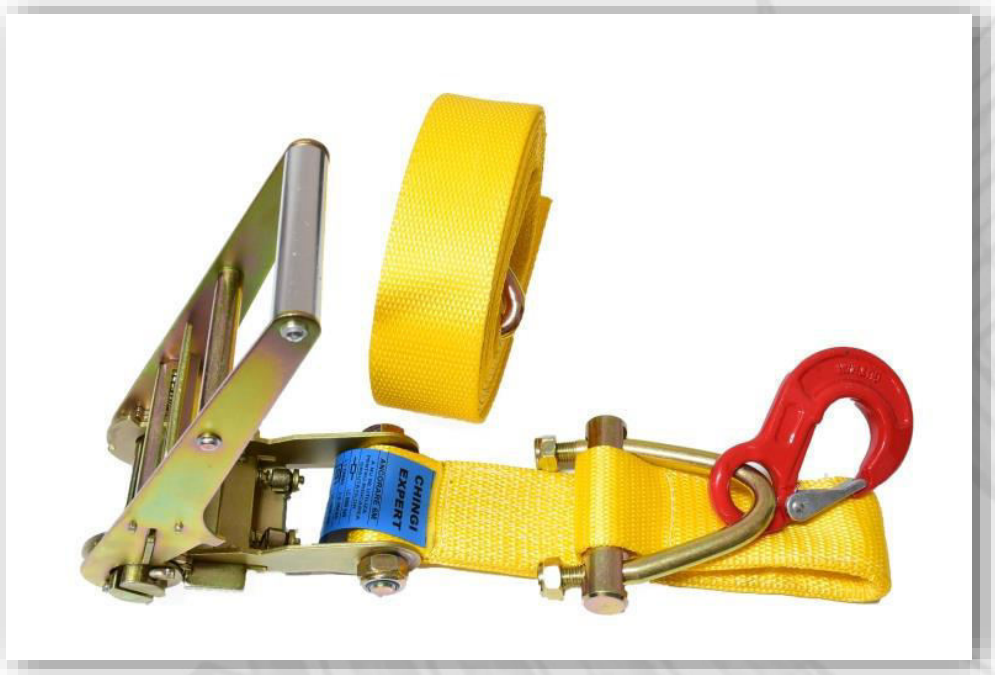
CHINGI EXPERT

EUROPEAN MANUFACTURER of LASHING & LIFTING SLINGS

F

Author: Larisa Rerat

Established in 2014, CHINGI EXPERT manufactures in Romania, customised solutions in cargo & lifting systems. We are continuously moving forward, innovating, and improving. Passion is at the heart of our company!



Safety represents our top priority!

CHINGI EXPERT

Our lashings and webbing slings are products approved and certified in accordance with the European Standards and ISO 9001-2015

In our range you can find ratchet lifting slings, roundslings, eye webbing slings, lifting chaines, wire ropes and more!

Contact: www.chingiexpert.ro
office@chingi-expert.ro
Mobile 0040 749 090 725

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Mistic life

Concept

Autor: Ludvic Kasler

F

Impactul generat de interferența dintre particulele constitutive ale roboților și celulele care alcătuiesc corpul uman generează vibrații percepute la nivel teluric și metafizic rezultând un produs ilustrat în mod plastic și auditiv datorită sunetelor create prin simbioza dintre ființa umană în calitate de creator și robot în calitate de produs al acestuia.

Ca și exercițiu de imaginație auditivă, frecvența generată de procesul descris mai sus și-a găsit ca termen de comparație armonia sunetelor ca mediană a unui produs de colaborare între creator și creația sa. Utilizarea sunetelor descriptive, sintetice, este un produs al imaginației marcat de bagajul de cunoștințe și experiențe dobândite în contextul unui trai aproape virtual.

The concept of "Mystical life" is based on the idea of overlapping between telluric and metaphysical, illustrated by synthetic sounds. The impact generated by the interference between the constituent particles of robots and the cells that make up the human body generates vibrations perceived at the telluric and metaphysical level resulting in a plastic and auditory illustrated product due to sounds created by the symbiosis between human being as creator and robot as product of it.

As an exercise in auditory imagination, the frequency generated by the process described above found as a term of comparison the harmony of sounds as the median of a collaborative product between the creator and his creation. The use of descriptive, synthetic sounds is a product of the imagination marked by the baggage of knowledge and experiences acquired in the context of an almost virtual life.

Contact:

email: ludvickasler@gmail.com

link: https://youtu.be/XEUFgbXvOh0

DESEN TEHNIC INDUSTRIAL
ELEMENTE TEORETICE ȘI PRACTICE

ISBN 978-606-13-0135-5/2010

Author: Cioată Vasile George

F

The work Industrial technical drawing. Theoretical elements and applications support those who study technical drawing at university level.

In the first chapters of the book are presented, in correlation with the standards and norms in force, the basic notions necessary for the elaboration of the drawings of the piece.

These refer to: types of lines and use cases, writing, formats and their graphic elements, representation scales, usual geometric constructions, projection methods, visual and sectional representation of objects, dimensioning, surface condition notation and notation dimensional and geometric accuracy.

We continue with the presentation of the methodology for drawing up the piece drawings, be they sketches or scale drawings. Most of the chapters end with solved applications and / or applications proposed for solving that allow the deepening of the theoretical notions presented.

The work is an important book for the training of future engineers in the technical field and is addressed, in particular, to students who have provided the subjects Descriptive Geometry, Technical Drawing and Infographics in the curricula. At the same time, the material can be of real use to those who study technical drawing in other forms of education.

Contact: vasile.cioata@fih.upt.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Web pages

Cercul de Informatică – Palatul Copiilor Deva

Prof. Popescu Bianca Claudia

F

Within the Computer Science Circle at the Deva Children's Palace, students also learn programming techniques in HTML, CSS, as well as some notions of JavaScript, for building web pages. A website built by children contains between 4 and 6 web pages. Younger students learn to create web pages in HTML language, older ones in HTML and CSS languages. HTML or Hyper Text Markup Language is the standard language for creating web pages. It contains a series of single or paired elements (tags), through which the structure of a web page is described. The theme of the web pages in the accompanying images is Little Union. One of the sites is made in HTML and a few JavaScript elements that change an image by clicking on it or enlarge another image by hovering over it.

The other pages are made by combining HTML and CSS. The HTML code is saved with the .html extension. The CSS code is written to an external file and saved with the .css extension.

In the pictures below are some of my little digital creators, 5th and 6th graders.

În cadrul cercului de Informatică de la Palatului Copiilor Deva elevii învață și tehnici de programare în limbajul HTML, CSS, precum și câteva noțiuni de JavaScript, pentru construirea paginilor web. Un site web construit de copii conține între 4 și 6 pagini web. Elevii mai mici învață să creeze pagini web în limbajul HTML, cei mai mari în limbajele HTML și CSS. HTML sau Hyper Text Markup Language este limbajul standard pentru crearea paginilor web. Cuprinde o serie de elemente (tag-uri) singulare sau în pereche, prin intermediul cărora se descrie structura unei pagini web.

CSS sau **Cascading Style Sheets este un limbaj de stilizare a elementelor HTML. Utilizând stilurile CSS se colorează fundalul, se dimensionează, formatează, colorează literele, se poziționează elementele de pe o pagină web.** Codul pentru fiecare pagină web este scris într-un editor de text, noi utilizăm Notepad.

Tema paginilor web din imaginile alăturate este Mica Unire. Unul dintre site-uri este realizat în HTML și câteva elemente de JavaScript prin care se schimbă o imagine prin click pe aceasta sau se mărește o altă imagine prin trecerea cursorului peste ea. Celelalte pagini sunt realizate îmbinând HTML și CSS. Codul HTML este salvat cu extensia .html. Codul CSS este scris într-un fișier extern și salvat cu extensia .css.

În imaginile alăturate sunt câțiva dintre micii mei creatori digitali, elevi în clasele a V-a și a VI-a.

Contact: popescu_bianca7@yahoo.com

GRAFICĂ TEHNICĂ ASISTATĂ DE CALCULATOR

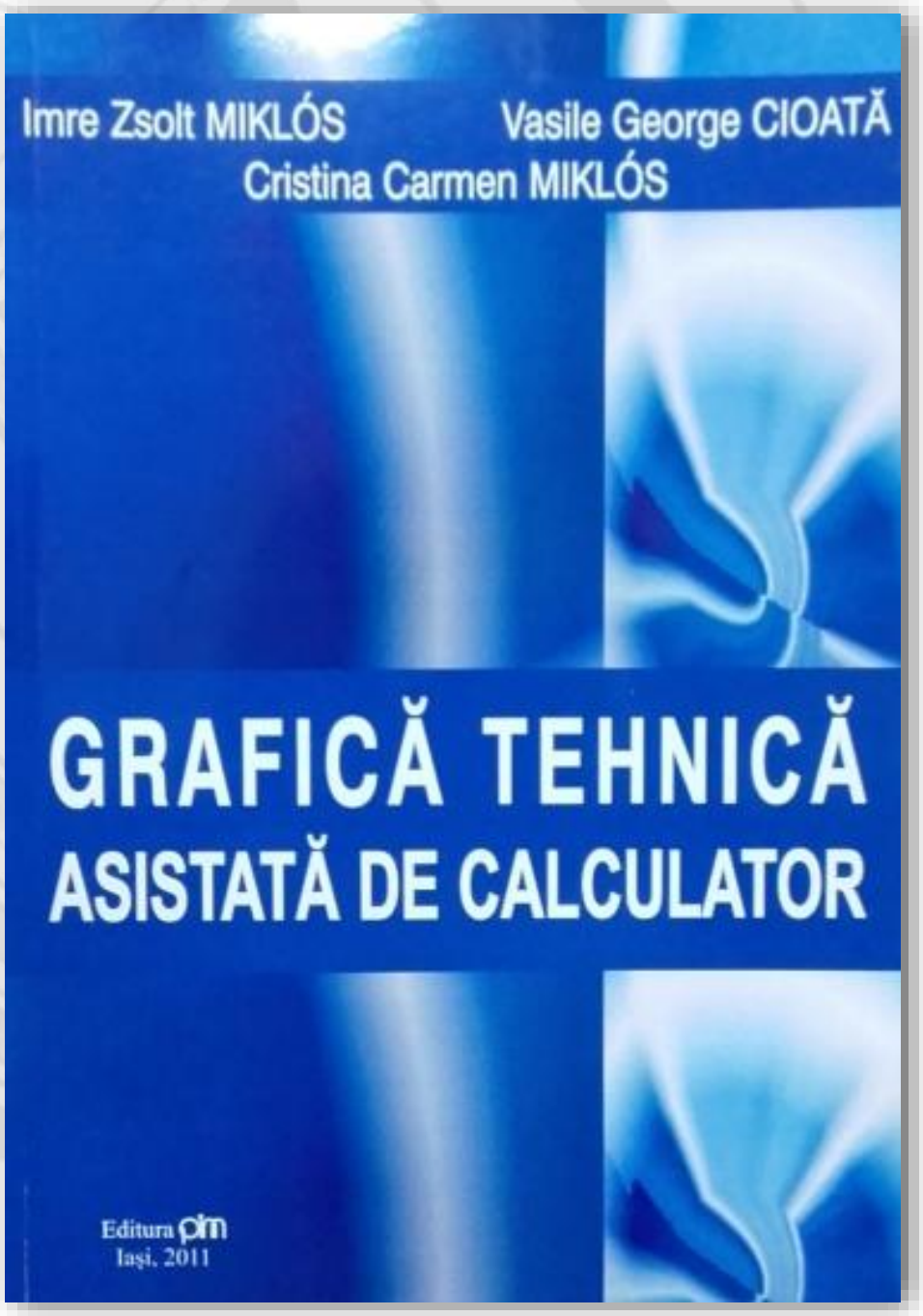
ISBN 978-606-13-0597-1/2011

Authors: Miklos, I.Z, Cioată, V.G., Miklos, C.C

F

Evoluția impresionantă a tehnicii de calcul a condus la dezvoltarea unor aplicații grafice de tipul *CAD/Computer Aided Design*, *CAM/Computer Aided Manufacturing*, *CAE/Computer Aided Engineering*, etc., fără de care activitatea de proiectare în domeniile inginerești nu mai poate fi concepută.

Unul dintre programele de bază în domeniul graficii pe calculator, dar și a proiectării asistate, este *AutoCAD*. Cartea se adresează celor care doresc să se inițieze în domeniul graficii pe calculator, respectiv a modelării 3D, dar și celor care doresc să se perfecționeze. Structura lucrării facilitează familiarizarea utilizatorului *AutoCAD* cu modul de lucru *2D*, respectiv cu personalizarea mediului de desenare, inițializarea sesiunii de lucru, cu principalele comenzi de desenare, editare, cotare, inserare de text, crearea și inserarea de obiecte grafice complexe și de tipărire a desenelor create. Sunt prezentate, totodată, noțiuni legate de parametrizarea desenelor, iar un capitol al cărții este destinat modelării în *AutoCAD* a obiectelor *3D*. Pe tematica abordată, lucrarea cuprinde și aplicații rezolvate, precum și un set de aplicații propuse.



The impressive evolution of computing technology has led to the development of graphic applications such as CAD / Computer Aided Design, CAM / Computer Aided Manufacturing, CAE / Computer Aided Engineering, etc., without which the design activity in engineering can no longer be conceived.

One of the basic programs in the field of computer graphics, but also of assisted design, is AutoCAD. The book is addressed to those who want to get started in the field of computer graphics, respectively 3D modeling, but also to those who want to improve. The structure of the work facilitates the familiarization of the AutoCAD user with the 2D work mode, respectively with the

Contact: zsolt.miklos@fih.upt.ro

ORGANE DE MAȘINI. REDUCTOARE DE TURAȚIE
Îndrumar de proiectare

ISBN 978-606-13-1166-8/2012

Author: Miklos, I.Z

F

Activitatea de proiectare în construcția de mașini, ca etapă în realizarea unui produs nou sau de îmbunătățire a unuia existent, implică cunoașterea, încă din fazele de concepție și de prelucrare a soluției adoptate, o serie de date specifice problematicii abordate, care eficientizează apoi finalizarea, respectiv construcția produsului respectiv.

Lucrarea cuprinde elementele necesare proiectării reductoarelor de turație de diferite tipuri, respectiv a angrenajelor, arborilor, lagărelor cu rulmenți, carcasei, dar și a principalelor elemente de fixare, asamblare, etanșare, etc.

Îndrumarul de proiectare, ce este destinat în principal viitorilor ingineri mecanici dar și celor cu altă specializare în vederea elaborării proiectelor de an la disciplinele Organe de mașini, respectiv Mecanisme și organe de mașini, precum și a unor capitole din proiectele de diplomă sau de disertație, conține datele și informațiile necesare rezolvării temelor propuse: relații de calcul, coeficienți, factori de utilizare, elemente tipizate, etc., în conformitate cu standardele actuale în vigoare. Criteriile de proiectare prezentate urmăresc atât alegerea corectă a materialelor, cât și stabilirea corespunzătoare a dimensiunilor şi a formei elementelor, pentru reducerea consumurilor specifice şi pentru asigurarea fiabilității acestora.

The design activity in the construction of machines, as a stage in the realization of a new product or the improvement of an existing one, involves the knowledge, from the design and processing phases of the adopted solution, of a series of data specific to the approached problem respectively the construction of the respective product.

The work includes the elements necessary for the design of speed reducers of different types, namely gears, shafts, bearings, housing, but also the main elements of fixing, assembly, sealing, etc.

The design guide, which is intended mainly for future mechanical engineers but also for those with other specialization in order to develop the year projects in the disciplines Machine parts, respectively Mechanisms and machine parts, as well as some chapters from the diploma or dissertation projects, contains the data and information necessary to solve the proposed topics: calculation relationships, coefficients, usage factors, standardized elements, etc., in accordance with current standards in force. The design criteria presented aim at both the correct choice of materials and the appropriate determination of the size and shape of the elements, in order to reduce specific consumption and to ensure their reliability.

Contact: zsolt.miklos@fih.upt.ro

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

Tarnovean
Claudiu

Când a venit Dumnezeu, prima oară, în Budaitău

Author: Tarnovean Claudiu

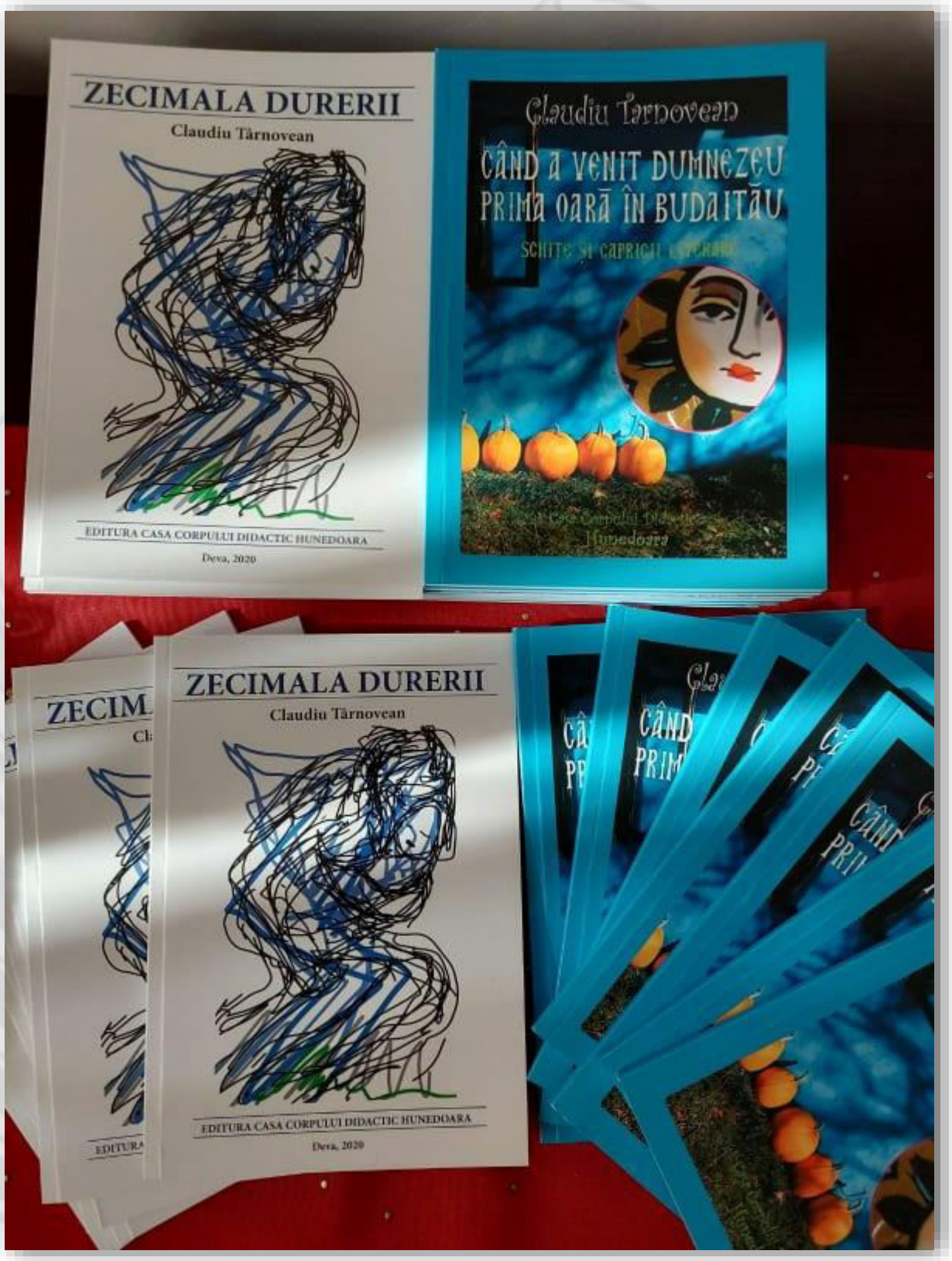
F

"Zecimala durerii" este despre adunarea prin îndepărtare și despre alegoria iubirii, pe care o simți ca o rană ,atunci când despărțirea este simfonia plecării definitive.

"Când a venit Dumnezeu prima oară în Budaitău" este încercarea de a topi într-o bomboană fondantă,ingenuitatea fanteziei, cu ridurile realității iluzorii.

"Zecimala durerii" it is about the gathering by distance and about the allegory of love, which you feel like a wound, when the parting is the symphony of the final departure.

"Când a venit Dumnezeu prima oară în Budaitău" it is the attempt to melt in a fondant candy, the ingenuity of fantasy, with the wrinkles of illusory reality.



Contact: +40740233100

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

IMPLEMENTATION OF THE INDUSTRY 4.0 IN THE FESTO DIDACTIC EDUCATIONAL SYSTEMS MPS 203

Research project

Author: Gelu-Ovidiu TIRIAN

F

When designing automated assembly systems according to the Industry 4.0 reference architecture, it is important to rely on them and try to implement them into devices and systems according to the Topdown model according to the Industry 4.0 reference architecture model. When designing automated assembly systems, it is possible to use several key elements of Industry 4.0, which belong to the basic nine technologies of Industry 4.0. The MPS® system 203 assembly system from Festo Didactic. Figure 1, will be used as a model for the Industry 4.0 reference architecture and Figure 2 MiniMES Tools configuration.

Figure 1

Figure 2

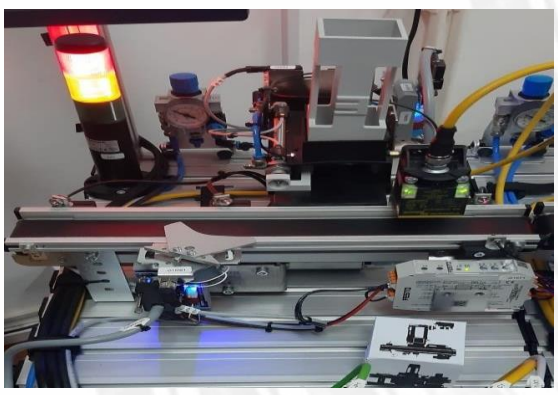


Figure 3

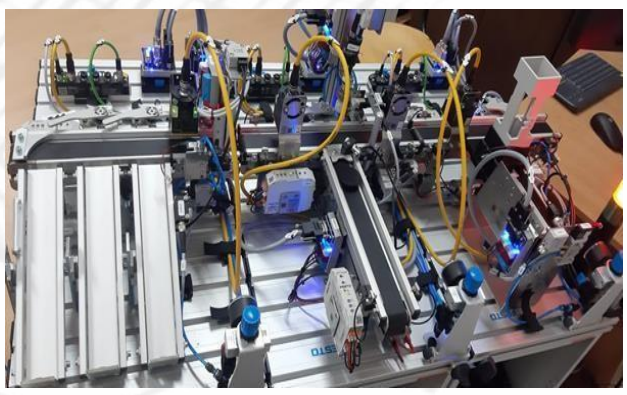


Figure 4

One of the ways to achieve the goals of Industry 4.0 to produce products customized in one-piece batches is to have machines, equipment, and assembly cells designed so that the entire assembly system is flexible, which is also defined by the reference architecture. Production resources must therefore be modularized. The entire assembly system is created in a decentralized manner, where the individual modules are designed as a separate cyber-physical system, a mechatronic system with its own control system and connectivity. The module should include a standardized interface so that the module can be connected to the assembly system and manufactured. Industry 4.0 defines this concept as "Plug & Produce". Modularity is important not only at the level of local automated equipment, but also at the level of machines, stations, assembly cells, or lines, Figure 3 and 4.

The applicability of these new approaches in digital design was verified by creating a digital twin and performing a virtual commissioning of the automated assembly system MPS® system 203.

Contact: ovidiu.tirian@gmail.com +40769602413

Liceul Tehnologic "Transilvania" Deva

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

F

TehnoART

Authors: Demeter Sorin & LTTD Team

Techno-ART *is a national competition for high school students and more.*

The aim of ***Techno-ART*** *is technical creativity in this sense students are invited to present their ingenious projects.*

The ***Techno-ART*** *competition focuses on environmental protection so we encourage students to use recycled components from scrap yard.*

The participating students transform these scrap into robots, cars, statues, lighting fixtures, figurines or various installations, which leads to the development of the practical skills so necessary for their future careers.

ROMÂNIA, Deva,
330162 B-dul 22 Decembrie, Nr. 116
Tel./Fax: 0254/ 230739
E-mail: deva_trans2003@yahoo.com
http://www.cttdeva.ro

G

Medicine

Veterinary medicine

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

UNIVERSITATEA TITU MAIORESCU BUCUREȘTI ROMANIA

DIGITAL VIDEOCAPILAROSCOPE

Patent A/00285/2018

DIPLÔME

inventions Geneva

SALON INTERNATIONAL DES INVENTIONS GENÈVE

Après examen, le Jury International a décidé

de remettre à: COCHIOR Daniel, CUSTURA Craciun Dan, GORECKI Gabriel-Petre, STOICA Radu, MOLDOVAN Horatiu, DOROBANTU Lucian Florin

pour l'invention: Digital videocapilaroscope.

MÉDAILLE D'OR GOLD MEDAL GOLDMEDAILLE

Genève, le 12 avril 2019

Authors: Gabriel Petre GORECKI
Daniel COCHIOR
Dan CUSTURA-CRACIUN
Horatiu MOLDOVAN
Radu STOICA
Lucian Florin DOROBANTU

CATEGORY

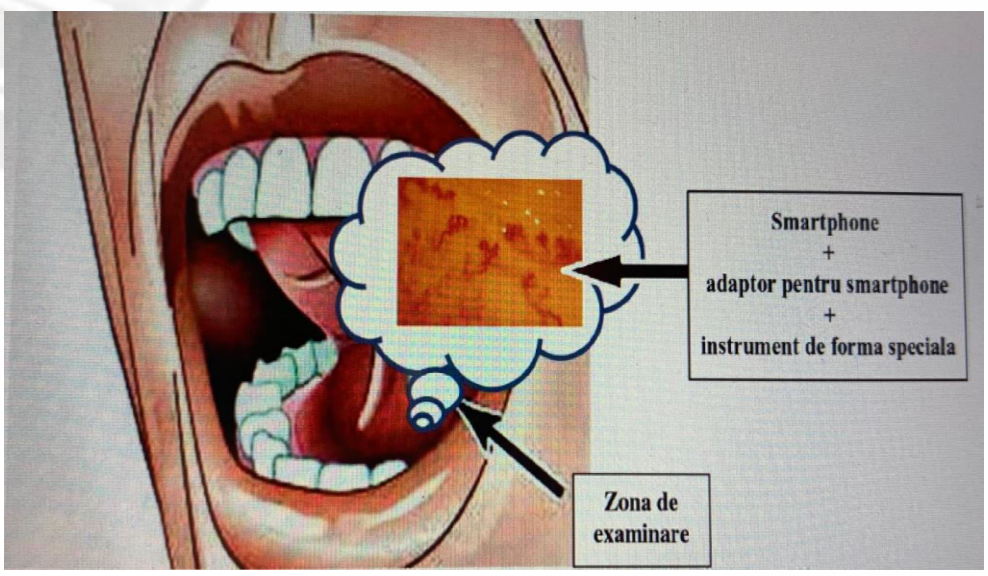
G

(MEDICINE)

Our project proposal regards the creation of an experimental device (HD wireless videocapilaroscope)a hardware and software solution used for an early and non-invasive diagnosis in emergency situations. The videocapillaroscope collects both dynamic and morphological data by analyzing the microscopic vessel distribution in the oral mucosa in order to diagnose and treat (following software processing) the early systemic microvascular changes that precede the onset of septic shock and, consequently, multiple system organ failure. The possibility to detect early-phase microvascular anomalies using videocapilaroscopy offers new diagnostic and research opportunity.

Novelty:

1. Early diagnostic clinical protocol of septic shock for incipient, targeted and preventive treatment .
2. Oral microcirculation exploration and practical use (diagnose and monitoring of septic shock) in ICUs.
3. Succesfull use for other medical specialities (rheumatology, dermatology, vascular surgery, angio and phlebology, estetic surgery, dentistry)
4. Being a non-invasive method it does not involve ethical issues.



MANAGEMENT ALGORITHM FOR OBESE PARTURIENTS WITH LIVER DYSFUNCTION

Authors: Cristina Oana Daciana TEODORESCU
Amorin Remus POPA
Gabriel Petre GORECKI
Andrei George TEODORESCU

CATEGORY

G

(MEDICINE)

The research project consist in development of a management algorithm for obese pregnant patients with liver dysfunction, with the primary objective to evaluate the impact of obesity during pregnancy and all the other issues that might arrise with the newborn during antenatal, peripartum and postpartum period.

The target of this project is to create a management algorithm for obese parturient with hepatic dysfunction for an easy and rapid monitoring of the patient. This algorithm will be used as a mobile application for the physician and the patient.

Novelties:

1. The development of an early prognostic tool for liver dysfunction for obese pregnant patients
2. Mobile application with easy interface, with comprehensive informations
3. Monitoring system for newborn complications as following the mother's liver dysfunction
4. First algorithm to evaluate the liver dysfunction during pregnancy

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

UNIVERSITAS MEDICINAE ET PHARMACIAE "CAROLUS DAVILA" - BUCURESTI

DOCENDO DISCITUR A.D. 1857

Staging method for management of biohumoral changes in pregnant woman with COVID 19 infection

Authors: Marilena BĂLUȚĂ
Liana PLEȘ
Gabriel Petre GORECKI

CATEGORY

G

(MEDICINE)

The risk of infection of the pregnant woman with Covid 19 seems to be equal compared to the general population, however the evolution of the disease can be modified by the presence of pregnancy both by the age of the viral strain and immunosuppression following pregnancy, the patients having a higher risk of developing an average or severe form.

Covid 19 infection triggers a systemic inflammatory response, and in order to reduce perinatal morbidity and mortality it is absolutely necessary to initiate a correct treatment depending on the particularities and associated pathologies that the pregnant woman presents.

An algorithm for dynamic investigation of inflammation markers: CRP, IL-6, Fertinine, Serum lactate, leukocytes, lymphocytes, D-dimers, acid-base balance brings a clinical benefit by establishing and monitoring the response to treatment.

The dynamics of serum markers of inflammation together with the clinical evolution and gestational age dictate the therapeutic behavior.

Novelties:

1. Development of staging method for management of biohumoral changes (main inflamatory markers)
2. Monitoring system for prognostic and clinical evolution of the pregnant pacients
3. First method to evaluate the response to treatment

Marker	Interval de monitorizare
CRP	day 1 – day 3 – day 7
IL-6	day 1 – day 3 – day 7
Serum ferrithin	day 1 – day 10
Serum lactate	day 1 – day 3 – day 5
D-dimers	day 1 – day 7 – day 10
WBC	day 1 – day 5 – day 10
Lymphocytes	day 1 – day 5 – day 10
ABG	day 1 – day 3 – day 5- day 7

CORNELIUGROUP research-innovation association

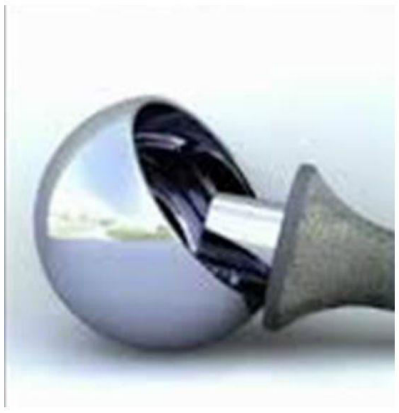
INVENTCOR

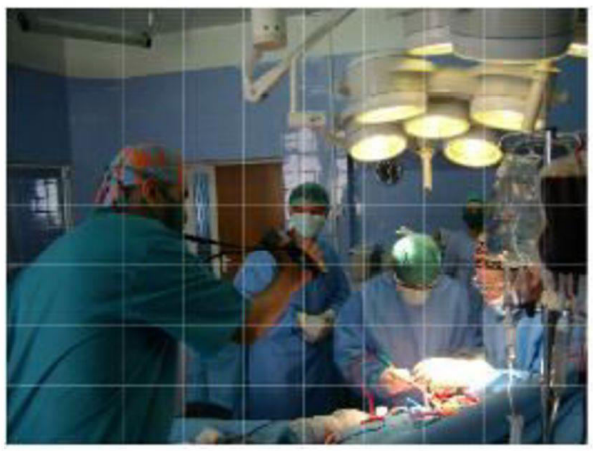
Power of Creative Mind

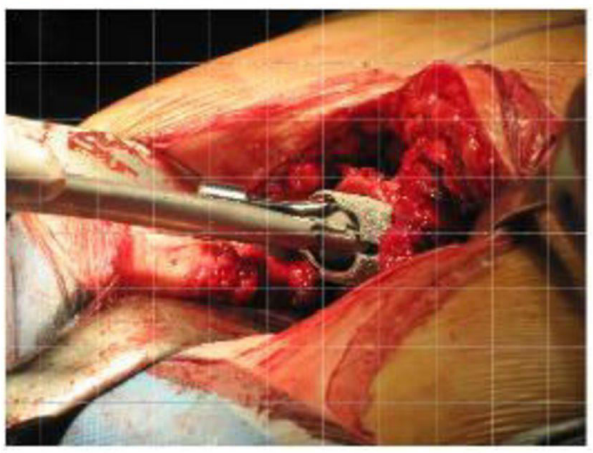
UNIVERSITATEA POLITEHNICA DIN BUCUREȘTI

G

SHORT FEMORAL STEM CERVICAL ENDOPROSTHESIS



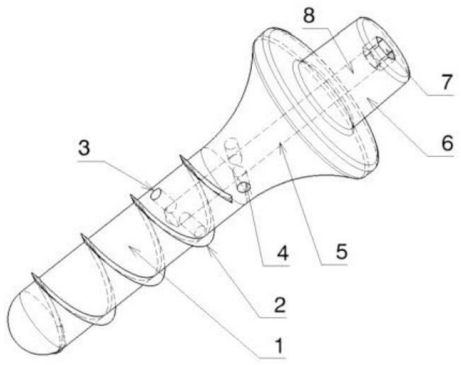


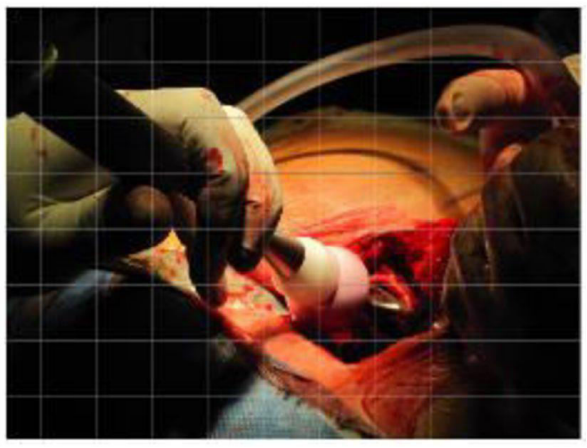


A/00551/29.07.2015
Clasa A61F 2/36, A61F 2310/00
IPC8 Class: AA61F236FI
USPC Class: 623 2335

Abstract

The patent relates to a SHORT FEMORAL STEM CERVICAL ENDOPROSTHESIS, conceived with a threaded fixation system, working through the process of screwing, improves the process of osteo-integration by increasing the application forces of the bone-prosthesis interface and by increasing the primary and final stability, through the injection via an axial or excentric opening of low viscosity orthopaedic cement.





EURO INVENT

NATIONAL INSTITUTE OF INVENTICS, IASI, ROMANIA

TISIAS

inventions geneva

SALONUL INTERNATIONAL DE INVENTII INOVATII „TRAIAN VUIA" TIMIȘOARA

IWIS

INTARG

Research team

Marius MOGA
Augustin SEMENESCU
Mihnea Cosmin COSTOIU
Ileana Mariana MATES
Cezar - Ionut CALIN
Catalin Gheorghe AMZA

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

G

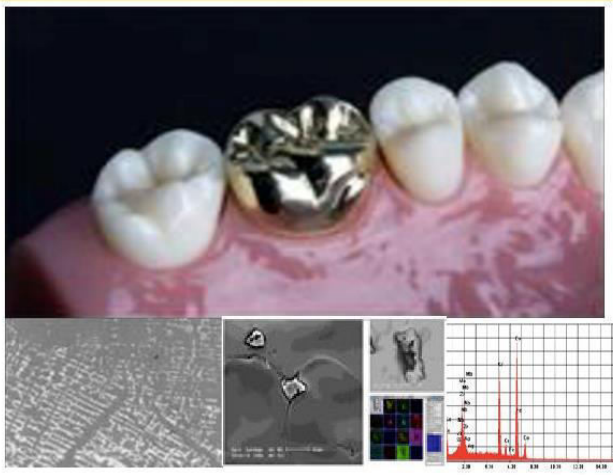
UNIVERSITATEA POLITEHNICA DIN BUCUREȘTI

DENTAL ALLOY OF COBALT-CHROMIUM-MOLYBDENUM TYPE USED FOR MAKING METAL-CERAMIC DENTAL PROSTHESES, COMPRISES COBALT, CHROMIUM, MOLYBDENUM, SILICON, NIOBIUM, RUTHENIUM, ZIRCONIUM AND SILVER (patent no: RO134131)

ANTONIAC Vasilea Iulian,RAU Dzulietta, SEMENESCU Augustin, DAWOD Nazem, GEANTA Victoras, VOICULESCU Ionelia, MATES Ileana Mariana, SOLEA Marina Roxana

Contact persons: augustin.semenescu@upb.ro

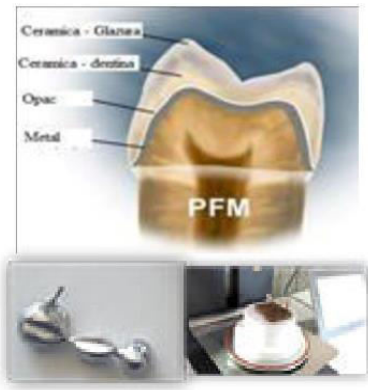
PRESENTATION



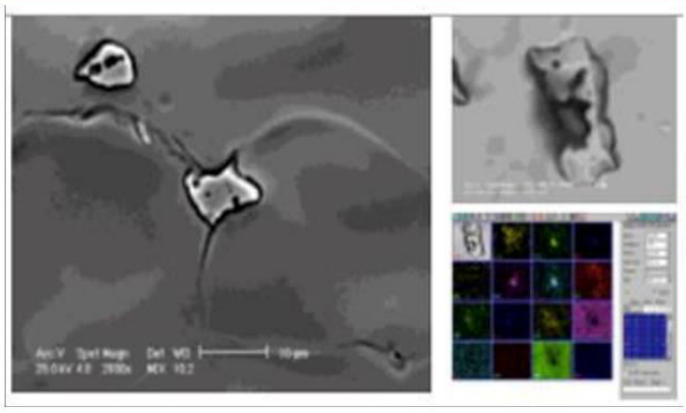
Dental alloy of cobalt-chromium-molybdenum type comprises 47-53 wt.% cobalt, 22-26 wt.% chromium, 4-7 wt.% molybdenum, 0.9-1.2 wt.% silicon, 3-5 wt.% niobium, 0.8-1.1 wt.% ruthenium, 10-14 wt.% zirconium and 2-4 wt.% silver, where the alloy has biocompatible metals comprising molybdenum, zirconium, niobium, silver and ruthenium, and is prepared by elaboration in electric arc furnace in neutral atmosphere.

ADVANTAGES

- The alloy exhibits excellent biocompatibility and corrosion resistance.



PROBLEM SOLVED



- The alloy is used for making metal-ceramic dental prostheses.

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

G

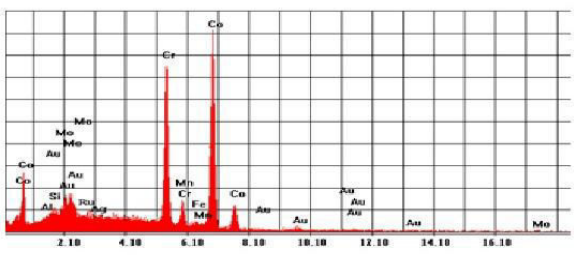
UNIVERSITATEA POLITEHNICA DIN BUCUREȘTI

COBALT, CHROMIUM AND NOBLE METAL CONTAINING ALLOY USED FOR MANUFACTURING METAL-CERAMIC DENTAL PROSTHESES, COMPRISES COBALT, CHROMIUM, SILICON, RUTHENIUM, ZIRCONIUM AND SILVER (patent no: RO134132 A0)

ANTONIAC Vasilea Iulian, RAU Dzulietta, SEMENESCU Augustin, DAWOD Nazem, GEANTA Victoras, VOICULESCU Ionelia, MATES Ileana Mariana, SOLEA Marina Roxana

Contact persons: augustin.semenescu@upb.ro

PRESENTATION

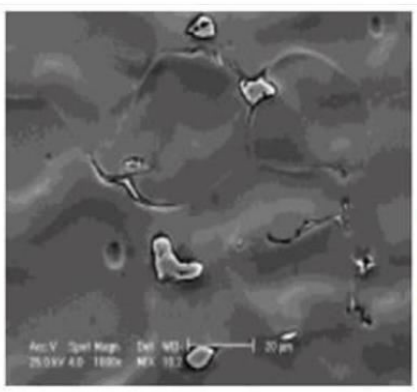


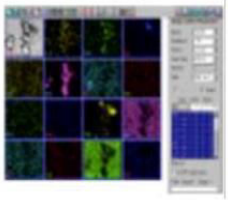
Cobalt, chromium and noble metal containing alloy comprising 58-61 %mass cobalt, 28-30 %mass chromium, 3.4-4.4 %mass silicon, 2-4 %mass ruthenium, 0.7-1.4 %mass zirconium and 0.8-1.2 %mass silver and obtained by elaboration in an electric arc furnace in a neutral atmosphere, with or without magnetic levitation.

ADVANTAGES

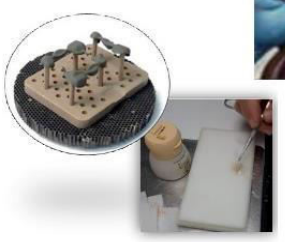
- The alloy has high biocompatibility. DETAILED DESCRIPTION - Cobalt, chromium and noble metal containing alloy of formula: CoCrMn comprises 58-61 %mass cobalt, 28-30 %mass chromium, 3.4-4.4 %mass silicon, 2-4 %mass ruthenium, 0.7-1.4 %mass zirconium and 0.8-1.2 %mass silver and obtained by elaboration in an electric arc furnace in a neutral atmosphere, with or without magnetic levitation. Cobalt, chromium and noble metal containing alloy of formula: CoCrMn comprises 58-61 %mass cobalt, 28-30 %mass chromium, 3.4-4.4 %mass silicon, 2-4 %mass ruthenium, 0.7-1.4 %mass zirconium and 0.8-1.2 %mass silver and obtained by elaboration in an electric arc furnace in a neutral atmosphere, with or without magnetic levitation

PROBLEM SOLVED





- The alloy is useful for manufacturing metal-ceramic dental prostheses.



CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

G

UNIVERSITATEA POLITEHNICA DIN BUCUREȘTI

MANUFACTURING PROCESS OF A PRODUCT DESTINED FOR BONE DEFECTS RECONSTRUCTION, BASED ON HYDROXIAPATITE AND BIOGENIC BIPHASIC CALCIUM PHOSPHATE

OSIM

ARCA

F. Miculescu[1] - A.C. Mocanu[1] - G. Stan[2] - I.V. Antoniac[1] - M.C. Costoiu[1]
S.I. Voicu[1] - M. Miculescu[1] - I.M. Mates[1] - A. Semenescu[1]

The invention relates to the manufacturing process of a product destined for bone defects reconstruction, based on hydroxyapatite and biogenic biphasic calcium phosphate, with a controlled ratio between hydroxyapatite/tricalcium phosphate. All calcium phosphates result from the thermal dissociation of calcium carbonate in form of dolomitic marble and seashells, and treatment of calcium hydroxide solution with phosphoric acid (range: 100–130% x calculated stoichiometric amount).

1 THERMAL DISSOCIATION
Biogenic calcium oxide synthesis

- Mechanical brush
- Sectioning of marble slabs

Thermal treatment in electric oven

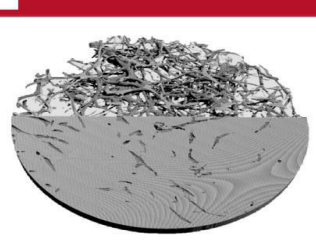
- Temperature: **1300°C**
- Duration: **6 hours**
- Ambient: **air**
- Cooling: **oven cooling**

The porosity of the product, evidenced as interconnected channels and pores, results after the complete combustion of the incorporated organic materials. The modulation of the mechanical and biological features is performed function of the sintering parameters (modification of the temperature and holding time).

Thermal treatment in electric oven with continuous ventilation

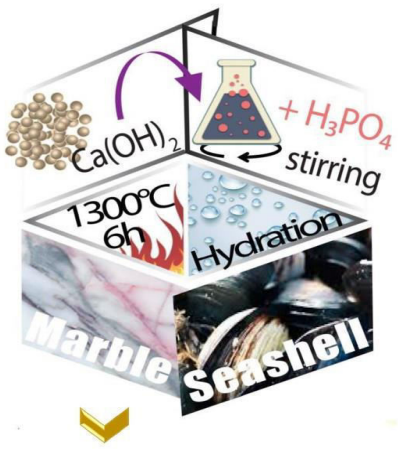
- Temperature: **1200°C**
- Duration: **10 hours**
- Ambient: **air**
- Cooling: **oven cooling**

4 Internal architecture forming
SINTERING

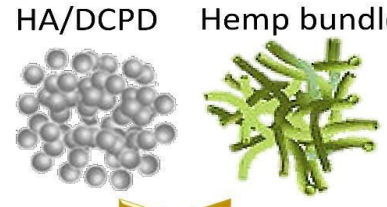


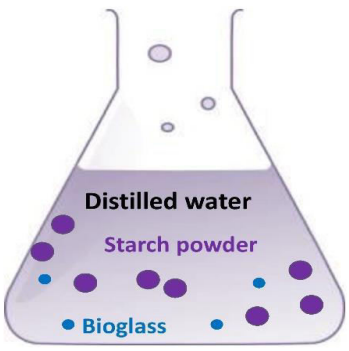
Bone reconstruction
SCAFFOLD

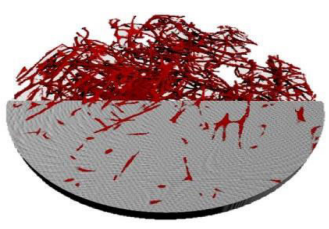
- Theoretical porosity: **29%**
- Dimension of hollow pores and channels: **500 – 1000 µm**
- Dimensional shrinkage (after sintering): **34%**
- Composition: **90% hydroxyapatite – 10% β – tricalcium phosphate**



HA/DCPD Hemp bundle







2 MODULATED WET SYNTHESIS
Synthesis of ceramic powders

- Hydration of calcium oxide: **distilled water**

Synthesis solution formation

- Distilled water: **200 ml**
- Calcium hydroxide: **10 g**
- Stoichiometric H_3PO_4 (85%): **5.5 ml**
- Acid addition rate: **1 ml/min**

Magnetic stirring

- Temperature: **25°C**
- Time: **2 hours**
- Rotations per minute: **700 rpm**

Drying thermal treatment

- Preliminary: **24 hours/ RT**
- Temperature: **1300°C**
- Duration: **6 hours**
- Ambient: **air**

The obtained powders are mixed with hemp fibres braided/twisted as a bundle and then soaked in aqueous-solution of starch and bioglass. The mixture is compacted by cold isostatic pressing.

Aqueous starch and bioglass solution

- Bioglass: **0.1-2%** of the starch mass
- Vol. parts starch+bioglass/distilled water: $^1/_5$
- Environment: **thermostatic bath**
- Temperature: **75°C**

Hemp fibres soaked in aqueous starch+bioglass solution

- Sectioning dimensions: **12 mm**
- Bundle diameter by twisting: **1 mm**
- Modelling: **various shapes**
- Drying: **room temperature (RT)**

Mechanical processing

- Mixture formation – mass ratio of ceramic powder/soaked hemp fibres: **30/2**
  - Pressing: **10-25 MPa**
  - Shape: **cylindrical**
  - Cylinder dimensions:

$$h = 30\ mm;\ \emptyset = 10 - 50\ mm$$

3 Preparation technology
FABRICATION OF 3D PRODUCTS

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Expoziția Internațională Specializată INFOINVENT

WIIPA

[1] Department of Metallic Materials Science, Physical Metallurgy, University Politehnica of Bucharest, 313 Splaiul Independentei, Bucharest, Romania
[2] National Institute of Materials Physics, 405A Atomistilor Street, Măgurele, Romania

NIMP

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

G

UNIVERSITATEA POLITEHNICA DIN BUCUREȘTI

CUSTOM MADE IMPLANT FROM BIORESORBABLE MATERIALS FOR INTERNAL FIXATION OF LONG BONE FRACTURES

F. Miculescu[1], O.E. Ilie[1], M. C. Costoiu[1], A. Semenescu[1] , V. Gheorghiță[2], A. Marin[1]

[1] Department of Metallic Materials Science, Physical Metallurgy, University Politehnica of Bucharest, Romania; [2] Dr. Carol Davila' Central Military Emergency University Hospital, Bucharest

INTRODUCTION

The invention relates to a process for obtaining a unique, biodegradable, customized implant for the internal fixation of long bones, whose physical properties are predetermined by controlling the specific geometric parameters of the holes on its surface.

The implant meets the mechanical and biological requirements for bone regeneration and eliminates the need for secondary surgery, being a less invasive method for internal fixation of long bone fractures.

The technical problem is solved by obtaining a customized cylindrical bone fixation product, which can be made of polymeric, ceramic or bioresorbable composite materials, in a one-component or two-component way, with holes on the implant surface of different geometries and sizes and holes specific for screw fixing.

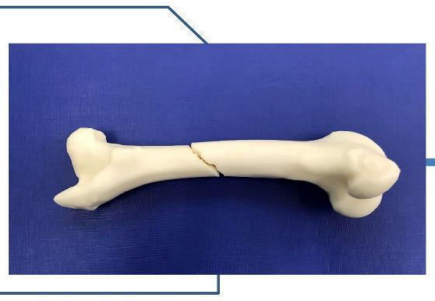
INTRODUCERE

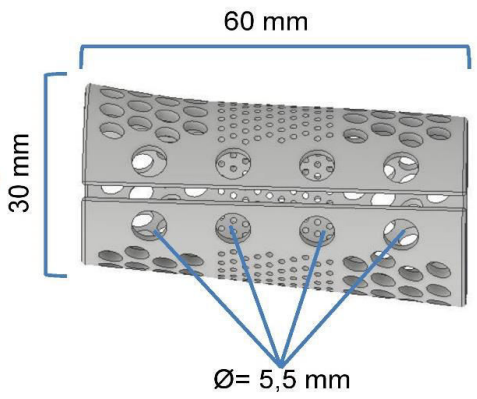
Invenția se referă la un proces pentru obținerea unui implant unic biodegradabil, personalizat, pentru fixarea internă a oaselor lungi, ale cărui proprietăți fizice sunt predeterminate prin controlul parametrilor geometrici specifici ale gaurilor de pe suprafata acestuia.

Implantul îndeplinește cerințele mecanice și biologice necesare regenerării osoase și elimină necesitatea unei intervenții chirurgicale secundare, fiind o metodă mai puțin invazivă pentru fixarea internă a fracturilor osoase lungi.

Problema tehnică este rezolvată prin obținerea unui produs de fixare osoasă de formă cilindrică, personalizat, care poate fi realizat din materiale polimerice, ceramice sau compozite bioresorbabile, într-un mod monocomponent sau bicomponent, cu găuri pe suprafața implantului de diferite geometrii și dimensiuni și găuri specifice pentru fixarea cu șuruburi.

3D scanning through optical methods of an induced fractured animal bone





CONCEPTUAL DESIGN

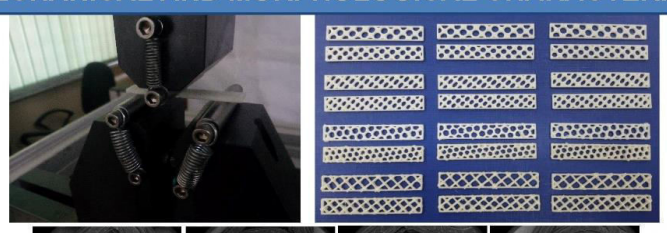
Cylindrical implant that mimics the natural profile of the bone, specific to each patient, designed to surround the bone and cover the fragmented section and an additional segment without defects that allows fixing with screws (providing adequate mechanical strength). Depending on the complexity of the structure, there are monocomponent and two-component types of implants.

CAD DESIGN OF THE IMPLANT

The surface of the implant is provided with holes of different sizes (between 1 mm and 5 mm) and various geometries (square, hexagon, ellipse or circle), at an angle of inclination between 20˚ and 40˚ from the vertical, with a distance between the holes from 0.5 mm to 1 mm.

The middle area of 30 mm, corresponding to the fracture area of the bone, may be compact or with small circular holes (1 mm), at a distance of 0,5 mm and an inclination of 20˚, opposite the direction of the large holes.

MECHANICAL AND MORPHOLOGICAL CHARACTERIZATION



Square
L_{holes} = 4 mm

Hexagon
L_{holes} = 4 mm

Ellipse
$Ø_{1\ holes}$ = 4 mm
$Ø_{2\ holes}$ = 3 mm

Circle
$Ø_{holes}$ = 4 mm

Ellipse
$Ø_{1\ holes}$ = 3 mm
$Ø_{2\ holes}$ = 4 mm

Circle
$Ø_{holes}$ = 2 mm

Ellipse
$Ø_{1\ holes}$ = 2 mm
$Ø_{2\ holes}$ = 3 mm
$Ø_{middle\ holes}$ = 1 mm

Circle
$Ø_{holes}$ = 4 mm
$Ø_{middle\ holes}$ = 1 mm

Monocomponent implants

Bicomponent implants

FDM 3D PRINTING OF DIFFERENT MODELS

Finite Element Simulation and numerical modeling of mechanical stresses applicable to long bone fixators.

SELECTIVE REFERENCES: [1] M. Navarro, A. Michiardi, O.Castano, J.A. Planell, *Biomaterials in orthopedics*, Journal of The Royal Society Interface, 5(27):1137-58, August 2008; [2] Z. Sheikh, S. Najeeb, Z. Khurshid, V. Verma, H. Rashid, M. Glogauer, *Biodegradable Materials for Bone Repair and Tissue Engineering Applications Materials*, 2015, 8, 5744-5794; [3] G. Chandra, A. Pandey, S. Pandey, *Design of a biodegradable plate for femoral shaft fracture fixation*, Medical Engineering and Physics.

Corresponding author:
Prof. dr. habil. ing. Florin Miculescu
Politehnica University of Bucharest,
Faculty of Materials Science and Engineering
f_miculescu@yahoo.com www.florinmiculescu.ro

Development and experimental validation of 3D bioprinting software for building model tissues for cancer research

research project

Arjoca Stelian, Neagu Adrian, Bojin Florina, Tanasie Gabriela, Gavriliuc Oana

Victor Babes University of Medicine and Pharmacy Timisoara, Timisoara, Romania

Three-dimensional (3D) bioprinting is being used nowadays for the fabrication of functional living tissues. While still in its early stages, this technology proves great potential in creating transplantable tissues and facilitating personalized drug testing. Remarkable progress has been also shown in the field of cancer research. Recently, scientists from our group from the Victor Babes University of Medicine and Pharmacy Timisoara in collaboration with researchers from the OncoGen Center for Gene and Cellular Therapies in the Treatment of Cancer of the Pius Brinzeu Emergency Clinical County Hospital Timisoara created 3D bioprinted models of the tumor microenvironment and studied their evolution. Nevertheless, 3D bioprinting still faces challenges, many of which are related to bioprinter programming. G-code, the traditional method of providing printing instructions, is time-consuming and inflexible to geometry or process adjustments. Therefore, this project aims to develop and validate Python programs that can generate G-code for the bioprinting of tissue constructs with complex and adjustable geometries. In addition, the bioprinting process will be optimized to produce toroidal and triple-layered structures containing SK-BR-3 cells and peritumoral cells (tumor associated fibroblasts – TAFs – and peripheral blood mononuclear cells - PBMCs). Cell viability will be assessed as a function of incubation time and bioprinting conditions, whereas cell proliferation will be investigated via immunohistochemistry.

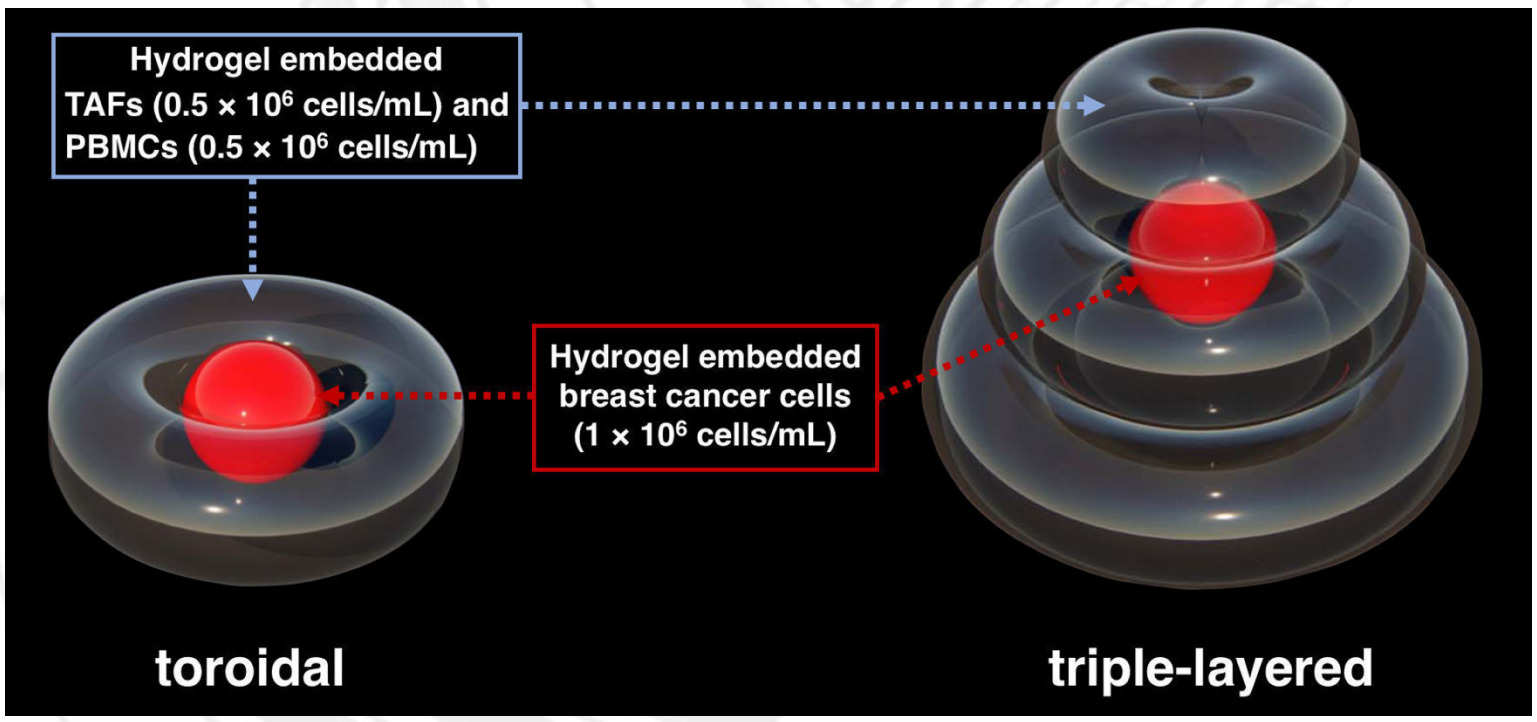


Figure: Digital designs of our proposed tumor models: toroidal and triple-layered. The red spheres represent droplets of breast cancer cells embedded in hydrogels, surrounded by strands of hydrogel containing peritumoral cells (shown in translucent grey).

Contact: arjoca.stelian@umft.ro

Acknowledgement: This research is funded by the Victor Babes University of Medicine and Pharmacy Timisoara, grant number 1POSTDOC/1310/31.01.2020.

Reference: Bojin, F.; Robu, A.; Bejenariu, M.I.; Ordodi, V.; Olteanu, E.; Cean, A.; Popescu, R.; Neagu, M.; Gavriliuc, O.; Neagu, A.; Arjoca, S.; Păunescu, V. 3D Bioprinting of Model Tissues That Mimic the Tumor Microenvironment. *Micromachines* 2021, **12**, 535. https://doi.org/10.3390/mi12050535

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

MINISTRY OF EDUCATION AND RESEARCH

DEVICE AND METHOD FOR DISPOSAL AND COLLECTION OF PATHOLOGICAL PRODUCTS

G

Authors: Sabău Dan, Sabău Alexandru Dan, Dumitra Anca Maria, Țîțu Aurel Mihail

Patent request: A 00004 2013 / 04.01.2013

DESCRIPTION

The invention refers to a method and a device of abdominal collection of some corpuscular/hydrous structures with a diameter smaller than 10 mm. The collecting methods are based on the existence of a closed, hyperbaric chamber (abdominal cavity) and of several gallstones fragments, coagulates, tissue dispersed or agglutinated, possibly hydrous, which require a relatively quick evacuation without any unnecessary movements of fragmentation and/or contamination.

The device, is made out of a tube with the interior diameter of circa 9-9.5-10 mm capable to evacuate the structures due to the difference in pressure between the interior and exterior of the abdomen, difference which can be emphasised by attaching an exterior aspirator.

On the path of the tube there is an eccentric collector which collects the structures or the evacuated liquid with the help of a deflector/ filter, which separates the air or liquid from the evacuated structures. The collector, is detachable and voidable when full. The filter can be quickly extracted and it can be cleaned. The device is kept airtight when pausing and decompressed intermittently after selecting and applying the intra-abdominal orifice of the suction unit on the solid or liquid structure that is aimed with the diameter smaller than the diameter of the tube which the abdominal decompression or the additional suction at the level of the external orifice could lead to the evacuation of the foreign matter.

Decompression is done manually (with the thumb) or instrumentally through a valve with flapper (rapid, sensitive, efficient) The efficiency of the evacuation can be increased by connecting with valve the evacuation ramification to a suction unit and connecting a rinsing system under the flapper which closes the system, it ensures the cleaning of the filter and device alternatively with the suction. The filter ensures the continuous functionality, without "plugs" of the external suction unit by creating a detour for the corpuscular structures and leaving the air or water pass through.

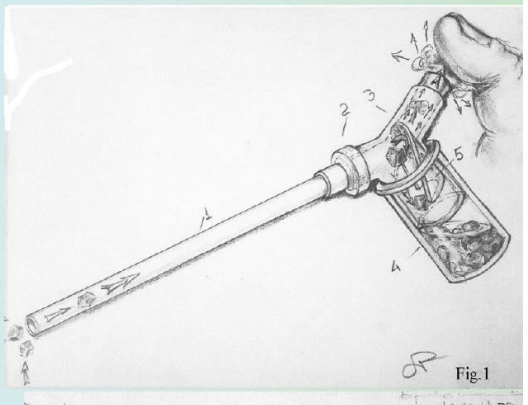


Fig.1

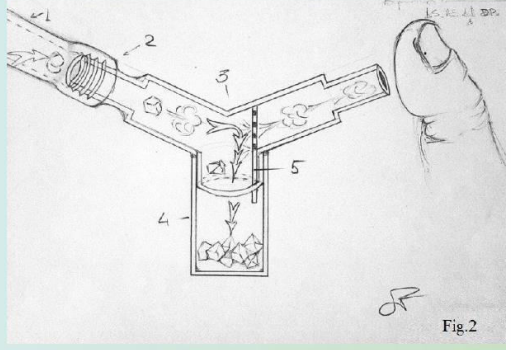


Fig.2

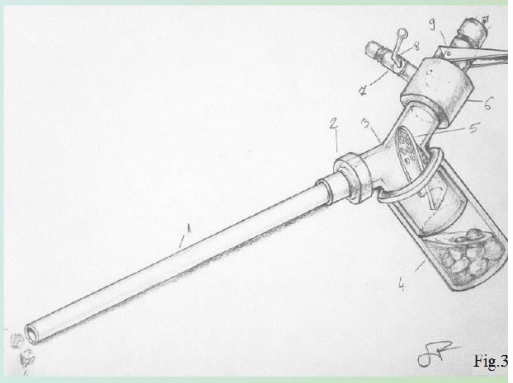


Fig.3

ADVANTAGES

-the extraction of the pathological products located or dispersed in the abdomen is done rapidly with storing for their intra-operatory analysis;
-the efficiency and the accessibility of the device in the entire abdomen, as well as in tight spaces, are remarkable;
-elimination of the contamination risk under the conditions of obtaining quick information;
-reduces the duration of the interventions;
-reduces the clogging of the suction unit by interposing the deflector filter;
-the capacity to quickly wash and clean the intra-operatory device which is modular with partial dismantling;
-the capacity to clean the intra-operatory filter through rinsing in backward flow without dismantling.

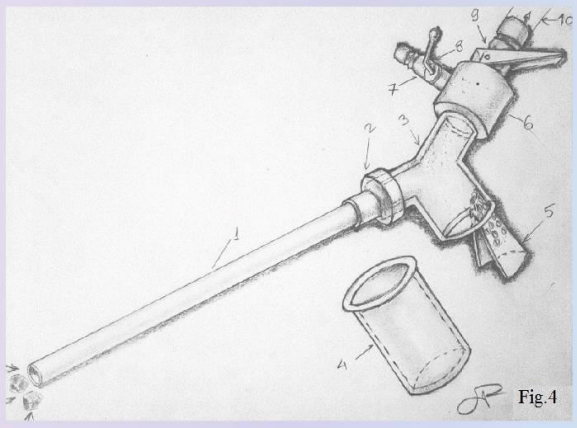


Fig.4

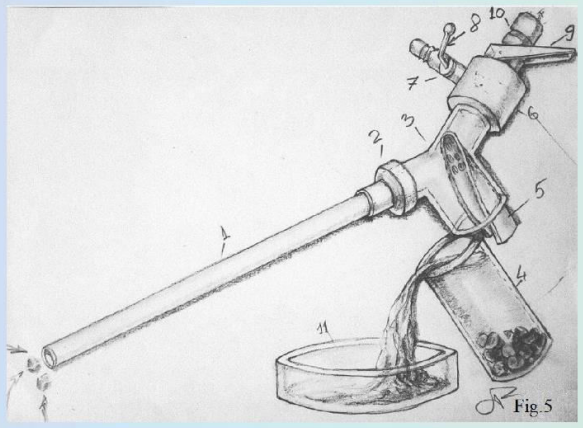


Fig.5

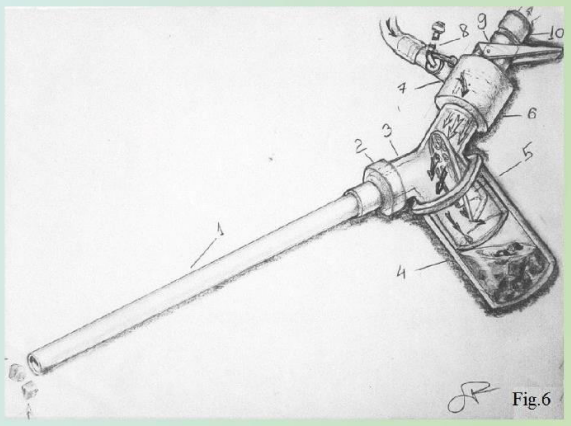


Fig.6

APPLICATIONS

- Destined for the minimal invasive surgery, especially laparoscopic, but also for open surgery;
- The method can be applied to gallstones up to 9-9.5 mm with container storage, quickly applying it to manoeuvres and protecting the tubular suction unit system from the cleaning/clearing manoeuvre by interposing a deflector filter which isolates the corpuscular elements from the liquid or gas ones.

Contact:
Prof. Eng.& Ec. Aurel-Mihail TITU, Sc.D. & Ph.D., Dr. Habil., D.H.C.
Manager of Regional Centre OSIM-EPO forIntellectual Property Protection (PatLib Sibiu);
President of Romanian Association for Alternative Technologies Sibiu (A.R.T.A. Sibiu);
The Academy of Romanian Scientists Associate Member;
Editor-in-Chief Nonconventional Technologies Review;
"Lucian Blaga" University of Sibiu,
Faculty of Engineering, Industrial Engineering and Management Department,
4, Emil Cioran Street, 101-100 Room, code 550025, Sibiu, ROMANIA
Mobile Phone: +40 744 390 290
Fax: +40 269 430 110
E-mail: mihail.titu@yahoo.com
http://www.revtn.ro
http://www.artasibiu.ro
http://osim.ro/despre-osim/centre-regionale/centrul-regional-sibiu/
http://www.epo.org/searching-for-patents/helpful-resources/patlib/directory/details-id_90.html

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

UMFT VICTOR BABEŞ

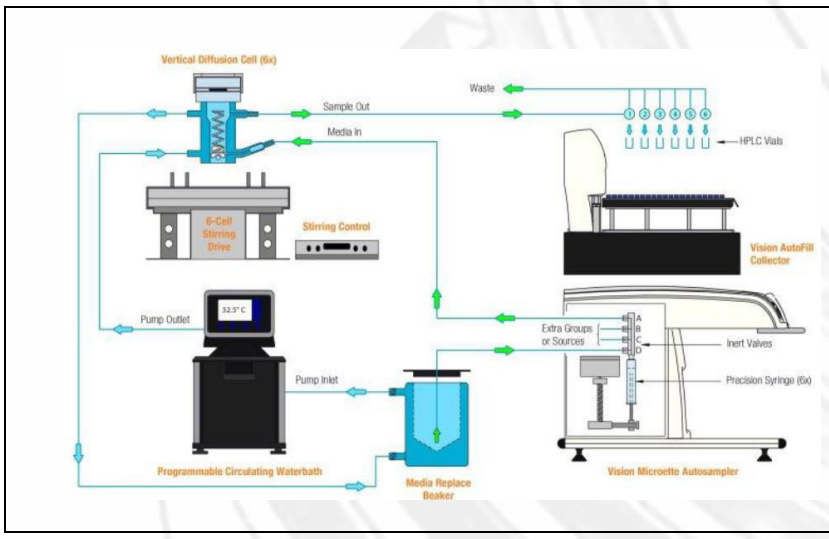
Medicated composition with propranolol hydrochloride and eucalyptol for topical treatment of infantile hemangiomas

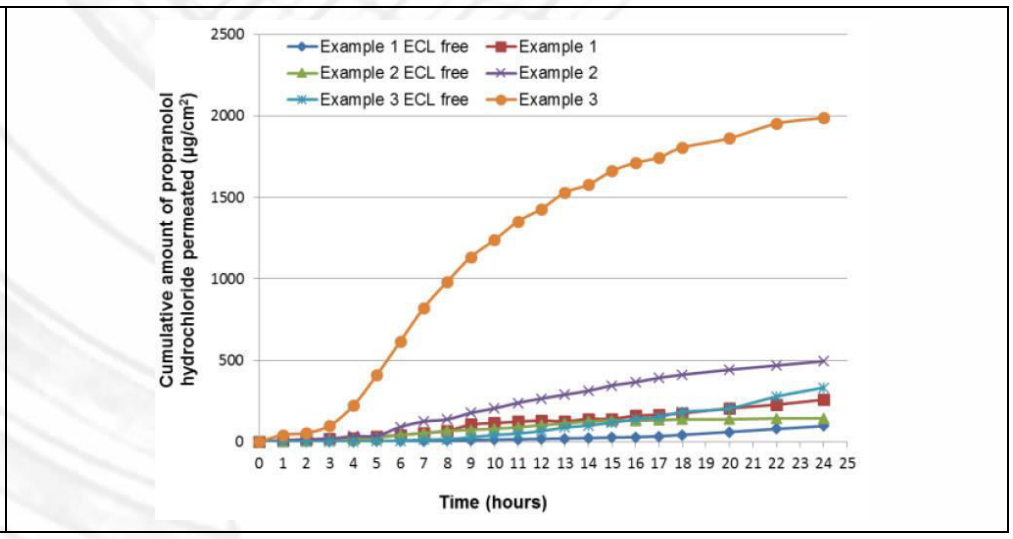
Patent no. 130963

Vlaia Lavinia-Lia, Olariu Ioana-Viorica, Coneac Georgeta-Hermina
Lupuliasa Dumitru, Vlaia Vicenţiu, Muţ Ana-Maria

G

This patent refers to a novel composition of medicated hydrogel for human use, containing propranolol hydrochloride and eucalyptol, intended for topical treatment of infantile hemangiomas. The medicated composition overcomes the disadvantage of low percutaneous permeation of propranolol hydrochloride, due its combination with eucalyptol, monoterpene used as penetration enhancer. According to the patent, the composition is: 1...3% propranolol hydrochloride, 2...5% eucalyptol, 2.5% hydroxypropylmethylcellulose, 10...20% propyleneglycol, 30...50% ethanol and distilled water to 100% (w/w). Compared to few topical propranolol hydrochloride compositions described in literature, the present invention can be considered a safer and more effective drug for topical treatment of infantile hemangiomas.





Eucalyptol acted as skin penetration enhancer in all three tested formulations, the intensity of this effect being proportional to its concentration Used at a concentration of 5 in the hydrogel formulation of the present invention (Example 3 eucalyptol showed the most pronounced effect of increasing the percutaneous permeation of propranolol hydrochloride, producing the highest values for steady state flow and cumulative amount of drug permeated through the skin, that were approximately 7 5 times and respectively 6 times higher than those obtained with the control formulation.

Contact:

Vlaia Lavinia-Lia

Telephone: +40723570499 Email: vlaia.lavinia@umft.ro

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

ROMANIAN INVENTORS FORUM

1. „Dunărea de Jos" University, Faculty of Medicine and Pharmacy, Galați, Romania

2. State University of Medicine and Pharmacy „Nicolae Testemițanu", Faculty of Stomatology, Departament of Orthopedic Dentistry „Ilarion Postolachi"

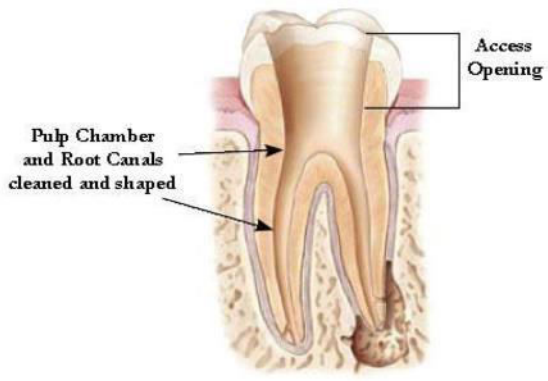
PROCEDURE FOR DECONTAMINATION THE ENDODONTIC SPACE AND THE PERIODONTAL PATHOGENIC MICROORGANISMS

G

Authors:

Kamel EARAR[1]
Anamaria ZAHARESCU[1]
Oleg SOLOMON[2]
Gabi TOPOR[1]

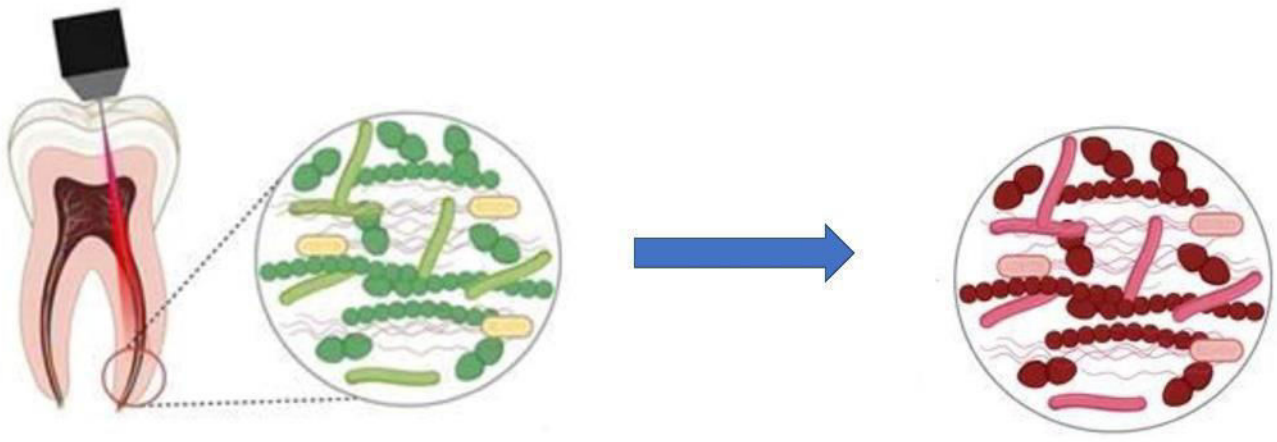
Patent application



This invention refers to a process for decontamination of the endodontic space and the periodontal pathogenic microorganisms used in dentistry.

There are used two unconventional treatment systems: the injection of 5% hydrogen peroxide, chemically stabilized and antimicrobial photodynamic therapy with DENMAT – SOL type laser.

Judicious mechanochemical decontamination, assisted by the coexistence of the two unconventional treatment systems, is the key for success in endodontic treatment of extensive chronic apical periodontitis.



Advantages:

- Efficient decontamination
- Easy to apply
- No development of bacterial, fungal and viral resistance
- Synergic effect
- A good resistance to recontamination of the endodontic space
- Reduces the time required for treatment
- Prevention by limiting the affected area
- Cheap process
- The components are easy to buy
- Low toxicity
- Reduced number of work steps

CONTACT

Kamel EARAR MD, PhD. Professor
Mailing address: Str. Alexandru Ioan Cuza 35, 800010, Galați, România
Phone: +40-748-930339
E-mail: erar_dr.kamel@yahoo.com
Anamaria ZAHARESCU MD, PhD. Lecturer
Mailing address: Str. Alexandru Ioan Cuza 35, 800010, Galați, România
Phone: +40-757-016857
E-mail: anamaria.zaharescu@ugal.ro
Oleg SOLOMON MD, PhD. Professor
Mailing address: Str. Mihai Viteazul 1A, Chișinău, MD-2004, Republica Moldova
Phone: +37-369-129599
E-mail: oleg.solomon@usmf.md

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Promoted by

ROMANIAN INVENTORS FORUM

organizers of EUROINVENT - European Exhibition of Creativity and Innovation, Iași - Romania

HIGH ENTROPY ALLOY FOR MEDICAL SURGICAL APPLICATIONS IN THE FeMoTaTiZr METALLURGICAL SYSTEM AND METHOD OF OBTAINING

G

Authors:

GEANTĂ Victor, VOICULESCU Ionelia, ŞTEFĂNOIU Radu
BINCHICIU Horia,
VIZUREANU Petrică, SANDU Andrei Victor, BĂLȚATU Simona,
KELEMEN Hajnal,
CODESCU Mirela Maria, MARINESCU Virgil

– UNIVERSITY POLITEHNICA OF BUCHAREST

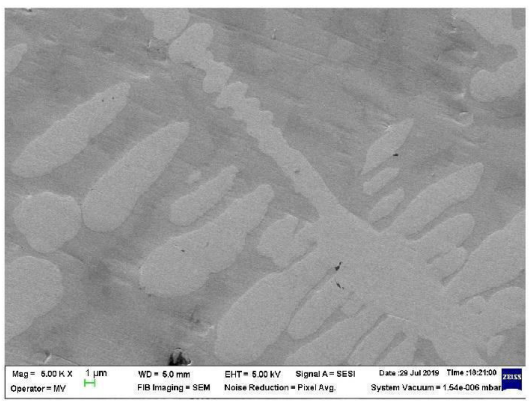
– SUDOTIM AS TIMISOARA

– GHEORGHE ASACHI TECHNICAL UNIVERSITY OF IASI

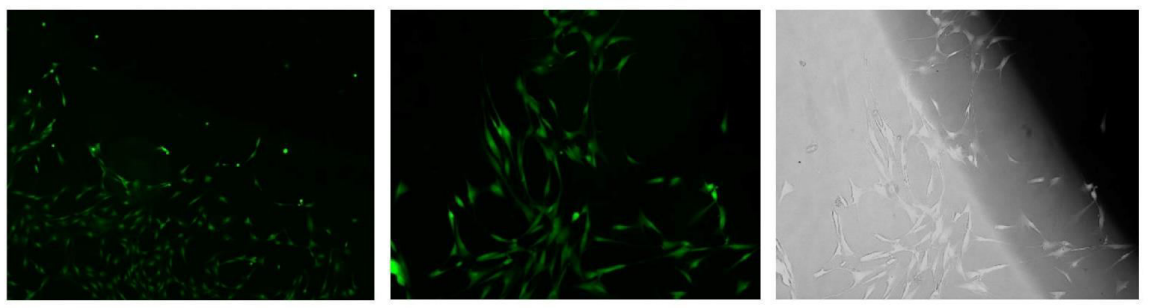
– UNIVERSITY OF MEDICINE, PHARMACY, SCIENCE AND TECHNOLOGY TARGU MURES

– N.I.R.D. FOR ELECTRICAL ENGINEERING ICPE CA BUCHAREST

Patent Pending
OSIM
RO134978

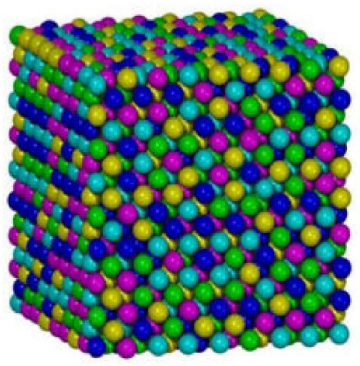


Casted state alloy



Viability, adhesion and proliferation of mesenchymal stem cells isolated from bone tissue on FeMoTaTiZr alloy samples in fluorescence (50x); fluorescence (100x) and phase contrast (100x).

The metallic load on the copper plate and the resulted miniingots



The present invention relates to a high metal entropy from the FeMoTaTiZr system, consisting of elements with the lowest biotoxicity on the human body, used in the medical field for orthopedic implants, characterized in that it has a very good biocompatibility, behavior appropriate to processing mechanical and high mechanical strength in conditions of wear bone-alloy system, combined with mechanical fatigue, as well as the process of obtaining it.

The alloy with high entropy from the FeMoTaTiZr system, consists of elements with the lowest possible toxicity to the human body and which is the object of the invention, has high hardness and toughness, being composed of five metal elements of advanced purity, having chemical composition located in the value ranges, as follows: Fe = 9.5 - 12.5%, Mo = 19 - 22%, Ta = 36 - 40%, Ti = 9 - 11.5%, Zr = 18 - 21% with a density of 10.8 - 12 kg / dm3 and a melting temperature of 2300 - 2400oC, material which before heat treatments (in the molded state) has average microd hardness values of 694 HV0.5, and after the application of specific heat treatments (heating up to 900oC, stationary on the bearing for 2 hours, hardening in water) has an associated hardness of 800 HV0.5, being obtained by melting and homogenization in a vacuum spring remelting plant under a protective argon atmosphere.

- The process for obtaining the high entropy alloy is characterized by the fact that the metallic materials used to obtain Fe, Mo, Ta, Ti, Zr are of the most advanced purity (over 99.3%), selected and mechanically prepared suitable for introduction into the RAV (Vacuum Arc Melting) installation, which ensures the working temperature under the action of the electric arc of at least 3500 degrees C, with pressure level of 3x10-3 mbar and then with argon atmosphere, with load calculation that account of the losses of elements that occur during the elaboration process, losses depending on the size of the working cell, the selection (order of addition) and the way of working, the order of addition being Ti, Zr, Ta, Mo, Fe to create a metal baths capable of rapidly dissolving elements with high melting temperature.

CONTACT
E-mail: euroinvent@yahoo.com
Web: www.afir.org.ro & www.euroinvent.org
President: Eng.PhD. Andrei Victor SANDU

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Promoted by

ROMANIAN INVENTORS FORUM

organizers of EUROINVENT - European Exhibition of Creativity and Innovation, Iași - Romania

HIGH ENTROPY ALLOY FROM MoNbTaTiZr SYSTEM WITH YTRIUM FOR MEDICAL APPLICATIONS AND CONSOLIDATION PROCESS

G

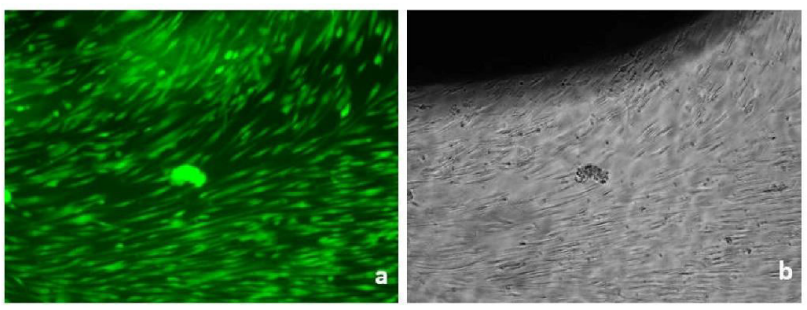
Authors:

VOICULESCU Ionelia, GEANTĂ Victor, ŞTEFĂNOIU Radu, KELEMEN Hajnal,
VIZUREANU Petrică, SANDU V. Andrei, BĂLŢATU M. Simona, CODESCU Mirela Maria, PĂTROI Delia,
BINCHICIU Emilia Florina

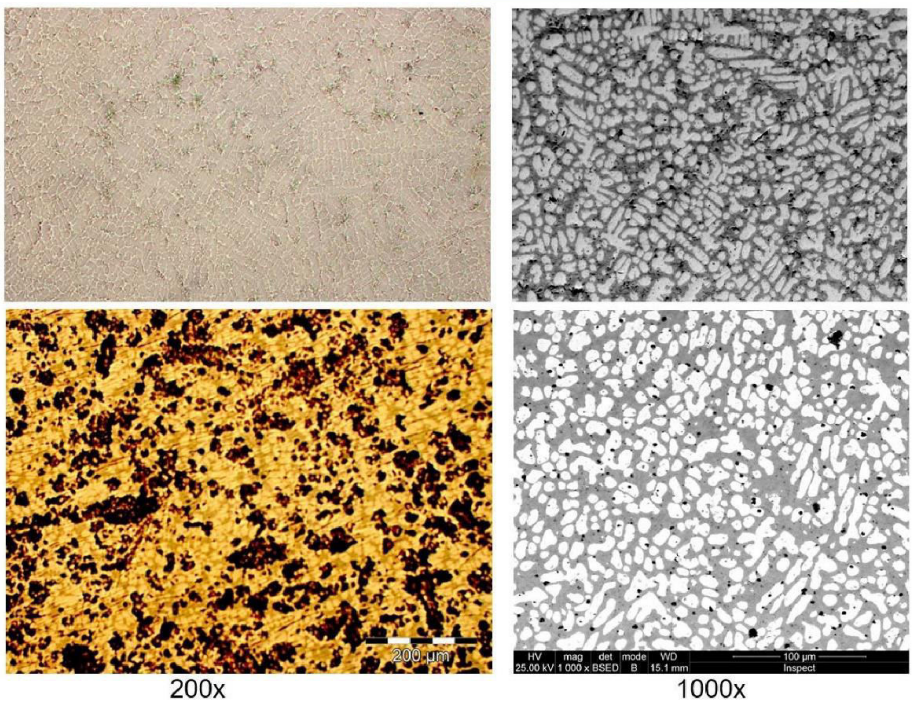
– UNIVERSITY POLITEHNICA OF BUCHAREST
– GEORGE E. PALADE UNIVERSITY OF MEDICINE, PHARMACY, SCIENCE AND TECHNOLOGY TARGU MURES
– GHEORGHE ASACHI TECHNICAL UNIVERSITY OF IASI
– N.I.R.D. FOR ELECTRICAL ENGINEERING ICPE CA BUCHAREST
– SUDOTIM AS TIMISOARA

Patent Pending
OSIM
RO134977

Water-cooled copper plate in which the metallic materials of the load are placed in order to melt high entropy alloys under an inert argon medium in the RAV installation.



Viability, adhesion and proliferation of the human fibroblast cell line on contact with the alloy: a) 100x fluorescence; b) FOV phase contrast 100x, after 10 days.



200x 1000x

The Microstructure of the biocompatible MoNbTaTiZrY alloy after the application of the heat treatment. Homogenization of the dendritic bi-phase solid solution and quenching of intermetallic compounds (1000x).

The multi-element biocompatible alloy MoNbTaTiZr microalloyed with Y for medical applications of the present invention simultaneously has high hardness and compressive strength values, being composed of five metal elements of advanced purity, having the equimolar chemical composition of: Mo = 18.86 %; Nb = 18.27%; Ta = 35.56%; Ti = 9.43%; Zr = 17.88%: and the percentage composition imposed by: Mo = 17 - 19%; Nb = 17 - 19 %%; Ta = 34 - 36%; Ti = 8.5 - 10%; Zr = 16.5 - 18.5%, microalloy with yttrium in proportions between Y = 0.1 - 0.5% to reduce brittleness, granulation finish, reduce the tendency of brittle fracture, globulation of oxide films separating on the boundaries grains, inhibition of the tendency to segregate sulfur at grain boundaries with beneficial consequences for increasing intergranular cohesion and reducing the tendency to crack or weaken, reducing the total concentration of dissolved oxygen in the metal matrix and improving toughness, having a density in the range 10.5 – 11.3 g/cm3 and liquid temperature between 2300 – 2500 degrees C. This alloy can be obtained by a melting process in a vacuum spring remelting (RAV) installation, with melting at least 5 times and rotating on the seating surfaces to homogenize the chemical composition and the microstructure, whose mechanical characteristics can be increased by applying a heat treatment of homogenization at 900oC with maintenance for 2 hours, followed by rapid cooling in water, from average hardness values between 515 - 565 HV0.5 to average hardness values between 850 -1000 HV0. 5. The biocompatibility of the alloy has been demonstrated by cell proliferation tests up to 100% confluence of the human fibroblast line, both in the vicinity of the alloy and on its surface.

ADVANTAGES:

- The material made is homogeneous and has concomitant properties of high hardness and biocompatibility, being microalloyed with Y to finish the granulation and to reduce the risk of embrittlement by uniform dispersion of oxide films;
- It allows obtaining in the metallic structure high hardnesses by applying short-term heat treatments and at lower temperatures than other similar alloys in the literature, reaching values of 1000 HV0.5;
- The chemical composition can be rigorously controlled within the technological process of obtaining by using some metallic materials of advanced purity in vacuum remelting installations;
- The heat treatment procedure provides protection against oxidation of the material, by packing in aluminum foil and wrapping in kaolin and then placing it in the treatment furnace under a layer of quartz sand.

CONTACT
E-mail: euroinvent@yahoo.com
Web: www.afir.org.ro & www.euroinvent.org
President: Eng.PhD. Andrei Victor SANDU

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

MOLDOVA STATE UNIVERSITY
Scientific Research Laboratory
Advanced Materials in Biopharmaceutical and technical
Alexe Mateevici str. 60, Chisinau, MD-2009, Republic of Moldova
Tel.: +373 69434910
E-mail: romanrusnac8@gmail.com

HR EXCELLENCE IN RESEARCH

USE OF NITRATO-[*N*-CYCLOHEXYL-*N'*-(PYRIDIN-2-YLMETHYLIDENE)-CARBAMOHYDRAZONETHIOATOCOPPER AS AN INHIBITOR OF THE REPRODUCTION OF BACTERIA OF THE SPECIES *ACINETOBACTER BAUMANNII*

PATENT: MD 4761/05.03.2020

AUTHORS: Aurelian GULEA, Roman RUSNAC, Greta BĂLAN, Anna RUSNAC, Nicoleta NICOLENCO, Victor ŢAPCOV

APPLICATION FIELDS: Medicine and Pharmaceutics.

AIM: The present invention consists in obtaining a novel coordination compound which possesses high bacteriostatic and bactericidal activity compared to *acinetobacter baumannii.*

SOLUTION: For the first time as an inhibitor of the growth and multiplication of bacteria of the species, *Acinetobacter baumannii* a coordination compound of copper (II) which contains a new combination of already known chemical bonds that manifest activity antimicrobial against *Acinetobacter baumannii* bacteria, and which exceeds 3 times the analogous characteristics of Gentamicin.

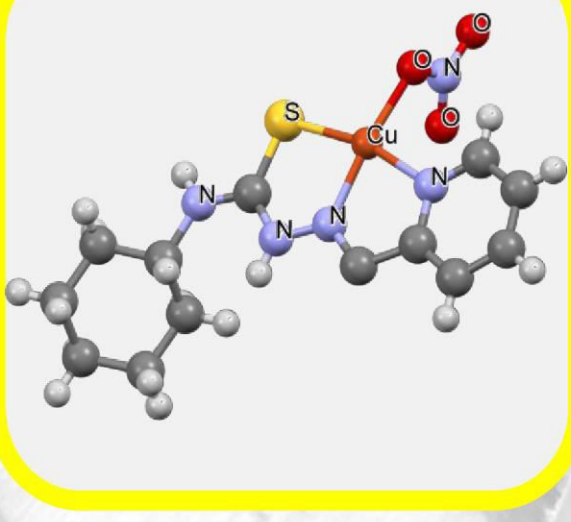


Figure. Crystalline structure of nitrato-[N-cyclohexyl-N'-(pyridin-2-ylmethylidene)carbamohydrazonethioatocopper(II)

Table

The bacteriostatic and bactericidal activity

Minimum inhibition concentration (MIC) and minimum bactericidal concentration (CBM) of the declared compound against Bacillus cereus bacteria compared to the prototype, (μg/mL).

Compound	MIC	MBC
Initial compounds[a)]	> 10 000,0	> 10 000,0
Gentamicin	16.0	32.0
Nitrato-[*N*-cyclohexyl-*N'*-(pyridin-2-ylmethylidene)-carbamohydrazonethioatocopper (II)	7.81	7.81

- Note: a) Initial compounds - $Cu(NO_3)_2 \cdot 3H_2O$ and *N*-cyclohexyl-2-[(pyridin-2-yl)methylidene]-hydrazine-1-carbothioamide

ADVANTAGES: the compounds exhibit antimicrobial activity against *Acinetobacter baumannii*, they can be used in medicine and veterinary medicine for the prevention and treatment of disease causing microbes.

IMPLEMENTATION STAGE: Prototype.

ACKNOWLEDGMENTS: This research was supported by the project 20.80009.5007.10 of the Ministry of Education, Culture and Research of the Republic of Moldova

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

MOLDOVA STATE UNIVERSITY
Scientific Research Laboratory
Ecological Chemistry and Modern Chemical Technologies
Alexei Mateevici str. 60, Chisinau, MD-2009, Republic of Moldova
Tel.: +373 69388268; E-mail: mvgonta@yahoo.com

HR EXCELLENCE IN RESEARCH

PROCESS FOR OBTAINING FUNCTIONALIZED CHITOSAN WITH DIHYDROXYFUMARIC ACID

PATENT APPLICATION: MD a 2021 0048/2021.07.16

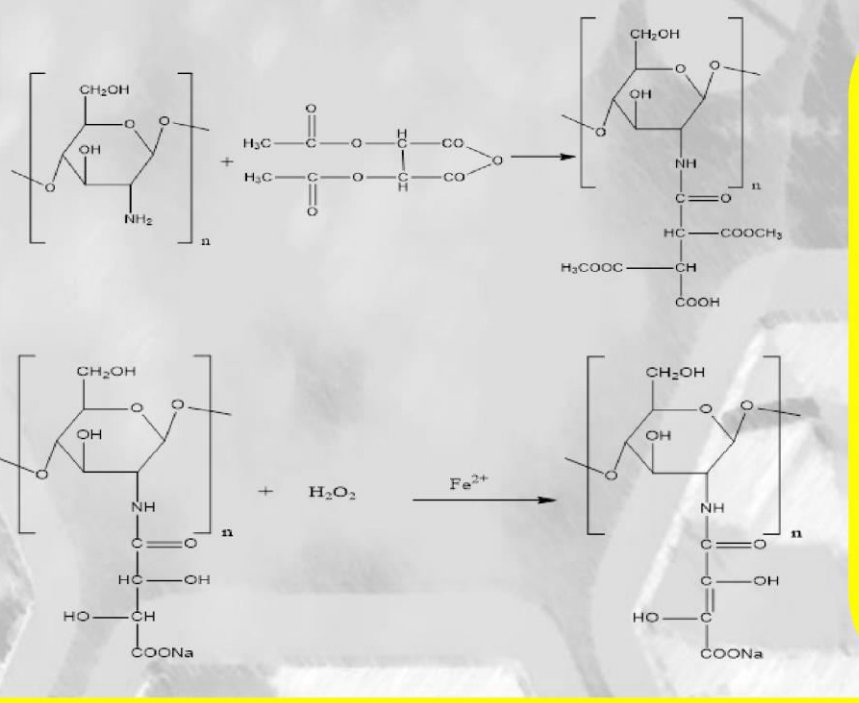
AUTHORS: Maria GONȚA, Iacob GUȚU , Mihai CEACÎRU

APPLICATION FIELDS: As an antioxidant in the cosmetic, food, pharmaceutical and biomedical technology.

AIM: Functionalization of chitosan with dihydroxyfumaric acid to obtain a polymeric composite with antioxidant properties.

SOLUTION: The new process of functionalization of chitosan with dihydroxyfumaric acid includes N-acylation of chitosan with diacetyl tartaric anhydride. Afterwards, chitosan with diacetyltartaric acid (Cht-ADAT) obtained undergo functionalization of chitosan by elimination of acetylated chitosan (Cht-ADAT) in alkaline hydrolysis media. In result we have synthesized chitosan functionalized with tartaric acid (Cht.AT), which was oxidated with cold Fenton reagent to obtain Cht-DFH2Na.

It was found that the concentration of the oxidative particle of DPPH, consumed over time at the interaction with non-functionalized DFH2Na is lower compared to the consumption of DPPH for CH: DFH2Na. Thus, we find that the CH: DFH2Na copolymer is about 2.5 times more active than DFH2Na.



Mechanisms of interaction of DPPH with reducing agents and formation of copolymer CH : DFH2Na

ADVANTAGES: In the proposed process the reactions are carried out in liquid phase which leads to an increase in the yield of the reaction. The formed product, chitosan with dihydroxyfumaric acid, shows antioxidant properties. Cheap reagents (tartaric acid, sodium hydroxide and hydrogen peroxide) are used and a high reaction yield product is obtained.

IMPLEMENTATION STAGE: In laboratory stage.

ACKNOWLEDGMENTS: This research was supported by the STCU research project # 6377.

Bioengineering of Implantable 3D Vascular Bioconstructs using Rapid Prototyping Techniques

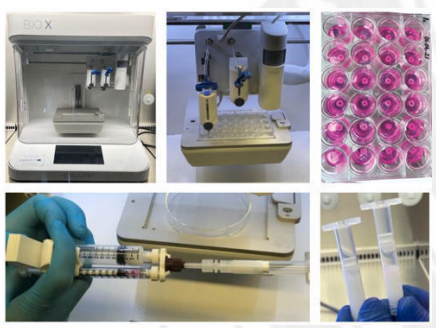
Project PN-III-P1-1.1-PD-2019-1213

Authors: Alexandru Nistor, Stelian Arjoca, Florina Bojin, Andreas Zoric, Andreas Salagean, Virgil Paunescu

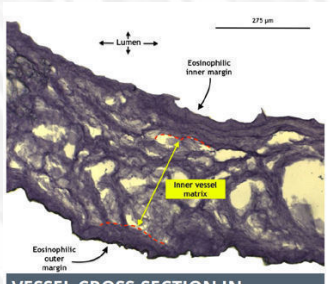
Category G

Description: 3D bioprinting is currently used for developing oncological research models such as organ-on-chip or organoid printing, involving the manufacturing of cellular and extracellular components of a tissue or organ. Ensuring adequate vascular supply for large organoids remains a challenge, due to the need for dedicated vascular supply. In this study, vascular bioconstructs of 3-4 mm diameter were fabricated following bioink pre-cellularization and incubation.

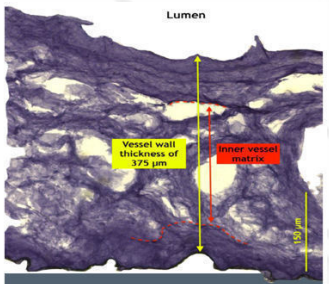
Methodology: A 3 mm diameter vessel was modeled via CAD/CAM using data obtained from rat femoral arteries via microCT scans and photoacoustic ultrasound imaging (Vevo-LAZR X, Fujifilm, Visualsonics). Human mesenchymal stem cells(hMSC) were cultured, expanded and suspended following Good Laboratory Practice standard operating procedures. Gelatin methacrylate-based hydrogel and alginate-hydrated cellulose nanofibrils hydrogel that present a similar structure as collagen were used to provide a scaffold for the cell suspension. Uniform cell distribution in the printing bioink was assured via rapid blending of the cell suspension and hydrogels. A BioX 3D bioprinter (BioX, CELLINK, Sweden) was used to print the mixture using 22G needles. Printed constructs were incubated for two weeks, followed by histological analysis via 4,6'-diamidino-2-phenylindole staining.



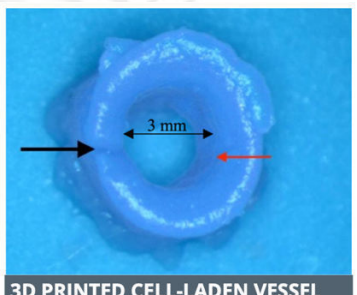
Top left: Cellink BioX 3D printer used for creating the bioconstructs. Top middle: 3D printer printing the cell-laden vascular constructs in 24 well-plate. Top right: 3D printed cell-laden vessels after 14 days of incubation. Bottom left: Rapid blending of the cell suspension and hydrogel used to create a uniform cell distribution. Bottom right: 3ml syringes filled with hydrogel-cell mixture, ready for 3D printing.



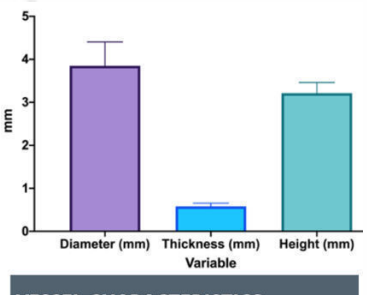
Paraffin cross-section of 3D printed vascular construct fragment demonstrating vessel wall thickness and vessel diameter, measured from the outer wall. (Ob.10x)



HE section of vessel test print with CELLINK hydrogel, most of the thickness of the vessel wall is determined by the inner vessel matrix (Ob. 20x)



Red arrow indicates a smooth vessel intimal wall, with no intimal break-down.
Black arrow shows site of external vessel wall rupture.



Characterization of the 66 3D-printed cell-laden vessel constructs in terms of diameter, thickness and vessel height. Values are means with SD.

Results: We established and refined a 3D-printing-protocol which generated 66 vessel constructs, with inner diameter of 3.84 ± 0. mm. After incubation, histological analysis demonstrated both cell viability and deposition of tissue-specific extracellular matrix.

Conclusion: Biofabricated small caliber vessels were successfully 3D-printed and cultured using this refined protocol, which allows for further studies regarding biocompatibility of the printed vessels.

Contact: alex.nistor@umft.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

UNIVERSITY OF NIŠ

FACULTY OF MECHANICAL ENGINEERING IN NIŠ

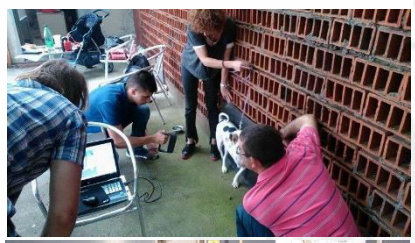
Design and production methodology of a personalized prosthetic dog leg

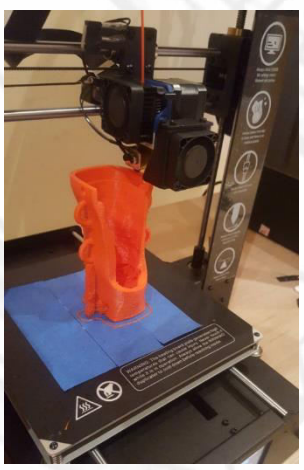
Student Project

Authors: Aranđelović Jovan, Turudija Rajko,
Drašković Pavle, Božić Nikola,
Marko Dimitrov, Arsić Milica

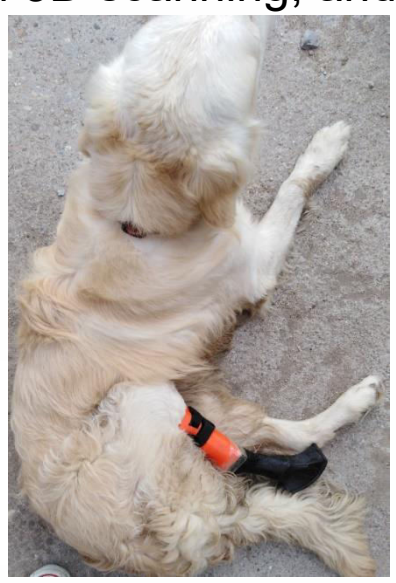
G

While attending the additive technology course and the basics of biomedical engineering course, students from the University of Niš - Faculty of Mechanical Engineering (from Serbia) participated in a project to develop a personalized prosthetic dog leg under the mentorship of their professors: Miroslav Trajanović, Miodrag Manić, Nikola Vitković and Jelena Milovanović. The main aim of this project was solving the mobility problems of two dogs with missing limbs: Gaša and Adonis. In order to create personalized prostheses first 3D scanning needed to be carried out to acquire the data needed for modeling, after this reverse engineering was used to design the orthosis and finally additive manufacturing was applied for prosthesis production. The project was successfully realized and the dogs have acquired greater mobility through the use of the developed prostheses. This project showcases the importance and benefits of cooperation between mechanical engineers and veterinarians in bettering the quality of life for disabled animals. Additionally, due to rapid technological advancements in the field of 3D printing and 3D scanning, and more manufacturers joining the 3D printer and 3D scanner market, personalized prosthetic solutions are starting to be more realistic, widespread and economically affordable solutions.





Contact: jovan.arandjelovic@masfak.ni.ac.rs,
https://www.masfak.ni.ac.rs/index.php/en/,
https://www.facebook.com/MFNbestCAD, **+38162405063**



APPARATUS AND METHOD FOR IMPROVING IMMUNITY IN NATURAL CONDITIONS OR EPIDEMIC/PANDEMIC STRESS

G

Authors: Marian Velcea, Cornel Ion Moldovan, Mihai Chetan, Ioan Curta, Ciprian Ene, Mandrea Lucian, Ioan Plotog, Bogdan Mihailescu, Catalin Robertino Hideg

A 2020/00412

Inventia se refera la un aparat si la o metoda de utilizare a aparatului in scopul imbunatatirii starii de sanatate prin cresterea imunitatii, in conditii naturale sau de stress epidemic/pandemic. Aparatul de imbunatatire a imunitatii este constituit din 23 de dispozitive biorezonante pasive realizate conform brevetului WO 2018037379 si calibrate pe frecventa de 4,32 MHz, care se ampaseaza simultan pe punctele de acupunctura cu care interactioneaza: S (ST) 36 , IG (SJ) 4, S (ST) 6, P (LU) 6, R (KID) 7, VU (BL) 12, 13, 43, R (KID) 1, P (LU) 1, P (LU) 7, VC (REN). Metoda de utilizare a aparatului de imbunatatire a imunitatii in conditii de stress epidemic/pandemic si natural consta in stimularea prin intermediul aparatului a celor 23 de punctele de acupunctura precizate, pentru un interval de timp total de stimulare de aproximativ 30 min, la un interval de 1 ora dupa micul dejun, cu un numar maxim de 14 sedinte de stimulare/luna, de 3-4 ori per an.

The invention relates to an apparatus and to a method of using the apparatus for the purpose of improving health by increasing immunity, under natural conditions or from epidemic / pandemic stress. The immunity enhancing device consists of 23 passive bioresonance devices made according to patent WO 2018037379 and calibrated on the frequency of 4.32 MHz, which are simultaneously impassioned on the acupuncture points with which it interacts: S (ST) 36, IG (SJ) 4, S (ST) 6, P (LU) 6, R (KID) 7, VU (BL) 12, 13, 43, R (KID) 1, P (LU) 1, P (LU) 7, VC (REINDEER). The method of using the immunity enhancing device in conditions of epidemic / pandemic and natural stress consists in stimulating through the device the 23 acupuncture points specified, for a total stimulation time interval of approximately 30 min, at an interval of 1 hour after breakfast, with a maximum number of 14 stimulation sessions / month, 3-4 times a year.

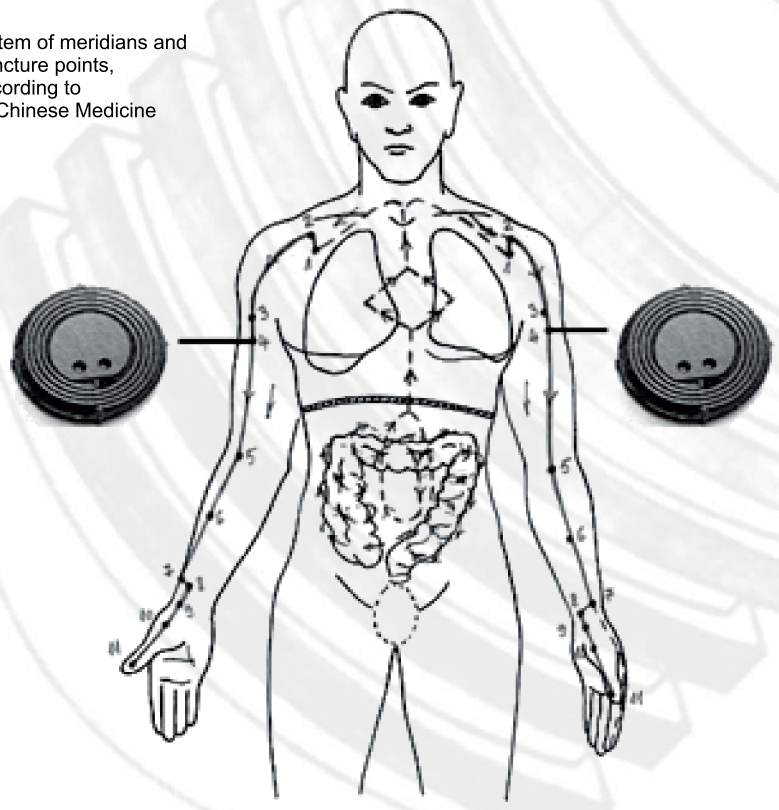


Fig. 1. The system of meridians and acupuncture points, according to Traditional Chinese Medicine

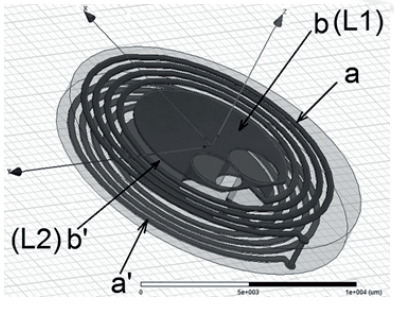


Fig. 2. Passive bioresonant device according to WO 2018037379 with 2 interaction planes

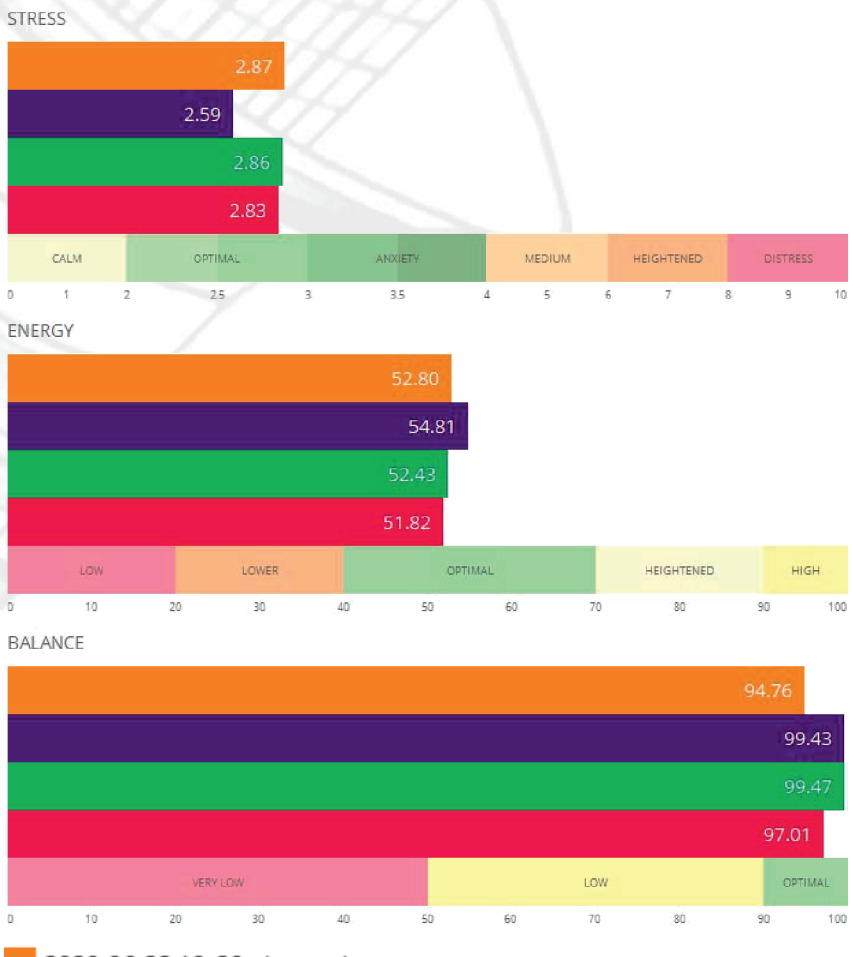


Fig. 3. Example of reporting energy results provided by the Bio-Well device

Contact person: VELCEA Marian
E-mail: marian.nicolae.velcea@gmail.com

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

Asociația „Justin Capră“

G

DOCTOR TECH MULTI-NUMBERED INSOLES FOR ENERGY REBALANCING

Authors: Velcea Marian, Moldovan Corneliu-Ion, Plotog Ioan, Hideg Catalin-Robertino, Mihailescu Bogdan

RO 132423 A2 revendicare distinctă

The energy rebalancing Doctor Tech multi-numbered insoles are high frequency passive electronic devices of the electromagnetic patch type (PEM); they are applied to the footwear insoles for the purpose of the electromagnetic activation, at the sole level, of some specific acupuncture points or of some specific electrodermal active areas.

These help to diminishing the back pains caused by lower back pain (LBP) or lumbosciatica, to correcting the postural walking and balance disorders and to fighting chronic fatigue.

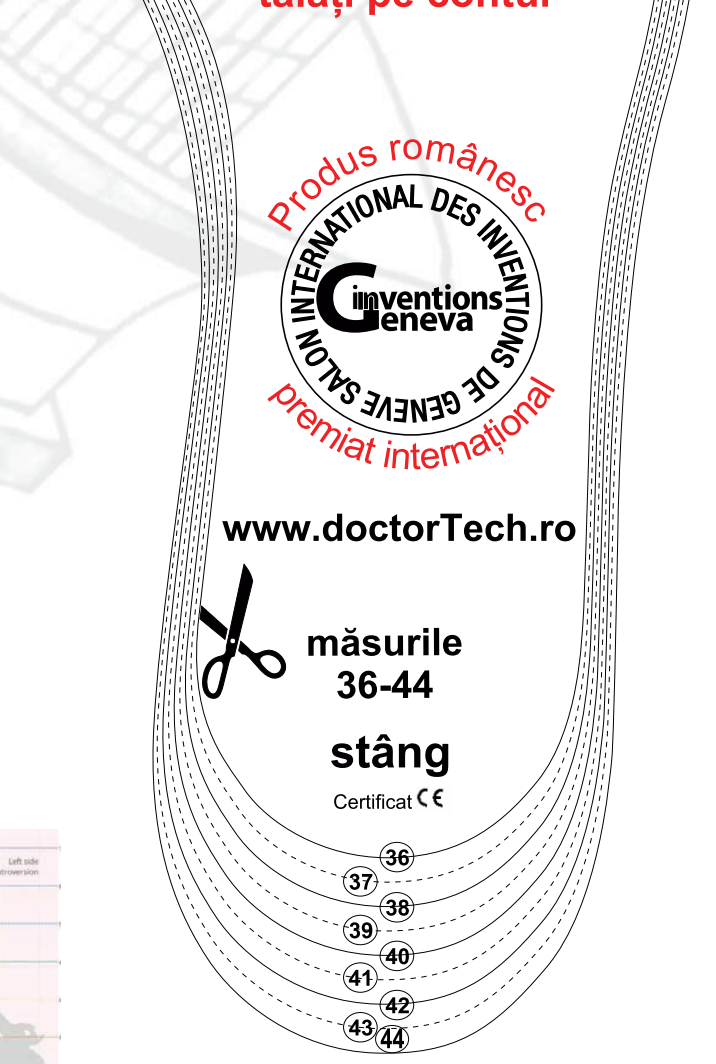
The bioenergetic Doctor Tech multi-numbered insoles have obtained the gold medal in the International Salon for Inventions in Geneva-Switzerland.

WHO CAN BENEFIT FROM THIS INVENTION?

The energy rebalancing Doctor Tech multi-numbered insoles are addressed to:

- women wearing high-heeled shoes;
- women carrying small children in their arms;
- persons performing office activities or sedentary persons;
- persons performing activities in the standing position;
- amateur or performance athletes;
- elderly people with walking difficulties;
- other persons with back pains, postural walking and balance disorders.

OPERATING PRINCIPLE - The energy rebalancing multi-numbered insoles Doctor Tech stimulate the electro-dermal active zones by means of a very high frequency electromagnetic field generated with an intensity proportional to the local energy imbalance.



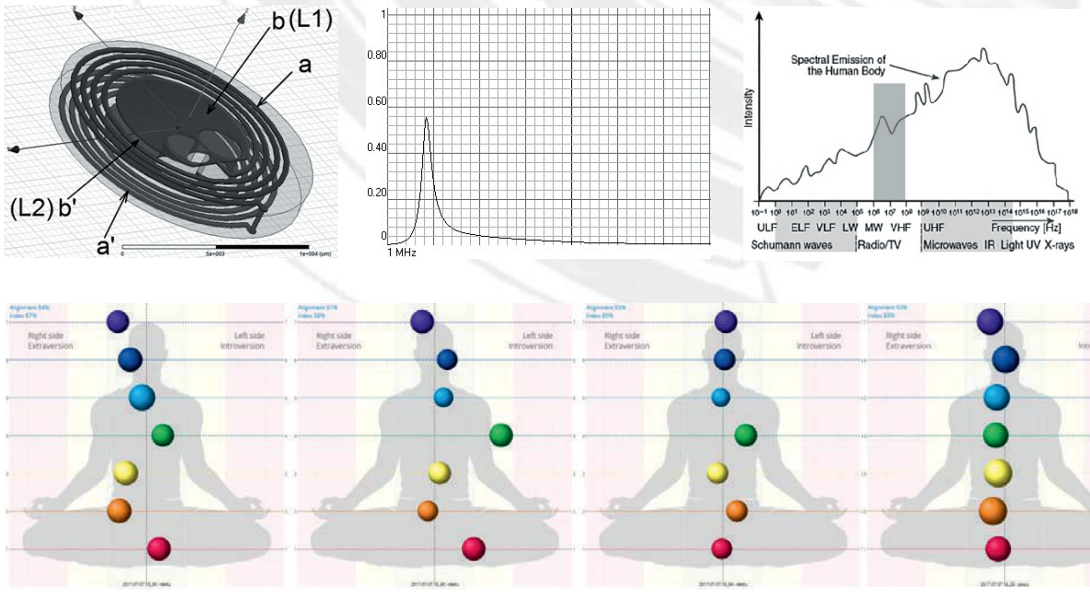


Fig. 1. The principle of interaction

Contact person: VELCEA Marian
E-mail: marian.nicolae.velcea@gmail.com

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

ASOCIAȚIA "Justin Capră"

MEDICAL EARRINGS FOR ENERGY REBALANCING

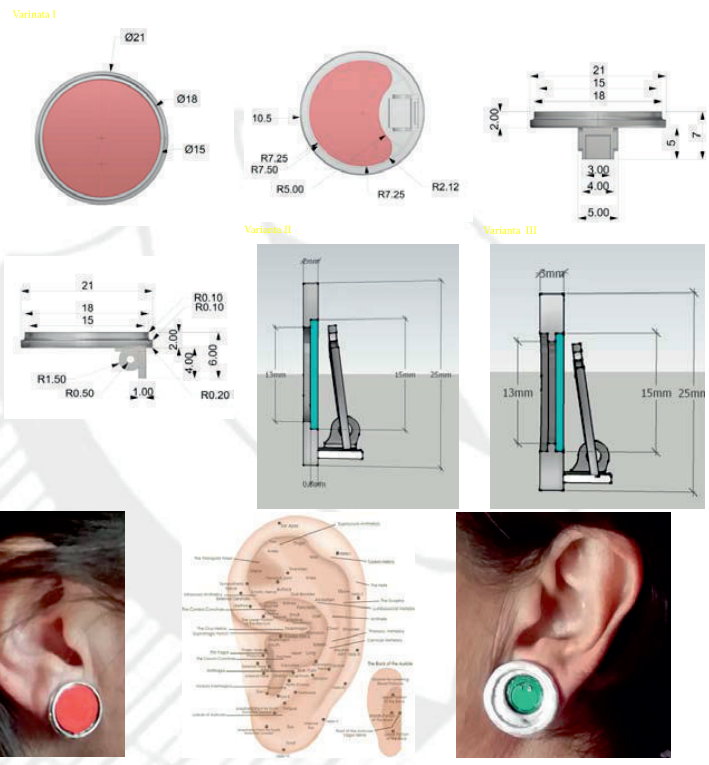
G

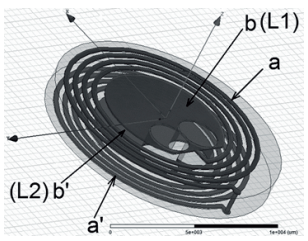
Authors: Marian VELCEA, Ion Cornel MOLDOVAN, Ioan PLOTOG, Cătălin Robertino HIDEG, Ioan CURTA, Etelka ANEBTAWI, Benjamin AVIDAN

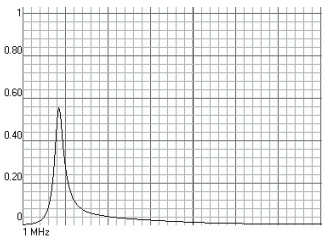
RO 132423 A2 revendicare distinctă
©2021 Doctortech SRL doctortech2000@yahoo.com

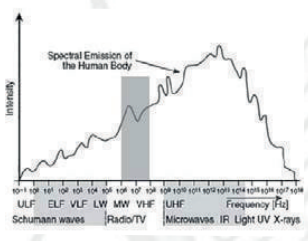
The invention relates to an ear-like medical device built to interact with acupuncture points located on the ear lobe and controlling the health of the eyes.

The device contains electromagnetic patches (PEMs) characterized by specific frequencies that are fixed above the active electrodermal points on the earlobe by means of screws or clips; the device acts as an intelligent acupuncture needle: their activation is ordered by their own biorhythm by the user's body. The device does not require a source of electrical power, being fed from the local electric field.



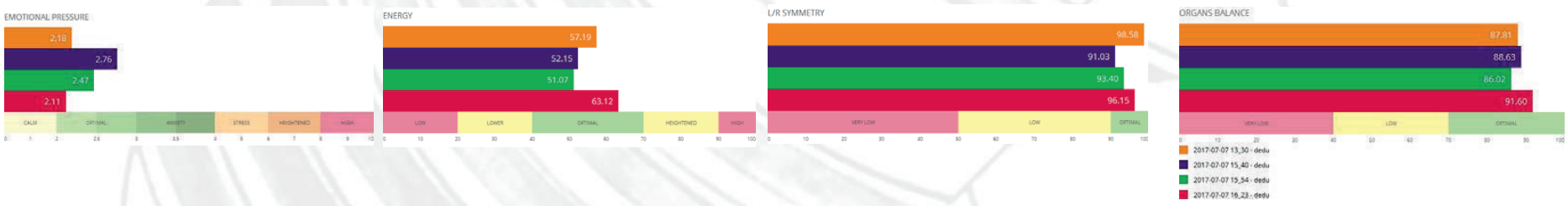






The power of the spectrum emitted by the human body (Bembenek, 1998).

The measurements show the decrease of the stress level, the left-right energetic balancing, the increase of the energy of eyes and the increase of the energy of the internal organs, with the consequence of the improvement of the general immunity.



©2019 Marian VELCEA

Give a better chance to your health!

Contact person: VELCEA Marian
E-mail: marian.nicolae.velcea@gmail.com

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

Asociația „Justin Capră“

G

Mumie – Gama de suplimente nutritive pe bază de răşini naturale

Ce este Răşina MUMIE?

Răşina Mumie este colectata la înălțimi de peste 2000-5000 de metri, din locuri greu accesibile omului: grote, peşteri şi stânci din zona Podişului Tibet şi Pamir.

În compoziția sa intră un întreg **complex de la 25 până la 40 de substanțe organice şi minerale**:

- produsele de descompunere a compuşilor polimoleculari (acizi zoomelanici, acizi humici, acid benzoic, oxalic, aminoacizi: fenilalanina, alanina, arginina, acid glutamic, acid aspartic, glicina, lisina, metionina, serina, tirozina, valina) şi alţi acizi;
- terpenoide, steroizi naturali;
- vitamine din grupele B şi P;
- fragmente de molecule polifenolice şi alţi compuşi);
- macro-şi microelemente (calciu, magneziu, siliciu, aluminiu, fier, mangan, seleniu, nichel, vanadiu, bariu, molibden, cadmiu, cupru, zinc, iod, bismut, crom, fosfor, cobalt, bor, stronfliu, beriliu, zirconiu, titan, argint, galiu);
- miere.

Cunoscutul medic german Max Gerson, afirma că, pentru a trăi, organismul uman are nevoie de 50 de microelemente, toate acestea regăsindu-se în răşina Mumie, fiind recunoscută ca un tonic puternic care acționează multilateral atât în cazul multor afecțiuni, cât şi asupra întregului organism.

Fiecare din elementele componente acționează asupra proceselor metabolice corespunzătoare ale organismului, activează procesele regeneratoare ale tuturor țesuturilor, au acțiune antitoxică (elimină reziduurile toxice din organism), antiinflamatoare, cresc imunitatea şi rezistența corpului, restabilesc funcțiile scăzute ale nervilor periferici şi ale centrilor de analiza ai creierului, participa la biosinteza ADN-ului celular, grăbind diviziunea şi mărirea numărului celulelor.

Mai mult de jumătate din elementele existente în tabelul lui Mendeleev se găsesc în răşina Mumie.

Administrarea sistematică a acestei răşini face să sporească numărul şi forța limfocitelor T şi a limfocitelor B, arsenalul de elită al sistemului imunitar. În medicină tradițională, răşina Mumie acționează direct, stimulând procesele de cicatrizare, totodată influențând curățarea rapidă a rănilor de microbi şi bacterii, inhibând evoluția proceselor inflamatorii, acționează cu succes în cazul rănilor (a celor purulente), accelerând procesul de epitelizare şi scurtând timpul necesar regenerării pielii.

Răşina Mumie are efecte pozitive asupra regenerării oaselor şi asupra diferitelor răni, stimulează procesul de regenerare a țesutului osos în cazul fracturilor şi scurtează perioada necesară refacerii.

©Damar General Trading. Toate drepturile rezervate. https://damargt.ro/

Contact person: VELCEA Marian
E-mail: marian.nicolae.velcea@gmail.com

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

University of Agronomic Sciences and Veterinary Medicine – București

G

Building multi-actor farm health teams and plans designed to reduce the antibiotic use in Romanian dairy farms: Disseminating Innovative Solutions for Antibiotic Resistance Management (DISARM)

Stelian Baraitareanu, Livia Vidu, Georgeta Stefan, Bogdan Mihai, Robert Mihai, Ion Silver Militaru, Dragos Birtoiu, Viorel Nastase, Marius Cristian Catana, Tiberiu Constantin, Alexandru Dutulescu, Stefan Vrabie, Ciprian Florin Furnaris, Doina Danes, Gina Fintineru, Laura Palczynski, Frederik Leen, Erwin Wauters

Keywords: antibiotic resistance, livestock farming, best practices, innovation, precision farming.

Multi-Actor Farm Health Teams (MAFHT) development and Multi-Actor Farm Health Plans (MAFHP) design for Romanian dairy farms are innovative solutions proposed to optimize the heard health management and to reduce the need for antibiotics in animals by H2020 DISARM Project.

MATERIALS AND METHODS

Dairy Farms

- Dairy Farm 1: 27 adult cows, 6 heifers, and 15 calves.
- Dairy Farm 2: 1006 adult cows, 349 heifers, and >750 calves.
- Dairy Farm 3: 678 adult cows, 125 heifers, and >200 calves.
- Dairy Farm 4: 720 adult cows, >150 heifers, and >600 calves.
- Dairy Farm 5: 24 adult cows, 10 heifers, and 6 calves.

MAFHT

It brings together the owner/manager of the dairy farm and his veterinarian, who are supported by other health and feed specialists. It has a facilitator who organizes the team's activity, supports the team in drafting the action plan, and identifies specialists who can provide information specific to the health of dairy farms. It is in charge to diagnose the dairy farms' main points of improvement that will increase the herd health status.

BioCheck scoring tool

Dairy farms were scored before the design of MAFHPs by using Biocheck.UGent™ (https://biocheck.ugent.be/en/questionnaires/dairy-cattle-11/start-questionnaire?language=en) questionnaire. The system provides various biosecurity scores and allows for benchmarking of farms and herd-specific advice for improvements (Damiaans et al., 2020).

MAFHP

It is based on the Planning-Do-Check-Adjust (PDCA) cycle. It is focused on:

1. Listing and determining goals and points of improvement;
2. SMART (Specific / Measurable / Acceptable / Realistic / Time-specific) definition of each goal;
3. Detailed description of the action plan to achieve each goal (each action of the plan is described, has a project owner and a project implementer, and clear deadlines for starting, running, and completing);
4. Monitoring execution of actions for each goal;
5. Adjusting action plan and/or goals.

RESULTS AND DISCUSSIONS

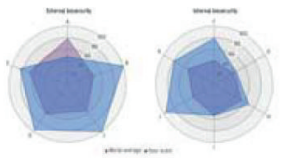


Fig. 1. Subcategories scores of the internal and external biosecurity obtained by using the biosecurity scoring system Biocheck.UGent™ in Dairy Farm 1

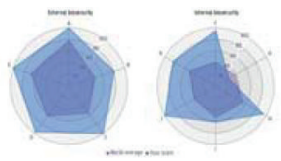


Fig. 2. Subcategories scores of the internal and external biosecurity obtained by using the biosecurity scoring system Biocheck.UGent™ in Dairy Farm 2

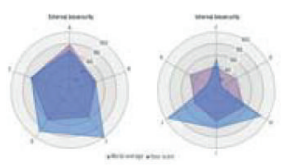


Fig. 3. Subcategories scores of the internal and external biosecurity obtained by using the biosecurity scoring system Biocheck.UGent™ in Dairy Farm 3

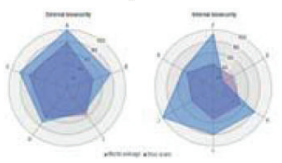


Fig. 4. Subcategories scores of the internal and external biosecurity obtained by using the biosecurity scoring system Biocheck.UGent™ in Dairy Farm 4

Fig. 5. Subcategories scores of the internal and external biosecurity obtained by using the biosecurity scoring system Biocheck.UGent™ in Dairy Farm 5

A. Purchase and reproduction;
B. Transport and carcass removal;
C. Feed and water;
D. Visitors and farmworkers;
E. Vermin control and other animals;
F. Health management;
G. Calf management;
H. Calving management;
I. Dairy management;
J. Adult cattle management;
K. Working organisation and equipment

In this study, all MAFHTs identified the farm practices to reduce bacterial disease and developed MAFHP tailored to specific situations in correlation with the results of the Biocheck.UGent™ and teams' meetings. MAFHT's practitioners considered the general recommendations regarding the holistic approach to disease control, considering the epidemiology of diseases and the specific situations of each farm including the risks and perceptions of risk by decision-makers (Dargatz et al., 2002; Wells et al., 2002; Dewolf & Van Immerseel, 2019).

Damiaans, B., Renault, V., Sarrazin, S., Berge, A.C., Pardon, B., Saegerman, C., & Dewulf, J. (2020, April 15). A risk-based scoring system to quantify biosecurity in cattle production. Preventive Veterinary Medicine, *179*, Article 104992, from https://www.sciencedirect.com/science/article/abs/pii/S0167587719308517?via%3Dihub

Dargatz, D.A., Garry, F.B., & Traub-Dargatz, J.L. (2002). An introduction to biosecurity of cattle operations. Veterinary Clinics of North America: Food Animal Practice, 18(1). 1–5, v.

Wells, S.J., Dee, S., & Godden, S. (2002). Biosecurity for gastrointestinal diseases of adult dairy cattle. Veterinary Clinics of North America: Food Animal Practice, 18(1). 35–55.

Dewulf, J., & Van Immerseel, F. (2019). Biosecurity in animal production and veterinary medicine. Leuven, BE: ACCO Publishing House.

CONCLUSIONS

Farmers usually face management and/or health problems in correlation with the age category and physiological condition. The most common calf diseases were respiratory and enteric, but these problems did not create severe outbreaks of disease. Large dairy farms are more common with hoof disorders while small dairy farms are more exposed to udder diseases.

Contact person: BĂRĂITĂREANU Stelian
e-mail: stelian.baraitareanu@gmail.com

disarm Disseminating Innovative Solutions for Antibiotic Resistance Management

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 817591

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

Asociația „Justin Capră“

G

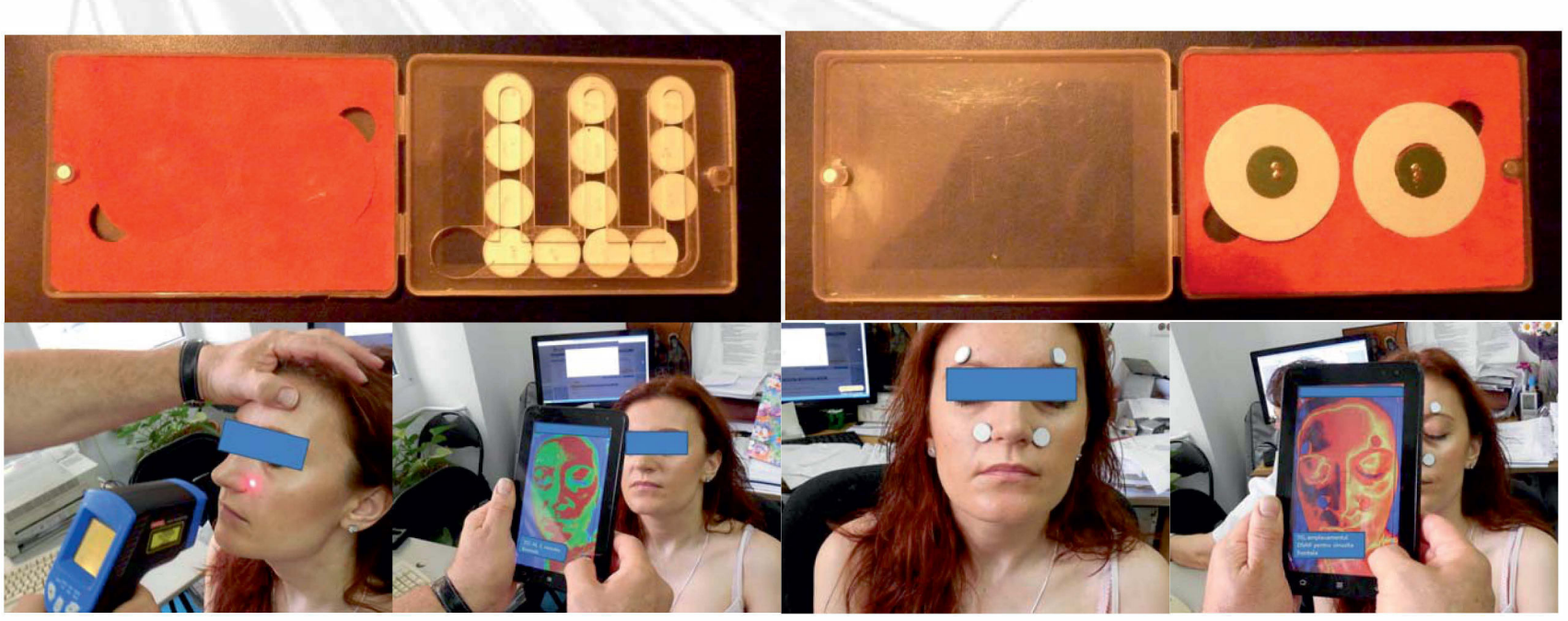
RESONANT DEVICE, APPARATUS, AND METHOD FOR HIGH FREQUENCY ELECTROMAGNETIC STIMULATION ACUPUNCTURE POINTS AND OTHER AREAS ACTIVE ELECTRODERMAL

RO 132423 A2

Autori: Marian VELCEA, Cornel MOLDOVAN, Ioan PLOTOG, Bogdan MIHĂILESCU, Cătălin HIDEG

Invenția se referă la un dispozitiv și un aparat - set de dispozitive rezonante pasive pentru stimularea electromagnetică de înaltă frecvență (DSAIF) a punctelor și meridianelor de acupunctură sau a zonelor electrodermice active situate în afara sistemului acupunctural, fără sursă de energie externă, în scopul de a modifica o stare fiziologică sau pentru tratamentul unei afecţiuni patologice date prin obținerea unor efecte locale de stimulare sau de inhibiție și a unor unor efecte sistemice care pot fi utilizate în terapeutică medicală. Dispozitivul electromagnetic rezonant pasiv este construit din componente realizate pe una sau mai multe suprafețe plane având forme geometrice de cerc sau poligoane regulate suprapuse, din materiale dielectrice, conductoare sau magnetice și componente standard, calibrat astfel încat să asigure frecvențe rezonante unice sau multiple în plaja 0,5-300 Mhz.

Metoda, conform invenției, constă în plasarea unui set de dispozitive electronice pasive cu câmp de interacțiune predominant magnetic variabil în anumite locaţii - cunoscute din terapiile de acupunctură atât ca poziție, cât și ca efect și interacțiune, care sunt propice pentru o astfel de echilibrare energetică (stimulare/dispersie), astfel încât dispozitivul/aparatul menționat, sub influenţa câmpului magnetic şi a radiaţiei electromagnetice generate de către organism, să asigure transferul energetic util echilibrării acestuia.



SC INVEL – Agenţie de Proprietate Intelectuală SRL
sediul: str. Ion Ghica nr. 3, ap. 32, sector 3 – Bucureşti
mobil: 0723.20.50.48, e-mail: invel_agency@yahoo.com

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

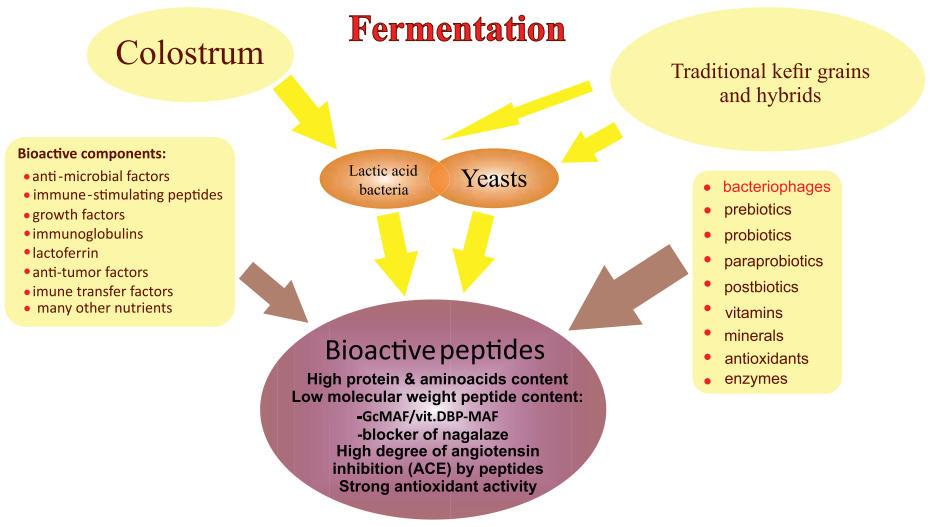
Puterea Minții Creative

PRO natura ™

Col-Kefir® 3xBiotics & Milk Therapy
Colostru bovin fermentat în granule de kefir și hibrizi cu beneficii sporite pentru sănătate

Asociația „Justin Capră“

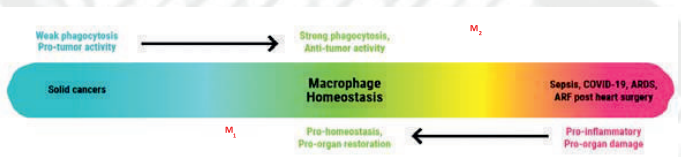
G



„Procedeu de fermentare a colostrului cu granule ameliorate de kefir“
Colostrum fermentation process with improved kefir grains
O.S.I.M. 22.09.2020 nr.1033542

În ultimii ani, lumea medicală a realizat importanța produselor fermentate (care conțin pre / pro / parapro și postbiotice, numeroși bacteriofagi), pentru menținerea sănătății; în acest context, compania Laboratoarele Medica SRL, a lansat produse sub formă de suplimente alimentare, dermato-cosmetice și dispozitive medicale. Fermentările au fost efectuate în următoarele culturi SCOBY (culturi simbiotice de bacterii și drojdii): plante, ciuperci medicinale și polen au fost fermentate în Culturile Kombucha, iar colostrul a fost fermentat cu granule de kefir îmbunătățite, rezultând gama Kombucell 3xBiotics, respectiv Col-Kefir Milk Therapy.

Colostrul este lapte matern din primele 48 de ore după naștere, cu o compoziție diferită de laptele matur. Anticorpii din colostru protejează mucoasa intestinală, gâtul și plămânii, așa că mulți experți îl numesc„vaccin natural”, ajutând la construirea sistemului imunitar (lactoferină, imunoglobuline, factori de transfer, factori anti-cancer, factori de creștere). Prin fermentarea sa, peste 230 oligopeptide bioactive sunt generate ca noi produse de metabolism. Peptidele cu greutate moleculară mică (LMW) au următoarele activități biologice: grad ridicat de inhibare a ACE2, activitate antioxidantă, antivirală, bactericidă și efecte bacteriostatice, antifungice, antiparazitare și modulare a sistemului imunitar (macrofage M1 / M2) via vit.D biding protein-macrophage activating factor (DBP-MAF); s-a demonstrat o scadere a cytokinonelor pro-inflamatorii (efect antiinflamator), precum și scăderea viabilității celulelor tumorale în adenocarcinomul colorectal uman; de asemenea, existența bacteriofagilor și lactobacililor din acest produs duce la eliminarea toxinelor și a toxicitatii cadmiului. Gama Kombucell 3xbiotics conține ca materie primă Amrita (polen poliflor fermentat în culturi SCOBY) bogată în pre / pro / parapro și postbiotice, enzime,vitamine, minerale, antioxidanți, acizi organici, acizi grași, aminoacizi, zaharuri rare, omega 3, 6, polifenoli, flavonoizi și biosiliciu solubil care menține vitalitatea și asigură echilibrul întregului corp.



De ce hibrizii?

Colostrul fermentat cu culturi SCOBY (granule kefir sau granule îmbunătățite, hibrizi de kombucha și kefir) crește biodisponibilitatea si numarul produsilor bioactivi; se utilizează pentru suplimente alimentare umane sau veterinare sau produse dermato-cosmetice. Mai multe bacterii și drojdii, mai mulți bactoriofagi, mai mulți metaboliți înseamnă efecte mai puternice.

Analyzed patameter	Bovine colostrum	Colostrum fermented with kefir	Colostrum fermented with improved kefir	%
Protein content %	65	21,5	72,6	
Lipid contet %	2,7	21,96	12,33	
Low molecular weight eptide content (3000-5000 Da)(mg/ml)	1,5	20	98,5	660
Carbohydrate contet (reported to lactose) %	73,14	8,3	1,1	
Carbohydrate contet (reported to glucose) %	16,9	11,95	9,4	
Free amino acids %	0,32	0,55	3,12	
Degree of angiotensin inhibition (ACE) by low molecular weight peptides %	7,24	20,5	40,2	560
Antioxidant activity (mMTrolox/mg protein)	1,18	2,41	9,39	79

Combinația Col-Kefir +/- Amrita poate fi găsită în următoarele produse:

S.C. LABORATOARELE MEDICA S.R.L. Tel: 021-351.47.77, E-mail: office@pro-natura.ro; www.pro-natura.ro;
facebook.com/Pro.Natura.RO ~ instagram.com/pronatura_medica

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

Asociația „Justin Capră“

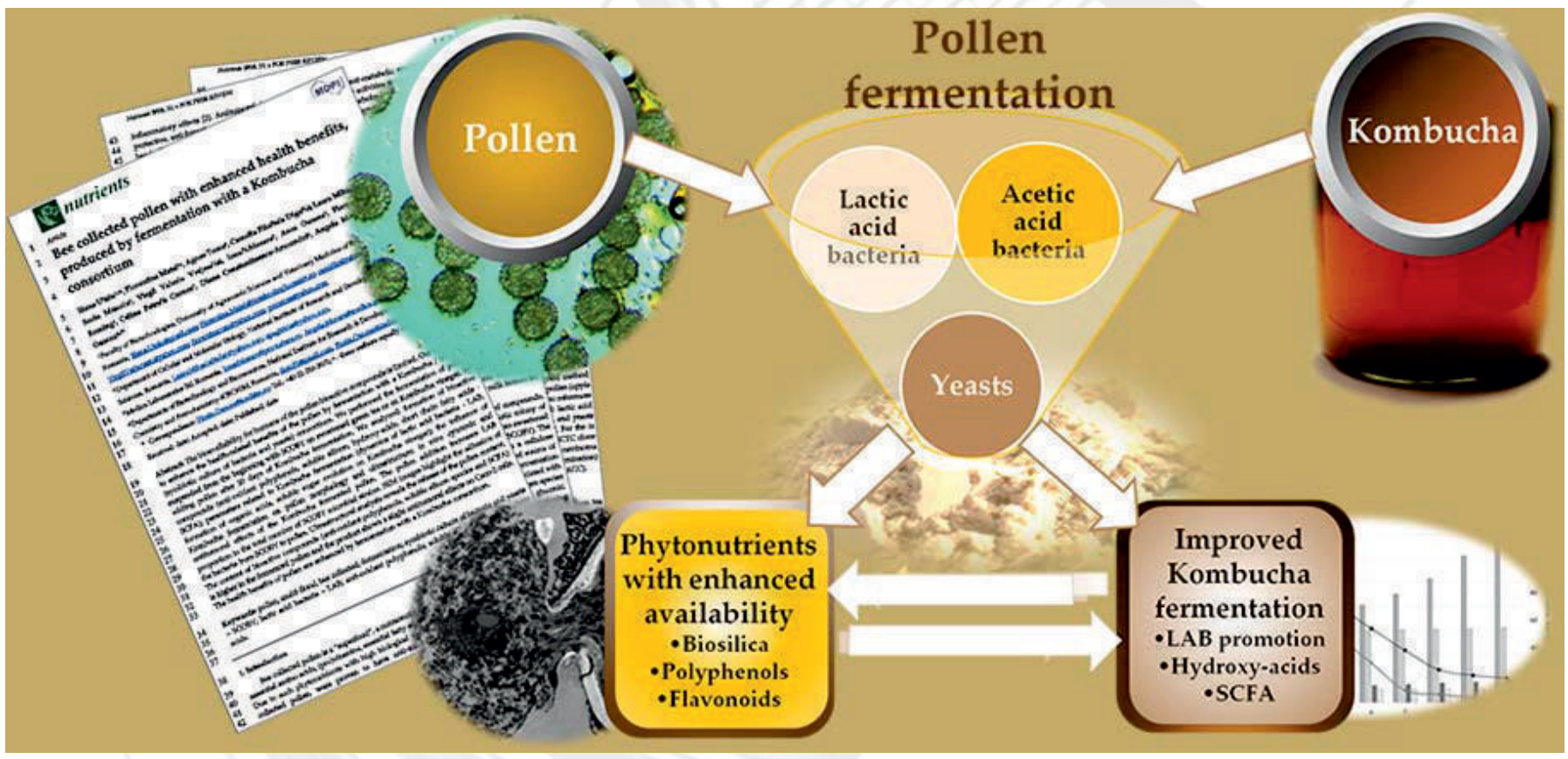
G

PRO natura ™

Original fermented products useful in viral respiratory infections

Col-kefir®

Amrita®



These fermented raw materials were used in the following products:

S.C. LABORATOARELE MEDICA S.R.L. Tel: 021-351.47.77, E-mail: office@pro-natura.ro; www.pro-natura.ro;
facebook.com/Pro.Natura.RO ~ instagram.com/pronatura_medica

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

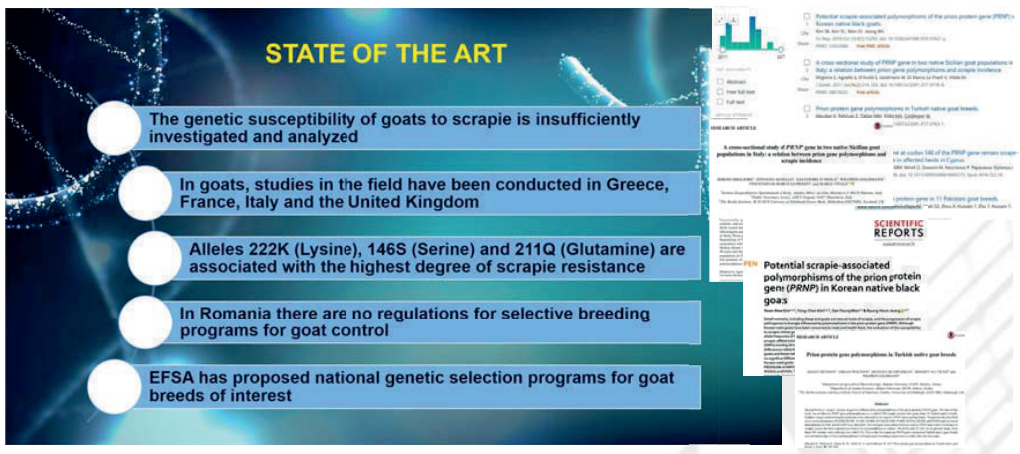
USAMV BUCUREȘTI

University of Agronomic Sciences and Veterinary Medicine – București

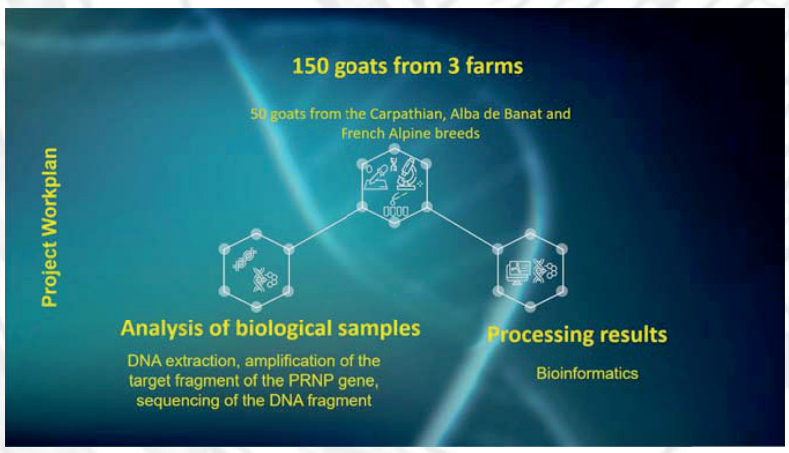
G

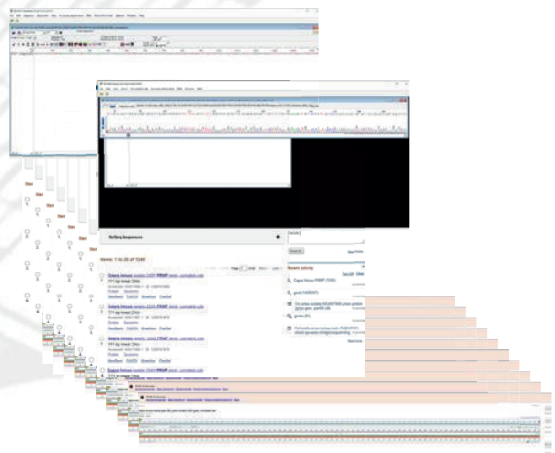
Prion protein (PRNP) gene variability analysis in goat breeds from Romania

Gurău Maria-Rodica, Negru Elena, Ionescu Teodor, Udriște Anca-Amalia, Cornea Petruța, Bărăităreanu Stelian

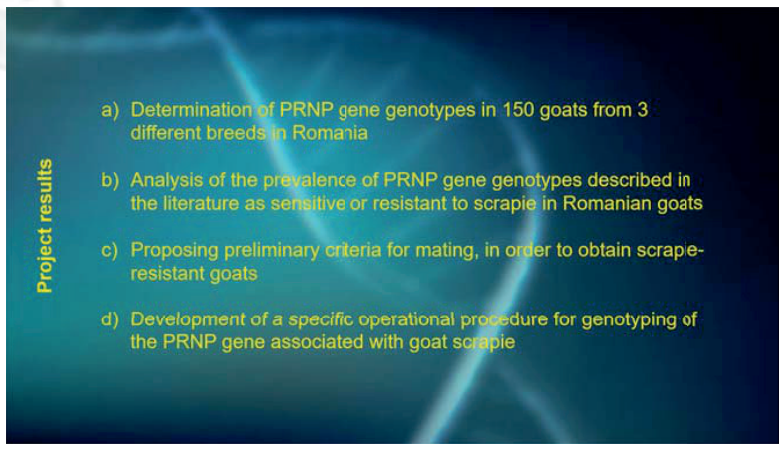


Since the end of the last century, scrapie has been a concern for public health, due to the zoonotic nature of the pathogens that produce the transmissible spongiform encephalopathies (TSEs).
In small ruminants, it is known that the expression of the disease is associated with the genetic susceptibility of the host. Therefore, the control of scrapie in sheep is achieved by selecting genetically resistant breeders.
Such a strategy is also applied in Romania for scrapie control in sheep.





Analyzing the diversity of goat breeds resident in Romania, we find mainly the Carpathian breeds, a native breed that comes from the Prisca breed and Alba de Banat.
There are also many farms with imported breeds, such as the French Alpine, Angora and Saanen.
All of these breeds should be tested for genetic susceptibility to scrapie.
Therefore, it is necessary to know the circulating genotypes in the population of goats in our country regarding their susceptibility to scrapie.



Contact person: Bărăităreanu Stelian
E-mail: doruvet@yahoo.com

Asociația CORNELIUGROUP cercetare-inovare
INVENTCOR
Puterea Minții Creative

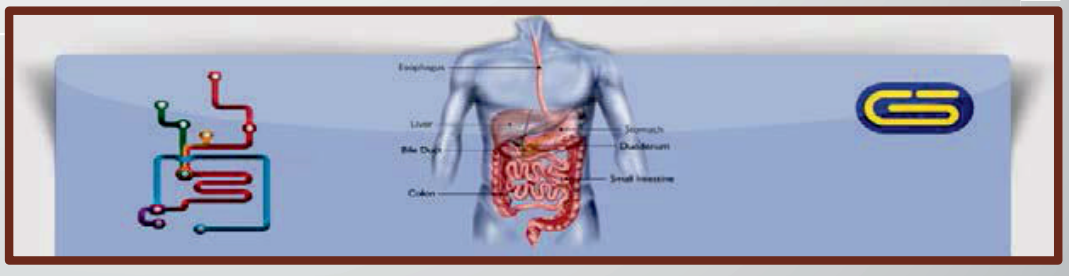
University of Agronomic Sciences and Veterinary Medicine – București

G

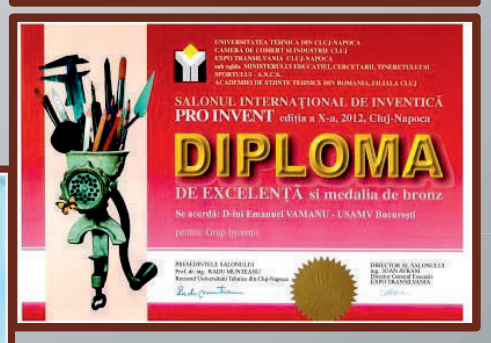
Method for *in vitro* testing of the viability of lactic bacteria probiotic strains during gastrointestinal transit and unicameral system for its application

Author: Emanuel Vamanu

OSIM patent: 127801/2016



This test system is an *in vitro* simulator of the effect of transit through the human gastrointestinal tract. It was designed to operate in two independent phases. The main goal was to test probiotic strains (lactic acid bacteria and/or yeast). The *in vitro* system ensures in the first phase the simulation of the transit from the stomach (pH 2 - 3 and action of pepsin) and the small intestine (the action of pancreatin and bile salts). In the second phase, that of the colon, the simulation is ensured in three distinct stages differentiated based on the pH value and the residence time: ascending colon (pH 5.6-5.9, for 4h), transverse colon (pH 6.2-6.5, for 8h) and the descending colon (pH 6.6 - 6.9, for 12h).



Phase 1 - Stomach and small intestine

ColHumB
Microbiota Fingerprint

Phase 2 - Colon

The advantages of the *in vitro* system

www.gissystems.ro

Representative publications:

1.Study of PROBAC product influence on infant microbiota in a single-chamber colonic fermentation model GIS1. Ann Microbiol 2013, 63, 1029–1038 (2013), **Impact factor 2.112**.

2.An In Vitro Evaluation of Antioxidant and Colonic Microbial Profile Levels following Mushroom Consumption, BioMed Research International 2013, 2013, Article ID 289821, **Impact factor 3.411**.

3.Probiotic Strains Influence on Infant Microbiota in the In Vitro Colonic Fermentation Model GIS1, Indian J Microbiol., 2015, 55, 423-9, **Impact Factor 2.461**.

4. Comparative Fingerprinting of the Human Microbiota in Diabetes and Cardiovascular Disease Journal of Medicinal Food. 2016.1188-1195, **Impact factor 2.786**.

5.Effect of gastric and small intestinal digestion on lactic acid bacteria activity in a GIS1 simulator, Saudi J Biol Sci. 2017, 24, 1453-1457, **Impact factor 4.219**.

6. Antioxidative Effects of Phenolic Compounds of Mushroom Mycelia in Simulated Regions of the Human Colon, In Vitro Study, Pol. J. Food Nutr. Sci. 2018;68(1):83–90, **Impact factor 2.111**.

7.An In Vitro Study of the Influence of Curcuma longa Extracts on the Microbiota Modulation Process, In Patients with Hypertension. Pharmaceutics 2019, 11, 191, **Impact factor 6.321**.

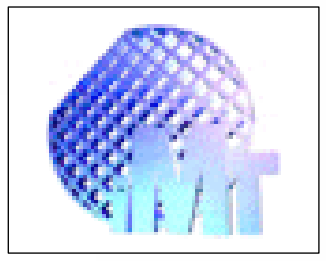
- Possibility to test functional products in conditions close to natural ones;
- Allows a dynamic identical to other similar systems;
- Ability to evaluate the viability rate of probiotic microorganisms;
- Allows a determination of the effect of gastrointestinal transit on the bioavailability of bioactive compounds;
- Allows the evaluation of the modulation capacity of the microbiota.

E-mail: emanuel.vamanu@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind



RESISTIVE OXYGEN SENSOR AND METHOD OF MANUFACTURING IT

G

Application Patent OSIM, ROMANIA, A/00470, 31.07.2020

Authors: Bogdan-Cătălin Șerban, Octavian Buiu, Cornel Cobianu, Roxana Marinescu

FIELD OF INVENTION

- Oxygen concentration monitoring is a process of cardinal importance in various sectors, such as indoor air quality control (air conditioning and ventilation systems), combustion monitoring in industrial boilers, healthcare (breathing monitoring, incubators), automotive (lambda probe), food technology, etc.
- Along with electrochemical, optical and paramagnetic structures, resistive structures O_2 are a viable solution for O_2 monitoring. Drawback: chemiresistive sensors typically require high operating temperature.

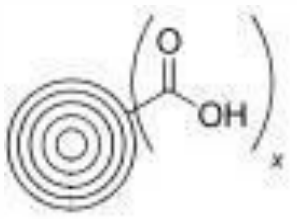


FIG 1 – Structure of oxidized carbon nano-onions (CNOs-ox)

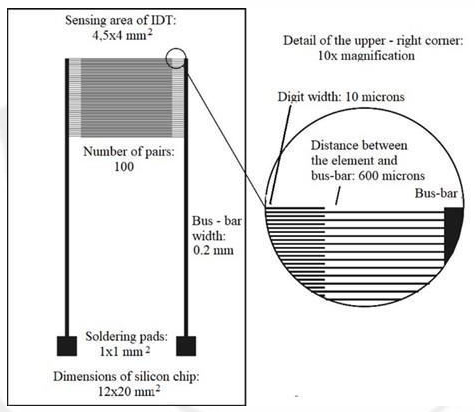


FIG 2 – Structure of the O_2 sensor

ORIGINAL APPROACH

- The invention includes the design and manufacturing process for a new resistive, RT O_2 sensor, employing as sensing layer organic - inorganic halide perovskites (CH3NH3PbI3−xClx) - oxidized carbon nano-onions (CNOs-ox, **FIG 1**). The O_2 sensor includes a Si/SiO_2 substrate, interdigitated (IDT) electrodes and the sensing layer, deposited via spin coating (**FIG 2**).
- The O_2 monitoring capability was investigated by applying a current between the two electrodes and measuring the voltage at different O_2 concentration levels. The resistance of the sensitive layer varies with O_2 concentration.

SYNTHESIS OF THE SENSING LAYER

- The Si / SiO_2 substrate is cleaned for 10 minutes in the ultrasonic bath using sequentially equal volumes of acetone, ethanol and finally deionized water.
- Carbon nano-onions (CNOs) are synthesized from nanodiamonds, by heating at 1650^0C, in a helium atmosphere. The synthesis of CNOs-ox is performed by reaction with nitric acid, 3 M, at reflux, for 48 h. The product obtained is washed with deionized water, acetone and deionized water.
- A dispersion of CNOs-ox (0.15 mg / mL) in isopropyl alcohol is prepared and subjected to ultrasonication for 2 h. The obtained dispersion is deposited by the "spin coating" method (1000 rpm for 20 seconds) on the Si / SiO_2 substrate employing liner or interdigitated electrodes (after previously masking the contact area).
- A solution of 0.8425 g of methylammonium iodide and 485 mg PbCl2 in 10 mL dimethylformamide is prepared, to which 20 µL of HCl (concentration 36.5%) are added. The obtained solution is deposited by the "spin coating" method (1000 rpm for 15 sec; 3000 rpm for 40 sec) over the initially deposited CNOs-ox film.
- The obtained layer is heated at 100^0C for 30 minutes. Halogenated perovskite penetrates the nanocarbon structure, forming a hybrid structure: CH3NH3PbI3 − xClx / CNOs-ox.

ADVANTAGES OF THE PROPOSED SENSING LAYERS

- The presence of CNOs-ox ensures a high specific surface area / volume ratio, as well as a pronounced affinity for O_2 molecules;
- Detection over a wide temperature range;
- Fast response;
- Reversibility.

Contact: bogdan.serban@imt.ro / www.imt.ro

CORNELIUGROUP
research-innovation
association
INVENTCOR
Power of Creative Mind

CANINE PSYCHOLOGY APPLIED IN PAWS & JO'S GROOMING SALON

Author: Teodorescu Alina Ioana

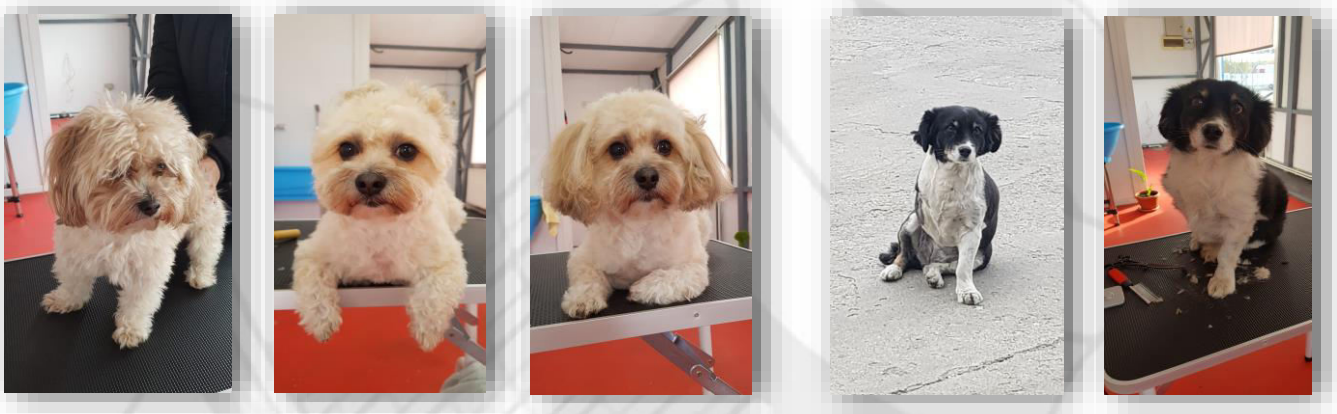
G

The new Paws & Jo's concept is based on communication with the quadruped, it only involves his emotional system, no medical methods (anesthesia) are used, or other methods of forced coercion. The groomer develops and uses methods to adapt his behavior to each type of puppy, so that first he knows him, then he gains his trust, and the haircut procedure will not be a physical or mental trauma for the puppy.

A good relationship between Paws & Jo's groomer and quadruped, based on trust and increased attention to the psychology of each animal, will ensure the proper functioning of the maintenance salon, and the return of both the quadruped and its owner to the salon.

The groomer Paws & Jo's will understand that if a traumatic event in the past has negatively affected the dog, he will need to gradually get used to the groomer, to gain confidence that he will be treated with gentleness and friendship. We already know that quadrupeds are intelligent creatures. Dogs can only understand a few words, but they can easily recognize several different human voices. If you call the dog by name, using different tones, his reaction will also be different. If you call him to you in a friendly and loving tone, he will come running away, wagging his tail. If you call him in an angry tone, the dog will greet you fearfully.

The groomer's ability to empathize with the animal will help him develop his confidence that Paws & Jo's is the place where he feels at ease and will receive physical comfort in a pleasant and relaxing manner.



Feeling vs. reasoning

In the human-animal relationship, the differentiating factor is the reasoning that only man has, as opposed to the animal that has only feelings and instinct.

Paws & Jo's Salon offers puppy care services, the purpose being to maintain hygiene, haircut and ensure their body comfort, through methods based on empathy, free communication, affection and dedication. The aim is to please the quadruped, not only physically, but also emotionally.

Instinctively, the animal will remember that this is where it felt good, and its human owner will understand that the dog's need for physical comfort will be fulfilled in a pleasant way.

Principles applied in Paws & Jo's salon

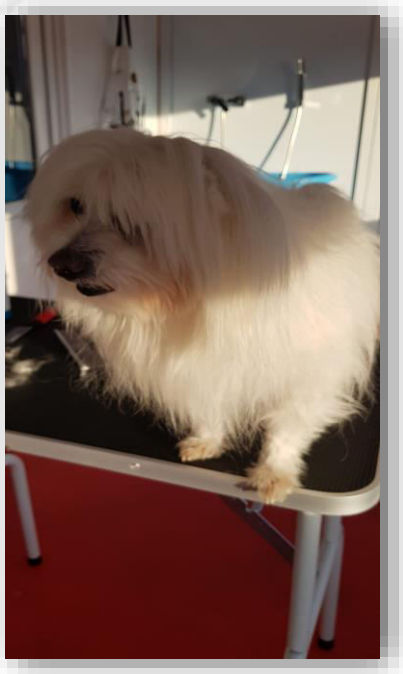
1. The dog should never listen out of fear, but because of the positive associations with the commands.

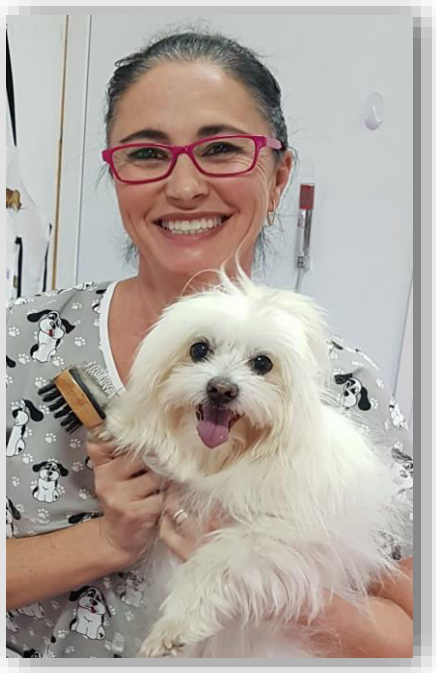
2. Violence has no place in Paws & Jo's salon.

3. Rewards for dogs and positive experiences, shape the dog and lead to the desired behavior.

4. Patience is the most important virtue in canine psychology.

5. The relationship between man and quadruped, implemented through the new Paws & Jo's concept, is a relationship of friendship and mutual trust of the "happy pet-happy groomer" type.





Contact: alina.teodorescu@autogroup.ro
+40724305751

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

IRGH

Institutul Regional de Gastroenterologie-Hepatologie „Prof. Dr. Octavian Fodor" Cluj-Napoca

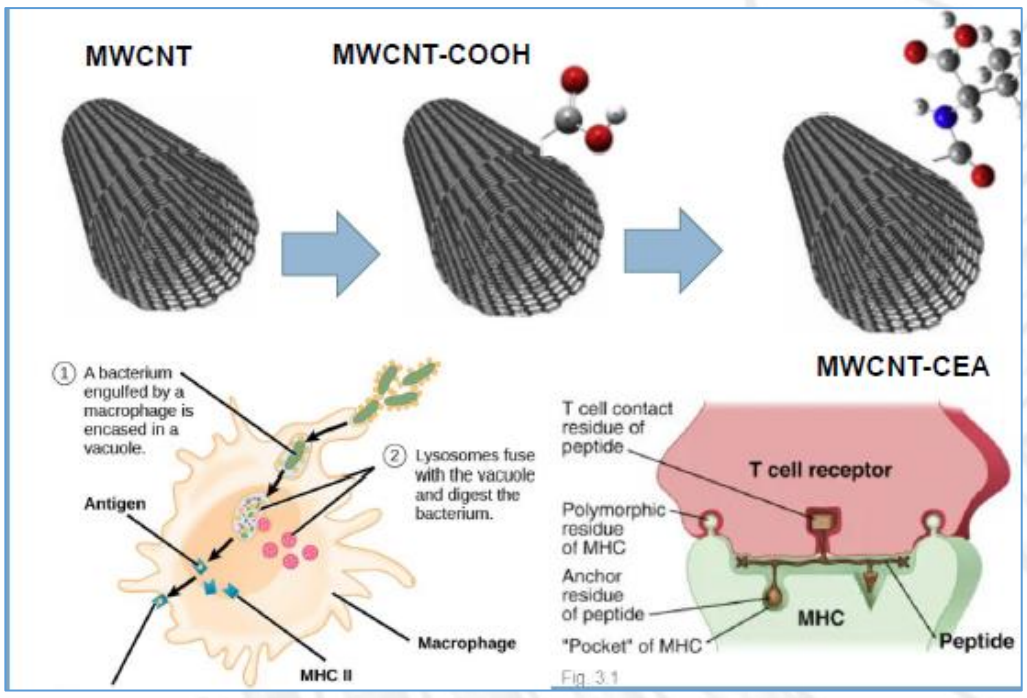
Method for Obtaining Functionalized Nanostructures for Immunoprophylaxis of Colon Cancer

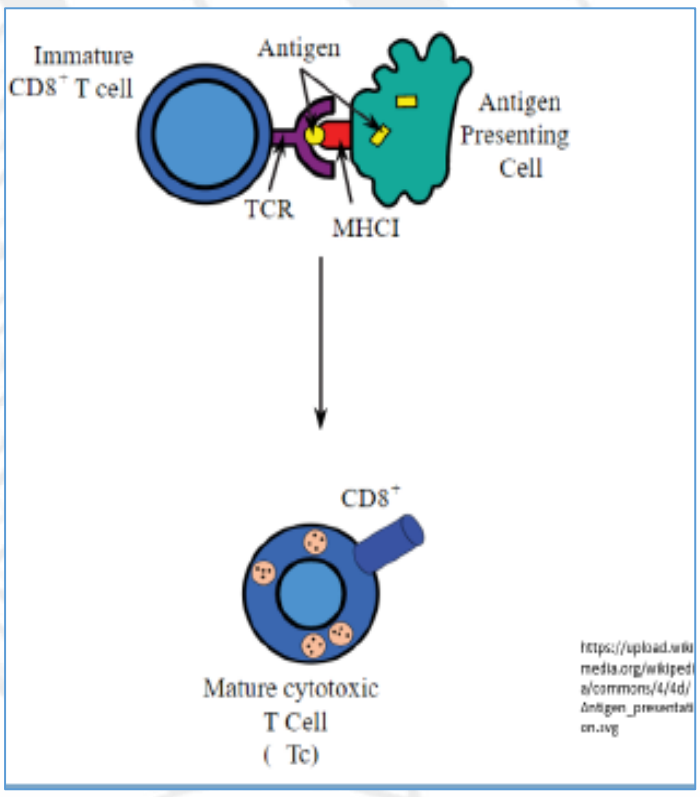
Patent 131850

Authors: Mocan Teodora, Matea Cristian, Iancu Cornel, Mocan Lucian

G

The invention refers to a method of obtaining of a product formed of carbon nanotubes, functionalized with carcinoembrionar antigen (CEA).





The method follows two steps

1. Obtaining of carboxilated carbon nanotubes. 50g carbon nanotubes are dispersed using an ultrasonnicator in 5 mL mixture of H_2SO_4:HNO3 2 :1 v/v (10 min).Next, a supplimentary volume of 45 mixture is added. Solution is brought to 95^oC(15 min) and it is further added over 150g of ice. The so obtained carboxilated carbon nanotubes are centrifuged (3000rpm, 10 min), and redispersed in 50 mL dH_2O. Level of pH is adjusted to 8.5.

2. Functionalization of carboxilated nanotubes with CEA protein. 9mL MWCNT solution are added to 2mL solution of EDC/NHS (30mg:30mg/mL) under continuous agitation (RT, 10 min). Next, 10µL mercaptoethanol and 3mL CEA solution(5µM). Reaction is carried out (120min,agitation, RT). Functionalized nanotubes are further exposed to centrifugation (1500rpm/30min), followed by H_2O redispersion, for removal of secondary products.

Contact:Mocan Teodora, dr.teodora.mocan@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

UNIVERSITATEA DE MEDICINĂ, FARMACIE, ȘTIINȚE ȘI TEHNOLOGIE „GEORGE EMIL PALADE" DIN TÂRGU MUREȘ

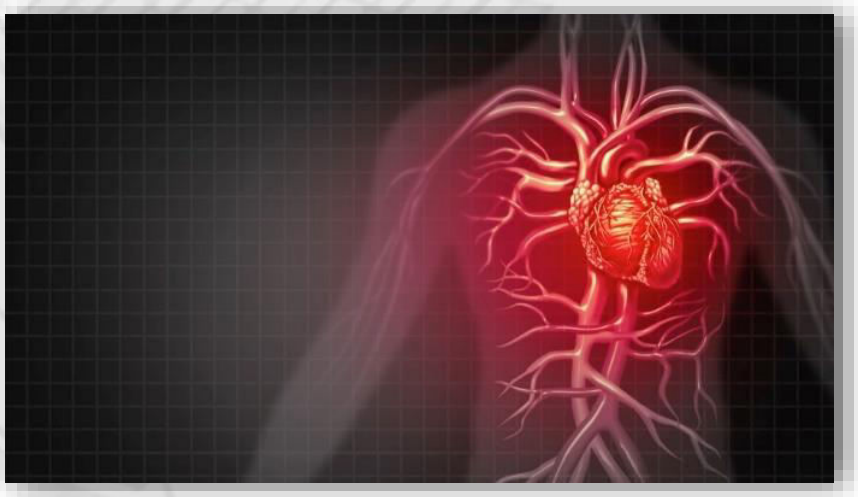
Linguistic analysis in Cardiology
Analiză lingvistică în Cardiologie

PhD Thesis

Author: Găianu Oana

G

Limbajul medical poate deveni o "limbă străină" pentru orice nespecialist. Dicționarele generale, articolele și mass-media joacă un important în înțelegerea diferențelor dintre lexical specializat și lexicul comun. Acestea oferă acces ușor și de cele mai multe ori gratuit fiecărei persoane care intră în contact cu limbajul medical. În numeroase situații, pacientul și medicul trebuie să ajungă la un numitor comun pentru ca mesajul să fie înțeles cu succes. De-a lungul timpului, în limbajul din domeniul Cardiologiei s-au dezvoltat noi metafore, sinonime și antonime pentru termenii săi specializați.



The medical language can become a "foreign language" for anyone. General dictionaries, article and mass-media play an important in narrowing the gap between specialized language and common language. They offer easy and most of the times free access to every individual that comes into contact with the medical language. In every situation the patient and the doctor must come to a common ground in order for the message to be successfully understood. Throughout time the language in the Cardiology domain has developed new metaphors, synonyms and antonyms for its specialized terms.

Contact: oanagaianu@yahoo.com
+40773785307

H

Mechanics

Engines

Machinery

Tools

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

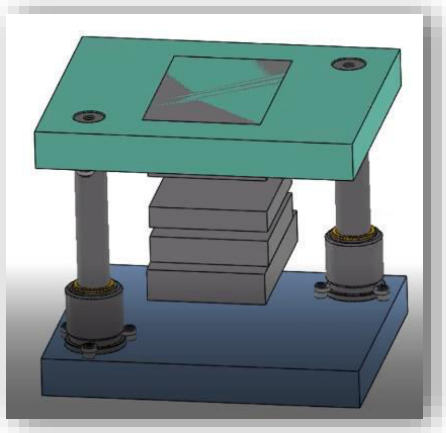
Die for cold pressing of sheet metal parts

Student Project

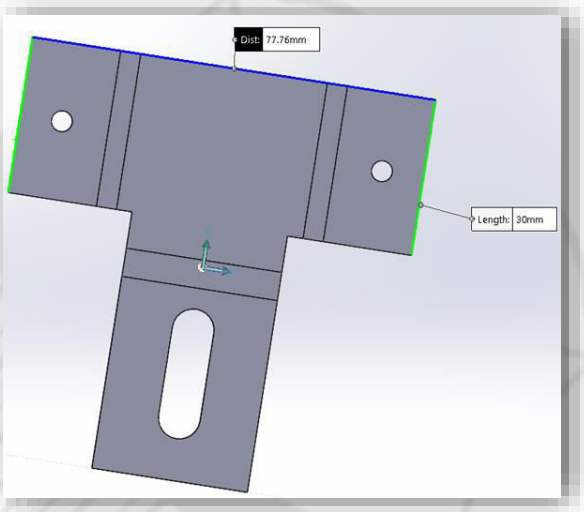
Author: **Pinca-Bretotean Alexandru Mihai**

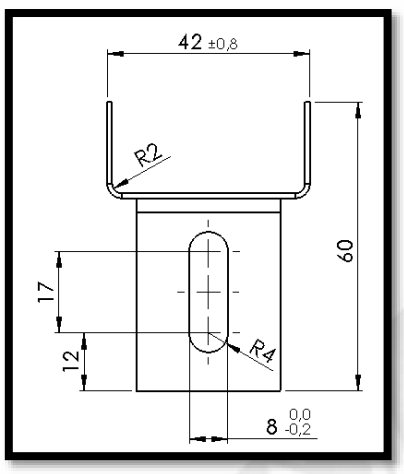
H

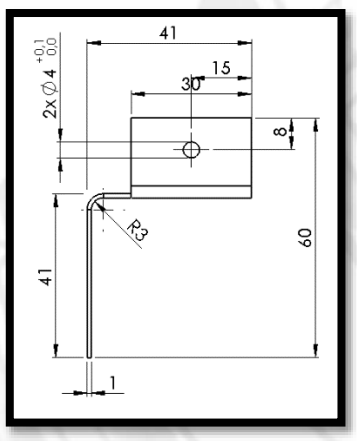
The designed die allows the realization of thin sheet metal parts with a thickness of 1 mm by cold plastic deformation. The parts obtained are intended for the automotive industry. The stamp ensures a high precision of the dimensions, a good quality of the surfaces, which allows the elimination of some subsequent mechanical processing. The die also ensures low metal consumption and high productivity.

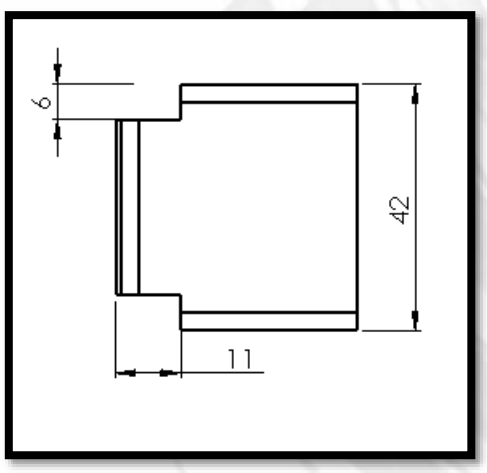


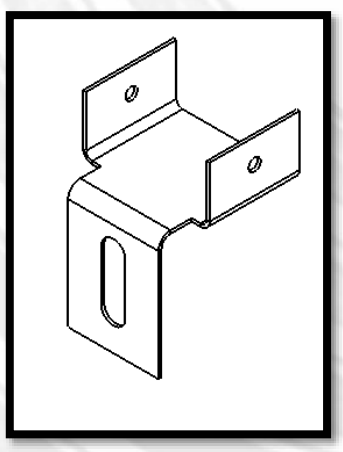
Desfășurata piesei obținută cu ștanța



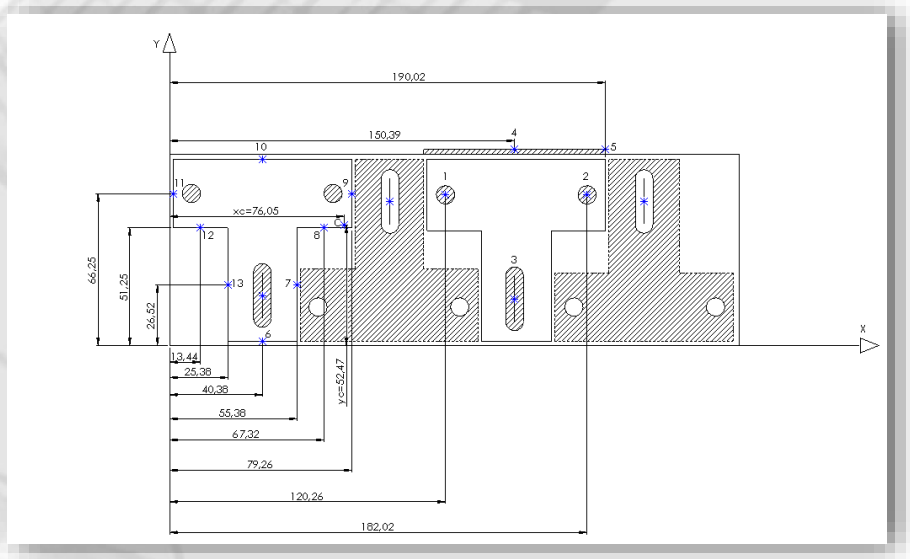








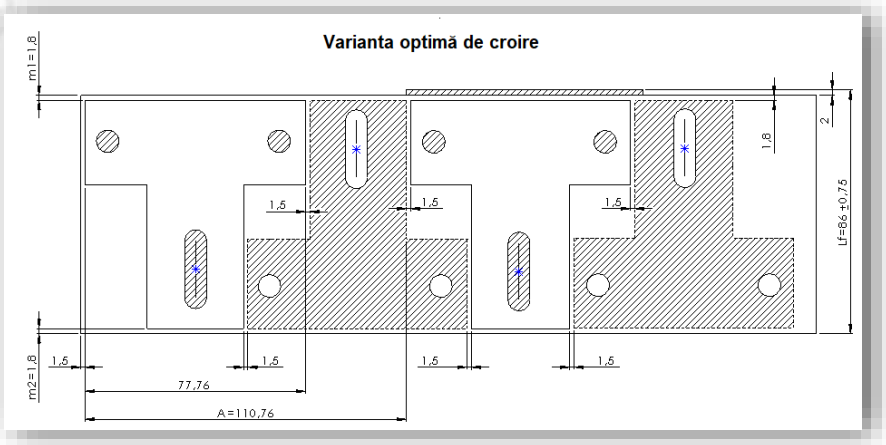
Dimensiuni piesă



Determinarea centrului de presiune

Numar criteriu	Operatie	Schema prelucrării
1	Debitare fasii	
2	Perforare+Decupare	
3	Indoire	
4	Control tehnic de calitate	

Itinerar tehnologic-producție de serie mare



Contact: alexandru.pinca@yahoo.com

LINK SMS "HOME ELECTRICAL APPLIANCE CONTROLLER"

Autors/s: Kadek Reda Setiawan, I Gede Ardi Darmawan, Putu Pipit Pricellia Eka Putri, Ni Luh Putu Restu Adi Utami, Ni Putu Ayu Yuli Sumadianti

H

CATEGORY: ENGINESS

GUIDE BOOK

Tool

Copyright

REPUBLIK INDONESIA
KEMENTERIAN HUKUM DAN HAK ASASI MANUSIA

SURAT PENCATATAN CIPTAAN

Dalam rangka pelindungan ciptaan di bidang ilmu pengetahuan, seni dan sastra berdasarkan Undang-Undang Nomor 28 Tahun 2014 tentang Hak Cipta, dengan ini menerangkan:

Nomor dan tanggal permohonan	: EC00202023684, 21 Juli 2020
Pencipta	
Nama	: Kadek Reda Setiawan Suda, Dr. Nyoman Santiyadnya, S.Si.,M.T. dkk
Alamat	: Br. Dinas Kembang Sari, Desa Penji Kec. Sukasada, Kabupaten Buleleng, Bali, 81117
Kewarganegaraan	: Indonesia
Pemegang Hak Cipta	
Nama	: Kadek Reda Setiawan Suda, Dr. Nyoman Santiyadnya, S.Si.,M.T., dkk
Alamat	: Br. Dinas Kembang Sari, Desa Penji, Kec. Sukasada, Kabupaten Buleleng, 16, 81117
Kewarganegaraan	: Indonesia
Jenis Ciptaan	: Buku Panduan/Petunjuk
Judul Ciptaan	: Buku Panduan Penggunaan LINK SMS Produk Kendali Peralatan Listrik Rumah
Tanggal dan tempat diumumkan untuk pertama kali di wilayah Indonesia atau di luar wilayah Indonesia	: 31 Juli 2020, di Singaraja
Jangka waktu pelindungan	: Berlaku selama hidup Pencipta dan terus berlangsung selama 70 (tujuh puluh) tahun setelah Pencipta meninggal dunia, terhitung mulai tanggal 1 Januari tahun berikutnya.
Nomor pencatatan	: 000105314

adalah benar berdasarkan keterangan yang diberikan oleh Pemohon.
Surat Pencatatan Hak Cipta atau produk Hak terkait ini sesuai dengan Pasal 72 Undang-Undang Nomor 28 Tahun 2014 tentang Hak Cipta.

a.n. MENTERI HUKUM DAN HAK ASASI MANUSIA
DIREKTUR JENDERAL KEKAYAAN INTELEKTUAL

Dr. Freddy Harris, S.H., LL. M., ACCS.
NIP. 196611181994031001

Paten

(20) RI Permohonan Paten
(19) ID (11) No Pengumuman : 2020/SID/01776 (13) A
(26) I.P.C :
(21) No. Permohonan Paten : S00202000244
(22) Tanggal Penerimaan Permohonan Paten : 2020-07-17
(30) Data Prioritas :
(43) Tanggal Pengumuman Paten : 2020-10-20
(71) Nama dan Alamat yang mengajukan permohonan paten
Universitas Pendidikan Ganesha Bali
Jl. Bisma Utara No.75X Singaraja
(72) Nama Inventor
Dr. Nyoman Santiyadnya, S.Si.,M.T.
I Gede Ardi Darmawan
Kadek Reda Setiawan Suda
(74) Nama Dan Alamat Konsultan Paten
Universitas Pendidikan Ganesha Bali
Jl. Udayana No.11 Singaraja
(54) Judul Invensi : "Link SMS" Alat Kendali Peralatan Listrik Rumah
(57) Abstrak : Abstrak
"LINK SMS" ALAT KENDALI PERALATAN LISTRIK RUMAH
Invensi ini berhubungan dengan suatu alat pengontrol atau kendali peralatan listrik rumah, seperti TV, Lampu, Kulkas, Magicom, Strika, dll dari jarak jauh menggunakan sms atau aplikasi yang sudah disiapkan. Kendali peralatan listrik ini menggunakan rangkaian yang sudah dirakit sedemikian rupa dengan bahan-bahan utama yaitu modul relay, modul GSM SIM 800L, Arduino Nano, dan Adapter 5V DC. Dengan cara mengirim SMS ke kartu yang terpasang pada modul GSM SIM 800L, maka secara otomatis akan mengendalikan peralatan listrik dari jarak jauh, atau dengan aplikasi yang sudah disediakan.

Contact: 089523934358
Kadek Reda Setiawan

DESCRIPTION

LINK SMS "home electrical appliance controller" The present invention relates to a home electrical appliance controller or control device, such as a TV, Lamp, Refrigerator, Magicom, Strika, etc. remotely using SMS or pre-prepared applications. Control this electrical equipment using a circuit that has been assembled in such a way with the main ingredients, namely a relay module, GSM SIM 800L module, Arduino Nano, and 5V DC Adapter. By sending an SMS to the card installed on the GSM SIM 800L module, automatically will automatically control electrical equipment remotely, or with an application that has been provided.

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Articulated lip leg system for telescopic leveler

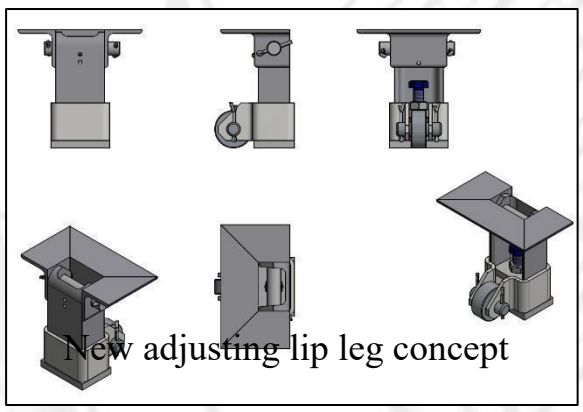
PhD thesis

Author: Cioroagă Bogdan-Dorel

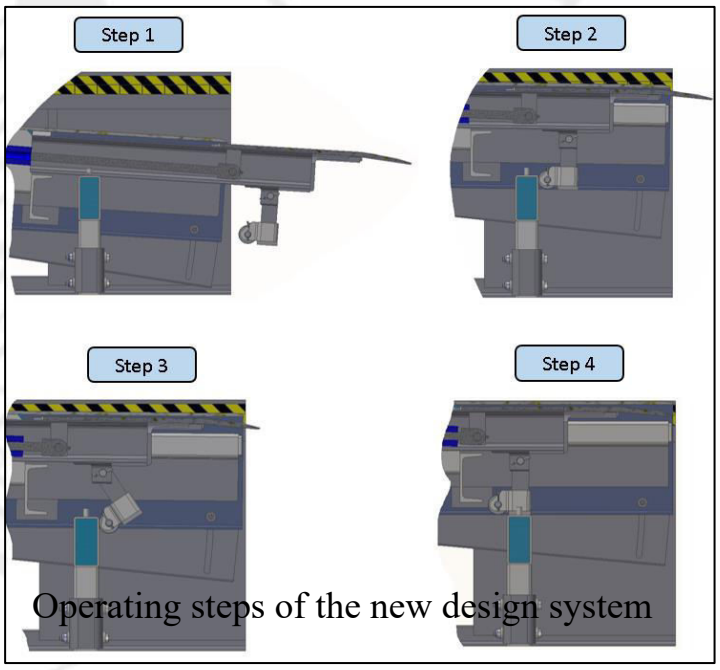
The support legs of the telescopic lip do not always align with their supports from the frame of the leveler, creating an unaesthetic problem for this docking product.

Bringing the platform to the normalresting position level must often be adjusted with the help of plates, there may be 2-3 plates depending on the gravity of the situation. New design for lip legs is required for solving these adjustment and alignment problems.

Original desing issues



New adjusting lip leg concept



Operating steps of the new design system

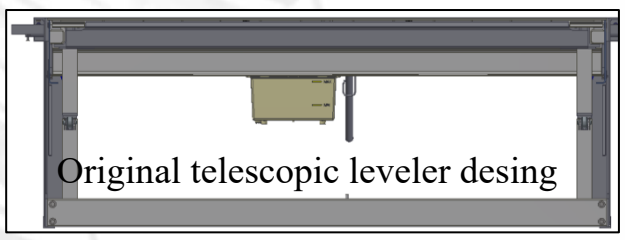
Operating Steps

Step 1
- Telescopic lip extension
- Lowering the leveler platform

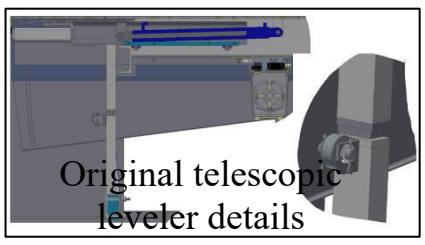
Step 2
- Telescopic lip retraction
- Lifting the leveler platform

Step 3
- Telescopic lip retraction
- Collision of lip leg with front cross beam
- The joint allows the obstacle to be avoided and the roller guides the lip leg to its resting position, also there is an spring that helps bring the lip leg into position

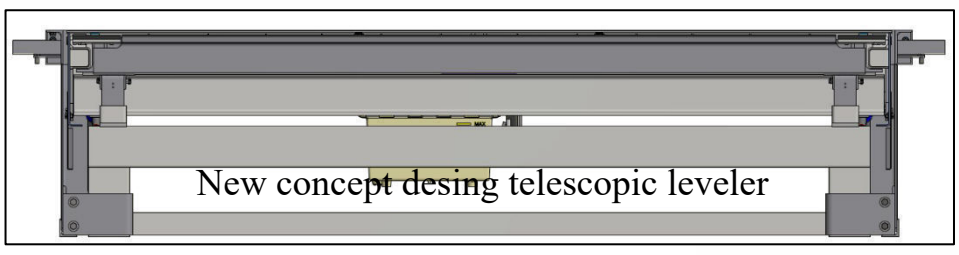
Step 4
- Resting position
- Telescopic lip fully retracted



Original telescopic leveler desing



Original telescopic leveler details



New concept desing telescopic leveler

Issues solved by new desing:

1. Leg side alignment
2. Possibility of vertical adjustment without the addition of plates
3. Clean aspect of front cross beam without the roller in front
4. Safe and easy passage to the resting position for the lip

Contact: +40 722 378 702
bogdan.cioroaga@student.upt.ro
cioroagabogdandorel@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

COMOTI
ROMANIAN RESEARCH & DEVELOPMENT INSTITUTE FOR GAS TURBINES

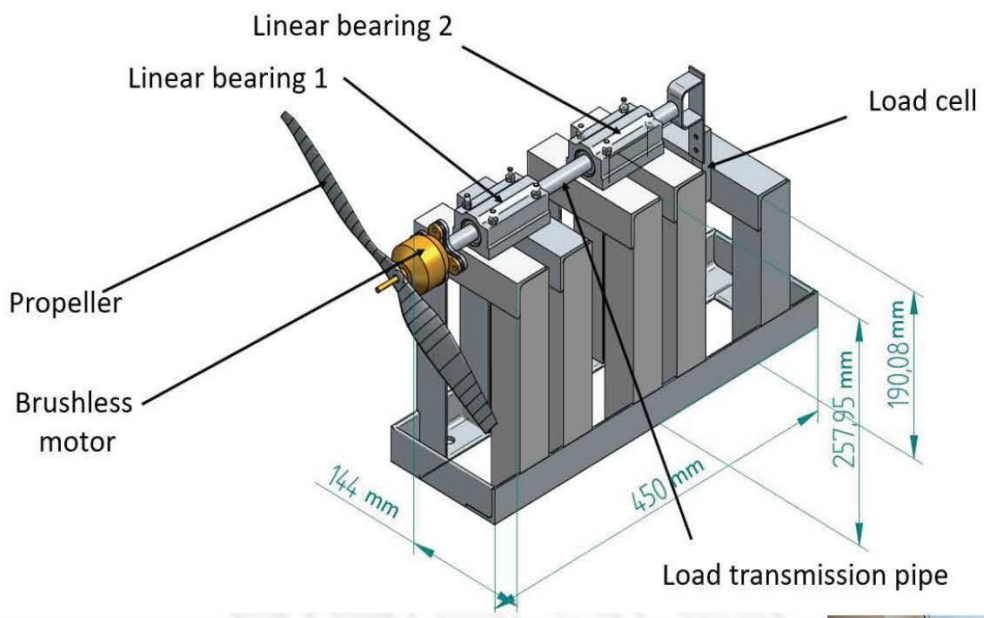
220D Iuliu Maniu Ave., 061126 Bucharest 6, ROMANIA PO 76, POB 174
Phone: +4 021/4340198, +4 021/4340240; Fax: +4 021/4340241
E-mail: contact@comoti.ro, www.comoti.ro
Nr. Of. Com. Reg. J40/4880/1997, CIF: RO445238

AUTOMATED TEST BENCH FOR UNMANNED AERIAL VEHICLES WITH PROPELLER-DRIVEN ELECTRIC PROPULSION

Patent U2021_00010

Author/s: Tiberius-Florian FRIGIOESCU, Teodor-Adrian BADEA, Mihaela-Raluca CONDRUZ, Alexandru PARASCHIV

Autonomous test bench, with software interface, for brushless motors with propeller for unmanned aerial vehicles. This bench was designed to evaluate the performances of a motor configuration and it consists of 2 computers, a metal structure with linear bearings and a rod, structure on which the propeller motor is mounted. The R1 computer controls the engine speed through the R2 computer which will also display, record, vectorize and save the values of motor's force, voltage, intensity, temperature and sound. The software interface allows to enter the maximum percentage of pulse-width modulation (PWM), maximum intensity, maximum power and display the processed data.

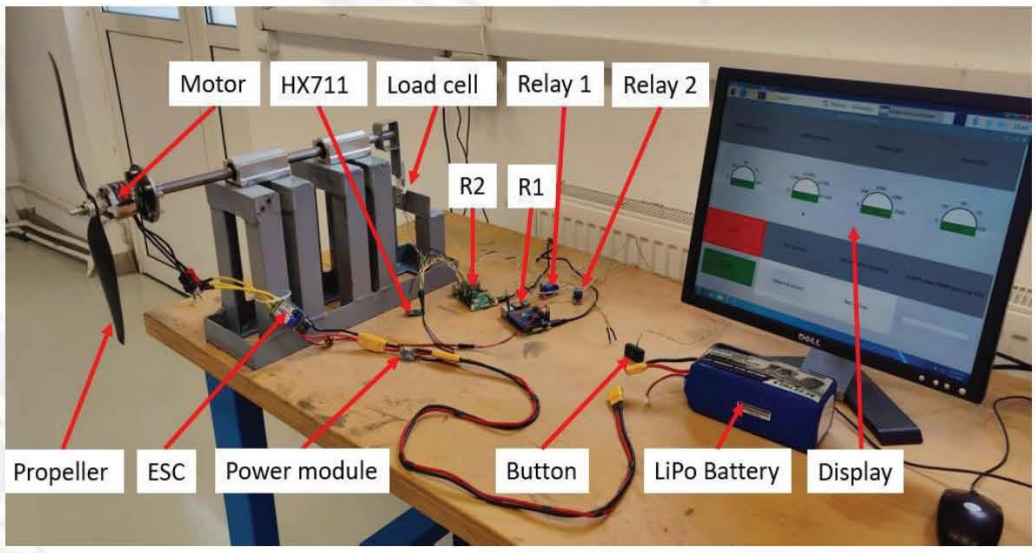


Main components:

- Motor configuration (battery-ESC-motor-propeller)
- 2 Raspberry Pi 4 computers
- 2 relays
- Metal skeleton test bench
- Power transducer with HX711 reader
- Power module
- Emergency stop button
- Temperature, speed, intensity, voltage, audio sensors

Benefits

- **The test is performed autonomous,** the engine speed is increased automatically by a step of 1% PWM;
- **Equipped with emergency manual stop button;**
- **It has 4 emergency systems:** reaching the maximum force value, sudden decrease of 30% of the force, exceeding the maximum intensity, exceeding the maximum motor power;
- **Automatically export data to an excel file.**



Contact
E-mail: contact@comoti.ro
Mobile: 021-434 02 40

Input data:

- Maximum PWM percentage
- Maximum engine power
- Maximum current intensity ESC
- Maximum force

Results after testing

- Propulsion force
- Motor current voltage
- Propeller speed
- Power consumed by the propeller
- Current intensity
- Motor stator temperature
- The sound produced by the propeller and engine

This invention was funded by Romanian Minister of Research and Innovation, within POC-A1-A1.2.3-G-2015, ID/SMIS code: P_40_422/105884, "TRANSCUMAT" Project, Grant no. 114/09.09.2016 (Subsidiary Contract no. 2/D.1.6/114/24.10.2017).

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

COMOTI
INSTITUTUL NATIONAL DE
CERCETARE - DEZVOLTARE
TURBOMOTOARE

B-dul Iuliu Maniu 220D, 061126, Bucureşti, sector 6, OP 76, CP 174
Telefon: 021/434.01.98, 021/434.02.40; Fax: 021/434.02.41
E-mail: contact@comoti.ro, www.comoti.ro
Reg. Com. J40/4880/1997, Cod fiscal: RO445238

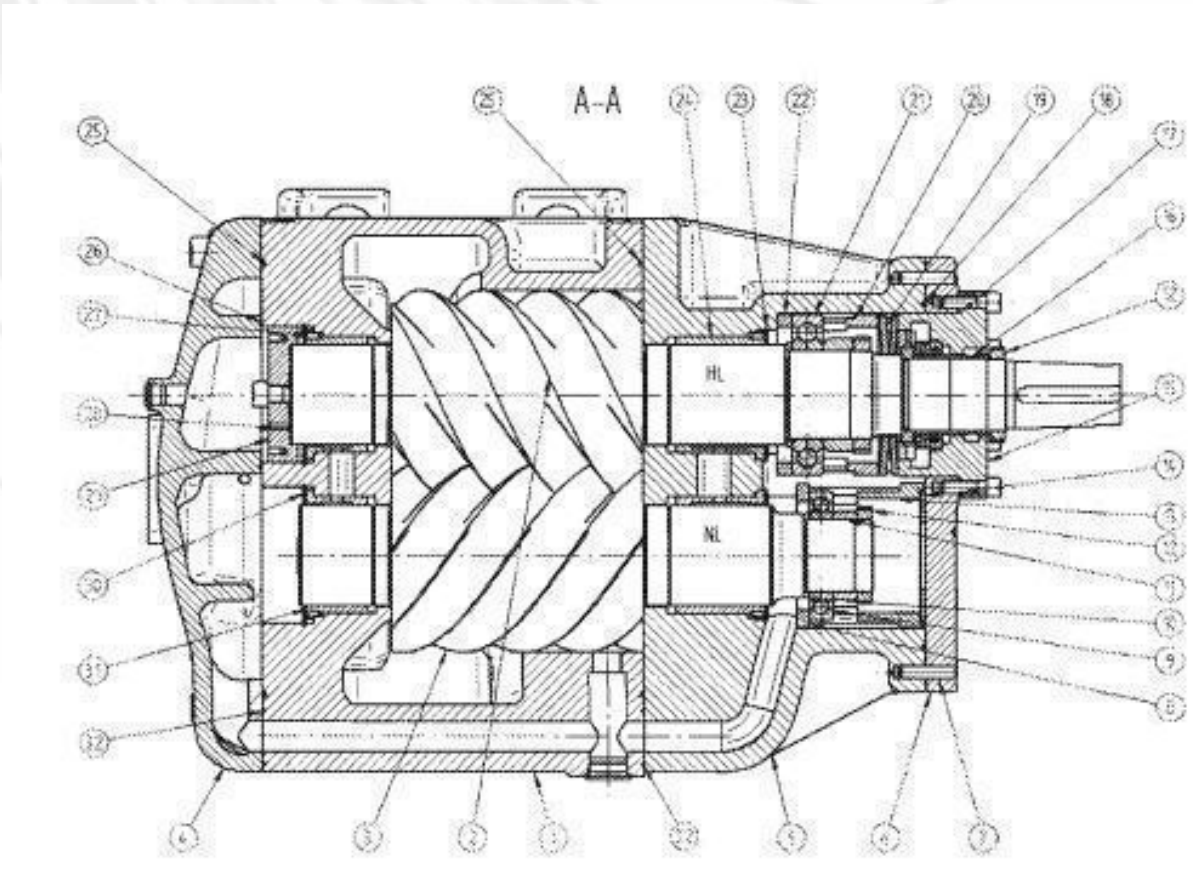
SCREW COMPRESSOR ASSEMBLY CU200

Category H

RO 2020 00031 U1 / 29.04.2021

Authors: **NIŢULESCU MARIAN [RO]; SLUJITORU CRISTIAN [RO]; SILIVESTRU VALENTIN [RO]; FETEA GHEORGHE [RO]**

The invention relates to a screw compressor assembly CU200 meant to be used in oil/gas extraction plants, in the petrochemical industry, in pumping gas in pipelines or storage tanks, in turbine gas supply system, as well as in marine platform exploitation. According to the invention, the assembly comprises a compressor casing provided inside with two rotors, a driving one and a driven one, and connected to an intake cover, a pressurized delivery casing and a pressurized delivery cover, a spacer being placed inside the casing and a disc outside, a sealing casing, a support ring over which a ball bearing is located, a disc, a spacer in connection with a ball bearing, a support ring, a resilient ring for the boring, a pressurized delivery slide bearing, a balance piston and a slide bearing.



CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

COMOTI
INSTITUTUL NATIONAL DE
CERCETARE - DEZVOLTARE
TURBOMOTOARE

B-dul Iuliu Maniu 220D, 061126, Bucureşti, sector 6, OP 76, CP 174
Telefon: 021/434.01.98, 021/434.02.40; Fax: 021/434.02.41
E-mail: contact@comoti.ro, www.comoti.ro
Reg. Com. J40/4880/1997, Cod fiscal: RO445238

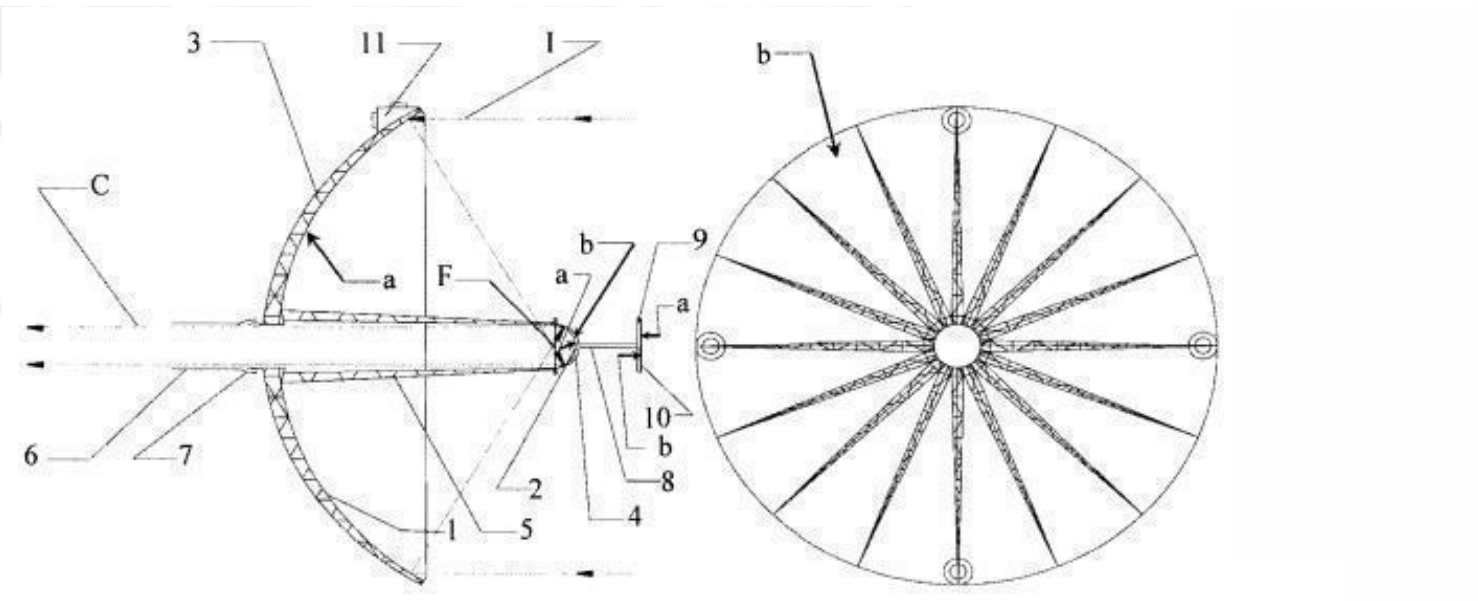
SPACE GUN WITH CONCENTRATED LIGHT, INTENDED FOR EARTH PROTECTION AGAINST ASTEROIDS, FOR SUPLIMENTARY ENERGY SUPPLY TO SPACESHIPS, ORBITAL STATIONS, SATELLITES, FOR SPACE CLEANING BY WASTE REMOVAL AND FOR TERRAFORMING OF OTHERS PLANETS AND NATURAL SATELLITES WITHIN THE SOLAR SYSTEM

Category H

RO 131758 B1 / 28.05.2021

Authors: SANDU CONSTANTIN [RO]; SILIVESTRU VALENTIN [RO]; BRAŞOVEANU DAN [US]; ANGHEL OCTAVIAN [RO]

The invention relates to a space gun with concentrated light intended for Earth protection against asteroids, for supplementary energy supply to spaceships, orbital stations, satellites, for space cleaning by waste removal and for terraforming of other planets or natural satellites within the Solar System. According to the invention, the space gun consists of a large parabolic mirror, a small parabolic mirror positioned towards the large parabolic mirror, having the same focus point, protected against direct Sun rays by a shield subtended on some bars which are radially fixed on a support, the said mirrors and shield being made of reflective gold foils - face, applied on graphite fiber cloths - face, bearing structures of parabolic shape, subtending the said mirrors and mutually positioned by means of some supports, the said structures and supports being configured as latticework made of thin-walled tubes of composite materials or titanium alloys, the claimed gun being permanently oriented with the large parabolic mirror towards the Sun, using some electromagnetic motors, thereby concentrating some parallel incident rays coming from the Sun and producing a concentrated light beam which can be guided by a cylindrical tube reflective inside, that can be oriented by means of a knuckle joint towards the desired object.



CORNELIUGROUP
research-innovation
association
INVENTCOR
Power of Creative Mind

COMOTI
INSTITUTUL NATIONAL DE
CERCETARE - DEZVOLTARE
TURBOMOTOARE
B-dul Iuliu Maniu 220D, 061126, Bucureşti, sector 6, OP 76, CP 174
Telefon: 021/434.01.98, 021/434.02.40; Fax: 021/434.02.41
E-mail: contact@comoti.ro, www.comoti.ro
Reg. Com. J40/4880/1997, Cod fiscal: RO445238

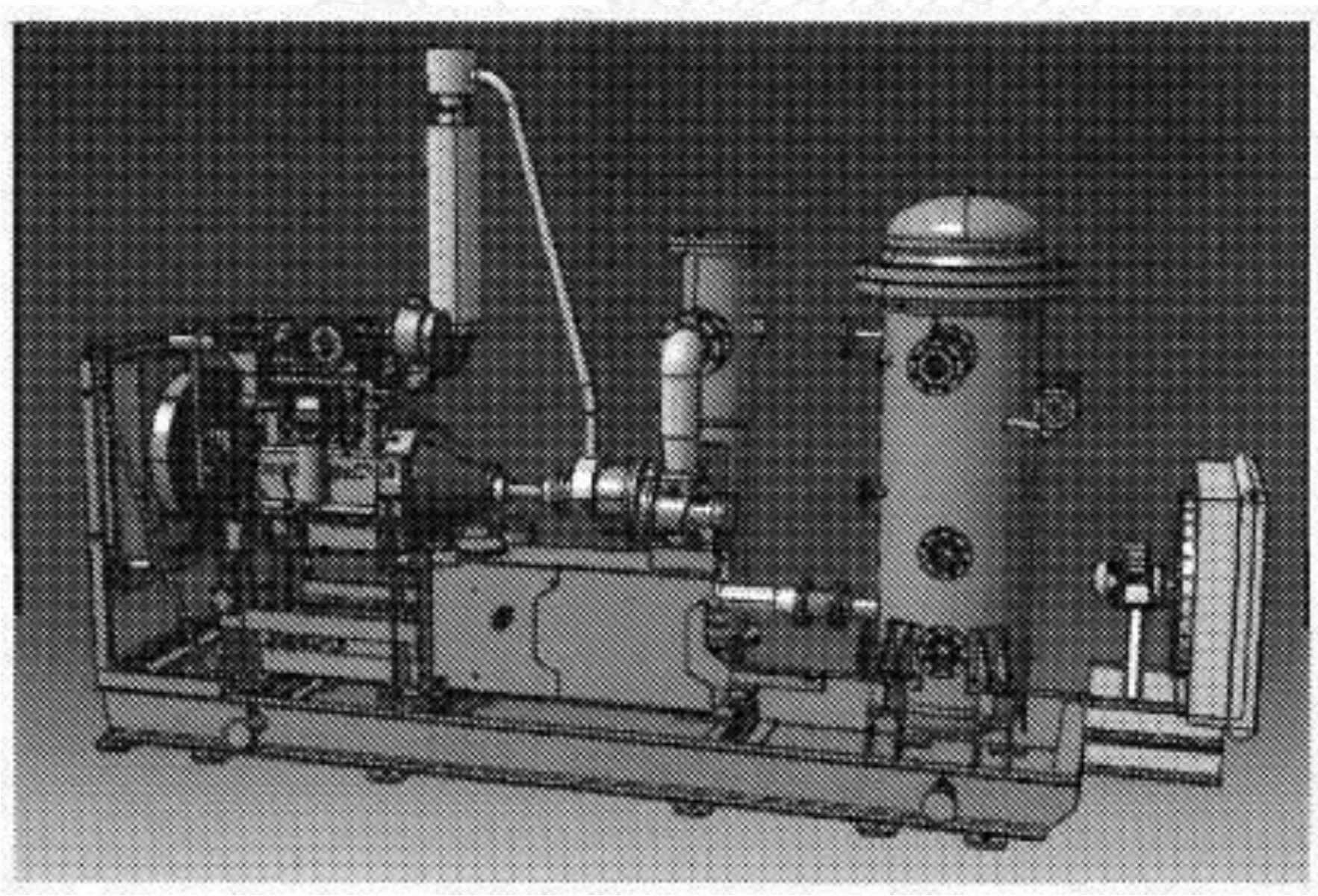
DEVICE FOR EVACUATING LOSSES OF CH4

Category
H

RO 134987 / 28.05.2021

Authors: **MANGRA ANDREEA CRISTINA [RO]; PETCU ROMULUS [RO]**

The invention relates to a device for evacuating losses of CH4, which may be mounted on a motor-compressor unit meant to be used in natural gas compression stations, in order to evacuate losses of CH4 coming from the compressor, caused by the worn sealing in the shaft area during exploitation. According to the invention, the device consists of a funnel, which is fixed on the compressor case, above the drive shaft, in the area where losses of CH4 may occur, a nozzle, which is mounted on the exhaust box of the piston engine driving the compressor and a pipe which connects the funnel and the nozzle, wherethrough the emissions of CH4 are evacuated by ejection.



CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

2nd international exhibition

INVENTCOR

16-18.12.2021 – Deva

COMOTI ROMANIAN RESEARCH & DEVELOPMENT INSTITUTE FOR GAS TURBINES

Title: Mobile Test Bench for Contra-Rotating Fans Rotors Testing

Patent no. RO 135127A0/30.07.2021

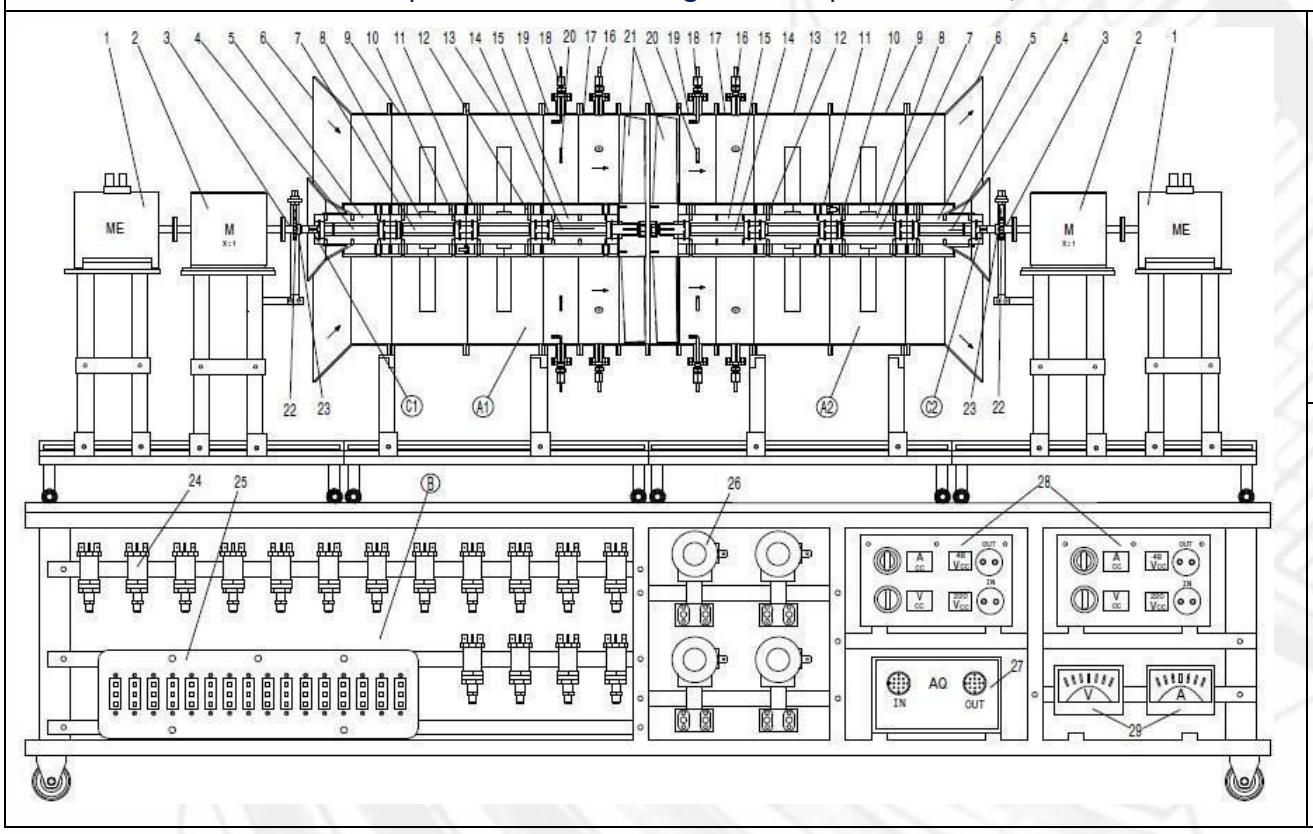
Author/s: Catana Razvan Marius, Gabriel Dediu, Tarabic Mihai Cornel

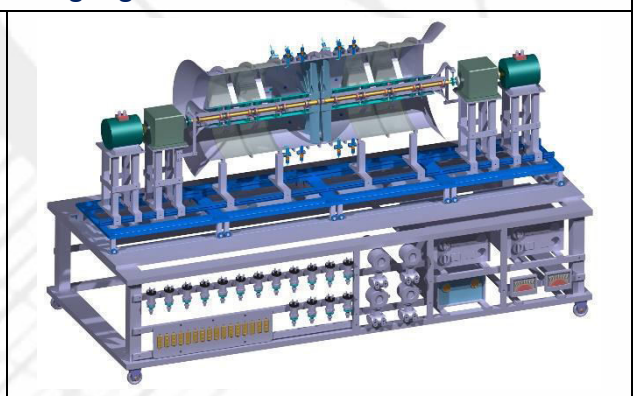
Serbescu Horatiu Mihai

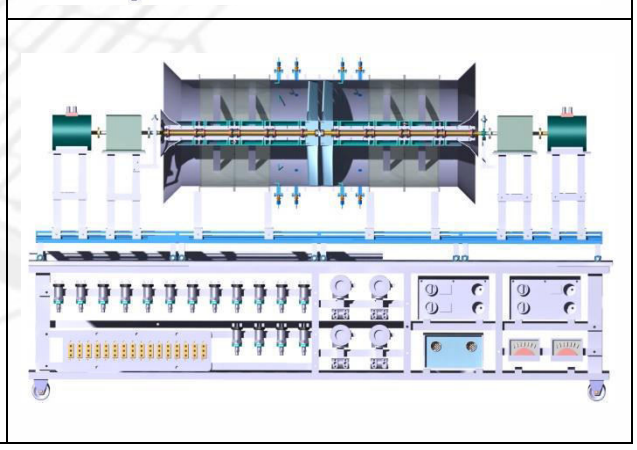
H

General Description: The invention is referring to a mobile test bench, designed at a reduced scale, dedicated to experimental research for contra-rotating fan rotors, with fix and variable pitch blades, for turbofan engines, through which rotor performances are determined, as air mass flow, overall pressure ratio, actual rotor work, adiabatic efficiency and thrust, for fan optimization in order to reduce the turbofan engine fuel consumption.

Tehnical Description: The mobile test bench for contra-rotating fan rotors testing, for turbofan engines, contains two fan assemblies **A1, A2,** mounted symmetrically opposite, consisting of a two fan rotors **21**, and a series of sectors for strength **13**, **9**, for instrumentation **17**, **19**, and for fan inlet and fan outlet **6**. The fan rotors **21**, with opposite rotation directions, are driven by their own electric motor **1**, through their own speed gear multiplication **2**, part of transmission modules **C1**, **C2**, from their own adjustable electric power source **28**, and by an instrumentation system **B**, consisting of instrumentation probes, **16**, **18**, **20,** measuring sensors **24**, **25**, **26**, and data acquisition module **27,** air pressure and temperature are measured in front and back of the contra-rotating fan rotors. Each fan assembly has the ability to adjust the hub fan diameter of the section flow, by mounting some cylindrical parts **11** on interior sectors **5**, **8**, **15**, of the strength sectors **13**, **9**. The experimental data are used into a model calculation to determine the specific contra-rotating fan rotor performances, to evaluate the fan working regimes.







Particularities: This invention is derives from **Patent no. RO 133517/28.04.2021**

1. The turbofan working regimes analysis is performed by a turbo machinery specific law, named similarity law.
2. By similarity law the electric motor parameters, as voltage and current, are converted into turbofan engine main parameters.
3. In this case the voltage is similar with the engine shaft speed and the current consumption is similar with the engine fuel consumption.
4. The test for variable pitch fan blades is not adjustable in real time, it is performed by installing several identical rotors, but with different blades stagger angle, and a series of test at the same working regime are executed.

Advantages: This mobile test bench provides significant advantages, without modifying the constructive configuration, as follows:

1. Allows to install and to test different geometry of rotor fans, because it has a variable hub diameter of fan flow section
2. Allows to install different electric motors and speed gear multiplication, to extend the power and speed working limits
3. Allows to extend measuring data limits, because the instrumentation probes are interchangeable and have adjustable radial position
4. Allows a configurable and adaptable instrumentation, depending on experimental application request
5. Allows to assure different working regimes of each fan rotor, to extend the experimental working area of contra-rotating rotor fan

Contact: 220 Iuliu Maniu Ave, 061126 Bucharest 6, Romania PO 76, POB 174, Phone:+4 021/4340198, +4 021/4340240

Email: contact@comoti.ro, www.comoti.ro, Nr.Of. Com. Reg. J40/4880/1997, CIF: RO445238

Member of: AAAR ECATS WORLD ENERGY COUNCIL CONSEIL MONDIAL DE L'ENERGIE AHK OPTAR

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

COMOTI
INSTITUTUL NATIONAL DE
CERCETARE - DEZVOLTARE
TURBOMOTOARE

B-dul Iuliu Maniu 220D, 061126, Bucureşti, sector 6, OP 76, CP 174
Telefon: 021/434.01.98, 021/434.02.40; Fax: 021/434.02.41
E-mail: contact@comoti.ro, www.comoti.ro
Reg. Com. J40/4880/1997, Cod fiscal: RO445238

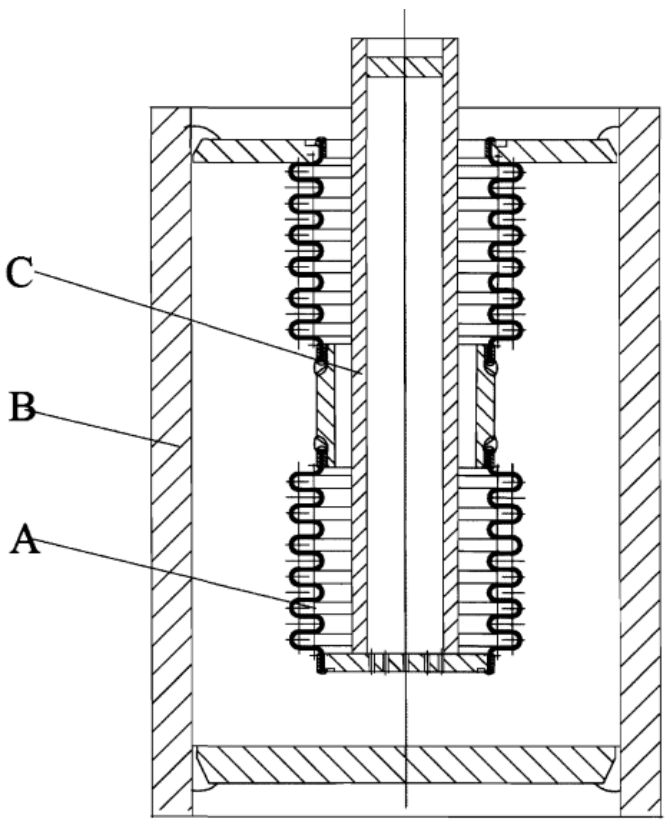
PROCESS AND HYDRAULIC SHOCK ABSORBER OF HIGH PRESSURE

Category H

RO 135173 A0 / 30.08.2021

Authors: GICA MIHAI [BE]; PRISECARU TUDOR [RO]; SILIVESTRU VALENTIN [RO];
GRIGORESCU MIHAI [RO];
CÂRLĂNESCU RĂZVAN [RO]; MANGRA ANDREEA CRISTINA [RO];
GICA NICOLAE [RO]

The invention relates to a process and a hydraulic shock absorber of high pressure, meant for the protection of civil and industrial constructions against seismic movements. According to the invention, the process has several successive work steps, as follows: making high-pressure lenticular elements by isobar hydro-buckling; assembling the high pressure lenticular elements with a technological ring, a connecting nozzle, with a sealing plate and a stiffening ring; making the enclosure of the hydraulic shock absorber on which, at the lower end, a cover, some reinforcing elements, a supply channel, a sealing element are fixed, after which, at the upper end, an air shaft channel is made and a sealing element is fixed; making the displacement amplifier by fixing a pressure plate on the lower end of a cylindrical casing, after which, at the upper end, a cover is fixed, an air shaft is made and sealed by means of sealing elements, after which some reinforcing elements are welded; checking the shock absorber at the hydraulic test pressure; checking the axial and lateral compensation capacity on the axes x, y and z. The claimed shock absorber consists of a vibration absorber parallely connected with a hydraulic shock absorber and a displacement amplifier, representing the interaction interface between the high pressure hydraulic shock absorber and some disturbing forces.



CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

2nd international exhibition

INVENTCOR

16-18.12.2021 – Deva

COMOTI ROMANIAN RESEARCH & DEVELOPMENT INSTITUTE FOR GAS TURBINES

Title: Mobile Test Bench of Testing Fans for Turbofan Engines

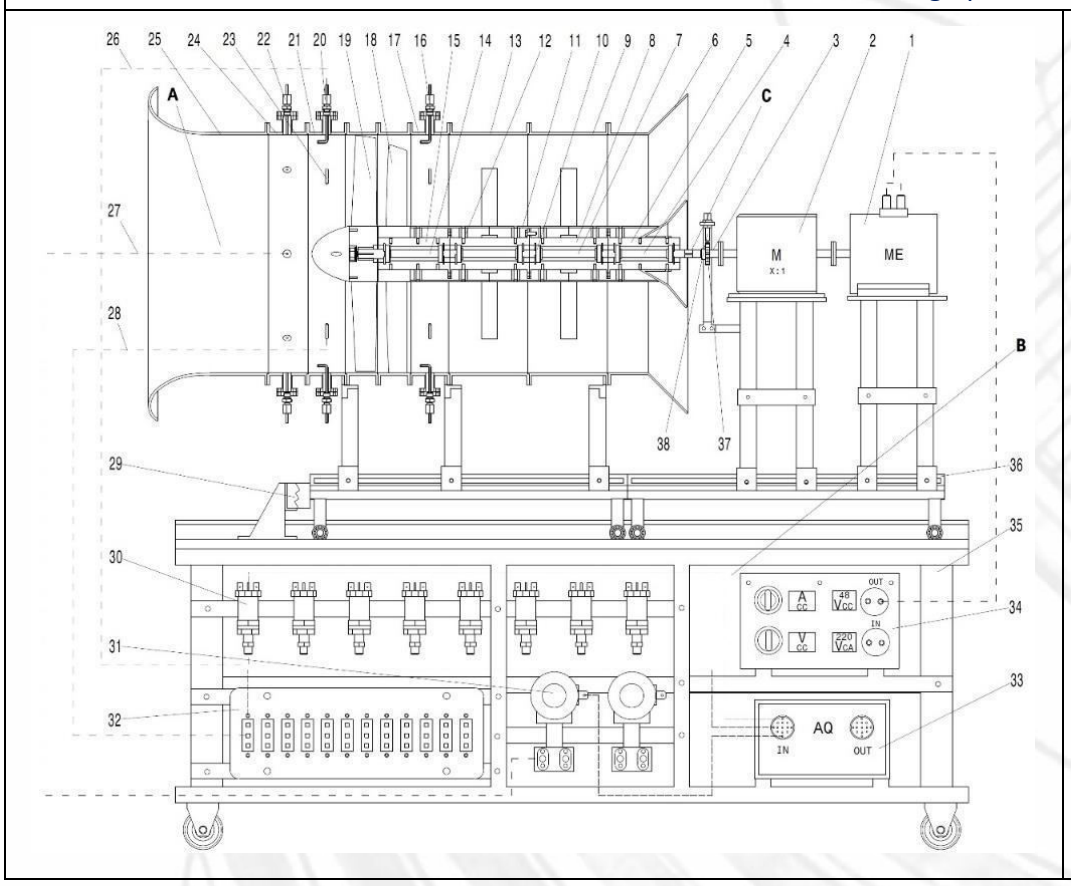
Patent no. 133517/28.04.2021

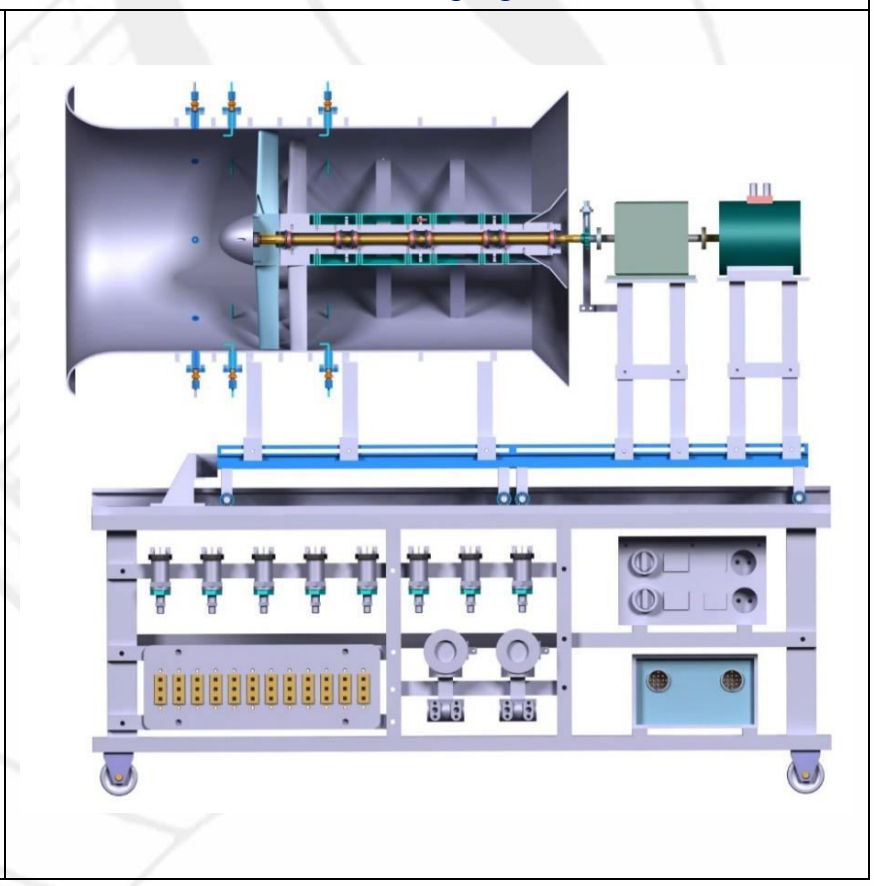
Author/s: Catana Razvan Marius, Gabriel Dediu, Serbescu Horatiu Mihai

H

General Description: The invention is referring to a mobile test bench, designed at a reduced scale, dedicated to experimental research of a fan stage, with fix and variable pitch blades, for turbofan engines, through which the fan stage performances are determined, as air mass flow, overall pressure ratio, actual rotor work, adiabatic efficiency and fan thrust, in order to optimize the fan and to reduce the fuel consumption of turbofan.

Tehnical Description: The mobile test bench of testing fans for turbofan engines contains a fan assembly **A,** consisting of a fan stage, with rotor **19** and stator **18**, and a series of sectors for strength **13**, **9**, for instrumentation **24**, **21**, **17**, and for fan inlet **25** and fan outlet **6**. The fan rotor **19** is driven by an electric motor **1,** through a speed gear multiplication **2**, part of transmission module **C,** from an adjustable electric power source **34**, and by an instrumentation system **B**, consisting of instrumentation probes, **23**, **22**, **20**, **16,** measuring sensors **30**, **31**, **32**, and data acquisition module **33,** air pressure and temperature in front and back of the fan stage are measured. The fan assembly has the ability to adjust the hub fan diameter of the section flow, by mounting some cylindrical parts **11** on interior sectors **5**, **15**, of the strength sectors **13**, **9**. The experimental data are used in a model calculation to determine the characteristic fan stage performances, to evaluate the fan working regimes.





Particularities:

1. The turbofan working regimes analysis is performed by a turbo machinery specific law, named similarity law.
2. By similarity low the electric motor parameters, as voltage and current, are converted into turbofan engine main parameters.
3. In this case the voltage is similar with the engine shaft speed and the current consumption is similar with the engine fuel consumption
4. The test for variable pitch fan blades is not adjustable in real time; it is performed by installing several identical rotors, but with different stagger angle blades, and a series of tests are executed at the same working regime.

Advantages: This mobile test bench provides significant advantages, without modifying the constructive configuration, as follows:

1. Allows to install and to test different geometry of fans, because it has a variable hub diameter of fan flow section
2. Allows to install diverse electric motors and speed gear multiplication, to extend the power and speed working limits
3. The instrumentation probes are interchangeable and have adjustable radial position, that allow to extend measuring data limits
4. Allows a configurable and adaptable instrumentation, depending on experimental application request
5. The mobile test bench is also valid and can be used for compressor stage experimental tests and aerodynamic analysis

Contact: 220 Iuliu Maniu Ave, 061126 Bucharest 6, Romania PO 76, POB 174, Phone: +4 021/4340198, +4 021/4340240
Email: contact@comoti.ro, www.comoti.ro, Nr.Of. Com. Reg. J40/4880/1997, CIF: RO445238

Member of: AAAR ECATS WORLD ENERGY COUNCIL CONSEIL MONDIAL DE L'ENERGIE AHK OPIAR

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

2nd international exhibition

INVENTCOR

16-18.12.2021 – Deva

Title: Fan Rotor For Turbofan Engine

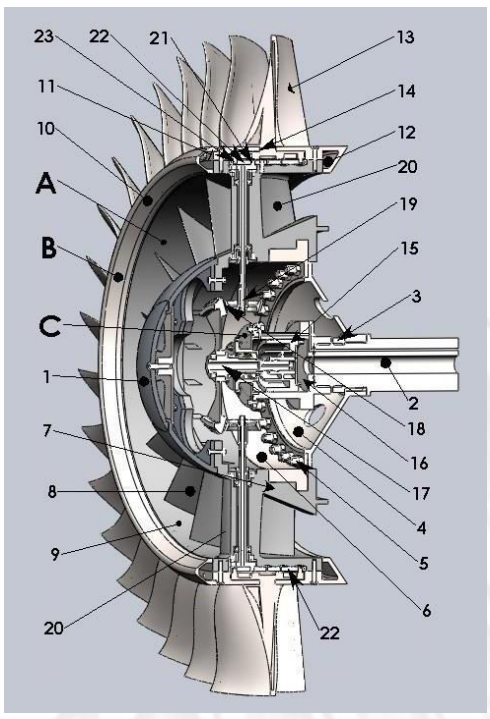
***Patent no.*127764/28.02.2017**

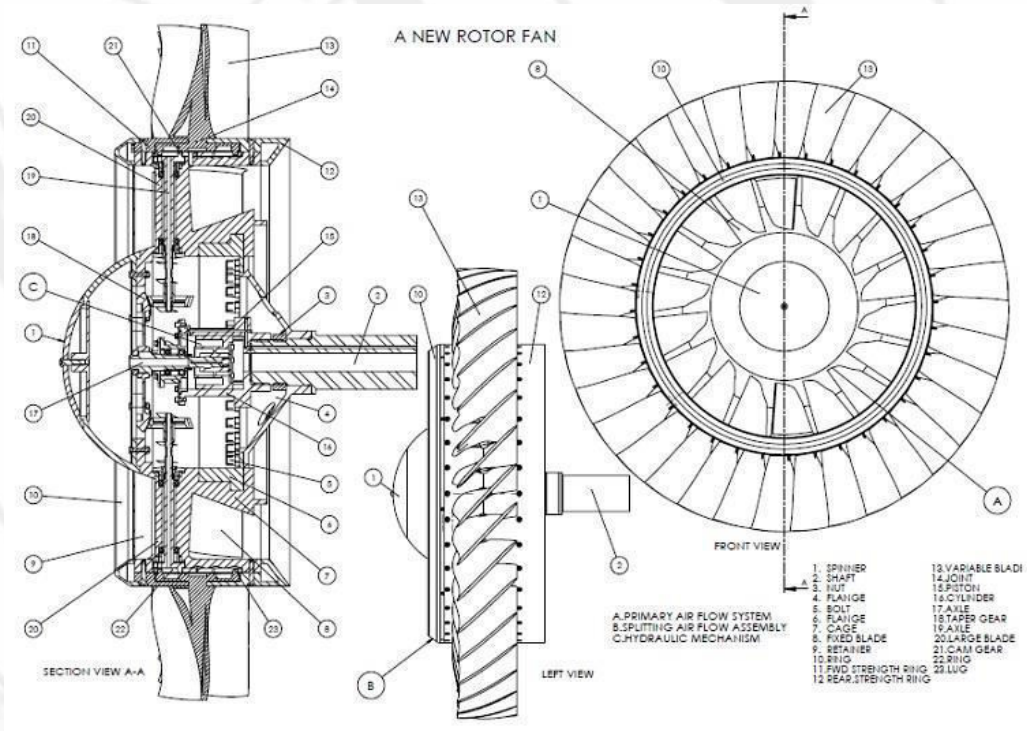
Author/s: Panaitescu Costin, Catana Razvan Marius

H

General Description: The invention is referring to a new fan rotor configuration and constructive solution, for turbofan engines, a fan rotor that is split in two different sections rotors, a section with fix pitch blades dedicated for engine primary flow, and a section with variable pitch blades dedicated for engine secondary flow. This new fan rotor is designed for a secondary flow optimization at different engine working regimes, in order to decrease the specific fuel consumption and to reduce the gas emissions of turbofan engine.

Technical description: The new fan rotor configuration consisting of an assembly **A,** a fan rotor section dedicated for the inlet of the engine primary air flow, a ring assembly **B** that splits the fan rotor in two rotor sectors for primary and secondary air flow and a hydraulic mechanism **C** for changing the blades pitch of fan rotor section for secondary air flow. The assembly **A** is one frame rotor section with fix pitch blades **8** with a top circumferential sector **9** that serves as a frame installation for blades of the secondary flow rotor section. The assembly **A** contains two particular blades **20**, fixed diametrically opposite, through which the transmission shaft **19** is passed to drive the internal mechanism **22**, from the ring assembly **B**, to adjust the blades **13** pitch for the fan rotor section of secondary flow. The hydraulic mechanism **C**, receives oil pressure from the engine on piston **15**, which rotate the shaft 17 and by the bevel gear 18, it drives the transmission shafts **19.**





Particularities:

- The new fan rotor is designed to increase the fan efficiency or to be more efficient on different engine working regimes
- The new fan rotor can have different overall pressure ratio between rotor section of primary flow and secondary flow
- The new fan rotor has variable bypass ratio, depending on engine working regimes
- Best performances of new fan rotor are obtained by changing the stagger blade angle of secondary air flow in relation to maintaining engine shaft speed constant, without affecting primary air flow characteristics
- The new fan rotor can be developed for the next generation of turbofan engines; currently a fan with variable blades is applied on engine demonstrator named ultra high bypass ratio (UHBR), by Rolls Royce engine manufacturer

Advantages: The new fan rotor provides significant advantages over the classical fan, including;

1. Allows a better optimization of the engine secondary air flow, because it has variable pitch blades on secondary flow rotor section
2. Allows a better optimization of load distribution between the engine primary flow and secondary flow
3. Allows to be mounted a different number of blades between section rotor, to decrease the blade density, and to mount blades with higher chord, to increase aerodynamic load.
4. Improves the operating working line of turbofan engine
5. Following a global calculation, in some ideal conditions, allows to convert between 50÷60 % of fuel's energy into propulsion, than 40% potential energy stored in the fuel in case of classical fan

Contact: Email: catana_razvan.marius@yahoo.com, razvan.catana@comoti.ro, Phone: +40763181775
Email: panaitescu.costin@yahoo.com, Phone: +40744511155

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

2nd international exhibition

INVENTCOR

16-18.12.2021 – Deva

Title: Mixed Turbofan Engine with Primary Reverse Flow

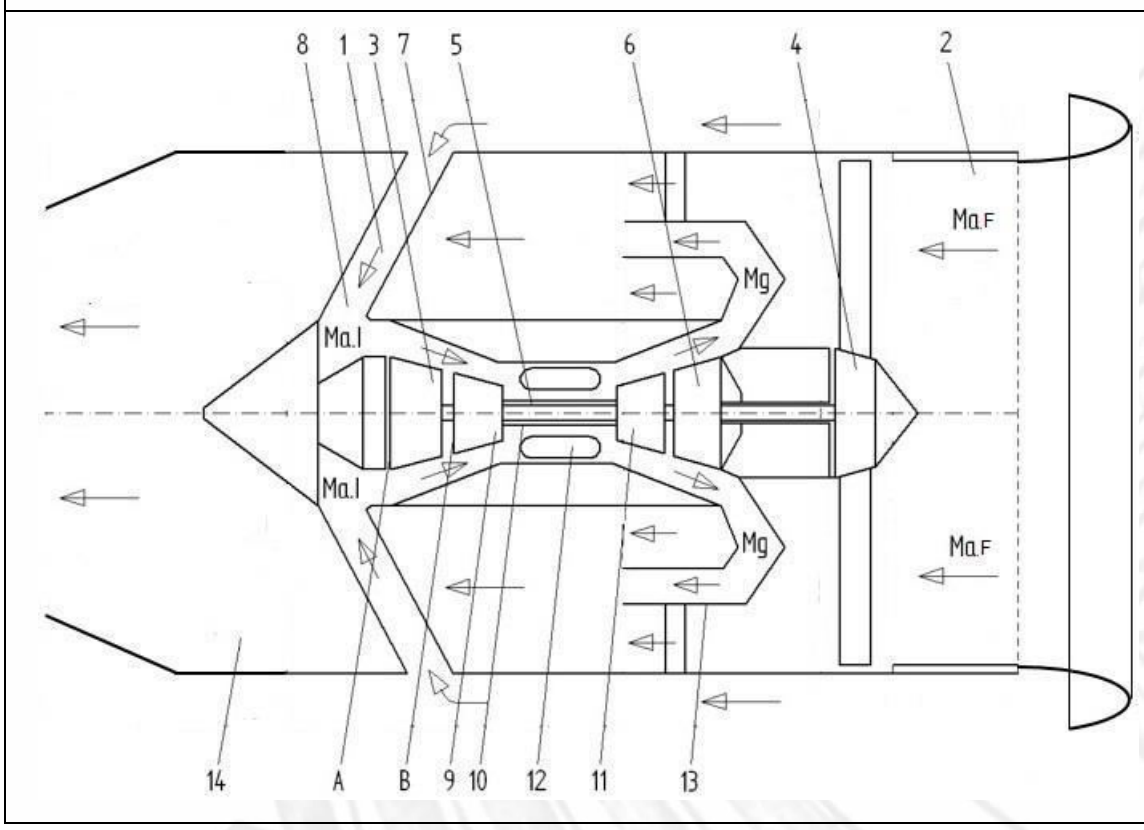
Patent, no: 130120/30.03.2018

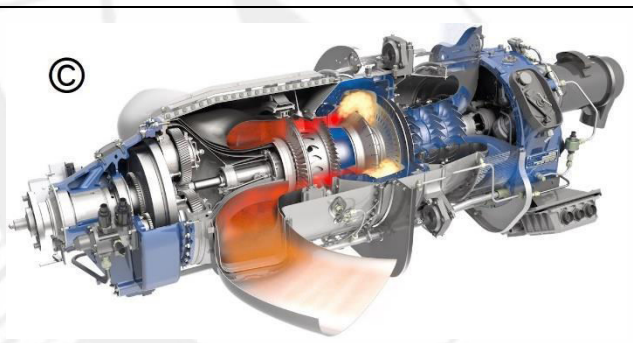
Author/s: Catana Razvan Marius, Stanciu Dorin, Panaitescu Costin

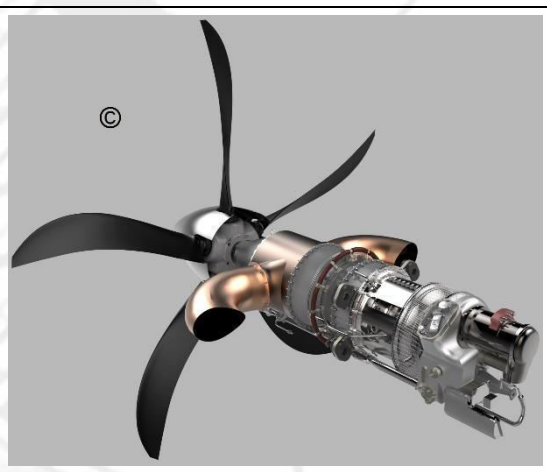
H

General description: The invention is referring to a new turbofan engine model, with a specific gasodynamic and spool configuration, a mixed flow turbofan, where the air mass for the primary flow is dragged separately than the air mass for the secondary flow, on different directions, and from different engine rotors, designed to increase the thrust, to reduce the engine noise level, and to reduce the specific fuel consumption.

Technical description: The mixed turbofan is a two spool engine configuration, with a low pressure spool **A**, formed by a low pressure turbine **6** that drives the low pressure compressor **3** and the fan **4,** and a high pressure spool **B**, formed by a high pressure turbine **11** that drives only the high pressure compressor **9**. The mixed turbofan engine, with primary reverse flow, has a specific intake configuration. The engine contains the intake **1** for the primary flow, and the intake **2** for the secondary flow. The air mass Ma.I for primary flow is dragged at an angle direction, through the profiled mounts **7**, by the low pressure compressor **3.** The compressed air, by low and high compressor, mixed with the fuel, is burned in the combustor chamber **12** and produces combustion gases that are expanded into the high turbine **11** and low turbine **6**. The gases mass Mg are discharged, through the reverse profiled mounts **13,** on the secondary flow. The air mass for secondary flow Ma.F is dragged, on axial direction, by the fan rotor **4.**







Particularities:

1. The increasing of engine thrust is performed by increasing the air mass of secondary flow.
2. The low pressure spool **B** has a typical configuration; the low pressure turbine **6** is mounted at the back of the fan **4**
3. The primary flow has a reverse flow direction, by discharging the primary flow on the secondary flow
4. The engine pressure ratio is only the compressor ratio because the fan and the compressor has different intakes
5. Because the fan overall pressure ratio does not participate to the engine pressure ratio, the fan can be designed for a lower pressure ratio and a higher air mass flow, that means a higher diameter and a lower fan speed.
6. Currently a similar technical solution of invention, about gasodynamic and spool configuration, was applied for GE Catalyst turboprop, an advanced engine patented by General Electric engine manufacturer ©.

Advantages: The new turbofan type provides some advantages over the classical turbofan, including:

1. The fan use all the air mass for the thrust, because the fan air mass is not divided as in classical turbofan case.
2. The turbofan has a higher bypass ratio, because the inlet of secondary air flow is separated from the primary flow.
3. The noise level is reduced because the hot gases mass of the primary flow are discharged in a cold bigger air mass of the secondary flow.
4. Following a global calculation, in some ideal conditions, it is determined that:
   - the thrust increases up to ≈ 10 ÷ 20 %
   - the specific fuel consumption decreases up to ≈ 5 ÷ 10 %
   - the noise level decreases up to ≈ 5 %

Contact: Email: catana_razvan.marius@yahoo.com, razvan.catana@comoti.ro, Phone: +40763181775
Email: dorin.stanciu@upb.ro, Phone: +40724569954
Email: panaitescu.costin@yahoo.com, Phone: +40744511155

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

MODULAR TECHNOLOGY TO SUPPORT UNDERGROUND EXCAVATIONS

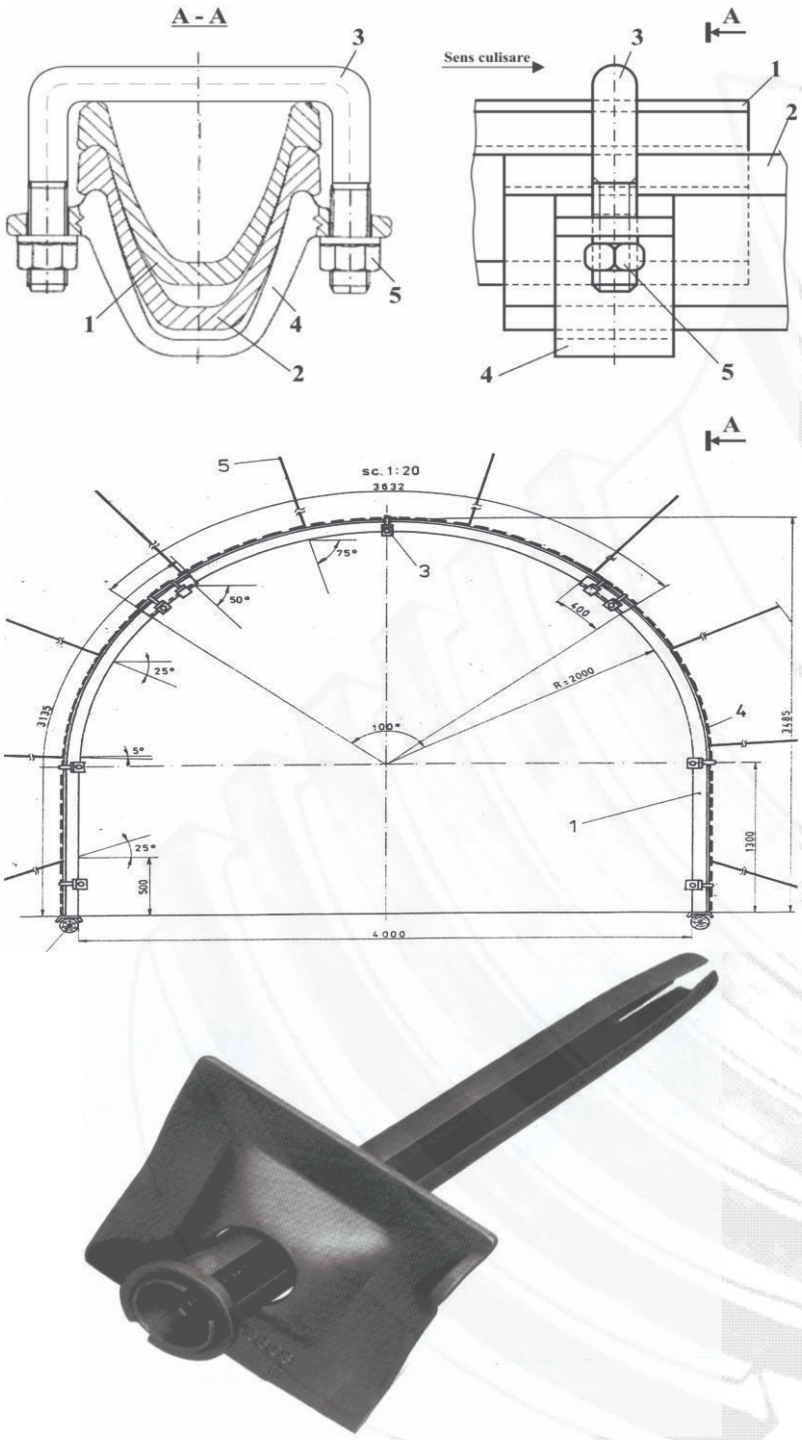
TEHNOLOGIE MODULARĂ DE SUSȚINERE A EXCAVAȚIILOR SUBTERANE

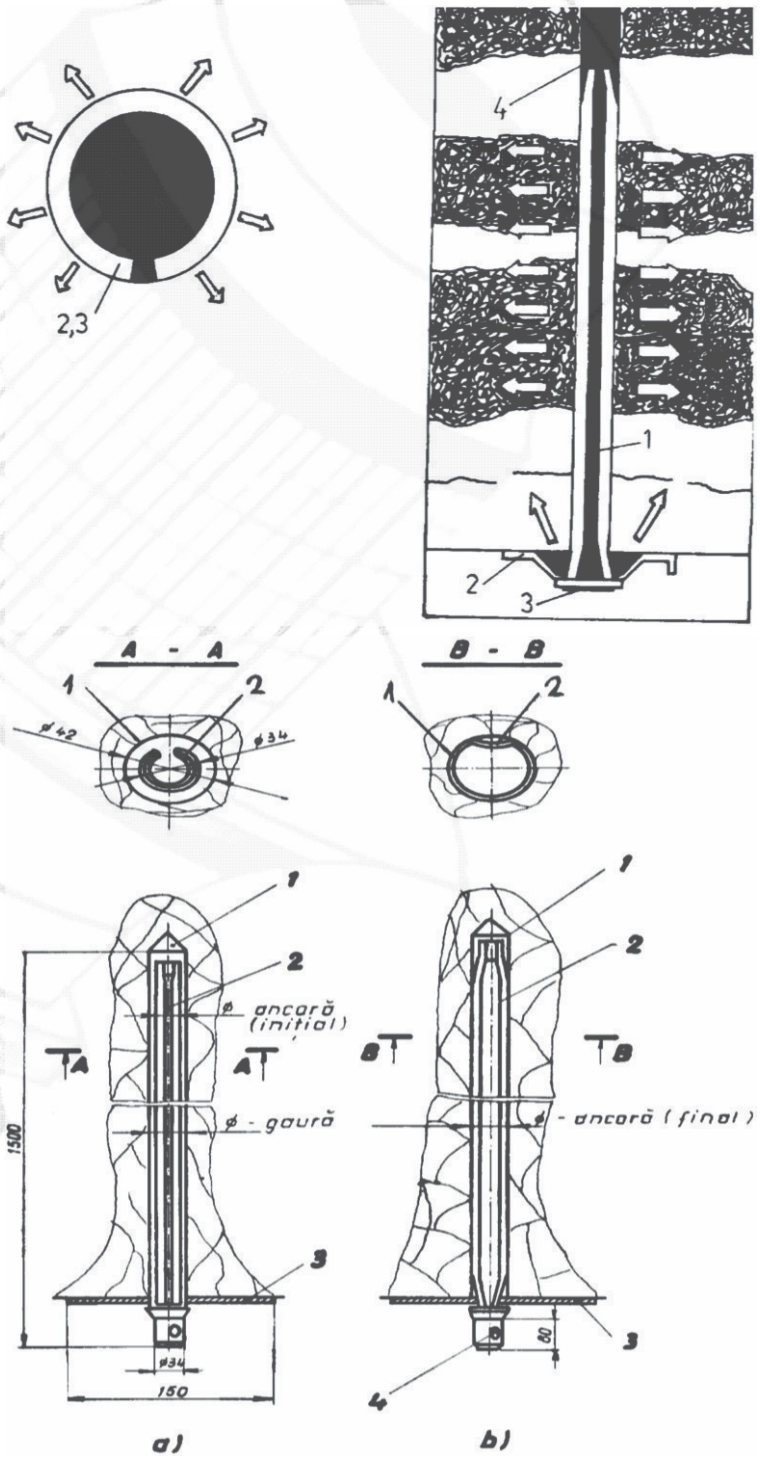
1948 UNIVERSITATEA DIN PETROȘANI

Category H

Patent number: OSIM A00596/25.08.2016, prototype
Ioel Samuel VEREȘ,
Mihai Sorin RADU, Sorinel Ștefan GHIMIȘI, Valeriu PLEȘEA

The invention consists in the development of a support technology that ensures the stability of underground excavations for much longer periods of time.





Invenția constă în dezvoltarea unei tehnologii de sprijin care asigură stabilitatea săpăturilor subterane pentru perioade mult mai lungi de timp.

Asociația de Cercetare Doctorală Petroșani

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

УНИВЕРЗИТЕТ У НИШУ
МАШИНСКИ ФАКУЛТЕТ У НИШУ

Train Undercarriage Visual Inspection Systems

H

Author/s: Marko Perić, Damjan Rangelov, Aleksandar Miltenović, Milan Banić

In the poster are given technical solutions developed at Faculty of Mechanical Engineering University of Niš for the under locomotives visual inspection without using inspection pit. Here are preented three basic concepts: „rod”, „tray” and „trolley”.

The technical solution "rod" is based on similar products used for inspection and control of passenger vehicles and trucks where the concept is adapted to the needs of inspection of railway vehicles.

Fig. 1. Concept of technical solution „rod“

Technical solution "tray" is an improved technical solution "rod" based on the installation of the entire device on the rails.

Fig. 2. Concept of technical solution „tray“

Technical solution "trolley" is designed as a solution where the camera with the device would move on the profiles back and forth. This concept is equipt with camera that can come under any point under the railway vechicle and it is design to be fully remote controled.

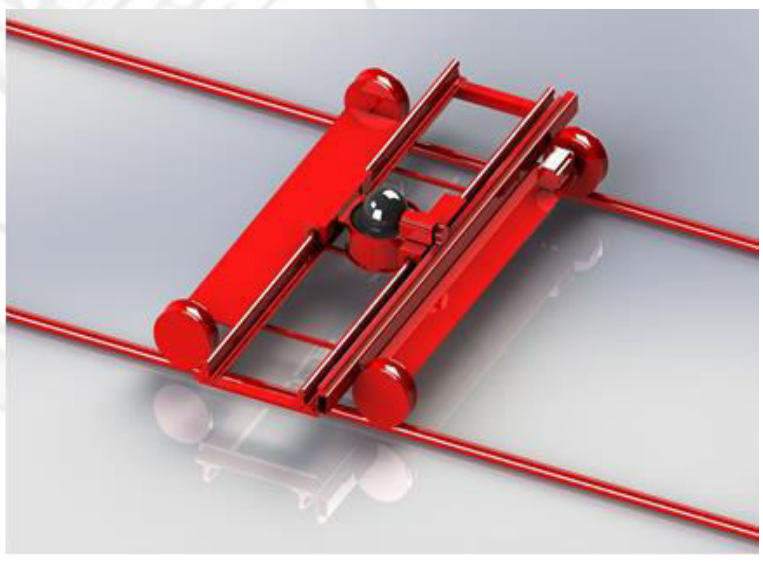


Fig. 3. Concept of of technical solution „trolley“

Fig. 4. Image of undercarridge taken by PTZ camera

Contact: marko.peric@masfak.ni.ac.rs
https://www.masfak.ni.ac.rs
+381600946101

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

CONTAINER

SUPORT LOGISTIC

INTERVENȚIE TIP IV

ILUMINAT (450 KVA)

ASOCIAȚIA "Justin Capră"

H

DESTINAȚIE

Alimentarea cu energie electrică a unor tabere mobile, spitale, gospodării, în cazul producerii unor situații de urgență.

ORGANIZARE

Container DIN 30722 pe șasiu Roll-Off

Grup electrogen 450 KVA

Panou comandă, automatizare și distribuție

Cabluri electrice de legatură și prelungire (5x640A; 6x125A; 10x63A; 38x16A)

Distribuitoare mobile

Inspectoratul General pentru Situaţii de Urgenţă (IGSU)

ELECTRO OPTIC COMPONENTS
www.electro-optic.ro

S.C. CROS CONSTRUCT S.R.L.
www.crosconstruct.ro

Contact person: VELCEA Marian
E-mail: marian.nicolae.velcea@gmail.com

©2021 Electro Optic Components

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

1970-2020 ISIM

Excellence through competence

National Research & Development Institute for Welding and Material Testing - ISIM Timişoara

Institutul Naţional de Cercetare-Dezvoltare în Sudură şi Încercări de Materiale - ISIM Timişoara

Research on the development of new innovative methods for the application of the friction stir welding process in order to expand the possibilities of application in priority areas

Research Project PN 19 36 01 01 / 2019-2022

Authors: Lia-Nicoleta Boţilă, Radu Cojocaru, Victor Verbiţchi, Ion-Aurel Perianu, Iuliana Duma, Cristian Ciucă

H

Scope:
Development of innovative processes and technologies for joining by welding of non-ferrous metals and steels, using friction stir welding in inert gas environment (FSW-IG)

Objectives:
- ❖ Improving the quality of welded joints made of materials used in priority industries;
- ❖ Increasing the service life of welding tools.

Results:
- Application with good results on Cu 99 copper, DD13 steel, AZ31B magnesium alloy; positive results for TiGr2 titanium and AISI 304L stainless steel;
- Improved quality of the welded joint surface;
- Improvement of mechanical properties;
- Increase the service life of welding tools.

Innovative own contributions:
- Enclosure solution for the application of shielding gas, which allows the process temperature monitoring by infrared thermography (patent application no. A/00746/18.11.2020 - ”Method for monitoring the FSW-IG welding process”)
- FSW-IG welding technologies (DD13, Cu99, AZ31B, TiGr2, AISI 304L)

FSW-IG welding equipment

Welding tools

Smooth conical pin

Pin with 4 flat chamfers

Threaded cylindrical pin

Smooth cylindrical pin

304L stainless steel

Titanium TiGr2

Macroscopic aspect for FSW-IG welded joints

AZ31B magnesium alloy

DD13 steel

Copper Cu99

Benefits of FSW-IG welding compared to classic FSW process:
- increase the tensile strength of the welded joint (DD13, Cu99 and AZ31B);
- improvement the deformability degree (AZ31B);
- improvement the aspect of the weld surface (DD13, Cu99, AZ31B, TiGr2, AISI304L);
- reduction of defects and imperfections in the FSW-IG welded joints, including at high welding speeds (AZ31B, Cu99);
- increase the service life of the welding tools (estimated up to 20 – 30 %).

Contact: ISIM Timişoara, 30 Mihai Viteazu Bv., 300222 Timişoara, România • tel.:+40 256 491831 • www.isim.ro, isim@isim.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

1970-2020 ISIM

Excellence through competence

National Research & Development Institute for Welding and Material Testing - ISIM Timişoara

Institutul Naţional de Cercetare-Dezvoltare în Sudură şi Încercări de Materiale - ISIM Timişoara

Method for monitoring of the friction stir welding process in inert shielding gas environment

Patent application No. A/00746/18.11.2020

Authors: Radu Cojocaru and Lia-Nicoleta Boțilă

H

Friction stir welding in inert shielding gas environment FSW-IG aims to improve the quality of welded joints, protect the welding tool and the welding area against oxidation.

Object of the invention: Development of a method for monitoring the friction stir welding process in inert shielding gas environment FSW-IG, by identifying a technical solution which allows to monitor the process temperature evolution by using infrared thermography.

Current technical situation:

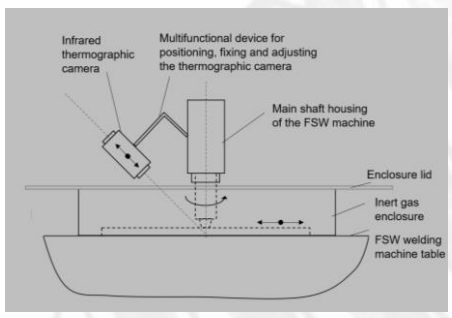
At the FSW-IG welding is currently used a small size inert gas enclosure, which is mounted on the main shaft housing of the friction stir welding machine. The monitoring of the process temperature cannot be performed, the walls of the enclosure being an obstacle on the focus direction of the thermographic camera.

Enclosure version for inert gas application, mounted on the main shaft housing of the FSW machine

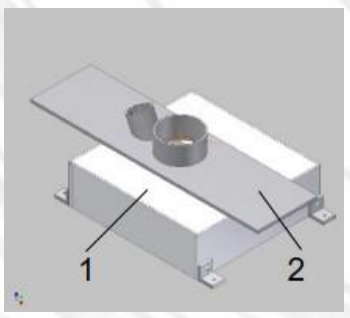
Friction stir welding machine (with inert shielding gas enclosure)

Technical problem solved by the invention:

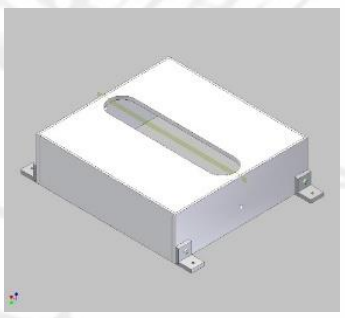
Possibility to monitor the process temperature at FSW-IG welding by using an inert gas enclosure that will allow access of the infrared thermographic camera lens in the welding area to focus and measure the temperature on the joining line, at a short distance behind the welding tool.



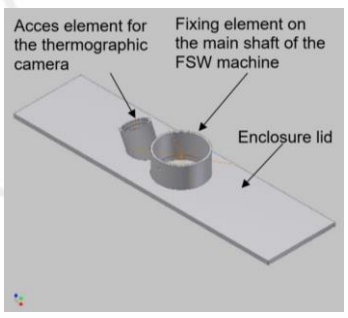
FSW-IG welding assembly with new enclosure variant for inert gas



New inert gas enclosure



1 - Enclosure body



2 - Assembled lid

Description:

The method use a shielding gas enclosure fixed on the table of the FSW welding machine, with the enclosure lid fixed on the main shaft housing of the FSW machine. The thermographic camera is properly positioned and fixed in the lid (also fixed on the same main shaft housing). The enclosure moves during the welding process together with the machine table (with welding speed), slides in relation to the enclosure lid and the thermographic camera, allowing the thermographic camera to focus and measure the temperature on the joining line, at 1mm behind of the FSW tool shoulder, thus ensuring monitoring the welding process. The fixing on the machine and the adjustment of the thermographic camera lens is done through a multifunctional positioning, fixing and adjustment device in relation to the joining area.

Benefits:

- the possibility of the process temperature monitoring to the friction stir welding in inert gas environment FSW-IG, using infrared thermography;
- ensuring a large volume of inert gas in the working area, which should provide:
  - a uniform and wider protection of the area around the welding tool;
  - protection of the welding materials and welding tool against oxidation.

Contact: ISIM Timişoara, 30 Mihai Viteazu Bv., 300222 Timişoara, România • tel.:+40 256 491831 • www.isim.ro, isim@isim.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

1970-2020 ISIM

Excellence through competence

National Research & Development Institute for Welding and Material Testing - ISIM Timişoara

Institutul Naţional de Cercetare-Dezvoltare în Sudură şi Încercări de Materiale - ISIM Timişoara

Method of making rectangular and square tubes of aluminum alloys, by the process of friction stir welding (FSW)

Patent Application Number: A 2020 00242 / 06th.05.2020

Authors: Victor VERBIŢCHI (1); Nicuşor-Alin SÎRBU (1); Miomir VLASCICI (2)
Affiliation: 1 – National Research & Development Institute for Welding and Material Testing – ISIM Timisoara, Romania;
2 – Company Nano Inteliform S.R.L. Timisoara, Romania

H

Description

The invention relates to a method of making rectangular and square tubes, in the size range 10 - 100 mm of each side of the cross section of the tube, using sheets of aluminum alloys, with a thickness of 2 – 5 mm.

The friction stir welding (FSW) process is applied for the actual execution.

Friction stir processing (FSP) is also used, to improve the shape, appearance, structure and technical characteristics of the joints.

The invention can be applied industrially on specialized machines, as an alternative technical solution to extrusion or rolling.

Target applications consist of arrangements, light constructions and welded structures.

The areas covered are: construction, electrical engineering, manufacturing, rolling stock and the automotive industry.

The FSW and FSP processes are ecologic, without toxic substances.

Contact:
Dr. Eng. Victor VERBIȚCHI
Affiliation:
National Research & Development Institute for Welding and Material Testing – ISIM Timisoara, Romania
E-mail: isim@isim.ro; centa@isim.ro; vverbitchi@isim.ro
Telefon: +40768188979
Website: www.isim.ro

Section A-A

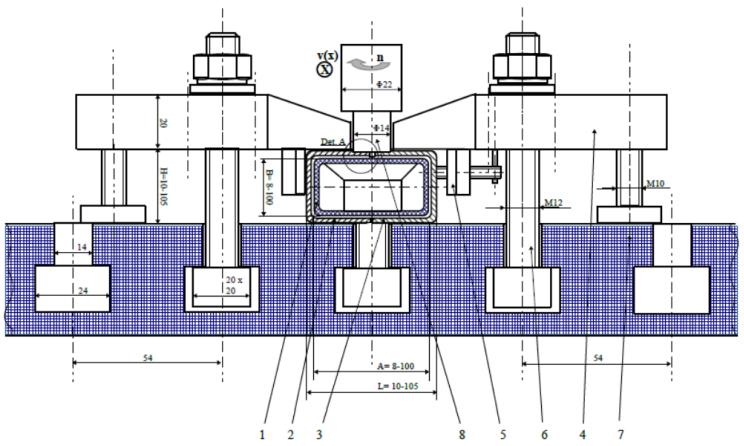


Figure 1a. Set-up for the application of the method. Side view

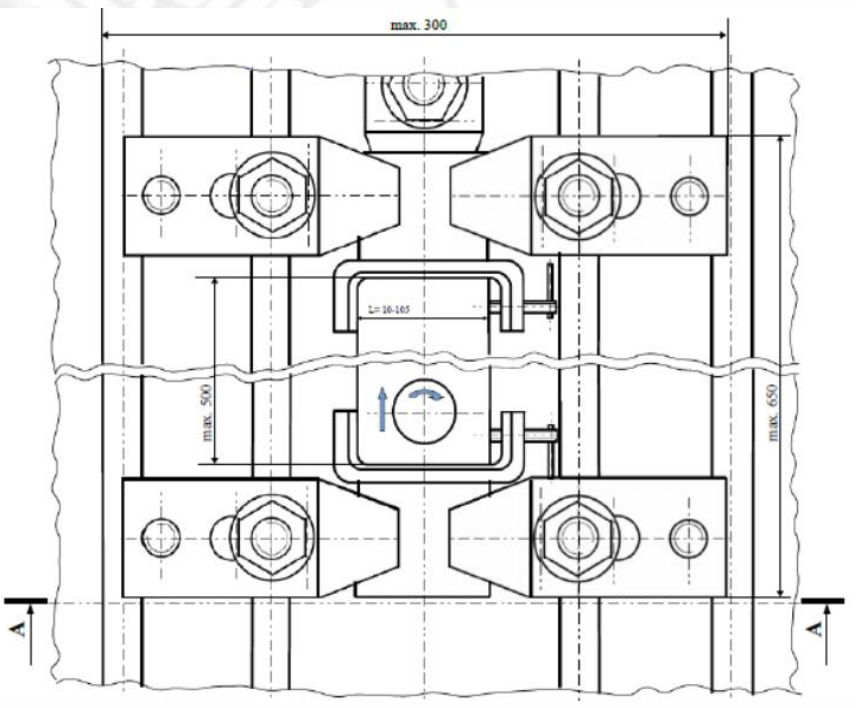


Figure 1b. Set-up for the application of the method. Top view

Set-up components: 1 – Model; 2 – Sheet A; 3 – Sheet B; 4 – Clamp; 5 – Vise; 6 – Screw; 7 – FSW machine table; 8 – FSW machine tool.

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

1970-2020 ISIM

Excellence through competence

National Research & Development Institute for Welding and Material Testing - ISIM Timişoara

Institutul Naţional de Cercetare-Dezvoltare în Sudură şi Încercări de Materiale - ISIM Timişoara

Project title:
A rapid joint by alternative processes. Acronym J-FAST. Program MANUNET

Contracts No. 17 and 18 / 2015-2017 of UEFISCDI Bucharest

Authors: Victor VERBIŢCHI (1); Miomir VLASCICI (2); Radu COJOCARU (1); Lia-Nicoleta BOȚILĂ (1); Cristian CIUCĂ (1); Nicu VÂNĂTU (2); Florin SIMEON (2)
Affiliation: 1 – National Research & Development Institute for Welding and Material Testing – ISIM Timisoara, Romania;
2 – Company Nano Inteliform S.R.L. Timisoara, Romania

H

Description

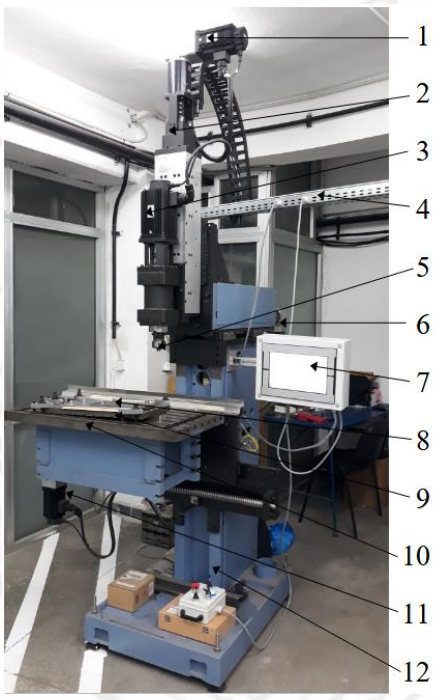
Purpose of the project: Development of new technologies of plastic deformation of metals, without cutting, for fast joining

Partners of the Basque Country, Spain
- Coordinator / Partner P1: Company Metal Estalki S.L.
- P2: Company Inpromat S.L.
- P3: Company Susensa S.L.
- University of the Basque Country (Subcontracted by P1, P2 and P3)

Partners of Romania:
- P4: ISIM Timișoara
- P5: Nano Inteliform S.R.L. Timișoara

Technical characteristics of the MMPF
- Table sizes: 900 mm x 400 mm
- X-Y-Z coordinates-controlled motion
- Length travel stroke (X): max. 500 mm
- Cross stroke (Y): max. 200 mm
- Vertical stroke (Z): max. 300 mm
- Vertical thrust force (Z): max. 20 kN
- Horizontal force (X, Y): max 10 kN
- Rotational tool speed: 5 - 3450 rpm
- Travel speed v(x): 0 - 2000 mm / min

Contact:
Dr. Eng. Victor VERBIȚCHI
Affiliation: ISIM Timișoara
E-mail: isim@isim.ro; centa@isim.ro; vverbitchi@isim.ro
Telefon: +40768188979
Website: www.isim.ro



Components:
1- Vertical actuator (Oz); 2 - Vertical force transducer; 3 - Servomotor for rotating friction tools; 4 - Cables to the Control unit; 5 - Friction tool; 6 - Cross actuator (Oy); 7 - Control panel; 8 - Parts to be joined; 9 - Fixture jig; 10 - Travel table; 11- Length actuator (Ox); 12– Equipment body.

Fig. 1. Multifunctional friction processing machine, type MMPF, designed and executed in the project J-FAST

Fig. 2. Dissimilar friction stir welding (FSW) of a 6 mm thick EN AW 1200 aluminium alloy sheet with a 2 mm thick Cu99 copper sheet

Fig. 3. Execution by FSW of a functional layer of 1.0 mm thick 5754 aluminium alloy sheets, on a 50 mm x 50 mm S235 steel tube

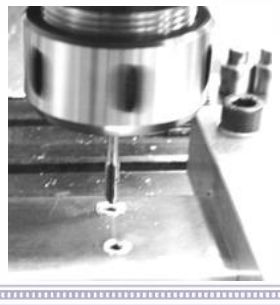


Fig. 4. Automated drilling and threading by plastic deformation, without cutting

H

SIMS – Sistem Integrat Mobil de Supraveghere

MISS – Mobile Integrated Surveillance System

Autori: Emil POPESCU, Mihai JURBĂ, Dănuț STROE
ELECTRO OPTIC SYSTEMS S.R.L.
elop@elop.ro

Sistem destinat integrării unei game variate de senzori în scopul de a colecta, procesa, stoca și transmite date privind supravegherea acțiunilor dăunătoare mediului, influenței traficului asupra mediului, managementului prevenirii și reducerii riscurilor de mediu, modificărilor climei, supravegherii faunei.

System design to integrate a various range of sensors in order to collect, process, store and transmit data regarding surveillance of hostile actions to the environment, influence of traffic over the environment, management of prevention and mitigation the environmental risks, weather, climatic change, fauna surveillance.

SC INVEL – Agenţie de Proprietate Intelectuală SRL
sediul: str. Ion Ghica nr. 3, ap. 32, sector 3 – Bucureşti
mobil: 0723.20.50.48, e-mail: invel_agency@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Technical University of Cluj-Napoca

INTENSIFIER SYSTEM FOR HIGH PRESSURES

Patent number: RO131458-B1/30.10.2019

Author/s: **Cornel Ciupan, Emilia Ciupan, Rareş Petrus**

H

The invention relates to an intensifier system for high pressures, which can be used in the manufacturing of water jet cutting machines or in other industrial applications requiring high pressure. According to the invention, the system consists of the following components:

- a sonic generator comprising a camshaft which moves a rod that pushes on a membrane fixed with some screws between a lower casing and an upper casing that generates pressure waves in a liquid (oil) found in the pipe connected to the sonic amplifier;
- a sonic amplifier made of a chamber having the membrane (D-oil) coupled, by a rod to another membrane (d-water), where the pressure waves generate a reciprocating motion of the two membranes, the pressure amplifying ratio being given by the square of the ratio between the diameters (D/d).

The system is recommended for waterjet cutting machines and offers the following advantages: technological and constructive simplicity; high reliability and easy maintenance; high volumetric efficiency due to avoiding leakage losses through seals; possibility of making membranes from materials resistant to corrosion or to different chemical agents, depending on the specific application.

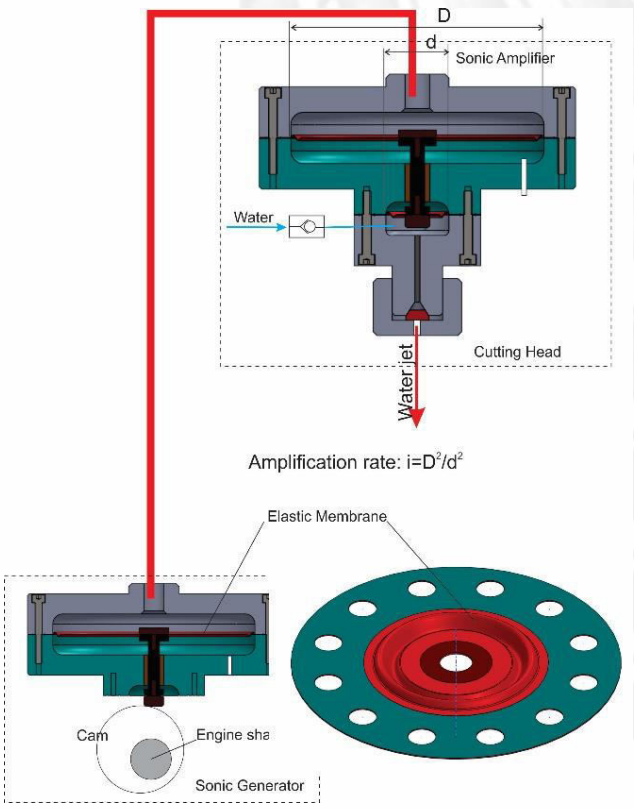


Figure 1

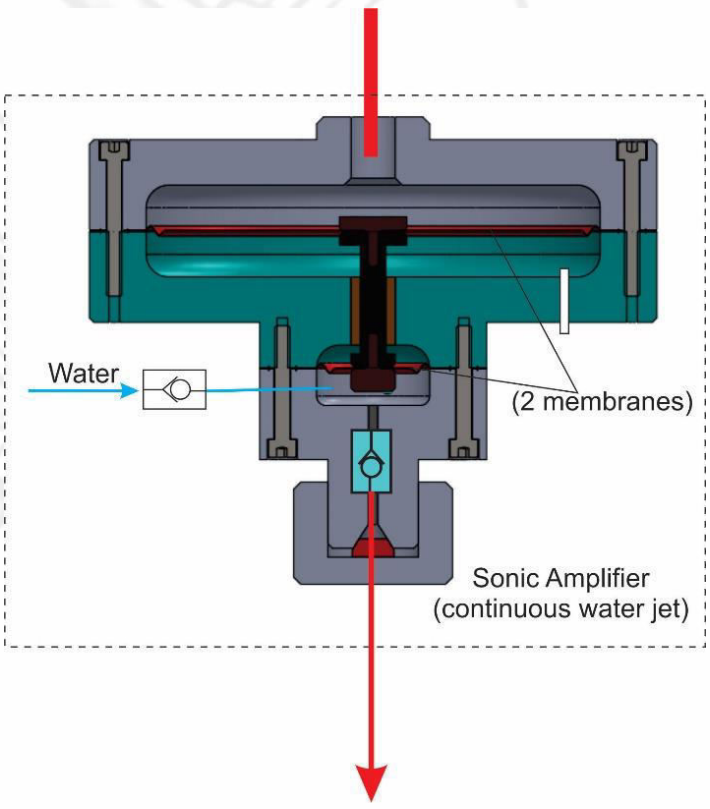


Figure 2

Contact: cornel.ciupan@muri.utcluj.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Technical University of Cluj-Napoca

SEALING SYSTEM FOR HIGH PRESSURE

Patent RO130127 (B1)/2020-05-29

Author: **Ciupan Mihai**

H

The invention relates to a sealing system which can be used in the construction of a hydraulic or pneumatic pump or motor, preferably operating at high pressure. According to the invention, the system comprises a cylinder (2) wherein a piston (1) slides driven by a crank shaft (3), having a tight chamber of variable volume (6) confined by a membrane (4) and a cover (5), as well as a metallic membrane (4) of a shape of revolution, having a cylindrical part with a corrugated zone (4a) playing the role of a spring, at one end having a flanged edge (4b) by means of which it is tightly fixed between the cylinder (2) and the cover (5), using some screws (9) while, at the other end (4c) facing the piston (1), the membrane (4) may be either closed or open.

The invention relates to a sealing system without flow losses, which can be used in the construction of hydraulic or pneumatic pumps and motors, especially those operating at high pressures.

The sealing system according to the invention has the following advantages:

- 100% volumetric efficiency (does not lose liquid);
- simple construction and high reliability;
- can be made of materials resistant to corrosion or various chemical agents.

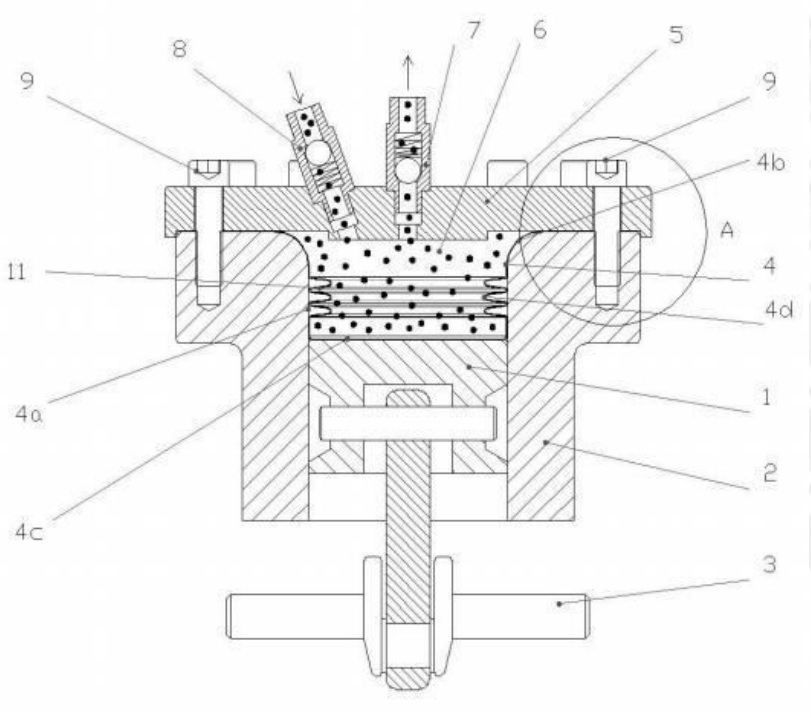


Fig. 1. Assembled pump cylinder

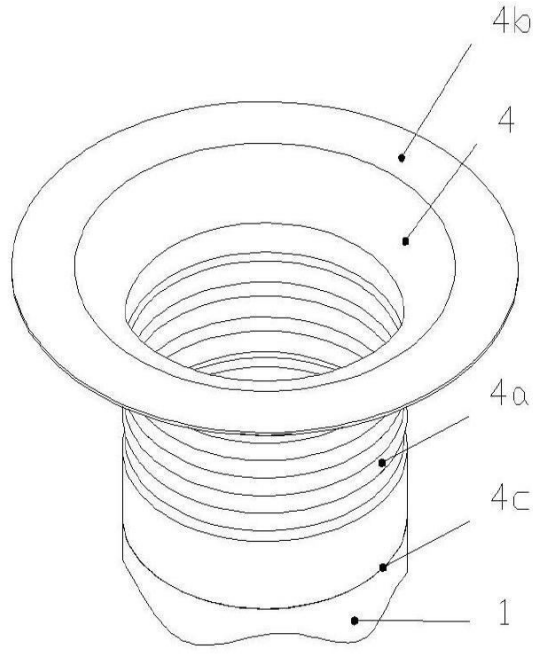


Fig. 2. Metallic bellow which provides the sealing

Contact: mihai.ciupan@muri.utcluj.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Technical University of Cluj-Napoca

METHOD OF CONTROLLING ROBOTS TO AVOID OBSTACLE

Patent number: RO125210 (B1)/2016-05-30

Author/s: **Emilia Ciupan, Liviu Morar, Cornel Ciupan**

H

The invention consists of a method for modeling the kinematics of a robot, based on neural networks, so that it bypass an obstacle located on its way while it moves between two points of the workspace. Neural model is obtained through a training process, "deliberately wrong", by associating the coordinates (X, Y, Z) of some points situated on the direct path of the robot with appropriate motor couplings coordinates of points on the detour path.

For example it is considered a portion of the robot workspace, the cube $P_1P_2P_3P_4P_5P_6P_7P_8$ from Figure 1. It contains an obstacle ABCDA'B'C'D' which should be avoided during the operation of the robot. The robot effector must travel between points P_1P_3, but on a trajectory to avoid the obstacle ABCDA'B'C'D'. The model is imaged to be an artificial neural network with three layers as it is shown in Figure 2. The network inputs consist of the coordinates (X, Y, Z) of the effector position. Coordinates of motor couplings q_1, q_2, …, q_m are its outputs. The desired model is obtained by training the neural network with a set of data pairs. These pairs are obtained through associating (X, Y, Z) coordinates of the points on the direct path, for example, point A, O_1, C with motor couplings coordinates that correspond to points on the detour path, ie A′, O'_1, C′ (Table 1).

Applicability: The invention relates to obtaining a neural network controller for industrial robots, in order to avoid obstacles.

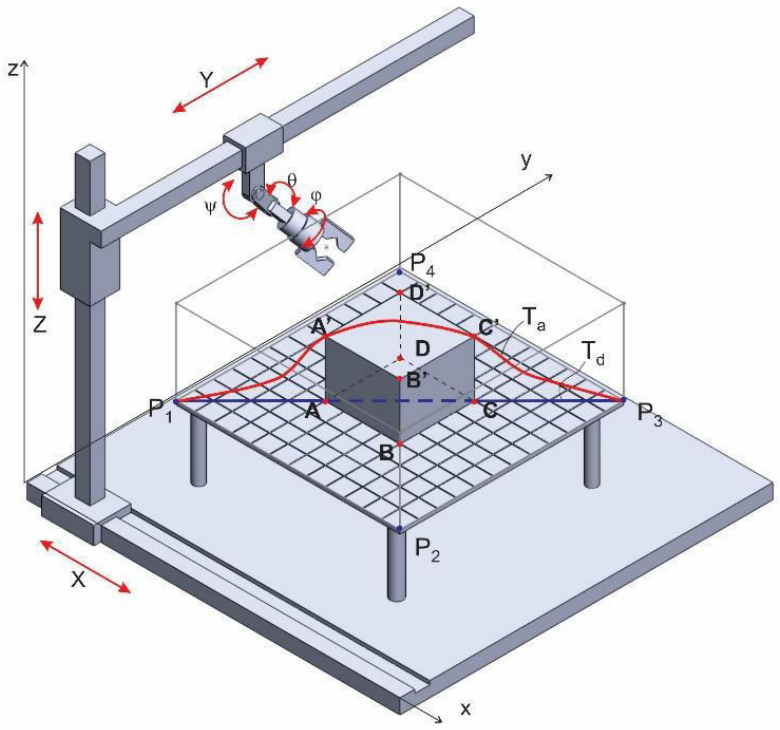


Figure 1

Table 1: The way for obtaining the training data

No.	Points of training	Wished input						Wished output	Origin q_i
1.	P_1	X_1	Y_1	Z_1	ψ_1	θ_1	φ_1	$q_{i,1}$	P_1
2.	P_2	X_2	Y_2	Z_2	ψ_2	θ_2	φ_2	$q_{i,2}$	P_2
3.	P_3	X_3	Y_3	Z_3	ψ_3	θ_3	φ_3	$q_{i,3}$	P_3
4.	P_4	X_4	Y_4	Z_4	ψ_4	θ_4	φ_4	$q_{i,4}$	P_4
5.	A	X_A	Y_A	Z_A	ψ_A	θ_A	φ_A	$q_{i,A'}$	A’
6.	B	X_B	Y_B	Z_B	ψ_B	θ_B	φ_B	$q_{i,B'}$	B’
7.	C	X_C	Y_C	Z_C	ψ_C	θ_C	φ_C	$q_{i,C'}$	C’
8.	D	X_D	Y_D	Z_D	ψ_D	θ_D	φ_D	$q_{i,D'}$	D’
9.	O_1	X_{O1}	Y_{O1}	Z_{O1}	ψ_{O1}	θ_{O1}	φ_{O1}	$q_{i,O'1}$	O'_1

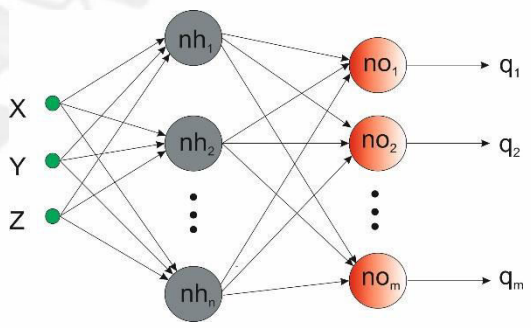


Figure 2

Contact: emilia.ciupan@mis.utcluj.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Technical University of Cluj-Napoca

METHOD OF INDUSTRIAL ROBOTS CONTROL

Patent number: RO125211 (B1)/2016-05-30

Author/s: **Emilia Ciupan, Liviu Morar, Cornel Ciupan**

H

The patent offers a new method for controlling industrial robots based on a neural network training algorithm (Figure 1). According to the method proposed, the set of training examples results from the imposition of a successive move of the signals q_i, i=1,..., 6, by the successive move of each signal by a step p, followed by mixed moves of several axes, for each set j of input data $q_{i,j}$, i=1,...,6 and j=1,...,m, where m is the total number of sets of this type, resulting in a set of output data $F(q_{1j},q_{2j},q_{3j},q_{4j},q_{5j},q_{6j})$ that is used for the network training. The training and testing data is determined according to the mathematical model for the function F by modifying the input signals according to Table 1.

The training data is determined by the mathematical model or physical model experiments on the robot.

The robot kinematics is modelled by a 3-layers neural network (Figure 2). The number of neurons belonging to the input layer is equal to the input signals number. The output layer has a number of neurons equal to the output signals number. In case of the direct kinematics the input signals consist of motor couplings displacements q_i, i=1… n. The outputs correspond to the effector position and orientation (X, Y, Z ψ, θ, φ). The inputs and outputs mentioned above interchange in case of reverse kinematics. The network hidden layer is composed by a convenient number of neurons.

This invention presents a method for training a neural network with a small number of examples used for robot control.

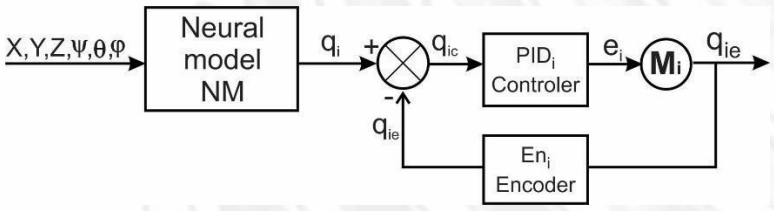


Figure 1

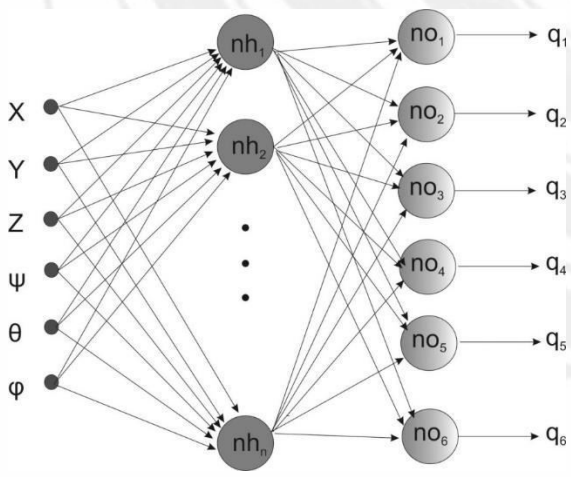


Figure 2

Table 1

Stage	Joints coordinates (q_i, i=1,…,6)						Effector coordinates $P_{f,z}(X,Y,Z,\psi,\theta,\varphi)$, f=1,…,30, z=0,…,j					
f	q_1	q_2	q_3	q_4	q_5	q_6	X	Y	Z	ψ	θ	φ
1.	$\mathbf{q_{1\,min}+z\cdot p}$	$q_{2\,min}$	$q_{3\,min}$	$q_{4\,min}$	$q_{5\,min}$	$q_{6\,min}$	$X_{1\cdot0}$	$Y_{1\cdot0}$	$Z_{1\cdot0}$	$\psi_{1\cdot0}$	$\theta_{1\cdot0}$	$\varphi_{1\cdot0}$
							…	…	…	…	…	…
							$X_{1\cdot z}$	$Y_{1\cdot z}$	$Z_{1\cdot z}$	$\psi_{1\cdot z}$	$\theta_{1\cdot z}$	$\varphi_{1\cdot z}$
							…	…	…	…	…	…
							$X_{1\cdot j}$	$Y_{1\cdot j}$	$Z_{1\cdot j}$	$\psi_{1\cdot j}$	$\theta_{1\cdot j}$	$\varphi_{1\cdot j}$
2.	$q_{1\,min}$	$\mathbf{q_{2\,min}+z\cdot p}$	$q_{3\,min}$	$q_{4\,min}$	$q_{5\,min}$	$q_{6\,min}$	$X_{2\cdot z}$	$Y_{2\cdot z}$	$Z_{2\cdot z}$	$\psi_{2\cdot z}$	$\theta_{2\cdot z}$	$\varphi_{2\cdot z}$
3.	$q_{1\,min}$	$q_{2\,min}$	$\mathbf{q_{3\,min}+z\cdot p}$	$q_{4\,min}$	$q_{5\,min}$	$q_{6\,min}$	$X_{3\cdot z}$	$Y_{3\cdot z}$	$Z_{3\cdot z}$	$\psi_{3\cdot z}$	$\theta_{3\cdot z}$	$\varphi_{3\cdot z}$
4.	$q_{1\,min}$	$q_{2\,min}$	$q_{3\,min}$	$\mathbf{q_{4\,min}+z\cdot p}$	$q_{5\,min}$	$q_{6\,min}$	$X_{4\cdot z}$	$Y_{4\cdot z}$	$Z_{4\cdot z}$	$\psi_{4\cdot z}$	$\theta_{4\cdot z}$	$\varphi_{4\cdot z}$
5.	$q_{1\,min}$	$q_{2\,min}$	$q_{3\,min}$	$q_{4\,min}$	$\mathbf{q_{5\,min}+z\cdot p}$	$q_{6\,min}$	$X_{5\cdot z}$	$Y_{5\cdot z}$	$Z_{5\cdot z}$	$\psi_{5\cdot z}$	$\theta_{5\cdot z}$	$\varphi_{5\cdot z}$
6.	$q_{1\,min}$	$q_{2\,min}$	$q_{3\,min}$	$q_{4\,min}$	$q_{5\,min}$	$\mathbf{q_{6\,min}+z\cdot p}$	$X_{6\cdot z}$	$Y_{6\cdot z}$	$Z_{6\cdot z}$	$\psi_{6\cdot z}$	$\theta_{6\cdot z}$	$\varphi_{6\cdot z}$
7.	$\mathbf{q_{1\,min}+z\cdot p}$	$q_{2\,med}$	$q_{3\,med}$	$q_{4\,med}$	$q_{5\,med}$	$q_{6\,med}$	$X_{7\cdot z}$	$Y_{7\cdot z}$	$Z_{7\cdot z}$	$\psi_{7\cdot z}$	$\theta_{7\cdot z}$	$\varphi_{7\cdot z}$
8.	$q_{1\,med}$	$q_{2\,min}+z\cdot p$	$q_{3\,med}$	$q_{4\,med}$	$q_{5\,med}$	$q_{6\,med}$	$X_{8\cdot z}$	$Y_{8\cdot z}$	$Z_{8\cdot z}$	$\psi_{8\cdot z}$	$\theta_{8\cdot z}$	$\varphi_{8\cdot z}$
9.	$q_{1\,med}$	$q_{2\,med}$	$q_{3\,min}+z\cdot p$	$q_{4\,med}$	$q_{5\,med}$	$q_{6\,med}$	$X_{9\cdot z}$	$Y_{9\cdot z}$	$Z_{9\cdot z}$	$\psi_{9\cdot z}$	$\theta_{9\cdot z}$	$\varphi_{9\cdot z}$
10.	$q_{1\,med}$	$q_{2\,med}$	$q_{3\,med}$	$q_{4\,min}+z\cdot p$	$q_{5\,med}$	$q_{6\,med}$	$X_{10\cdot z}$	$Y_{10\cdot z}$	$Z_{10\cdot z}$	$\psi_{10\cdot z}$	$\theta_{10\cdot z}$	$\varphi_{10\cdot z}$
11.	$q_{1\,med}$	$q_{2\,med}$	$q_{3\,med}$	$q_{4\,med}$	$q_{5\,min}+z\cdot p$	$q_{6\,med}$	$X_{11\cdot z}$	$Y_{11\cdot z}$	$Z_{11\cdot z}$	$\psi_{11\cdot z}$	$\theta_{11\cdot z}$	$\varphi_{11\cdot z}$
12.	$q_{1\,med}$	$q_{2\,med}$	$q_{3\,med}$	$q_{4\,med}$	$q_{5\,med}$	$\mathbf{q_{6\,min}+z\cdot p}$	$X_{12\cdot z}$	$Y_{12\cdot z}$	$Z_{12\cdot z}$	$\psi_{12\cdot z}$	$\theta_{12\cdot z}$	$\varphi_{12\cdot z}$
13.	$\mathbf{q_{1\,min}+z\cdot p}$	$q_{2\,max}$	$q_{3\,max}$	$q_{4\,max}$	$q_{5\,max}$	$q_{6\,max}$	$X_{13\cdot z}$	$Y_{13\cdot z}$	$Z_{13\cdot z}$	$\psi_{13\cdot z}$	$\theta_{13\cdot z}$	$\varphi_{13\cdot z}$
14.	$q_{1\,max}$	$\mathbf{q_{2\,min}+z\cdot p}$	$q_{3\,max}$	$q_{4\,max}$	$q_{5\,max}$	$q_{6\,max}$	$X_{14\cdot z}$	$Y_{14\cdot z}$	$Z_{14\cdot z}$	$\psi_{14\cdot z}$	$\theta_{14\cdot z}$	$\varphi_{14\cdot z}$
15.	$q_{1\,max}$	$q_{2\,max}$	$\mathbf{q_{3\,min}+z\cdot p}$	$q_{4\,max}$	$q_{5\,max}$	$q_{6\,max}$	$X_{15\cdot z}$	$Y_{15\cdot z}$	$Z_{15\cdot z}$	$\psi_{15\cdot z}$	$\theta_{15\cdot z}$	$\varphi_{15\cdot z}$
16.	$q_{1\,max}$	$q_{2\,max}$	$q_{3\,max}$	$\mathbf{q_{4\,min}+z\cdot p}$	$q_{5\,max}$	$q_{6\,max}$	$X_{16\cdot z}$	$Y_{16\cdot z}$	$Z_{16\cdot z}$	$\psi_{16\cdot z}$	$\theta_{16\cdot z}$	$\varphi_{16\cdot z}$
17.	$q_{1\,max}$	$q_{2\,max}$	$q_{3\,max}$	$q_{4\,max}$	$\mathbf{q_{5\,min}+z\cdot p}$	$q_{6\,max}$	$X_{17\cdot z}$	$Y_{17\cdot z}$	$Z_{17\cdot z}$	$\psi_{17\cdot z}$	$\theta_{17\cdot z}$	$\varphi_{17\cdot z}$
18.	$q_{1\,max}$	$q_{2\,max}$	$q_{3\,max}$	$q_{4\,max}$	$q_{5\,max}$	$\mathbf{q_{6\,min}+z\cdot p}$	$X_{18\cdot z}$	$Y_{18\cdot z}$	$Z_{18\cdot z}$	$\psi_{18\cdot z}$	$\theta_{18\cdot z}$	$\varphi_{18\cdot z}$
19.	$\mathbf{q_{1\,min}+z\cdot p}$	$\mathbf{q_{2\,min}+z\cdot p}$	$q_{3\,med}$	$q_{4\,med}$	$q_{5\,med}$	$q_{6\,med}$	$X_{19\cdot z}$	$Y_{19\cdot z}$	$Z_{19\cdot z}$	$\psi_{19\cdot z}$	$\theta_{19\cdot z}$	$\varphi_{19\cdot z}$
20.	$q_{1\,med}$	$q_{2\,med}$	$\mathbf{q_{3\,min}+z\cdot p}$	$\mathbf{q_{4\,min}+z\cdot p}$	$q_{5\,med}$	$q_{6\,med}$	$X_{20\cdot z}$	$Y_{20\cdot z}$	$Z_{20\cdot z}$	$\psi_{20\cdot z}$	$\theta_{20\cdot z}$	$\varphi_{20\cdot z}$
21.	$q_{1\,med}$	$q_{2\,med}$	$q_{3\,med}$	$q_{4\,med}$	$\mathbf{q_{5\,min}+z\cdot p}$	$\mathbf{q_{6\,min}+z\cdot p}$	$X_{21\cdot z}$	$Y_{21\cdot z}$	$Z_{21\cdot z}$	$\psi_{21\cdot z}$	$\theta_{21\cdot z}$	$\varphi_{21\cdot z}$
22.	$\mathbf{q_{1\,min}+z\cdot p}$	$\mathbf{q_{2\,min}+z\cdot p}$	$\mathbf{q_{3\,min}+z\cdot p}$	$q_{4\,med}$	$q_{5\,med}$	$q_{6\,med}$	$X_{22\cdot z}$	$Y_{22\cdot z}$	$Z_{22\cdot z}$	$\psi_{22\cdot z}$	$\theta_{22\cdot z}$	$\varphi_{22\cdot z}$
23.	$q_{1\,med}$	$q_{2\,med}$	$q_{3\,med}$	$\mathbf{q_{4\,min}+z\cdot p}$	$\mathbf{q_{5\,min}+z\cdot p}$	$\mathbf{q_{6\,min}+z\cdot p}$	$X_{23\cdot z}$	$Y_{23\cdot z}$	$Z_{23\cdot z}$	$\psi_{23\cdot z}$	$\theta_{23\cdot z}$	$\varphi_{23\cdot z}$
24.	$\mathbf{q_{1\,min}+z\cdot p}$	$\mathbf{q_{2\,min}+z\cdot p}$	$\mathbf{q_{3\,min}+z\cdot p}$	$\mathbf{q_{4\,min}+z\cdot p}$	$q_{5\,med}$	$q_{6\,med}$	$X_{24\cdot z}$	$Y_{24\cdot z}$	$Z_{24\cdot z}$	$\psi_{24\cdot z}$	$\theta_{24\cdot z}$	$\varphi_{24\cdot z}$
25.	$q_{1\,med}$	$q_{2\,med}$	$q_{3\,min}+z\cdot p$	$\mathbf{q_{4\,min}+z\cdot p}$	$\mathbf{q_{5\,min}+z\cdot p}$	$\mathbf{q_{6\,min}+z\cdot p}$	$X_{25\cdot z}$	$Y_{25\cdot z}$	$Z_{25\cdot z}$	$\psi_{25\cdot z}$	$\theta_{25\cdot z}$	$\varphi_{25\cdot z}$
26.	$\mathbf{q_{1\,min}+z\cdot p}$	$\mathbf{q_{2\,min}+z\cdot p}$	$\mathbf{q_{3\,min}+z\cdot p}$	$\mathbf{q_{4\,min}+z\cdot p}$	$\mathbf{q_{5\,min}+z\cdot p}$	$\mathbf{q_{6\,min}+z\cdot p}$	$X_{26\cdot z}$	$Y_{26\cdot z}$	$Z_{26\cdot z}$	$\psi_{26\cdot z}$	$\theta_{26\cdot z}$	$\varphi_{26\cdot z}$
27.	$\mathbf{q_{1\,min}+z\cdot p}$	$q_{2\,min}$	$\mathbf{q_{3\,min}+z\cdot p}$	$q_{4\,min}$	$\mathbf{q_{5\,min}+z\cdot p}$	$q_{6\,min}$	$X_{27\cdot z}$	$Y_{27\cdot z}$	$Z_{27\cdot z}$	$\psi_{27\cdot z}$	$\theta_{27\cdot z}$	$\varphi_{27\cdot z}$
28.	$\mathbf{q_{1\,min}+z\cdot p}$	$q_{2\,max}$	$\mathbf{q_{3\,min}+z\cdot p}$	$q_{4\,max}$	$\mathbf{q_{5\,min}+z\cdot p}$	$q_{6\,max}$	$X_{28\cdot z}$	$Y_{28\cdot z}$	$Z_{28\cdot z}$	$\psi_{28\cdot z}$	$\theta_{28\cdot z}$	$\varphi_{28\cdot z}$
29.	$q_{1\,min}$	$\mathbf{q_{2\,min}+z\cdot p}$	$q_{3\,min}$	$\mathbf{q_{4\,min}+z\cdot p}$	$q_{5\,min}$	$\mathbf{q_{6\,min}+z\cdot p}$	$X_{29\cdot z}$	$Y_{29\cdot z}$	$Z_{29\cdot z}$	$\psi_{29\cdot z}$	$\theta_{29\cdot z}$	$\varphi_{29\cdot z}$
30.	$q_{1\,max}$	$\mathbf{q_{2\,min}+z\cdot p}$	$q_{3\,max}$	$\mathbf{q_{4\,min}+z\cdot p}$	$q_{5\,max}$	$\mathbf{q_{6\,min}+z\cdot p}$	$X_{30\cdot z}$	$Y_{30\cdot z}$	$Z_{30\cdot z}$	$\psi_{30\cdot z}$	$\theta_{30\cdot z}$	$\varphi_{30\cdot z}$

Contact: emilia.ciupan@mis.utcluj.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Technical University of Cluj-Napoca

METHOD FOR PRODUCING WORK AND ROTARY HEAT ENGINE FOR APPLYING SAID METHOD

Patent number: RO129731 (B1)/2020-03-30

Author/s: **Cornel Ciupan, Mihai Ciupan, Emilia Ciupan**

H

The present invention solves the technical problems by developing a simple and efficient internal combustion rotary engine, with low vibration levels, that can operate efficiently at speed over 10,000 rpm, providing a power-to-weight ratio higher than that of all known engines and that can be designed and manufactured for a wide range of power and applications.

The invention describes an internal combustion rotary engine designed for the operation of vehicles or certain tools, machinery or equipment.

Internal combustion rotary engine comprising of a volumetric blade rotary compressor (1), a volumetric blade rotary engine (2) consisting of a housing (12), which holds rotor (13), which is equipped with some slots (13a), on which blades (14) are mounted. Housing (12) is built inside with a complex bore consists of two cylindrical bore (12a), (12b), concentric with rotor (13). The compressed air or mixed fuel is taken in by the constant volume chambers (a0) and (b0) through the engine supply channel (AM) located in the secondary bore (12b) area. The constant volume chambers (a0) and (b0) go to the ignition channel (I), the ignited gas acting upon the blades and thus produces useful work. Internal combustion rotary engine designed for the operation of vehicles or certain tools, machinery, and equipment.

Building a rotary internal combustion engine according to the model described by this invention brings the following advantages:

- small and compact engines which generate high power
- high efficiency
- very low levels of vibration and noise
- simplicity of construction by eliminating valves and using a continuous burning.

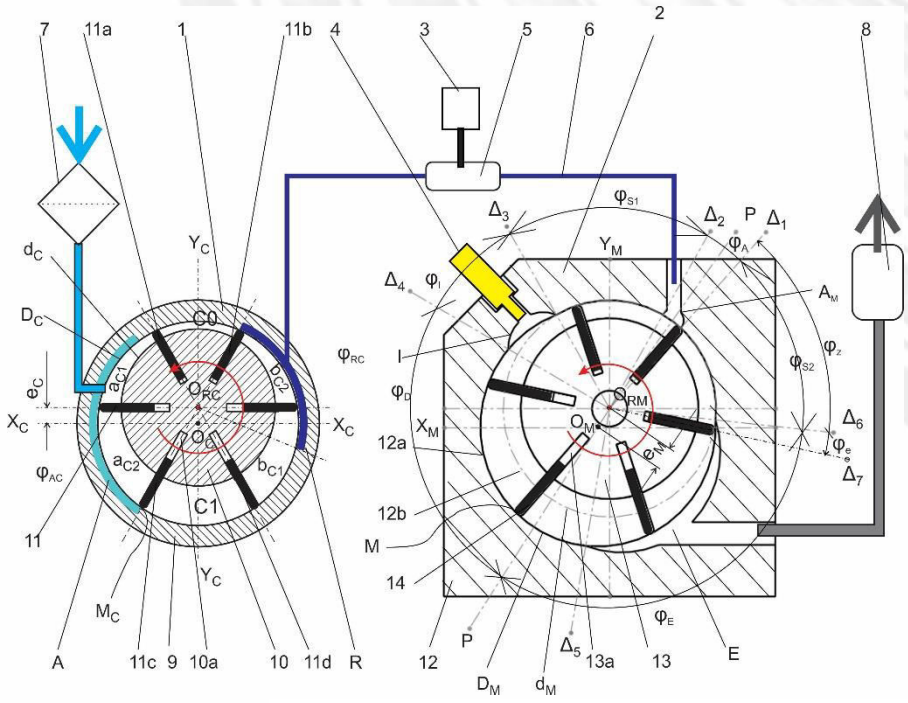


Figure 1

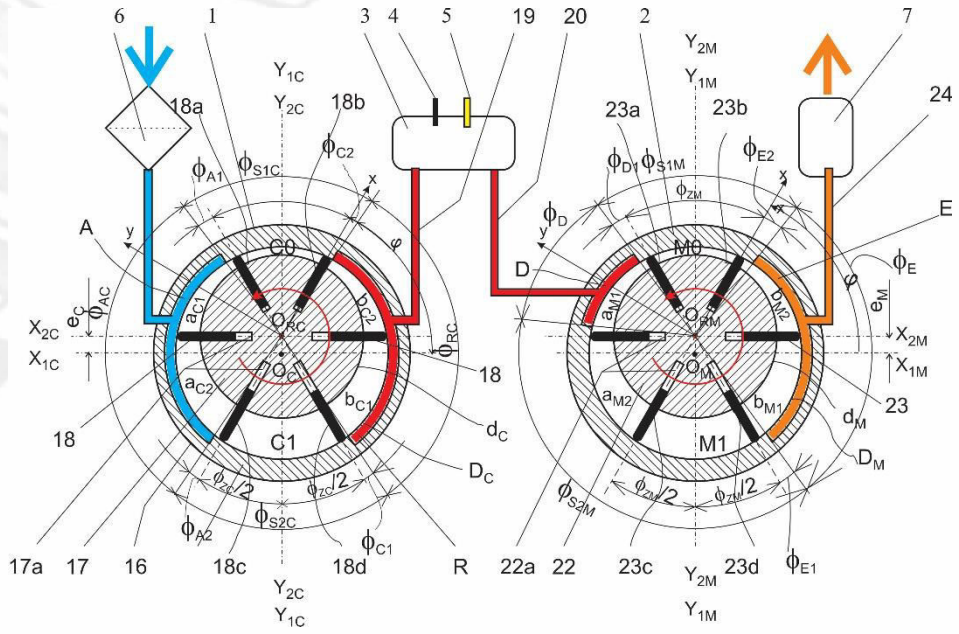


Figure 2

Contact: cornel.ciupan@muri.utcluj.ro

I

Metallurgy

Industrial processes

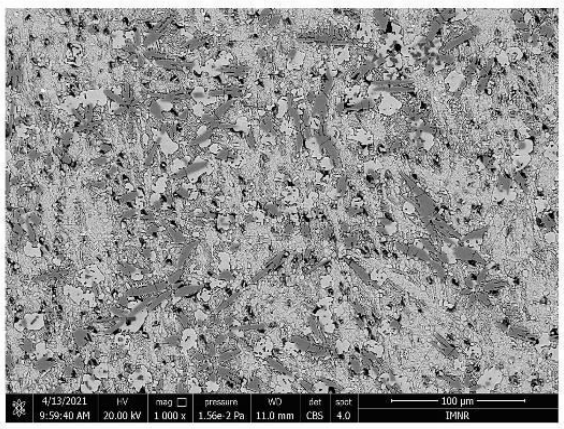
Antifriction alloys improved by microalloying

AVRAM Vasile, SEMENESCU Augustin, CSÁKI Ioana, STOICA Nicolae Alexandru

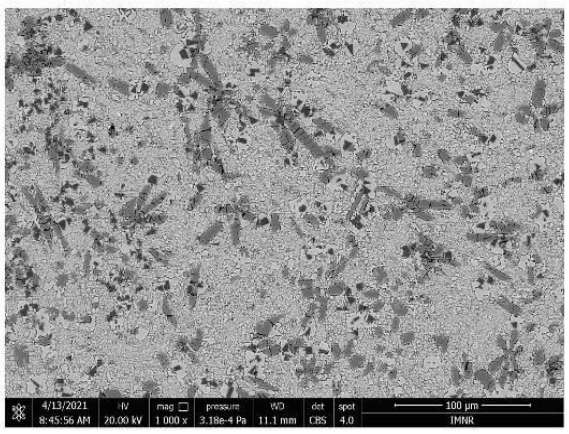
Contact person: augustin.semenescu@upb.ro

PRESENTATION

The invention relates to antifriction alloys YSn83 micro-alloyed with Ca and Mg conferring properties for improved lubrication properties.



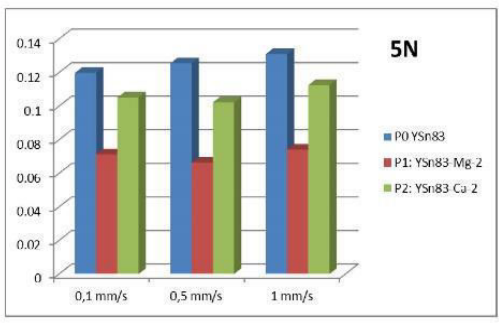
YSn83Ca

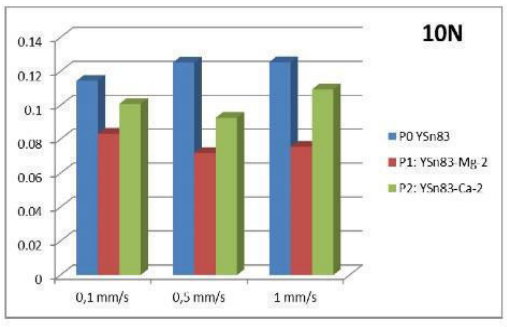


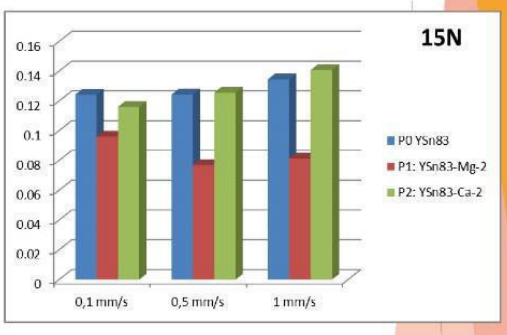
YSn83Mg

Alloy	Chemical composition % gr.								
	Sn	Sb	Cu	Pb	Al	Mg	Ca	Other	impurities
Y-Sn83Ca	82-84	10-12	5.5-6.5	-	-	-	0.2-0.5	-	0.25
YSn83Mg	82-84	10-12	5.5-6.5	-	-	0.2-0.5	-	-	0.25

IMPROVEMENT







The friction coefficient values are between 0.0663 and 0.1286, a value with 59% improved within the base alloy.

PROBLEM SOLVED

❖ The present invention represents a technical progress due to the fact the optimized compositions for the antifriction alloy have a uniform structure resulting in the alloy improvement the tribological properties of the mentioned alloy.

❖For this invention we used Ca and Mg due to the fact that they present a low toxicity.

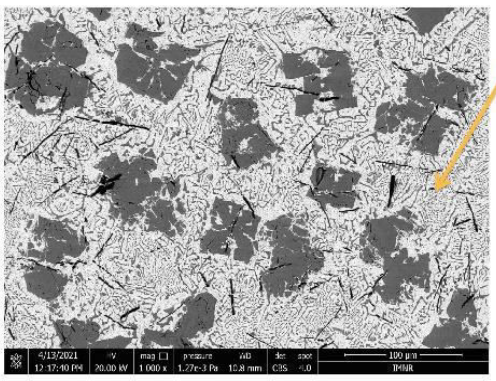
Alloys for tribological applications

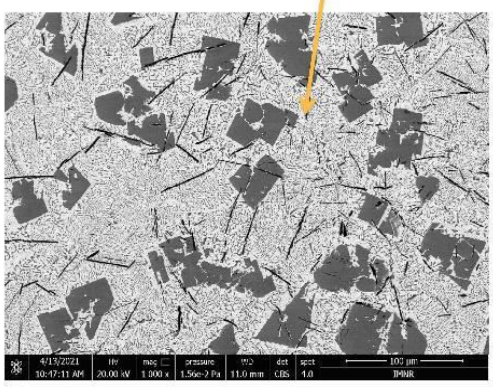
AVRAM Vasile, SEMENESCU Augustin, CSÁKI Ioana, STOICA Alina Maria

Contact person: augustin.semenescu@upb.ro

PRESENTATION

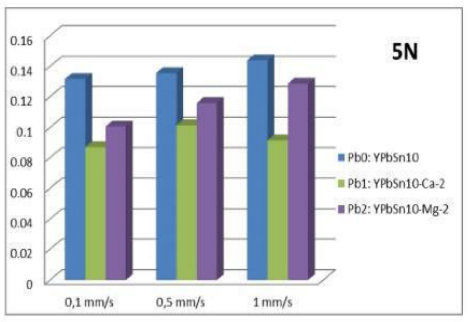
The invention relates to antifriction alloys YPbSn10Ca and YPbSn10Mg with superior properties in comparison with the commercial alloy YPbSn10.

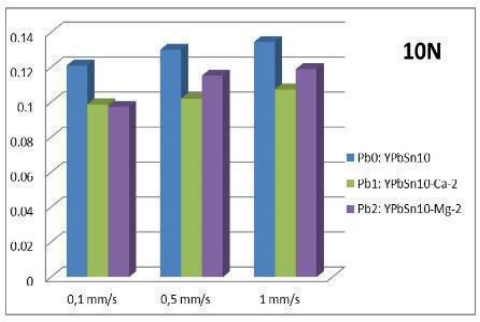


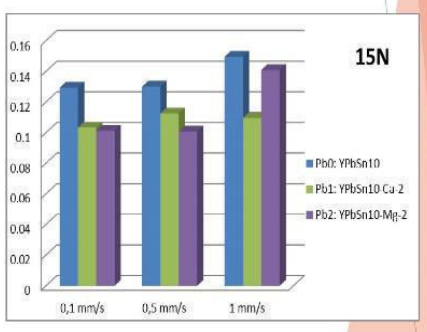


Alloy	Chemical composition % gr.								
	Sn	Sb	Cu	Pb	Al	Mg	Ca	Other	Impurities
YPbSn10Ca	9.5-12	14.5-6.5	0.5-1.5	Rest	-	-	0.2-0.5	-	Max 0.2
YPbSn10Mg	9.5-12	14.5-6.5	0.5-1.5	Rest	-	0.2-0.5	-	-	Max 0.2

IMPROVEMENT







The friction coefficient values are between 0.087 and 0.1126, a value with 66% improved within the base alloy.

PROBLEM SOLVED

❖ The present invention represents a technical progress due to the fact the optimized compositions for the antifriction alloy have a uniform structure in which the hard and soft phases are uniformly distributed in the alloy improvement the tribological properties of the mentioned alloy.

❖For this invention we used Ca and Mg due to the fact that they present a low toxicity. These elements could segregate at the grain dimensions/ dendrites and reducing interface energy grain/dendrite, stopping the movement or grain slipping.

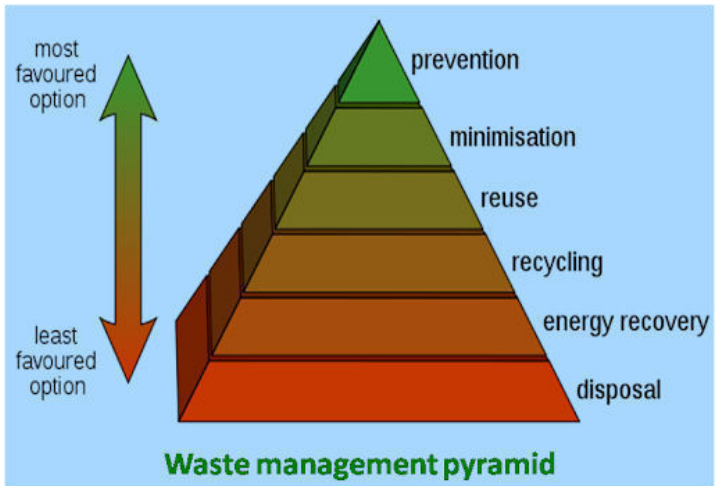
Recycling of waste from the steel industry in the context of the circular economy

PhD Thesis

Authors: Fărcean Ioana-Lucica, Proștean Gabriela Ioana

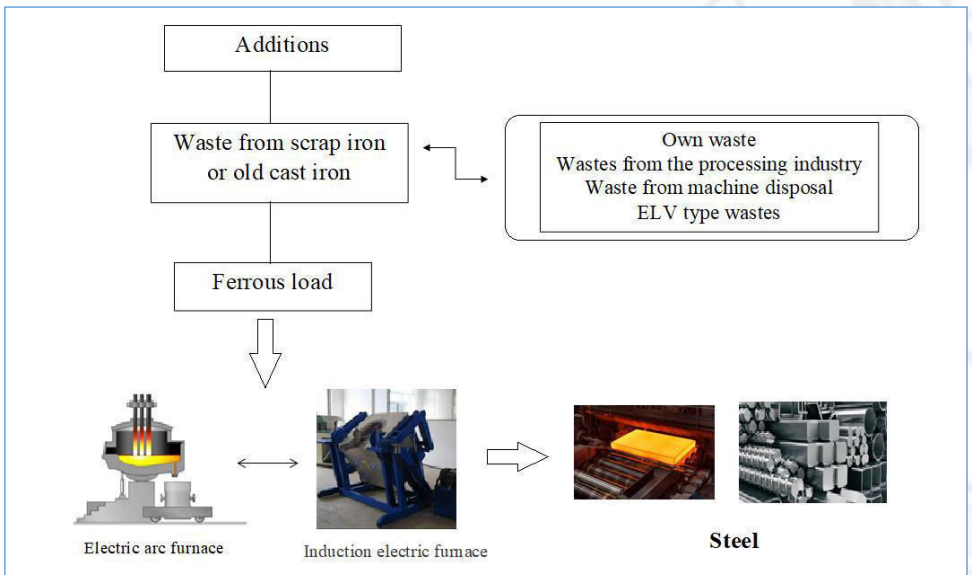
I

Este important ca deșeurile feroase să fie privite drept niște resurse cu o valoare economică importantă în procesul de fabricare a noilor produse deoarece în acest mod se poate elimina obțiunea privind depozitarea lor.
Colectarea și reciclarea deșeurilor feroase nu doar că ajută la salvarea resurselor globale, dar protejează și mediul înconjurător, economisind cantități mari de energie, fapt care contribuie la calitatea vieții.
Reciclarea deșeurilor feroase este fără îndoială mult mai eficientă din punct de vedere economic decât exploatarea în subteran a minereului de fier și pregătirea acestuia în vederea procesului de topire.

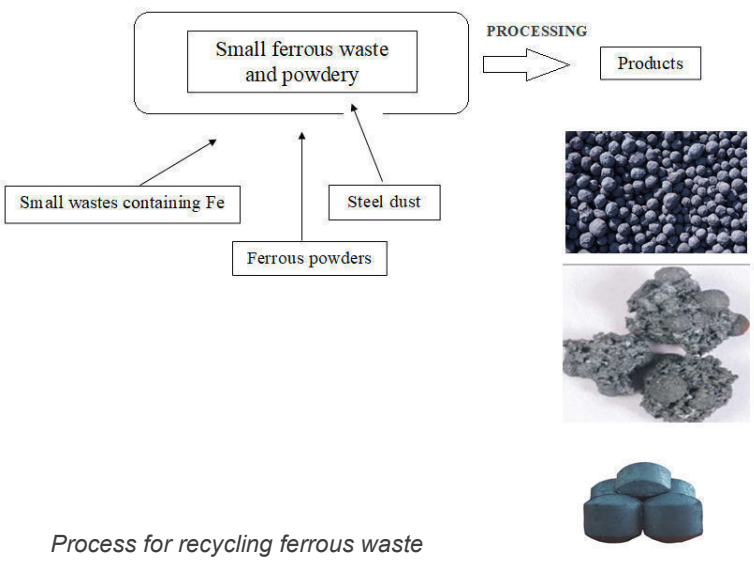


Waste management pyramid

În județul Hunedoara industria siderurgică a fost mereu predominantă motiv pentru care pe teritoriul județului există depozite semnificative de deșeuri industriale. Astfel că este absolut necesară valorificarea potențialului acestor deșeuri și transpunerea procesului de reciclare în abordarea conceptului de circuit economic.



Process for recycling ferrous waste



Process for recycling ferrous waste

It is important that ferrous waste is seen as a resource with an important economic value in the process of manufacturing new products because in this way the option of storing them can be eliminated.
The collection and recycling of ferrous waste not only helps save global resources, but also protects the environment, saving large amounts of energy, which contributes to quality of life.
The recycling of ferrous waste is undoubtedly much more economically efficient than the underground mining of iron ore and its preparation for the smelting process.
In Hunedoara County the steel industry has always been the predominant one, which is why there are significant deposits of industrial waste in the county. Thus, it is absolutely necessary to capitalize on the potential of this waste and transpose the recycling process into the concept of economic circuit.

Contact: farceanioana@yahoo.com
+040773953261

CORNELIUGROUP research-innovation association

INVENTCOR

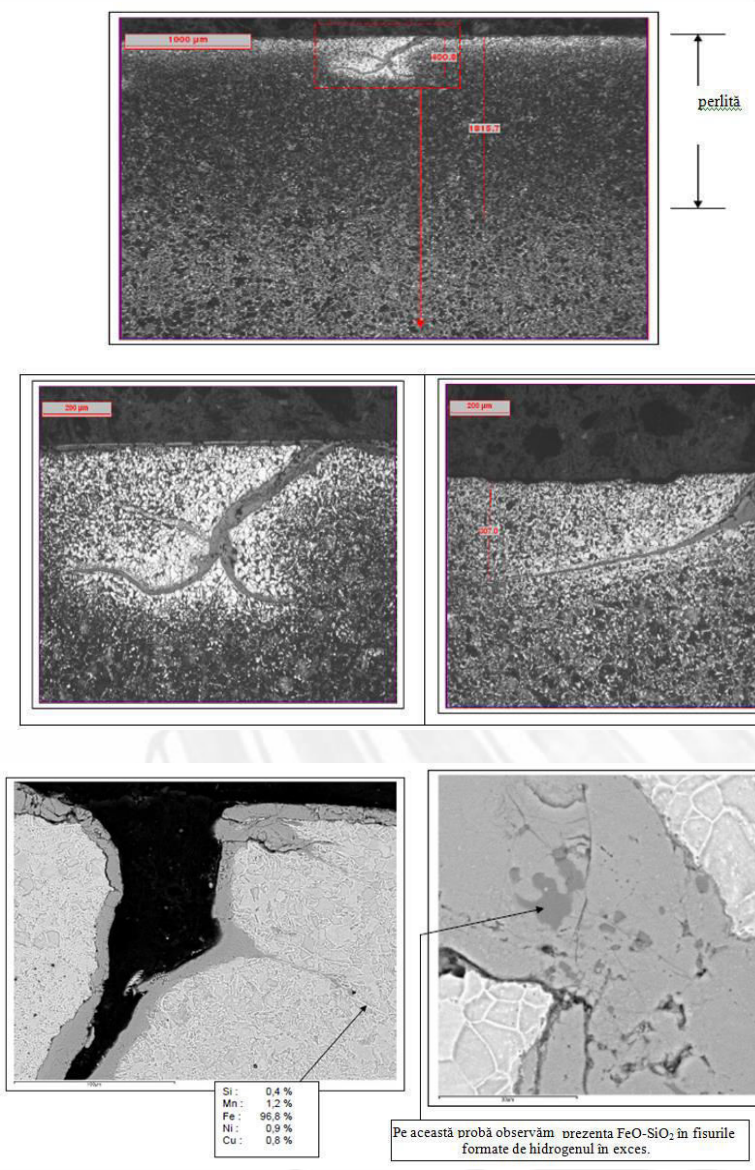
Power of Creative Mind

Hydrogen in steel

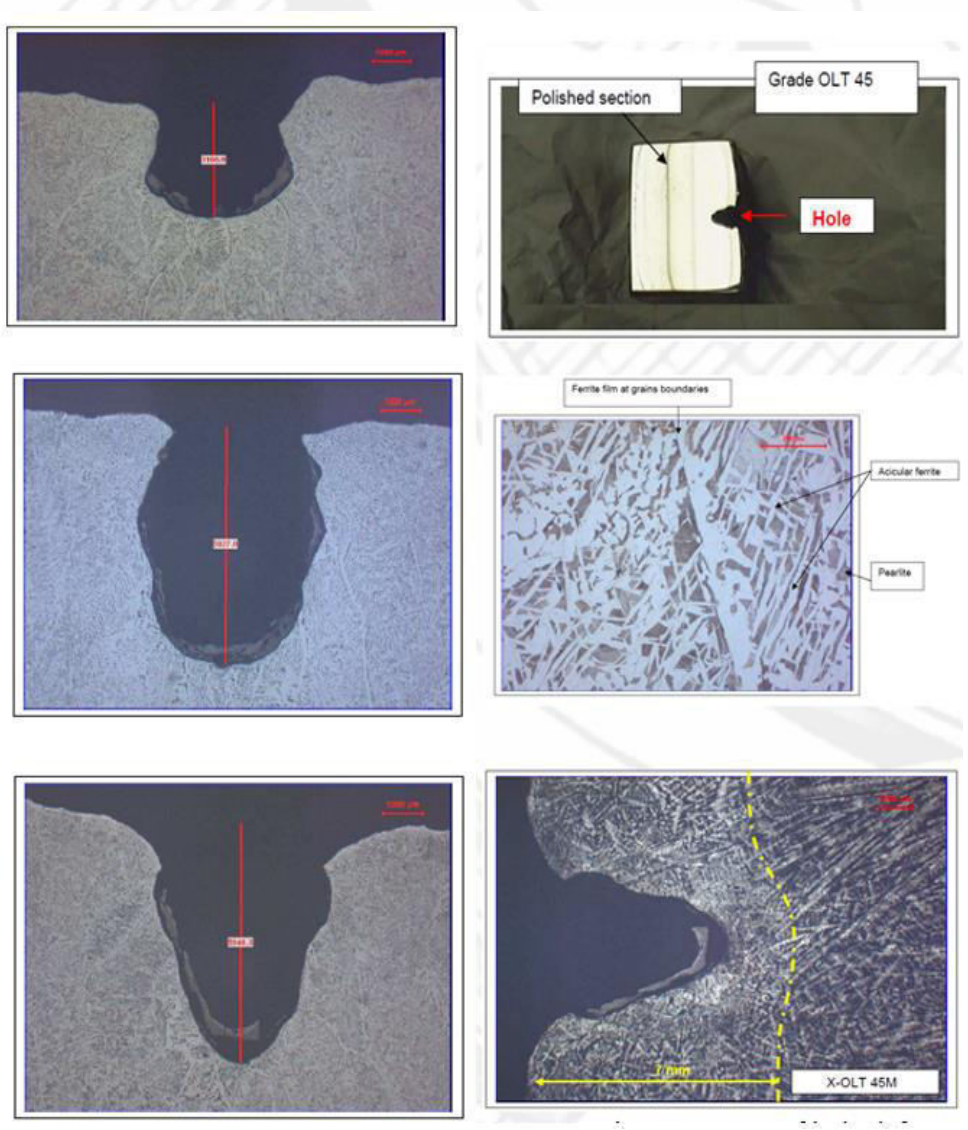
Research project

Author: Ana Socalici

When making steel in electric arc furnaces there are different sources of hydrogen (moisture of the metal charge, the additions needed to form the slag and the atmosphere of the furnace) which under certain conditions of pressure and temperature make it possible to absorb hydrogen in the metal bath. The existence of hydrogen in steel is one of the causes of the appearance of blows in semi-finished castings / castings and contributes to the appearance of the defect called "flakes" in steel. Industrial research has analyzed the possibilities of increasing the degree of hydrogen removal in steels developed in the EBT-LF duplex system.



Defect analysis - stellar crack type



SEM microstructures of hole defects

The analyzes followed: the study of the behavior of hydrogen in steel, the sources of origin in liquid steel of gases, defects caused by gases in finished products, methods of hydrogen removal from steel and the influence of steel gases on the mechanical properties of finished products.

Contact: virginia.socalici@fih.upt.ro, +40741192503

CORNELIUGROUP
research-innovation
association

INVENTCOR

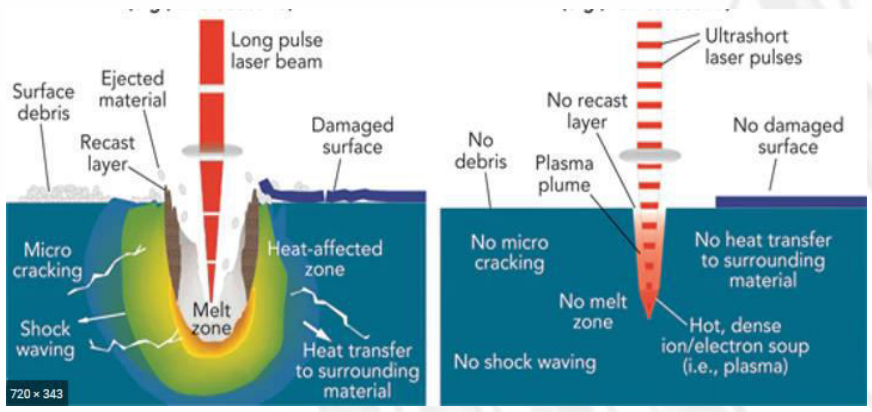
Power of Creative Mind

Unconventional method of cutting aluminum plates using fiber laser with oxygen assist gas

PhD Thesis

Authors: Laurentiu Zgripcea, Richard Molnar, Teodor Heput

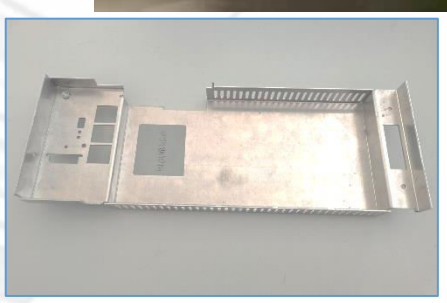
The process of cutting aluminum plates is widely used in automotive industry, especial in the last years for new electrical vehicles. Conventional method of cutting uses CO_2 and fiber lasers together with nitrogen used as assist gas. This paper presents new method of cutting aluminum sheets using pulsed laser in combination with oxygen instead of nitrogen. Results obtained in workshop are presented, in terms of productivity, quality and increase of laser range thickness for aluminum plates.



Continuous or low frequency inert gas (nitrogen) laser cutting

High frequency active gas (oxygen) laser cutting

Laser processing



Various aluminium pieces after laser active cutting

Analyzing the experimental data results the following conclusions:

- Changing of the assist gas can increase the cutting range for aluminum plates by 50%.
- Using laser pulsed output is possible to narrow the cut line and decrease roughness of the cut walls.
- Pulse frequency is essential parameter for alumina removal. Best results are obtained at 3000Hz, when dross formation is minimal and cut line is without alumina insertions.
- Laser operation is more stable with oxygen versus nitrogen, and gas consumption decrease by 68%.
- Total cost of operation is decreased by 30% due to lower gas consumption and second, by oxygen price which is lower than nitrogen price.

Contact: laurentiu.zgripcea@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

COMOTI
ROMANIAN RESEARCH & DEVELOPMENT INSTITUTE FOR GAS TURBINES

220D Iuliu Maniu Ave., 061126 Bucharest 6, ROMANIA PO 76, POB 174
Phone: +4 021/4340198, +4 021/4340240; Fax: +4 021/4340241
E-mail: contact@comoti.ro, www.comoti.ro
Nr. Of. Com. Reg. J40/4880/1997, CIF: RO445238

AUTOMATED INSTALLATION FOR TESTING THERMAL-BARRIER COATINGS TO THERMAL SHOCK, OXIDATION AND CORROSION

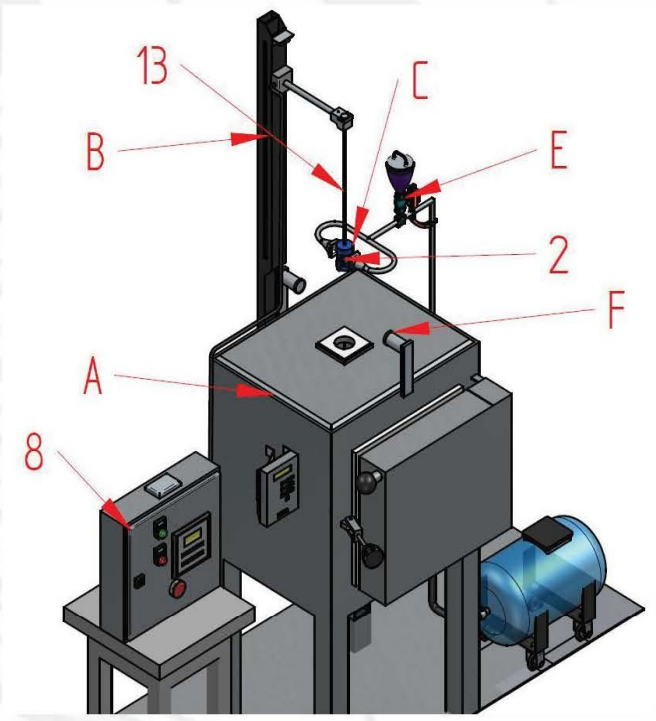
Patent RO 134516 A0

Authors: Alexandru PARASCHIV, Mihaela-Raluca CONDRUZ, Cristian PUŞCAŞU, Tiberius-Florian FRIGIOESCU

The invention relates to an automated test installation for thermal shock cycles, long-term cyclic oxidation and / or hot corrosion of thermal barrier coatings used for the protection of complex gas-dynamic components in gas turbines used in the energy and aerospace industries.

Summary

The installation consists of a heating system (A), into which two samples (2) in direct contact with a thermocouple (13) are simultaneously inserted, by displacement (B) and clamping (C) systems, the test cycles involving the cooling of the samples under predetermined conditions, introduced into the control panel (8). Testing is carried out until the sample degradation self-detection system (F) that 20% of the total surface area of the coating has been exfoliated. The installation is also equipped with a corrosive dosing system (E) which doses small quantities of powder in a controlled and automated mode to the samples during the cooling process.



Technical characteristics

1. Allows individual/combined high-temperature cycling of thermal shock, oxidation, corrosion (spraying with corrosive compounds) at temperatures between 30-1400°C;
2. High-resolution video monitoring system and self-detection of the degree of coating exfoliation by image binarisation technique;
3. Cooling can be achieved slowly or rapidly to room temperature;
4. Allows simultaneous testing of two samples under the same conditions, no matter the geometrical shape;
5. High precision for measuring the temperature of the samples and the furnace;
6. Testing with high precision and repeatability ;
7. Possibility of remote monitoring and control.

Contact
E-mail: contact@comoti.ro
Mobile: 021-434 02 40

This invention was funded by Romanian Minister of Research and Innovation, within POC-A1-A1.2.3-G-2015, ID/SMIS code: P_40_422/105884, "TRANSCUMAT" Project, Grant no. 114/09.09.2016 (Subsidiary Contract no. 5/D.1.3/114/18.12.2017).

CORNELIUGROUP research-innovation association

INVENTCOR

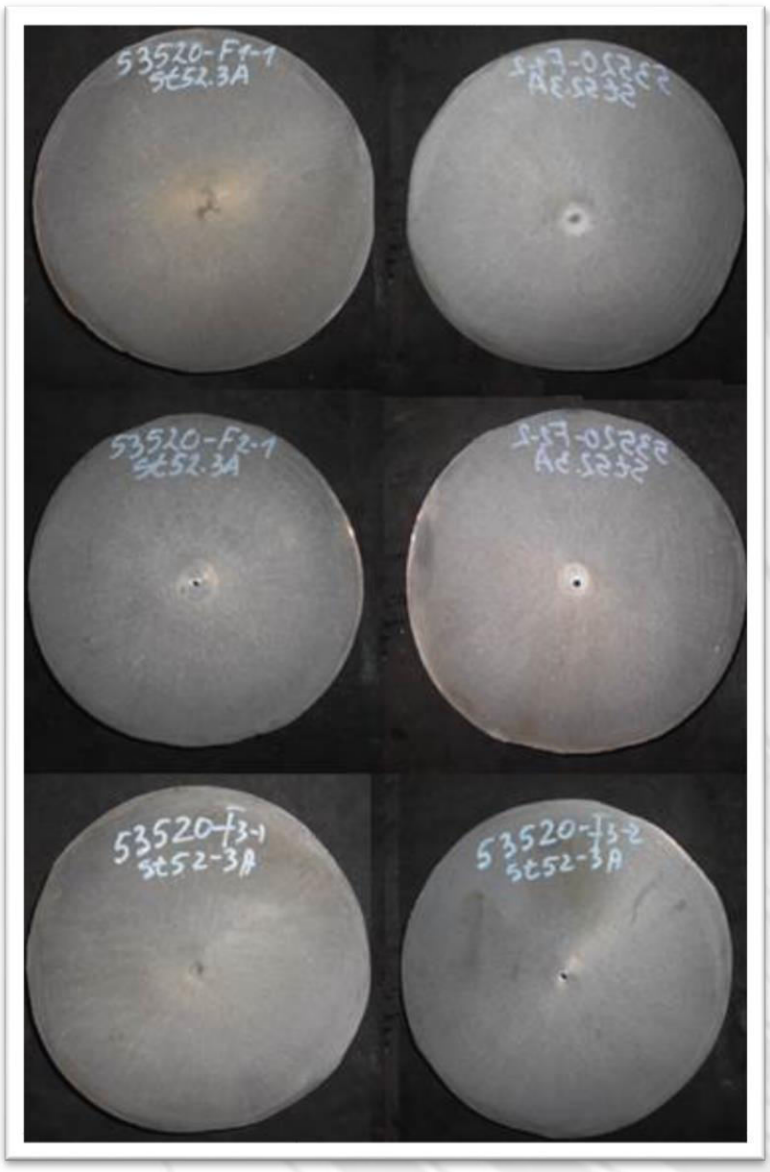
Power of Creative Mind

Quality of continuous cast steel products

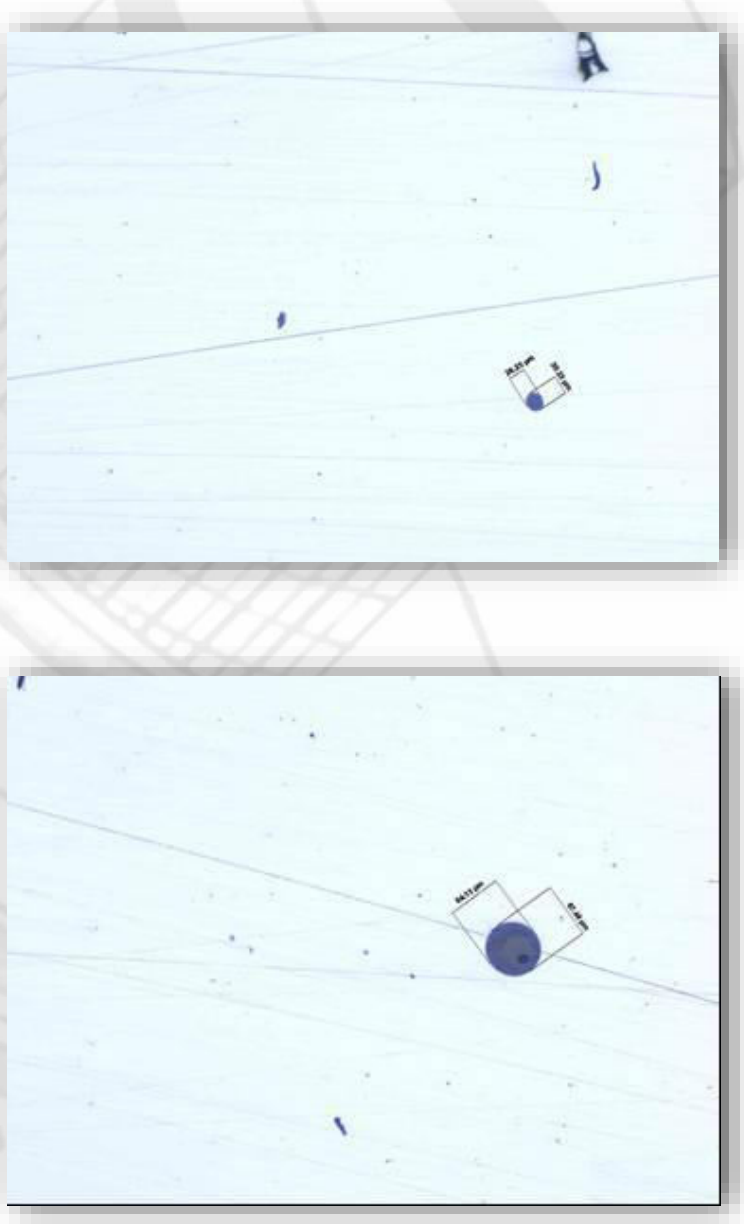
PhD Thesis

Authors: Iulia Poenaru, Ana Socalici, Erika Ardelean, Adina Budiul Berghian

In steel industry is not possible to produce steel without inclusions. The efforts to obtain steel with as little non-metallic inclusions as possible focus on their reduction and modification. This depends on ensuring thermodynamic and kinetic conditions during steel manufacturing and casting. The research were entreprised on a steel factory which is equipped with an Electric Arc Furnance (EAF - EBT), Laddle Furnance (LF), Vacuum Degasing (VD), and Continuous Casting (CC).



Macro analyze



Analyze non-metallic inclusions, scale 100x

The process of removing non-metallic inclusions from the liquid steel is proceeding mainly during their forming and growth, the main objective is increasing the speed of removing this inclusions. Qualitative and quantitative analyses of non-metallic inclusions from cast steel lead to determine their origin and nature. The research and results regarding the influence of non-metallic inclusions reflected on quality of continuous cast steel products used in manufacturing of hydraulic cylinders from automotive industry.

Contact: iulia.poenaru@student.upt.ro +40724336658

Research on the influence of casting powders on the higher quality of continuous cast semi-finished parts

Authors: Mihai Radu, Teodor Hepuț, Erica Ardelean, Robert Bucevschi

Ca urmare a modernizării tehnologiilor de elaborare și turnare a oțelului, în prezent peste 90% din oțelul lichid este turnat continu. Calitatea produselor turnate este influențată de: temperatura și viteza de turnare, debitul apei de răcire, caracteristicile prafurilor de turnare. În studiu se prezintă rezultatele cercetărilor efectuate privind variația conținuturilor de carbon, mangan și sulf pe produsul turnat pentru fiecare fir de turnare și fiecare bară din fir. Rezultatele obținute au aplicabilitate în cercetare și practică.

Pursuant of the modernization of steel elaboration and casting technologies, at present over 90% of the liquid steel undergoes continuous casting. The quality of the cast parts is influenced by: the casting temperature and rate, the flow rate of the cooling water and the characteristics of the casting powders. The study gives the results of the research on the variation of the carbon, manganese and sulphur content per cast product for each casting strand and for each rod of the strand. The results are applicable in research and in practice.

Contact: mihairadu_66@yahoo.com
+40729077933

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

CONSTRUCTIVE IMPROVEMENTS IN THE IN–LADLE TREATMENTS

Industrial Research

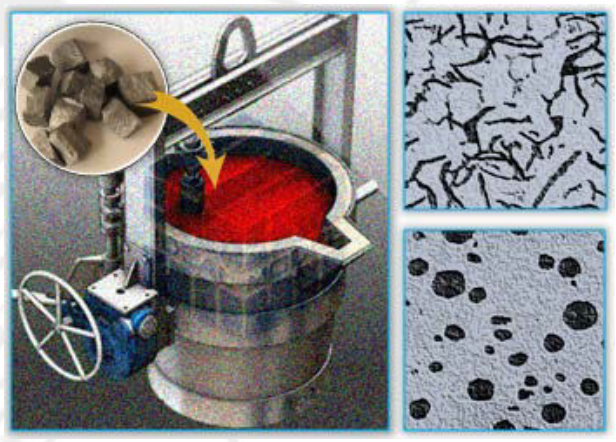
I

Author: Imre KISS

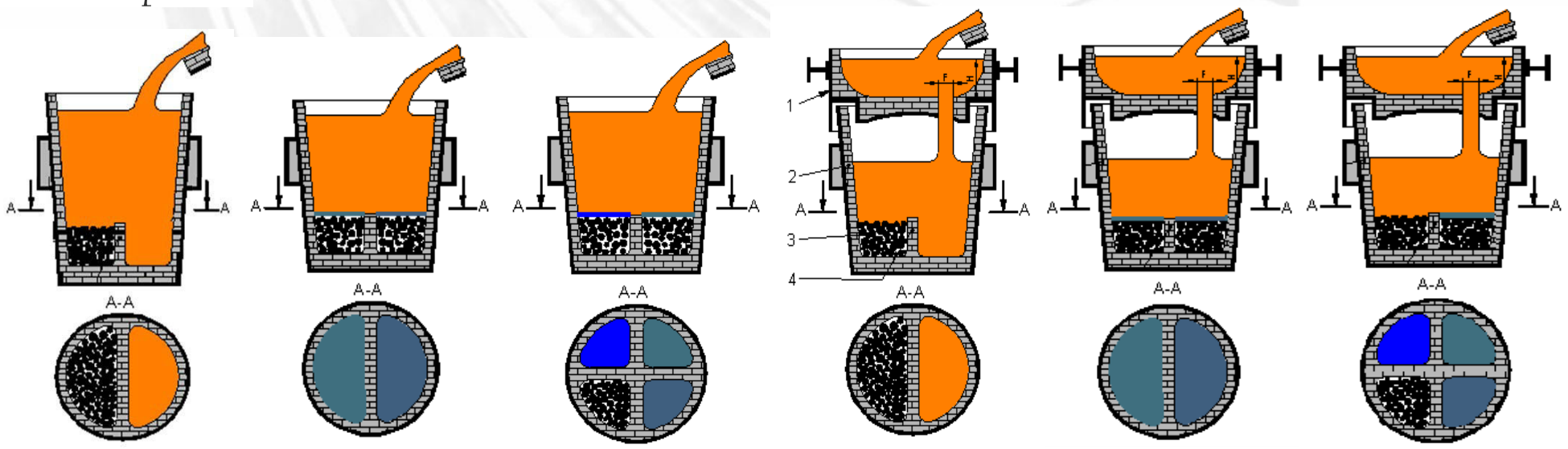
Nodular gray cast iron having properties superior to conventional gray cast iron can be produced by treating the molten iron so that, when cast, the graphite will be compacted rather than in flake form. One such treatment involves the introduction of magnesium (Mg) into a molten iron bath of such composition. It is the principal object of the present industrial experiments to provide an improved process for the ductile cast iron production. Another object is to provide a process which permits the efficient use of the nodulizing agents, which results in the efficient production of an improved homogeneous nodular cast iron. Essentially such treatments result in the retention by the cast iron of small amounts of nodulizing agents, for example magnesium (Mg). Conventionally these agents are added to cast iron, usually in the form of pre–alloys and the efficiency of the process is illustrated by the high assimilation of the added nodulizer's constituents. Another object of this technological practice is to provide an improved method for introducing the nodulizing agents, using constructive improvements to the in–ladle equipment.

Finding magnesium (Mg) using novel techniques is the first step to advance the understanding of the role of magnesium (Mg) in the formation of the nodular graphite, the mechanism behind nodular graphite formation due to the addition of Magnesium (Mg) being still relative unclear at present time. Moreover, this may advance new methods to improve the nodulizing treatment process.

Silicon–based (light) master alloys as nodulizer (a) magnesium–ferrosilicon lump; (b) magnesium–



In–ladle treatment



This study take into account the flexibility of the used technique, which describes the elasticity of the treatment process, by improvement or alternative to the existing one. As nodulizing agents magnesium–ferrosilicon (Fe–Si–Mg type) and cerium–magnesium–ferrosilicon (Nodulin type) are examples of materials containing nodulizing agents that have given excellent results in the mixture. This experiments relates to a process for the production of ductile iron (nodular gray cast iron) and particularly to a process for adding magnesium (Mg) to the melted iron.

Contact: Imre Kiss/UPT /Faculty of Engineering Hunedoara/Dept. Engineering&Management/imre.kiss@fih.upt.ro

J

Kids Corner

Games

Toys

Outdoor

GAMING EXPERIENCE WITH EYE TRACKING TECHNOLOGY

student project

Author: MUTU Robert Marian
Coordinator - POPA Mihaela

The present research aims to find out what can be improved during the massive multiplayer role-playing game Elder Scrolls Online, developed by Bethesda, which has two different points of view. One is the perspective in the first person, the other is the perspective in the third person. The purpose of the experiment is to choose the perspective that motivates and gives greater satisfaction to the player. VPS 16 glasses from View Point System technology were used to record the gameplay, and the post-processing was done with the Filmora Editing Program.

Figure 1

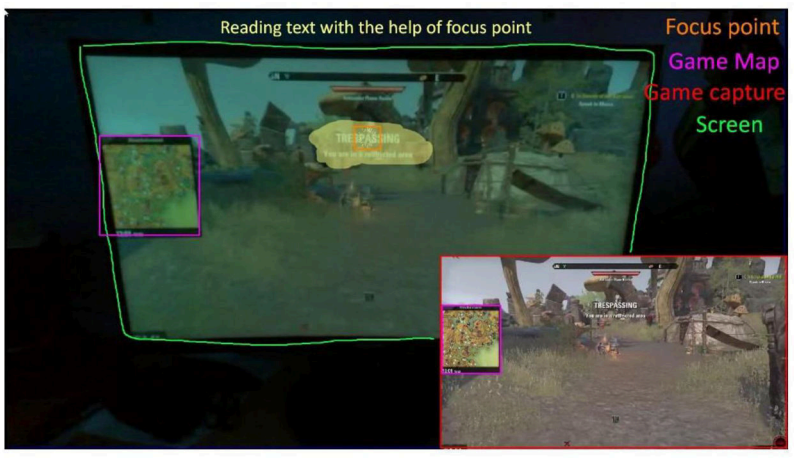


Figure 2

In Figure 1 it is presented the enemy highlighted wtih white which helps representing our focus point while we play highlighted with orange. With the help of player focus point we can also determine the in-game character, which in most cases in the main source of the focus points is highlighted with blue.
In this game it is important to pay attention to the abilities bar, highlighted with purple. The screen determines the edges of the game and is highlighted with red, in most cases this edges reduce the immersion that the player have in the game.

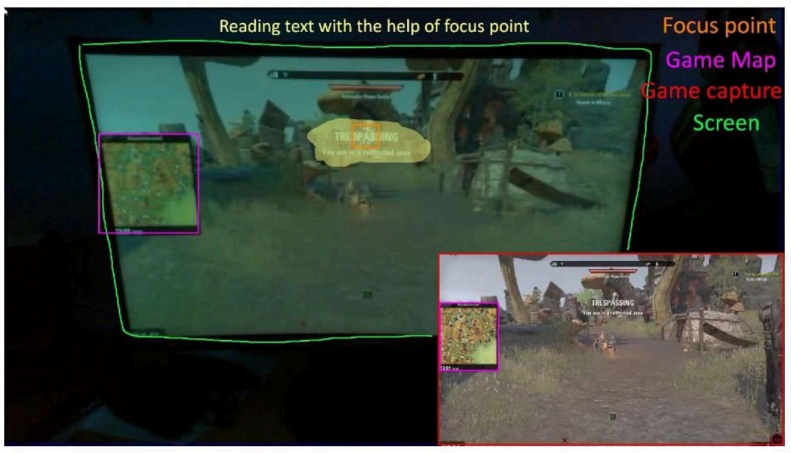


Figure 3

Figure 2 shows that we can see the device that we are recording with highlighted with red, in this picture it is also showed the in-game footage highlighted with blue in the bottom right corner. Screen edges are represented with green and the focus point is represented with orange, this time allowing us to see through the player perspective.

Figure 3 indicate the screen, focus point and screen edges, but this time the focus point plays the role of reading the text highlighted with yellow. It is also presented the game mini-map that helps the player guide himself through the environment from the game.

Contact: robert.mutu@student.upt.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

IYSA Indonesian Young Scientist Association

Save The Forest (SAFOST) Game

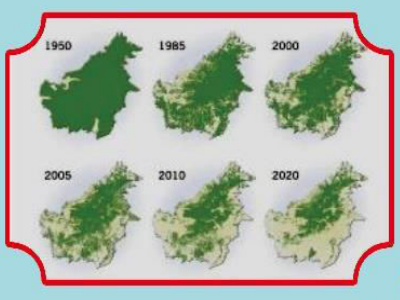
Educational Game for Children to Protect and Converse The Forest

Student Project

J

Category : Kids Corner, Games, Toys, Outdoor

Backgrounds



The forest is an invaluable natural resource as it contains biodiversity as a source of germplasm, timber and non-timber sources, water regulator, flood prevention and erosion and soil fertility, biological safety for the benefit of science, culture, recreation, tourism, etc

Forest destruction that includes forest fires, illegal logging, and others are one of the more frequent forms of disruption

Children as the successor generation of the nation , important agents in the building of the environment. With this project we can educate the children to Protect and Converse the Forest

Purpose

To increase the knowledge of the students about the forest with SAFOST game

Hypothesis

SAFOST Game can increase student's knowledge about forest

Methods

Make an education game with the scratch application

Test the game to SD Hj Isriati Elementary School Semarang student (Pretest and posttest)

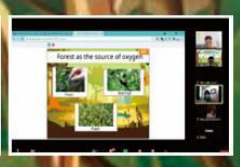
Timeline Research

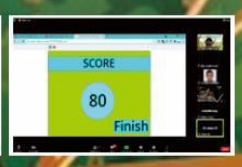
PLANNING	DESIGN	TESTING & EVALUATION	REPORT
Discussion abaout enviroment with supervisor study literature searching materials Time : 4 weeks	Making game prepare the materials Time : 4 weeks	Testing the students Evaluation Time : 2 weeks	Discussion the result Make the Journal Time : 2 weeks

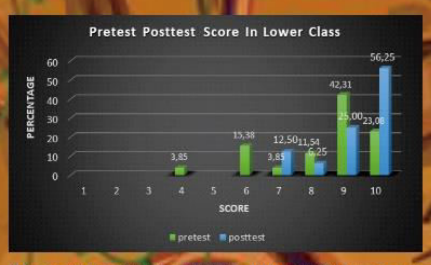
Discussions

- The effectiveness of digital game-based learning is also measured by testing the game to students by holding a pre-test and post-test. The result used as a tool in learning can increase students' interest and motivation (Rawendy D, Ying Y, Arifin Y, 2017).
- Education via Scratch-based game activities contributes significantly to the students' academic achievements (Korkmaz, 2016).
- The students' interest increases as they thought the game is advantageous and fun, which at the same time causes them to be more knowledgeable. (Andreani & Ying, 2019).
- The students' interest increases as they thought the game is advantageous and fun, which at the same time causes them to be more knowledgeable. (Andreani & Ying, 2019).

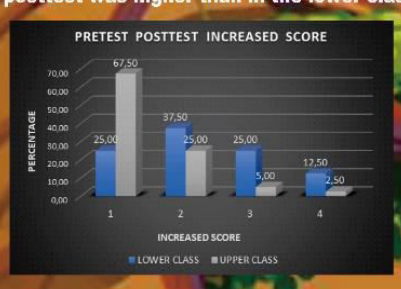
Result







These two charts showed the differences result of the pretest and post-test from the student in the lower and upper class. The student get score 10 in the upper-class posttest was higher than in the lower class (84,81 compared to 56,25 percent)



This is the result of the pretest and post-test increased scores from the student. The number of students who increased by one point was 67,50 percent in the upper class compared to 25 percent in the lower class. The highest increased score in the lower class was two points. In the upper class highest increased score was one point, it because 22,5 percent of upper-class student already get score 9 at pretest and 10 in the post-test.

Conclusion and Suggestion

SAFOST games can increase the knowledge of students. For the next research, we can test it on the student in junior, senior high school, and adult with question modification

References

1. Rahman MS, Alam MA, Salekin S, Belal MAH, Rahman MS. The COVID-19 pandemic: A threat to forest and wildlife conservation in Bangladesh? Trees, For People [Internet]. 2021;5:100119. Available from: https://doi.org/10.1016/j.tfp.2021.100119
2. Edwards RB, Naylor RL, Higgins MM, Falcon WP. Causes of Indonesia's forest fires. World Dev. 2020;127:1–13.
3. Torkar G, Krašovec U. Students' attitudes toward forest ecosystem services, knowledge about ecology, and direct experience with forests. Ecosyst Serv. 2019;37(February).
4. Golar G, Malik A, Muis H, Herman A, Nuraidin N, Lukman L. The social-economic impact of COVID-19 pandemic: implications for potential forest degradation. Heliyon [Internet]. 2020;6(10):e05354. Available from: http://dx.doi.org/10.1016/j.heliyon.2020.e05354
5. Kidi N, Kanigoro B, Salman AG, Prasetio YL, Lokaadinugroho I, Sukmandhani AA. Android Based Indonesian Information Culture Culture Education Game. Procedia Comput Sci [Internet]. 2017;116:99–106. Available from: https://doi.org/10.1016/j.procs.2017.10.015
6. Rawendy D, Ying Y, Arifin Y RK. Design and development game Chinese language learning with gamification and using mnemonic method. Procedia Comput Sci. 2017;116:61–7.
7. Korkmaz Ö. The Effects of Scratch-Based Game Activities on Students' Attitudes, Self-Efficacy and Academic Achievement. Int J Mod Educ Comput Sci. 2016;8(1):16–23.
8. Andreani W, Ying Y. ScienceDirect ScienceDirect " PowPow " interactive game in supporting English vocabulary " PowPow " interactive game in supporting English vocabulary learning for elementary students learning for elementary students. Procedia Comput Sci [Internet]. 2019;157:473–8. Available from: https://doi.org/10.1016/j.procs.2019.09.005

By :
Dilan Cryillo Anwar, 9 Y.O, 4th Grade
Research Supervisor :
Mr. Sunoto
School : Hj. Isriati Baiturrahman 1 Elementary School Semarang, Central Java, Indonesia
Contact : +62 8112741612 | Email : dilancyrilloanwar@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

2nd International Exhibition InventCor 16 - 18.12.2021 - Deva

PATENT APPLICATION NO: PI2020002110

MYSOIL MYPLANT VERSION 2.0

Kavisha Nagarajan
Kailesh Saravanan
Yuvika Mahaganapathy
SJKT Taman Melawati, Selangor, Malaysia
Kavisha2009@gmail.com
skailesh11@gmail.com
yuvikamahaganapathy@gmail.com

J

INTRODUCTION

Plants need plenty of sun, air, water, and nutrients to grow. Sun and Water is available thru nature. However, how can we make sure our plants have enough nutrients? Measuring different aspects of soil can tell you exactly what you need and what your missing, and help you to foster strong and healthy plants.

Testing the pH, moisture content, and temperature of your soil are a good start for healthy soil. Monitoring phosphates, nitrates, calcium, and potassium are all primary components to plant growth. Other minor nutrients are needed as well.

One way to help keep track of all these nutrients is by testing the electrical conductivity of your soil. Electrical conductivity can tell you if you need more nutrients, or if you have too much. This will save you time and money when managing your plants.

METHODOLOGY

Electrical conductivity is the measure of a material's ability to conduct an electrical charge, measured in Siemens per meter. An electrical current (measured in amperes) is the movement of electrons over time across a medium such as water. Put simply, EC gauges how a current moves in solution. The link between EC and fertilizers - first, let us look briefly at how an EC probe works and how temperature affects EC.

An EC probe is comprised of two electrodes to which voltage is applied. The voltage reading is the resistance (ρ) of the solution. The instrument calculates the reciprocal of this value, allowing electrical conductivity to be calculated. The resistance is calculated based on the distance between the two electrodes.

PURPOSE

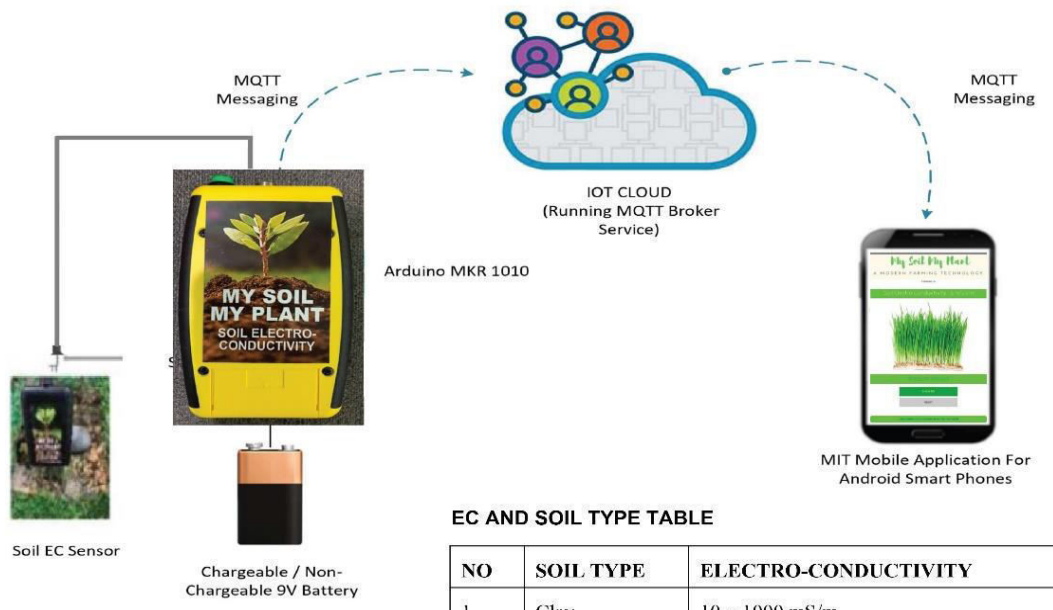
Soil type identification is essential to determine what type of plants to be grown in a particular type of soil. The soil type can be identified by measuring its Electro-conductivity.

By measuring the EC, we can plan what types of plants is suitable to be grown in the soil.

HYPOTHESIS

EC stands for electrical conductivity, which measures the potential for a material to conduct electricity. Even though most growers are familiar with measuring the amount of feeding that they have to give in ounces per gallon, grams per liter, or any other measuring units used, EC goes a little further than this. When growing, it is important to have a good understanding of what EC is all about and its significance to the grower.

DATA AND DISCUSSION



EC AND SOIL TYPE TABLE

NO	SOIL TYPE	ELECTRO-CONDUCTIVITY
1	Clay	10 ~ 1000 mS/m
2	Loam	25 ~ 250 mS/m
3	Sandy	0.25 ~ 2.5 mS/m

MARKET / COMMERCIAL POTENTIAL

SIMILAR PRODUCTS IN MARKET

RM 500 RM 450 RM 2,453.00 RM 300

MySoil MyPlant is only cost RM300 and comes with the app for android.The app have the capability to display the plants type suitable for soil type.

CONCLUSION

Soil types and nutrient level determine plant types to be grown. Education plays a significant role in alleviating poverty, especially in rural areas.

The future of the agricultural sector is all about science, technology and education and there is no better place to propel that type of growth than through knowledge, which is created at the education institutions. They have a role to educate and prepare the future entrepreneurs* who are coming through the education system.

Need to become even more productive in terms of generating research - around seed technologies, better planting methods, ways of analyzing soil, and understanding and mitigating the impacts of climate change because much of what is going to happen in the agricultural sector has to do with operating within a knowledge-based global economy.

REFERENCES

Allison Hubbard The Ultimate Guide to Testing Electrical Conductivity of Soil - https://blog.hannainst.com/soil
Pieter Klaassen CANNA research Electrical Conductivity, why it matters - http://www.cannagardening.com/electrical-conductivity
Bill DeBoer | August 1, 2015 Electrical Conductivity and Monitoring Plant Nutrition - https://www.maximumyield.com/electrical-conductivity-and-monitoring-plant-nutrition/2/946

2021 GOLD AWARD:

- ASEAN INNOVATIVE SCIENCE, ENVIRONMENTAL AND ENTREPRENEUR FAIR (AISEEF) 2021 Gold Award & Special Award
- THE 5TH INTERNATIONAL INNOVATION, DESIGN AND ARTICULATION
- International Invention, Innovation & Design Expo (INoDEx 2021) Special Award: Platinum Award
- MPIPANS 2021 & AINS 2021 Johan - School Category
- E-NNOVATE 2021 INTERNATIONAL INNOVATION SHOW
- International Youth Invention and Innovation Award

2020 GOLD AWARD:

- INTERNATIONAL INVENTION INNOVATION COMPETITION IN CANADA - ICAN-TORONTO, CANADA Special Award: Best Invention Video Awards, Canadian Special Awards & Best Young Inventor Awards
- MALAYSIA YOUNG SCIENTISTS CONFERENCE & EXHIBITION
- INTERNATIONAL INVENTION & TRADE EXPO LONDON Special Award: Platinum Award
- 31ST INTERNATIONAL INVENTION, INNOVATION & TECHNOLOGY EXHIBITION, MALAYSIA

2019 GOLD AWARD:

- INTERNATIONAL YOUNG SCIENTISTS INNOVATION EXHIBITION 2019
- INTERNATIONAL COMPETITION AND EXHIBITIONS ON COMPUTING INNOVATIONS 2019 ORGANIZED BY FACULTY OF COMPUTING, UNIVERSITY MALAYSIA PAHANG, 2019
- INTERNATIONAL FRONTIERSCIENCE INNVOVATION & INVENTION COMPETITION (I-FIC) 2019
- INTERNATIONAL INNOVATION AND INVENTION COMPETITION, TAIPEI TAIWAN 2019

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Car restoration

Student Project

Author:David Miklos

J

When I received this car, it was old and hit in some places. After about a month I managed to fix it and to paint it. This was not easy because the car was quite old and dirty, but in the end I managed to completely restore it.

Firstly, I had to take off the old wheels because they were broken, then I had to wipe the car, after that I started painting the inside. After I finished the inside, I continued with the outside. I started with the middle, which I painted black, then the edges, which I painted red. After it dried, I started assembling the new motors and wheels. I used LEGO BOOST motors, which can be controlled by an app on the phone trough Bluetooth, or with a controller. After that I put a pair of LEGO BOOST LEDs in the font part of the car, which can be controlled only trough the app. They can change their color from white to red, blue or green and they can also blink in different ways.

Contact: g-mail: davidkrisztianmiklos@gmail.com

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

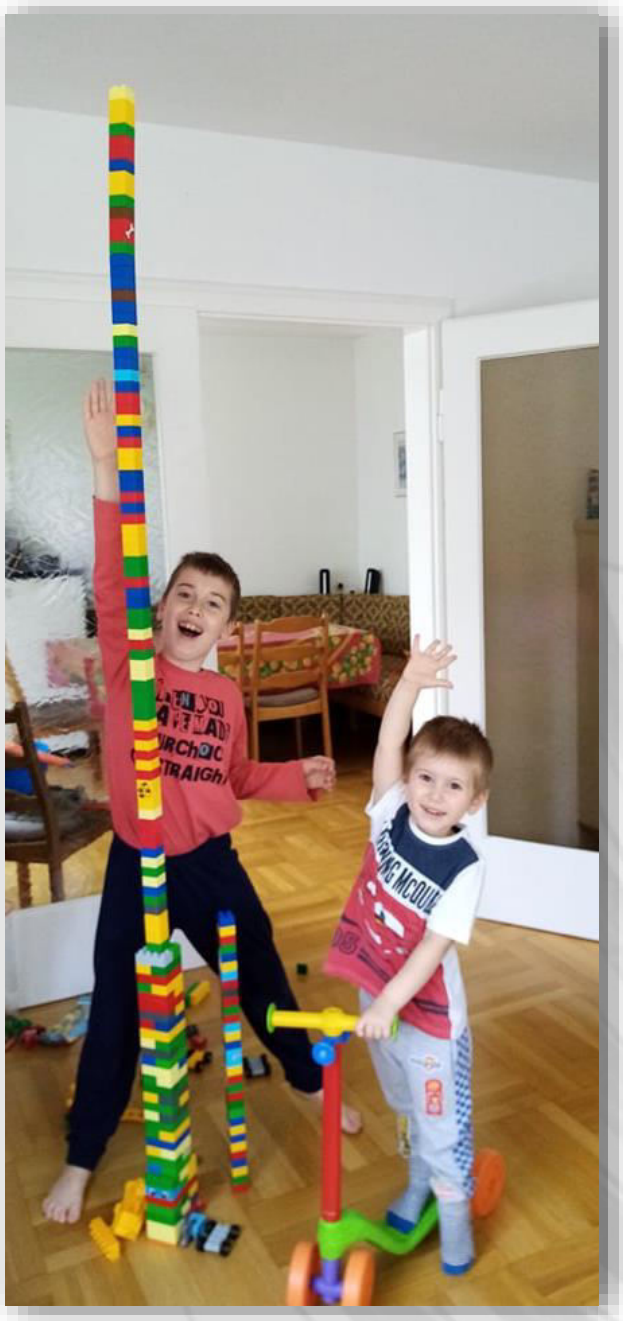
LegoInvent[13]

Kids project

Authors: Sebastian Rotea, Alexandru Rotea

J

Creative projects made by the LegoInvent[13] team, two innovative talented kids, from Lego pieces, natural materials and recyclable materials. Lego constructions are the passion of our team. We like to build Lego cars, ships, planes, but most of all we like to build our own creations / inventions.



Presentation video

After we come home from school we do our homework and then start crafting our favourite projects such as monster truck, car parking buildings, ambulance cars, racing cars, fire trucks.

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

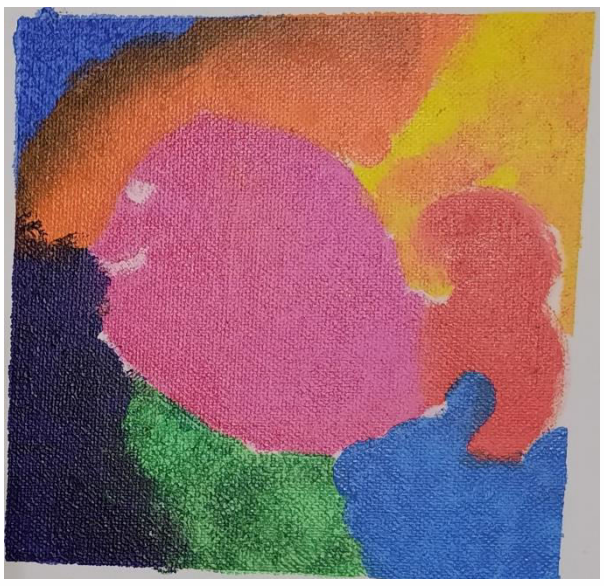
Rebeka's Paints

Kids project

Author: Miklos Rebeka

J

I present through paintings what I feel. When I feel happy I'm painting something colorful and nice like animals, when I'm upset I'm painting undefined geometrical shapes.



Colored whale

How I imagine flowers

Art and geometry

My favorite pet

Rabbit painting an egg

A portrait

A hart in cosmos

Little cute monsters

Little pony

Colored leaves

Contact: +4072234782

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Kids project

PĂPUȘIM, DESENÂND

Author: Bichescu Eveline Anais

Papusesc cu desenele , de la rucsacelele preferate, le purtam cu drag la gradi!

J

Pisoiul, pufosul, preferatul nuanțelor.

Animalele simpatice, au prins viata în culorii, printul fermecat de ele!

CORNELIUGROUP research-innovation association

INVENTCOR

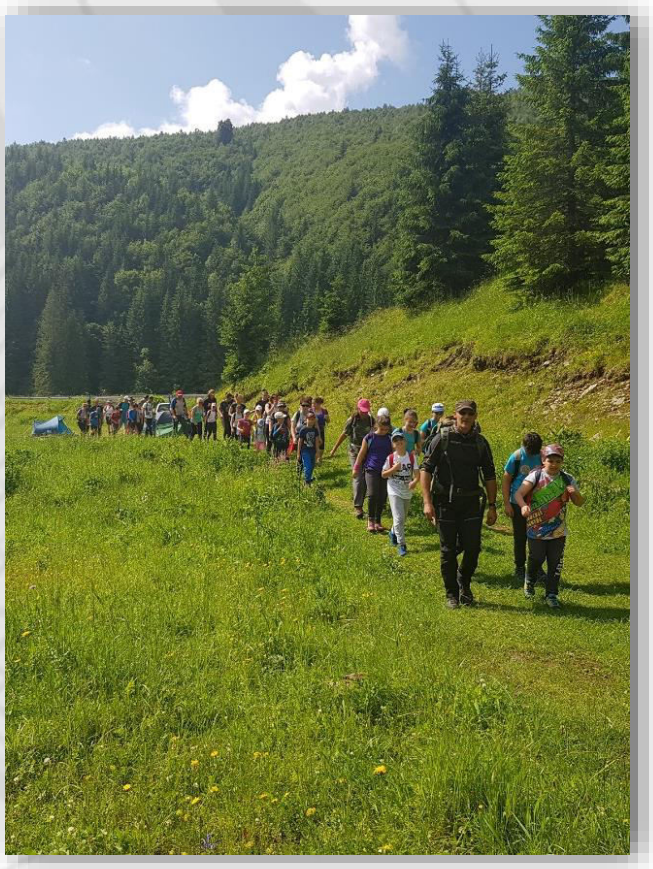
Power of Creative Mind

Club Evoluţii cu Alexandra Marcu

Author: Alexandra Marcu

J

Club Evolutii is an organisation from Romania, providing personal development activities based on mountain and traveling education. We organize mountain hikes, expeditions, camps and educational courses for children who want to become explorers and enjoy many experiences and adventures.



Video Club Evolutii

Club Evolutii este o organizatie din Deva care se ocupa cu dezvoltarea personala a copiilor prin educatie montana. Organizam ture montane, tabere si cursuri educative pentru copiii care doresc sa devina EXPLORATORI si sa se bucure de o multitudine de experiente si aventuri!

Contact: https://www.facebook.com/clubevolutii
alexandraflaviamarcu@gmail.com
Mobile: 004 0723 219 655

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Mobile robot Mindstorm realised with Lego

J

Student Project

Authors: Matei – Octavian TIRIAN, Andrei-Vladimir TIRIAN

Builders of all ages will love building and coding their fully-functional robot to walk, talk, and even play games or complete tasks. This educational STEM robot toy makes engineering fun for everyone who builds it. LEGO INDSTORMS EV3 is built with 601 pieces and includes the intelligent EV3 Brick, 3 servo motors, plus color, touch and IR sensors. Connect with your smart device and download the free EV3 programmer app to control the robot. LEGO MINDSTORMS EV3 comes with instructions for 17 different robotic designs, each with its own unique features. Builders can program their STEM robots to talk, walk, grab, shoot targets and more! Kids will love this creative and educational toy. LEGO MINDSTORMS building toys are compatible with all LEGO construction sets for creative building.The perfect tech toy if you want to build your own robot and explore endless learning activities. My robot is made with Lego pieces (Fig.1) and can be controlled remotely via a remote control that has an infrared transmitter (Fig.2). The robot that I was made contains a control center and power source (Fig.3), motors that have the role of moving the robot (Fig.4), a remote infrared emitter and an infrared sensor that detects objects and can track and find the remote infrared transmitter (Fig.5).

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 6 show us how I realized the robot. It is programmed on an intuitive icon-based programming interface. Drag and drop the desired actions into the programming window and adjust them to fit the behavior of the realized robot. To control the robot, the IR module is used to receive the IR remote signal and send the signal to the microcontroller, it will analyze the signal and then control the motors and implicitly the movement of the mobile robot using the IR remote control.

Contact: ovidiu.tirian@gmail.com +40769602413

K

Automotive

Ships

Aviation

Accessories

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Universitatea Politehnica Timișoara

ELECTRICAL INSTALLATION FOR AIR AND SURFACE DISINFECTION FROM THE PUBLIC TRANSPORT

K

U/ 00024 24.06.2020

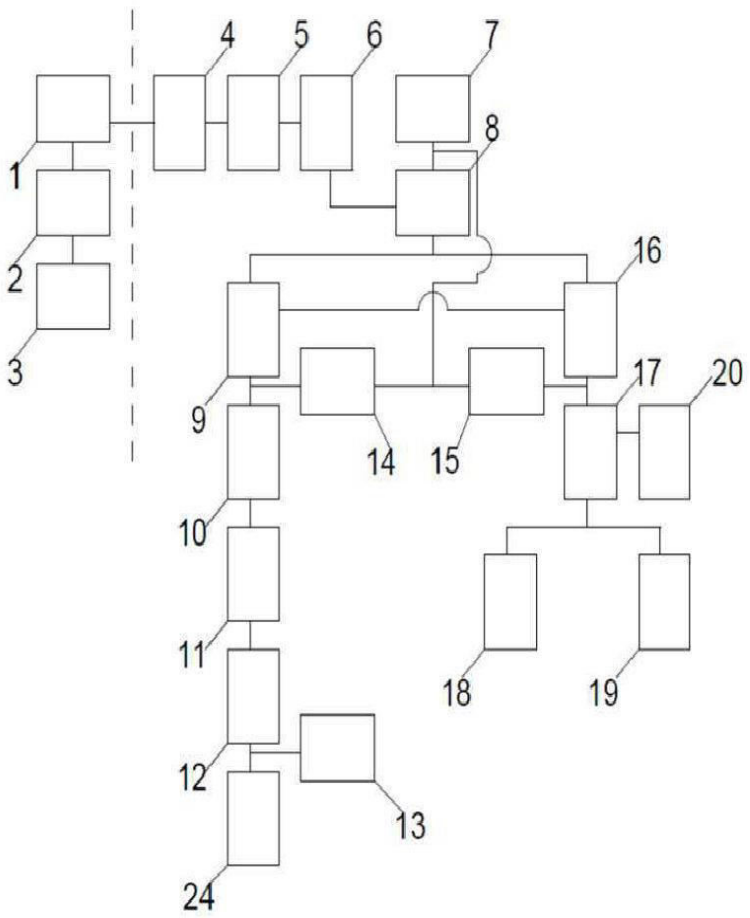
autori: Pavel Ștefan, Ungureanu Daniel-Viorel, Bînzar Alexandru, Tutelcă Ancuţa Letiţia, Suciu Silviu Cristian, Popoiu Călin Marius

DESCRIPTION

The technical problem which is solved by the invention, consists in realization of a fixed electrical installation which is used for surface and air disinfection with UVC ultraviolet radiation from the public transport, mounted on the ceiling of the transportation vehicle, powered by the electrical source of the public transport vehicle. The command of the disinfection installation can be executed manually or via Wi-Fi, from a predetermined distance

ADVANTAGES:

Being a fixed technical solution, located on the ceiling of the vehicle and powered by the electrical source of the public transport vehicle, compared to other types of similar solutions, for the same disinfection effect, it offers a lower manufacturing and operation costs. It uses three UVC germicidal lamps (26), two at the wavelength of 253.7 nm, and one at the wavenelgth of 183 nm [3], UVC radiation generators and ozone. The disinfection lamps are incorporated in an assembly protected by a slotted stainless steel with rhomboidal slots (perforations), expanded (successive “zig-zag” L-bends), with multiple reflection surfaces for the dispersion of the radiation into the device, for air disinfection, and into the exterior, onto the surfaces which necesits disinfection found inside the space of the public transport vehicle. The installation operates, disinfects the air and the surfaces, within 10 minutes, during the intended break of the tram driver or the bus driver, at the end of the public transportation vehicle route, place where the Wi-Fi transmitter is mounted and/or in the depot.



Model for the study of the Multilink Suspension from road vehicles

Student Project

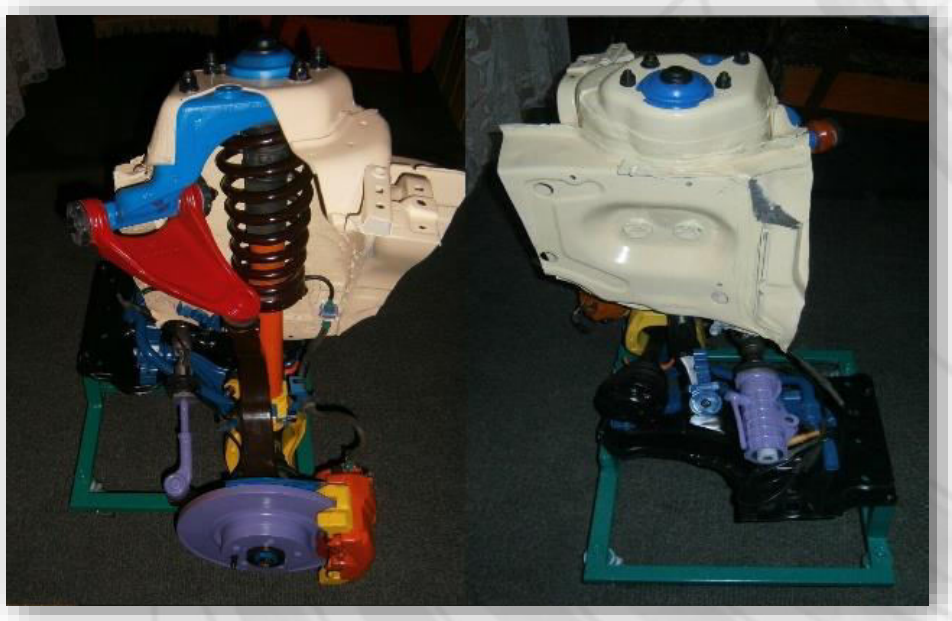
Author/s: **Pinca-Bretotean Camelia, Ungur Răzvan**

K

The model allows the constructive analysis of the elements of the front axles and of the Multilink suspension system, specific to modern vehicles. Multilink suspension is a type of independent suspension that uses three or more side arms or one or more longitudinal arms, which are not equal in length and can be tilted at different angles to their actual direction.

Unlike other suspensions, through its construction and its specific elements offers a high degree of comfort, ensures the correct kinematics of the steering mechanism, dampens the vibrations of the body and wheels, ensures increased sportiness by maintaining permanent contact of the tires with the tread surface.

The Multilink suspension is derived from the suspension with oscillating arms. The connection between the arms and the body is made by spherical joints or rubber bushes. When moving the car in a curve, the suspension changes its geometry with the help of all arms, this being due to the pivots.



This suspension uses helical springs as the elastic element, the most common in independent wheel suspensions, due to the comparatively low weight. As the friction process does not occur with this type of spring, the suspension requires the use of double-acting hydraulic shock absorbers. The suspension springs only take on loads that work along their axis, which is why the suspension is equipped with guide devices. The coil springs are supported on the lower and upper plates of the shock absorber. Between the plates and the spring there is a rubber gasket to avoid noise during operation.

The didactic model aims at the constructive knowledge of the Multilink suspension for the front axle of modern vehicles and allows the identification of the component elements and the presentation of the construction specific to this type of suspension.

Contact: camelia.bretotean@fih.upt.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

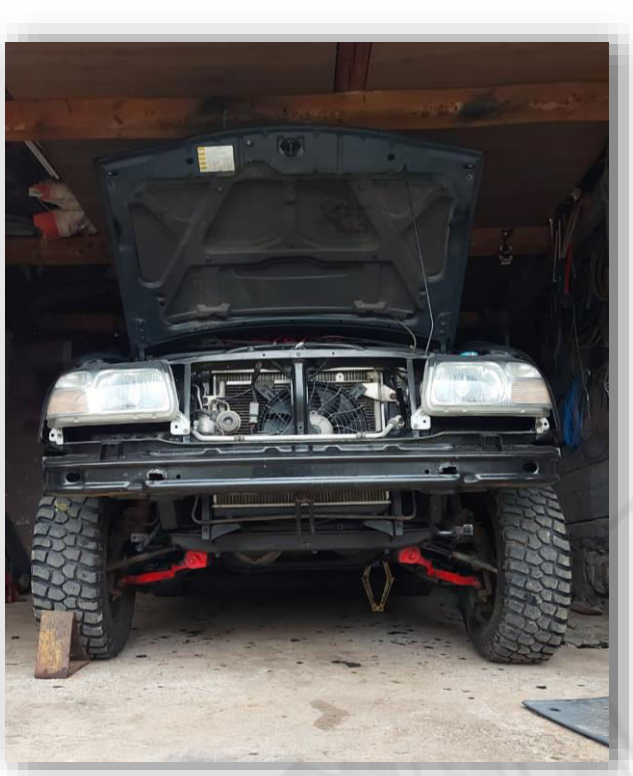
Body protection and conservation in the case of Suzuki Grand Vitara

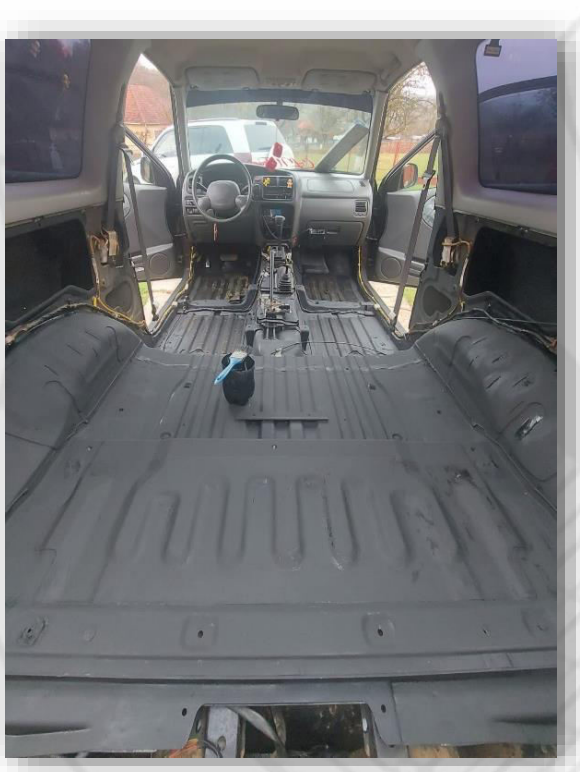
Student Project

Authors: Henţiu Lucian Nicolae, Măgduţ Răzvan Dorian
Coordinator – Birtok Bănească Corneliu

Autovehiculele japoneze se deosebesc prin modele diversificate, cu fiabilitate ridicată a grupului propulsor, însă caroseria prezintă rezistanță scăzută în timp la factorii de mediu.

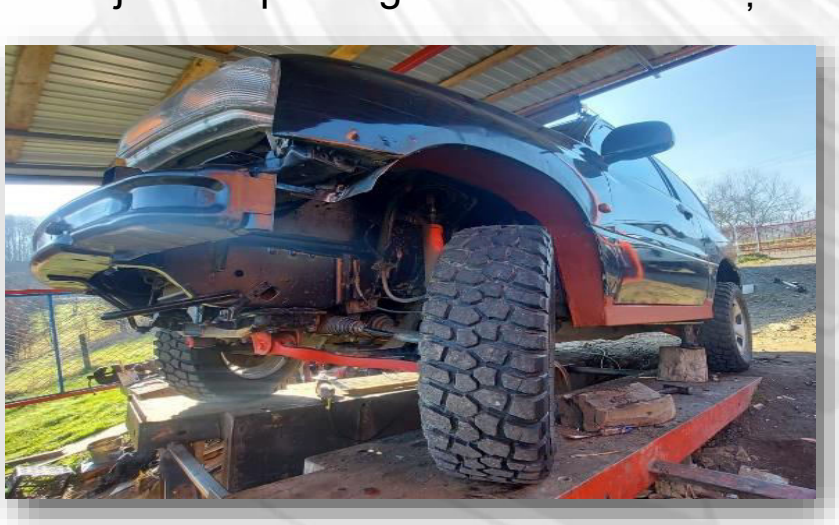
Studiul de caz îl reprezintă Suzuki Grand Vitara, având urme de coroziune la nivelul elementelor caroseriei.

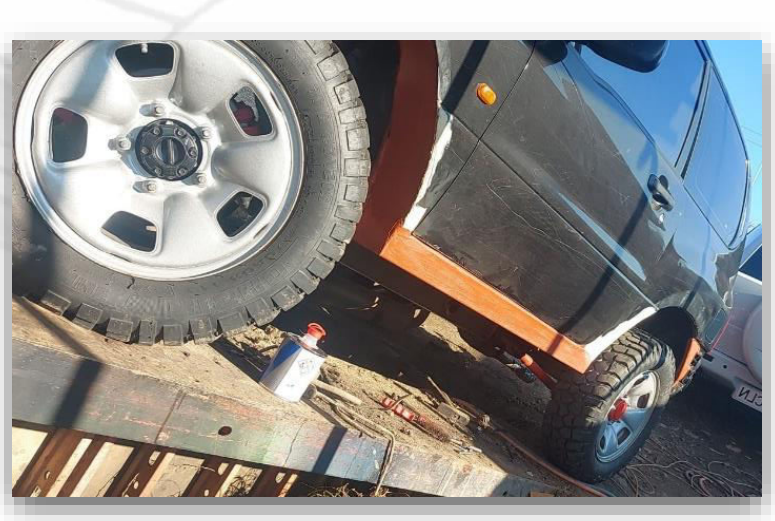




Pentru remediere s-au efectuat lucrări de înlocuire ale elementelor afectate, curățarea suprafeței, aplicare a unei vopsele tip primer, ulterior s-a aplicat insonorizant, iar în final, un strat de ceară pentru rezistența prelungită la factorii de mediu.

Avantajul fiind prelungirea duratei de viață a autoturismului.





Japanese vehicles are distinguished by diversified models, with high reliability of the powertrain, but the body has low resistance over time to environmental factors. The case study is the Suzuki Grand Vitara, with traces of corrosion on the body elements. For remediation, replacement works were performed on the affected elements, surface cleaning, application of a primer-type paint and soundproofing layer, and finally, a layer of wax for prolonged resistance to environmental factors.

The advantage is the extension of the life of the car.

Contact: hentiu.lucian@yahoo.com
+40728707760

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

GUARDRAILS AND ROAD SAFETY

Student Project

K

Author: Teodorescu Călin Rareș

The study presents a comparative analysis on the use of various types of railings in order to increase traffic safety on public roads. In the technical literature, the parapet is considered as a wall or railing with variable height that ensures the delimitation of the sides of a road, the purpose being to prevent accidental exits of vehicles by protecting the routes and areas delimited by them.

The most used types of guardrail are the following:

Flexible barriers, made from wire rope supported between frangible posts

Semi-rigid barriers, made from steel beams or rails

Rigid barriers, made of concrete

Benefits:

-If properly designed, installed and maintained, barriers should reduce the severity of crashes involving ‘out of control' vehicles.

-When used in the median, safety barriers can greatly reduce the likelihood of head-on crashes.

Much of the benefit from the use of barriers comes from a reduction in crash severity. Although a crash may still occur, it is likely to have a safer consequence than colliding with the object that the barrier is protecting.

Contact: trarescalin@icloud.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

INJECTION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

K

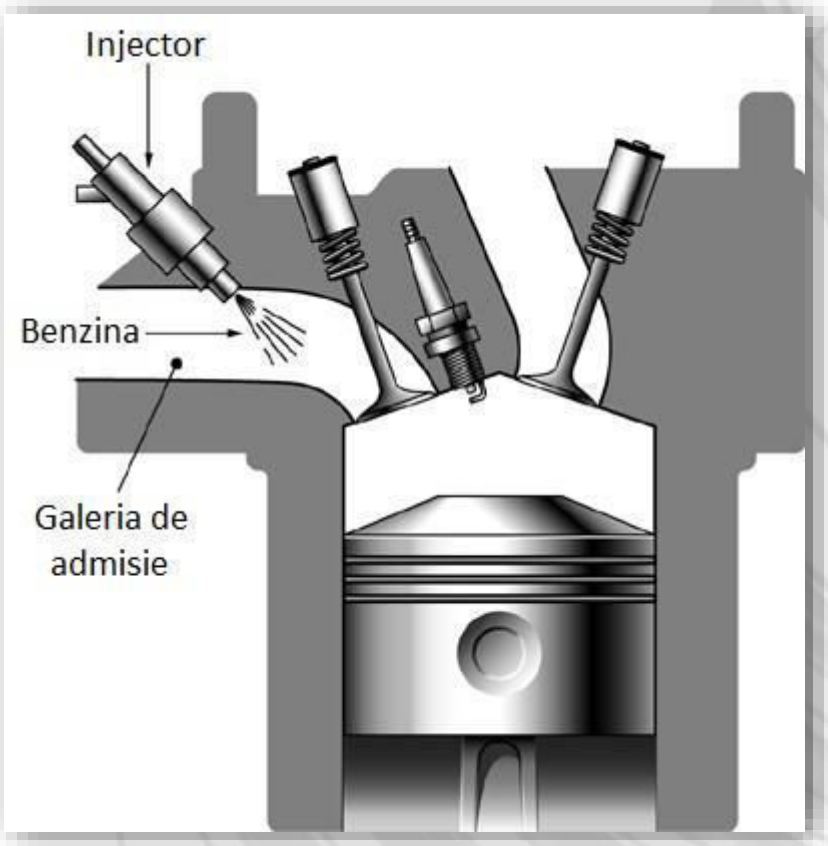
Student Project

Author: Albescu Corina

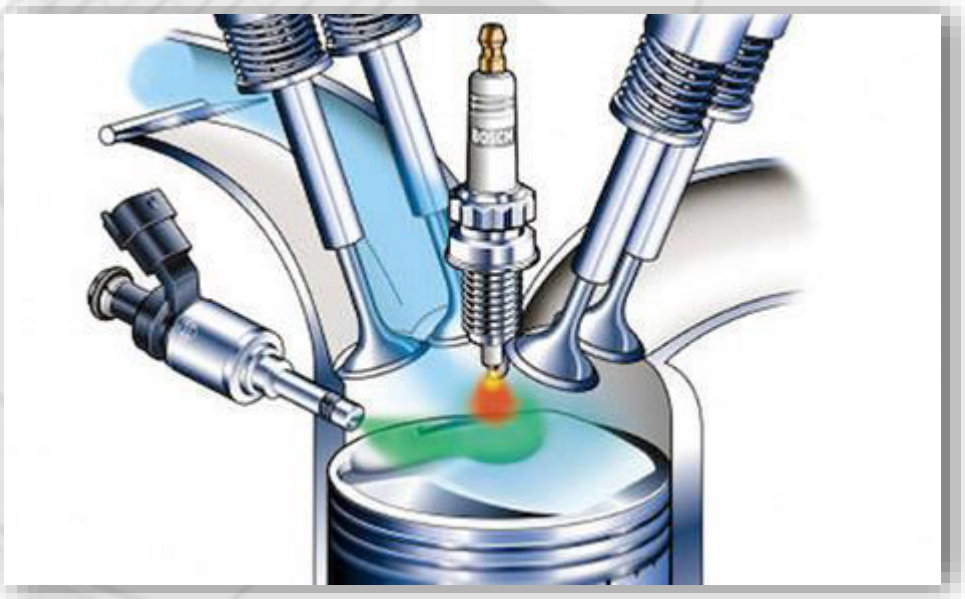
The study aims at a comparative analysis of the two injection systems used in internal combustion engines powered by gasoline: indirect injection compared whit direct injection.

In the case of indirect injection are two different types: the multi-point injection (MPI) system, also known as port injection, or dry manifold system and the single-point injection (SPI) system. At indirect injection the gasoline is sprayed into the intake manifold.

Gasoline direct injection (GDI), also known as petrol direct injection (PDI), in this case gasoline is sprayed directly into the combustion chamber. Indirect injection has some advantages, but nowadays it can no longer meet the current requirements for pollutant emissions and dynamic performance improvement.



Indirect injection
multi-point injection (MPI)



Gasoline direct injection (GDI)

The advantages of the indirect injection system are the following:

- elimination of fuel deposition on the walls of the exhaust manifold and on the valves;
- improving the control of the air-fuel mixture;
- reduction of losses by pumping (air suction) in the mode of operation with stratified mixture;
- improving the thermal efficiency, during operation with layered mixture, due to the higher compression ratio;
- reduction of CO_2 emissions and fuel consumption due to the possibility of operation with a stratified mixture.

Contact: albescu.corina@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

SANTECH LOGISTIC

Rulotika – camper box concept

Prototype

Author: Alexandru Barbu

K

R u l o t i k a – is a concept of commercial or tourist box for camping and traveling arranged on any trailer, pick-up or boat, detachable, used in static conditions but also offering mobility and multiple configuration possibilities

Contact:

Alexandru Barbu
Tel. +40721 560 074
E-mail: centruderulote@gmail.com

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

COMOTI
ROMANIAN RESEARCH & DEVELOPMENT INSTITUTE FOR GAS TURBINES
220D Iuliu Maniu Ave., 061126 Bucharest 6, ROMANIA PO 76, POB 174
Phone: +4 021/4340198, +4 021/4340240; Fax: +4 021/4340241
E-mail: contact@comoti.ro, www.comoti.ro
Nr. Of. Com. Reg. J40/4880/1997, CIF: RO445238

UNMANNNED AERIAL VEHICLE, SUCH AS QUADCOPTER, WITH VARIABLE WINGS, VECTORIZED ENGINE AND METHOD OF FLIGHT AT FIXED POINT AND FORWARD

Patent RO 134896 A0

Author/s: Tiberius-Florian FRIGIOESCU, Mihaela-Raluca CONDRUZ, Teodor Adrian BADEA, Alexandru PARASCHIV

The invention relates to an unmanned aerial vehicle, such as a quadcopter with independent detachable wings, with vectorized engines and to a method of flight at fixed point and forward, used in surveillance and data recording missions. The vehicle consists of three zones, a first central zone there is a power source and electronic control components, including a control board, the second zone, positioned in the four quadrants, ensures the change of the wings' angle of incidence and the third zone arranged at each end of the second zone which comprises the vectorized engines. The claimed method of forward flight of the UAV consists in tilting the aerial vehicle with a certain angle towards the front direction, then increasing the angle of incidence of the wings depending on the speed of travel, rotation of front and rear engines and reducing/maintaining the speed of engines with increasing autonomy/max forward speed.

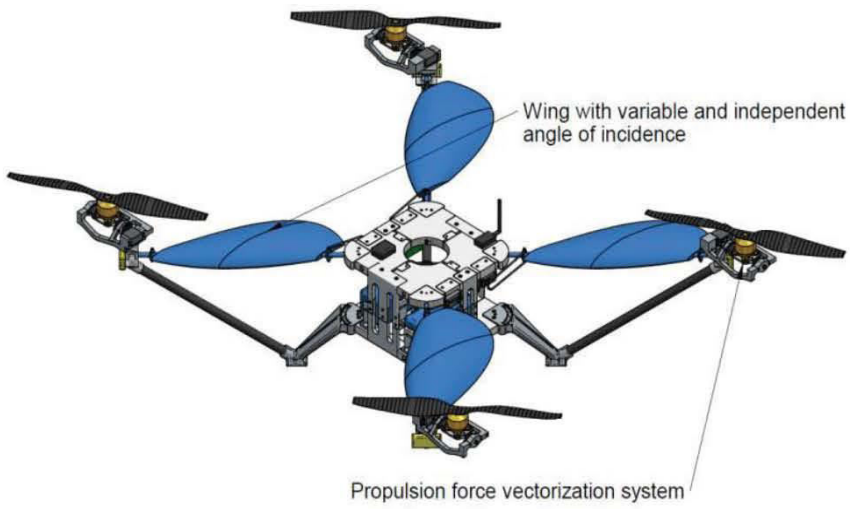
Mass: 12.5 Kg
MTOW: 20 Kg
Payload: 5 Kg
Engines
- Number: 4
- Power: 1420 W
- KV: 660

Propellers
- Number: 4
- Diameter: 38.1 cm
- Pitch: 13.97 cm

Source of energy
- LiPo Batteries
- Voltage: 22.2 V
- Capacity: 16 000 mAh
- Number: 2

Features

- Independent vectorization on each engine
- 2 computers (first for automatic stabilization and autopilot and second for vectorization of engines and control of wings
- 4 wings with independent adjustment of the angle of incidence



During forward flight, the wings produce lift, the engine speed is kept constant and thus, to maintain a constant flight altitude, the engines are vectorized, which leads to the following advantages:

- **Increases maximum forward speed by 59%;**
- **Decreases energy consumption by 36% compared to a route;**
- **Extend the maximum flight distance by 58%.**

Grounded UAV

UAV in flight

Contact
E-mail: contact@comoti.ro
Mobile: 021-434 02 40

This invention was funded by Romanian Minister of Research and Innovation, within POC-A1-A1.2.3-G-2015, ID/SMIS code: P_40_422/105884, "TRANSCUMAT" Project, Grant no. 114/09.09.2016 (Subsidiary Contract no. 2/D.1.6/114/24.10.2017).

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

SMART ELECTRIC VEHICLE WITH LoRa COMMUNICATION SYSTEM AND RECOVERY OF A PART OF THE ELECTRICITY CONSUMED IN ORDER TO INCREASE AUTONOMY

AUTOVEHICUL SMART ELECTRIC CU SISTEM DE COMUNICAȚIE LoRa ȘI RECUPERAREA UNEI PĂRȚI A ENERGIEI ELECTRICE CONSUMATE ÎN VEDEREA CREȘTERII AUTONOMIEI

1948

UNIVERSITATEA DIN PETROȘANI

Patent number: OSIM A00201/28.03.2019, prototype

Răzvan-Marcel MĂRCUȘ,
Cosmin-Neluțu RUS, Monica LEBA

Category
K

An intelligent electric vehicle with a LoRa communication system that monitors the quality of the environment, taking over the data of the various sensors located on the vehicle, also having the functionality of energy recovery.

Figure 1. Arrangement of generators on the functional platform of the smart electric vehicle

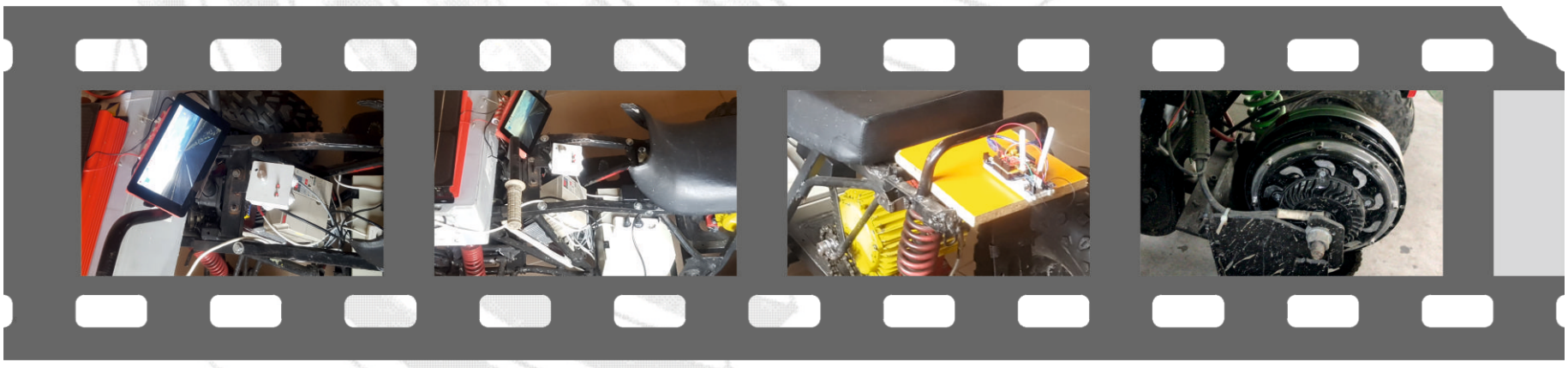


Figure 2. Command, control and monitoring elements implemented

Un vehicul electric inteligent cu un sistem de comunicație LoRa care monitorizează calitatea mediului, preluând datele diferiților senzori amplasați pe vehicul, având și funcționalitatea de recuperare a energiei electrice.

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

Asociația de Cercetare Doctorală Petroșani

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

eTruck@RO.UPET

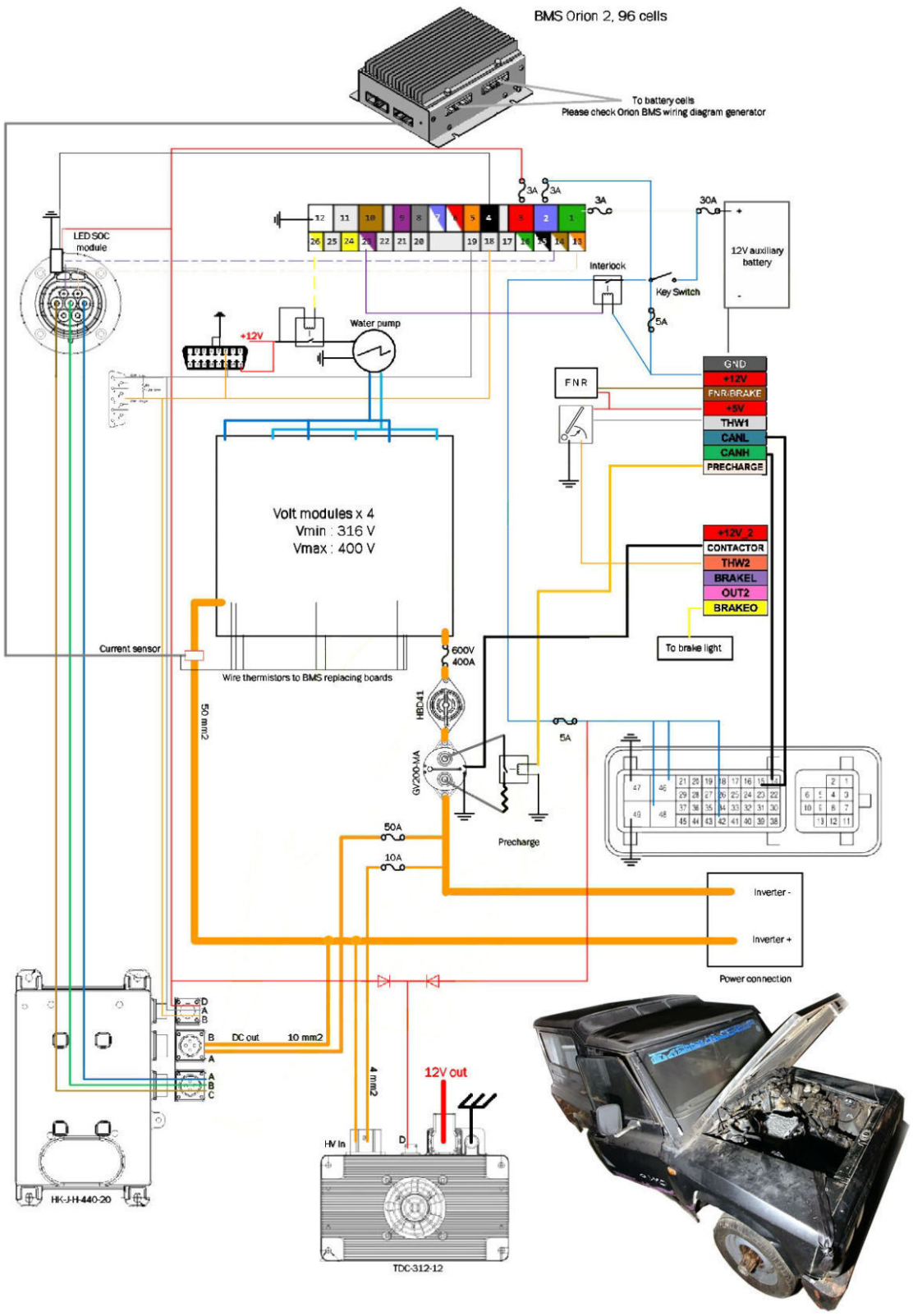
UNIVERSITATEA DIN PETROȘANI

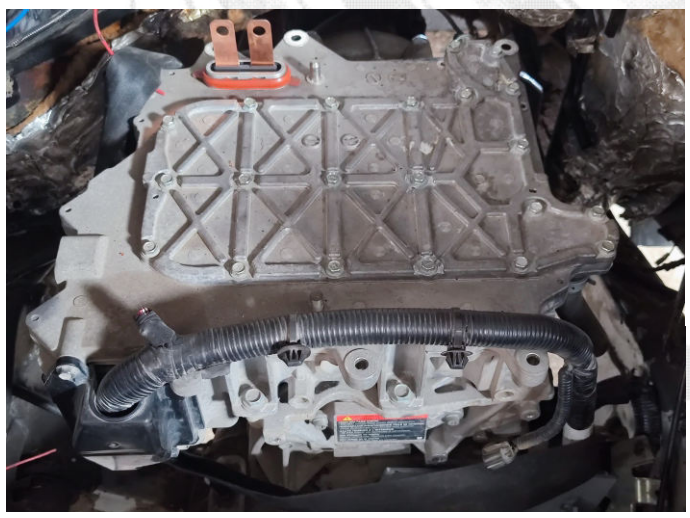
PhD student project, prototype
Răzvan-Marcel MĂRCUȘ, Monica LEBA, Marius-Nicolae RISTEIU

Category
K

The project relies on an electric car concept, based on a classic Romanian truck platform, designed based on the open-source principles. The basic system developed contains an 80 KW BLDC motor, powered by a 25 KW battery bank, at a DC voltage of 400 V. This system is designed to be a research stand for various adapted hardware elements, but also for testing different driving algorithms.

Un concept de mașină electrică, bazat pe o platformă de camionetă românească clasică, concepută de tipul open-source. Sistemul de bază dezvoltat conține un motor BLDC de 80 KW, alimentat printr-un banc de acumulatori de 25 KW, la o tensiune de 400 V, current continuu. Acest sistem este în așa fel conceput încât să fie și un stand de cercetare pentru diverse elemente hardware adaptate, dar și pentru testarea diferiților algoritmi de conducere.





Asociația de Cercetare Doctorală Petroșani

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

BUGGY4FUN

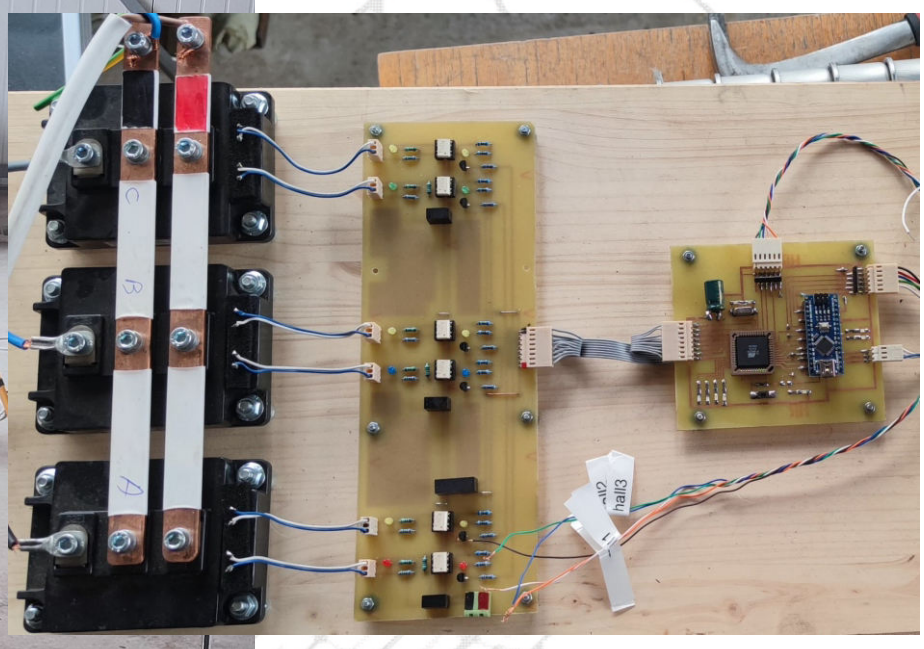
1948

UNIVERSITATEA DIN PETROȘANI

PhD student project, prototype
Marius Nicolae RISTEIU, Monica LEBA, Mărcuș-Marcel RĂZVAN,
Remus Constantin SIBIȘANU, Alexandru CHIUDA, Alexandru STOICA

Category
K

The project presents a small electric car, which can be used on various types of terrain, including in urban centers, to reduce pollution. The developed platform offers the possibility to test several types of electric motors, together with their controllers. The engines are powered both from dedicated batteries and from alternative sources resulting from regenerative braking, as well as from solar energy sources.



Automobilul electric de mici dimensiuni, care poate fi utilizat pe diferite tipuri de teren, inclusiv în centrele urbane, pentru a diminua poluarea. Platforma dezvoltată oferă posibilitatea testării mai multor tipuri de motoare electrice, împreună cu controlerele acestora. Alimentarea motoarelor se face atât de la acumulatorii dedicați, cât și prin surse alternative rezultate din frânarea recuperativă, precum și din surse de energie solară.

Asociația de Cercetare Doctorală Petroșani

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

LSM -OFF ROAD Team

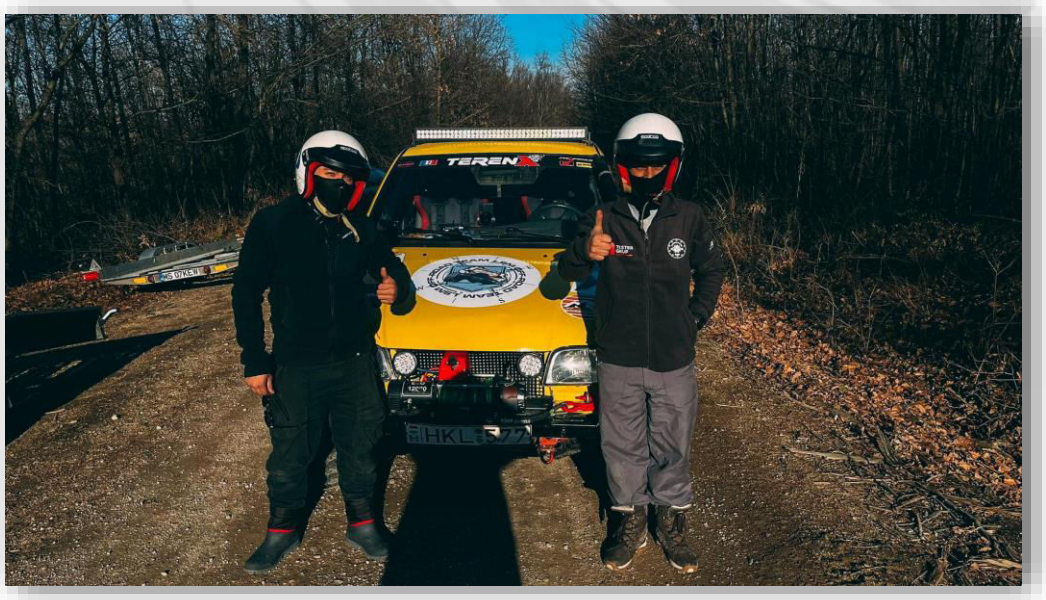
K

Student project

Authors: Ciuperca Alexandru, Andriș David, Anton Costin, Funduianu Theodor, Mihai Marius, Tcaciuc Florin, Anechiței Cătălin,
coordinator Adrian SACHELARIE

The LSM-OFF ROAD Team is made up of students who have prepared a car from the KIA SPORTAGE 1998 model family to participate in Off Road competitions. In this respect, the front and rear axle suspensions have been modified to increase the ground clearance and the damping coefficient, the modification of the connection system between the rear axle and the vehicle chassis in the sense of designing a new multilink articulation system which allows a substantial increase in vehicle passing capabilities. To use 33-inch-diameter tires, the front and rear ratios have been modified accordingly. Next, the design of a new front axle arm system is designed, also in order to increase the passing capacity of the vehicle.

From an energetic point of view, the management of the computer that manages the operation of the engine was intervened and the car was lightened with about 250 kg. The replacement of body parts with panels made of composite materials is to be replaced, in order to make the vehicle lighter.



Etapa 7
CNOR

Contact: adrian.sachelarie@tuiasi.ro

CORNELIUGROUP research-innovation association

INVENTCOR

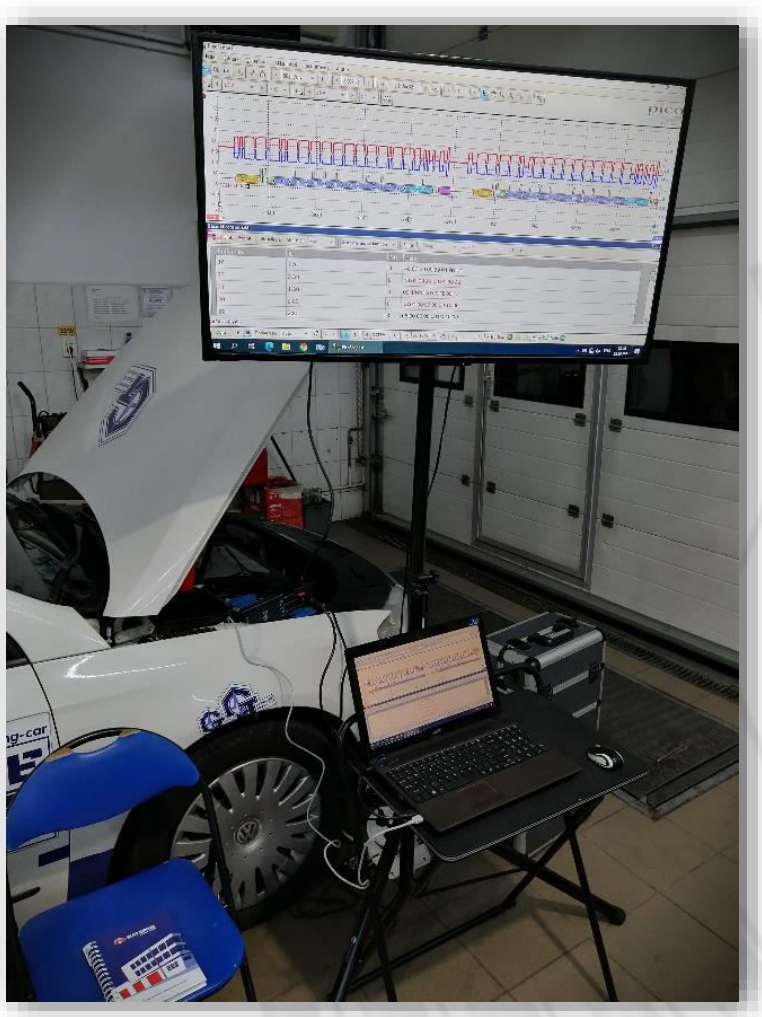
Power of Creative Mind

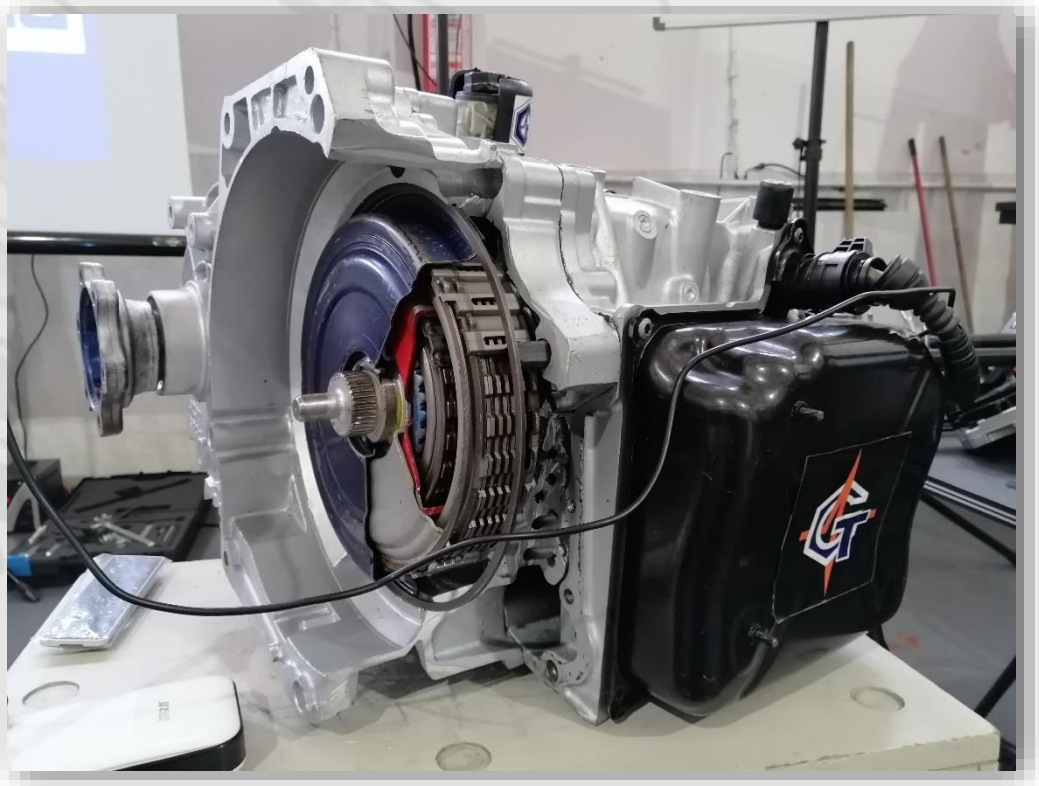
GARAGE TRAINING

Authors: Gidali Adrian, Simon Florin

K

Garage Training SRL has as main activity the development and support of technical trainings dedicated to professional car diagnostics. The training sessions are designed both for advanced level and for the initiation of those who want to practice this field, having structured the main notions about: mechanics and electricity programming. Another related activity of Garage Training is the construction of simulators for various vehicle systems, specially designed to optimize the training process, using for this purpose real components of vehicles.





Benefits:

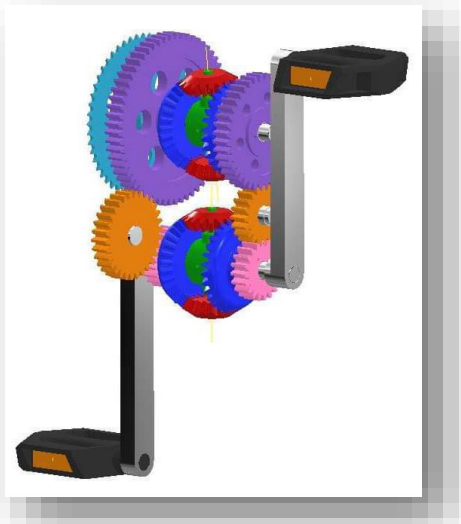
Through the activity carried out and adapted to the needs of car workshops, we want to actively participate in the development of professional skills in the field, constantly holding training sessions for teachers of educational institutions, in order to update specific knowledge and keep pace with technological developments of automotive systems.

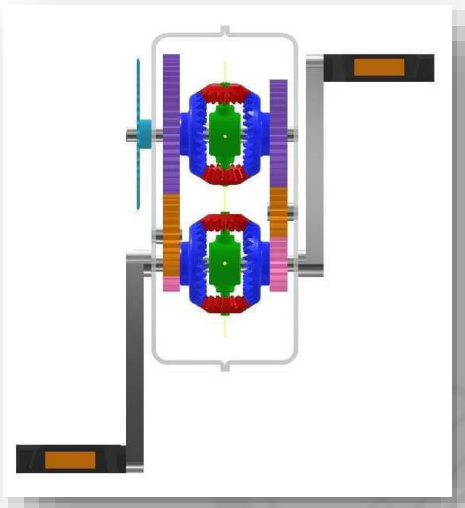
Contact: cursuri.garagetraining@gmail.com

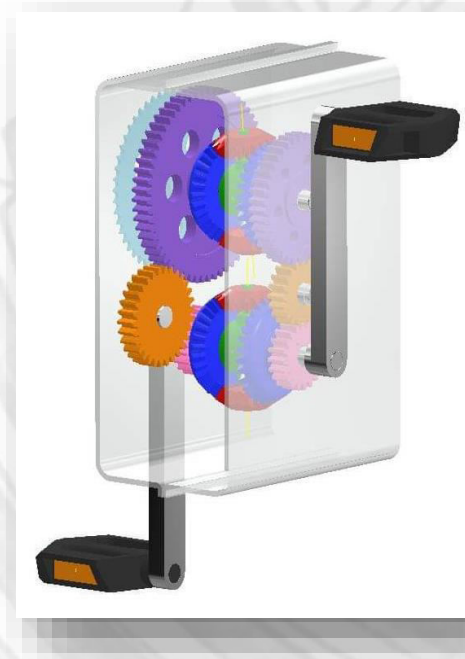
SELF-ADAPTIVE GEARBOX FOR BICYCLES

Authors: Romeo CĂTĂLINOIU, Sorin-Aurel RAȚIU, Imre-Zsolt MIKLOS

K







Soluția propusă se referă la o aplicație a cererii de brevet Nr. 00889 din 12.12.2019 și constă într-o cutie de viteze destinată să echipeze mijloace de transport terestre de agrement, cum ar fi: biciclete, triciclete, mopede, carturi cu pedale etc.

Cutia de viteze este un reductor mecanic caracterizat prin aceea că variază autoadaptiv raportul de transmitere pe fiecare treaptă de viteze selectată de conducător, în funcție de valoarea momentului rezistent ce trebuie învins.

Avantajul major constă în aceea că nu este necesară schimbarea frecventă a treptelor de viteze, având un ritm de pedalare lejer atât pe drum orizontal, cât și la urcarea unei rampe cu înclinare mare.

The proposed solution relates to an application of patent application no. 00889 of 12.12.2019 and consists of a gearbox intended to equip recreational land transport vehicles, such as: bicycles, tricycles, mopeds, pedal carts, etc.

The gearbox is a mechanical reducer characterized by self-adaptively varying the transmission ratio on each gear selected by the driver, depending on the value of the resistance to be overcome.

The major advantage is that it is not necessary to change gears frequently, having a light pedaling rhythm both on the horizontal road and when climbing a slope.

Contact: catalinoiuromeo@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

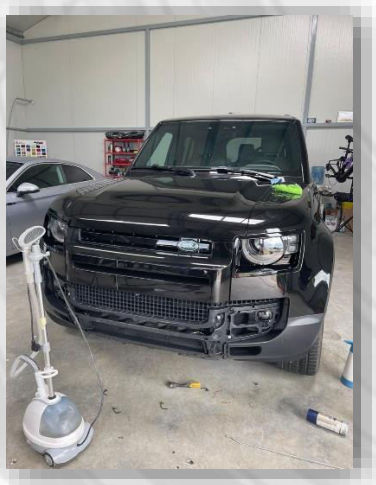
Service & Maintenance by AutoVest

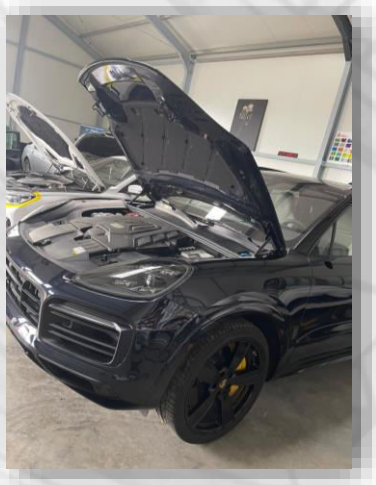
Author: Mararu Leonard Nicolas

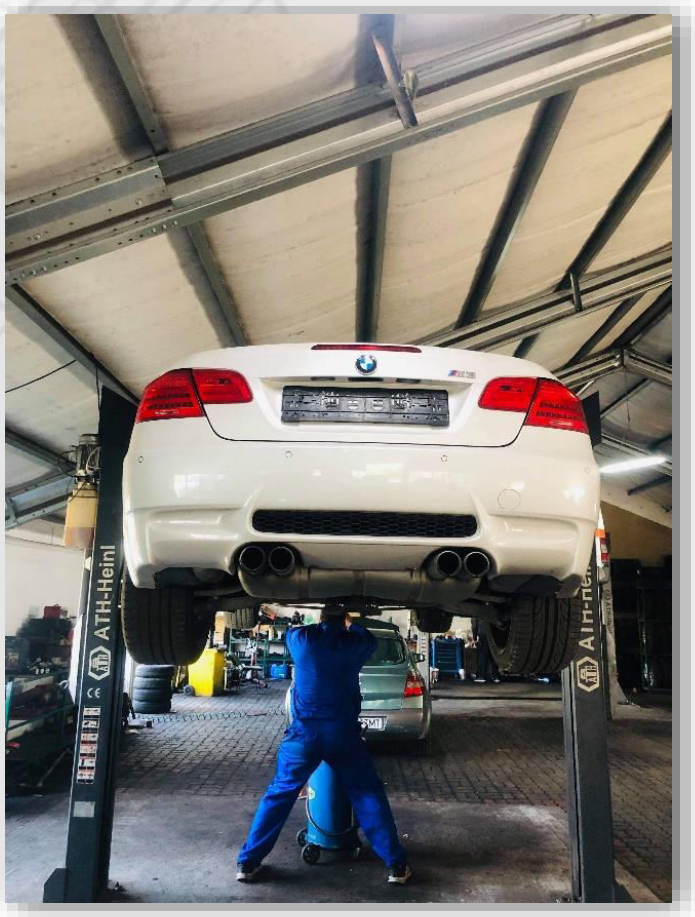
K

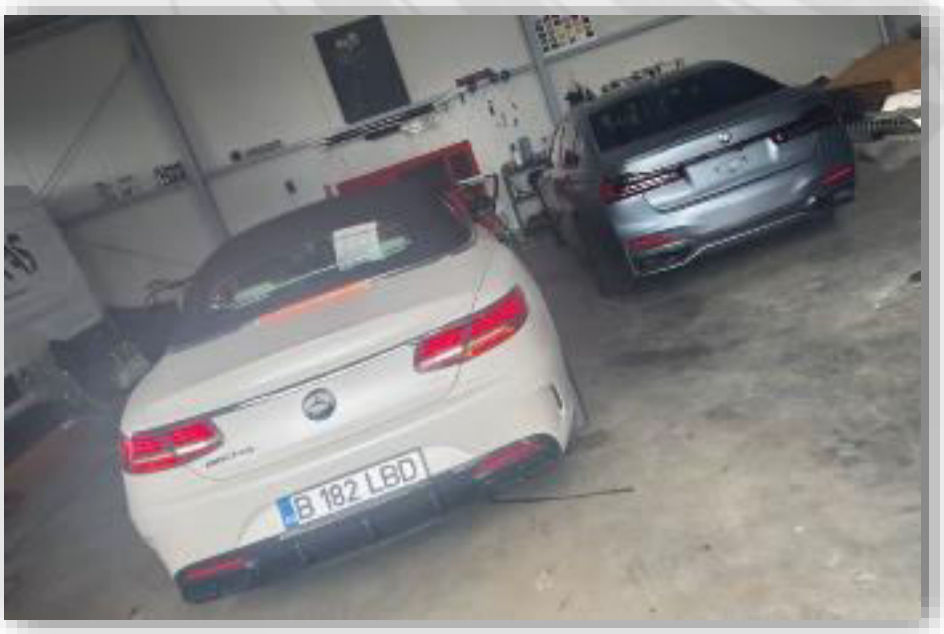
Whatever the size of your car, Auto Vest Service can offer you premium services with no hidden costs for all pockets. We can offer you all the benefits of a service representative of trained mechanics, the latest diagnostic devices and original parts. We are committed to providing you with the best services that can save you money. We are confident that once you try our services you will not be disappointed.

Our main activity is the maintenance and repair of motor vehicles, offering a wide range of services (diagnostics, testing, checks, adjustments, maintenance and mechanical and electrical repairs, etc.).









Contact: D-va Rosie, jud. Neamt, Piatra Neamt
E-mail: office@autovest-service.ro
Telefon: +40233 280 737

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

THE EVOLUTION OF THE FORD MUSTANG

Student Project

Author: Popescu Alin Andrei

K

This project deals with the study of the evolution of the Mustang model from the Ford brand. This consists both in the evolution of the engine and in the improvement of the parts that make it up, which made it raise its performance to much higher levels over time, and in the evolution of the external appearance, which as we could see is a radical one.

In the early 1960's, Lee Iacocca, Ford's vice president and general manager, came up with a sports car for young people. The idea quickly took shape on April 17, 1964, at the World's Fair in Flushing Meadows, New York, where Henry Ford II presented the first Mustang.

The first Ford Mustang had two seats, the engine mounted in the middle and was a convertible. The car was equipped with the engine from the Falcon models, with a capacity of 2.8 liters and 101 hp. The Falcon engine was later replaced with a 4.7-liter V8.

In 1965, the GT350 was introduced with a 306 hp V8 engine, and minor changes were made the following year. 1966 is the year when the Mustang exceeded one million sales.

To celebrate the 30th anniversary of the first Mustang, Ford completely redesigned the 1994 model to make it look as much like the original as possible: long muzzle, patterned side bars and sleek roofs. The change came as a result of studies conducted by the American company, which showed that fans want the classic version.

In 2004, Ford produced the 404th anniversary of the 004 Mustang GT Convertible, and in 2008, the 9,000,000th Mustang, a GT Convertible, was sold to an Iowa farmer.

After a break of 40 years, in 2012, the Mustang Boss 302 returns to production. In 2013, Ford launched what it called the most powerful Mustang car - GT500, with 662 hp, 5.8-liter supercharged 5.8-liter V8 engine, which can go at 320 km / h. The 2020 model has more horsepower and, theoretically, would be faster, but the car company has electronically limited its speed to 290 km / h.

The formidable Ford Mustang GT is joined, in 2021, by the most powerful and capable Mustang that has ever crossed European roads: the Ford Mustang Mach 1.

Behind the power Mustang GT was an improved version of the renowned 5.0-liter V8 engine, which incorporates dual fuel injection technology for superior performance. Mustang Mach 1 has a 5.0-liter V8, specially modified and calibrated, which can reach up to 460 hp at 7,250 rpm and 529 Nm of torque at 4,900 rpm.

Contact: a_popescu71@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Grand passion - Grand Cherokee

Student project

Authors: Gafencu Gabriel, Lupas Adrian

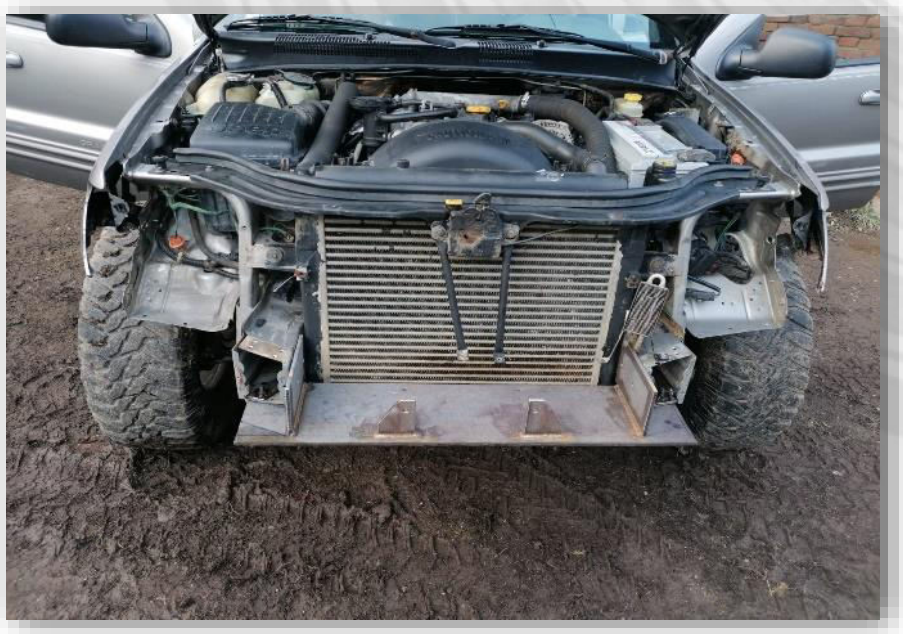
K

The model chosen for our project is the Jeep Grand Cherokee from 2000, an American model, equipped with a 3124 cm3 diesel engine, placed in front longitudinally (5 cylinders in line). The engine has 140 hp and a maximum torque of 384 Nm compared to 1800 rpm, reaching a top speed of 173 km / h (it is also equipped with a turbocharger).

This model has undergone a number of changes in order to significantly improve off-road performance.

These changes include the following:

- Suspension raising kit with 15 cm;
- 10 mm spacer kit both on the front and on the back;
- Installation of led-bar on the ceiling;
- Cutting the front-rear wings to allow the installation of higher profile tires;
- Front winch mounting;
- Replacing the front and rear bumper with others, custom-made.



Contact: gabigafencu78@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

SYNERGISTIC RECONFIGURABLE TRAFFIC INTERSECTION
随需应变交通

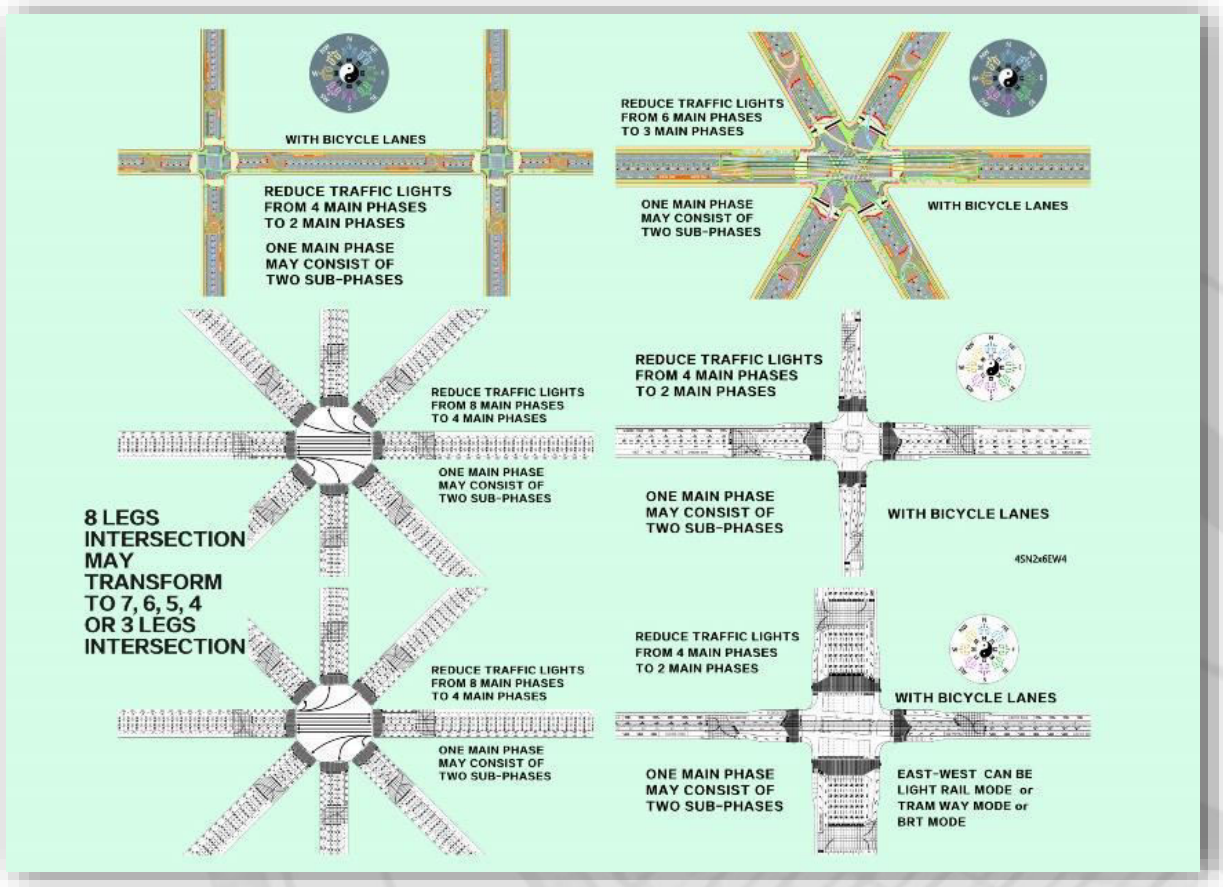
PCT/AU2018/051398 TW 108101681 AU 2019200133 PK 234/2019

Contact: Valiant Yuk Yuen Leung Email: 3110284705@qq.com

This SYNERGISTIC RECONFIGURABLE TRAFFIC INTERSECTION was invented on 17/4/2018 and targets the worldwide urban traffic congestions due to the existing tram way/light rail, BRT, tidal lanes, bicycles lanes and or in lack of parking spaces.

K

Flyovers, subways and tunnels are not necessary. What we need to do are just rearrange the layout pattern of the functions, installing more traffic control lights, readjusting the traffic light timing and phases per cycle.



By reducing the time–costly red traffic–light phase without losing any function. Existed road spaces of all directions are wisely rearranged to lower the red and green phase ratio from currently 3:1 to 1:1.

The reconfigurable lanes will be reconfigured according to the need raised either travel in a opposite direction as tidal lanes or to be closed for parking at night. The road resources and functions are designed to meet the demand at any time.

Combinations of continuous green–wave flows are grouped comparatively easier and further. As a result, a constant high–speed smooth circulation will clean up all hotbeds of traffic congestion.

Since the construction period is short and simple with a higher cost performance, this should become the priority choice for the world, no matter developed or developing countries.

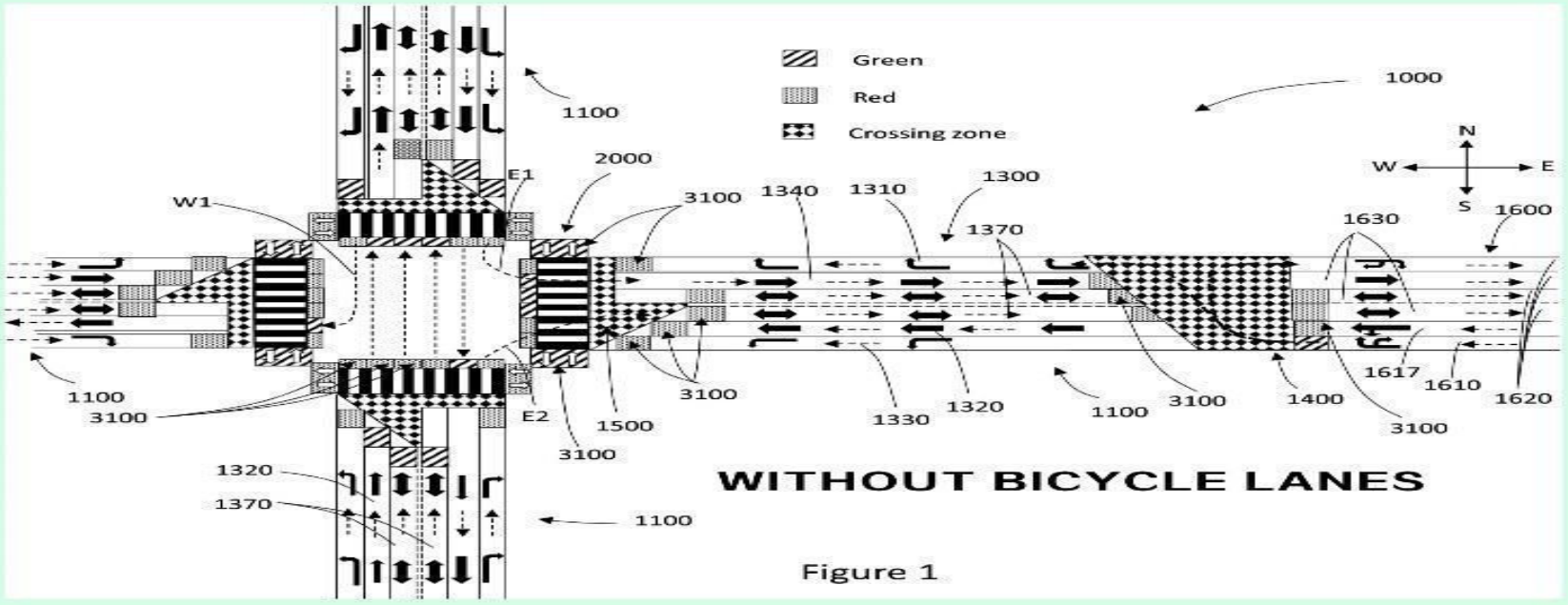


Figure 1

WE SAY NO TO TRAFFIC CONGESTION

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Bogdan's DACIA

Student Project

Author: Bogdan Tudor Mihai

K

One of the most famous Romanian brands in the world is, without a doubt, Dacia. A name that, at one time or another, closer or farther away, meant something to any family in our country.

Fortunately for us, the Dacia name still has something to say on the international car scene even at this moment, being one of the brands that is in great demand in countries such as France or Great Britain.

Dacia 1300 is a family car manufactured by Dacia between 1969 and 1984. It appeared under the license obtained from the French company Renault, went into production in August 1969 and was based on the Renault 12 model. At that time the model had a modern and economical look.

Initially, the model had a single sedan body with 4 doors and 5 seats. The powertrain had a cylinder capacity of 1,289 cc that developed 54 horsepower, a top speed of 144 km / h and a consumption of 7.0 liters. The capacity of the tank is 42 liters.

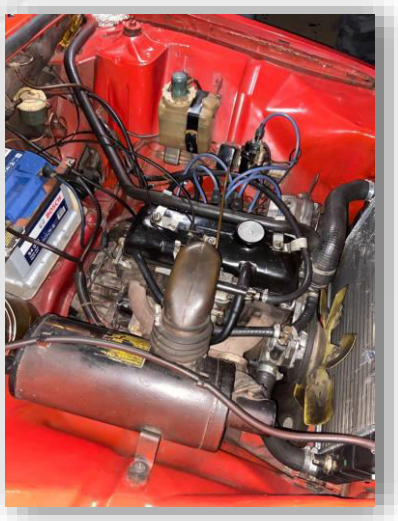
It is interesting that in 1970 no less than three variants of the 1300 model were launched, respectively: the Standard, Lux and Lux Super 1301 model (used as a service car only by the members of the Romanian Communist Party and Security). Moreover, the 1301 Lux Super model had features that other cars could do nothing but dream of. These include: radio, raised seats at the front, dual braking circuit, exterior mirrors, interior mirror, cigarette lighter, lighted glove compartment, sun visor with mirror, windshield wiper. At the same time, this car was available in darker and more elegant colors such as black.

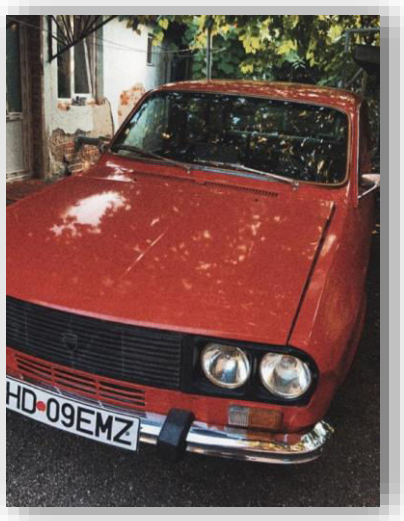
Last year I also managed to get a driver's license and my grandfather gave me a Dacia 1300 as a gift. He has owned it since 1983. Apart from consumables, all the parts are original, even the paint. He always kept it in the garage. it has no traces of rust. I want to keep the original, collector's car.

TECHNICAL SPECIFICATIONS

Dacia 1300
Anul fabricatiei-1983
Sedan, 4 Doors, 5 Seats
54 Hp, 88 Nm
1.3 L 1289 cm3
4 cylinders inline
890 Kg
Top speed-142 km/h
Acceleration 0-100 km/h - 18.4s
Tire size- 155/65 R13

Contact: bogdan_tudormihai@yahoo.ro





CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Toyota Celica by Alex

Student Project

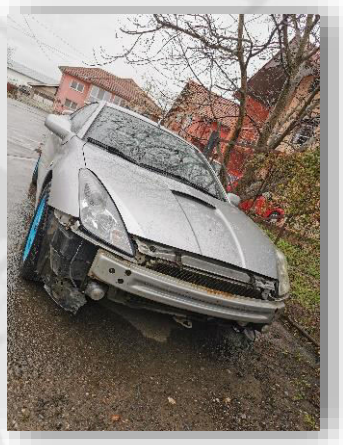
Author: Predescu Alexandru Ioan

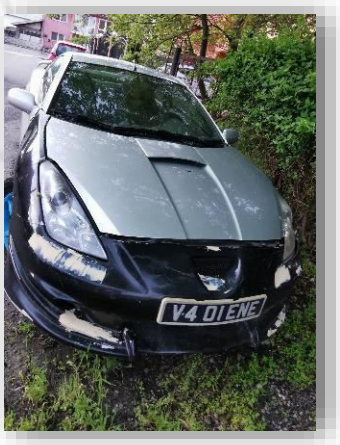
K

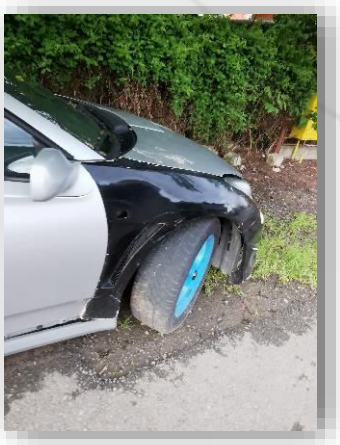
My name is Predescu Alexandru and today I present my project, a car with a story, this car is a Toyota Celica that has a 1.8 liter engine that produces 150 hp, and an advantage of this car is the lightweight body which is 1070 kg. I raised money from various jobs and I managed to buy it at the age of 17, I bought the car from an old man who was the first owner. , the engine was in good condition but esthetically it was nt very good.

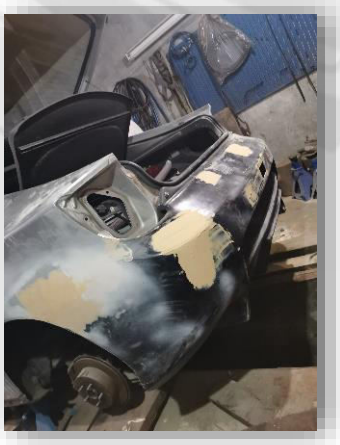
After I bought it I bought a Veilside body kit (which contained the front bumper, rear bumper, fenders and sikids) and I wanted to make it unique by making it unibody (in short all the bars are joined made in one piece) after I mounted the bodykit and I managed to put them all together in one piece I started to prepare the machine for painting.

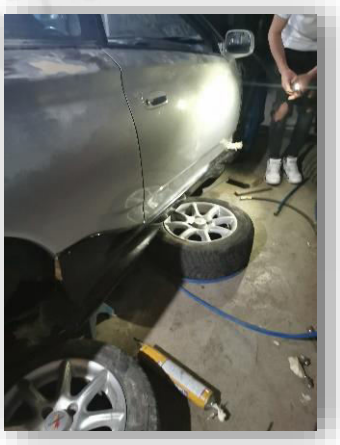
After a while I decided that the color will be a metallic and pearly blue which makes it unique from this point of view because during the day the car has a light blue hue, in the evening when the sun sets in certain positions it has a purple hue, and night in the dark has a shade of dark blue.

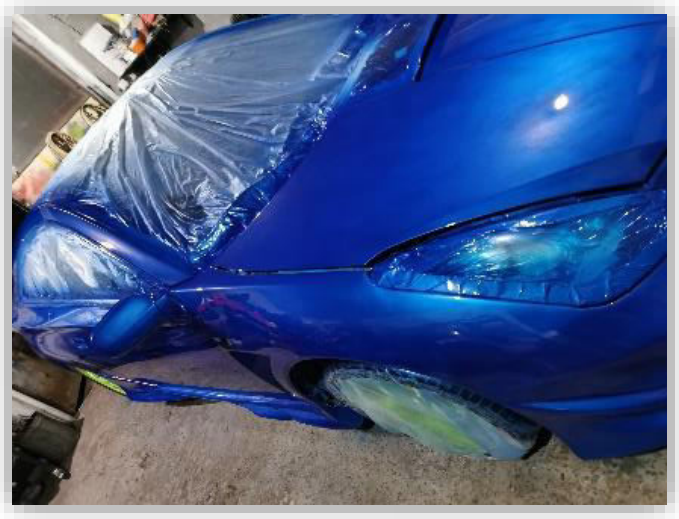












Contact: prede42@gmail.com
+40732753059

L

Innovative ART

Photography

Video

Publicity

Printing

Painting

SELF AWARENESS-BASED PHSYCOEDUCATION MEDIA TO OVERCAME PUBLIC PANIC ATTACKS DUE TO THE IMPACT OF THE COVID-19 VACCINATIOAN HOAX

Student Project

Faza Kasyiva Az-Zahra, Hengki Tri Hidayatullah, Dzulkifli Abdullah, Kheren Carollina Pamintarso, Ijazah Ilmi Rohmah
Advisor : Dr. Muslihati, S.Ag., M.Pd

L
Category

Psychoeducational media as innovations and breakthroughs for public concerns regarding the massive hoax news related to vaccination and pay attention to psychological aspects to help the community in reducing panic attacks they experience. The developed psychoeducational media reconstructs and adopts the Rational Emotive Behavior Therapy (REBT) counseling pattern to change people's irrational thinking towards rational and logical thinking, and uses a cultural approach to make it easier for people to receive and understand the message to be conveyed.

Utilization of the cultural values of the Malang people as well as the Rational Emotive Behavior Therapy (REBT) counseling pattern which is then constructed into self-awareness-based psychoeducational media that can be applied to Malangsuko residents, Malang Regency who experience panic attacks due to the impact of the COVID-19 vaccination hoax. which is the result of this research, is expected to be the basis for developing self-awareness-based psychoeducational media that is tailored to the characteristics of the target community.

Contact: faza.kasyiva.2001116@students.um.ac.id (+62-896-9682-6329)

H.O.P.E.

L

Photography

Author: Diana Miruna Armioni

My fascination with the world of children led me to choose the theme for this photographic project. Taken as a whole, it represents hope; both the hope of the children in what will follow, in a better world, and the hope of humanity, represented precisely by these children.

One thing too often ignored by adults is that the little people around them feel and understand much more than they seem. Their emotions are as strong and real as those of adults. I tried to "catch" some of these emotions in the images that make up this project, with the conviction that as long as the child is encouraged to feel, the future will be much brighter, better, more human.

Contact: armionimiruna@yahoo.com, +40740908169

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

LEMNĂRIA LUI RADU

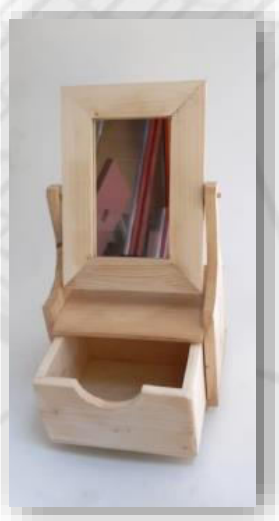
Lemnăria Lui Radu

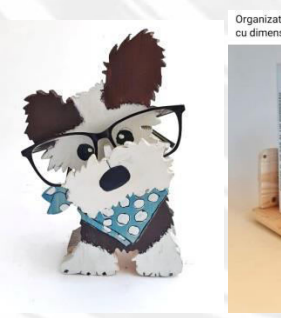
Woodcraft

Author: Fachin Radu Luigi

L

Obiecte din lemn reciclat, create cu drag.
Important este ca orice obiect să aibă trei utilități: să fie plăcut ochiului, să fie folositor și să aibă o semnificație.
Acolo caut eu să mă îndrept de fiecare dată când realizez un obiect!





Objects made of recycled wood, created with love.
The important thing is that every object has three purposes: to please the eye, to be useful and to have a meaning. That's where I try to go every time I make an object!

Contact: www.lemnarialuiradu.ro

www.facebook.com\lemnarialuiradu

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

TURURI VIRTUALE 360°

Deva Fantastica 360°

Immersive Digital Art

Author: Irina Fachin

L

RO: “Municipiul reședință al județului Hunedoara” sau “orașul de la poalele Cetății” - așa este cunoscută Deva de către locuitorii ei sau de către turiștii care o vizitează. Însă atunci când nu o privește nimeni, Deva se transformă într-un loc misterios, un oraș fantastic în care totul e posibil, deși nimic nu este ceea ce pare. Un vis ciudat sau realitatea ascunsă? Explorează Deva fantastică 360° și poate vei afla.

EN: "The municipality of Hunedoara County" or "the city at the foot of the fortress" - this is how Deva is known by its inhabitants or by the tourists who visit it. But when no one is looking, Deva turns into a mysterious place, a fantastic city where anything is possible, even if nothing is what it seems. A strange dream or hidden reality? Explore the fantastic Deva 360° and you may find out.

Explore photos in 360 degrees: https://bit.ly/devafantastica360

CORNELIUGROUP research-innovation association

INVENTCOR

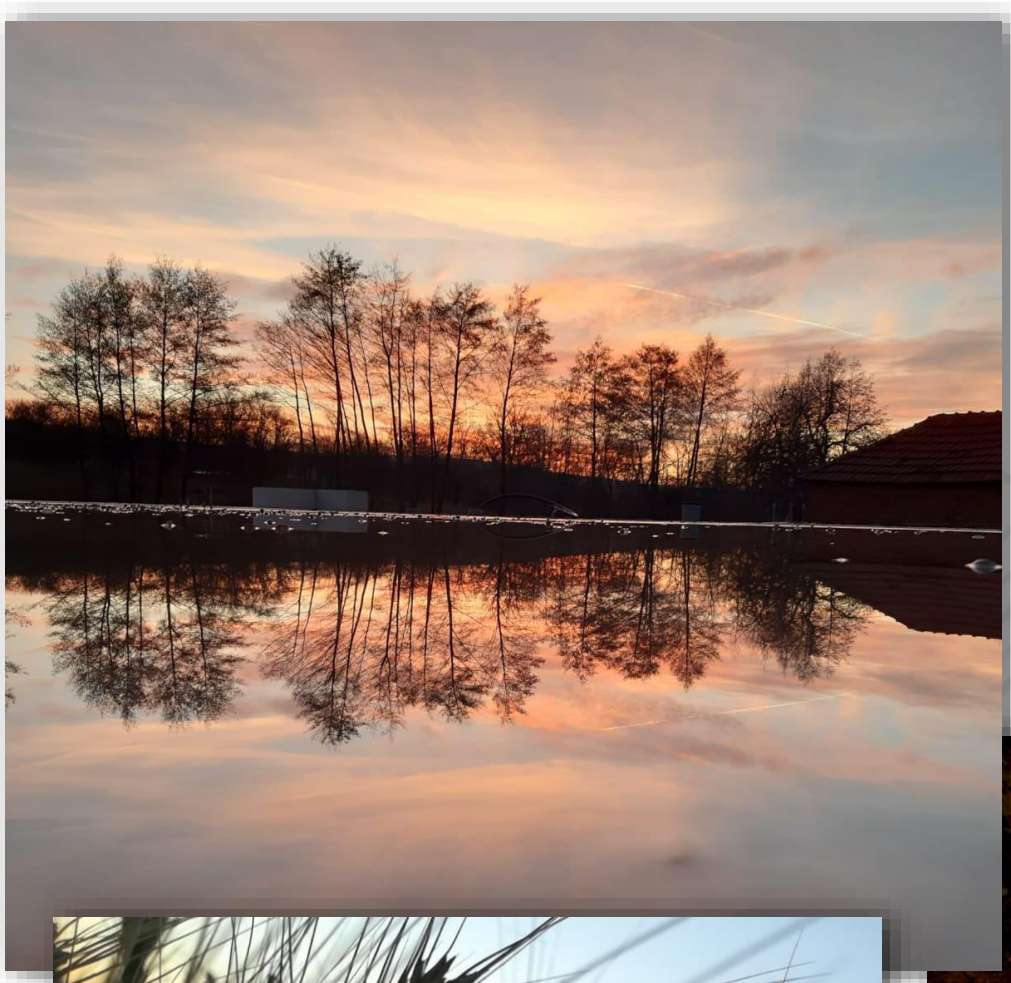
Power of Creative Mind

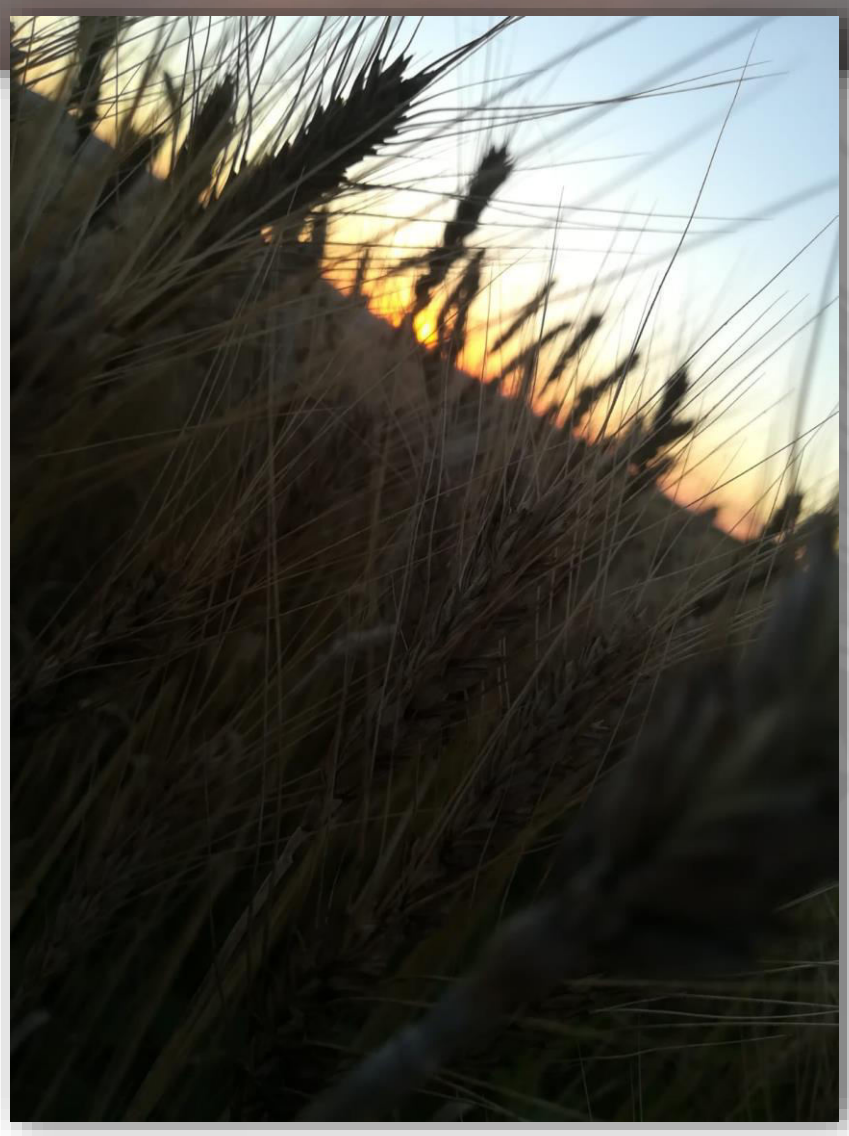
PUT ON PAUSE

L

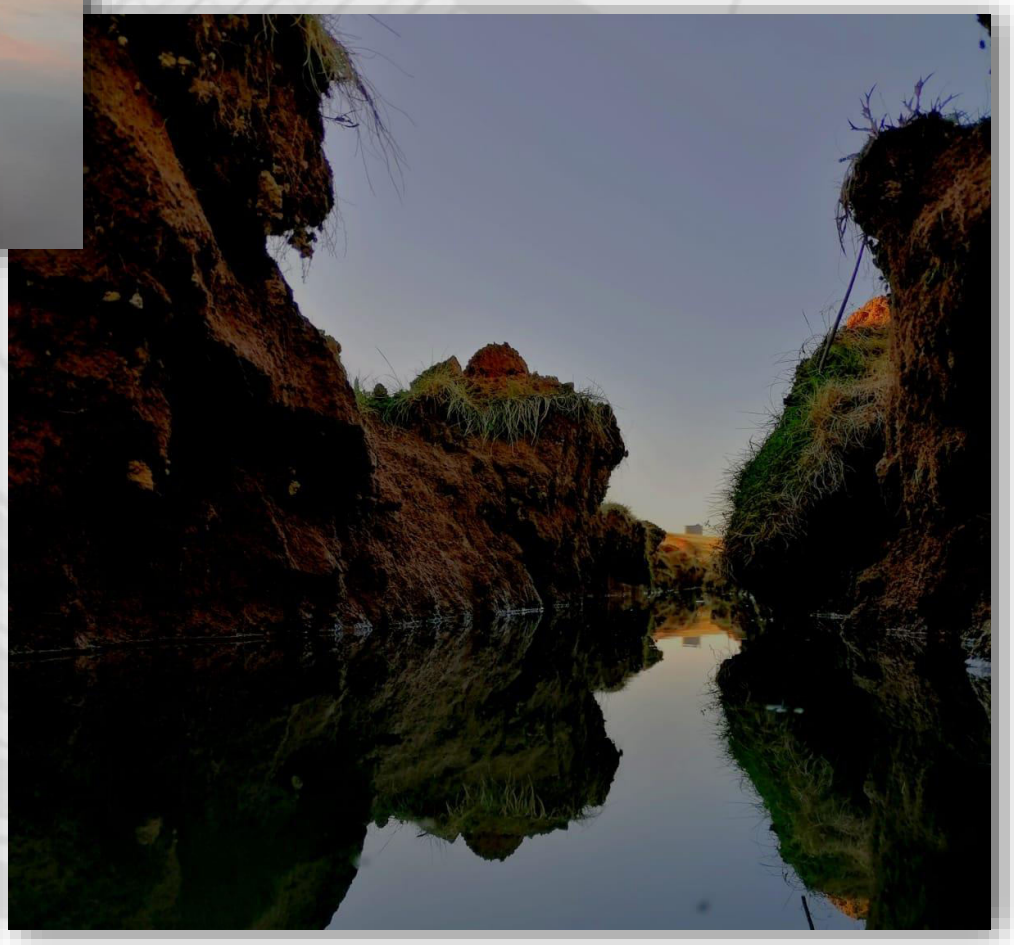
student project

Author: Obrejan Ioana





Ce e timpul? Privirea unei mame, glasul unui tată. Amintirea copilăriei care-ţi strânge inima. O muzică îndepărtată, auzită într-o noapte caldă de vară, o fotografie îngălbenită de vreme, un sat uitat... Copilul pe care nu l-ai văzut încă, chipurile pe care nu le vei mai vedea niciodată, iar dacă ai impresia ca fotografiile nu sunt importante, așteaptă până când tot ce îți va rămâne vor fi ele.



What's the time? The gaze of a mother, the voice of a father. The memory of the childhood that tightens your heart. A distant music, heard on a warm summer night, a photo yellowed by the weather, a forgotten village... The child you haven't seen yet, the faces you'll never see again, and if you think that the photos are not important, wait until all you have left will be them.

Contact: ioanaobrejan@gmail.com +40754664990

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Video presentation of the multimedia class

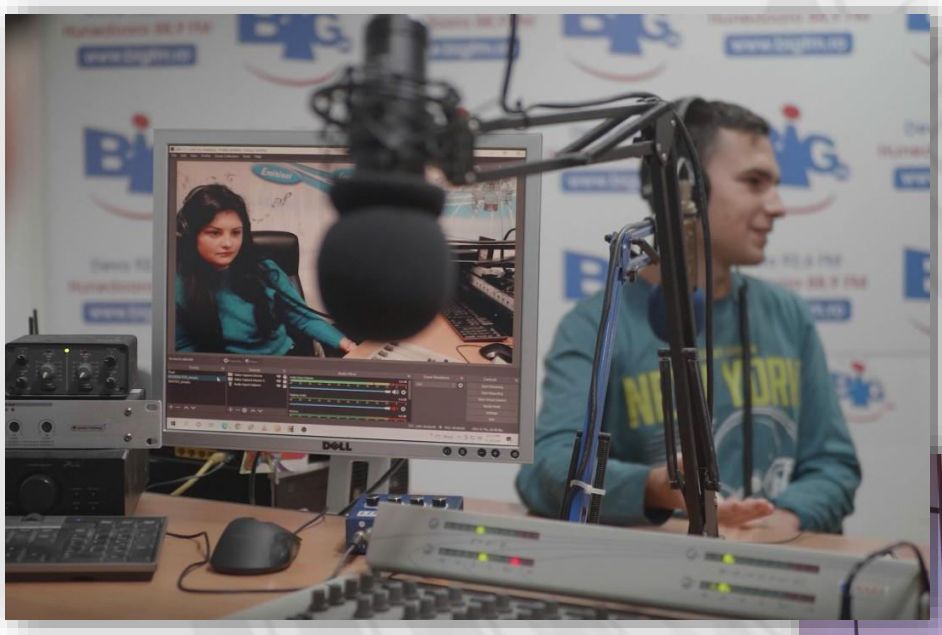
Student Project

Authors: Multimedia Technicians High School L.T.E. "Dragomir Hurmuzescu" Deva,
Coordinators: Marius Dragomir, Paul Țoța

L

Film de prezentare a profilului de tehnician multimedia din cadrul liceului L.T.E. "Dragomir Hurmuzescu" Deva. Veți putea urmări cum elevii pot începe o carieră în industria media. Pornind de la cei patru ani de studiu în care învață noțiuni despre fotografie, tehnologia filmului, echipamente de filmare, animații, internet, procesare sunet și imagine, radio și televiziune.

Fi creativ și spune DA, începe o carieră în media!



A movie presenting the profile of multimedia technician from the L.T.E. high school "Dragomir Hurmuzescu" Deva. You will be able to watch how students can start a career in the media industry. Starting from the four years of study, where students learn about photography, film technology, film equipment, animations, internet, sound and image processing, radio and television.

Be creative and say YES, start a media career!

Contact: marius.dragomir@big-fm.ro
Phone: +40744636456

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Edwina Kasler PHOTOGRAPHY

I’m not a human

Research project

Author: Edwina Kasler

L

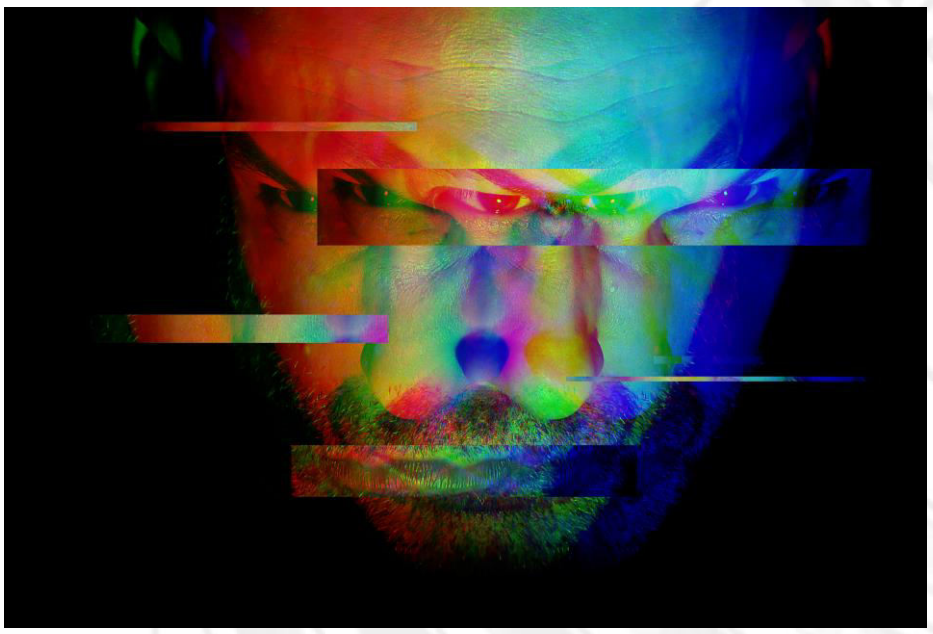
During the evolution of a system there is always a „0” to „1” moment. The research project „I’m not a human” is based on a bunch of rhetorical questions to find out which is the „1” moment for a new world of robots.

Created by humans it is possible for a time to come when robots will get their own consciousness.

What will they be able to do than? Is that an „1” moment for starting to create art? Why art? Because creating art is an unique proof of independence.

How will this art look like? Will it be an updated replay of human art or a kind of innovative one?

How will a robot’s copyright logo look like? Will it be only a square on the bottom of the art work: „I’m not a human” ?



Contact:

email: edwinakasler@yahoo.com

facebook: https://www.facebook.com/edwina.kasler1

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Adrian Stoica Photo Art

Sleeping Beauties

Photography Project

Author: Stoica Adrian

L

"Sleeping beauties" is an artistic project that refers to the interaction of the seasons, in this case the arrival of spring, metaphorically represented by feminine beauty, by simple awakening to life.

The chromatics used show the transition from the cold season to the raw green that represents the rebirth of Nature.

Sleeping beauties

Contact: adistoica21@gmail.com ,Tel : 0735181643, www.adistoica.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Adrian Stoica Photo Art

Autumn Queens

Photography Project

Author: Stoica Adrian

L

"Autumn queens" is an analogy that brings the idea of transition from early autumn to late autumn transposed into photography through concept, color and feminity.We can notice from left to right the representation of the riches of early autumn in contrast to late autumn , pale and lifeless.

Autumn Queens

Contact: adistoica21@gmail.com ,Tel : 0735181643, www.adistoica.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

UNIVERSITATEA „ALEXANDRU IOAN CUZA“ din IAŞI

Adopt, don’t buy Campaign

Student Project

Author: Spanache Andreea-Eliza

L

Adopt, don’t buy campaign is a project made in order to convince citizens from Bucharest to adopt a dog from Kola Kariola’s dog shelter. The campaign was established two months ago and our motto is “Adopt, don’t buy” as you can see in the title.

Kola Kariola is one of the most known non-gouvernamental organisation of rescue dogs in Romania. We promote the message to all willing people who want a dog company and with the purpose of helping the organisation to fulfil its aims.

Contact: e-mail andreeaasss@yahoo.com

tel. +40766854191

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

ACCEPTING SHADOWS AND MANIFESTING LIGHT

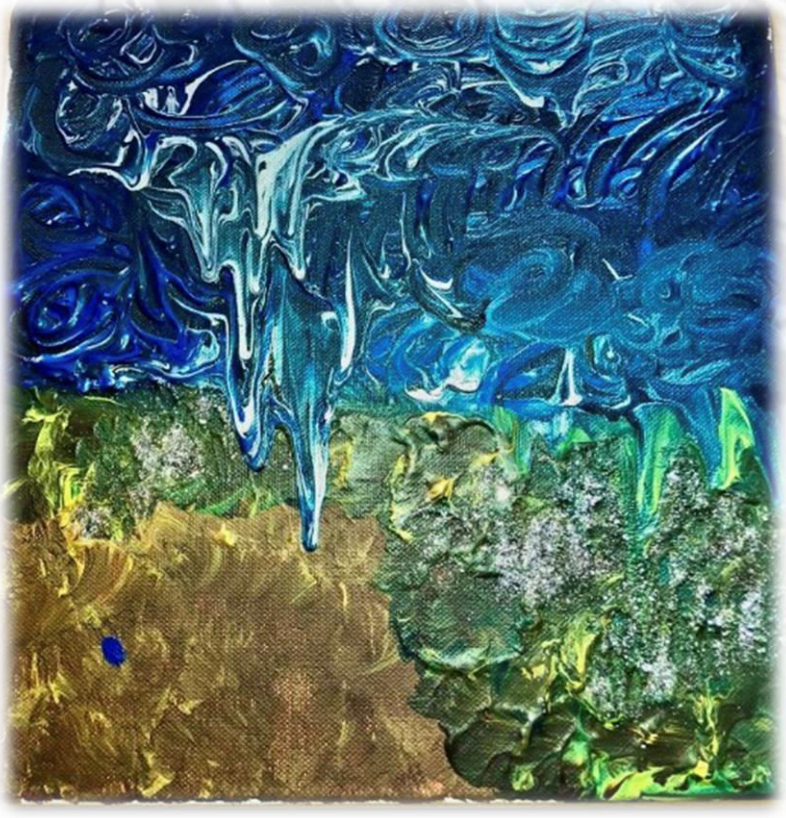
Student project

Author: Zaharioiu Axenia

L

How shadows become light. And how the dark side becomes the reborn from ashes. We ran out of emotions, even if it can be positive or negative. The painting suggest thetransition to good, living the imminance of death. Sometimes, living in a fear of death is waking up in the middle of death, but not in life. That's why we need to open our hearts, our intuition and be brave in the middle of our war. Our war is our mind, that's why we feel like living in a prisoner.

Accepting shadows, but manifesting light is the way of receiving the authentical love.



Contact: axenia.zaharioiu@gmail.com
+40766432435

M

Textiles

Clothing

Fashion

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

DiaSHOE - Digital Education for Diabetic Foot Control

Project 2020-1-PT01-KA202-078687

Authors: Mihai Aura, Costea Mariana,
Seul Arina, Sârghie Bogdan

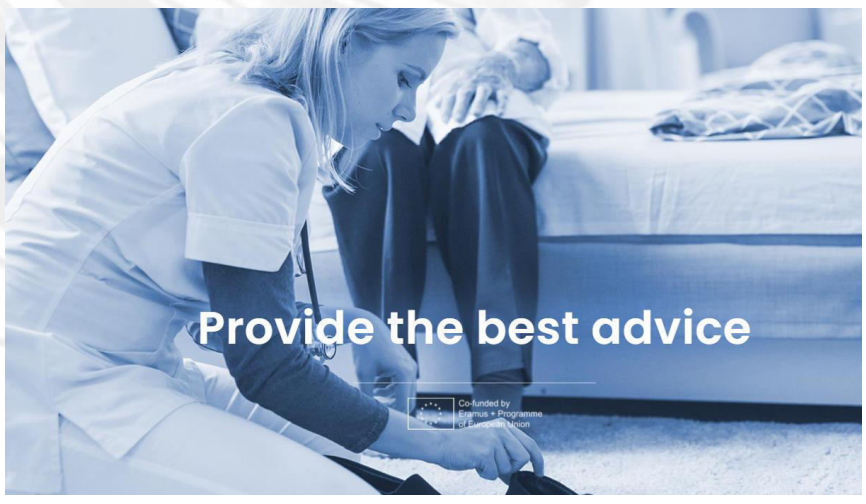
M

Statistics show that diabetes affects 463 million people in the world (2019). In Europe, there are approximately 60 million people diagnosed with diabetes, representing nearly 8% of the European population.

The project's overall aim is to inform and guide footwear manufacturers, patients, informal caregivers, healthcare workers, and shoe-store clerks to best to tackle this issue through prevention and skills development.

The project will produce 3 Digital Education Packages for different target groups:

- Digital Education Package for designers, footwear technicians, and product managers
- Digital Education Package for health technicians and shoe shop assistants
- Self-care Digital Education Package targeting patients, their families, informal caregivers, and school teachers/educators.



Contact: aura.mihai@academic.tuiasi.ro

The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Com-mission cannot be held responsible for any use which may be made of the information contained therein.

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

DigitalFABLAB-Footwear virtual learning by doing - Transition from analogue practices to digital education

Project 2020-1-PT01-KA226-VET-094924

Authors: Mariana Costea, Aura Mihai, Arina Seul, Bogdan Sarghie

DIGITAL FABLAB **FOOTWEAR VIRTUAL LEARNING**

M

PROJECT OBJECTIVES:

- Joint digital international course "Training through virtual practice" for footwear manufacturing, fully anchored in digital strategies.
- Virtual laboratory for footwear and corresponding contents in Augmented Reality (AR). It also includes a course for trainers, teachers and instructors on how to use tools to develop innovative and engaging content in AR.
- Common training methodology for augmented reality (RA) learning itineraries that includes textbooks for teachers, instructors and trainees, and training opportunities for end-users.

IO1 Joint International course for digital "Learning by Doing" on Footwear manufacturing

Joint International course for digital "Learning by Doing" on Footwear manufacturing consisting in the co-creation, by all partners, of a digital joint international course for the practical learning on Footwear manufacturing, supported on practical already existing certified Units of Learning Outcomes (ULOs), integrally anchored in digital strategies. This IO will make possible the creation of a high-quality certified joint digital practical learning methodologies for the footwear industry, design and pilot relevant practices for training/education, adapted to specific challenges and local realities and to reinforce and extend networking between European training institutions for the footwear industry.

IO2 Joint virtual Shoe Fab Lab and correspondent contents in Augmented Reality (AR)

Joint virtual Shoe Fab Lab and correspondent contents in Augmented Reality (AR) consisting in a range of results from the virtual ShoeFabLab to the footwear related contents in AR on footwear manufacturing and will make possible the joint functional and active digital tool for the development of practical skills on footwear manufacturing which will integrate the most expertise of the footwear VET providers in Europe. This IO also includes a LTTA which consists in a course for trainers, teachers and coaches on how to use authoring tools (Vuforia or Blippar) for the development of innovative and attractive contents in AR which is a pillar for the development of capacity and autonomy of the training entities.

IO3 Common for training itineraries based on augmented reality (AR)

Common methodology on training/teaching/coaching for training itineraries based on augmented reality (AR) which includes manuals for trainers/teachers, coaches and trainees will develop capacity to implement innovative digital training/education strategies designed in IO1 and IO2, extending collaboration with technological specialists on advance educational technologies as it's the case of HESO.

Co-funded by the Erasmus+ Programme of the European Union

Partners:

HeartHands SOLUTIONS — HANDS ON KNOWLEDGE

ctcp centro tecnológico do calçado de portugal

INESCOP FOOTWEAR TECHNOLOGICAL INSTITUTE

POLITECNICO CALZATURIERO

Łukasiewicz Instytut Przemysłu Skórzanego

Confédération Européenne de l'Industrie de la Chaussure
European Confederation of the Footwear Industry

Contact: mariana.costea@academic.tuiasi.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

DicSHOEnary-
Language guide for footwear and leather industry

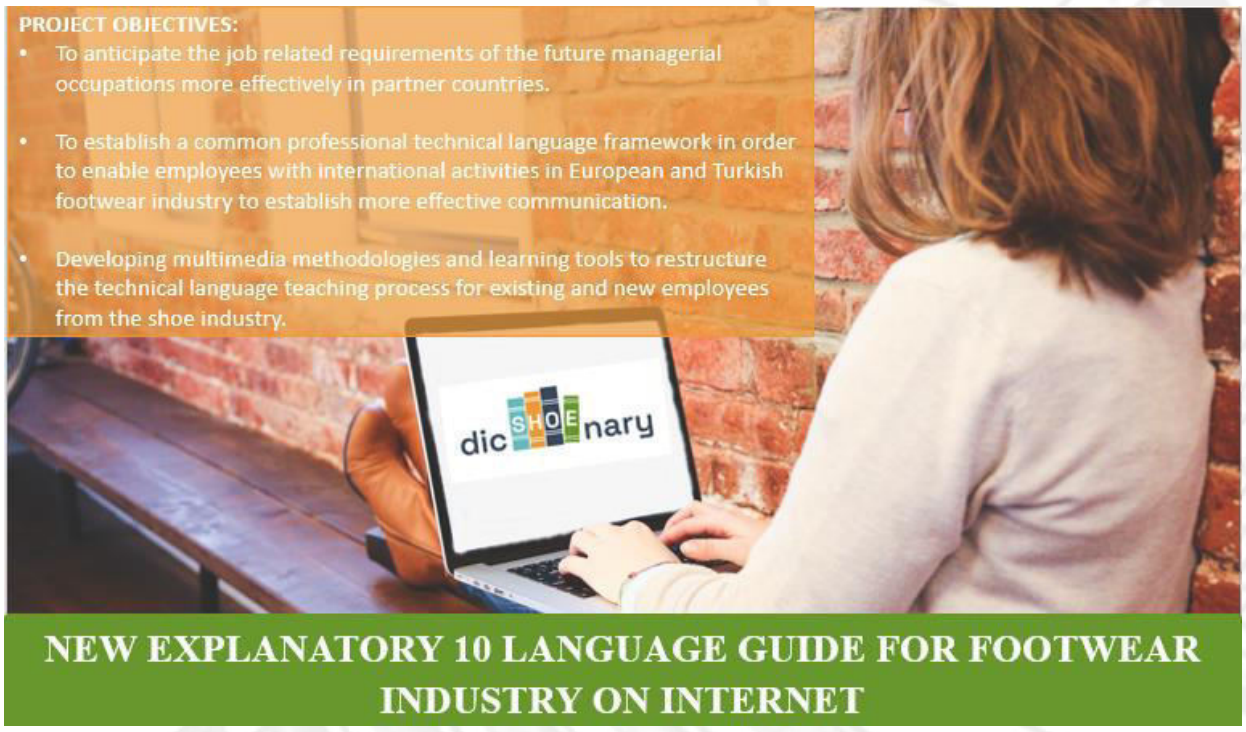
Project 2020-1-TR01-KA202-092689

Authors: Mariana Costea, Aura Mihai, Arina Seul, Bogdan Sarghie

LANGUAGE GUIDE FOR FOOTWEAR AND LEATHER INDUSTRY

WWW.DICSHOENARY.EU

M



O1 Need Analysis & State of the Language Report

Identifying and analysing those characteristics of the footwear and its connected industries today, regarding the provided training, the existing trends in the industry, the anticipated skills, and the training needs, using desk and field research done by all partners in the project, will result in a research report. This research report is the compass of the following actions and subsequent decisions in the project.

O2 Language guide in 10 languages

Selection and set of 3000 vocational terms with explanation in English : The output of this activity will be the language guide with a comprehensive overview of the footwear vocabulary in 10 languages (English, Turkish, Czech, Romanian, Polish, Slovenian, Portuguese, Italian, Greek and Spanish). This will include explanation used in production, technology, materials, retail trade, design, research, teaching and trading. This output will be used as a background for the future multilanguage guide as the major output of this project.

O3 Interactive web portal

Web portal represents main output of the project. This is a platform for full run of prepared multimedia dictionary (terms + explanation in 10 languages) on internet. Web portal is the communication platform for dissemination of the project results and available tool for sustainable using of created multilanguage guide. Electronic version of the explanatory language guide will be mainly focused on target groups which have got used to using the internet and web translators for their common work with vocational foreign language.

Co-funded by the Erasmus+ Programme of the European Union

Partners:

Contact: mariana.costea@academic.tuiasi.ro

REILEAP

REILEAP - Reinforcing capacities of HEIs for leather products in Uzbekistan-Kazakhstan

Project 618930-EPP-1-2020-1-EL-EPPKA2-CBHE-JP

Authors: Aura Mihai, Arina Seul, Mariana Costea, Bogdan Sarghie

www.reileap.com

OBJECTIVES OF THE PROJECT

To develop a capacity building programme in order to allow partners from Uzbekistan and Kazakhstan to learn from the European experience

To set up and install equipment for the centres for the reinforcement of the knowledge capacities of the leather sectors in Uzbekistan and Kazakhstan based on the EU experience

To guarantee the sustainability of the project through the creation of a collaboration platform

To guarantee the creation of collaboration and business opportunities through the creation of a collaboration platform

REILEAP project aims to fill the gap in the area of specialized services for the leather sector with the establishment of the Leather c entres in Uzbekistan and Kazakhstan utilizing the experience and expertise of EU partners in the area of services for the leather and leather products sector which includes all materials and products from untreated skins to the final product like footwear accessories and clothing

Through the creation of these centres and their operation the leather sector in Uzbekistan and Kazakhstan will be offered access to business services such as quality testing product certification specialised training fashion trends modern design production organization and funding opportunities The professionals and students of the subject will improve their qualifications and skills which will in turn upgrade the capabilities of the leather and leather manufacturing companies

The project also aims to create and maintain cooperation links between Universities and businesses of the leather sector that will foster innovation and the manufacturing of high value quality products as well as further cooperation between EU, Uzbek and Kazak Universities and training institutions and sectoral stakeholders

Co-funded by the Erasmus+ Programme of the European Union

Partners

Contact: aura.mihai@academic.tuiasi.ro

S4TCLF

Skills4Smart TCLF Industries 2030

Project 591986-EPP-1-2017-1-BE-EPPKA2-SSA-B

Authors: Aura Mihai, Arina Seul, Mariana Costea, Bogdan Sarghie

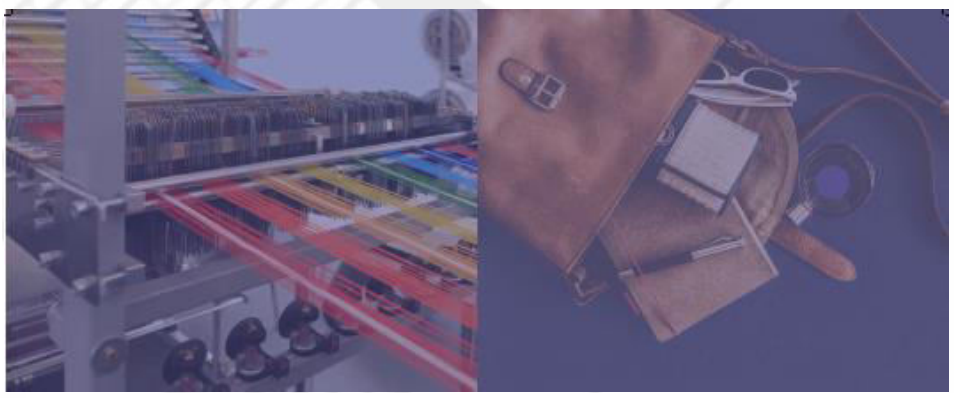
M

Skills4Smart TCLF Industries 2030

Strategic Sectoral Skills Alliance for the European Textile, Clothing, Leather & Footwear Industries

Skills4Smart TCLF 2030

An Erasmus+ Blueprint Project



MAIN OBJECTIVES:

- Update training and curricula offer to better match industry needs;
- Upgrading the image of careers in the TCLF sectors to attract new workers, in particular young talents;
- Create a dynamic community of private and public actors across Europe committed to support skills development and employment opportunities within a common EU-wide skills strategy.

THE PROJECT IN A NUTSHELL:

- 2018: Analysis of skills gaps in 100 companies and 50 training institutes
- 2019: Design of 8 new Vocational and Educational Training Programmes (VET)
- 2020-21: Pilot and Validation of the new training courses
- 2018-2021: Develop a Sustainability Action Plan through:
  - Network of VET providers across EU
  - Engagement of regions and other stakeholders
  - Creation of a Virtual EU Fashion Campus

info@s4tclfblueprint.eu

s4tclfblueprint.eu

@skills4tclf

Skills4Smart TCLF

Contact: aura.mihai@academic.tuiasi.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Compensating motor skills deficiencies of obese adolescents and young adults by developing highly adapted footwear products / Y-Step

Project GI/P15IDEI/2021

Authors: Costea Mariana, Seul Arina, Aura Mihai

M

The main objective of Y-Step project is to develop intelligent footwear products, highly adapted to anthropometric and biomechanical parameters of overweight and obese adolescents and young adults' foot, contributing to its normal development and reducing the negative impact of the weight on its structural changes. The shoes will be produced in order to have a low carbon footprint. The team will also work with manufacturers to apply the "buy back" concept for shoes.

The aim of the project is to contribute to the development of a healthy lifestyle of children by stimulating physical activity, using footwear products with high tech applications. It will rely on a strong media campaign on social networks and other platforms frequented by young people.

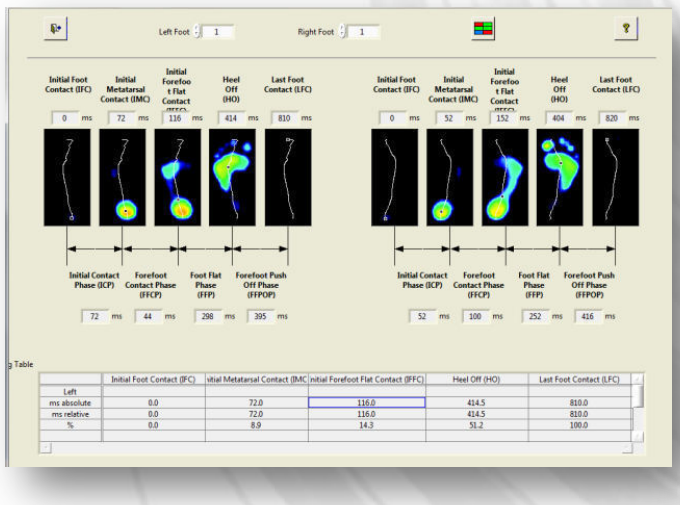


Figure 1. Gait. Plantar pressures during walking

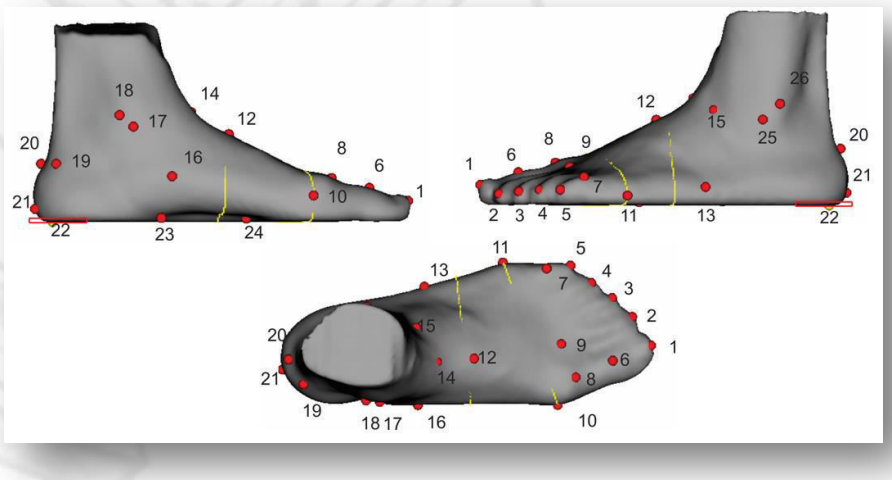


Figure 2. Positioning anatomical points on the foot

In Romania, in terms of prevalence of overweight and obesity in adolescents, up to 33% of boys and 19% of girls among 11-year-olds were overweight, according to data from the Health Behaviour in School-aged Children (HBSC) survey. Among 13-year-olds, the corresponding figures were 25% for boys and 15% for girls, and among 15-year-olds, 27% and 10%, respectively.

Contact: mariana.costea@academic.tuiasi.ro

Acknowledgments. This work was supported by "Gheorghe Asachi" Technical University of Iasi, Romania, GI/P15IDEI /2021, Compensating motor skills deficiencies of obese adolescents and young adults by developing highly adapted footwear products / Y-Step Project.

Colecție de portchei în stil național

Collection of keychains in the national style

Patent no.: ***MD f 2021 0005***

Author/s: Marina Malcoci, conf. univ. dr.; Maria-Eudochia Malcoci, elevă clasa a VIII-a

M

Sursa de inspirație pentru colecție este costumul național. Costumul național duce mesajul de pricepere și gândire a neamului, este un etalon de demnitate și frumusețe. Colecția este realizată manual, fiind utilizată pielea natural și ața cerată de diverse culori. La toate modelele s-a folosit cusutul în cruci. Motivele ornamentale folosite la elaborarea colecției sunt geometrice, vegetale și figurale. Colecția elaborată este bogată în elemente decorative, care în ansamblu creează un aspect estetic variat și interesant ce corespunde sursei de inspirație.

The source of inspiration for the collection is the national costume. The national costume carries the message of skill and thinking of the nation, it is a standard of dignity and beauty. The collection is made by hand, using natural leather and waxed thread of various colors. Cross-stitching was used on all models. The ornamental motifs used in the elaboration of the collection are geometric, vegetal and figurative. The elaborate collection is rich in decorative elements, which as a whole create a varied and interesting aesthetic aspect that corresponds to the source of inspiration.

Contact: marina.malcoci@gmail.com
www.colegiultehnologic.md
(+373)69062399

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

ADAPTIVE MEDICAL CLOTHES

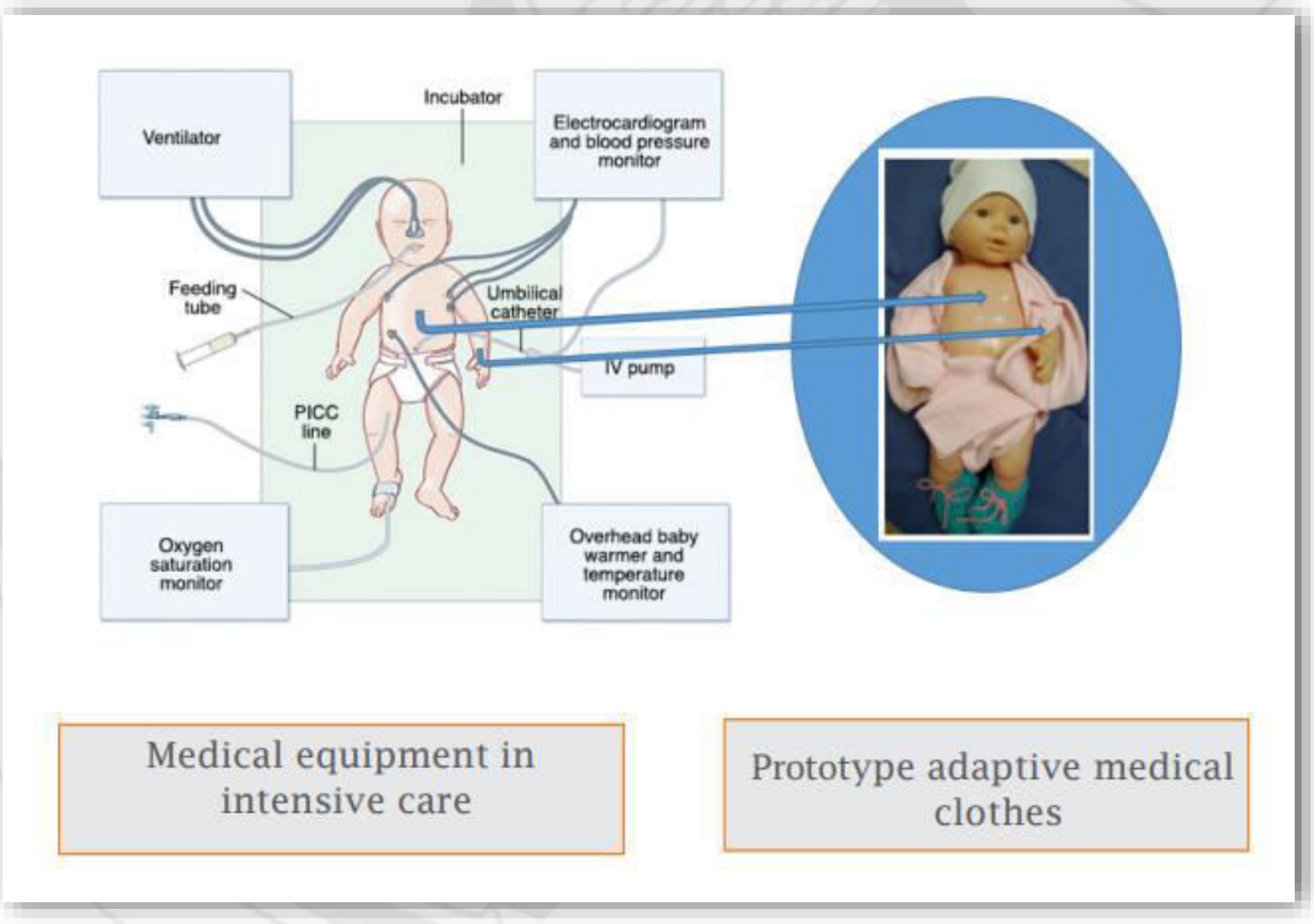
WIPO85961, DM/203338

M

Author/s: Victoria Danila, Stela Balan, Antonela Curteza,

Rotaru Dorina, Ana Ischimji

Medically adaptable clothing for children (premature babies, infants, toddlers and infants) aims to care for and provide harmless medical care. The clothes are carefully designed to adapt to medical treatments, to ensure safe and comfortable dressings. The constructive-compositional elements are characterized by functionality and adjustments corresponding to the requirements of the investigated patients.



Medical equipment in intensive care

Prototype adaptive medical clothes

The advantages of the products are: connecting medical devices without keeping the child completely empty, exposing only certain parts of the body; the possibility of undressing without disturbing the patient undergoing treatment; the possibility to provide medical assistance in a short time; the possibility to monitor vital parameters; the ability to maintain body temperature on a certain surface of the body.

Contact: victoriavasiledanila@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

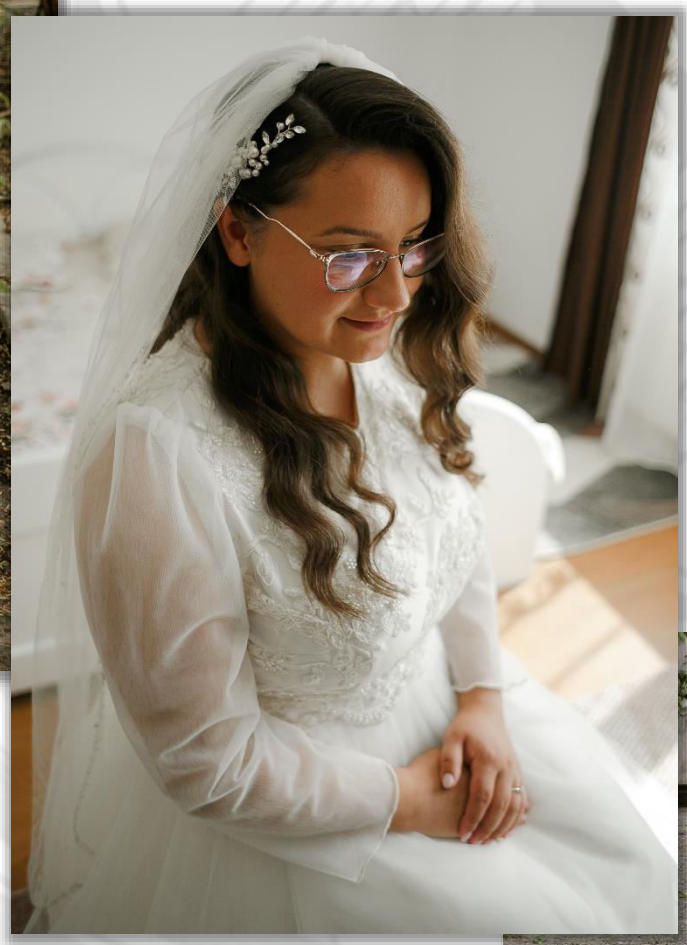
COCO'S BRIDAL DRESS

Author: Albescu Corina
Patent no: 2021002R

M

Designerul american de modă Ralph Lauren afirmă "Eu nu creez haine, eu creez vise". La început a fost un vis, acela de a crea, combinând clasicul și modernul, simplitatea și luxul, pasiunea si tandrețea, însă prin multă muncă și dedicare a prins contur si această creație

Moda rochiei albe a fost implementată de către Regina Victoria, in anul 1840, când s-a căsătorit cu vărul său, Albert de Saxa-Coburg, culoarea aceasta însemnând emblema purității fetei, după cum este precizat și în revista "Godey's Lady's Book", în 1849.



Rochia de mireasă stil prințesă este compusă dintr-o parte superioară care se pliază pe corp, ce scote in evidență cu grație talia, și fusta cu o ușoară trenă ce ii acordă un ton de eleganță. Taftaua și tull-ul conferă volum parți de jos, astfel crează un echilibru perfect cu partea superioară ce este acoperită de o dantelă rafinată, cu modele florale și perluțe. Spatele este închis cu ajutorul năstureilor de tip perlă, inspirând frumusețe și inocență.

American fashion designer Ralph Lauren says "I don't create clothes, I create dreams"." At first it was a dream, that of creating, combining the classic and the modern, simplicity and luxury, passion and tenderness, but through a lot of work and dedication it took shape and this creation

The fashion of the white dress was implemented by Queen Victoria, in 1840, when she married her cousin, Albert of Saxe-Coburg, this color meaning the emblem of the girl's purity, as it is also mentioned in the magazine "Godey's Lady's Book", in 1849.

The princess style wedding dress is composed of an upper part that folds on the body, which gracefully highlights the waist, and the skirt with a slight train that gives it a tone of elegance. Taftaua and tull give volume to the bottom parts, thus creating a perfect balance with the upper part that is covered by a refined lace, with floral patterns and pearls. The back is closed with the help of pearl-type watercress, inspiring beauty and innocence.

Contact: albescu.corina@yahoo.com

+40754990236

N

Foods

Drinks

Restaurants

Hotels & Spa

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

BoRD^{13} FOODTRUCK

Project no. 1/15.09.2021

Author: MIRELA STANCU

N

One of a kind concept that brings closer the art of high-quality restaurant cuisine, with mobility and new scenery. But in a slightly faster, yet same tasteful and professional way.

The food-truck is, basically, a high-end kitchen on wheels, with a terrace in front and one on its rooftop! It has all the modern facilities that you can find at our restaurant, so that the products and the recipes remain as the ones that make up our special menu.

SCAN ME

The whole truck is transformed in just a few minutes into a mobile restaurant, a place to enjoy our menu in front and also on the roof.

Contact: Mirela STANCU: +40753013013

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Star Doner & Pizza Bistro

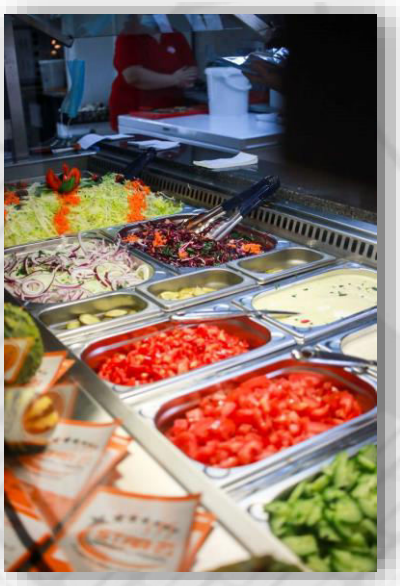
Food Project

Author: Irimia Marius Ionut

N

STAR Doner&Pizza, un concept nou, original bazat pe calitate si diversitate adaptat pentru orice situație, cu un portofoliu peste 60 de produse. Servirea fiind asigurată în restaurant sau pe baza de comanda cu livrare la domiciliu.

★ Fii diferit, alege STAR! ★



STAR Doner & Pizza, a new, original concept based on quality and diversity adapted to any situation, with a portfolio of over 60 products. The service is provided in the restaurant or on the basis of an order with home delivery.

Contact: +40723 900 655

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

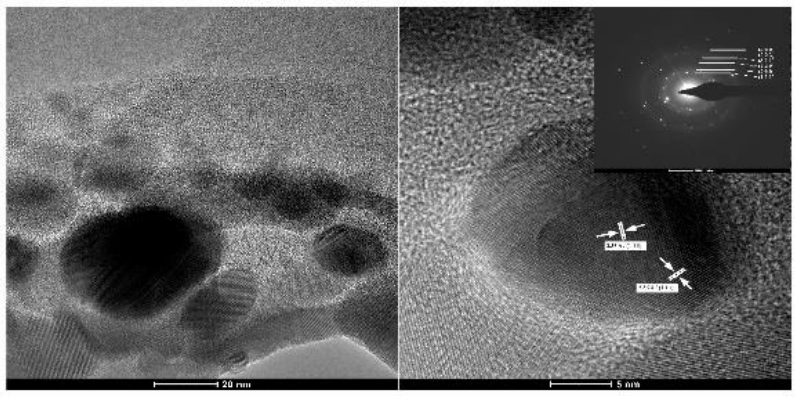
Categoria

N

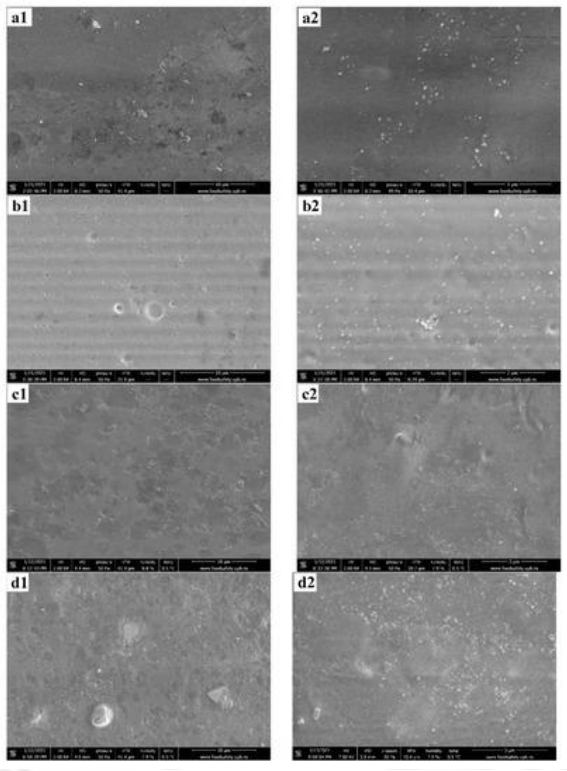
Filme biodegradabile antibacteriene pe bază de alginat cu nanoparticule de argint și ulei esențial de lămâie - ambalaje inovatoare pentru brânză

Doctorand: Ludmila MOTELICA

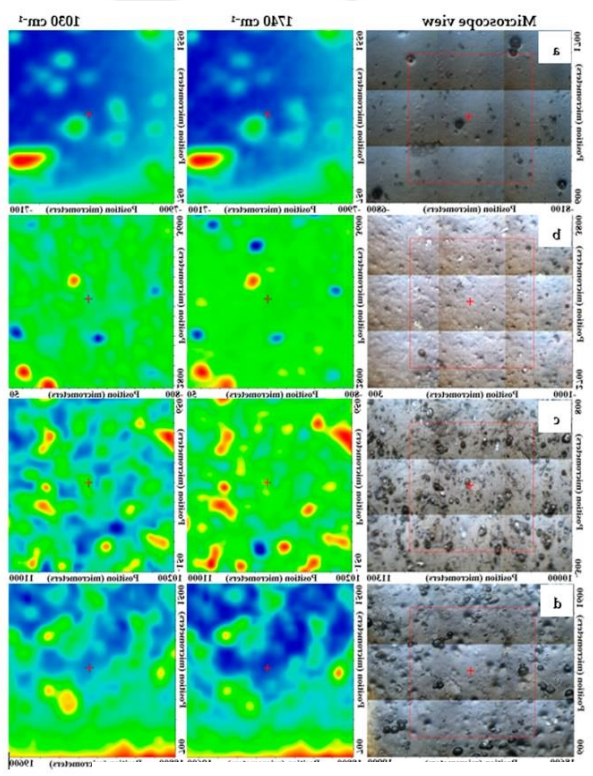
Ambalajele biodegradabile vor contribui la diminuarea impactului activității umane asupra mediului. Îmbunătățirea unor astfel de materiale de ambalare biodegradabile prin adăugarea de activități antimicrobiene nu numai că va prelungi durata de valabilitate a produselor alimentare, ci va elimina și unele pericole pentru sănătate asociate bolilor transmise de alimente, iar prin diminuarea deteriorării alimentelor va scădea risipa de alimente. Obiectivul acestei cercetări a fost de a obține filme antibacteriene inovatoare pe baza unui polimer biodegradabil, și anume alginat. Ca agenți antimicrobieni, am folosit nanoparticule sferice de argint (Ag NPs) și ulei esențial de lămâie (LGO), care s-au dovedit a acționa într-un mod sinergic.Testele indică faptul că filmele antimicrobiene pot fi utilizate ca ambalaj, păstrând culoarea, textura suprafeței și moliciunea brânzei timp de 14 zile.



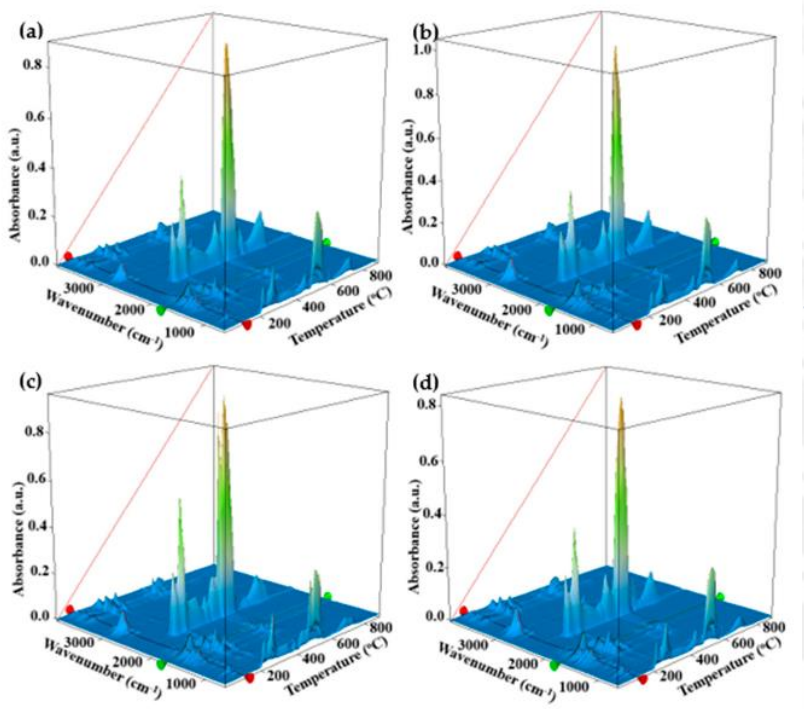
Imaginile TEM pentru Ag NPs obtinute. Modelul de difractie a electronelor de zona selectata (SAED) din inertie.



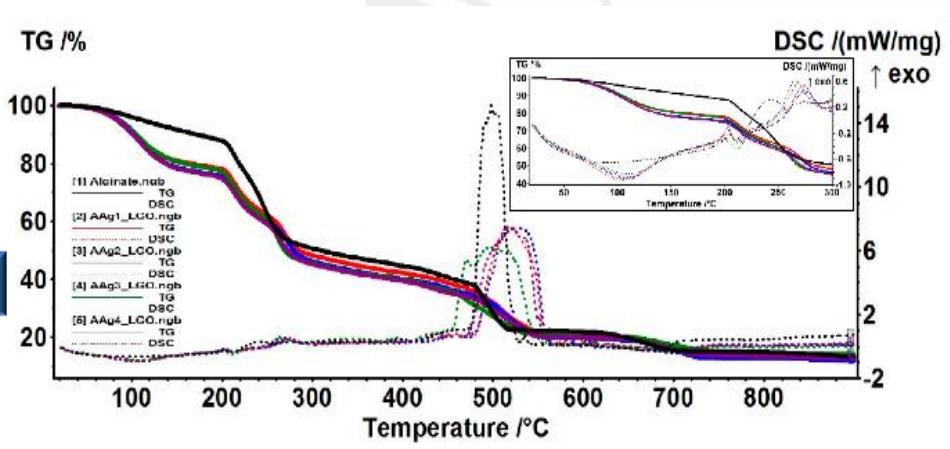
Imaginele SEM



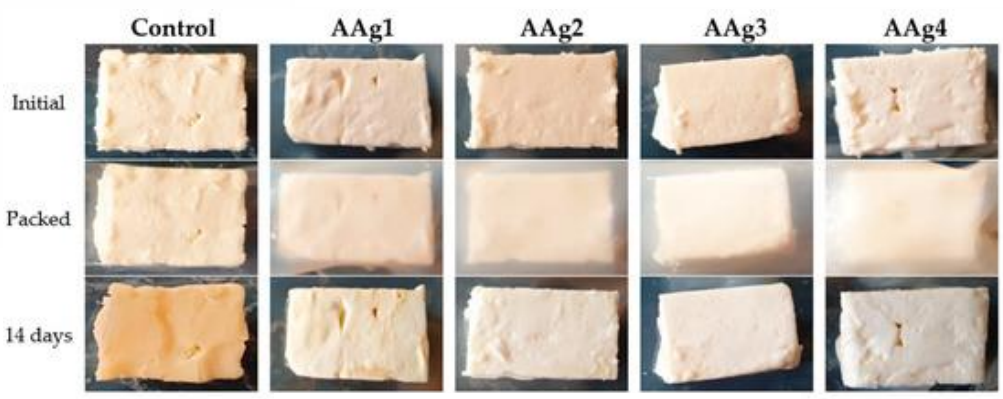
Imaginele FTIR-map



Graficul 3D FTIR al gazelor evoluate.



Curbele TG/DSC pentru filmele de alginat



Aspect visual al bucatilor de branza ambalate in filme de alginat.

Contact: motelica_ludmila@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

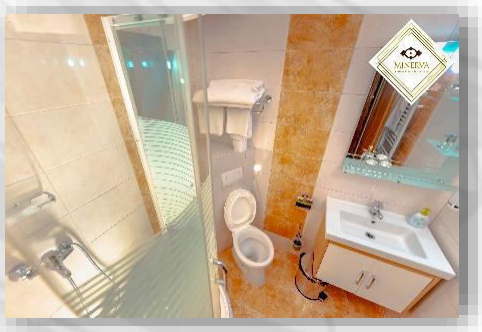
Minerva Guesthouse-Event Room

N

Author: Betea Adriana

The Pension is located in the center of Halmagel, on the right shore of Halmagel Valley. The town is situated at the foot of the western slope of Gaina Mountain, a place full of history and legends,where every year on the closest Sunday to St. Elijah the Prophet (July 20) takes place the traditional “Fair of Girls”, which brings together the motives of four neighboring counties: Arad,Hunedoara,Alba and Bihor. Another important moment in the life of the village is “ Nedeia de la Halmagel” ,which takes place during the month of Pentecost. The name of the locality is linked to Avram Iancu (a Transylvanian Romanian lawyer who played an important role in the local chapter of the Austrian Empire Revolutions). In the proximity to Halmagiu (locality situated 2 km away from Halmagel), the tourists can visit the “Voievodal Church “ and “Hanul Motilor (tavern)“ , attractions that testify over the centuries about the history of the places.

The Pension itself is related to this aspect , being built on the hearth of the potter’s house from Halmagel , who successfully represented Arad County at many international competitions.



The natural space where the village is located , makes the transition from the mountain to the depression area conducive to outdoor relaxation, offering the freshness and health of clean air and pure spring waters. Natural curiosities such as “Piatra Fetei” complete the special beauty of this landscape.

The access to the Pension is easy as it is located on the county road 792F paved with the entrance on the European road E79(N76) road that connects the cities Oradea and Deva . Another opportunity is a relatively short distance from spa resort “Vata de Jos” and the historic complex of “ Tebea”. The church from Halmagel has a special historical specific, together with the one from Luncsoara.

Contact: +40753311240

VIDEO

CORNELIUGROUP research-innovation association

INVENTCOR

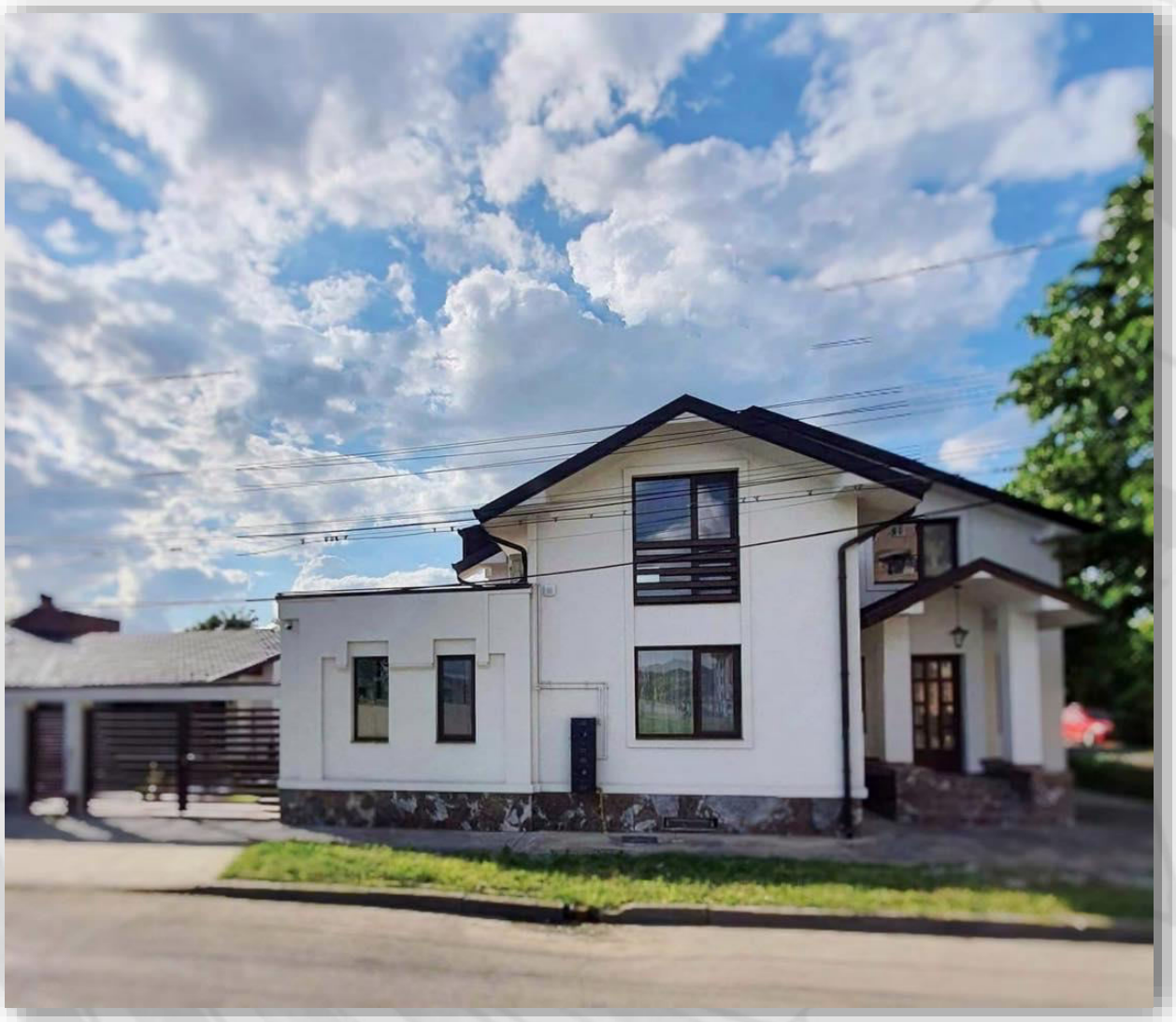
Power of Creative Mind

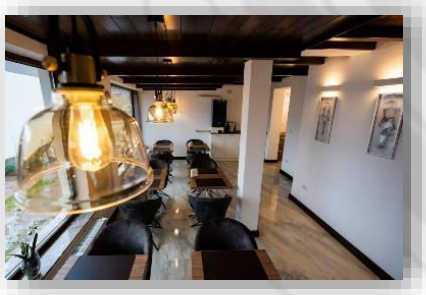
White Residence

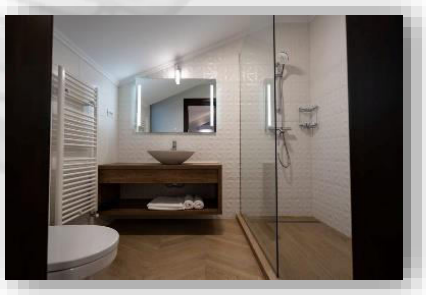
Author: Tonța Adrian

N

Arad is a important western city for Romania, in terms of industry, as well as road transport. Regarding the tourist points in the city, there are more 100 buildings from the 19th and 20th centuries, inscribed in the cultural heritage of Romania. It is an amazig cultural place. Among the many beautiful historical buildings, there is the Church of St. Anton of Padova - built in the early 20th century. It is distinguished by its magnificent Renaissance details. Another statement in the city is the Classical Theater Ioan Slavici where you can watch various plays and shows. If you want an amazing view, Avram Iancu Square is a place surrounded by buildings with baroque, secession andneoclassical architecture. The Cultual Palace is also an gemstone that currently hold the headquarters of the County Museum and the Philharmonic. The City Hall, also known as The Administrative Palace makes the city gloe by being not only important, but very imposing. Last but not least, the fortress of Arad is a actual peace of history everyone should visit. If you come to such a beautiful city, you have to book an accommodation even more beautiful.







For that metter, White Residence is the place for you. This is located in Arad, just a few minutes from downtown. Thanks to that, the guests have quick access to all the points of interest in the city. Everything is arranged out of passion for beauty, every detail being designed to create a unique and pleasant environment. Our 6 rooms are bright, with a modern but minimalist and elegant design, based on neutral colors. In each room you will find a flat-screen TV, air conditioning, a work desk inside and a private bathroom.

Now that you are convinced to come to Arad and explore its beauty, you sure need White Residence to stay.
Be our guest!

Contact: +40755079874

SHORT PASTA OF SPELT FLOUR WITH ADDITION OF SPENT GRAIN FLOUR AND PROCESS FOR OBTAINING THEM

PASTE FĂINOASE SCURTE DIN FĂINĂ SPELTA ȘI ADAOS DE FĂINĂ DE BORHOT DE MALȚ ȘI PROCEDEU DE OBȚINERE A ACESTORA

Authors: Adriana Dabija, Ancuța Chetrariu

***Patent application* A/00646/2021**

Pastele făinoase scurte din făină spelta și adaos de făină de borhot de malț au o valoare nutritivă îmbunătățită, un conținut ridicat de proteine și fibre și sunt destinate tuturor categoriilor de consumatori. Acest produs, cu un indice glicemic scăzut și uşor asimilabil de organism, poate fi consumat pentru efectul benefic în controlul și prevenirea diabetului. Făina integrală de grâu spelta prezintă efecte benefice asupra sănătății, prin conținutul de fibre dietetice care mențin sațietatea și echilibrează nivelul de zahăr din sânge, este bogată în vitamine din complexul B și substanțe minerale, în special magneziu, fier și fosfor. Făina de borhot de malț, prin aportul de fibre are implicații majore în digestie, prin încetinirea golirii gastrice şi prelungirea timpului de tranzit intestinal, reducând astfel mişcările gastro-intestinale şi reducerea vitezei de absorbţie a nutrienţilor în intestinul subţire. Acest sortiment de paste prezintă un comportament la fierbere îmbunătățit, o aromă și gust de nucă, conferite de făina integrală de grâu spelta.

Short pasta made of spelt flour with addition of spent grain flour have an improved nutritional value, a high content of protein and fiber, and are intended for all categories of consumers. This product with a low glycemic index and easily assimilated by the human body can be consumed for its beneficial effect in the control and prevention of diabetes. Whole spelt flour has beneficial effects on health through the content of dietary fiber that maintains satiety and balances blood sugar levels, is rich in B-complex vitamins and minerals, especially magnesium, iron, and phosphorus. Spent grain flour, through the intake of fiber has major implications in digestion by slowing gastric emptying and prolonging intestinal transit time, thus reducing gastrointestinal movements and reducing the rate of absorption of nutrients in the small intestine. This pasta assortment has an improved boiling behavior, a nutty aroma and taste conferred by spelt flour.

Contact: adriana.dabija@fia.usv.ro

+40748845567

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Stefan cel Mare University of Suceava

PRALINE WITHOUT SUGAR AND COCOA AND PROCESS FOR OBTAINIG THEM

PRALINE FĂRĂ ZAHĂR ȘI CACAO ȘI PROCEDEU DE OBȚINERE A ACESTORA

Authors: Adriana Dabija, Georgiana Gabriela Codină

***Patent application* RO 132798-A2/2017**

N

Pralinele fără zahăr și cacao sunt produse zaharoase în care au fost înlocuite integral pudra de cacao cu făină de ghinde și pudră de roșcove și zahărul cu sirop de păpădie. Produsul finit se obține din două părți distincte: învelișul, realizat dintr-o ciocolată obținută din următoarele ingrediente: pudră de roșcove, semințe de pin, lapte praf și sirop de păpădie, și nucleul, format din masa de pralină, din făină de ghinde, semințe de pin, sirop de păpădie și opt fructe de pădure confiate / liofilizate: afine, fragi, căpşuni de pădure, cireşe amare, zmeură, coacăze negre, coacăze roşii, merişoare. Făina de ghinde are proprietăți antiinflamatoare, mineralizante, antianemice, antirahitice, antitumorale, antioxidante, diuretice și favorizează secreția de insulină. De asemenea, este recomandată în tratarea gastritei, ulcerului, enteritei, anemiei, tulburărilor psihice, oboselii, extenuării psihice, surmenajului și durerilor de cap. Pudra de roșcove conține de două ori mai mult calciu față de pudra de cacao, mult mai puține grăsimi și nu conține cofeină, fiind ca atare recomandată copiilor.

Carob powder

Pine seeds

Dandelion syrup

Milk powder

Acorn flour

Berries

Praline without sugar and cocoa

Contact: adriana.dabija@fia.usv.ro

+40748845567

Sugar-free and cocoa-free pralines are sugary products in which cocoa powder with acorn flour and carob powder and sugar with dandelion syrup have been completely replaced. The finished product is obtained from two distinct parts: the coating, made of a chocolate obtained from the following ingredients: carob powder, pine seeds, milk powder and dandelion syrup, and the core, consisting of praline mass, acorn flour, pine seeds, dandelion syrup and eight candied / freeze-dried berries: blueberries, strawberries, wild strawberries, bitter cherries, raspberries, blackcurrants, redcurrants, cranberries. Acorn flour has anti-inflammatory, mineralizing, antianemic, antitumor, antioxidant, diuretic, energizing properties and promotes insulin secretion. It is also recommended in the treatment of gastritis, ulcers, enteritis, anemia, mental disorders, fatigue, mental exhaustion, overwork and headaches. Carob powder contains twice as much calcium as cocoa powder, much less fat and does not contain caffeine, as such it is recommended for children.

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Stefan cel Mare University of Suceava

GLUTEN-FREE PENNE RIGATE PASTA BASED ON LEGUMES FLOURS AND PROCESS FOR OBTAINING THEM

Paste tip penne rigate, fără gluten, pe bază de făinuri de legume și procedeu de obținere a acestora

Patent application RO135029A2

N

Author/s: Atudorei Denisa, Atudorei Olivia, Mironeasa Silvia, Codină Georgiana Gabriela

This invention presents a type of short tubular pasta, obtained from flours of different legumes and a process for obtaining them. 100 g of product contains: 67.12 g carbohydrates, 11.15 g protein, 8.08 g lipids, 8.64 g fiber and has an energy value of 403.08 kcal. The production of this pasta involves three main stages: preparation and processing of the dough and drying of pasta and can be easily obtained on an industrial scale. Its consumption has special health properties: antibacterial, toning, anticancer action, supports cardiovascular health, reduces the risk of constipation and colon cancer and of osteoporosis.

RAW MATERIALS

green lentil flour

Jerusalem artichoke root flour

broccoli powder

patato starch

sea salt

white grape seed oil

water

Această invenție prezintă un tip de paste tubulare scurte, obținute din făinuri de diferite leguminoase și un procedeu de obținere a acestora. 100 g de produs conține: 67,12 g carbohidrați, 11,15 g proteine, 8,08 g lipide, 8,64 g fibre și are o valoare energetică de 403,08 kcal. Producția acestor paste constă în trei etape principale: prepararea și prelucrarea aluatului și uscarea pastelor și pot fi obținute cu usurință la scară industrială. Consumul său are proprietăți deosebite pentru sănătate: acțiune antibacteriană, tonifiantă, anticancerigenă, susține sănătatea cardiovasculară, reduce riscul de constipație și de cancer de colon și de osteoporoză.

Contact: codina@fia.usv.ro
+4075460727

GLUTEN FREE WAFFLES BASED ON VEGETABLE FLOURS AND PROCESS FOR OBTAINING THEM

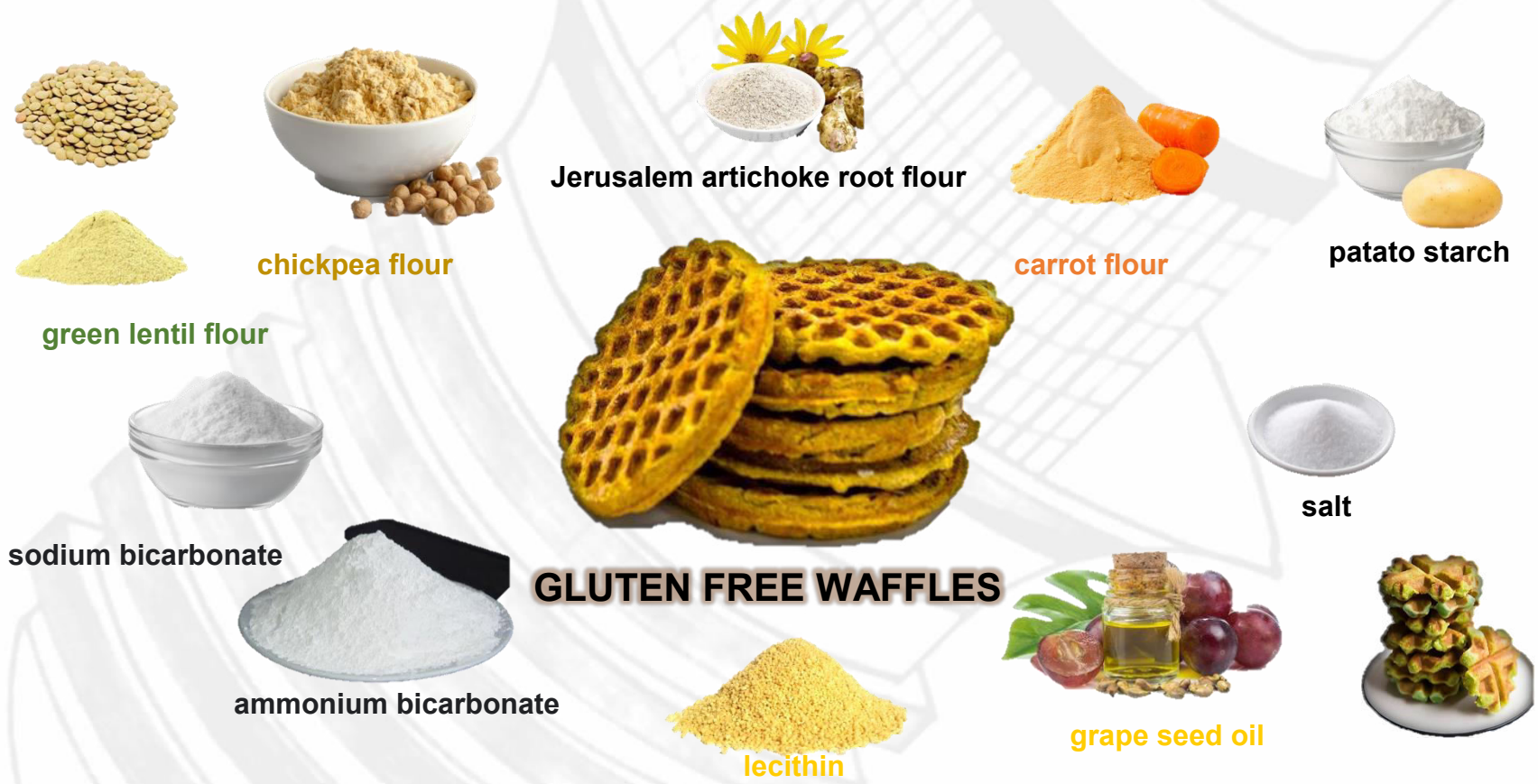
Vafe aglutenice pe bază de făinuri de legume şi procedeu de obţinere a acestora

Patent application A/00458

N

Authors: Codină Georgiana Gabriela, Dabija Adriana

Invenţia se referă la un **produs făinos de tip vafe aglutenice**, cu rol de aliment funcţional, destinat consumului de către toate grupele de vârstă şi la **un procedeu de obţinere a acestuia**. Produsul are caracteristici senzoriale plăcute și are o culoare portocalie deschisă datorită colorației naturale a pudrei de morcov. Produsul conține 65,27 g carbohidrați, 9,39 g proteine, 3,90 g lipide, 11,93 g fibre (100 g produs) si are o valoare energetica de 357 kcal/100 g. Printre **avantajele** produsului pot fi enumerate: poate fi consumat de persoanele care suferă de boală celiacă, are un conținut ridicat de fibre alimentare, are o valoare nutritivă bogată, are efecte benefice asupra organismului. Produsul poate fi reprodus oricând la **nivel industrial**, cu aceleași caracteristici de calitate superioară.



The invention relates to **a gluten-free flour waffle product**, with the role of a functional food, intended for consumption by all age groups and to **a process for obtaining it**. The product has pleasant sensory characteristics and has a light orange color due to the natural coloration of carrot powder. The product contains 65.27 g carbohydrates, 9.39 g protein, 3.90 g fat, 11.93 g fiber (100 g product) and has an energy value of 357 kcal / 100 g. Among the advantages of the product can be listed: maybe be consumed by people suffering from celiac disease, has a high content of dietary fiber, has a rich nutritional value, has beneficial effects on the body. The product can be reproduced at any time at the **industrial level**, with the same high quality features.

Contact: codina@fia.usv.ro
+40745460727

University of Agronomic Sciences and Veterinary Medicine – București

N

Sensory evaluation of some fresh jujube fruits and jujube processed products

Gabriela Stan[1], Lavinia Mihaela ILIESCU[1, 2], Florin STĂNICĂ[1, 2]

[1] Faculty of Horticulture; [2] Research Center for Studies of Food Quality and Agricultural Products

University of Agronomic Sciences and Veterinary Medicine of Bucharest, B-dul Mărăști 59, 011464, București, România

Keywords: *food products, sensory evaluation, Ziziphus jujuba Mill.*

INTRODUCTION

Chinese Jujube (*Ziziphus jujuba* Mill.) is the most important species of *Rhamnaceae* family and is one of the oldest cultivated fruit trees in the world. In Romania, it was introduced for the first time in Dobrogea region, close to the Black Sea, some 2000 years ago. The first cultivated varieties were introduced after **1997** at the Faculty of Horticulture in Bucure ti. The aim of this paper is to present some results regarding sensorial evaluation of some fresh and dehydrated fruits, from different cultivars of Chinese Jujube, and also some jujube products.

MATERIALS AND METHODS

Sensory evaluation

Fresh jujube

Jujube liqueur

Dehydrated jujube (simple, with walnuts or almonds)

Jujube tart

Jujube compote

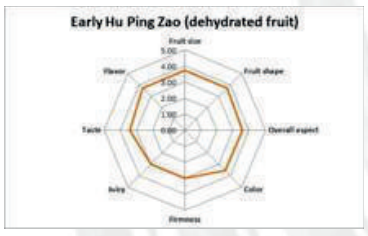
The results were obtained during the international workshop "Prospective of Chinese jujube (*Ziziphus jujuba* Mill.) cultivation in Romania" organized in 2nd of October 2020.

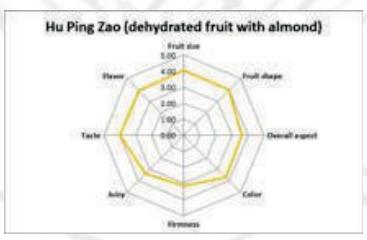
RESULTS AND DISCUSSIONS

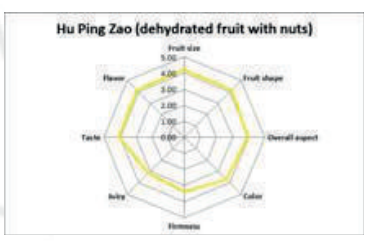
Jujube sensorial analysis results

Fresh jujube

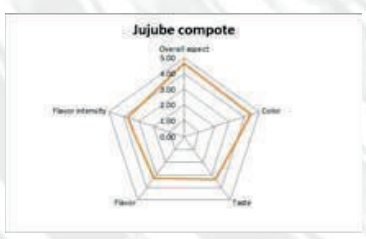
Dehydrated jujube



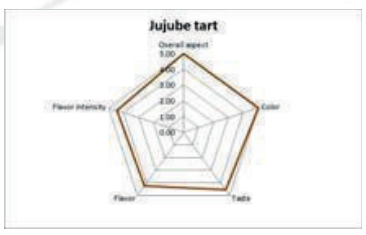




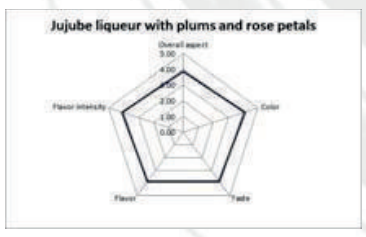
Jujube compote

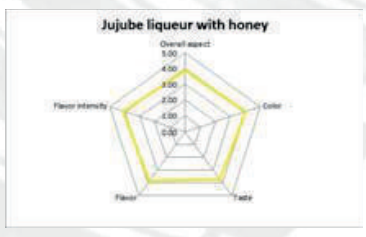


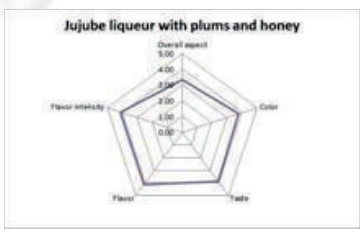
Jujube tart

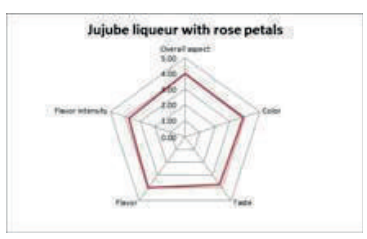


Jujube liqueur

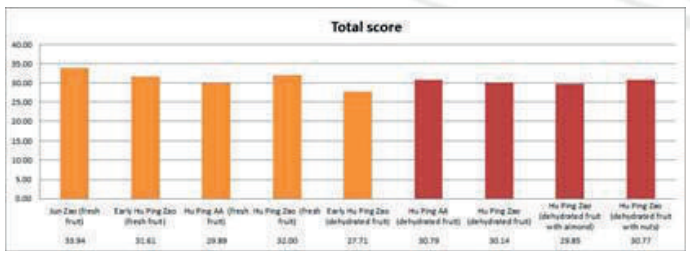


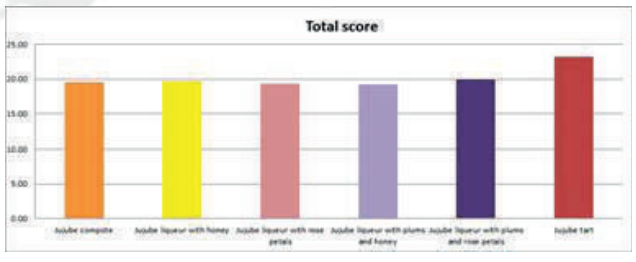






CONCLUSIONS





The results showed that, the consumers perception varied with the age, gender and origin; Fresh jujube fruits and processed jujube products, were positively appreciated by most of the participants.

stanelenagabriela@yahoo.ro

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

University of Agronomic Sciences and Veterinary Medicine – București

N

INNOVATIVE APPROACH FOR SUSTAINABLE PRESERVATION OF MEAT BASED ON BIODEGRADABLE NANOSTRUCTURES

Popa Elena[1], Râpă Maria[2], Miteluț Amalia[1], Popa Mona[1], Drăghici Mihaela[1], Popescu Paul[1], Popa Vlad[1], Danaila-Guidea Silvana[1], Geicu-Cristea Mihaela[1]

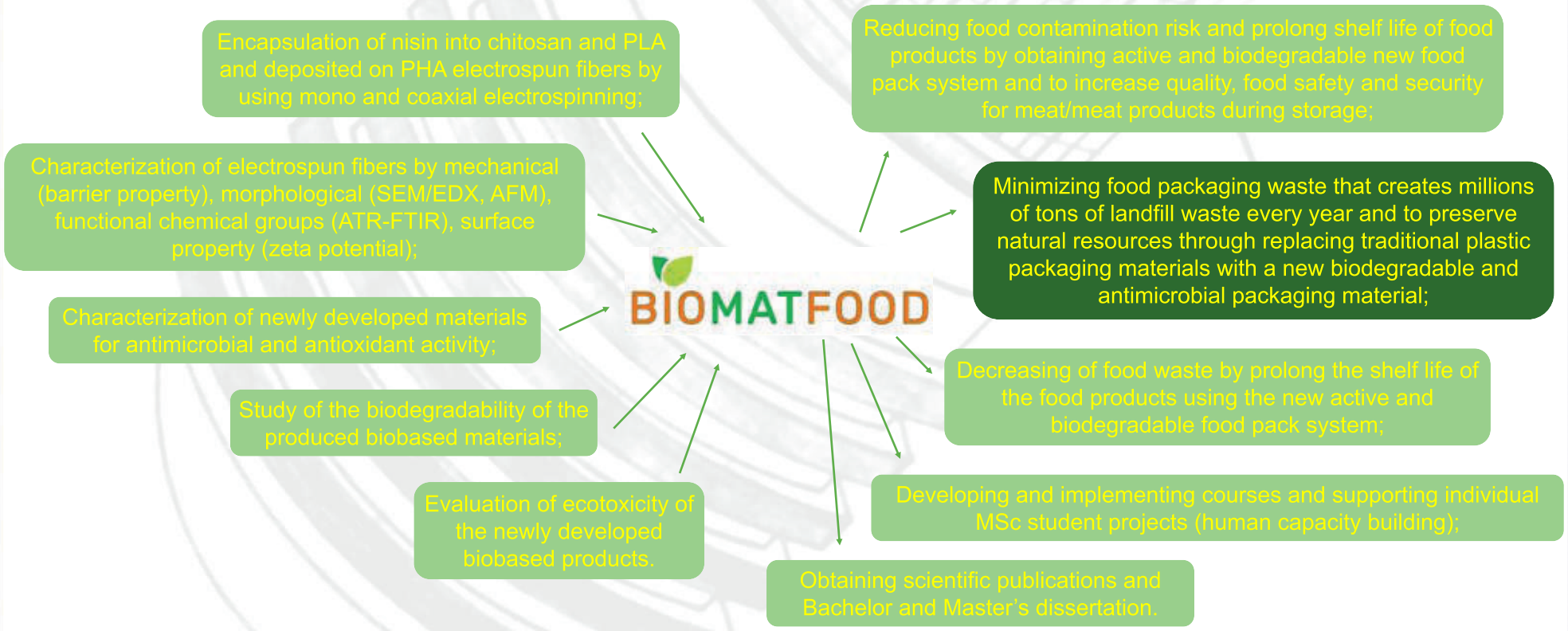
[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Biotechnology

[2]University Politehnica of Bucharest

INTRODUCTION

Nowadays, food packages market is in ongoing growth in order to accomplish world population's requirements. Thus, many efforts are focused on developing specific packages having tailored properties such as mechanical, thermal, optical and barrier in order to assure integral product quality. The most well-known packaging materials that meet these criteria are those based on petrochemical sources. However, these conventional plastics, manufactured from fossil fuels are non-renewable and, furthermore, they have a strong impact on environment. Biopolymers produced from various natural resources are considered attractive alternatives for non-biodegradable petroleum-based plastics since they are renewable, environmentally friendly and biodegradable. Polyhydroxyalkanoates (PHAs) are naturally produced (biogenic) aliphatic polyesters with highly promising thermoplastic polymer applications being potentially one of the „sustainable" replacement to fossil fuel based plastics. It is fully biodegradable and it exhibits remarkable mechanical properties, comparable only to 100% polypropylene and polyethylene. PHB offers many advantages over traditional petrochemically derived plastics for food packaging applications, being completely biodegradable, biocompatible and nontoxic.

BIOMATFOOD will focus on the obtaining of food packaging as demonstration model, based on electrospinning technology of poly(hydroxyalkanoates)(PHA) and encapsulated nisin in chitosan, having performant characteristics (physical-mechanical, antimicrobial). The processing of PHA and the performance of the formulations (mechanical and barrier properties) will be optimized.



This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CNCS/CCCDI – UEFISCDI, project number 379PED/2020, acronym BIOMATFOOD, within PNCDI III.

Contact person: POPA Elena
e-mail: elena.eli.tanase@gmail.com

UNIVERSITY OF AGRONOMIC SCIENCES AND VETERINARY MEDICINE – BUCUREȘTI

Development of functional coatings based on chitosan and plant extracts for applications in the agri-food industry (EDIFOODMAT)

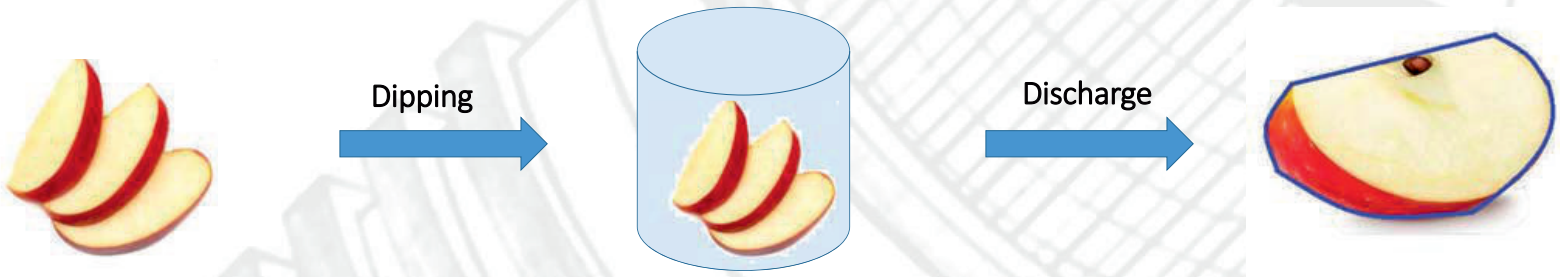
Paul-Alexandru POPESCU[1], Vlad Ioan POPA[2], Mihai Frîncu[2]

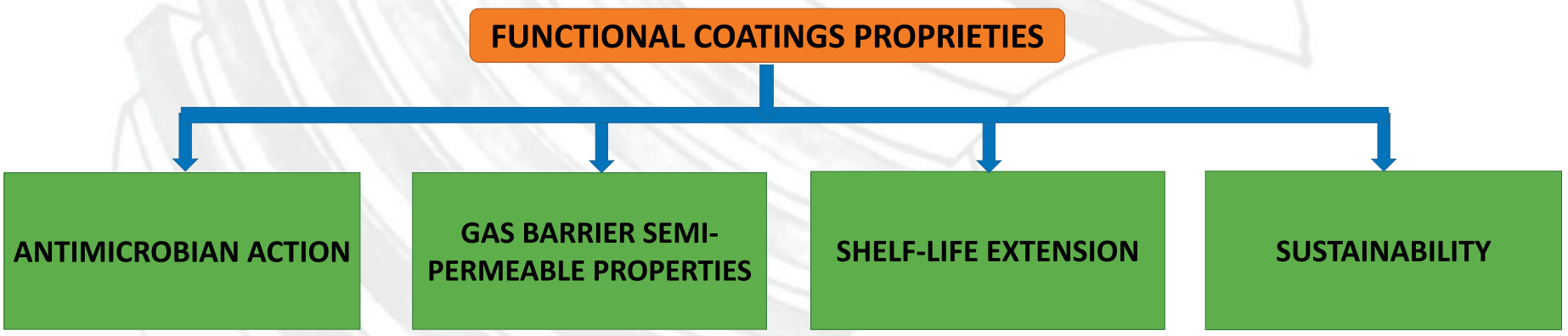
[1]Faculty of Biotechnology, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, 011464, Romania

[2]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

▪ The **EDIFOODMAT** project aims to obtain edible chitosan coatings as a demonstration model of technology for producing film-forming solutions. This requires obtaining and characterizing different mixtures. The aim is to achieve an efficient storage system for freshly cut fruits, reducing the degradation of quality aspects during the post-harvest period and for extending the shelf life.

▪ The properties of the coatings can be improved by incorporating functional ingredients, such as anti-browning or antimicrobial agents, essential oils or natural dyes.





Acknowledgments

▪ This work was supported by a grant of the University of Agronomic Sciences and Veterinary Medicine of Bucharest, project number 2021-8/2021.07.19 acronym EDIFOODMAT, within Joint Junior Competition 2021 and project FDI-2021-0430.

Contact person: Popescu Paul-Alexandru
e-mail: paul.popescu@biotehnologii.usamv.ro

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

UNIVERSITATEA DE ȘTIINȚE AGRONOMICE ȘI MEDICINĂ VETERINARĂ – BUCUREȘTI

N

BIO TEANELA
MIXTURE OF TEA OBTAINED FROM ORGANIC FREEZE-DRIED FRUITS

Authors :
DRAGOMIR Nela, NICOLAE Carmen Georgeta, STAN Andreea, ION Violeta Alexandra, FRÎNCU Mihai, PETRE Andrei, BĂDULESCU Liliana, DOBRIN Aurora

The concern for health translates into a higher and varied consumption of herbal teas / infusions, consumed for therapeutic or relaxation purposes. In the tea beverage industry, the characters of tea change from season to season. In search of new solutions, manufacturers mixture by different types of teas, plants or fruits, and come up with a mixture of products that conform to the color, taste, aroma and other acceptable perceptions of the consumer. Thus was born - brewing tea - a new tool for marketing tea

BIO TEANELA is a freeze-dried organic fruit tea (95% piece of freeze-dried apple pulp and peel, from the *Gala* variety and 5% raspberry powder). It is a tea made from a mixture of freeze-dried organic fruits, to be enjoyed as a tea for both personal satisfaction and health. Freeze-dried organic fruits were obtained within the SusOrgPlus project, through controlled drying methods and which protect their nutritional and functional value.

INGREDIENTS FOR MIXTURE OF TEAS::

Ingredients obtained from organic farming were used to make the tea mixture:

- ***Freeze-dried apple powder (pieces of pulp and peel) from the Gala ecological variety*** - it is obtained from the mixture of peel, apple pulp. It is characterized by a high antioxidant capacity and the ability to eliminate free radicals, in correlation with the content of polyphenols and ascorbic acid. Its presence in the recipe balances the taste and aroma of the finished product, and the pieces of freeze-dried apple give a pleasant texture and aroma to the product;
- ***Organic freeze-dried raspberry powder*** - is obtained through a process of freeze-dried dehydration that helps preserve nutrients. Freeze-dried raspberry particles retain their natural aroma, unique and sweet taste, specific color, and are easily hydrated. Freeze-dried raspberry powder is a natural and healthy way to introduce extra fruit into your diet, as well as to have a natural, safe color and aroma;

The organic apples and raspberry powders were obtained within the SusOrgPlus project at the Research Center for Studies on Food and Agricultural Products Quality, from USAMV Bucharest.

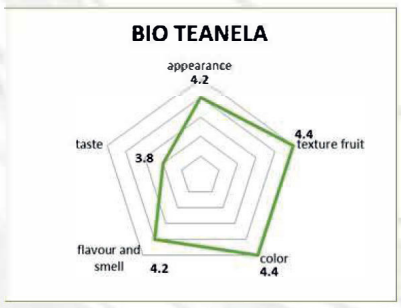
Characteristics of preparation (mixture fruits tea) BIO TEANELA

Preparation conditions		
Water (mL/tea bag)	**Temperature (°C)**	**Time (min)**
100	100±2	10 minute

Sensory attributes for the mixture tea organic fruits

Attributes	BIO TEANELA
Overall appearance	Particle shape: raspberry powders are fine, easily adhere to the surface pieces of apple pulp and peel
Color	The color is specific to the freeze dried fruits present in the mixture (yellow to pink)
Texture	The pieces of apple stand out with a nice texture and slightly sticky to the touch. Apple peels appears as hard particles. Raspberry powders have a nice appearance that adheres nicely to the surface of other products in the mixture.

Consumer acceptability scores on a 5-point Hedonic scale



Tea infusion	Total polyphenol content (mg/mL of infusion)	Antioxidant activity (%)
BIO TEANELA	14.73 ± 1.28	48.93 ± 4.48

Sensory attributes for tasting the infusion of mixture fruit teas

Attributes	BIO TEANELA
Appearance of infused fruits	The obtained tea has a slightly pink color; the fruits were rehydrated, the apple pieces and peel returned to their initial form. The raspberry particles were dispersed throughout the liquid mass. At the bottom of the cup a sediment is formed consisting of rehydrated raspberry and apple powders. At the top, gather the rehydrated pieces of apple.
Clarity	The infusion shows hydrated fruit particles in suspension. The liquid is relatively clear. After separating the fruit, the liqueur becomes clear.
Color	The color is yellowish white with a pale pink tinge. It has a bright color, and the rehydrated fruits from tea have regained their native, beautiful shape.
Flavor and smell	Delicate apple, sour and fragrant. Predominates the smell of apples.
Taste	The general impression is tasty, discreetly sweet, slightly sour and mild due to the dehydrated apple powder. The taste and aroma are balanced.

Obtaining mixture fruit teas from preserved organic ingredients, through various dehydration processes, is a sustainable and economically feasible option. Blended fruit infusion is easily accepted by the modern consumer, especially because they are mindful about health.

The infusion obtained from the BIO TEANELA sample shows a higher total polyphenol content. Sensorial analysis show that BIO TEANELA it was more easily accepted by consumers. The predominant taste of apple in infusion, which is sweet and slightly aromatic, can be enriched by high additions of raspberry or another fruit and/or plant powders.

*„This work was supported by grant of the Romanian Authority for Scientific Research and Innovation, CCCDI - UEFISCDI, project number 4/2018 ERANET-COREORGANIC **SusOrgPlus**, within PNCDI III".*

USAMV BUCURESTI
CENTRUL DE CERCETARE PENTRU STUDIUL CALITATII PRODUSELOR AGROALIMENTARE

CORE organic

Contact person: DRAGOMIR Nela
E-mail: carageanela@gmail.com

a

Asociația CORNELIUGROUP cercetare-inovare

INVENTCOR

Puterea Minții Creative

USAMV BUCUREȘTI

UNIVERSITY OF AGRONOMIC SCIENCES AND VETERINARY MEDICINE – BUCUREȘTI

N

BIO GRISINELA

Grissini enriched with organic freeze-dried dill powder

Authors :
DRAGOMIR Nela, NICOLAE Carmen Georgeta, BUJOR-NENIȚA Oana-Crina, POPA Elisabeta Elena, PETRE Andrei, BĂDULESCU Liliana

The dill (*Anethum graveolens* L.) is an aromatic plant that is part of the Romanian culinary tradition. This plant grows easily and has good productivity. Fresh and dried dill leaves are widely used as herbs in Europe and central Asia.

The dehydration, by controlled methods, of different parts of the plant, aims at the most preservation of its sensorial and physico-chemical properties. The organic product can be stored for an extended period of time and incorporated into various products to enrich their aromatic profile.

The leaves and stems of organic dill obtained by controlled dehydration techniques are used for development a new recipe by grissini enriched with organic dill powders.

- ***Organic dill leaves powder*** has an intense green color, small, fine and uniform particles, giving a powdery appearance, free of agglomerations, has an intense taste and smell of dill, characteristic.
- ***Organic dill stem powder*** has a light green color, has particles of different sizes, highlights the fibers (which come from the stem) and is rougher to the touch, has a characteristic taste and smell of dill, not very intense.

3 samples were made: S0 control sample (without powder), S1 with 1% organic dill leaf powder dehydrated and S2 with 2% organic dill powder (respectively 1% dill leaf powder dehydrated and 1% dill stem powder dehydrated). (Table 1).

The consumer acceptance was done using 5-point Hedonic scale. Nutritional value it was calculated using a nutritional development tool, Softfedima program (http://softfedima.ro/).

Table 1. Grissini enriched with organic dill powders

	Sample		
	S0	S1	S2
Main ingredients	organic wheat flour 58%, water 29%, cold pressed sunflower oil 7%, unrefined brown sugar from organic sugar cane 2.33%, salt 1.4%, organic active dry yeast 1%,		
Organic dill leaves powder, %	-	0.5%	1%
Organic dill stem powder, %	-	0.5%	1%

The obtaining technology of Grissini enriched with organic dill powder has been adapted according to the natural organic powder added. That are the main objective of the study.

All ingredients were purchased from retail specialty store, except organic dill powders, which were realized in the framework of the SusOrgPlus project at the Research Centre for Studies of Food Quality and Agricultural Products, University of Agronomical Sciences and Veterinary Medicine of Bucharest.

Grissini enriched with organic dill powders come in the form of crumbly and crispy bars, with original and pleasant taste, specific to dill, golden color. It is recommended to be eaten simple as snacks or in combination with various dishes.

Grissini with the addition of freeze-dried dill powder were distinguished by special sensory characteristics. The presence of dill has led to a different appreciation among consumers, some appreciating samples with higher percentages of dill, others preferring products with a content of 2% and even more powder added (figure 1).

The use of powder from dill stalks has led to increased attention to the preparation of the ingredient before introduction into the recipe.

Due to the high fiber content of the freeze-dried dill stalk powder, an additional amount of water is required in the recipe. In order to hydrate completely and disperse better in the dough, it is recommended to pre-hydrate this ingredient in water or other warm liquid. Dill leaf powder is finer, more crumbly, with a lower fiber content, so it can be added as such or hydrated in a liquid beforehand. In terms of energy value, the values have not changed much. It was 297.7 kcal, instead the fatty acid profile and antioxidant value have changed (Table 2)

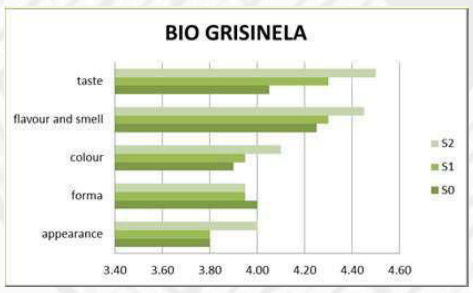


Figura 1. BIO GRISINELA – consumer acceptance

Table 2. Nutritional values for 100 g Grissini enriched with organic dill powder

	S0	S1	S2
Energy value	1522.2	1516,1	1515,2
	362.7	361,3	361,1
Fat	11.1	11,1	11,1
of which saturated fatty acids	0,8	0,8	0,8
Carbohydrates	50.9	50.3	50,1
of which sugars	3.9	3.9	3.9
Fiber	10.8	11,1	11.2
Protein	9.4	9,5	9.6
Salt	2	2	1.9

CONCLUSIONS

Sensory Analysis tests have shown a differentiated influence of SusOrgPlus organic ingredients in the sensory quality of food. The use of organic dill powders (from leaves and stems), obtained in the SusOrgPlus project at the Research Centre for Studies of Food Quality and Agricultural Products, USAMV Bucharest, to obtaining Grissini enriched with organic dill powders, has increased sensory value and it was accepted by consumers.

As the percentage of powder in dill, especially in the stem, increases, it increases its visibility in section and on the finished product and there is also the danger of advanced dehydration of these particles during baking. It is recommended that the powder be finer so that this inconvenience does not occur.

Freeze-dried dill bread crumbs are produced with low humidity, which last very well over time and retain their sensory properties. It is very important that storage is done in appropriate packaging and in rooms free of moisture and light.

„This work was supported by a grant of the Romanian Authority for Scientific Research and Innovation, CCCDI - UEFISCDI, project number 4/2018 ERANET-COREORGANIC SusOrgPlus, within PNCDI III".

USAMV BUCURESTI
CENTRUL DE CERCETARE PENTRU STUDIUL CALITATII PRODUSELOR AGROALIMENTARE

CORE organic

Contact person: DRAGOMIR Nela
E-mail: carageanela@gmail.com

CORNELIUGROUP
research-innovation
association
INVENTCOR
Power of Creative Mind

DISCOVER ZANZIBAR WITH MUDI

N

Author: Muhammed Suleiman Yussuf

My name is Mudi and I am a tour guide here in Zanzibar. I only learned Romanian on the internet and on youtube, and now I have a school where I also teach other friends of mine.

If you choose to spend your holiday here you will have the opportunity to discover Zanzibar and its beauty with me. This is my website and the place where I can be with you, my whole story in one place, along with information for tourists about Zanzibar.

Numele meu este Mudi și sunt ghid turistic aici în Zanzibar. Am învățat singur limba română doar de pe internet și youtube, iar acum am și o școală unde îi învăț și pe alți prieteni de-ai mei. Dacă alegeți să vă petreceți vacanța aici veți avea ocazia să descoperiți Zanzibarul și frumusețea lui alături de mine. Acesta este website-ul meu și locul în care pot fi alături de voi, toată povestea mea într-un singur loc, împreună cu informații pentru turiști în ceea ce privește Zanzibarul.

Contact: https://bubutzi.wixsite.com/zanzibarcumudi
https://www.facebook.com/ghidturisticdespre.zanzibar
tshabalalajunior17@gmail.com
+255 783 396 944

O

Health

Cosmetics

Hygiene

Paramedical

P

History and Cultural Studies

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Universitatea Politehnica Timișoara

ELECTRICAL LIGHT INSTALLATION FOR DENTAL ESTHETICS

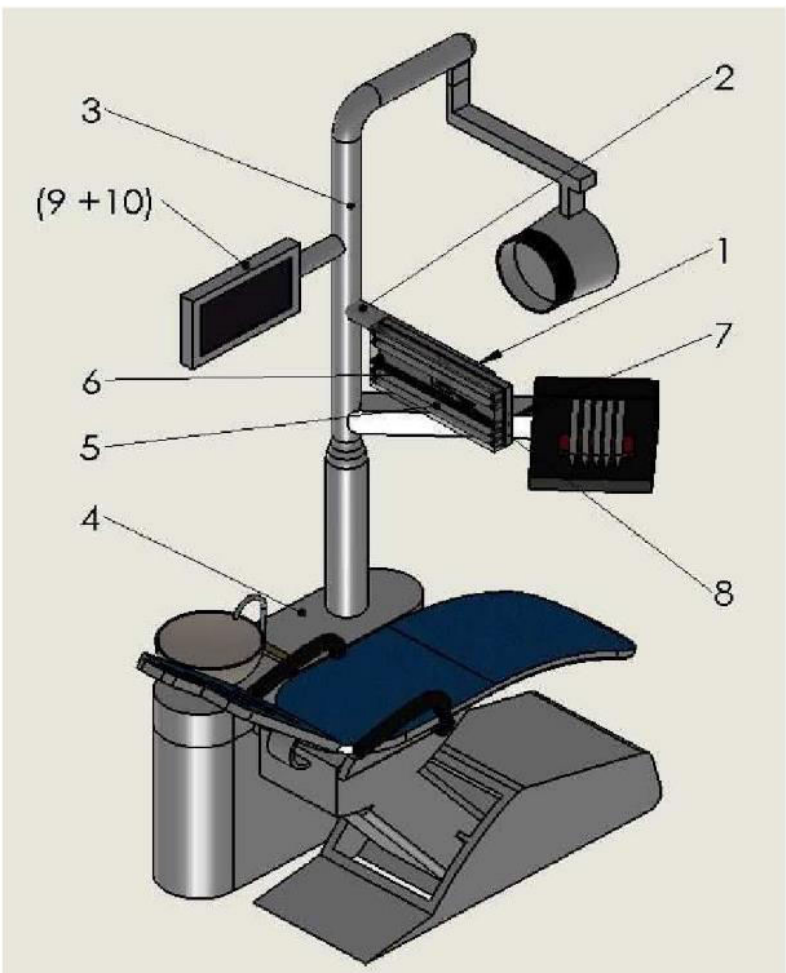
U/00018 28.04.2017

O

autori: Pavel Ștefan, Krems Cristina, Mocan Marian Liviu, Doboși Ioan Silviu

DESCRIPTION

The invention relates to a fixed electrical lighting installation used in the dental cabinets which provides illumination to the dental area of the patient, illumination which is very close to the daylight parameters. The installation is made up of a mobile metal body made from a mirror coated inoxidable steel, attached to the dental pillar unit, in which 5 lamps with the true color rendering index are mounted, 97 Ra8 and the color temperature of 5300^{0}Kelvin, a black light type of lamp, and between the lamps is mounted a camera connected to a computer with the monitor fixed (optionally) on the dental pillar unit.



ADVANTAGES:

- **Ensures transparency in the incisal zone of the teeth;**
- **Ensures an illumination very close to the daylight parameters on the dental work area ;**
- **It ensures that the teeth are photographed with an illumination very close to the daylight parameters before and after the medical procedure of dental aesthetics;**
- **It ensures a better color setting in dental aesthetics.**

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

RoBioMush - Bioactive product from edible wild mushrooms for improving colon microbial fingerprint

Patent application - A/00459/7.07.2017

Category

O

Author/s: Emanuel Vamanu, Sârbu Ionela, Pop Octavian, Pop Erdelyi Andrea, Ene Mihaela

Description: The invention concerns a bioactive product used in nutritional and cardiovascular pathologies to improve the colon microbial fingerprint. According to the invention, RoBioMush product consists of an atomized fungal extract of the mushrooms species *Boletus sp., Pleurotus eryngii, Armillana mellea* and *Tuber melanosporum*, in a ratio of 30:7:2:1 and 7% maltodextrin. The product has a phenolic compound content of 7.8 mg/mL gallic acid equivalents and a total antioxidant activity of over 90%. RoBioMush follows the correction of microbial disorders (microbial fingerprint), an effect associated with nutritional pathologies (e.g., diabetes type 2) and cardiovascular diseases. Once administered, an increase in the antioxidant capacity of the colon is also obtained due to its composition in bioactive compounds to combat the effects caused by oxidative stress.

CHARACTERISTICS: The functional product presents novel inventive activity, both in its composition and in the mode of action in the human colon. The functional product eliminates toxicity and negative side effects in order to multiply favorable strains of the genus *Lactobacillus* and *Bifidobacterium*. The metabolic characteristics demonstrate that the presence of bioactive compounds leads to a direct link of the fermentative profile with the number of favorable strains.

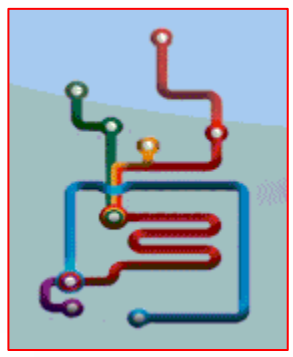
EFFECTS: The atomized formula from edible wild mushrooms has the following effects on/at the level of human colon microbiota: adjuvant in the treatment of colon microbial dysfunctions caused by cardiovascular pathologies and nutritional diseases (e.g. diabetes type 2), correction of microbial metabolism by balancing the microbial fingerprint, stimulating multiplication of favorable strains of the human colon.

Contact: email@emanuelvamanu.ro

www.gissystems.ro

GS Systems
Gastrointestinal simulation

HYPERICUM IMPEX



Topical product for the protection of the skin from the action of artificial light

Category

O

Author/s: Cristina Monica Papa, Emanuel Vamanu

Description: Pigmentation of human skin is a complex biological process, and sun exposure is considered the main factor responsible for it. Most of the effects of sun exposure on the skin, related to UV radiation, cause oxidative stress. The functional product aims to combat/remedy the problems caused by the appearance of oxidative stress through blue light through a combination of natural extracts. Testing the extracts from the composition of the product (cream) includes the following steps: the effect of blue light by *in vitro* and *in vivo* study - yeasts; the effects caused on some cell lines - keratinocytes; characterization of plant and mushroom extracts and their combination in an original formula that protects against the effects of exposure to blue light; making a cream with an effect of reducing oxidative stress caused by the action of blue light. Thus, the proposed product contains a cream base of natural ingredients and extracts of red currant (*Ribes rubru*), blueberry (*Centaurea cyanus*), hot lettuce (*Lactarius piperatus*). It is initially tested, being a stable formula, with in vitro protection against the action of oxidative stress induced by UV radiation.

CHARACTERISTICS: Combating/remedying the problems caused by the appearance of oxidative stress due to the action of blue light through a combination of original natural products.

Contact: email@emanuelvamanu.ro

Liquid soap exfoliating with volcanic rock

MINISTERUL EDUCAȚIEI ȘI CERCETĂRII
Ministry of Education and Research

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

O

STABLE SYNERGISTIC COMPOSITION WITH ANTIOXIDANT AND ANTI-INFLAMMATORY PROPERTIES BASED ON BIOACTIVE PHYTOEXTRACTS

Authors: Oancea Rodica Simona, Tecucianu Andreea Cristina, Dulf Francisc Vasile

Patent request no.: A 003932 / 09.07.2020

DESTINATION

The invention relates to a new synergistic composition, 100% natural, in the form of an emulsion, containing extracts of β-carotene from pumpkin, anthocyanins from red cabbage and inulin from parsnips, as well as the method of preparation and its bioactive properties. The invention is of practical importance both by valorization of local plants rich in bioactive compounds to obtain extracts with special biological properties, and by applying sustainable technologies for their preparation and for the final product.

PRINCIPLES USED

The process according to the invention consists in combining 50% and 25%, respectively, β-carotene oily extract from pumpkin, 25% and 15%, respectively, concentrated anthocyanin extract from red cabbage and 25% and 60%, respectively, aqueous fructan extract from parsnip, in the presence of 0.5% guar gum relative to the composition, resulting in a stable composition of phytoextracts with bioactive properties tested *in vitro*.

ADVANTAGES

- Obtaining synergistic natural compositions by combining 3 natural extracts of pumpkin rich in β-carotene, red cabbage rich in anthocyanins and parsnips rich in inulin, with beneficial effects on human health;
- The new compositions are advantageous in terms of costs, as it would reduce the costs of importing similar products;
- The new compositions allows creating a Romanian registered trademark product by exploiting the research in this area.

APPLICATIONS

- the invention is situated at the intersection of food science and health, useful for food supplements industry;
- the invention offers the possibility of combining phytoextracts with multifunctional properties;
- it is useful, in particular, for the development of nutraceutical products.

Bioactive content and antioxidant properties of the new synergistic developed compositions

Attributes	Composition 1	Composition 2
Saturated fatty acids	8.58	8.68
Monounsaturated fatty acids	23.11	27.71
Polyunsaturated fatty acids	68.30	63.61
Omega-3	0.04	0.05
Omega-6	68.26	63.56
FRAP (mg ascorbic acid/ 100 ml extract)	84.78	53.49
DPPH (% inhibition)	39.35	19.38

Contact
Prof. Simona OANCEA, Ph.D., Dr. Habil.
"Lucian Blaga" University of Sibiu, Romania
simona.oancea@ulbsibiu.ro

Prof. Eng. & Ec. Mihail TITU, Sc.D. Ph.D., Dr. Habil.
Manager of PAtLib Centre of Sibiu
"Lucian Blaga" University of Sibiu
10, Victoriei Street, Sibiu, 550024, România
mihail.titu@ulbsibiu.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

INDONESIA LETTER-Let's Fight Together!

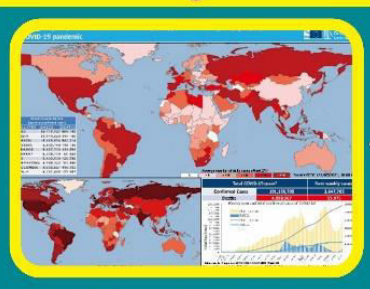
Educational Game to Fight Against Corona Virus Student Project

IYSA Indonesian Young Scientist Association

ASOCIATIA CORNELIUGROUP CERCETARE - INOVARE

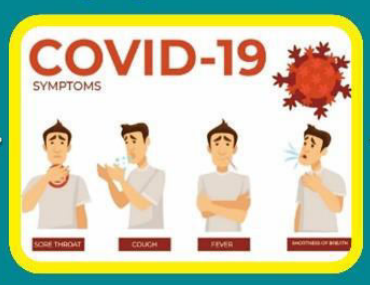
Backgrounds

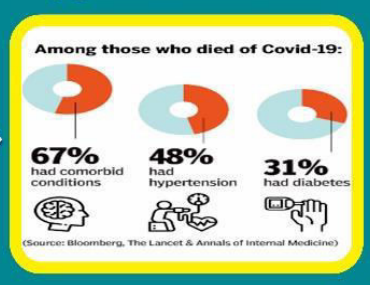
Category : Health, Cosmetics,Hygiene, Paramedical



Since 31 December 2019 and as of week 2021-30 (August 5, 2021), 198.964.259 cases of COVID-19 have been reported, including 4.232.713 deaths

In September 2021, Indonesia report the active confirmed cases number of 115,679 with 138,701 deaths





0

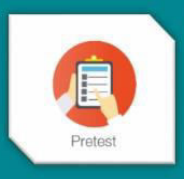
The status of knowledge and desirable practices were not sufficient to fight this rapidly spreading virus.

Information alone thus combining some entertainment such as games, will make the application more attractive

Research on digital games based on education and creativity is still active. The results indicated the increasing positive effect to connect knowledge and creativity

Purpose

To increase the knowledge of the student about COVID-19.



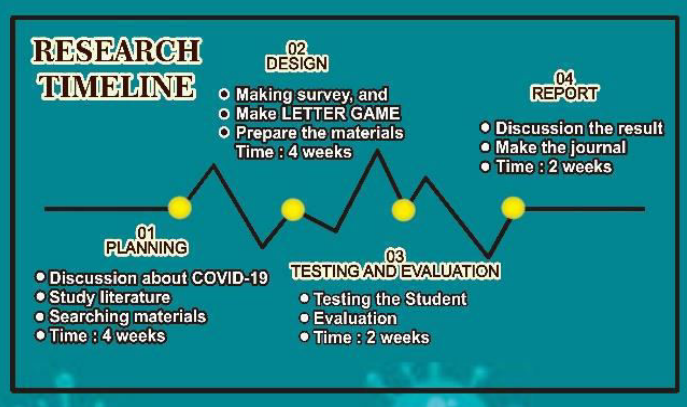
Test the game to 101 College students as a pretest and posttest and collected the data

Make an education game with the scratch application

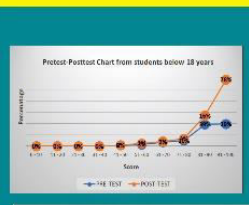
Methods

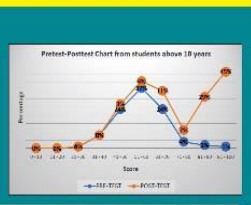
PRELIMINARY STUDY

Got 416 students from elementary to a college student taking part in the survey. The questioner is taken from knowledge, attitude, and practice questioner from a previous study. Rank the answer and take the 10 most false questions to add to the game for each category (category A below 18 years, category B above 18 years).



Pretest-Postest Chart



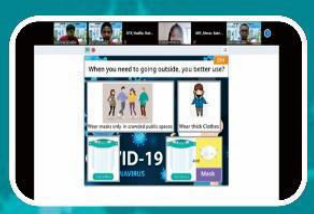


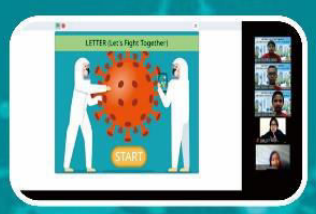
This chart is the comparison between the increasing score of students below and above 18 years. The increasing score is higher in the student above 18 years from the result of the pretest and post-test. As we have seen, the increasing score in students above 18 years was 29 points, meanwhile, the number of students below 18 years increasing score

Discussions

- ✓ The effectiveness of digital game-based learning is also measured by testing the game to students by holding a pre-test and post-test. The result used as a tool in learning can increase students' interest and motivation (Rawendy D, Ying Y, Arifin Y, 2017).
- ✓ Education via Scratch-based game activities contributes significantly to the students' academic achievements (Korkmaz, 2016).
- ✓ The students' interest increases as they thought the game is advantageous and fun, which at the same time causes them to be more knowledgeable. (Andreani & Ying, 2019).

Results





Conclusions and future recommendations

- ✓ LETTER games can increase the knowledge of students.
- ✓ For the next research, we can test it on the community (non-student).

References

1. ECDC. COVID-19 situation update worldwide, as of week 30, updated 5 August 2021 [Internet]. An agency of the European Union. 2021. Available from: https://www.ecdc.europa.eu/en/geographical-distribution-2019-ncov-cases
2. Wu ZJM. Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID 19) Outbreak In China Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention. J Am Med Assoc. 2020;323(13):7–10.
3. Pusdatin Kementerian Kesehatan. Data positif berdasarkan provinsi, jenis kelamin, usia, gejala, dan komorbid [Internet]. 2020. Available from: https://data.covid19.go.id/public/index.html
4. IDAI. Panduan Klinis Tata Laksana COVID-19 pada Anak. 3rd ed. 2020. 1–73 p.
5. Kemenkes. Proporsi Kasus Aktif Covid-19 Anak Lebih Tinggi dari Lansia [Internet]. 2021. Available from: https://databoks.katadata.co.id/datapublish/2021/06/24/proporsi-kasus-aktif-covid-19-anak-lebih-tinggi-dari-lansia
6. Holshue M. First Case of 2019 Novel Coronavirus in the United States. Holshue M.L. N Engl J Med. 2020;
7. Kebede Y, Yitayih Y, Birhanu Z, Mekonen S. Knowledge , perceptions and preventive practices towards COVID-19 early in the outbreak among Jimma university medical center visitors , Southwest Ethiopia. PLoS One [Internet]. 2020;77:1–15. Available from: http://dx.doi.org/10.1371/journal.pone.0233744
8. Kidl N, Kanigoro B, Salman AG, Prasetio YL, Lokaadinugroho I, Sukmandhani AA. Android Based Indonesian Information Culture Culture Education Game. Procedia Comput Sci [Internet]. 2017;116:99–106. Available from: https://doi.org/10.1016/j.procs.2017.10.015.
9. Saefi M, Fauzi A, Kristiana E, Cahya W, Muchson M, Setiawan ME, et al. Survey data of COVID-19-related knowledge , attitude , and practices among Indonesian undergraduate students. Data Br. 2020;31.
10. Korkmaz Ö. The Effects of Scratch-Based Game Activities on Students' Attitudes, Self-Efficacy and Academic Achievement. Int J Mod Educ Comput Sci. 2016;8(1):16–23.
11. Andreani W, Ying Y. ScienceDirect ScienceDirect " PowPow " interactive game in supporting English vocabulary " PowPow " interactive game in supporting English vocabulary learning for elementary students learning for elementary students. Procedia Comput Sci [Internet]. 2019;157:473–8. Available from: https://doi.org/10.1016/j.procs.2019.09.005

By : Kevan Vallerio Anwar, 15 Y.O, 10th Grade
Brian Alvarico Anwar, 12 Y.O, 7th Grade
Research Supervisor : Dra. Agus Priyantno, M.Pd
Dra. Cahyo Kismurwati, S. Kom and

School :
1. State Junior High School 2 Semarang, Central Java, Indonesia
2. State Senior High School 3 Semarang, Central Java, Indonesia

Contact : +62 823-1313-1878 | Email : kevanvallerio06@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Syria

Safe removal of the employee from the client

Student Project

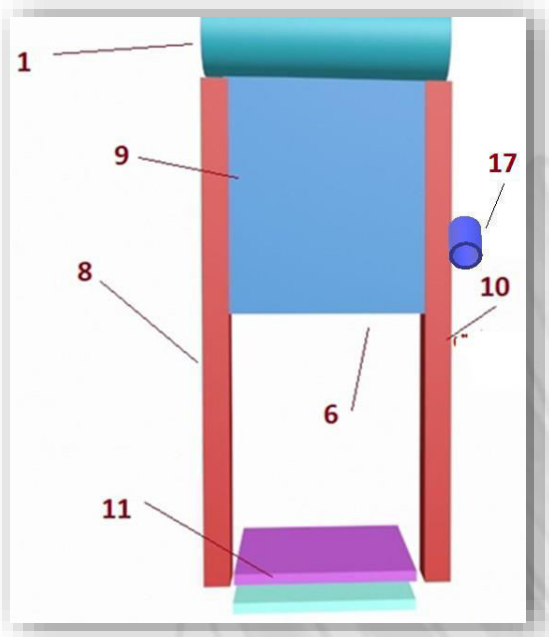
Author/s: Mustafa Ahmad Hamdi, Abdulrahman Hamdi

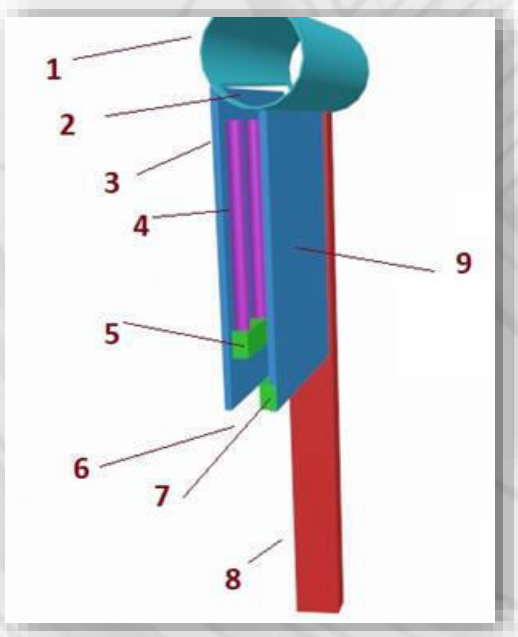
No: 2021070054

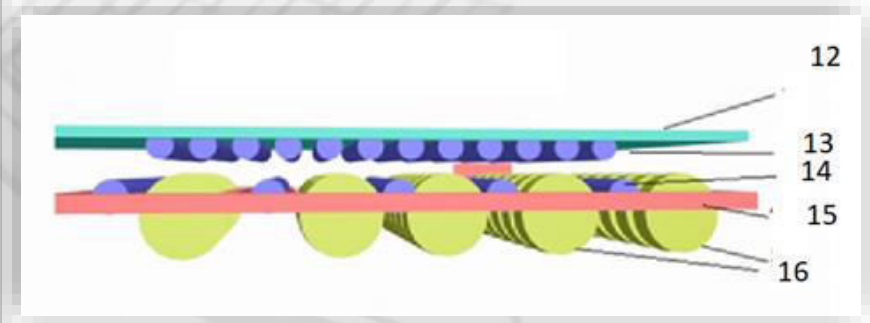
O

The employee's safe isolation device for the customer consists of a parallel rectangular channel open from the top and from the bottom, and the channel is provided with a turbine to pump air from the top through it to pass over a set of sterilizing lamps that work with ultraviolet rays to sterilize the air and kill any bacteria or viruses in the air, and the air exits from the bottom to form a curtain Sterilized air isolates the employee from the client.

At the bottom of the window, a special device for sterilizing documents and cash is also sterilized by means of rows of sterilization lamps located in the channel to pass the documents to exit from the other side sterile.







1- Air turbine.
2- Air passage hatch.
3- The outer surface of the sterilizer.
4- Ultraviolet rays for sterilization.
5- A barrier that prevents the exit of rays.
6- Sterile air exit hole.
7- A barrier that prevents radiation from leaving the other side.
8- Symptoms of carrying the device.
9- The inner surface of the sterilization channel.
10- Keel to carry the device.
11- Documents and cash sterilization device.
12- Document sterilization cover.
13- Top row of UV sterilizer lamps.
14- Bottom row of UV sterilizer lamps.
15- The surface bearing the rollers for moving documents.
16- Rollers for moving documents.
17- User temperature measurement with alarm.

Inventor Mustafa Ahmad Hamdi
Second year of chemistry, Damascus University
Syria Damascus
Mobile&whatsApp:00963953402038
Email: ahmadtaligom@gmail.com

Inventor Abdulrahman Hamdi
High school stage - eleventh grade
Syria Damascus
Mobile:00963930262532
Email: abodyhamdi1234@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

MOVEMENT IDENTIFICATION AND SUPPORT DEVICE FOR THE RIGHT ARM FOR PERSONS WITH MOBILITY PROBLEMS

1948 UNIVERSITATEA DIN PETROȘANI

DISPOZITIV DE IDENTIFICARE ȘI SUSȚINERE A MIȘCĂRII BRAȚULUI DREPT PENTRU PERSOANELE CU PROBLEME DE MOBILITATE

Patent number: OSIM A00101/18.02.2019, prototype

Marius-Nicolae RÎSTEIU,
Monica LEBA, Andreea Cristina IONICĂ

Category
O

The invention aims to provide a device for identifying and supporting the movement of the right arm for people with mobility problems.

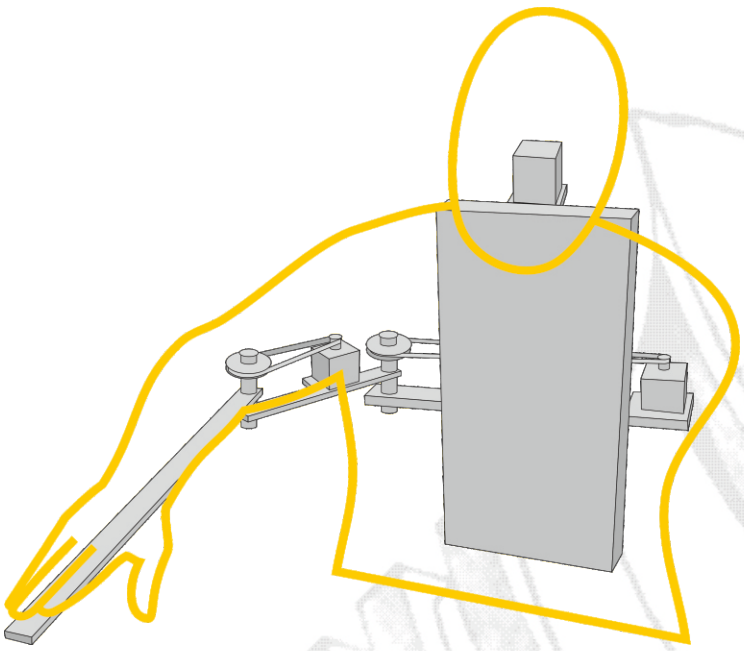


Figure 1. Exoskeleton scheme – front view

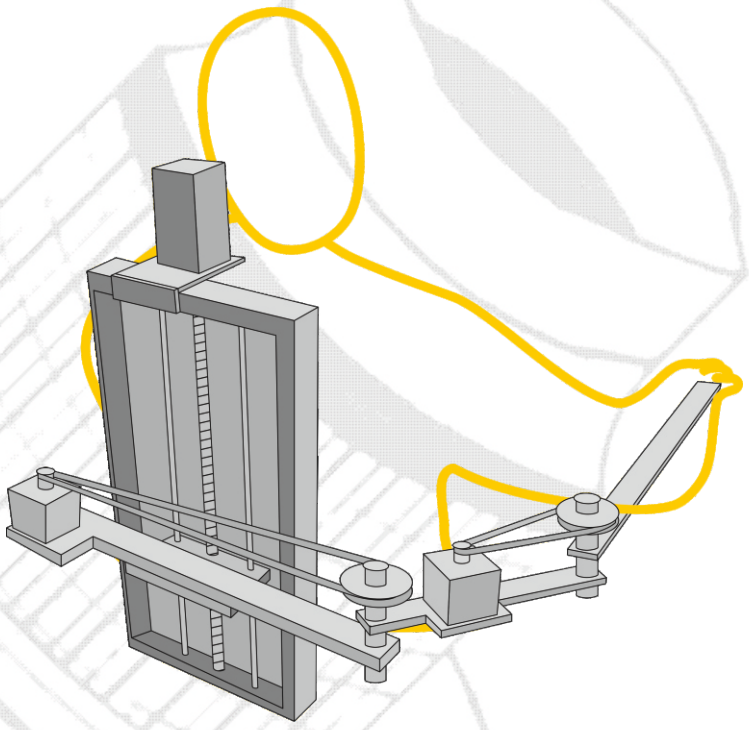


Figure 2. Exoskeleton scheme – rear view

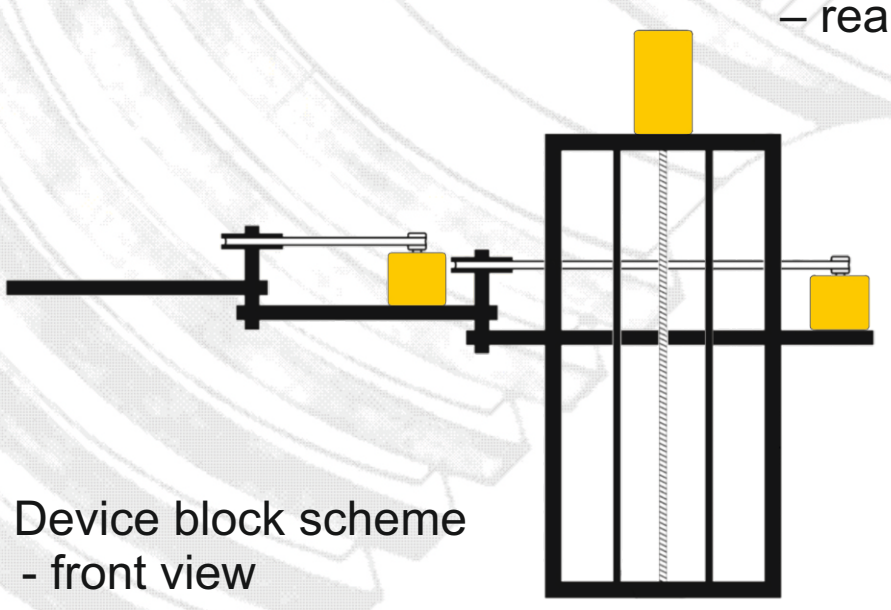


Figure 3. Device block scheme - front view

Invenţia îşi propune să ofere un dispozitiv pentru identificarea şi susţinerea mişcării braţului drept pentru persoanele cu probleme de mobilitate.

Asociația de Cercetare Doctorală Petroșani

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

BURNOUT STATUS IDENTIFICATION AND ALARMING SYSTEM

SISTEM DE IDENTIFICARE ȘI ALARMARE A STĂRII DE BURNOUT

1948 UNIVERSITATEA DIN PETROȘANI

Category O

Patent number: State of Israel Patent Office, no. 270751 / 18.11.2019, prototype
Yonnis NASSAR,
Andreea Cristina IONICĂ, Monica LEBA

A system consisting of two devices, one portable for identifying and alarming the occurrence of burnout and the second for setting / reading the initial / measured data, by the specialist.

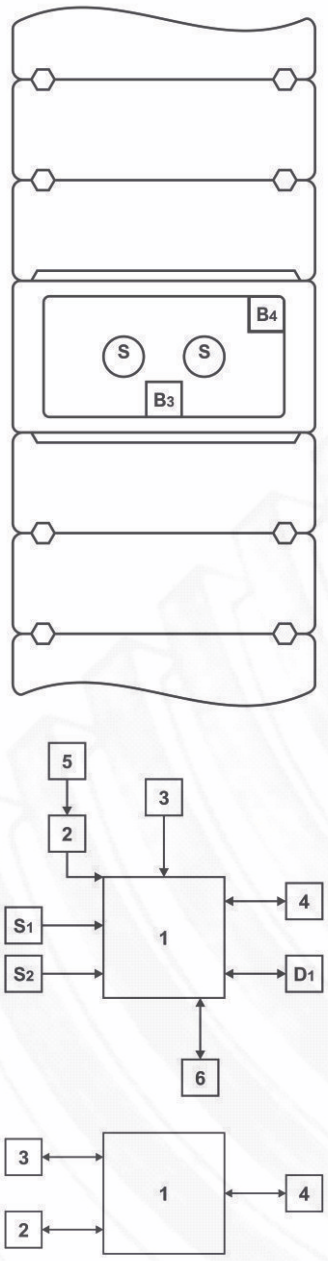


Figure 1. Hardware

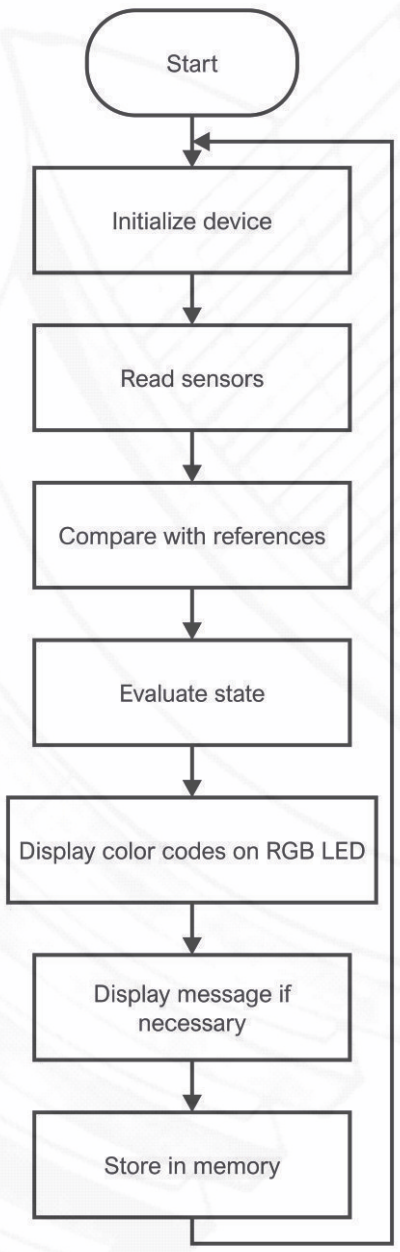


Figure 2. Algorithm

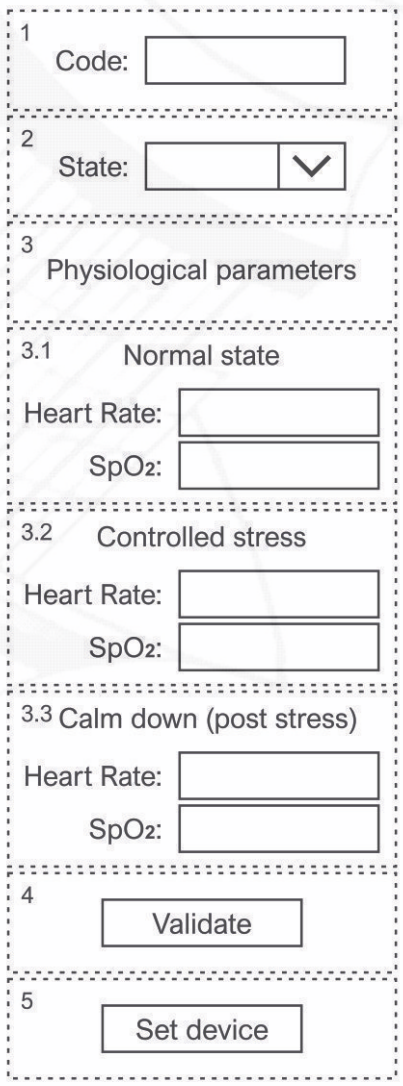


Figure 3. Software

Un sistem format din două dispozitive, unul purtabil pentru identificarea și alarmarea apariției stării de burnout și al doilea pentru setarea/citirea datelor inițiale/măsurate, de către specialist.

Asociația de Cercetare Doctorală Petroșani

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
Telephone: 0721705284 **Email:** pdragos_74@yahoo.com

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

MOLDOVA STATE UNIVERSITY
Scientific Research Laboratory
Human and Animal Ecophysiology
65 A, Mihail Kogălniceanu str., Chisinau, MD-2009, Republic of Moldova
Tel.: +373 68082030; E-mail: iurabacalov@mail.ru

HR EXCELLENCE IN RESEARCH

PHYTOTHERAPEUTIC REMEDY FOR THE TREATMENT OF HYPERGLYCEMIA AND ACUTE INFECTIONS IN EXPERIMENTAL DIABETES

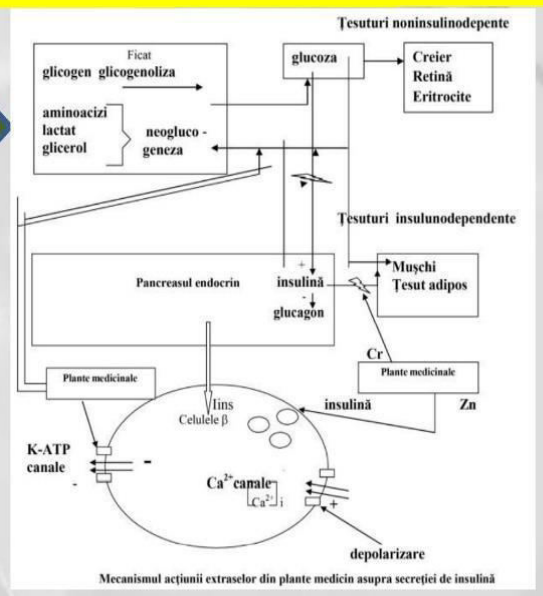
PATENT APPLICATION: a 2021 0038/2021.06.24

AUTHORS: Iurie BACALOV, Aurelia CRIVOI, Elena CHIRIȚA, Adriana DRUȚA

APPLICATION FIELDS: Biomedicine.

AIM: Treatment of hyperglycemia and acute infections in experimental diabetes.

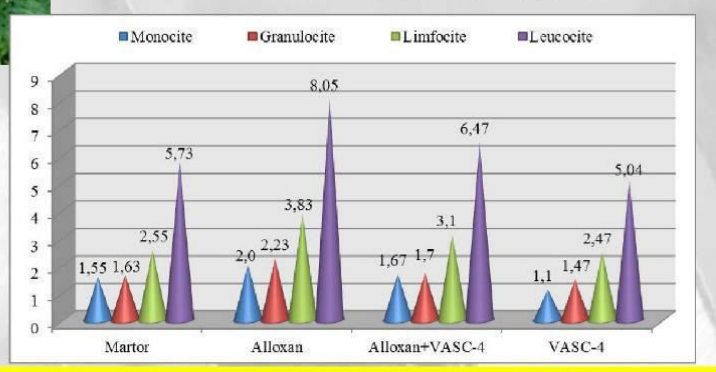
SOLUTION: The present invention represents a phytotherapeutic remedy with multiple action, which ensures a greater efficiency in the treatment of diabetes, both by maintaining blood glucose and by the immunostimulatory effect, to protect the body from the action of viruses and pathogenic bacteria; it is purer, so it does not contain toxic substances and prevents the appearance and evolution of complications that occur in diabetes due to high blood glucose levels. The phytotherapeutic remedy developed as a bioactive substance contains infusion of flowers of *Calendula officinalis, Sambucus nigra, Achillea millefolium* and *Verbascum phlomoides.*

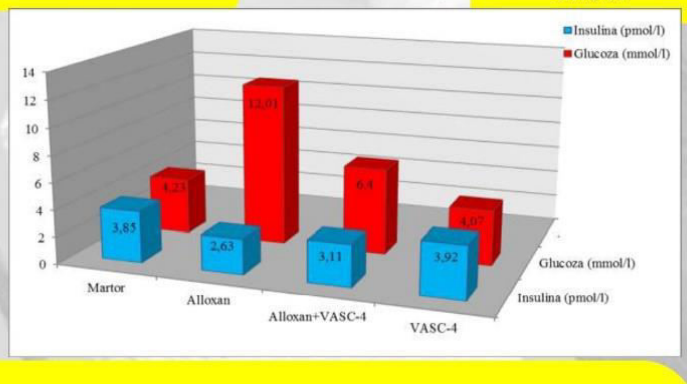


Mecanismul acțiunii extraselor din plante medicin asupra secreției de insulină

Immunoprotective effect

Hypoglycemic effect





ADVANTAGES: Compared to existing remedies, this biopreparat has multiple action (hypoglycemic and immunostimulatory), which allows the body to fight infection and excludes or eliminates the occurrence of severe complications in patients, dependent on hyperglycemia.

IMPLEMENTATION STAGE: At the laboratory level.

ACKNOWLEDGMENTS: This research was supported by the project 20.70086.06/COV(70105) of the Ministry of Education and Research of the Republic of Moldova.

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

MOLDOVA STATE UNIVERSITY
Scientific Research Laboratory
Human and Animal Ecophysiology
65 A, Mihail Kogălniceanu str., Chisinau, MD-2009, Republic of Moldova
Tel.: +373 68082030; E-mail: *iurabacalov@mail.ru*

HR EXCELLENCE IN RESEARCH

PHYTOTHERAPEUTIC REMEDY FOR THE TREATMENT OF THYROID DYSFUNCTION AND IMMUNE SYSTEM STIMULATOR IN EXPERIMENTAL DIABETES

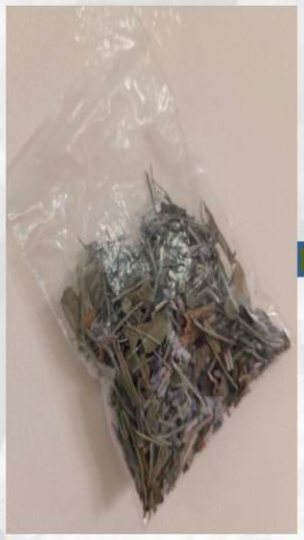
PATENT APPLICATION: a 2021 0044/2021.07.05

AUTHORS: Iurie BACALOV, Aurelia CRIVOI, Elena CHIRIȚA, Adriana DRUȚA

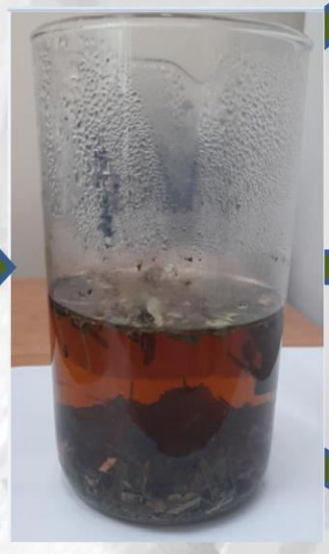
APPLICATION FIELDS: Biomedicine.

AIM: Treatment of thyroid dysfunction and immune system stimulator in experimental diabetes.

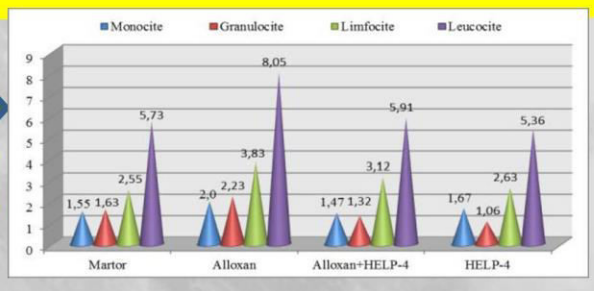
SOLUTION: The present invention is a phytotherapeutic remedy with multiple action, which ensures a greater efficiency in the treatment of diabetes, both by maintaining blood sugar and regulating the functional state of the thyroid, which is often affected in this pathology, and by maintaining immune balance; it is purer, so it does not contain toxic substances and prevents the appearance and evolution of the complications characteristic of the evolution of diabetes as well as of the disorders of other endocrine glands. The elaborated phytotherapeutic remedy, as a bioactive substance, contains infusion of leaves of *Prunus domestica* and *Hippophae rhamnoides*, the aerial parts of *Equisetum arvense* and *Lavandula angustifolia*.



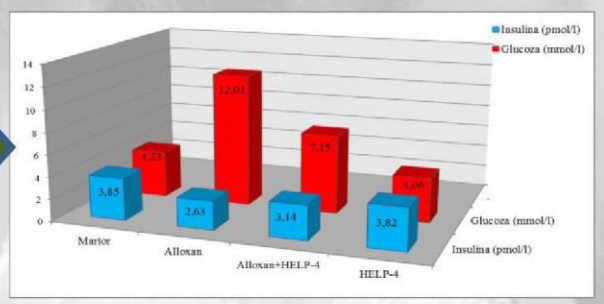
Phytotherapeutic remedy



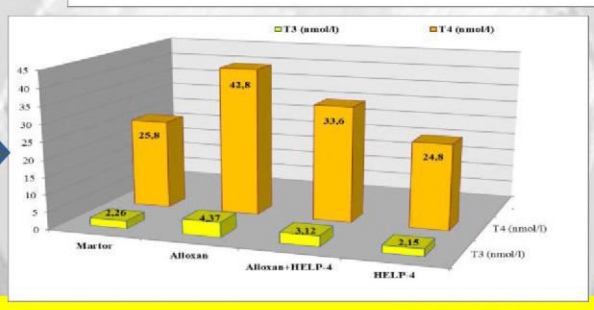
Immunoprotective effect



Hypoglycemic effect



Effect thyroid regulator



ADVANTAGES: Compared to other remedies, this biopreparation has a multidirectional effect (hypoglycemic, thyroid regulator, immunostimulatory), which prevents the occurrence and evolution of acute infections in diabetes, maintains blood sugar and improves the functional state of the thyroid which is often deregulated in this endocrine pathology.

IMPLEMENTATION STAGE: At the laboratory level.

ACKNOWLEDGMENTS: This research was supported by the project 20.70086.06/COV(70105) of the Ministry of Education and Research of the Republic of Moldova.

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

MOLDOVA STATE UNIVERSITY
Scientific Research Laboratory
Advanced Materials for Biopharmaceuticals and Technics
60, Alexei Mateevici str., MD 2009, Chisinau, Republic of Moldova
Tel.: +373 69127593; E-mail: *guleaaurelian@gmail.com*

HR EXCELLENCE IN RESEARCH

NEW INHIBITOR OF PROLIFERATION OF HUMAN RHABDOMYOSARCOMA RD CELLS

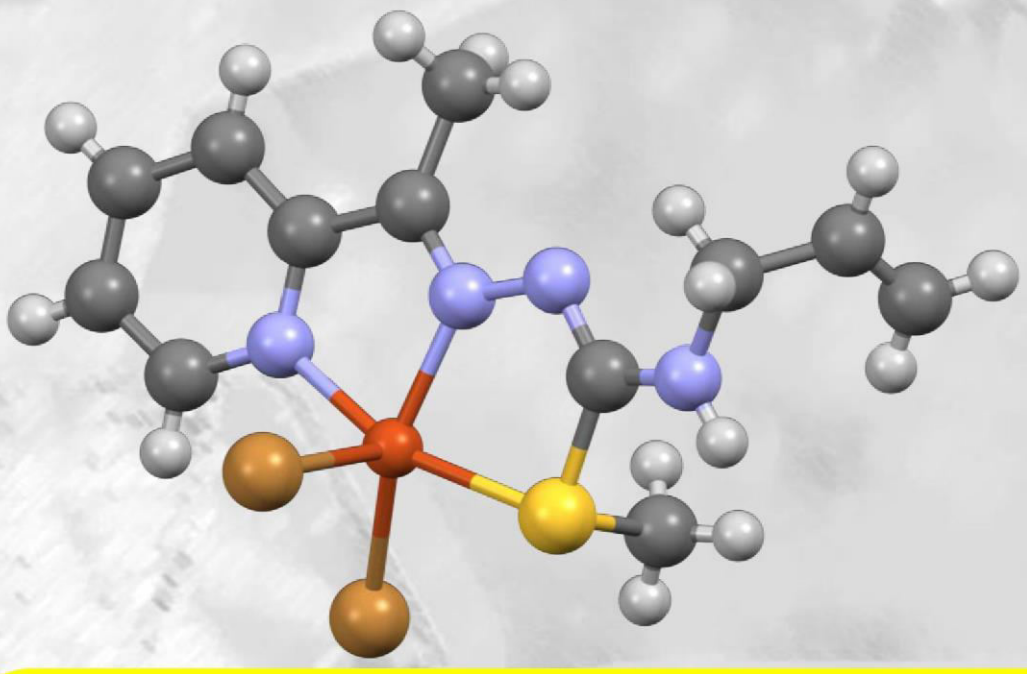
PATENT: MD 4764/2021.08.31

AUTHORS: Aurelian GULEA, Vasilii GRAUR, Irina USATAIA, Olga GARBUZ, Victor ŢAPCOV

APPLICATION FIELDS: Medicine – Pharmacy – Cosmetics.

AIM: Chemical synthesis, characterization of new synthetic inhibitor of human rhabdomyosarcoma RD cells that may find application in medicine.

SOLUTION: New copper coordination compound with thiocarbamide ligand has been obtained using the directed synthesis method.



The IC_{50} values towards RD cells

Compound	IC_{50}, µmol/L
Prototype	1,4
Structural analog	0,68
Claimed substance	0,05

ADVANTAGES: The described compound inhibits the growth and multiplication of human rhabdomyosarcoma RD cells. This agent exceeds 28 times the analogous characteristics of the prototype that is used in medical practice, and 13.6 times analogous characteristics of the structural analog. The discovered property of this substance is of interest for medical practice for enhancement of the arsenal of human rhabdomyosarcoma inhibitors.

IMPLEMENTATION STAGE: At the laboratory level.

ACKNOWLEDGMENTS: This research was supported by the project 20.80009.5007.10 of the Ministry of Education, Culture and Research of the Republic of Moldova.

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

MOLDOVA STATE UNIVERSITY
Scientific Research Laboratory
Advanced Materials for Biopharmaceuticals and Technics
60, Alexei Mateevici str., MD 2009, Chisinau, Republic of Moldova
Tel.: +373 22 24 248; E-mail: *guleaaurelian@gmail.com*
UNIVERSITY OF VERSAILLES
SAINT-QUENTIN-EN-YVELINES, FRANCE

HR EXCELLENCE IN RESEARCH

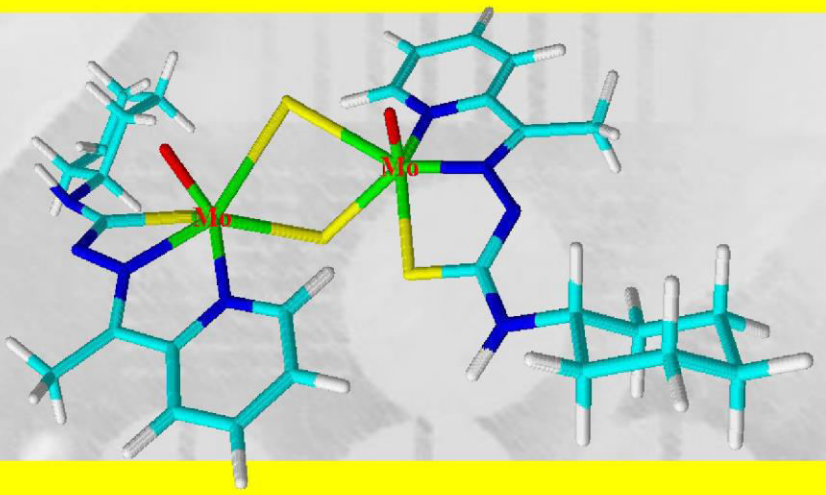
NEW MOLYBDENUM COORDINATION COMPOUNDS WITH IMPORTANT BIOLOGICAL ACTIVITIES

PATENT: MD 4708/2020.08.31

AUTHORS: Arcadie FUIOR, Sebastien FLOQUET, Emmanuel CADOT, Victor TSAPKOV, Olga BURDUNIUC, Ion TODERAS, Aurelian GULEA

APPLICATION AREA: Medicine and pharmaceutics.

AIM: Chemical synthesis and characterization of molybdenum coordination compounds that may be applied in medicine as antifungal agents.



SOLUTION: New molybdenum coordination compound of the thiosemicarbazonate class with high antifungal activity has been obtained using the directed synthesis methods.

Fungiostatic activity (μg / mL) of the claimed compound compared to the prototype

Compound	*Candida albicans ATCC 10231*	*Candida parapsilosis ATCC 22019*	*Cryptococcus neoformans CECT 1043*
Claimed substance	0,98	0,98	0,12
Fluconazole (prototype)	20,0	20,0	16,0

ADVANTAGES: This compound exhibits selective antifungal activity against *Cryptococcus neoformans*, *Candida parapsilosis*, *Candida albicans* that exceeds 133 times analogous characteristics of fluconazole.

STAGE: At the laboratory level.

ACKNOWLEDGMENTS: This research was supported by the project 20.80009.5007.10 of the Ministry of Education, Culture and Research of the Republic of Moldova.

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Liceul Teoretic "Traian Lalescu" Hunedoara

health4everyone Team Romania

Title: Health4Everyone

Student Project

O

Author/s: Maria Gabriela Alexa, Radu Gabriel Buboiu, Alexandru Vasile Budiul, Alecsandru Costa, Ioana Dîscă, Alexia Ioana Neamțu, Ruben Samuel Rotariu, Brianna Alexandra Stan, Denisa Ramona Stroia, Radu Susan (Coordonator: prof. Mircea Nistor)

Health4Everyone este un pachet de soluții la problemele generate de pandemie, alcătuit din trei componente:

1. Sterilizator termic pentru măști de protecție, care permite reutilizarea în siguranță de pâna la 20 de ori a măștilor de protecție. Este deosebit de simplu și ieftin, realizat integral din materiale reciclabile (carton și doar 1,5 grame de fir de cupru).

   Poate fi alimentat de la un încărcător de telefon sau o baterie externă, capabile de minimum 2A la 5 V. Costul energiei electrice pentru sterilizarea unei măști este de doar 0,35 bani.

2. Robot autonom pentru sterilizarea UV. Acesta permite, printr-o suflantă cu efect Coandă și panglici de mylar, sterilizarea și în spatele obiectelor sau în spații mai greu accesibile. Totodată are și funcția de purificare a aerului, cu filtre HEPA de înaltă eficiență.

   Robotul este complet autonom, urmând un traseu prestabilit, marcat cu bandă neagră. Este echipat cu senzori PIR dacă detectează prezență umană și senzori ultrasonici pentru detectarea obstacolelor. Robotul este de câteva zeci de ori mai ieftin decât variantele comercializate curent.

3. Sistem de monitorizare a nivelului de oxigen din aer, destinat saloanelor de spital în care este folosit intens oxigenul. Sistemul monitorizează permanent nivelul oxigenului din aer și semnalează sonor, prin internet și prin sistemul de telefonie mobilă depășirea nivelului admis.

Contact: Mircea Nistor 0727335129 mircea.fizitec@gmail.com

Facebook: RobotX Hunedoara

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Rig-S™: All-In-One Portable Device for Endoscopes

PROFESSOR DR SALINA HUSAIN

NATIONAL UNIVERSITY OF MALAYSIA

O

Project Description

Rig-S is a one-stop portable semi-automated device for sterilizing, drying and storing the endoscopes

Novelty

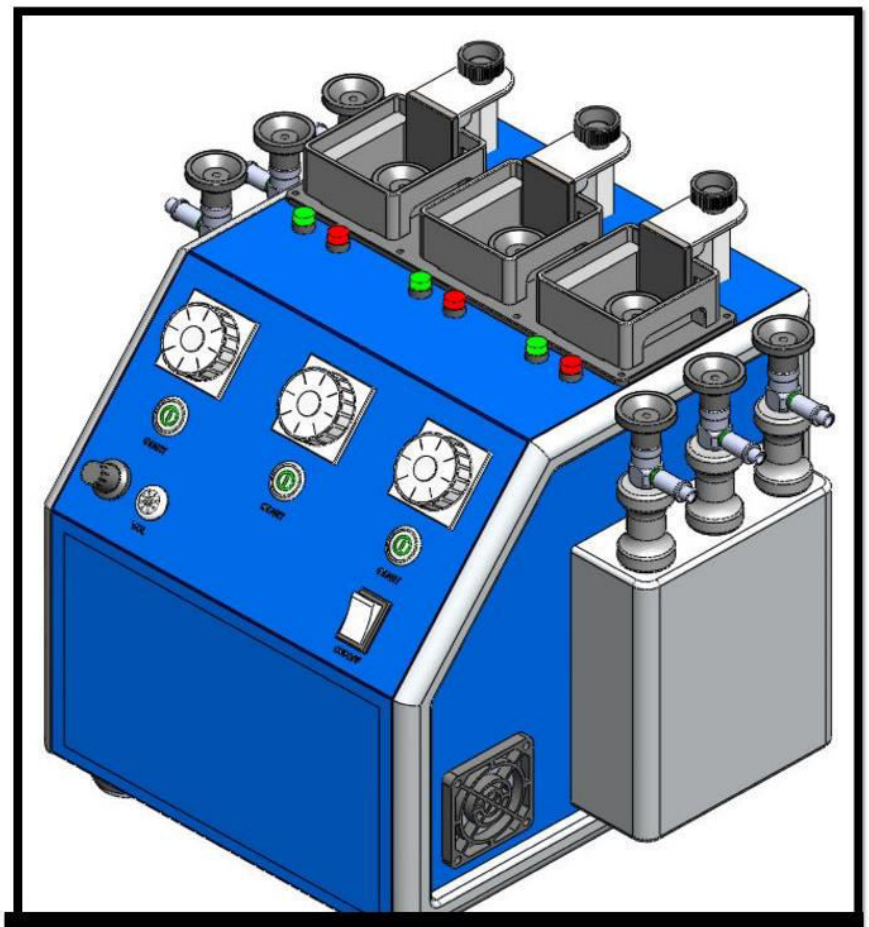
All-in-one portable device comprises of storage unit, sterilization unit with integrated timer and alarm and drying unit with warmer plate

Business Opportunity/Applicability

ENT & Endoscopic Centre at Government and Private Hospitals in Malaysia and ASEAN countries

Business Model

in Ringgit Malaysia	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
CASH INFLOW	**RM 1,190,000**	**RM 650,000**	**RM 930,000**	**RM 1,341,000**	**RM 1,946,700**	**RM 2,842,290**
Investments:	RM 1,190,000	-	-	-	-	-
Government Grant	RM 1,090,000					
Directors/Investors capital	RM 100,000					
Financing:	-	-	-	-	-	-
Bank loan						
Sales Revenue:	-	**RM 650,000**	**RM 930,000**	**RM 1,341,000**	**RM 1,946,700**	**RM 2,842,290**
Manual Model		RM 150,000	RM 180,000	RM 216,000	RM 259,200	RM 311,040
Automated Model		RM 500,000	RM 750,000	RM 1,125,000	RM 1,687,500	RM 2,531,250
CASH OUTFLOW	**RM 1,190,000**	**RM 506,625**	**RM 640,405**	**RM 846,945**	**RM 1,058,031**	**RM 1,361,959**
Startup Expenses	**RM 1,190,000**					
Cost of Goods Sold	**0**	**RM 200,000**	**RM 285,000**	**RM 409,500**	**RM 592,650**	**RM 863,055**
Manual Model		RM 50,000	RM 60,000	RM 72,000	RM 86,400	RM 103,680
Automated Model		RM 150,000	RM 225,000	RM 337,500	RM 506,250	RM 759,375
Manpower	**0**	**RM 162,500**	**RM 188,500**	**RM 240,500**	**RM 240,500**	**RM 240,500**
Management level		RM 65,000	RM 65,000	RM 65,000	RM 65,000	RM 65,000
Sales & Marketing		RM 26,000	RM 52,000	RM 52,000	RM 52,000	RM 52,000
Technical Consultants		RM 52,000	RM 52,000	RM 104,000	RM 104,000	RM 104,000
Admin & Accounts		RM 19,500	RM 19,500	RM 19,500	RM 19,500	RM 19,500
Sales, Marketing & Promotions	**0**	**RM 75,000**	**RM 90,000**	**RM 108,000**	**RM 129,600**	**RM 155,520**
Sales & Marketing Promotion		RM 25,000	RM 30,000	RM 36,000	RM 43,200	RM 51,840
Advertising Cost		RM 25,000	RM 30,000	RM 36,000	RM 43,200	RM 51,840
Marketing materials		RM 25,000	RM 30,000	RM 36,000	RM 43,200	RM 51,840
General Office Expenses	**0**	**RM 69,125**	**RM 76,905**	**RM 88,945**	**RM 95,281**	**RM 102,884**
Office & Showroom Rental		RM 24,000	RM 24,000	RM 24,000	RM 24,000	RM 24,000
Utilities + Office Supplies		RM 5,000	RM 6,000	RM 7,200	RM 8,640	RM 10,368
Telecommunications		RM 5,000	RM 6,000	RM 7,200	RM 8,640	RM 10,368
Internet & website maintenance		RM 2,000	RM 2,400	RM 2,880	RM 3,456	RM 4,147
Miscellaneous general expenses		RM 10,000	RM 12,000	RM 14,400	RM 17,280	RM 20,736
Employee Providence Fund (13%)		RM 21,125	RM 24,505	RM 31,265	RM 31,265	RM 31,265
General & Staff Insurance Premium		RM 2,000	RM 2,000	RM 2,000	RM 2,000	RM 2,000
NETT CASHFLOWS:	**RM 0**	**RM 143,375**	**RM 289,595**	**RM 494,055**	**RM 888,669**	**RM 1,480,331**
OPENING BALANCE:	**RM 0**	**RM 0**	**RM 143,375**	**RM 432,970**	**RM 927,025**	**RM 1,815,694**
CLOSING BALANCE:	**RM 0**	**RM 143,375**	**RM 432,970**	**RM 927,025**	**RM 1,815,694**	**RM 3,296,025**



Intelectual Property

PATENT: UKM.IKB.800-4/1/2085
INDUSTRIAL DESIGN: 20-00532-0101

PROBLEM STATEMENTS

Autoclave – it takes about 45-90 minutes to sterilize the endoscopes

High-level disinfectant in a container – it uses up to 15 litres of solution and no timer

Product Readiness Device, Brochure, Video

Industry Partners

Level of Impact

1. No risk of transmission of microorganisms 2. Reduction of sterilization duration to 5-10 minutes 3. Reduction of the amount of high-level disinfectant to 1 liter 4. User-friendly, ergonomic and good aesthetic value. 5. Reduction of maintenance costs of endoscopes

Achievements / Recognitions

1. All American Davinci International Innovation & Invention Expo, Southern Utah University, USA, 11-13 august 2021 - **Davinci Gold Award**
2. International Invention Innovation Competition Canada (iCAN 2021– Toronto, Canada) **Gold Award and Best Woman Inventor Award**
3. International Exhibition of Inventions Geneva, Switzerland 2021 - **Gold Award**
4. The 35th Virtual World Genius Convention, WGC 2021, Tokyo, Japan 13-14thMay 2021
   i) **Special Award** by International Invention & Innovation Institute
   ii) **Special Award** by Toronto International Society of Innovation & Advanced Skills
   iii) **Gold Award** by World Genius Convention
5. 13th Virtual European Exhibition of Creativity and Innovation, EUROINVENT 2021, Iasi, Romania, 20-22 May 2021
   i) EUROINVENT 2021 **Gold Medal Award**
   ii) **Diploma of Excellence** in EUROINVENT 2021
   iii) **Excellence in Innovation Award** by the Romanian Inventors Forum
   iv) **Special Award** of the Turkish Inventors Association (TUMMIAD)
   v). **Special Award Diploma** of the "Stefan cel Mare University of Succava, Romania
6. **International Award of Merit** – The Malaysia-Croatia Technology Exchange 2020
7. **Gold Award** - 19th International Expo on Inventions and Innovations, Kuala Lumpur, 2021

★★★★★ SMART WARD (IOT) ★★★★★

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

SIVASHANKERY BALAN & SHIVA ROOBINI BALAN
ROBOTICS LAB G-ROBOTECH ACADEMY – MALAYSIA

O

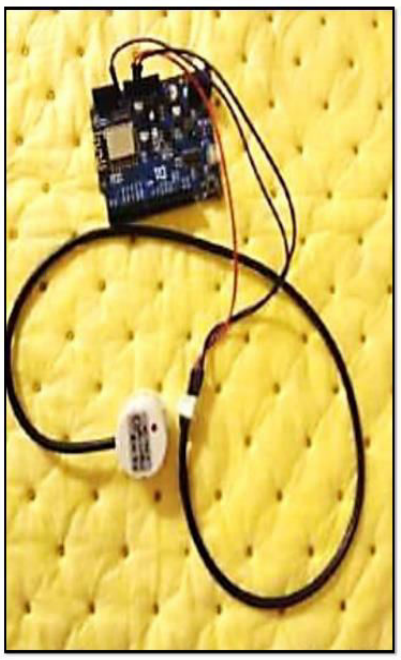
INVENTION DESCRIPTION SUMMARY

Smart ward has the ability to dispense medicine to a patient on time. Water dispenser is integrated with the system and water will be dispensed once the medicine is dispensed and senses a cup. There will be a sound to notify the patient to take medicine on time. Air and light monitoring system are also embedded in this project. We are using blynk app to control. This will allow the nurses to perform others work such as taking blood pressure reading from patient and giving injection to patients on time. We can give full assurance this idea would be grade implements in all hospitals to reduce the workload of a nurse. By reducing nurses' burden, they can focus more on other tasks and provide a more comfortable environment for all patients.

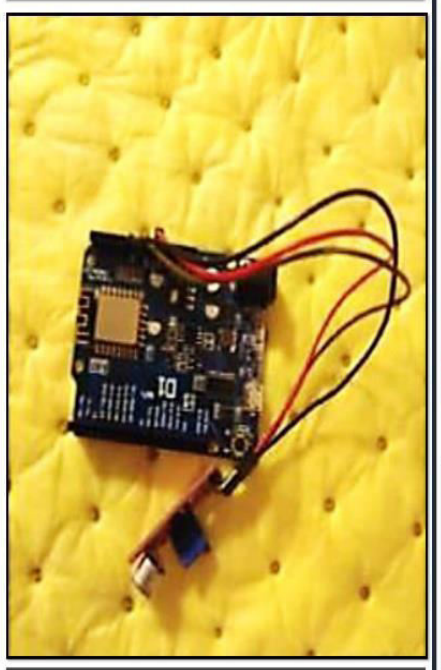
INVENTION VISUALS

AUTOMATIC WATER & MEDICINE DISPENSER

LIGHT CONTROLLING MONITORING SYSTEM



LIQUID LEVEL DETECTOR



NOISE LEVEL CONTROL

AWARDS

E-INNOVATE 2020 GOLD MEDAL

E-THIC 2020 GOLD MEDAL

I+ACEH 2020 SPECIAL AWARDS FROM SRIT-INDIA & KINEWS-KOREA

ICCI 2020 GOLD MEDAL

I+ACEH 2020 GOLD MEDAL

iCAN 2020 GOLD & SPECIAL AWARD

GOLD MEDALS in IPITEx & WICO 2020

INVENTION PRESENTED BY
TISIAS - CANADA
WEBSITE: www.tisias.org
EMAIL: info@tisias.org
FACEBOOK: INVENTOR SOUND

TISIAS
TORONTO INTERNATIONAL SOCIETY OF INNOVATION & ADVANCED SKILLS

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Method of recovery of protein concentrates enriched with alpha-lactalbumin from whey

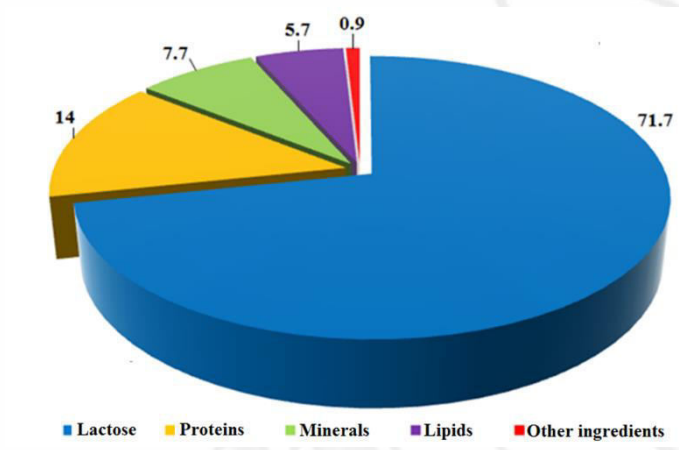
Patent MD 1547 Y

O

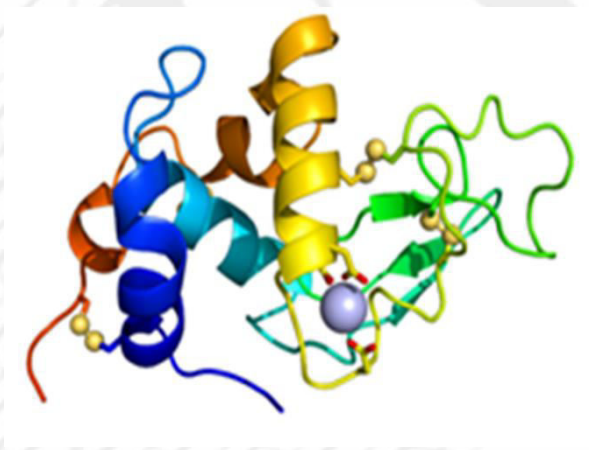
Author/s: Vrabie Elvira, Sajin Tudor, Bologa Mircea, Paladii Irina, Vrabie Valeria, Stepurina Tatiana, Policarpov Albert, Gonciaruc Valeriu, Sprincean Catalina

Purpose: The method of recovery of protein concentrates enriched with α-La from whey can be used in dairy industry

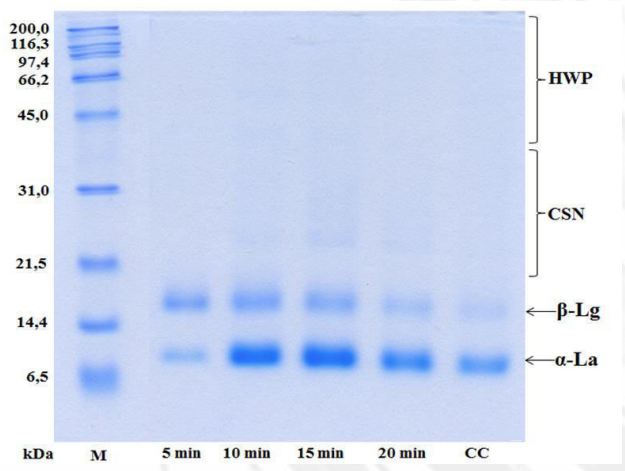
Advantages: Wasteless processing of secondary dairy products with the extraction of mineral protein concentrates (PMC) and simultaneous isomerization of lactose in lactulose, which allows the recovery of proteins in PMC with predetermined protein content, especially with α-La.



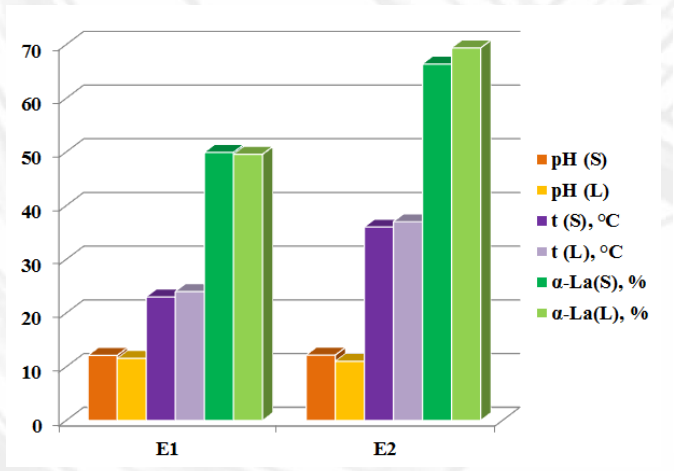
The solid content of whey



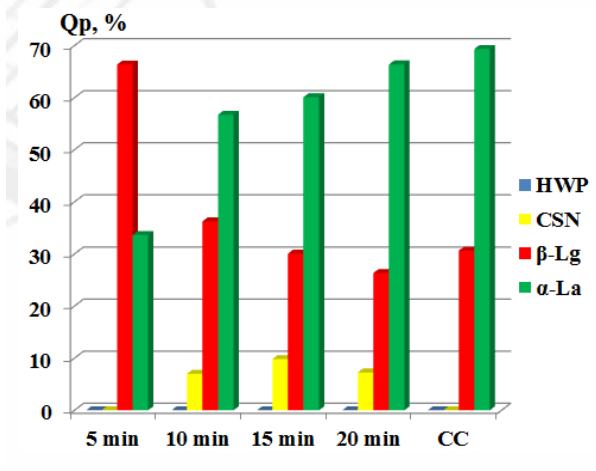
Structure of the α-La



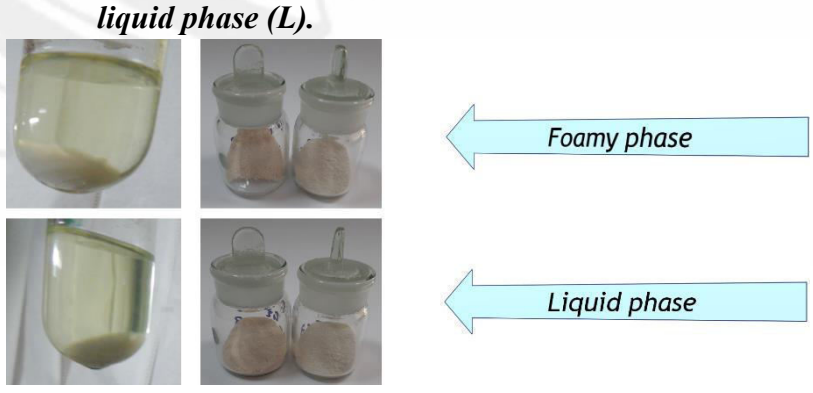
SDS-PAGE 15% of soluble protein concentrates isolated with 0.05 M Tris-HCl buffer 0.5 M NaCl, 0.5 mM EDTA (0.04% NaN_3), pH 8.0



Variation of α-La extraction in PMC depending on processing regimes and variation of pH and temperature values in examples E1 (10 mA/cm²), E2 (20 mA/cm²) in the foamy phase (F) and the liquid phase (L).



Variations of content (Q_p, %) of major soluble protein fractions recovery in PMC



Contacts: *5, Academiei Str., Chisinau, MD 2028, Republic of Moldova.*
Phone: (+373) 69637074 E-mail: vrabie657@yahoo.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

MEDICAL RECOVERY DEVICE BY THE 3D METHOD for therapy through the mirror system

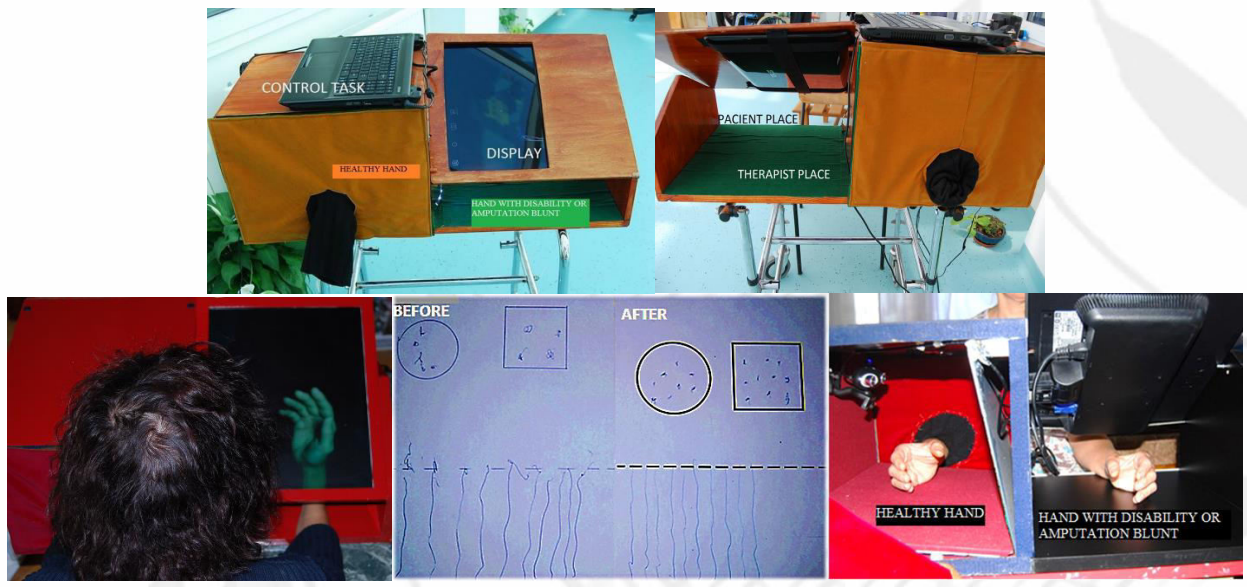
DISPOZITIV DE RECUPERARE MEDICALĂ PRIN METODA 3D pentru terapia prin sistemul oglindă

Author/s: **Istvan VER, Rodica-Ana UNGUR**

Patent: **130153/30.08.2021**

O

The invention relates to a recovery device, intended for mirror therapy, which can be used to correct mobility disorders in upper and / or lower limb paresis caused by stroke (stroke), trauma, tumors, in the treatment of phantom limb pain in people who have suffered amputations, in the treatment of complex regional pain syndrome (post-surgical, post-traumatic, post-stroke, etc.) and in the treatment of musculoskeletal pain of various etiologies.



Mirror therapy is based on "brain trickery" and the activation of mirror neurons along with neurons that give commands of similar movement in the paired limbs. This is based on replacing the image of the diseased limb (amputation blunt or spastic paretic limb with a modified appearance and movement following a stroke, etc.) with a normal image that the patient views instead of the diseased limb image. In the simplest way, the image of the healthy limb reflected by a mirror, placed so as to mask the diseased limb, can replace the image of the diseased limb. The brain has the property of changing through learning - this is the plasticity of the brain. Thus, stimulated neurons can create numerous synapses to increase the efficiency of neural circuits or to transfer certain lost functions (the function of lost neurons can be taken over by the remaining neurons). In the process of learning or re-learning lost movements, it is very important to perform and repeat the movements in the most correct way. Repeating as many numbers as possible and in the most correct way of the movements leads to the automation of the movements and to the creation of some motor frames. The construction of the device provides the maintenance of a correct posture of the patient during the exercises, and due to the fact that the image is viewed in real time and is a real image of the patient's limb, which moves according to his voluntary desire, and 3D glasses reduce the influence of stimuli. external, the whole re-learning process is optimized and streamlined.

Contact: veristvan69@yahoo.ro

0040745424085

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

DISPOZITIV DE MERS CU MECANISM adaptat dispozitivelor de mers, pentru asistarea transferului din poziția șezând în ortostatism și din ortostatism în poziția șezând

WALKING DEVICE WITH MECHANISM adapted to walking devices, to assist the transfer from sitting to orthostatism and from orthostatism to sitting position

Author/s: Istvan VER, Rodica-Ana UNGUR, Alina-Elena VER

Patent: A00199/2015

Various methods have been tried to streamline the systems for fixing and adjusting the telescopic rods of walking devices, so that they achieve with the best possible results the objectives proposed in medical recovery and in improving the quality of life of patients.

From a technical point of view, the functional role of this lifting piston mechanism (telescope) applied to walking devices is to assist the transfer from a sitting position to orthostatism - providing a propulsive force when lifting, as it supplements the force required for lifting. on the gait device) and to provide a controlled transfer from orthostatism to the sitting position of the patient only to be left with his own weight on the gait device, which is shortened and at the same time supporting the patient's weight. It can also assist the ascent and descent of the steps.

Initiating the sliding of the elements that make up the walking device rod, this is done by the patient actuating the lever mechanism that initiates the locking mechanism, thus achieving the locking / unlocking in / from the desired position of the walking device

The advantages of the device with the lifting piston mechanism (telescope) attached to the walking devices, which is the object of the present invention, are:

• the constructive solution proposed in the invention does not imply the design of new walking devices, but the adaptation of the existing ones;
• technical development of the device and its adaptation to walking devices, involves low costs;
• the release time of the mechanism when actuating the lever, which has the effect of lengthening or shortening the telescopic part of the walking device, is almost instantaneous;
• transfers from orthostatism to sitting position and from sitting position to orthostatism are faster, so there is no overload of the patient's scapulohumeral joint.

Contact: veristvan69@yahoo.ro

0040745424085

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

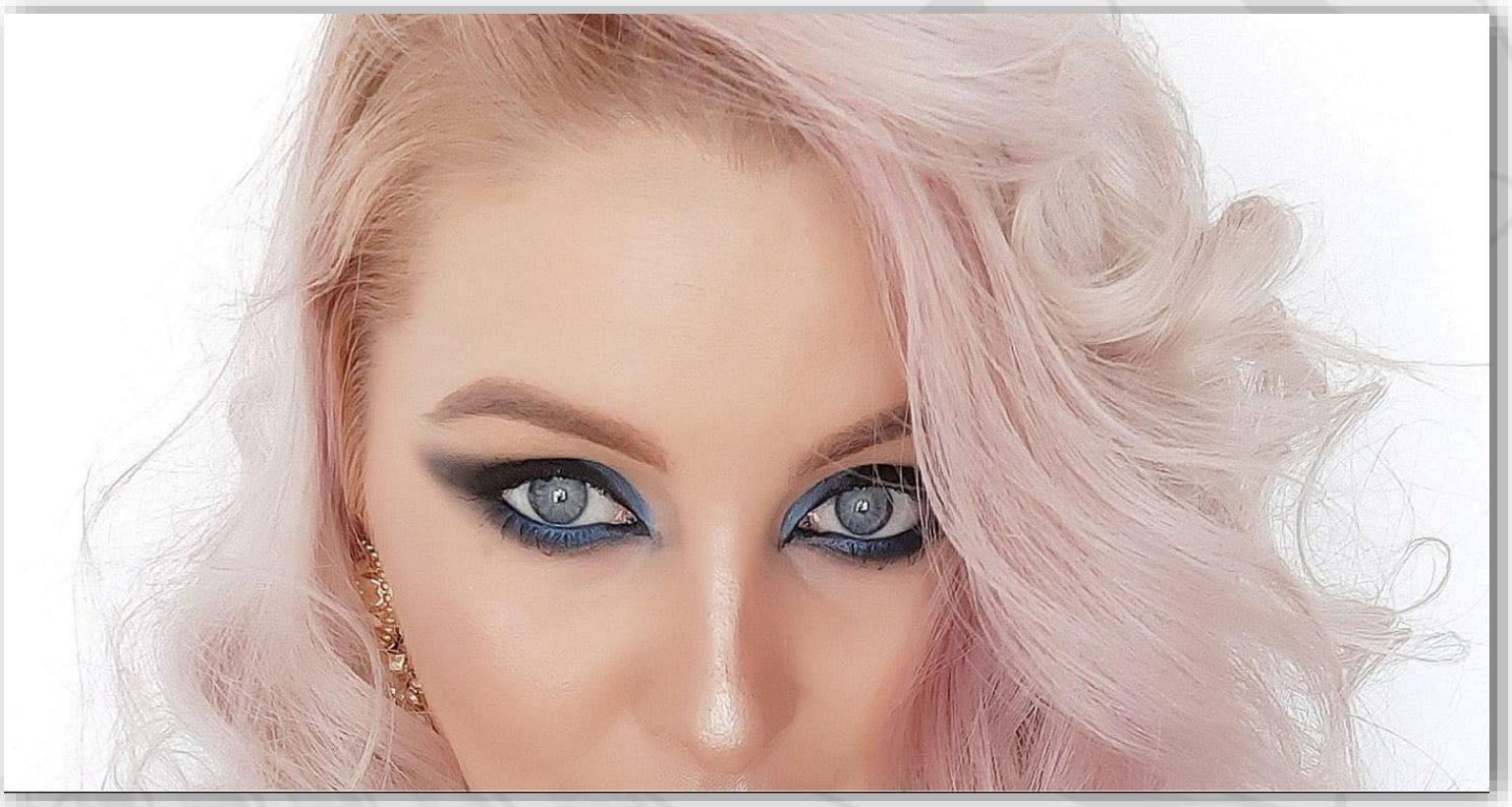
Make-up
by
R.P

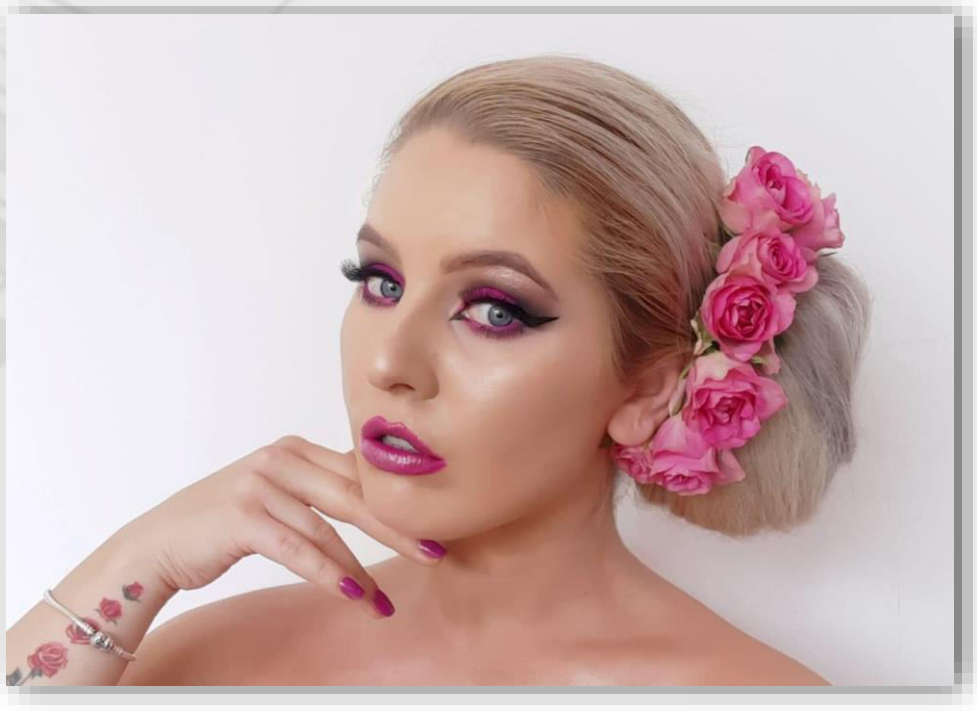
Make-up by R.P

Author: Raluca Plesca

O

Ma numesc Raluca, am 23 de ani iar pasiunea mea este machiajul. Încă din copilărie căutam frumosul in orice făceam, apreciam femeile frumoase, aranjate. Totul a început de la o joaca, treptat ajungând la dorința de a creea propriul business. Am început sa îmi ma machiez prietenele, vecinele, care ulterior au devenit clientele mele fidele. Am început un job pentru a strânge bani pentru cursuri. Am ales primul curs acreditat, urmând alte masterclassuri și cursuri pentru sitilizarea sprâncenelor. Treptat am achiziționat materiale de cea mai buna calitate, ustensile și am creat un spațiu pentru a-mi desfășura activitatea, următorul proiect va fi deschiderea unui salon persoanal unde sa creez frumos alături de clientele mele. Imi iubesc hobby-ul, creez machiaje unice, schimb stările clientelor prin frumusestea creatilor mele. Curând **Make-up by R. P** va deveni un brand de succes, care va lansa pe viitor propria linie de beauty. Momentan sunt formator de make-up in Deva la un centru beauty.





Contact: raluca.plesca18@gmail.com

+4 0744407371

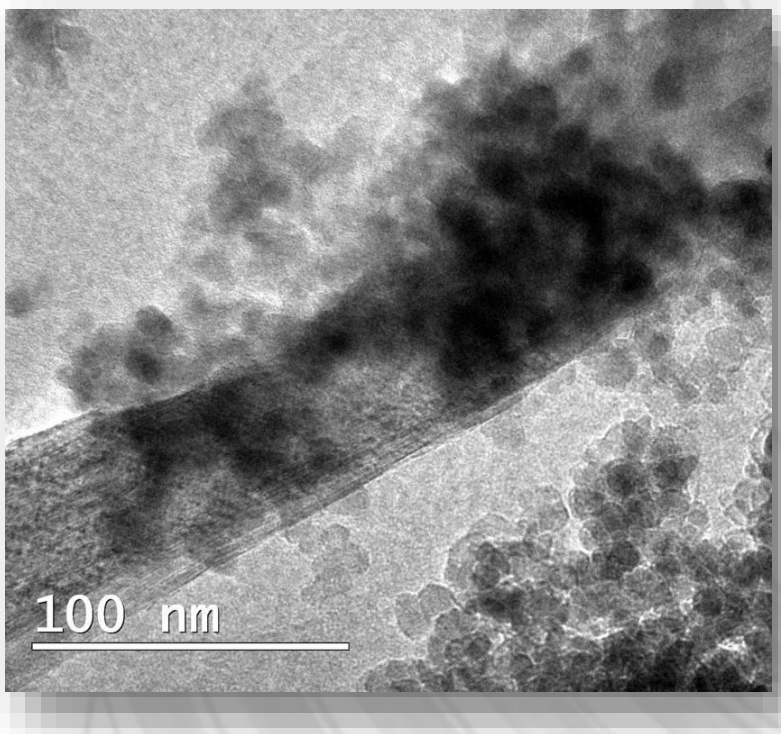
ANTIMICROBIAL FILMS FROM MULTIPLE-WALLED CARBON NANOTUBES DECORATED WITH TITANIUM DIOXIDE NANOPARTICLES FOR DERMATOLOGICAL PROTECTION AND REGENERATION

O

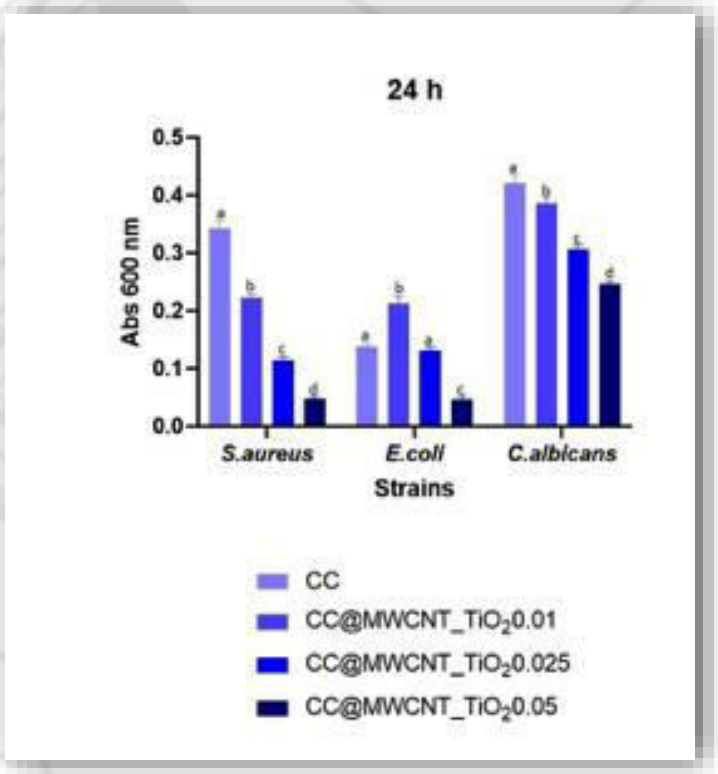
Patent Application: 00705/23.11.2021

Authors: Mădălina Elena David, Rodica Mariana Ion, Laura Monica Gorghiu, Lorena Iancu, Ramona Marina Grigorescu, Nelu Ion

This research focused on the synthesis of multi-walled carbon nanotubes (MWCNTs) decorated with TiO_2 nanoparticles (NPs) and incorporated in cellulose acetate-collagen film in order to obtain a new wound dressing biomaterial with improved antimicrobial activity.



TEM of MWCNTs decorated with TiO_2 NPs



Antimicrobial tests

MWCNTs decorated with TiO_2 NPs with diameter of about 15 nm was confirmed by several structural and morphological analysis, such as Fourier transformed infrared spectroscopy, Raman spectroscopy, X-ray diffraction and transmission electron microscopy. The antimicrobial tests sustained that the presence of the nanocomposites into the polymeric matrix is an important aspect in increasing and maintaining the antimicrobial activity of the polymeric wound dressings over time. The biocompatibility and cytotoxicity of the obtained films was evaluated using MTT assay and fluorescent microscopy which revealed the ability of the obtained materials as wound dressing biomaterial.

Contact: rodica_ion2000@yahoo.co.uk

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

Camera analgezicã/Analgesic chamber

Ce reduce: durerea, oboseala, depresia, somnolenta, nervozitatea, anxietatea, stresul, ametelile, zgomotul si ne face mai lucizi

What it reduces: pain, fatigue, depression, drowsiness, nervousness, anxiety, stress, dizziness, noise and makes us more lucid

AUTOR: NICOLAE BUCUR MAIL: bucur.nicolae39@gmail.com

Patent N0.:

WIPO/PCT/RO2021/050009

OSIM/ RO202000525A

2020-08-20

EPO/ RO134640 A0

Category: O

Advantages of the invention

A first advantage of the room is that it can be placed I - 2 - 3 or in windows in the form of portholes. No windows could be placed in a classic anechoic room.
The invention has the following advantages: it can be built from sizes starting from a few centimeter to the size of a cathedral or even a stadium. So, you can make a room the size of a cup, where we can insert a mouse, which protects it from a noise of 200 decibels. It can be built perfectly transparent it can be mounted in homes or offices
Theoretically, if the vacuum is absolute and there is no acoustic bridge (it would levitate magnetically), you should shoot with the cannon outside, and there should be absolute silence inside.

digi24.ro that: "40% of the Earth's population suffers from meteosensitivity". According to my calculation, about 300 million Europeans are meteosensitive, and there are about 3 billion worldwide. I am sure that many need a lot of answers. These answers may come from this chamber.
If a patient feels bad outside and well inside, then that person will know for sure what upsets him / her, and he / she will understand that it is not something serious.

WHAT SCIENTIFIC AND MEDICAL VALUE DOES THE ANALGESIC CHAMBER HAVE ON THE METEOSENSITIVES?

Infrasound and meteosensitivity can cause a whole series of symptoms throughout the body. In the skeletal system, articular system, central nervous system, cardiovascular, respiratory, digestive and muscular system etc. Even vision is impaired. If it affects the whole body, with this new tool, we can research the suite of diseases that do not know why they occur, and there is no treatment.

All kinds of experiments are performed in research with rats or mice. We can experience whether this chamber can prolong the life of a little mouse, as compared to one that lives under normal conditions. We can experience if those living in the room still develop diabetes, cancer, Alzheimer's, Parkinson's, dementia or autoimmune diseases.
The life of these rodents is very short, and we can do tests related to diseases for which one does not know the causes. There are about 500 diseases in which the cause is not known, and so we can check if infrasounds would have any contribution in triggering them.

More details at Vremea meteosensibiilor(Facebook) and at Academia Română on the link
https://www.facebook.com/2378497412212883/posts/3903310603064882/

Camera analgezicã/Analgesic chamber

Ce reduce: durerea, oboseala, depresia, somnolenta, nervozitatea, anxietatea, stresul, ametelile, zgomotul si ne face mai lucizi

What it reduces: pain, fatigue, depression, drowsiness, nervousness, anxiety, stress, dizziness, noise and makes us more lucid

AUTOR: NICOLAE BUCUR MAIL: bucur.nicolae39@gmail.com

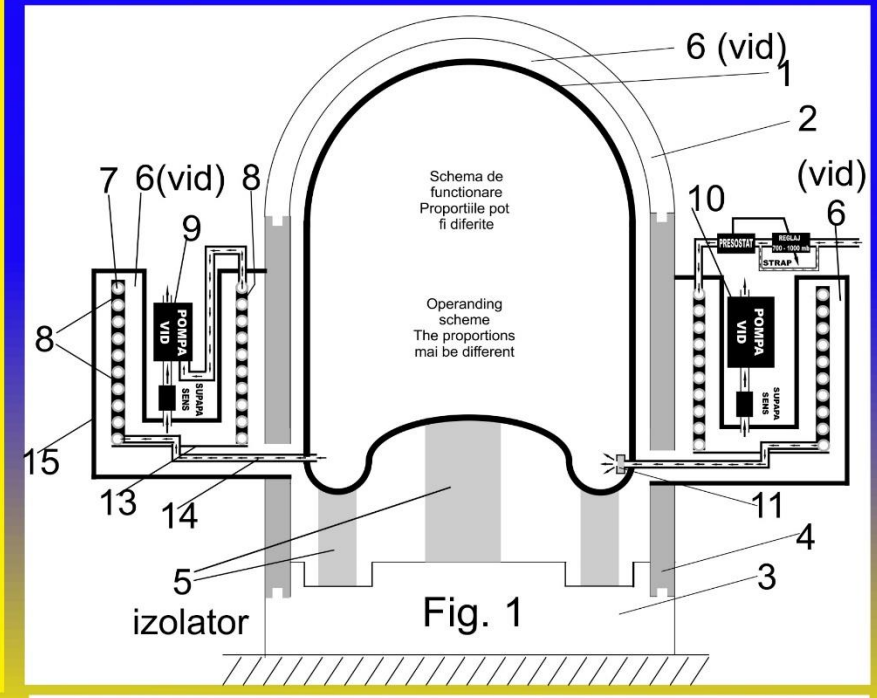


Fig. 1

Avantajele inventiei

Un prim avantaj a camerei este ca se poate pune 1 - 2 - 3 sau n ferestre sub forma de hublouri. La o camera anecoica clasica nu se putea pune ferestre.

Inventia are urmatoarele avantaje: se poate construi de la marimi incepand cu cativa centimetri, pana la marimea unei catedrale sau chiar unui stadion. Deci se poate realiza o camera de marimea unei cani, unde sa introducem un soricel, ce il protejeaza de un zgomot de 200 de decibeli. Se poate construi perfect transparenta, se poate monta in locuite sau birouri.

Teoretic, daca vidul este absolut si nu exista nici o punte acustica (ar levita magnetic), ar trebui ca afară sa tragi cu tunul, iar in interior sa fie liniste absoluta.

"40% din populația Pământului suferă de meteosensibilitate" După calculul meu, vreo 300 de milioane de europeni sunt meteosensibili, iar în lume sunt cam 3 miliarde. Sunt convins că foarte mulți au nevoi de multe răspunsuri si de aceasta camera.

Camera analgezică, ar putea fi utilă în cercetarea medicală, a celor circa 500 de boli care au cauză necunoscută

Infrasunetele și meteosensibilitatea, pot genera o serie întreagă de simptome în întreg organismul. In sistemul osos, sistemul articular, nervos central, cardiovascular, respirator, digestiv, muscular etc. Chiar și vederea este afectată. Dacă afectează întreg organismul, cu acest instrument nou, putem cerceta suita de boli care nu se cunoaște de ce apar, și nu exista tratament.

In cercetare se fac tot felul de experimente cu șobolani sau șoareci. Putem experimenta dacă această cameră, poate prelungi viața unui șoricel, comparativ cu unul care trăiește în condiții normale. Putem experimenta dacă cei care trăiesc în camera, mai fac diabet, cancer, Alzheimer, Parkinson, demență, sau boli autoimune. Viața acestor rozătoare este foarte scurta, și putem face teste legate de bolile care nu se cunosc cauzele. Sunt circa 500 de boli in care cauza nu este cunoscută, și deci putem să verificam dacă înfrasunetele ar avea vreo contribuție în declanșarea lor.

Mai multe amanunte in 11 articole la Vremea meteosensibililor si la Academia Romana pe link_ul :
https://www.facebook.com/2378497412212883/posts/3903310603064882/

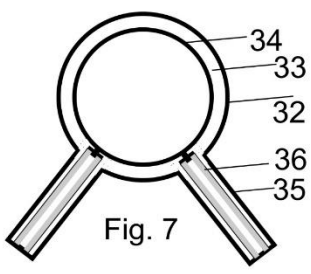


Fig. 7

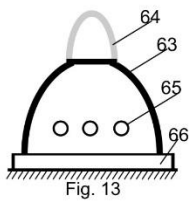


Fig. 13

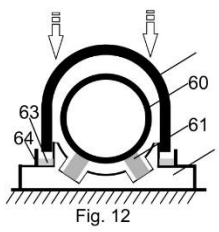


Fig. 12

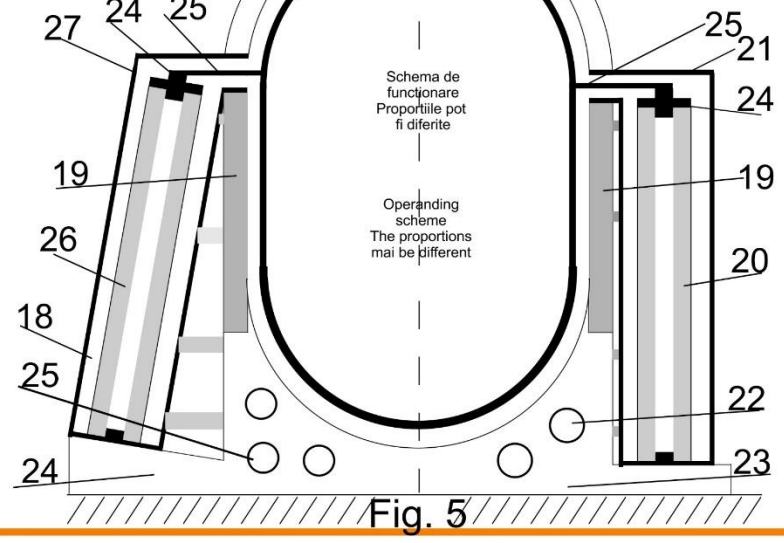


Fig. 5

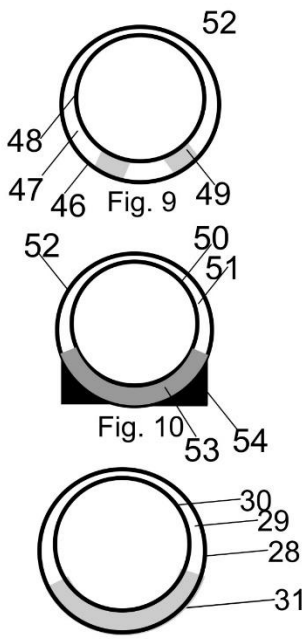


Fig. 9
Fig. 10
Fig. 6

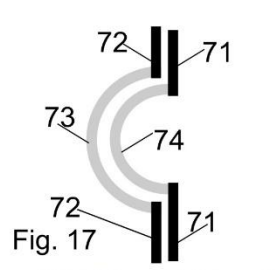


Fig. 17

Hublou dublu emisferic, izolat cu vid
Double hemispherical porthole,
insulated inside with vacum

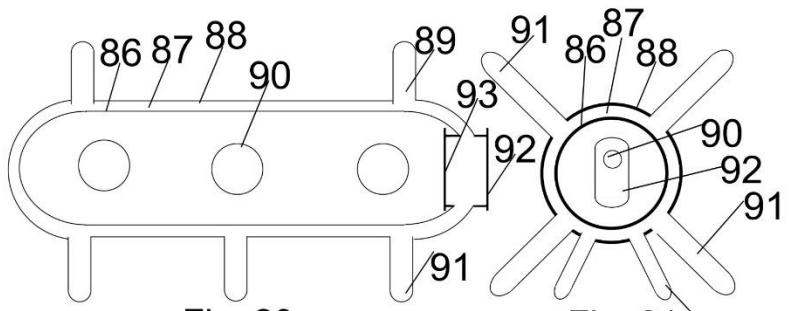


Fig. 20
Fig. 21

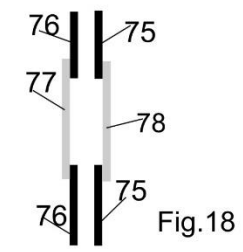


Fig.18

Hublou dublu simplu, izolat cu vid
Double simple porthole,
is with vacuum insulated

Lucrare în curs de brevetare :WIPO/PCT/RO2021/050009 – OSIM/ RO202000525A · 2020-08-20
EPO/ RO134640 A0 documentatie completa la Oficiul European Brevete
https://worldwide.espacenet.com/publicationDetails/originalDocument?CC=RO&NR=134640A0&KC=A0&FT=D&ND=3&date=20201230&DB=&locale=en_EP

Descrierea lucrării,

Inventia de fata se refera la o camera/cladire/locuinta foarte bine izolata fonic (anecoica), destinata tratamentului persoanelor meteosensibile, bolnavilor de fibromialgie, oboseala cronica, durere cronica, cu fobie meteo, astenie de primavara, bolnavii in faza terminala, pentru bolnavii de alzhaimer aflati in depresie sau crize isterice. Se poate folosi pentru recreere si stare de bine, pentru crestrea randamentului si creativitatii, pentru inspiratia poetilor, pictorilor, compozitorilor.
Este o camera suspendata in vid. Este o butelie dubla ai căror pereti nu se ating, care poate avea orice forma. Este de mii de ori mai bine izolata decat o camera fonica cu izolatia de 2 – 3m pe toate laturile.

The present invention relates to a very well soundproofed (anechoic) room / building / dwelling, intended for the treatment of sensitive weather persons, patients with fibromyalgia,chronic fatigue, chronic pain, with weather phobia, spring asthenia, terminally ill, for Alzheimer's patients in depression or hysterical attacks. It can be used for recreation and well-being, to increase efficiency and creativity, to inspire poets, painters, composers.
It is a vacuum-suspended chamber. It is a double bottle (tank - cylinder) whose walls do not touch, which can have any shape. It is thousands of times better insulated than a sound chamber with 2-3 m insulation on all sides.

Domeniul de aplicabilitate:Teste medicale asupra imbatranirii si a celor 500 de boli cu cauza necunoscuta, la oameni sau rozatoare. Reducerea (teoretica) cu 200 Db zgomot si a infrasunetelor. Putand fi folosita pentru industrie, poligon de tragere, stiinta.

Mai multe detalii gasiti pe link-ul de mai jos (in 11 articole)
Totul despre camera analgezica
https://www.facebook.com/2378497412212883/posts/3903310603064882/

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

ROZY
NAILS

ROZY NAILS

Author: Cailean Rozalia

O

The **Rozy Nails Salon** spoils you with high quality services. The impeccable manicure is your business card, the first detail that those around you notice at first sight.

Services offered by **Rozy Nails**: classic manicure, gel manicure and semi-permanent manicure.

Salonul Rozy Nails te răsfață cu servicii de înaltă calitate. Manichiura impecabilă reprezintă cartea de vizită, un detaliu care face diferența.

Servicii oferite de **Rozy Nails**:

- manichiură clasică;
- manichiură cu gel;
- manichiură semipermanentă.

Contact: **https://www.facebook.com/cailean.rozalia**

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

cca
Centrul de Cultură și Artă
al Județului Hunedoara

Mioriţa. Ethnography and folklore review

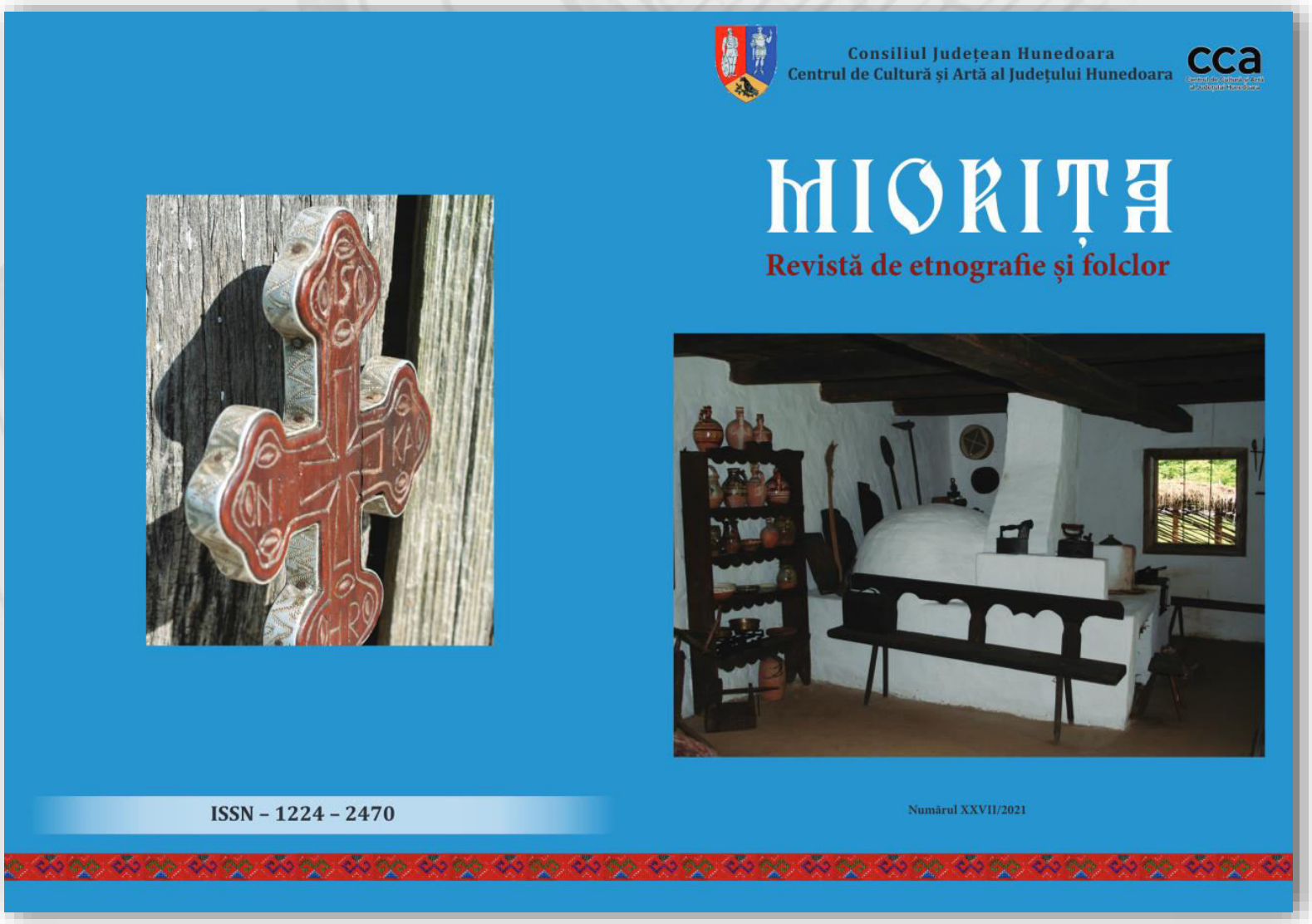
Scientific Review

Author/s: **Editor:** CS I dr. habil. Gherghina Boda,
Scientific editorial secretary: CS III dr. habil. Dumitru-Cătălin Rogojanu

P

The *Miorița* review appeared for the first time in 1994. In 2019, it appeared in a new format under the care of the ***Hunedoara County Council*** and the ***Culture and Art Center of Hunedoara County.*** The scientific committee has included writers, academics, specialists in ethnography and folklore, historians, personalities that have given the journal its thoroughly scientific approach and particular visibility in the Romanian ethnographic space.

The studies published by these prominent personalities in the fields of ethnology, history, anthropology, communication sciences and ethnomusicology have given special importance to the journal while contributing to the enrichment of the scientific heritage of the county but not limited to it, offering the reader a series of information, some unique, related to the chosen topic or to the results of the scientific research undertaken by the authors.



Contact: Bd. 1 December 1918, no. 30, Deva, Hunedoara County
Telephone: 0354 407 408, Email: revistamiorita@yahoo.com, contact@ccajhd.ro

Q

Space science

Astronomy

R

Nanotechnology

Advanced materials

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Casa Științei

Space science by Casa Științei

experimental learning project for students

Author: Tiberiu Stroia & Team

Q

Multiple experiments explained for everyone's understanding with refinement and fun by Tiberiu Stroia, founder of Casa Științei Deva.

Experiment for aerospace technology case study being the rocket. The components used in the construction of the experimental missiles are generally recyclable materials purchased from the scrap yard.

Using a mixture of potassium nitrate, glucose and iron oxide, we can get the fuel needed to power a rocket engine.

Multiple experimente explicate pe înțelesul tuturor cu rafinament si amuzament marca Tiberiu Stroia fondator Casa Științei Deva.

Folosind un amestec de nitrat de potasiu, glucoză și oxid de fier, putem obține combustibilul necesar alimentării unui motor de rachetă.

Prin aprindere, acesta degajă, cu mare viteză, o cantitate mare de gaze care, conform principiului reacțiunii, va propulsa racheta experimentală.

Contact: stroiatiberiu@yahoo.com

Development of sensor for ultraviolet radiation detection based on Ti-n-TiO_2/p-$CuMnO_2$ heterostructure

Nicolaescu Mircea-Daniel[1,2], Lazau Carmen[1], Orha Corina-Ileana[1], Bandas Cornelia-Elena[1], Poienar Maria[1]
[1]National Institute for Research and Develpment in Electrochemistry and Condensed Matter, no 144, A. Paunescu Podeanu Street, Timisoara 300569
[2]Politehnica University of Timisoara, 300006, Timisoara, Romania

Patent requst no. A/00474/11.08.2021

Description

The technical problem solved The invention relates to the development of heterostructure sensors based on Ti-TiO_2-$CuMnO_2$ obtained in two steps: The first step involves the chemical treatment in 0.5 M hydrofluoric acid for 1h, and, respectively, the grow of TiO_2 layers by thermal oxidation on the titanium foil forming the Ti-TiO_2 structure. The second step consisted of deposition the $CuMnO_2$ film on the Ti-TiO_2 surface forming the Ti-TiO_2-$CuMnO_2$ structure by using the "Doctor Blade" method followed by thermal sintering at 250 ◦C for 1 h. The current-voltage measurement of the as-synthesized oxide "n-p" heterojunction was investigated at room temperature in dark and UV conditions, to show both junction formation and UV detection. Additionally, the photo detective properties under UV and dark exposure of the heterojunction device at a bias of 2 V were achieved by switching of the UV illumination from the "ON" to the "OFF" state.

Testing UV sensor

In Figure 7 is presented the Current-voltage measurements in dark and UV condition. The I-V analysis shows a reduced turn-on voltages from 0.858 V to 0.513 V at UV illumination.

Also, an increase of current from 241mA to 412 mA in forward bias between dark and UV illumination can be observed.

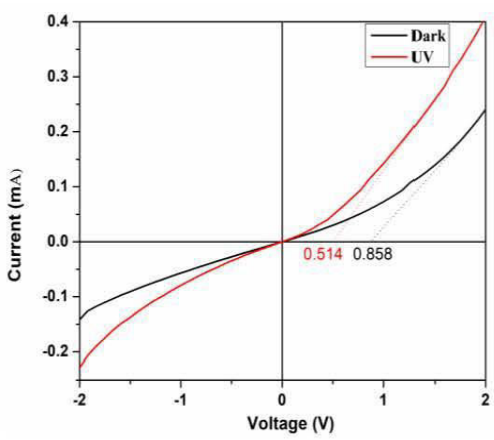


Fig. 7. Current-voltage characteristics of *n*-TiO2/*p*-CuMnO2 heterojunction under dark and UV irradiation

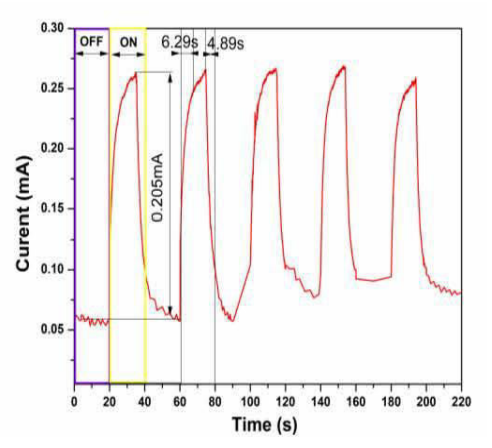


Fig. 8. Current-time photo-detective properties of the UV sensors at light exposure (ON/OFF = 20 s).

The response time of the heterojunction sensor upon UV lighting it was about 6.29 s and recovery time is about 4.89 s.

The sensitivity of the sensor was determinate at 4.89.

The responsivity value was determinate at 2.05 A W^{-1} cm^2

Characterization TiO_2 layer

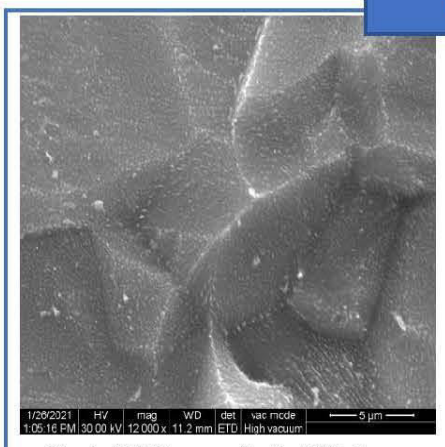


Fig 1. SEM images for the TiO_2 layer

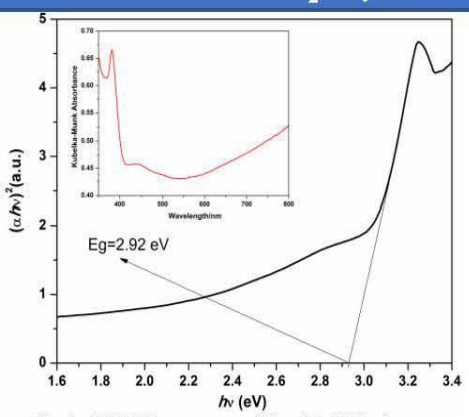


Fig 2..UV-Vis spectra of the Ti-TiO_2 layers

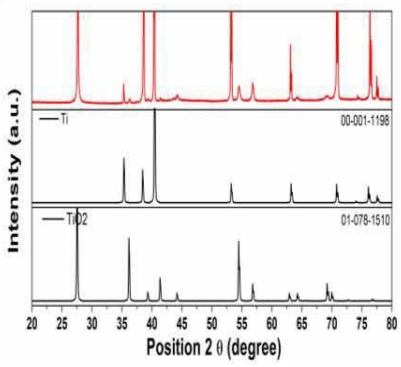
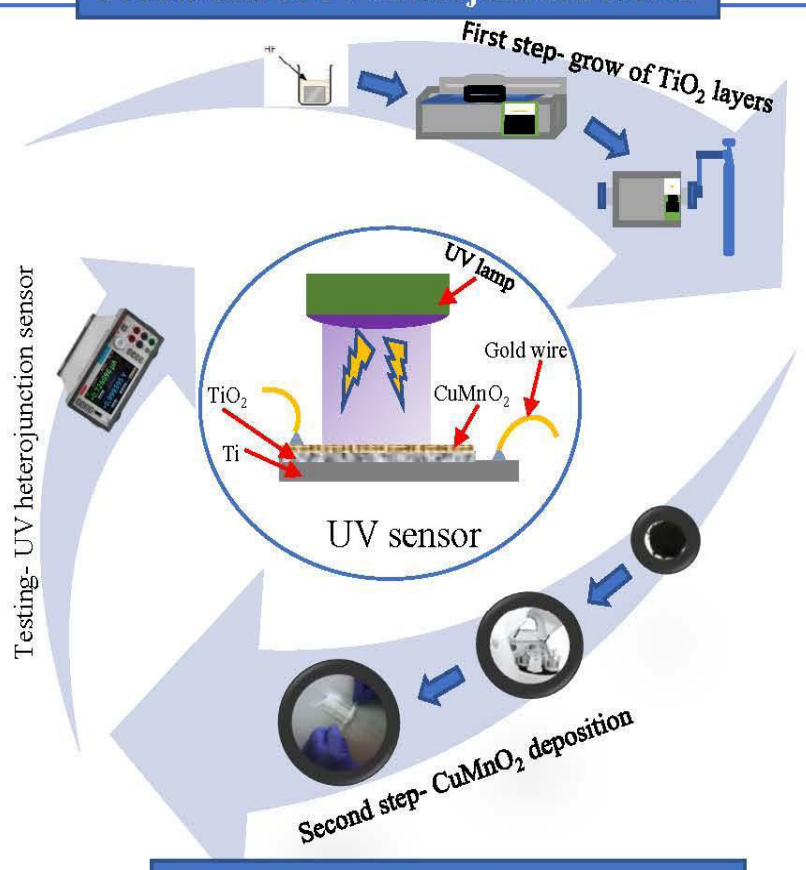


Fig.4. XRD patterns for Ti-TiO_2 layers

Production of UV heterojunction sensor



Discusses heterostructure layers

Morphological characteristics that were determined by SEM underlined that the TiO_2 layers were grown and oriented in clearly defined and delimited directions by the curved surfaces of the polyhedral structure. The $CuMnO_2$ films uniformly covered, without cracks, the surface of the TiO_2 layers following their polyhedral shape.

The structural characteristics of the Ti-TiO_2 layers and Ti-TiO_2-$CuMnO_2$ sensor were investigated by XRD technique, which confirmed the phases stability and purity of the as-synthesized materials.

The UV-Vis absorption spectra of the synthesized oxide layers show that the synthesized Ti-TiO_2-$CuMnO_2$ structures have a strong absorption in the UV range, demonstrating that the heterostructures have a strong affinity for UV light

Characterization $CuMnO_2$ layer

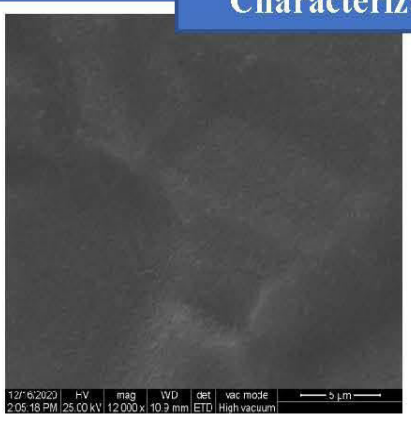


Fig. 5. SEM images for the as-deposition $CuMnO_2$ layer

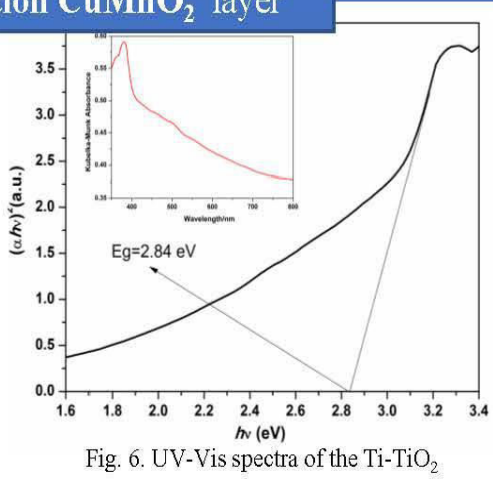


Fig. 6. UV-Vis spectra of the Ti-TiO_2 $CuMnO_2$ layers

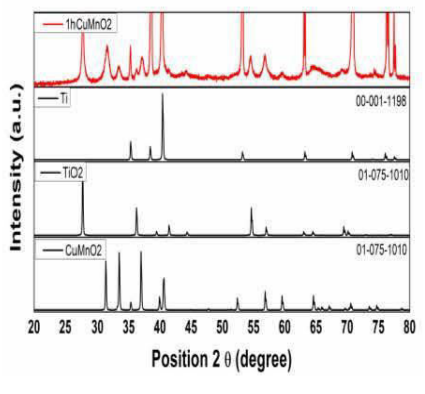


Fig.4. XRD patterns for Ti-TiO_2-$CuMnO_2$ layers

This research was funded by a grant of the Romanian Ministry of Research and Innovation UEFISCDI project code PN 19 22 04 01 TINSME contract number 40 N/2019;

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Category

R

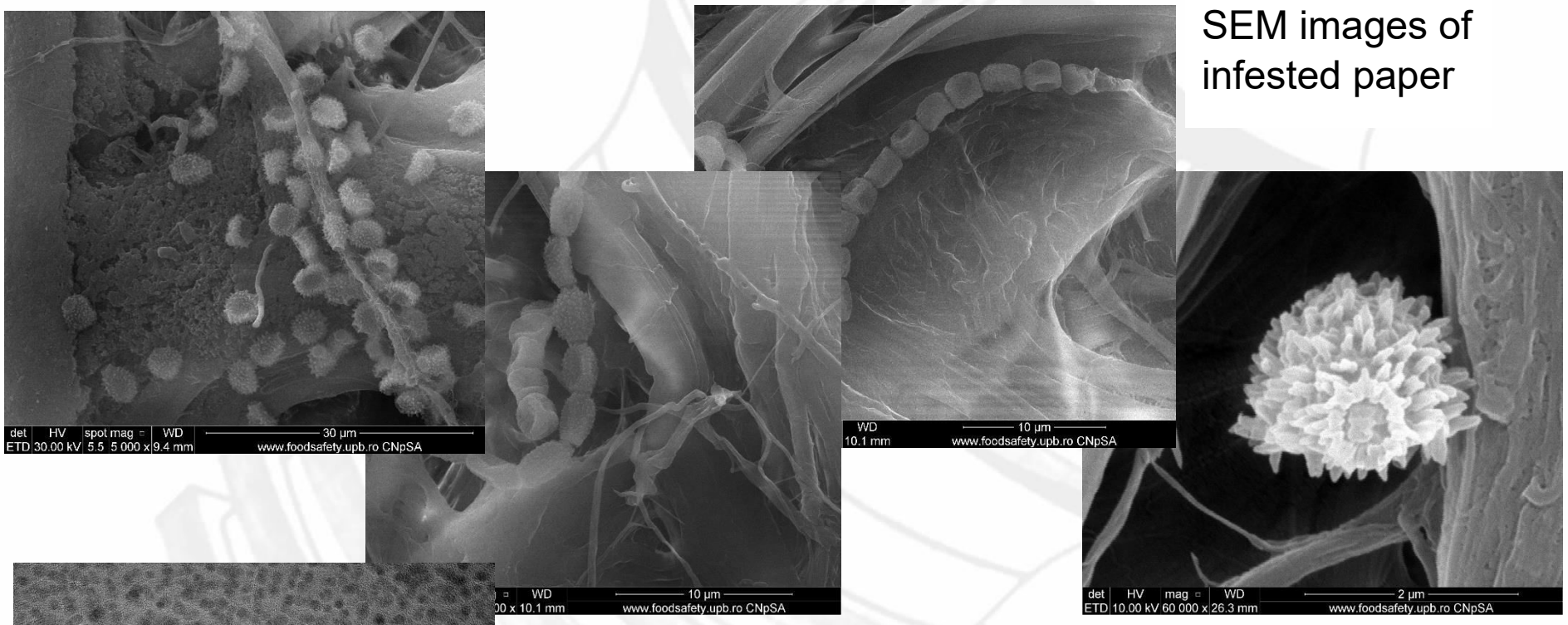
Composition for restoring paper from documents affected by microorganisms

Patent application A00818/09.12.2020

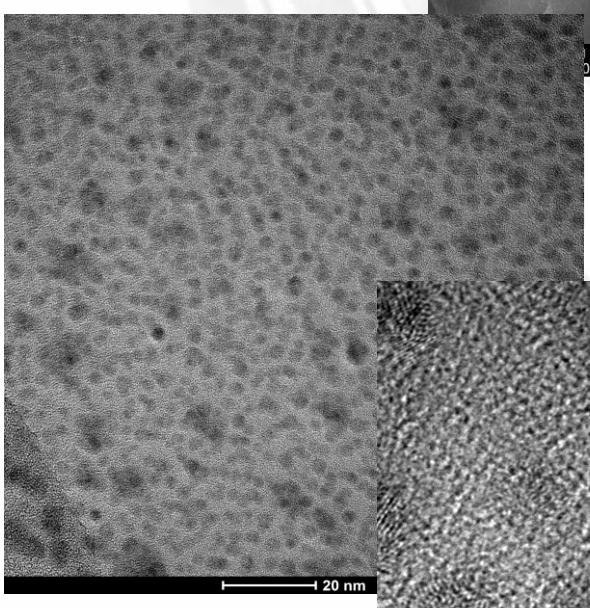
Author/s: Ovidiu OPREA, Anton FICAI, Denisa FICAI, Ludmila MOTELICA, Roxana TRUȘCĂ, Ecaterina ANDRONESCU

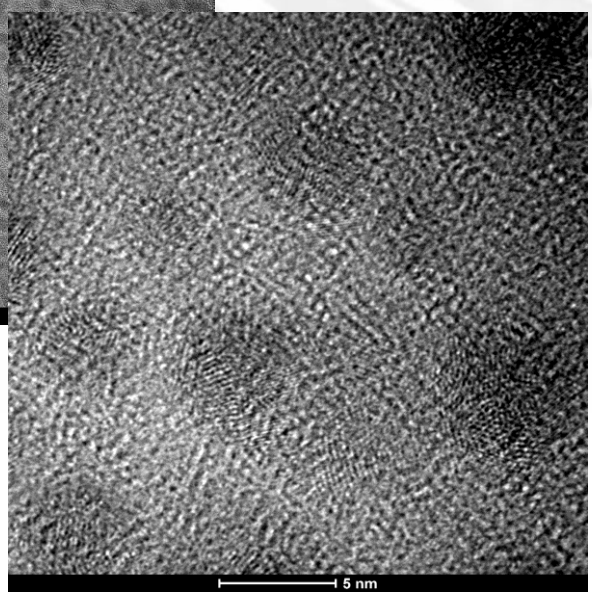
The present invention relates to the production of gel-type compositions based on cellulose derivatives, with silver nanoparticles protected with biocompatible polymers, for the restoration of paper documents, which will provide long-lasting antimicrobial protection.

The gel, by rapid drying, forms a cellulose film that will repair the damaged areas. The gel can also be inserted under the letters that came off the initial support following the degradation of the cellulosic material. By the silver nanoparticles, the cellulose film presents antimicrobial activity and no longer allows the development of microorganisms on the treated area.

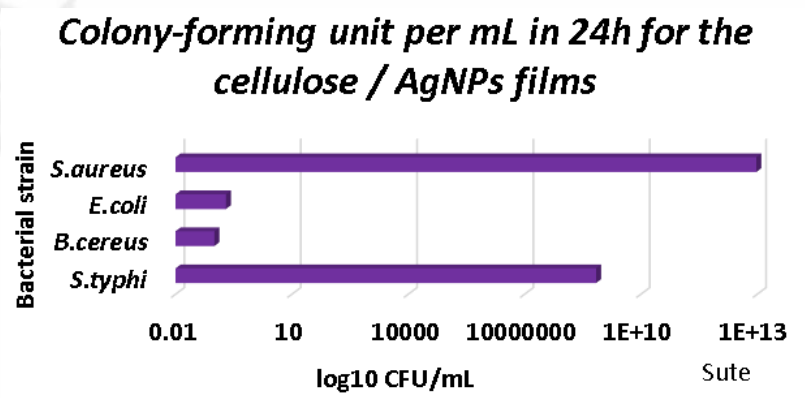


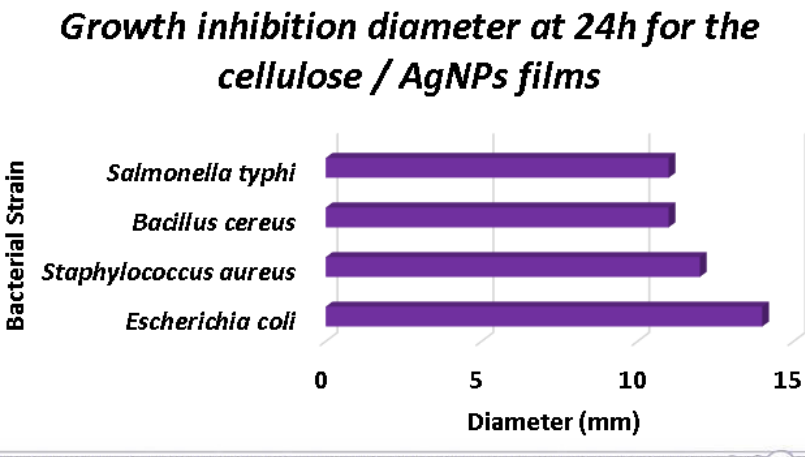
SEM images of infested paper





TEM images of silver nanoparticles





Contact: ovidiu.oprea@upb.ro

INSTITUTE FOR CELLULAR BIOLOGY AND PATHOLOGY

PETRU PONI INSTITUTE OF MACROMOLECULAR CHEMISTRY

Patent application A/00339/15.05.2021

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Smart Magnetic Nanoparticles for Targeted Cellular Internalization

Codina MOVILEANU, Denisa FICAI, Anton FICAI, Manuela CALIN,
Maria Florentina ANGHELACHE, Anca Violeta GAFENCU, Gheorghe FUNDUEANU-CONSTANTIN,
Mariana PINTEALA, Maya SIMIONESCU, Ecaterina ANDRONESCU

R

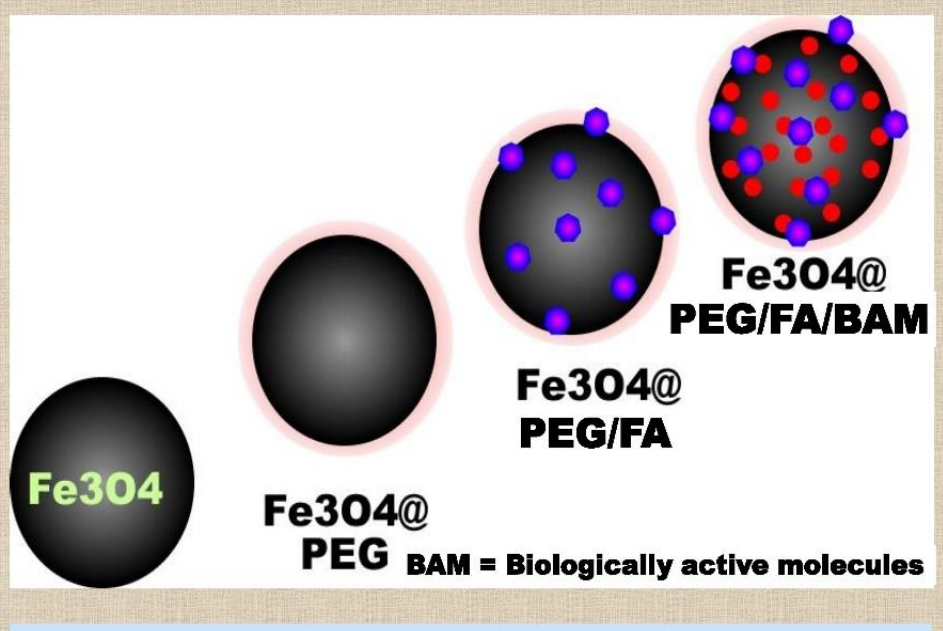
University POLITEHNICA of Bucharest, Gh Polizu Street 1-7, 011061 Bucharest, Romania
Institute for Cellular Biology and Pathology, 8 B.P. Hasdeu street, district 5, Bucharest
Petru Poni Institute of Macromolecular Chemistry, 41A Grigore Ghica Voda Alley, 700487 Iasi, Romania

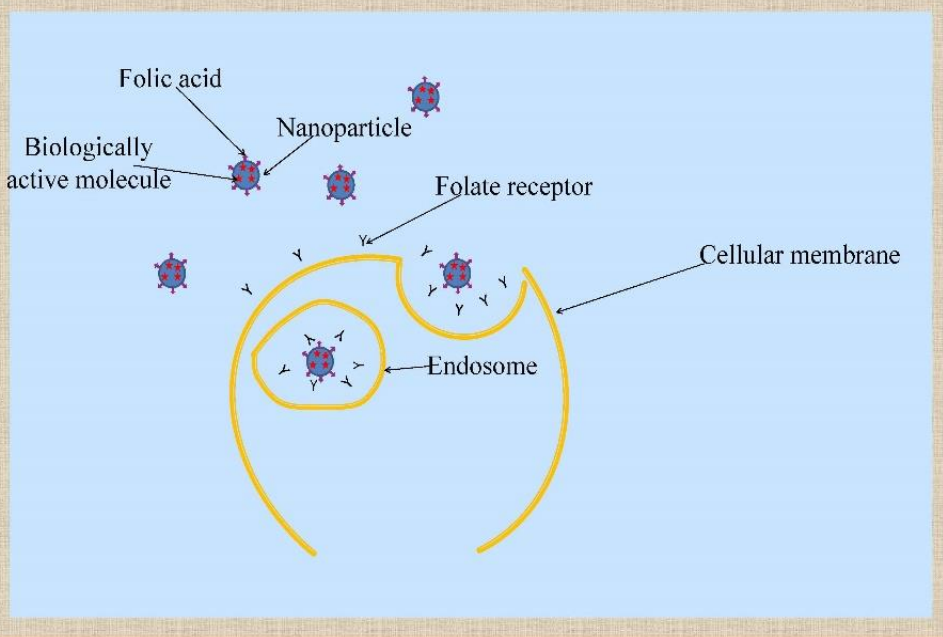
Abstract:

The invention refers to the development of core-shell nanoparticles having a magnetite core, and the surface stabilized with PEG and / or PEI or other suitable stabilizing molecules and decorated with folic acid / folate molecules that can ensure directed transport and better internalization in cells and thus deliver the load of magnetic nanostructures (biologically active molecules such as proteins / peptides, DNA, RNA, RNA interference, vaccines, etc.) inside the target cells.

The use of magnetite nanoparticles has been of particular interest in the field of medical applications in recent times, especially in terms of their use in clinical therapy as drug delivery systems.

Experimental:





Conclusions:

❑ the developed magnetic systems ensure a better internalization of the biological material, including DNA, messenger RNA, interfering RNA, peptide molecules, etc. by the presence of folic acid on the surface of magnetite nanoparticles;

❑ may have multiple therapeutic uses, such as:

- **cancer treatment** - in targeted transport and intelligent and personalized release of antitumor substances,
- **therapy of cardiovascular diseases** (e.g. atherosclerosis, diabetes),
- **therapy of autoimmune diseases** (e.g. rheumatoid arthritis),
- **obesity**, by delivering biologically active substances that facilitate internalization in target cells (from polyphenols, vitamins, to anti-inflammatory, antimicrobial, etc.).

❑ the proposed technology has the great advantage of allowing targeted transport, efficient internalization of active ingredients and predetermined controlled release through a normal diffusion mechanism or bio-erosion (as a result of controlling the resorption rate of the support induced by the nature of the polymer / polymers used) but also a controlled release triggered by the induction of hyperthermia.

Acknowledgement: *This work was realized within the framework of the PCCDI Call supported by the* Executive Unit for Financing Higher Education, Research, Development and Innovation (UEFISCDI) via INTERA project, No. 13PCCDI/2018

Patent application A/00075/25.02.2021

Process for treating various natural or synthetic substrates in order to induce antimicrobial, antibiofilm, antifungal, antialgic or even antiviral activities based on nanotechnologies

Liliana MARINESCU, Laura-Florentina BOANȚĂ, Anton FICAI, Denisa FICAI, Ecaterina ANDRONESCU

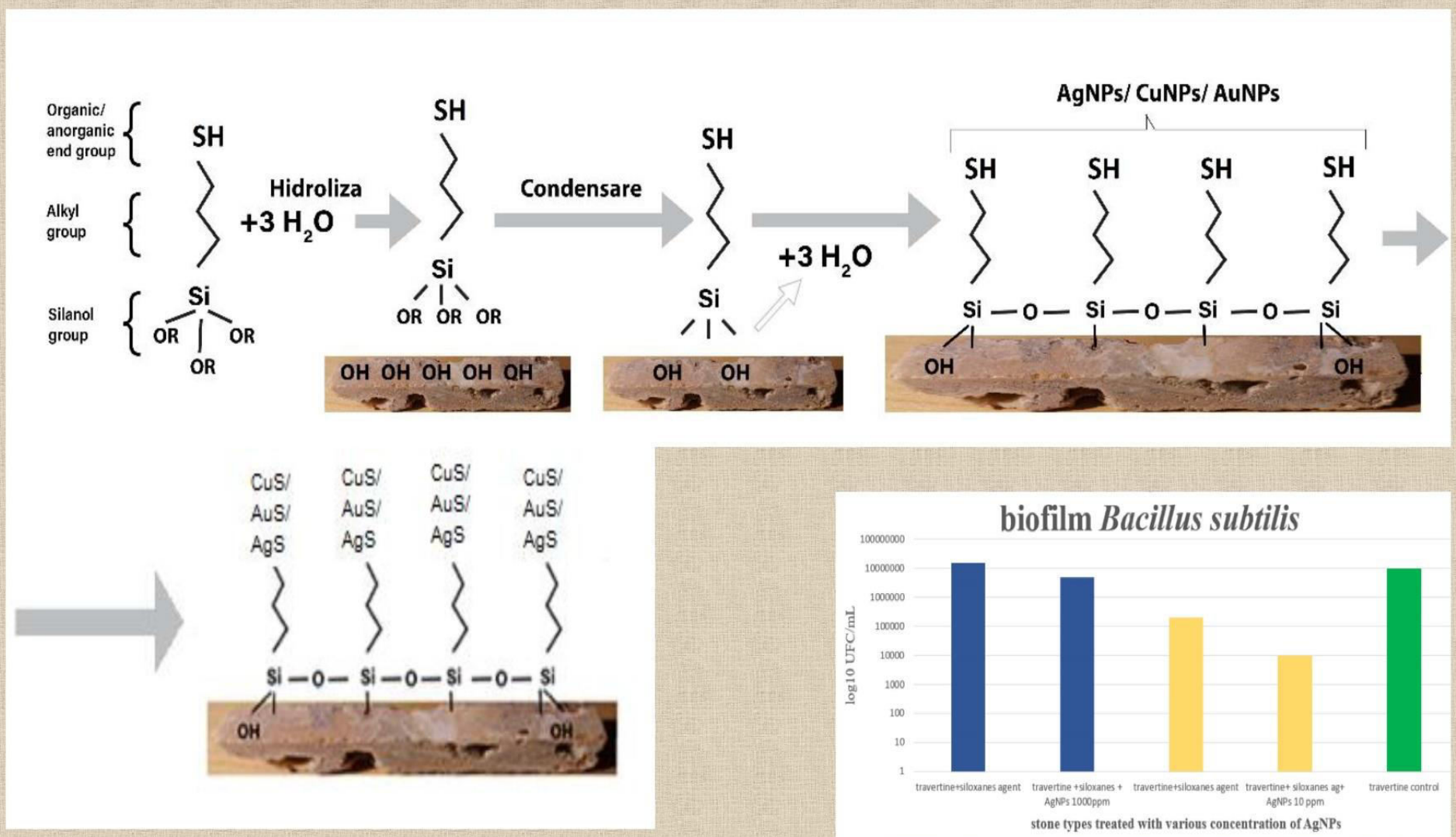
University POLITEHNICA of Bucharest, Gh Polizu Street 1-7, 011061 Bucharest, Romania

R

Abstract:

The invention consists in developing new systems for the treatment of various substrates such as: natural stone, brick, concrete, glass, etc. and the related treatment method. The proposed system consists in the use of organo-siloxane functionalization agents based on $(RO)_3Si\text{-}C_aH_bSH$. The proposed solutions will have a variable content of functionalizing agents and solvent, especially alcohols that will increase the penetration depth. These functionalizing agents have multiple roles, by condensation they form network-type structures that repair existing cracks and at the same time confer the selective permeability of the substrate while the presence of functional groups will induce new properties, including self-cleaning, antimicrobial, antifungal, antibiofilm especially if decorated with proper nanoparticles such as Ag, Cu or Au being effective in the case of civil or special constructions (dams, swimming pools, treatment plants), monuments, etc. Surface treatment will be done by any available technique, such as: sprays, brushing, roller application, etc. The application can be done in one layer or in multiple layers, in which case it is recommended to apply successive layers, oriented perpendicular to each other to ensure a uniform application.

Experimental:



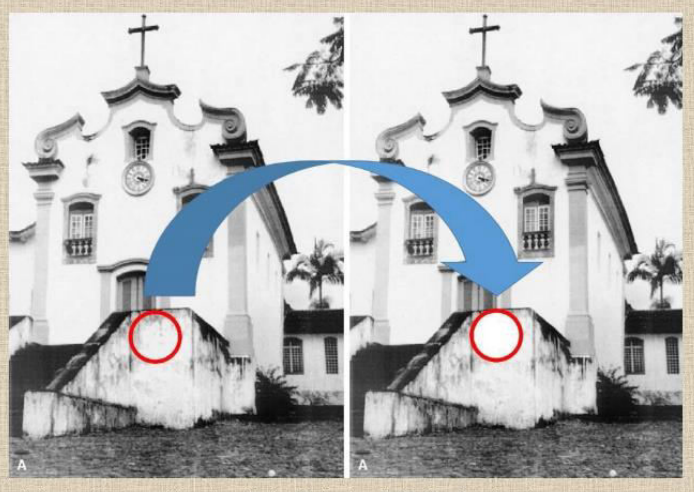
Schematic treatment protocol for stone based on silanisation followed by decoration with AgNPs

Antimicrobial activity induced by functionalization and decoration with AgNPs

Conclusions:

The surface is silanized using adequate silanisation agents bearing thiolic groups. Due to the presence of these groups, AgNPs, CuNPs or AuNPs will be decorated onto these surfaces via covalent bonds and thus self-cleaning, antimicrobial, antifungal or antibiofilm activity will be induced. These treatment opportunities can be applied on the clean surfaces for preventing biofilm formation or, it can be used as an efficient solution in treating the already inoculated surfaces and to destabilize these biofilms. As a consequence of the covalent immobilization of the nanoparticles, these will be retained for a longer period of time and thus long lasting activity is expected. From environmental point of view, it is expected that no / low dose of nanoparticles and ions will be release which means that low negative environmental impact is expected.

Acknowledgement: *This work was realized within the framework of the PCCF Call supported by the* Executive Unit for Financing Higher Education, Research, Development and Innovation (UEFISCDI)



Adapted according to: C.A. Crispim & C.C. Gaylarde, Cyanobacteria and Biodeterioration of Cultural Heritage: A Review; *Microbial Ecology* volume 49, pages 1–9 (2005)

Patent applications - A/00244/06.05.2020

COMPOSITIONS AND METHOD FOR TREATING MATERIALS FOR THE DEVELOPMENT OF (MEDICAL) PROTECTIVE DEVICES WITH ANTIVIRAL AND ANTIMICROBIAL ROLE

Anton FICAI, Denisa FICAI, Ludmila MOTELICA, Ovidiu-Cristian OPREA, Ecaterina ANDRONESCU

University POLITEHNICA of Bucharest, Gh. Polizu Street 1-7, 011061 Bucharest, Romania (anton_ficai81@yahoo.com)

CORNELIUGROUP research-innovation association

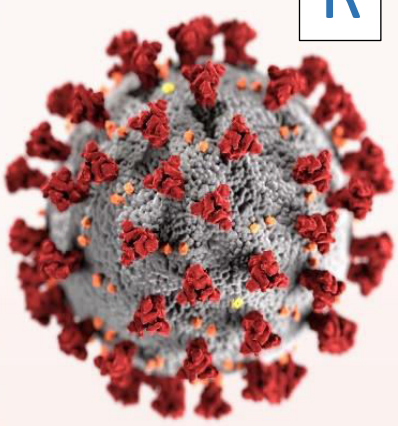
INVENTCOR

Power of Creative Mind

Abstract

The present invention provides the technology for modifying protective devices (masks, overalls, gowns, gloves, visors) by applying a polymeric layer loaded with Ag nanoparticles (of various shapes and sizes from spherical nanoparticles to triangular, truncated triangular, hexagonal, cubic, cylindrical, etc.), Cu, ZnO, etc. stabilized with suitable agents and loaded with antiviral / antimicrobial substances based on pure components such as eugenol, eugenyl acetate, ..., oils or extracts with low volatility to ensure long-lasting action. In the case of masks, in particular, to avoid inhalation of high amounts of volatile components with irritating / inflammatory effects the volatility and irritability should be considered. In the formulations to be applied on the protection devices, the nanoparticle content can reach 1-2%; antiviral / antimicrobial components also 1-2% while the polymer content varies in the range of 0.1-100% the difference being solvent. The technology can also be applied on the raw material from which the protection devices are obtained, following the thermoforming to be performed with the raw material that already contains the antiviral / antimicrobial components and through this process their embedding in the material takes place.

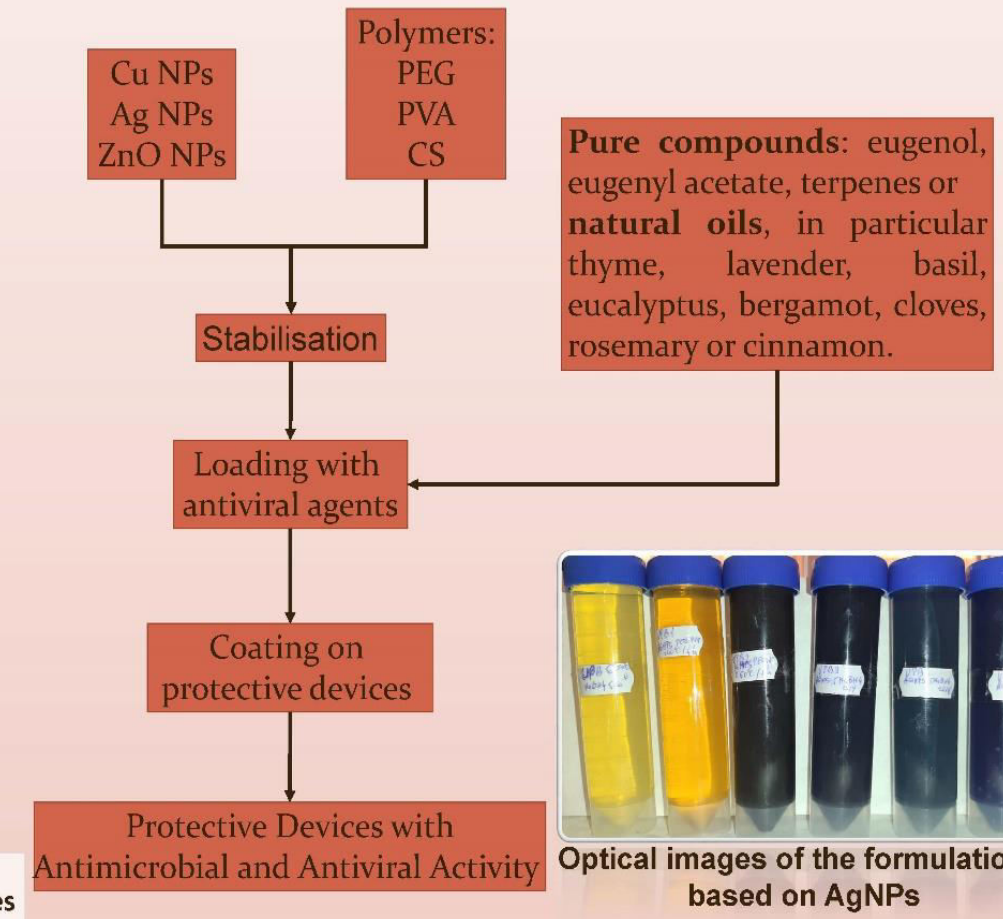
R



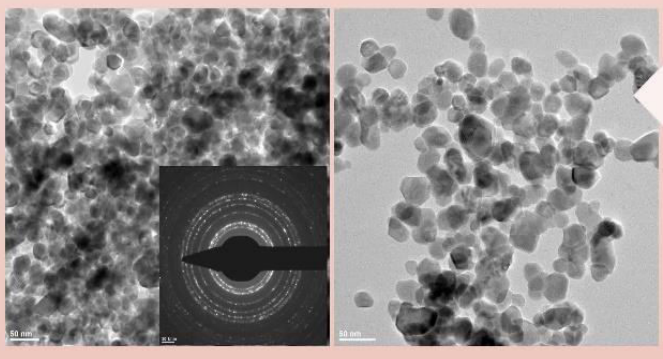
Context

Worldwide, there is an increasing need of manufacturing efficient protective devices, preferable with antimicrobial and antiviral activity! The usual masks are efficient for bacterial penetration, bacterial cells usually having 0.5 – 5μm but limited or no efficiency against viruses which, are usually, from 5 to 300nm in diameter. SARS-Cov-2 is, for instance a small virus of about 125nm which easily pass through the most protective masks. In this context, it is necessary to develop new masks with smaller pores – but inducing problems in breathing or to increase the time needed to pass through these filtrating material (by improving the virus – material interaction) and during this time, to assure the loss of the infectiousness!

Treating protocol for the development of (medical) protective devices with antiviral and antimicrobial role

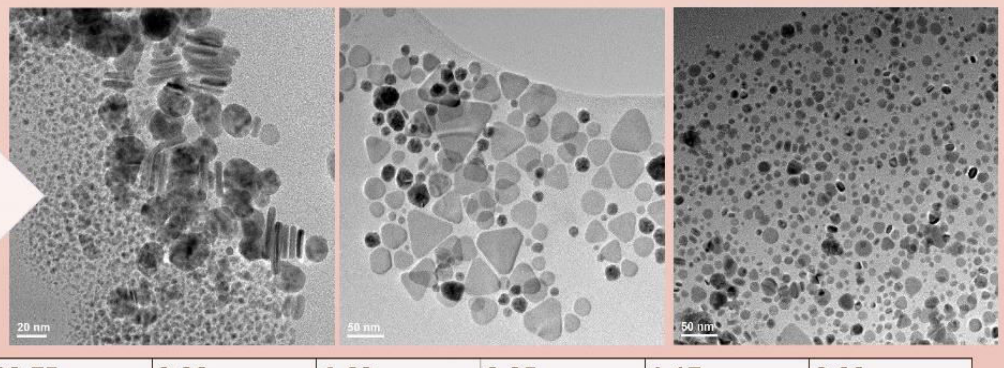


Optical images of the formulations based on AgNPs



TEM images for ZnO NPs

TEM images for Ag NPs



Quantitative assay of the ZnO antimicrobial activity

Bacterial strain	150 μg/mL	75 μg/mL	37.5 μg/mL	18.75 μg/mL	9.38 μg/mL	4.69 μg/mL	2.35 μg/mL	1.17 μg/mL	0.09 μg/mL
L. monocyt. 318	0.085	0.059	0.067	0.063	0.065	0.062	0.086	0.122	0.336
S. aureus ATCC 25923	0.090	0.083	0.080	0.083	0.086	0.239	0.942	1041	1170
Bacillus cereus	0.071	0.069	0.075	0.070	0.075	0.072	0.084	0.098	0.902
E. coli ATCC 25922	0.066	0.077	0.070	0.077	0.605	0.488	0.579	0.753	0.960
P. aeruginosa ATCC 27853	1146	1276	1295	1252	1327	1235	1255	1382	1301

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Smart drug delivery systems based on graphene oxide and natural agents for biomedical and pharmaceutical applications

Sisteme inteligente cu eliberare controlată bazate pe grafenoxid și agenți naturali cu aplicații în domeniul biomedical și farmaceutic

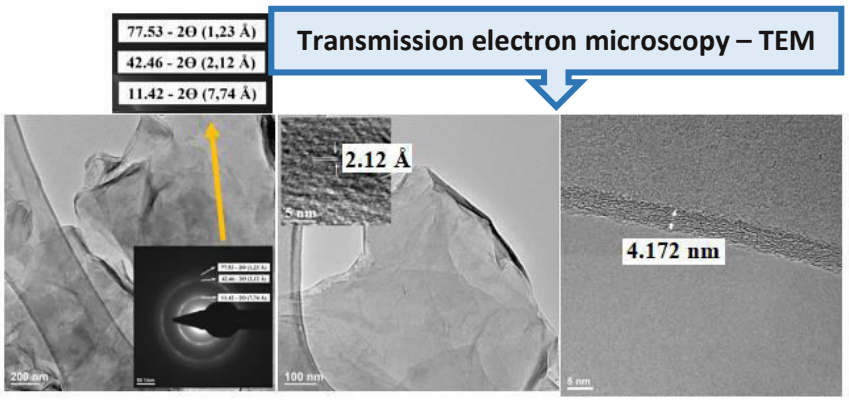
PhD Thesis

R

Author: Croitoru Alexa-Maria

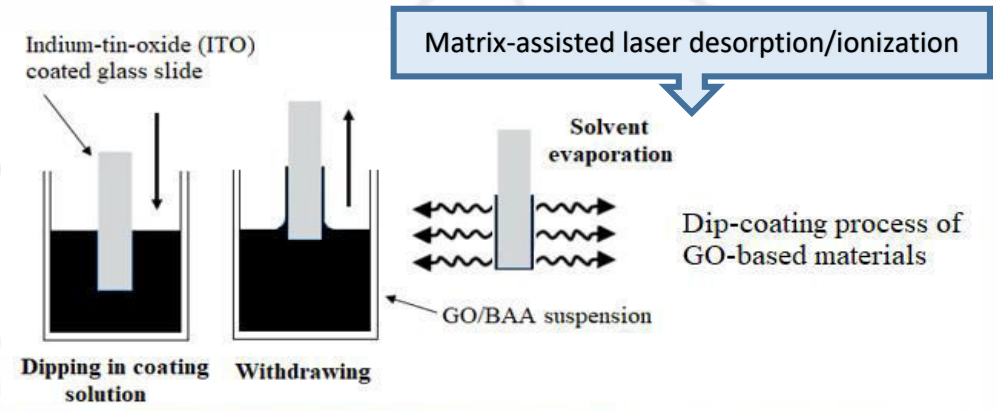
The scope of this research consisted in the development of - new smart drug delivery systems based on graphene oxide (GO) as nanocarrier, loaded with natural substances, such as gallic acid, quercetin and juglone and – novel poly (lactic acid)/GO fibrous scaffolds for controlled and triggered release of active agents in the desired situs (using electrical stimulation) in order to prove the potential of the scaffolds as wound dressing materials. The obtained nanocomposites demonstrated excellent antimicrobial efficacy on both *S. aureus* and *E. coli* bacteria with reduction rates above 90 %, and fungistatic action reducing the *Candida* populations. Moreover, the obtained materials showed good biocompatible behaviour for L929 and BT474 cells. According to the obtained data, the complete release happened in just 1-2 minutes when electric field of 10 and 50Hz was used (the release profile of quercetin was 8640 and 864 times more rapid) while hundreds of minutes were necessary for similar release without any electric stimulation. Based on these results, it is evident that the addition of GO can induce electric triggering capacity and can represent the premises of personalized therapy. The dosage flexibility and release behaviour given by using an external electric field makes the fibrous scaffold a promising candidate for on-demand drug delivery with applications in personalize medicine.

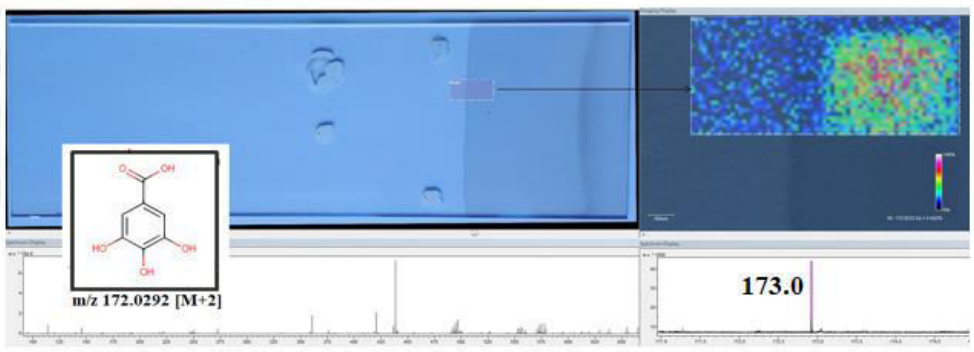
Transmission electron microscopy – TEM



TEM image and SAED pattern—insert (**a**), TEM image with an HRTEM image—insert (**b**) and lateral view of the graphene layer indicating the thickness (**c**) of GO sheets.

Matrix-assisted laser desorption/ionization

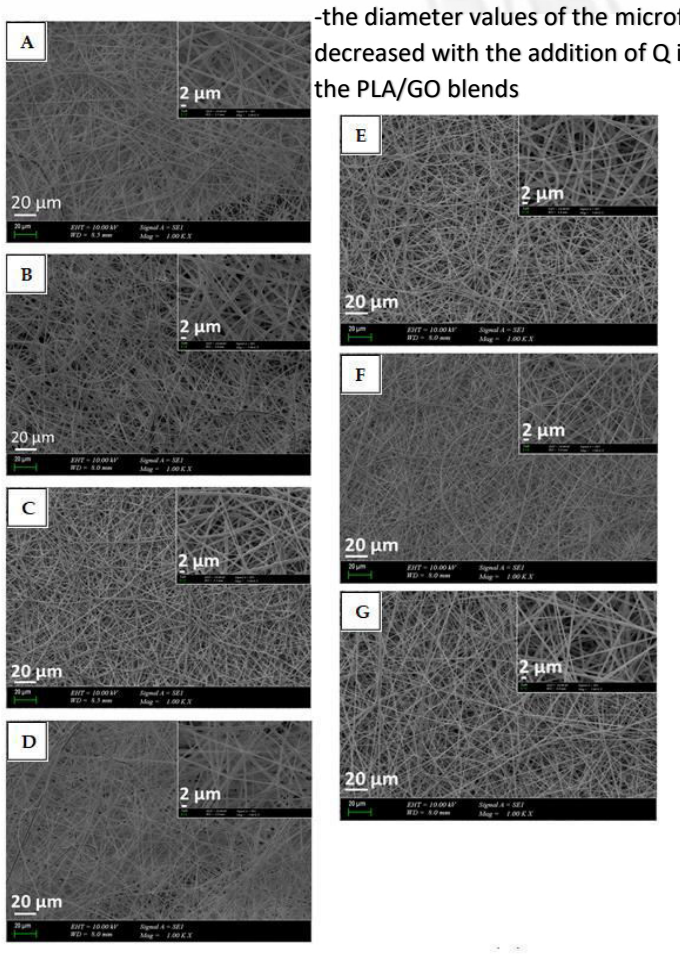




MALDI analysis of GOGA nanofilm

Scanning electron microscopy – SEM

-the diameter values of the microfibers decreased with the addition of Q into the PLA/GO blends

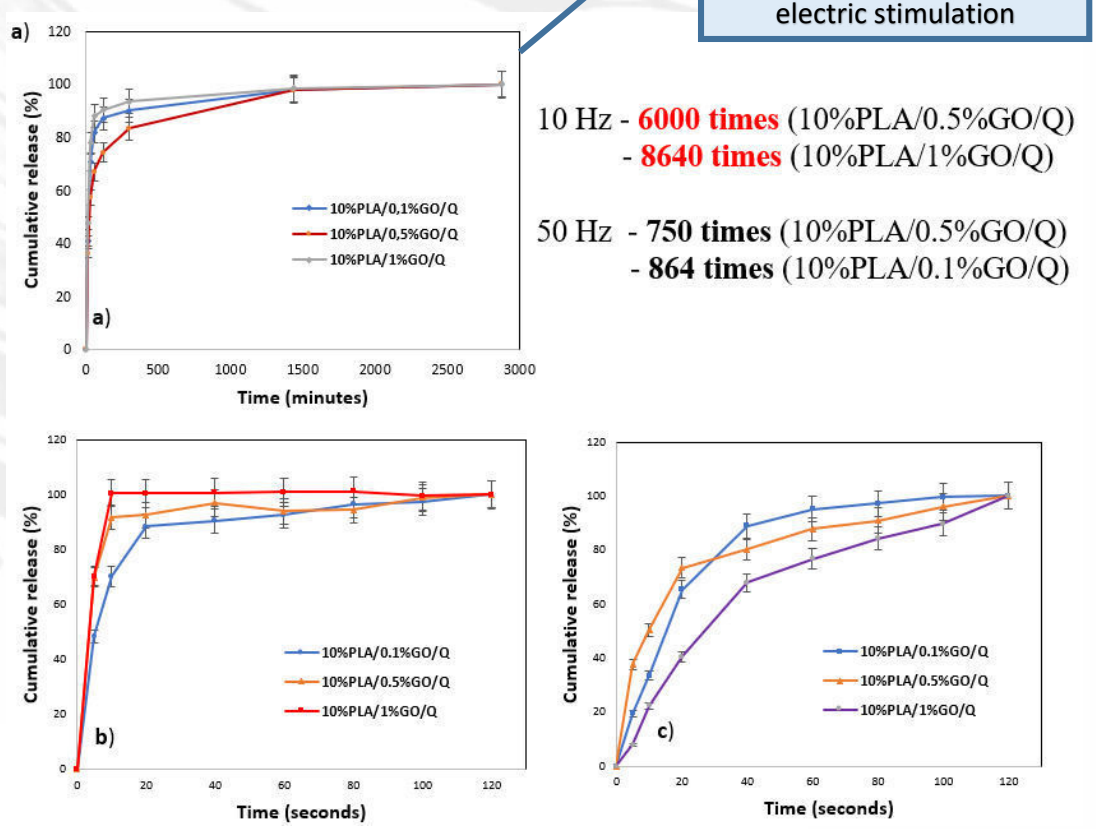


SEM images of the 10%PLA (**A**), 10%PLA/0.1%GO (**B**), 10%PLA/0.5%GO (**C**), 10%PLA/1% GO (**D**) 10%PLA/0.1%GO/Q (**E**), 10%PLA/0.5%GO/Q (**F**), 10%PLA/1%GO/Q (**G**) and their diameter distributions.

Q release with and without electric stimulation

10 Hz - **6000 times** (10%PLA/0.5%GO/Q)
- **8640 times** (10%PLA/1%GO/Q)

50 Hz - **750 times** (10%PLA/0.5%GO/Q)
- **864 times** (10%PLA/0.1%GO/Q)



The cumulative release graphs of the drug-loaded microfiber scaffolds without electric stimulus (**a**), and under electric stimulus with two different frequency values: 10 Hz (**b**), 50 Hz (**c**).

Contact: croitoru.alexa@yahoo.com

Hybrid micro-machining processes with ultrasonic assistance: technologies, specific components and improved parameters

PhD Thesis

R

Authors: Cornel-Cristian Enciu, Gabriela Pârvu and Liviu-Daniel Ghiculescu

The major developments are made at a submicron level machining and big challenges for engineers are to find solutions, to fabricate components at lower dimensions (Figure 1). The project deals with the main nonconventional hybrid micro-machining processes with ultrasonic assistance (Figure 3 and 4).

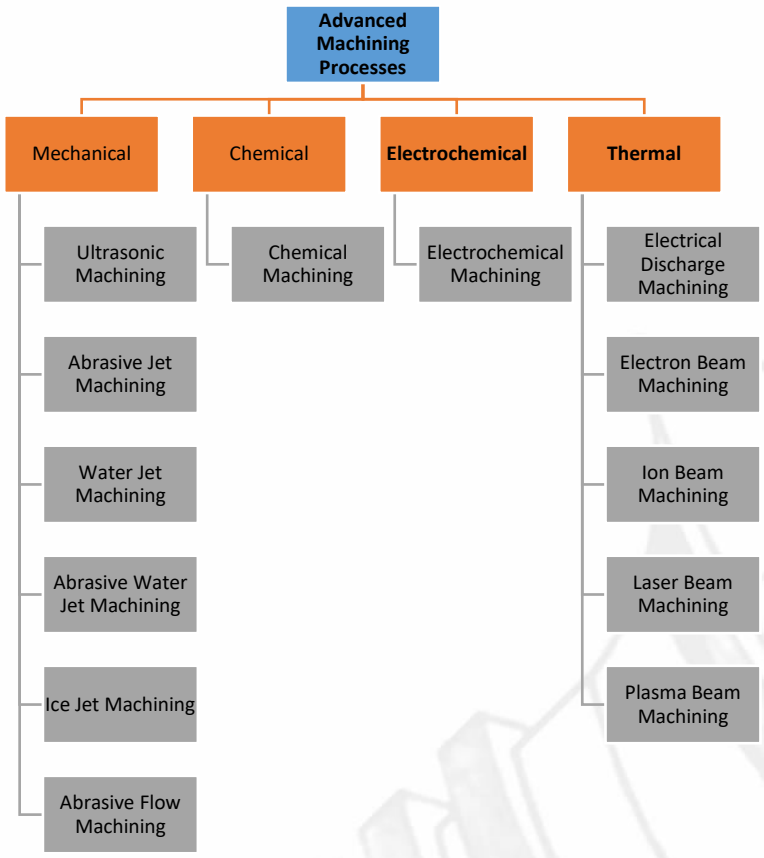


Figure 1. Classification of advanced machining processes

Figure 2. Ultrasonic chains for EDM+US microslots (UPB)

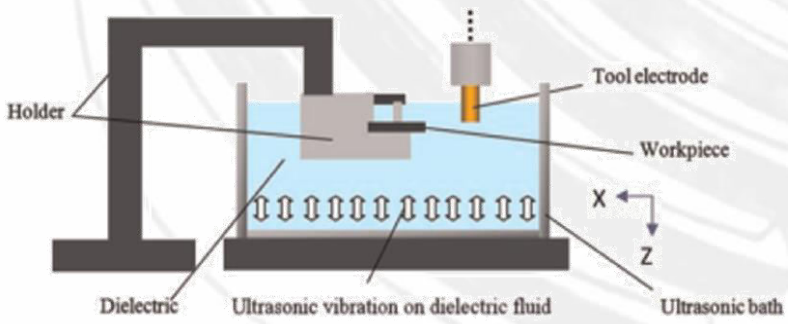
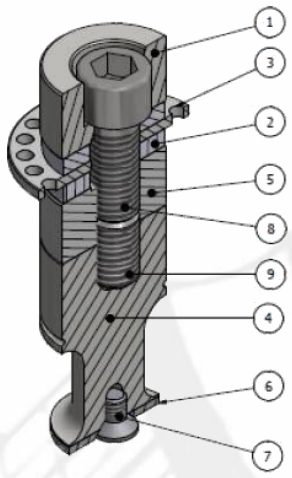


Figure 3. Ultrasonic bath in micro EDM



1 – reflecting bush;

2 – piezo-electric transducer;

3 – nodal flange;

4 – US horn; 5 – radiant bush;

6 – ultrasonically activated tool / workpiece;

7, 8, 9 – assembling screws

Figure 4. Ultrasonic chain with components (UPB)

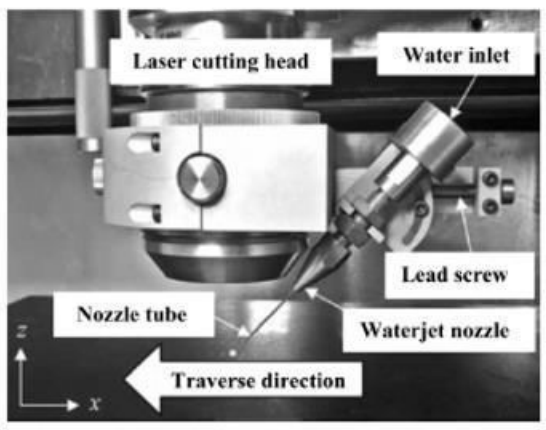


Figure 5. The hybrid laser-assisted waterjet cutting head

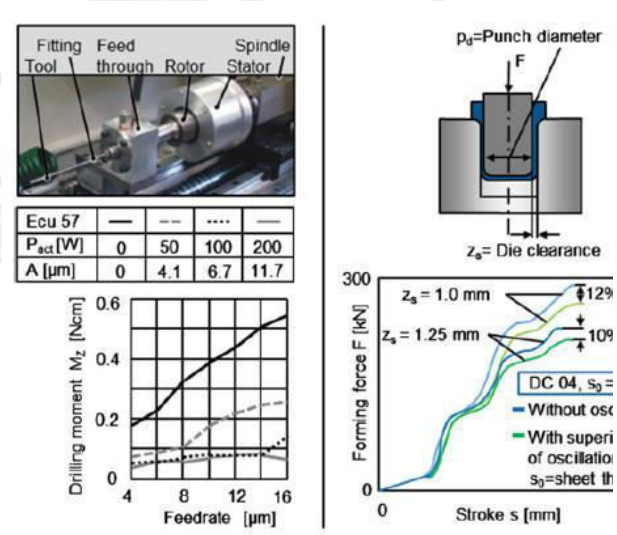


Figure 6. Process force reductions in vibration assisted hole drilling (left) and sheet bulk metal forming (right)

Some hybrid processes are presented like vibration (Figure 2, UPB), laser (Figure 5), fluid, magnetic field, external electric field or carbon nanofibre assisted micro-machining. Using these technologies, some parameters (Figure 6) can be improved: reduction of process force, higher material rate removal, reduced tool wear, excellent surface quality, and high precision.

Contact: "Politehnica" University of Bucharest, Faculty of Industrial Engineering and Robotics, Department of Manufacturing, cornel.enciu@upb.ro

Applications and evolution of micro-electrochemical machining

PhD Thesis

Authors: Gabriela Pârvu, Cornel-Cristian Enciu and Liviu-Daniel Ghiculescu

Electrochemical processing (ECM, Figure 1) is a process of anodic dissolution of the metal from the part, ion by ion. It is widely used as a practical method of metalworking due to its various advantages, such as lack of tool wear, no tension/burrs, and high productivity (Figure 2 and 3).

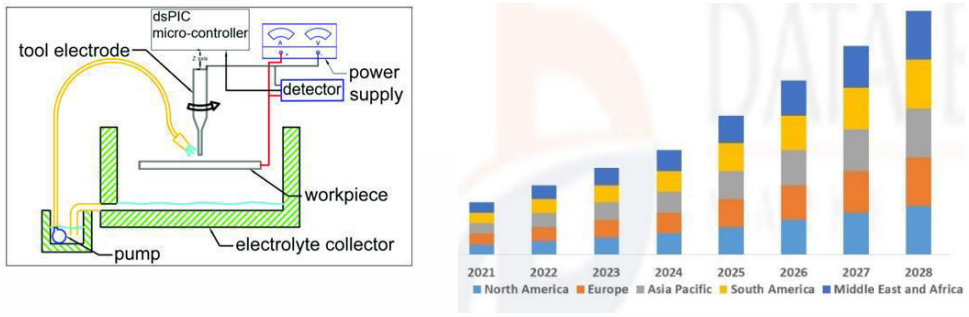
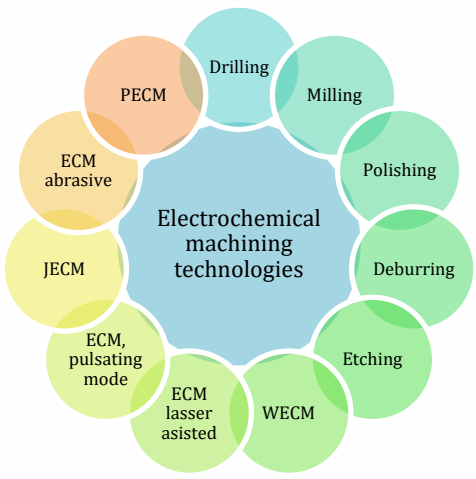


Figure 1. ECM set up and Global Micromachining Market Forecast



Legend
PECM-precision electrochemical machining;
JECM-jet electrochemical machining;
WECM-wire electrochemical machining;

Figure 2. Electrochemical machining technologies

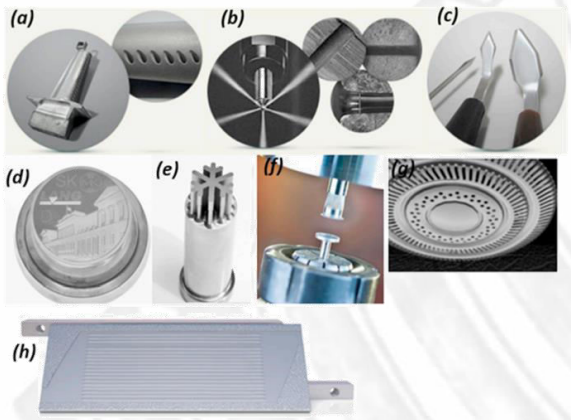


Figure 3. Potential industrial applications of electrochemical micromachining

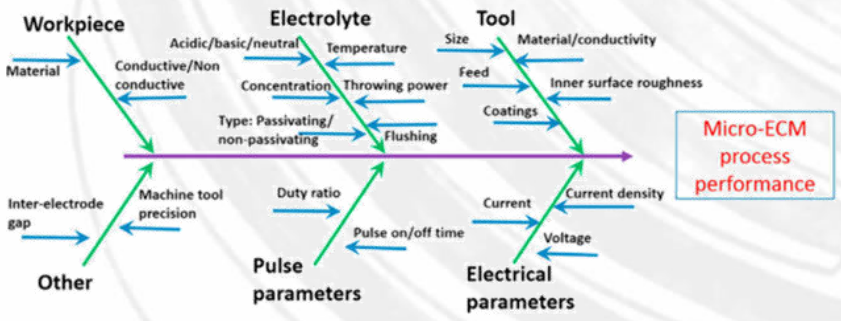


Figure 4. Ishikawa diagram for Micro-ECM process performance

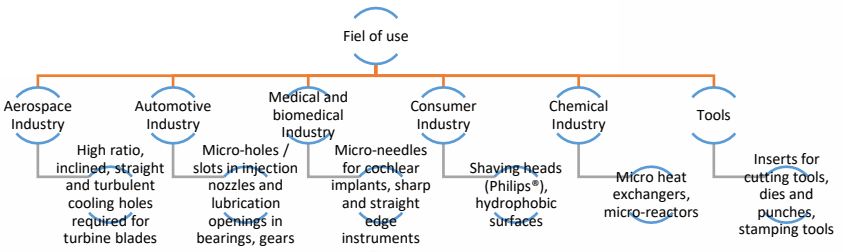
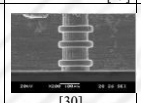
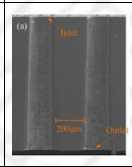
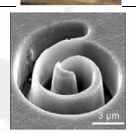
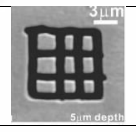
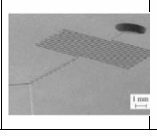


Figure 5. Industries using electrochemically manufactured miniaturized products

Table 1. Capabilities of advanced electrochemical Micromachining processes in the current literature

Process capability	Figure and Bibliographic references	Details
The cooling passage of the spiral pipe	[29]	Controlled parameters of µECM: 8 V, 150 g / l, NaNO3, electrolyte pressure 0.2 MPa, electrolyte speed 15 m / s, machining time 10 min
Clearance matrix in micro-holes	 [30]	Manufactured using a single electrode disc in µECM, hole diameter 130 µm, groove depth and height 30 µm and 33 µm respectively.
Inverted conical holes		Micro-holes with an inlet diameter of 178 µm and an angle of 1.05º on a 18CrNi8 thickness of 1 mm, can be machined by voltage variation, variable load ratio and variable feed rate machining.
Bamboo hole		Manufactured using a variable feed rate machining mode on a 1.0 mm thick 18CrNi8 workpiece, internal surface roughness Ra 674 nm.
Pocket machining		**µECM milling mode, made of cylindrical electrodes, the short passage distance generates smooth surfaces.**
Spiral channel		Depth of 5 mm, workpiece - Ni, tool - Tungsten, electrolyte - 0.2 M HCl, parameters: 3 ns, pulses of 2 V, repetition rate of 33 MHz.
Micro-structuring		Workpiece - Au, electrolyte - 1 M LiCl / DMSO solution, machining parameters: 4.2 V, pulses of 20 ns.
Manufacture of micro-reactors		1.4541 stainless steel workpiece, manufactured by milling with JECM, use of free electrolytic jet - localized machining.

↑- represents an increasing trend
↓ -represents a decreasing trend.

Parameters	MRR	Surface Finishing	Shape accuracy	Machining gap
↑ Tension	↑	↓	↓	↑
↑ Impulse duration	↑	↓	↓	↑
↑ Concentration of electrolyte	↑	↓	↓	↑
↑ Duty cycle	↑	↓	↓	↑

Table 2. Overview of the effect of key process parameters on process performance in micro-ECM

In modern manufacturing industry (Figure 4 and 5), harder, complex materials that are difficult to cut are frequently used. Therefore, more attention is paid to the machining processes-if the mechanical properties of the workpiece material (Table 1) do not impose limits on the material removal process (Table 2). In this respect, nonconventional machining techniques have entered practice as an alternative in terms of processing, shape complexity, surface integrity and miniaturization requirements.

Contact: "Politehnica" University of Bucharest, Faculty of Industrial Engineering and Robotics, Department of Manufacturing, gabriela_marina.ene@upb.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Institute of Microbiology and Biotechnology, Ministry of Education and Research of the Republic of Moldova

IMB

The procedure for cultivation of *Rhodotorula gracilis* yeasts

Patent: MD 4690/2018.07.31,

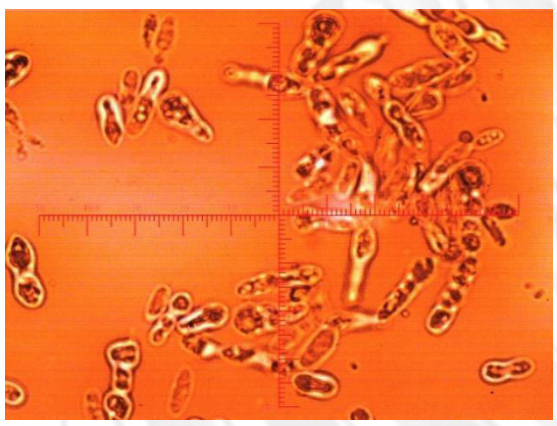
Patent application: No. a 2020 0013/2020.02.18

Authors: BEŞLIU Alina, EFREMOVA Nadejda, USATÎI Agafia

R – Nanotechnology,
Advanced materials

Aim: The invention relates to microbial biotechnologies, in particular to the process of increasing the content of protein and essential amino acids in the biomass of yeasts *Rhodotorula gracilis*.

Essence: The process according to the invention includes obtaining the yeast suspension of the *Rhodotorula gracilis* CNMN-Y-30 strain grown for 24 hours on YPD medium, inoculating the suspension in 5% volume concentration and cultivating on YPD medium with the addition of ZnO nanoparticles 50 nm in concentration 20.0-70.0 mg/L under sterile conditions, at +28...30ºC with continuous stirring at 180...200 rot/min within 72 hours.



***RH. GRACILIS* CNMN-Y-30 UNDER ACTION ZnO (<50 nm) NANOPARTICLES**

Advantage: The technical result of the invention consists in significantly increasing the content of proteins by 23,1-34 and essential amino acids by 32%-89% in the levurian biomass compared to the control and reducing the cultivation time up to 72 hours.

Field of application: Nanotechnology, Advanced materials, Agriculture, Medicine - Health Care-Cosmetics and Pharmaceutical Industry

Contact: Institute of Microbiology and Biotechnology, 1 Academiei Street, Chisinau Republic of Moldova. Beșliu Alina email: besliu.imb@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Institute of Microbiology and Biotechnology, Ministry of Education and Research of the Republic of Moldova

IMB

The process for increasing the antioxidant enzymes in yeasts *Rhodotorula gracilis*

Patent: MD 4709 /2019.07.25

Authors: EFREMOVA Nadejda, BEŞLIU Alina, USATÎI Agafia

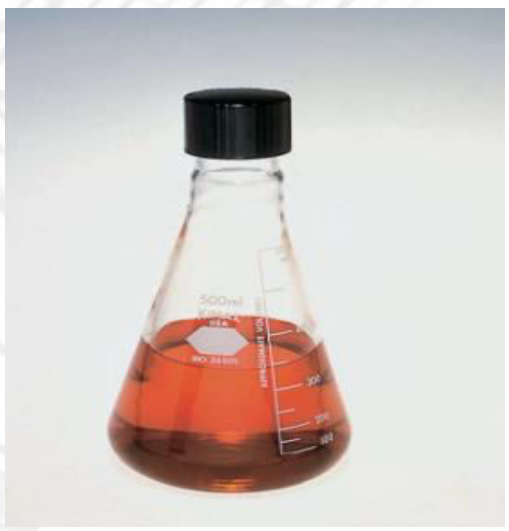
R – Nanotechnology,

Advanced materials

Aim: The invention relates to biotechnology, in particular to a process for cultivation of *Rhodotorula gracilis* yeast and can be used to produce antioxidant enzymes superoxide dismutase and catalase.

Essence: The method, according to the invention, comprises production of a yeast suspension of *Rhodotorula gracilis* CNMN-Y-03 strain by cultivation for 24 hours on YPD medium, inoculation of the suspension at a concentration of 5%, on YPD medium with addition of Ag nanoparticles with a size of 5 nm at a concentration of 10.0…5.0 mg/L and cultivation at a temperature of 25…28°C with continuous stirring at 180…200 rpm for 72 hours.

***RH. GRACILIS* CNMN-Y-03**



ENZYMATIC PREPARATION

Advantage: The invention consists in the significant increase of the SOD activity by 40-52% and CAT by 33-45% in the yeast biomass superior to the control variant and the reduction of the cultivation time up to 72 hours.

Field of application: Nanotechnology, Advanced materials, Agriculture, Medicine - Health Care-Cosmetics and Pharmaceutical Industry

Contact: Institute of Microbiology and Biotechnology, 1 Academiei Street, Chisinau Republic of Moldova. Beșliu Alina email: besliu.imb@gmail.com

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Institute of Microbiology and Biotechnology,
Ministry of Education and Research
of the Republic of Moldova

IMB

Proceeding for obtaining spirulina biomass - raw material for new immunomodulatory, antiviral, antimicrobial and anticancer remedies

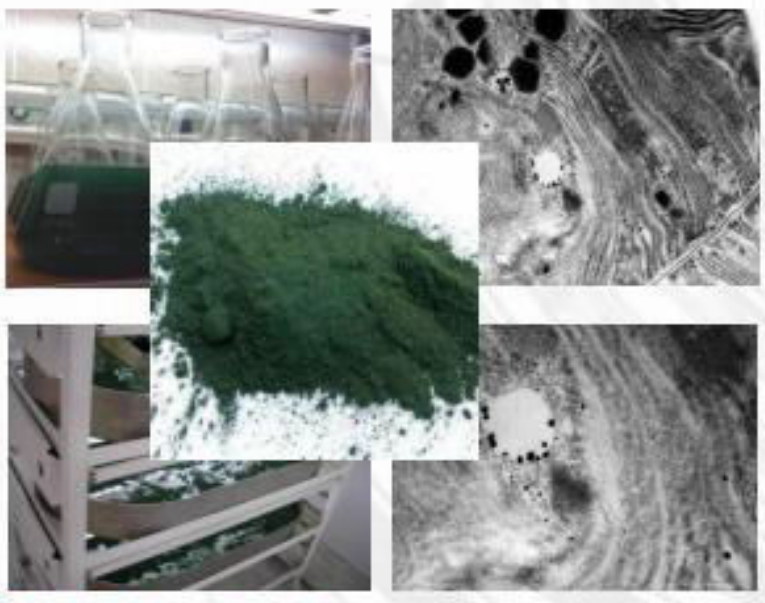
Patent: MD 4714 / 2020.09.30

Authors: RUDI Ludmila, CHIRIAC Tatiana, CEPOI Liliana, RUDIC Valeriu, DJUR Svetlana, ROTARI Ion, MISCU Vera, VALUŢA Ana, IAŢCO Iulia, CODREANU Liviu, ZINICOVSCAIA Inga

R – Nanotechnology, Advanced materials

Description:

It is proposed a proceeding of cyanobacterium *Spirulina platensis* cultivation in order to obtain raw material for the development and manufacture of preparations based on biofunctionalized nanoparticles suitable for use in medicine, pharmaceutics and cosmetology. The proceeding involves growing spirulina culture on a mineral medium with the addition of 5 nm water-soluble copper nanoparticles in concentration of 3.15-3.18 µg/L to obtain biomass and, in particular, to stimulate lipid and other biologically active compounds biosynthesis. At the same time, spirulina produces biofunctionalized copper nanoparticle that can be used as immunomodulatory, antiviral, antimicrobial, and anticancer agents.



The technological schema for obtaining a new immunomodulatory, antiviral, antimicrobial, and anticancer agents from spiulina with CuBFNPs.

Fields of application:

Bionanotechnology, Pharmaceutical and biotech producing companies;
Human health, Food production and security; Medicine; Pharmaceutics.

The results included in the invention contribute to the realization of new innovative materials with outstanding performance and the development of new sustainable technological processes, as well as to the design of new functionalities for special and consumer drugs and products.

The research was carried out within the project 20.80009.5007.05, funded by NARD, Republic of Moldova.

Contact: RUDI Ludmila, Phycobiotechnology laboratory, Institute of Microbiology and Biotechnology, 1, Academiei str., MD 2028, Chisinau, email: rudiludmila@gmail.com

CORNELIUGROUP research-innovation association
INVENTCOR
Power of Creative Mind

MOLDOVA STATE UNIVERSITY
Scientific Research Laboratory
Organic/Inorganic Materials for Optoelectronics
Alexei Mateevici str. 60, Chisinau MD-2009, Republic of Moldova
Tel.: 373 69 784311; Email: GKolibaba@yandex.ru

HR EXCELLENCE IN RESEARCH

OBTAINING HIGHLY CONDUCTIVE ZnO:Ga:Cl CERAMICS AND THIN FILMS AT LOW TEMPERATURES

PATENT: MD a 2020 0024/2020.03.27

R

AUTHORS: Gleb COLIBABA, Dumitru RUSNAC, Vladimir FEDOROV

APPLICABILITY: Optoelectronics.

SCOP: The elaboration of cost-effective technology for low temperature deposition of highly conductive ZnO thin films.

SOLUTION
(ceramic targets)

$ZnO+Ga_2O_3$ mixed powder is sintered using HCl transport agent:

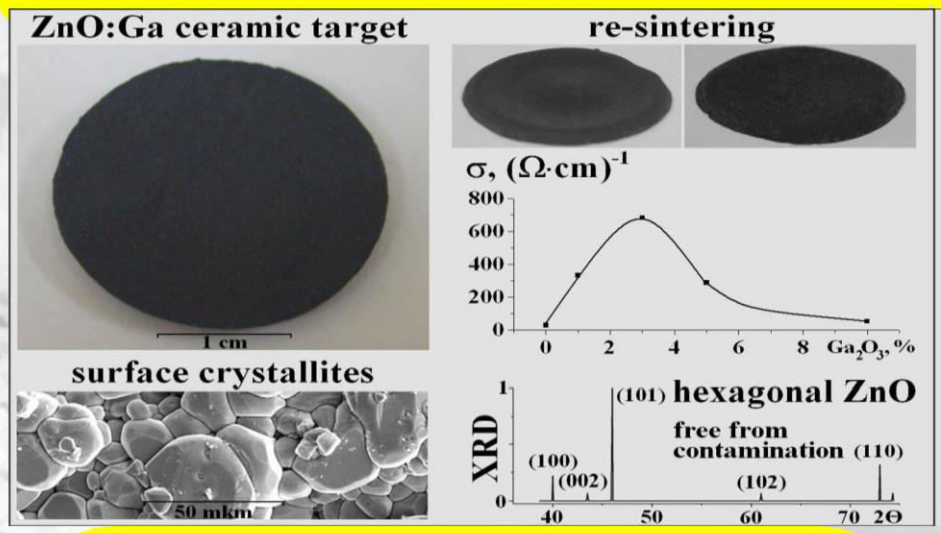
HCl increases the solubility rate of Ga_2O_3 by 7 orders of magnitude,

Ga_2O_3 solubility limit is as high as 3 mol % (2-3 times higher compared to other methods).

SOLUTION
(magnetron deposition of films)

High concentration of Ga (6 at. %) results in a high doping level of films,

Cl impurity favors the incorporation of Ga even at low growth temperatures (100 °C), increasing the transparency, concentration and mobility of charge carriers.



ADVANTAGES
(ceramic targets)

- Low sintering temperature of 1050 °C
- 99% of the initial diameter
- 80% of single crystal hardness
- 95% of ZnO density
- High conductivity of 700 $(\Omega\cdot cm)^{-1}$
- Free from powder pressing
- Possibility of multiple resintering
- High solubility limit of 3 mol %

ADVANTAGES
(100 °C deposition films):

- Doping efficiency by Ga at 100 °C deposition is as high as at 250 °C;
- Low resistivity of $2.5\cdot10^{-4}$ Ω·cm;
- High mobility of 30 cm^2/Vs;
- High transparency of 80 %;
- High figure of merit of 31 $k\Omega^{-1}$ (800 nm); one of the highest value achieved for transparent electrodes

STAGE: Pilot.

ACKNOWLEDGMENTS: This research was supported by the project 20.80009.5007.16 of the Ministry of Education and Research of the Republic of Moldova.

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

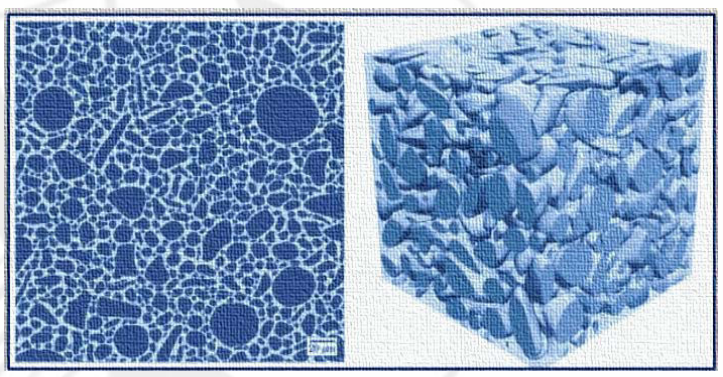
DEVELOPMENT OF DISCONTINUOUSLY REINFORCED METAL MATRIX COMPOSITES

PhD Thesis

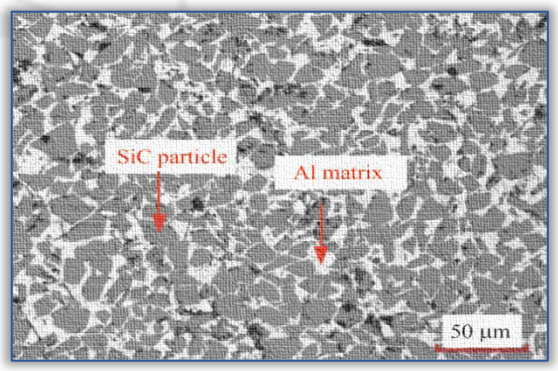
Author/s: Ciprian BULEI, Imre KISS

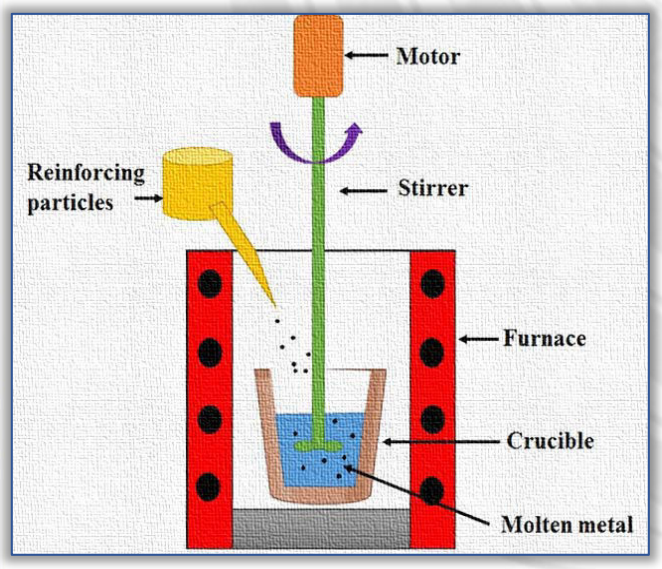
R

METAL MATRIX COMPOSITES become interesting for use as constructional and functional materials. The development of METAL MATRIX COMPOSITES was primarily directed to the CONTINUOUS-FIBER REINFORCED METAL MATRIX COMPOSITES – such as BORON FIBER/ALUMINUM-BASED MATRIX, CONTINUOUS ALUMINA FIBERS / ALUMINUM-BASED MATRIX, GRAPHITE FIBER / ALUMINUM-BASED MATRIX or GRAPHITE FIBER / MAGNESIUM-BASED MATRIX COMPOSITES. Despite the successful production of these metal matrix composites, they manufacturing was limited by the concerns related to the technological processes and cost, their availability remaining a significant barrier to their manufacturing.



Concurrently, DISCONTINUOUSLY REINFORCED METAL MATRIX COMPOSITES - such as SILICON-CARBIDE PARTICULATE REINFORCED ALUMINUM-BASED MATRIX or GRAPHITE PARTICULATE REINFORCED ALUMINUM-BASED MATRIX COMPOSITES -, were developed cost effectively for industrial and commercial applications, based on the particulate materials which could be integrated in a light matrix, using innovative manufacturing methods. This type of material has become a major research subject in recent years.





The benefits of METAL MATRIX COMPOSITES as compared to the unreinforced (monolithic) metals or alloys include superior mechanical and physical properties that deliver improved structural performance. Careful control of reinforcement particles, distribution and size allows to provide outstanding structural performance in a range of applications. Therefore, discontinuously reinforced metal matrix composites are suitable for a wide range of industrial applications. This study aims to investigate the developments in area of the DISCONTINUOUSLY REINFORCED ALUMINUM MATRIX COMPOSITES.

Contact: Imre Kiss/UPT /Faculty of Engineering Hunedoara/Dept. Engineering&Management/imre.kiss@fih.upt.ro

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

INCD EMC

INSTITUTUL NAŢIONAL DE CERCETARE – DEZVOLTARE PENTRU ELECTROCHIMIE ŞI MATERIE CONDENSATĂ – INCEMC TIMIŞOARA

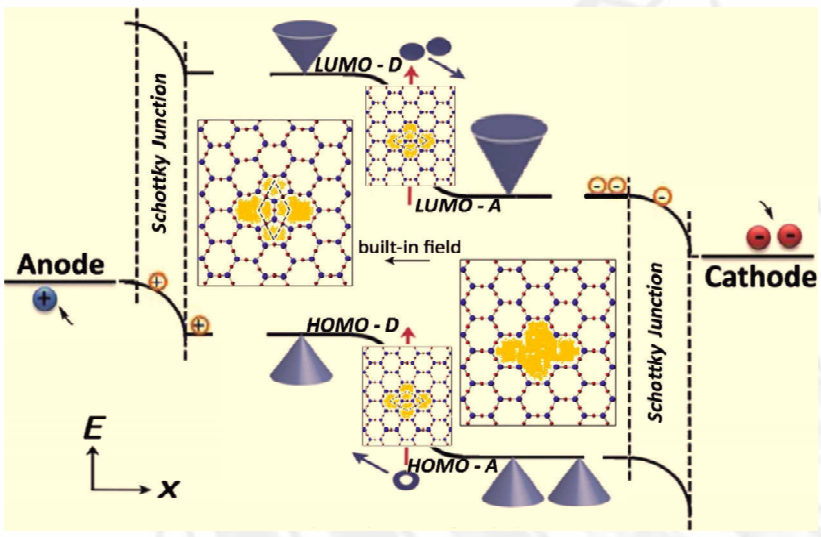
GRAPHENIC HETEROJUNCTION

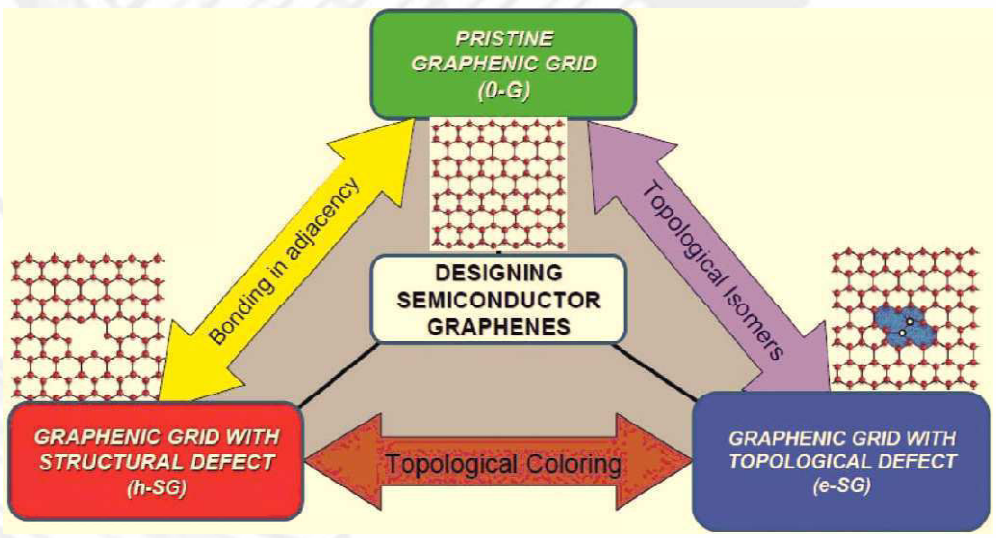
Project PED 123/2017-2018

Authors: Putz Mihai Viorel, Buzatu Doru Laurenţiu

R

The present challenge addresses the smart design and exploit semiconductor-graphene – SG nano-deca-systems, with controlled conductivity assuring the desired energy conversion while maintaining the long life using photovoltaics. Accordingly, two forms of graphene are under study and testing, especially regarding their structural support for the graphenic n-doped, and p-doped semiconductors; they are expected to reveal the so called e-SG (electron-type semiconductor graphene), based on topological defective Graphene, as appeared by inherent Stone-Wales topological rotations in pristine Graphene 0-G and h-SG (hole-type semiconductor graphene), when the structurally defective graphene is present.





This way, the new controlled photovoltaic systems is projected by various layers and or matrices of pristine and semiconductor graphenes, passing from the fashioned generation of i-/p-/n-semiconductor based heterojunctions photovoltaics to the new generation of e-/h-SG controlled photovoltaics based on defective semiconductor graphenes – for a long-life use. The efficiency of photovoltaic materials with 0-G, e-SG, and h-SG heterojunctions is curently explored by using computational quantum chemistry methods in sensing/setting-up the complete metrological triangle (U-I-R) while, in experimental side, their controlling semiconducting photovoltaic effects, i.e. R=i(U,I), U=p(I,R), and I=n(U,R), are forseeing in providing further evidence for their controlled functionality, respectively.

Contact: mv_putz@yahoo.com

+40726 011 866

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

Universitatea de Vest din Timișoara

Designing and controlling the crystalline structures and morphologies of bismuth ferrites by cooling rate, a low-cost and simple way of the microcrystal synthesis

Author: Cristian Căşuţ[1,2], Daniel Ursu[1], Marinela Miclău[1] , Iosif Mălăescu[2]

[1]National Institute for Research and Development in Electrochemistry and Condensed Matter, Str. Plautius Andronescu 1, 300224 Timisoara, Romania
[2] West University of Timisoara, Bulevardul Vasile Pârvan 4, Timișoara 300223 Timisoara, Romania

R

Description

We report the synthesis and characterization of **$BiFeO_3$** and **$Bi_{25}FeO_{40}$** microcrystals by using a simple one-step hydrothermal synthesis method. The experiments have been carried out under three different cooling rates (20°C/min, 0.75°C/min and 0.125°C/min). The synthesized particles were characterized using several techniques such as X-ray diffraction and SEM/EDX. It was observed that the cooling rate had a great influence on the purity, crystallization, and morphology of the synthesized bismuth ferrite particles. This study may provide a new way to design and synthesize novel microscale functional materials.

Bi-based ferroelectric ceramics have demonstrated the potential applications in the emerging field of spintronics, information storage, and sensors. Further focus was directed to them because of their photovoltaic effect, that was highlighted by extremely high open-circuit voltage and external quantum efficiency.

There are many methods available for the synthesis of bismuth ferrites i.e., solid state method, mechanochemical method, solution chemistry method, sol-gel method, hydrothermal method and sonochemical method.

We choose this method, considering the significant impact of hydrothermal synthesis conditions on the morphologies and sizes. The influence of the principal reaction parameters - ratio of precursors, the concentration of the sodium hydroxide, final reaction temperature, reaction time and **cooling rate** - on the size, morphology and composition of the bismuth ferrites particles was investigated.

The synthesis temperature has little effect on the morphology, which is mainly reflected in the change of the aspect ratio, but the effect on the size and morphology of the cooling rate is significant under low-temperature conditions.

Generally, ions precipitate slowly from the supersaturated solution at a slow cooling rate. On the contrary, the faster cooling rate is beneficial to the formation of **$BiFeO_3$**. **$Bi_{25}FeO_{40}$** impurity phase may be found when the cooling rate is lower, a slow cooling rate being essential in the formation of the perfect crystal.

Objectives:

- To test if changing the synthesis parameters will result in obtaining microcrystals that are in accordance with the proposed growth mechanism.
- To control the particle formation process by understanding the effects of the cooling rate as well as all the other parameters involved in the synthesis process
- To control the morphology of the microcrystals
- To control the size of the microcrystals
- To implement tunable morphology of bismuth ferrites in future applications.

Synthesis of bismuth ferrites

$Fe(NO_3)_3*9H_2O$ *20mmol*

$Bi(NO_3)_3*5H_2O$ *30mmol*

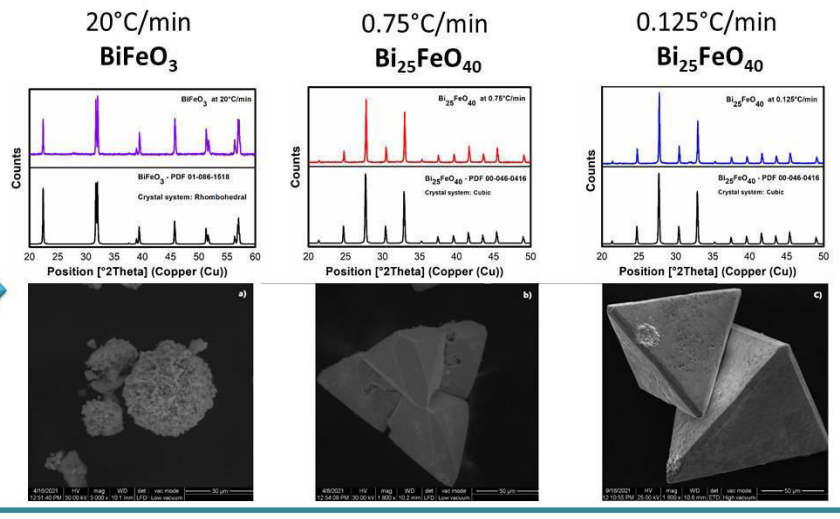
NaOH *1M*

H_2O *30 ml*

Temperature: 200°C
Time: 12h

Hydrothermal reaction

Microcrystals



Acknowledgment:
This work was supported by a grant of the Romanian National Authority for Scientific Research and Innovation, the project number PN 19 22 04 01, within PNCDI.

Contact: marinela.miclau@gmail.com
tel:+40752197756

References:
[[[1] G. Catalan, Advanced Materials 21, 2463-2485 (2009)
[2] F. Ruiz-Jorge, A. Benitez, Ind. Eng. Chem. Res., 59, 9318–9327 (2020)

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

INCD EMC
www.incemc.ro

INSTITUTUL NAȚIONAL DE CERCETARE – DEZVOLTARE PENTRU ELECTROCHIMIE ȘI MATERIE CONDENSATĂ – INCEMC TIMIȘOARA
Str. Aurel Păunescu Podeanu nr. 144, Timișoara, Timiș, România
Cod: 300569; Tel./Fax: +40 256-222.119 /+40 256-201.382;
CIF RO9364218; R.C. J35/350/1997; E-mail: incemc@incemc.ro

Reactive synergistic composition for the treatment of polluted waters with hexavalent chromium

Patent: no. 132867/2021.

Authors: Gheju Marius Traian, Balcu Ionel, Mosoarca Giannin Emanuel, Vancea Cosmin Nicolae

R

Description

The *invention* relates to a reactive composition, with synergistic effect, used for removing hexavalent chromium from polluted waters.

The technical problem solved by the present invention consists in the identification of technical conditions that ensure, with low costs and high yields, the elimination of hexavalent chromium from polluted waters.

The reactive synergistic composition for removing Cr^{VI} from polluted waters according to the invention consists of a mixture of solid particles (powders) of metallic iron (Fe^0) and manganese dioxide (MnO_2), with dimensions smaller than 0.5 mm, so that the mass percentage of MnO_2 in the homogeneous mixture should be 10 + 30%.

Cr^{VI} elimination in the presence of the reactive synergistic composition takes place through a series of mechanisms, the intensity of which depends on the pH of the treated water:

- Adsorption to the Fe^0 surface, or to the surface of the existing oxides on Fe0;
- Adsorption to MnO_2 surface;
- Heterogeneous reduction at the surface of Fe^0 or Fe^{II} oxides;
- Homogeneous reduction with soluble corrosion products of Fe^0 (Fe^{II} and H_2).

Contact: ionel_balcu@yahoo.com
+40742018319

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

INCD EMC
www.incemc.ro

INSTITUTUL NAȚIONAL DE CERCETARE – DEZVOLTARE PENTRU ELECTROCHIMIE ȘI MATERIE CONDENSATĂ – INCEMC TIMIȘOARA
Str. Aurel Păunescu Podeanu nr. 144, Timişoara, Timiş, România
Cod: 300569; Tel./Fax: +40 256-222.119 /+40 256-201.382;
CIF RO9364218; R.C. J35/350/1997; E-mail: incemc@incemc.ro

Process for obtaining hybrid materials based on clay minerals functionalized with perovskitic structures

Patent application: no. A/00822/2020.

Authors: Sfirloaga Paula, Poienar Maria, Vlazan Paulina

R

Description

- The invention relates to a process for obtaining hybrid materials based on clay minerals (montmorillonite -MMT-K10) functionalized with Ag-doped $LaMnO_3$ type perovskitic structures, obtained by the ultrasonic method with sonotrode immersed in the reaction medium.
- The technical problem solved by the invention consists in obtaining hybrid materials based on montmorillonite functionalized with perovskitic structures in a very short time and with enhanced properties. Ultrasonication causes high heating and cooling rates caused by the implosion of cavitation bubbles, which give rise to reactive species that can react either inside the bubbles or after migration into the liquid. As a result of these phenomena, intense local heating points and high pressures appear in a very short time of the order of nanoseconds.
- The process for obtaining hybrid materials, characterized in that montmorillonite (MMT) is functionalized with Ag-doped $LaMnO_3$ type perovskitic material, using the mass ratio montmorillonite: perovskite - 4: 1 mass ratio, synthesized by ultrasonic method (20 minutes, temperature= 80 °C, amplitude 80% and pulses 10 s ON / 5 s OFF, followed by heat treatement at 600 ° C for 6 hours.

Contact: paulasfirloaga@gmail.com

+40724637570

CORNELIUGROUP
research-innovation
association

INVENTCOR

Power of Creative Mind

INCD EMC
www.incemc.ro

INSTITUTUL NAȚIONAL DE CERCETARE – DEZVOLTARE PENTRU ELECTROCHIMIE ȘI MATERIE CONDENSATĂ – INCEMC TIMIȘOARA
Str. Aurel Păunescu Podeanu nr. 144, Timişoara, Timiş, România
Cod: 300569; Tel./Fax: +40 256-222.119 /+40 256-201.382;
CIF RO9364218; R.C. J35/350/1997; E-mail: incemc@incemc.ro

A new approach to the development of a sensor for selective monitoring of harmful gases using low-cost and eco-friendly materials

Project number:48PED/2017

Author: Sfirloaga Paula

R

Description

The aim of the project is to develop and test an experimental demonstration model, namely, a *SAW sensor*, using materials with perovskitic structure type ABO_3 (A = La and B = Mn) undoped and doped with Pd or Ca, obtained by ecological and sustainable processes. Planar technology was used to realization the *SAW sensor*, which is based on processes such as thermal oxidation, diffusion, deposition of thin layers and their configuration. In order to transpose the geometry on the piezoelectric substrate, it was necessary to make a mask (*Figure 1*), with the help of which the metallic geometry was printed in photoresist, by exposure to ultraviolet light.

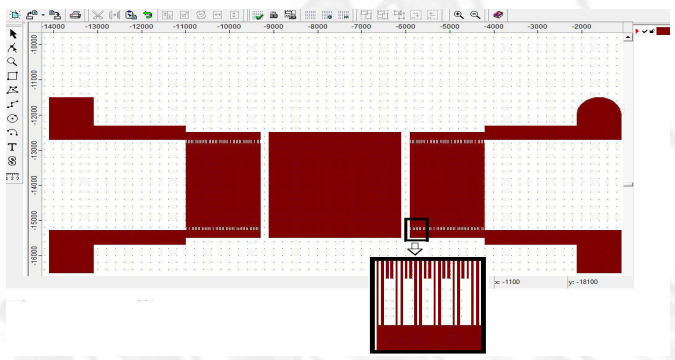


Figure 1. SAW device layout

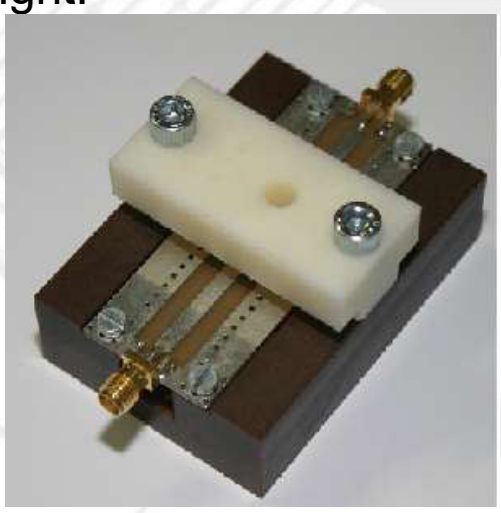
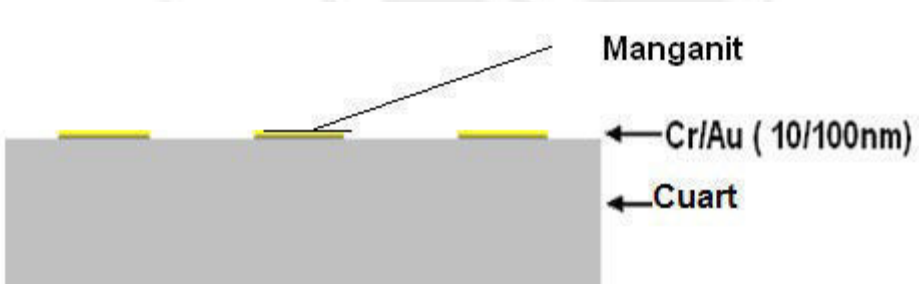


Figure 2. Sensitive platform

The sensitive platform (*Figure 2*) is composed of an ensemble of elements that have the role to fixing the sensor on the test plate, the upper element, namely the manganese deposition cell cover.



The ***SAW sensor*** (seen from the profile) with the manganite layer in the detection area.

Contact:paulasfirloaga@gmail.com

+40724637570

CARBON DIOXIDE SENSOR WITH SURFACE ACOUSTIC WAVES

Patent Application OSIM, ROMANIA, A/00474, 31.07.2020

Authors: **Bogdan-Cătălin Șerban, Octavian Buiu, Cornel Cobianu, Roxana Marinescu**

R

FIELD OF INVENTION

- Carbon dioxide (CO_2) detection is important in various sectors of domestic and industrial activity, such as indoor air quality control (air conditioning and ventilation systems), healthcare (monitoring of respiration, anaesthesia), agriculture (monitoring of CO_2 flow in soil), food technology (packaging processes, transport), alcoholic beverage industry.
- Along with optical, electrochemical and resistive sensors, gravimetric sensors are a solution for CO_2 monitoring. Drawback: Non-dispersive infrared (NDIR) structures, the most commonly used commercial devices used for CO_2 monitoring, have disadvantages, such as high cost, spectral interference and high detection limit.

ORIGINAL APPROACH

- The invention includes the design and manufacturing processes for a new gravimetric CO_2 sensor, employing carbon nanohorns functionalized with aminomethyl groups (abbreviated as CNH-CH_2-NH_2 – FIG 1) as sensing layer, deposited by spin coating, a quartz piezoelectric substrate and interdigital transducers.
- This type of functionalization confers selectivity to the nanohorn nanocarbon material by grafting aliphatic primary amine groups. Aliphatic amines, according to the HSAB theory, are hard bases and can interact reversibly, at RT, with CO_2 (hard acid) to form carbamates. The sensing structure used is of the "delay line" type, having a a double delay line in order to compensate the thermal drift.
- One of the delay lines is coated with CNH-CH2-NH2, the second delay line being the piezoelectric substrate without a sensitive layer. To obtain a signal due exclusively to the chemical interaction between CNH-CH2-NH2 and CO_2, the signal associated with the second delay line can be subtracted from the signal of the first delay line (FIG 2).

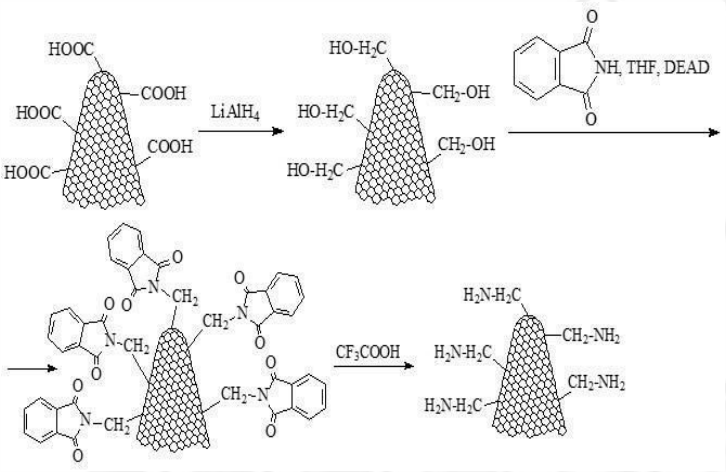


FIG 1 – Structure of CNH-CH_2-NH_2

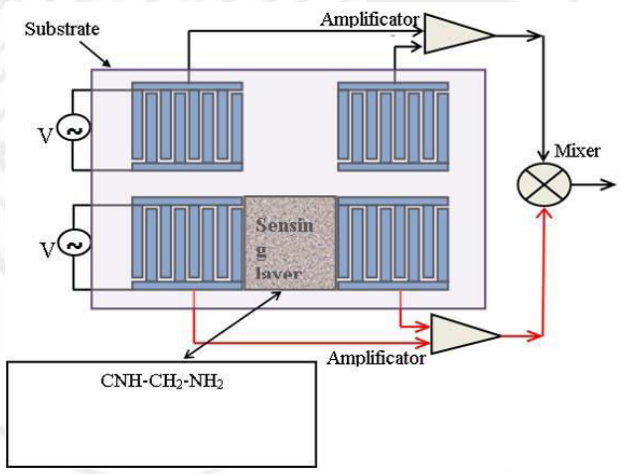


FIG 2 – Structure of the CO_2 sensor

SYNTHESIS OF THE SENSING LAYER

- Oxidized carbon nanoborns (40 mg), purchased from Sigma Aldrich, are dispersed in anhydrous tetrahydrofuran and subjected to ultra sonication for 90 minutes. 4 mg of $LiAlH_4$ are then added, the new mixture being ultrasonicated for two hours. The reaction mixture is dispersed in 250 ml of ethanol and filtered. The solid product is dried in the oven at 70°C for three hours.
- The reduced nanohorns are dispersed in tetrahydrofuran and ultrasonicated for 60 mins. 20 mg phthalimide and 4 mg ethyl azodicarboxylate (DEAD) are added. The solution is ultrasonicated for 4 hours, then the mixture is diluted with 300 ml of methanol and filtered. The solid product is dried in the oven at 90°C for three hours. The product obtained is treated with 20 mL trifluoroacetic acid, ultrasonicated for 3 hours and filtered.
- The CNH-CH2-NH2 is dried at 100°C under vacuum for 2 hours and then washed with ethanol, acetone and deionized water. A solution of CNH-CH2-NH2 (5 mg) in 50 mL dimethylformamide is ultrasonicated at RT for 10 hours. The obtained solution is deposited by the spin coating method on the quartz substrate (3000 rpm, for 60 s). The film is heated to 100^0C for 90 mins. The obtained film is subject to a final heat treatment, at 200^0C, for 10 mins.

ADVANTAGES OF THE PROPOSED SENSING LAYERS

- Improved mechanical properties, better processability, fast response, detection at RT, fast response, increased selectivity
- High specific area / volume ratio, affinity for CO_2 molecules through HSAB-type interactions ("mass loading"), as well as a variation of its resistance in contact with CO_2 molecules ("electric loading").

Contact: bogdan.serban@imt.ro / www.imt.ro

2022

Posters II[nd] International Exhibition InventCor

16-18.12.2021 – Deva, Romania

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

See you next year!

Editor: Corneliu BIRTOK BĂNEASĂ

ISBN 978-606-35-0467-9

Editura POLITEHNICA