International Exhibition

INVENTCOR

5th edition

Poster Catalogue

Editor: Corneliu BIRTOK BĂNEASĂ

4-6 April 2024

Deva, Romania



SCAN ME

Opportunity
CORNELIUGROUP
Research-Innovation Association
INVENTCOR
Power of Creative Mind
Deva ROMANIA
Creation
Realization

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Catalogue 5th International Exhibition INVENTCOR

4-6 April 2024 – Deva, Romania

International Exhibition INVENTCOR 5rd edition

CORNELIUGROUP research-innovation Association in collaboration with **Faculty of Engineering Hunedoara - Politehnica University of Timisoara** organizes in a hybrid format, the **International Exhibition INVENTCOR**, 5th edition, 04-06 April 2024, at the **Cultural Center „Drăgan Muntean”** from Deva city, Romania.

Description: The event is dedicated to non-formal education for all ages. **INVENTCOR** presents inventions, research projects, prototypes, and products, educational programs, experimental teaching stands of universities, research institutes, companies and private inventors.

Objective: The main objective of **INVENTCOR 2024** is the importance of developing the creative-innovative spirit, through the **power of example** with the involvement of young people and the promotion of Hunedoara County & Romania.

Site: CORNELIUGROUP association https://www.corneliugroup.ro/inventcor.html

FB event page: INVENTCOR 2024 https://www.facebook.com/share/T8AtrsYcdHeaRkKv/

Period & Location: 04-06.04.2024 - **Cultural Center „Drăgan Muntean”**

Motto: Creation **O**pportunity **R**ealization

Promo: https://youtu.be/WyJQzS0YnnU
Hashtag: #InventCOR2024 #CorneliuGroup #PutereaMintiiCreative

Origin: Deva City





INVENTCOR President: Corneliu Birtok Baneasa
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https://www.linkedin.com/in/corneliu-birtok-baneasa-547765240

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The **International Exhibition INVENTCOR** covers the following fields: environmental protection, materials, bio & nanotechnology, food industry, architecture, IT, electronics, computer science, automotive, aeronautics, publications, history, medicine, agriculture, textiles, includes **KidsCorner** and **InnovativeART**.

The **Power of Creative Mind Symposium** will be held within **INVENTCOR** with presentations on various topics: science, innovation, ecology, security, health, community, intellectual property, teaching methods, entrepreneurship, art and others.
The interest shown for the 5th edition of **INVENTCOR 2024** is quantified in more than 300 registrations from 31 countries.

Participating Countries: Australia, Brazil, Canada, Cambodia, Cameroon, China, Egypt, England, Germany, Greece, Hungary, India, Indonesia, Iraq, Israel, Italy, Lebanon, Malaysia, Moldova, Philippines, Portugal, Romania, Saudi Arabia, Serbia, Spain, Sweden, Switzerland, Thailand, Turkey, Vietnam and Zanzibar.

Co-organizer

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

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

"Lucian Blaga" University of Sibiu
https://www.ulbsibiu.ro/en/

Educational partners

County Library "Ovid Densusianu" Hunedoara-Deva
https://www.bibliotecadeva.ro/desprenoi.html

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General Directorate of Monuments Administration and Tourist Promotion of Hunedoara County – DGAMPT
https://www.dgampt.ro/?page_id=5592

Museum of Dacian and Roman Civilization
https://mcdr.ro/index.php/en/home-5

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

Hunedoara County Center of Excellence
https://cexhd.ro/despre/

Hunedoara County School Inspectorate
http://isj.hd.edu.ro/index.php

Technical College TRANSILVANIA Deva
https://cttdeva.ro/

Energetic Technological High School "Dragomir Hurmuzescu" Deva
https://www.energeticdeva.ro/

"Universul" Theoretical High School Chisinau
https://www.liceul-universul.md/

Territorial Aeroclub "Constantin Manolache" Deva
https://www.facebook.com/AeroclubulDeva/?locale=ro_RO

Research and innovation partners

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https://www.osim.ro/en/

Romanian Association for Alternative Technologies Sibiu - A.R.T.A. Sibiu
http://artasibiu.ro
https://www.facebook.com/mihail.titu/
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World Invention Intellectual Property associations
https://wiipa.org/about-us/

UPT Center for Innovation and Technology Transfer
https://citt.upt.ro/en/

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

The Patent - International Magazine of World Inventions
https://www.thepatent.news/

Research Center for Engineering and Management
http://www.mpt.upt.ro/eng/research/research-center.html

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

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

Satit Chula Innovation Society
Chulalongkorn University in Bangkok, Thailand
https://www.chula.ac.th/en/

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

Indonesian Young Scientist Association (IYSA)
https://iysa.or.id/

Macedonian Association Doza Srekja
https://www.facebook.com/djovanov24

NWERA Association
https://nwera.org/our-team/

Bliss Education Center
https://www.facebook.com/blisseducationcenter?locale=ro_RO

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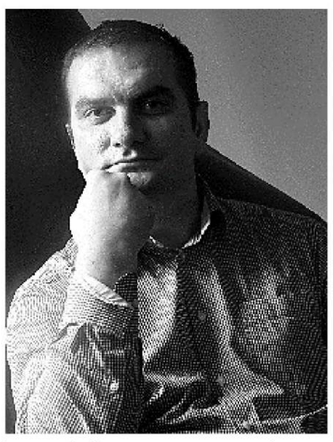
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INVENTCOR Awards

The following awards are presented at the **INVENTCOR International Exhibition**



- **INVENTCOR GRAND AWARD**
- **JURY AWARD**
- **UPT AWARD**
- **ULBS AWARD**
- **CORNELIUGROUP AWARD**
- **A.R.T.A. Sibiu AWARD**
- **CITT AWARD**
- **MEDICINE AWARD**
- **EDUCATION AWARD**
- **A.G.I.R. AWARD**
- **RESEARCHER AWARD**
- **PhD Student AWARD**
- **BEST INNOVATION AWARD**
- **MEDIA AWARD**
- **BUSINESS AWARD**
- **LEADERSHIP AWARD**
- **MANAGEMENT AWARD**
- **INNOVATIVE ART AWARD**
- **CREATIVE AWARD**
- **POPULARITY AWARD**
- **VOLUNTEER AWARD**
- **KIDS CORNER AWARD**
- **Categories Awards**
- **Special Awards of the INVENTCOR partners**



Following the international judging process, gold, silver and bronze medals will be awarded for all INVENTCOR participants.

Organizing committee

Corneliu BIRTOK BĂNEASĂ - Politehnica University of Timisoara

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Florin Nicolae OANCEA

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Dan BOBOUTANU

Mayor of Hunedoara

Guests Speakers

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A/Prof. Sorin Aurel RATIU, Sc.D.

President of General Association of the Engineers in Romania Hunedoara Branch



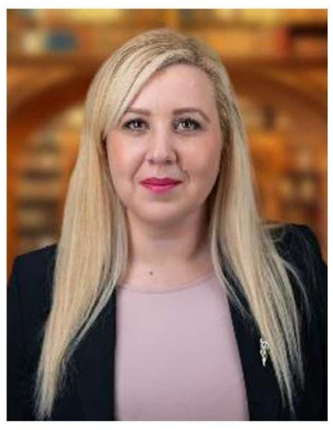
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Patricia KUMBAKISAKA

Foreign Policy researcher & Global advocate
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Head of Communication and Operational Marketing Service, State Office for Inventions and Trademarks



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Gheorghe Asachi Technical University of Iasi
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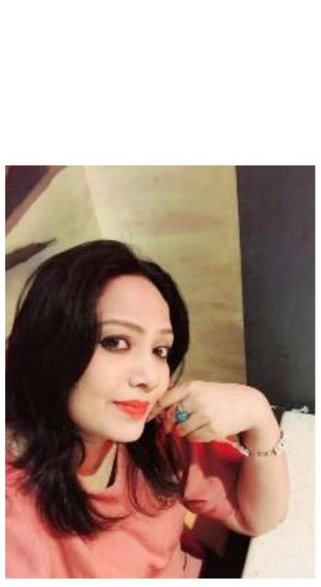
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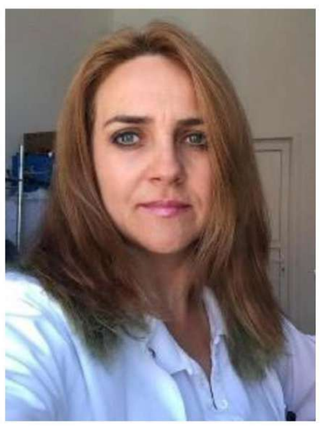


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Expert in nutrition and health

InventCor Categories

A - Energy, Protection of the environment, Biotechnology

B - Nanotechnology, Advanced materials, Metallurgy, Civil engineering

C - Computer sciences, Electronics and Electrical engineering

D - Automotive, Space science, Aviation, Ships, Mechanics

E - Teaching methods, Books, History and Cultural studies

F - Medicine, Paramedical, Pharmacy, Cosmetics, Hygiene

G - Agriculture, Veterinary medicine

H - Foods, Drinks, Restaurants, Hotels & Spa

I - Textiles, Clothing, Fashion, Handmade

J - Kids Corner, Games, Toys, Outdoor activities

K - Innovative ART, Music, Video, Photography, Publicity

A

Energy

Protection of the environment

Biotechnology

PROCESS FOR OBTAINING A FUNCTIONAL DRINK WITH HIGH BIOAVAILABILITY BASED ON THE FERMENTATION OF KOMBUCHA CULTURE

Patent number: CBI A/00076/27.02.2024

Author: Teodora-Otilia ALEXIU

Mentor: Prof. Univ. Dr. Emanuel VAMANU

A

In the current context, the development of foods is a necessity. The innovative idea involves a new process to create a functional beverage characterized by high bioavailability using the Kombucha culture.

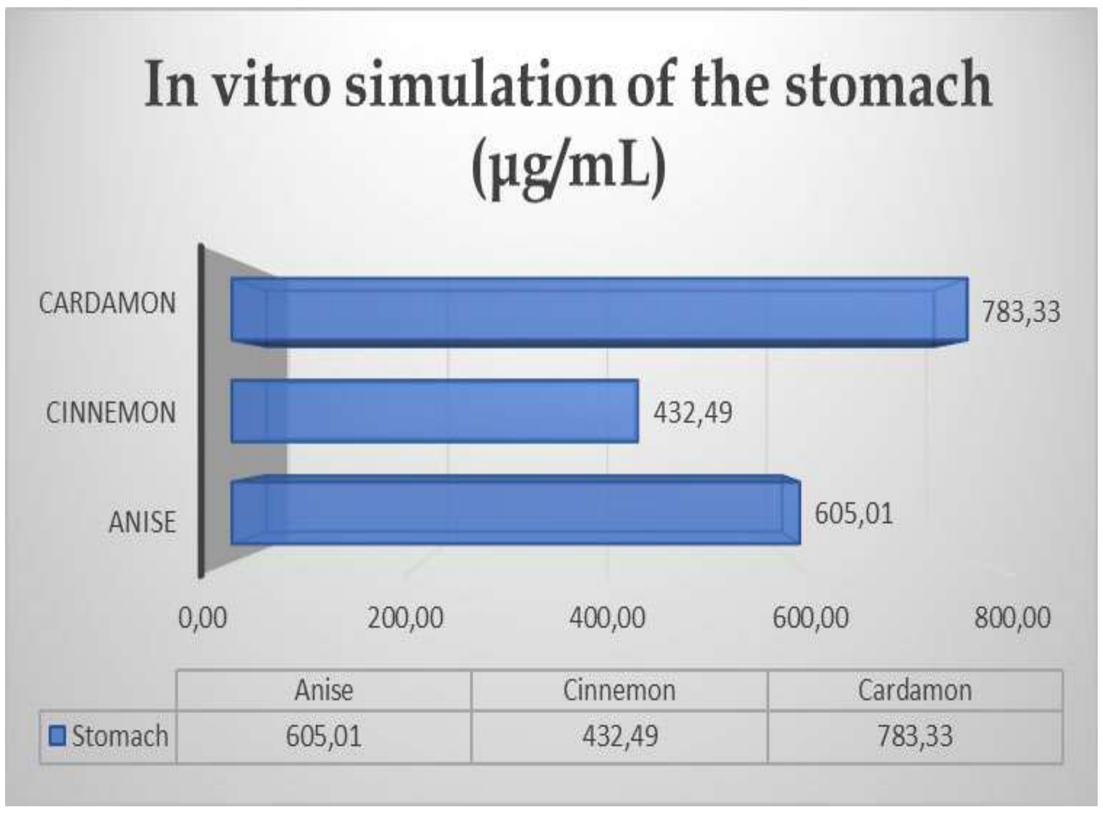
The probiotic drink, dedicated to human consumption, with antioxidant properties and is enriched with vitamin C from substrate composed of apple juice, lemon slices, flavored with anise, cardamon and cinnamon. The addition of cinnamon also contributes to its antibacterial effect.

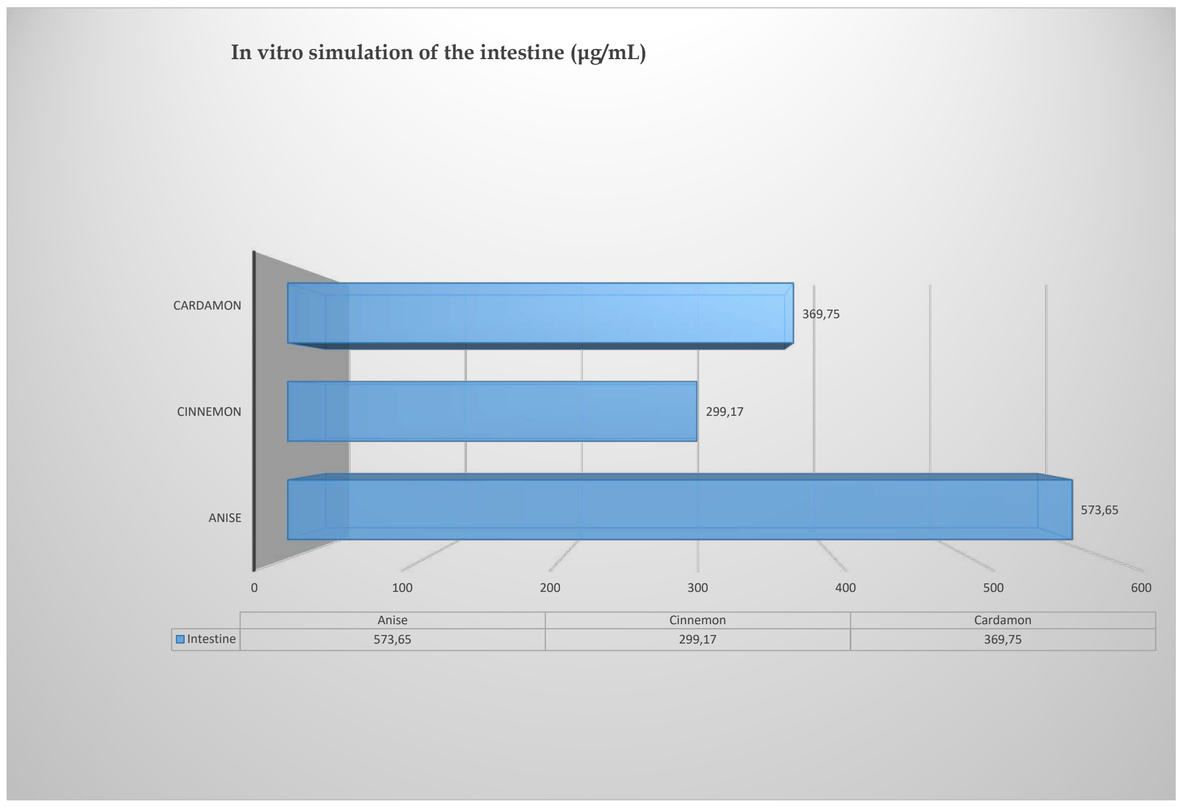
Carefully monitored and optimized fermentation not only refines the taste but also ensures the maximum bioavailability of beneficial components, such as organic acids, polyphenolic compounds, antioxidants, and ultimately probiotics. The final result is a functional beverage that transforms the concept of a refreshing drink into a product with healing and medicinal properties.

1. **A-product with anise**
2. **C-product with cardamon**
3. **S-product with cinnamon**



To demonstrate antioxidant properties, an in vitro simulation of the digestive tract was employed. It was observed that a significant amount of antioxidant compounds could be absorbed following the action of pepsin in the stomach and pancreatin in the intestine, as follows:





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C.I.F. RO9364218; Nr. R.C. J35/350/1997; E-mail: incemc@incemc.ro

Nr. certificat : 4567
ISO 9001:2015

INO-SEN-Innovative Technology for the realization of SENsors for greenhouse gases

POC/1025/1/3

Cod SMIS 2014+

156350

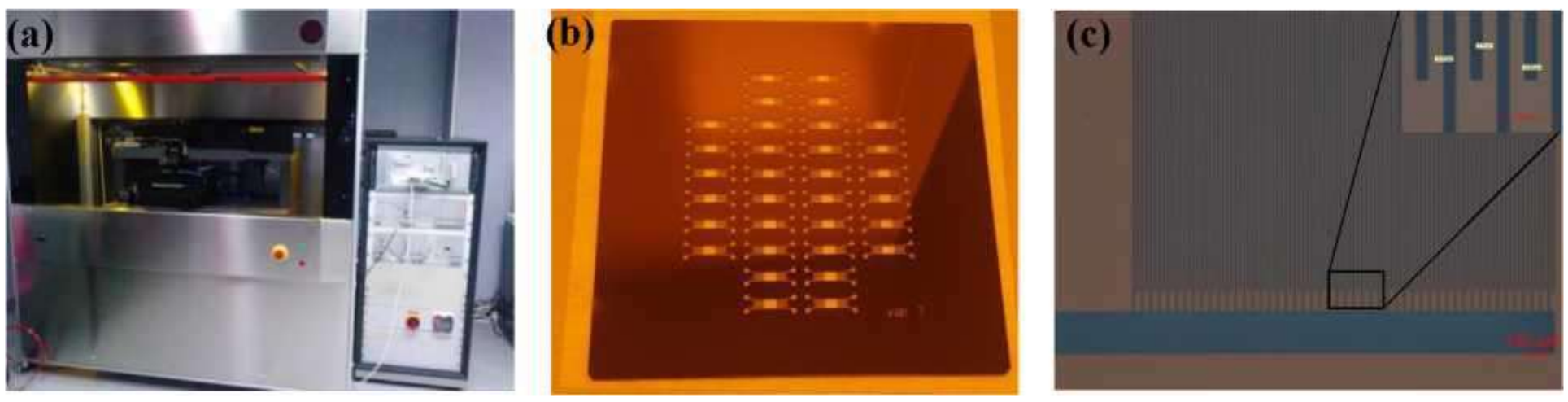
Category A

Author: Paula Sfirloaga

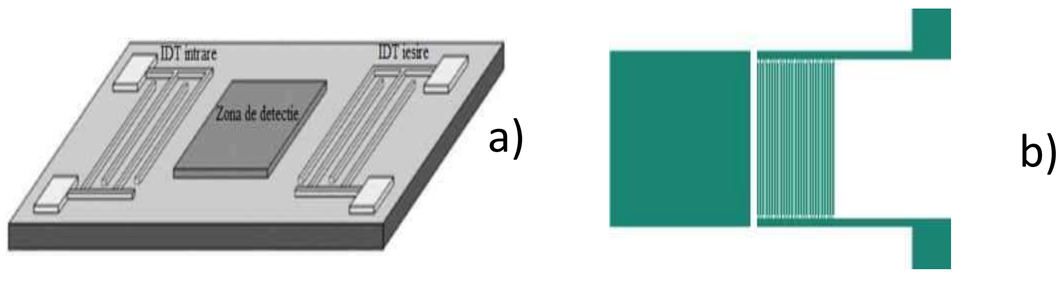
The general objective of the project refers to the founding of an innovative spin-off aimed at commercializing the scientific results obtained on the basis of a patent obtained within a public research institute, namely a sensor for the purpose of detecting greenhouse gases. The project aims to create a sensitive platform based on surface acoustic wave sensors (SAW) that uses perovskite materials of the ABO_3 type (where A is a rare earth - La, and B is a transition metal - Mn) for the detection of gases with greenhouse effect (eg CO, CO_2) from the Western Region of Romania. The newly established spin-off is of SRL type and will have CAEN code 2790 - Manufacture of other electrical equipment.



Sensor for CO_2 detection



(a) the mask making equipment - DWL 66fs, (b) photolithographic mask used to define the SAW sensors and (c) detail on the photolithographic mask with interdigitated structure



(a) Simplified structure of the delay line Rayleigh wave SAW sensor and (b) mask designed using the CleWin program

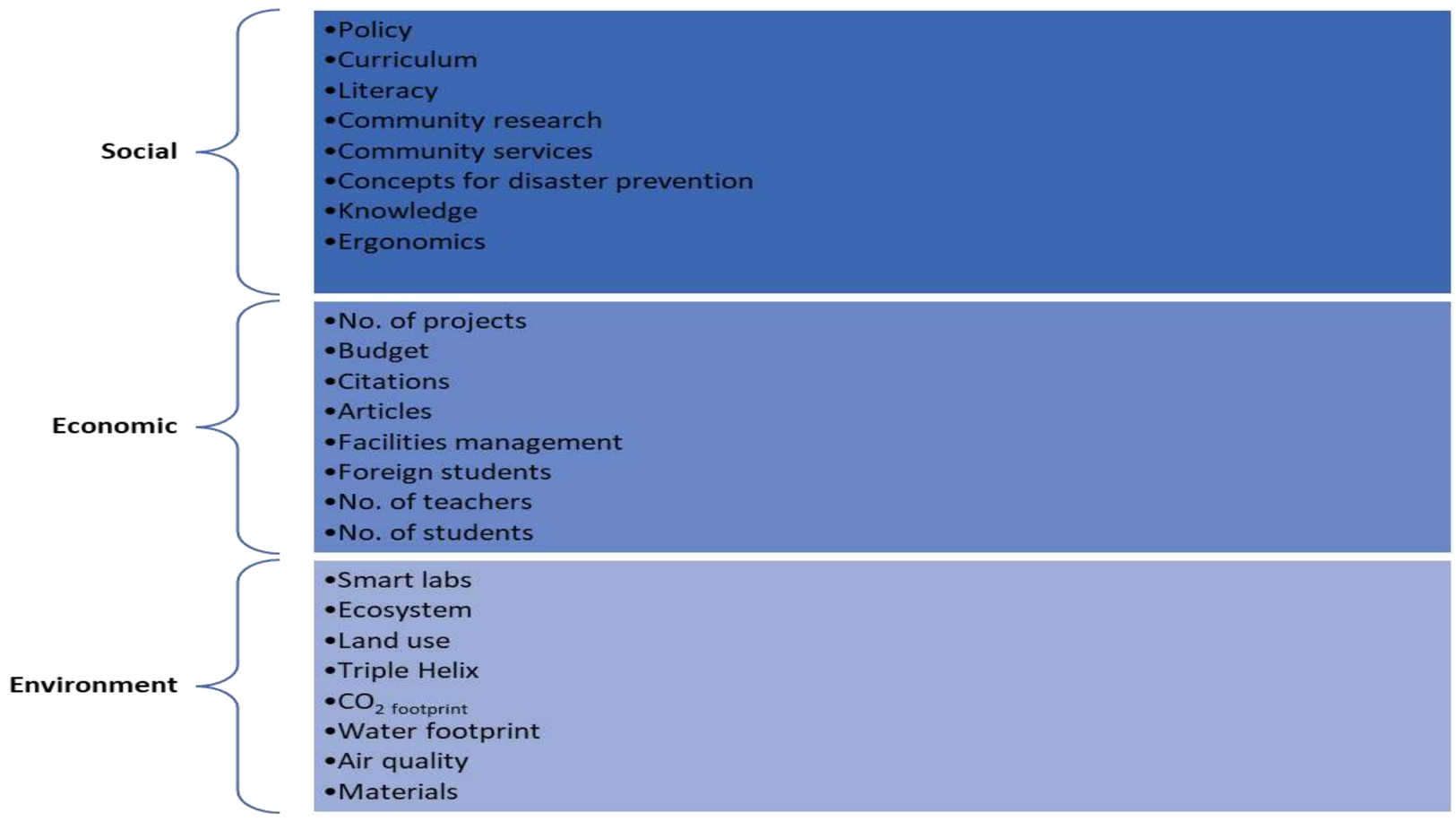
Contact: paulasfirloaga@gmail.com

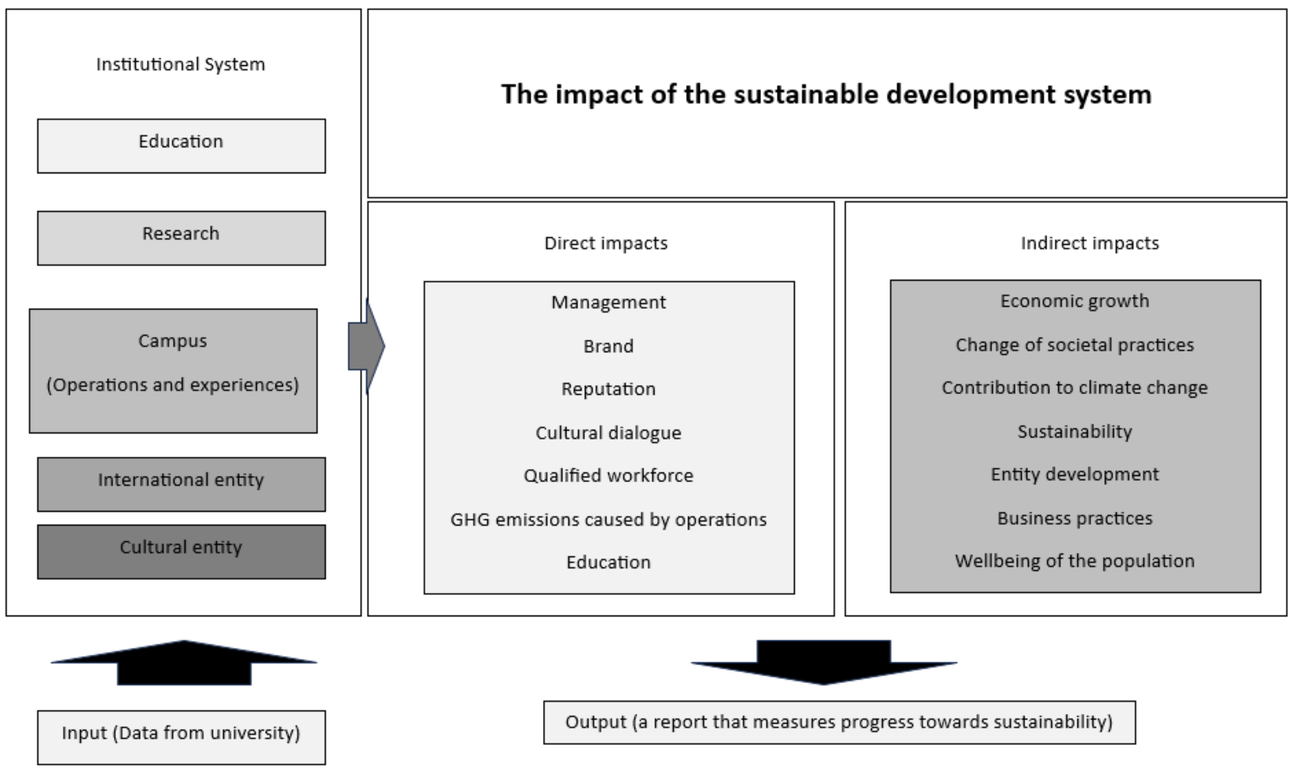
EVALUATION OF UNIVERSITY SUSTAINABILITY THROUGH THE SUny SYSTEM

A

Authors: Delia ROZOVLEAN, Laura-Crina COCA, Larisa IVAȘCU

This innovative system is considered to be unique for evaluating the sustainability of universities. It is based on 150 indicators covering a wide range of issues, including policy, campus, financial resources, facilities management, curriculum, sustainability literacy, smart labs, community research, ecosystem, land use, energy, water, community services, concepts for disaster prevention and others. The established indicators fall under the three responsibilities of sustainability (economic, social, and environmental). The indicators are applied to the institutional system which is designed on 5 entities: education, research, campus (operations and experiences), international entity, and cultural entity. The purpose of the platform is to improve social responsibility and environmental performance through a whole institution approach.





This system will help with the design, planning, delivery, and control of your strategic sustainability activities.

The output of the system will be a report that measures progress towards sustainability and be recognized for sustainability leadership. The system will have direct impacts (management, brand, reputation, cultural dialogue, qualified workforce, GHG emissions caused by operations, and education) and indirect impacts (economic growth, change of societal practices, contribution to climate change, sustainability, entity development, business practices, and well-being of the population).

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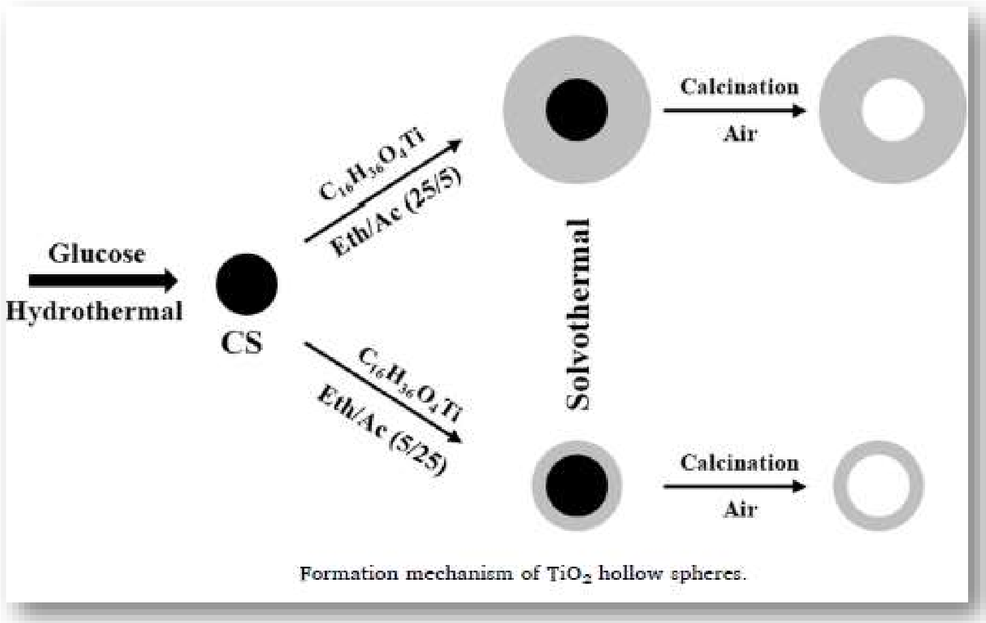
EFFICIENT INDOOR DYE-SENSITIZED SOLAR CELLS BASED ON TiO_2 HOLLOW SPHERE

Research project: *PN-III-P2-2.1-PED-2021-0624*

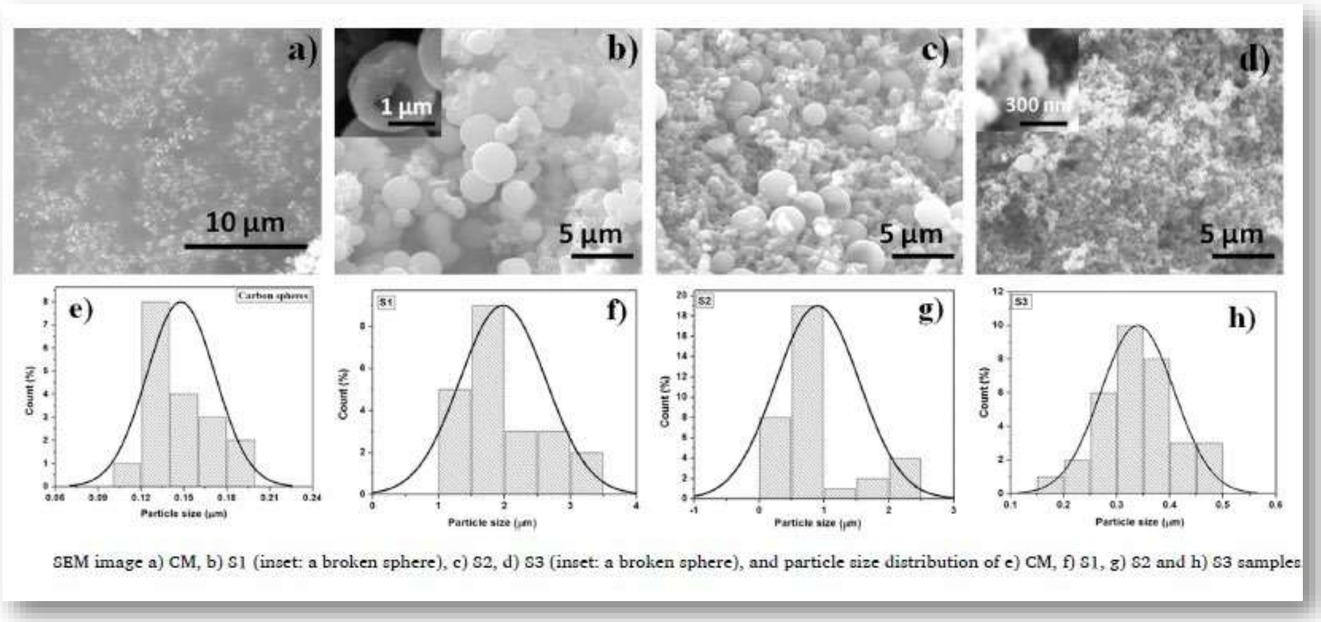
A

Daniel Ursu, Marinela Miclău, Corneliu Birtok-Baneasa, Melinda Vajda

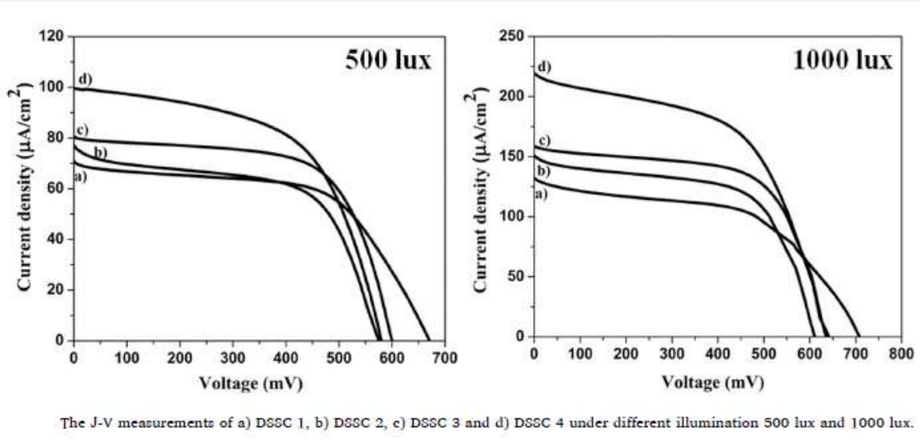
The upcoming successful commercialization of dye-sensitized solar cells as is conditioned by the improvement of the device performance and durability. One of promising strategies exploited so far is co-sensitization, which involved the development of the dyes with high light absorption together with high expensive photovoltage redox mediators. Here, we propose a different strategy to improve ambient light harvesting capacity and durability using the three-dimensional hollow sphere architecture of the photoanode, commercial XY1b dye, and common iodide/triiodide redox electrolyte. Under 1000 lux illumination, TiO_2 hollow spheres obtained by nearsupercritical solvothermal synthesis with tuning shell thickness **provided a power conversion efficiency of 25.25%**, which is a 56.6% increase comparable to dispersed nanoparticles used in classical dye-sensitized solar cells. Together with the dye loading capacity and light scattering efficiency, the TiO_2 hollow spheres improved the long-term stability of the cell under indoor lighting conditions. Thus, even **after 720 h of operation, the DSSC continued to provide a stable** short-circuit current with a moderate increase, approximately 10% from the initial value.



Formation mechanism of TiO_2 hollow spheres.



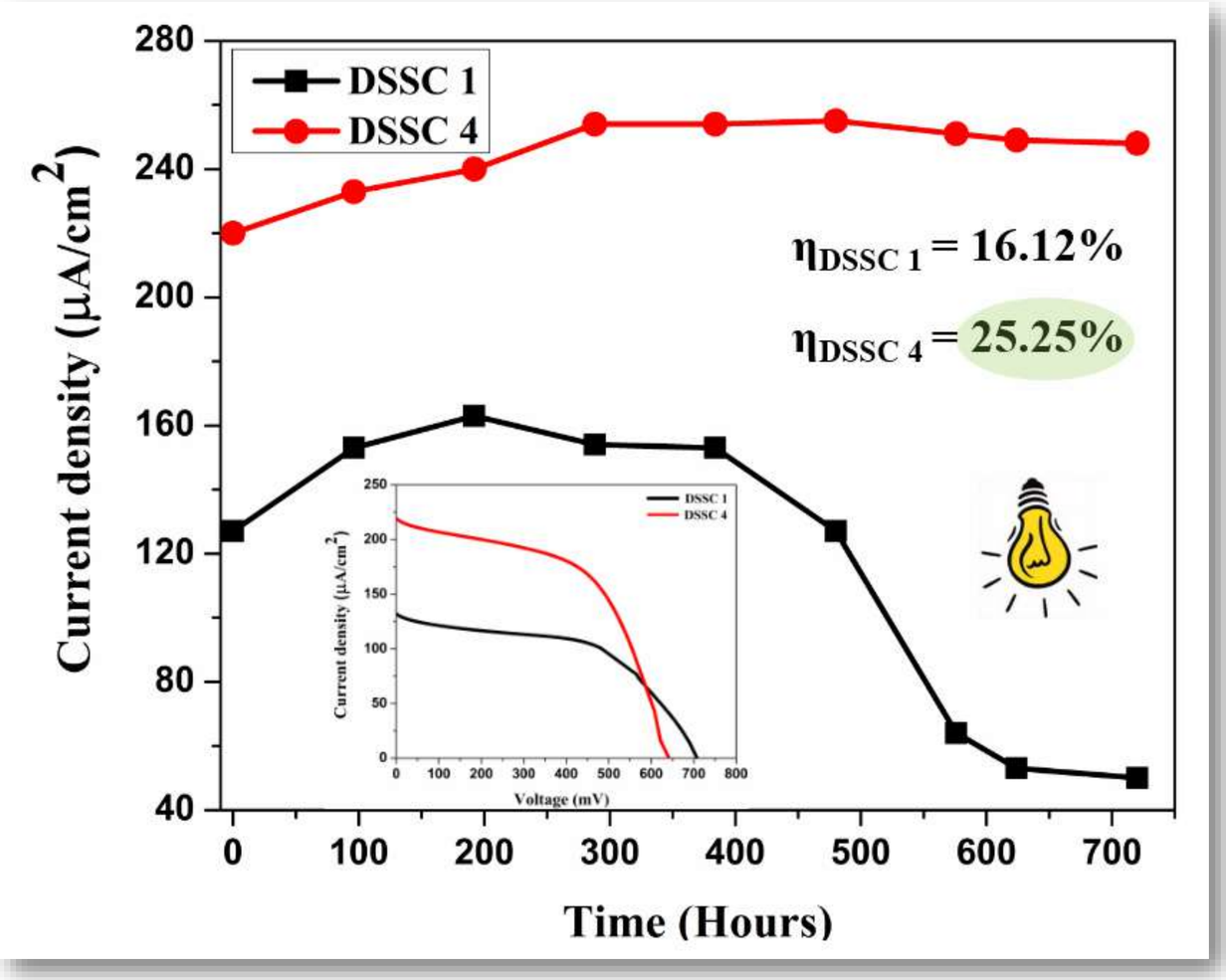
SEM image a) CM, b) S1 (inset: a broken sphere), c) S2, d) S3 (inset: a broken sphere), and particle size distribution of e) CM, f) S1, g) S2 and h) S3 samples



The J-V measurements of a) DSSC 1, b) DSSC 2, c) DSSC 3 and d) DSSC 4 under different illumination 500 lux and 1000 lux.

The photovoltaic performances of DSSC 1, DSSC 2, DSSC 3 and DSSC 4 under 500 lux and 1000 lux illumination conditions.

DSSC type	Light intensity	J_{SC} (µA/cm²)	V_{OC} (mV)	FF (%)	η (%)
DSSC 1		70.8	671	58.1	18.36
DSSC 2	500 lx	63.5	650	62.2	17.11
DSSC 3		80.2	600	64.6	20.72
DSSC 4		99.6	580	57.1	21.98
DSSC 1		132.2	708	51.7	16.12
DSSC 2	1000 lx	131.5	700	59.9	18.34
DSSC 3		158.7	636	62.7	21.04
DSSC 4		219.5	642	53.8	25.25



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ENHANCED INDOOR CONVERSION EFFICIENCY OF DYE-SENSITIZED SOLAR CELLS BY OPTIMIZING BALL-MILLING PROCESS OF TiO_2 PASTE

A

Research project: PN 23 27 01 03

Authors: Marinela Miclau, Melinda Vajda, Daniel Ursu

The rapid spread of the Internet of Things (IoT) along with the development of innovative low-power electronic devices has also driven the development of indoor photovoltaics. In this paper, we propose a simple and economically feasible solution that can **improve the efficiency of dye-sensitized solar cells (DSSCs) under indoor light conditions by ~112%**, without requiring a complex TiO_2 photoanode architecture or the design of new dyes. The ball milling process of the TiO_2 paste was optimized for indoor light conditions for the first time, both in terms of efficiency and production costs, by developing a rapid preparation method that can be used industrially for the application of DSSCs. A simple use of 12 mm diameter balls caused beneficial structural modifications, decreasing the size of the crystallites, and leading to a high OH generation on the TiO_2 surface responsible for the improvement of energy conversion efficiency.

Due to the ***high impact force on the material caused by the increasing size of zirconia balls,*** and the kinetic energy which breaks down the bonds between molecules, a simple use of 12 mm diameter balls caused beneficial structural modifications, **decreasing the size of the crystallites**, and **increasing OH generation on the TiO_2 surface**. The reduced crystallite size also allowed the **absorption of a much larger amount of dye** on the surface of the photoanode, this leading to an **increase in the efficiency of DSSC under indoor light**.

Table 1. Crystallite size from XRD analysis

Sample	Crystallite Size	
	3 h [nm]	12 h [nm]
Ti_NP	16.3	16.3
5 mm balls	13.4	13.6
8.5 mm balls	11.7	10.4
10 mm balls	11.3	10.3
12 mm balls	10.3	9.5

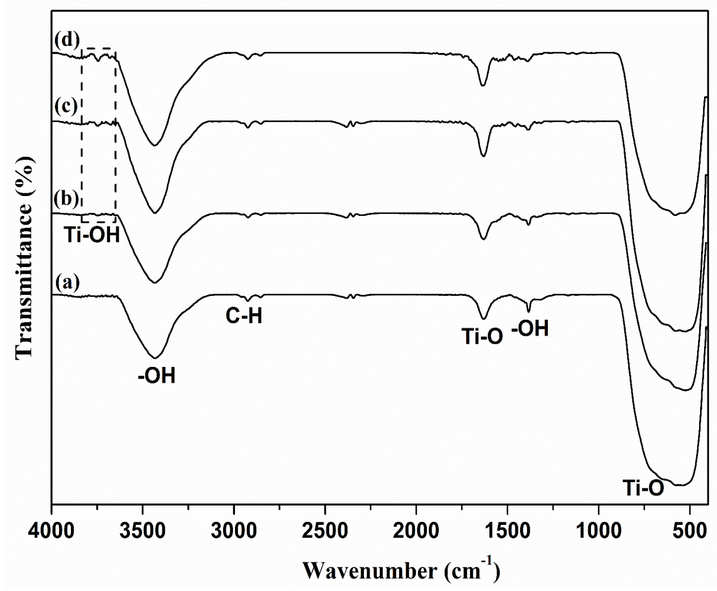


Fig. 1. FTIR spectra of paste using (a) 5 mm, (b) 8.5 mm, (c) 10 mm, and (d) 12 mm balls at 3 h rotation time.

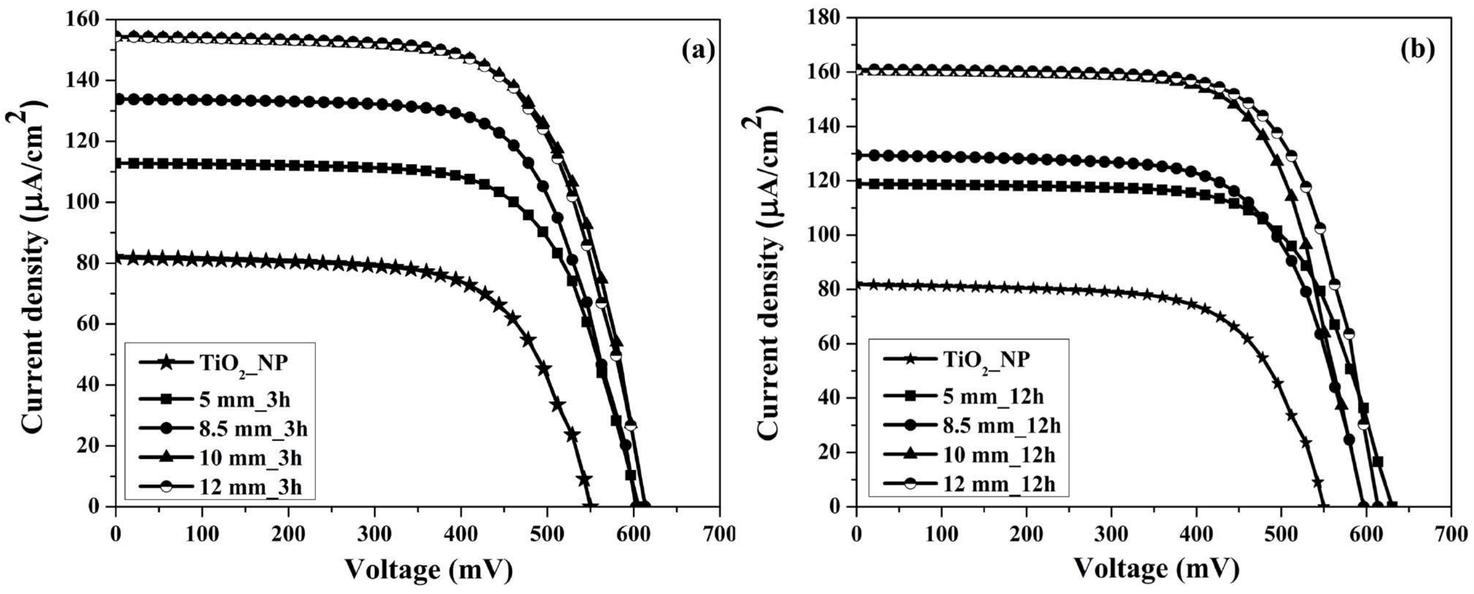


Fig. 2. J-V measurements of DSSCs for TiO_2 paste un-milled and milled at different rotation time (a) 3 h and (b) 12 h, under 1000 lux illumination.

Table 2. Photovoltaic performances of DSSCs under 1000 lux illumination conditions.

Time	Materials	J_{SC} [μA cm^{-2}]	V_{OC} [mV]	FF [%]	η [%]
-	TiO_2_NP	81.91 ± 0.01	549.9 ± 0.1	66.3 ± 0.1	9.96 ± 0.02
3 h	5 mm balls	112.81 ± 0.01	605.6 ± 0.1	67.6 ± 0.1	15.38 ± 0.04
	8.5 mm balls	133.83 ± 0.01	602.7 ± 0.2	67.8 ± 0.1	18.22 ± 0.03
	10 mm balls	154.19 ± 0.02	613.6 ± 0.2	67.2 ± 0.1	21.20 ± 0.03
	12 mm balls	154.39 ± 0.02	613.6 ± 0.2	67.0 ± 0.1	21.15 ± 0.02
12 h	5 mm balls	118.88 ± 0.01	630.5 ± 0.1	67.5 ± 0.1	16.85 ± 0.03
	8.5 mm balls	129.39 ± 0.01	596.7 ± 0.1	66.9 ± 0.1	17.21 ± 0.03
	10 mm balls	160.33 ± 0.02	596.7 ± 0.2	69.1 ± 0.1	22.09 ± 0.02
	12 mm balls	160.91 ± 0.02	613.6 ± 0.2	69.7 ± 0.1	22.92 ± 0.02

The DSSC obtained from the TiO_2 paste mortared for 3 h with 12 mm balls highlighted an **efficiency increase of ~37.5% (21.15% PCE)** compared to the paste obtained with 5 mm balls (15.38% PCE) **and 112.3%** compared to the untreated paste (9.96% PCE), respectively, at 1000 lux.

In terms of production costs, the 8.4% increase in energy conversion efficiency does not justify the 12 h used for the ball-milling process compared to 3 h for 12 mm balls.

In conclusion, the ball-milling process of the TiO_2 paste was optimized for indoor light conditions for the first time, both in terms of efficiency and production costs, by developing a rapid preparation method that can be adopted industrially for the application of DSSCs.

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NATIONAL SECURITY RESEARCH-DEVELOPMENT INSTITUTEMINING AND EXPLOSIVE PROTECTION – INSEMEX PETROSANI
ROMANIA

DYNAMICS DETERMINING OF EXPLOSIVE ATMOSPHERES FORMATION METHOD

A

Patent application no. A 2022 00534

Authors:

Cioclea Doru, Găman George Artur, Ghicioi Emilian, Gherghe Ion, Ianc Nicolae, Rădoi Gheorghe Florin, Boantă Corneliu Dănuț, Chiuzan Emeric, Tomescu Cristian, Matei Adrian, Drăgoescu Răzvan, Cămărășescu Alexandru, Vlasin Nicolae, Șimon Marinică Adrian Bogdan

Dynamics determining of explosive atmospheres formation method is based on the analysis of dispersion dynamics in the accumulation phase, with the highlighting of areas with low concentrations as well as the reaction capacity of the ventilation system in the dilution and evacuation phase, through:

- the choice of the closed enclosure where the dynamics of the formation of the explosive atmosphere are to be established;
- determining the total free volume of the closed enclosure;
- establishes the shape and layout of the measuring equipment;
- the methane concentration measurement system is located;
- the ventilation system is configured for the evacuation of the dangerous atmosphere;
- the gas flow control system is installed at the measurement site;
- the system for continuous determination of gas concentrations is connected;
- data resulting from continuous measurements are collected;- the airing time is set;
- the gradient of dispersion and progressive dilution of the gas at the level of the closed enclosure is determined, which determines the dynamics of the formation of the explosive atmosphere.

Dynamics determining of explosive atmospheres formation method can be applied to any closed, semi-closed or open industrial premises where there is a risk of explosive atmospheres.

The method for dynamics determining of explosive atmospheres formation method was designed within INCD INSEMEX Petroșani and can be used for any combustible gas with explosive properties and for any closed, semi-closed or open premises.

The method for dynamics determining of explosive atmospheres formation method was tested with good results in the closed premises of the experimental laboratory, regarding the study of industrial ventilation systems.

The application of the method for dynamics determining of explosive atmospheres formation method resulted as a necessity for the efficiency of the management of networks or industrial ventilation systems, as well as for increasing the degree of safety and health at work at the level of industrial premises with the risk of formation of explosive atmospheres.

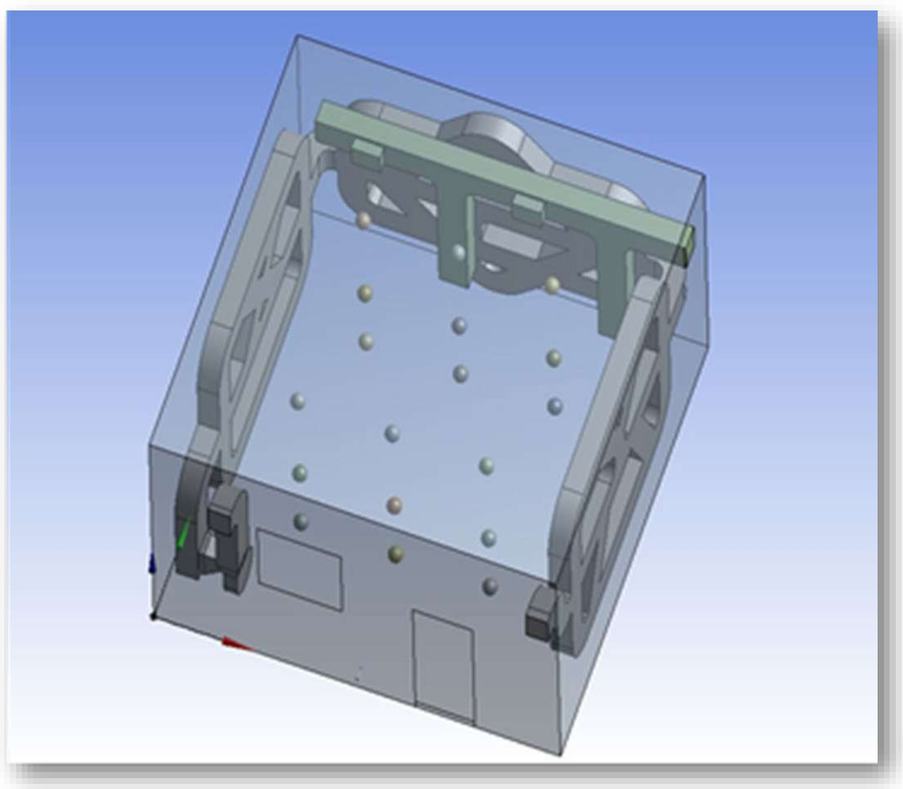


Fig. no. 1. Establishment of closed premises

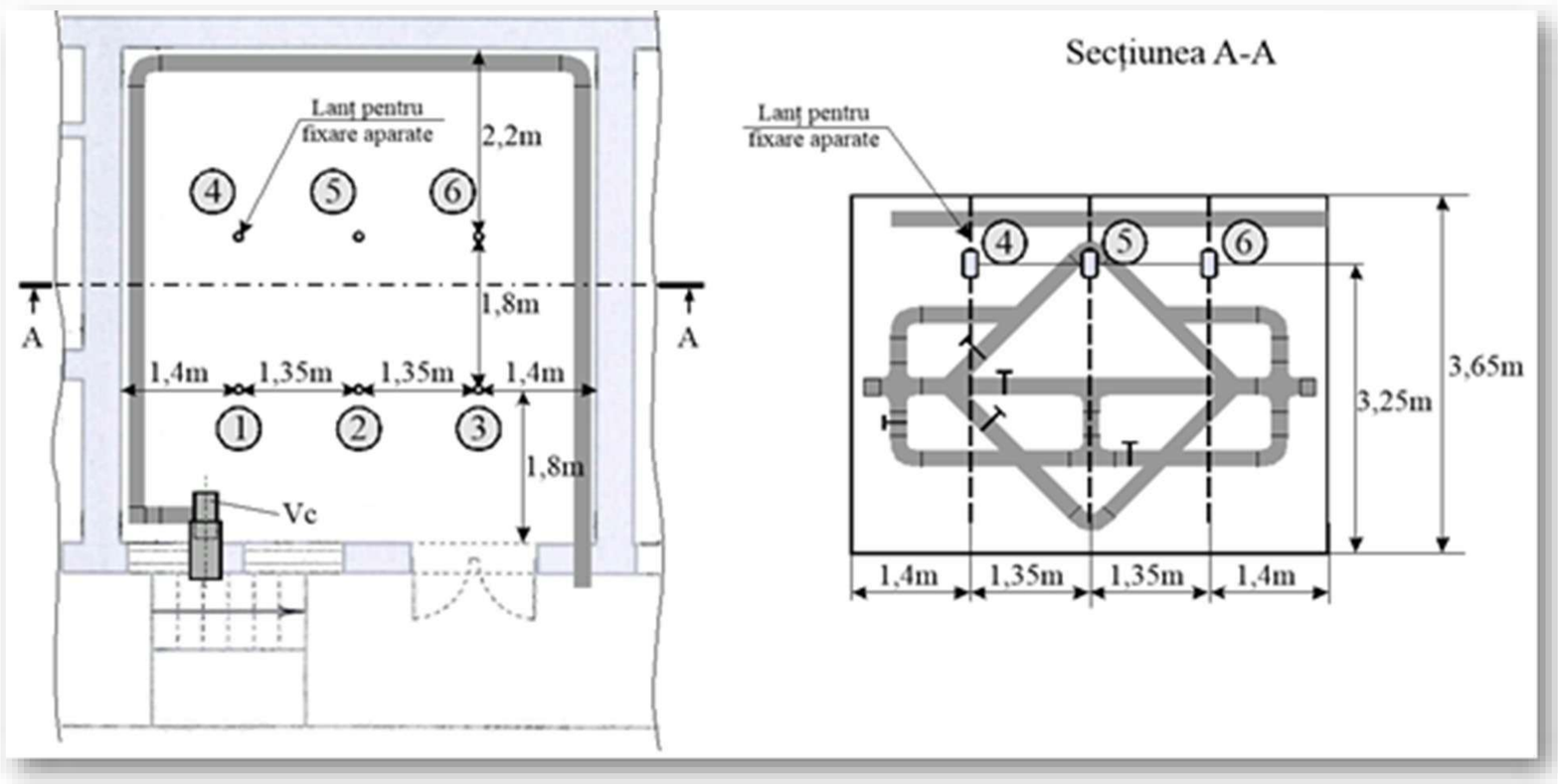


Fig. no. 2. Establishing measurement points at the level of the closed enclosure

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NATIONAL SECURITY RESEARCH-DEVELOPMENT INSTITUTEMINING AND EXPLOSIVE PROTECTION – INSEMEX PETROSANI
ROMANIA

FAST SEALING SYSTEM FOR UNDERGROUND MINING WORKS

A

Patent no. BI 129843/2019

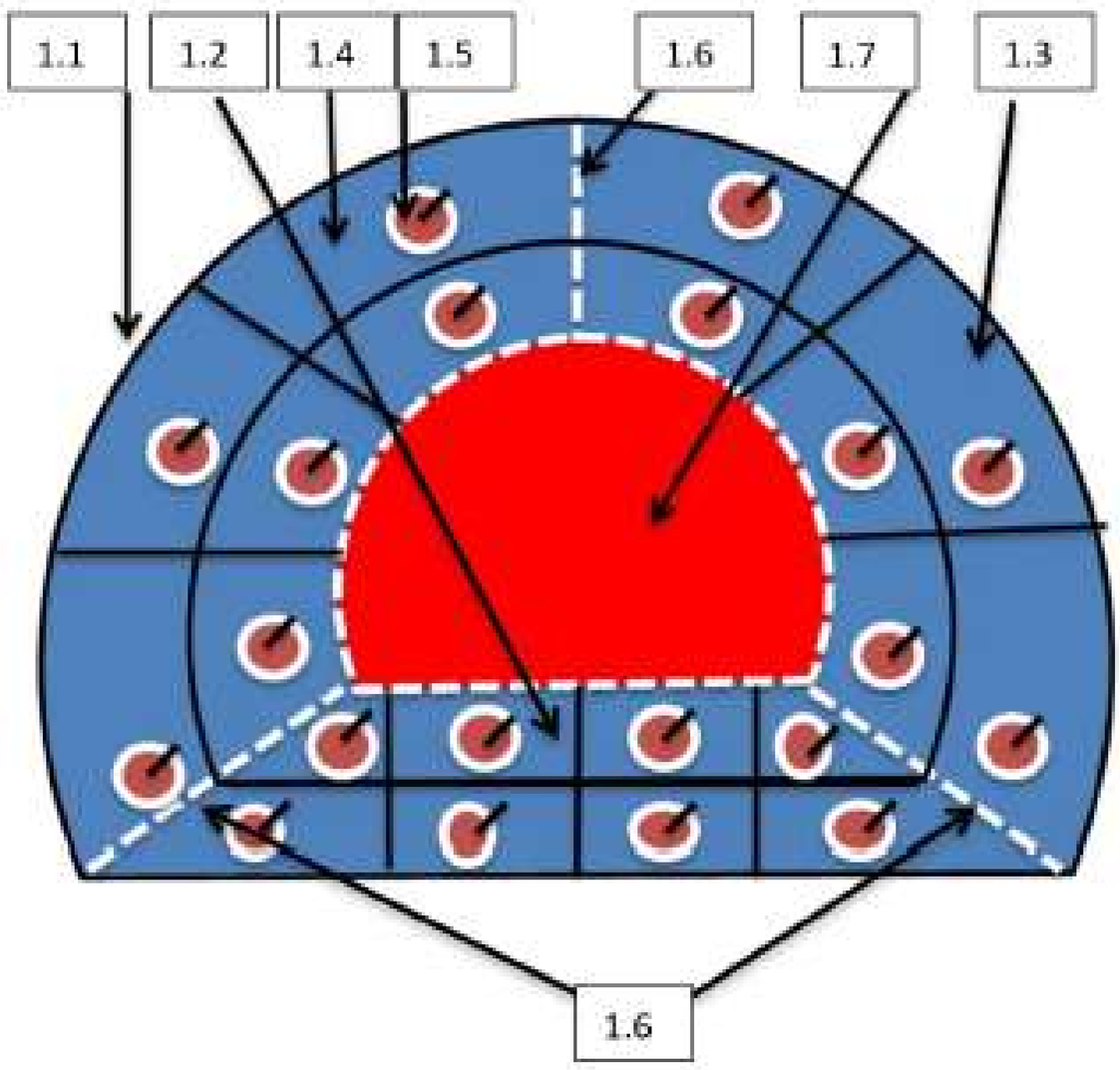
Authors: **Emilian Ghicioi, Constantin Lupu, Doru Cioclea, Ion Toth, Sorin Constantin Burian, Artur George Găman, Mihaela Părăian, Maria Prodan, Jeana Ionescu**

The invention relates to the development of a system for fast sealing underground mining works in order to guide air into those underground mining works located in the proximity of areas in which occurred explosion or fire type events and which have to be insulated with priority and celerity in order to minimize the risk for the initiation of a new explosion or of new coal self-ignition processes (in the insulated area) or against the input of toxic/flammable gases released within the insulated perimeter/mining work into mining works which have to dispose of uncontaminated fresh air.

The rapid closure system for underground mining workings according to the invention consists of two identical elements placed at a distance from each other of about1.5-5 m in the underground mine workings. Each part of the system consists oft here inflatable modules–the left-side module (1.1), the lower module (1.2), and the right-side module (1.3). Each module is multicellular, or honeycombed, consisting of a series of inflatable cells (1.4) with individual valves (1.5), coupled together using fasteners of the Velcro (hook-and-loop fastener) or zipper type (1.6). An access window (1.7) made of material similar to that of the inflatable cells is integrated into the assembly of the three modules, using the same fastener type. This system can be used temporarily to ensure worker safety during the construction of permanent containment dams. It can also be used for longer periods of time after an explosion has occurred, with proper instrumentation and a device to compensate for air/nitrogen leakage in the containment area.

The invention is useful for quickly isolating parts or areas of an underground mining network where explosions or fires have occurred. It also facilitates the rapid restoration of critical mining ventilation routes, as well as providing a controllable level of safety for mine rescue teams who need to intervene to rescue victims caught in the event. This ensures that the flow of toxic and/or explosive gases from the affected area is restricted to the fresh air mining workings, while preventing fresh air from penetrating the underground mining workings that need to remain active. This helps prevent the formation of new explosive atmospheres or the continuation of the original combustion process.

Fig. no. 1. Element of a fast sealing system for underground mining works



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NATIONAL SECURITY RESEARCH-DEVELOPMENT INSTITUTEMINING AND
EXPLOSIVE PROTECTION – INSEMEX PETROSANI
ROMANIA

EXPERIMENTAL SET-UP FOR THE DETERMINATION OF THE EXPLOSION LIMITS OF FLAMMABLE LIQUIDS VAPOURS

A

Patent no. BI 131748/2023

Authors:

Maria Prodan, Găman George Artur, Ghicioi Emilian, Lupu Constantin
Cioclea Doru, Păsculescu Vlad, Gabor Dan, Vlasin Nicolae, Jurca Adrian, Szollosi Mota Andrei,
Nălboc Irina, Șuvar Marius

The invention refers to a stand for determining the explosion limits for the vapors of flammable liquids, respectively the lower explosion limit (LEL) and the upper explosion limit (LSE), a stand that allows the recording of the explosion pressure and where the processes of creating vapors from the liquid, of the homogeneous air-vapor mixture and that of rapid combustion, all take place in an thermostated explosion vessel at the boiling temperature of the liquid, the initial pressure and temperature conditions can be set to values between 0.4 bar and 2 bar, respectively between 20 degree C and 400 degree C, the ignition source being either electric sparks (inductive or capacitive) or incandescent wire.

The stand, according to the invention, consists of an assembly consisting of a thermostated explosion vessel, equipped with temperature and pressure transducers, an optical sight, metal electrodes for the electric ignition spark (alternatively, an incandescent wire can be mounted), external device for making of the balance of the explosion vessel to achieve internal homogenization of the air-vapor mixture, digital manometer, taps for flammable liquid sample intake, to achieve the initial pressure conditions, to evacuate reaction products, to purge the explosion vessel, as well as related devices: source for supplying electricity to the thermal envelope of the explosion vessel, source for spark generation, video camera for recording explosion phenomena, digital oscilloscope amplifier connected to PC for recording explosion pressure, vacuum/compressed air pump, determined explosion limits providing the technical-scientific basis for the development of technical-organizational explosion protection measures for industrial activities that process, store or use flammable liquids, substances that can create potentially explosive atmospheres.

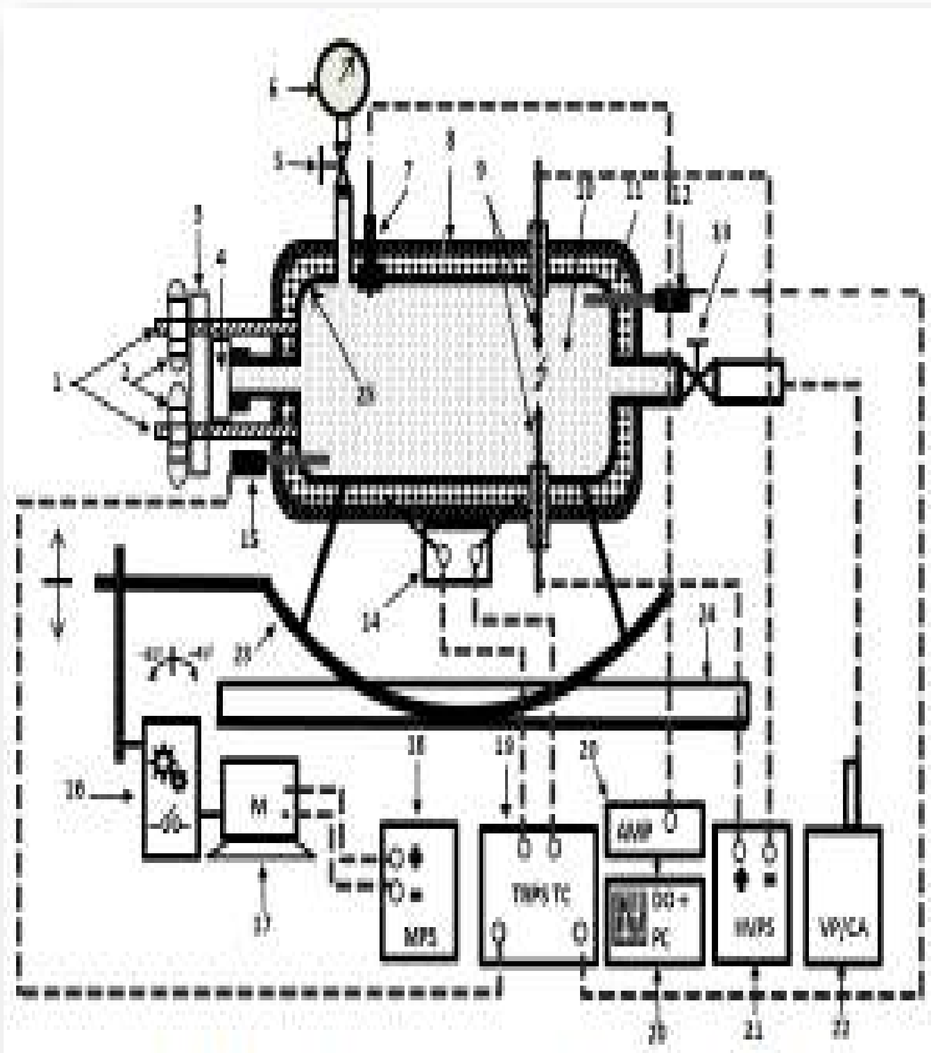


Fig. no. 2. Experimental set-up for the determination of the explosion limits of flammable liquids vapours

-1 Tie rods, for fixing and sealing the visor, supports for the tightening element; -2 Butterfly nut for fixing the clamping element; -3 Visor tightening element; -4 Visor for viewing the spark and the explosion propagation phenomenon, as well as for video recording (by detaching the visor, it is possible to achieve: a second way to purge the combustion gases - in tandem with valve 13, the introduction of the flammable liquid sample) ; -5 Valve for isolating the control manometer during the production of the controlled explosion; -6 Manometer for measuring the initial pressure (0.4 bar -2 bar); -7 Pressure transducer for dynamic measurement of explosion overpressure; -8 Insulating cover to maintain the temperature set at the beginning of the test (between 200C and 4000C) -9 Metal electrodes with pass-through insulators with the possibility of adjusting the electric arc (spark) penetration distance or, alternatively, allows the installation of an incandescent wire; -10 Flammable liquid air-vapor mixture (made and homogenized inside the explosion vessel 25) -11 Thermal cover made of electrical resistance to be heated - nickeline in insulating ceramic (the supply of the thermal resistance is made from the dedicated source 19 with temperature control on the transducers 12,15-type K probes);-12 Temperature transducer - type K probe;-13 Multifunctional valve: vacuum creation, initial overpressure exhaust, explosion pressure exhaust, compressed air inlet for purging, liquid sample inlet, air inlet for mixing;-14 Connector for the thermal element;-15 Temperature transducer - type K probe for controlling the thermal element;-16 Worm reducer-worm wheel with arched base actuating arm for making the rocking movement of the explosion vessel to achieve a complete vaporization and homogenization of flammable liquid vapors in the air inside the vessel 25);-17 Electric motor 12 Vdc for driving the reducer with operating arm; -18 Motor power supply (12 Vdc, 3 A);-19 Electric heating resistance power supply with temperature control between 20 C and 400 C; -20 Signal amplifier for the pressure transducer; -21 High voltage source for creating the electric spark between the electrodes with an output voltage higher than 6 kV (alternatively, a source with the appropriate voltage can be used to feed the incandescent wire mounted between the electrodes in the explosion vessel);-22 Air pumping/vacuum unit required to achieve the initial depression or overpressure in the range of 0.4 bar and 2 bar, pressures in absolute value;-23 Arched sole for balancing the explosion vessel 25, movement necessary for total vaporization and complete homogenization of the air-vapor mixture of flammable liquid; -24 Guide rail (U profile) for the arched base of the blasting vessel support;-25 Explosion vessel;-26 Video camera for recording the phenomena of the appearance of the spark and the propagation of the explosion.

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NATIONAL SECURITY RESEARCH-DEVELOPMENT INSTITUTEMINING AND
EXPLOSIVE PROTECTION – INSEMEX PETROSANI
ROMANIA

STAND FOR IGNITION TEST OF SMALL COMPONENTS THAT ARE PART OF THE EQUIPMENT INTENDED FOR USE IN EXPLOSIVE ATMOSPHERES

A

Patent no. BI 132397/2023

Authors:

Adriana Andriș, George Artur Găman, Constantin Lupu, Emilian Ghicioi , Constantin Sorin Burian, Marius Darie. Tiberiu Atila Csaszar, Iosif Lucian Moldovan, Ioan Cosmin Colda, Botar Daniela, Dănuț Nicolae Grecea. Dan Gabor, Pupăzan Gabriela

The invention relates to a stand for ignition test of small components that are part of the equipment intended for use in explosive atmospheres, a stand in which an explosive test mixture consisting of air and flammable gas is used, whose concentration must fall between the lower flammable limit and the upper flammable limit, a mixture that may be ignited by the hot surface of the small components subjected to the test, either during their normal operation or in fault conditions.

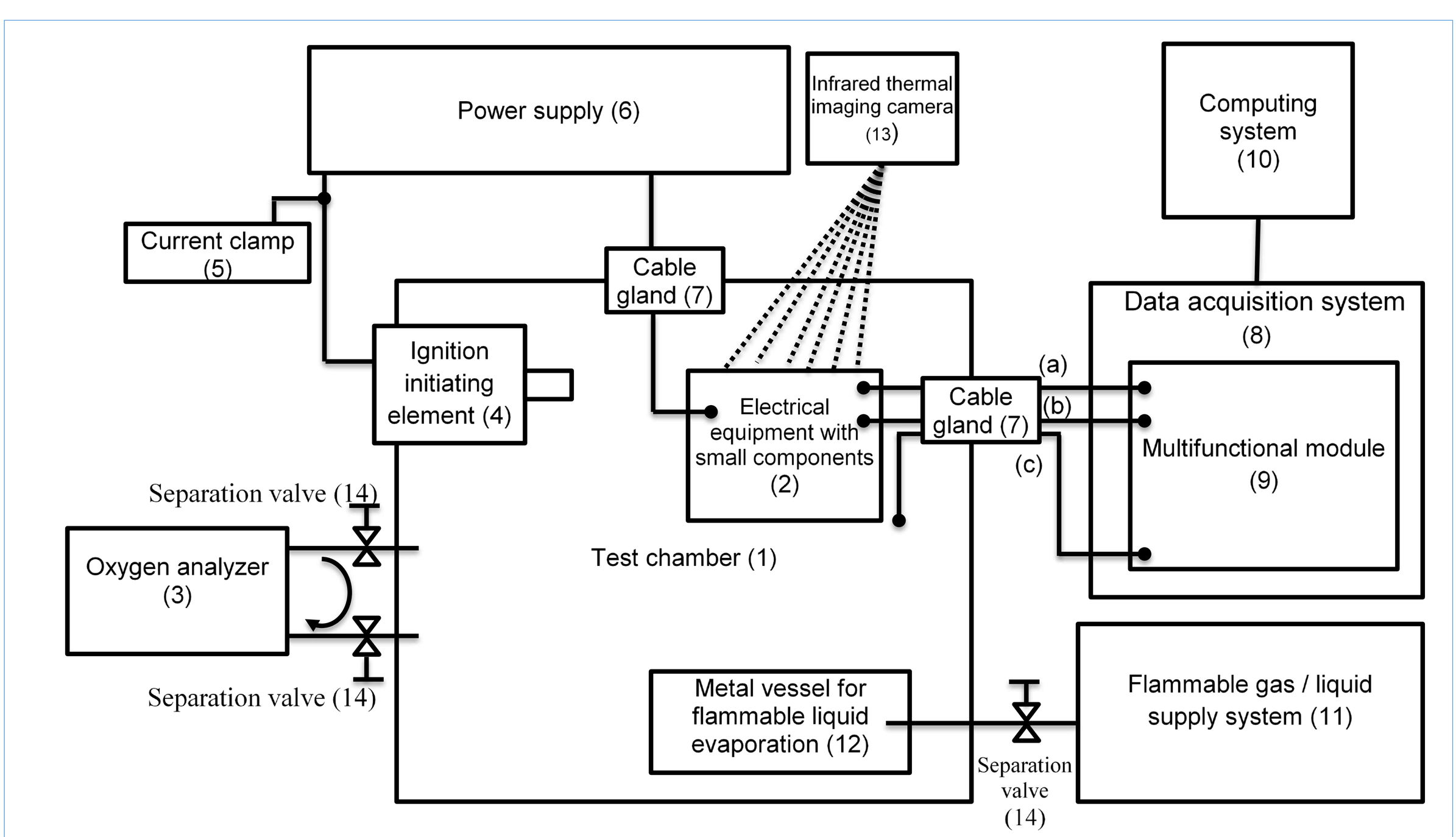


Fig. 1 Block diagram of the stand for ignition test of small components from equipment for use in explosive atmospheres

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INSEMEX
NATIONAL SECURITY RESEARCH-DEVELOPMENT INSTITUTEMINING AND EXPLOSIVE PROTECTION – INSEMEX PETROSANI
ROMANIA

METHOD FOR DETERMINING AERODYNAMIC PARAMETERS Hse AND Rse, SPECIFIC TO THE EXPLOITED SPACE

Patent no. BI 128521/2020

Authors:
Cioclea Doru, Constantin Lupu, Toth Ion, Ion Gherghe, Cristian Tomescu, Corneliu Boantă, Florin Rădoi

A

The invention relates to a method for determining aerodynamic parameters Hse and Rse, specific to the exploited space by using the bandied flows, namely the depression exerted on the exploited space. The method for determining aerodynamic parameters Hse and Rse, specific to the exploited space, proposed by the invention is based on the use of lost air flow through the exploited space, namely the determination of the pressure loss in the active works level related to a hewing.

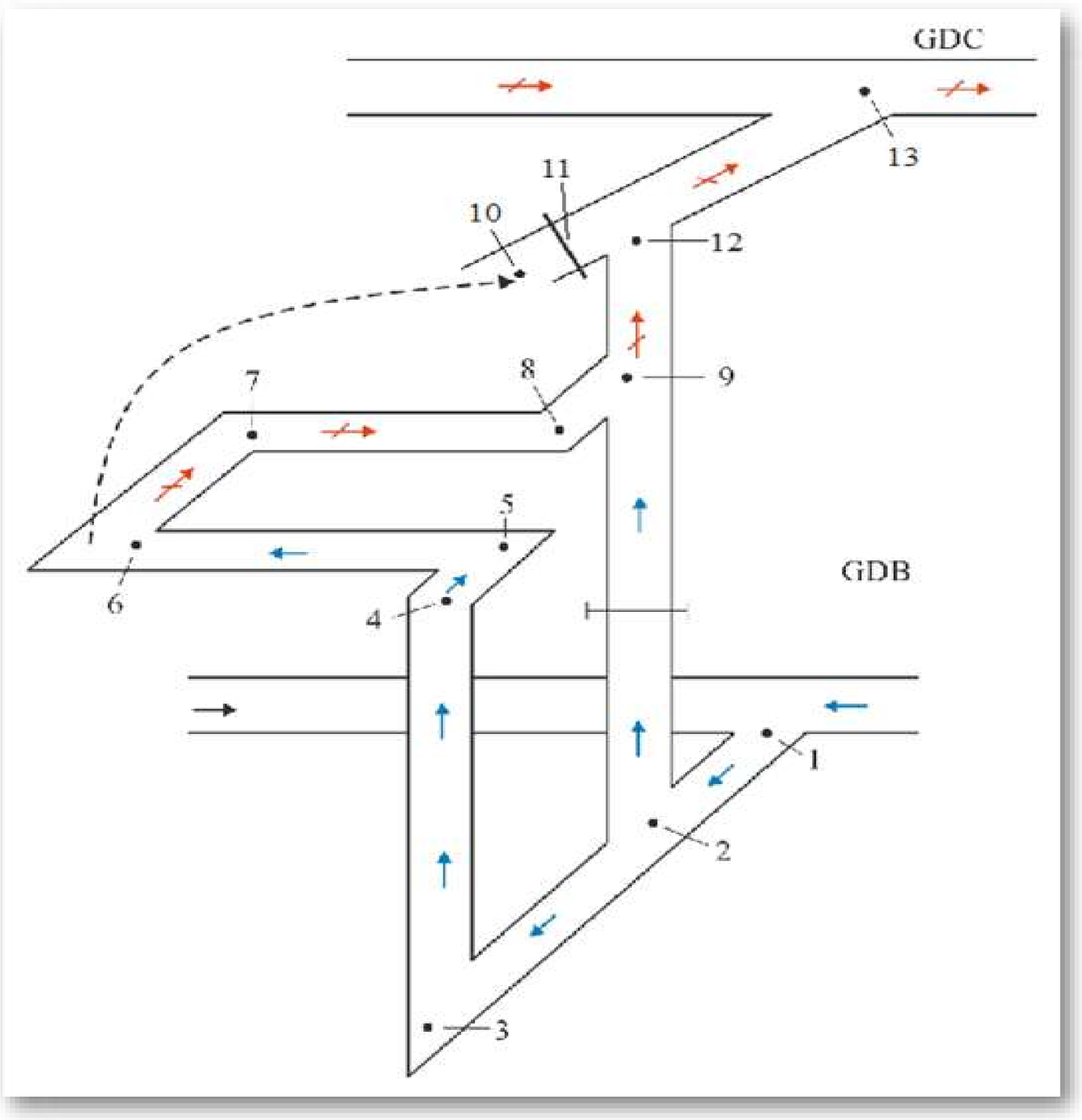
The technical problem that the invention solves consists in determining the aerodynamic parameters Hse and Rse, specific to the exploited space. The method of determining the aerodynamic parameters by using the air flow lost through the exploited space, respectively the determination of the pressure losses at the level of the active works related to an mining front, offers the opportunity to determine in real time the aerodynamic parameters Hse and Rse, specific to the exploited space.

By applying the method of determining the aerodynamic parameters Hse and Rse, specific to the exploited space, the possibility of choosing and sizing the measures to prevent and combat spontaneous combustion phenomena is ensured. The present invention is based on the use of the air flow lost through the exploited space, respectively of the pressure loss at the level of the active works related to an abattoir, through the direct or indirect measurement of these parameters. With the help of the air flow lost through the exploited space, respectively the depression exerted on it, the specific resistance of the exploited space is determined.

The method of determining the aerodynamic parameters Hse and Rse, specific to the exploited space, proposed by the invention lends itself to any underground mining of useful mineral substances.



Fig. no. 1 - Determining the aerodynamic parameters Hse and Rse specific to the space exploited at the level of a mining front.



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NATIONAL SECURITY RESEARCH-DEVELOPMENT INSTITUTEMINING AND
EXPLOSIVE PROTECTION – INSEMEX PETROSANI
ROMANIA

METHOD FOR PREVENTING SPONTANEOUS COMBUSTION IN THE EXPLOITATION OF COAL AREAS WITH UNDERMINED LAYER

A

Patent no. BI 127905/2020

Authors:

Ion Toth, Constantin Lupu, Doru Cioclea, Cristian Tomescu, Emeric Chiuzan

The invention relates to a method for preventing spontaneous combustion in the exploitation of coal areas with undermined layer through inerting. The technical problem solved by the invention consists of preventing spontaneous combustion by creating in the area of coal exploitation with undermined benches an atmosphere that inhibits coal auto-oxidation, low in oxygen and with a high nitrogen content, exceeding the value of 79% nitrogen, characteristic of atmospheric air, in order to achieve efficient inerting that eliminates the danger of spontaneous combustion with optimal nitrogen consumption.

The method solves this problem by inerting the exploited space with nitrogen sent through pipes connected to the nitrogen main pipeline and introduced in a controlled manner into the area of the goaf through deep holes, the inerting holes of the goaf space being made in the area of the field entries, the introduction of nitrogen being initiated when the free end of the inerting hole(s) is at least 30 m away from the working face line. The use of nitrogen in the inerting process requires its transport to the inerting installation, located on the surface, to the place of use underground, through a network of permanent pipes specially designed for this gas.

State of development: The method for preventing spontaneous combustion in the exploitation of coal areas with undermined layer through inerting is successfully applied in the coal mines of the Jiu Valley.



ROMÂNIA

OFICIUL DE STAT PENTRU INVENTII ŞI MĂRCI

BREVET DE INVENŢIE

Nr. 127905

Acordat în temeiul Legii nr 64/1991 privind brevetele de invenţie, republicată în Monitorul Oficial al României, Partea I, nr 613, din 19 august 2014

Titular: INSTITUTUL NAŢIONAL DE CERCETARE-DEZVOLTARE PENTRU SECURITATE MINIERĂ ŞI PROTECŢIE ANTIEXPLOZIVĂ - INSEMEX PETROŞANI, PETROŞANI, HD, RO

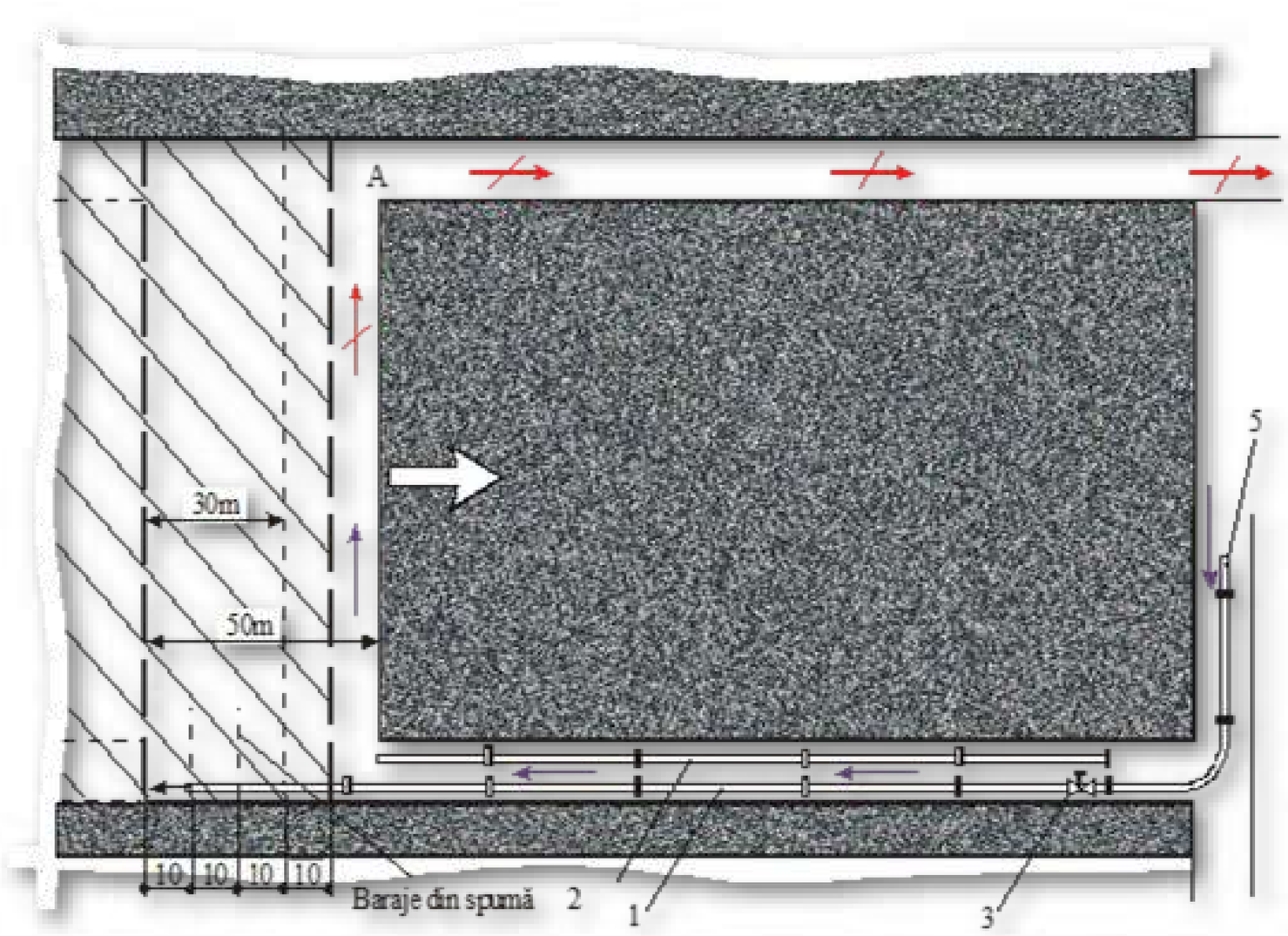
Titlul invenţiei: METODĂ DE PREVENIRE A COMBUSTIILOR SPONTANE LA EXPLOATAREA ZONELOR CARBONIFERE CU BANC SUBMINAT

Inventatori: TOTH ION, PETROŞANI, HD, RO; LUPU CONSTANTIN, PETROŞANI, HD, RO; CIOCLEA DORU, PETROŞANI, HD, RO; TOMESCU CRISTIAN, PETROŞANI, HD, RO; CHIUZAN EMERIC, PETROŞANI, HD, RO

Descrierea invenţiei, revendicările şi desenele la care se face referinţă în acestea, fac parte integrantă din prezentul brevet de invenţie.
Durata brevetului de invenţie este de 20 ani, cu începere de la data de 15/04/2011, cu condiţia plăţii taxelor anuale de menţinere în vigoare a brevetului.

Director General

Bucureşti, Data eliberării 30/07/2020



a) Conducta 1 se montează în faza de pornire a abatajului şi se cuplează la conducta magistrală 5 prin intermediul ventilului 3
b) Se începe injectarea azotului când abatajul ajunge la cca 30m faţă de linia de pornire
c) Se montează conducta 2 când abatajul a ajuns la cca 50m faţă de linia de pornire

Cristian Tomescu
Contact: cristian.tomescu@insemex.ro

NATIONAL SECURITY RESEARCH-DEVELOPMENT INSTITUTEMINING AND
EXPLOSIVE PROTECTION – INSEMEX PETROSANI
ROMANIA

STAND FOR CONDITIONING ELECTRICAL / NON-ELECTRICAL DETONATORS TO HYDROSTATIC PRESSURE AND TEMPERATURE

Patent no. BI 131064/2020

Authors:
Edward Jan Gheorghiosu, Emilian Ghicioi, Dragoş Vasilescu, Attila Kovacs, Ilici Ştrefan, Ilie – Ciprian Jitea

A

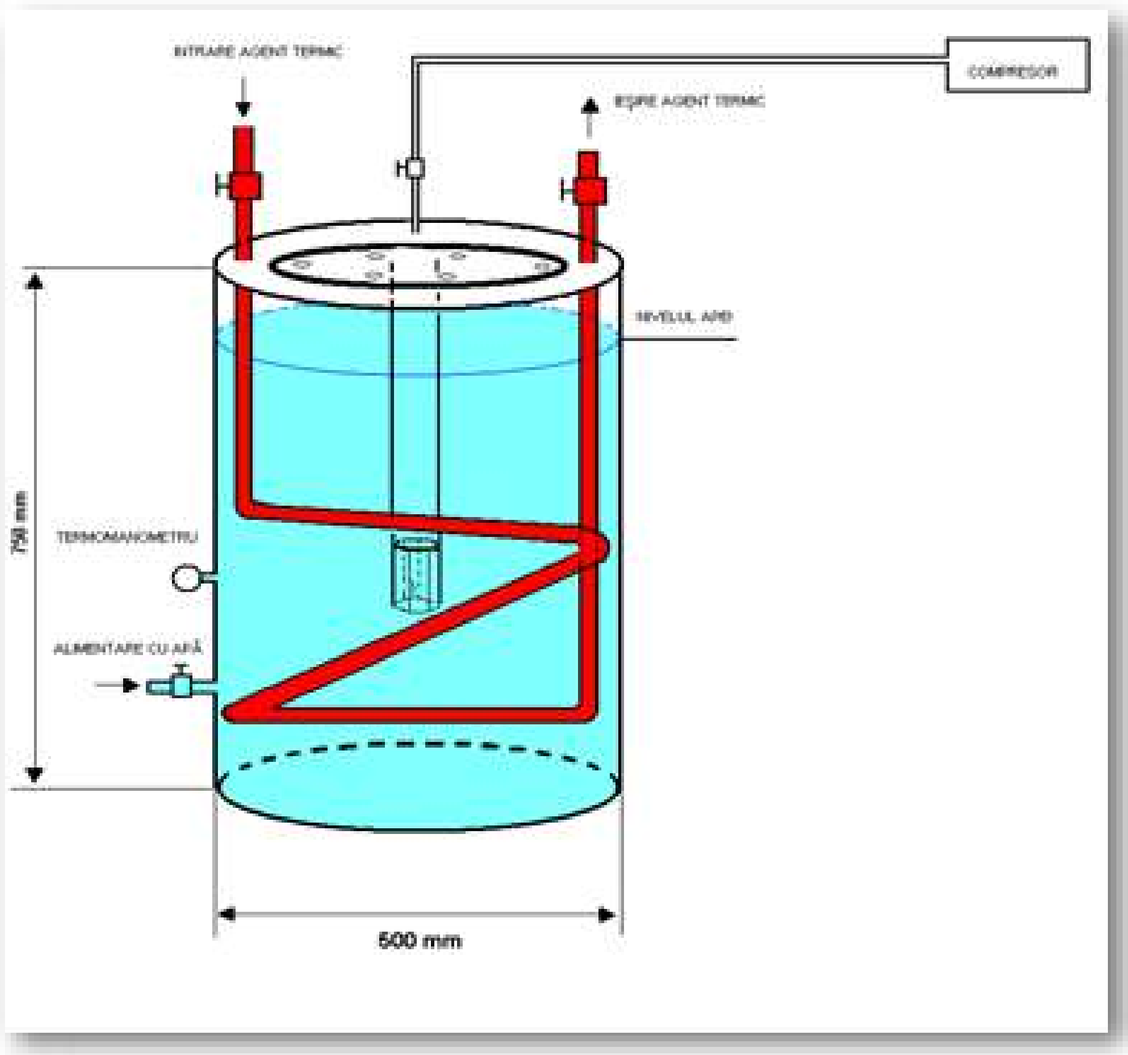
The invention relates to the realization of a stand where the means of initiating explosives for civil use, namely electric / nonelectric detonators be subjected for 48 hours, water pressure and temperature at preset values, according to the conditions in which they will be used. The pressure and temperature that the stand can maintain in order to condition electric / non-electric detonators are between 0.3÷1 MPa, respectively 20÷65^{0}C. The test conditions are established depending on the temperature range in which electric / non-electric detonators can be used, as follows:

• the detonators that are used in the blast holes, used up to max. 40^{0}C, it is conditioned by maintaining a temperature of 20±2^{0}C and a pressure of 0.3±0.01MPa;

• the detonators used in blast holes, used at temperatures >40^{0}C, conditioning starts from the upper limit of the temperature range declared by the manufacturer and the pressure of 0.3 ±0.01MPa;

The manifestation of hydrostatic pressure is combined with the thermal expansion / contraction of the materials from which they are made or which ensure the tightness of the detonators clips. Keeping the electric / non-electric detonators for 48 hours, under the mentioned conditions, can lead to the penetration of water inside the detonators up to the explosive substances and electrical devices that enter their structure, thus affecting the operating parameters.

After conditioning the electric / non-electric detonators, for 48 hours, under the specified conditions, within a maximum interval of 2 hours, the samples are individually checked regarding the measurement of delay accuracy, an essential parameter when using these products for civil blasting works , which highlights the influence of pressure and temperature on the operating characteristics.





Framework diagram and the stand intended for maintaining the detonating staples at hydrostatic pressure in temperature conditions.

Edward Gheorghiosu
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INSEMEX
NATIONAL SECURITY RESEARCH-DEVELOPMENT INSTITUTEMINING AND EXPLOSIVE PROTECTION – INSEMEX PETROSANI
ROMANIA

METHOD FOR DETERMINATION OF AIR FLOW THROUGH THE GOAF

A

Patent no. BI 128645/2021

Authors: **Cioclea Doru, Constantin Lupu, Toth Ion, Ion Gherghe, Dorel Tamaş, Corneliu Boantă, Florin Rădoi**

The method for quantitative determination of the lost air flow, proposed through the invention, is based on the velocity measurement of air exiting the goaf through the insulation construction at the level of an active mining work. In order to determine air velocity, there is required the development of a diaphragm made of impermeable material, located in front of the insulation construction in a convenient area where the profile of the mining work is regular and allows sealing on the outline. The diaphragm is fitted with a circular or rectangular opening in the middle and which is properly sized.

The technical problem that the invention solves consists in the quantitative determination of air losses through the goaf. The method of determining air losses by using a diaphragm offers the opportunity to determine directly, in real time, the air flows lost through the goaf.

The present invention is based on the use of a diaphragm for the quantitative determination of the air flow through the goaf, by directly measuring the speed of the air current coming from a mining work closed with an isolation dam, and is discharged on one or more mining works . With the help of the speed of air circulation through the opening made in the diaphragm, the air flow rate lost through the goaf and entering the poluted air current penetrating the insulation construction is directly calculated.

Using the air circulation velocity, there is precisely determined the air flow lost through the goaf, in order to properly choose and size the methods for preventing spontaneous combustions in coal mines.

The method of quantitative determination of the air flow lost through the goaf proposed by the invention lends itself to any underground mining of useful mineral substances.

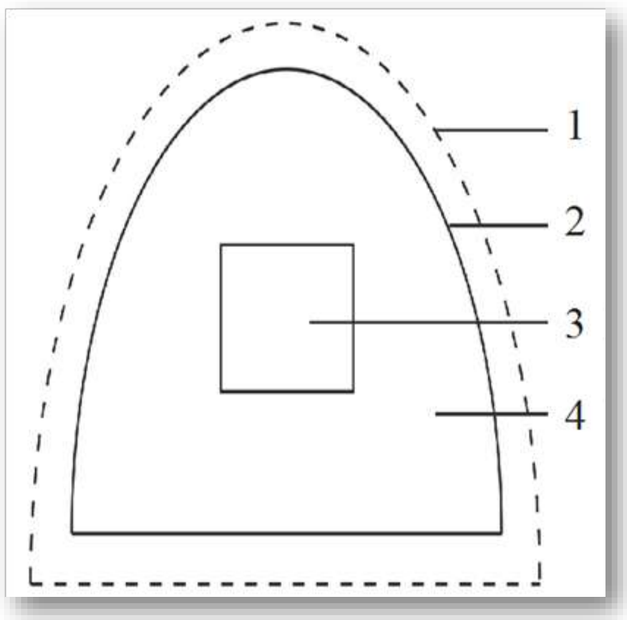


Fig. no. 1 - Determining the air flow lost through the goaf.


ROMÂNIA
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OFICIUL DE STAT PENTRU INVENTII SI MARCI
BREVET DE INVENTIE
Nr. 128646

RO 128646 B1/29.04.2021

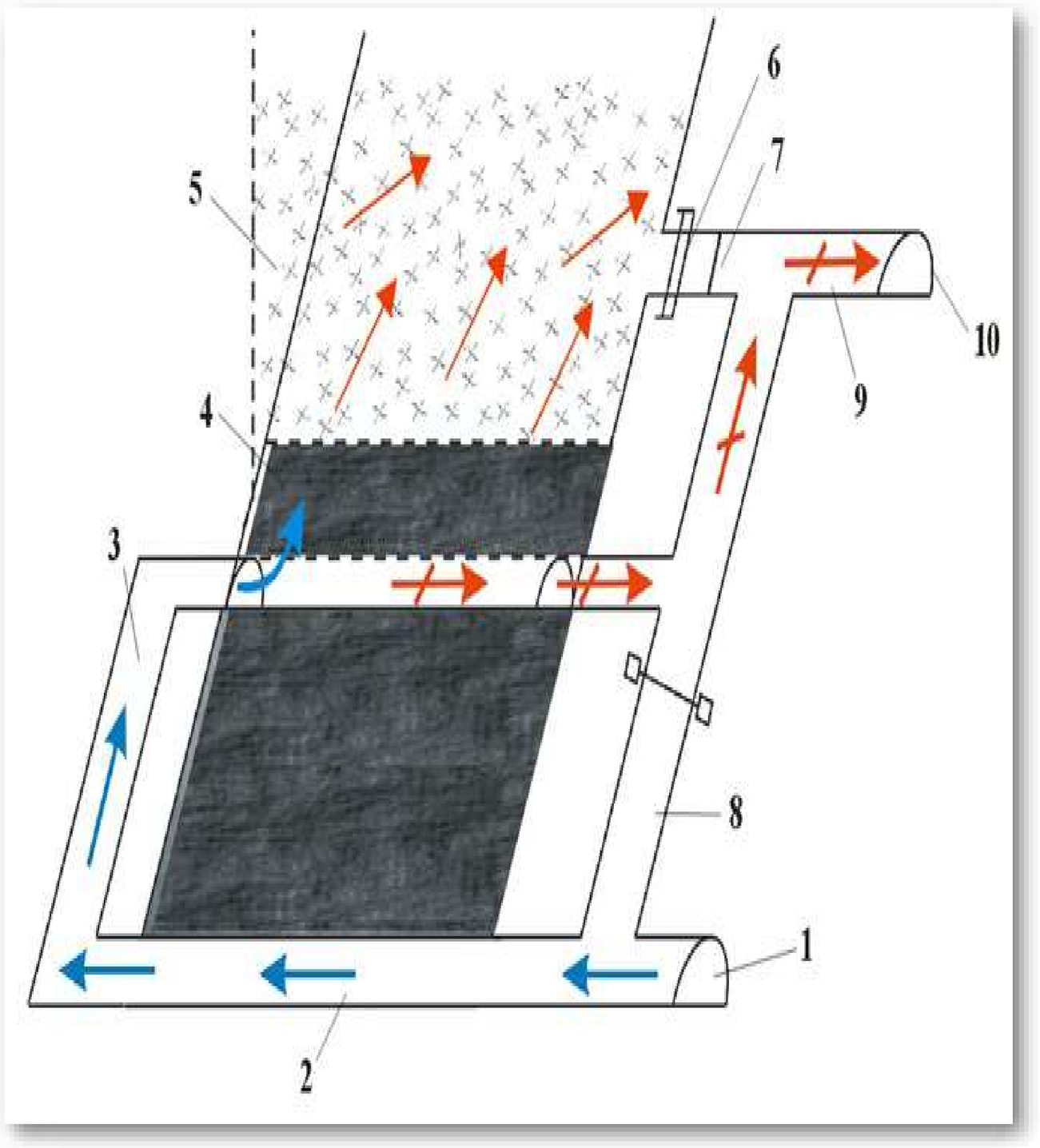


Fig. no. 2 - Assembly consisting of the diaphragm and the opening used to measure the air flow.

Contact: **Doru Cioclea** doru.cioclea@insemex.ro

INSEMEX
NATIONAL SECURITY RESEARCH-DEVELOPMENT INSTITUTEMINING AND EXPLOSIVE PROTECTION – INSEMEX PETROSANI
ROMANIA

METHOD FOR QUANTITATIVE DETERMINATION OF AIR FLOW LOSSES THROUGH GOAFS

A

Patent no. BI 128646/2021

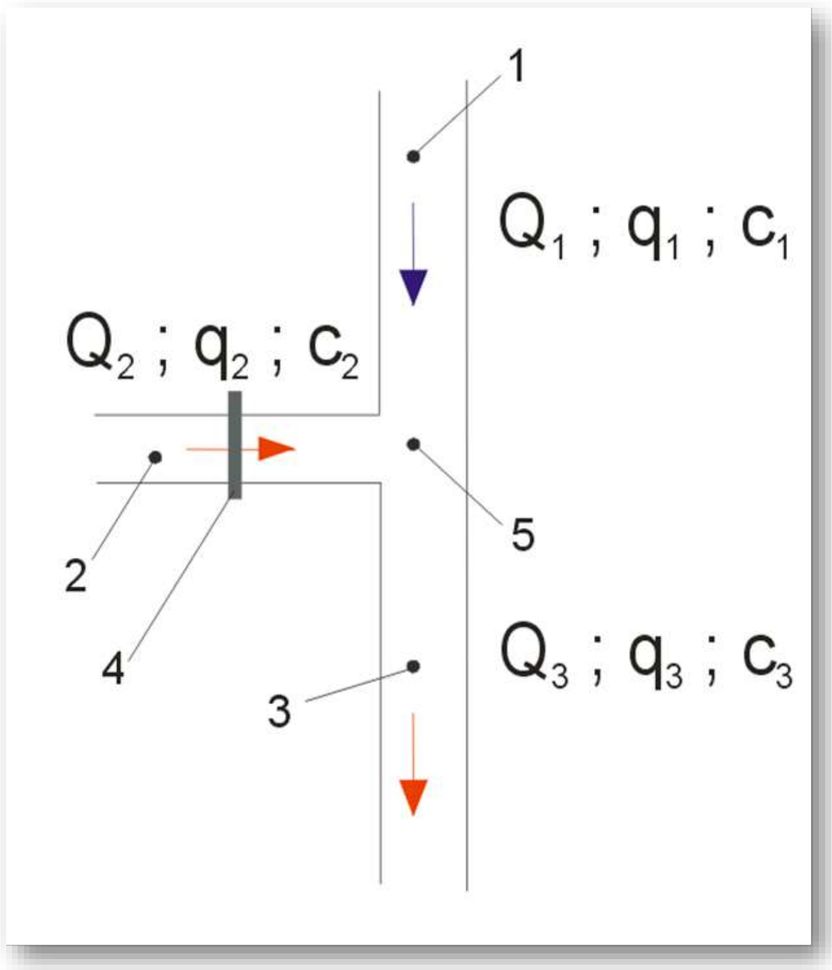
Authors: **Cioclea Doru, Constantin Lupu, Toth Ion, Ion Gherghe, Cristian Tomescu, Emeric Chiuzan**

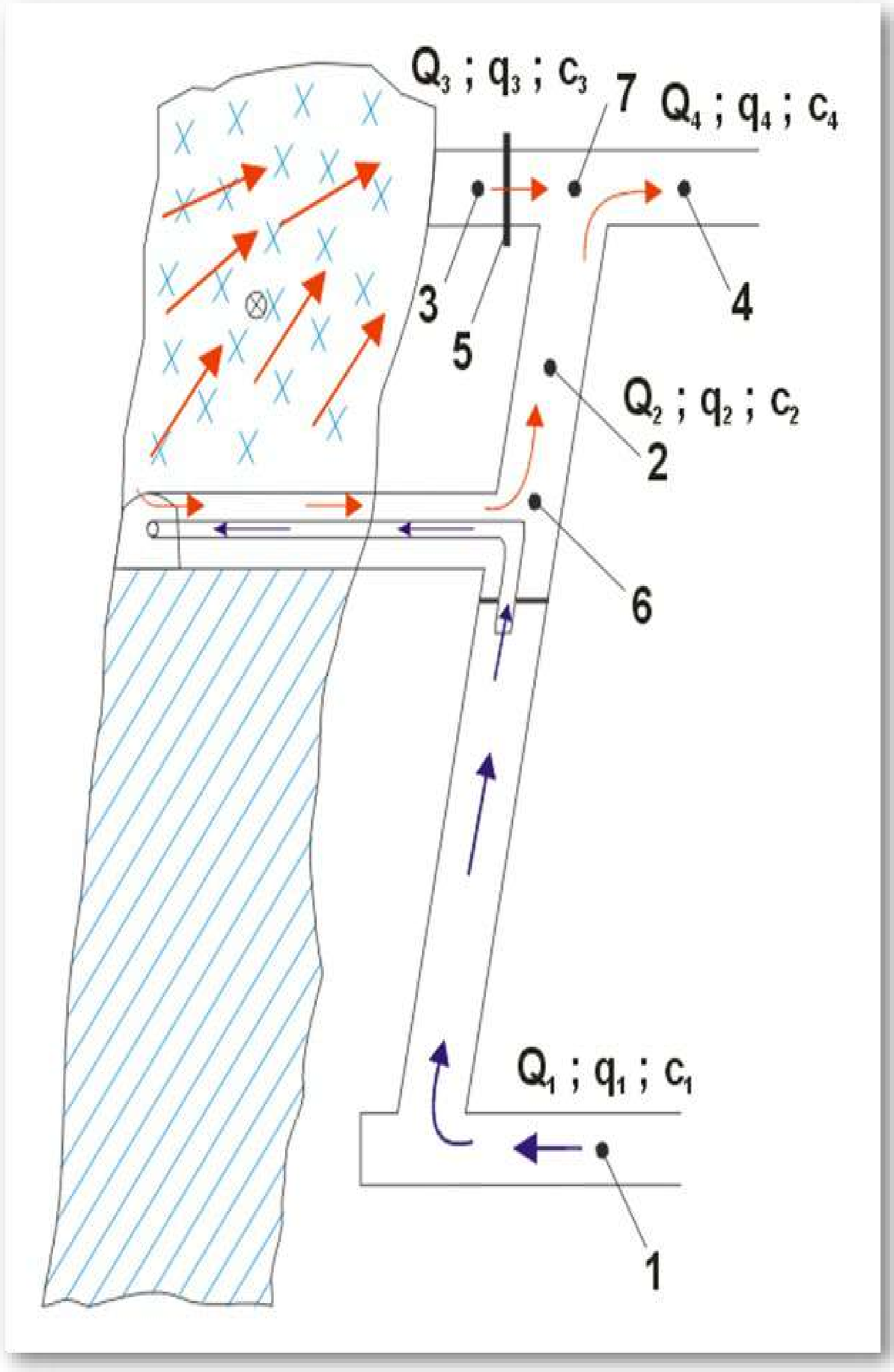
The technical problem that the invention solves consists in the quantitative determination of air losses through the goaf. The method of determining air losses by using the absolute flow of carbon oxide offers the opportunity to determine in real time the air flows lost through the goaf.

The method of quantitative determination of the flow of air lost through the goaf by using the absolute flow of carbon oxideis based on the use of the absolute flow of carbon monoxide for the quantitative determination of the flow of air through the goaf, by directly measuring the concentration of carbon monoxide in the air stream coming from one or more mining works with a free or closed section and is discharged on one or more mining works. With the help of the carbon monoxide concentration, the absolute flow of carbon monoxide and then the air flow lost through the goaf are determined.

By applying the method of quantitative determination of the flow of air lost through the goaf, the possibility of choosing and sizing the measures to prevent and combat spontaneous combustion phenomena is ensured.

The method of quantitative determination of the air flow lost through the goaf, proposed by the invention, lends itself to any underground coal mining.






ROMÂNIA

DUPLICAT ELIBERAT INVENTATORULUI

OFICIUL DE STAT PENTRU INVENTII ŞI MĂRCI

BREVET DE INVENŢIE

Nr. 128645

Titular: INSTITUTUL NAŢIONAL DE CERCETARE DEZVOLTARE PENTRU SECURITATE MINERĂ ŞI PROTECŢIE ANTIEXPLOZIVĂ- INSEMEX PETROŞANI, PETROŞANI, JD, RO

Titlul invenţiei: METODĂ DE DETERMINARE CANTITATIVĂ A DEBITULUI DE AER PIERDUT PRIN SPAŢIILE EXPLOATATE

Inventatori: CIOCLEA DORU, PETROŞANI, HD, RO; LUPU CONSTANTIN, PETROŞANI, HD, RO; TOTH ION, PETROŞANI, HD, RO; GHERGHE ION, PETROŞANI, HD, RO; TĂMAŞ DOREL, ANINOASA, HD, RO; BOANTĂ CORNELIU, DANUŢ, PETRILA, HD, RO; RĂDOI FLORIN, VIŞ CAN, HR, RO

Descrierea invenţiei, revendicările şi desenele la care se face referire în acestea, fac parte integrantă din prezentul brevet de invenţie.
Durata brevetului de invenţie este de 20 ani, cu începere de la data de 06/12/2011, cu condiţia plăţii taxelor anuale de menţinere în vigoare a brevetului.

Director General

Bucureşti, Data eliberării 23/04/2021

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INSEMEX
NATIONAL SECURITY RESEARCH-DEVELOPMENT INSTITUTEMINING AND EXPLOSIVE PROTECTION – INSEMEX PETROSANI
ROMANIA

A METHOD FOR DETERMINING THE DISPERSION OF THE GAS IN THE WORKINGS AFTER AN EXPLOSION PHENOMENON

A

Patent no. BI 130264/2021

Authors: **Doru Cioclea, George Artur Găman, Constantin Lupu, Emilian Ghicioi, Ion Gherghe, Corneliu Boantă, Emeric Chiuzan, Dorel Tamas**

The method of determining the dispersion of gases at the level of the abattoirs after the occurrence of an explosion phenomenon, is based on the determination of the dispersion of gases at the level of the abattoirs after the occurrence of an explosion phenomenon, by determining the concentration of explosive, toxic and asphyxiating gases at the level of the ventilation network after the occurrence an event.

For this, first, the ventilation network is solved and the functional parameters are established, under normal working conditions, the method of determining the variation of gas concentrations after an explosion is established, the average values of the explosive, toxic and asphyxiating concentrations are determined, in during the normal working period and during the rest period, the dispersion of explosive, toxic and asphyxiating gases is determined under normal working conditions, the vulnerable areas at the level of the ventilation network are determined in the event of explosion-type phenomena.

The pressure loss manifested radially on the alignment of the mining works in relation to the epicenter is established and thus the area affected by the ventilation network is determined by comparing the explosion pressure at the level of a branch with the minimum pressure necessary to destroy the ventilation constructions.

The functional parameters, the developed depression and the circulated flow rate at the level of the main aeration station after the occurrence of an explosion are determined.

The ventilation constructions are removed from the vent network modeled and solved under normal working conditions, and the functional parameters of the post-event active fan are entered.

The ventilation network is solved in the new conditions after the event, the variation of gas concentrations after the event is determined.

Finally, the dispersion of explosive, toxic and asphyxiating gases at the level of the ventilation network after an explosion is determined.

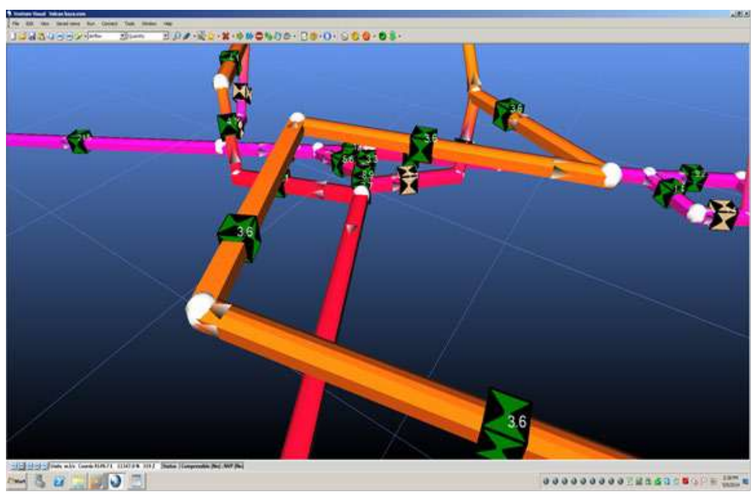


fig. no. 1 - The ventilation network solved under normal working conditions.

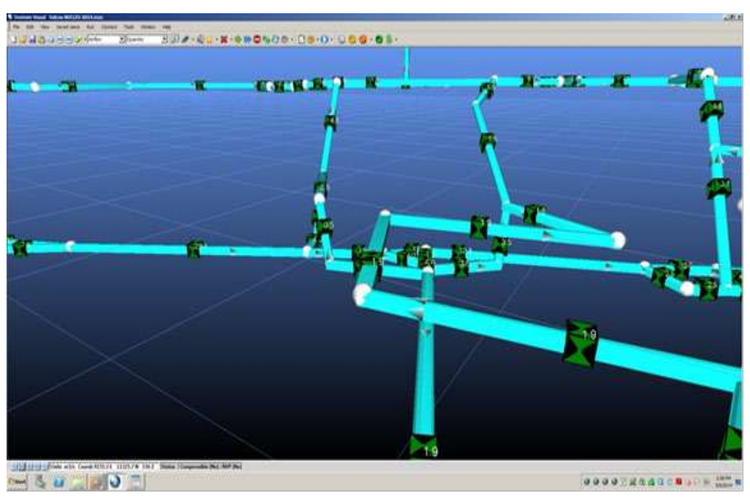


fig. no. 2 - The ventilation network solved after the explosion.

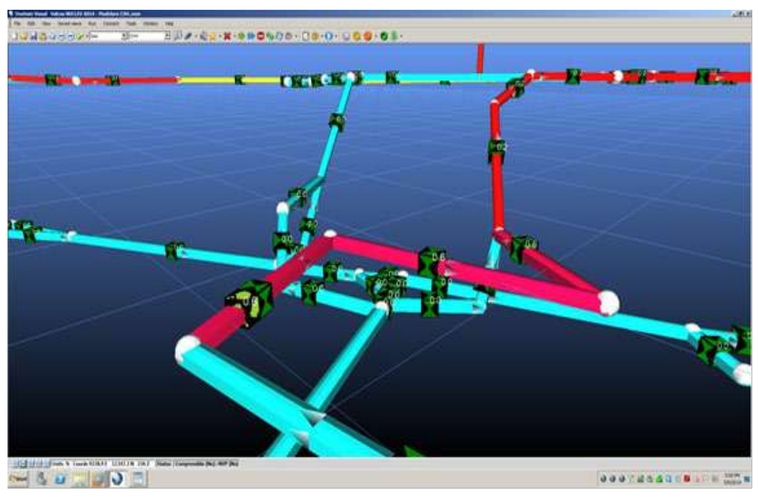


fig. no. 3 - Simulation of CH4 dispersion, after the event.



RO 130264 / B1
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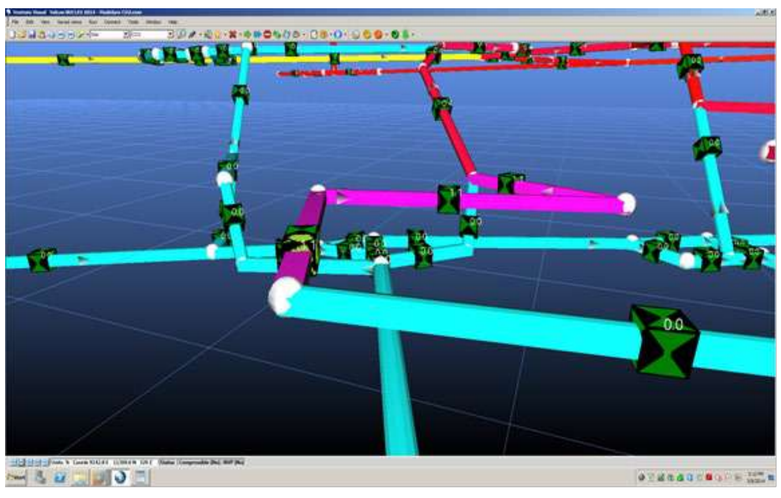


fig. no. 4 - Simulation of CO2 dispersion, after the event.

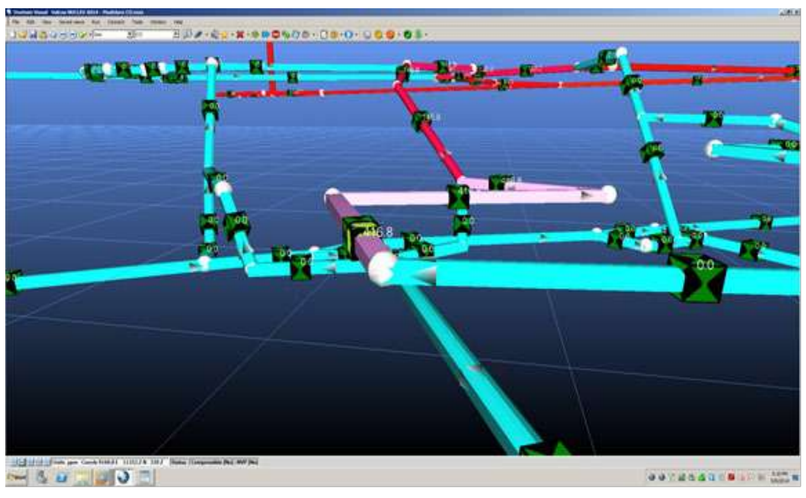


fig. no. 5 - Simulation of CO dispersion, after the event.

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NATIONAL SECURITY RESEARCH-DEVELOPMENT INSTITUTEMINING AND
EXPLOSIVE PROTECTION – INSEMEX PETROSANI
ROMANIA

APRIORI SOLVING METHOD FOR A VENTILATION NETWORK AFFECTED BY AN EXPLOSION PHENOMENON

A

Patent no. BI 130265/2021

Authors:

Doru Cioclea, George Artur Găman, Constantin Lupu, Emilian Ghicioi, Ion Gherghe, Florin Rădoi, Cristian Tomescu, Vlad Păsculecu, Marius Morar

The a priori solution of a ventilation network affected by an explosion phenomenon is based on determining the distribution of air flows at the level of a ventilation network after the occurrence of an explosion.

For this, first, the ventilation network is solved and the functional parameters are established, under normal working conditions, the areas vulnerable to the occurrence of explosion-type phenomena are established.

The pressure loss manifested radially on the alignment of the mining works in relation to the epicenter is established and thus the area affected by the ventilation network is determined by comparing the explosion pressure at the level of a branch with the minimum pressure necessary to destroy the ventilation constructions.

The total resistance of the ventilation network is recalculated. The functional parameters are determined, the depression developed and the flow rate circulated at the level of the main aeration station after the occurrence of an explosion.

The ventilation constructions are removed from the ventilation network modeled and solved under normal working conditions and the functional parameters of the active fan after the event are introduced. In this way, by solving the ventilation network under the new conditions, the distribution of air flows at branch level is obtained.

The a priori resolution of an aeration network affected by an explosion phenomenon lends itself to any underground mining of useful mineral substances where there is a risk of explosive mixture formation.

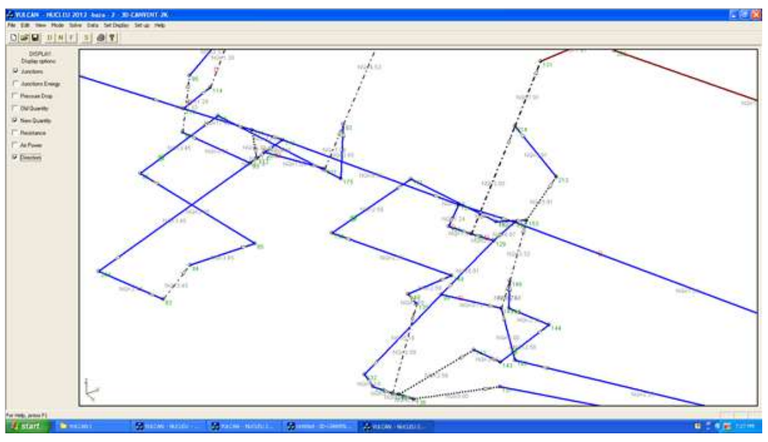


fig. no. 1 - The ventilation network solved under normal working conditions.

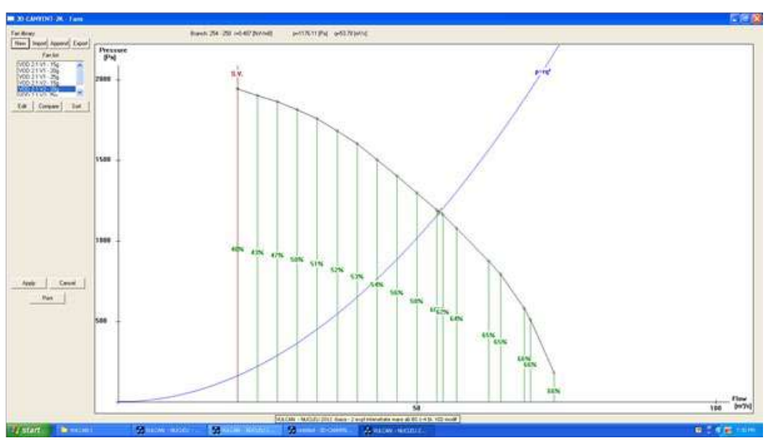


fig. no. 2 - Functional parameters of the active fan under normal working conditions.

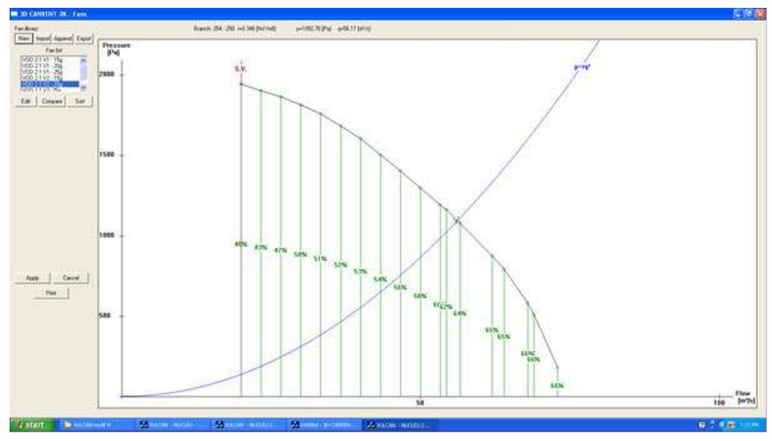


fig. no. 3 - Functional parameters of the active fan after the explosion.


ROMÂNIA

DUPLICAT

ELIBERAT INVENTATORULUI
în baza Art.34 alin.(2),
din Legea nr.64/1991 republicată

OFICIUL DE STAT PENTRU INVENȚII ȘI MĂRCI

BREVET DE INVENȚIE

Nr. 130265

Acordat în temeiul Legii nr.64/1991 privind brevetele de invenție, republicată în Monitorul Oficial al României, Partea I, nr.613, din 19 august 2014.

Titular: INCD INSEMEX PETROȘANI, PETROȘANI, HD, RO

Titlul invenției: METODĂ DE REZOLVARE A PRIORI A UNEI REȚELE DE AERAJ AFECTATĂ DE UN FENOMEN DE EXPLOZIE

Inventatori: CIOCLEA DORU, PETROȘANI, HD, RO; GĂMAN ARTUR GEORGE, PETROȘANI, HD, RO; LUPU CONSTANTIN, PETROȘANI, HD, RO; GHICIOI EMILIAN, PETROȘANI, HD, RO; GHERGHE ION, PETROȘANI, HD, RO; RĂDOI FLORIN, VULCAN, HD, RO; TOMESCU CRISTIAN, PETROȘANI, HD, RO; PĂSCULESCU VLAD, PETROȘANI, HD, RO; MORAR MARIUS SIMION, PETROȘANI, HD, RO

Descrierea invenției, revendicările și desenele la care se face referință în acestea, fac parte integrantă din prezentul brevet de invenție.
Durata brevetului de invenție este de 20 ani, cu începere de la data de 04/12/2014, cu condiția plății taxelor anuale de menținere în vigoare a brevetului.

Director General

București, Data eliberării 28/05/2021

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28.05.2021

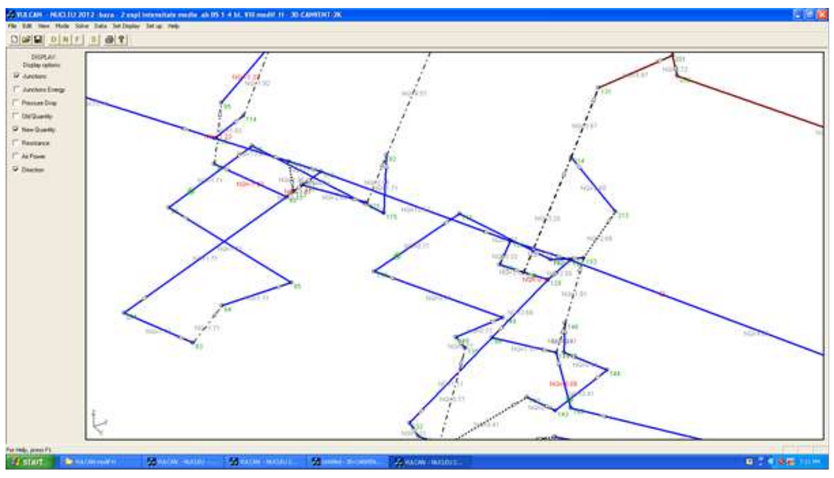


fig. no. 4 - Vent network resolved after explosion.

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INSEMEX
NATIONAL SECURITY RESEARCH-DEVELOPMENT INSTITUTEMINING AND EXPLOSIVE PROTECTION – INSEMEX PETROSANI
ROMANIA

SOURCE AND METHOD FOR TESTING SAFETY BARRIER COMPONENTS IN LOW-CURRENT INSTALLATIONS IN POTENTIALLY EXPLOSIVE ATMOSPHERES

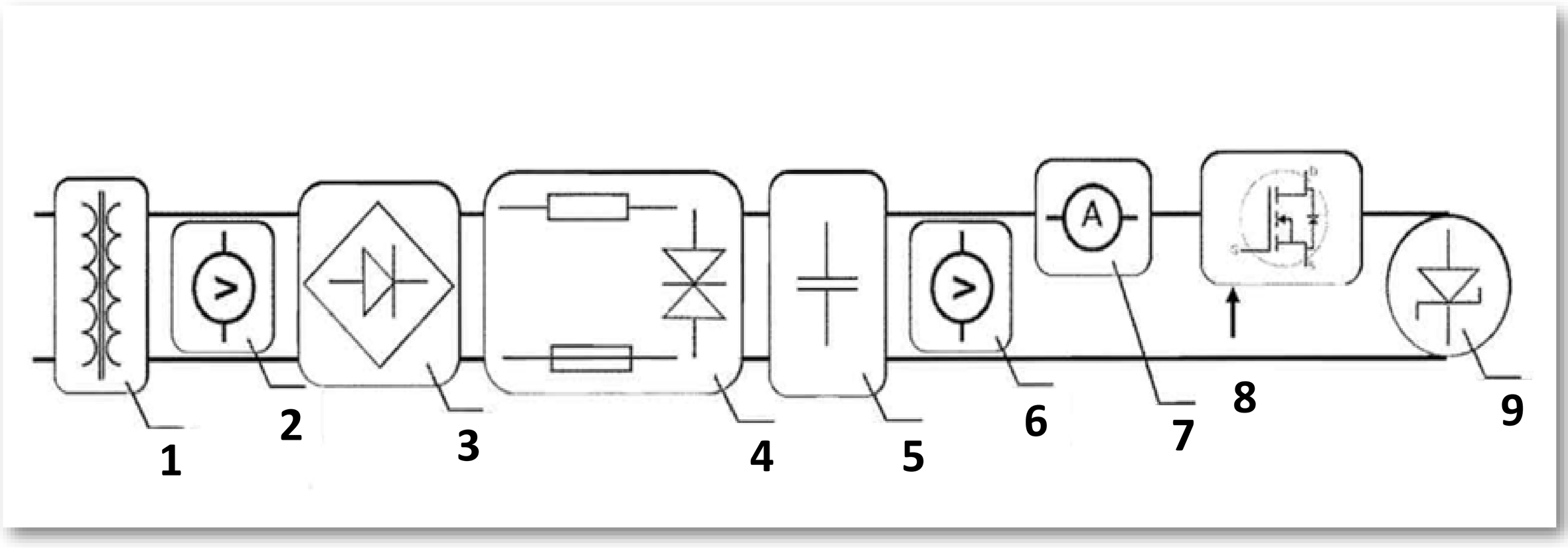
A

Patent no. BI 130444/2022

Authors:
Darie Marius, Sorin Constantin Burian, Jeana Ionescu, Tiberiu Csaszar, Lucian Moldovan, Ioan Cosmin Colda, Adriana Andriş, Daniela Botar

The invention relates to the development of a programmable, rectangular, short-pulse current source for testing safety barrier components in low-current installations in premises at risk of explosive atmospheres and to the method of calculating its operating parameters. The technical problem which the invention solves consists in verifying the suitability of components for use in safety barriers in low-current installations in potentially explosive atmospheres.

The solution to this problem is a programmable rectangular short pulse current source and a method for testing the components of safety barriers in low current installations in hazardous areas.



The components used are (1) transformer block, (2) voltmeter, (3) points, (4) protection block, (5) capacitors, (6) voltage acquisition board, (7) current acquisition board, (8) switching device, (9) test component.

Marius Darie
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Laboratory of Bioinorganic Chemistry and Nanocomposites
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HR EXCELLENCE IN RESEARCH

METHOD OF CORROSION PROTECTION OF STEEL IN WATER USING A GREEN INHIBITOR

A

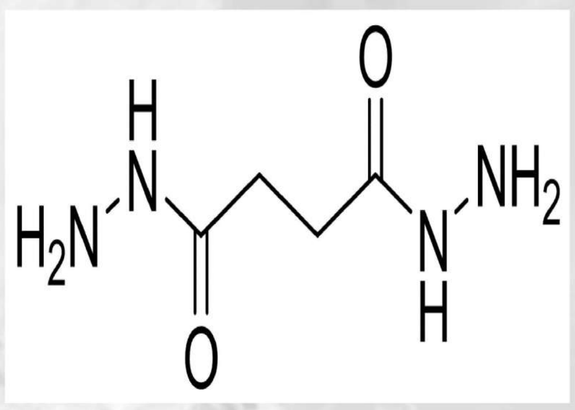
PATENT: MD 1726 Y / 2023.11.30

AUTHORS: Vasile LOZAN , Vladimir PARSHUTIN, Alexandr COVALI, Tudor JOVMIR

APPLICATION FIELDS: Thermal power steel pipes protection against corrosion in water.

AIM: To provide a method of protection of steel pipes contacted with water based on combination of cheap and ecologically safe components, which act synergistically.

SOLUTION: It has been proposed to use a combination of two inhibitors, namely succinic acid dihydrazide (*1*) and aqueous extract of walnut leaves (*2*), respectively at concentrations of 0.1…0.75 g/L and 10…30 mL/L.







Inhibitors	Inhibition, γ
1, 0.5 g/L	13.3
1, 0.75 g/L	16.6
2, 20 mL/L	4.3
2, 30 mL/L	5.3
0.5 g/L (***1***) + 30 mL/L (***2)***	25.4
0.75 g/L (***1***) + 20 mL/L (***2***)	19.6

ADVANTAGES: Corrosion losses are significantly reduced (up to 25.4 times) compared to inhibitors being used separately.

IMPLEMENTATION STAGE: At the laboratory level.

ACKNOWLEDGMENTS: This research was supported by the *research subprogram: # 010602.*

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Laboratory of Bioinorganic Chemistry and Nanocomposites
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INHIBITORS OF THE PROLIFERATION OF FUNGI OF THE SPECIES *Cryptococcus neoformans*

HR EXCELLENCE IN RESEARCH

A

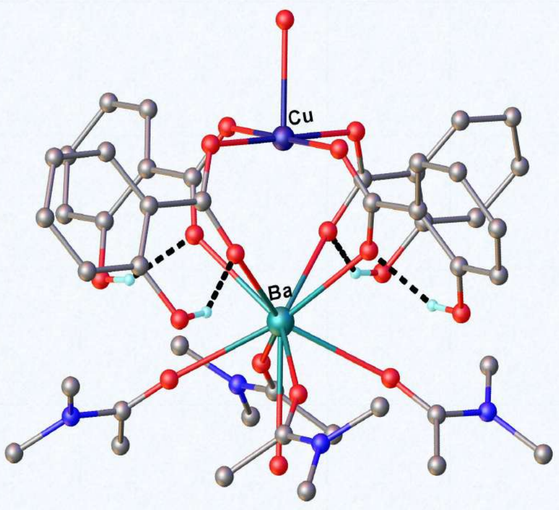
PATENTS: MD 4712 C1 / 2020.09.30
MD 4742 C1 / 2021.02.28

AUTHORS: Viorina GORINCHOY, Vasile LOZAN, Olga BURDUNIUC, Greta BALAN, Victor TSAPCOV, Aurelian GULEA

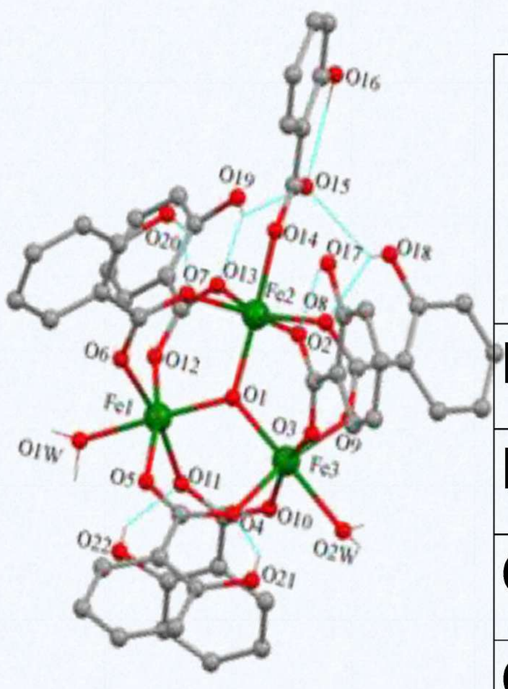
APPLICATION FIELDS: A - Medicine – Pharmacy – Cosmetics.

AIM: Chemical synthesis, characterization of new synthetic antifungal agents with potential application in medicine.

SOLUTION: New polynuclear coordination compounds based on oxo-bridged salicylates have been obtained.



compound 1



compound 2

Antifungal activity (MIC* / MFC) (μg/mL)**

Compound	*Cryptococcus neoformans* CECT 1043	
	MIC	MFC
Fluconazole	16.0	-
Proximal analogue	0.12	0.24
Claimed compound 1	0.10	0.20
Claimed compound 2	0.08	0.16

*MIC – minimum inhibitory concentration.
**MFC – minimum fungicidal concentration.

ADVANTAGES: The described compounds manifest antifungal properties against *Cryptococcus neoformans* CECT 1043. These agents exceed 200-160 times the analogous characteristics of Fluconazole that is used in medical practice and 1.5-1.2 times the analogous characteristics of closest prior art. They can be used in medicine and veterinary medicine for the prevention and treatment of mycoses.

IMPLEMENTATION STAGE: At laboratory level.

ACKNOWLEDGMENTS: This research was supported by Subprogramm # 010602

Opportunity
CORNELIUGROUP
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Creation
Realization
Power of Creative Mind
Deva ROMANIA

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VITAE DISCIMUS

HR EXCELLENCE IN RESEARCH

ADVANCED PHYSICAL METHODS AND UAV-BASED TECHNOLOGIES FOR COMPLEX MONITORING, ASSESSMENT AND MODELING

RESEARCH PROJECT NUMBER: # 011210

A

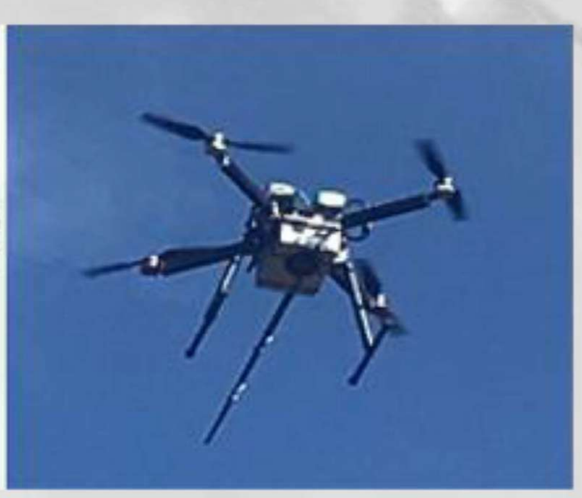
AUTHORS: Veaceslav SPRINCEAN, Marianna SAVVA, Marian JALENCU, Mihail CARAMAN, Alexandr A. BARSUK, Arcadi CHIRITA, Florentin PALADI

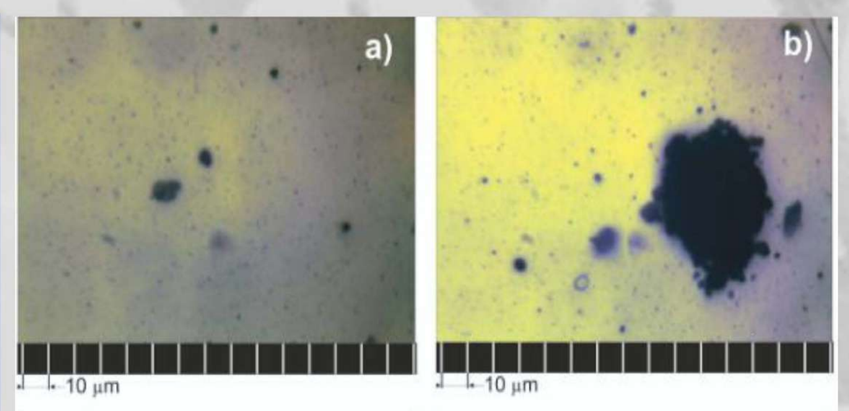
APPLICATION FIELDS: A - Energy, Protection of the Environment, Biotechnology.

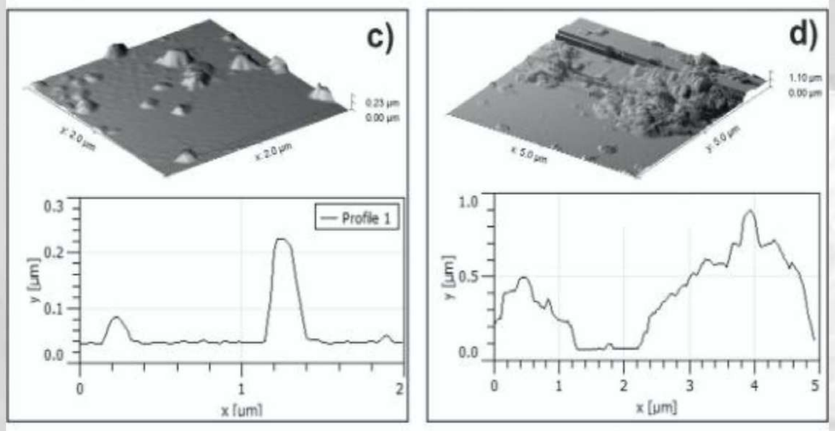
AIM: Development of the physical methods for measuring environmental factors, computational modeling, analysis, and risk forecast in order to increase the resilience to biotic and abiotic factors.

UAV-based monitoring: **Optical and Atomic Force Microscopy (AFM):**









SOLUTION:

Systemic approach inspired by the interdisciplinary applications, computational modeling of environmental factors, UAV-based 3D mapping through Pix4Dmapper photogram-metry allow formulation of scientifically based recommendations regarding the adjustment of technological processes with the aim of reducing the effects of atmospheric pollution, soil surface degradation and the instability of urban and natural ecosystems, e.g., solid pollutant particles are collected from diesel exhaust and examined directly by means of optical microscopy and AFM:

MD patent no. 1706 on 2023.07.31.

ADVANTAGES: Small size and weight of pollutants collection device; use of drones allows particle collection at various altitudes and over extended areas; possibility to study directly airborne microparticles collected on different substrates.

IMPLEMENTATION STAGE: Actual system is proven in operational environment.

ACKNOWLEDGMENTS: Ministry of Education and Research through the grant number # 011210.

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HR EXCELLENCE IN RESEARCH

DEVICE FOR DECONTAMINATION LIQUID

PATENT APPLICATION: MD s 2023 0031 / 02.08.2023

A

AUTHORS: Ion MUNTEANU, Nicolae ENAKI

APPLICATION FIELDS: A - Energy, Protection of the environment, Biotechnology.

AIM: The decontamination and inactivation of pathogens, frequently present in polluted fluids (for example, water, blood, blood plasma, various hygienic and food liquids) following the action of applied ultraviolet radiation, currently enjoys notoriety, which can be applied in various fields such as: medicine, food industry, agriculture and health.

SOLUTION: The particularity of the proposed device is the introduction of a quartz spiral that increases the efficiency of the disinfection rate of the infected liquid.

Currently, the application of Ultraviolet C Radiation is gaining notoriety for the decontamination and annihilation of pathogens frequently present in polluted fluids, which is used in various fields such as food, Health, Hygiene, Medicine, etc. To improve the efficiency of decontamination, we pay attention to equipment prepared from quartz rods/spherical optics related to the rotational movement of the contaminated fluid through the screw channels. The main idea of the proposed device is related to the rotation of contaminated liquids and gases under the action of UV-C through the screw channels, prepared from the quartz rod in the torsion configuration, where the contaminated liquids are rotated along the flow direction. The particularity of the proposed device is the introduction of a quartz spiral inside the decontaminating tube, which increases the efficiency of the disinfection rate of the infected liquid.

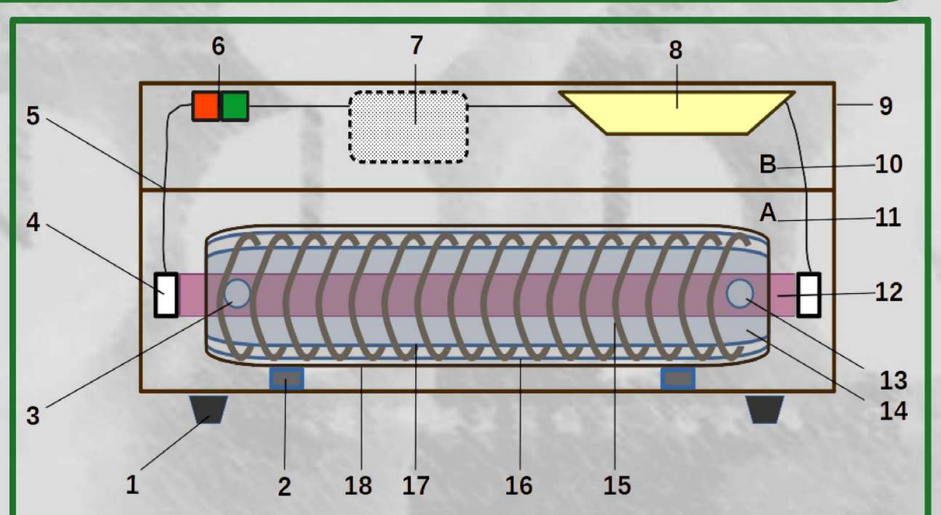


Fig. The device for decontamination of liquids includes the housing of the device (9), an inlet port (3) and an outlet port (13) through which the liquid enters and leaves, respectively, the decontaminating tube formed by two quartz cylinders of different diameters (16) and (17) joined at the ends by the welding method, with an external covering of reflective material (18), which contains an ultraviolet radiation source (12) and a quartz spiral (15) between the cylinders (16) and (17) , which is fixed on the support (2) in the decontamination compartment (11); the electrical compartment (10) contains the switch (6), the electrical ballast (8), the electrical wires (5) that ensures the current transport to the connector (4), control device (7) that provides information about the source of ultraviolet radiation.

ADVANTAGES: The advantages of this device is the manipulation of pathogens with the help of the quartz coil inserted in the decontamination tube, therefore, the pathogens are directed to the evanescence zones with increased radiation intensity that appear around the coil, and thus the pathogens are subjected to higher doses of radiation with inactivation them.

IMPLEMENTATION STAGE: : At the laboratory level.

ACKNOWLEDGMENTS: This research was supported by the *research project:* # 011206; NATO G 4890, No. 15.817.02.07F, No. 18.80012.50.33A and STCU 6140

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NEW POSSIBILITIES OF DISINFECTION AND PROTECTION SURFACE IMPLANT BY ULTRAVIOLET C RADIATION USING PERIODICAL OPTICAL STRUCTURE

RESEARCH PROJECT NUMBER: # 011206

AUTHORS: Ion MUNTEANU, Marina ȚURCAN, Elena STARODUB, Sergiu BAZGAN, Tatiana PASLARI, Podoleanu DIANA, I. COSTIȘIN and Nicolae ENAKI

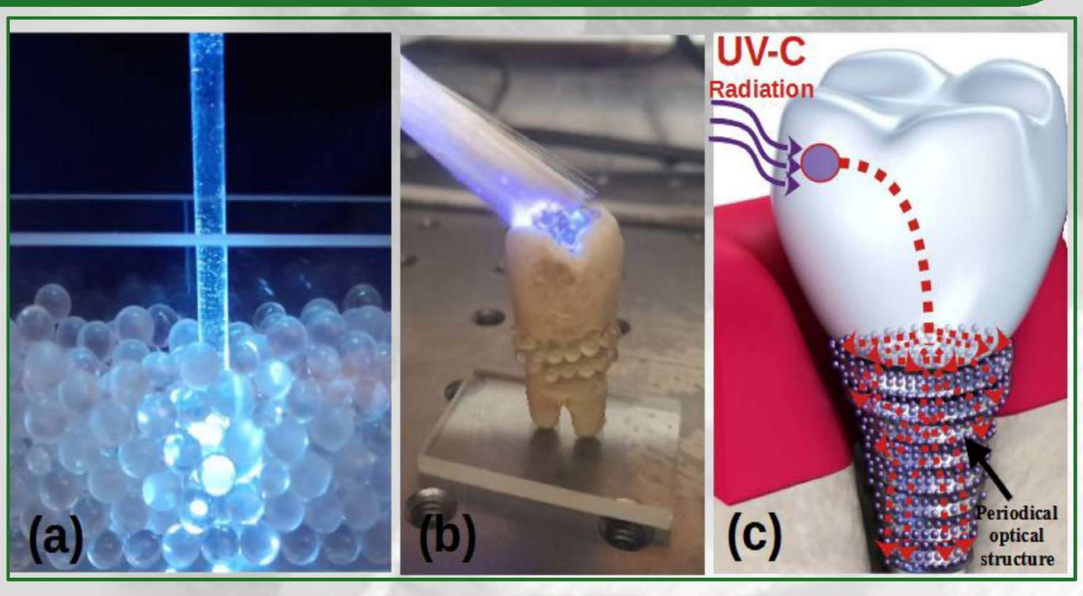
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APPLICATION FIELDS: A - Energy, Protection of the environment, Biotechnology.

AIM: Aspects of the interaction of UVC radiation with implant surfaces for the purpose of disinfection were investigated. Using metamaterials such as photonic crystals and photonic crystal fibers we have the possibility to channel UV radiation in the affected area of the implant surfaces.

SOLUTION: New implementation methods recently opens up new possibilities for decontamination and the adhesion of the modern implant surface to the organic tissue using the periodical optical system (photonic crystals and photonic crystal fibers).

The development of new implementation methods in use of implant treatments, open up new possibilities for decontamination and adhesion of the implant surface to the organic tissue. New aspects of the interaction of ultraviolet C radiation with implant surfaces for disinfection and protection are proposed. UV-C disinfection is efficient at wavelengths from 220 to 280 *nm*. The DNA absorbs it, destroys its structure, and inactivates living cells and therefore microorganisms such as viruses, bacteria, yeasts, and, fungi are rendered harmless within seconds by UV-C radiation. Using metamaterials such as periodical optical structures (photonic crystals and photonic crystal fiber), we have the possibility to channel UV-C radiation in the affected area of the implant surfaces, to treat the infection on the surface formed at the interface between the implant and the cellular tissue in the process of poor adhesion.



(a)- channeling UV-C radiation through metamaterials
(b)- illustration of UV-C light transmission, in dental sample consisting of a bundle of fibers in contact with a system of quartz balls. The dispersion of the UVC radiation on the contact volume inside the dental sample is observed
(c)- dispersion of UV-C radiation inside the implant through metamaterials up to the surface in contact with the cellular tissue.

ADVANTAGES: The described method consists in efficient decontamination of pathogens from the interface between the implant and the cellular tissue resulting from the poor adhesion process.

IMPLEMENTATION STAGE: At the laboratory level.

ACKNOWLEDGMENTS: This research was supported by the *research project:* # 011206; NATO G 4890; No. 15.817.02.07F; No. 18.80012.50.33A and STCU 6140.

APPLICATION OF THE CONCEPT OF IHYAUL MAWAT AS A WONOSANTRI ECONOMIC JIHAD IN THE CONSERVATION OF DEGRADED FOREST LAND

11903205

Authors: Aretha Puspa Indriani, Jasmine Ahnafiah Tunggadewi, Efendi Bagus Rahman Adhipramana, Nafeeza Putri Niza

A

Conservation of degraded land

Degraded land: forest whose function has decreased is not utilized or controlled by the community for other uses.

Conservation: efforts to maintain and increase the productivity of land so that it can be used sustainably

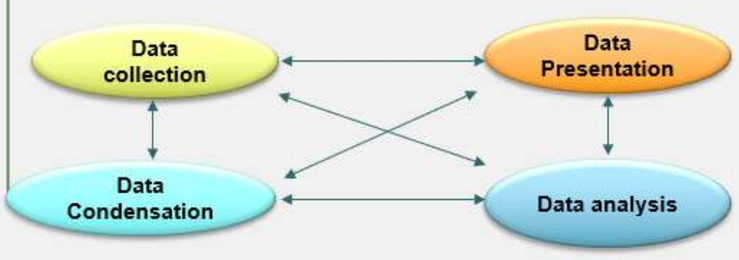
The Concept Of Ihyaul Mawat: Al-Mawat is dead land or abandoned land mean while Ihya' is efforts to revive, prosper, provide added value, make it useful so that barren land becomes planted, unproductive land becomes productive

Research Purposes

1) To find out the concepts of Ihyaul Mawat applied by Wonosantri in conserving degraded forest land on the slopes of Mount Arjuno.
2) To find out the economic implications of Ihyaul Mawat as an economic jihad effort carried out by Wonosantri.

Research Method

Research Approach	Qualitative case study method
Research Subject = Informant	✓ *Founder* Wonosantri : Bpk Fathul Ulum, M.Ag. ✓ *Wonosantri Co-founder and Education Sector: Mr. Ali Machrus, M.Pd.* ✓ Several farmers are members of Wonosantri

Techniques and Data Collection Tool	1. Observation 2. Interview 3. Documentation
Analisis Data	Miles and Huberman Model 

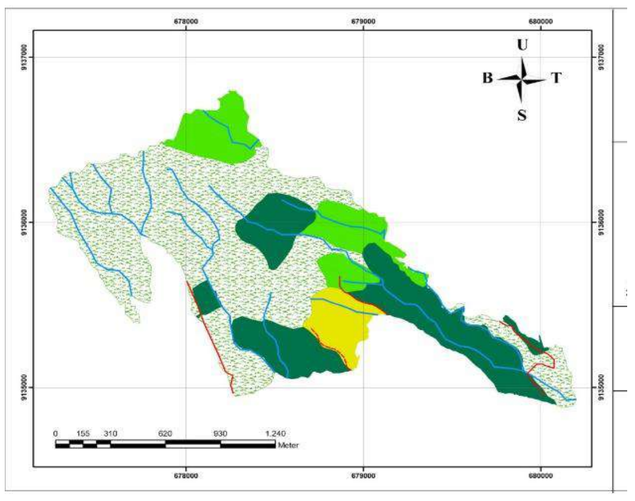
Result and Discussion

- The ihyaul mawat concepts applied by Wonosantri in the conservation of degraded forest land on the slopes of Mount Arjuno are the ihyaul mawat concept as Munif's (2018) concept which is adapted to the social forestry program.
- Economic jihad through ihyaul mawat has vertical and horizontal economic implications.
- Ihyaul mawat carried out by Wonosantri in conserving degraded forest land on the slopes of Mount Arjuno have had good economic implications for the Wonosantri themselves, coffee farmers, and even for the surrounding community.

Pictures & graphics



Coffee Farmer



Map of Arjuno Mountain



Gathering in Arjuno Mountain

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ECO-Deco: GLITTERING DECORATION SAND FROM WASTE GREEN MUSSEL SHELLS NANOPARTICLES

ECO-Deco Project

Author/s: Jeerasak Jitrotjanarak , Soamshine Boonyananta, Churiparn Lertvachirapaiboon, Namphueng Taweepornpathomgul, Robert Armstrong, Parinton Jangtawee, Suchart Imsamraan

A

ECO-Deco is a high-value product which was made of mussel shell waste, by extracting calcium carbonate and processing it with other materials such as titanium dioxide to increase air purification, adding color or scent to create a feeling of relaxation. The processed calcium carbonate is used to coat products to decorate the surface. It involves taking mussel shells through a process of extracting unwanted organic substances through a chemical process. Calcium carbonate crystals are left as the main ingredient, ground, and graded to the desired size. It is then mixed with various substances to coat the product, such as titanium dioxide, color, odor, etc., causing the product to have properties that change according to the context of use.









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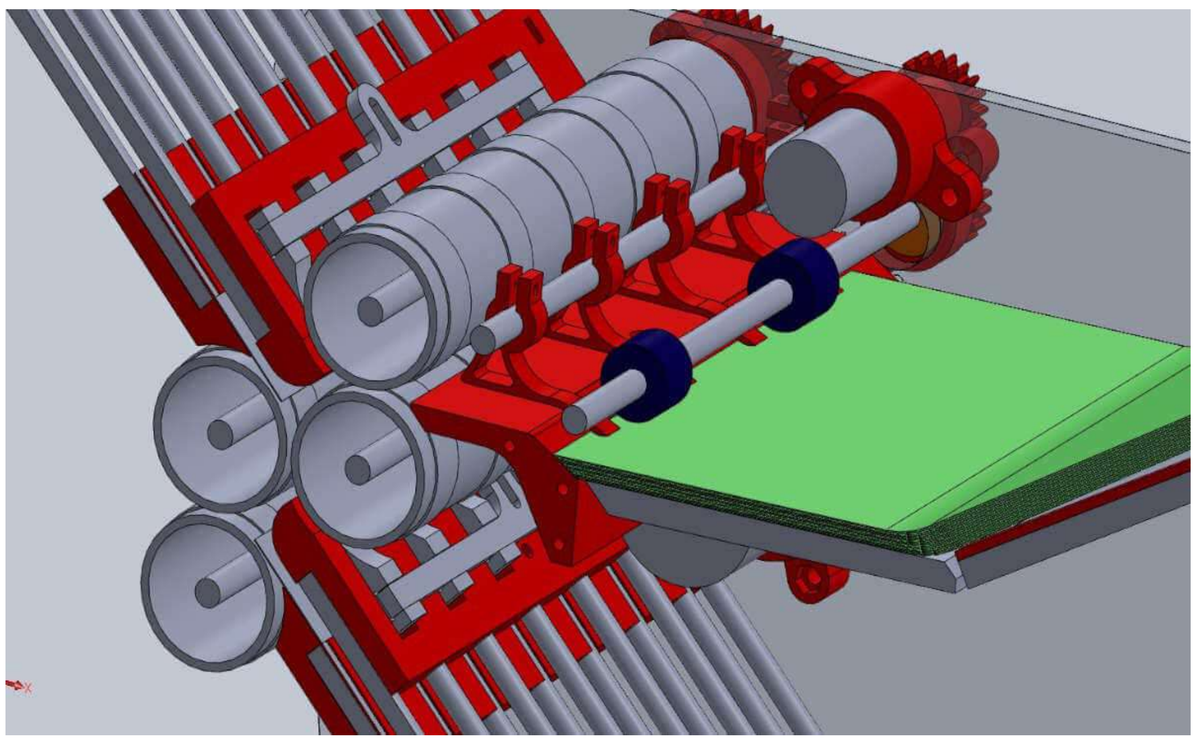
FoldMAX

Author: Zgardan Maxim
Mentor: Prof. Ciuvaga Victor

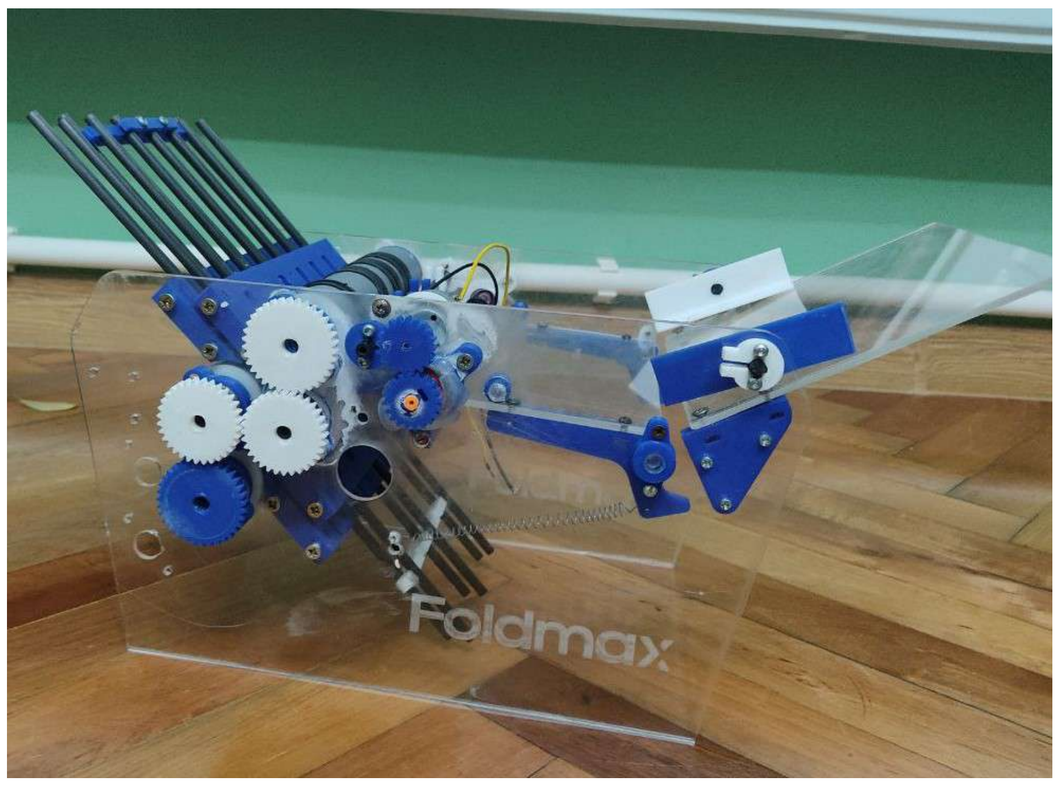
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The problem of paper waste is not a new problem for us today. The ecological problem of paper began to be seriously recognized from the 1960s and 1970s, with the growing awareness of the negative impact of deforestation and pollution on the environment. In this context, my teacher and I thought to find a solution to this problem, and we came up with the paper recycling method, and I thought why not make a machine that reuses this paper.

Textile waste is fragmented into small pieces and soaked in water for two hours. After this, they're mixed in a laboratory mixer with a water solution for 1-2 minutes. The resulting consistency is transferred to a larger container and mixed again. Square cloth pieces are soaked, extracted, and dried, resulting in beautiful creations.



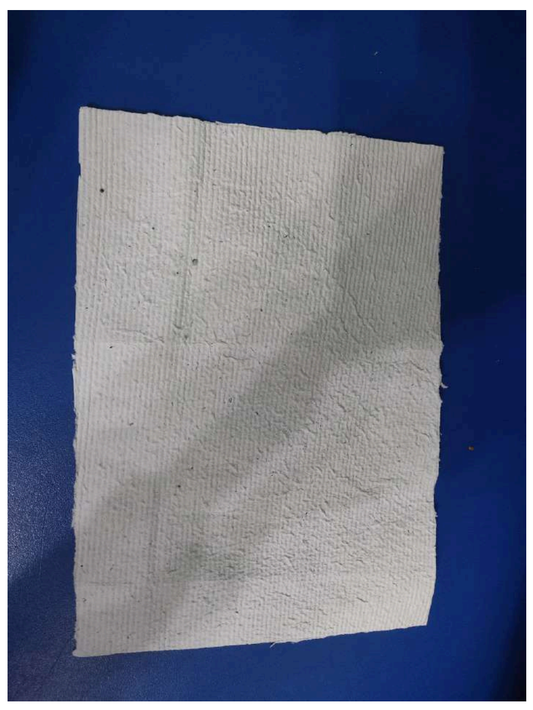
3D printed-parts



The final result

The process involves designing 3D-printed parts without supports, utilizing strong PLA. Acrylic is cut via CNC Laser for precision. Roller friction is enhanced with rubber rings for efficiency. Components are assembled, including buckle and insert plate, to aid paper folding. Machine operation is controlled by Arduino and L293D Motorshield, with code programming ensuring continuous folding roller speed and timed separating roller control. We demonstrated the possibility of the act of paper recycling in domestic conditions, which represents a solution to the global ecological problem. At the same time, we built a modern and robotic device, which reuses recycled paper in the field of bureaucracy, the final product representing universal use envelopes.

In the future we can automate this paper recycling method, and once this method is seen as effective, from the point of view of entrepreneurs, it can be applied in many areas: fabrics and materials for cleaning, printing and writing paper, ecological packaging, office supplies, construction insulation, packaging and hygiene products. Paper recycling and the use of recycled products are significant steps towards a more circular economy and more efficient resource management. Through this method and this machine, the aim is to contribute to the development of sustainable solutions for managing resources and reducing the impact on the environment through the efficient reuse of paper.



Recycled paper

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Use of ecological/renewable energy sources: The Stirling engine

A

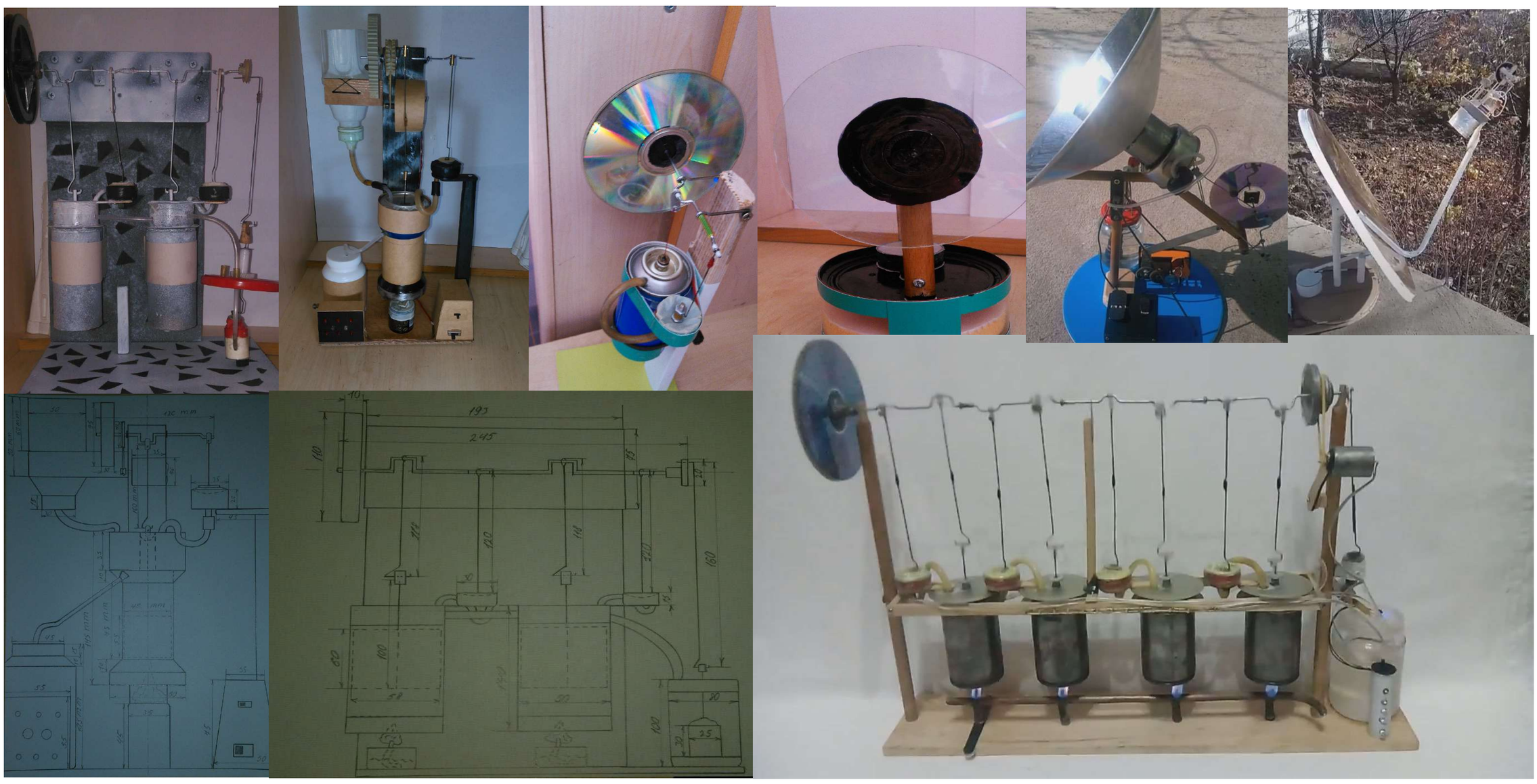
Author: Deșan Dumitru

Our project focuses on revolutionizing the efficiency of Stirling engines by introducing a transition from conventional air cooling to more advanced water cooling systems. This strategic shift is poised to bring about a paradigm shift in the engine's performance metrics, elevating its operational capabilities to unprecedented levels of efficiency and effectiveness. Through the incorporation of water cooling mechanisms, we envisage a substantial enhancement in the engine's ability to dissipate heat, thereby optimizing its operating temperatures and mitigating the detrimental effects of overheating-induced energy losses.

Stirling engines possess a remarkable advantage over traditional internal combustion engines due to their innate adaptability in harnessing heat from a diverse array of sources. From biomass to solar energy, Stirling engines exhibit unparalleled versatility, positioning them as frontrunners in the realm of sustainable energy solutions. This inherent flexibility not only renders them highly sought-after in environments where access to conventional fuels is restricted but also underscores their pivotal role in fostering environmentally conscious energy practices.

Moreover, the integration of water cooling mechanisms into Stirling engines holds immense promise in broadening their applicability across an extensive spectrum of industries and sectors. Whether deployed for power generation, heating, or refrigeration purposes, the augmentation of Stirling engines with water cooling capabilities promises to unlock new realms of performance excellence. The resultant improvements in efficiency are poised to not only amplify the engine's power output but also precipitate a notable reduction in emissions and operational expenditures, thereby heralding a new era of sustainable energy utilization.

In essence, our project stands as a testament to our unwavering commitment to driving innovation in the realm of energy technology. By spearheading the transition from air cooling to water cooling in Stirling engines, we are poised to catalyze transformative advancements that transcend mere functionality, paving the way for a more sustainable and environmentally conscious future.



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The biodegradable plastic

Author: Starîș Mădălina
Mentor: Dorogan Elena

A

One of the major issues threatening the integrity of our environment is plastic pollution. The optimal solution is the production of biodegradable plastic.

In this project we studied 5 substances, namely: potato starch, vinegar, glycerin, water and corn starch.We chose these substances because potato starch and corn starch provide a suitable texture for modeling, being biodegradable and environmentally friendly compared to regular media. Glycerin helps maintain shape and texture, and steel hardness, while water is needed for hydration. These substances are affordable and economical sources, reducing raw material costs.

For one portion, I homogenized 2 teaspoons of corn starch and potato starch, one teaspoon of vinegar and glycerin and 2-3 teaspoons of water. I continuously stirred the resulting mixture at the flame of the spirit until it thickened and changed a little color.I leveled the resulting plastic mass a little and waited three days until it dried well, after which I put it in the ground. For two weeks the obtained plastic decomposed completely, compared to ordinary plastic which decomposes during 400-500 years.

To analyze the obtained plastic, a piece was mechanically crushed, then placed in several chemical beakers in which different agents were then added, such as: methyl alcohol, acetonitrile, distilled water, waste water and alkaline water. In all cases, the resulting plastic decomposed.

In the IR spectrum we noticed that starch and glycerin did not undergo major changes, being present the characteristic peaks of the triol (CH-OH) 995.96 cm-1 and the characteristic peaks of the carbon hydrate 1338.40 cm-1, 2361.47 cm-1, 3267.53 cm-1.

We decided to make biodegradable plastic toys. Thus, we placed the obtained plastic in various shapes (stars, bunnies, bears), thus obtaining ecological and safe toys for children, this being one of the fields in which biodegradable plastic can be used.



The ingredients used



Obtaining biodegradable plastic



Descomposition



Chemical analysis



IR spectrum



Biodegradabil plastic toys

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Determining groundwater transmissivity through the analyses of physical properties and chemical composition from Svalbard fjord sediments

A

Research project

Author: Zaga Trišović

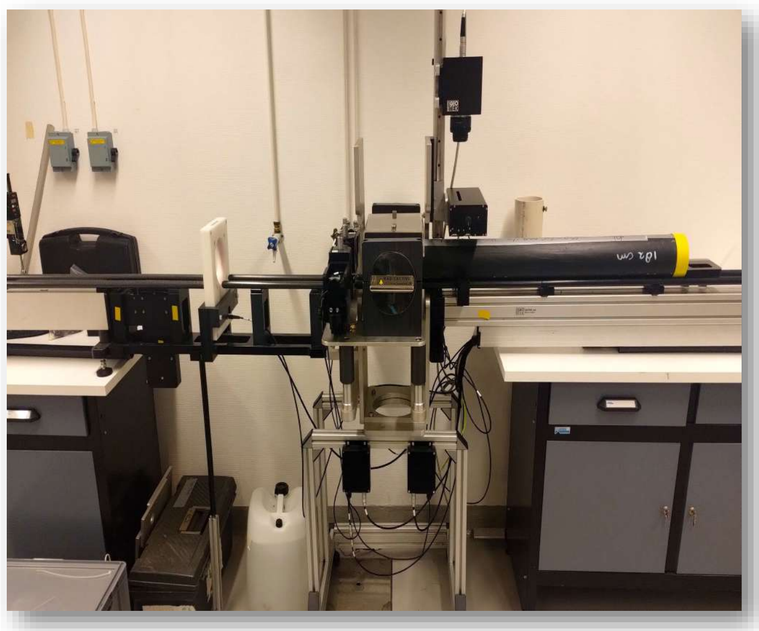
Throughout the two-week Short-Term Scientific Mission (STSM), a thorough evaluation of the physical and mechanical properties of soil and sediment cores from Svalbard was diligently carried out. These cores underwent meticulous measurements, analysis, and processing as outlined in the predetermined work plan, considering practical constraints and the available timeframe.

The culmination of these efforts resulted in meticulously examined and refined datasets and imagery derived from comprehensive analysis of the sediment cores. These valuable resources are set to be openly accessible to the public via esteemed Open Access data repositories. This deliberate transparency not only promotes scientific openness but also lays the groundwork for future research endeavors in the realm of Offshore Freshened Groundwater (OFG).

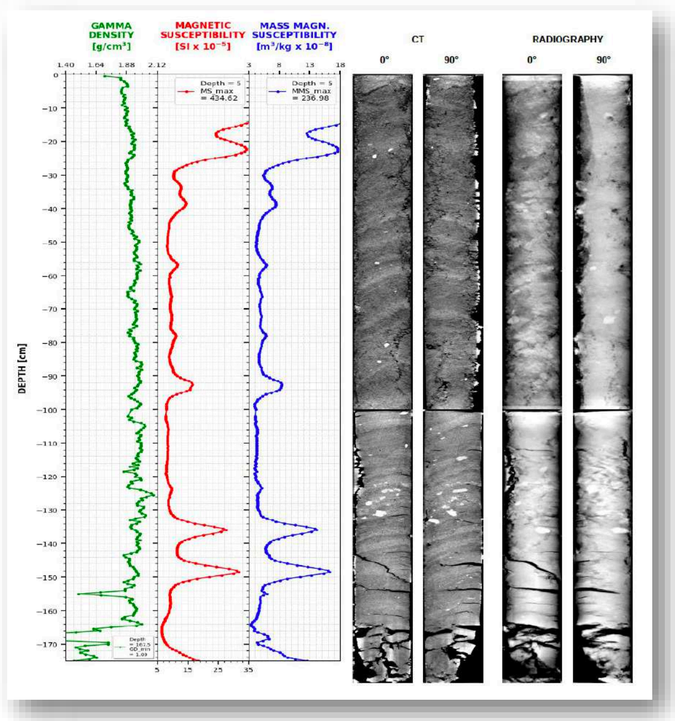
The next step involves further exploration and analysis of the amassed data and imagery, to be presented either at an academic conference or as part of a forthcoming scientific paper. This forthcoming documentation will detail the laboratory procedures, data analyses, and resulting insights, significantly contributing to ongoing discussions within this scientific field.



Rotating X-ray CT system - RXCT



The Multi-Sensor Core Logger - MSCL



Visual representation of the data obtained from RXCT and MSCL.

Although time constraints prevented examinations of split cores, collaborative efforts in the future are expected to facilitate additional analyses of these samples. Potential future endeavors may include further measurements of split cores, allowing for deeper characterization of groundwater transmissivity within Svalbard's fjords. Additionally, the prospect of developing numerical models and fostering collaborations within the COST Action network holds promise for future project undertakings within the broader framework of the COST Action.

Contact: Zaga Trišović, +38162295270, **Email:** zaga.app@gmail.com

DIGITAL TRANSFORMATION - AN APPROACH IN THE OIL AND GAS INDUSTRY IN A LOCAL, REGIONAL AND GLOBAL CONTEXT

Scientific paper

A

Author/s: Valentin-Paul TUDORACHE[1], Niculae-Napoleon ANTONESCU

In a global context where governments are setting increasingly ambitious targets to reduce carbon dioxide emissions while also addressing a greater presence of renewables in their local energy mix, the oil and gas industry needs to turn to new clean technologies - to find the best strategies to re-establish itself in the new era of the energy sector and beyond. It is estimated that in the new era of the oil industry - despite a price boom - oil and gas will provide more than 50% of the world's energy needs by 2050. As organisations in the oil industry accelerate the pace of their economic diversification strategies, this is driving an even greater and faster adoption of sustainability measures across the industry. Optimism, in terms of resource abundance in a new era of major social, technological and political trends, must be that of adapting to the current demands in which oil industry organisations operate.

In a complex world, nobody can do everything. In the quest for cost reduction and profitability in the short to medium term, both operators and organisations in their field need to collaborate more, exploring multiple strategies to succeed in this digital transformation. Clearly, more and more oil and gas organisations are testing - often successfully - a growing range of technologies and solutions to help them become more sustainable, reduce costs and, at the same time, reduce carbon dioxide emissions into the atmosphere.

There are many different components of digital transformation, but some common examples include the use of data analytics for production optimization, the use of drones and robots for exploration and maintenance, and specifically the use of virtual reality for training and simulations. An offshore platforms approach to better use of data, specifically properly implemented data analysis systems and tools can overcome the operational complexity of offshore platforms, quickly delivering returns of up to 40-50 times the initial investment and thus reducing environmental impact by reducing costs, accidents and bottlenecks. Advances in technologies, falling cost through digitisation and exponential growth in device connectivity offer not only a real opportunity to beat supply chain competition, but also potential material externalities for society at large. The use of digital technologies and how they are transforming the oil industry, such as: Big data; AI (Artificial Intelligence); IoT (Internet of Things/Things); RPA and AI (Robotic Process Automation and Intelligent Automation); AR and VR (Augmented Reality and Virtual Reality); Blockchain (Data Integrity) place a strong emphasis on Cyber Security (CS) and Industrial Control Systems (ICS) security, but also on worker protection and security, industrial assets, i.e. critical infrastructure and physical security; (*see Figures below*). Of course, it is no coincidence that the focus on Industry 5.0 is accelerating. Today, Industry 5.0 is a complement to Industry 4.0 and focuses mainly on a sustainable, human-centred and resilient industry.



Source: www.google.com (processed)

Overview: Offshore platform
(use of data analysis systems and tools with digital technology)



Source: www.google.com (processed)

Digitisation of the oil sector (*Upstream, Midstream and Downstream*)



Source: www.google.com (processed)

Overview: Using digital technologies

Today – ***in the DIGITAL ERA*** – several modern orientation technologies are established that can answer these problems, such as: *Rotary Steerable System; Reel Well Drilling; Geosteering Drilling; Autonomous Directional Drilling*.

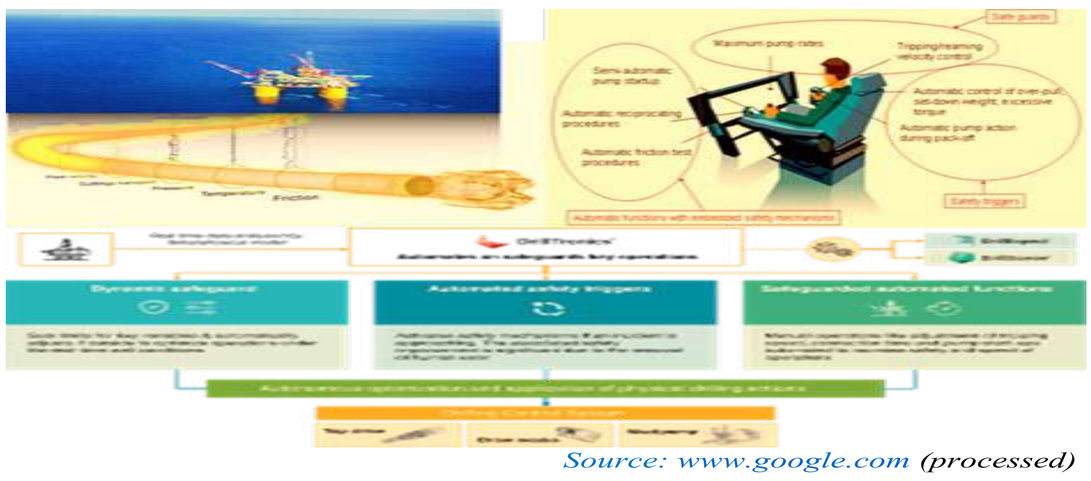
and which, use bottom motors and measurement devices while drilling (MWD), providing access to real-time data.

For example, **Autonomous Directional Drilling (***see Figure below***)** is a significant step forward for the industry's digital transformation, helping organizations achieve new levels of well construction efficiency, consistency and sustainability. This technology allows - within the drill string - a self-steering bottom assembly (BHA) capable of drilling through any section of the wellbore. As one of the four pillars of autonomous directional drilling, downhole automation capabilities drive directional adjustments as conditions are encountered to significantly increase penetration rates (POR) and improve well quality, leading to a potential for higher production and lower emissions.



Source: www.google.com

Overview: Autonomous Directional Drilling



Source: www.google.com (processed)

DrillTronics Functions and Data Flow

In terms of the offshore digitization initiative, today's drilling operations on offshore platforms range from DrillTronics (Drilling Automation), DrillScene (Real-time Well Transient Monitoring), DrillExpect (Drilling Simulation) to implementation integrated project Drill Well on Simulator, providing the oil industry with advanced modeling and analysis, respectively leading global services. For example, **DrillTronic** (*see Figure above*) reduces risk and ensure maximum drilling efficiency through automatic functions: automatic tripping; automatic friction tests; automatic reciprocation; automatic start of mud pump.

Advantages , recommendations and conclusion:

As advantages: Based on the recent World Economic Forum White Paper, new technologies are expected to support the oil industry by: 20% reduction in drilling-extraction costs; 25% reduction in maintenance costs (inspection and maintenance); 20% reduction in labour costs.

Is recommended: The digital transformation of the oil and gas industry needs to address all elements of the operating model (so from strategy and capabilities to organisational structure). Therefore, organisations in the oil and gas industry need to approach digitalisation from the perspective of building new capabilities and leveraging technology in all key aspects of the value chain.

As a general conclusion: It is already a recognised fact that every organisation that benefits from this trend where operations and relationships are fully digitised, or at least improved in this respect, will generate growth far beyond traditional operating models. So, digital transformation means progress and growth, although -in the present- with trillions of dollars already being spent globally on the digital shift.

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POWER PLANT SAND

Student Research Project

Authors: Cloțan Antonio

Coordinator: Professor Aurel Mihail ȚÎȚU

A

DESCRIPTION:

This type of Power plant sand is intended for use in dry areas of the Earth. The energy obtained in this way is a clean source of energy, since no greenhouse gases are emitted into atmosfphere. Sand is a non-volatile, almost infinite, cheap resource, and last but not least, during repeated use it does not show significant physical-chemical changes.From an ecological point of view, it is very sustainable, the same amount of sand can be reintroduced into the circuit a large number of time, almost infinitely, because sand does not evaporate like water.

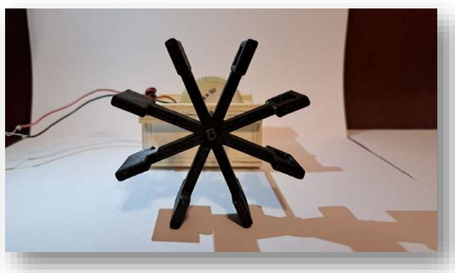
ADVANTAGES:

-Sand is very cheap and easily accessible.
- The operating technology is not complicated.
- Is a source of renewable energy.
- After repeated use, it does not present signifiant physical-chemical changes.

APPLICATIONS:

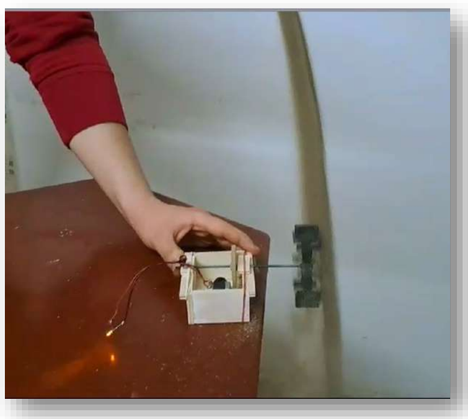
The Power Plant Sand work as follows:

1. We will use a turbine adapted to our needs.



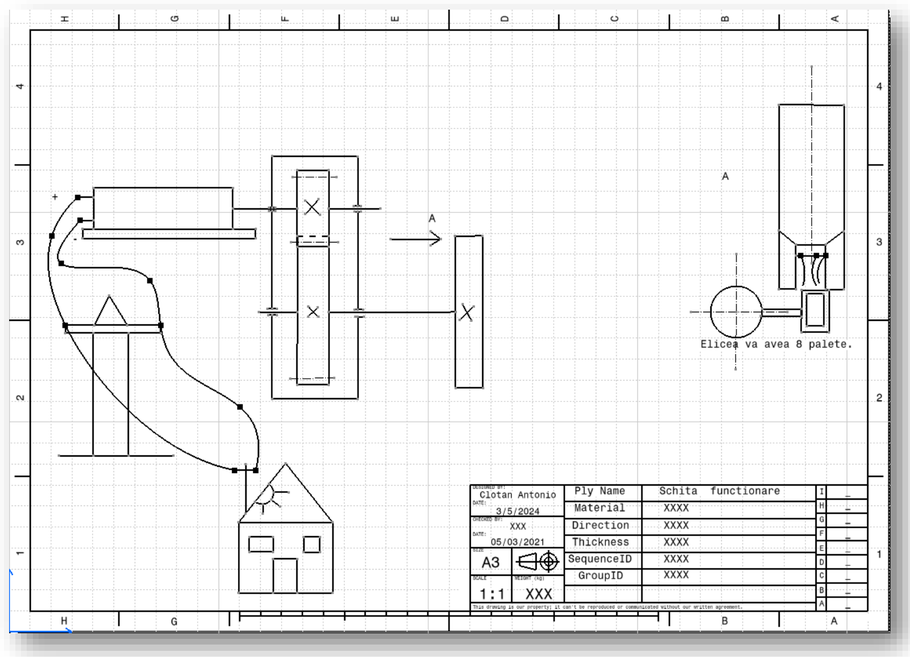


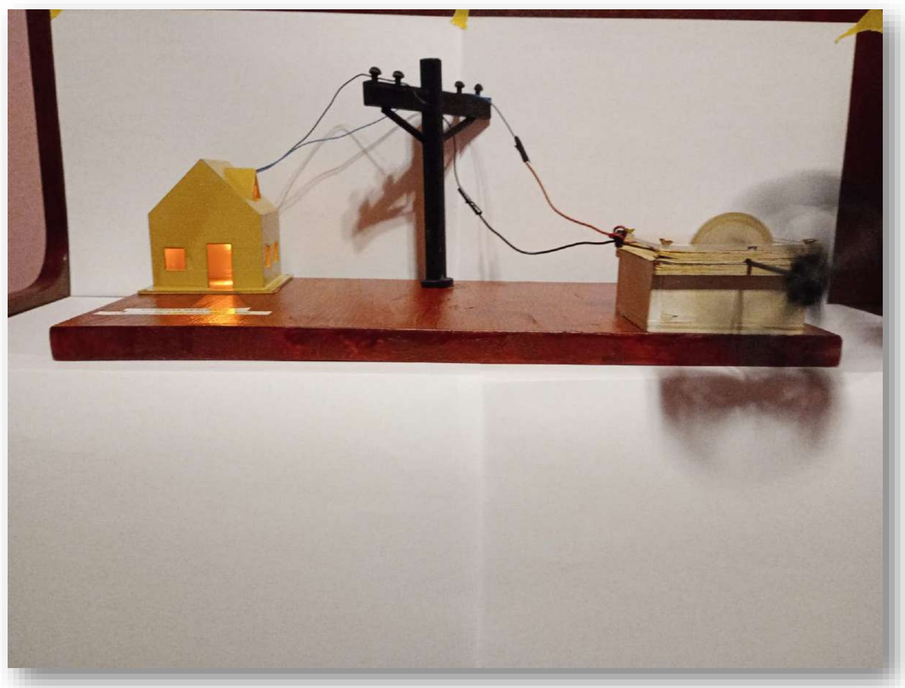
2. The sand jet pushes the turbine blades, changing the direction of the flow, this resulting in an impulse.



3. In the lower base of the silo, through which the sand falls freely, due to the force of gravity. As the sand falls, it hits the blades of a propeller which is connected to a turbine, the turbine which converts the kinetic energy of the sand into mechanical energy, which is then converted into electrical energy by a dinam. To introcude current into the system, inverters wil be used.

RESULTS AND DISCUSSIONS





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AUTONOMOUS MOBILE PLATFORM WITH UV RAY DISINFECTION SYSTEM, A MODULAR AND AFFORDABLE SOLUTION FOR VIRUS ELIMINATION

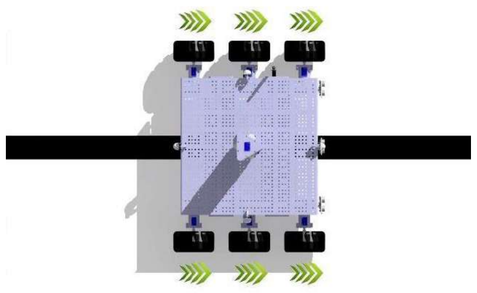
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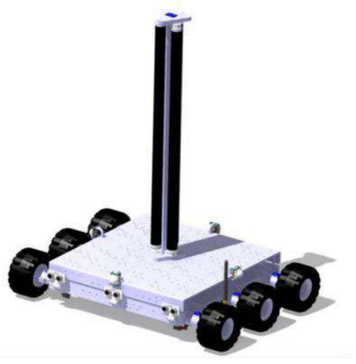
Scientific Research Project

Authors: Aurel Mihail ȚÎȚU, Daniel BÂLC, Emanuel BÂLC

DESCRIPTION

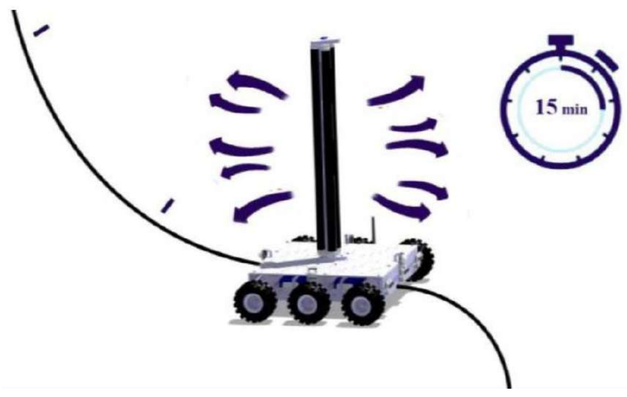
The Autonomous Mobile Platform with UV Ray Disinfection System is a complex concept that describes an adaptable ensemble for different workspaces, a flexible structure designed to address the existing challenges in the robots already on the market and bring about improvements in the UV ray disinfection process. This is designed to follow a predetermined path using a series of QTR8A reflective sensor modules connected in series. The chain of five such QTR-8A reflective sensors is configured as a line sensor but can also be used as a proximity or general-purpose reflective sensor.



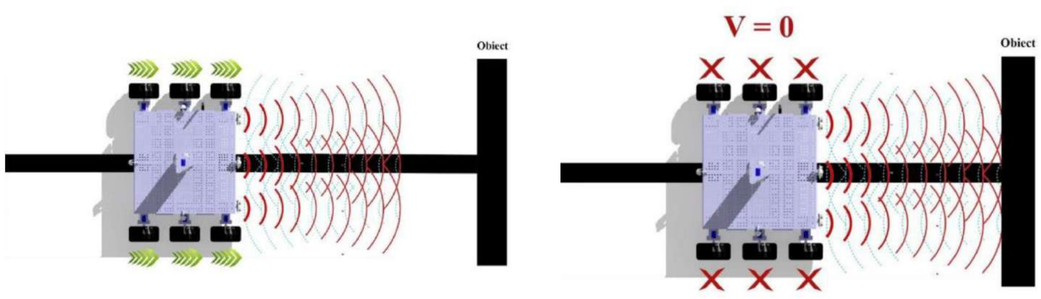


As there is a differential drive mechanism, the so-called line following involves keeping two sensors (or, depending on the width of the strip, possibly three sensors) above the line. Forward movement is possible if the sensors declared as central are above the line. Thus, the motors receive a signal to move forward at a cruising speed (cruising speed is lower than the maximum speed) in the positive direction if the sensors meet the specified conditions.

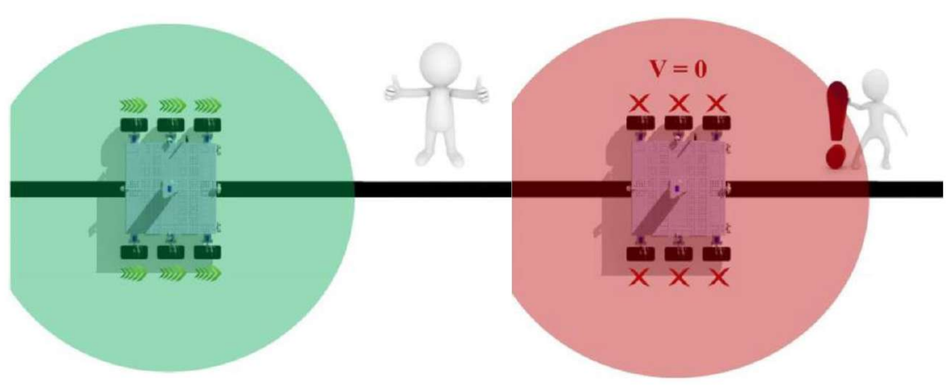
Depending on the signal received after reading the QR code, as seen in the figure the autonomous mobile platform must stop the motors and generate UV rays for a predetermined time specified in the code (this time can be set to 10, 15, or 20 minutes) [16,17].



This represents the path the autonomous mobile platform must follow, along with the strategic points where it must pause to emit UV rays [18,19,20]. Again, this is one of the ideal cases in which the autonomous mobile platform can operate freely, can smoothly navigate throughout the route as long as there are no obstacles along its path or individuals that could potentially affect in any way as seen in the following figure.



The autonomous mobile platform is equipped with the necessary sensors to be able to stop the generation of UV rays and the motors as long as there are people or objects within its range of action, resuming its route when the objects or individuals exit the range of action as seen in the figures.



THE SOLUTION PROVIDED BY THE AUTONOMOUS MOBILE PLATFORM WITH UV RAY DISINFECTION SYSTEM

First and foremost, the issue of incomplete disinfection, especially in stair areas, is addressed within this platform by adapting the mechanism for lifting people with disabilities. When the Autonomous Mobile Platform with UV Ray Disinfection System reaches the stair area, it emits a signal through the Wireless Nrf24l01 module to indicate its arrival and waits for the platform to move to the point where it can receive it. Then, it can proceed with disinfection while the platform descends or ascends, depending on the case.

Secondly, the cost issue is addressed within the "Autonomous Mobile Platform with UV Ray Disinfection System" by limiting the decision-making scope of the ensemble. The fact that it follows a predefined route and encounters strategic points along it that convey what to do significantly reduces costs and enables the use of affordable components for different categories of individuals.

Thirdly, the problem where the disinfection robot may become an obstacle in emergency situations is resolved in the "Autonomous Mobile Platform with UV Ray Disinfection System" by establishing refuge zones to facilitate the optimal unfolding of emergency situations. After receiving the emergency signal, it halts its basic functions UV ray generation and QR code reading activates the Wireless Nrf24l01 Module to detect the nearest zone of refuge, and moves towards it. This zone of refuge serves as a place where the robot avoids becoming an obstacle in emergency situations and, at the same time, a location where it can recharge until the emergency signal is lifted, then resume its activities.

RESULTS AND DISCUSSIONS:

From a testing perspectiv, the energy consumption for the autonomous mobile platform was recorded in a specific scenario. The autonomous mobile platform operated within a medical facility, traversing a route of 21 meters, resulting in a total distance covered by the autonomous mobile platform of 42 meters. Following the test, the current consumption for 10 complete operations in different days, during which the autonomous mobile platform completed the disinfection of the entire medical facility, was recorded. Taking into consideration the identified aspects, several optimization directions can be further outlined, such as the introduction of multiple charging zones along the route. Although for a small-scale route, such as the one analyzed, a single charging zone may suffice, it should be noted that nearly 60% of the battery capacity was utilized. For longer or double routes, it is advisable to consider installing multiple charging zones, allowing the autonomous mobile platform to complete the route and return to the initial charging area. This approach would contribute to reducing the risk of battery depletion and ensuring continuous and efficient operation of the platform.

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Inteligent Waste Sorting System

A

Scientific Research Project

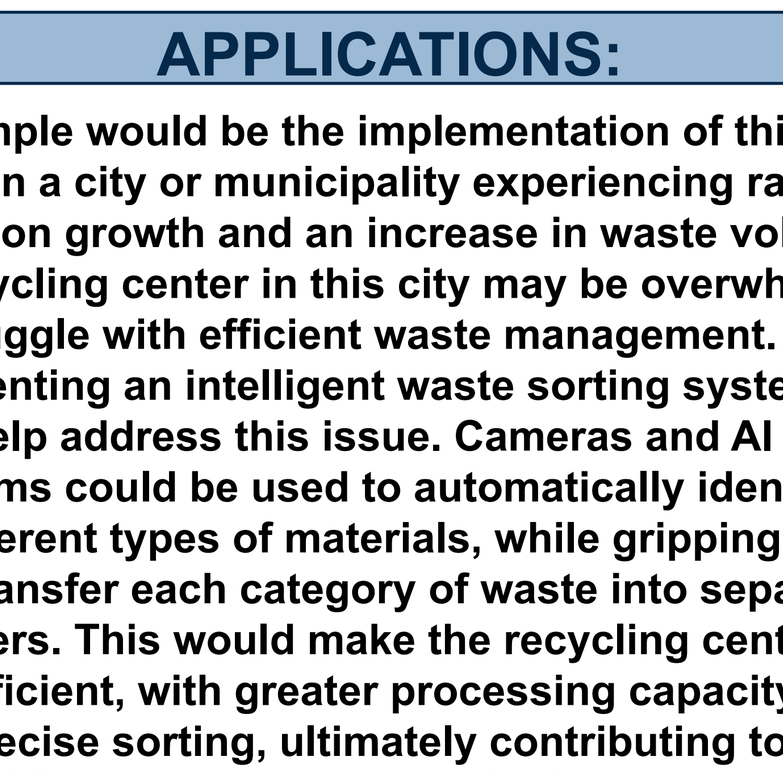
Authors: Doară Mihai-Alexandru, Costea Marius, Popa Ioan Alin
Coordinator: Professor Aurel Mihail ȚÎȚU

DESCRIPTION:

Our project is about an intelligent waste sorting system. Through this system, we aim to assist people who have difficulties in disposing and correctly sorting waste. This system is equipped with cameras and AI algorithms to automatically identify the types of waste being thrown into a container. The algorithm can be trained to recognize various materials such as plastic, metal, paper, glass, biodegradable waste, and many more. The system is equipped with two small-sized cameras, a few mechanical arms with sensors that sort the garbage and four waste compartments for various materials. This system can be implemented in homes, restaurants, cafes, and even on the streets.

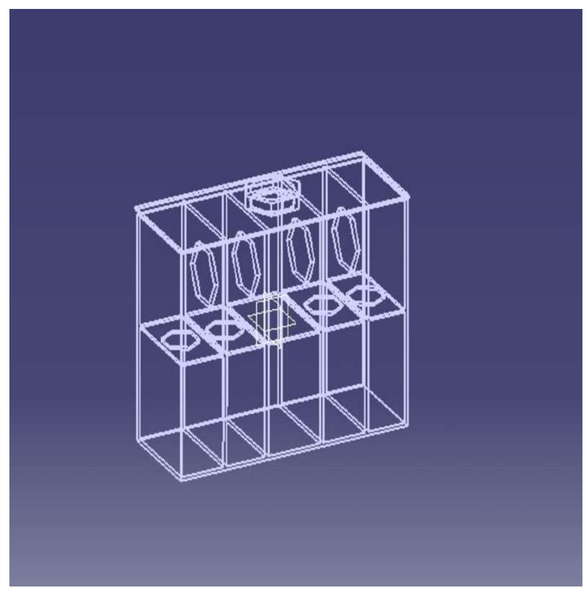
APPLICATIONS:

An example would be the implementation of this project in a city or municipality experiencing rapid population growth and an increase in waste volume. The recycling center in this city may be overwhelmed and struggle with efficient waste management. Implementing an intelligent waste sorting system could help address this issue. Cameras and AI algorithms could be used to automatically identify and sort different types of materials, while gripping arms could transfer each category of waste into separate containers. This would make the recycling center more efficient, with greater processing capacity and more precise sorting, ultimately contributing to more sustainable waste management in the community.

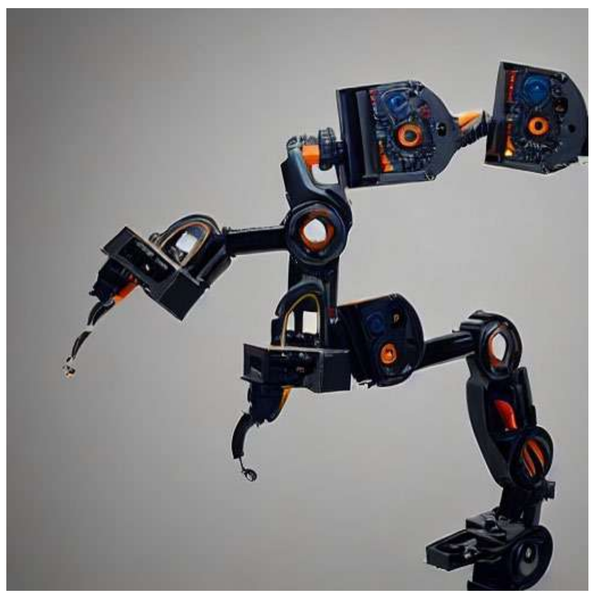


ADVANTAGES:

Increased Efficiency:
The use of artificial intelligence and computer vision technologies can significantly improve the sorting process, reducing the time and effort required for waste management.



Reduced Human Errors:
Automated sorting systems minimize human errors and ensure more accurate sorting of recyclable materials, contributing to increased recycling rates and reduced contamination.



Resource Optimization:
Intelligent sorting enables more efficient use of resources, such as recyclable materials or the energy required for waste treatment.

Environmental Impact:
By promoting recycling and efficient waste management, this project can contribute to reducing pollution and environmental impact.



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BLACK SOLAR

INNOVATIVE GREEN ENERGY SOLUTIONS FOR A HEALTIER FUTURE

Green Energy Project

Authors: Razvan MARCUS, Nicoleta MARCUS

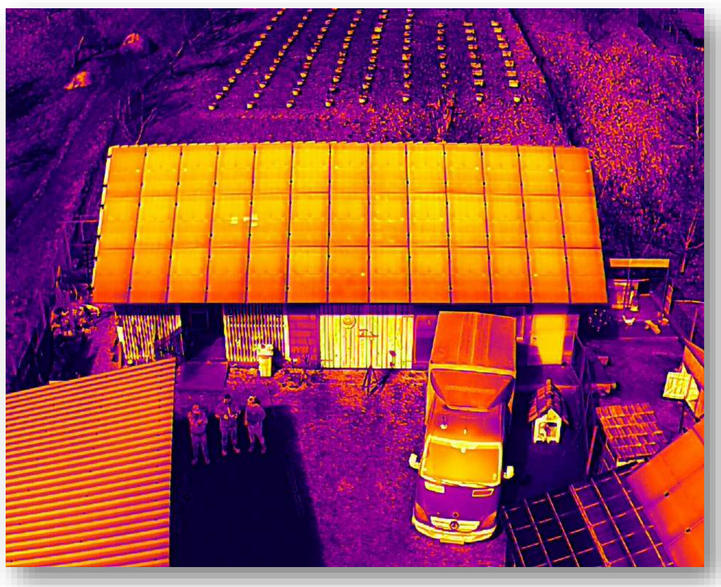
A

Black Solar is dedicated to pioneering the future of renewable energy through cutting-edge technology and innovation. Our mission is to harness the power of advanced technologies, including drone thermal imaging and 3D scanning, to provide our clients with the most efficient, reliable, and sustainable energy solutions available.

By integrating these innovative tools into our services, we aim to optimize energy consumption, reduce environmental impact, and lead the transition towards a more sustainable and energy-efficient world. Our commitment to excellence and innovation drives us to continuously explore new horizons in renewable energy, ensuring that we offer the best solutions that meet and exceed the evolving needs of our clients and the planet. We strive to lead by example in the transition towards a greener planet, ensuring reliability, efficiency, and excellence in all our projects.















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Environmental cost analysis in the electrical lighting equipment industry

Student Project

Authors: Gabor Antonio, Petruț Adriana, Basarabă Andra, Szekely Ioana
Coordinators: Fărcean Ioana, Ștefan Mihaela

Category A





The environment is an essential element of human existence, being the result of the interaction between material elements: soil, air, water, climate, biosphere, with the elements resulting from human activity. All this influences the living conditions and future development prospects of society, so environmental protection is a priority both in Romania and globally. Environmental Fund, and the duties of the Environmental Fund Administration with regard to the declaration and settlement of the amounts due for waste resulting from the production process in the production of electrical lighting equipment and reported to the Environmental Fund.



Given the fact that we are talking about an economic-financial body aimed at solving and carrying out processes for the protection of the environment", for the subject we wish to address in this paper, we find of interest the field of production of electrical and electronic equipment (EEE), because these products are indispensable for everyday activities. As users of these types of equipment, not all of us are aware of the environmental obligations, but as manufacturers or importers of electrical and electronic equipment things are different - there are a number of legal obligations and European directives that must be respected by all legal entities producing or importing electrical and electronic equipment. The aim is to highlight the obligation of legal entities producing and importing electrical and electronic equipment (EEE) to report to the Environmental Fund and the impact of environmental costs on this field of activity.

Contact: antonio.gabor@student.upt.ro

ANALYSIS OF ENVIRONMENTAL COSTS IN THE LIGHTING EQUIPMENT INDUSTRY WITH THE HELP OF ENVIRONMENTAL MANAGEMENT ACCOUNTING

A

Research project

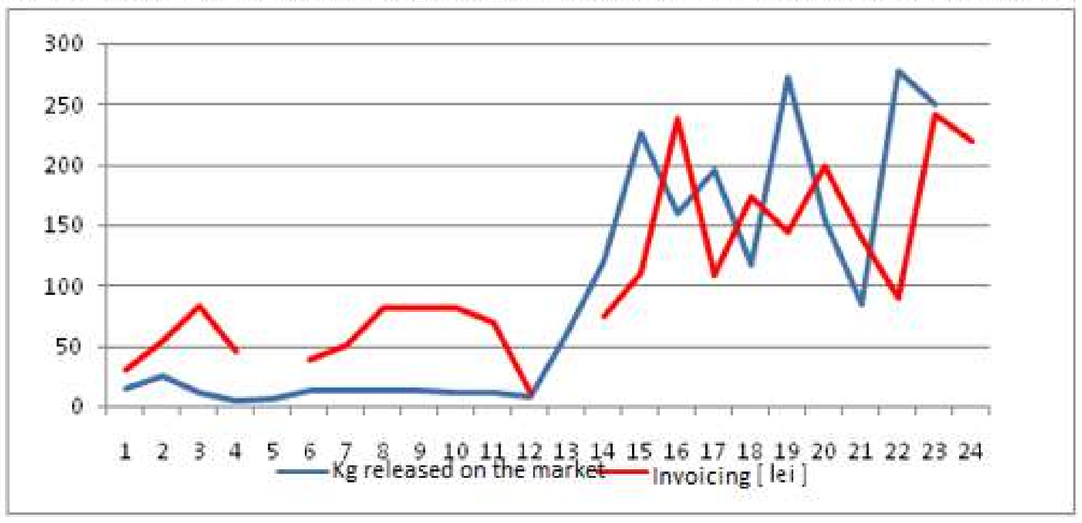
Author/s: Ştefan Mihaela, Fărcean Ioana

The implementation of environmental management accounting can give us an insight into the efficiency of activity in different fields of activity. As the main objective for this study, we intend to analyze both the evolution of EMA based on results analyzed by specialists, but also the benefits brought by the implementation of EMA within economic entities with production activity in the field of lighting fixtures. Thus, we try to prove the importance of the benefits that EMA / statistical model offers us on the example of the impact of environmental costs both for the studied economic entity and in order to extend this study to other economic entities with other fields of activity, this being the subject of future research.

Analysis of the dependence between the products placed on the market and the resulting waste

Month	Projectors APOLO II +hale		SS Solar + Photon SP II		Display Line III		Projectors Proton		Beacons		Aluminium waste	
	[pcs]	Cum.	[pcs]	Cum.	[pcs]	Cum.	[pcs]	Cum.	[pcs]	Cum.	[lei]	Cum.
1	***89***	***89***	***33***	***33***	***165***	***165***	***60***	***60***	***128***	***128***	***736***	***736***
2	222	311	424	457	417	582	20	80	187	315		
3	53	364	1789	2246	98	680	40	120	214	529		
4	159	523	882	3128	24	704	13	133	89	618		
5	216	739	315	3443	64	768	175	308	145	763		
6	***136***	***875***	***220***	***3663***	***141***	***909***	***62***	***370***	***342***	***1105***	***1560***	***2296***
7	208	1083	61	3724	18	927	22	392	272	1377		
8	123	1206	29	3753	96	1023	42	434	141	1518		
9	430	1636	40	3793	68	1091	3	437	173	1691		
10	194	1830	636	4429	94	1185	38	475	187	1878		
11	159	1989	832	5261	149	1334	46	521	170	2048		
12	59	2048	1101	6362	265	1599	59	580	90	2138		
13	***179***	***2227***	***63***	***6425***	***441***	***2040***	***16***	***596***	***84***	***2222***	***520***	***2816***
14	356	2583	31	6456	30	2070	0	596	104	2326		
15	282	2865	35	6491	202	2272	9	605	192	2518		
16	270	3135	239	6730	209	2481	0	605	104	2622		
17	***128***	***3263***	***155***	***6885***	***139***	***2620***	***28***	***633***	***98***	***2720***	***574,6***	***3390,6***
18	170	3433	38	6923	90	2710	2	635	138	2858		
19	***516***	***3949***	***215***	***7138***	***0***	***2710***	***44***	***679***	***135***	***2993***	***585***	***3975,6***
20	135	4084	3	7141	75	2785	8	687	102	3095		
21	56	4140	318	7459	85	2870	10	697	206	3301		
22	***257***	***4397***	***145***	***7604***	***121***	***2991***	***44***	***741***	***140***	***3441***	***83,2***	***4058,8***
23	302	4699	499	8103	214	3205	89	830	363	3804		
24	***67***	***4766***	***463***	***8566***	***17***	***3222***	***47***	***877***	***185***	***3989***	***78***	***4136,8***
Total	4766		8566		3222		877		3989		4136,8	

Correlation between the amount of packaging placed on the market and environmental costs



The hierarchy of products according to the weight placed on the market

No.	Category of products	Pieces	Total weight [kg]
1	Projectors APOLO II + halls	4766	27083,9
2	SS Solar + Photon SP II	8566	14156,1
3	Display Line III	3222	7699,8
4	Projectors Proton	877	4433,8
5	Beacons	3989	3217,2
6	Linear projectors	2294	3186,9
7	Rooflights	795	2154,8
8	CISA	1317	1056
9	Projectors ASTRO + SATURN	427	771,5
10	Retrofit. Heliport, Leon	665	714
11	Reloc	767	383,5
12	Atlas	214	272,1
13	Lamps ELM	113	90,4
14	Rod LINEA	182	72,8
15	Adjustable spots	78	21

Analyzing the dependencies according to the product categories

No.	Production of equipment in the category: Category 1 [pcs]	Category 2 [pcs]	Category 3 [pcs]	Category 4 [pcs]	Category 5 [pcs]	Resulted and recovered aluminum waste [lei]
1	89	33	165	60	128	736
2	875	3663	909	370	1105	2296
3	2227	6425	2040	596	2222	2816
4	3263	6885	2620	633	2720	3390,6
5	3949	7138	2710	679	2993	3975,6
6	4397	7604	2991	741	3441	4058,8
7	4766	8566	3222	877	3989	4136,8

The need to prevent pollution by economic entities is the result of two main factors: 1 - the market of industrial products follows the rapid pace of development of technologies, shaping and adapting to the requirements of the moment; 2 - in order to achieve managerial performance, economic entities must establish an efficient reporting system to internal and external environmental regulations.

If companies realized that treating and disposing of waste is less expensive than producing waste, then those companies would commit to reducing costs by minimizing waste. This would motivate companies to strive for continuous improvement of their efficiency and profit levels.

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RECYCLING OF LITHIUM ION BATTERIES

Research project

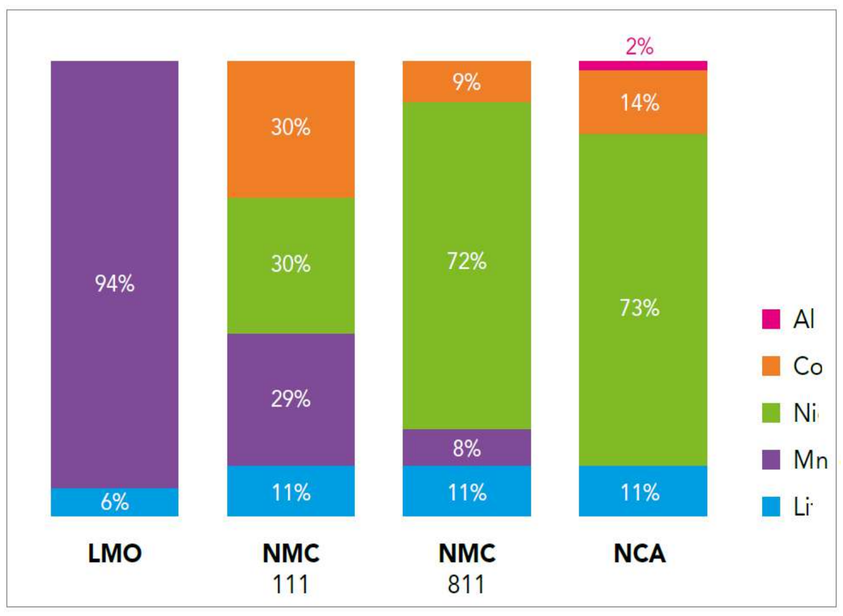
Author: Iulian NISTOR

Coordinators: Ana SOCALICI, Corneliu BIRTOK-BANEASA

A

A Li-ion battery is a group of interconnected cells capable of charging and discharging. Common end uses for Li-ion batteries include consumer electronics, electric vehicles, and energy storage. A Li-ion battery cell is made up of several components: a negative electrode or anode (usually made of graphite with a copper collector), a positive electrode or cathode (made of a transition metal oxide that can vary in chemical composition with an aluminum collector), a separator and an electrolyte. The chemical composition of the cathode defines the specific type of Li-ion battery. The type or composition of the Li-ion battery determines the mineral requirements below, with the mineral proportions for the LMO, NMC 111, NMC 811 and NCA battery types shown below. For the recovery of metals from used Li-ion batteries, LiCoO2/LCO batteries from mobile phones (Huawei and Samsung) were used in the direct recycling. For our own experiments, the technological flow of the recovery of the cathodic active paste by ultrasound was used, and organic solution (lactic acid) was used as the leaching medium.

The Li-ion batteries were then disassembled manually, and the content was separated into components (anode – copper foil covered with graphite, respectively cathode – aluminum foil covered with active paste containing cobalt). The ultrasonic bath with a capacity of 1.5 l and a maximum ultrasonic power of 80W was used. Analyzing the data obtained for the disassembly of used Li-ion batteries results: 50% cathode with active paste; 40% anode with anode paste; 4% plastic elements; 6% case, separators and contacts.



Materials used in the production of batteries













Recovery efficiency of the cathode paste varied between 80-84%. The recovered cathode paste was homogenized with alumina and thermally treated in an oven to obtain cobalt blue. Recycling Li-ion batteries is extremely important for protecting the environment and recovering precious resources. As Li-ion batteries contain hazardous chemicals and precious metals such as lithium, cobalt, nickel and aluminium, it is essential to recycle them properly to avoid pollution and recover these resources.

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MODELLING THE SURFACE RUNOFF IN THE BARZAVA BASIN BASED ON GEOGRAPHIC INFORMATION SYSTEMS AND HEC Geo-HMS

A

Research project

Codruta Badaluta – Minda, Mihai Valentin Herbei

In the last decades, the floods are more and more present and of high intensity, both in Romania and worldwide. The process of estimating leaks in a river basin is extremely complicated and depends on several factors including the meteorological and physical characteristics of the river basin. The results from the land pre-processing were used in HEC-Geo-HMS to extract the hydrological parameters of the river basin. In this paper, based on the precipitation recorded in the river basin of the Barzava River, the hydrographic method of the soil conservation unit was used to simulate the runoff rate. Corine Land Cover 2006 was used to make the land use / cover map of the Barzava catchment (Fig. 1 and Fig.2). Soil date, land cover and humidity were modelled with HEC Geo-HMS , resulting the map of CN value for Superior Barzava catchment (Fig. 3).

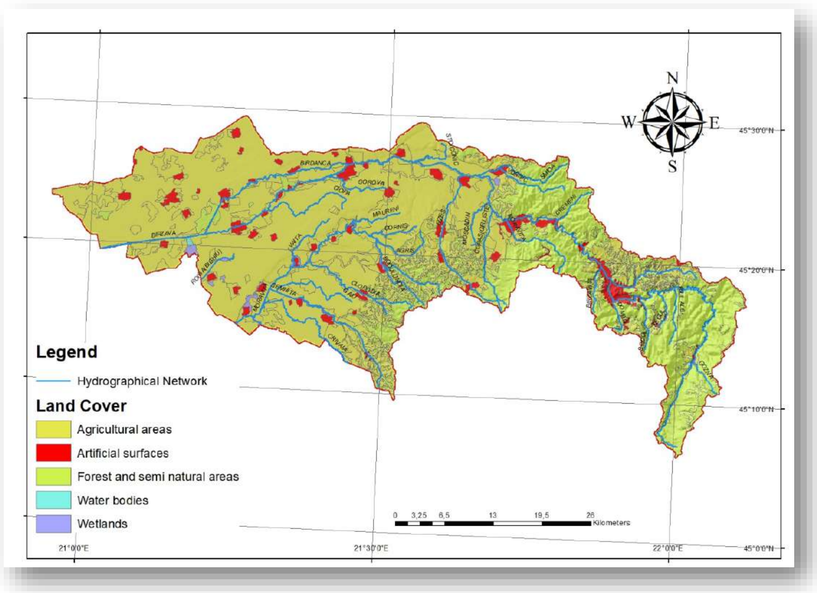


Fig. 1 Map of the soil type

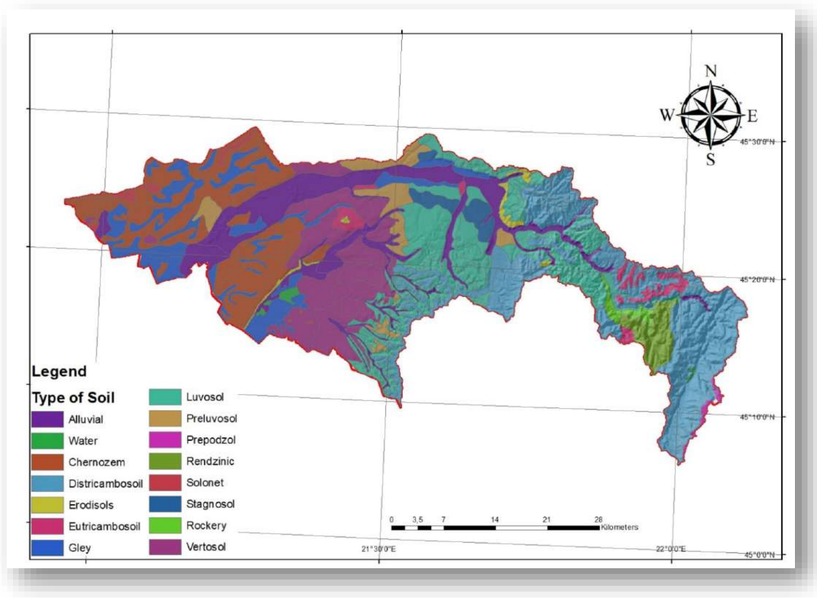


Fig. 2 Map of the land cover

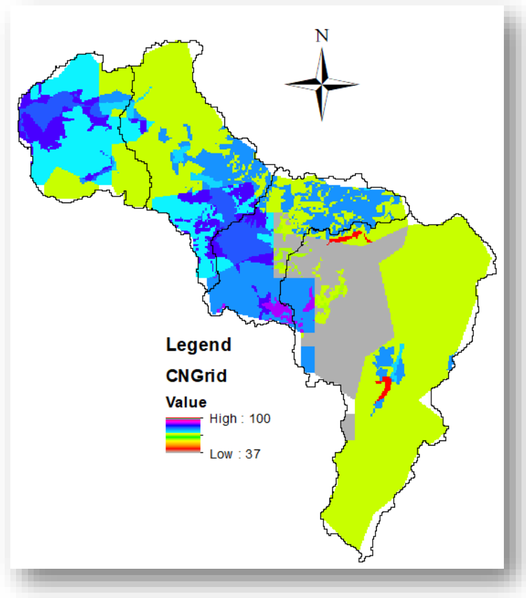


Fig. 3 Map of the CN for Superior Barzava River

The calibration of the model was performed with the registered discharge at the Moniom hydrometric station from April 14 to 21, 2005. Following several steps with the software used, based on the amounts of precipitation falling over a period of time, the result is discharge and volume in the Moniom Section (outlet).The model parameters were calibrated according to observed discharge at Moniom section (outlet). (Fig.4 , Fig. 5 and Fig. 6).

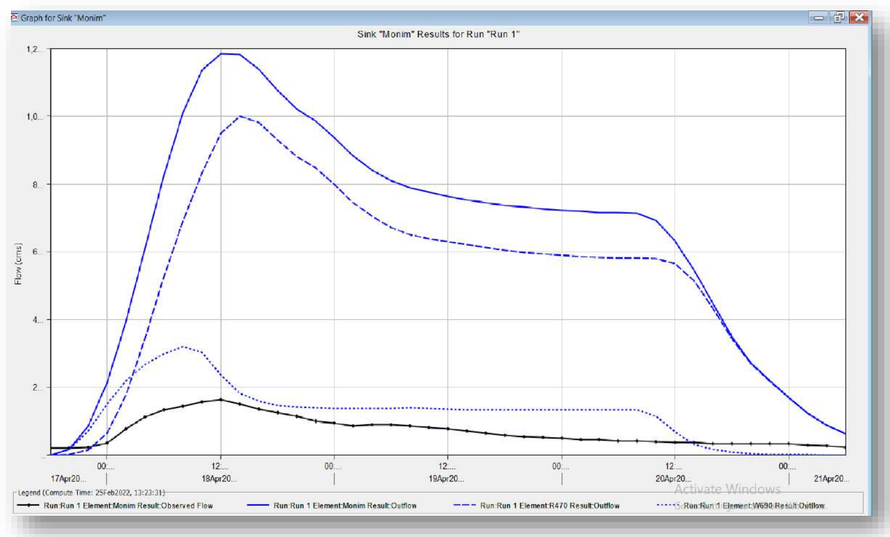


Fig.4 Simulated and observed discharge in Monion section

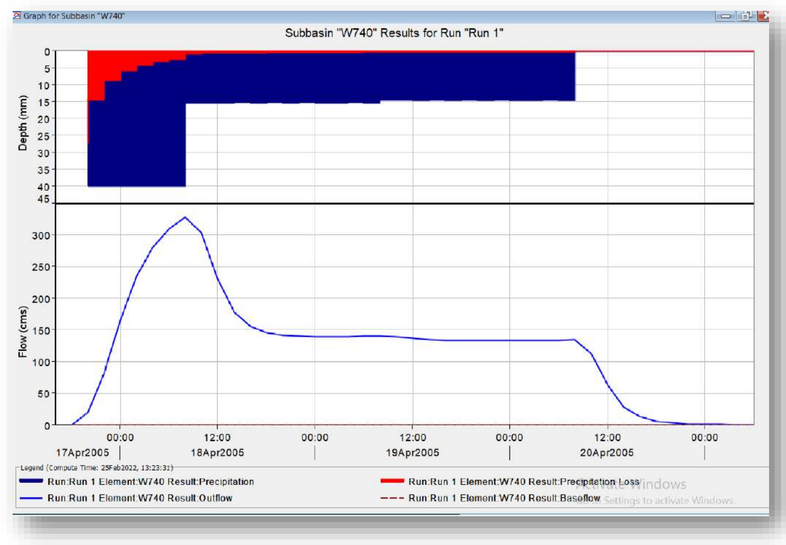


Fig.5 Simulated hydrograph and precipitation in subbasin

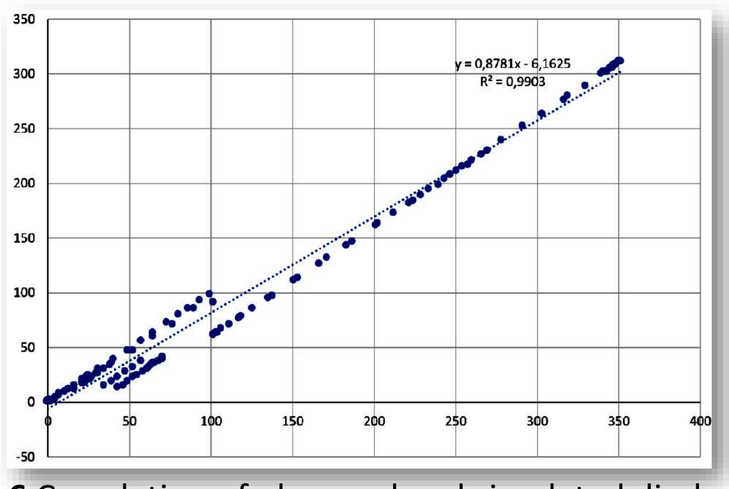


Fig.6 Correlation of observed and simulated discharge

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QUALITATIVE CHARACTERIZATION OF THE SIDERITIC WASTE

Research project

Author: stud. Maria-Alexandra BRUMAR
Mentors: Daniela Miloștean, Erika ARDELEAN

A

In the conditions of the sustainable development concepts implementation, assumed worldwide, the industrial waste generators have the obligation to identify those technological options that make possible to transform this waste into secondary materials and to replace the deficient raw materials. In addition, there are a large number of historically generated waste, stored more or less controlled, which can be recovered and reintroduced into the economic circuit. But, in order to establish an adequate management is necessary to determine the quantitative and qualitative characteristics of this waste.

In the present research, qualitative determinations were made on the sideritic sterile resulted from the concentration operation of iron ores, exploited from the Ghelari mine and currently stored in three tailing ponds. The following characteristics were determined: chemical composition, grain size, the angle of repose, magnetic concentration, humidity, apparent density and flow capacity.

The main chemical elements found in the tailings composition

Chemical elements	%
Si	30,87
Fe	29,77
Ca	22,24
Mg	4,32
Ba	3,23
Cl	2,25
Mn	2,20
Al	2,20

The main chemical compounds found in the tailings composition

Chemical compounds	%
SiO_2	44,94
Fe_2O_3	21,82
CaO	18,24
MgO	5,09
Al_2O_3	2,89
BaO	1,66
MnO	1,48
Cl	1,40

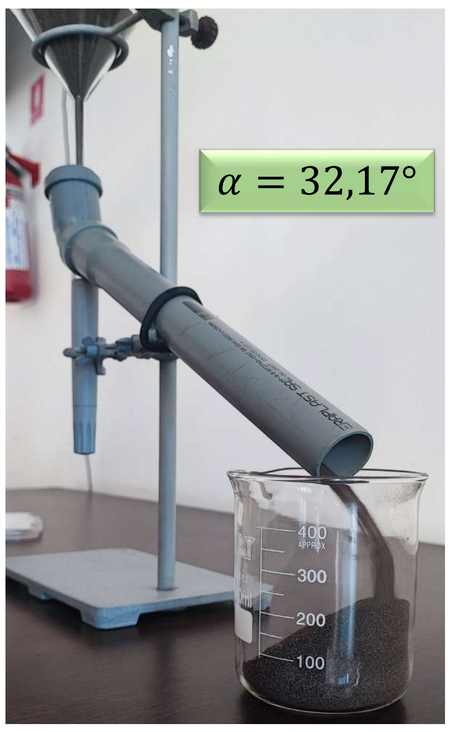
In addition to the previously mentioned compounds, tailings also contain other compounds in very small amounts, such as Na_2O, K_2O, TiO_2, P_2O_5, SrO, As_2O_3, CuO, etc.

Magnetic concentration



28,24% is attracted by the magnet

The angle of repose

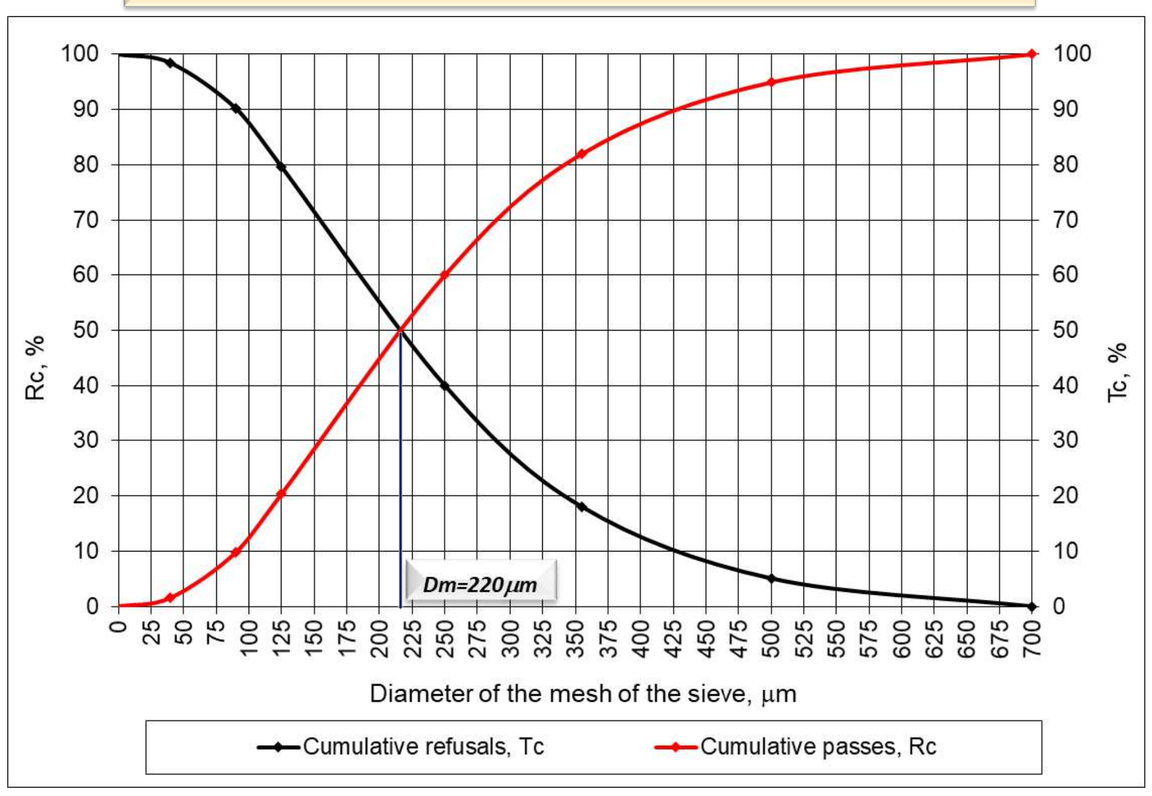


Humidity



W_h = 2,92%

Cumulative particle - size distribution



Apparent density



ρ_a = 56,844 g/cm^3

Flow capacity



Flow time is 27,736 s

Based on the results obtained, different experiments can be proposed and carried out, in the first phase in laboratory conditions, leading to the obtaining of secondary material that can be reused in the steel industry.

Contact: ma.brumar@yahoo.com

Automatic Device for Production of Hybrid Composite Compounds for Water Disinfection

Patent: P-2011/0518

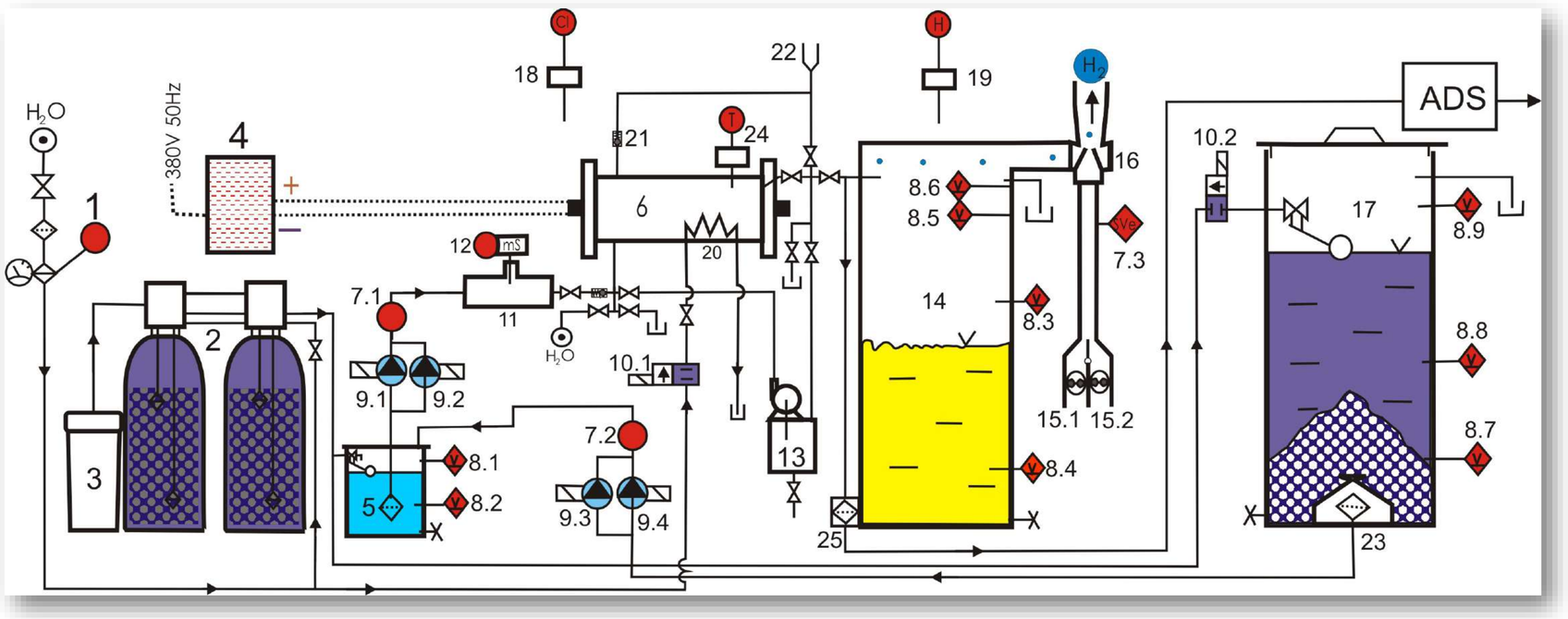
Author: Tomislav Trišović

A

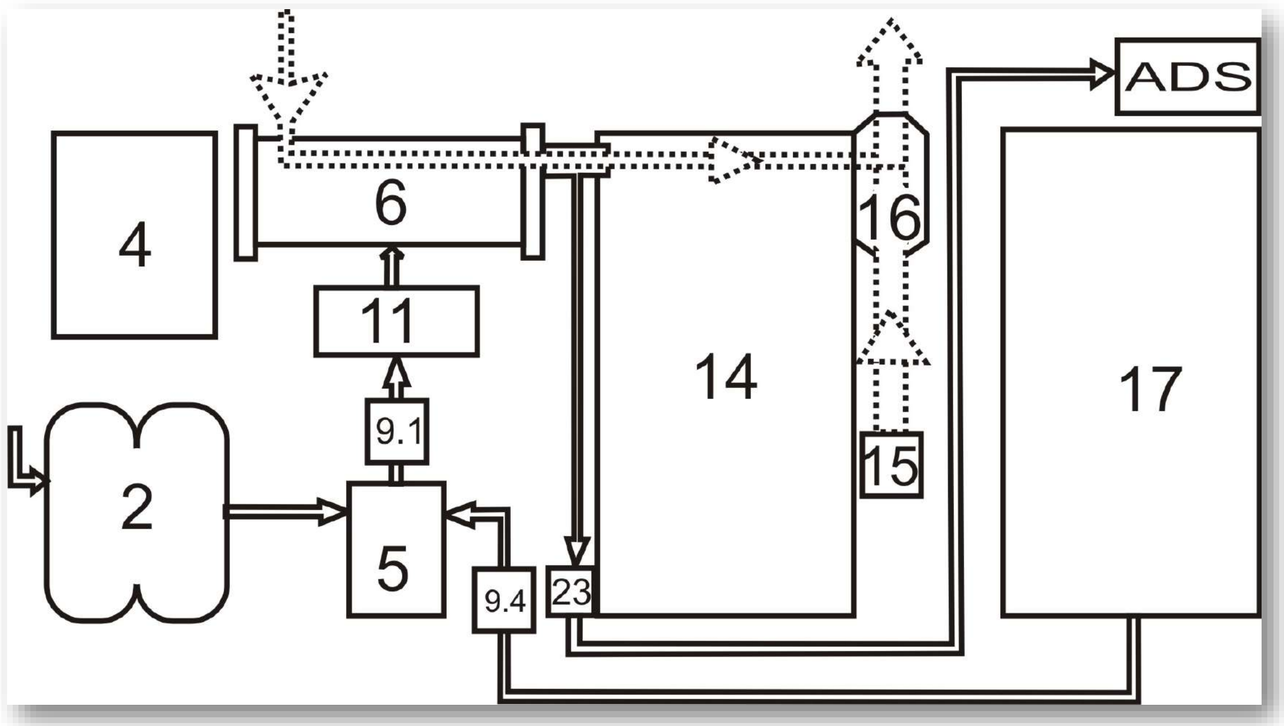
Chemical compounds with pronounced oxidizing or reducing properties, typically obtained through electrochemical reactions, are highly unstable and require special storage conditions. Besides the ideal storage conditions (temperature, UV radiation, humidity, etc.), their half-life ranges from a few seconds to several months. Extended storage can lead to spontaneous decomposition of the product obtained (reducing the concentration of the active component), posing challenges for its use or recycling. Therefore, before using such substances, the concentration of the active material must be determined, further increasing the costs of processes in which these compounds are used.

Another serious issue with storage is the potential danger of uncontrolled decomposition, explosion, leakage, and evaporation, which can cause significant environmental pollution. In industrial processes involving the synthesis of hazardous substances, it is necessary for such material to be produced at the site of its application and stored in appropriate containers. In cases where smaller quantities of such substances are required, they can be purchased and transported with all necessary security measures to the end-user.

The purchase of hazardous materials (including all strong oxidizers) involves transportation with specialized vehicles and trained personnel, ensuring appropriate transportation security accompanying the procurement of hazardous materials. For the storage of larger quantities, the facility must be secured 24/7, and appropriate sensors should be installed to alert in case of leakage of stored hazardous materials. To prevent excessive situations, sensors are installed that are linked to appropriate automation systems that activate the spraying of a neutralizing substance (stored nearby), which forms a stable - less hazardous compound with the leaked substance.



The shema of the device for producing hybrid composite compounds for water disinfection



Block shema of the device for producing hybrid composite compounds for water disinfection

Contact: Tomislav Trišović, +381637200083, Email: trisatrisatrisatrisa@gmail.com

Device for measuring gas and air quality

Laboratory project

Author/s: Gabriel Nicolae Popa,
Corina Maria Diniș

A

A device has been designed and built for measuring gases (LPG gas, methane, carbon monoxide, hydrogen, ammonia) concentration in the air, as well as measuring air temperature and humidity. The device uses four electrochemical gas sensors, an electrochemical sensor for measuring air quality, a sensor for measuring temperature and humidity that are connected to an Arduino development board that is connected to a 2x16 LCD display with six buttons and one electromagnetic relay. Each sensor (MQ types) usually measures more than two types of gas. The sensors also have a digital output that becomes 1 logic when a preset value has been exceeded, set from a potentiometer located on the sensor board. The analogue outputs from each sensor are connected to the analog inputs (A1, A2, A3, A4, A5) from an Arduino Uno development board. A 2x16 character LCD shield is connected to the Arduino Uno development board. Arduino Uno's A0 analogue port is connected to the the LCD screen with six buttons. In addition, the device also uses a digital temperature and humidity sensor (DHT 11) which is powered between +5V and ground which has a pin through which the information (regarding temperature and humidity) is digital transmitted (serially) to the digital port 7 of Arduino Uno.



Fig.1. Device for measuring gas and air quality

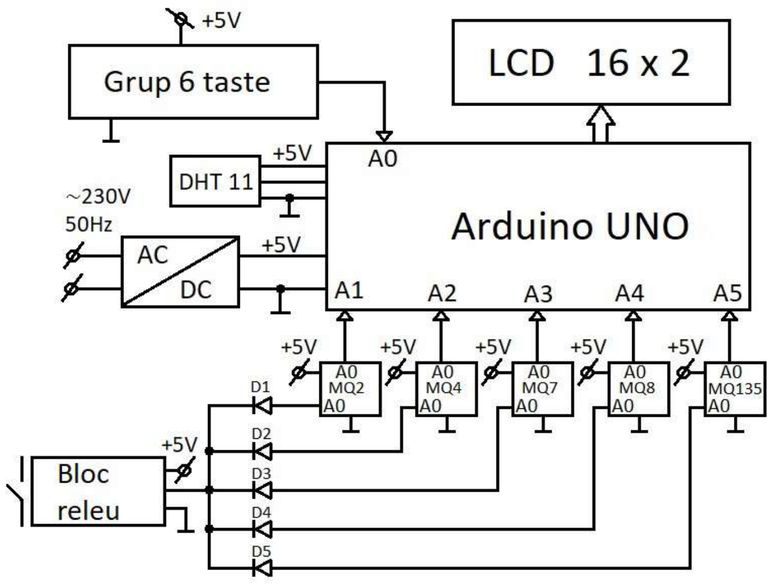


Fig.2. Electrical diagram of the device

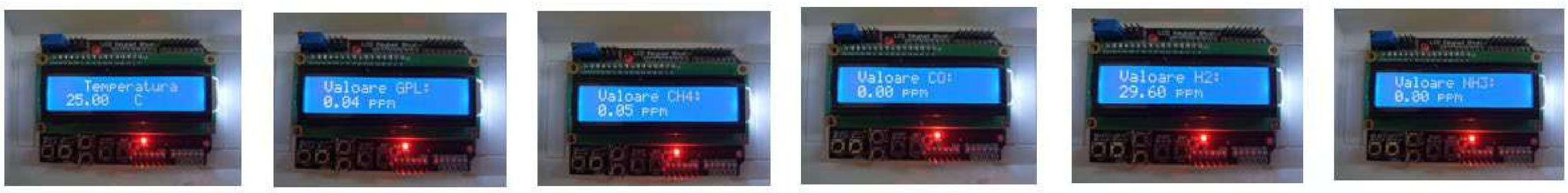


Fig.3. Aspects from displayed data on LCD

The digital outputs of the sensors together with the diodes D1, D5 form a logic gate OR with 5 inputs and one output, being connected to an electromagnetic relay that has the normally open contact (NO) connected to the outside of the device. If any of the sensors detect a value that is exceeded a certain value the output D0 will be 1 logic. If any of the outputs D0 will be 1 logic the electromagnetic relay, the relay will expand and the contact will close (to start a fan). The whole assembly is supplied from a switching voltage source 230V 50 Hz / 5V, 2A DC voltage. The program was made to display the information from sensors, at a certain moment, on the LCD display, with the possibility to display information by using the buttons in the menu.

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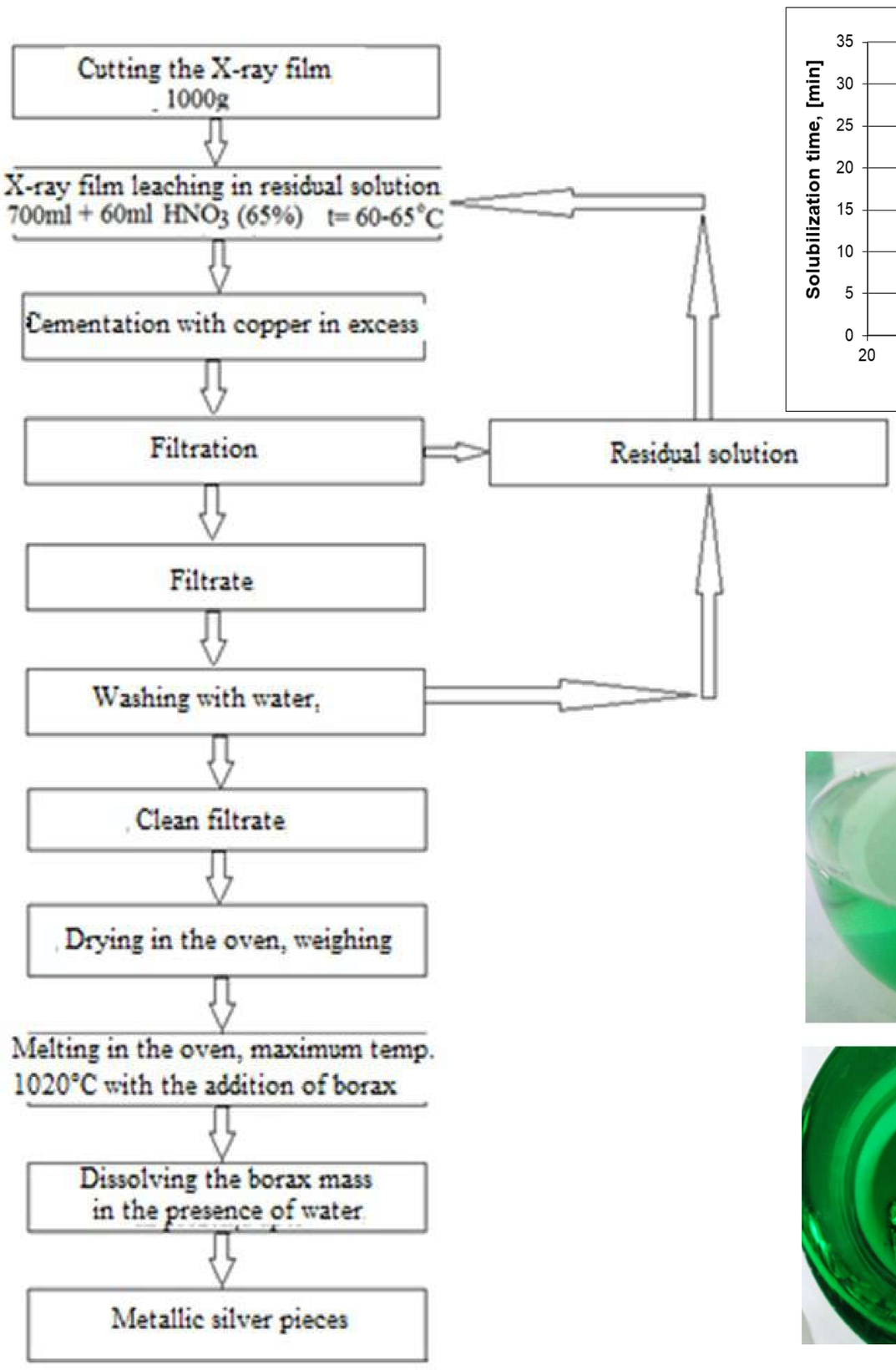
Recovery of silver from X-rays films with nitric acid

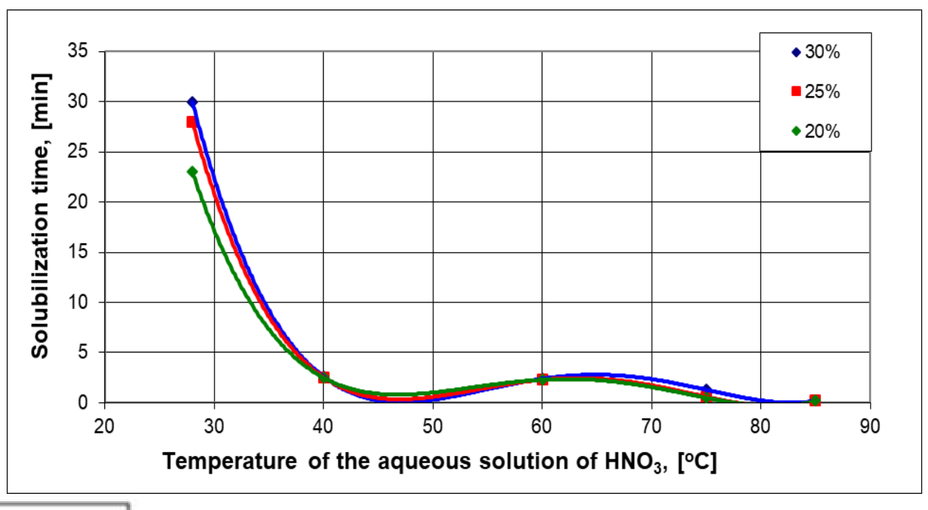
A

Research project

Cânda Letiția-Roma, Ardelean Erika

Solutions containing silver react with nitric acid, if its concentrations are high enough. The reaction results in silver nitrate and other chemical compounds, depending on the type of solution, and in some cases, silver can be recovered from this mixture either by chemical reduction with one or more reducing agents, or by cementation, a method also used in silver purification. During the research, results were obtained by cementation of silver with copper from silver nitrate.

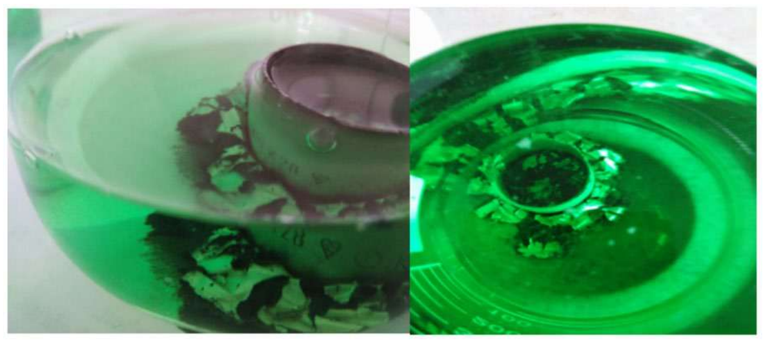




Dependence between the solubilization time and the temperature of the aqueous solution



The silver deposited on the filter paper after successive cementations



Formation of silver in the form of cement and foil



Following the silver-based study of exposed radiographs using nitric acid, the following conclusions are reached:

- The optimal stripping temperature is 55-65°C, which leads to a percolation time of radiographic films of approx. 30s.
- The optimum nitric acid concentration in the aqueous solution is 20% and the optimal recommended dilution ratio before cementation is 1:1.
- The shape and dimensions of the obtained silver particles differ for each stage of cementation, at first the particles are of smaller size, later they grow and can be visualized with the naked eye.
- When the concentration of copper in the solution reaches a too high concentration, it can be subjected to an electrolysis process with copper anode, a classic method of copper recovery and refining. Considering that this happens after a large number of re-use, and the amount of solution is not high because it evaporates, the costs of this remediation process are low.
- The purity proven by the results of laboratory tests shows that silver recovery through cementation is a viable method of recovering it from radiographs.

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Universitatea Ștefan cel Mare Suceava

HYBRID SYSTEM FOR IMPROVING THE ENERGY EFFICIENCY OF PHOTOVOLTAIC PANELS

A

Patent Application

Author/s: Milici Laurențiu Dan, Pavăl Mihaela, Atănăsoae Pavel,
Nițan Ilie, Ungureanu Constantin, Iavorschi Eugen,
Alisavetei Irina, Tuduriu Constantin Cornel

Description

The solution involves a panel placed on the back of the photovoltaic panel and which has a system of channels, of variable section through which the cooling fluid circulates, which can be water for the preparation of hot water or air for heating a room.

ADVANTAGES

- Increasing the efficiency of photovoltaic panels by cooling them with fluid knowing that the efficiency of the panels increases with the decrease of their temperature.
- Improved thermal comfort by using solar heat to heat water and/or spaces without relying excessively on traditional heating or air conditioning systems, reducing the carbon footprint by reducing pollution and conserving natural resources.
- Simultaneous generation of electricity and domestic hot water or hot air. The electricity produced by the solar panels can power electrical appliances, and the heat from the cooling fluid can be used to heat water or heat indoor spaces.

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METHOD FOR ACTUATING SPRINGS MADE OF SHAPE MEMORY MATERIALS

A

Patent Application

Author/s:

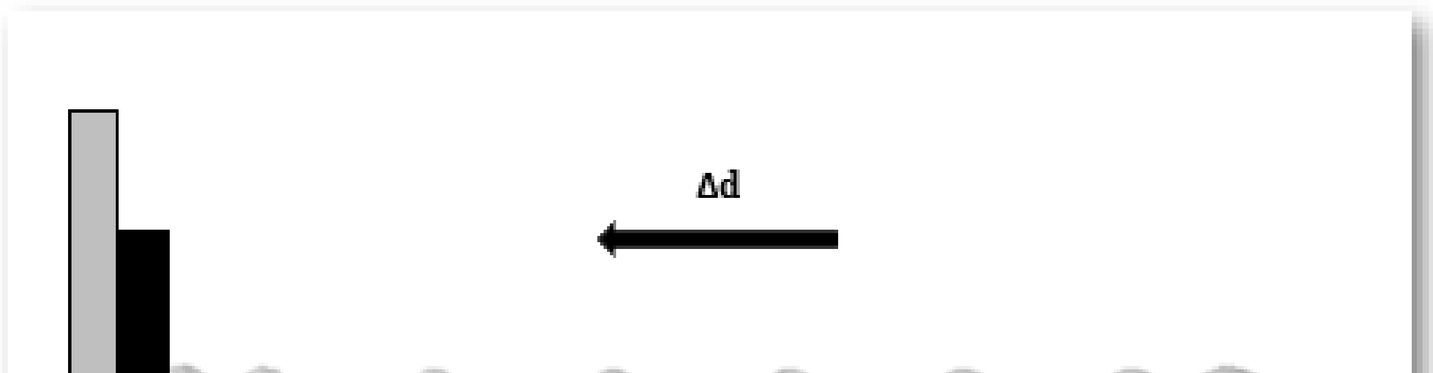
Bejenar Ciprian, Bejenar Marian, Popa Valentin, Dimian Mihai,
Milici Laurențiu Dan, Rață Mihai, Afanasov Ciprian, Ungureanu Constantin

Description

The method for actuating shape memory material springs according to the invention features a distinctive three-phase, implementable and parameterizable power supply sequence that can be modeled, integrated, adjusted and generated by programmable electronic systems as needed, so as to cause a reaction of additional speed and force, both by thermal and electromagnetic effect, simultaneously developed on the actuation spring coils within an actuator.

ADVANTAGES

- The method introduces new possibilities for electric actuation of springs made of materials with shape memory, with efficient energy consumption;
- The method improves the performance of actuators that use actuation springs made of materials with shape memory, in that it increases the reaction speed and the force developed by them at the time of electrical actuation;
- The method allows adjusting the speed and actuation force, developed by an actuator at the moment of the electric actuation of the springs made of materials with memory of the shape of the component;
- The method leads to an increase in the period of use of actuation springs made of materials with shape memory, because they are not subject to excessive thermal regimes;
- The method is compatible with actuation methods that compensate with electricity different disturbing factors on the controlled phenomena during actuation.



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HYBRID COMPOSITE MATERIAL FOR THE RECOVERY OF CHROMIUM FROM WASTE WATER

Adina Segneanu[1], Ionela-Amalia Bradu[1], Titus Vlase[1,2], Gabriela Vlase[1,2]

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Category: A- Energy, Protection of the environment

Scurtă descriere

- *The invention refers to a hybrid composite material composed of the magnetite/power plant ash/potato peel complex in a mass ratio of 1/1/1, elements with different properties, simple or dual, such as magnetite, and a process for recovering Chromium from waste water. The capsules containing the adsorbent hybrid composite material are inserted into the waste water that is mechanically stirred for 2 to 4 hours at ambient temperature, after which the capsules containing the chrome-loaded hybrid composite material are recovered in a magnetic field.*

- Cromul un material important pentru o serie de industrii, insa este un poluant foarte toxic prezent frecvent in apele uzate municipale. In actuala conjunctura mondiala in care se pune accentul pe recuperarea si reutilizarea unor materiale de interes economic conform conceptului de economie circulara, recuperarea si reutilizarea unor materiale reciclabile constituie o actiune foarte importanta ce are ca scop reducerea substantiala a costurilor pentru procesarea acestora. In acest context, toate materialele utilizate pentru realizarea materialului compozit cu proprietati adsorbante pentru recuperarea Cromului din apele uzate municipale sunt ieftine, aflate din abundenta si la indemana. Magnetita (Fe_3O_4), cu denumirea comerciala de oxid negru de fier, este accesibila la un pret mic in magazine de specialitate, sub forma de pulbere cu granulatie nanometrica si este utilizata de obicei ca pigment negru. Ea are un dublu rol, atat de a adsorbi cromul, cat si de a facilita recuperarea materialului compozit din apa uzata cu ajutorul unui camp magnetic. Actiunea are drept scop atat tratarea apelor municipale în vederea redarii lor circuitului agricol, industrial si casnic dupa potabilizare, cat si recuperarea unor materiale reciclabile, in speta Cromul, dar si alte metale grele sau nutrienti.

Obținerea materialului hibrid

- Conform inventiei, materialul compozit hibrid pentru recuperarea cromului din apele uzate se obtine astfel: coaja de cartof se usuca în etuvă la o temperatură de 600C, se micronizeaza cu ajutorul unei mașini de măcinat, se sitează pentru a obține o granulație cuprinsa într-un interval restrans de dimensiuni si, impreuna cu Magnetita si Cenusa de termocentrala se cantaresc la mase egale, se omogenizeaza si se introduc in raportul 1/1/1 in capsule polimerice cu porozitate controlata si nedegradabile in apa, dar degradabile in sol.

- Capsulele continand materialul compozit hibrid adsorbant se introduc in apa uzata care se agita mecanic pentru 2 pana la 4 ore la temperatura mediului ambiant, timp dupa care capsulele continand materialul compozit hibrid incarcat cu Crom se recupereaza in camp magnetic. Prin diverse metode, cromul poate fi recuperat de pe materialul compozit hibrid, iar acesta reutilizat

Avantajele invenției

- Susține conceptul de economie circulară, recuperarea si reutilizarea unor materiale reciclabile;
- Materialele utilizate sunt rentabile din punct de vedere al costului și la îndemână;
- Tratarea apelor municipale în vederea redării lor circuitului agricol, industrial și casnic după potabilizare, cât și recuperarea unor materiale reciclabile, în speța Cromul, dar și alte metale grele sau nutrienți.

Static Electricity Generator

M.V.P. – product presentation, preparation for starting series production

Author: Marian Părău Grigorescu

A

Static Electricity Generators are an autonomous power sources, based on electrical accumulators (as the primary source of energy) and which benefits from the technological contribution of some of variants of applications from the range of ***Power Amplifier in magnetic field with double magnetic field***, applications that offer an electrical performance coefficient up to 1:3.5. By means of such an application model, it is possible to obtain an additional supply of energy that allows the supply of an external consumer, but also a small reserve necessary to maintain the energy level in the accumulators.

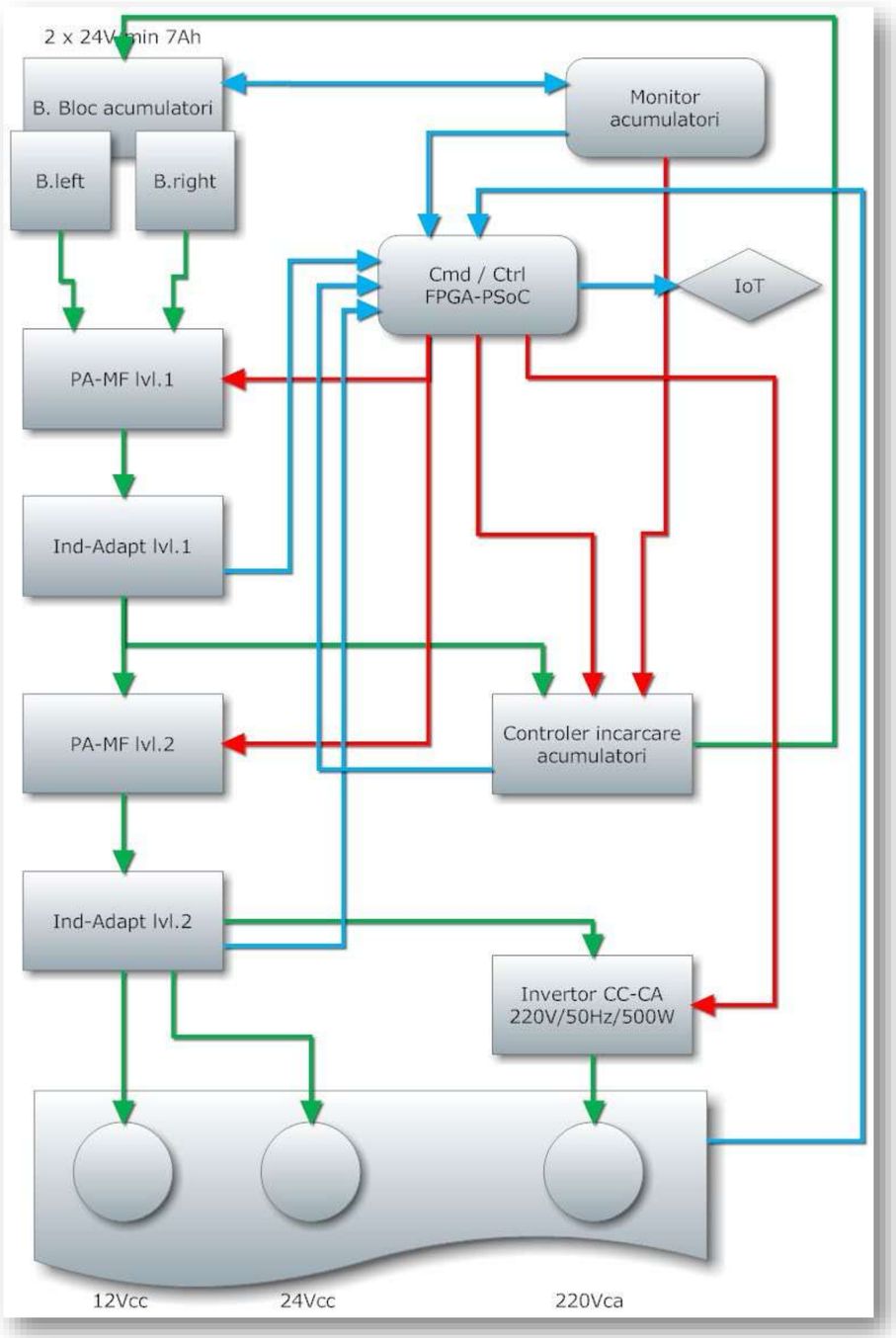
The products line will propose:

- Functional autonomy for 3 – 6 years;
- Autonomous energy source for all types of electricity consumers with a relatively constant operating regime;
- Very simple to install and easy to use;
- The product is sustainable, since all components are 100% recyclable;
- Compliance with quality and warranty standards.
- Autonomous electricity source for domestic and industrial consumers - for general use;
- Autonomous source of electricity for domestic heating systems;
- Autonomous source for electric car charge station;
- Autonomous source for any type of consumer located in isolated locations.

The price of the supplied electricity is 0.85-0.1E/kWh, guaranteed for the entire period of exploitation of the products – 3 up to 6 years, with the possibility of expansion.



Static Electricity Generator
500W, 750W, 1.000W



Static Electricity Generator
500W

Contact: Marian Părău Grigorescu - office@rheealenergycore.ro - tel: 0743 307421

MEMBER OF

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Knowledge and Technological Transfer Center
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Ex-situ bioremediation system and process of hydrocarbon polluted soils using pseudomonas and bacillus microorganisms

A

Patent OSIM no.: RO132554- B1/30.08.2023

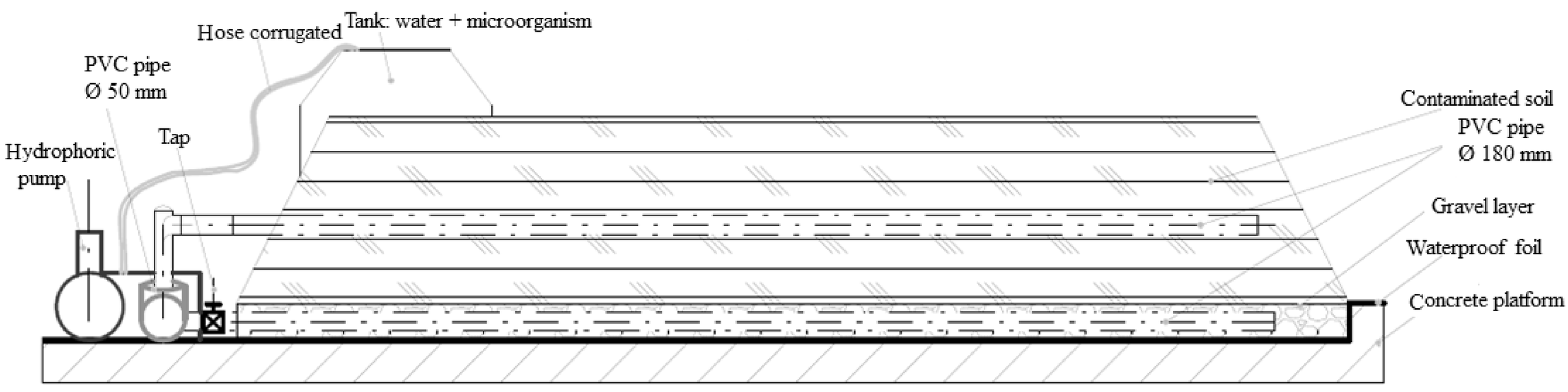
Author/s: Prof. dr. ing. MICLE Valer, Conf. dr. ing. SUR Ioana Monica, Ing. MITREA Mihai

Short presentation:

The ex-situ bioremediation system is composed of the concrete platform, the plastic foil on which a draining layer of gravel and the polluted soil is deposited, an aeration system consisting of a blower and a network of air distribution provided with five perforated PVC pipes, three being placed horizontally in the gravel layer at the base of the pile and two in the middle of the pile and a system for introducing water and the solution with nutrients and microorganisms consisting of a tank, hydraulic pump and corrugated suction and discharge hoses. Soil polluted, after sorting and homogenization is mixed with nutritive substances (C/N/P 100:10:1) and microorganisms, is placed in a pile (Lxlxh:3000x1400x500 mm). By using this system for 12 weeks in the case of treating an amount of 4000 kg of loamy soil polluted with petroleum hydrocarbons (with an initial concentration of 4280 mg kg^{-1}) at a temperature of 24–26°C, pH 7.5–8, humidity of 28–30%, 5 days a week and 8 h a day aeration, with a flow of 50 m^3/min and an increase in the total number of microorganisms from $151x10^5$ to $213x10^7$ CFU/gram of soil, has shown a decrease in the concentration of pollutant below 1000 mg kg^{-1}. The use of this ex-situ bioremediation system in optimal conditions and by controlling the process parameters allows the depollution of soil polluted with petroleum hydrocarbons with a depollution yield of 83%.

Applicability:

Decontamination of soils polluted with hidrocarbons – there have been developed an innovative solution for ex-situ bioremediation of contaminated soils with hydrocarbons. This process can also be adapted to treat polluted soil with other pollutants such as heavy metals. Soil treatment based on this patent can be used for the ecological rehabilitation of hydrocarbons polluted sites: areas with oil exploitation, areas related to fuel stations, accidental pollution. It is a process of reducing the impact on the environment, it has low costs and it is suitable for treating large quantities of soil.



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Energy management method in smart microgrids, based on prediction, optimization, and correction algorithms. A

Patent application OSIM no.: A/10011/09.03.2023

Author/s: PETREUȘ Dorin, PĂTĂRĂU Toma, SZILAGYI Eniko, PAULESCU Marius, STROIA Nicoleta

Short presentation:

The invention relates to a method of controlling an intelligent microgrid for supplying the loads using several types of renewable energy generators (solar panels, geothermal generators, biomass generators, and battery storage), by combining prediction algorithms with correction algorithms that use real-time data. Optimization algorithms will be used to reduce the cost of electricity in the microgrid. The method involves going through the following steps: measuring the irradiance and temperature with a pyranometer (11), mounted in close proximity of the photovoltaic panels (1) and saving them in a first local file (12); estimating the next day's irradiance and temperature based on a prediction algorithm (14) using data from the local file (12) or using data available free retrieved from the satellite using specialized websites and writing the resulting data to a second file (15); determination of generator operation data and cost optimization with an optimization algorithm (17) (the resulted data that controls the generators is in the form (power, time) for each time interval); correcting the operating data of the generators with a correction algorithm (19) running on the external computing system (16) or cloud. Figures 1 and 2.

Applicability:

The invention is intended to be used in the field of renewable energies and Smart Microgrids, for energy management with the aim of reducing the cost of energy. The proposed method can be applied to energy management systems in islanded microgrids that use industrial inverters and other different types of generators like geothermal and biomass generators.

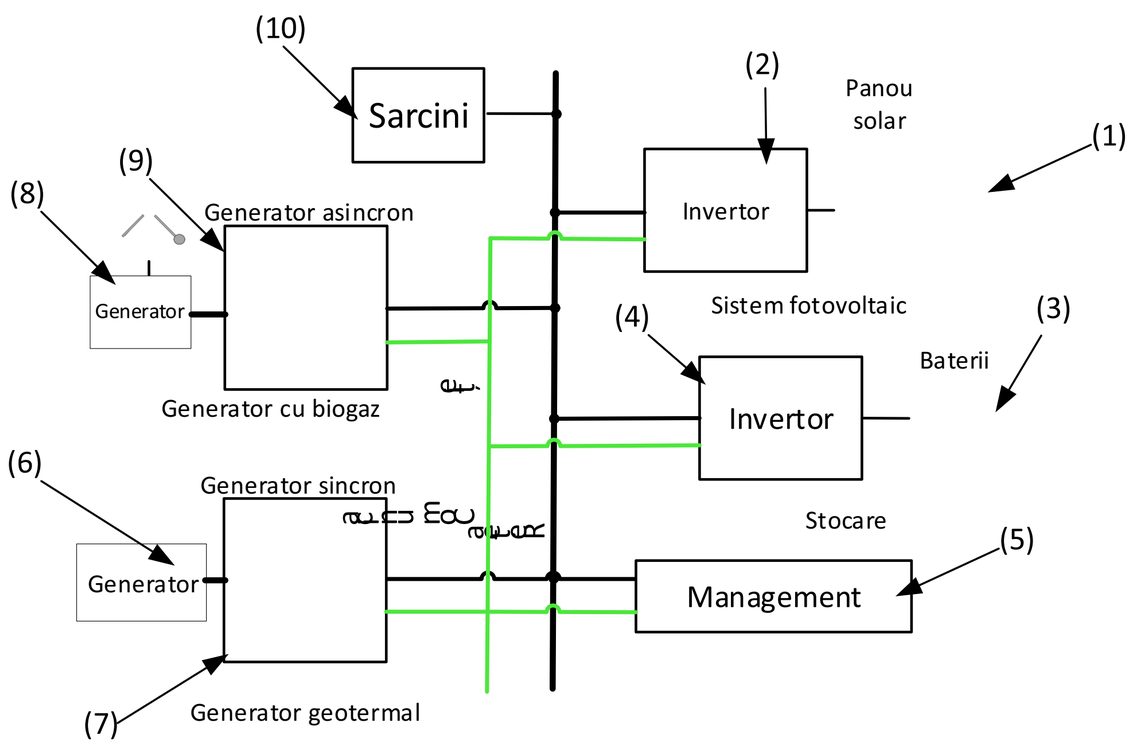


Fig.1

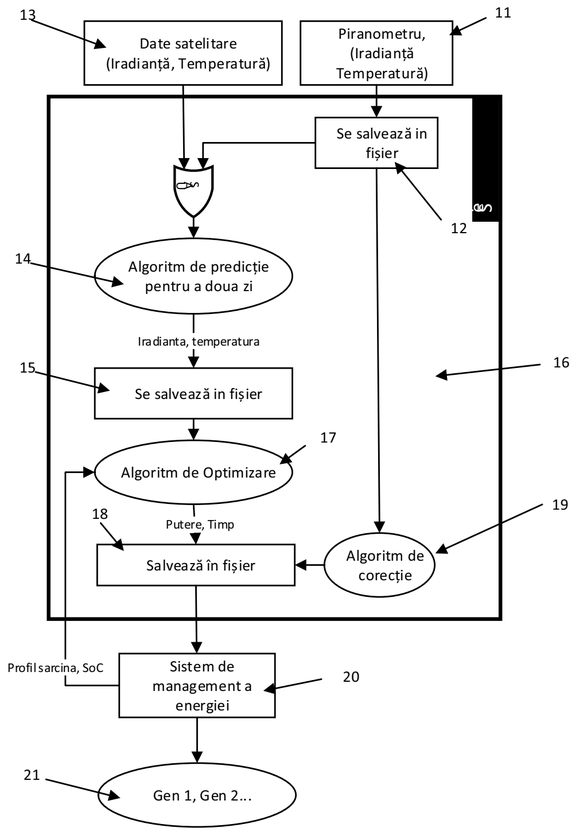


Fig.2

Contact: dorin.petreus@ael.utcluj.ro

Lubricants for internal combustion engines and transmission oils for hybrid vehicles: an overview

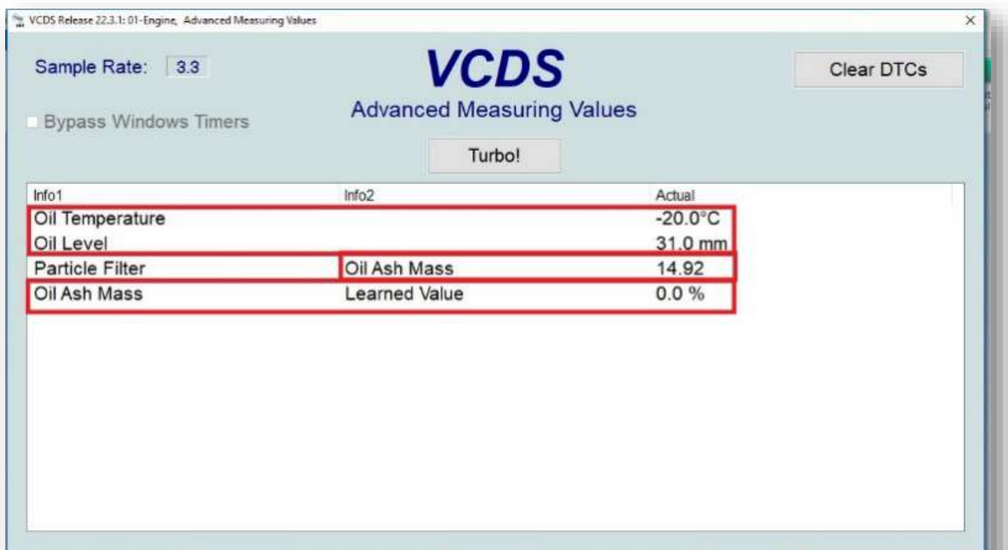
A

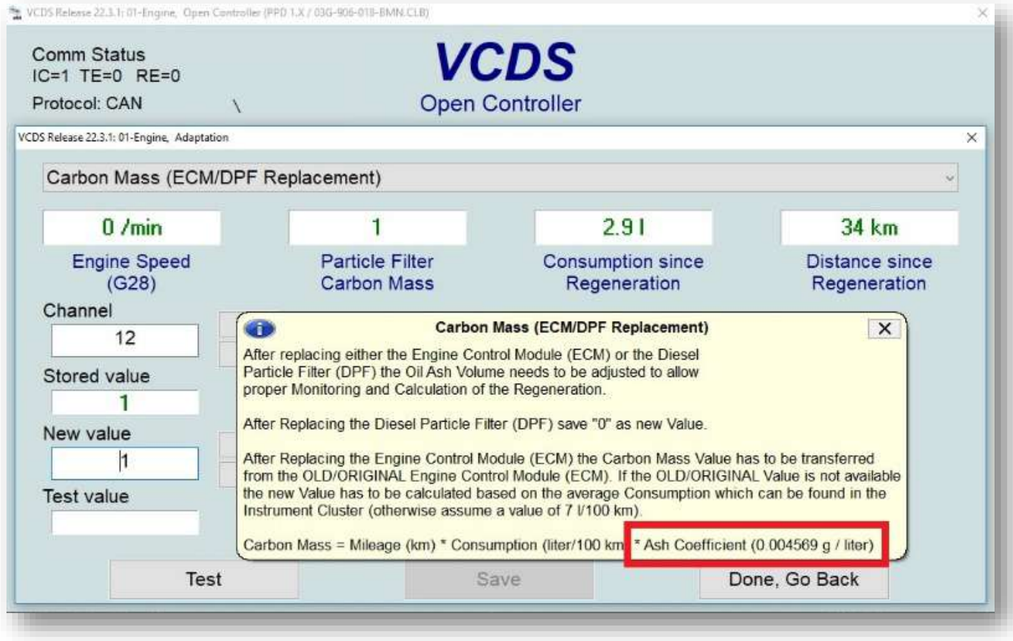
Scientific paper/PHD Student

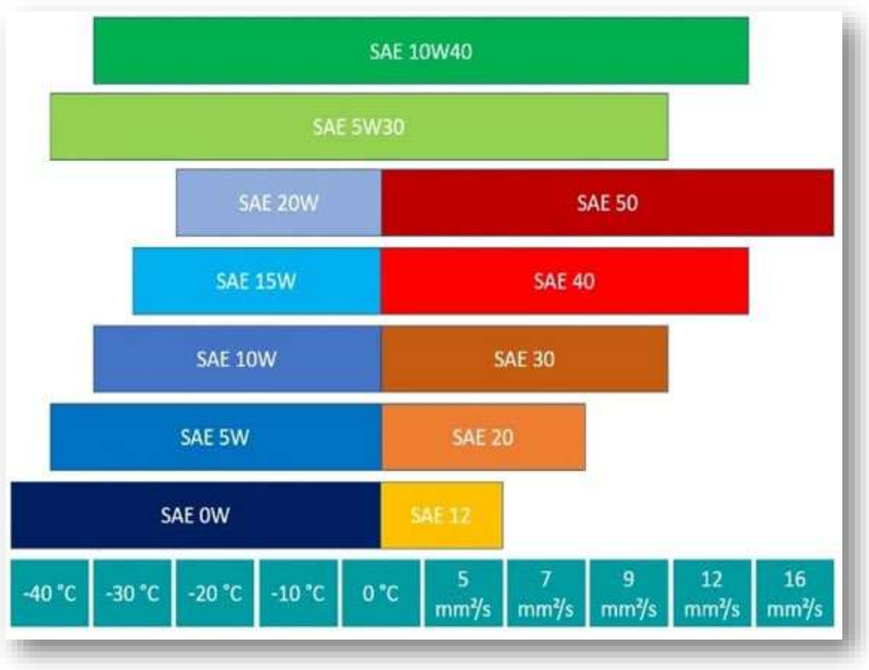
Authors: Diana Miruna Armioni, Ioana Ionel, Sorin Aurel Rațiu, Adrian Gidali

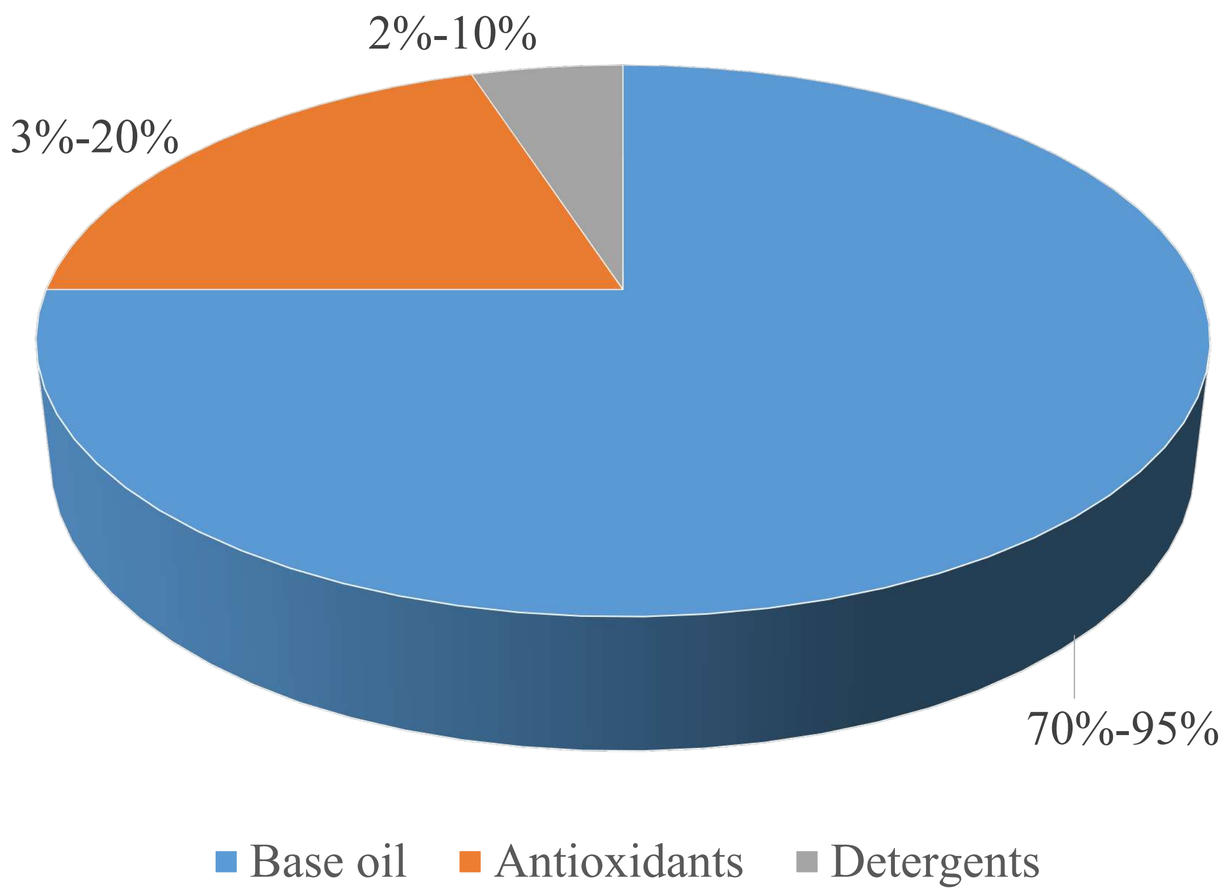
In the coming decades, the automotive industry will undergo significant transformation, driven by the rapid proliferation of electric mobility solutions, including hybrid and electric vehicles. These innovative transportation systems introduce unique challenges pertaining to lubrication and cooling due to their unconventional design. Notably, hybrid vehicle heat engines operate within a lower temperature spectrum compared to traditional combustion engines. This variance poses distinct hurdles for engine oils, which are traditionally engineered for sustained operation at higher temperatures with minimal temperature fluctuations.

This article conducts a comparative analysis of lubricant specifications tailored to internal combustion engines and transmission oils specifically designed for hybrid vehicles. The aim is to underscore the distinctive characteristics of these lubricants and emphasize their critical role in ensuring the efficient operation of the engine.









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B

Nanotechnology

Advanced materials

Metallurgy

Civil engineering

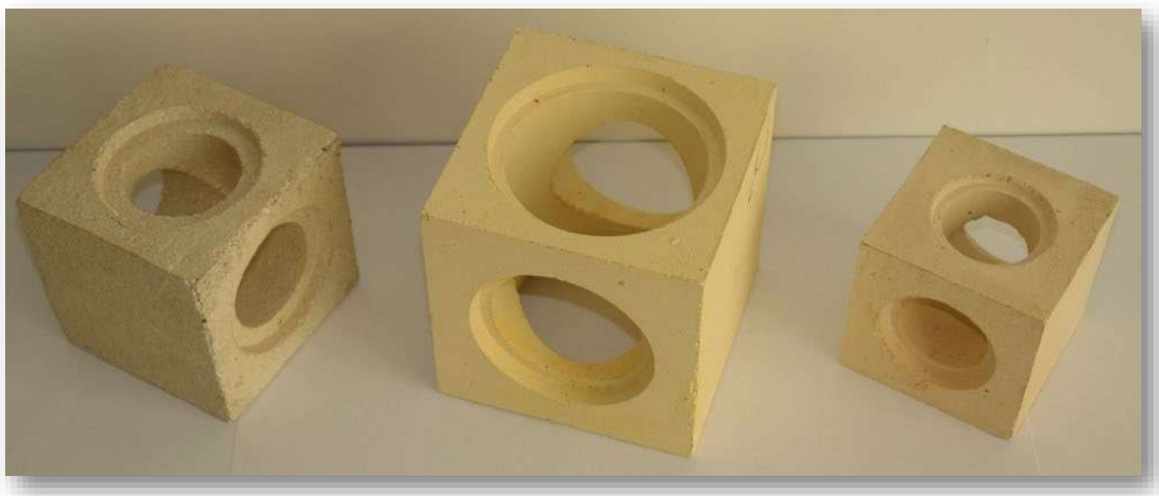
PRODUCTION METHODS OF REFRACTORY COMPONENTS

Refractory products

Author: *Radu BUZDUGA*

B

The sharp development of the economy in our country imposed an increase in the industry of refractory products, a fact that led to the need to establish a research and design unit specific to this field, which had the mission of ensuring the modernization of the refractory industry and the assimilation of products necessary for the steel industry taking into account all the changes along the way, through own research efforts without the contribution of a license, know-how, etc. This is how the Design Research Center for Refractory Products Braşov came into existence in 1973, and in 1974 a branch of it was established in Alba Iulia.



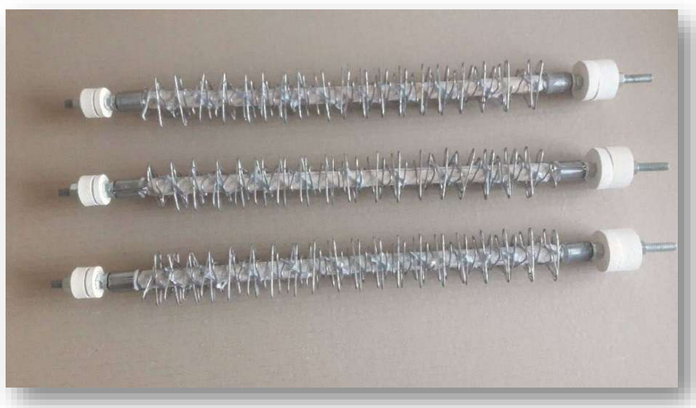












In 1999, the Alba Iulia Branch became, through division, an independent company, under the name Refractory Research, Design and Production Center (CCPPR SA), having diversified micro-production activities in two workshops (a refractory production workshop and a mechanic workshop). With a rich experience in applied research, the research team of CCPPR SA Alba Iulia is the author or co-author of numerous scientific works, a number of 130 inventions, 300 research works realized through the assimilation of over 140 refractory products.

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SLAG RECYCLING

Research project

Author: Ana Socalici

B

During the production of steel, in addition to the secondary product, there is also a waste, metallurgical slag. Currently, a special emphasis is placed on the sustainable management of the environment. The ferrous fraction of the metallurgical slag can be reused in the steel industry and the non-ferrous fraction is used as recycled aggregate in the building materials industry, construction, agriculture, etc.

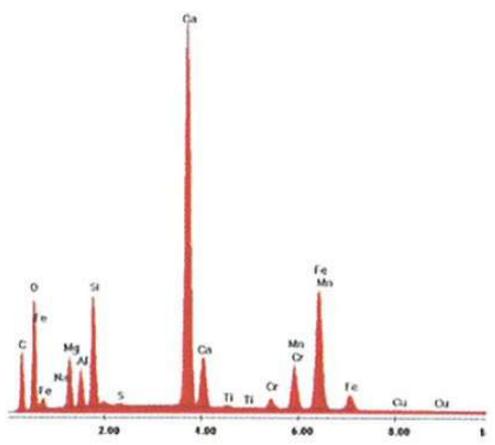
Experiments in the laboratory phase focused on the identification of solutions for valorization of the ferrous fraction of the steel mill slag with a grain size of 0-10 mm. This, in most cases, is stored and not introduced into the economic circuit. The chosen technology - briquetting. Briquettes were made which have in their composition 30% ferrous fraction of steel mill slag, 60% ferrous sludge, 5% furnace agglomeration sludge and 5% bentonite. The experimental briquettes obtained have an iron content of 45-58%Fe. Iron recovery rate 70%.























The target of the current metallurgical industry is to recycle and utilize all their by-products, so as to close the sustainable production loop. Due to the large amounts of slag still stored and the strict environmental regulations, the recycling and use of slag is an attractive alternative to reduce and possibly to eliminate the disposal cost, to minimize associated environmental pollution and to save raw materials

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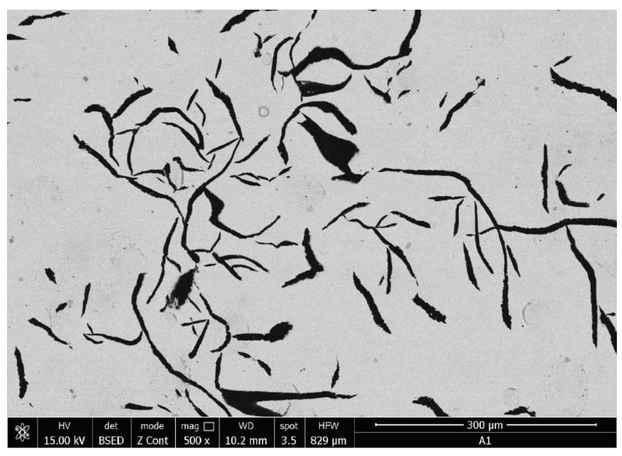
METALLURGICAL ANALYSIS OF PHOSPHOROUS CAST IRON BRAKE SHOES

Research project

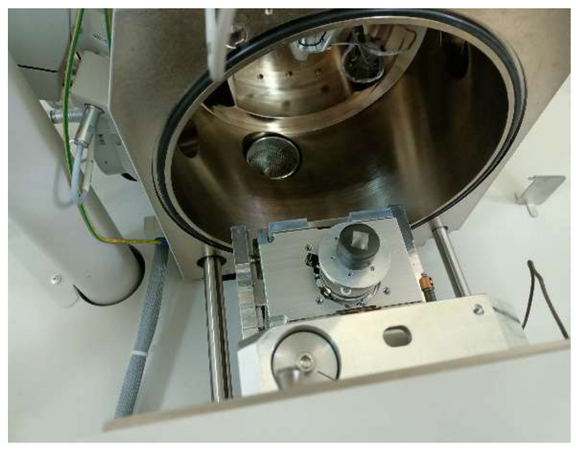
Author: Flavius BUCUR, Ana SOCALICI

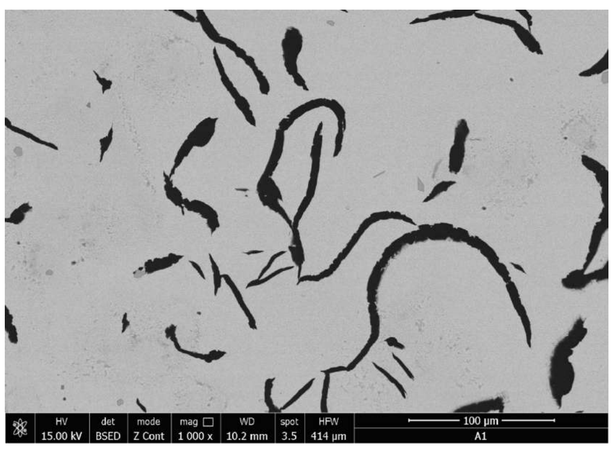
The researches were carried out in a specialized factory for casting brake blocks. The study focused on metallurgical characterisation of phosphorous cast iron and consisted of a study of microstructural analysis of samples taken from phosphorous cast iron intended for the manufacture of brake blocks.
Microscopic analysis was performed by determinations made with and without attack with reagents of the samples:

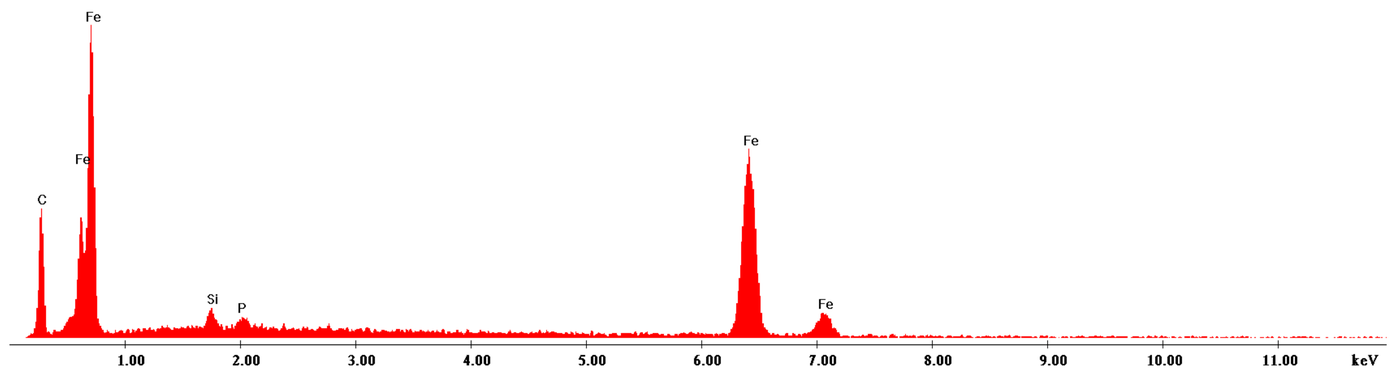
- graphite highlighting for both samples (form of graphite separations, graphite distribution, length of graphite separations and area occupied by it) was obtained on unattacked samples;
- Highlighting the basic metal mass, perlite and phosphorous eutectic was obtained by determinations on samples attacked with 5% nital

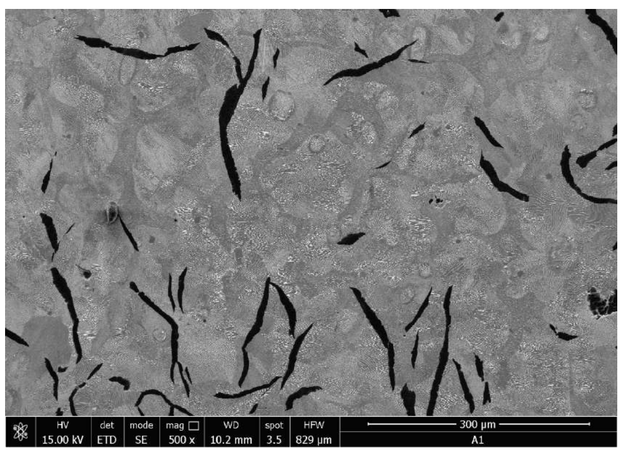


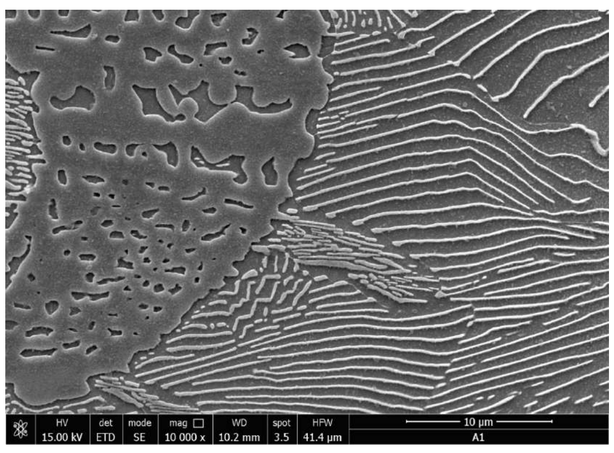


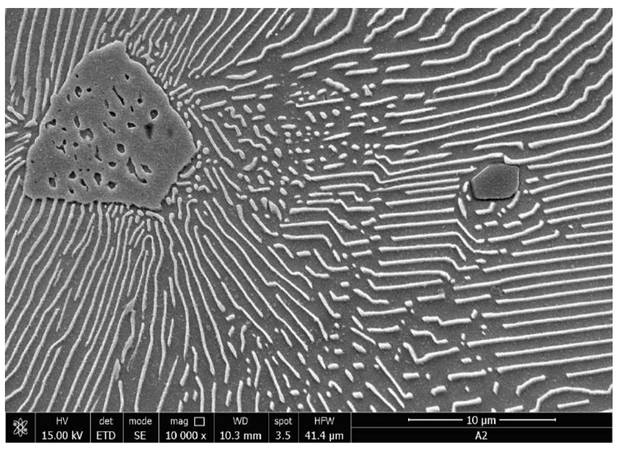


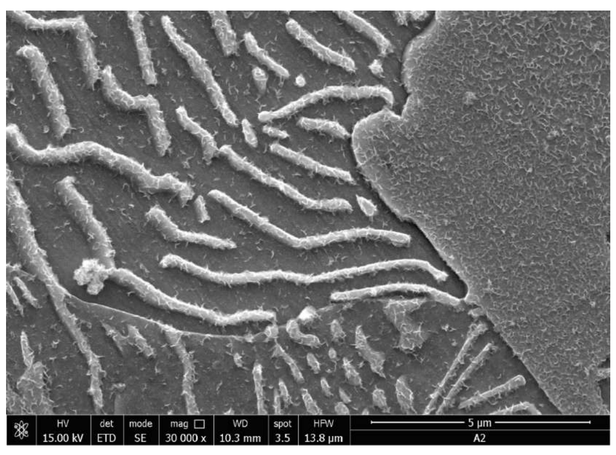


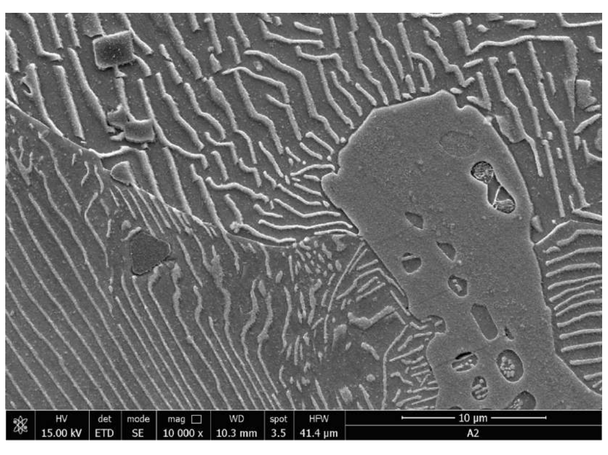


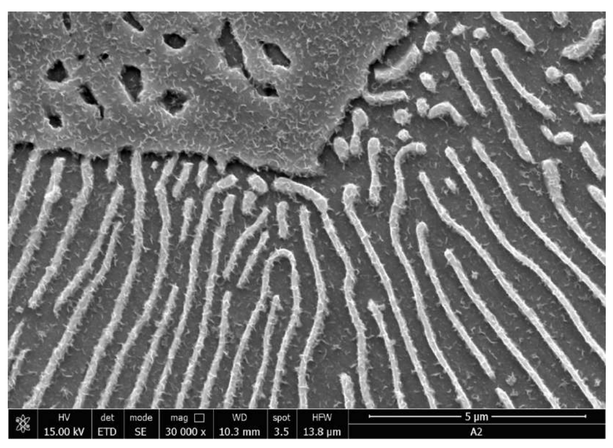












Brake blocks are part of the braking system of rolling stock. Cast iron is the most widely used metal cast into shapes and phases of cast iron graphite develop together with the metal matrix during solidification and understanding and control of its structure, density and morphology is essential for cast iron properties.

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"Gheorghe Asachi" Technical University of Iaşi

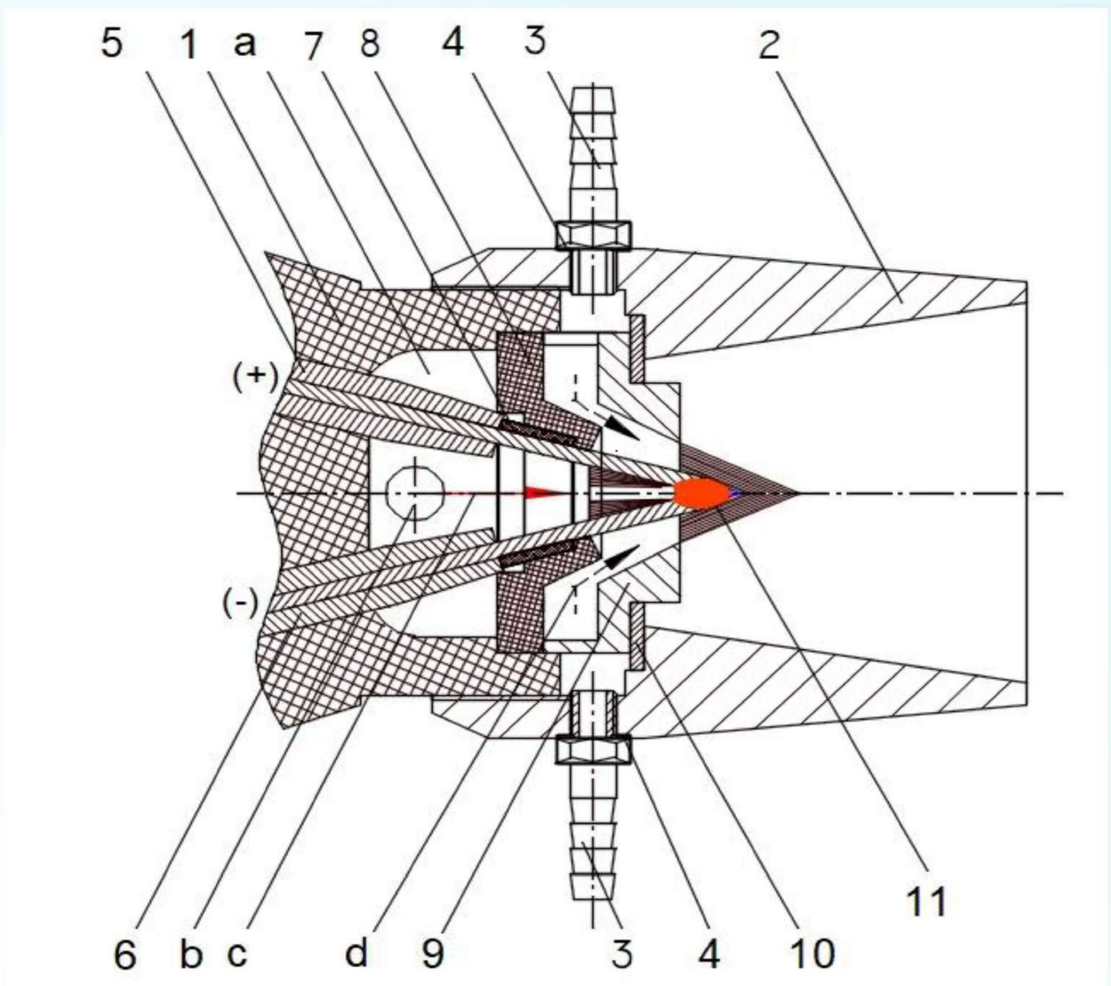
Nozzle system used for metallic coating by wire arc thermal spraying

Authors:
Stefan Lucian TOMA, Gabriela Alina SAVIN, Bogdan Florin Toma, Costica BEJINARIU, Iulian IONITA, Petrica VIZUREANU, Gheorghe BADARAU, Andrei Victor SANDU, Alin Marian CAZAC, Diana Petronela BURDUHOS NERGIS

Patent 2023

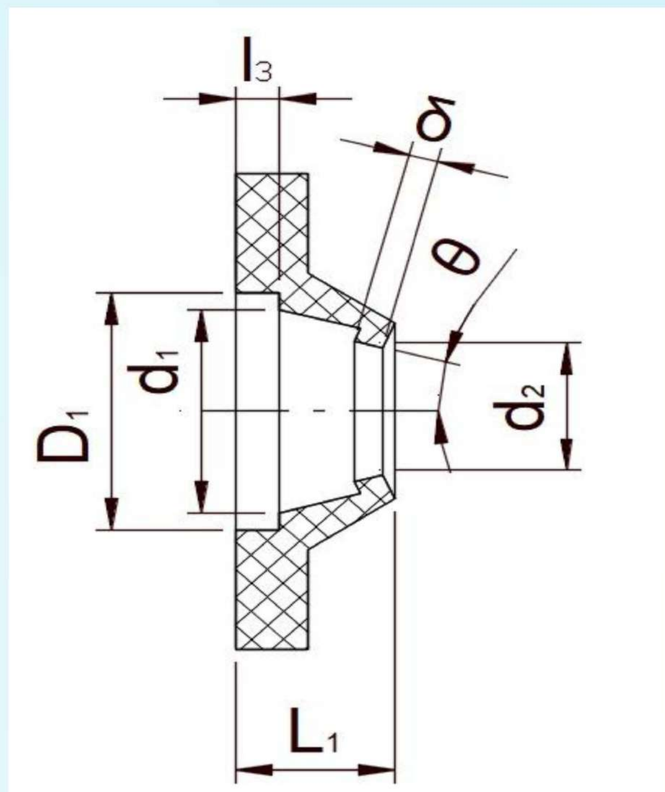
The invention relates to an assembly of concentric nozzles used at wire arc thermal spray guns. The technical problem solved by the present invention consists in the realization of a concentrically arranged nozzle system with a high degree of universality which allows the speed and temperature of the pulverized particles to be increased without diminishing the deposits chemical composition or mechanical properties.

Convergent nozzle system– axial section, top view

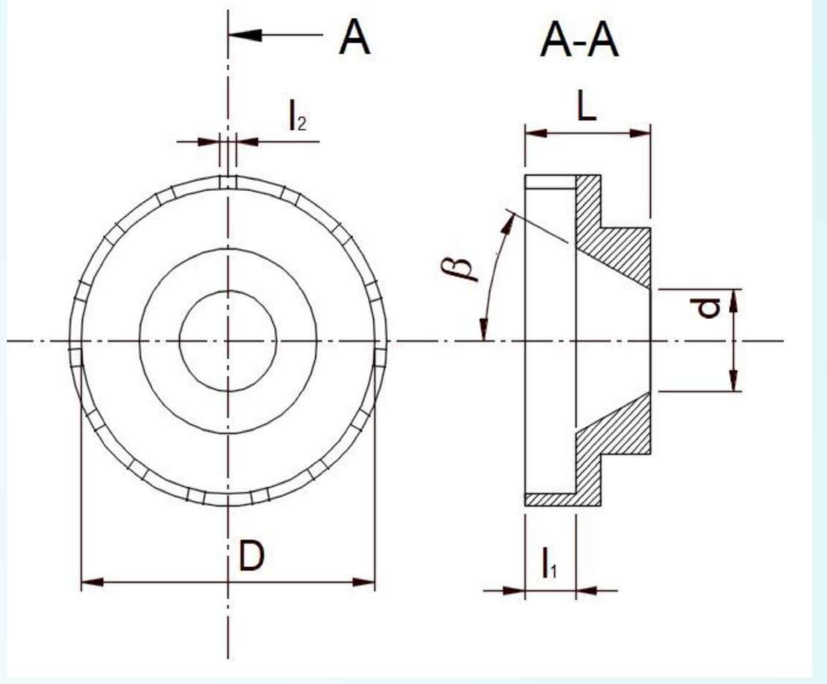


Components: 1- body; 2- frontal cover; 3- nipples; 4- washers; 5, 6- wire guides; 7– insulator conical nozzle; 8- conical nozzle; 9- frontal nozzle; 10- sealing washers; 11- wire arc.
a- cylindrical hole; b- hole; c- primary circuit of compressed air; d- secondary circuit of compressed air.

Conical nozzle



Frontal nozzle



Advantages

- contains a convergent frontal nozzle providing the possibility of forming a secondary air circuit that allows control of the sprayed particles temperature by wire arc constraint degree;
- contains a convergent conical nozzle in the wire arc part that allows to increase the pulverized particles velocity by changing the compressed air speed.
- the secondary air circuit allows alloying or chemical composition modifications of the pulverized material by introducing of gaseous or solid powdered chemical materials in the wire arc formation zone;
- can be used for experimental laboratory research as well as for industrial production;
- can be adapted to any type of thermal spraying device;
- easy maintenance;
- high reliability.

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National Institute for Research and Development in Environmental Protection - INCDPM - Bucharest, Romania

ADDITIVATED MORTAR COMPOSITION FOR FINISHING WORKS IN OLD MONUMENTS AND PROCESS FOR PREPARING AND APPLYING THE SAME

Patent RO135116

Authors:

SANDU Ion, DEAK Gyorgy, SANDU Irina Crina Anca, MONCEA Mihaela-Andreea, SANDU Ioan Gabriel, DUMITRU Florina Diana, SANDU Andrei Victor, MATEI Monica, PANAITE Sorin, BOBOC Mădălina Georgiana

The invention relates to an additivated mortar composition for finishing works to be used in restoration of old monuments and to a process for preparing and applying the same. The claimed composition comprises 15% parts of mineral binder consisting of fly ash resulting from the burning of sunflower husks, Portland cement and calcium oxide ground to a fineness between 6...10% residue on a sieve with 4900 meshes/ cm2, in gravimetric ratio ash : Portland cement : Ca oxide = 1: 2: 2 and 10 parts of a mixture of expanded perlite and fine eggshell powder, both with a granulation <0.1 mm and additivated with ZnO and TiO2 and three ceramics of burnt clay, colored differently in scarlet, brown and black, in perlite : eggshell : ZnO : TiO2 : colored ceramics gravimetric ratio = 6: 3.6: 0.16: 0.04: 0.2, the parts being expressed by weight.
The claimed preparation process consists in homogenizing the above mentioned mixture, by kneading for 10...20 minutes, followed by sieving it on a 0.063 mm mesh sieve, and, separately, dispersing the acrylic binder in the wetting water, in a gravimetric ratio 2 : 8, to finally obtain a mortar consisting of 15% parts by weight of a mixture of fly ash resulting from the burning of sunflower husks, Portland cement and calcium oxide, 10 parts by weight of expanded perlite mixture, eggshell, calcium oxide, zinc oxide, titanium dioxide and the three colored ceramics and 25 parts by weight of water with acrylic resin.





The **advantages** of the additive self-cleaning mortar and the method of obtaining and applying it, according to the present invention, are structured on the two levels of execution, namely:

a. when putting into operation:

- allows an adequate structuring of the uniform and homogeneous thin layer and a grouting in the intervention area;
- adheres well to the operative support;
- does not give microcracks;
- it is economical and can be applied to both exterior and interior walls;
- offers good workability;
- the composition can be applied to any type of plaster, and for spreading in a thin and uniform layer, the workability of the paste is achieved by changing the content of water added for wetting in relation to the redispersible solid powder;
- it can be applied manually or mechanically on any type of facade with chromatic aberration, chemical degradation (efflorescence, delinquency, segregation, etc.) and physical-structural and mechanical damage, cracks, cavities, lack of material - lacunar areas - etc.).

b. after commissioning:

- achieves an effective consolidation and a compatible restoration through structural and chromatic reintegration of the intervention area;
- does not generate the appearance of florescences and microbiotic attack; has a self-cleaning effect over time;
- does not produce chromatic aberrations and other alterations or microstructural destruction of the surface and interior;
- offers superior thermal insulation compared to many similar materials;
- it is a light and durable material;
- has good hydro-, thermal- and sound-insulating capacity;
- allows the inner masonry to breathe and shapes the - water balance in the volume phase of the wall.

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INSTITUTUL NAȚIONAL DE CERCETARE – DEZVOLTARE PENTRU ELECTROCHIMIE ȘI MATERIE CONDENSATĂ – INCEMC TIMIȘOARA
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Nr. certificat : 4567
ISO 9001:2015

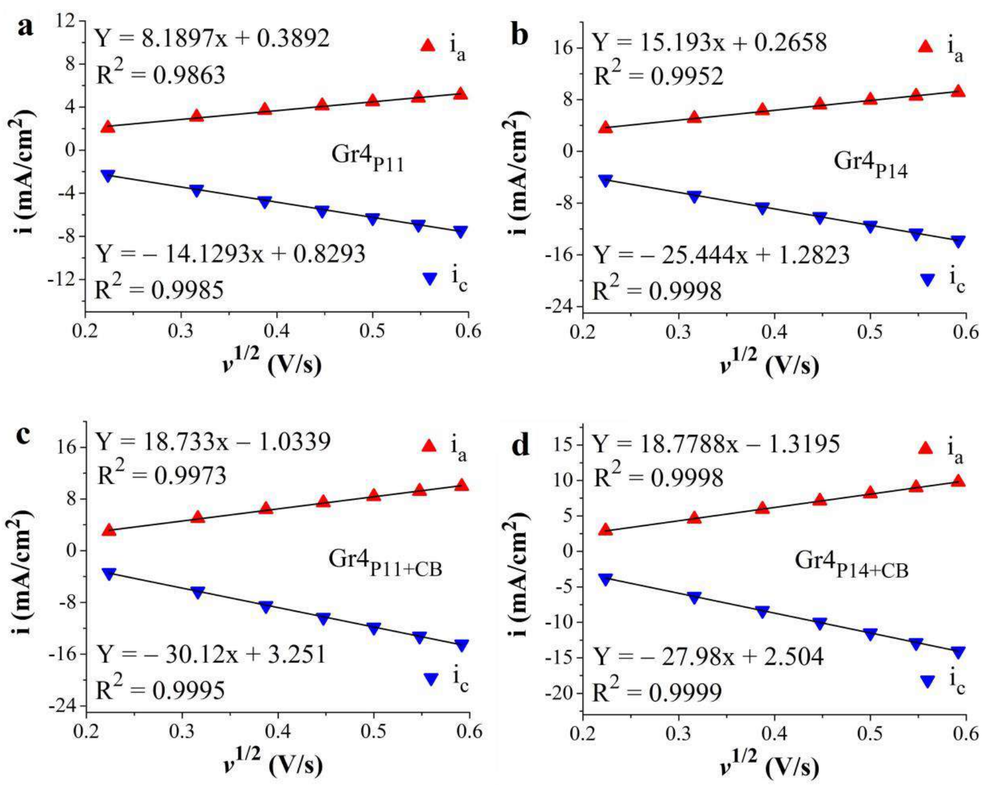
New PVP–Ag or Pd-Doped Perovskite Oxide Hybrid Structures for Water Splitting Electrocatalysis

Author: Paula Sfirloaga, Adina Cata, Bogdan-Ovidiu Taranu, Ioana Maria Ienascu

Appl. Sci. 2024, 14, 1179.

Category B

Global warming and the global energy crisis are two major challenges humanity is currently confronting that are pressuring the scientific community to find efficient, low cost and environ-mentally sustainable solutions. Within this context, hydrogen has emerged as a clean and efficient energy carrier promising to replace the environmentally hazardous fossil fuels. The present study, of relevance to the water splitting domain, concerns the synthesis of two novel hybrid structures, based on perovskite materials functionalized with polyvinylpyrrolidone (PVP). The water electrolysis catalytic activity of these new materials was evaluated in a strongly alkaline medium. Perovskite-based modified electrodes were manufactured through four different procedures. The samples displayed electrocatalytic activity for the O_2 evolution reaction and the most active electrode was the one obtained by drop-casting a mixture of $LaMnO_3$:Ag/PVP, Carbon Black and Nafion on graphite support. The study is aimed at and succeeds in increasing the scientific database concerning the role of perovskite oxides in the water splitting field.



The graphical representation of the dependence between the peak current densities of the anodic and cathodic peaks corresponding to the ferrocyanide/ferricyanide redox couple and the square root of the scan rate for the Gr4P11 (a), Gr4P14 (b), Gr4P11+CB (c) and Gr4P14+CB (d) electrodes.

The samples displayed OER activity; the electrode obtained by drop-casting a composition containing $LaMnO_3$:Ag/PVP (P11), Carbon Black and Nafion on graphite substrate was identified as being the most electrocatalytically active for the OER. Its OER overpotential at i = 10 mA/cm^2 is 0.83 V and its Tafel slope is 0.197 V/dec. It was also found to be more electrochemically stable than the other samples.

The present study evaluates for the first time the electrocatalytic properties of new perovskite materials and the obtained results extend the available knowledge of relevance to the water splitting domain.

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Acknowledgments: This work was supported by the Experimental Demonstrative Project 683 PED/2022.

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Nr. certificat : 4567
ISO 9001:2015

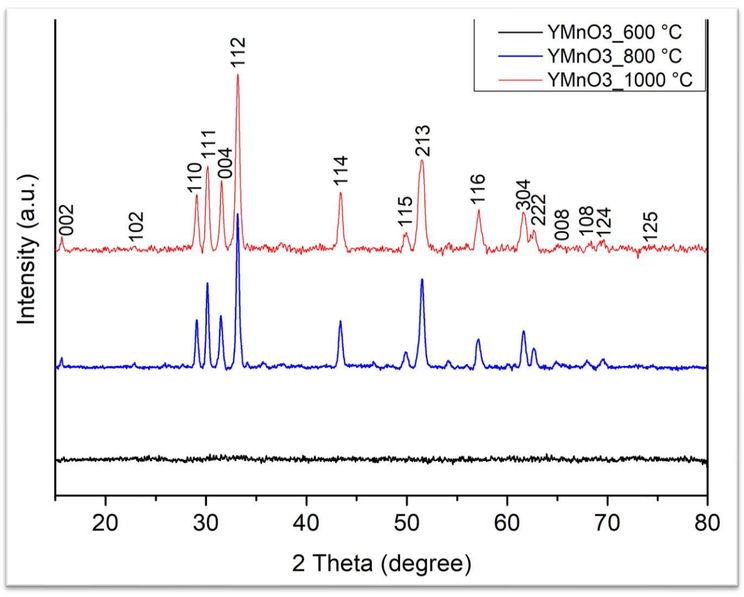
Process for obtaining of YMnO3 perovskite type materials

Category B

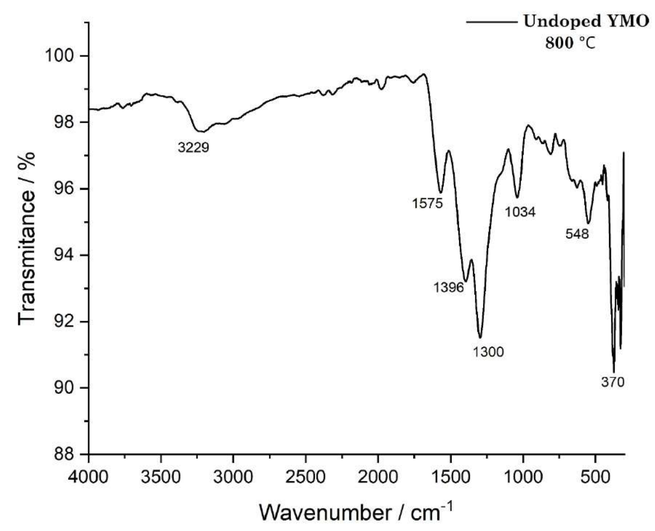
Patent application: A/00500/13.09.2023

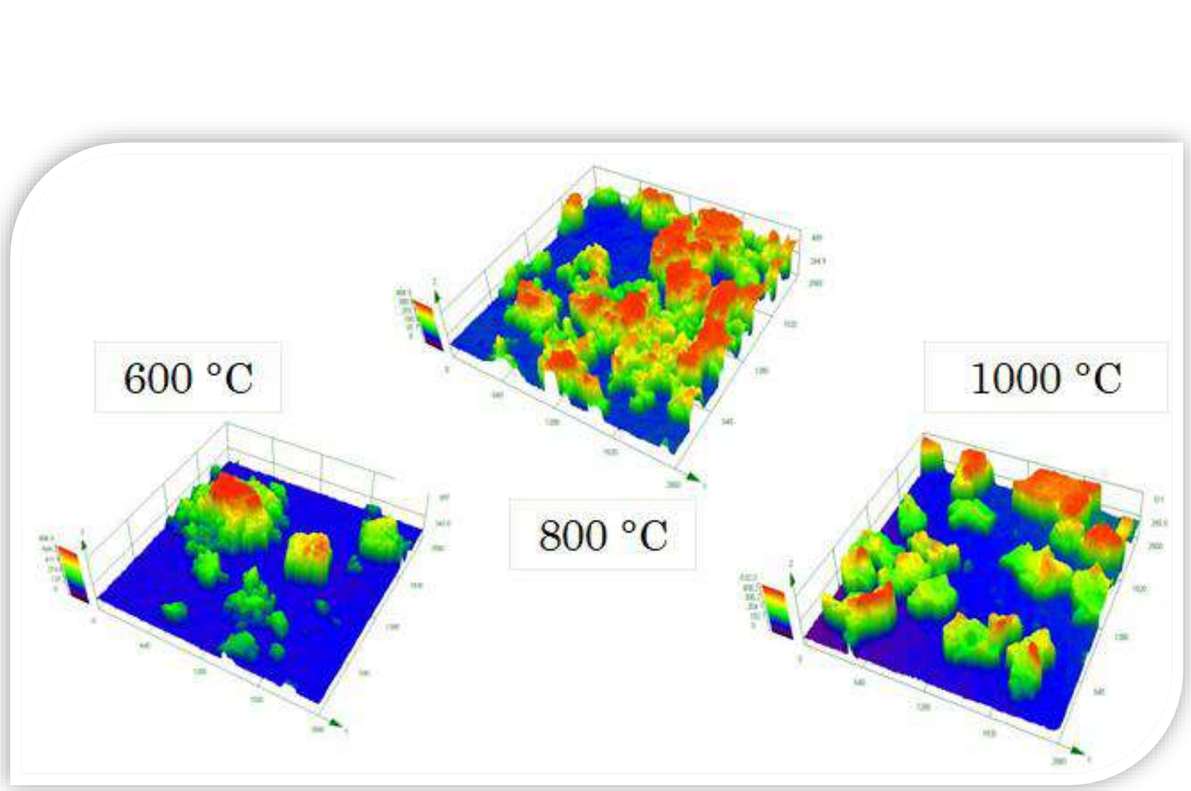
Author: Paula Sfirloaga, Ionel Balcu, Corina Macarie, Paulina Vlazan

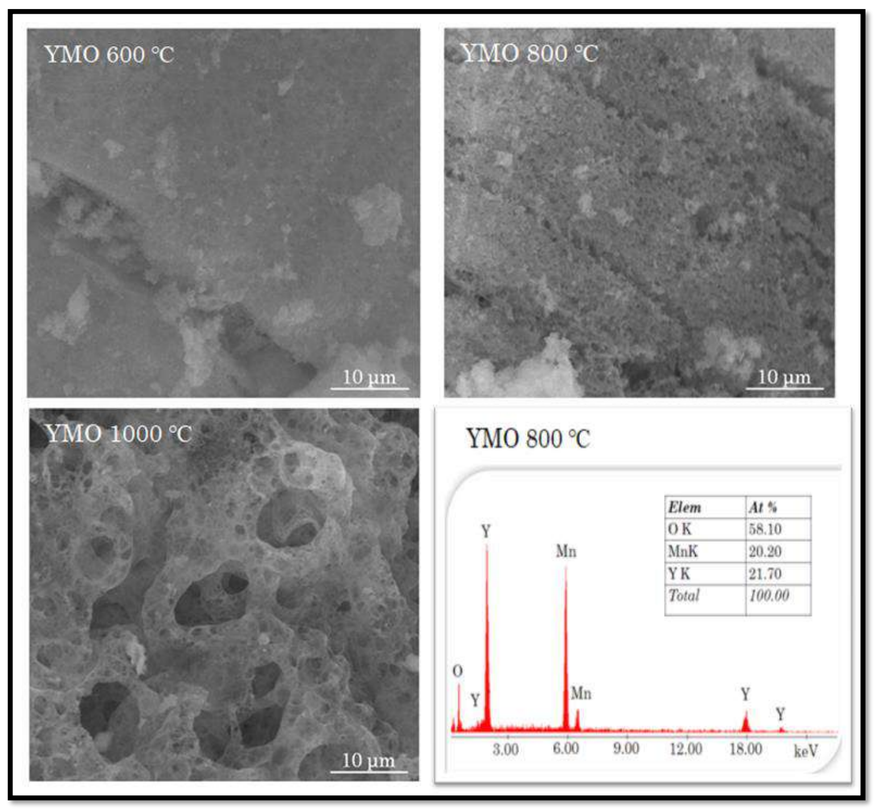
The invention refers to an efficient process for obtaining perovskite nanomaterials based on $YMnO_3$, using the following precursors: $Y(NO_3)_3 \cdot 6H_2O$; $Mn(NO_3)_2 \cdot 4H_2O$;$C_6H_8O_7$ (citric acid); ethylene glycol; 25% NH4OH solution, synthesized by the ultrasonic method with the sonotrode immersed in the reaction medium. The process according to the invention consists in obtaining nanomaterials based on yttrium manganite by the ultrasonic method with the sonotrode immersed in the reaction medium at the developed power of 750W, the frequency of 20 KHz, and the ultrasonication process for 40 minutes, at pulsations 10 ON - 5 OFF, amplitude – 80%, working temperature – 80 °C. The precipitate obtained by ultrasonic synthesis with an immersed sonotrode was dried in an oven at 80 ºC for 4 hours and finally it was thermally treated at a temperature of 800 ºC for 6 hours.



$YMnO_3$	Space group	Cell volume [Å^3]	D [nm]
600 °C	Poorly crystallized, almost amorphous sample.		
800 °C	$P6_3\,c\,m$ (185)	372.30	27.2
1000 °C	$P6_3\,c\,m$ (185)	372.89	20.5







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Acknowledgments: This work was supported by the Experimental Demonstrative Project 683 PED/2022.

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C.I.F. RO9364218; Nr. R.C. J35/350/1997; E-mail: incemc@incemc.ro

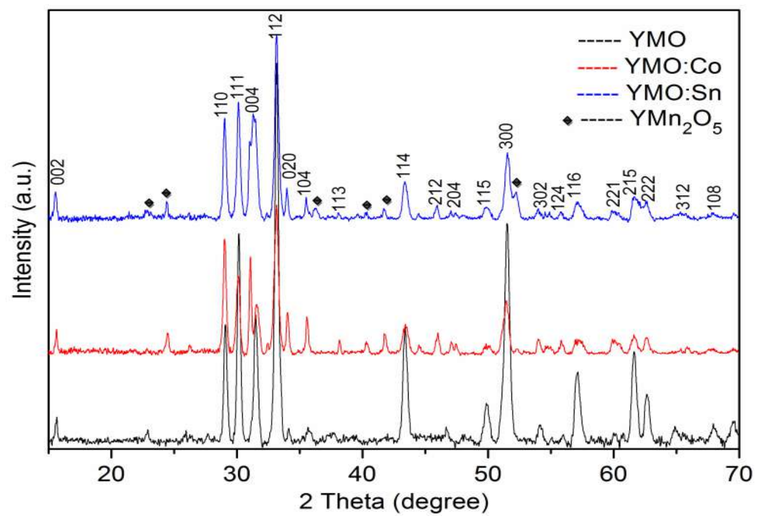
Nr. certificat : 4567
ISO 9001:2015

Process for obtaining modified electrodes with perovskite materials with application in water electrolysis

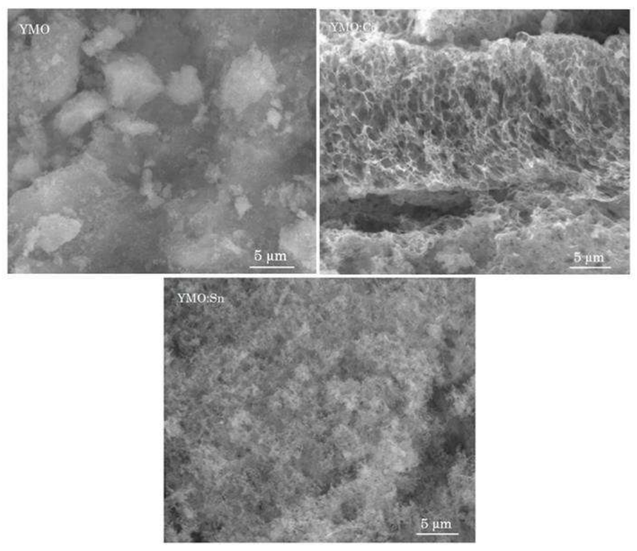
Category B

Patent application: A/00552/05.10.2023.
Author: Paula Sfirloaga, Bogdan Taranu

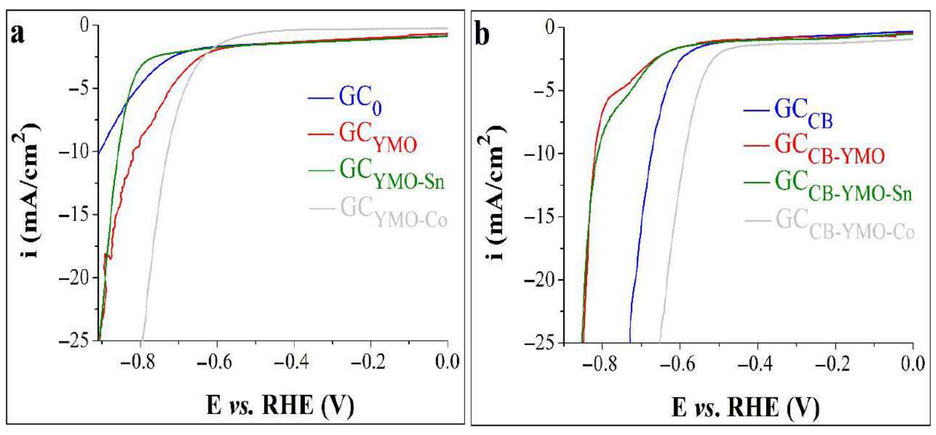
The invention refers to a process for obtaining modified electrodes, by the drop-casting method, on a glassy carbon conductive substrate, using an ethanol-based suspension containing perovskite material and Nafion or perovskite material, Nafion and Carbon Black, at room's temperature.
The advantages of this method are: obtaining of modified electrodes with perovskite materials in a short real time and the simplicity of the method of depositing the suspension on the substrate. Also, the use of ultrasound inhibits the formation of conglomerates or separates those resulting from the synthesis process. Moreover, the main advantages of the method are the obtaining of electrodes with a relatively uniform surface and the low manufacturing cost.



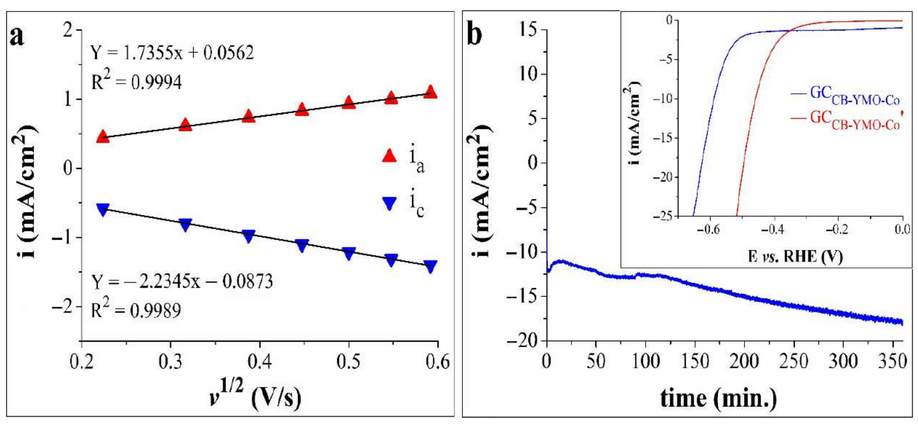
XRD patterns for undoped and Co or Sn-doped $YMnO_3$ materials.



SEM images of YMO, YMO:Co, and YMO:Sn perovskite materials



a) Cathodic polarization curves recorded in 1 M KOH solution, at v = 5 mV/s, on the bare GC electrode (GC_0) and on the following modified electrodes: GC_{YMO}, GC_{YMO-Sn} and GC_{YMO-Co}. b) Cathodic polarization curves recorded in 1 M KOH solution, at v = 5 mV/s, on the GC_{CB}, GC_{CB-YMO}, $GC_{CB-YMO-Sn}$ and $GC_{CB-YMO-Co}$ modified electrodes.



a) The graphical representation of the anodic and cathodic peak current densities as a function of the square root of the scan rate for the $GC_{CB-YMO-Co}$ electrode. b) Chronoamperogram obtained on the $GC_{CB-YMO-Co}$ electrode in 1 M KOH solution and inset containing the cathodic polarization curves recorded on the same electrode, in 1 M KOH solution and at v = 5 mV/s, prior to the stability test ($GC_{CB-YMO-Co}$) and following the respective test ($GC_{CB-YMO-Co}$').

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Acknowledgments: This work was supported by the Experimental Demonstrative Project 683 PED/2022.

CHEMISTRY FOR SUSTAINABILITY: EXPLORING ENVIRONMENTAL SOLUTIONS

Experimental Demonstrative Project

Author/s: Prima Yugala, Parinton Jangtawee, Supakorn Boonyuen and Jeerasak Jitrotjanarak

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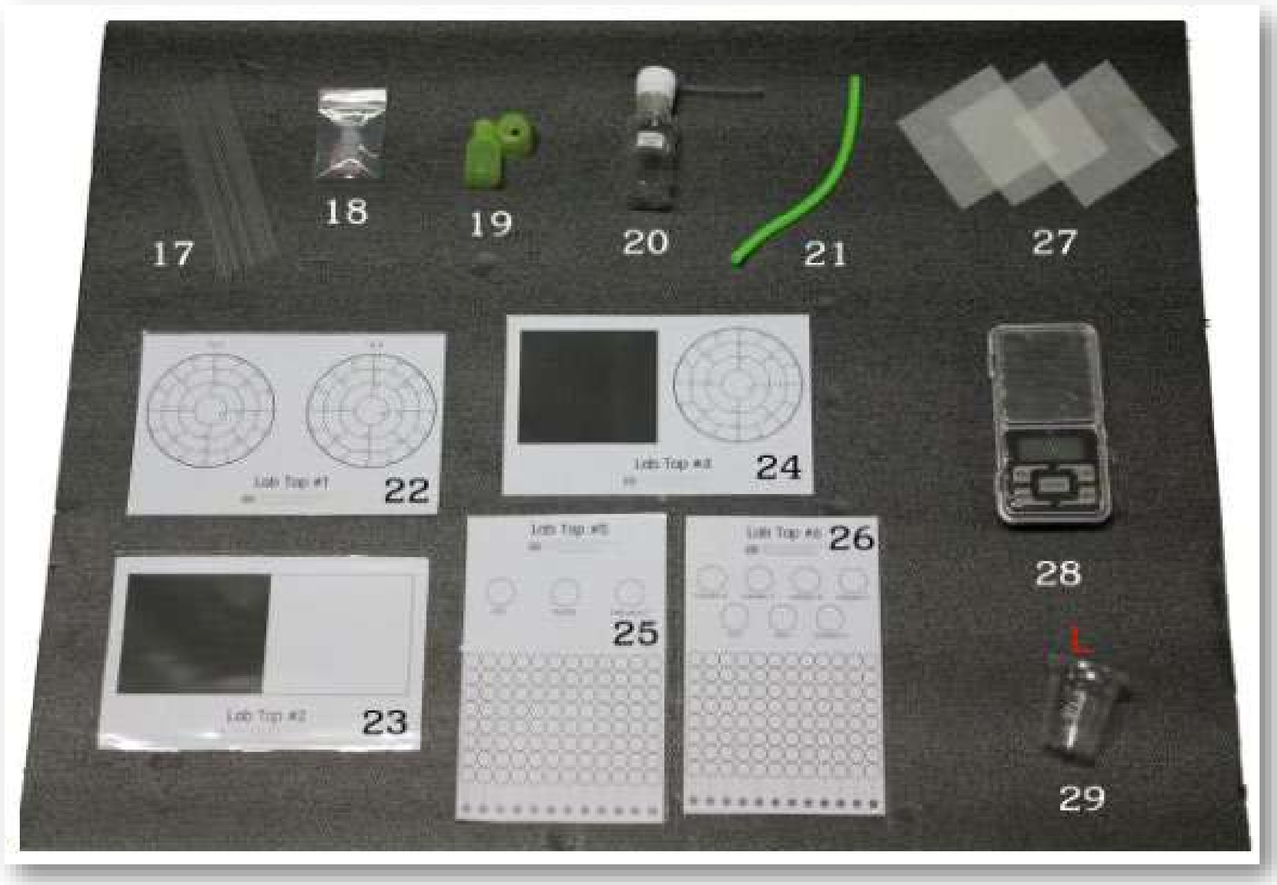
"Chemistry for Sustainability: Exploring Environmental Solutions" revolutionizes education with hands-on experiments designed to address pressing global challenges like climate change and air pollution.

Our innovative project emphasizes equity by using locally available equipment and simple chemicals, ensuring accessibility in underserved communities.

Through interactive learning experiences, students gain a deep understanding of carbon capture, renewable energy, and other critical sustainability concepts.

By empowering educators and students alike, our project inspires a new generation of environmentally conscious leaders ready to tackle real-world issues. Join us in fostering positive change and building a more sustainable future for all.





Contact: j_jeerasak@hotmail.com

Pavlov's cat

Author/s: Tartus Mădălina
Mentor: Prof. Ciuvaga Victor

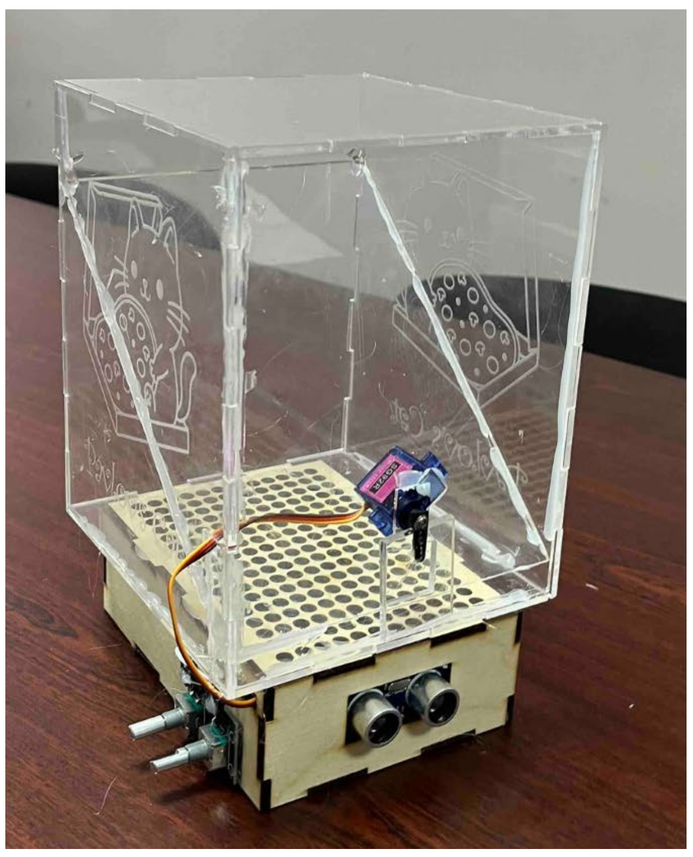
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Organizinga regular feeding regime is a problem, and solving it will have a major influence on the biochemical composition of the products obtained from livestock farms. So I created a robot that would systematize their feeding process, it being made based on Arduino smart circuits: Arduino board, 1 distance sensor with ultra sound, 2 buttons, 1 servomotor and the base, but also the laser cutter.

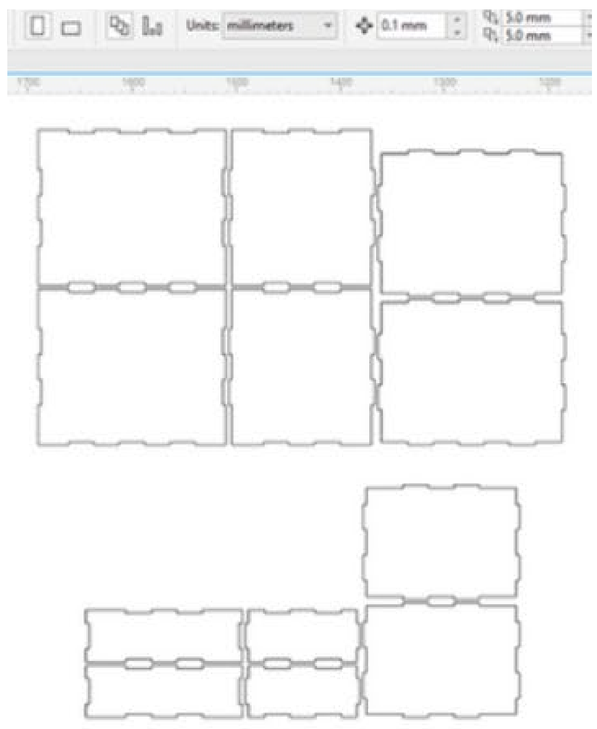
. It can be controlled by 2 ways: by buttons and by distance sensor, applying the programs made. With this mechanism the animal will feel comfortable. So he will hear his master's voice or a song and thus develop a conditioned reflex.



Device assembly process



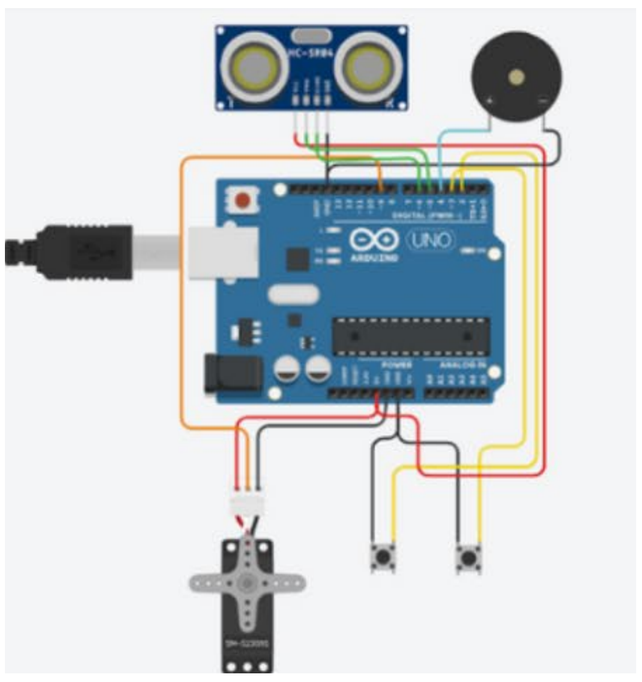
The final result



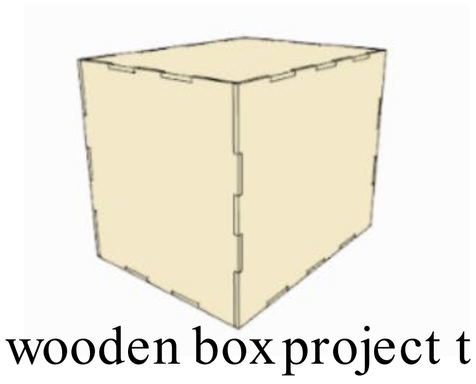
Scheme of the organic glass box

In addition to all this, we found that like domestic quadrupeds, horned animals on farms that are predisposed to a certain type of production could also be trained in this way. Thus, we carried out a study on the influence of the storage time of fodder under normal conditions, where it is manually served to the animals by a worker for 2-3 hours, and its quality if it will be kept in a closed space. So we concluded that it is more beneficial to use such a robotic system in the process of feeding cattle or pigs in the livestock industry.

By developing these conditioned reflexes, the animals will initiate the salivation process and the food will be more easily assimilated, contributing to the increase in the quality of the animals' milk or meat.



Connected Arduino components



The wooden box project that will cover the Arduino components

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5th International Exhibition
InventCor
4-6 April 2024 – Deva, Romania

ORGANIC/INORGANIC COMPOSITE MATERIAL WITH ANTIMICROBIAL EFFECT FOR CONSOLIDATING ARCHAEOLOGICAL WOOD WITH EXCESS OF MOISTURE AND METHOD OF OBTAINING IT

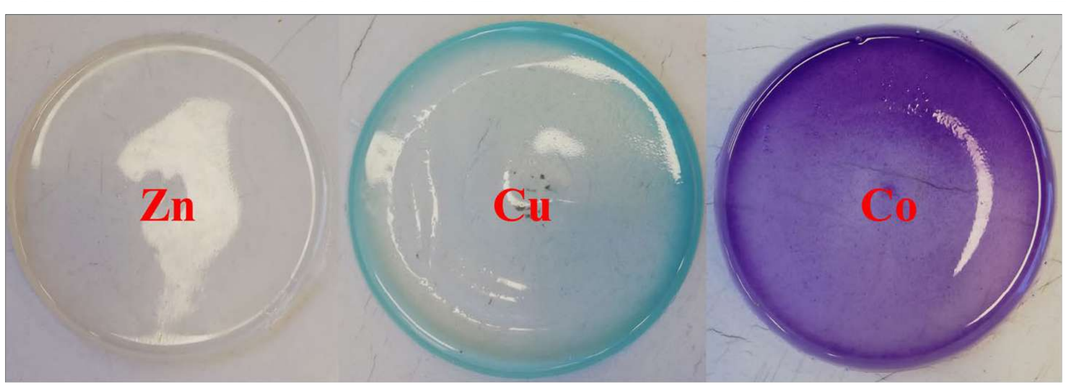
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Patent application No. A-00070/2024

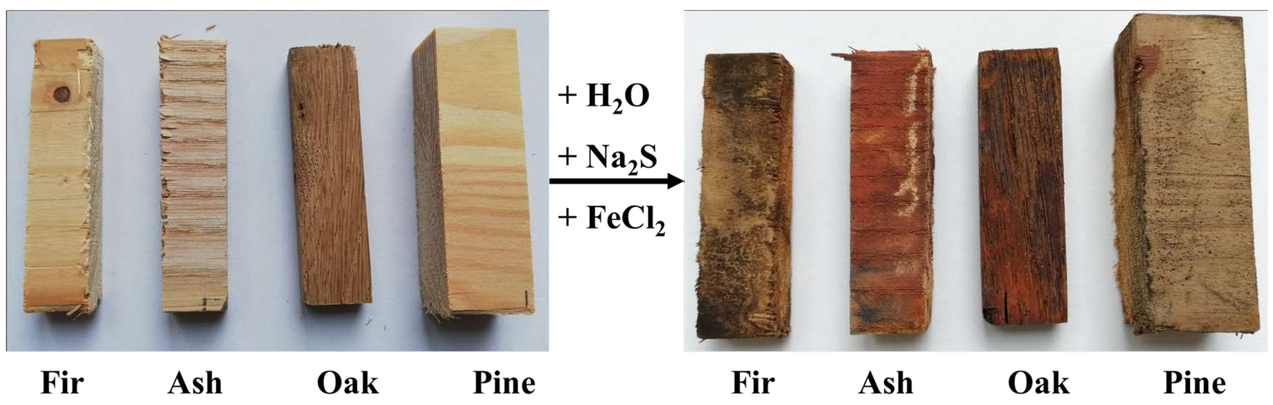
Toma Fistos, Sorin-Viorel Dolana, Radu Claudiu Fierascu, Irina Fierascu, Anda Maria Baroi, Roxana Ioana Brazdis (Matei), Andrei Sarbu, Tanta-Verona Iordache, Anamaria Zaharia

The present invention refers to a nanocomposite coating material with antimicrobial and consolidant properties (demonstrated by the improvement of the mechanical properties) for archaeological wood with excess moisture (known in the specialized literature as waterlogged wood), material constructed of two components: an antimicrobial component (substituted apatitic material with various heavy metals) that gives protection against biodeteriogens and a polymeric component that gives the compound compatibility with the support material on which it is applied (archaeological wood) and improves the mechanical properties (consolidation) and to a method of obtaining it.

NANOCOMPOSITE COVERING MATERIAL



FRESH WOOD TO WATERLOGGED WOOD



Polymer Component + Antimicrobial Component

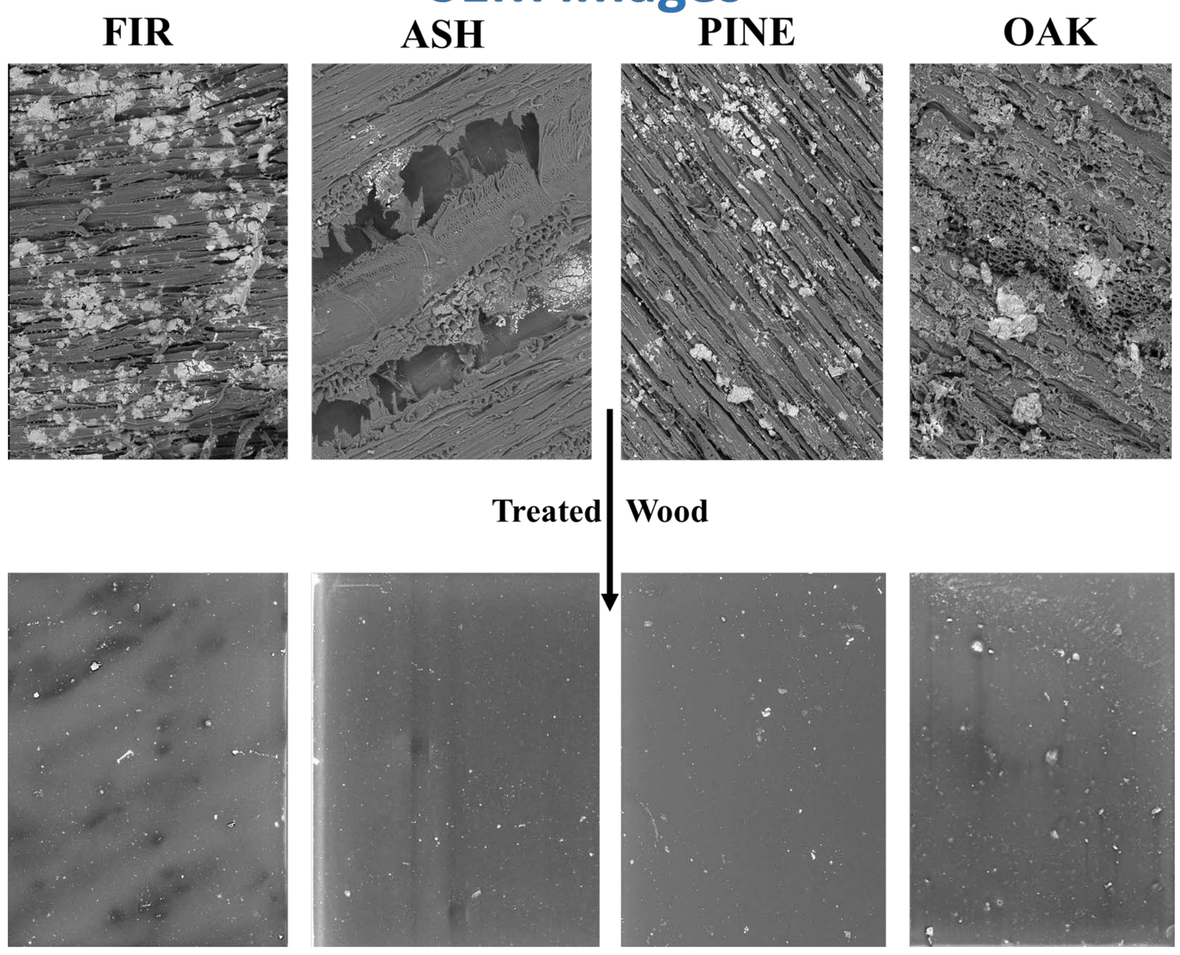
- Solvent: butyl acetate
- Binder: polyurethane (mixture of polyols + isophorone diisocyanate)
- Apatite material doped with: Cu, Zn or Co
- Catalyst: dibutyltin dilaurate
- Antifoam additives

TREATMENT APPLICATION

BEFORE —IMMERSION→ AFTER



SEM images



ACKNOWLEDGEMENTS

This work was supported by a grant of the Ministry of Research, Innovation, and Digitization, CCCDI-UEFISCDI, project number PN PN-III-P2-2.1-PED-2021-0627, contract 591PED/2022, within PNCDI III. It is also acknowledged the support of Ministry of Research, Innovation and Digitization through Program 1 - Development of the national research-development system, Subprogram 1.2- Institutional performance- Projects to finance excellence in RDI, Contract no. 15PFE/2021.

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5th International Exhibition
InventCor
4-6 April 2024 – Deva, Romania

COATING WITH PHOTOCATALYTIC AND ANTIMICROBIAL EFFECT FOR THE PROTECTION OF NATURAL LIMESTONE ELEMENTS OF VERNACULAR BUILDINGS AND PROCEDURE FOR OBTAINING IT

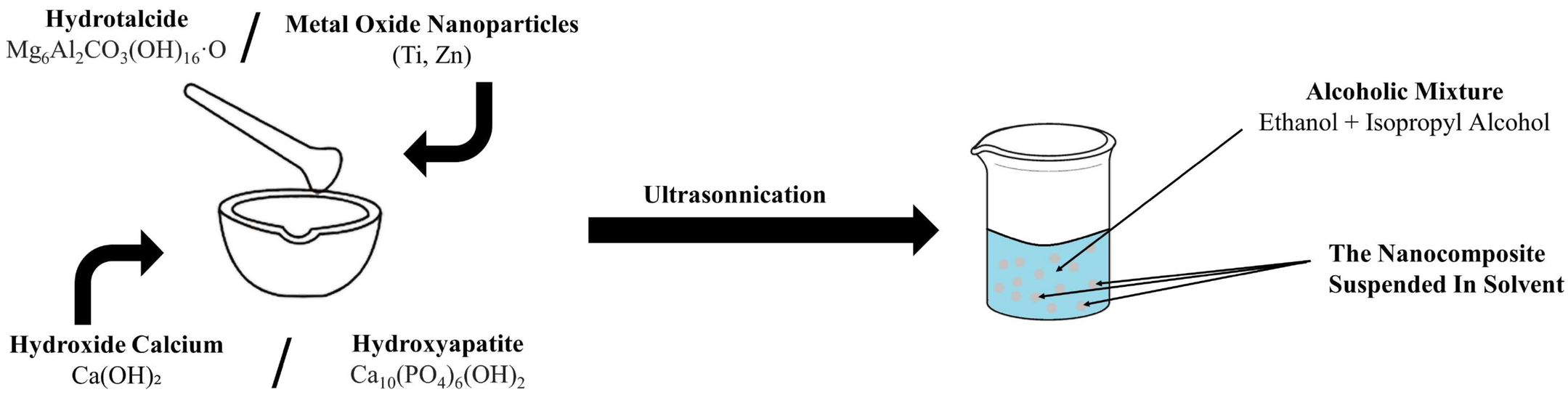
Patent application No. A0558/2023

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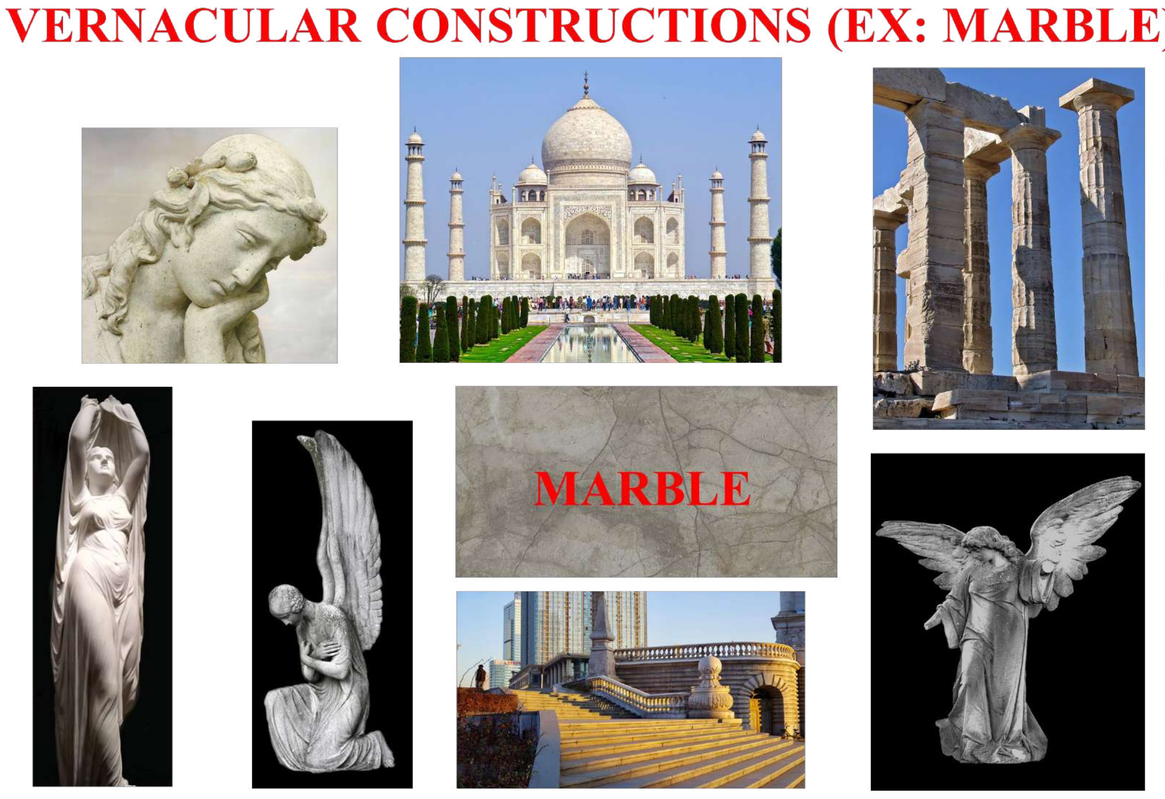
Toma Fistos, Radu Claudiu Fierascu, Irina Fierascu, Mihaela-Alina Melinescu, Anton Ficai, Denisa Ficai, Lia Mara Ditu, Irina Gheorghe-Barbu, Roxana Ioana Brazdis (Matei), Anda Maria Baroi

The present invention refers to a nanocomposite coating material with photodegradation and antimicrobial properties, which provides protection (consolidation) for natural stone elements in the composition of vernacular constructions (materials with high calcium content), represented by an alcoholic dispersion, made in a mixture ethanol: isobutyl alcohol, containing a composite material consisting of two phases: a phase based on a double-layered hydroxide mixture (hydrotalcite)/metal oxide nanoparticles (Ti, Zn) of commercial origin and a phase consisting of a mixture of hydroxide calcium and hydroxyapatite in which calcium has or has not been partially dislocated with zinc. The formulation, due to the inorganic composition, presents an improved stability in relation to other formulations based on organic polymers and organic antimicrobial substances.

OBTAINING THE PROPOSED MATERIAL



VERNACULAR CONSTRUCTIONS (EX: MARBLE)



ADVANTAGES

- Provides stain protection
- Has antimicrobial and photocatalytic properties
- Does not cause major chromatic changes
- Does not affect the structure of the treated material
- Absence of support alterations and glossy films
- It can be applied to different types of building materials specific to vernacular constructions

ACKNOWLEDGEMENTS

This work was supported by a grant of the Ministry of Research, Innovation, and Digitization, CCCDI-UEFISCDI, project number PN PN-III-P2-2.1-PED-2021-0627, contract 591PED/2022, within PNCDI III. It is also acknowledged the support of Ministry of Research, Innovation and Digitization through Program 1 - Development of the national research-development system, Subprogram 1.2-Institutional performance- Projects to finance excellence in RDI, Contract no. 15PFE/2021.

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RECIPE FOR OBTAINING COMPOSITE SYSTEMS BASED ON RENEWABLE, CHEAP MATERIALS, USED TO FUNCTIONALIZE THE SURFACES OF MEDICAL DEVICES

B

Patent Application

Authors: Anita Ioana VIȘAN, George STAN, Carmen Georgeta RISTOSCU , Gianina Florentina POPESCU-PELIN, Luiza Izabela TODERAȘCU, Consuela Elena MATEI, Valentin Paul ARANGHEL, Gabriel SOCOL, Rodica CRISTESCU

The invention refers to a recipe for obtaining composite materials based on apatite (with a role in promoting bone growth) and renewable and sustainable biomaterials (with the role of combating antibiotic resistance).These natural resources with antimicrobial, antibacterial and anticancer properties can be used to functionalize the surface of medical devices with the Matrix-Assisted Pulsed Laser Evaporation (MAPLE) technique, improved for complex 3D surfaces.

The problem initially identified is related to the prevention and control of nosocomial infections, which is a current strategic priority for hospitals and other health institutions around the world. A strategy that has been proposed in the past is to functionalize the surfaces of medical devices with antibiotic-based antimicrobial coatings that retain good efficacy for a long time. However, the antimicrobial action of these substances decreases rapidly over time and continuous administration is therefore mandatory. Moreover, viruses, bacteria and fungi adapt over time to new drugs, developing resistance and forming biofilms. The development of a new anti-infective strategy is thus justified by the continuous changes of new strains of viruses, bacteria or fungi.

The solution proposed to solve the problem is to improve the implant coating method by integrating an original recipe based on apatite and NATURAL AND RENEWABLE substances (Lignin and Essential Oils (Frankincense and Myrrh)) with the aim of preventing localized infections. The developed composite material proposes a "green" alternative to the currently used synthetic antibiotics, as the phenomenon of resistance to conventional drugs has become an alarming circumstance that endangers the lives of patients. The use of these natural products involves low costs and represents an attractive solution by extending the MAPLE technique for the fabrication of antimicrobial coatings for the prevention/eradication of infections of medical implant surfaces followed by local, sustained administration of natural antimicrobial agents.

POSSIBLE ALTERNATIVE TO CLASSIC ANTIBIOTICS!

Advantages of these coatings involve improved properties of the obtained functionalized surfaces:

1. The recipe for obtaining composite systems involves simple, environmentally safe and relatively inexpensive renewable materials.
2. The novel anti-infective functionalization strategy using the MAPLE technique to combat antibiotic resistance could be extended to a large class of medical devices with complex 3D surfaces.

The **purpose** of the invention is to formulate a new recipe for obtaining nanosystems based on ecological materials with synergistic action against infections. The recipe presents unique advantages because the thin layer application of these composite materials can lead to the fabrication of new, relatively cheap, mechanically resistant functional medical devices with complementary properties, which ultimately lead to the achievement of the proposed goal: obtaining improved surfaces that have therapeutic effects (anti-inflammatory, antibacterial, prevention and/or combating nosocomial infections).

The **novelty of the concept** is to incorporate natural lignin and essential oils (***Frankincense and Myrrh***) as suitable component substances for apatite-based composites, thus mimicking the structure and properties of natural bone. Both essential oils have been shown to be effective in the treatment of inflammation, chronic diseases or cancer with relatively low side effects.

Another **advantage** of using these systems with nanometric dimensions is that they can ensure a prolonged and controlled release of substances with a therapeutic effect (essential oils) in the long term. The proposed solution does not require consumables such as drugs, cleaning reagents or other chemicals. It is entirely ecological, as it does not produce toxic residues or other waste.

Description

For the proposed solution, thin films were obtained by the MAPLE method, which involves the interaction of the laser beam with a frozen target and the transfer of the dislocated material to the substrate of interest, positioned parallel to the target (composite material).

The recipe for obtaining composite materials involves dissolving or suspending the materials of interest in a suitable volatile solvent, which is then flash-frozen to form a "target". The amount of active material was in the range (1.2 - 1.4) g.

The steps to obtain the composite materials ("targets") are presented below:

1. Realization of the mixture in the proposed composition.
2. The composite liquid mixture (obtained at step 1) is then frozen thus obtaining the target used during deposition. The target is kept at a low temperature during the surface functionalization process with the help of a cooling device (cooler) through the controlled immersion of liquid nitrogen

The process of functionalizing medical surfaces by covering them with the composite materials obtained following the steps described above is suitable for both flat surfaces and complex 3D structures and involves the following steps:

1. ***Preparation of surfaces/substrates for functionalization***. The MAPLE technique allows the use of different types of substrates/surfaces: metals, ceramics, polymers and semiconductors, which is an advantage. In the present case, the surfaces consisted of titanium root abutments (Dentstore S.R.L. (ISO 13485 certificate), 99.8% purity) of different lengths [short, medium and long (8, 10, 12 mm)] and thicknesses [from 1 to 2 mm (0.9, 1.1, 1.2, 1.4, 1.6 mm)] as well as flat 20 mm x 10 mm x 0.25 mm Ti substrates (99.7% purity, purchased from Sigma Aldrich). The surfaces of the substrates were successively degreased in acetone and ethanol for 30 minutes, using an ultrasonic bath, then rinsed with deionized water and dried in a stream of compressed air/nitrogen.

2. The ***MAPLE functionalization of the substrates*** is carried out using excimer lasers (193 or 248 nm) as well as the third (355 nm) and fourth (266 nm) harmonics of the solid Nd: YAG laser, which generate ns order pulses [with durations of 25 ns (excimer laser) and ≈5 ns (Nd: YAG laser)], energy between (150-700) mJ (excimer laser) and (60 – 225) mJ (Nd: YAG laser) and rates of repetition between 1 and 50 Hz (excimer laser) and 1-10 Hz (Nd: YAG laser), focused on the target in spots of 15-25 mm2 (excimer laser) and 60 mm2 (Nd: YAG laser), respectively. The number of consecutive laser pulses applied for deposition was in the range (10000-150000). In general, the preferred laser wavelength for growing thin films is in the (200-400) nm range, as most of the deposited materials exhibit strong absorption bands in this region of the spectrum. The laser fluence incident on the target is adjusted between 0.1 and 0.6 J/cm2, depending on the dissolved composite material and the solvent. Two important advantages of the applied MAPLE technique are (i) the fact that ultra-high vacuum is not required, a base pressure of 10-2-10-3 mbar being sufficient, and (ii) the flexibility in the selection of solvents.

3. The substance of interest is evaporated and transferred, by the action of short high-energy laser pulses (generally ns, but also ps and fs), from a solid sample (target) to the support material of interest (substrate), where it forms a thin layer.

4. The verification and validation of prototypes of functionalized surfaces is carried out through a series of specific analyses: FTIR; AFM; SEM; in vitro evaluation of biological performance and antimicrobial activity.

Therefore, for the effective clinical use of functionalized surfaces, the optimal concentration of natural agent 2% was chosen (recipes obtained following steps 1-2) for which the medical surfaces are not cytotoxic, in addition proving increased antimicrobial activity. Electrochemical experiments have been used to induce accelerated degradation effects knowing that medical devices corrode in the human body. Thus, biodegradability investigations (corrosion stability and bioactivity in simulated biological fluids) showed that adjusting the composition of the synthesized material can be applied to prevent corrosion.

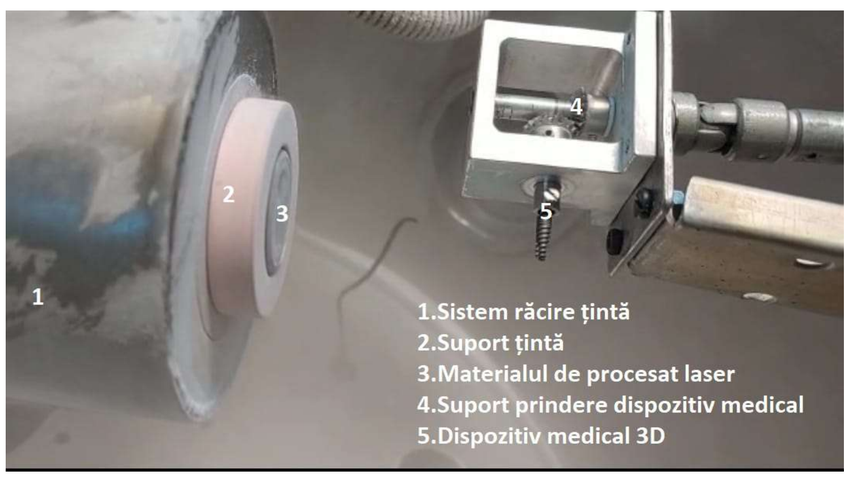


Figure 1*. MAPLE functionalization process of medical surfaces. The anatoform titanium radicular pivot was screwed into the metal support that makes it possible to rotate and tilt the medical implant prototype during deposition and cover the entire surface.*

FINAL CLAIMS

1. Recipe for obtaining composite materials based on apatite with the addition of natural substances with antibacterial and anti-inflammatory properties, characterized by the fact that they have as components lignin and essential oil of Frankincense and Myrrh (with concentrations in the range (5-7)%) .
2. Process for functionalizing the surfaces of medical devices with complex 3D architecture, which provides protection on a wide spectrum of microbial species (Staphylococcus aureus ATCC 25923, Enterococcus faecalis ATCC 29212, Escherichia coli ATCC 25922, Candida albicans ATCC 10231), of clinical interest, with costs manufacturing and maintenance minimums.

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Acknowledgments: The authors are grateful for the financial support provided within the project PN-III-P4-ID-PCE-2020-2273 (PCE 11/2021), Romanian Ministry of Education and Research, CNCS-UEFISCDI

BIO-BORATE GLASS DOPED WITH CERIUM OXIDE IN THE FORM OF A THIN FILM FOR IMPROVING SURFACES OF MEDICAL INTEREST AND OBTAINING METHOD

B

Patent: A/00615

Authors: Gabriela- Irina UNGUREANU (NEGUȚ), Bogdan SAVA, Grațiela GRĂDIȘTEANU, Bogdan BIȚĂ

The invention relates to bio-borate glasses doped with cerium oxide (BBGi) in the form of thin films for the improvement of Titanium (Ti) surfaces of medical interest and to a method of obtaining them.

The doped BBGi according to the invention is composed of: vitreous network formers - 40...65% B_2O_3 and 2.5...10% P_2O_5, vitreous network modifiers - 15... 30% Na_2O and 20...30% CaO, as well as dopants with special properties - 1...3% CeO_2 and 0...1% SrO_2, in molar percentages.

The production process involves the following stages: volumetric and gravimetric dosing of raw materials, homogenization, mixture of raw materials dried in the oven, melting, glass annealing, glass mortaring, mixing with dimethyl sulfoxide (DMSO), freezing in liquid nitrogen and deposition on Ti substrates by matrix assisted pulsed laser evaporation technique (MAPLE), with the help of a KrF* excimer laser source, the substrates being placed plane-parallel in the deposition chamber.

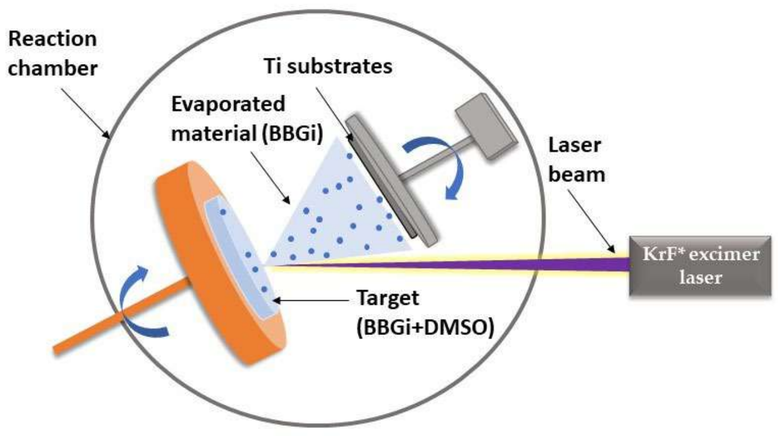


Figure 1. Simplified scheme of MAPLE experimental set-up

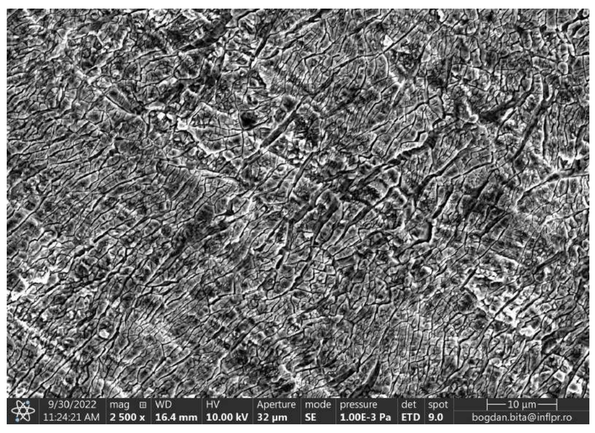


Figure 2. Scanning electron microcopy image of BBGi thin film

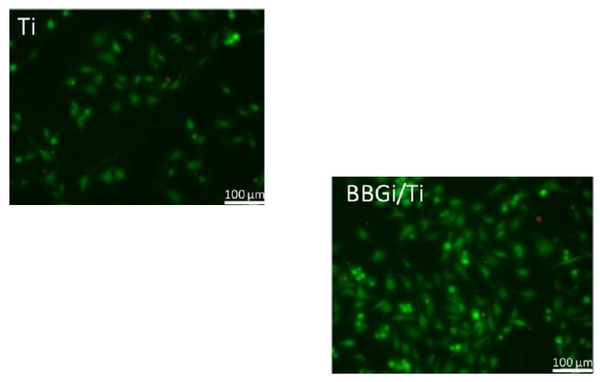


Figure 3. Live Dead test for BBGi thin film

Acknowledgement: This work was supported by the Romanian Ministry of Education and Research, under Romanian National Nucleu Program LAPLAS VII—contract no. 30N/2023. We acknowledge the support of a grant of the Ministry of Research, Innovation and Digitization, CNCS—UEFISCDI, project no. PN-III-P2-2.1-PED-2021-3178 within PNCDI III.

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A fiber glass reinforced composite for CAD CAM aplications in dentistry

Authors: Bogdan Culic[1], Mihai Varvară[1], Diana Dudea[1], Alexandru Grecu[1], Alexandru Burde[1], Cristina Gasparik[1], Cristina Prejmerean[2], Mărioara Moldovan[2], Doina Prodan[2], Codruța Sarosi[2], Laura Silaghi-Dumitrescu[2], Miuța Filip[2]

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B

Introduction

In the last three decades, exciting new developments in dental materials and computer science have led to the success of contemporary dental computer-aided design - computer-aided manufacturing (CAD-CAM) technology. Each year, new materials appear with improved properties and qualities.

The **objective** of the work was to develop a new cad cam milling material using fiber glass reinforced composite.



Figure 1. CAD-CAM restorative materials

Materials and method

A selection of 2 different types of resins (R1 composed from 25%Bis-GMA, 40%UEDMA, 35%DMTEG and R2 composed from 65%Bis-GMA, 35% DMTEG) with 2 different types of hybrid filler (F1 with 42% quartz, 42% radiopaque glass and 16% hydroxyapatite and F2 with 90% quartz and 10% colloidal silica) and 3 different types of E type fiber glass geometries (veil 30g/m2, twill 163g/m2 and stratimat 300g/m2) in 4, 6, 8 and 10 layers were used in this in vitro study. Inside of a silicon cube of 1 cm side, layers of resin and fiber glass were placed one above another. After each layer a light curing process of 10 seconds was done in 5 different points. 2 mm thick samples were cut with a precision saw (Isomet 1000, Buehler, USA) and investigated with SEM and Raman spectroscopy. Data were analyzed with dedicated software.

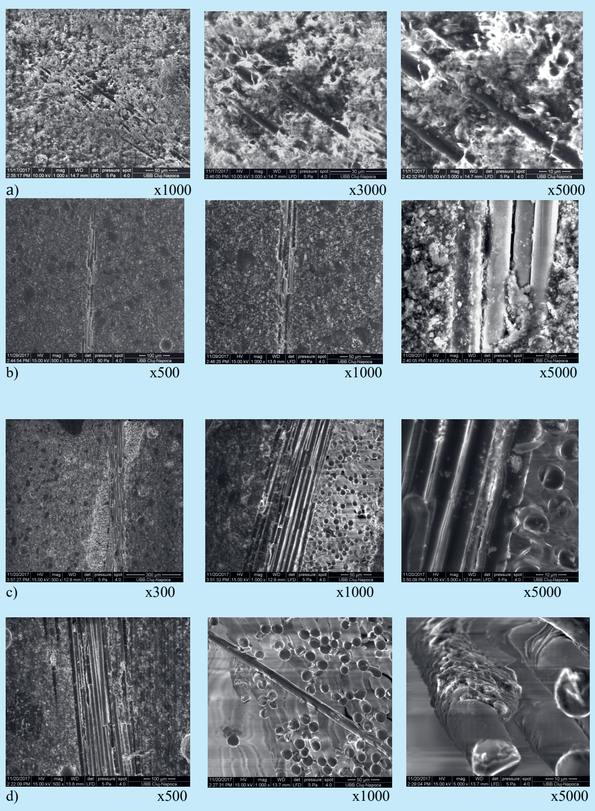


Figure 2. SEM images of fiber glass reinforced composite a) FRC1; b) FRC2; c) FRC3; d) FRC4

The following studies were performed:

- Design of FRC components for applications in CAD / CAM technology
- Formulation of a series of resins / glass fibers / coupling agent
- Study of the polymerization mechanisms of particulate composites using various initiation systems
- Preparation of a series of FRC using fiberglass with different architectures
- Structural characterization of the obtained material, at nanometric level
- Studies on the cytotoxicity of FRC components and material
- Development of the experimental model of FRC material for the CAD / CAM processing
- Manufacture of experimental restorations from the tested FRC disks
- Testing the optical properties of FRC
- Validation of the system in laboratory conditions



Figure 3. Evolution of the homogeneity



Figure 4. Different E type fiber glass geometries

Type	Resin	Hybrid filling	Fiber glass geometry	Number of layers
FRC1	R1	U1	Veil	6
FRC2	R2	U2	Veil	10
FRC3	R2	U2	Twill	8
FRC4	R2	U2	Stratimat	4

Results

Raman analysis showed a powerful interaction between the polymer and the fiber glass. SEM data revealed that the different fiber glass geometries were well incorporated inside the resin, resulting an acceptable homogeneity. The invention relates to a composition of fiber glass reinforced composite material based on thermo-baro-photopolymerizable composite resin and fiber glass fabric type E in the form of a veil and / or Stratimat, being indicated for obtaining a material to be used for prosthetic restorations using CAD / CAM technology. The material has superior mechanical properties and corresponding radiopacity. The dental product is presented in the form of a composite disc reinforced with solid fiberglass, with a diameter of 98.5 mm and a height of 10 mm, dimensions specific to dental CAD/CAM technology.

Conclusions

Within the limitation of this study, it seems that it is possible to achieve a fiber glass reinforced composite for the use of CAD CAM technology. Further investigation must be done in order to test all the properties of the new material.

Key words: CAD CAM, composite, fiber glass

Acknowledgement: This work was supported by the Romanian National Authority for Scientific Research and Innovation, UEFISCDI, project PN-III-P2-2.1-PED-2016-1936

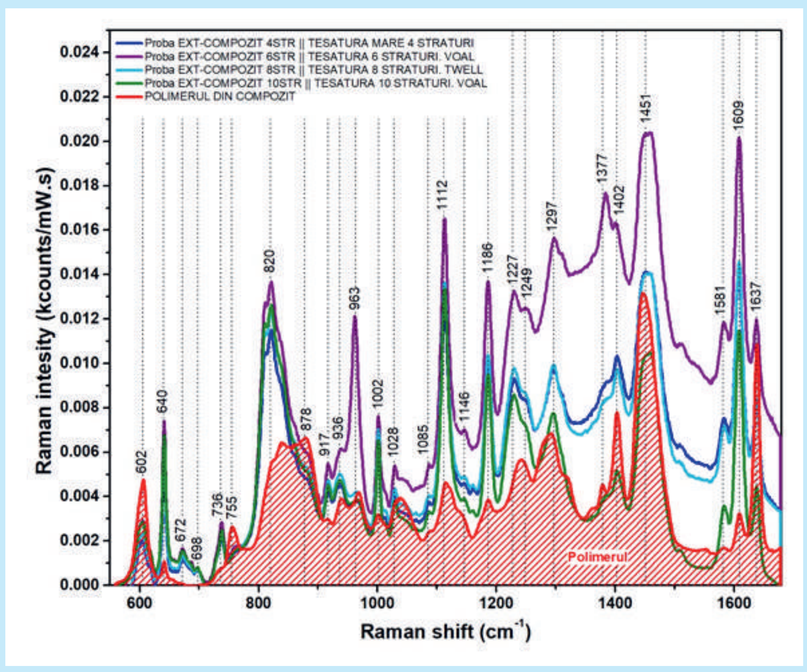


Figure 5. Raman spectra averages measured on the pure polymer, respectively on the 4 classes of FRC materials

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CONSTRUCTION BRICK MANUFACTURING PROCESS USING INDUSTRIAL WASTE

B

Patent : **13077/30.10.2020**

Author/s: Popescu Georgeta Luminița, Marica Mădălina Mirabela, Abagiu Traian Alexandru, Predeanu Georgeta, Racoceanu Cristinel, Cruceru Mihai, Diaconu Bogdan Marian, Dițescu Corneliu Laviniu, Dondoe Valentin, Anghelescu Lucica

The invention refers to a process for the manufacture of heat-insulating concrete, using as light granular The invention refers to a process for manufacturing construction bricks using industrial waste, in which raw materials are exclusively used materials considered waste in the energy and extractive industries: heavy ash from thermal power plants, clay from lignite mining quarries in the area Carboniferous Gorj, drilling mud.





The advantages of this process are represented by the fact that power plant ash successfully replaces the sand used as an additive to correct the plasticity of the Rovinari clay, under conditions of reducing the density of the finished products by (8-12) %, increasing the thermal insulation capacity by (10-15)% and the reduction of the sintering temperature by (30-50)% in the final stage of heat treatment.

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PROCESS FOR OBTAINING HEAT-INSULATING CONCRETE BASED ON HEAVY ASH OF POWER PLANT

B

Patent : **129872/27.04.2018**

Author/s: Popescu Georgeta Luminița, Marica Mădălina Mirabela, Abagiu Traian Alexandru, Predeanu Georgeta, Racoceanu Cristinel, Cruceru Mihai, Popescu Cristinel, Diaconu Bogdan Marian, Ciofu Florin Cristian, Cazalbașu Ramona, Anghelescu Lucica

The invention refers to a process for the manufacture of heat-insulating concrete, using as light granular aggregate the hearth ash resulting from the burning of coal in thermoelectric power plants. It is known that for the manufacture of heat-insulating concrete with maximum usage temperatures of up to (1000-1100)0C, light aggregates are currently used, such as calcined diatomite and granulated blast furnace slag, raw materials that are currently in short supply in Romania. The technical problem that the invention solves consists in obtaining concrete with thermal power plant ash, through a cheap, economical and easy to apply process in production.









The process of obtaining heat-insulating concretes, based on thermal power plant heavy ash and cement, assumes that in the composition of these concretes, ash represents (25-80)%, either as a single granular aggregate or in combination with other types of heat-resistant, lightweight granular aggregates, usual, such as, for example, expanded perlite. Heat-insulating concretes based on thermal power plant ash, obtained according to the invention patent, can be put into operation by known technical processes, of casting-vibration or shotcrete.

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PROCESS FOR OBTAINING COMPACTION MASSES WITH REINFORCEMENT BASED ON HYDRAULIC BINDER

Patent : **129783/30.03.2018**

Author/s: Georgeta Luminița, Marica Mădălina Mirabela, Abagiu Traian Alexandru, Predeanu Georgeta, Racoceanu Cristinel, Cruceru Mihai, Popescu Cristinel, Diaconu Bogdan Marian, Ciofu Florin Cristian, Cazalbașu Ramona, Anghelescu Lucica

B

The invention refers to a process for obtaining quick-hardening masses, based on hydraulic binder, used in the execution of reinforced form, leveling or filling layers, in construction works. The process according to the invention capitalizes on the specificity of the oxidic and mineralogical chemical composition of the secondary steel treatment slag, in that, after grinding to an appropriate fineness for a rest of a maximum of 10% on the sieve with the meshes of 0.09mm , is used as a hydraulic binder in the composition of the compacting masses.





The process according to the invention uses industrial waste with a relatively low degree of recovery as granular aggregates, to obtain the compaction masses with rapid hydraulic hardening: steel making slag in an electric furnace and ash of power plant.

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NANOSTRUCTURED SURFACES USED IN THE BIOMEDICAL FIELD

B

Student Project

Author: Avramoiu Roxana

Coordinators: ***Associate PhD professor Tătar Adina,***
Lecturer PhD eng. Rădulescu Constanța

The main subject of the work is the obtaining of nanostructured surfaces based on magnetite (Fe_3O_4) functionalized with carboxymethylcellulose and loaded with ceftriaxone, with the aim of combating the microbial biofilm. The nanostructured films were deposited on a silicon support, in order to evaluate the antimicrobial effect. In order to obtain a more uniform and complex surface, advanced laser processing was chosen, through the MAPLE technique, and the surfaces were investigated by means of infrared microscopy. In order to obtain the films formed from Fe_3O_4@CMC/CEFT, the fluence of the laser beam was modified, and the infrared mapping carried out later allowed obtaining qualitative information on the composition and chemical distribution of the surface layer formed, at laser fluence values of 300, 400, respectively 500 mJ / cm^2.

Analyzing the infrared absorption spectra associated with the three experimental variants, it can be noted that the lowest degree of degradation of the functional groups is recorded in the case of using a laser beam fluence value of 400 mJ /cm^2, this value being considered optimal for deposition MAPLE related to the application targeted in the work. The newly synthesized thin film showed high antimicrobial activity. Its surface inhibited the formation of biofilms formed following bacterial colonization.

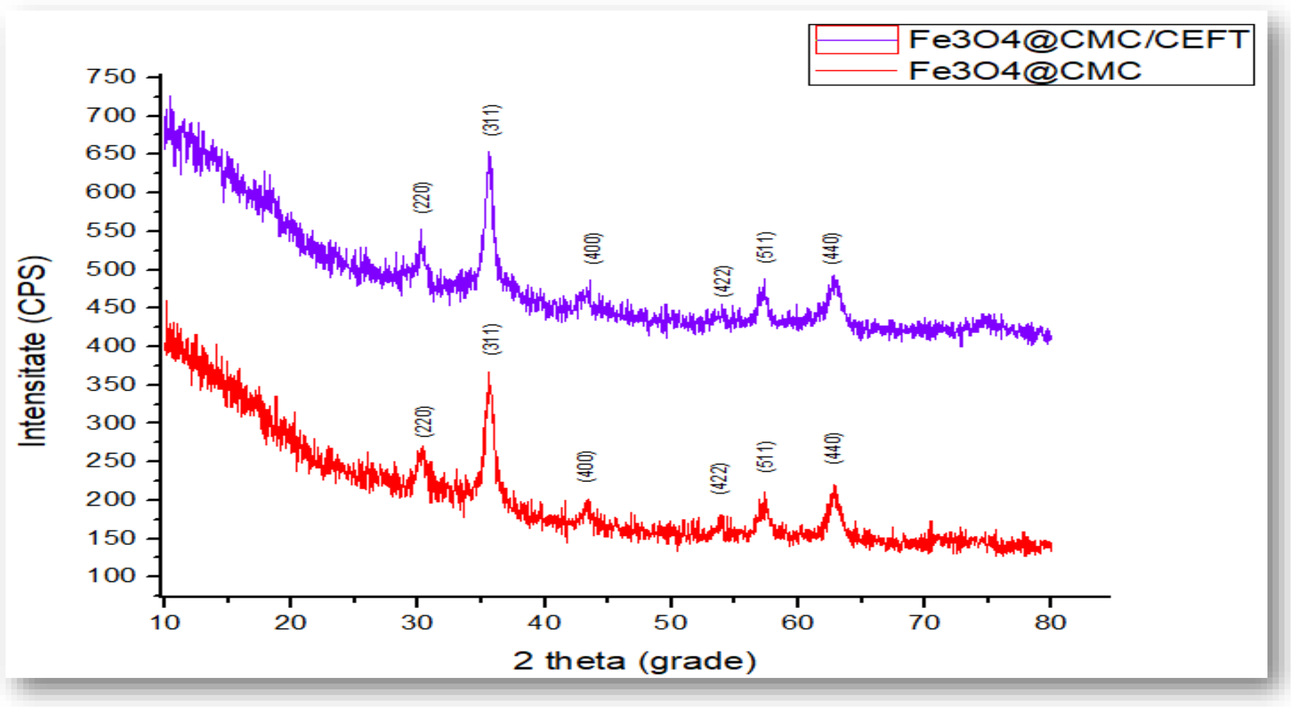


Fig.1. The diffractogram recorded for the powders of: Fe_3O_4@CMC (red) și Fe_3O_4@CMC/CEFT (mauve)

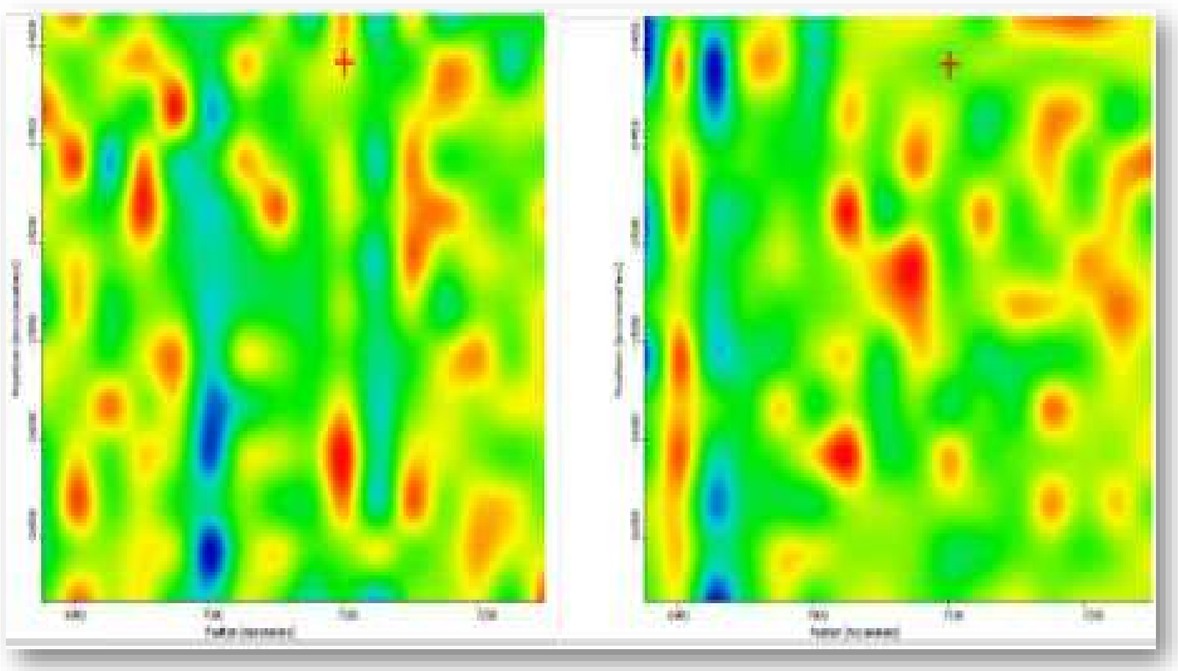


Fig. 2. IR maps constructed based on group distribution C-H and C=O group belonging to CMC at laser fluence of 400 mJ/cm^2

Fe_3O_4@CMC/CEFT nanostructured surfaces, in the form of thin films, deposited by the MAPLE technique, interfere with the formation of biofilms both in the initial phase and during biofilm maturation, both in the case of E. coli and in the case of P. aeruginosa when biofilms were significantly affected at all time points tested. Although the results in terms of UFC / mL values were not as high in the case of S. aureus, we can consider that time was an impediment in obtaining these values, the effect decreasing quite a lot in the period 24-48- 72 hours after incubation

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SEMIPRECIOUS ROCKS COLLECTION

Student Project

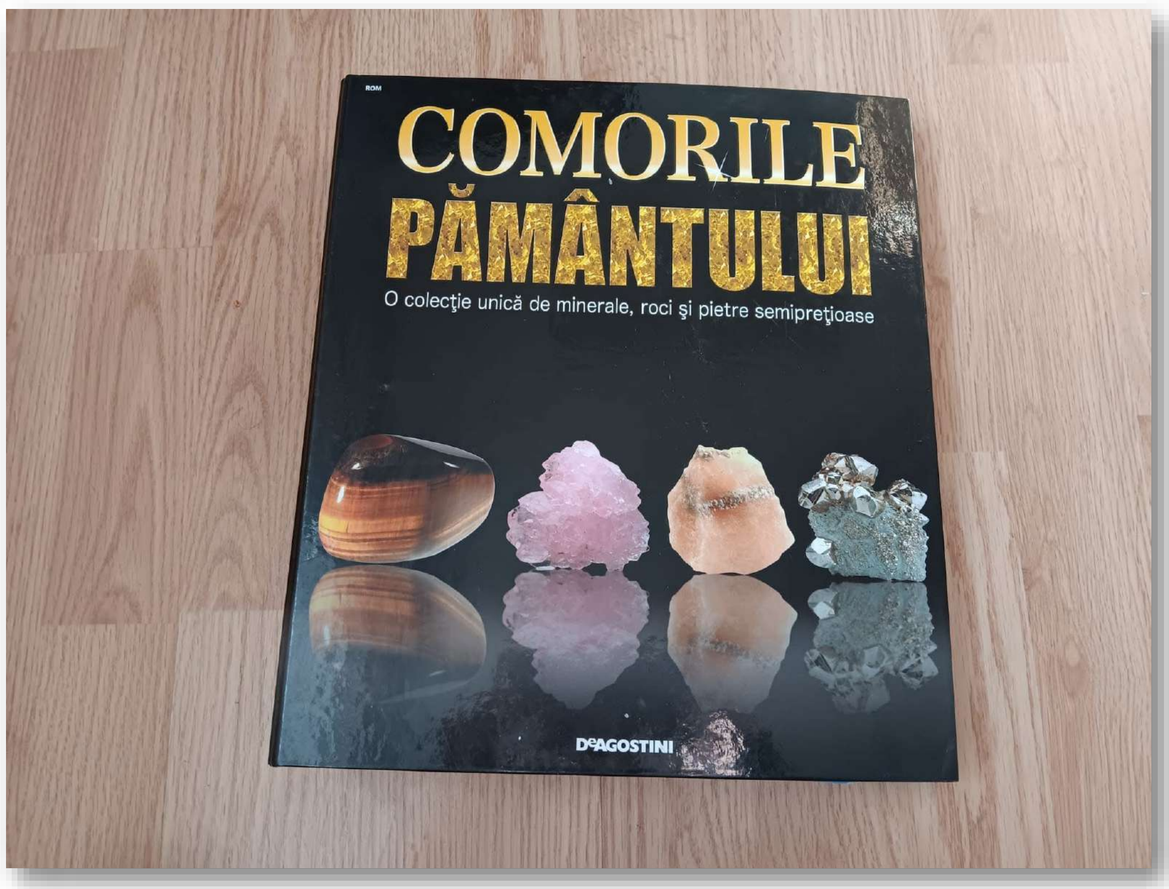
Author: Mihaita Sergiu Nicolae

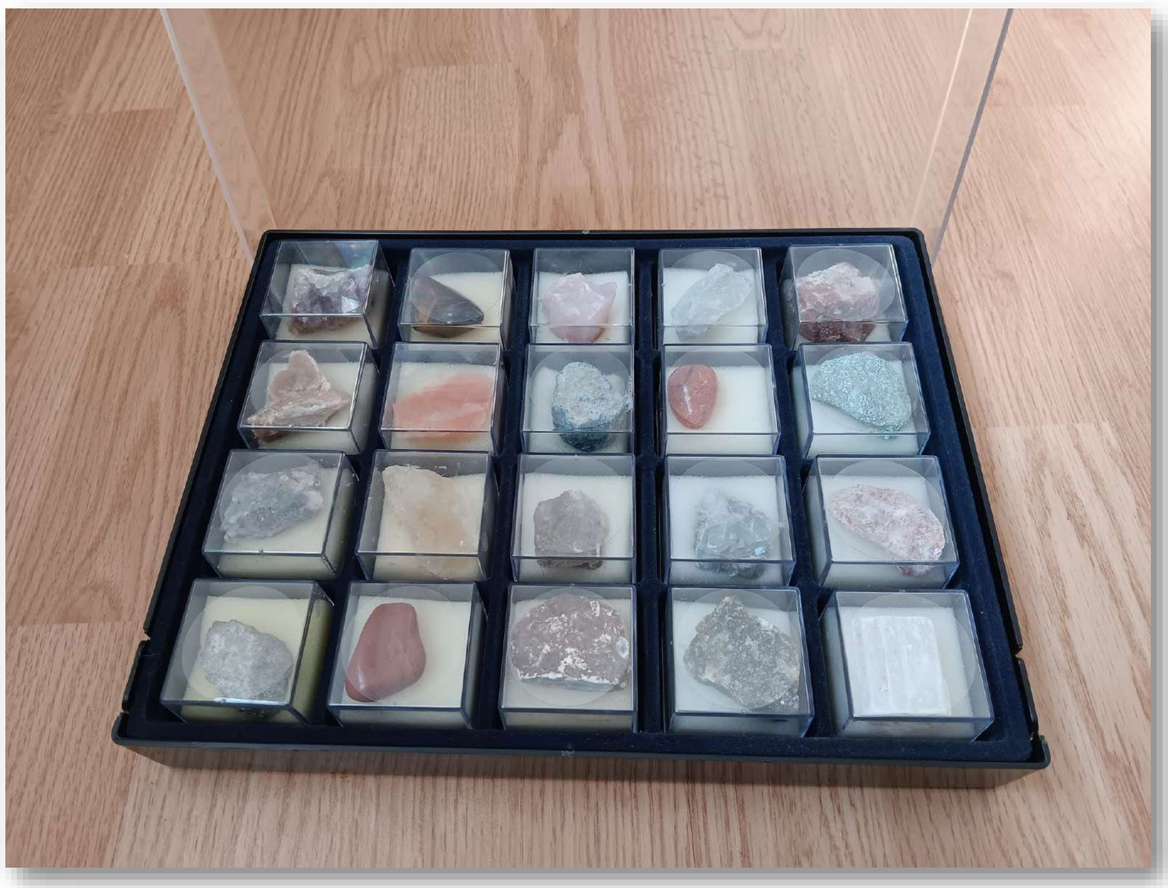
Mentor: Corneliu BIRTOK BANEASA

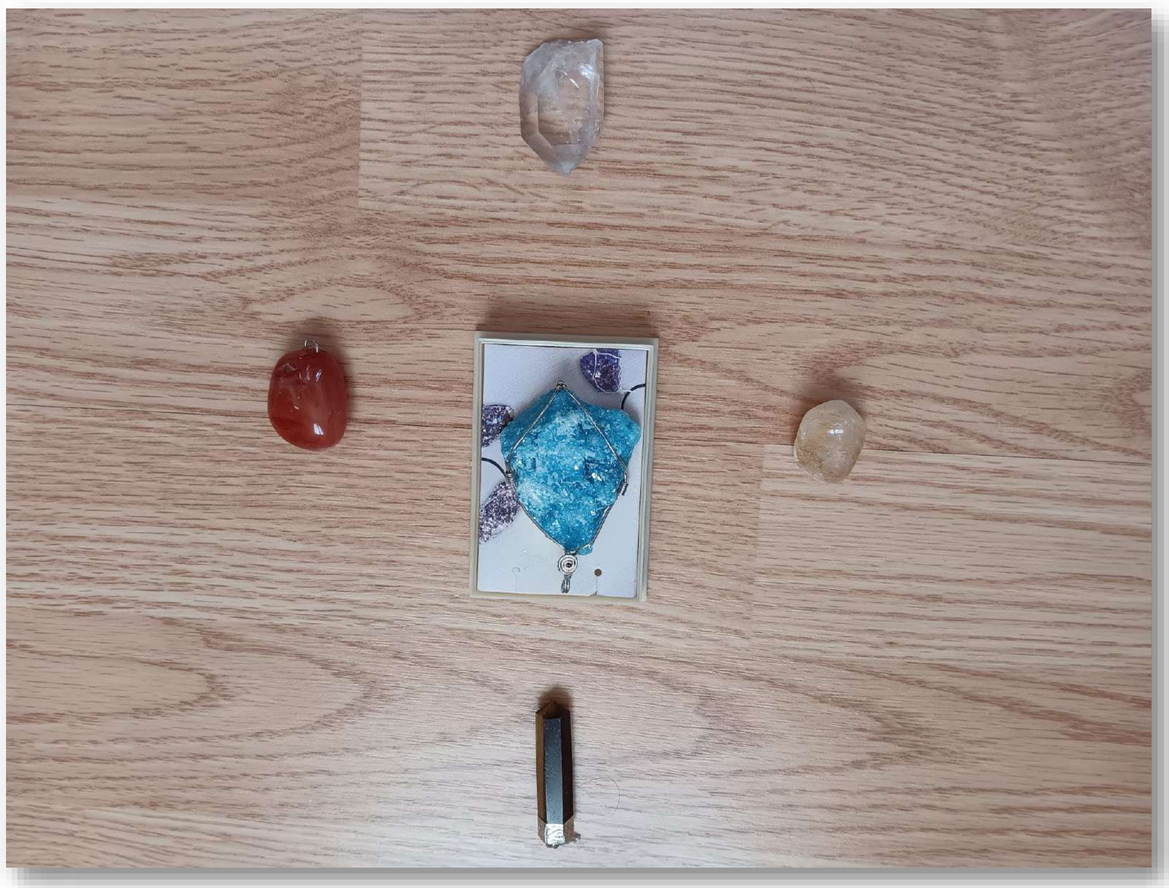
In this project I study and presenting a collection of semiprecious rocks that were maintained for years with love and care. Besides the other two semiprecious rock cases with plastic cubes and a safety sponge, there will be featured some more rocks in addition.

For example: A sheet of gold incased in plastic to protect it, a piece of green glass that got eroded by the water into a rock, which was found in a river, a tiger s eye pendant, a red jasper pyramid and much more.









Why is the knowledge about geology so important?

Well Geology is the primary Earth science and looks at how the earth formed, its structure and composition, and the types of processes acting on it. It is very important for the understanding of Earth's Processes, Resource Exploration, Environmental Management, Infrastructure Development, Climate Change Study and Water Resource Management. Geology is also tied to many industries across the world like Construction Companies, Agriculture, and much more.

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Aspects regarding the process of reducing steel by-products under laboratory conditions

B

Research project

Author/s: Ioana FĂRCEAN, Erika ARDELEAN, Ana SOCALICI, Marius ARDELEAN

The permits of this research focused on the need to expand and ensure a diversified raw material base that would positively influence the quality of the finished product as well as the economic exploitation of waste historically deposited and generated on current production flows of Fe-C alloys, focusing on the recovery of useful elements found in these wastes. The research focused particularly on the recovery of Fe content, opting for pelletizing processing of small and powdery waste with high content of this element.

The experiments in laboratory conditions were carried out at the Faculty of Engineering Hunedoara, being made a series of own recipes based on aspects from the specialized literature (chemical and granulometric composition), being used in the pelletizing process the particle size fractions smaller than 0.5mm.

Chemical composition of some of the processed waste

Sideritic waste, [%]					
SiO_2	Fe_2O_3	CaO	MgO	Al_2O_3	Other elements
42.94	19.70	17.30	8.44	5.12	6.5
Sideritic waste concentrate - magnetic fraction, [%]					
SiO_2	Fe_2O_3	CaO	MgO	Al_2O_3	Other elements
35.53	24.67	18.22	9.96	5.64	5.98

small powdery waste containing Fe → waste processing in pelletizer → by-products obtained (raw pellets) → reduction of pellets in the oven → reduced / hardened pellets



sideritic waste



ground mill scale

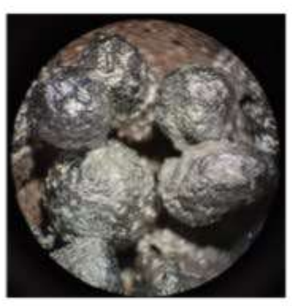


sideritic waste concentrate









In our own recipes, bentonite and cement were mainly used as binders, and to preserve the scared shape of the pellets, a small amount of graphite was added shortly before the completion of the pelletizing process. Subsequently, the pellets were hot-hardened/reduced in an experimental installation at a temperature of 1200 ^{0}Celsius, a quantity of graphite being added to favor the reduction process. The aim was to improve the physical qualities of pellets, reduce iron oxides and obtain metallized pellets (by-products) that can be considered secondary raw materials in industrial steel processes. The results obtained were satisfactory and in accordance with the proposed objectives, representing a first point for further research.

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Direct reduced iron a valuable by-product for the steel industry

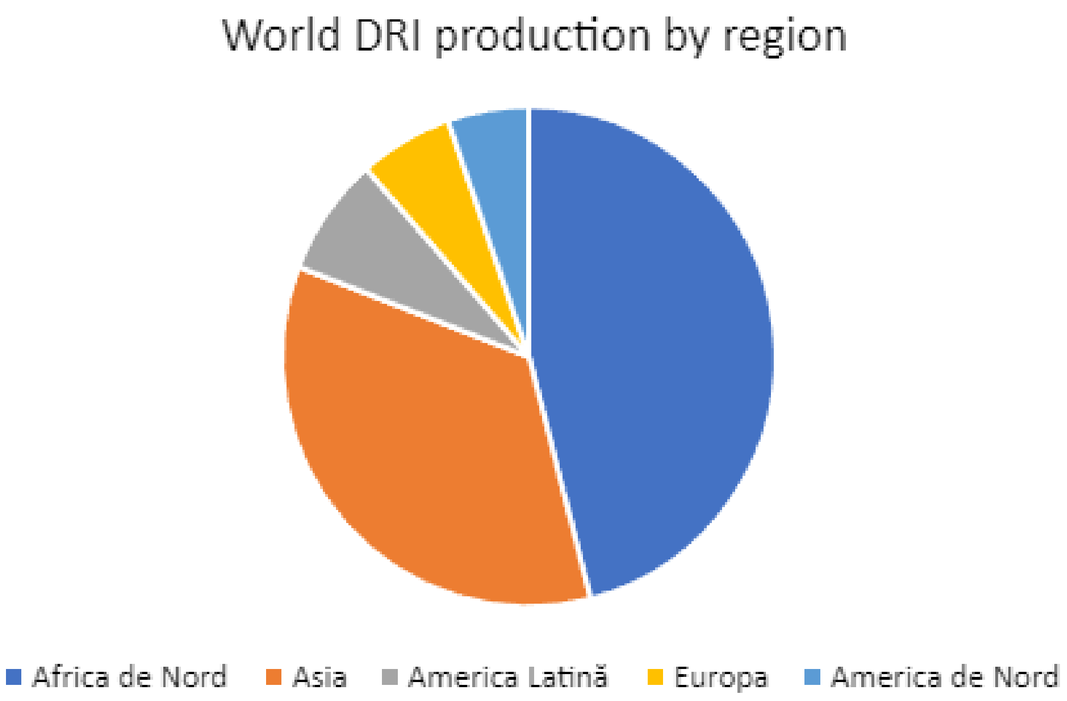
Doctoral research project

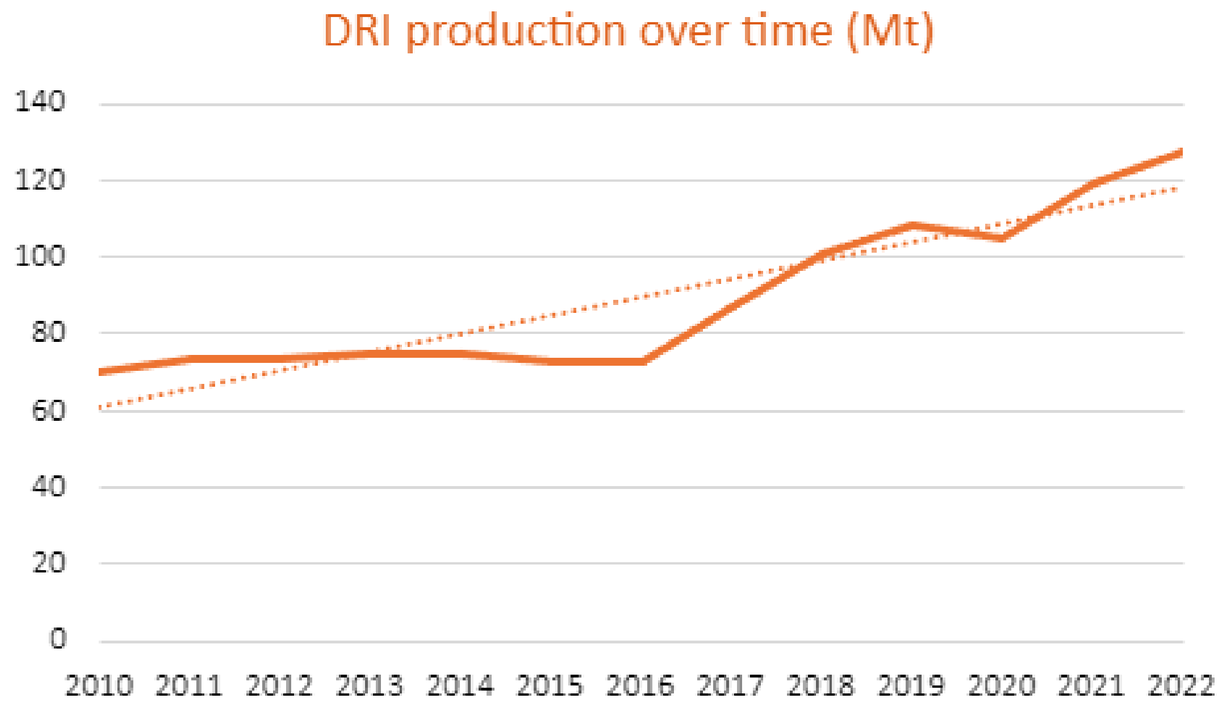
Author: Ioana FĂRCEAN

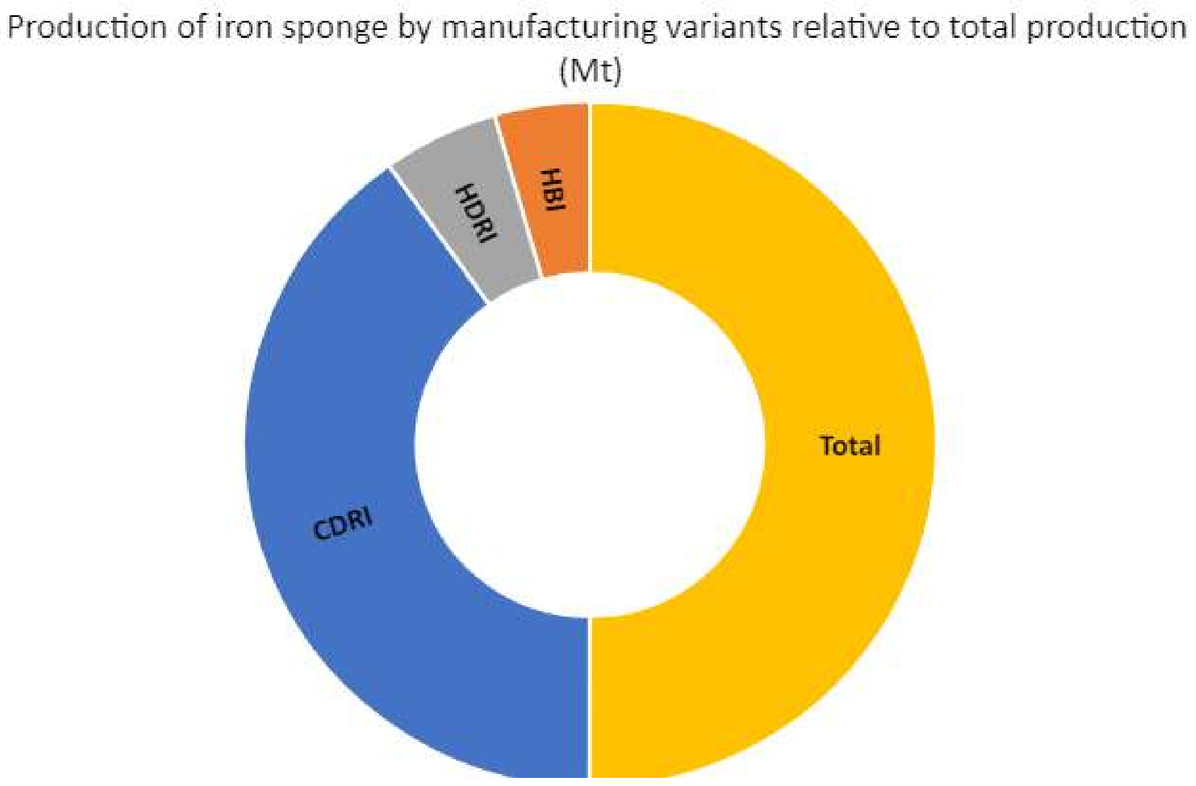
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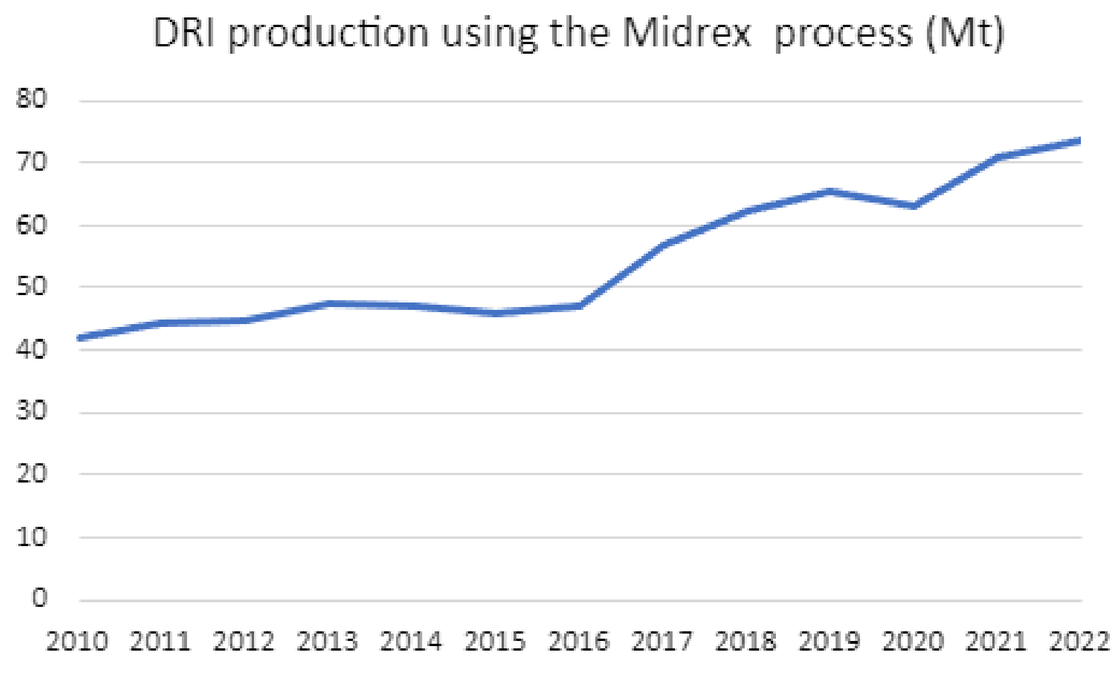
Worldwide, direct reduced iron production (DRI) is increasing due to the need (demand) for by-products used in steel plants as substitutes for iron ore (raw material in pig iron and steel production processes) and scrap metal (secondary raw material).

According to statistics, in 2022 the top five countries in the world producing iron sponge are: India with a production of 43.55 million t., Iran with a production of 32.90 million t., Russia with a production of 7.66 million t., Saudi Arabia with a production of 6.48 million t, and Mexico with a production of 5.84 million t. According to research the research carried out, in 2022 the largest amount of directly reduced iron was manufactured in regions of North America.









It is important to mention that in Romania there are no capacities to produce iron sponge from ores, but there are production capacities in Europe (Germany where CDRI-0.40Mt/year is produced, Russia where there are 2 plants producing CDRI-1.67Mt/year and HBI-2.08Mt/year.

As a solution to the decrease in iron ore resources, holders of direct reduction technologies (Midrex-leader in DRI production) will have to find replacement materials for iron ore.

It is considered that in the future the direct reduction process will focus on exploiting the intrinsic value of industrial waste, which will favor the reduction of pollution levels caused by the steel industry, together with the activity of replacing solid combustion with hydrogen, which is currently being worked on.

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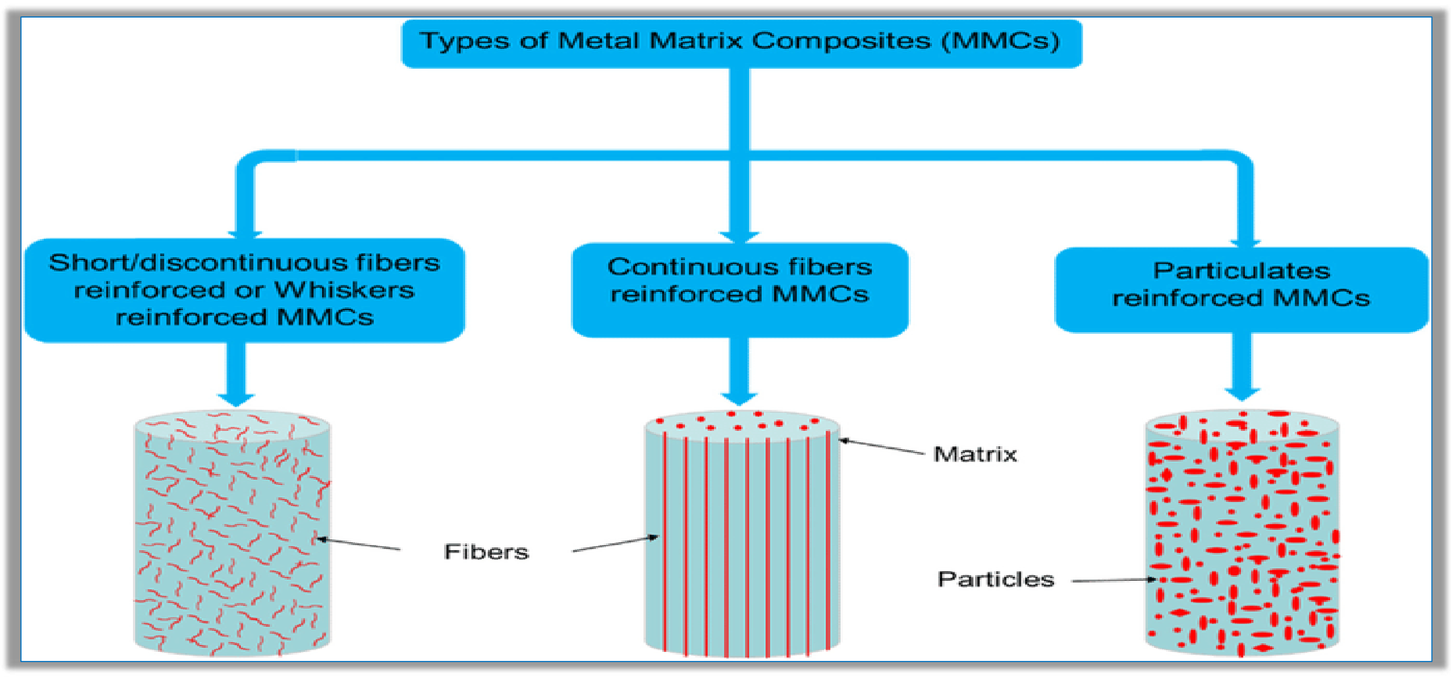
DEVELOPMENT ON ALUMINIUM METAL MATRIX COMPOSITES

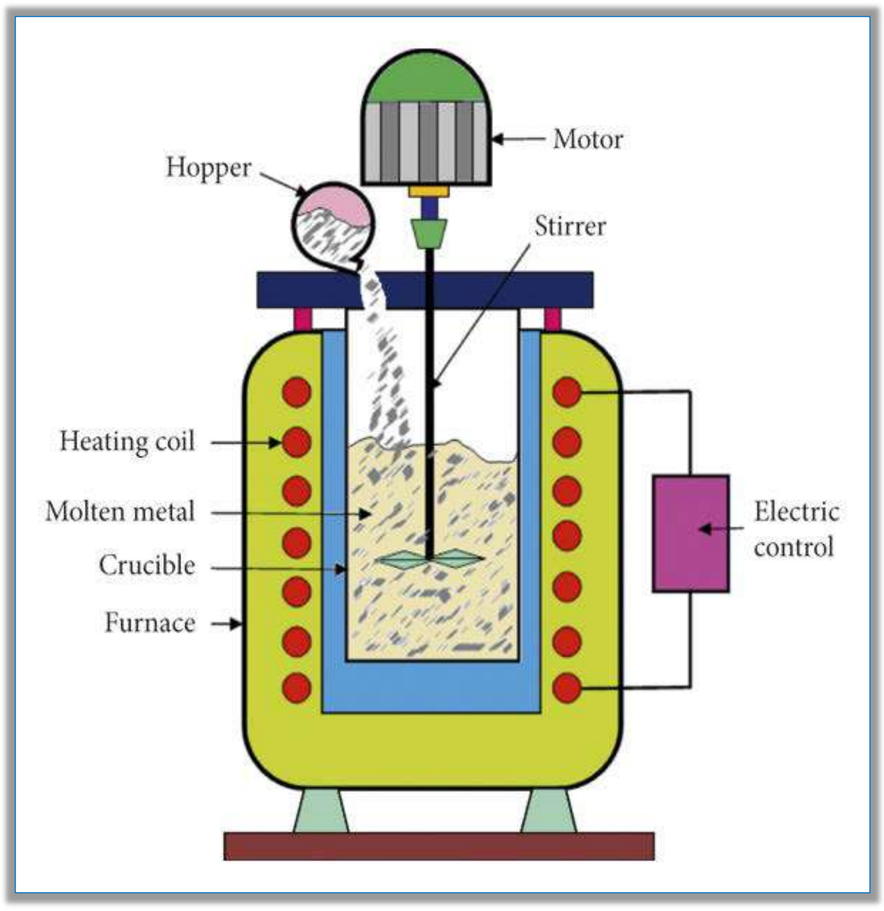
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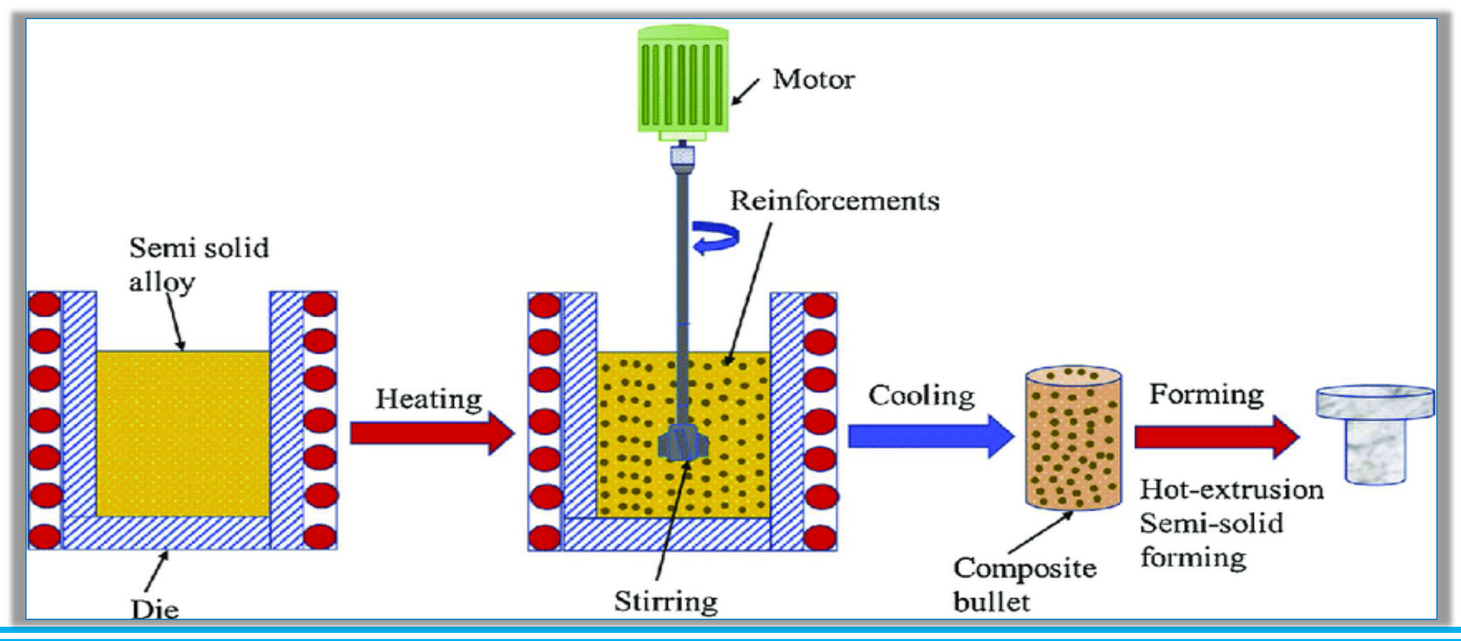
Research project
Ciprian BULEI, Mihai-Paul TODOR, Imre KISS

ALUMINIUM METAL MATRIX COMPOSITES are light in weight, highly resistive to corrosion and very hard. Due to these properties, aluminium metal matrix composites lead to have various applications. The reinforcements considered are Al2O3, silicon carbide, fly ash, zircon, boron carbide etc. improves the mechanical and tribological properties of the metal matrix composite.

A metal matrix composite is a combined product of matrix phase and reinforcement phase. The combination of matrix phase of aluminium and reinforcements phase denotes aluminium MMC. Because of different properties like low density, better corrosion resistance, high abrasion and wear resistance, high thermal conductivity, high specific modulus aluminium metal matrix composites are applied in various fields such as aeronautical, automobile and in marine fields. The properties of the metals can be improved by the addition of more elements to the parent metal. The alloys of metals reinforced with particulate ceramics or fibers to achieve combined properties and formed as metal matrix composites. The properties of these materials have an excellent applications in various areas.







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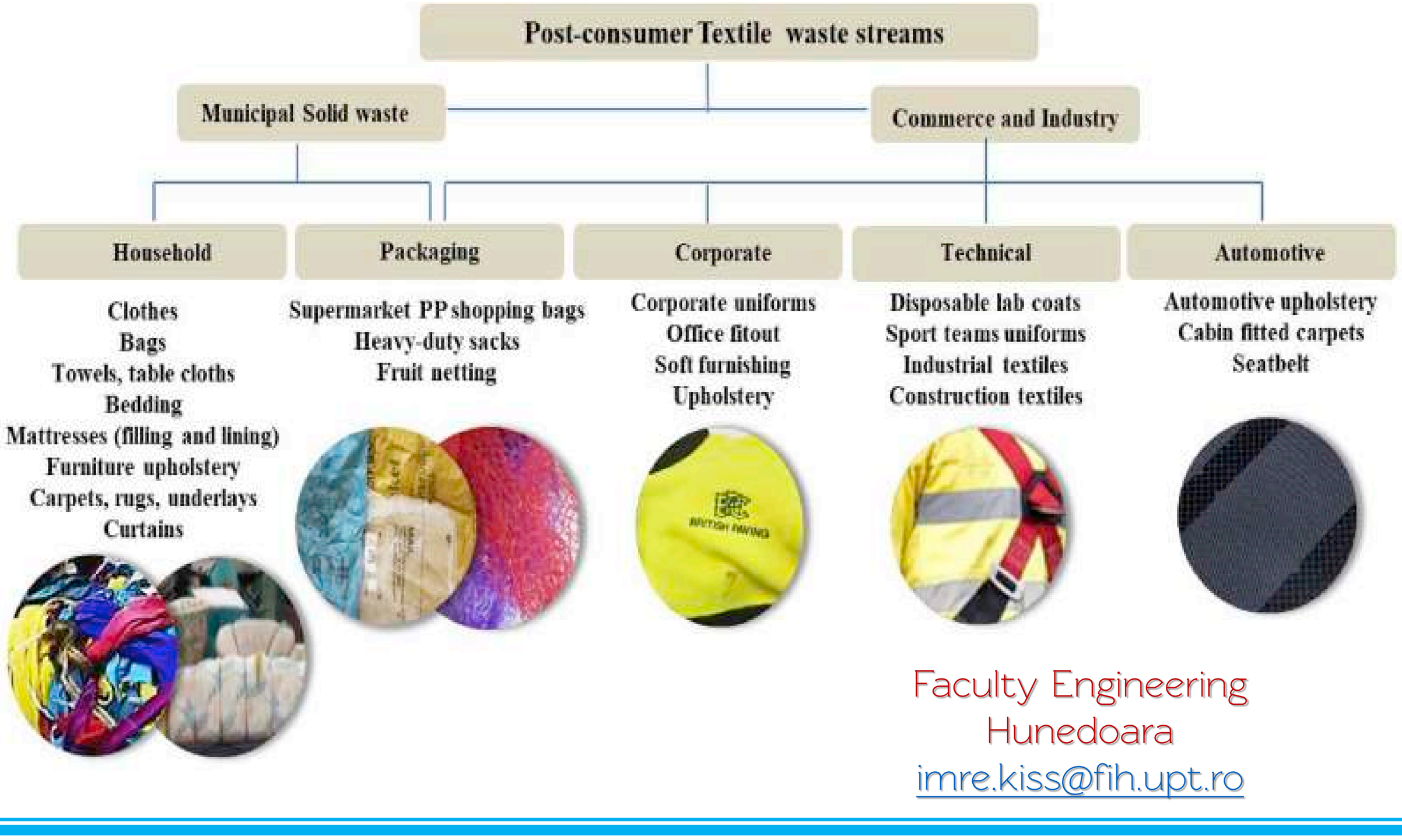
DEVELOPMENT OF TEXTILE-REINFORCED COMPOSITE MATERIALS

B

Research project
Mihai-Paul TODOR, Ciprian BULEI, Imre KISS

TEXTILE COMPOSITES are FIBER-REINFORCED COMPOSITE MATERIALS. The form of TEXTILE FABRIC being used as reinforcement are: woven, knitted, braided.
TEXTILE-REINFORCED COMPOSITE MATERIALS are part of the general class of engineering materials called COMPOSITE MATERIALS. Two or more chemically distinct material which when combined have improved properties over the individual material.

TEXTILE COMPOSITES, which are a combination of POLYMER MATRIX and TEXTILE REINFORCEMENTS, provide an attractive alternative to unidirectional (UD) composites as they enable easier and automated manufacturing of complex component shapes.
Ease of draping results in lower overall manufacturing costs.
The large variety of available textile reinforcements, which includes woven, braided and knitted fabrics, offers a large choice of engineering solutions.



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Opportunity
CORNELIUGROUP
Research-Innovation Association
Creation
Realization
INVENTCOR
Power of Creative Mind
Deva ROMANIA

B

REINFORCING CONCRETE WITH RECYCLED PLASTIC WASTES

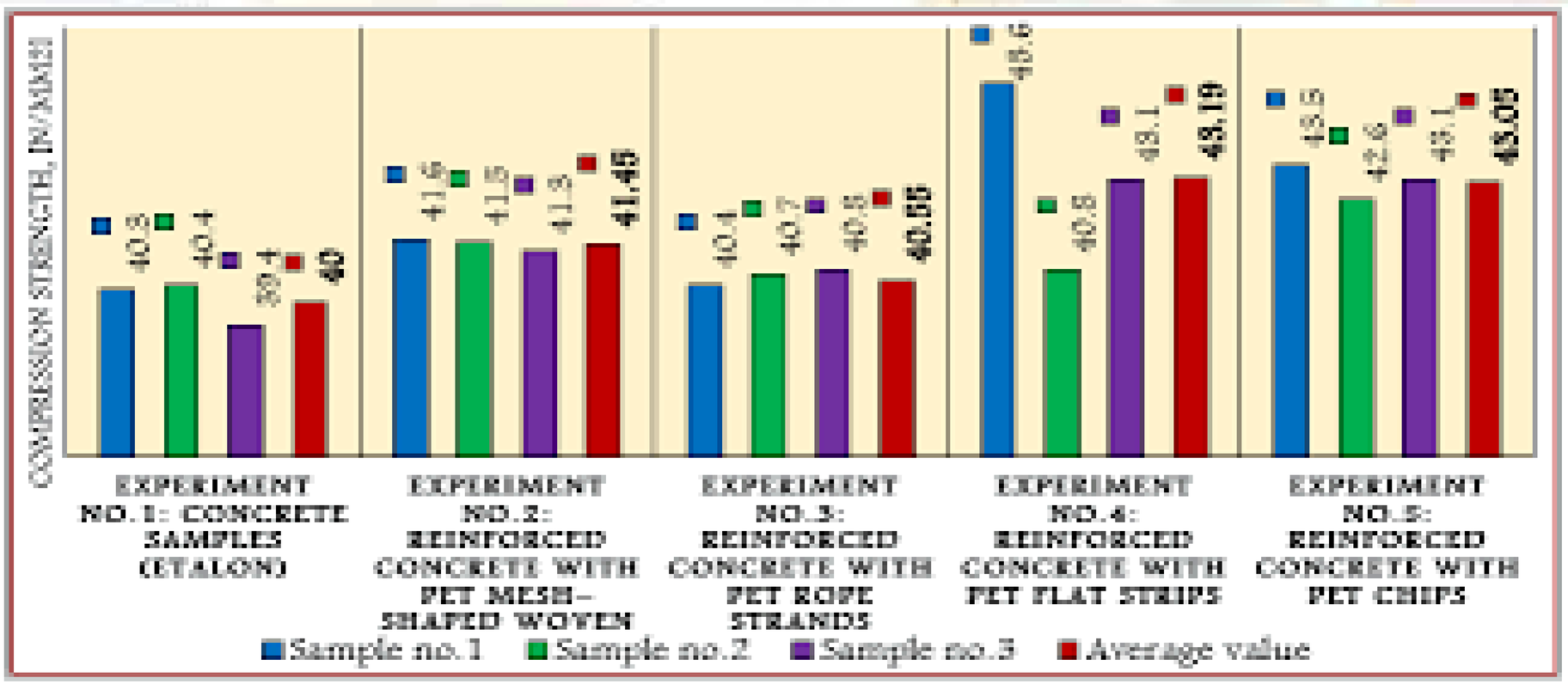
Research project

Andrei-Mihai BACIU, Imre KISS

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.





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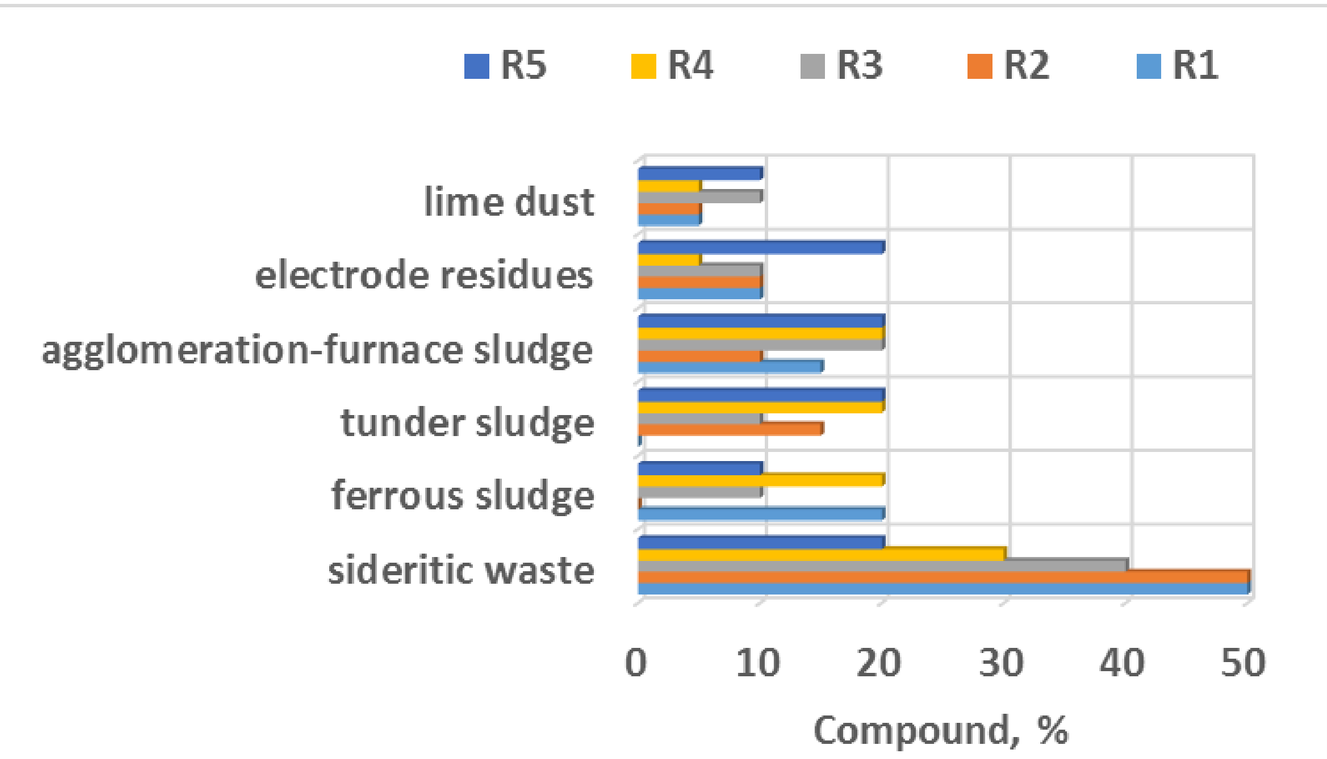
VALORIZATION OF POWDERY WASTE IN STEEL INDUSTRY

B

PhD Thesis

Authors: Adriana BOBORA, Ana SOCALICI

The steel industry is looking for sustainable solutions to produce high-quality steel while minimizing environmental impact. Steelmakers are exploring ways to maximize the use of waste or switch to new waste-based steelmaking processes. At the same time, the waste industry continues to invest in waste processing facilities to ensure the qualities and quantities of waste required by the steel industry.

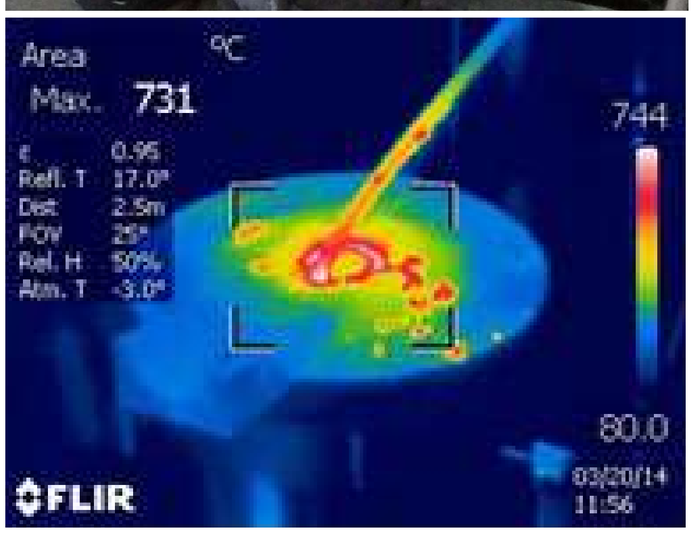












The use of dusty waste in the production of steel in the form of a Carbofer-type by-product used as a slag foaming agent represents the optimal technological solution for the recycling of this waste. Experiments in the laboratory phase have in mind the valorization of dusty waste through the Carbofer process with the obtaining of a powdery mechanical mixture. In the composition of the recipes were used: sideritic waste, agglomeration-furnace sludge, tunder sludge, ferrous sludge, electrode residues and lime dust. The processed materials contain the elements - Fe, C, Ca - useful for the processes taking place in the steel aggregates. The obtained product is used in steelmaking in the electric arc furnace as a slag foaming agent. The applied procedure has the advantage of flexibility, it offers the possibility of choosing some recipes that may contain one or more powdery wastes.

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Institutul Naţional de Cercetare-Dezvoltare în Construcţii
Urbanism şi Dezvoltare Teritorială Durabilă URBAN-INCERC
INCD "URBAN-INCERC"

INNOVATIVE SUSTAINABLE SOLUTIONS TO SUPPORT THE IMPLEMENTATION OF EMERGING TECHNOLOGIES THROUGH THE DEVELOPMENT OF ADVANCED, ECO-SMART COMPOSITE MATERIALS

Research project PN 23 35 05 01

LĂZĂRESCU Adrian-Victor, CSAPAI Alexandra,
IONESCU Brăduţ-Alexandru, CHIRA Mihail, RUS Mircea-Iosif

B

Innovative sustainable solutions to implement emerging technologies with cross-cutting impact on local industries and the environment and to facilitate technology transfer through the development of advanced, eco-smart composite materials in the context of sustainable development of the built environment

2023 — O1

Formulation and conceptual demonstration of the functionality of the technological concept of the project (smart- eco-innovative geopolymer composite materials with self-cleaning capacity, enhanced resistance to microorganisms and valorising industrial waste/by-products) with establishment of the basic principles, highlighting, evaluation and prioritisation of factors influencing their production.

2024 — O2

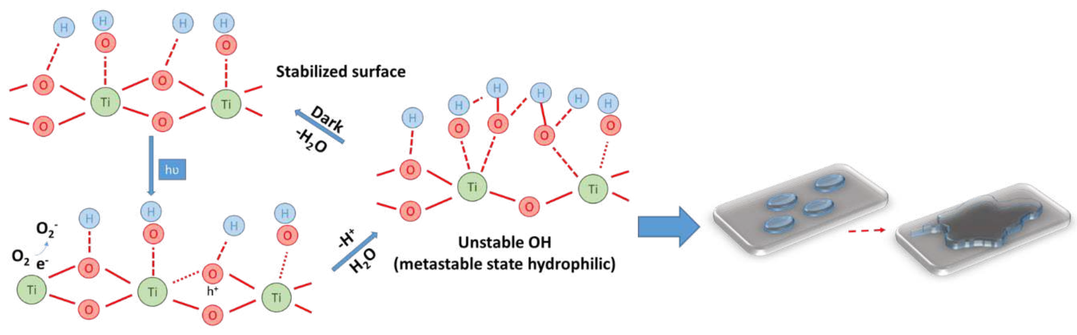
Demonstration of the functionality of the technological concept of the project to obtain geopolymer smart- eco-innovative composite materials with self-cleaning capacity, enhanced resistance to microorganisms and that valorise industrial wastes/by-products under conditions of adaptation to the national specificity of raw materials.

2025 — O3

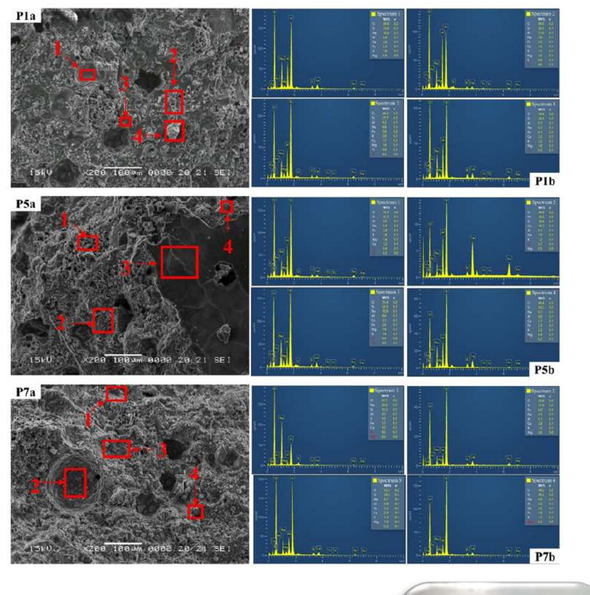
Compositional and functional optimization with validation under laboratory conditions of geopolymer smart- eco-innovative composite materials with self-cleaning capacity, enhanced resistance to microorganisms and valorising industrial wastes/by-products under conditions of adaptation to national raw material specificities.

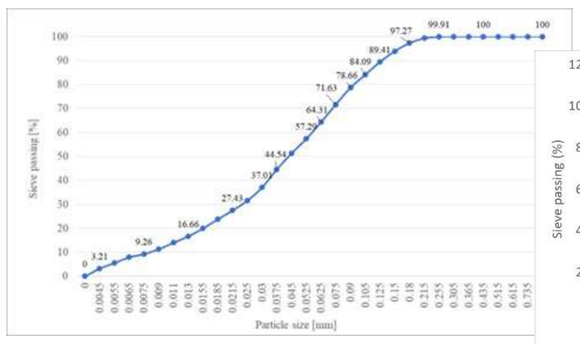
2026 — O4

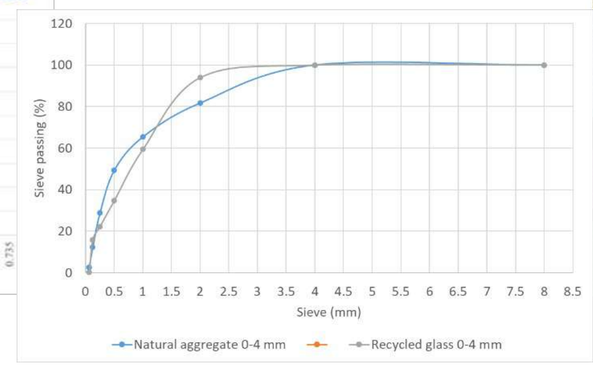
Development and validation of small prefabricated products made of smart eco-innovative geopolymer composite materials, with self-cleaning capacity, increased resistance to micro-organisms and that valorise industrial waste/by-products, in terms of functionality and compliance with the proposed field of use, in order to generate solutions that can be offered to the economic agent.

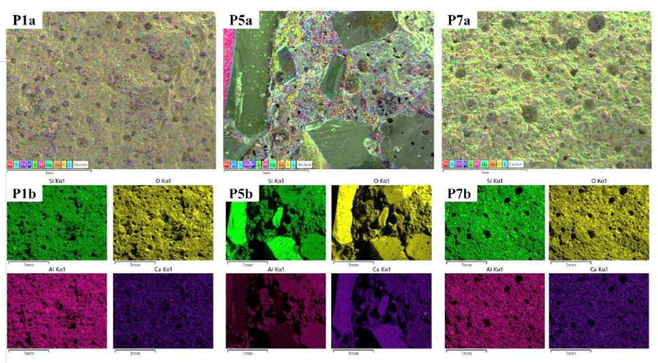








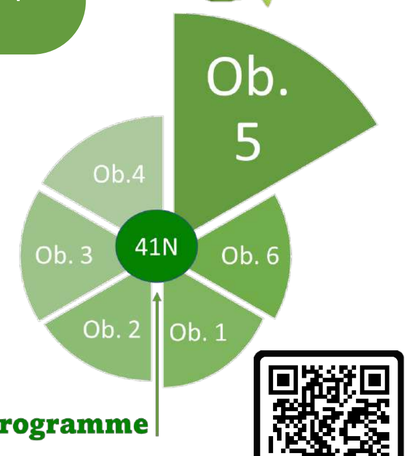






The novelty of the solutions proposed in the project derives on the one hand from the multi and transdisciplinary approach of a research field still in the avant-garde phase at the non-interaction level, and on the other hand from the ambitious design of the combination of two characteristics, one of the "smart" type - self-maintenance and self-cleaning capacity, and the other of the "eco-friendly" type - cement-free material with low environmental impact, obtained by alkaline activation of industrial wastes and by-products, and last but not least, by targeting high durability performance (especially in terms of resistance to microbiological corrosion), all with an impact both on increasing national skills and visibility and on creating the right framework for mobilising entrepreneurship towards innovation and providing products of excellence.

ACKNOWLEDGEMENTS:
This work was carried out within *Nucleu Programme* of the National Research Development and Innovation Plan 2022-2027, supported by the Romanian Ministry of Research, Innovation and Digitalization - MCID, "ECODIGICONS" project no. PN 23 35 05 01: "Innovative sustainable solutions to implement emerging technologies with cross-cutting impact on local industries and the environment, and to facilitate technology transfer through the development of advanced, eco-smart composite materials in the context of sustainable development of the built environment"



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THE INFLUENCE OF AGGREGATES ON THE PHYSICO-MECHANICAL PERFORMANCE OF ALKALI ACTIVATED FLY ASH GEOPOLYMER COMPOSITES

Research project PN 23 35 05 01

LĂZĂRESCU Adrian-Victor, HEGYI Andreea, CSAPAI Alexandra, POPA Florin

B

The aim of this study is to explore the effects of mixing different aggregates with an alkali activated fly ash geopolymer binder in composite materials. These aggregates are sourced from either recycled waste (glass waste, spent garnet) or quartz aggregates, each being characterized by a different granulation that influences the basic physico-mechanical properties of the material.



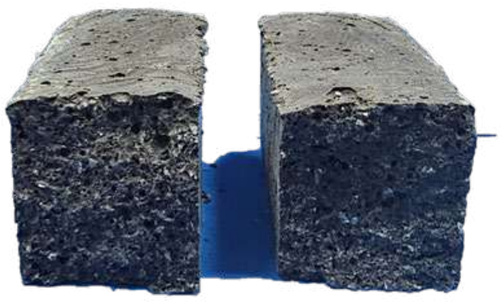
Geopolymerization





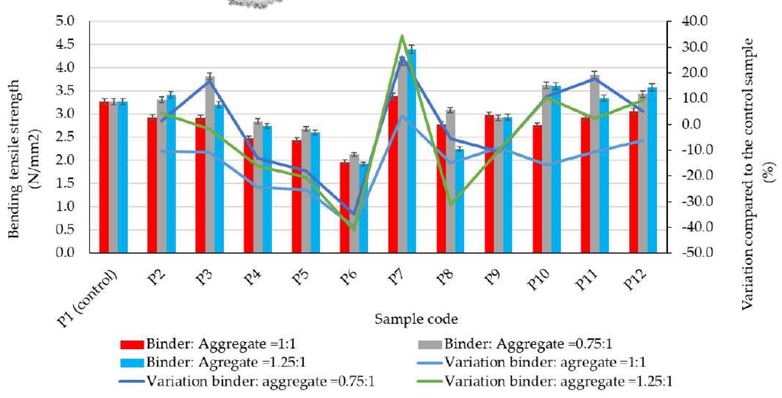
Standardized aggregates

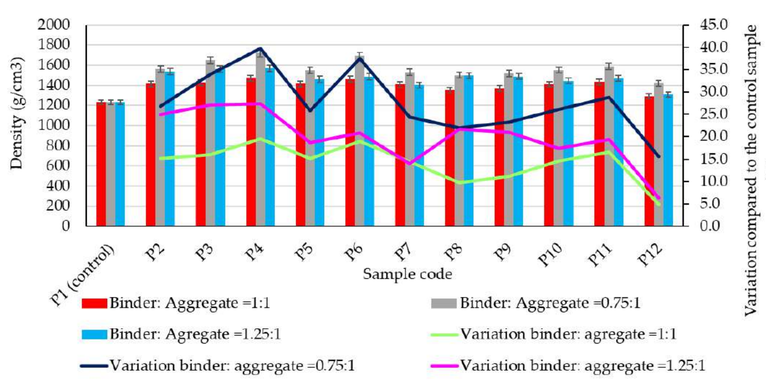
0/4 mm recycled glass

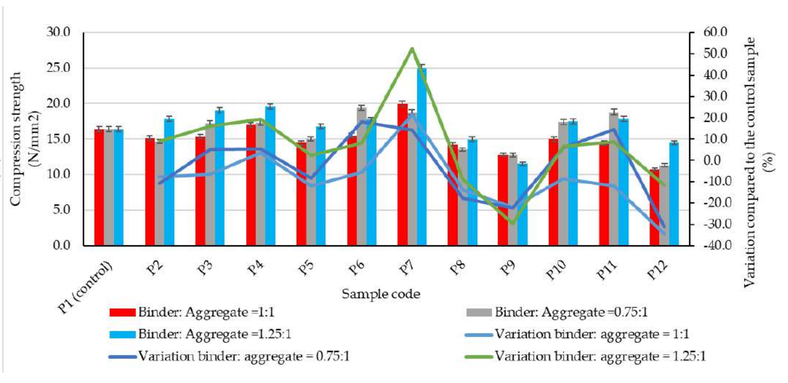


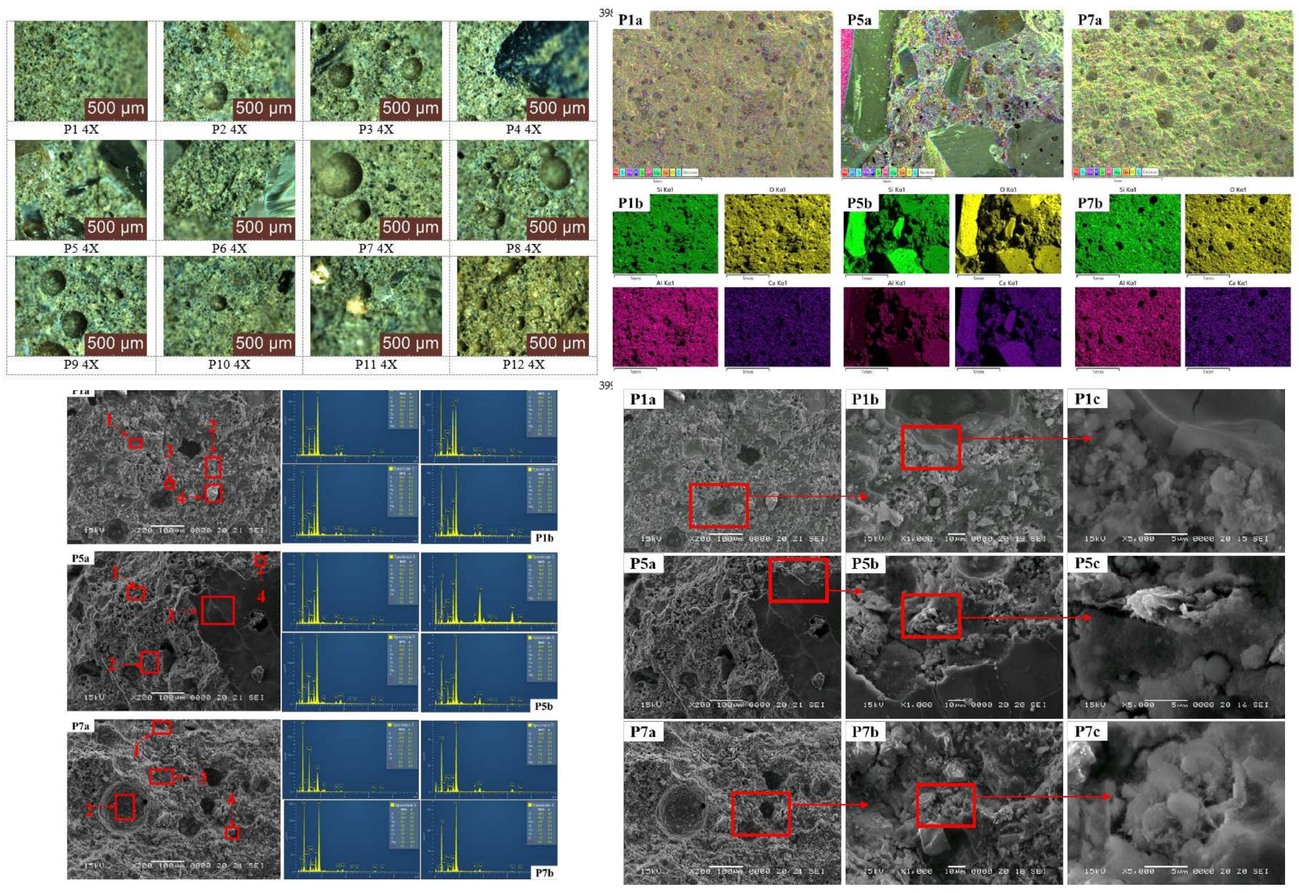


Micronized quartz









The results are supported by the structural and microstructural characterization of the samples by optical, SEM and EDS images. These images show a largely homogeneous distribution of Si, Na and Al in the geopolymer composites, and a relatively uniform distribution of macro and micro pores, therefore contributing to the physico-mechanical properties of the alkali-activated fly ash geopolymer composites.

ACKNOWLEDGEMENTS:
This work was carried out within *Nucleu Programme* of the National Research Development and Innovation Plan 2022-2027, supported by the Romanian Ministry of Research, Innovation and Digitalization - MCID, "ECODIGICONS" project no. PN 23 35 05 01: "Innovative sustainable solutions to implement emerging technologies with cross-cutting impact on local industries and the environment, and to facilitate technology transfer through the development of advanced, eco-smart composite materials in the context of sustainable development of the built environment"



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THE IMPACT OF ARTIFICIAL INTELLIGENCE IN THE CONSTRUCTION INDUSTRY

Research project PN 23 35 05 01

RUS Mircea-Iosif, AIVAZ Kamer Ainur

B

Artificial Intelligence (AI) is having a significant impact in the construction industry, bringing a number of important benefits and changes. Several ways in which AI is influencing the construction industry can be mentioned





1. **Design and planning optimization**-IA can be used to analyze data and generate predictive models to optimize construction projects. This can help identify the most efficient and economical design and construction planning solutions.

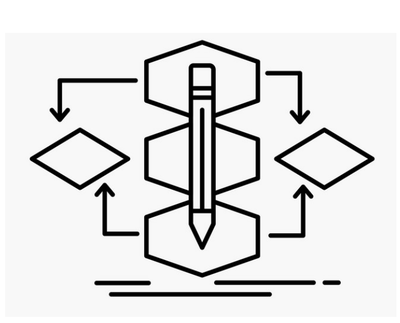
2. **Construction management and control** - AI systems can be used to manage and monitor construction projects in real time. This can involve analysing site data to identify potential problems or delays and propose preventive solutions.

3. **Construction automation**-IA can be used to automate certain construction processes, such as the erection of prefabricated structures or the use of robots for construction work. This can lead to a reduction in the time and costs associated with construction.

4. **Improving energy efficiency and sustainability**-Through data analysis and predictive simulations, AI can contribute to the design and construction of more energy-efficient and sustainable buildings, thereby reducing environmental impact.

5. **Improving site safety**-Using AI-powered monitoring systems can improve site safety by identifying and preventing potential hazards or risk situations

6. **Data analysis and decision making**-IA can help analyse and interpret the large volumes of data generated during construction, thus providing valuable information for more informed and effective decision making.







So, the use of AI in the construction industry brings with it certain risks and concerns that need to be considered during implementation. Some of the main risks associated with the use of AI in construction are the following





1. **Reliability of algorithms and models**-Algorithms and AI models can be susceptible to errors and inaccuracies, especially if they are trained on incomplete or inadequate data. Thus, there is a risk that decisions made based on these models may be incorrect or lead to unsound results in the construction.

2. **Data security**-Using AI often involves processing large volumes of sensitive data, such as design plans, materials data and financial information. This data can be at risk of unauthorised access or security compromise, which can have serious consequences for construction projects.

3. **Over-reliance on technology**-An over-reliance on AI systems in the construction process can lead to a lack of flexibility and increased vulnerability to technical problems or system failures. In addition, a lack of adequate human expertise to manage and interpret data can amplify these risks.

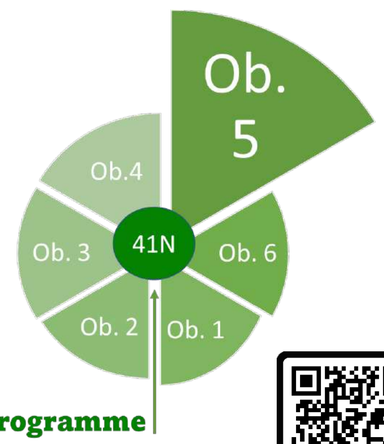
4. **Erosion of traditional jobs**-Automation and the use of robots in construction can lead to a reduction in the number of jobs available to human workers. This can have a negative impact on local communities and generate social and economic tensions.

5. **Legal and compliance issues** - The use of artificial intelligence in construction can raise legal and compliance issues related to liability for automated decisions, protection of personal data and other legal issues. It is important for organisations to ensure that they comply with relevant laws and regulations in this area.

6. **Resilience to cyber-attacks**-AI systems used in construction can be at risk of cyber-attacks and data manipulation. It is essential to implement appropriate Cyber Security measures to protect these systems against extreme threats.

To manage these risks it is crucial that construction companies take a proactive approach to data security, ethics and legal compliance, invest in staff training and promote a culture of transparency and accountability in the use of AI technologies in construction.

ACKNOWLEDGEMENTS:
This work was carried out within *Nucleu Programme* of the National Research Development and Innovation Plan 2022-2027, supported by the Romanian Ministry of Research, Innovation and Digitalization - MCID, "ECODIGICONS" project no. PN 23 35 05 01: "Innovative sustainable solutions to implement emerging technologies with cross-cutting impact on local industries and the environment, and to facilitate technology transfer through the development of advanced, eco-smart composite materials in the context of sustainable development of the built environment"



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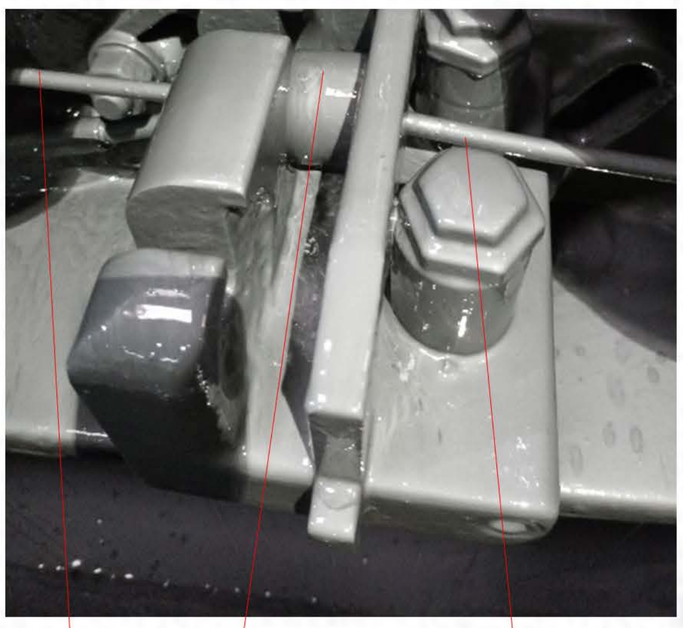
Ultrasonic activation of the molds used for wire drawing in order to reduce the frictional forces and obtain substantial reductions of the fabrication energy

Gheorghe Marilena, Nițoi Dan Florin, Chivu Oana Roxana, Borda Claudia, Crangureanu Anda

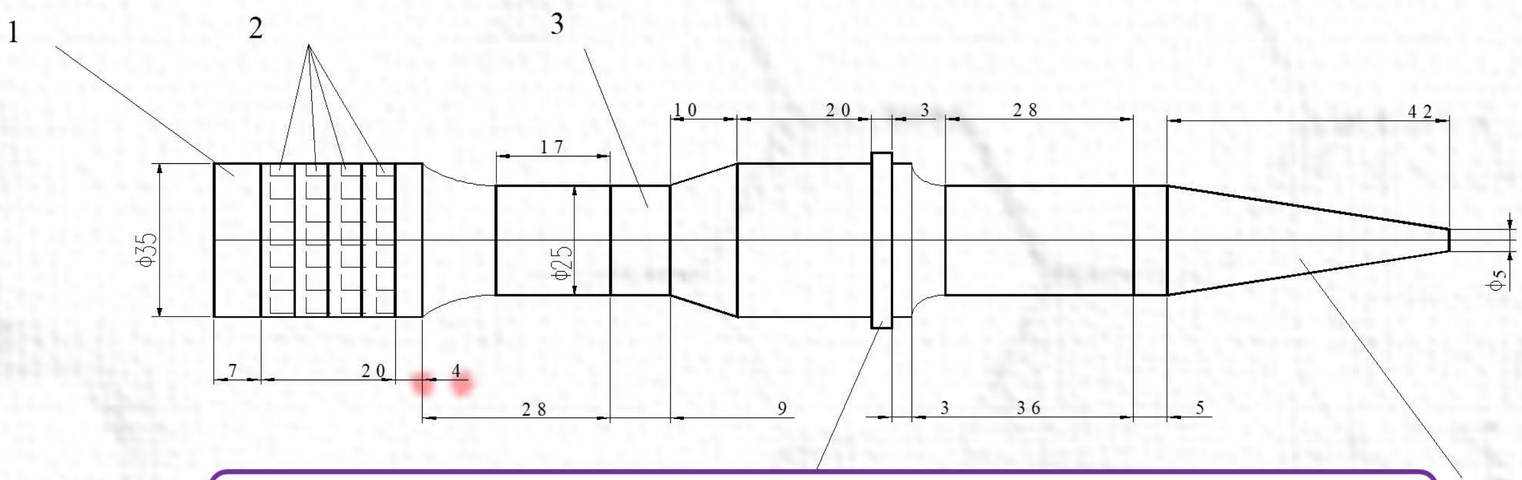
GNAC ARUT 2023 nr. 109/04. 12. 2023

B

Metal wire drawing and optical fiber drawing are in an exponential evolution taking into account the transition to green energy where the recording of wind farms, photovoltaic farms and the transport of electricity become critical especially since all of these are arranged in certain favorable geographical areas and the electricity obtained must transported. The presented project proposes the ultrasonic activation of the metal molds used for drawing by putting them in contact with the concentrator of an ultrasonic system. As is known, the production of vibrations with the amplitude of about 0.1 mμ is sufficient for the significant reduction of friction. According to studies, an amplitude between 20...60 nm leads to a drastic decrease in frictional forces, by approximately 30...40%, at vibration frequencies in the range of 40...70 Khz.



Starting from this well-known process, the ultrasonic activation of the mold 2 is followed, through which the semi-finished product 1 passes, resulting in the finished product 3. Thus, the energy consumption resulting from the substantial reduction of the frictional force should decrease by approximately 30%.



Design of the ultrasonic transducer



Wire drawing mold



Realization of the ultrasonic transducer



Ultrasonic generator

The transition to renewable, green energy requires special scientific and financial efforts in many areas of social life. The problem of the energy consumed in the industry is extremely important, especially now that the focus is extremely much on the objectives of Sustainable Development where the classical type of energy must be drastically reduced. In this sense, Objective no. 7 "Clean energy at affordable prices" and Objective 12 "Responsible consumption and production" which specifically calls for the reduction of energy consumption are very important.

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B

Innovative use of sheep wool and polyurethane foam for obtaining materials with sound-absorbing properties

Patent OSIM no.: RO136050- B1/30.05.2024

Author/s: Ovidiu NEMEȘ, Simona Ioana BORLEA (MUREȘAN), Ancuța-elena TIUC, Gyorgy DEAK

Short presentation:

The aim of this work was to obtain materials with sound-absorbing properties using sheep wool and rigid bicomponent polyurethane foam. Four materials with three layers were obtained. A layer of sheep wool previously processed by hot pressing at 80°C and 5 MPa, with final thicknesses of 2, 4, 6 and 12 mm; a layer of polyurethane foam, with a thickness of 8....37 mm and a transition layer, 1...20 mm thick, resulting from the migration of polyurethane foam during the multilayer panel manufacturing process into the wool layer and/or the migration of wool into the polyurethane foam layer. Wool and polyurethane foam are the combination of sound insulation and sound absorption - wool absorbs sound and reduces it, and due to the rigid structure of polyurethane foam (closed pore structure), it does not allow sound to travel further, resulting in sound insulation.

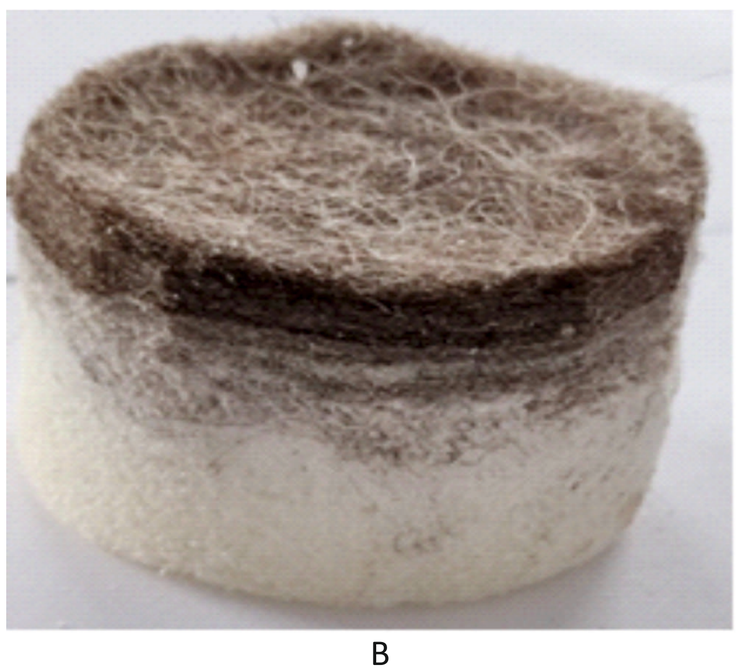
The obtained materials have very good sound absorption properties with acoustic absorption coefficient values over 0.7 for the frequency range 800 ÷ 3150 Hz; the results prove that the sheep wool has a comparable sound absorption performance to that of mineral wool.

Applicability:

The study explores alternative usage of sheep wool as a construction material with improved sound absorbing properties beyond its traditional application as a sound absorber in textile industry or using of waste wool in the textile industry as a raw material. Sound absorbing materials can be used to reduce noise and to obtain an adequate acoustic for enclosed spaces. They can have many uses, both outdoors and indoors: in industry, commercial areas, relaxation and leisure areas, in areas used for education, in constructions, on building sites, highways, roads and streets, airports, ports, railways, etc. Materials studied in this research can be used to reduce noise impact, as decorative panels with sound absorbing role, to improve acoustic conditions, and to reduce or stop reverberations.



A



B

Fig. 1. Processing phases: A: Phase I - Wool plate hot formed and B: Phase II – Finale structure of the plate

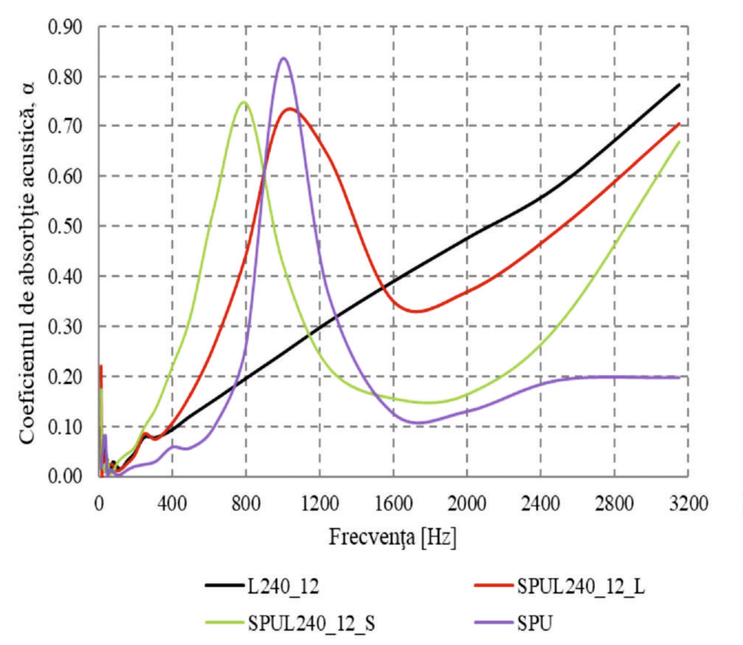


Fig. 2. Variation in the acoustic absorption coefficient with frequency for multi-layer materials in comparison with rigid polyurethane foam (SPU) and the layer made of pressed sheep's wool (L240_12).

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Method for making supports to be used in selective laser melting by differential scanning

B

Patent OSIM no.: RO134105- B1/ 30.06.2023

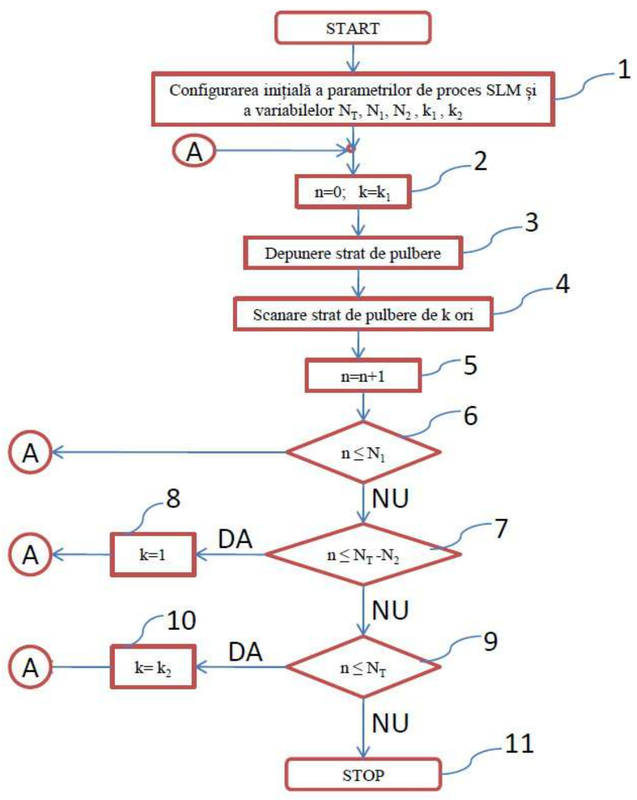
Authors: COSMA Sorin Cosmin; BÂLC Nicolae Octavian;
POPAN Alina Ioana; HENDEA Radu Emil

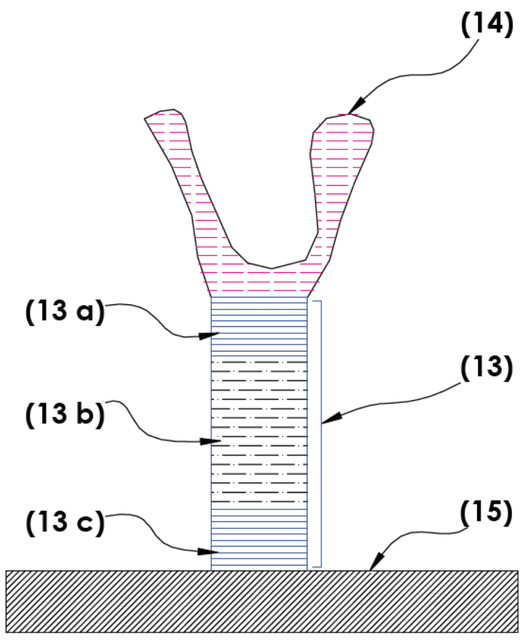
Shorttipresentation:ti

The invention relates to a method for making supports to be used in selective laser melting (SLM) by differential scanning, more exactly to anchor the parts during the SLM process. The purpose is to improve the quality of support structures by having be er adhesion with SLM platform and fabricated parts.
Details can be seen in Figure 1 and Figure 2. According to the invention, the method comprises the stages of initialization of process parameters corresponding to the scanning of the lower zone of the supports, material deposition layer-by-layer and laser scanning of 2D sections of the support for consolidation purposes, the support (13) being divided into a lower zone (13a) which is the contact zone with a working platform (15), an upper zone (13c) on which the piece (14) is fixed and a medial zone (13 b), where the scanning of the support (13) is differentiated on the three zones (13a, 13b, 13c).
By applying the invention, the following advantages are obtained:
- The possibility to increase the adhesion of the supports with working platform of the SLM equipment and with fabricated part;
- Obtaining supports with different micro-structure by multiple laser scanning in the lower, middle, and upper area of them;
- The invention uses existing additive technology, and it can be integrated in existing SLM systems;
- There is no limit to the complexity of the support shape, this manufacturing method can be applied to any model;
- Improved physical-mechanical characteristics of supports by multiple laser scanning of specific sections;
- Avoiding cracks and other defects in the lower and upper areas of the supports.

Applicability:

The invention relates to a method of manufacturing supports used to anchor parts during their processing by selective laser melting (SLM). The method is intended for Additive Manufacturing (AM) technologies that use powdered materials and lasers for melting and adhesion of particles.





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B

PVA fiber reinforced cementitious composite with fly ash as a replacement for natural aggregate and process of obtaining

Patent application OSIM no.: A/00832/13.12.2023

Author/s: NEGRUȚIU Camelia Maria, ȘOȘA Pavel Ioan, CÂMPIAN Cristina Mihaela, POP Maria Ileana

Short presentation:

This invention relates to the composition and process of obtaining a fiber reinforced cementitious composite with 2% Polyvinyl Alcohol (PVA) fibers and fly ash as a substitute for natural aggregates. The innovative approach involves a complete substitution of aggregates typical in conventional concrete with waste from thermal power plants, such as fly ash. The result is a novel eco-friendly material with compressive and tensile strengths comparable to traditional concrete but marked by significant improvements in deformability properties.

The unique properties of this material make it ideal for applications requiring increased durability, seismic resistance, and the ability to absorb energy. By incorporating fly ash as a complete replacement for natural aggregates, the material brings advantages such as reduced volumetric weight, diminished hydration heat, and lower production costs while safeguarding the environment and preserving natural resources.

Applicability:

PVA fiber reinforced cementitious composite with fly ash as a replacement for natural aggregate can be applied in ductile and durable construction components such as beams, columns, and slabs, as well as in infrastructure elements like bridges and pavements. The versatility of this composite positions it as a promising solution for sustainable construction practices, offering a balance between enhanced performance and environmental responsibility.

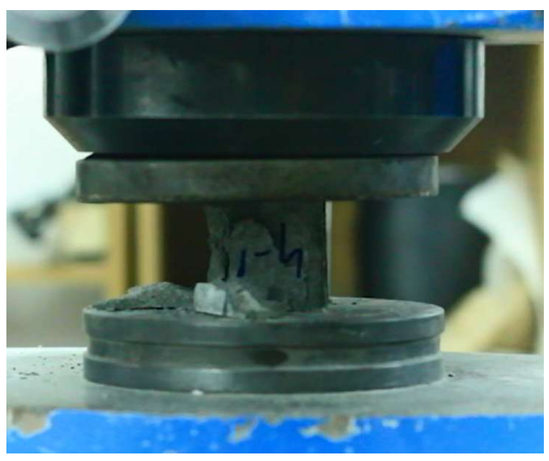


Figure 1. Visual aspects during compression testing of PVA fiber reinforced cementitious composite



Figure 2. Visual aspects of the cross-section fiber distribution of PVA fiber reinforced cementitious composite

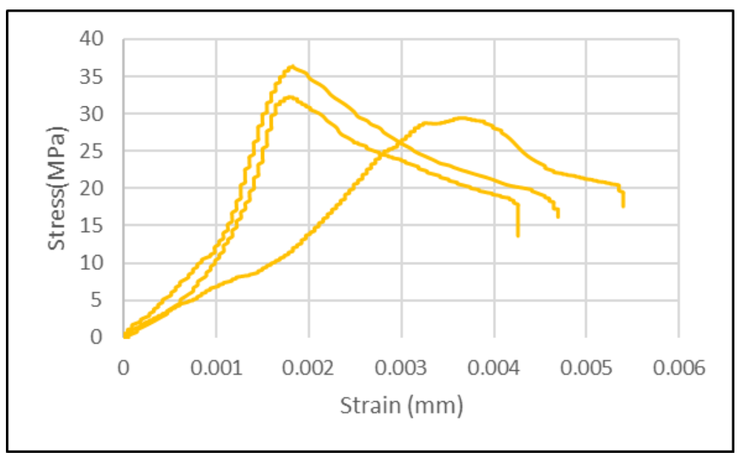


Figure 3. Stress-strain curve in compression of PVA fiber reinforced cementitious composite



Figure 4. Lucrability of PVA fiber reinforced cementitious composite

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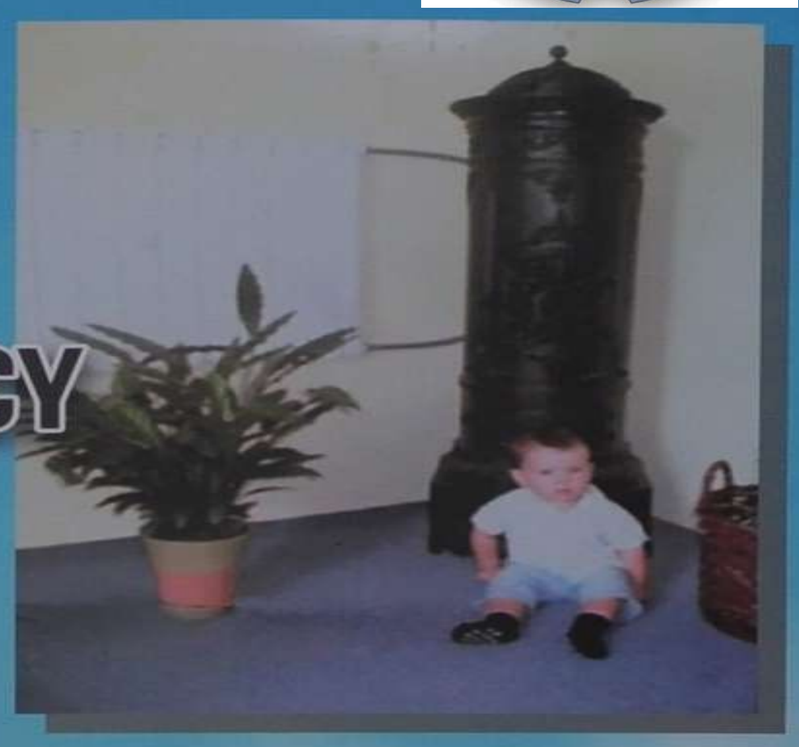
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Author:
Lajos Vásárhelyi





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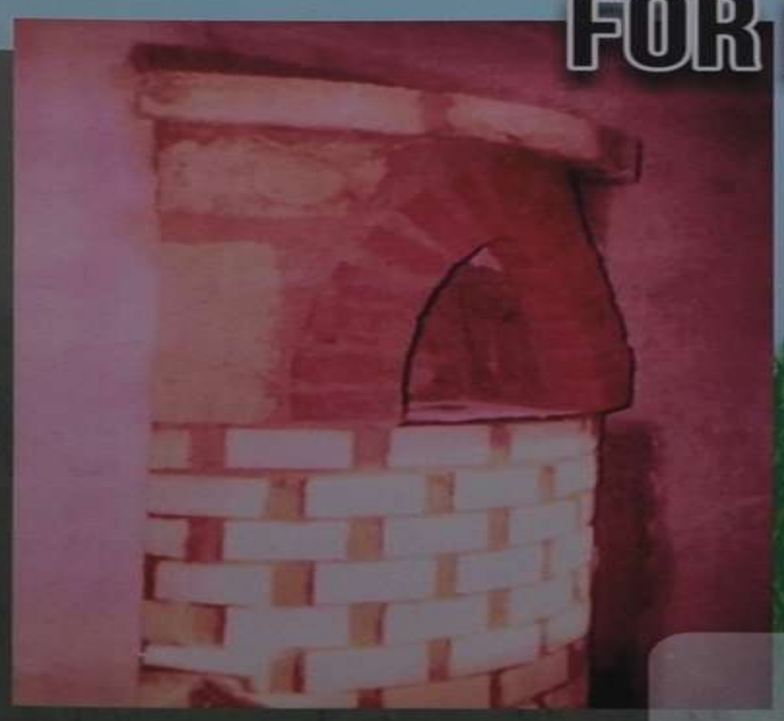
3 IN 1
STOVE &
CENTRAL HEATING &
WATER HEATER

B

ECONOMICAL

STORE THE HEAT
UP TO 6 HOURS

FOR MASS PRODUCTION





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B

Automatic line and thermoforming process of the parts from thermoplastic composite material

Patent application OSIM no.: A/00574/18.10.2023

Author/s: Cornel CIUPAN, Mihai CIUPAN, Ioan FILIP, Emilia CIUPAN

Short presentation:

The invention refers to an automatic thermoforming line for parts made of thermoplastic composite materials reinforced with plant fibers.

The line consists of a heating system 1 formed by a conduction heating zone 1a where two strips 9a and 9b of composite material are heated in parallel by pressing between the plates of a hot press and a roller heating zone 1b.

The material is kept in the hot press for a time t1, after which it passes through the hot rollers 6 in the second zone forming a single strip 9 which is further heated by conduction and convection for a time t2, until the thermoplastic matrix melts. The strip of plasticized material passes from the heating zone to the forming zone with cold rollers 2, resulting in a profiled board 10.

The thermoforming process consists of the following phases:

a. Supplying the line with two strips of material 9a and 9b which enter zone 1a between the plates of the hot press, the plates being 10-30 C above the melting temperature of the thermoplastic matrix.

b. Pressing strips 9a and 9b on one side and on the other of fixed plate 3 with the help of the moving plates 4 and 5, and holding them for a time t1 necessary for the superficial layers of the material to plasticize in order to avoid the expansion and wrinkling of the material.

c. Opening moving plates 4 and 5 of the hot press and advancing strips 9a and 9b by a step p in the area 1b where they overlap and are pressed between two rollers 6a and form a single strip 9, which is further heated by conduction and by convection.

d. Advancing of strip 9 by a step p in the forming and cooling system 2 where a pre-forming and calibration of the board takes place.

Applicability:

Profiled boards for the support structure of upholstered furniture or panels for other pieces of furniture, automotive panels and insulating panels for construction.

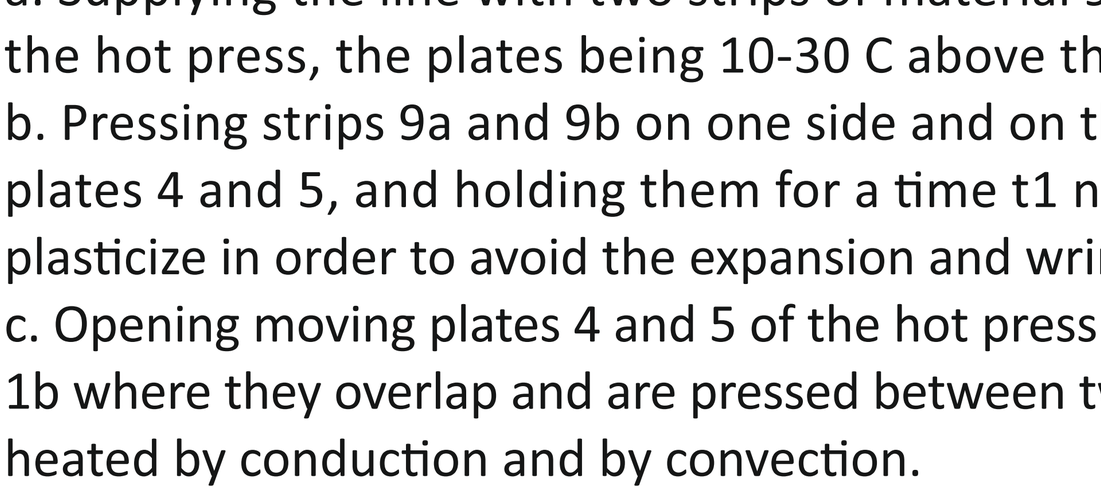


Figure 1

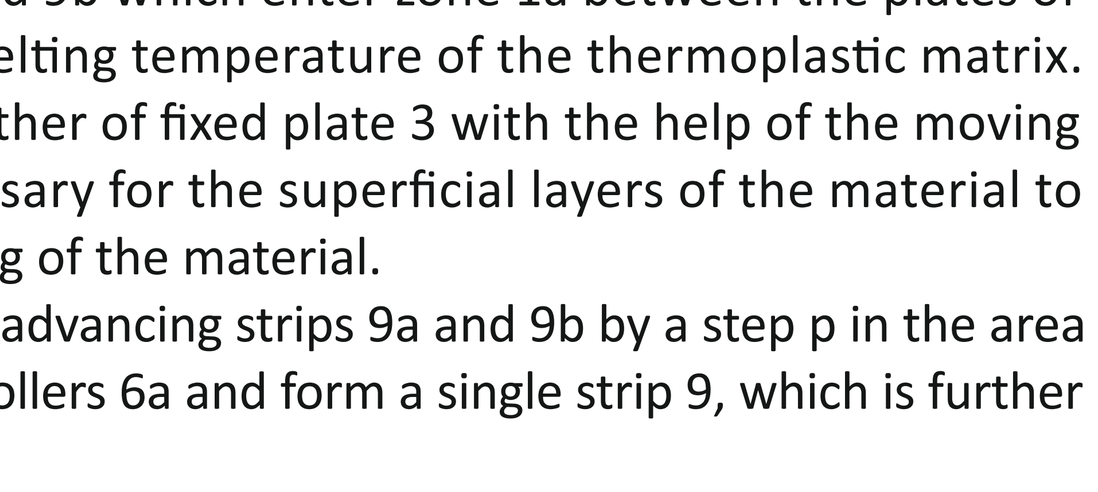


Figure 2

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Continuous thermoforming line for profiled boards

B

Patent application OSIM no.: A/00575/18.10.2023

Author/s: Cornel CIUPAN, Mihai CIUPAN, Ioan FILIP, Emilia CIUPAN

Short presentation:

The invention refers to an automatic thermoforming line for parts made of thermoplastic composite materials consisting of a reinforcing element (hemp fibers, flax, willow, poplar etc.) and a thermoplastic matrix (polypropylene).

The line consists of a material feeding system in the form of two strips of fibrous layer 2a and 2b, a heating furnace 3 with two successions of rollers 7 and 8 that lead the strips of material in separate zig-zag paths, and finally, at the terminal part of the furnace, the strips come together in a single strip 2 with the help of two pairs of rollers 8c and pass into the forming system with rollers in order to obtain a profiled board 10.

The final profile of board 10 is obtained by rolling with the help of forming rollers 9 and 11 and calibrating rollers 12. After calibration, profiled board 10 advances on to table 13 where it is cut to size.

Oven 2 has mixed heating by contact with hot rollers 7 and 8, by radiation with infrared lamps and by convection with hot air currents.

The material advances continuously and the feed rate is set according to the time required for the material to plasticize sufficiently while traveling through the heating path.

The invention offers the following advantages:

·simple technological solution with a small footprint;

·high productivity due to the continuous advance;

·superior efficiency due to the reduced dimensions of the furnace and the minimization of energy losses.

Applicability:

Profiled boards for the support structure of upholstered furniture or panels for other pieces of furniture, automotive panels and insulating panels for construction.

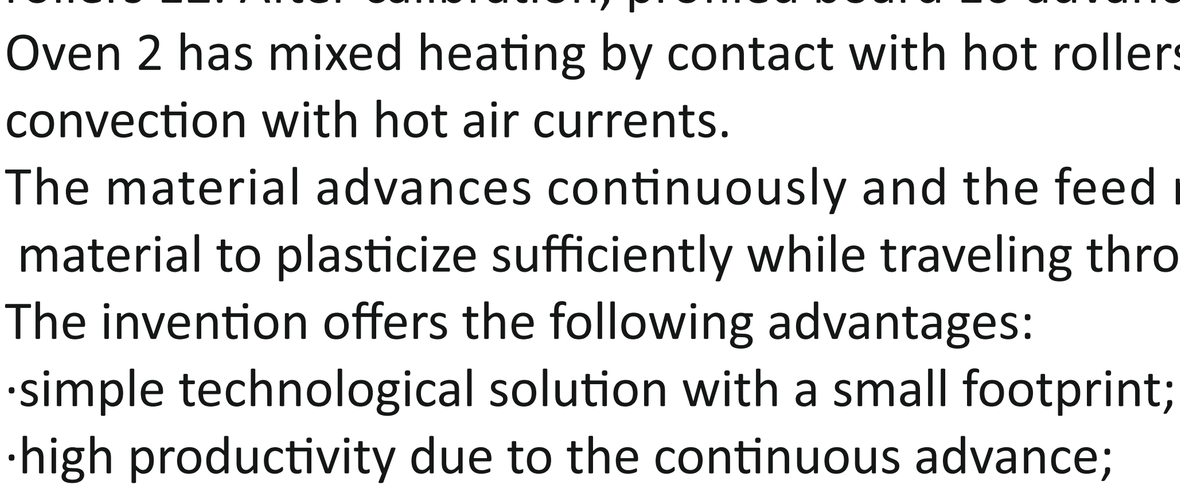


Figure 1

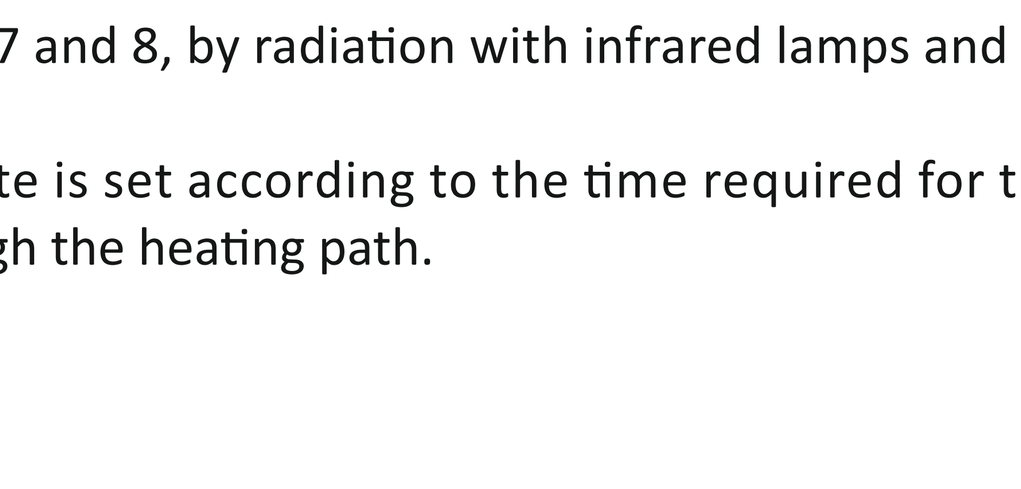


Figure 2

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C

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Electronics

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TÜV PROFI CERT ISO 9001
ZERTIFIKAT-NR 73 100 3168

PROCESS FOR OBTAINING SPATIAL FORMATIONS MADE OF CARBON ATOMS OF THE FULLERENE TYPE BY ELECTRICAL IMPULSE DISCHARGES IN UNDEREXCITATION MODE, USING PYROLYTIC GRAPHITE CATHODE

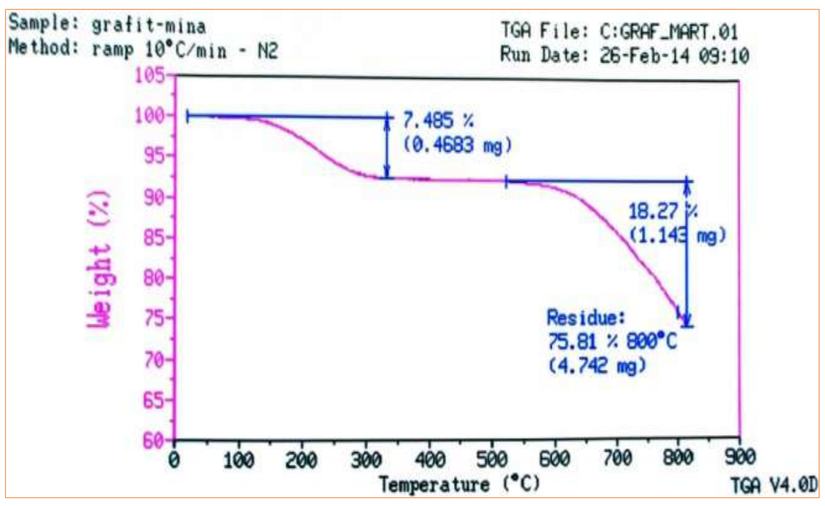
Patent nr. 133558/09.02.2018

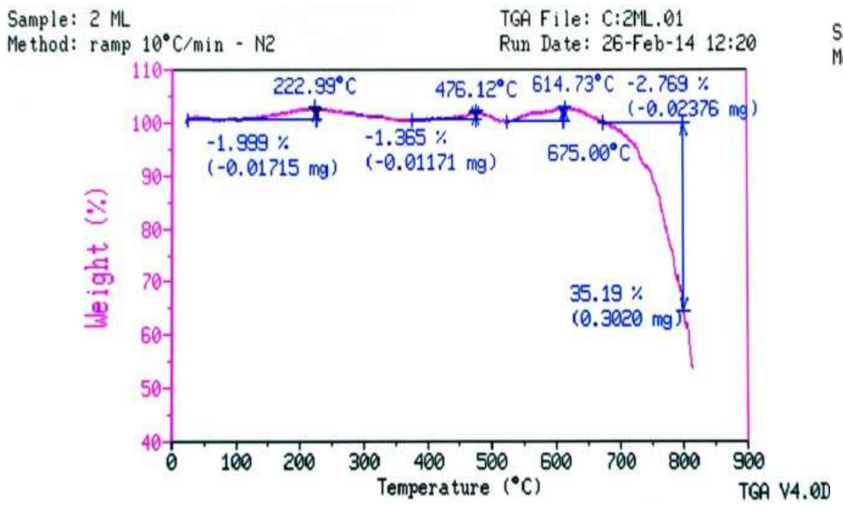
Author: Dr. Ing. Laurentiu MARIN

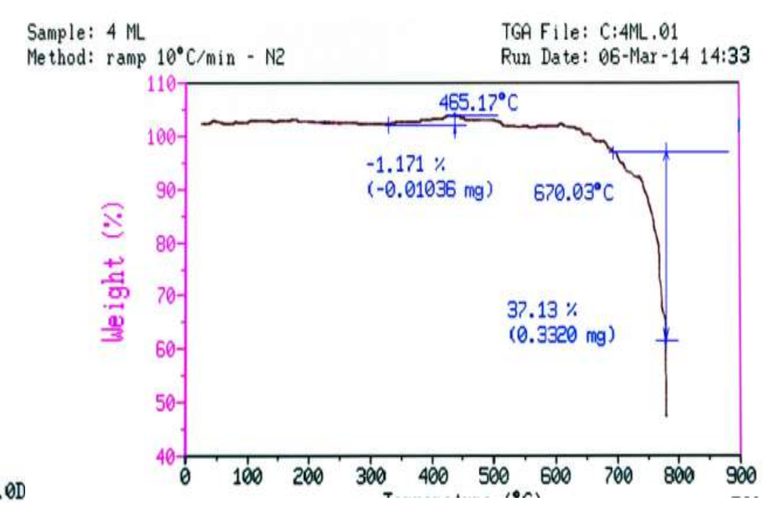
C

TheTGA for pyrolytic graphite (reference sample) of which the electrode is fabricated. A loss of mass of about 7,485 % is observed – in the range 150 – 300 ° C. This loss of mass represents the image of bonding material of the electrode degradation (bitumen). In the range 300 – 600 ° C a high termical stability for a graphite is revealed. The graphite termical degradation starts around 650 ° C. Following the thermo-gravimetric analysis the addition of mass in significant values, 1,365-2.769 %. were found although thermogravimetric analysis was conducted under nitrogen atmosphere.

As compared, the study of the graphite samples collected from the electrode does not present this phenomenon. The additions of mass takes place at elevated temperatures and have the following values 222, 99 Cº (1,99 %), 476,12 Cº (1,365 %), 614,73 Cº (2,769 %). The metal plates on whose surface a graphite pellicle was deposited. submitted to an electron microscopic analysis SEM, revealed a number of regular globular formations which are not part of graphite film. This observation corroborated with thermo-gravimetric analysis results, leads to the conclusion that the procedure for obtaining the graphite film also conduct to the obtaining of spatial formation composed of carbon atoms type fullerenes, able to incorporate in a reversible process small molecules (N2, HOH)

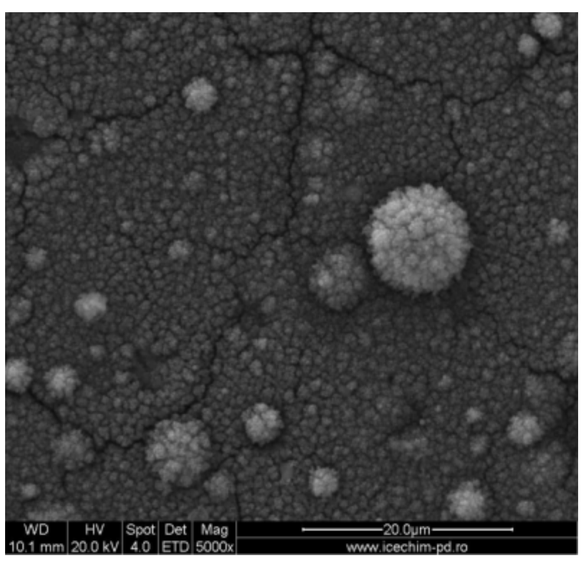


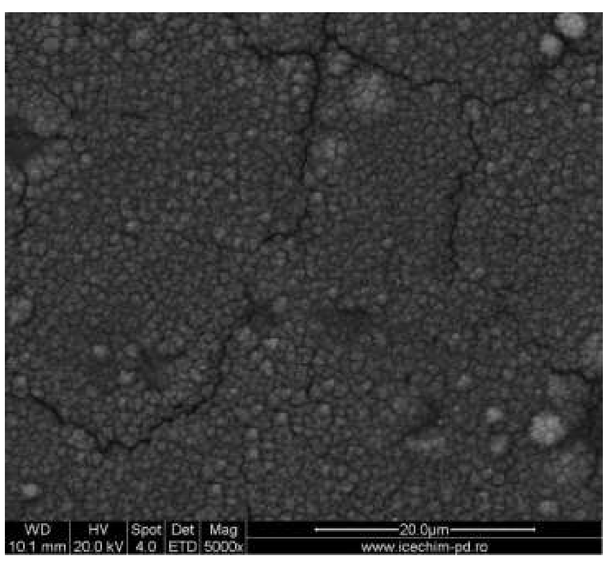


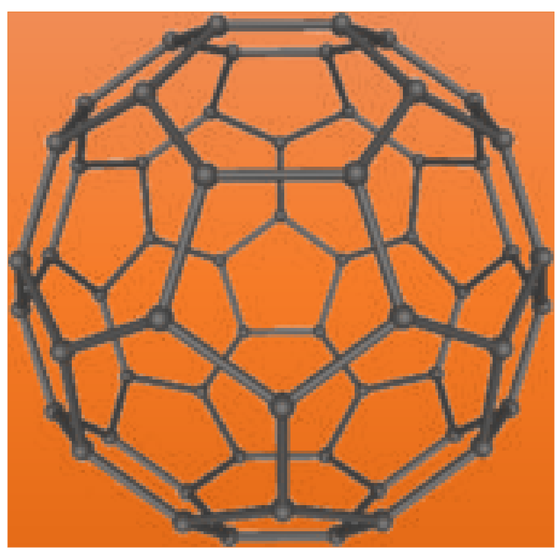


The TGA and SEM image for layed graphite on electrical discharges in pulse procedure EDI
In the ranges of temperature about 100-300º (with a peak at 222.99 ºC), 350-550 (with a peak at 476.12 ºC), si 550-675 ºC a peak at 614.73 ºc), quite high percentage of mass aditions occuring (2%) This fact denote a phenomenon of matter adsorption from trying envinronmentde (N2). Is also ascertained the existence of some globular formations.

The TGA and SEM image for layed graphite on electrical discharges in pulse procedure EDI after its treatment with ά Cl naphthalene. It has been observed that the points where occurs addition of mass have decreased. It is considered that ά Cl naphthalene removed a part of din chemical species responsible the mass adition.







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NATIONAL SECURITY RESEARCH-DEVELOPMENT INSTITUTEMINING AND EXPLOSIVE PROTECTION – INSEMEX PETROSANI
ROMANIA

INTEGRATED SYSTEM FOR SIMULTANEOUS MEASUREMENT OF PROPAGATION OF THE FLAME FRONT AND THE PRESSURE WAVE, IN THE CASE OF EXPLOSIONS

C

Patent no. BI 131464/2021

Authors:

Emilian Ghicioi, George Artur Găman, Lupu Constantin, Sorin Burian, Mihaela Părăian, Maria Prodan, Dan Sorin Gabor, Vlad Păsculescu, Nicolae Vlasin, Andrei Szollosi – Mota, Marius Şuvar, Irina Vasilica Nălboc

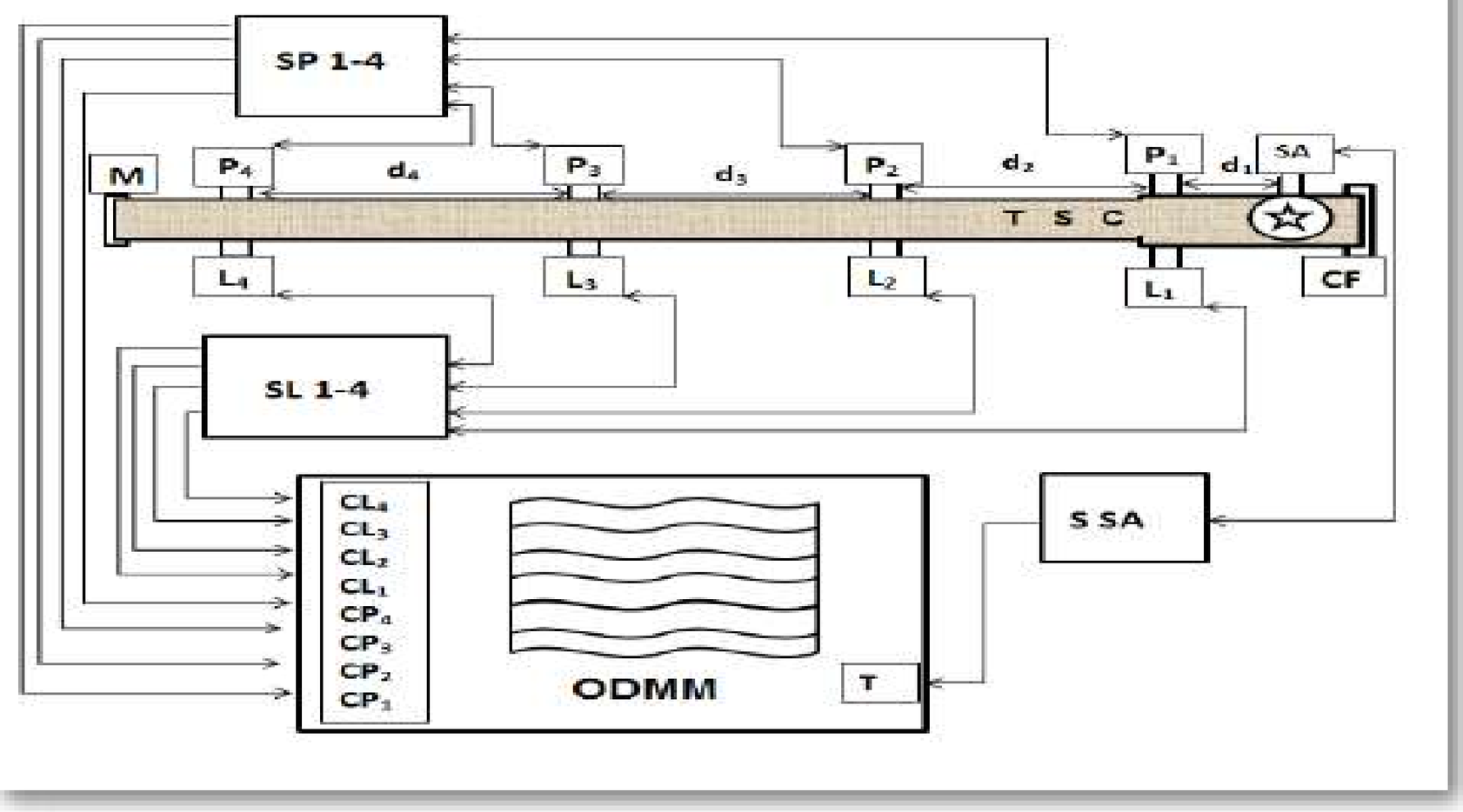
The invention relates to an integrated system for simultaneous measurement of flame front propagation and pressure wave velocities in case of air-flammable gas explosions triggered in the cylindrical shock tube, equipped with optical and pressure transducers, to study their behavior depending on the concentration, on the ignition sources and the propagation distance, respectively for establishing the deflagration or detonation characteristics.

The system consists of an assembly of optical transducers (L1,L2,L3,L4), which can also include the infrared spectrum-NIR, and pressure transducers (P1,P2,P3,P4). The sesensors are placed on a cylindrical shock tube (TSC) made of steel of at least 10 m length, at certain distances (d1,d2,d3,d4) from the ignition source (SA), fed from a source (SSA), which initiates the flammable air-gas explosion. The sensors are powered by dedicated sources (SP1-4,SL1-4,) and provide signals that are useful for simultaneous recording of both phenomena (pressure wave and flame front). The recordings are made using a multichannel digital oscilloscope with memory, with at least four channels for optical sensors(CL1,CL2,CL3,CL4) and four channels for pressure sensors (CP1,CP2,CP3,CP4), of which triggering (T) is commanded by the initiation of the explosion from the ignition source.

By knowing these propagation velocities of the flame front and pressure wave, it is possible to accurately characterize the behavior of explosions as a function of the concentration value, the type of initiating source, and the propagation distance, i. e. to determine the character of the explosion: deflagration (subsonic propagation velocities and the pressure wave is ahead of the flame front) or detonation (super sonic propagation velocities and the flame front is in phase with the pressure wave).



Fig. no. 1. Integrated system for simultaneous measurement of flame front and pressure wave propagation velocities of air-gas explosions in the shock tube



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NATIONAL SECURITY RESEARCH-DEVELOPMENT INSTITUTEMINING AND EXPLOSIVE PROTECTION – INSEMEX PETROSANI
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TEST BENCH FOR IMAGERY RESEARCH OF GAS EXPLOSIONS

Patent no. BI 131735/2023

Authors:

Vlasin Nicolae, Găman George Artur, Ghicioi Emilian, Lupu Constantin
Păsculescu Vlad, Pupăzan Gheorghe Daniel, Prodan Maria , Călămar Angelica Nicoleta
Cioclea Doru, Nălboc Irina, Șuvar Marius, Florea Gheorghe-Daniel

C

Knowing the evolution of the flame front of the explosion, from the initiation, along the path of the

transparent explosion chamber, to the exhaust of the combustion gases into the atmosphere, as well as the pressures developed by the explosion, provides extremely useful information for researching explosion phenomena, for understanding the mechanisms of their ignition and propagation in controlled environments (at various gas concentrations, in quiescent or turbulent state of the explosive mixture), as well as for calibrating computer simulations of flammable gas explosions

The invention refers to a stand for the imaging research of explosions of flammable air gas mixtures, which allows recording the phenomena of ignition and evolution of combustion (development of the flame front) with the help of a high speed camera (more than 30000 frames per second) The system uses a transparent parallelepiped explosion chamber, interspersed in a special montage of planar mirrors, mechanically deformed in a controlled horizontal and vertical plane, respectively, to obtain the focal distances required for the use of the Schlieren technique The system uses a cylindrical incandescent light source, internal pressures are monitored, and the explosion is initiated by an electrical spark (inductive or capacitive)

The advantages of using the stand are as follows

- ensures the complete imaging research of gas explosions, from the ignition initiation phase, during the evolution of combustion, until the exhaust in the atmosphere
- easy achievement of optical effects similar to fixed parabolic mirrors, by using plane mirrors, deformable mechanically controlled, with the possibility of adjusting the focal distances
- the use of a cylindrical light source with filament, with the possibility of adjusting the light intensity by means of an autotransformer, for the visualization of the Schlieren effect at speeds higher than 30000 frames per second of the video camera
- monitoring the pressure developed by the explosion



Fig. 1. Stand for the imaging research of explosions

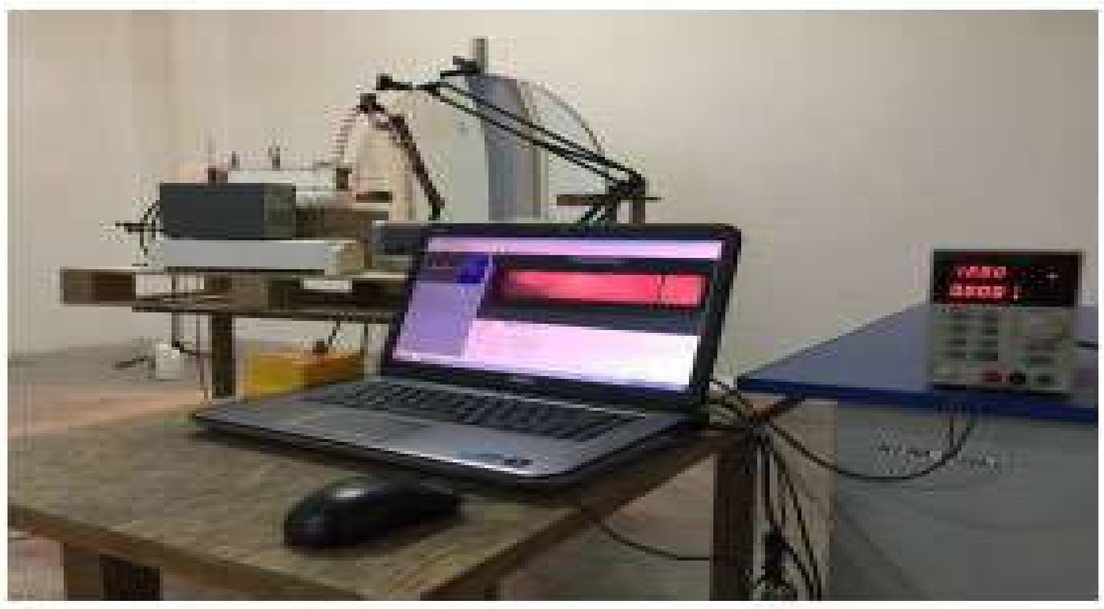


Fig. 2. Recording the explosion parameters

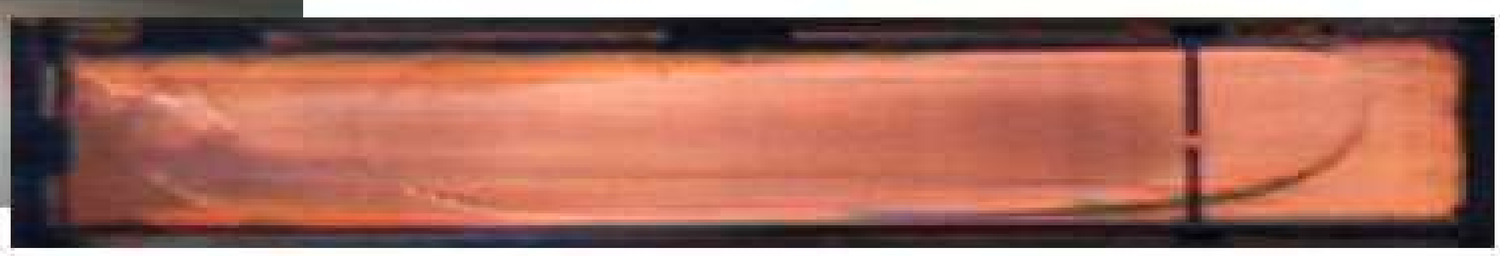


Fig. 3. Image of the flame front, obtained by using the stand

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STAND FOR DETERMINING REACTION PRODUCTS GENERATED BY SOLID COMBUSTIBLE MATERIALS

Patent no. BI 132612/2023

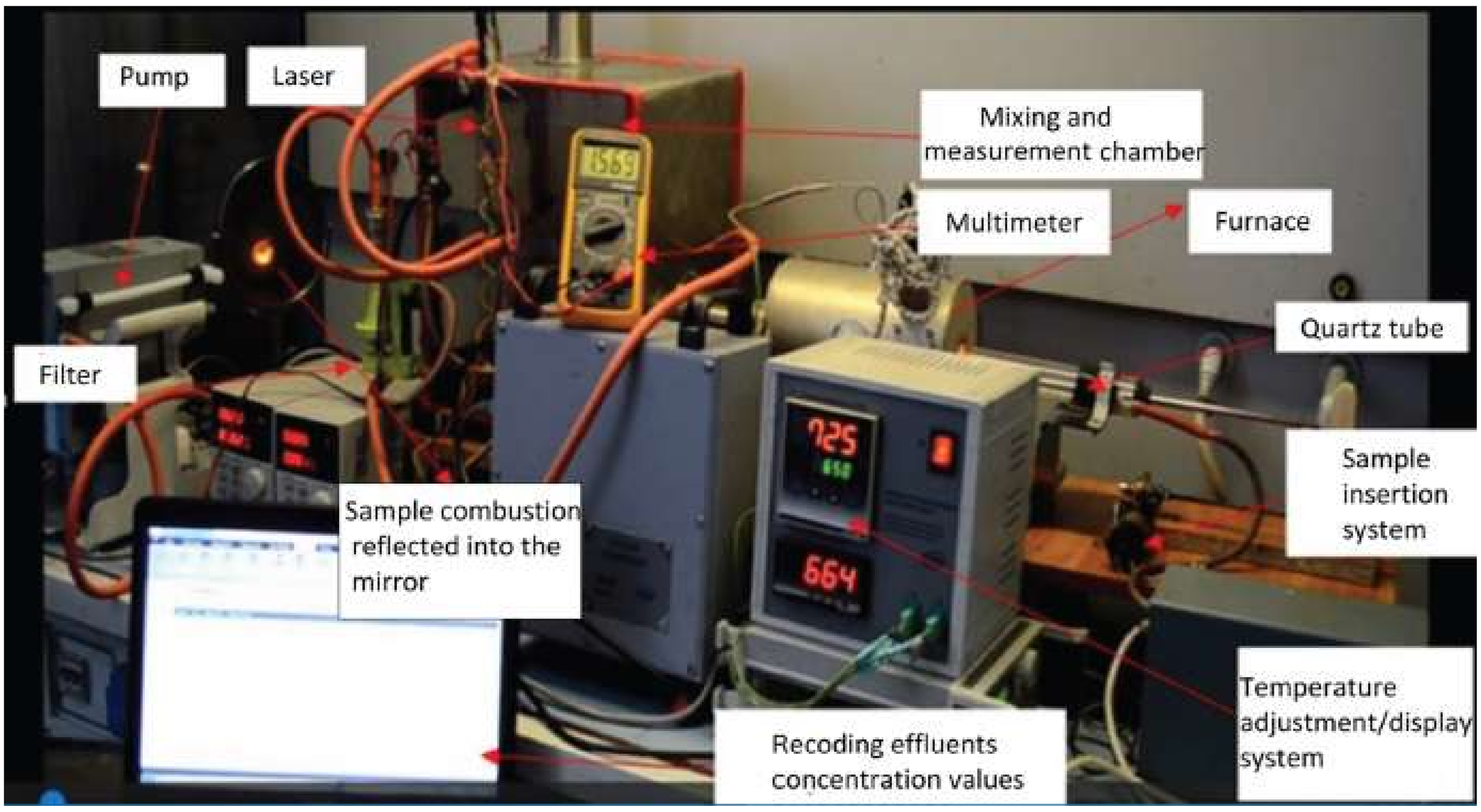
C

Authors:

**Ghicioi Emilian, Găman George Artur, Maria Prodan, Szollosi Mota Andrei
Lupu Constantin, Burian Sorin Constantin, Păsculescu Vlad, Cioclea Doru, Nălboc Irina
Șuvar Niculina Sonia, Vlasin Nicolae, Şuvar Marius, Rădoi Florin, Chiuzan Emeric,
Florea Gheorghe Daniel, Drăgoescu Răzvan**

The invention relates to a stand for determining reaction products generated by combustible solid materials subject to a controlled combustion/thermal decomposition process (pyrogenic process), providing the possibility for setting up the temperature, the air flow for combustion, the air flow for diluting effluents, the speed of inputting the sample into the furnace, in order to study the behaviour to exposure to the thermal radiation, the loss of mass, the clouding degree, of solid sample deposition and of the fuel-oxidant ratio.

According to the invention, the stand provides the performance of research, in safety conditions, on the pyrogenic behaviour of solid combustible materials, both in standard conditions, as well as in extended range required for experimental studies. By the adjustable pump for the air supply of the PSAATPP furnace and by the adjustable pump for dilution of gases PPAACG within the mixing chamber, the stand ensures a large range of air flow-rates, required for obtaining combustion/thermal decomposition within the electric horizontal furnace, controllable and monitored by the temperature unit and transducers SACT-MTIC-MTCT. Inserting or extracting the sample-holder into or out of the furnace is performed by means of a mechanism driven by an electric motor, controlled by a unit SRTMEAPP, and having an adjustable feed rate within an extended range, disposing also of a spring capable of quickly withdrawing the sample from the furnace, upon actuation of an articulated pusher fitted with a hinge that releases the rod stop.



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HR EXCELLENCE IN RESEARCH

METRIC SPACES FOR ASSESSING SIMILARITIES BETWEEN MENTAL AND BEHAVIORAL DISTURBANCES IN EPILEPSY

PATENT: O № 6819 / 04.02.2021 & OȘ № 5771 / 12.12.2017

AUTHORS: Mariana BUTNARU, Ana CĂPĂȚÂNĂ, Gheorghe CĂPĂȚÂNĂ, Alexandru POPOV

C

APPLICATION FIELDS: C – Computer sciences.

AIM: Assessing the degree of similarity of mental and behavioral disturbances in epilepsy.

SOLUTION: METRIC SPACES FOR ASSESSING SIMILARITIES BETWEEN MENTAL AND BEHAVIORAL DISTURBANCES IN EPILEPSY

Definition. The *similarity space* is a couple (X, *sim*), where X is a non-empty set whose elements are called points, and sim: $X \times X \rightarrow$ N an application called *similarity-function* with properties:

Sim_1: $0 \leq sim(x, y) \leq 100, \forall x, y \in X$

Sim_2: $sim(x, y) = sim(y, x), \forall x, y \in X$ (* symmetry *)

Sim_3: $sim(x, y) = 100, \forall x, y \in X$ (* if and only if $x = y$ *)

The similarity tables of MBDE diagnoses allow a deeper understanding of the mechanisms of manifestation of these diseases. The respective mathematical and informatics tools allowed the construction of similarity tables of Mental and Behavioral Disturbances in Epilepsy (MBDE) diagnoses. The tables proposed in the paper can contribute to more operative, effective and safer diagnosis of MBDE and will also contribute to the development of artificial intelligence systems for the diagnosis and treatment assistance of MBDE patients.

The development of the table of similarities of diagnoses for the BC MBDE $R_{FC}(F, C)$ compartment went through the following stages:

We denote by F the set of diagnoses, by {Fi} the elements of this set: $F = \{Fj, j = 1, \ldots, 28\}$, by C the set of syndromes, by {Cj} the elements of this set: $S = \{Ci, i = 1, \ldots, 163\}$.

We construct the MBDE similarity function: $T1 = Table[100 - k*sqrt(\sum_{i=1}^{163}(B[i, j] - B[k, i])^2, j, k = 1,..., 28)]$

where: *Table* - *Wolfram Mathematica* function; *sqrt* - mathematical function "*the extract of the square root*";

$B[j, i]$ - the value of symptom i for diagnosis j: $j = 1, \ldots, 28$; $i = 1, \ldots, 163$; B – the relation table $R_{FC}(F, C)$,

$B = \{B[j, i], j = 1, \ldots, 28; i = 1, \ldots, 163\}$;

k - the MBDE similarity normalization coefficient. Initially k receives the value 1 ($k = 1$) and will be adjusted after normalizing the similarities in the obtained table, so that the similarity values after normalization fall within the range [0, 100].

4. It is calculated, using the similarity evaluation function built in p. 3, the MBDE similarity table ordered according to the ICD-10 Classifier of the World Health Organization.

References:

Popov Al., Butnaru M., Căpățână A., Căpățână Gh. The Similarity of Mental and Behavioral Disorders in Epilepsy. In: Proceedings of Workshop on Intelligent Information Systems: WIIS2023, October 19-21, 2023, Chișinău / editors: I. Titchiev [et al.]. – Chișinău: [S. n.], 2023 (Valinex). – 244 p., ISBN 978-9975-68-492-7, p.181-190,https://www.math.md/wiis2023/Combined_Proc_WIIS2023_v1.pdf, https://ibn.idsi.md/sites/default/files/imag_file/181-190_8.pdf

ADVANTAGES: Metric spaces have been proposed for evaluating MBDE similarities (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 MBDE; training of doctoral students.

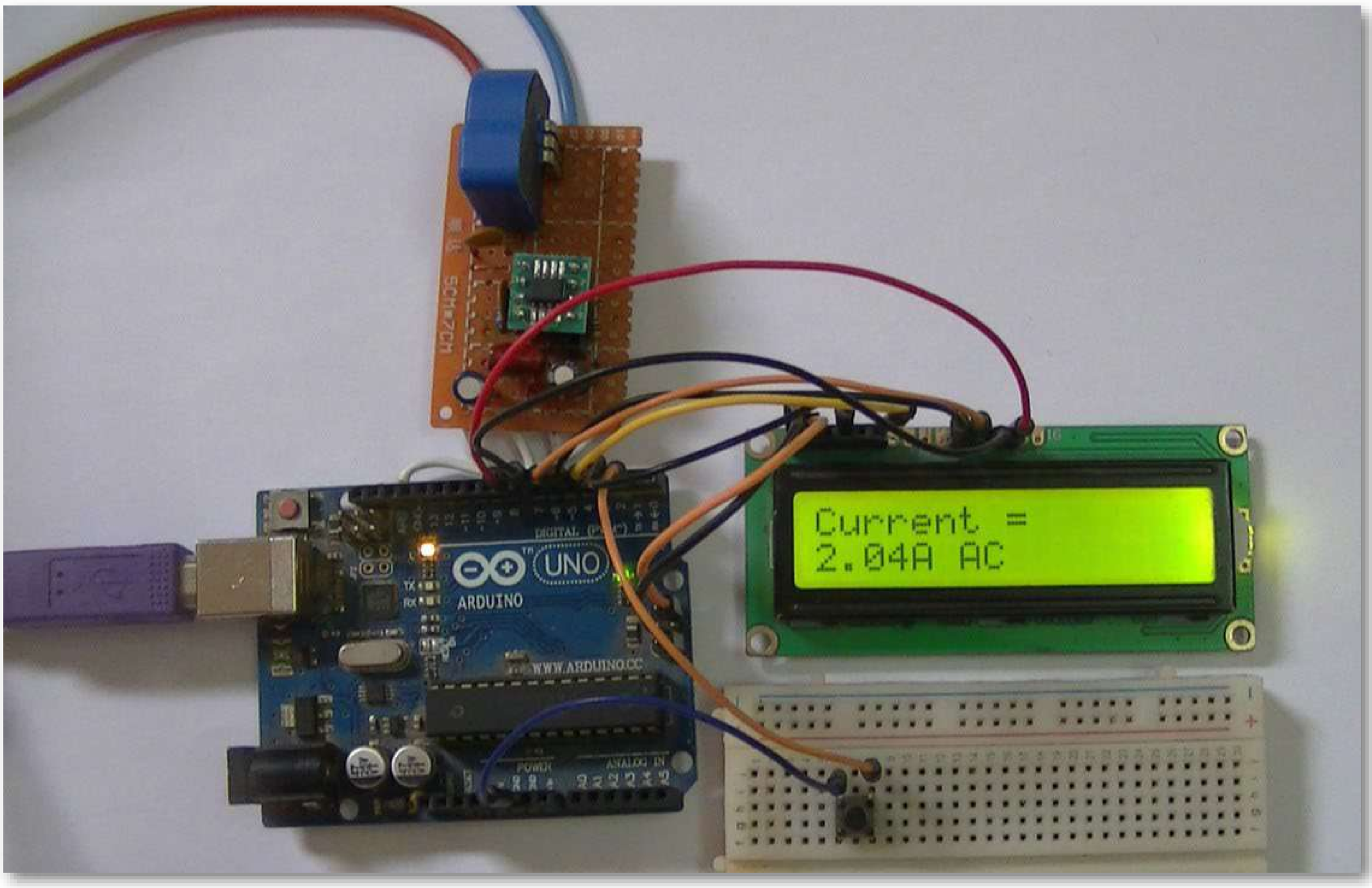
WEIGHTWATCH: BED SENSOR SYSTEM

Healthcare Project

C

Author/s: Gaweewat Thanasitnaphitkul, Parinton Jangtawee, Gaewgan Yambangyang, Jeerasak Jitrotjanarak

Revolutionizing patient care, our innovative project utilizes Hall effect sensors integrated into standard hospital beds to provide real-time weight monitoring. By measuring the current drawn by the lifting motor, our system accurately estimates patient weight without the need for additional equipment. This breakthrough technology enhances healthcare efficiency, enabling healthcare professionals to track patient weight seamlessly and non-invasively.



With precise calibration and advanced sensor technology, our solution ensures accuracy and reliability in diverse clinical settings. Join us in redefining patient care with our cutting-edge bed weight monitoring system.

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Costume for blind people

Author: Deșan Dumitru

C

The costume for the visually impaired is a specialized garment designed to provide additional assistance and independence to individuals navigating through unfamiliar environments. It consists of three main components: the suit itself, a cane, and a cap. The suit incorporates four sensors, with an additional two installed on the cap and cane, covering a total of 180 degrees. This innovative project aims to enhance the mobility and safety of visually impaired individuals by integrating intelligent systems directly into the urban environment.

Key features of the costume include:

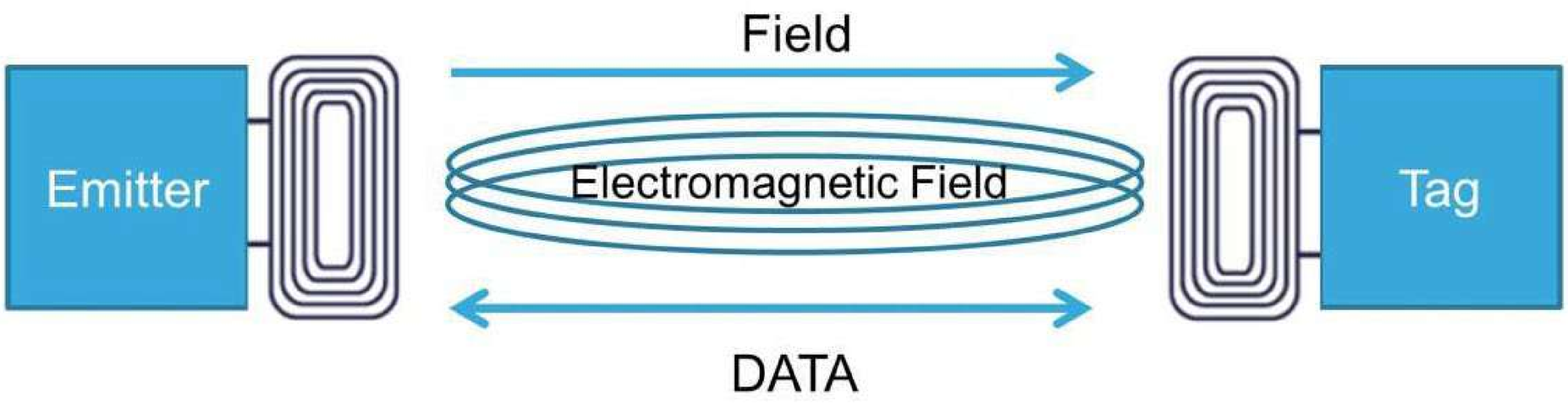
Sensors: The suit is equipped with sensors that detect obstacles and environmental cues, providing feedback to the wearer to assist in navigation.

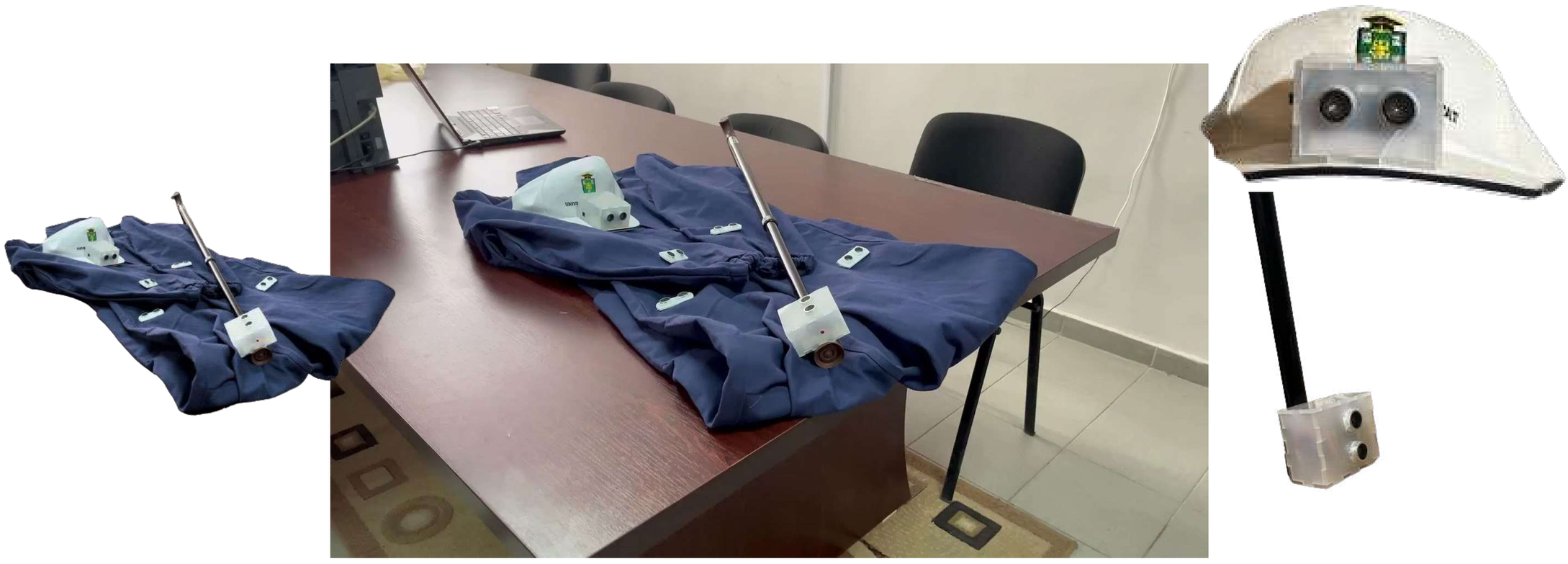
Integration with Urban Infrastructure: A groundbreaking aspect of the project is the implementation of an intelligent system embedded in the sidewalk. When detected by the cane, this system announces nearby landmarks or points of interest, such as stores or pharmacies, aiding in orientation and mobility.

Innovative Technology: The use of NFC sensors with magnetic inductors allows for seamless integration into the pavement without the need for external signage, enhancing the accessibility and usability of the system.

Conclusion:

Modern equipment and technologies, along with their applications, play a vital role in improving human activity and long-term development. The development of this system will contribute to reducing inequalities and creating a more comfortable environment for visually impaired individuals. Recommendations for future enhancements include the implementation of LiDAR sensors for improved distance sensing and consideration of integrating the project into educational activities to promote student engagement and stimulate further research and development.





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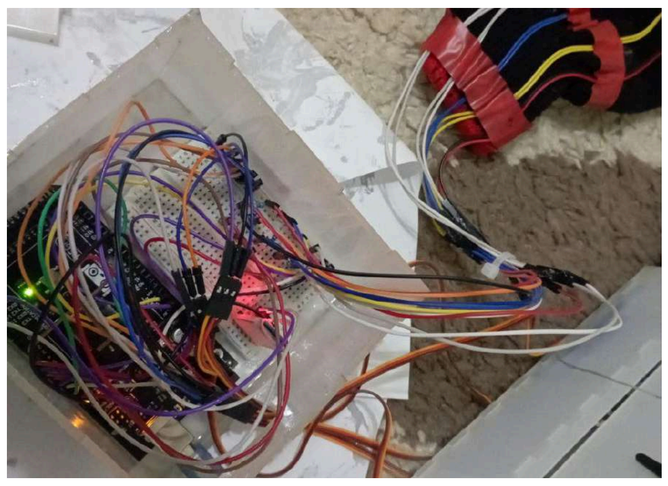
The Robotic Arm

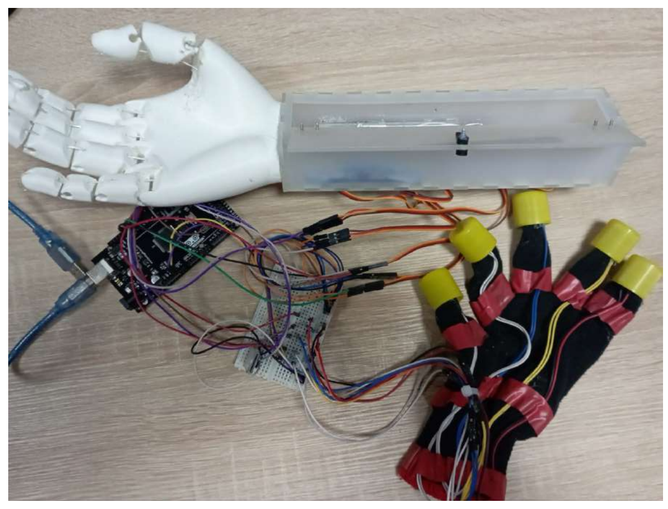
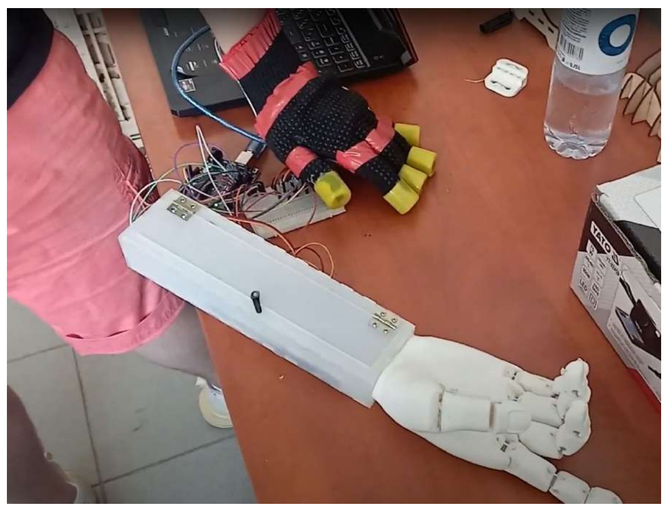
Author: Onilov Artiom

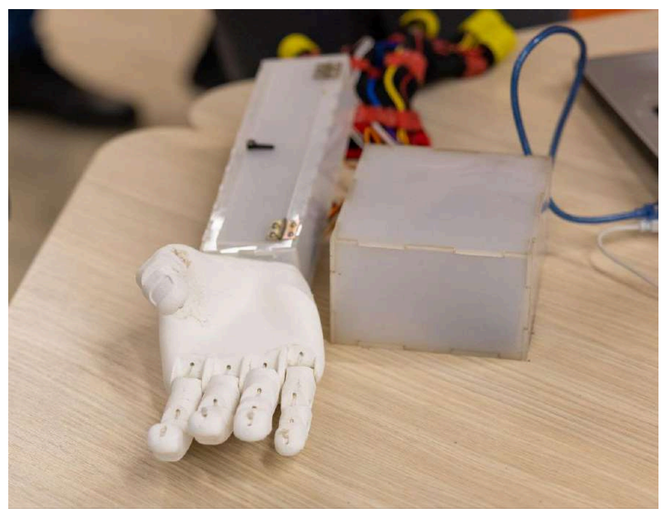
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The robotic arm is a prototype created for people with disabilities, like those suffering from the lack of one or both arms. We want to help people with disabilities to use an alternative for their missing hand. With the help of the robotic arm, people with disabilities will be able to carry most large objects. Having both hands we can always benefit from a normal life. The mechanical arm activates each finger independently when touching surfaces with the opposite hand. By equipping the glove, the movements of the real hand are recorded by the mechanical hand. As long as the glove is equipped and moves are emitted through it.

To perform the activities where it is necessary to move the hands individually, we can use the voice commands incorporated in the system, with the help of an application. The application can be installed on any phone. By recording our voice commands, it can send all the necessary information to the arm, through a Bluetooth module, from where it could be executed.





The activities planned and carried out within the project: 1) Assembling the Arduino smart circuits; 2) Assembling the support box with the help of Laser Cutting; 3) Printing the parts for the hand on the 3D Printer; 4) Assembling the arm and applying smart circuits; 5) Realization of the application and voice commands.

The end result is a successful one. With this invention, people can finally enjoy an easier life and accomplish more difficult activities.

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HEARTBEAT SMARTPHONE AUDIO CLASSIFICATION USING DEEP LEARNING, SAUDI ARABIA 2024

Research project

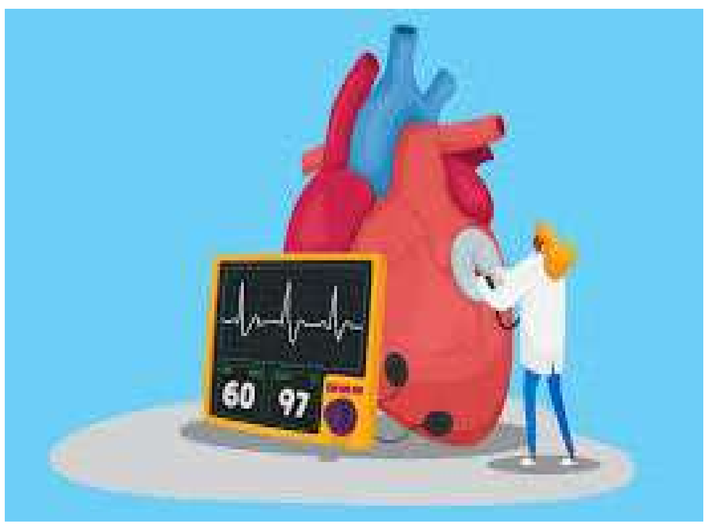
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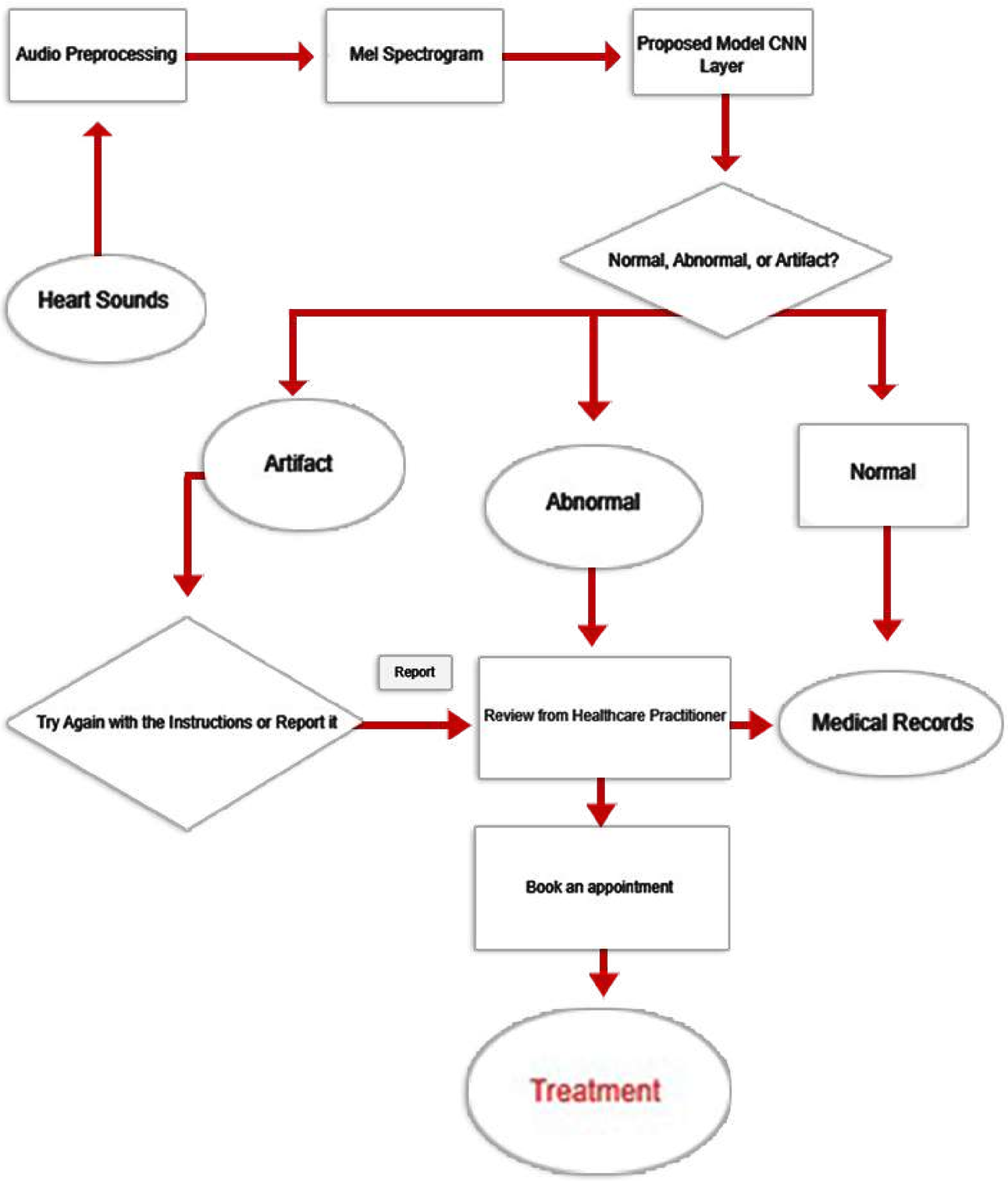
- KSA faces serious health challenges due to the high death rates from heart diseases, where it ranks 24th globally in this context.
- This necessitates enhancing health care and community awareness.
- In addition, the country is witnessing a spread of respiratory and obstructive pulmonary diseases, which requires enhancing awareness and taking preventive measures to address these ongoing health challenges.

The core Concept of Utilizing Deep Learning for Smartphone Audio Classification of Heartbeat Signals

- ✓ A mobile App designed to listen to and analyze heart and lung sounds aims to detect health changes early, offering immediate reassurance to users.
- ✓ By facilitating communication with medical professionals, it fosters early detection, thereby streamlining healthcare and enhancing overall well-being effortlessly.



The proposed Mobile App's Flow Chart Diagram





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Lighting technology market analysis

Student Project

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Coordinators: Mihaela Ștefan, Ioana Fărcean



At market level, there is a continuous growth in the need for LED lighting systems in the "lighting" segment, based on increasing customer interest, decreasing electricity consumption and increasing product lifetime. European Commission officials predict that in the future, LED lights will become a viable alternative to both incandescent bulbs and CFL lighting solutions, which include mercury vapour in the production process.

Therefore, taking into account the strong growth trends of the electrical equipment market, and in particular the LED lighting market, their electricity consumption, and the orientation towards "eco-friendly" behaviour of consumers, we consider this area to be of interest.

In addition to macro-economic developments, regulations affecting lighting products are a key determinant of the future lighting market. Governments around the world are accelerating initiatives in this area. Banning inefficient technologies is one such regulation. The other is to adopt stricter laws on high energy efficiency requirements, and provide incentives to build a whole infrastructure. This approach will further promote energy-efficient lighting technologies such as LED technology.

In fact, from the analyses carried out, it appears that the emphasis is increasingly placed on environmental protection actions, with clear trends towards the reduction of all technologies present in the general lighting sector and the monopolisation of the entire market by LED lighting devices (LLDs). At the same time, we are witnessing a gradual disappearance of the lighting industry, at least in the form we have known until now, and its increasing migration towards the electronics industry.

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BLUETOOTH SYSTEM USED FOR PARKING AND CONTROL OF AN AUTONOMOUS CAR

Student project

Authors: Eugen BIRTOK, Raluca ROB

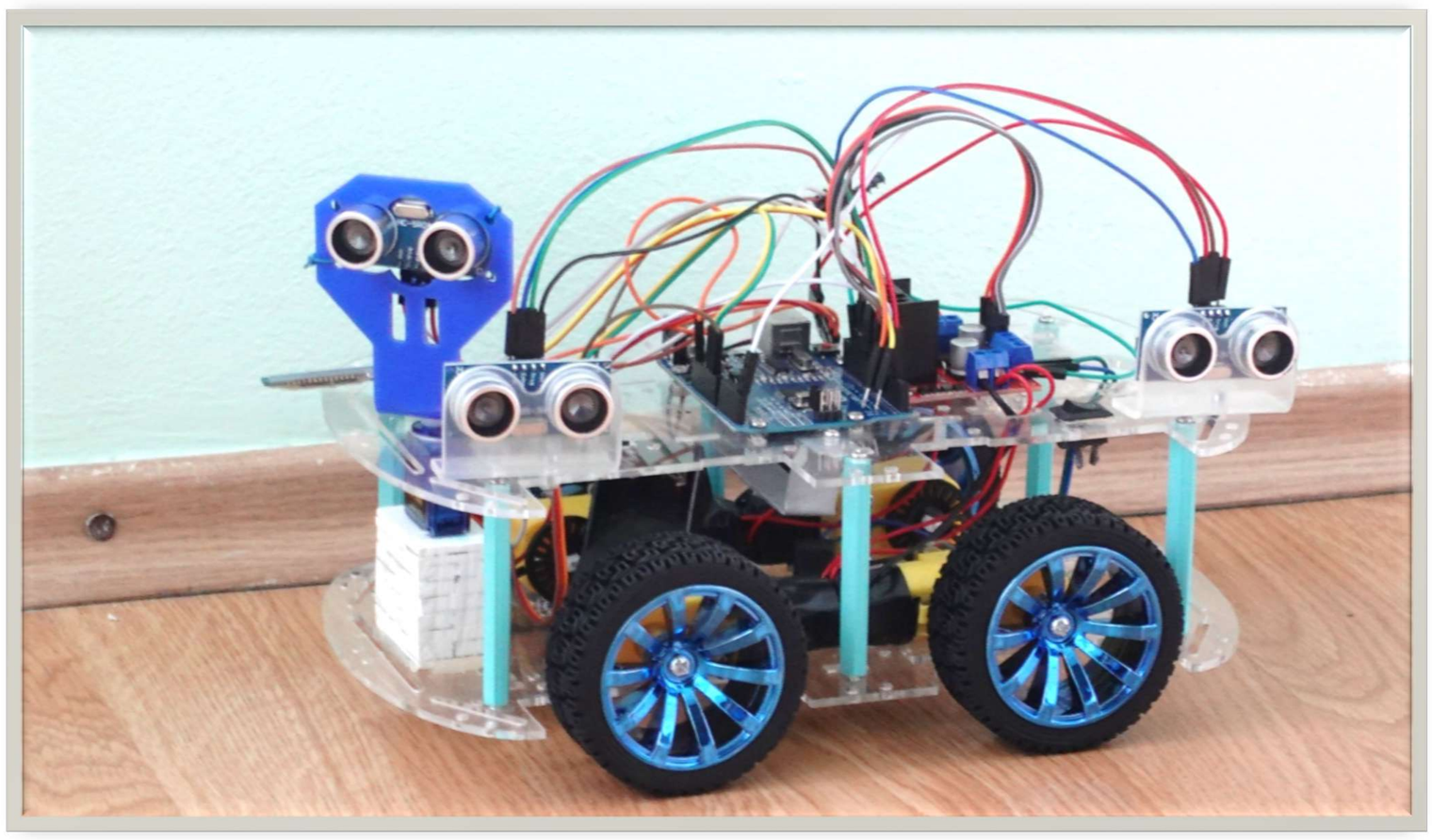
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This project presents the construction of an autonomous car and its programming in order to accomplish various abilities. The car is constructed on a chassis with four dc motors. The car controller is an Arduino Uno development board which is programmed in order the car is able to manage itself, avoiding the encountered obstacles. The distance to the obstacles can be modified by the user. An ultrasonic distance sensor is used for acquire the distance measurement. Like any autonomous car, the manual command options when required are mandatory. Therefore, an application on mobile phone is programmed. This application permits the motors controls on forward, backward, left and right turn, parking, using bluetooth transmission.

In the construction of this car were necesary 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 and parking)
SG90 servomotor (for sensor movement at a certain angle)
DC 12V Battery Pack 3000mAh Rechargeable Lithium Battery Pack
65 mm Rubber Wheel RC Model Tires







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 novelty consists in the implementation of two functions of modifying the engine speed. For parking I make a function Parking, and a function for Autonomy.

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.

Description of the module Bluetooth HC-05

HC-05 module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup.
Serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps.
Modulation with complete 2.4GHz radio transceiver and baseband. It uses CSR Bluecore 04-External single chip Bluetooth system with CMOS technology and with AFH(Adaptive Frequency Hopping Feature). It has the footprint as small as 12.7mmx27mm. Hope it will simplifyyour overall design/development cycle.

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The tool for identifying and assessing the risks of occupational injury and illness - SafetySfere

Research project

Authors: Adriana MILEA (PÂRVU), Prof. Dr. Eng. Lucian-Ionel CIOCA

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PURPOSE

- Development of a tool for identifying and assessing the risks of occupational injury and illness – **SafetySphere**, applicable to enterprises in the manufacturing industry of paper and corrugated cardboard and paper and cardboard packaging – method adapted to current legislative and management requirements

RESULTS

- The tool/method addresses the limitations and disadvantages identified following the rigorous analysis and practical application of the occupational injury and disease risk assessment method developed by "*Alexandru Darabonț*" National Research and Development Institute for Labor Protection in Bucharest, Romania (INCDPM method) – the most frequently used method, at national level, in most fields of activity

THE METHOD'S ADVANTAGES

SAFETY SFERE

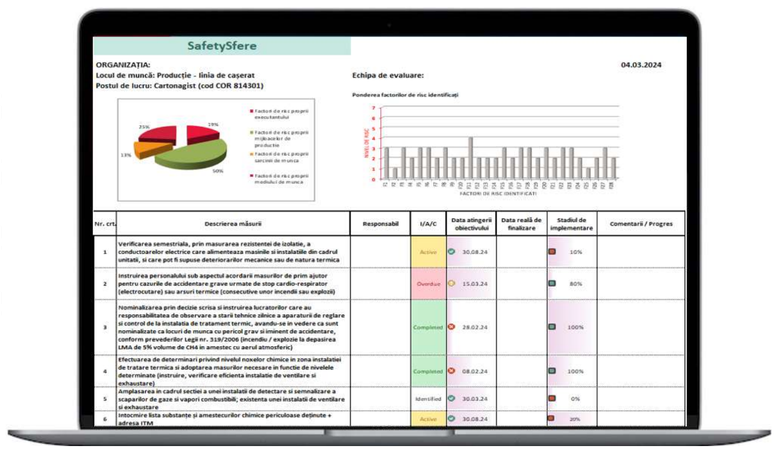
- it is flexible, in order to be able to quickly adapt to technological changes, to the emergence of new risks related to them, including to new fields of activity
- address all identified risks, including those initially classified in severity classes with small or negligible consequences, or with a very rare or extremely rare probability of occurrence of consequences, to prevent their evolution over time and the generation of more significant consequences on worker safety and health
- is appropriate for assessing new, emerging risks associated with new processes and technologies, in the context of the integration of digital technologies by organizations
- includes a simple and objective method for classifying the identified risk factors into a class of probability of occurrence of an event
- use standardized tools and techniques, which will help ensure consistency between risk assessments
- integrates tools and indicators that allow measuring the performance of risk management over time (to evaluate the effectiveness of the strategies and measures adopted and adjust them, if necessary)
- involve in the assessment process other relevant stakeholders (from IT, information security, human resources and other key people) who can bring a more comprehensive perspective on the risks associated with new digital technologies
- document and report assessment results in a clear and accessible way to facilitate understanding and communication of risks and prevention measures
- integrates the requirements of the occupational health and safety management system according to the EN ISO 45001:2023 standard (to ensure the organization's compliance with relevant legislation and regulations; to create a coherent and efficient occupational health and safety management framework; to establish specific objectives and for continuous improvement of occupational health and safety performance)

FUTURE WORK

- Development of a digital solution/software program for the identification and assessment of occupational injury and illness risks, in order to streamline the evaluation process

CONCLUSIONS

- In order to maintain or improve the safety and health of workers in the context of the transition to Industry 4.0, it is essential that organizations adopt a sociotechnical approach to the organization of workers' activity, an approach that facilitates the integration of digital technologies
- Identifying and assessing the risks of occupational injury and illness from the design and implementation phase of technology, products and processes is essential to establish appropriate preventive measures, to promote a culture of risk prevention and to improve the working conditions of workers.



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MULTISPECTRAL MODULE AND EQUIPMENT FOR PHYSICAL NON-DESTRUCTIVE CONTROL

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Patent: PCT/RO2024/000003/14.02.2024 - Doctoral Research project

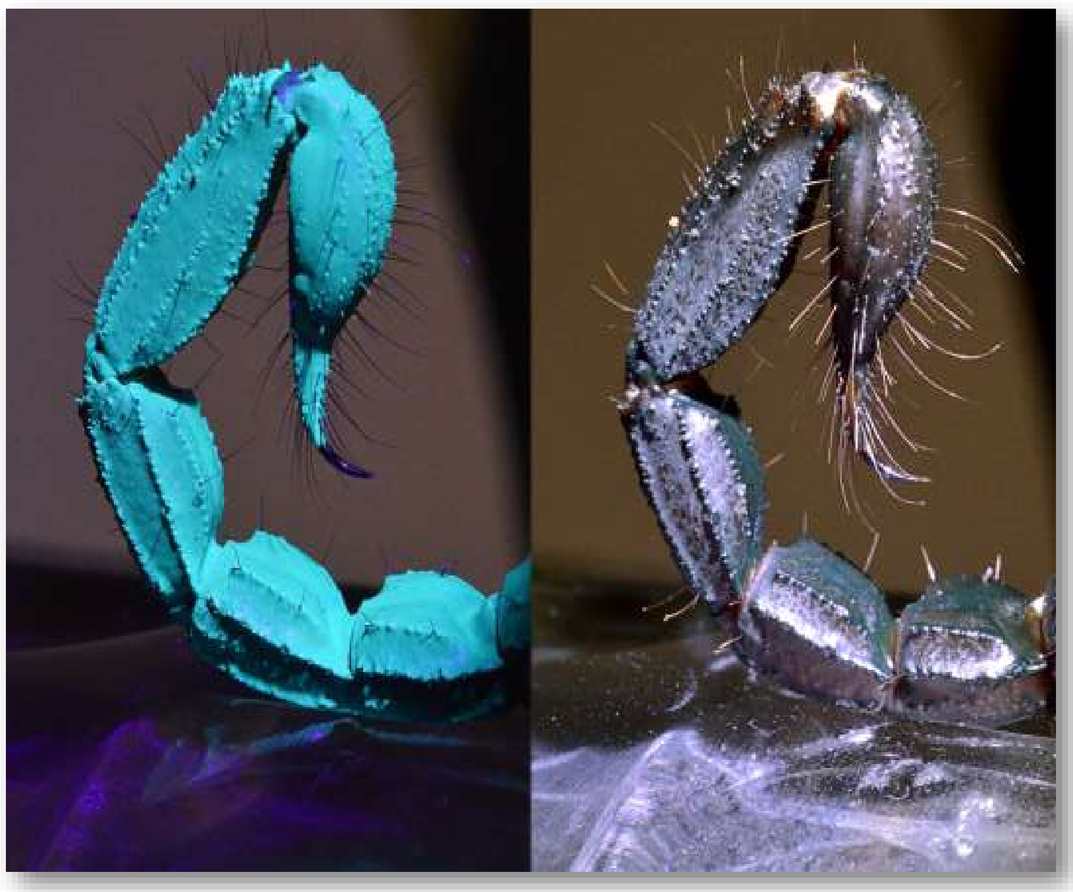
Authors: Șaptebani Neta Ionelia, Jurcutiu Corina Elena, Luca Flavia
Mentors: Marian Liviu Mocan, Larisa Victoria Ivașcu, Alin Emanuel Artene

It is a device designed for non-destructive physical customs control that can also be utilized in other areas of interest. Its major methods of operation include electromagnetic spectrum analyses in multiple bands and information gathering from other sensors. The module has the ability to interface with a special computer network, which enables it to carry out prompt comparison analyses to find any potential attempts to avoid customs clearance. This equipment's claimed goals are to enhance physical customs control, prevent human trafficking, economic crime, and other legal violations. By transmitting the pertinent data on a specialized computer network, the device can be utilized both singly and in groups.

Examples of photos in the ultraviolet spectrum: natural adaptations to the environment, camouflage, contrasting color differences in ultraviolet light



Thermal imprint on masonry



Scorpion metasoma imaged in parallel in visible and ultraviolet light



Thermal imprint on the glass



Image composed to show a scorpion in its natural environment with half of the body illuminated naturally and half illuminated in ultraviolet light

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Centrul de excelență
Prahova

Colegiul Național
Mihai Viteazul

High Voltage Plasma Flame Generator

C

Research project

Author: Albert VLĂDESCU

Gas ionization by high voltage and ohmic superheating.

Imagine the existence of such a device in space, where the stars provide unlimited energy, feeding, through photovoltaic systems built on a space scale, a plasma generator configured on a cosmic scale. We all know the problem of the existing and accumulating space debris belt around the Earth. They could be burned instantly by the proposed device, in the absence of any gas necessary to maintain combustion.

The high voltage gas ionization process involves several steps. We assume the case where we have a gas space between two electrodes with high voltage between them.

When the voltage first turns on, it "looks" for any ionization event occurring randomly in space, as it would if, for example, an ultraviolet photon struck the surface of one of the electrodes at that time, or if that photon hit a gas molecule and temporarily displaced one of its electrons into the space around the electrode.

The voltage then extraorbitally accelerates the free electrons out of the source molecule before they have the opportunity to recombine. They pick up energy from the field and accelerate enough that if they happen to collide with another gas molecule on the way, it also ionizes, and the charged particles join together and accelerate as well.

Almost instantly we will have an avalanche of ions moving away from the electrode, and the gas around the tip becomes an electrical conductor as it populates with ions. Ohmic heating then raises the temperature of the ionized gas to incandescence, and we have a high-power arc of hot plasma.

More important than direct ionization is that any free charge that appears in the high voltage volume (eg cosmic ray ionization) is accelerated by the field and can collapse into neutral atoms with enough energy to ionize them, so that the charge multiplies . If the temperature of the gas is well below the ionization energy of the atoms, the plasma is stable.

The high-voltage plasma flame is a superheated, ionized gas that can reach temperatures in excess of 2500°C (4532°F). This source of intense and concentrated heat is capable of igniting or sublimating various materials.

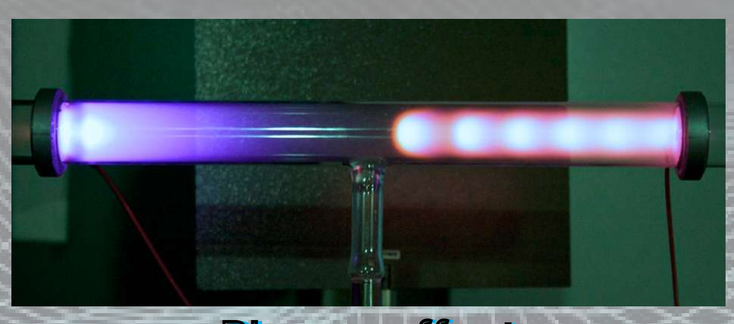
The plasma flame is made by a high voltage gas core transformer which is powered by a class E oscillator, built from: 3 inductors, 3 capacitors, 2 diodes, 1 potentiometer, 1 high power mosfet and 3 resistors.



Product assembly



Plasma Flame Generator



Plasma effect



Plasma welding



Space thruster, once...

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RESEARCH AND CONSTRUCTION OF INNOVATION TO REDUCE AIR HUMIDITY BY APPLING ELECTRIC FIELD INTENSITY ENERGY

Research project

Siseerot Ketkaew

C

This research project presents research and construction of innovation to reduce air humidity by appling electric field intensity energy consists of 2 parts: Part 1, a set of high-intensity non-uniform electric field cells with the corona discharge process to cause ionization to break the bonds of water molecules for use in reducing the relative humidity in the air using the technique of adjusting the high voltage voltage in the high voltage circuit to control the intensity of the electric field, and Part 2 is a set to reduce the amount of ozone gas using an ultraviolet light with a wavelength of 253.7 nm. Part 1 has designed and construction a set of electric field cells consisting of a corona wire placed between two aluminum plates and High voltage flyback converter circuit consists of a high frequency pulse generator using IC number 555 for adjusting the electric field intensity from 5 kV/cm to 25 kV/cm under the adjustment of a high voltage of 1 kilovolt to 5 kilovolts, respectively, by using a pulse signal to stimulate the work of the IGBT to control the operation of high-frequency high-voltage transformers to produce high voltage electricity for supplying electrical energy to a set of electric field cells.







The test results were that when measuring the relative humidity in the air, it was found that the electric field intensity was 25 kV/cm at a wind speed of 1 m/s able to reduce the amount of relative humidity in the air by 50%RH and produce 1 ppm of ozone gas in the electrical laboratory, area size 20 square meters, in 60 minutes, and in the set to reduce the amount of ozone gas, it will be found the amount of ozone gas produced by the electric field set will be reduced to 0.01 ppm. This research has passed the overall power consumption analysis test and analyze safety standards regarding electrical leakage for the safety of users, It is already completed and in the future it can be further developed into a commercial innovation.

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METAL GLAND FOR LARGE DIAMETER ELECTRICAL CABLES

Patent A/00303/30.07.2018

(patent application accepted)

Author/s: Dan Ciortea, Gabriel Nicolae Popa

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The invention relates to a single-body metal gland intended for sealing large-diameter cables or metal pipes when passing them through the wall of an enclosure. The gland consists of the metal body, the toroidal chamber with a filling-emptying valve, the rubber gasket and the locking nut. In the body of the gland is a rubber chamber with a valve. The rubber chamber with the valve is the sealing element between the outer surface of the electric cable and the inner surface of the gland body. An inert gel is inserted under pressure into the rubber chamber which inflates the toroidal chamber to its maximum contact with the outer surface of the cable or pipe. The deformation of the toroidal chamber allows perfect sealing regardless of the geometry of the large section of electric cable. The gland can have various fields of use:

- transport, distribution and use of electricity;
- the electrical machine and plant construction industry;
- metal drive cabinets.

The metal gland for electrical cables or large-diameter pipes has the following advantages:

- it is simple from a constructive point of view, having only four components;
- it has a low-cost price compared to existing glands on the market;
- it adapts well to the irregular surfaces of large-diameter armoured electric cables;
- a gland with a given inner diameter can be used for a wide range of electrical cables of different diameters;
- it is reliable in operation;
- the sealing process of the cable/pipe is performed in a very short time, on the order of seconds, it does not require a torque wrench or special technical skills;
- the amount of air initially existing in the toroidal chamber acts as a buffer element and allows maintaining the contact pressure between the toroidal chamber and the outer insulation of the cable even under the conditions of a temperature variation.

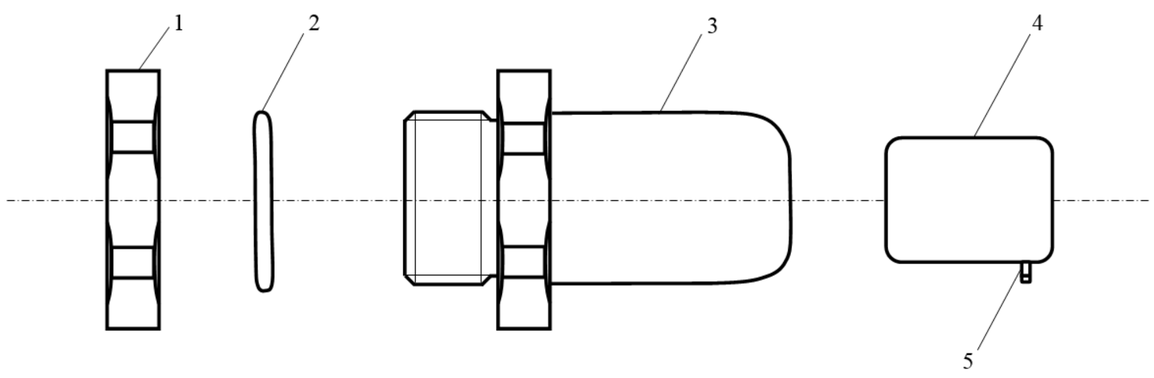


Fig. 1. The components of the cable gland for large diameter electrical cables

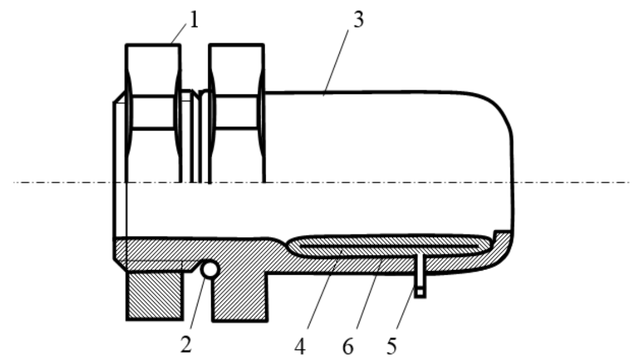


Fig. 2. Assembled gland for large diameter electrical cables

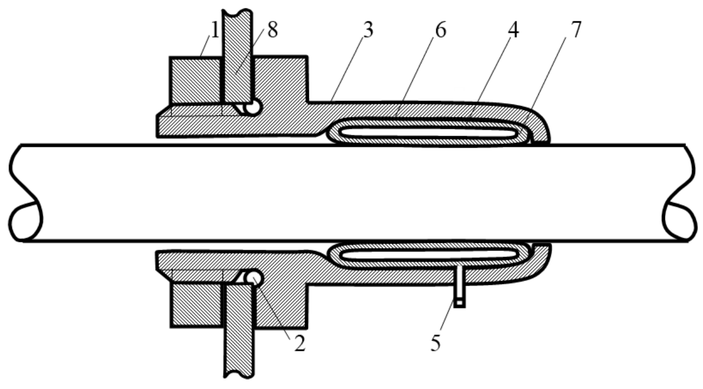


Fig. 3. Longitudinal section through the gland after sealing a large diameter electrical cable

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DC linear voltage-sinusoidal signal converter with adjustable frequency

Patent: 130458/30.05.2022

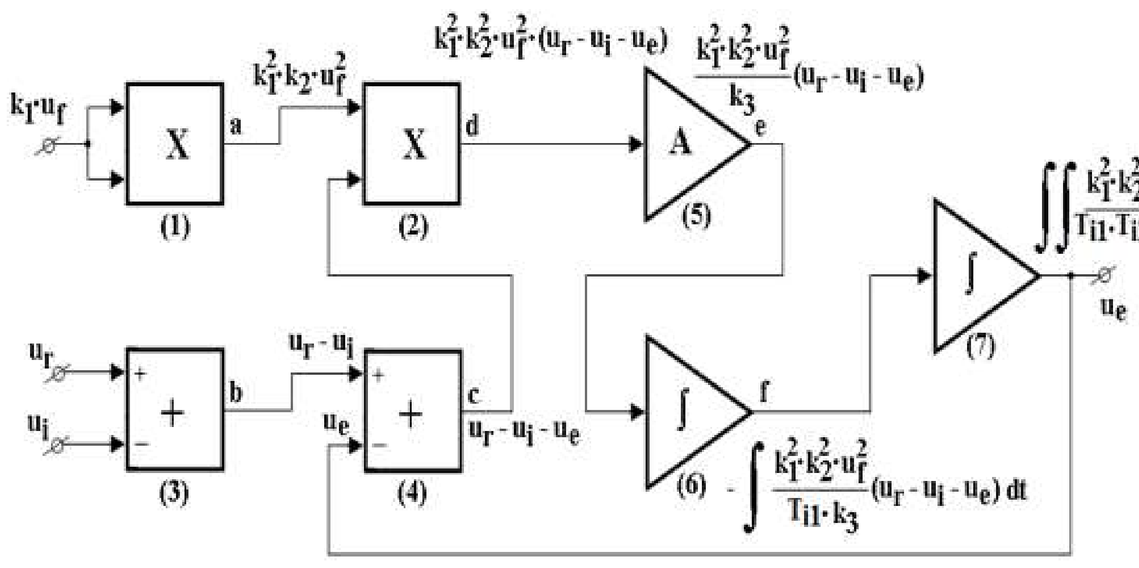
Author/s: Gabriel Nicolae Popa, Iosif Popa, Sorin Ioan Deaconu

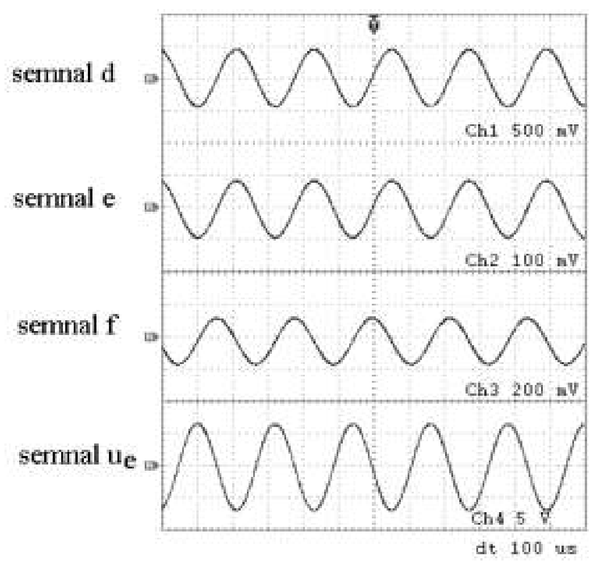
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The DC linear voltage-sinusoidal signal converter with adjustable frequency provides a periodic sinusoidal signal at the output that depends on the DC voltages applied on two inputs: a DC voltage is applied to one of the inputs, which linearly modifies the frequency of the output signal, and on the other of the inputs applies a DC voltage which linearly changes the amplitude of the signal from the output of the converter. The DC linear voltage-sinusoidal signal variable frequency converter comprises seven functional blocks: two analogue multiplication circuits, two analogue difference circuits, one non-inverting amplifier and two integrated circuits.

The linear DC voltage-variable frequency sinusoidal signal converter has the following advantages:

- it has a simple construction (requires only three integrated circuits and a few resistors and capacitors);
- it has two active continuous voltage inputs and one output;
- the outputs a sinusoidal signal whose frequency depends linearly on the DC voltage applied to one of the inputs;
- the amplitude of the output signal can change linearly depending on the DC voltage applied to the other input;
- the response time is very low due to the realization of the converter only with analogue components;
- the frequency of the output signal is in the range of kHz, the operating range can be tens of kHz, and the amplitude of the output signal is of the order of volts, this circuit can be used for transmitting signals at a distance with a high resolution with harmonic pollution diminished.





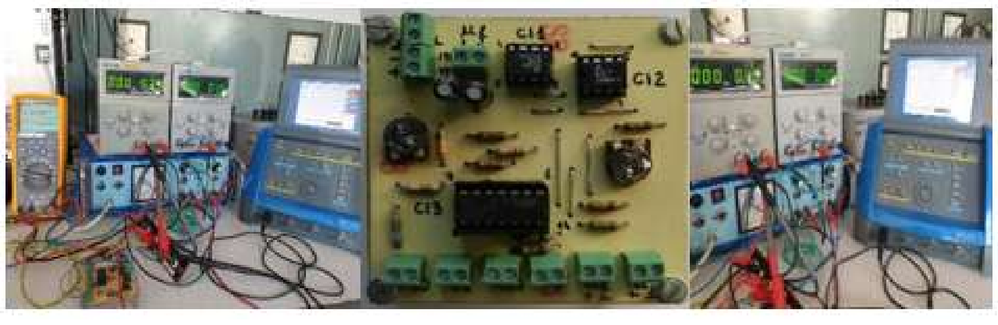


Fig.1. Block diagram of DC linear voltage-sinusoidal signal variable frequency converter and the prototype during experiments

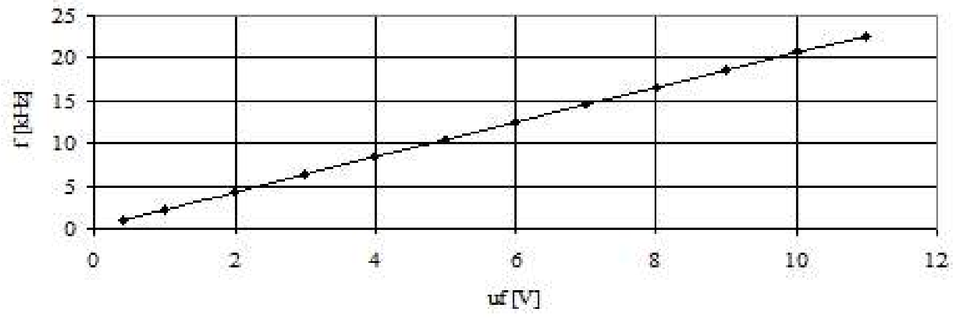


Fig.2. The sinusoidal signal in different points of the converter, the output frequency f depending on u_f

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DecisionHarborAI

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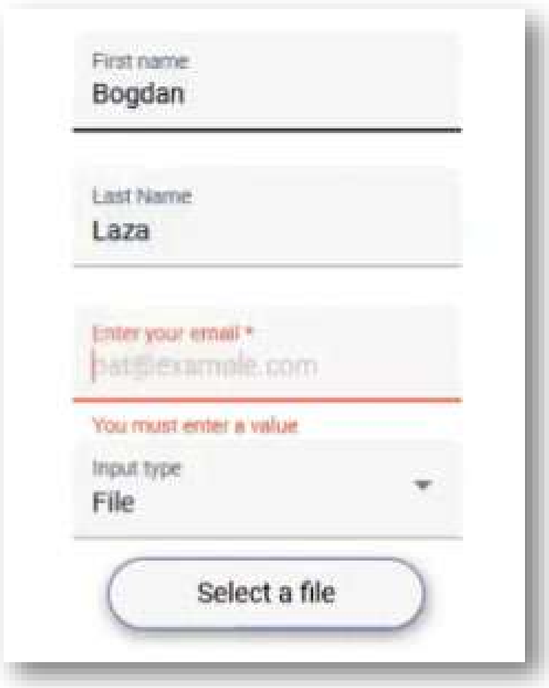
Research project

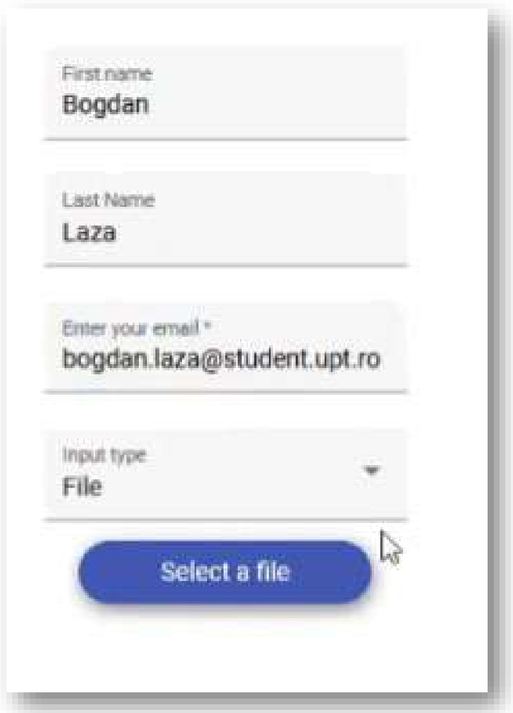
Alin Artene, Larisa Ivascu, Aura Domil, Bogdan Laza

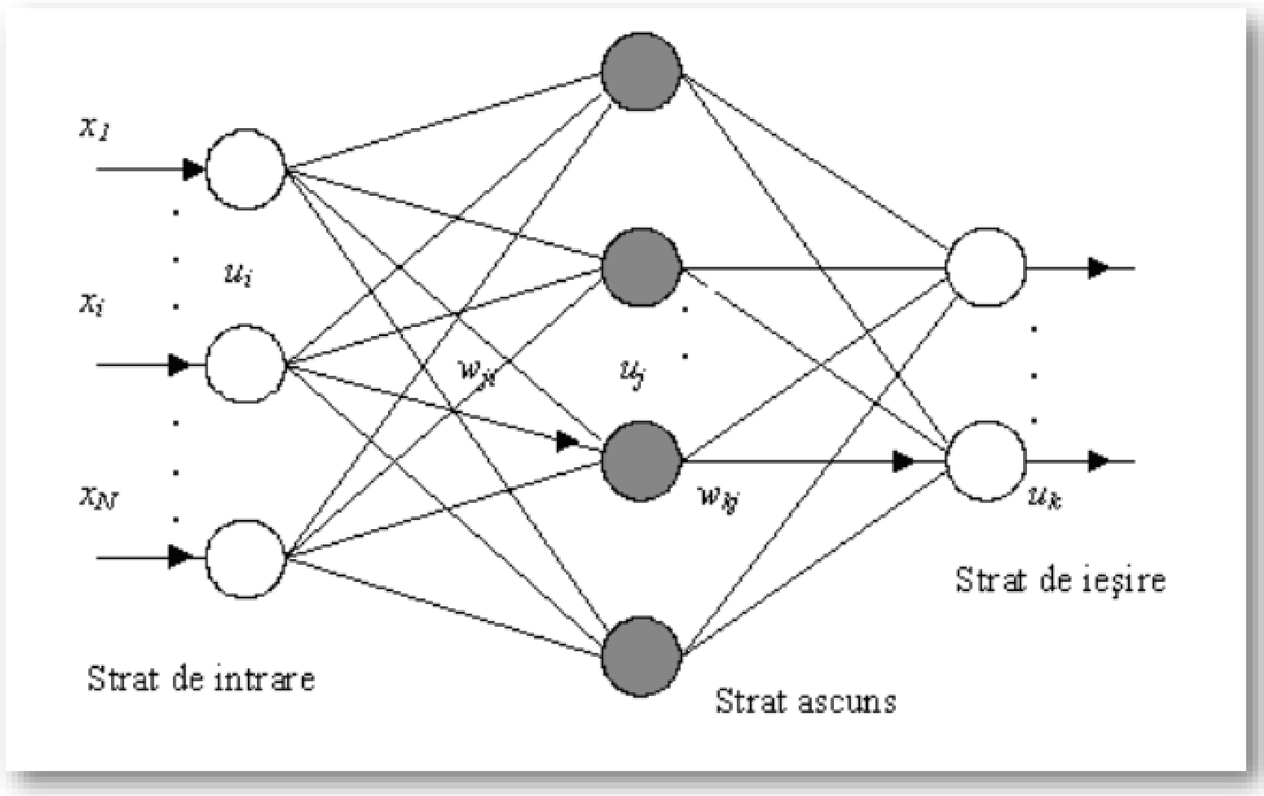
DecisionHarborAI App is a tool designed to enhance financial decision-making processes while offering versatility for application across various domains. Leveraging sophisticated neural network technology, it provides predictive financial analytics with accuracy and efficiency. The app employs a three-layer neural network architecture, trained through iterative forward propagation, loss calculation, and backpropagation methods. This training approach ensures optimal model performance, allowing for precise predictions on new financial data.

The first step is providing a picture or a PDF file of a balance sheet to our API. This will be done from a mobile app or a web application. As soon as a picture or PDF is received, it is converted to a TXT file. A parser takes the TXT gained from the OCR and converts it into structured JSON using machine learning. The JSON is then returned as output from the API. From here, data from the balance sheet can be processed further.

The app's primary function is to enhance decision-making in financial reporting tasks by seamlessly integrating input data representing the balance sheet structure with the hidden layer, ultimately predicting key financial performance indicators (KPIs) in the output layer. Custom adjustments can be made to adapt the model to specific data characteristics and task requirements, ensuring versatility and effectiveness.









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PROJECT STREAMFLOW GUARDIAN

Robotics for Fast-Flowing River Conservation

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Matthew David U. Catibog
Miguel Alfonso D. Mujar

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DESCRIPTION

In recent years the conservation of fast-flowing rivers has become a pressing issue due to the increasing pollution and waste accumulation. Fast-flowing rivers play a vital role in maintaining the ecological balance of aquatic environments. However these rivers often face significant challenges such as the accumulation of garbage and pollutants. Traditional manual cleaning methods are not only time-consuming and labor-intensive but also pose risks to human operators. Additionally the decomposition of garbage releases harmful pollutants into the water further deteriorating the water quality. Therefore an immediate solution is needed to resolve this issue. To combat this issue, the researchers proposes the development of a robotic system called Project StreamFlow Guardian. This machine is a rotating device that collects and eliminates garbage from the river systems that would otherwise remain uncleared.

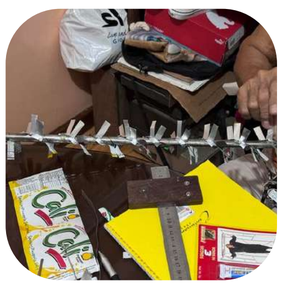
This rotating device is paired with a robovehicle programmed to bring the collected garbage from the rotating cylinder device to the assigned garbage disposal area. Insuring that the garbage collected from the rivers will be disposed properly and accordingly. This would not only result in a cleaner environment but also a safer and healthier marine ecosystem.

GRAPHICS



Body

Collection of the Needed Materials for the Project Streamflow Guardian



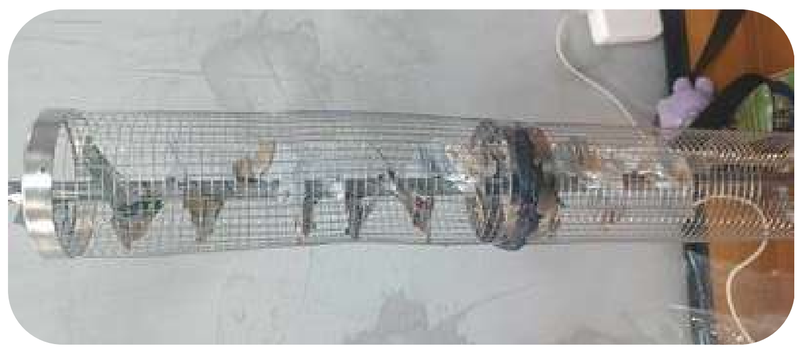
Base

Creation of the Parts Needed for the StreamFlow Guardian



Cylinder

Attaching of the Parts of the StreamFlow Guardian

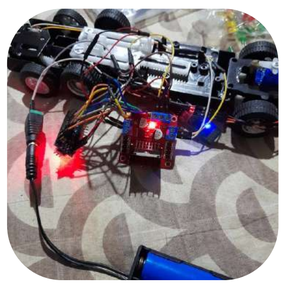


Cylinder Garbage Collector

Used for the collection of the garbage from the river

Body

Collection of the Needed Materials for the Project Streamflow Guardian



Circuit

Creation of the Parts Needed for the StreamFlow Guardian



Programming

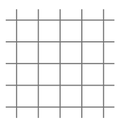
Creation of the Parts Needed for the StreamFlow Guardian



RoboVehicle

Used for the disposal of garbage from the cylinder

FEATURES



Steel Net Filters



Automated Disposal



Cylinder Collector



Android App Controlled

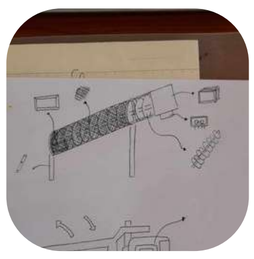


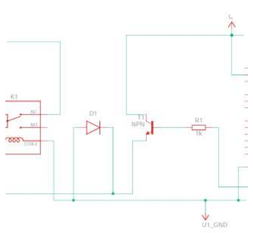
Garbage Collecting

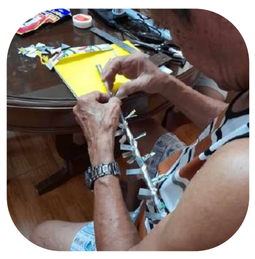


Storage Capacity

VISUALS

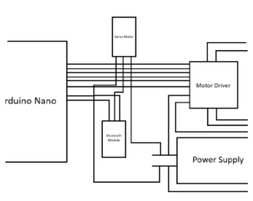


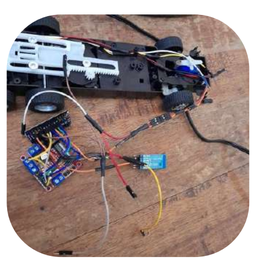














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Knowledge and Technological Transfer Center
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www.utcluj.ro

MPI Planar correction of pulse based ToF camera using CNN

Patent OSIM no.: RO135782- B1/30.08.2023

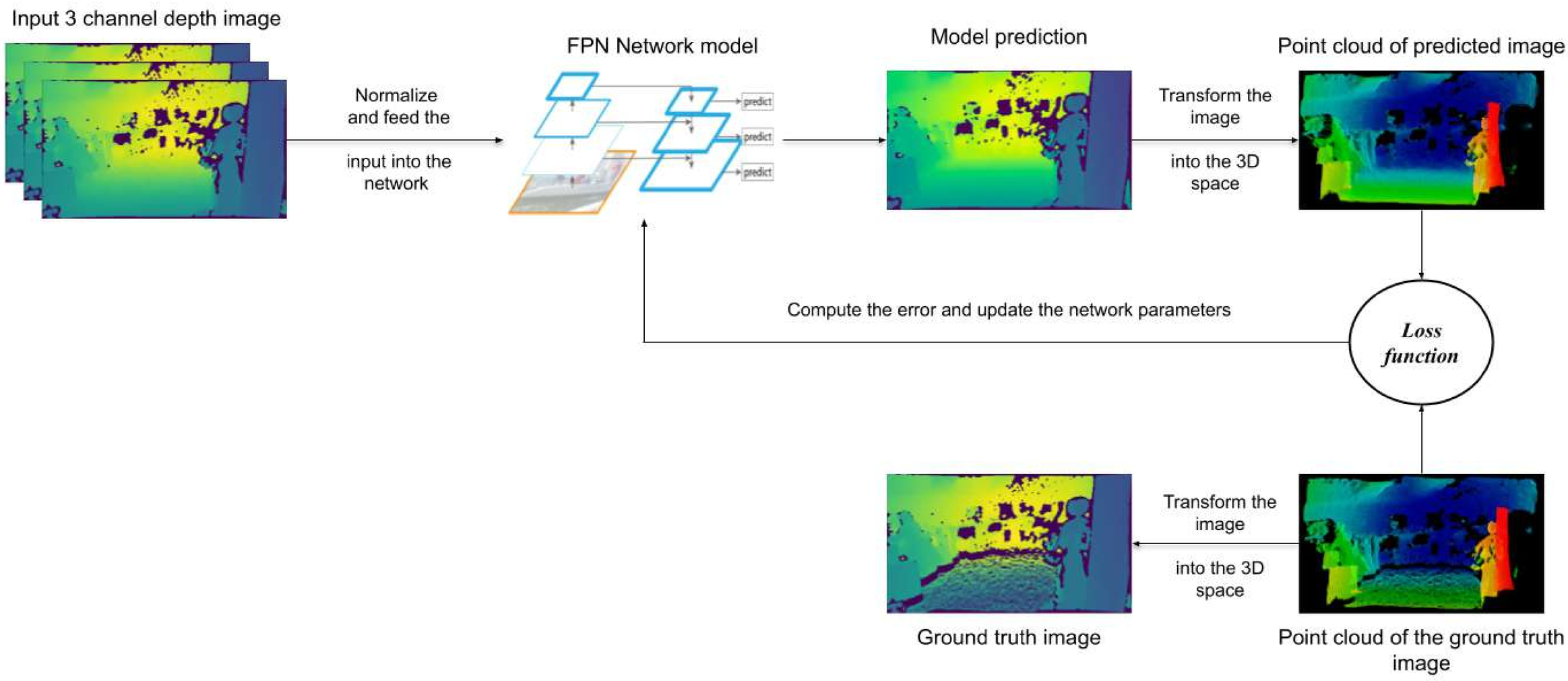
Author/s: Marian-Leontin POP, Levente TAMAS

Short presentation:

A system and method for automatically eliminating the multi-path interference on planar surfaces caused artifacts for the pulse based Time-of-Flight(ToF) cameras is provided. Moreover, the system comprises a component which is using convolutional neural network (CNN) for the elimination of the artifacts sensed and returned from the ToF camera depth images. The CNN is based on the 3 channel composition of information which is trained on a large real and synthetic dataset, for which an automatic 3D point processing chain is extracting and marking the correct ground planar information. During the evaluation mode, the CNN is able to correct in a seamless manner the artifacts on the planar patches from the ToF camera, ensuring a reduced MPI.

Applicability:

Robotics, AI



Contact: Levente.Tamas@aut.utcluj.ro

MEMBER OF

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e-mail: liliana.pop@staff.utcluj.ro
www.utcluj.ro

ToF Normal estimation for pulse based ToF camera using CNN

Patent OSIM no.: RO135781- B1/30.08.2023

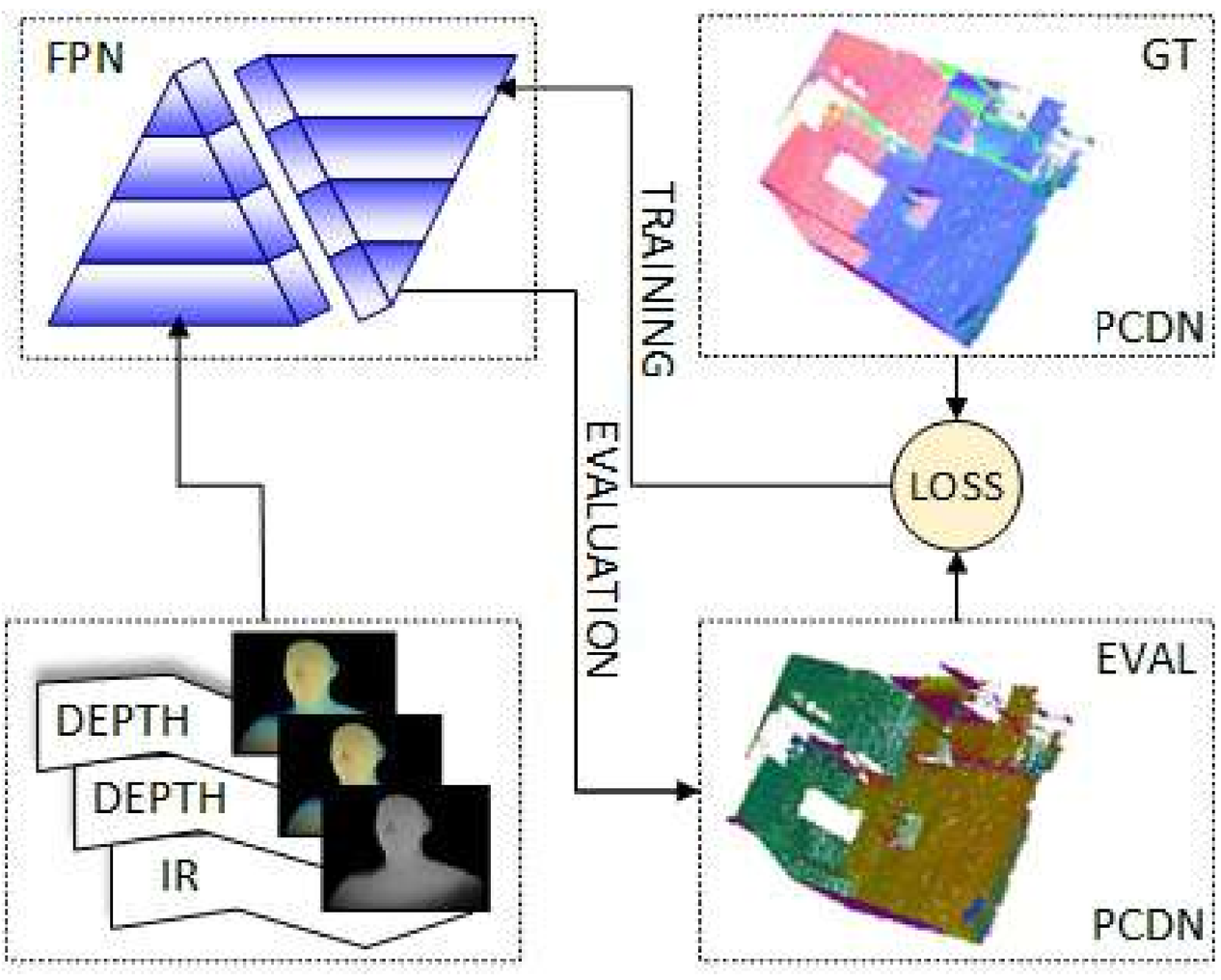
Author/s: Szilard MOLNAR, Levente TAMAS

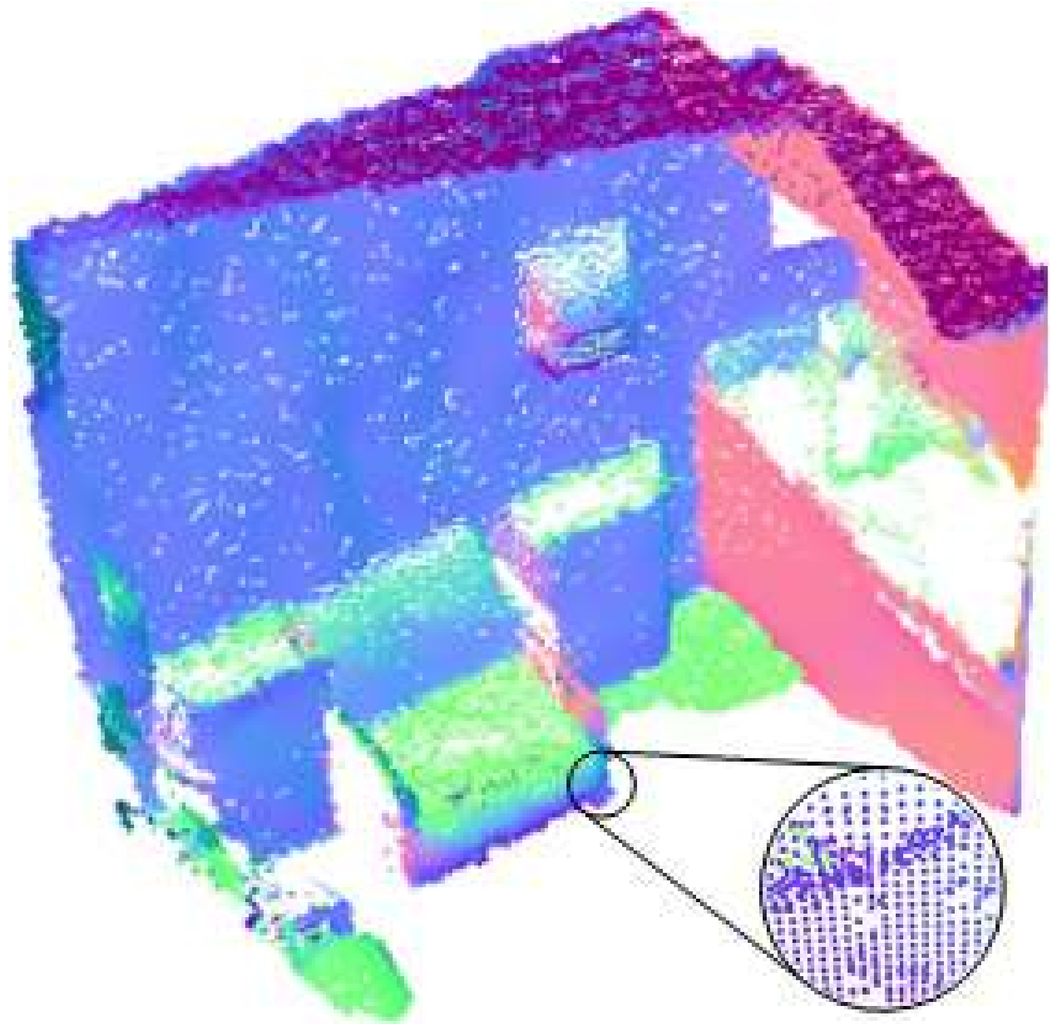
Short presentation:

A system and method for automatically computing spatial surface normals in 3D data from the pulse based Time-of-Flight(ToF) cameras is provided. Moreover, the system comprises a component which is using convolutional neural network (CNN) for computing the normals of a 3D pointcloud sensed and returned from the ToF camera depth images. The CNN is based on the 3 channel composition of information which is trained on a large real and synthetic dataset, for which an automatic 3D point processing chain is used to determine the normals. During the evaluation mode, the CNN is able to compute the normals of the pointcloud from the ToF camera, ensuring a fast and robust normal estimation for the pointclouds.

Applicability:

Robotics





Contact: Levente.Tamas@aut.utcluj.ro

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5th International Exhibition INVENTCOR
4-6 April 2024 – Deva, Romania

D

Automotive

Space science

Aviation

Ships

Mechanics

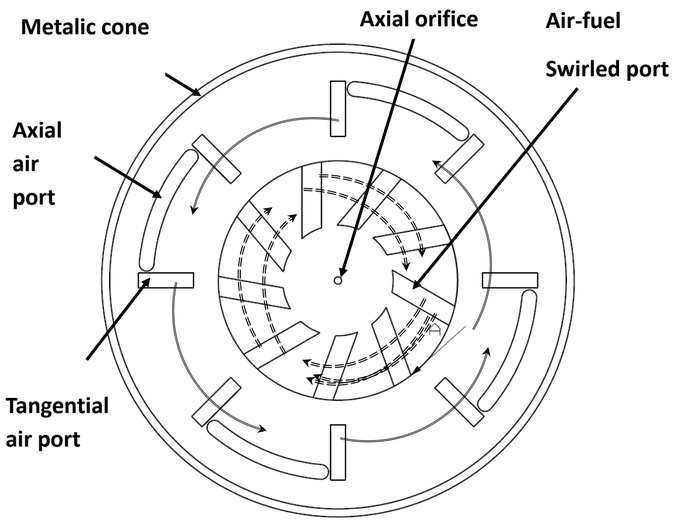
COMBUSTION CHAMBER WITH PREMIX, SWIRL AND PRIMARY DILUTION

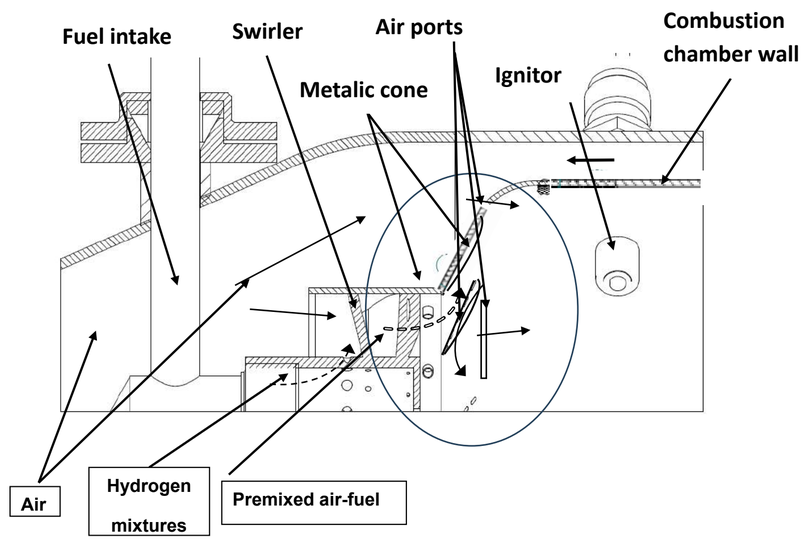
D

Patent RO137923

Authors: ENACHE MARIUS ŞTEFAN [RO]; PRISECARU TUDOR [RO]; SILIVESTRU VALENTIN [RO]; CÂRLĂNESCU RĂZVAN [RO]; MANGRA ANDREEA CRISTINA [RO]; FLOREAN FLORIN GABRIEL [RO]; KUNCSER RADU EUGEN [RO]

The present invention relates to a premix, swirl and primary dilution combustion chamber used in the field of gas turbines that are powered by gaseous fuels, in particular hydrogen, in which the fuels are represented by gas mixtures with high burning rates. It also represents research conducted for a PhD thesis. The study is realized through a functional prototype that can use a mixture of natural gas and hydrogen in volumetric proportions from 0% to 100% H_2. Current levels reported in the literature are up to 60% H_2 volumetric proportion.

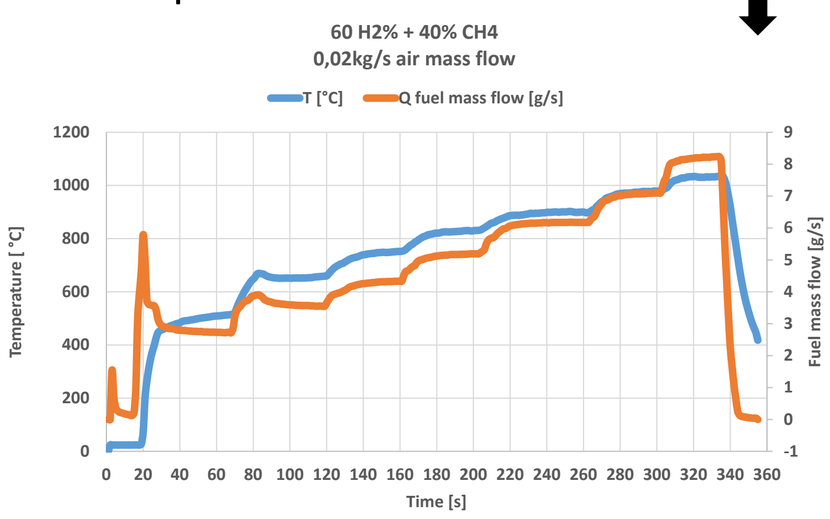


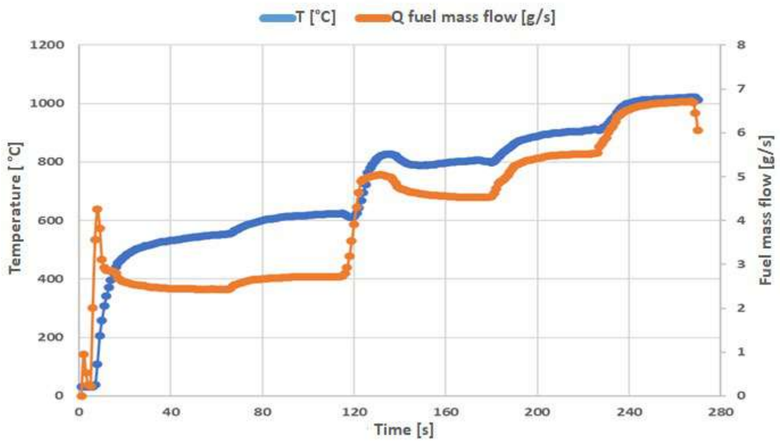


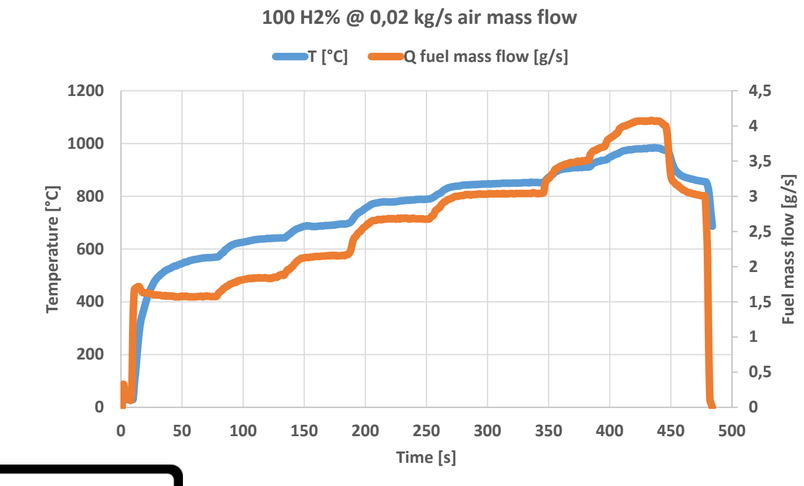
Frontal part of the combustion chamber



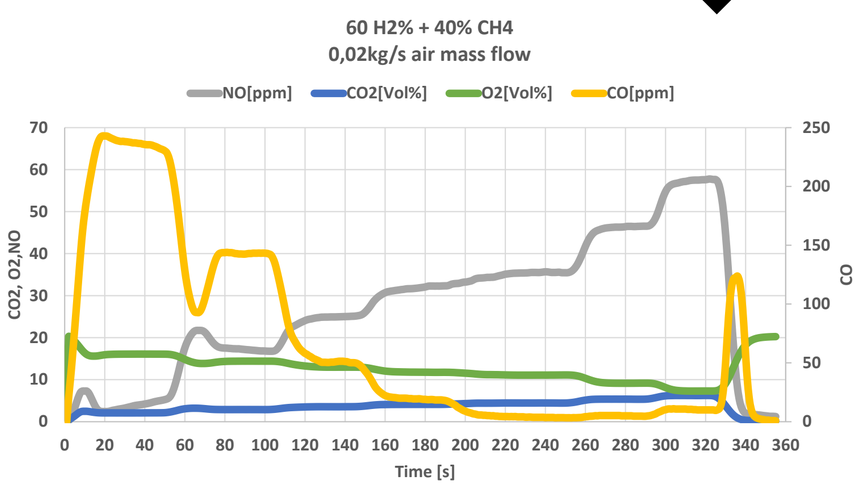
Temperature and fuel mass flow

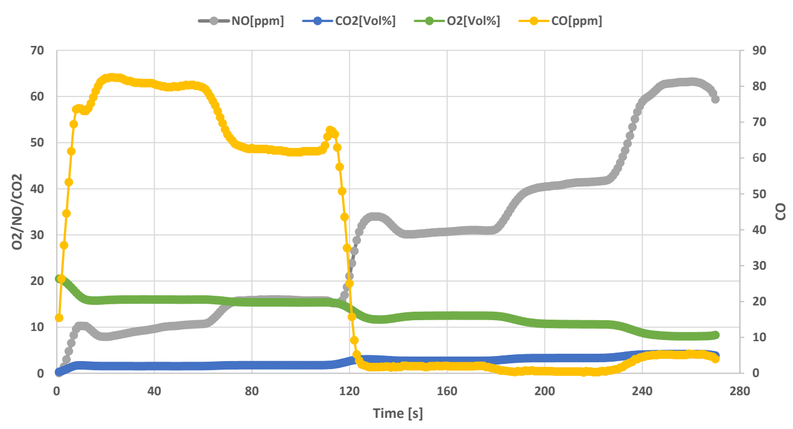


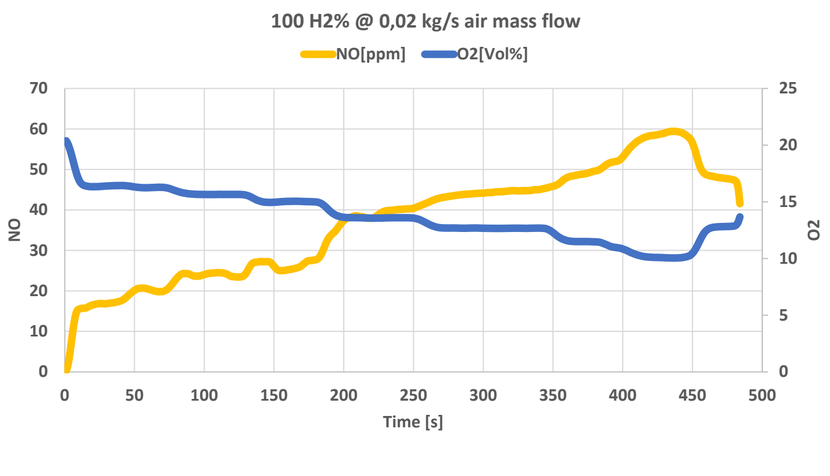




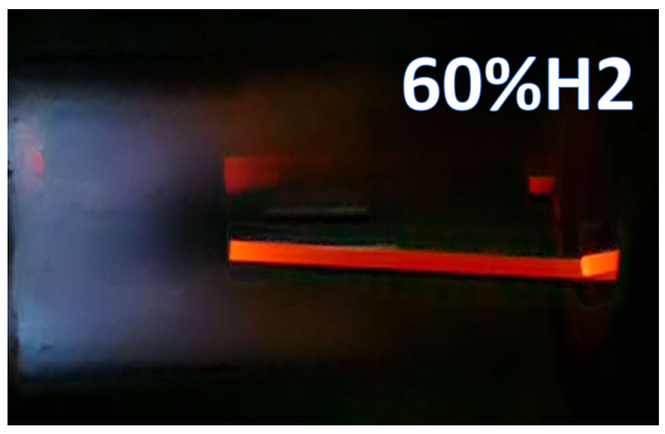
Exhaust gases analysis

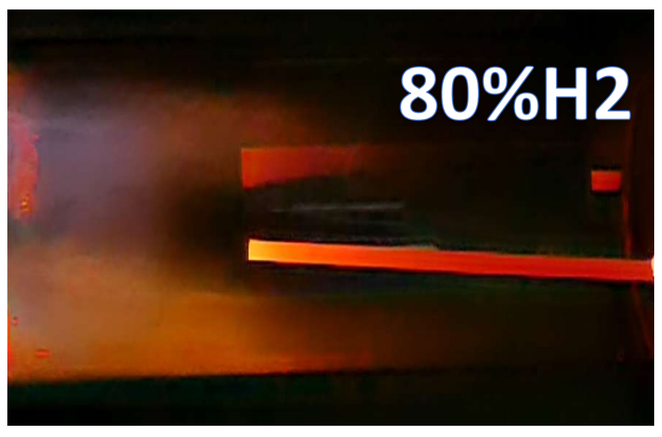


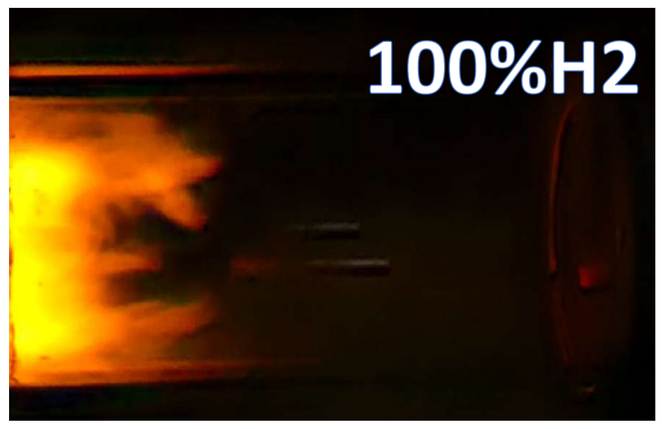




Flame visualization







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RECYCLING OF AUTOMOTIVE LITHIUM ION BATTERIES

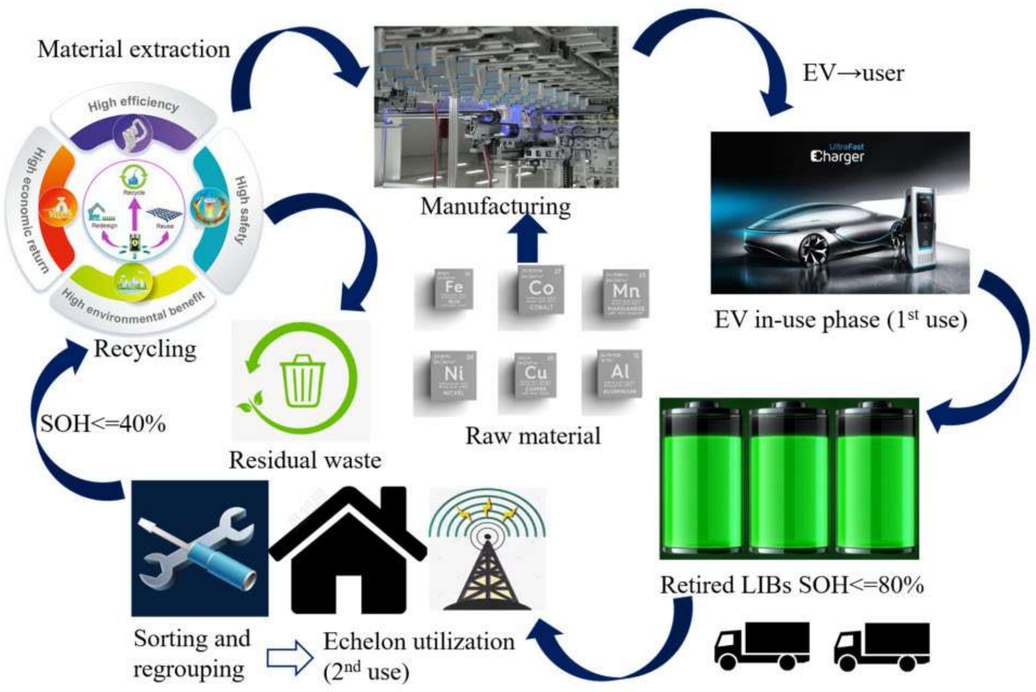
PhD Thesis

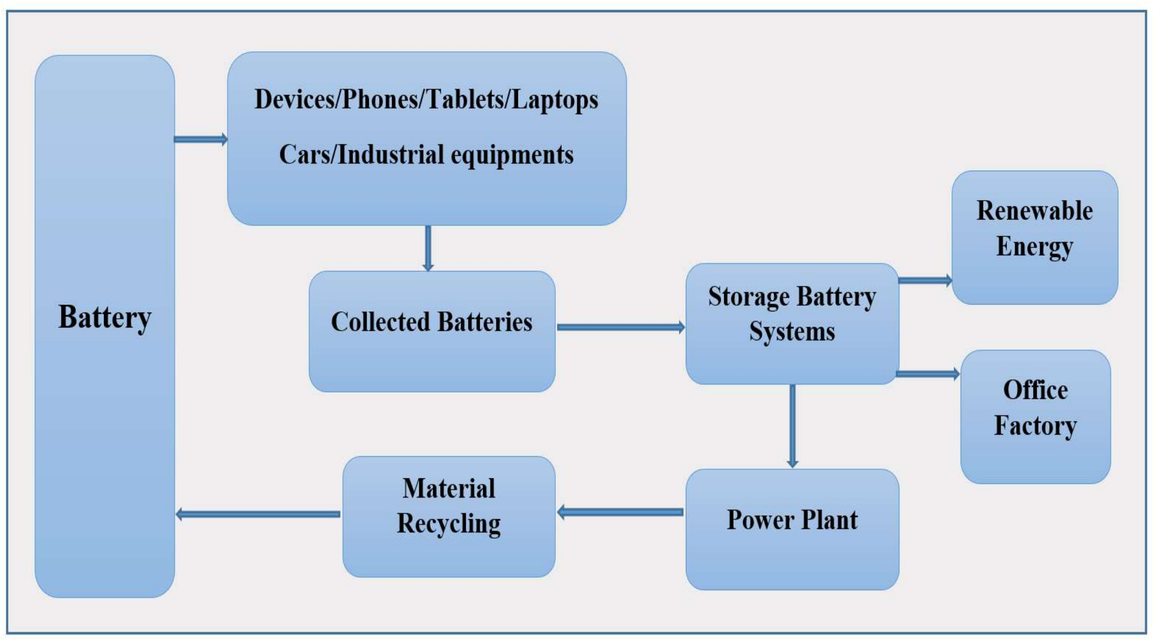
Author: Ioan Alexandru RUS

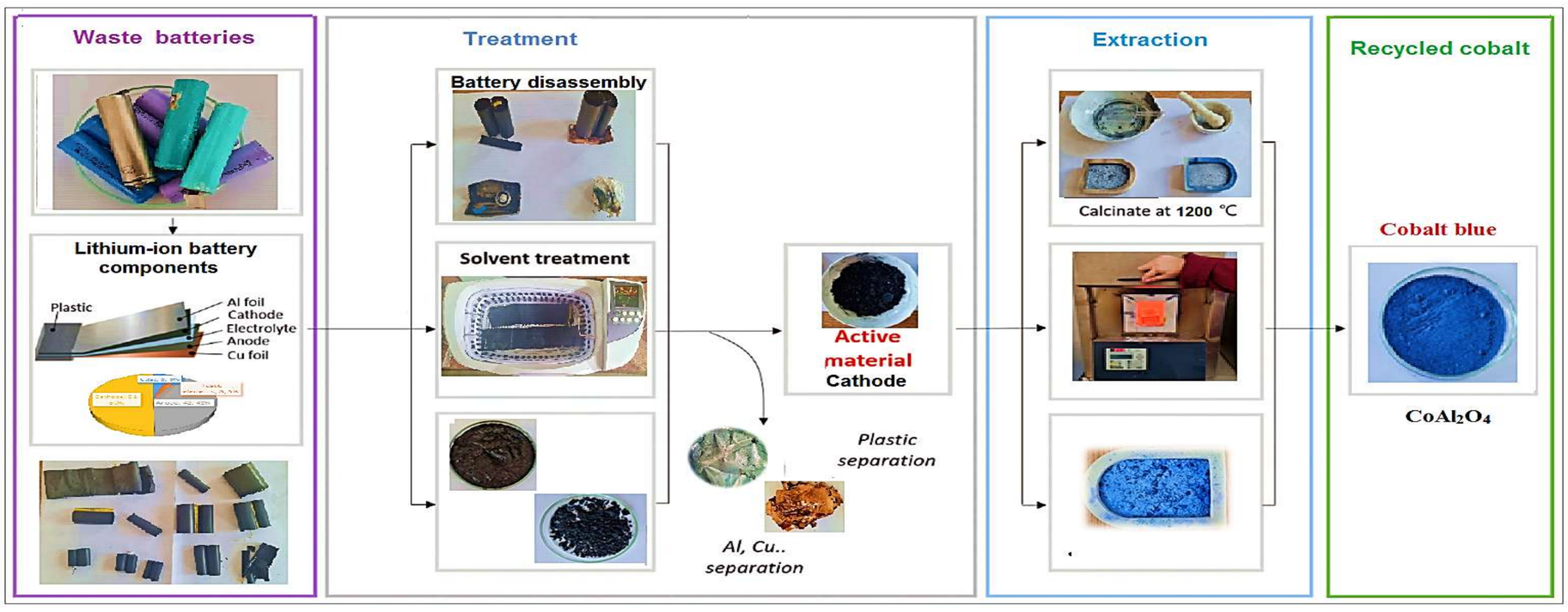
Mentors: Eugen-Viorel NICOLAE, Corneliu BIRTOK-BANEASA

Li-ion batteries have become the most widely used power source for electric vehicles due to their environmental protection, long life, high capacity, and high safety in charging and discharging. By 2025, used Li-ion batteries withdrawn worldwide are expected to exceed 600,000 tonnes. Battery manufacturing and end-of-life recycling has become a priority and strategic goal for many regions of the world, especially China and the EU. Although there are currently different types of batteries, Li-ion batteries are expected to dominate the electric vehicle market for at least another decade.

The recycling of used Li-ion batteries must be carried out in accordance with the 4R principle (recycle, reuse, reduce and recover). Battery recycling has two objectives: reducing the negative impact of waste on the environment and reusing the materials that make up the batteries to promote both sustainable production and the circular economy. Materials from battery recycling can also be a valuable resource. The recycling process can be defined as the process, which starts after the collection and possible sorting and/or preparation for recycling of waste batteries and accumulators obtained by a recycling facility and which is completed when the output fractions are produced for use in their original purpose or for other purposes, without being subjected to further treatment and which have ceased to be waste.







Cobalt blue is an inorganic pigment consisting of a cobalt aluminate spinel. The presented method of recovering cobalt in the form of a pigment is a viable and environmentally friendly method. The method involves the manual disassembly of the batteries and the recovery of the cathode paste in an ecological environment. The resulting cathodic paste is used for pigment production. Cobalt side sources are very valuable. Disposable Li-ion batteries have a high cobalt content. The obtained cobalt blue is a pigment used in various industrial sectors.

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TECHNOLOGIES FOR PROCESSING ROAD VEHICLE RIMS

PhD Thesis

Author: Doru Ioan SAPTA;

Mentors: Ana SOCALICI, Corneliu BIRTOK BANEASA

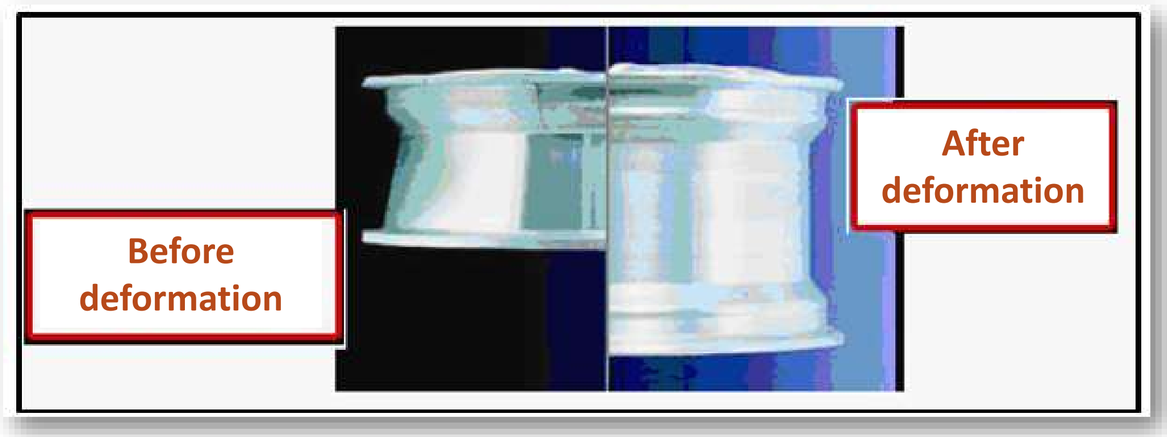
For alloy rims, the important thing is the quality of the alloy and the manufacturing technology, in the case of manufacturing rims by casting, their quality also depends on the casting technology: sand casting, gravity casting, centrifugal and low pressure casting. The first two technologies are less controllable operations, which can lead to the appearance of puffs and retouches. Gradually, the production of alloy wheels by casting is replaced by the production by plastic deformation, which leads to lower weight, physical-mechanical characteristics and improved performance.

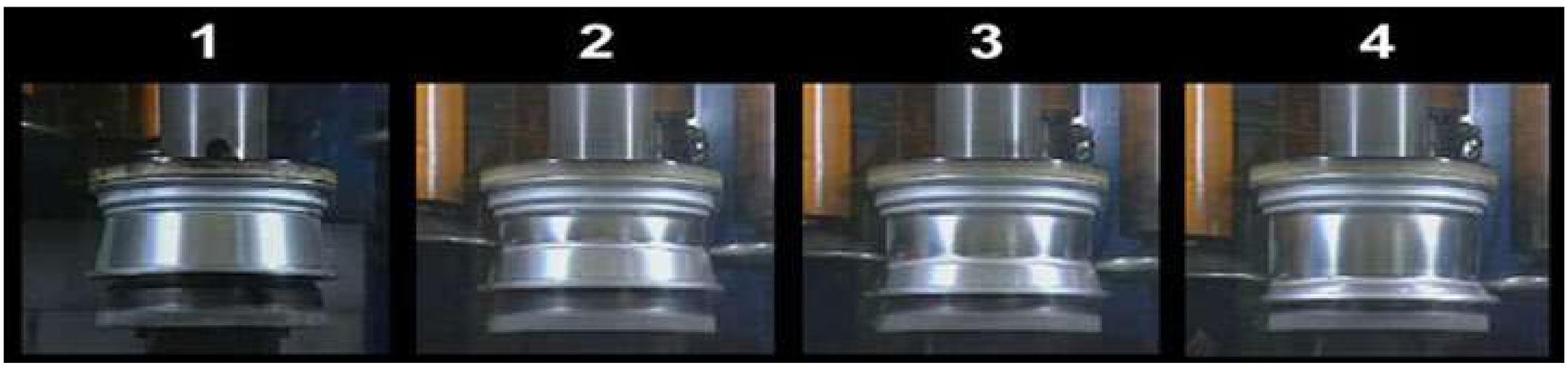
Forging is a technique for producing rims from metal alloys, by which the material is heated in a well-established area, the maximum heating temperature being below the solidus temperature. For forging, cylindrical alloy blocks are used, with diameter and height varying depending on the destination of the rim, its dimensions and weight respectively. Once forged, the rims are heat treated to maximize overall mechanical strength. To obtain the final configuration, lathes with computerized numerical control (CNC) are used. The final finishing takes place through careful processing, which involves extraordinarily fine equipment, all details being finished and precisely adjusted to the required dimensions, according to the specifications and design of the design team. Then, the rim is sanded by hand inside and out and a protective acrylic layer is applied.



The forging process

Flow Forming technology





The stages of the deformation process

One of the current trends is the increasing demand for large diameter rims, which can be difficult due to their weight, which leads to increased weight on the car's suspension, compromising comfort and safety behind the wheel, however, this problem has been solved by introducing flow technology forming.

"Flow Forming" is a procedure for increasing the width of the rim, which uses 3 hydraulic rollers and very high speeds and forces, which lead to very low weights and high resistances. Through this process, hydraulic rollers force the cast material to follow the profile given by the solid steel tools. During the process the entire diameter of the rim is created.

Contact: sapta94@gmail.com

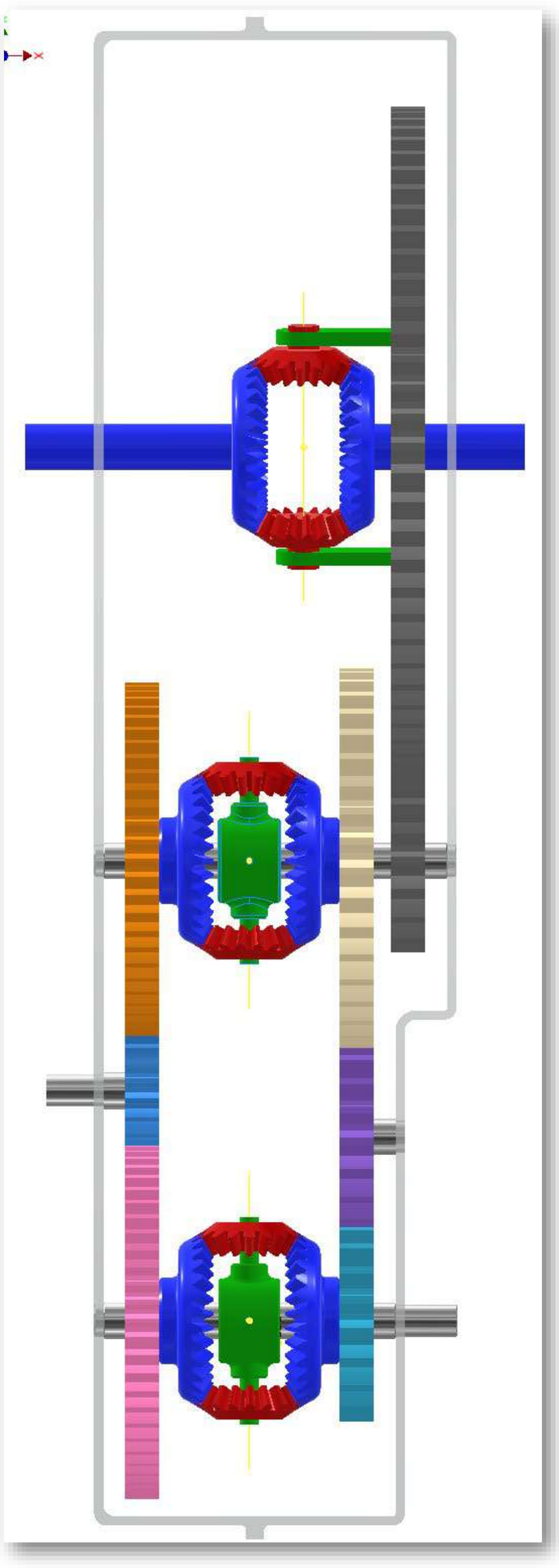
DUAL TANDEM TRANSMISSION

Patent RO134406 / 30.03.2023

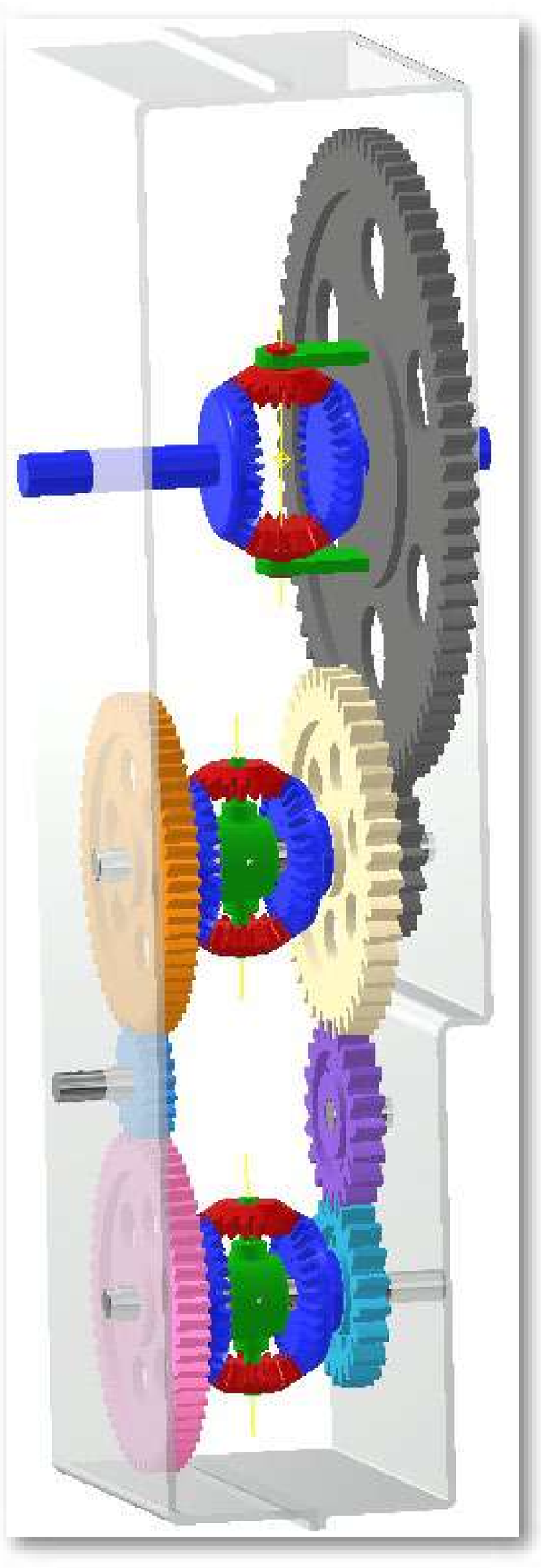
Authors: ROMEO CĂTĂLINOIU, SORIN AUREL RAȚIU, IMRE ZSOLT MIKLOS

The invention is an application of Patent RO134406 dated 30.03.2023 and refers to a gearbox intended to ensure the transmission of electrically powered automobiles with the aim of reducing energy consumption and increasing energy autonomy.

The gearbox is characterized by the fact that it continuously varies the value of the transmission ratio, by varying the revolutions of the two electric motors, which can work individually or in tandem.



SCAN ME



The gearbox is a mechanical reducer characterized by the fact that it provides assistance when pedaling through an electric motor, assistance that can be achieved in three modes: low, medium and high, self-adaptive depending on the value of the load torque that must be overcome.

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SUPER TOURING REPLICA

Student project

Author: Ovidiu Tudor Ioan OPREA

Mentor: Prof. Corneliu BIRTOK-BANEASA

D

This study presents the evolution of my racecar project, a 1997 Bmw 3 Series Saloon, that started its life as a basic 4 cylinder 1.6 sedan. I got this specific chassis thanks to its results in the Super Touring races back in 1993 to 1995 – Super Touring, Class II or Class 2 was a motor racing Touring Cars category defined by the Federation Internationale de l'Automobile (FIA) for national touring car racing in 1993. It was based on the "2 litre Touring Car Formula " created for the British Touring Car Championship (BTCC) in 1990. The FIA organised a World Cup for the category each year from 1993 to 1995,and adopted the term "Super Tourer" from 1995. The car in cause was running a stroked M42 2.0 that used to be a 1.8 from the factory , running 320 naturally aspirated horsepower on a 1250kg chassis.

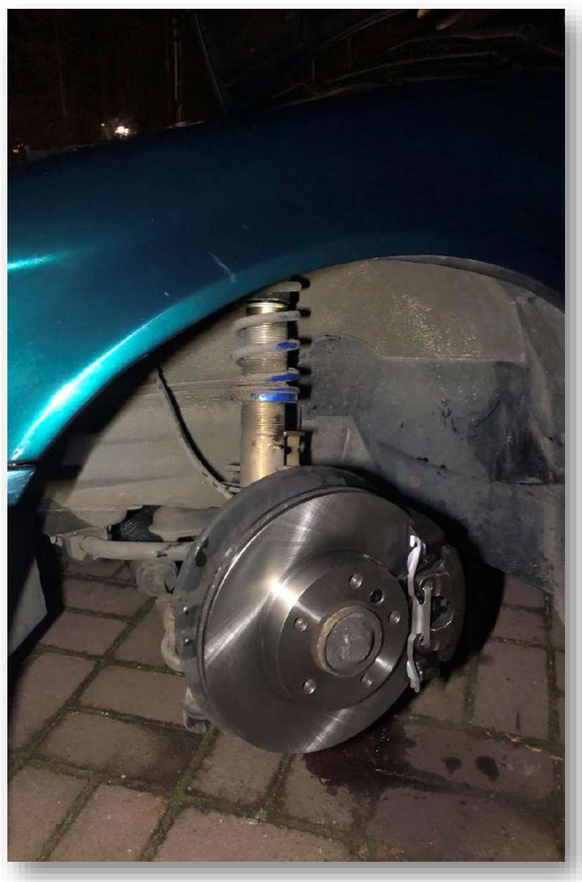












My project is using the same suspension setup like the Super Touring E36, received a M42 swap, lighter flywheel , 286 mm braking setup from the 328i E36, lighter 17-inch Oz Racing Superturismo Rims , front and rear strut bars , 3 spoke RRS Racing Wheel, Sparco Bucket Seat and a Short Shifter.

Future plans with my project? As the title says, I want it to look like a Racing car that was used 30 years ago in the Super Touring races and perform like one.

How do I intend to use my project and where? Currently I have been to few open trackdays to learn my car better and learn to perform better as a driver, my latest and first competition was a local one named Cupa Caprioara II this autumn, where I was able to secure the first place on the podium, there is more competitions to come in the future!

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@_tudor321 Instagram

Gaussian RBFNN method for solving FPK and BK equations in stochastic dynamical system with FOPID controller

Research project

Authors: [a]*Wei Li*, [a]*Guan Yu*, [a]*Huang Dongmei*, [b]*Trisovic Natasa*

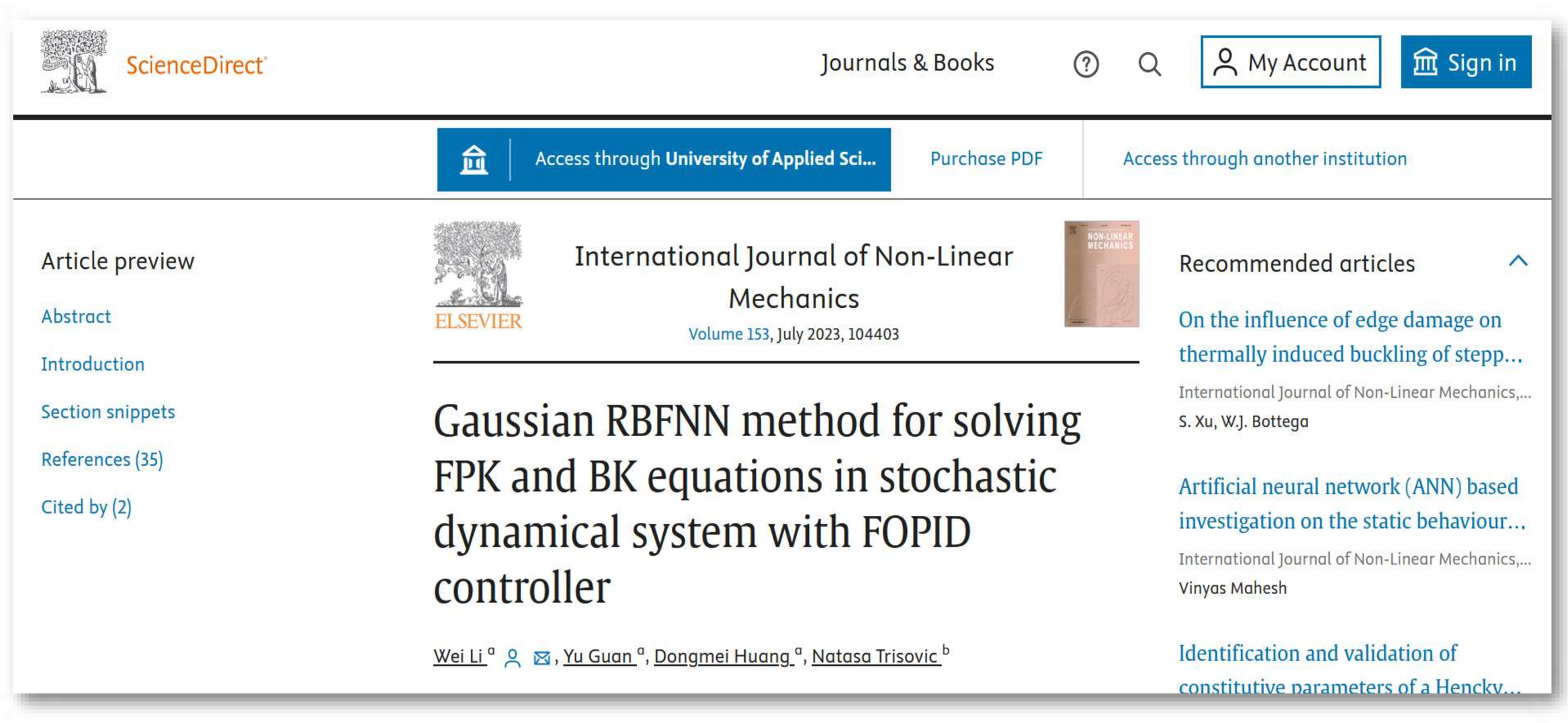
[a]School of Mathematics and Statistics, Xidian University, Xi'an 710071, PR China

[b]Faculty of Mechanical Engineering, Department of Mechanics, University of Belgrade, Belgrade 11000, Serbia

D

Addressing the Fokker–Planck–Kolmogorov (FPK) equation and its counterpart, the Backward-Kolmogorov (BK) equation, stands as a pivotal endeavor in capturing the transient behavior of stochastic dynamical systems.

The advent of Fractional order PID (FOPID) controllers heralds a new era in effectively modulating system responses to meet desired criteria. In this study, we propose the utilization of Gaussian Radial Basis Functions Neural Network (RBFNN) for tackling the FPK and BK equations, thereby deriving transient probability density functions and reliability functions for a generalized Van der Pol system under the influence of a FOPID controller. Through meticulous examination of various fractional orders, we delve into the efficacy of the FOPID controller in steering system dynamics.



Our methodology incorporates a strategic data collection approach to address boundary conditions, leveraging a singular Monte-Carlo simulation coupled with uniform distribution within the Gaussian RBFNN framework. This approach ingeniously transforms the solution process of FPK and BK equations into solving algebraic equations, streamlining computational complexity. Numerical analyses of transient system responses substantiate the efficiency and accuracy of the Gaussian RBFNN in solving FPK and BK equations. Notably, we highlight the pivotal role played by fractional integration and differentiation orders as critical parameters influencing system response control.

Furthermore, our findings underscore the capacity of fractional order parameters within FOPID controllers to augment system responsiveness and induce bifurcation phenomena, thereby enriching our understanding of system dynamics.

Contact: **Nataša Trišović, ntrisovic@mas.bg.ac.rs, Tel: +38163283507**

Presentation link: ***https://www.sciencedirect.com/science/article/abs/pii/S0020746223000550***

SCAN ME

TUGBOAT “NEREO”, 1: 43 SCALE, FAST ATTACK BOAT S-100, 1:35 SCALE

Modelships Project

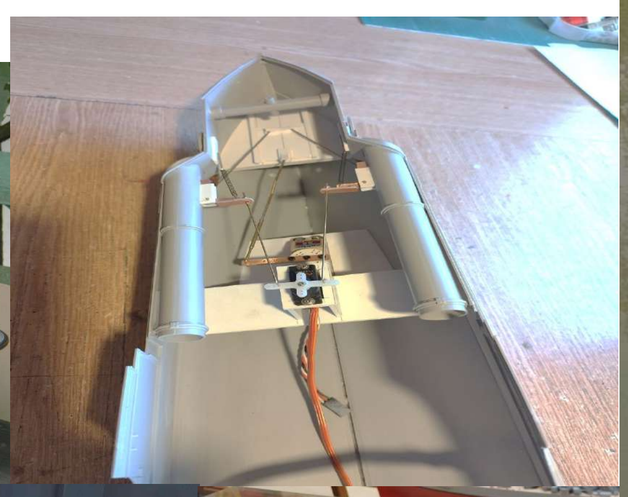
D

Author: George POPA – Emerit Master of sport

Scratchbuild modelships according to original shipyard plans and documentation. The modeltugboat “Nereo” is a true to scale replica of a WW 2 italian armed tugboat used by the italian navy to defend against aircrafts during the war. The model is fully functionaland can complete the following functions: forward / backward, left / right, anchor maneouvering, smoke and sound generator, navigation lights.

All these functions can be activated using a 10CH proportional remote control. The model has won the Gold medal in following international competions: World Chamionship NS class, Ornetta, Poland, 2017; european championship Burgas, Bulgaria, 2019; World championship C class, Rijeka, Croatia,2021, World champion ship C class, Jablonec, Czech Republic, 2023.













Fast attack S100 built by Kriegsmarine in WW2 and widely used on all naval operations aroun Europe. The model represents one of the ships used in Black Sea. RC model capable of launching electric torpedoes and also all basic running functions. Model has been awarded with the gold medal in C6 class at World championship in Jablonec, Czech Republic.

Presentation link: https://www.facebook.com/gemarmodelships

Contact: +40722284042 marinaru_ro@yahoo.com

SCAN ME

WE ARE SAVING THE PLANET!
SUSTAINABILITY THROUGH RECYCLING IN 3D PRINTING

Research Project

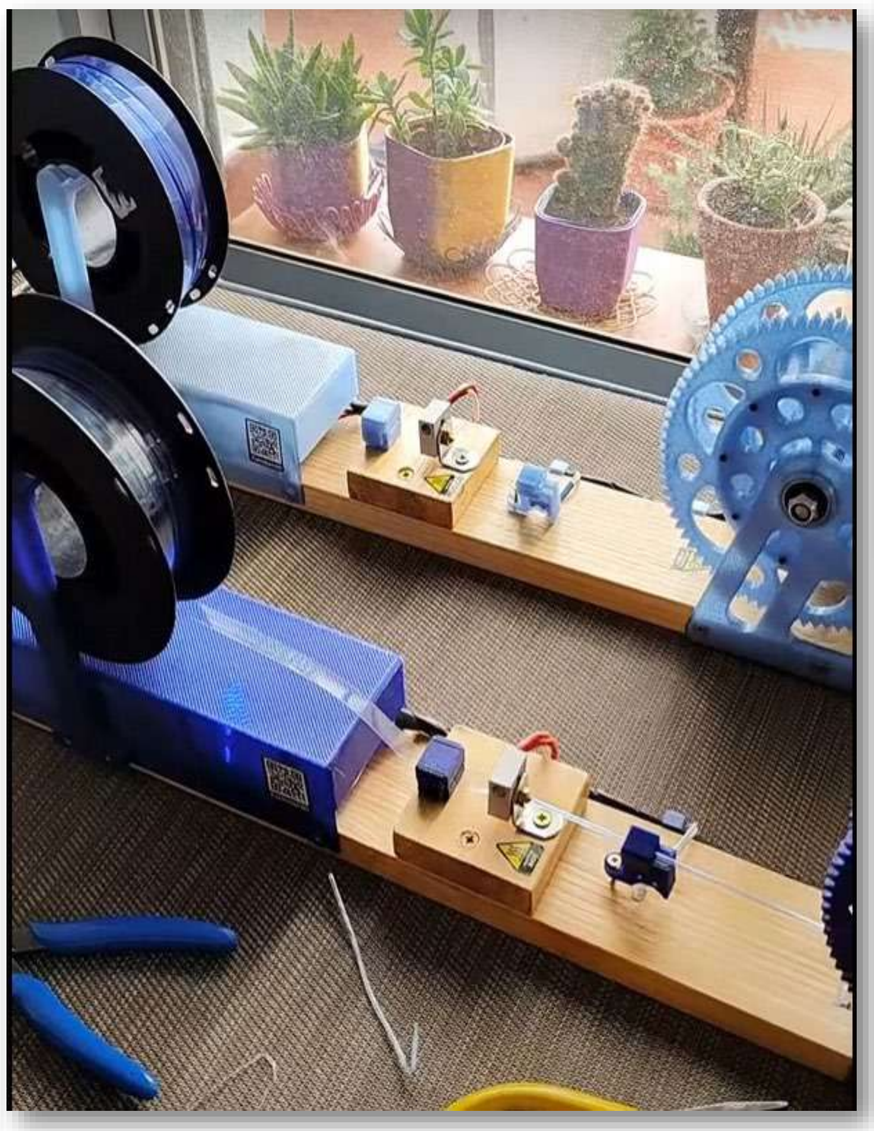
Authors: Simina Tănasă, Andrei Pîrvu, Nicoleta Vartolomei

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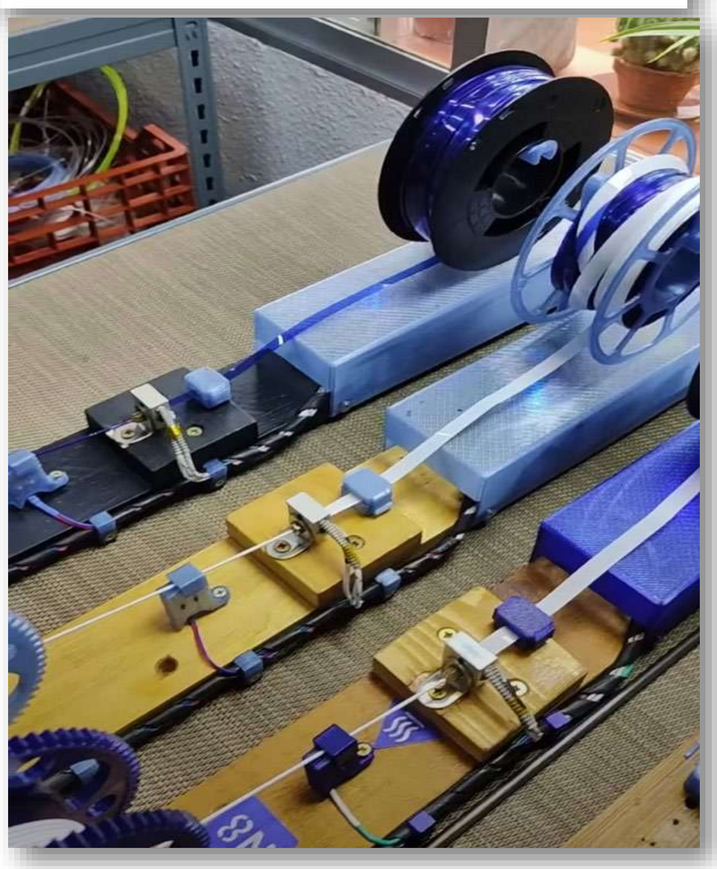
An experimental station for recycling plastic materials to produce filament for 3D printing. Environmental protection, recycling, are among the most important topics today. One of the most used materials in the additive manufacturing industry is PET (polyethylene terephthalate), exactly the same plastic from which most of the packaging and containers used in various industries are produced. Increasing involvement in environmental protection through the implementation of an experimental station for the recycling of plastic materials in order to produce filament for 3D printing, proposes an integrated approach in the management of plastic waste (especially PET) and recycling them into filament for 3D printing.

The general objective of the project is to increase the degree of involvement in environmental protection by implementing an experimental station for the recycling of plastic materials in order to produce filament for 3D printing.









Conclusions

All electronic components are easily accessible and all structural parts can be 3D printed or purchased from hardware stores.
Plastic bottles have found a new use: raw material for 3D printers.

Acknowledgements

This study was performed with the support material by ***Technological High School of Targu Ocna***

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ANALYZING THERMOELECTRIC BRAKE DISC HEAT RECOVERY THROUGH FINITE ELEMENT ANALYSIS

Scientific Research Project

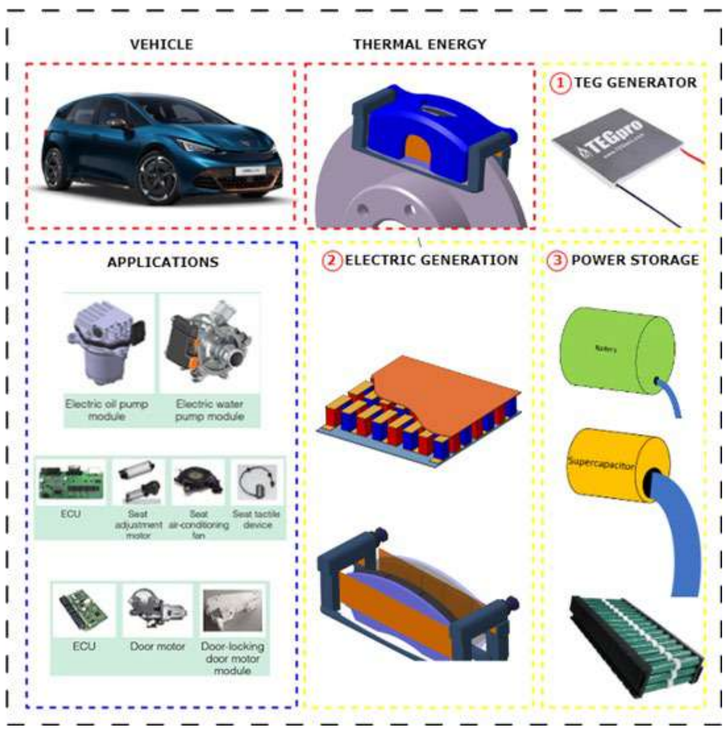
Authors: Cosmin PREDA, Robert-Marian BLEOTU

Coordinator: Professor Aurel Mihail ȚÎȚU

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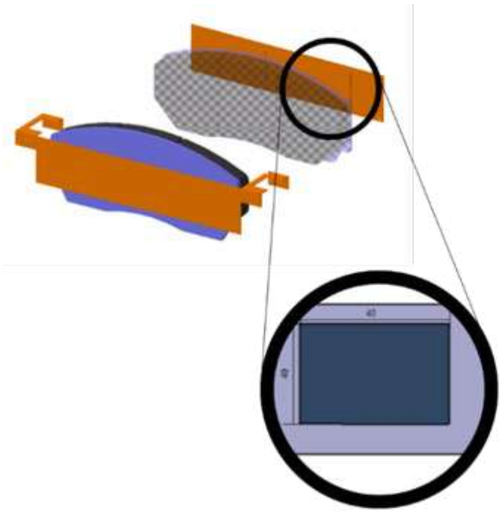
DESCRIPTION: *The paper presents the development of a calculation model for the braking system equipped with a thermoelectric generator to correlate the temperature of the brake disc with the performance of the generator. The variant with solid or ventilated brake disc is compared. The thermal analysis of the system temperature using finite elements was used to evaluate the potential energy that can be reused in the form of heat after braking. This research focused on the analysis of the conversion of thermal energy lost during the braking process into electrical energy, necessary for the operation of many auxiliary components of motor vehicles. The conversion of the heat generated in the braking process by means of thermoelectric generators was explored. The resulting electrical energy is fed back into the system to assist the electric motor or other auxiliary components fed directly from the heat engine. The potential benefit of using this electrical energy recovery system for vehicles is an important step in the automotive industry and the study of this topic within the work constitutes a step forward towards the current trend.*

APPLICATIONS:

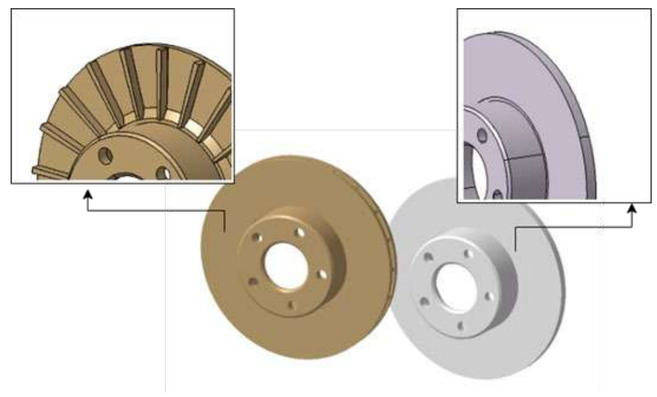


The brake system components analyzed in this study include the brake disc, made of gray cast iron, and a floating caliper. The caliper consists of two brake pads with their clamping plate, two actuation pistons and four thermoelectric generators, two for each pad. The figure shows the braking system considered in this study. The brake disc is the component attached to the wheel hub, rotating at the same time as the car's travel speed and thus constituting a moving part of the braking system.

TEG SYSTEM AND BRAKE DISCS:



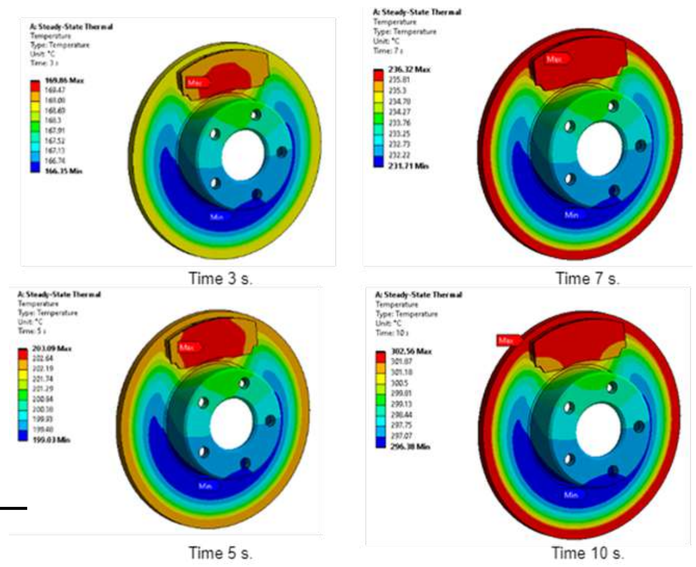
Plates were made for their attachment, so that the structure or functionality of the braking system is not affected.



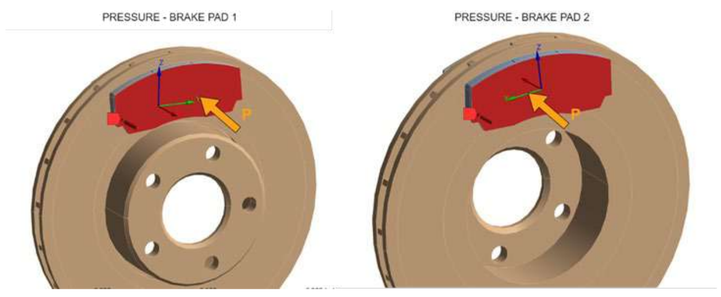
For thermal analysis, two different versions of brake discs were created, one solid and the other ventilated. In order to obtain the most accurate comparison in terms of thermal results for both brake discs, gray cast iron was chosen. The figure shows the two variants of the brake discs created for the analysis.

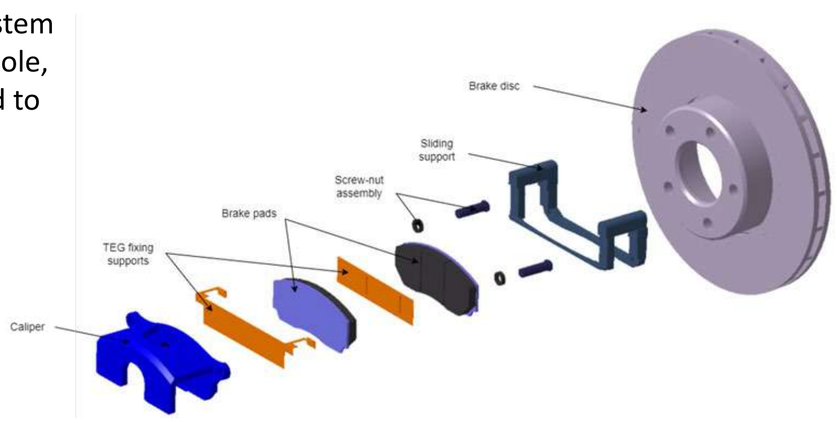
RESULTS AND DISCUSSIONS:

Regarding the other component of the braking assembly that was subjected to the thermal analysis, the figure shows the thermal results for the brake pad, during the 10 seconds of the thermal analysis. A significant increase in temperature can be observed on its contact surface, the thermal zone extends to the outside of the plate.

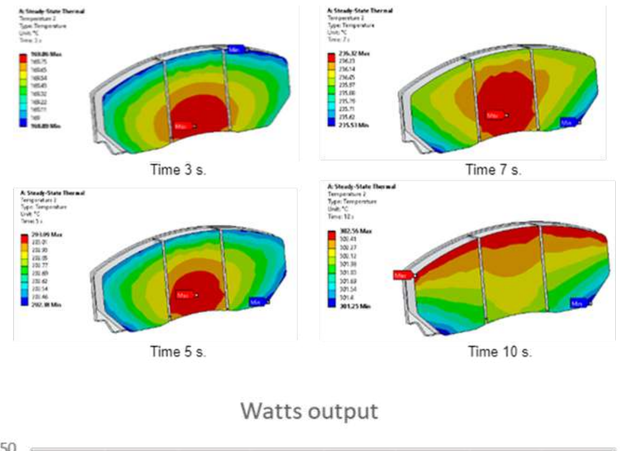


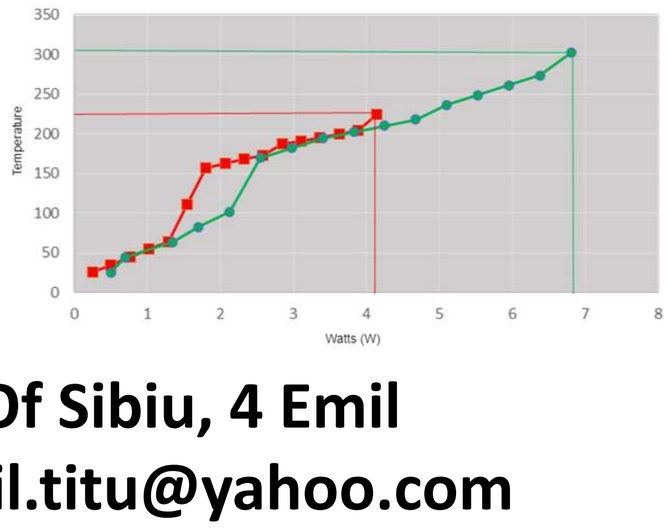
The previously performed thermal analysis is important, because in this way the optimal location for the thermo-electric generators is determined in order to be as efficient as possible. The figure shows the analysis process and the incorporation of the system into the vehicle as a whole, and the areas subjected to pressure





Regarding the other component of the braking assembly that was subjected to the thermal analysis, the figure shows the thermal results for the brake pad, during the 10 seconds of the thermal analysis.
The amount of energy is determined from the calculation made following the analysis and technical data of the thermo-electric generator that was used.
The results of the energy calculation were obtained starting from an ambient temperature value of 22 °C, which was calculated at the technical values of the thermo-electric generator used in this study, a resistance R_TEG=0.87Ω, a value of the output voltage V_TEG =10.4 V and for current I_TEG=2 A.





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ADVANCEMENTS IN DRONE TECHNOLOGY FOR ENHANCED SURVEILLANCE CAPABILITIES

Scientific Research Project

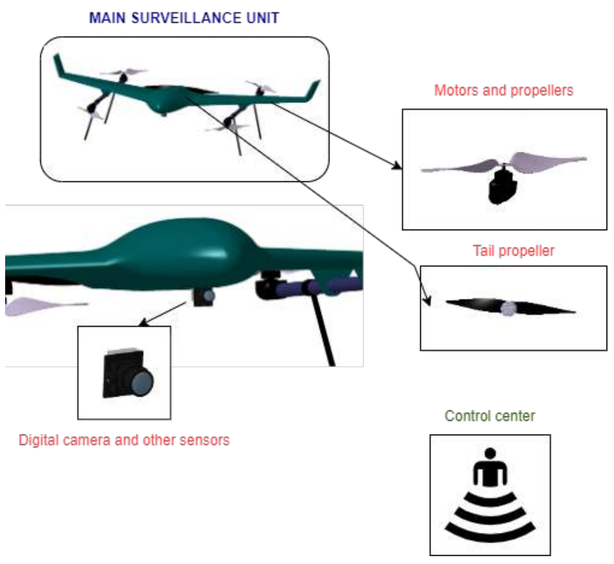
Authors: Robert-Marian BLEOTU, Cosmin PREDA

Coordinator: Professor Aurel Mihail ȚÎȚU

D

ABSTRACT *The proliferation of unmanned aerial vehicles (UAVs) has revolutionized various fields, including surveillance. In this paper, we present the design, implementation, and performance analysis of an advanced surveilling drone system. The system present state-of-the-art technologies in drone hardware, sensor integration, communication protocols, and data processing algorithms to achieve efficient and effective surveillance capabilities. Were presented the key components of the drone system, including the hardware architecture, sensor suite, communication infrastructure, and software algorithms. The end of the research is based on the performance of the system in real-world surveillance scenarios. The findings indicate that the advanced surveilling drone system offers enhanced capabilities for monitoring, reconnaissance, and situational awareness, making it a valuable tool for various applications including security, emergency response, and environmental monitoring for companies also.*

DESIGN AND METHODS



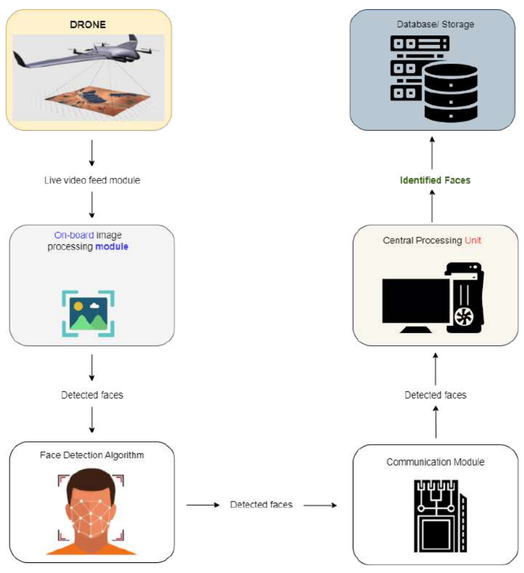
The drone platform serves as the primary hardware component of the system. It is equipped with a variety of sensors, including high-resolution cameras, thermal imaging cameras, LiDAR (Light Detection and Ranging), and microphones for audio surveillance. The drone's propulsion system, flight control unit, and onboard computing hardware are optimized for stability, endurance, and payload capacity

In this paper, it was presented the design, implementation of an advanced surveilling drone system. The main objectives of the research are:

-to provide a comprehensive overview of the system architecture, including the hardware components, sensor suite, communication infrastructure, and software algorithms.

-to describe the implementation details of the advanced surveilling drone system, including the integration of off-the-shelf components and custom-built software modules.

-to evaluate the performance of the system through field tests and experimental analyses, demonstrating its efficacy in real-world surveillance scenarios.





SOFTWARE ALGORITHMS

```python
import cv2
import dlib
import numpy as np
# Load pre-trained face detection model
detector = dlib.get_frontal_face_detector()
# Load pre-trained face recognition model
shape_predictor = dlib.shape_predictor("shape_predictor_68_face_landmarks.dat")
face_recognizer =
dlib.face_recognition_model_v1("dlib_face_recognition_resnet_model_v1.dat")
# Load a sample image for testing
img = cv2.imread("test_image.jpg")
# Convert the image to grayscale for face detection
gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
# Detect faces in the grayscale image
faces = detector(gray)
# Iterate through detected faces
for face in faces:
    # Determine facial landmarks
    shape = shape_predictor(gray, face)
    # Extract face descriptor
    face_descriptor = face_recognizer.compute_face_descriptor(gray, shape)
    # Convert to numpy array for easier manipulation
    face_descriptor = np.array(face_descriptor)
    # Perform face recognition (you would compare this descriptor to a database of
known face descriptors)
    # For this example, let's just print the descriptor
    print("Face Descriptor:", face_descriptor)
    # Draw rectangle around face
    cv2.rectangle(img, (face.left(), face.top()), (face.right(), face.bottom()),
(0, 255, 0), 2)
# Display the image with detected faces
cv2.imshow("Face Recognition", img)
cv2.waitKey(0)
cv2.destroyAllWindows()
```

```python
import sqlite3
class FaceDatabase:
    def __init__(self, db_name='face_database.db'):
        self.conn = sqlite3.connect(db_name)
        self.cursor = self.conn.cursor()
        self.create_table()

    def create_table(self):
        self.cursor.execute('''CREATE TABLE IF NOT EXISTS faces
                               (id INTEGER PRIMARY KEY, name TEXT, embedding
BLOB)''')
        self.conn.commit()
    def add_face(self, name, embedding):
        self.cursor.execute('''INSERT INTO faces (name, embedding) VALUES (?,
?)''', (name, embedding))
        self.conn.commit()
    def get_face_by_name(self, name):
        self.cursor.execute('''SELECT * FROM faces WHERE name=?''', (name,))
        return self.cursor.fetchone()
    def get_all_faces(self):
        self.cursor.execute('''SELECT * FROM faces''')
        return self.cursor.fetchall()
    def delete_face(self, name):
        self.cursor.execute('''DELETE FROM faces WHERE name=?''', (name,))
        self.conn.commit()
    def close(self):
        self.conn.close()
# Example usage:
if __name__ == "__main__":
    db = FaceDatabase()
    # Add face
    db.add_face('John', b'example_embedding_data')
    # Get face by name
    print(db.get_face_by_name('John'))
    # Get all faces
    print(db.get_all_faces())
    # Delete face
    db.delete_face('John')
    db.close()
```

The software part was made with the help of the Visual Studio Code program, and for this the code was made to allow the video camera mounted on the surveillance drone to detect girls and people, for the purpose for which it was made.

After the facial detection program was created, the next step was to create a program and code for the facial identification of the detected persons. Thus, a Python code was created which is presented in figure, which presents a simplified implementation of face recognition using the OpenCV and dlib libraries. Face recognition is a pivotal technology in computer vision, enabling systems to identify individuals from images or video streams automatically

RESULTS AND FUTURE DIRECTIONS

An interface was created for the integration of the components and to control the entire system of drones, which is presented in Figure 9. The interface provides an individual control for each drone, with audio-video images and with the possibility of identifying people according to the existing database.



To assess the performance of the advanced surveilling drone system, it is necessary to perform a series of field tests in various surveillance scenarios. The tests evaluated the system's ability to detect and track objects of interest, maintain stable flight under different environmental conditions, and transmit data reliably to the ground station.

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AUTOMATIC PROTECTION SYSTEM IN THE WINDSHIELD

Scientific Research Project

Authors: **Alexandru-Ionel SPIRCU, Laurentiu-Ilie SZOKE**

Coordinator: **Professor Aurel Mihail ȚÎȚU**

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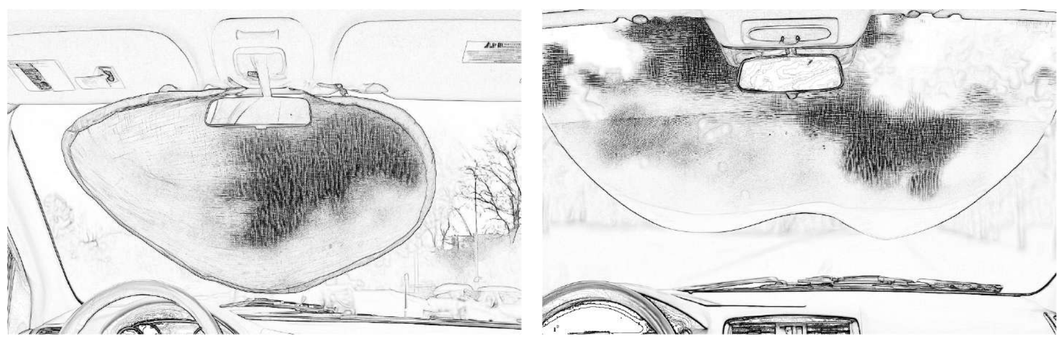
DESCRIPTION

This additional passenger safety system, integrated within the vehicle's interior, provides extended protection by covering the entire windshield surface with an airbag that prevents objects from entering from the outside and reduces the risk of injury in the event of windshield breakage. It also prevents the uncontrolled ejection of passengers who are not secured with a seatbelt. This system is automatically activated upon impact, occurring simultaneously with the standard airbag system of the vehicles. The airbag moves along two rods mounted on the front pillars of the car to completely cover the windshield surface. This movement is achieved with the help of two motors to ensure a rapid action.
This system can be integrated both into the car's ceiling and the top part of the dashboard, being activated with the help of motors.

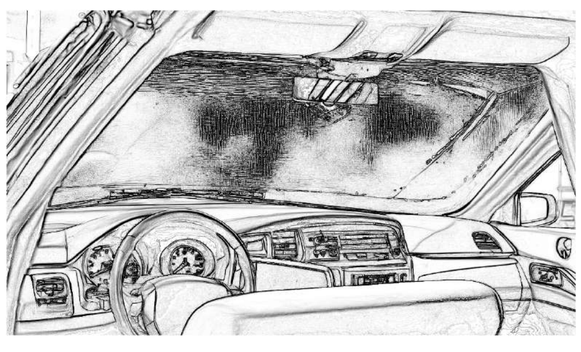
APPLICATIONS

At the core of creating this system lies the idea of prioritizing the safety of vehicle occupants. The operation of this system is synchronized with the current safety system implemented in vehicles, aiming to prevent the entry of unknown objects from the outside into the interior of the vehicle habitat.

- Superior actuation



- Inferior actuation



ADVANTAGES

- The system activates automatically;
- Prompt activation upon triggering;
- Activation occurs simultaneously with the standard airbags of the vehicles;
- The windshield is fully covered;
- Preventing objects from the outside environment from entering the interior of the vehicle cabin;
- Protection of vehicle passengers who are not wearing seatbelts.



SYSTEM PROTOTYPE



- Prototype 1



- Prototype 2

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Mechanical pencil with hub for pencil leads

Scientific Research Project

Authors: Todor Vlad-Vasile, Chitoiu Darius Marian Viorel

Coordinator: Professor Aurel Mihail ȚÎȚU

D

DESCRIPTION:

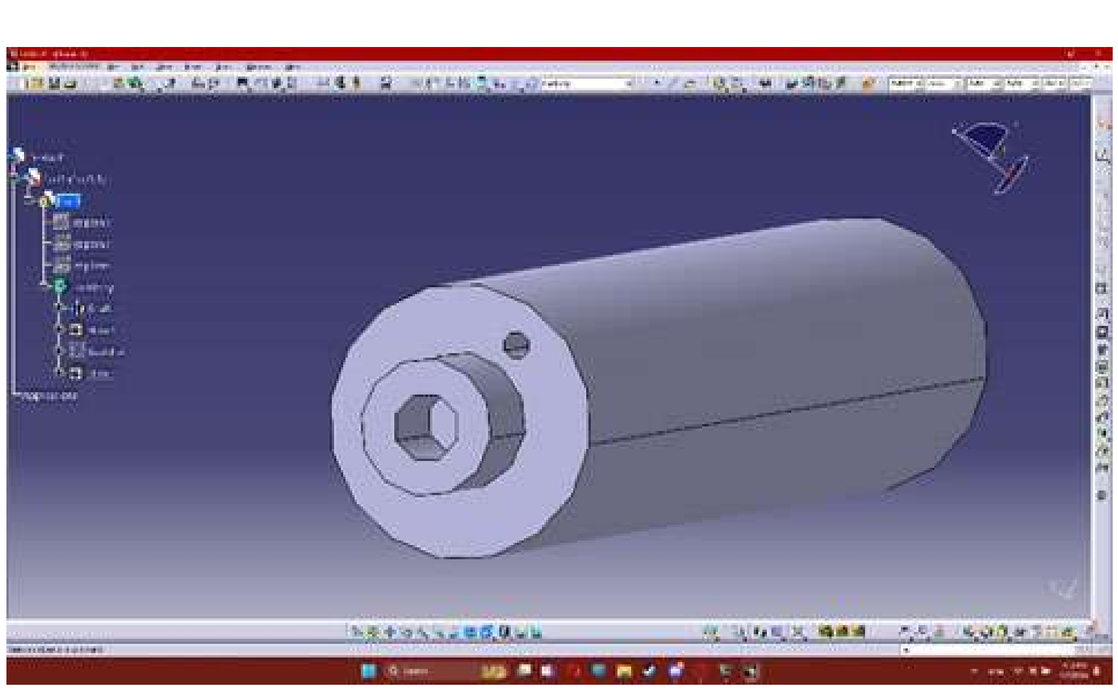
A simpler way to insert lead into the mechanical pencil and for a longer duration of its use.

This improvement refers to a hub inside the mechanical pencil where we will insert the pencil leads, to be used when the previous lead runs out.

The mines are inserted through a hole in the upper part of the pencil, placing one after the other in a semi-circle shape, guided by a groove to indicate the direction in which they must slide to reach the center of the pencil, the slide will be made with the help of a simple hand gesture.

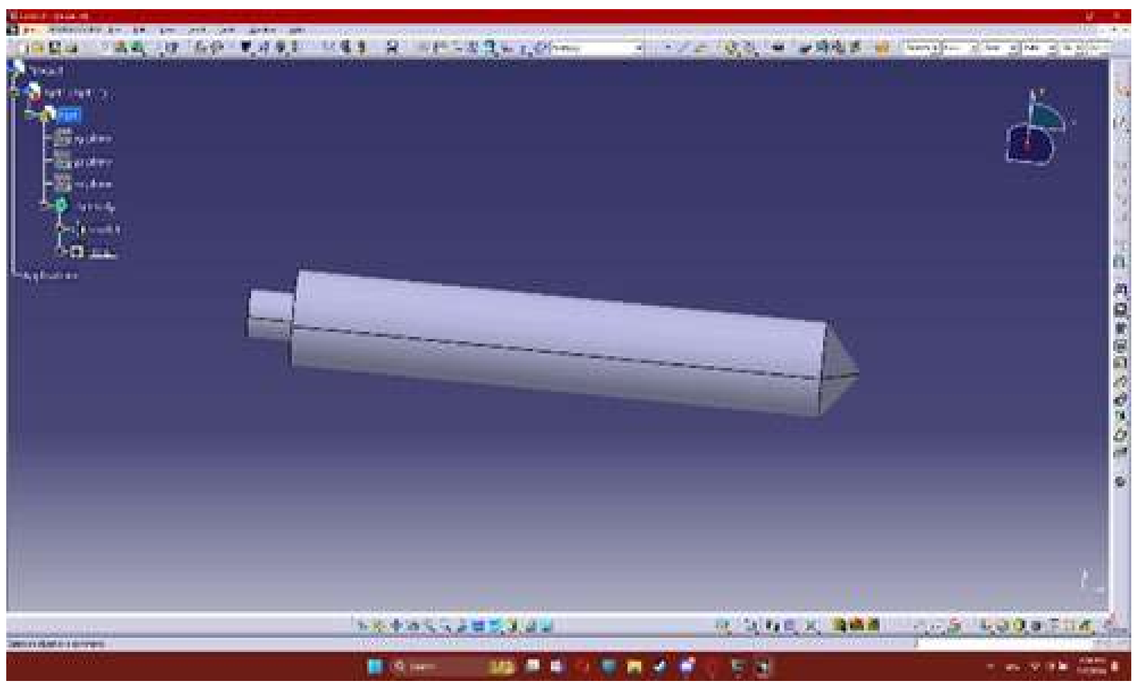
ADVANTAGES:

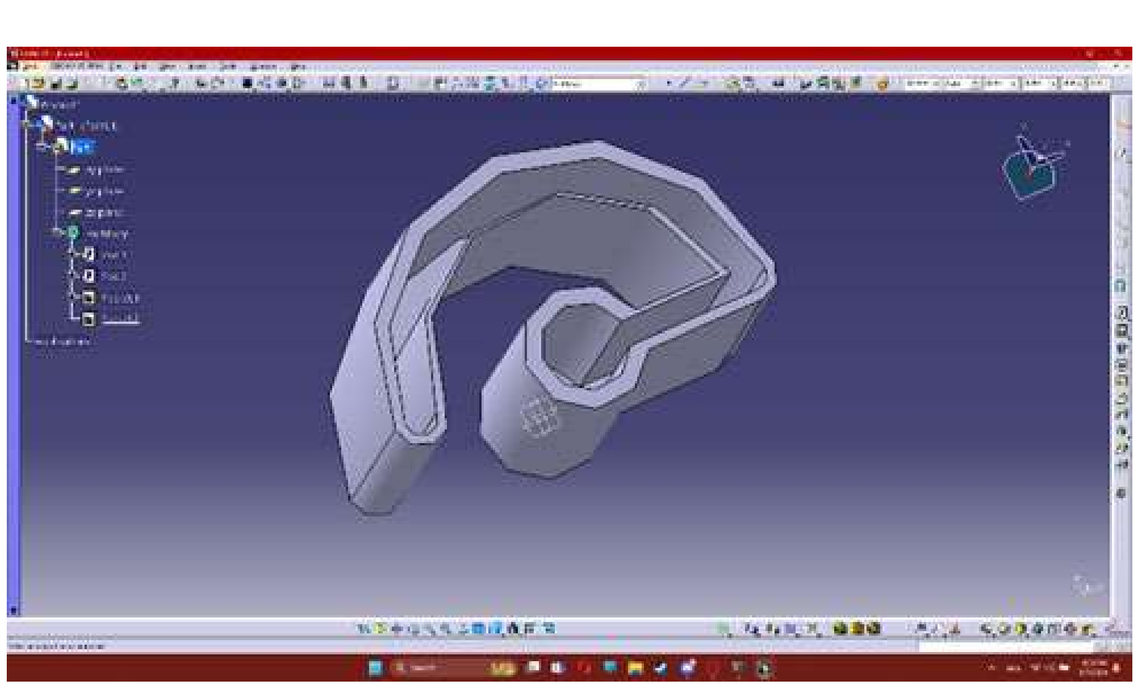
- The pencil is easier reloaded;
-The time of reload is shorter;
- We don’t need to carry with us additional pencil lead’s.



APPLICATIONS:

To create this product, we started from the idea of an easier and faster way to reload a mechanical pencil, that will last longer.





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WIRELESS PARKING SYSTEM

Scientific Research Project

Authors: **Flisc Adelina-Maria, Dumitru Alexandru-Nicolae, Florea Ionut-Alexandru**

Coordinator: **Professor Aurel Mihail ȚÎȚU**

D

DESCRIPTION:

The Wireless parking sensor system is meant to ease the process of installing an aftermarket parking sensor kit to a car that is not equipped with it from the factory. It does not require any cable or a long period of time to install it on the car, facilitating the user. The main advantage is the portability and the compatibility with any kind of vehicle, the system consisting of two sets of four sensors that have to be sticked to the car bumper and the main control unit that displays the signal from the sensors. The mounting bracket facilitates the removal of the sensors when the battery is running low, this being another great advantage, backing up the simplicity of use.

ADVANTAGES:

- - Efficient as one from the factory;
- - Compact and easy to install and to operate;
- - Long life battery for the main sensor;
- - It eliminates the need for cables that comunicate between ther main control uit and the sensor.
- - Compatible with any brand and model.





APPLICATIONS:

The main application is giving each car and indiviudal a chance to have the costly option from the factory of having a parking system at a fraction of the cost and giving the pleasure to the driver of customizing the car in his own way.



Variant A0



Variant A1



Variant A2

- Main control unit/ charging station = ***A0***
- Sensor bracket = ***A1***
- Sensor = ***A2***

RESULTS AND DISCUSSIONS:



The Wireless Parking Sistem is only one example of the the advance of technology, eliminating the need for cables.

It also solves the problem with older cars that aren't equipped with this kind of technology, giving anybody the chance to operate the vehicle at a high level.

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ELECTRIC CAR WITH SOLAR ENERGY

Scientific Research Project

Authors: Teodora DAN, Patricia ZIDARU

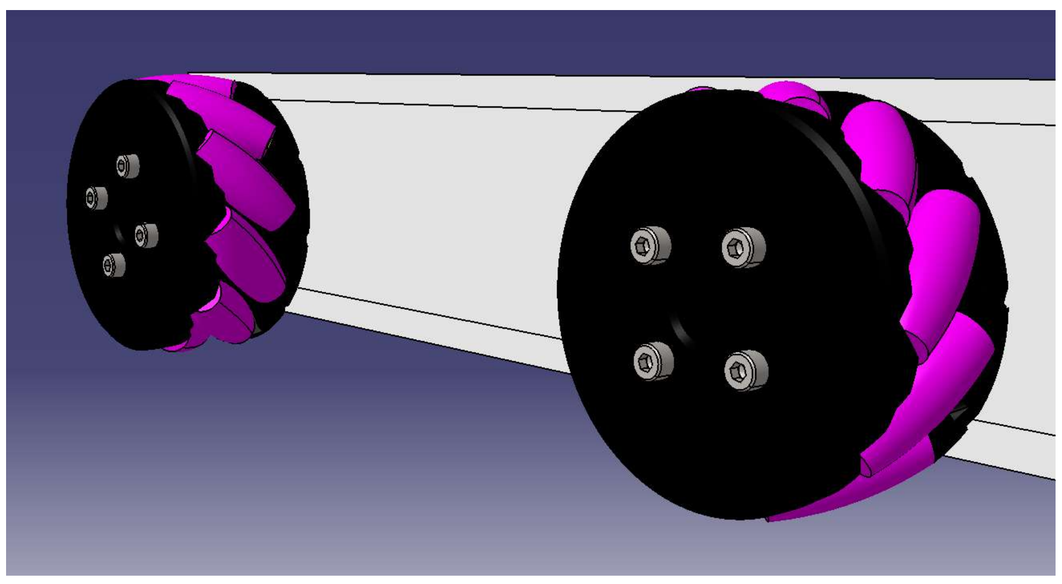
Coordinator: Professor Aurel Mihail ȚÎȚU

D

DESCRIPTION:

The vehicle we are currently in the process of designing and manufacturing harnesses the power of solar energy as its primary source of propulsion. This innovative mode of transportation is not only environmentally friendly but also showcases our commitment to sustainable technology. In the event of any unforeseen circumstances or periods of insufficient sunlight, the car seamlessly transitions to using a built-in battery system, ensuring continuous functionality and uninterrupted operation.

One of the standout features of this remarkable vehicle is its versatility in movement. Equipped with specially designed wheels, our creation boasts the ability to maneuver not only in the conventional forward and backward directions but also laterally, offering unparalleled flexibility in navigation. This multidirectional mobility opens up a myriad of possibilities for various applications, whether it be in urban settings with tight spaces or for specialized tasks requiring precise positioning.



Driving this cutting-edge vehicle is an intuitive and user-friendly experience, thanks to the incorporation of a sophisticated remote control system. Unlike traditional remote controls, ours is seamlessly integrated with modern technology, allowing any smartphone equipped with the dedicated car application and possessing the unique chassis number of the vehicle to serve as a remote control. This groundbreaking approach means that control over the car is not limited to a single device but can be extended to multiple remotes, offering convenience and accessibility to users across different platforms.

Furthermore, the use of smartphones as remote controls enhances the overall user experience by leveraging the familiar interface and functionalities of these ubiquitous devices. With the car app installed, users can effortlessly maneuver the vehicle, adjust settings, and monitor its performance directly from their smartphones, eliminating the need for separate and potentially cumbersome remote control units.

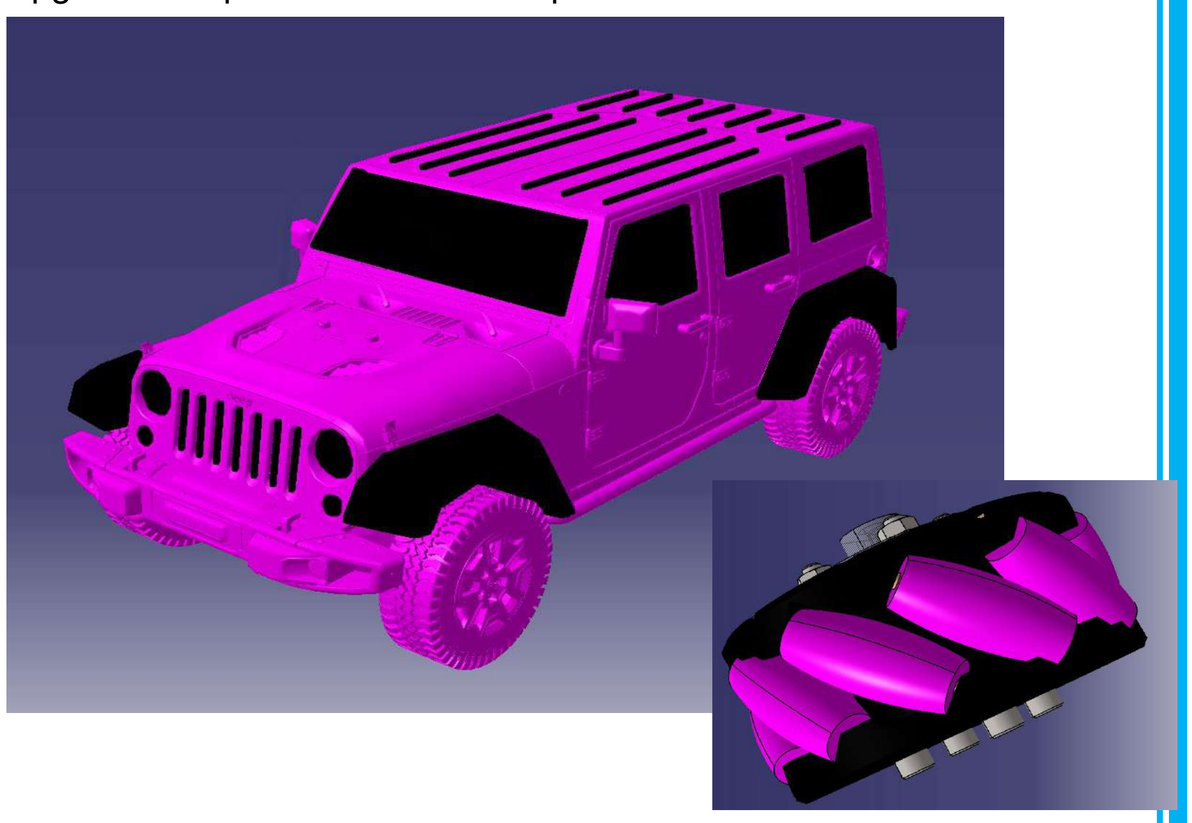
In addition to its remarkable technical capabilities, our solar-powered car represents a paradigm shift in the way we perceive transportation and energy usage. By harnessing the abundant and renewable energy provided by the sun, we are not only reducing our reliance on finite fossil fuels but also mitigating harmful emissions and contributing to a cleaner and more sustainable future.

DISADVANTAGE:

1)Dependence on Sunlight:The effectiveness of the solar-powered car is dependent on the availability of sunlight. Cloudy weather and nighttime may limit its functionality, requiring alternative power sources such as the batteries incorporated.
2)Complexity of Operation:While the integration of smartphones as remote controls offers convenience, it may also introduce complexity, especially for older users or those less familiar with technology.
3)Safety Concerns:As with any electronic car, there may be safety concerns related to electrical components because a little error might cause an accident or stop the car in the middle of the road.

ADVANTAGES:

1)Environmentally Friendly:By utilizing solar energy as its primary power source, the car reduces reliance on non-renewable energy sources such as fossil fuels
2)Long-Term Cost Savings:Once the initial investment is made, operating costs are minimal since solar energy is free and abundant. This can lead to long-term cost savings for users.
3)Versatile Movement:With its multidirectional movement capabilities, the car offers enhanced on parking and even when you just need to go from point A to point B.
4)Innovative Remote Control System: The integration of smartphones as remote controls adds a modern twist to traditional car operation, offering convenience and familiarity to users while leveraging existing technology.
5)Customizable Features:The car may offer opportunities for customization and personalization, allowing users to modify and upgrade components to suit their preferences and creative visions.



RESULTS AND DISCUSSIONS:

In summary, our innovative creation embodies the fusion of cutting-edge technology, sustainability, and user-centric design. With its utilization of solar energy, multidirectional movement capabilities, and smartphone-enabled remote control system, our vehicle represents a bold step towards a greener and more efficient mode of transportation.

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Audi’s Quattro history

Student project

Author: Sorin Mihai BOBARU

Mentor: Prof. Corneliu BIRTOK BANEASA

D

This study presents the evolution of the Audi car brand in the field of Motor Sport with the Adi Quattro model and the performances achieved in the world rally championship, being a pioneer in this field.

The headquarters of German luxury car manufacturer Audi AG are located in Ingolstadt, Bavaria. Operating as a division of the Volkswagen Group, Audi manufactures automobiles across nine global production sites.

The company's complicated beginnings may be traced to August Horch, an engineer who founded the Audiwerke and Horch in the early 20th century (1868–1951). Auto Union was founded in 1932 with further contributions from two firms, DKW and Wanderer. When VW bought Auto Union from Daimler-Benz in the 1960s, the current Audi era officially began. Following the 1965 release of the Audi F103 series, which revitalized the Audi brand, Volkswagen merged Auto Union with NSU Motorenwerke in 1969 to become the firm that exists today.



Audi has participated in a number of motorsports.Following its triumph in circuit racing in North America, Audi achieved success in the Touring and Super Touring divisions of motor racing.

Audi debuted the Quattro, a turbocharged, four-wheel drive (4WD) vehicle that would go on to win races and rallies all over the world, in 1980. Due to its early adoption of the then-recently modified regulations permitting the use of four-wheel drive in competitive racing, it is regarded as one of the most important rally vehicles of all time. Despite the doubts of many detractors who believed four-wheel drive racers would not be feasible due to their weight and complexity, the Quattro proved to be a successful vehicle. Before it broke down, it won its first rally; still, the rally community had been informed that 4WD was the way of the future.

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THREE-DIMENSIONAL PRINTING OF A VENTILATION VALVE

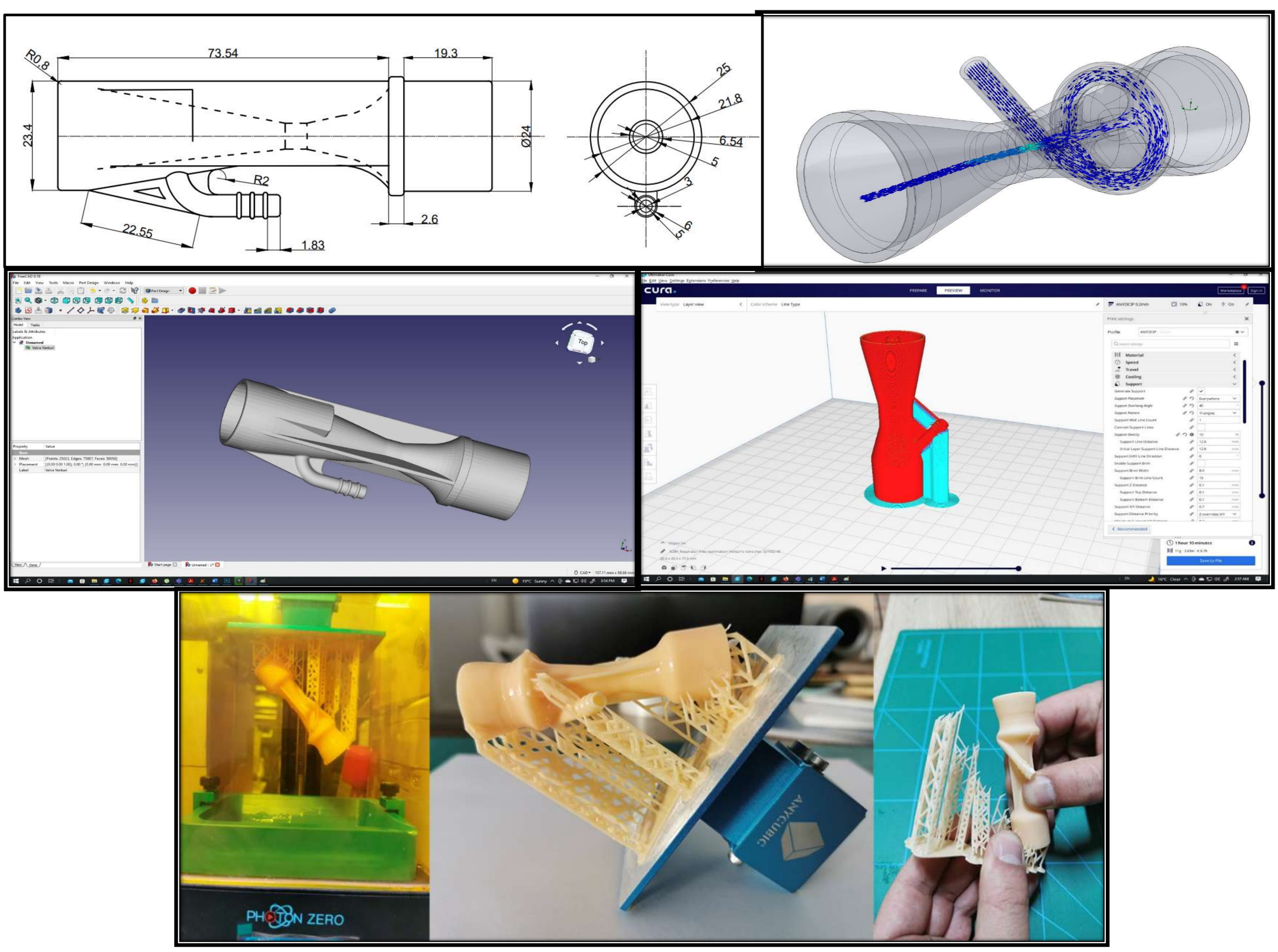
Student Project

Author: Păsătoiu Ciprian

Coordinators: *Associate PhD professor Cristina Ionici,*
Lecturer PhD eng. Rădulescu Constanța

D

The project presents a case study for printing a ventilation valve. It started with information about modeling the part in FreeCad software, starting from sketches available online. After designing the part, I presented information about preparing the model in the CURA slicer for a print using FDM technology, positioning it, generating support, and generating a support layer on the print bed. In the printing process, a lot of information is needed related to the initial layers, the final shape of the part and its surfaces. It was also considered the possibility of being able to print more or more or model of different sizes for an increased oxygen fraction and also tried to make a mask that could be connected to this valve.



The project presents a. The paper also presents information about printing a ventilation valve using SLA technology, the necessary steps of this process and what raw materials were used.

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Calculation and construction of American trucks

Student project

Author: Marius Alexandru ISTOC

Mentor: Prof. Corneliu BIRTOK-BANEASA

D

The study presents an analysis of the design and construction dynamics of American trucks, taking into account their evolution over time and technological progress.

American trucks are renowned for their ruggedness and strength, distinctly reflecting the characteristics of the US auto industry. With imposing designs and powerful engines, these vehicles are designed to handle heavy loads and varied road conditions. Built with attention to durability and performance, American trucks are often associated with impressive size, advanced technologies and the ability to handle diverse tasks, from hauling freight to towing in challenging conditions.



From the point of view of the constructive characteristics in the case of American trucks, two different architectures can be distinguished as follows: **Flat face** and **Long-nose.**



Flat face trucks have the following advantages: cab positioning, visibility and greater turning radius in smaller spaces compared to long nose trucks.



Long-nose trucks have the following differences: The cab is positioned behind the engine, an easier way to access the engine for maintenance and repairs, have a more traditional and iconic desing for each truck.

Contact: mariusalexistoc@gmail.com

Experimental stand for automotive CAN network

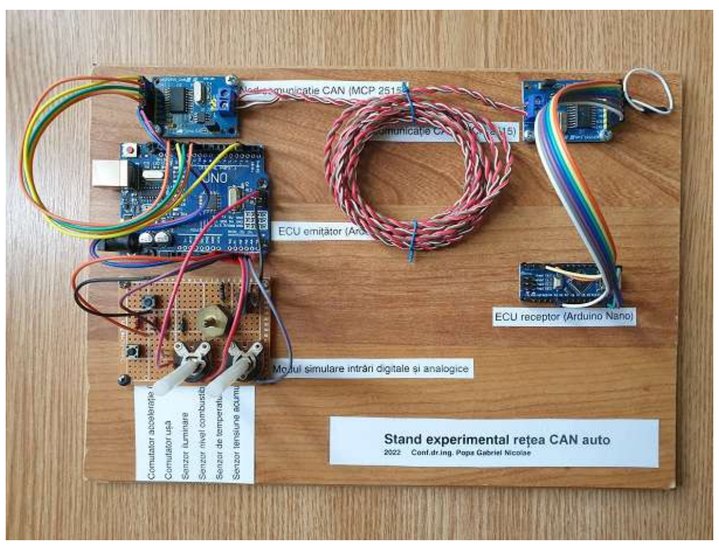
Patent: laboratory project

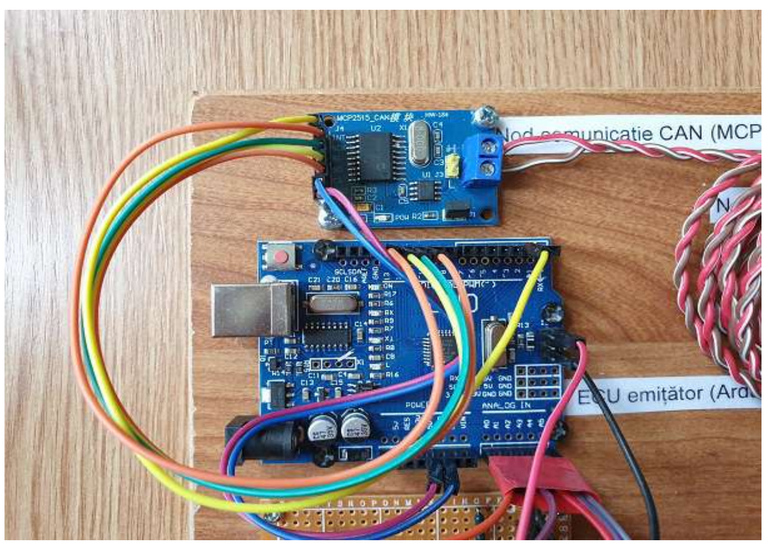
Author/s: Gabriel Nicolae Popa,
Corina Maria Diniș

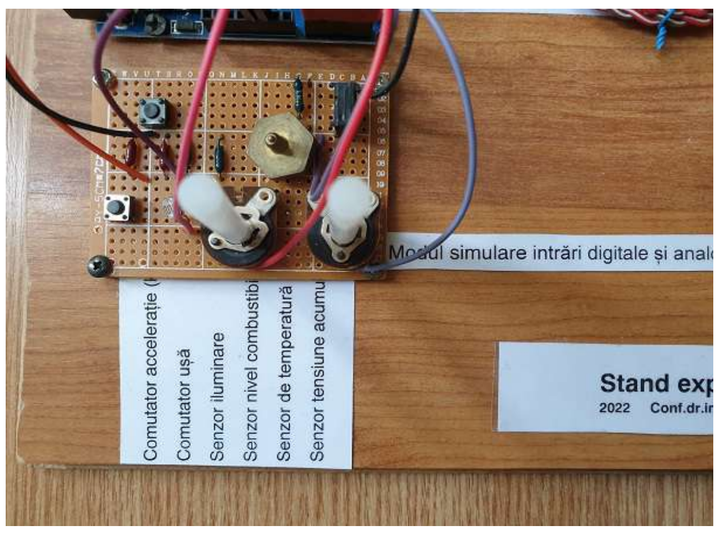
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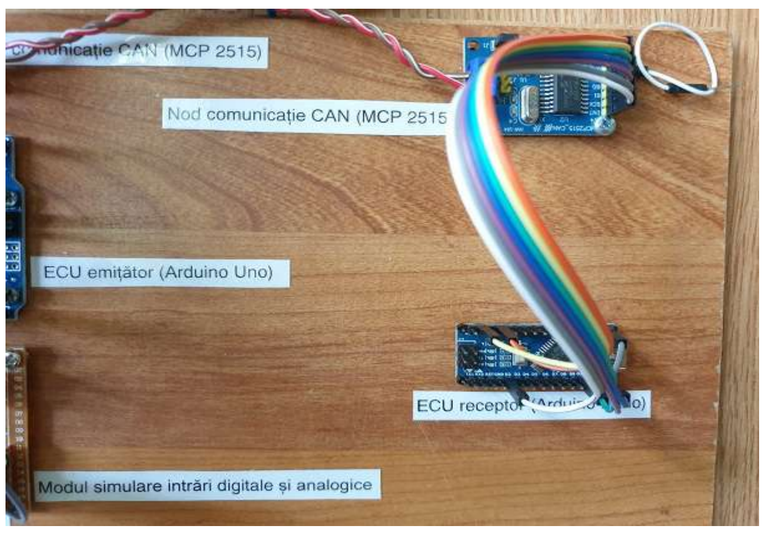
The benefits of using CAN networks are: it is a simple network (two conductors, it does not use the ground for data transmission - the car body), it ensures communication between several (different) equipment, and each message has a priority. An experimental laboratory stand has been created for simulations and study of car CAN networks. The stand contains a simulation block with digital and analogue inputs (which simulates a normally open switch - kick down acceleration and normally closed switch for the door; lighting measurement for light control; fuel level measurement; ambient temperature measurement; car battery voltage measurement) connected to an Arduino Uno (simulates an ECU 1), which is connected to a MCP 2515 CAN, which is a node for the CAN network that connects via two wires (CAN-L, CAN-H) to another MCP 2515 CAN node in connection with an Arduino Nano (simulates ECU 2). A laptop is connected to the Arduino Nano (ECU 2, to display the information on several lines of information), through the serial port, to analyze the data transmitted from the Arduino Uno (ECU 1). To achieve communication, different programs have been implemented for the two Arduinos. With the help of the experimental stand, studies (related to data integrity) can be carried out on the speed of data transmission (which can be changed through Arduino programs), the length of the CAN cable (short and long), the importance of the resistors (120 W) at the ends the cable when transmitting the information.

To achieve communication, different programs have been implemented for the two Arduinos. With the help of the experimental stand, studies (related to data integrity) can be carried out on the speed of data transmission (which can be changed through Arduino programs), the length of the CAN cable (short and long), the importance of the resistors (120 ohm) at the ends of the cable when transmitting the information.









Aspects on experimental stand for automotive CAN network

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TERRITORIAL AEROCLUB "Constantin Manolache" DEVA

D

Author: ***Gheorghe ȚINEGHE & Team***

Founded in 1975, the Deva Aeroclub is located east-southeast of the municipality of Deva, at a distance of 7 km. Its entire length is between the Simeria - Deva railway and the shore of Mureș. At the beginning of its operation, it was called the "Dacia" Deva Aeroclub, then the name changed, becoming the "Constantin Manolache" Deva Aeroclub, and then the Deva Territorial Aeroclub.

The Săuleşti field, which later became an airfield, not too far from the one in Bintiți where Aurel Vlaicu had flown with his "beetle" in 1909, is a place that has become an important airfield among the "airfields" in our country . On October 1, 1935, the decision was made to establish a flying school without a motor in the field of Săuleşti, and within the school of arts and crafts in Deva, a section to build gliders.











In 1975, the decision was made to reorganize the Deva aeroclub, using the former airport base and the AVIASAN station. in the latter part of 1975, preparations began and the Central Aeroclub established the personnel that will serve this aeroclub.

The Aeroclub organizes theoretical and practical courses for obtaining the licenses of parachutist, glider pilot, ultralight pilot and PPL(A) pilot.

Contact: ***deva@aeroclubulromaniei.ro***

5th International Exhibition

INVENTCOR

04-06.04.2024 – Deva, Romania

Universal test bench for gas turbine engines

D

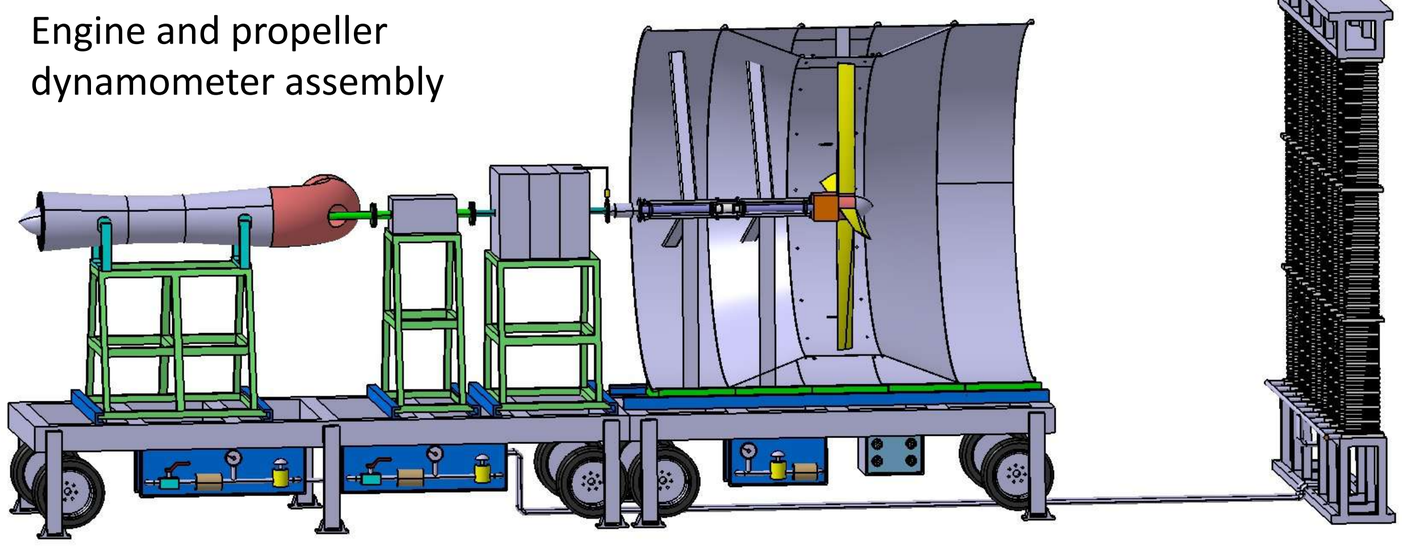
Patent Application: RO 137713 A0

Author/s: Catană Răzvan Marius, Dediu Gabriel, Șerbescu Horațiu Mihai

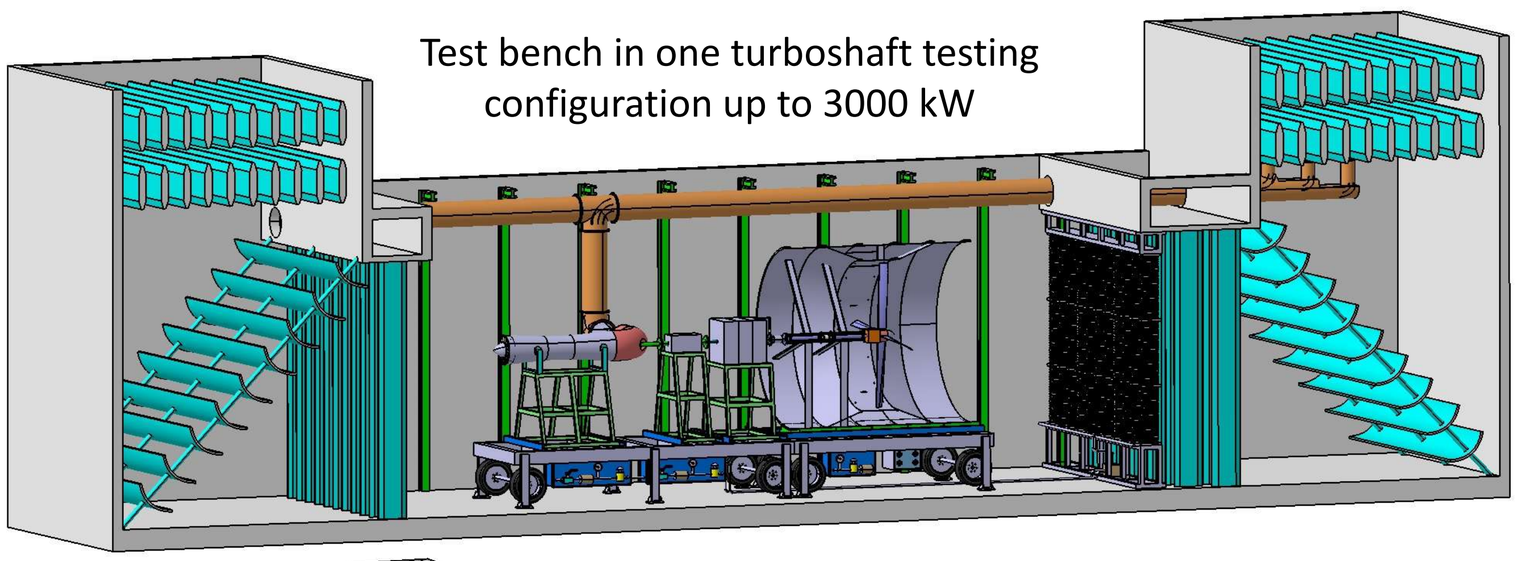
General description: The invention refers to a gas turbines test bench, for testing different engine types as turboshafts and turboprops, with shaft powers of up to 3000 kW, using an aerodynamic dynamometer such as an aviation propeller with variable pitch. The technical solution of the test bench allows to test experimental aviation propellers and turbojet engines, without modifications of constructive configuration of test bench but with minor replacement of particular component assemblies, reported to the testing application.

Technical description: The universal test bench for gas turbine engines testing, contains a cell assembly, in which the engine is installed on a mobile mounting assembly, and through a mechanical transmission assembly it is mechanically conected with the dynamometer assembly which contains a propeller with variable pitch. The propeller dynamometer measures the torque and shaft power, during the engine run, by adjusting the angular pitch of the propeller, using a hydraulic installation which modifies the aerodynamic load on the propeller to perform the required torque and speed.

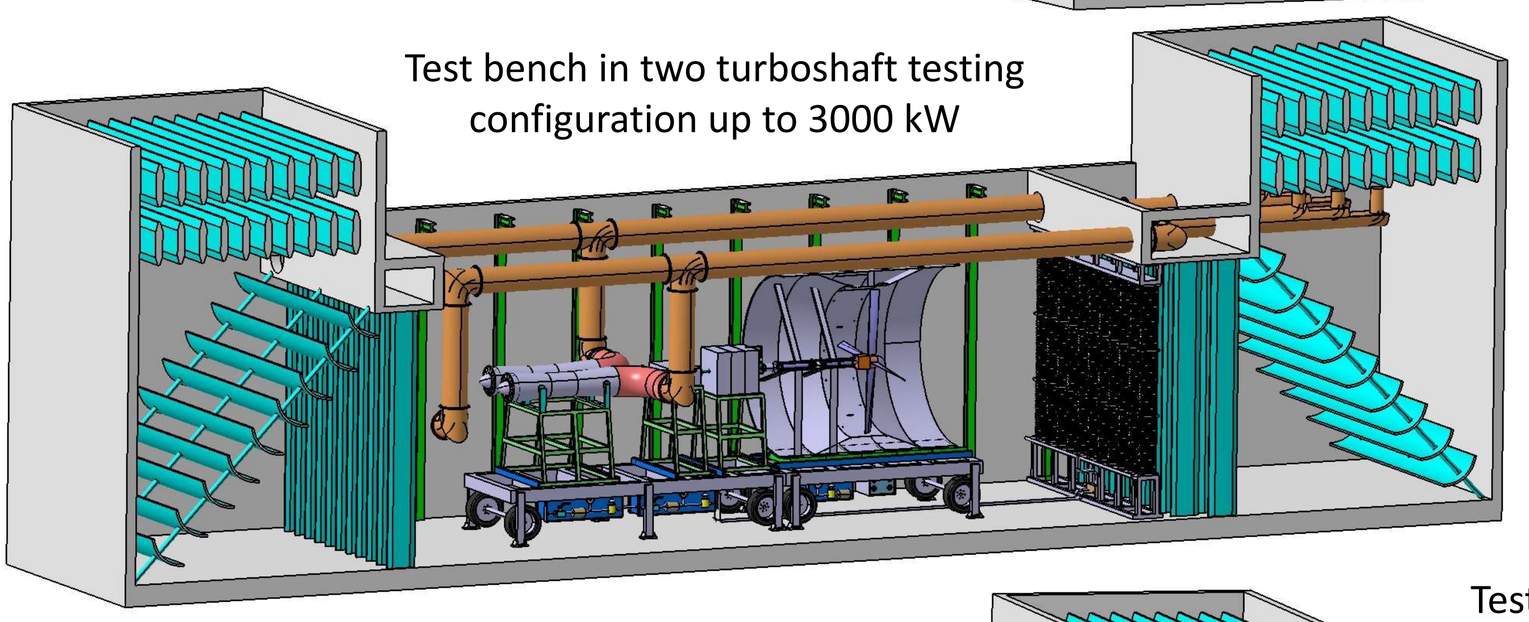
Engine and propeller dynamometer assembly



Test bench in one turboshaft testing configuration up to 3000 kW



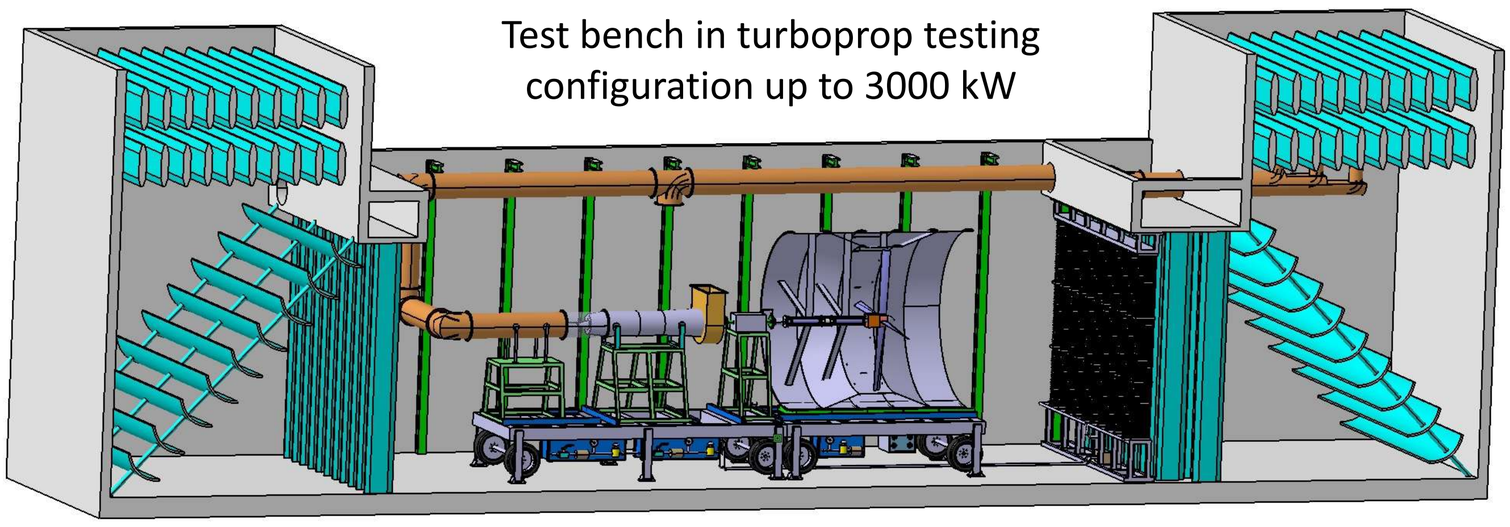
Test bench in two turboshaft testing configuration up to 3000 kW



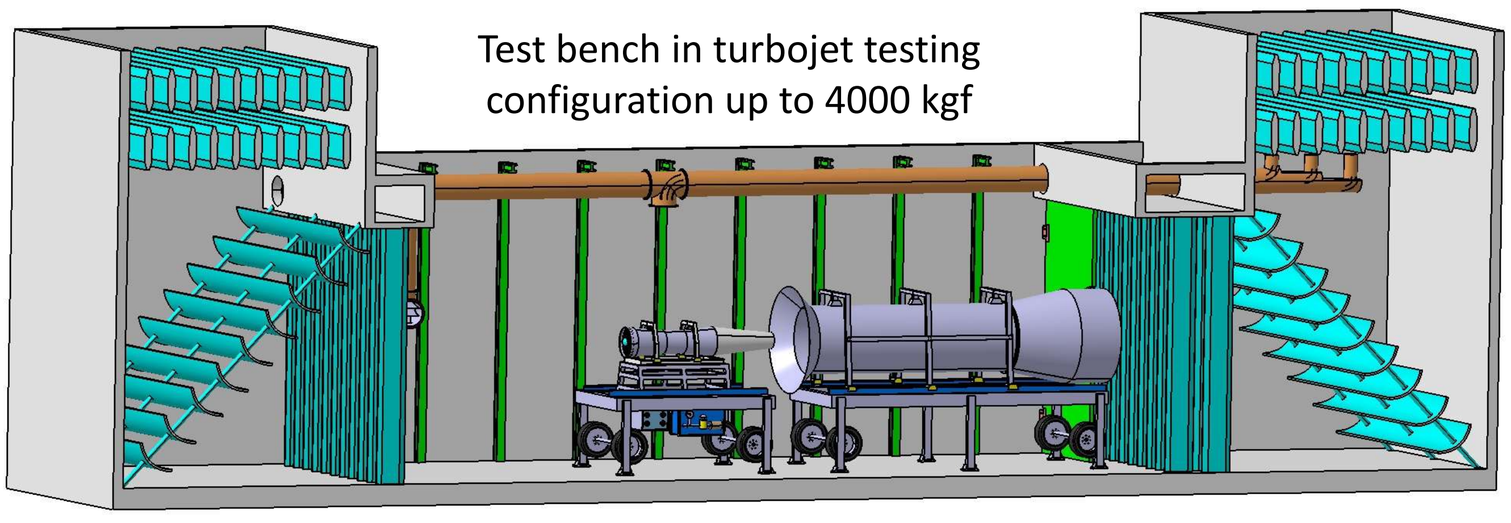
The variable pitch propeller is equipped with a duct section to increase the propeller efficiency and to compensate for the mechanical losses caused by the mechanical transmissions. The engine and propeller dynamometer has a specific oil supply and cooling installation with heat exchanger cooled by the air flow from the propeller.

Particularities: 1. Capacity to test two turboshaft engines in the same time, as on helicopter install configuration. 2. Specific configuration of the variable pitch propeller, by installing different propeller geometries and different number of blades. 3. Specific instrumentation for calculating the propeller performances based on measured parameters.

Test bench in turboprop testing configuration up to 3000 kW



Test bench in turbojet testing configuration up to 4000 kgf



5. Testing engines with turbine power shaft in front or rear. 6. More accessible alternative due to the low cost of execution, aquisition and maintenance, comparative with hydraulic and electric dynamometers, especially due to the particular configuration of the torque and speed working limits, depending on the engine power or thrust class.

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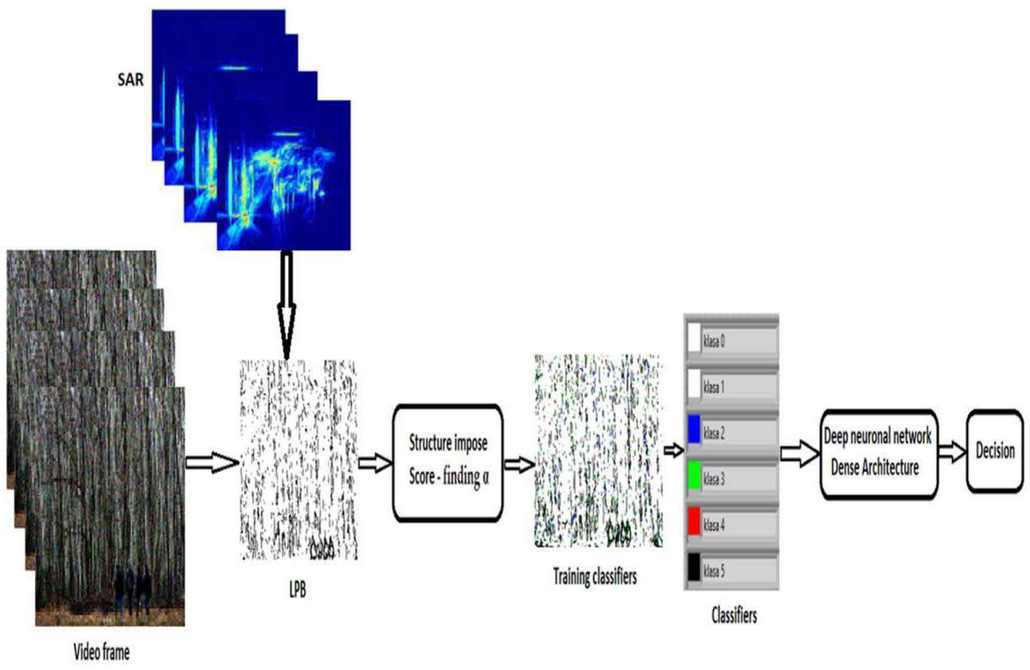
Member of: AAAR, ECATS, WORLD ENERGY COUNCIL, AHK, OPIAR

System and method for collecting, analysing and classifying incidents that occur in an operational area, based on Artificial Intelligence algorithms for the processing and analysis of aerial information acquired with LIDAR and video cameras in the visible and thermal spectrum, for the protection of Critical Infrastructures- RO

DUMITRESCU Cătălin Marian, CHIVA Ionuț-Cosmin, SEMENESCU Augustin, NECULA Horia, FLOREA Bogdan

Contact person: augustin.semenescu@upb.ro

PRESENTATION



The invention relates to a method and a hardware system for the collection, analysis and classification of incidents occurring in an operational area, based on Artificial Intelligence algorithms for the simultaneous processing and analysis of information acquired from LIDAR and video streams and still images aerial from the visible and thermal spectrum, for the protection of Critical Infrastructures.

ADVANTAGES

In this invention, we propose an innovative structure-imposed detector model for generating classifiers used to train Machine Learning architecture for analysis of Wigner-Ville spectrograms used for Synthetic Aperture Radar (SAR) analysis and simultaneous analysis of SAR and aerial imagery in the visible spectrum and thermal. The proposed invention represents an innovative system for the protection of Critical Infrastructures, but it can also be used for cross-border combating terrorism, organized crime and illegal trafficking of goods and people, especially in the current regional and international context. We introduce in this invention, with a novelty character, an analysis module based on a detector with an imposed structure, which leads to a high-performance model of analysis and classification of incidents that occur in an operational area.

PROBLEM SOLVED

❖ Realization of an integrated solution for the acquisition, analysis, classification, recognition and prediction of incidents in an operational area for the protection of Critical Infrastructures;

❖ The proposed algorithm exploits the intrascale dependence of the wavelet coefficients by determining the local dispersion of the signal, and the interscale dependence is exploited by determining the contours based on the hierarchical correlation map.

❖ Using a module to define and generate training classifier vectors for the aggregation convolutional neural network that classifies and predicts incidents and their occurrence. This module according to the invention introduces an algorithm with an innovative character - the detector with imposed structure.

❖ The use of a module for the classification of incidents which is based according to the invention on an algorithm made with convolutional neural networks based on the classifiers generated by the detector with imposed structure of class D;

❖ On the hierarchical correlation map, before determining the contours, we proceed to process it with a median-hybrid filter and the LBP algorithm.

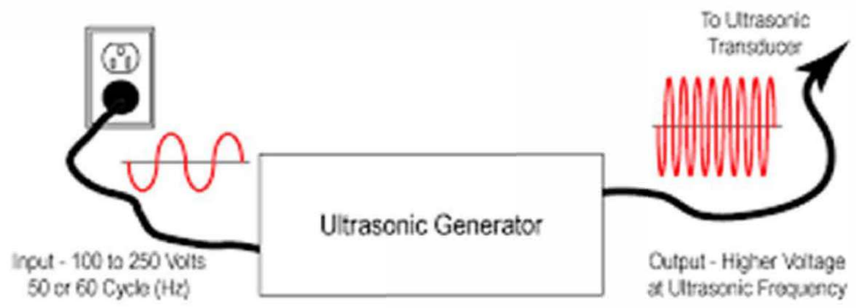
Hybrid technology for obtaining composite structures in the ultrasonic field

Florea Bogdan, Semenescu Augustin, Chivu Oana, Nitoi Dan, Marcu Dragos Florin, Pasare Vili

GNAC-ARUT 2023 nr.108/4.12.2023

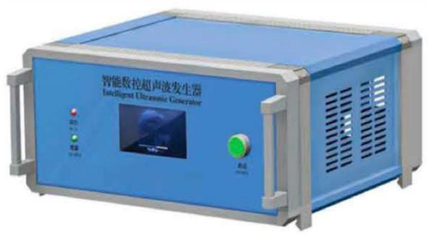
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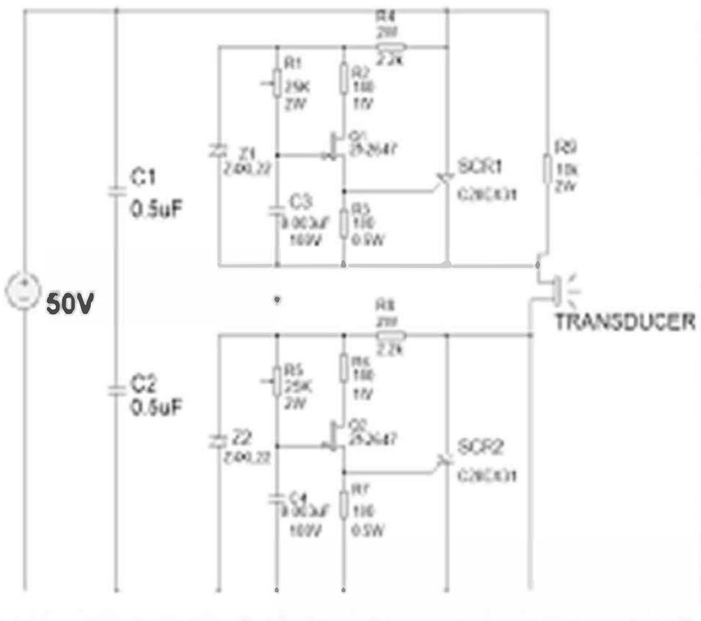
The proposed project aims at obtaining a new technology regarding the production of composite structures using the deposition of reinforcement materials in an ultrasonic field. Through this, the adhesion and mechanical properties are considerably improved to eliminate the defects of the composites such as delamination and premature wear by detaching the reinforcement particles. The project contains analytical calculations, MEF optimization, and the practical realization of the deposition stand in the ultrasonic field.











Installation design

The design of the ultrasonic system took into account the phenomenon of ultrasonic dispersion and its analytical calculation. Through mathematical modeling using the finite element method of the vibration modes, the optimal time for the realization of the composite structure was determined. The research carried out using the designed installation led to the determination of the way of optimal placement of the ultrasonic concentrator obtaining the composite structure.

ADVANTAGES

The result of the project will lead to the development of composite structures with high resistance to friction, wear, and delamination, made in low working times that are reflected in industrial, road, or transport applications.

CONTACT

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D

Reconfigurable gearbox

Patent OSIM no.: RO132365- B1/ 30.06.2023

Author/s: Cornel CIUPAN, Mihai STEOPAN, Emanuela POP

Short presentation:

The invention represents a reconfigurable gearbox designed for the skills development of students in the field of mechanical engineering. The solution offers students the opportunity to build 30 different types of gearboxes, depending on the structure and the speeds selected by the work load of the machine tool. Reconfigurability of the box is provided by a modularized concept, by using interchangeable shafts and gears and by creating an optimized set of gears, with the same module, width and bore.

The gearbox consists of a housing with a number of identical bores placed at the same axial distance, used for mounting the shafts, an input shaft, one or more intermediary shafts provided with the same bearings and a main shaft (output). The movement is transmitted from the motor to the gearbox through a series of gears and the speed changing is done using levers . They have a special construction and allow the forming of sliding gears composed by two or three gears, with any spare gear. Locking the levers in the desired position is provided by a number of holes and ball indexing.

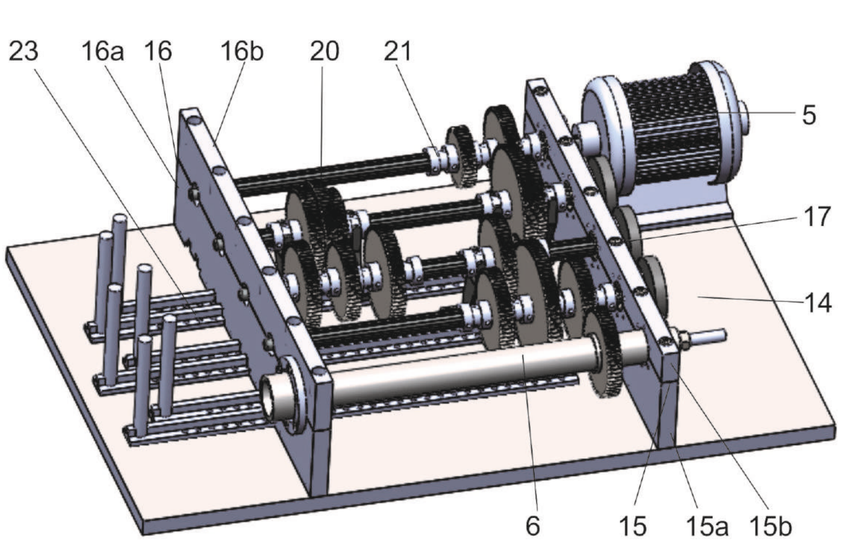
By completing the stand, the students will understand important aspects related to the design, construction and operation of the gearbox. Furthermore, the invention contributes to the development of creative abilities.

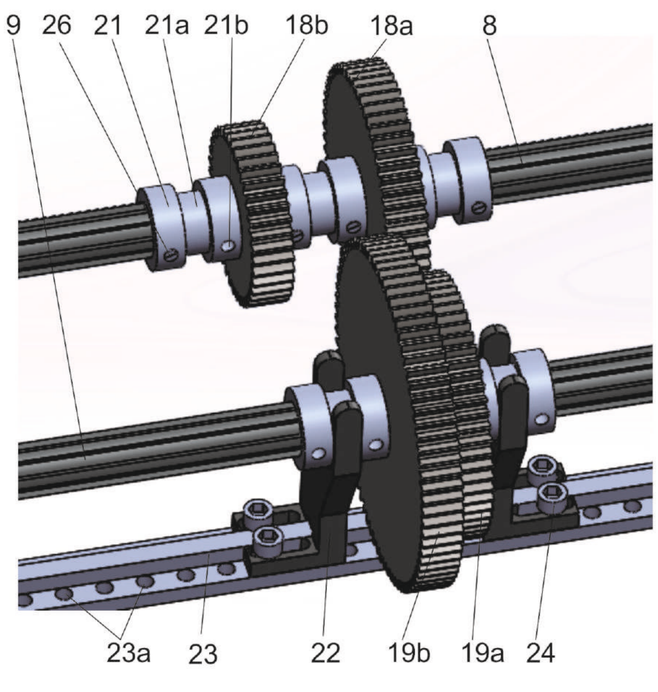
By applying the invention, the following advantages are obtained:

- Constructive and technological simplicity
- Easy installation and quick reconfiguration
- Learning facilities through practical experimentation.

Applicability:

The invention relates to a gearbox designed as a stand that can be reconfigured in several variants, designed for the skills development of students in the field of mechanical engineering.





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D

Device and method for precise remote synchronization of systems for astronomical observation

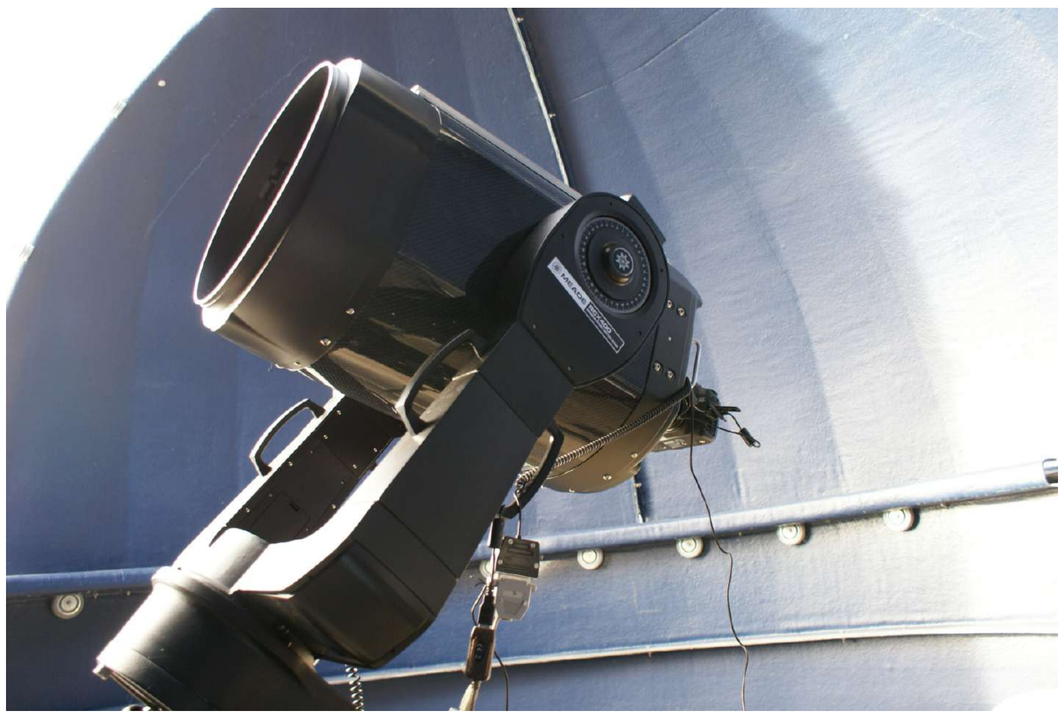
Patent OSIM no.: RO131751- B1/ 28.04.2023

Author/s: Radu DANESCU

Short presentation:

The invention relates to a system and a method for the remote synchronization of optical systems for sky observation, used for detecting objects on low, medium and high terrestrial orbits. The system, as claimed by the invention, comprises a releasing device which consists of a two-channel GPS receiver, a classic one for reading global time and a very precise synchronization signal 1 PPS (Pulse Per Second), a microcontroller board, a matricial keyboard available to the user and an LCD display screen , a telescope provided with a photo camera being connected to the device, in order for them to be released by the device according to a previously loaded exposure software. The method, as claimed by the invention, consists of stages for preparing two devices with an exposure software, for placing said devices in the places where the observations are intended to be carried out, for verifying the GPS signal and satellite synchronization, then making the devices operate in the active mode, connecting the photo cameras to the devices and running the exposure software for capturing images from the telescopes.





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D

Hybrid funicular with energy recovery

Patent application OSIM no.: A/00858/21.12.2023

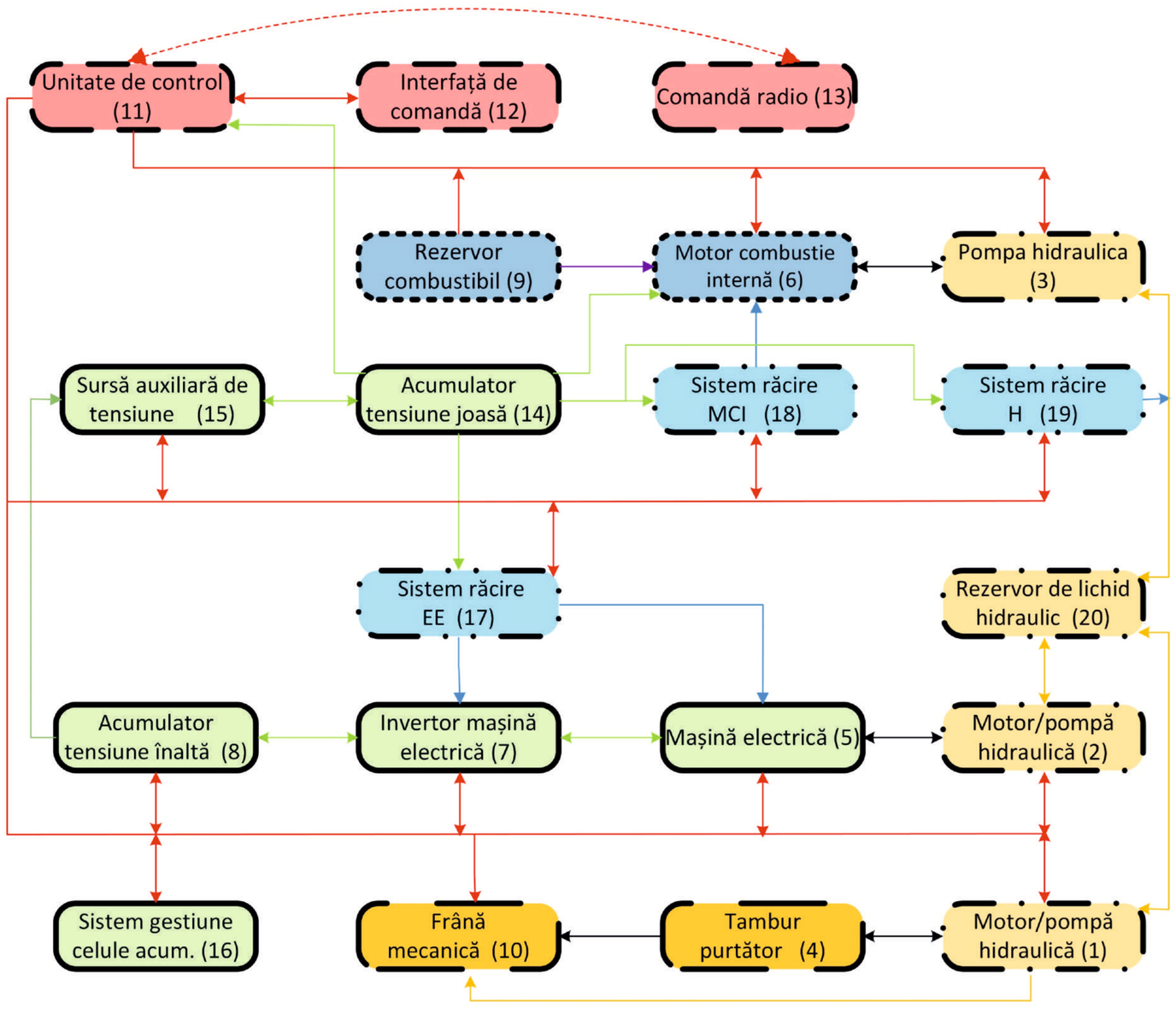
Author/s: OPREA Claudiu-Alexandru[1], BREBAN Ștefan[1], LATEȘ Daniel[2]

Short presentation:

Hybrid funicular, with energy recovery, that has a hydraulic system (motor/pump) to drive the carrier drum, driven by two other hydraulic machines which are connected to the shafts of an electric machine or diesel engine. The hydraulic machine is mechanically linked to the electric one and reversible, to allow the recovery of the potential energy available during the upstream to downstream transport of the material, so that the electric machine will operate in motor mode when lifting the transported material under the trolley and at returning the trolley to the material pick-up area and in generator mode when the material is transported downhill.

Applicability:

The invention refers to a hybrid drive system, with energy recovery, of the funicular type, for the transport of materials (including wood material), on cable. The potential (gravity) energy recovery function of the equipment can be used when transporting material from upstream to downstream. The equipment can also be used to transport material on flat ground or from downstream to upstream.



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D

Electric funicular with energy recovery

Cerere de brevet OSIM no.: A/00859/21.12.2023

Author/s: BREBAN Ștefan[1], OPREA Claudiu-Alexandru[1], LATEȘ Daniel[2]

Short presentation:

Electric funicular, with energy recovery, in which the drive of the carrier drum is done by one or two electric machines, which operate in motor mode when lifting the transported material under the trolley, when returning the trolley to the pickup area and when transferring it from downstream to upstream (if applicable) and in generator mode when transporting the load from upstream to downstream. In this way, the potential energy of the descending transported load is converted into electrical energy and stored in the battery, being later consumed for the return, on the way up, of the anchoring elements related to the transported loads.

Applicability:

The invention refers to an electric drive system, with energy recovery, of the funicular type, for the transport of materials (including wood material), on cable. The potential (gravity) energy recovery function of the equipment can be used when transporting material from upstream to downstream. The equipment can also be used to transport material on flat ground or from downstream to upstream.

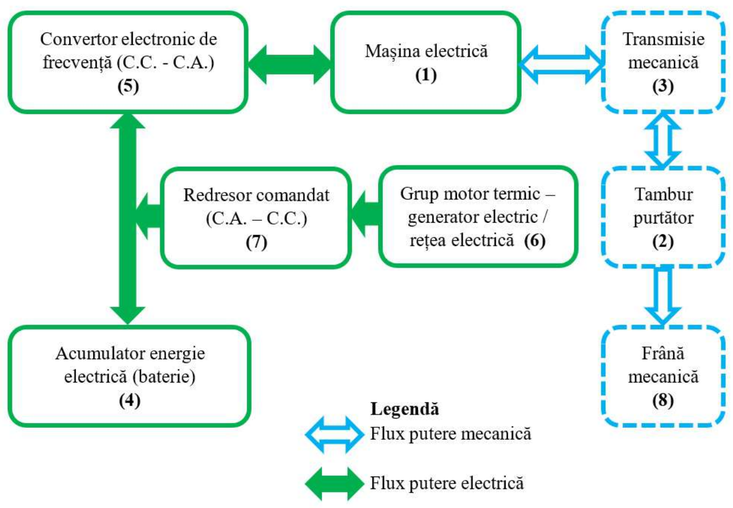


Fig.1

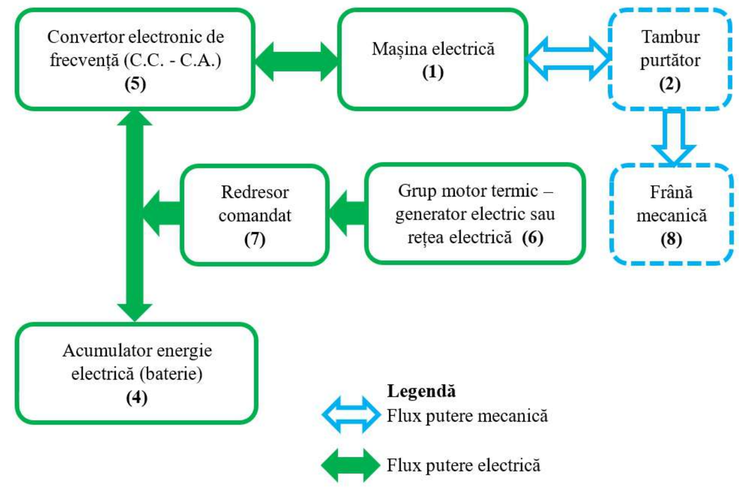


Fig.2

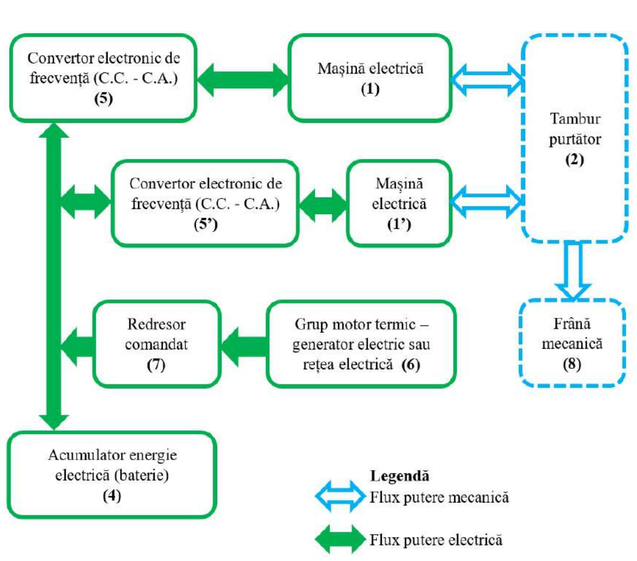


Fig.3

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D

Thermal management device of a catalytic system to reduce pollution caused by internal combustion engines

Patent application OSIM no.: A/00831/13.12.2023

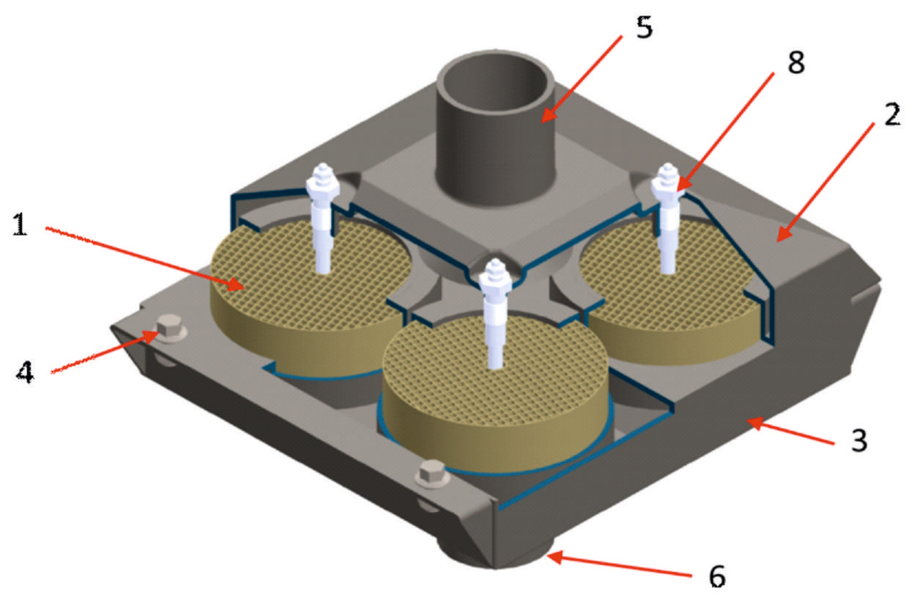
Author/s: Prof.dr.ing. MARIASIU Florin Emil

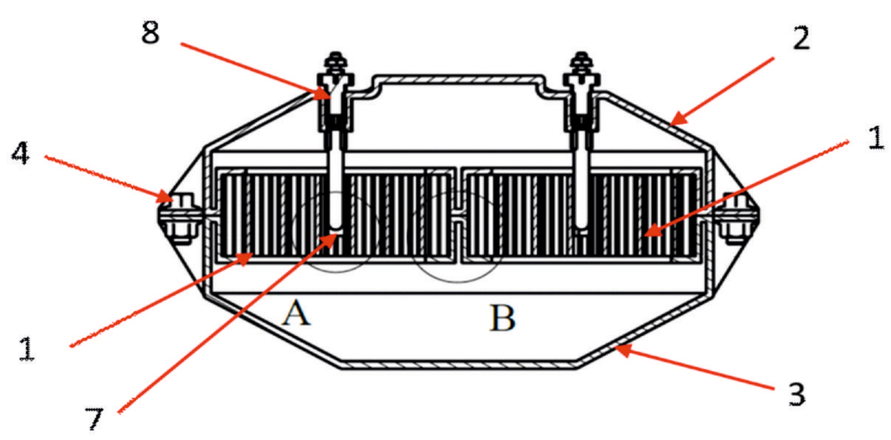
Short presentation:

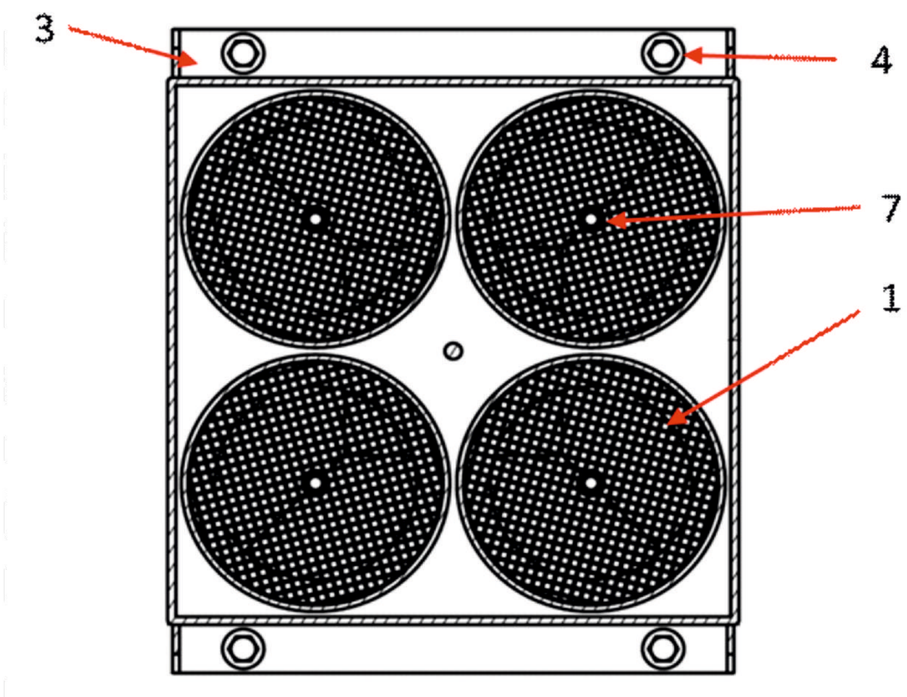
The invention refers to a thermal management device of a catalytic system to reduce pollution caused by internal combustion engines, which achieves, through construction and operation, bringing the catalytic system to the temperatures required by the operation of the internal combustion engine that equips a vehicle in a time very short, at stratified mixture operation, at cold start and operation. The problem that the invention solves is to reach an internal temperature of the catalytic pollution reduction system in a short time, which makes it possible to operate in the optimal pollution reduction parameters during the cold start of internal combustion engines.

Applicability:

The applicability of the device is directly related to the automotive industry, in the development of catalytic pollution reduction systems.







Legend:
1 - catalytic monoliths;
2 - upper half body;
3 - lower half body;
4 - mechanical fixing elements;
5 - entrance hole;
6 - outlet hole;
7 - central internal channel;
8 - glow plug

Contact: Technical University of Cluj-Napoca, Automotive Engineering and Transports Dept., Bdul.Muncii 103-105, Cluj-Napoca, ROMANIA

ADAM'S SERVICE

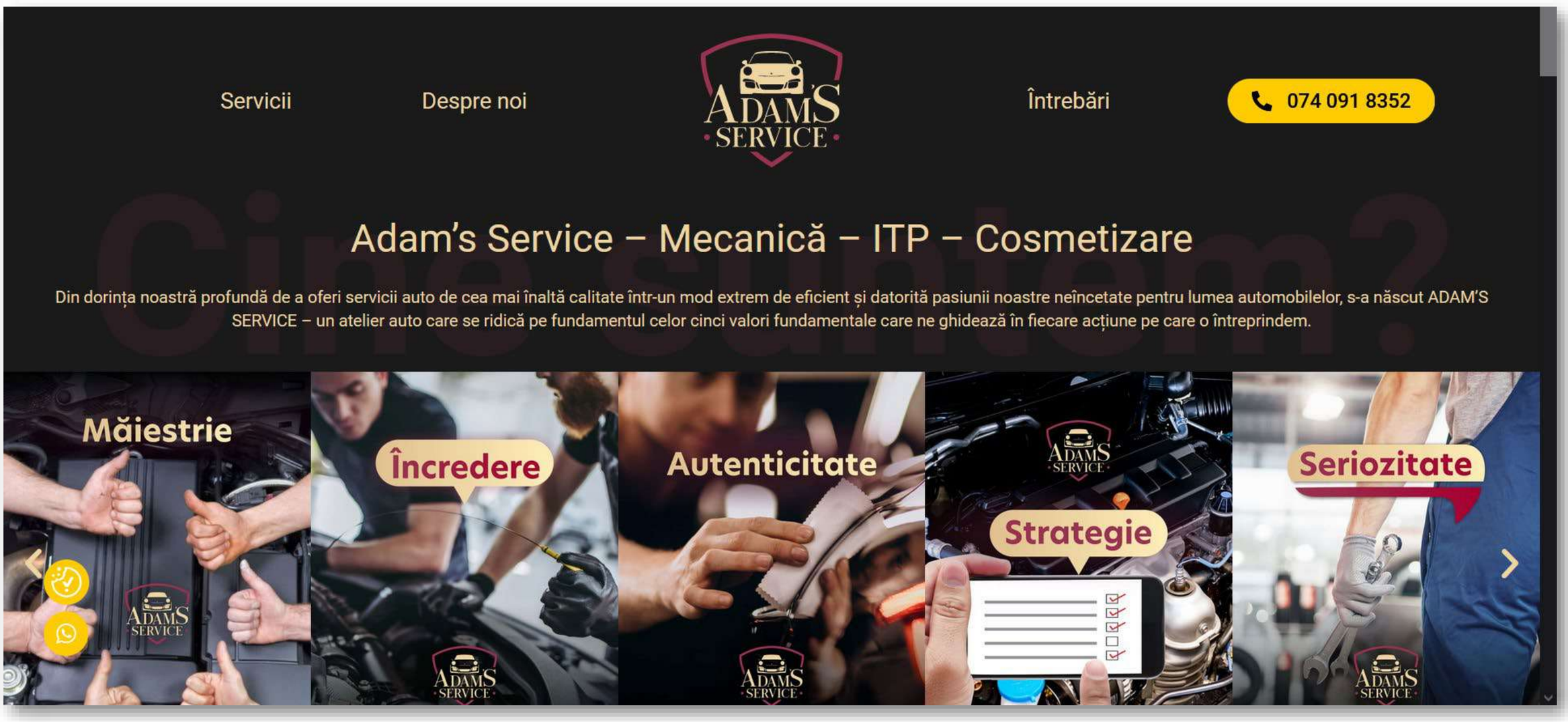
Everything in one place for your car!

D

Author: Florin ADAM & Team

With an undeniable passion for the world of automobiles, Florin, the CEO of Adam's Service, wanted to create a company that would offer high quality solutions and services, exceeding the expectations of customers in Alba Iulia and always being up to date with the latest technologies and industry trends.

Thus, in an attempt to satisfy the increasingly complex needs and requirements of car owners, ADAM'S SERVICE was born.





SCAN ME

Contact

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office@adamservice.ro

Str. Tudor Vladimirescu, nr. 48, Alba Iulia

Presentation link: https://adamservice.ro/servicii-auto/

Opportunity
CORNELIUGROUP
Research-Innovation Association
Creation
INVENTCOR
Realization
Power of Creative Mind
Deva ROMANIA

Will's Total Garage

AUTOMOTIVE DIAGNOSTICS by Will's GARAGE

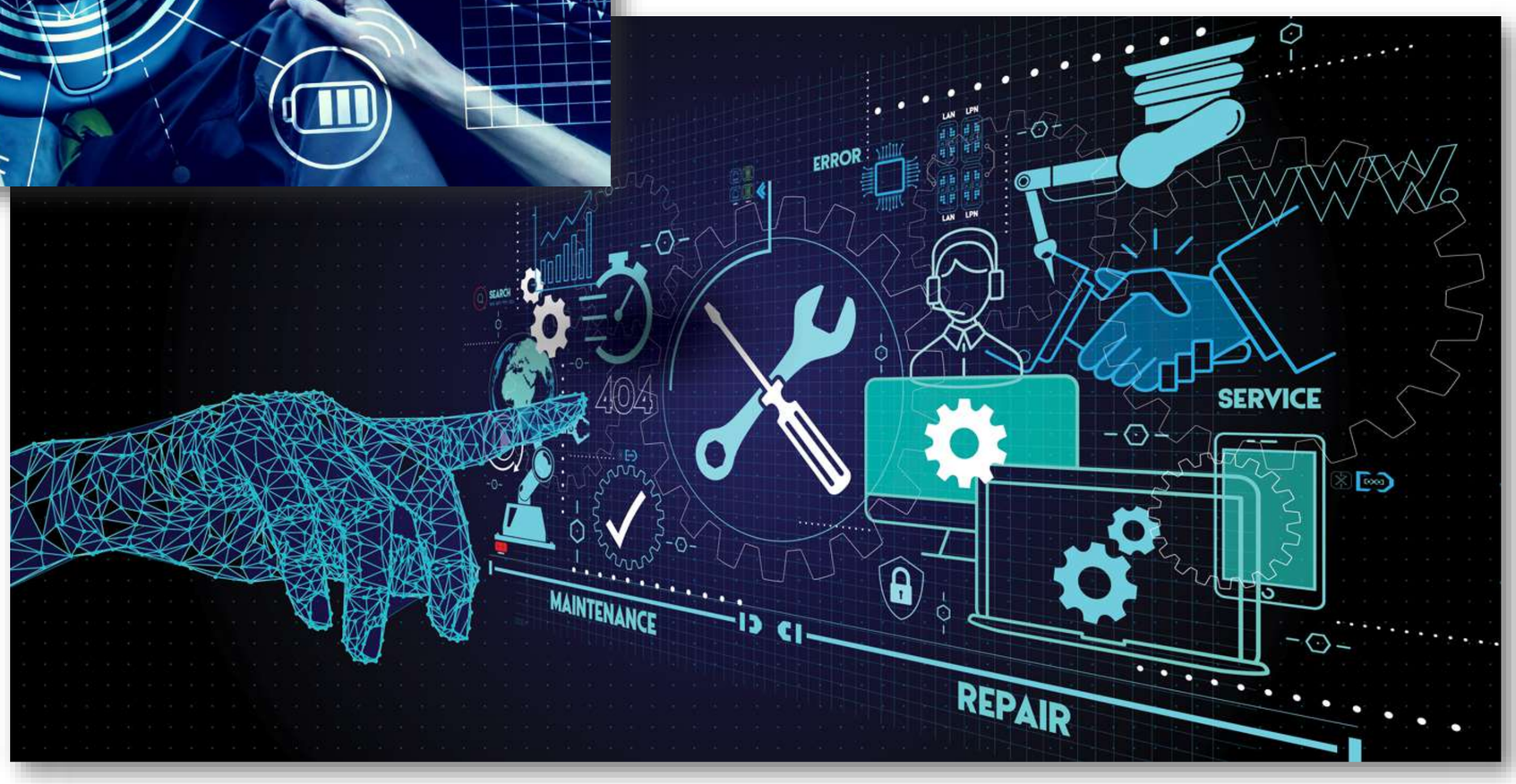
D

Author: ***Daniel Gabriel IORDACHI & Team***

Will's Total Garage, your trusted partner for leading diagnostic services in the automotive industry. With a team of experts passionate about technology and innovation, we are committed to providing accurate and efficient diagnostic solutions for your vehicle. Whether it's diagnosing mechanical, electronic or software issues, our experienced team uses the latest OBD diagnostic technology and equipment to quickly and accurately identify your vehicle's problems. From passenger cars to commercial vehicles and entire fleets, we offer a full range of diagnostic services tailored to your specific needs. With access to the latest software updates and diagnostic databases, we are able to provide customized solutions and efficient repair solutions. Transparency and open communication are fundamental to us. That's why our team will always thoroughly explain the diagnostic results and available repair options so you can make informed decisions about your vehicle.







Contact: *iordachidaniel01@gmail.com*

ALEX's MOTORCYCLES

D

Author: Alex SZEKELY

Classic motorcycles are an exciting hobby for many enthusiasts, this activity involves the search, restoration and preservation of old and rare motorcycles, often for display in private collections or at specialist events. For enthusiasts, every motorcycle is a story and a piece of motoring history, and the restoration process is a way to bring those stories to life and preserve them for future generations.

Hunedoara Classic Car Club is a passionate and dedicated group of classic car collectors and enthusiasts from Hunedoara County, Romania. Founded with the aim of promoting and preserving the historic automotive heritage, this club gathers around it lovers of vintage cars from different eras and brands. Club members are actively involved in the restoration and maintenance of their cars, attending local, national and international events to share their passion with other enthusiasts and promote classic car culture. The club serves as a meeting place to exchange ideas, experiences and advice related to restoration and maintenance, and encourages socialization and friendship among its members, thereby strengthening the community of classic car enthusiasts in the region.



SCAN ME



Contact: *classiccarhunedoara@yahoo.com*

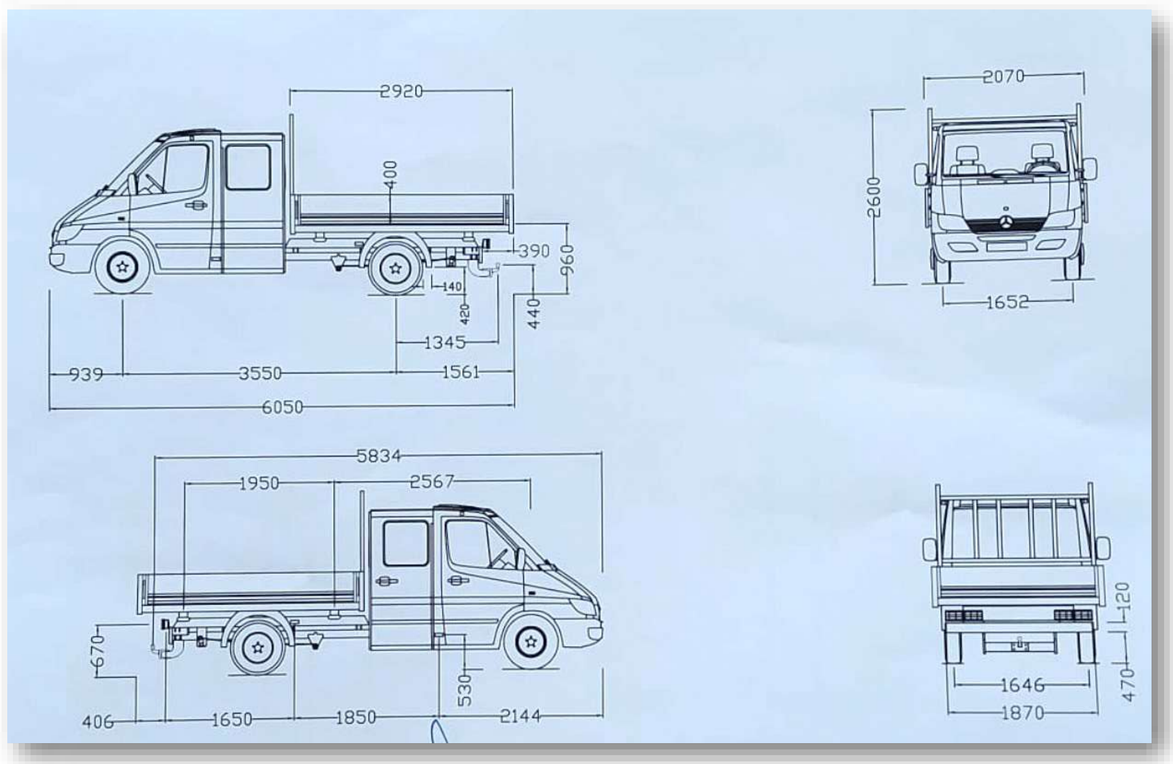
The procedure for implementation / homologation of the tipping system in the case Sprinter 311cdi Doka

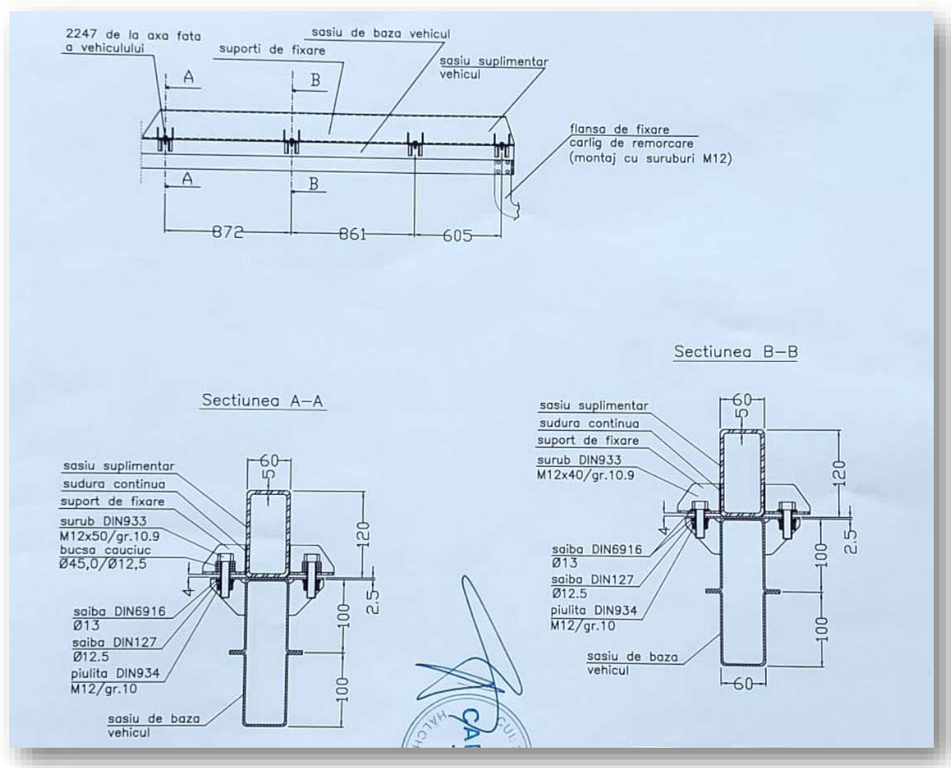
Student project

Author: ***Călin Rareș TEODORESCU***
coordinator Corneliu BIRTOK-BANEASA

D

The project presents a method of increasing the performance of the Mercedes van, model Sprinter 311cdi Doka, by implementing solutions to optimize the main functional systems, respectively the stages of the RAR approval procedure. Mercedes is a successful German brand, the Sprinter model launched on the market in 1995 and which established itself through performance, reliability/cost in the automotive industry, being among the most used vans worldwide.













The Sprinter 311cdi Doka model was originally designed with a fixed integrated flatbed, without the possibility of tipping, the disadvantage of this feature is that it requires a relatively increased time to unload the load.

The main change consisted in the implementation of a tipping kit, respectively the installation of a mobile flatbed with the aim of facilitating the faster unloading operation of the transported load.

Contact: trarescalin@icloud.com

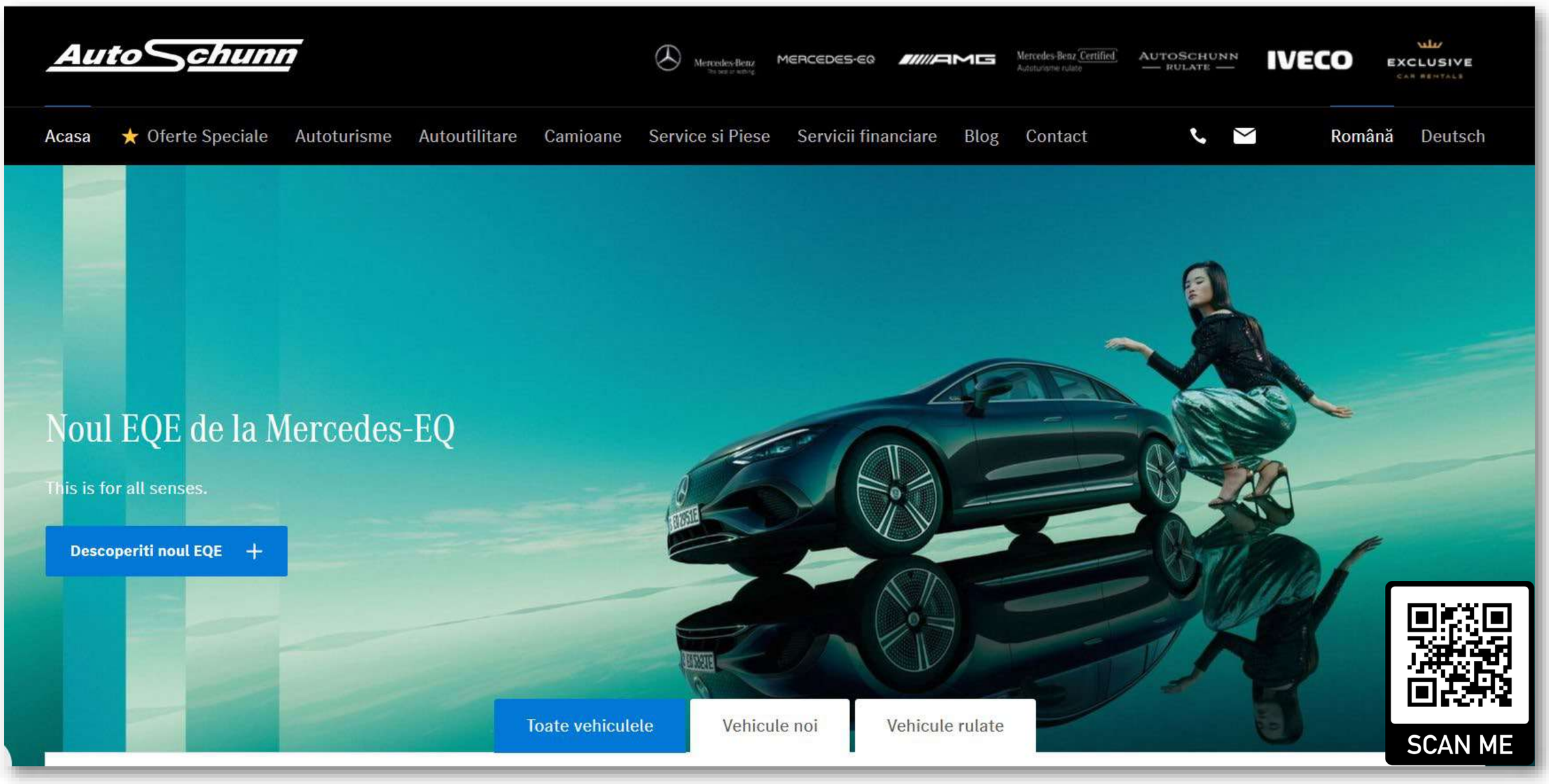
Auto Schunn

Author: : Jürgen Schunn & Team

D

Auto Schunn has been an authorized Mercedes-Benz partner car dealer in Romania for over 29 years. We are waiting for you at the Auto Schunn representatives in Arad, Deva and Suceava with a diverse portfolio of new and used Mercedes-Benz vehicles of the highest quality, available with immediate delivery directly from the showroom, and at the Auto Schunn centers in Sibiu and Timisoara to benefit used car sales and after-sales services to the highest German standards.

In order for you to be one step closer to the Mercedes-Benz car you want, at Auto Schunn you will always find special offers and promotions on new and used Mercedes-Benz cars, available with immediate delivery. We invite you to take a look at our stock of Mercedes-Benz cars available at special prices.



Oferte Mercedes-Benz

Pentru ca dumneavoastra sa fiti cu un pas mai aproape de autoturismul Mercedes-Benz pe care vi-l doriti, la Auto Schunn veti gasi in permanenta oferte speciale si promotii la autoturisme Mercedes-Benz noi si rulate, disponibile cu livrare imediata. Va invitam sa aruncati o privire pe stocul nostru de autoturisme Mercedes-Benz disponibile la preturi speciale.



Mercedes-Benz GLA 220
4M AMG ADVANCED++DISTRO+MEMO+C...



Mercedes-Benz T 180
180 d PROGRESSIVE+PREMIUM+NAVI+PA...



Mercedes-Benz GLB 220
4M 8G-DCT+AMG PREMIUM+THERMOTR...



Mercedes-Benz GLA 200
d 4Matic AMG PREMIUM+PANO+MEMOR...

Contact: https://www.auto-schunn.ro/contact/

CALIBRATION OF CAR-FOLLOWING MODELS USING TECHNIQUES BASED ON ARTIFICIAL INTELLIGENCE

Research project

This postdoctoral research project was financially supported by the Project "Network of excellence in applied research and innovation for doctoral and postdoctoral programs" / InoHubDoc, project co-funded by the European Social Fund financing agreement no. POCU/993/6/13/153437.

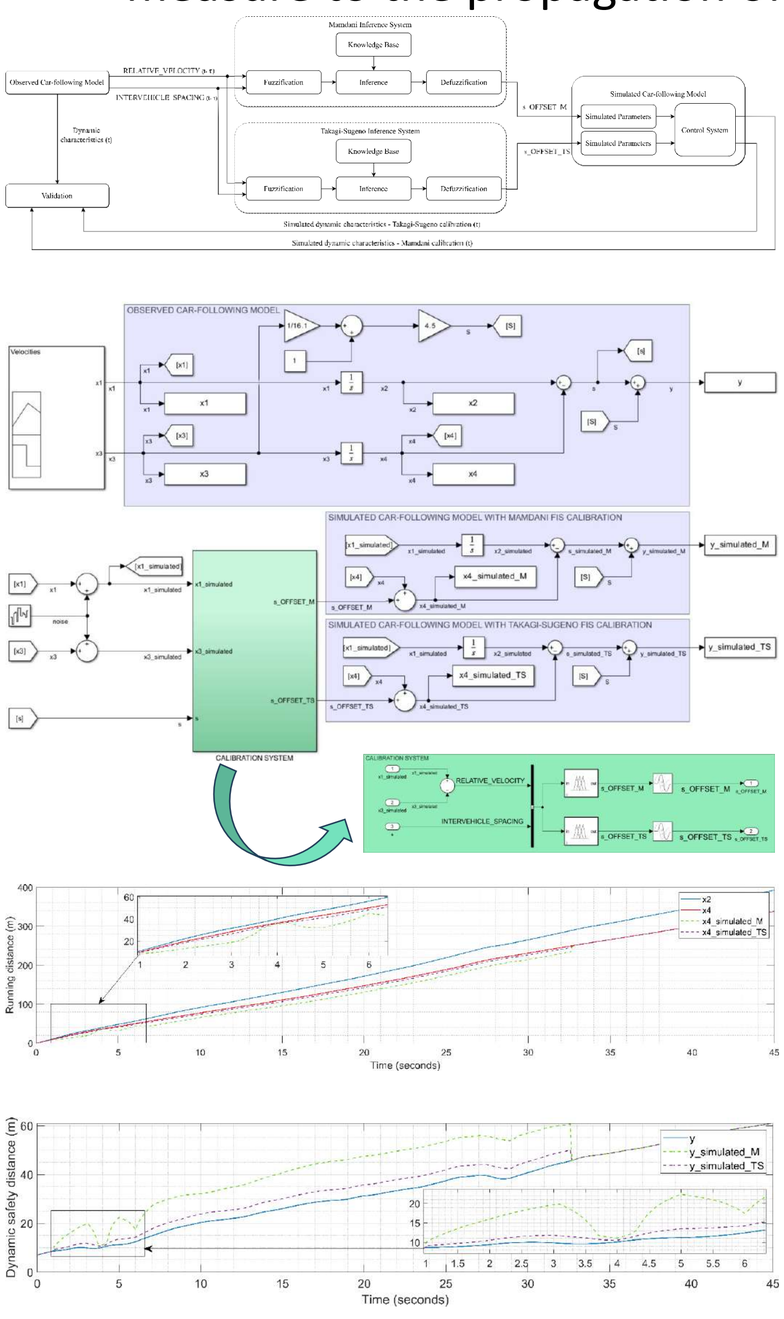
Author: Mădălin-Dorin POP
Menthor: Prof. Dr. Habil. Eng. Mihai V. MICEA

D

The purpose of this postdoctoral project was the development of new calibration methods for car-following models based on the use of artificial intelligence techniques. Validation of proposed models used real traffic data (i.e., data collected using inductive loop sensors during July – August 2019) provided by "Timișoara City Hall – General Directorate of Roads, Bridges, Parking and Utility Networks – Traffic Monitoring Office", Timișoara, Romania.

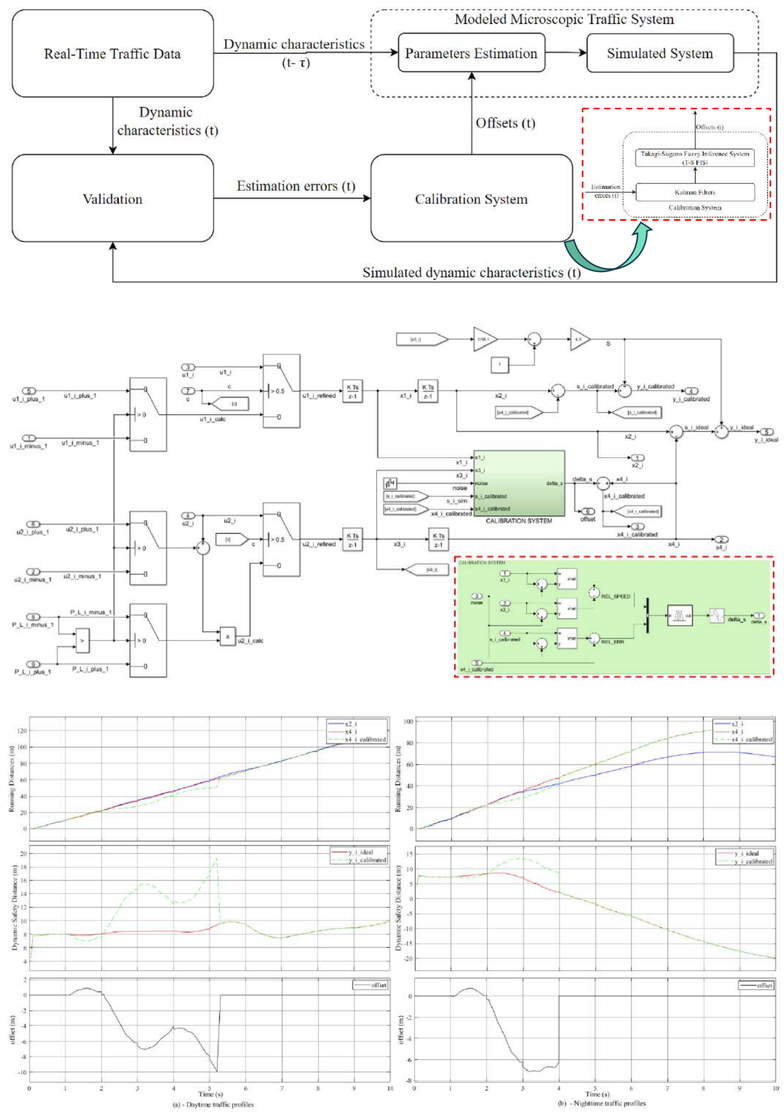
The research activities followed three directions:

- the analysis of the state-of-the-art in the calibration of car-following models;
- the development of new calibration methods based on fuzzy inference systems (FIS) and hybrid systems using FIS and Kalman filters that are capable of calibrating standard and refined car-following models with good performance in terms of response time, mean absolute error (MAE), and root mean square error (RMSE);
- the definition of a quality engineering framework applicable in the automotive industry as a counteract measure to the propagation of erroneous sensor data to control algorithms.



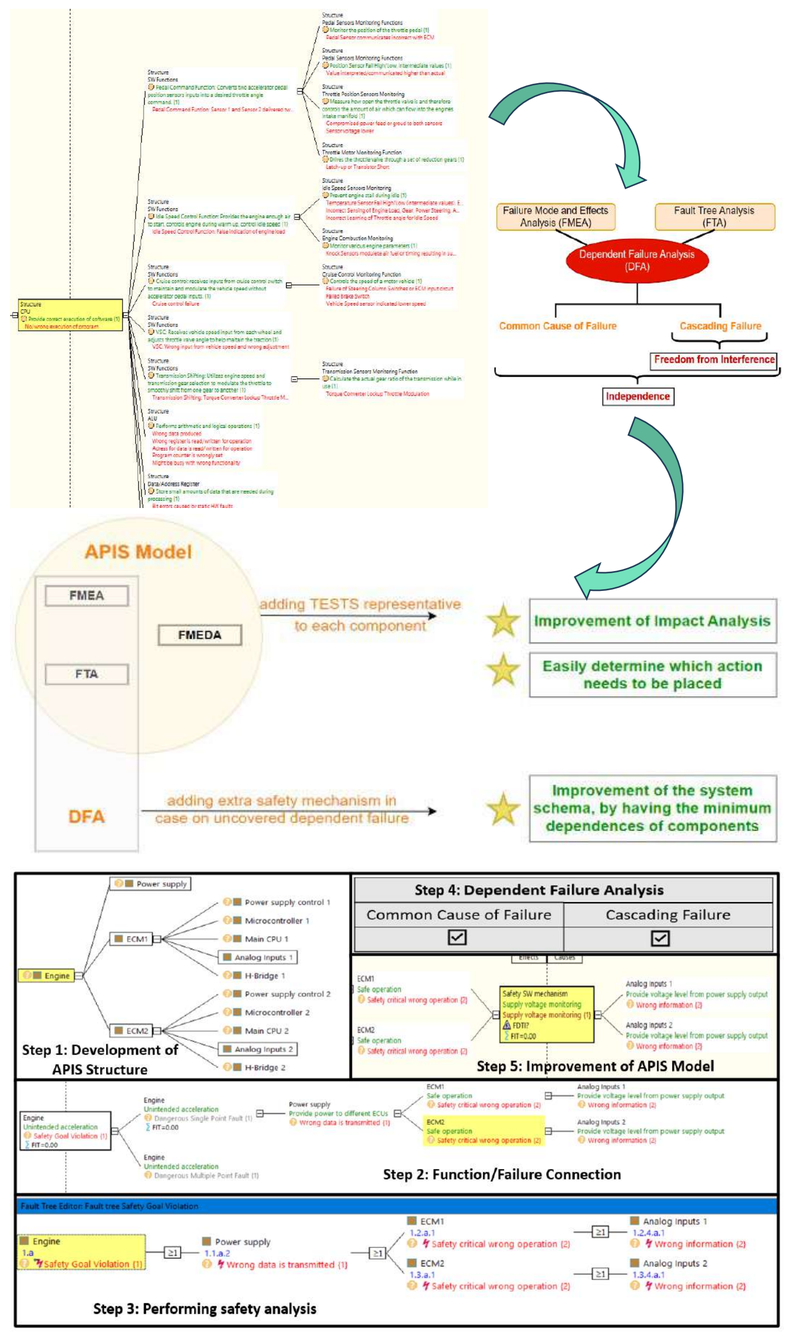
Deliverable:

M.-D. Pop, D. Pescaru, and M. V. Micea, "Mamdani vs. Takagi–Sugeno Fuzzy Inference Systems in the Calibration of Continuous-Time Car-Following Models," *Sensors*, vol. 23, no. 21, p. 8791, Oct. 2023, doi: 10.3390/s23218791.



Deliverable:

M.-D. Pop, O. Proștean, and M. V. Micea, "Evaluation of the Use of an Intelligent System in the Calibration of a Refined Car-Following Model," in *2022 IEEE 22nd International Symposium on Computational Intelligence and Informatics and 8th IEEE International Conference on Recent Achievements in Mechatronics, Automation, Computer Science and Robotics (CINTI-MACRo)*, Budapest, Hungary: IEEE, Nov. 2022, pp. 107–112. doi: 10.1109/CINTI-MACRo57952.2022.10029500.



Deliverable:

M.-D. Pop and D. Igna, "Quality Engineering Framework for Functional Safety Automotive Projects:," in *Proceedings of the 18th International Conference on Software Technologies*, Rome, Italy: SCITEPRESS - Science and Technology Publications, 2023, pp. 463–469. doi: 10.5220/0012119300003538.

Contact: madalin.pop@upt.ro

E

Teaching methods

Books

History and Cultural studies

EDUROD Association
for Digital and Environmental Education

I have knowledge! I know! / Ba Cunosc! Ba Stiu!

Discovering Professions

E

Author: Sarah LASCU HARVAT

The EDUROD Association aims to bring together three important directions: **digital education, environmental education, and cultural education**, in order to help and support educators, youth, parents, and individuals from disadvantaged groups in education and art therapy.

The main project **“I have knowledge! I know!” / ,,Ba Cunosc! Ba Stiu!"** aims to document as many professions from various locations as possible in order to make known to the general public their products and services, the people behind the professions, and the main activities required to carry out these professions.

The documented professions so far:

Providing document copying, spiral binding, and laminating services are key activities of a **printing & copying shop**.

A space **where fashion meets sustainability**, and individual style blends with environmental responsibility.

Behind the profession of ,,**Veterinarian**" lies a lot of dedication, knowledge, passion, and extensive practice. Discover the exceptional people who dedicate themselves to caring for and healing animals.

Where do the **vegetables and fruits** we find at our **local producers** come from, how are they cultivated, watered, and cared for.

Solar panels convert solar energy into electricity, contributing to reducing electricity costs and protecting the environment.

The **connection with objects where history is found** and how we can integrate them into the desired decor.

How to manage a **real estate agency** and what are the main activities of the profession of ,,**real estate agent”**.

We discover the mastery with which metal is treated. The profession of ,,**blacksmith”** is being related to us.

The importance of caring for pets and the discovery of a lesser-known profession, that of a ,,**pet groomer**”



















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5th International Exhibition InventCor
04-06.04.2024 – Deva, Romania
Universitatea de Stat de Medicină și Farmacie „Nicolae Testemițanu” din Republica Moldova
Nicolae Testemițanu State University of Medicine and Pharmacy of the Republic of Moldova

INTERACTIVE MODEL OF SIMULATION OF TECTONIC EARTHQUAKES VEN-GP V.1.0

Certificate of innovator No. 6169 from 11 January 2024

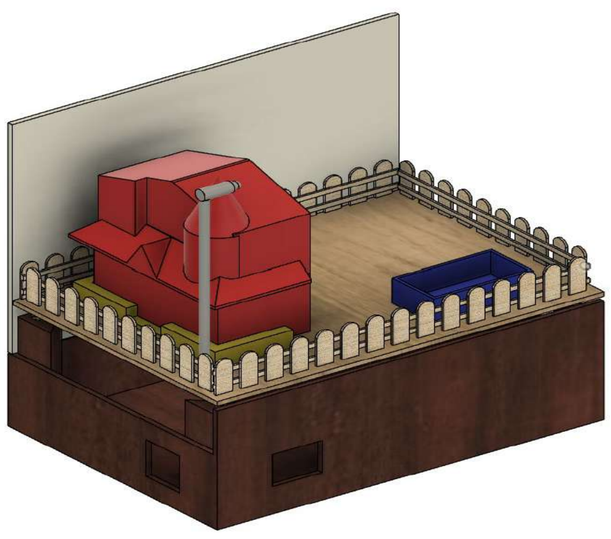
Authors: Valic Eugeniu, Valic Vladimir, Ciobanu Daniela, Bulgac Anatolie

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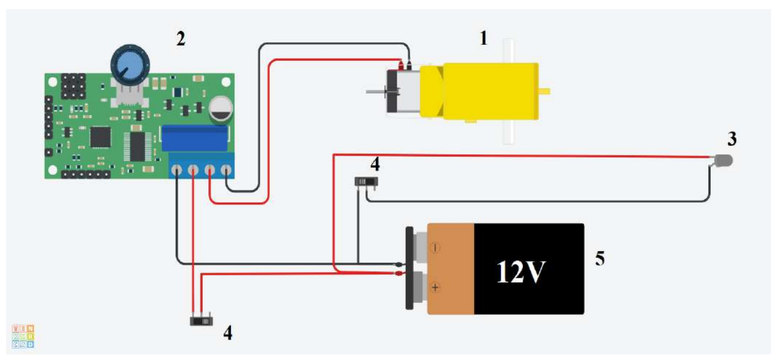
Background: Natural disasters produced over the years have caused material damage and an impressive number of human losses around the world. The beginning of the century the 21st century was marked by an increase in the tectonic activity of the earth's crust, as a result many earthquakes of various magnitudes were recorded, generating numerous victims among the population and disastrous effects on communities. Considering the geographical position of the Republic of Moldova (located near Vrancea seismic zone), the history of monitoring earthquakes and their consequences, the increased seismic activity in this region recently, it is necessary to emphasize the primary role of training the population and the implementation of new teaching methods regarding the rules of security and behaviour of every citizen in the event of an earthquake.

The aim of the project: Development of an interactive tectonic earthquake simulation model, adjustable according to magnitude, intended for students and the general population for teaching and training purposes regarding the manifestations of earthquakes, their consequences, measures of conduct in case of an earthquake.

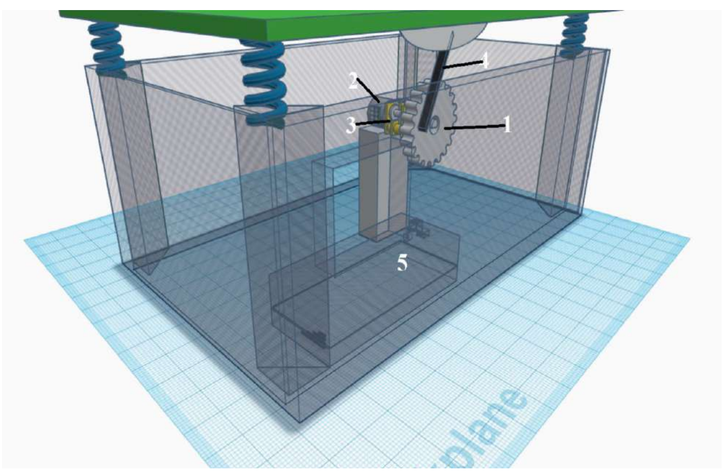
The principles of working: The innovation consists of an interactive tectonic earthquake simulation model. It is composed of a landscape represented by a model of a household consisting of a two-level building, lamp post with electric LED bulb, fenced yard placed on a mobile platform suspended on 4 springs. The platform is connected to a system consisting of crank connected to a DC motor and reducer. This system is powered by a DC power supply (Li-Po 18650 12V batteries, connected in series). The magnitude of the tectonic earthquakes is regulated by a DC controller with a potentiometer, being equated to the voltage in volts transmitted to the motor and reducer system. Its value is recorded by a voltmeter, whose display indicates the voltage transmitted to the system with motor and reducer.



Virtual representation of the model



1- DC motor with reducer
2- Speed controller with potentiometer
3- 12V LED bulb
4- Switch
5- Power supply (batteries connected in series 12V)



1- Gear wheel connected to motor with reducer and drive crank
2- DC motor
3- Reducer
4- Propulsion crank
5- Power supply (batteries connected in series 12V)

The advantages: The given simulation model of tectonic earthquakes represents a theoretical, methodical and practical support in lectures and seminars on disaster medicine as well as in open lessons intended for the general population regarding information, awareness and training about the manifestations of earthquakes, their consequences on localities populated, the measures of conduct in case of an earthquake.

The ergonomic design and small dimensions of this model allow it to be portable and transportable in a medium-sized bag or case. Li-Po model 18650 rechargeable batteries, connected in series, allow the model to operate autonomously, in rooms with or without an electric current source, with the possibility of recharging them when necessary and later use. The model of the household, consisting of the two-level building, decorative elements, the lamppost with electric lamp, accurately imitates the real-time manifestations and consequences of earthquakes on it

The results of implementation: Following the testing of this model during the seminars of the Department of Military and Disaster Medicine, the department's collaborators and students were impressed and motivated by the innovative approach in the instructional-didactic process of natural disasters, the convenience of its use and the adjustment of the magnitude of earthquakes with visualization in real time of its manifestations.

Contact: eugenvalic99@gmail.com +37368569162

A.D.O.R.

Human rights support project

E

Author: *Anca Maria Dorina & ADOR team*

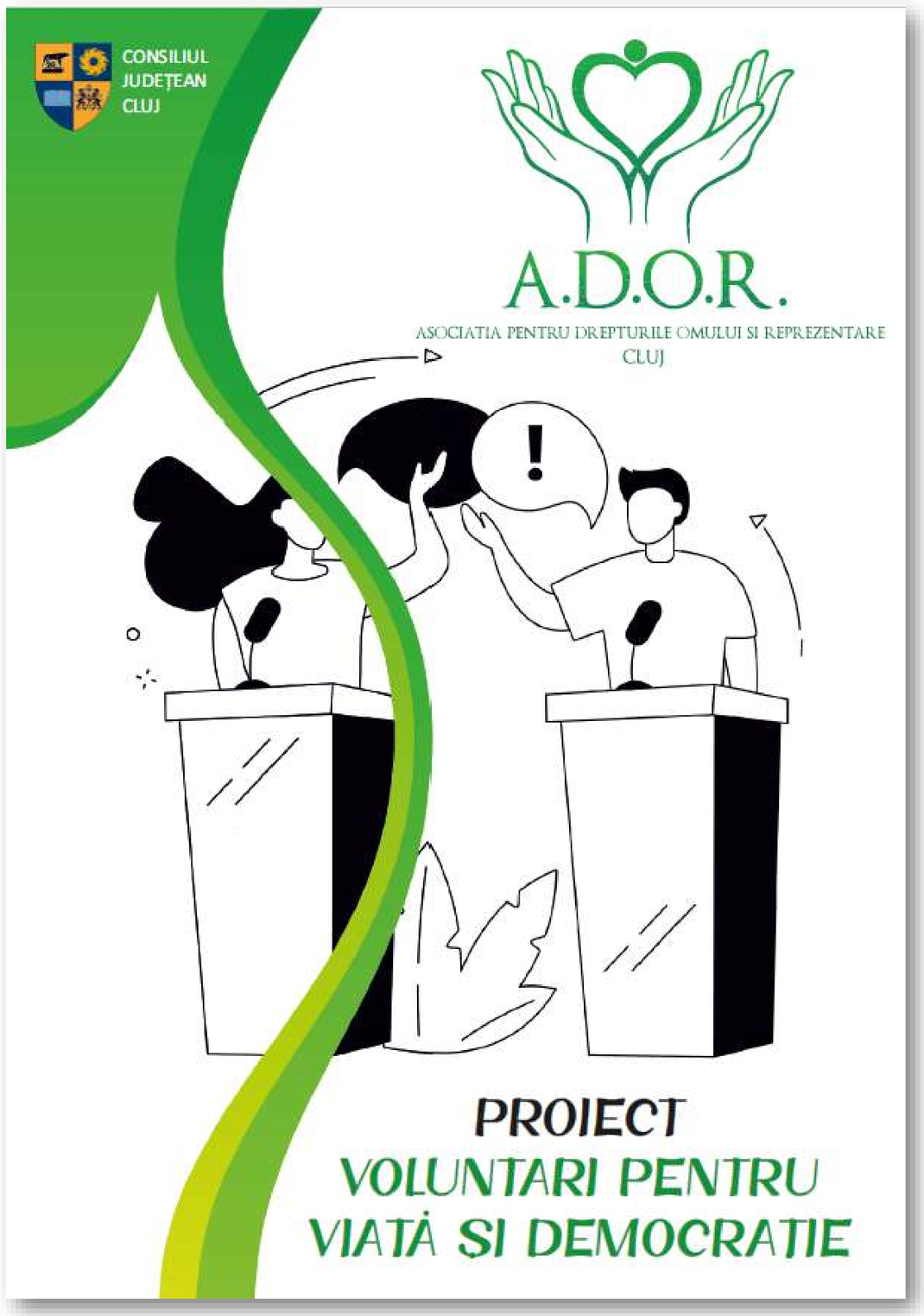
*The purpose of the **ASSOCIATION FOR HUMAN RIGHTS AND REPRESENTATION – ADOR** is in mainly, the support of human rights, and to increase it, it proposes a series of objectives, including:*

- monitoring local, parliamentary, European parliamentary, presidential elections and referenda local and national, through accredited observers and through any other legal means;

- creation of information centers and legal advice in the matter of human rights and social protection;

- carrying out studies, analyses, researches, opinion polls on different topics;

- promoting volunteerism, especially among young people.



*Through the **VOLUNTEERS FOR LIFE AND DEMOCRACY** project we propose to initiate and introduce the practice of dialogue with the all actors can contribute ideas, to promote structured dialogue between decision-makers at political level and civil society, in order to ensure the effective participation of employees in the electoral process. Also, through active involvement of our non-governmental organization in non-formal and informal education activities, we will lay the foundations the process of introduction into the formal curriculum of political education.*



SCAN ME

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MOLDOVA STATE UNIVERSITY

Scientific Research Laboratory
Environmental Physics and Modeling Complex Systems &
Cultural Heritage Management Center
Al. Mateevici str. 60, Chisinau MD-2009, Republic of Moldova
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HR EXCELLENCE IN RESEARCH

EDX ANALYSIS OF TILE MATERIAL FROM THE NORTH WEST OF THE BLACK SEA (1ST - 4TH CENTURIES AD)

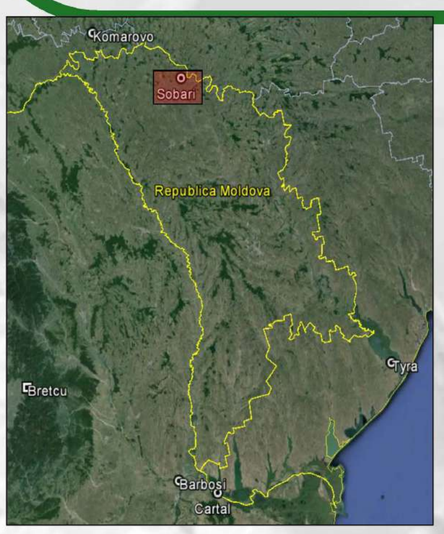
RESEARCH PROJECT NUMBER: # 011210

AUTHORS: Sergiu MATVEEV, Veaceslav SPRINCEAN

APPLICATION FIELDS: E - Teaching methods, Books, History and Cultural studies.

AIM: Identification of the place of production of the tile material from the Sobari archaeological site (Soroca district, Republic of Moldova).

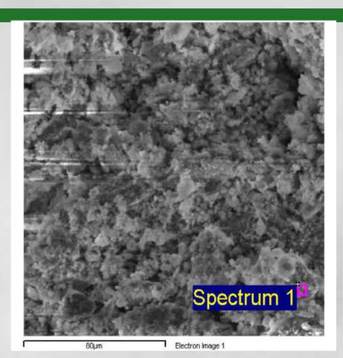
SOLUTION: The EDS analysis was performed on a batch of tiled materials (tile and brick, 14 samples) from several archaeological sites representative of the barbarian world: Sobari (Moldova), Komarovo (Ukraine) and for settlements from the Roman Empire: Cartal, Tyras (Ukraina) and Barboși (Romania). The obtained results allowed the establishment of the granulometry, the structure of the material, the texture of the matrix, as well as the degree of porosity for each studied group. The comparative statistical analysis of the elements demonstrated the similarity of the tile material from Sobari with those from the localities of the Roman Empire. We can state that the tile material from Sobari was brought from one of the Roman centers, most recently from Tyras, conquered by the Goths around 280 AD.



Map of archaeological sites with tile material subjected to EDS analysis

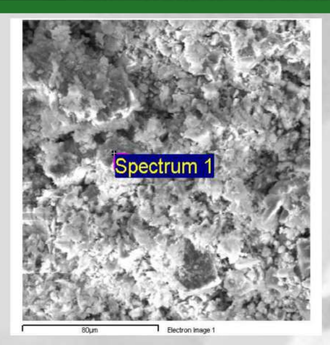


Proba	I					
Spectrum	1		2		3	
	W	A	W	A	W	A
C	4.34	7.23	0.99	1.87	3.85	6.38
O	46.64	58.32	40.57	57.78	52.94	65.93
F	3.49	3.67	-	-	-	-
Na	0.55	0.47	0.36	0.36	-	-
Mg	0.81	0.67	1.51	1.42	1.81	1.49
Al	4.57	3.39	8.06	6.81	7.67	5.66
Si	32.13	22.89	22.34	18.12	20.35	14.44
Cl	-	-	-	-	-	-
K	1.61	0.82	3.98	2.32	1.97	1.01
Ca	3.09	1.54	13.98	7.95	7.28	3.62
Ti	-	-	0.43	0.21	-	-
Fe	2.77	0.99	7.78	3.18	4.13	1.47
W	-	-	-	-	-	-



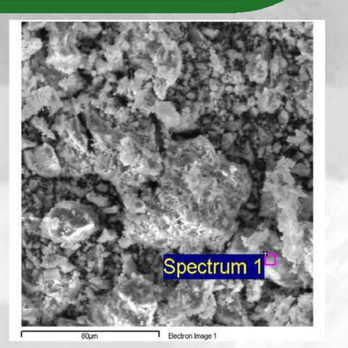


Proba	VI					
Spectrum	1		2		3	
	W	A	W	A	W	A
C	4.05	6.91	1.65	2.84	1.11	1.86
O	48.60	62.17	49.95	64.61	51.58	64.91
F	-	-	-	-	-	-
Na	0.78	0.70	1.38	1.24	4.20	3.68
Mg	1.85	1.56	3.43	2.92	1.04	0.86
Al	6.09	4.62	8.53	6.55	8.73	6.51
Si	26.07	19.00	20.90	15.40	26.25	18.81
Cl	0.45	0.26	0.31	0.18	0.35	0.20
K	1.44	0.75	2.45	1.30	1.93	0.99
Ca	4.77	2.44	5.06	2.61	3.09	1.55
Ti	-	-	-	-	-	-
Fe	3.72	1.36	6.34	2.35	1.74	0.63
Cu	-	-	-	-	-	-
Yb	-	-	-	-	-	-
W	2.18	0.24	-	-	-	-





Proba	VIII					
Spectrum	1		2		3	
	W	A	W	A	W	A
C	-	-	3.26	5.55	1.49	2.41
O	53.89	68.51	48.31	61.77	58.00	70.62
F	-	-	-	-	-	-
Na	0.36	0.32	-	-	-	-
Mg	0.79	0.67	1.22	1.02	-	-
Al	7.73	5.82	8.48	6.43	0.55	0.39
Si	27.81	20.14	29.04	21.15	37.77	26.20
Cl	-	-	-	-	-	-
K	7.10	3.69	2.46	1.29	0.18	0.09
Ca	-	-	0.99	0.50	-	-
Ti	-	-	-	-	-	-
Fe	2.32	0.84	6.24	2.29	0.29	0.10
Cu	-	-	-	-	-	-
Yb	-	-	-	-	-	-
W	-	-	-	-	1.75	0.18



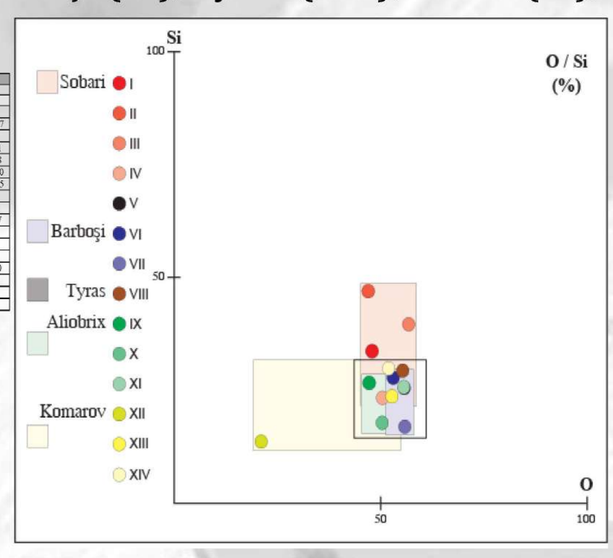
Examples of samples from Sobari (I), Barboși (VI), Tyras (VIII), Cartal (IX), Komarovo (XIII).



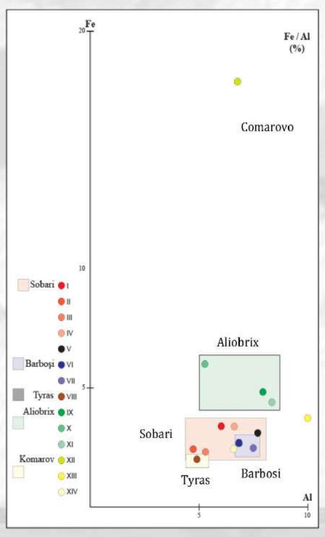
Proba	IX					
Spectrum	1		2		3	
	W	A	W	A	W	A
C	-3.79	-7.24	-	-	6.23	10.15
O	45.76	65.61	40.98	60.13	50.73	62.10
F	-	-	-	-	-	-
Na	0.86	0.85	0.61	0.66	0.74	0.63
Mg	2.14	2.02	1.51	1.45	2.10	1.69
Al	9.37	7.97	9.55	8.31	7.20	5.23
Si	25.10	20.50	18.10	15.12	22.18	15.46
Cl	0.27	0.18	-	-	-	-
K	3.61	2.12	13.33	8.00	2.39	1.19
Ca	6.78	3.88	3.59	2.11	3.94	1.93
Ti	0.87	0.42	0.98	0.48	0.72	0.29
Fe	9.04	3.71	7.84	3.29	3.77	1.32
Cu	-	-	-	-	-	-
Yb	-	-	-	-	-	-
W	-	-	3.48	0.44	-	-



Proba	XIII					
Spectrum	1		2		3	
	W	A	W	A	W	A
C	1.33	2.32	2.48	4.10	-	-
O	51.28	67.02	54.33	67.49	54.91	69.27
F	-	-	-	-	-	-
Na	-	-	-	-	0.36	0.31
Mg	1.68	1.45	0.94	0.77	0.95	0.78
Al	10.66	8.26	10.18	7.50	13.37	10.00
Si	22.12	16.47	23.36	16.53	23.04	16.55
P	-	-	-	-	-	-
Cl	-	-	-	-	-	-
K	2.29	1.23	3.23	1.64	2.66	1.37
Ca	0.45	0.24	-	-	-	-
Ti	0.36	0.16	0.40	0.17	-	-
Mn	-	-	-	-	-	-
Fe	6.61	2.48	5.07	1.80	4.72	1.70
Cu	-	-	-	-	-	-
Dy	1.19	0.15	-	-	-	-
W	2.01	0.23	-	-	-	-



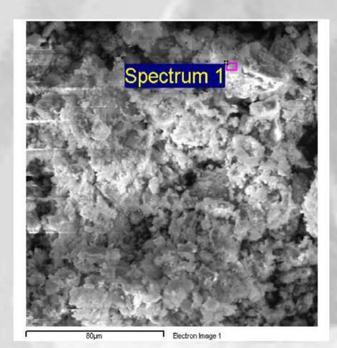
The correlation between Fe and Al

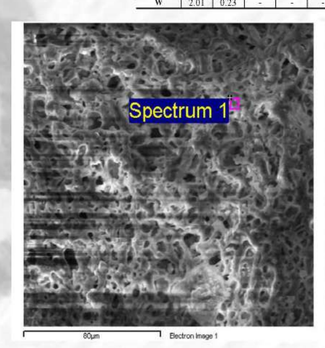


The relevance of Si in sample



Reconstruction of the house from Sobari





ADVANTAGES: The methods are non-invasive and repeatable; initiates a new database that can be expanded with evidence from other archaeological sites.

IMPLEMENTATION STAGE: At the laboratory level and preparing the publication.

ACKNOWLEDGMENTS: This research was supported by the *research project: # 011210.*

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HR EXCELLENCE IN RESEARCH

REMEDIES FOR THE LEGAL CRISIS IN THE REPUBLIC OF MOLDOVA

RESEARCH PROJECT NUMBER: # 010502

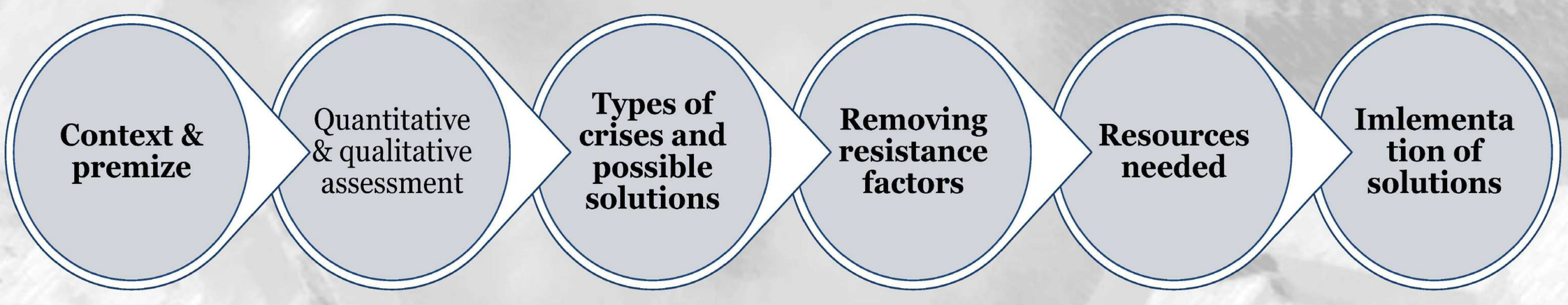
AUTHORS: Rodica CIOBANU, Elena ARAMA, Ion GUCEAC

APPLICATION FIELDS: E - Teaching methods, Books, History and Cultural studies.

AIM: To identify how the crisis of law is affecting the reform process of the Republic of Moldova and to define possible solutions.

SOLUTION: The complex nature of the problem shows the need for consensus and socio-professional and institutional mobilization in order to consistently apply mechanisms to overcome the legal crisis and achieve the modernization of the Republic of Moldova.

Steps to overcome the crisis



ADVANTAGES: Provides a comprehensive view of the causes and forms of the legal crisis;
Identifies distinct perspectives for addressing the crisis of law;
Broadens the understanding of the manifestation of the crisis and its impact at national level;
Develops solutions and formulates viable and effective instruments for intervention;
Sets benchmarks for the modernisation of the Republic of Moldova, thanks to the solutions offered to overcome the crisis of law.

IMPLEMENTATION STAGE: At the laboratory level.

ACKNOWLEDGMENTS: Moldova State University, Ministry of Education and Research, National Agency for Research and Development

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HR EXCELLENCE IN RESEARCH

AN INTEGRATED METHODOLOGY TO MEASURE THE RELEVANCE OF GOVERNANCE MODERNIZATION INDICATORS IN LINE WITH GOOD GOVERNANCE STANDARDS

PROJECT NUMBER: # 010502; OȘ 7728 / 14.12.2023

AUTHORS: Rodica CIOBANU, Mariana ROSCA

APPLICATION FIELDS: E - Teaching methods, Books, History and Cultural studies.

AIM: Identification of the assessment methodology algorithm of the relevance ratio of national indicators of modernization of governance focused on the protection of human rights in order to design integrated solutions to increase institutional and professional efficiency.

SOLUTION: Designing and delivering an integrated methodology to identify indicators that ensure the effectiveness of human rights protection mechanisms in conditions of transition to good governance standards.

EVALUATION
- Identifying the best practices and national resilience factors

CONSOLIDATED METHODS
- Tools, techniques for synthesizing dependencies and interdependencies

COMBINED AND INTEGRATED METHODOLOGY
- Hierarchical rationalisation of indicators

RESULT
- Benchmarking in the national context

ADVANTAGES:

Outlines the obstacles to good governance
Indentifies the factors of resistance to the process of governance modernization in Moldova
Draws up the priorities for overcoming the modernisation crisis
Creates more rapid and effective intervention opportunities
Increases the resilience to risk factors in the process of achieving transition to the standards of good governance
Provides a model for an integrated approach to the prospect of increasing institutional efficiency and professional effectiveness in harnessing human protection mechanisms

IMPLEMENTATION STAGE: Piloted , copyright obtained.

ACKNOWLEDGMENTS: Moldova State University, Ministry of Education and Research, National Agency for Research and Development.

CU-Dough: Anti-bacterial dough Cu nanoparticles

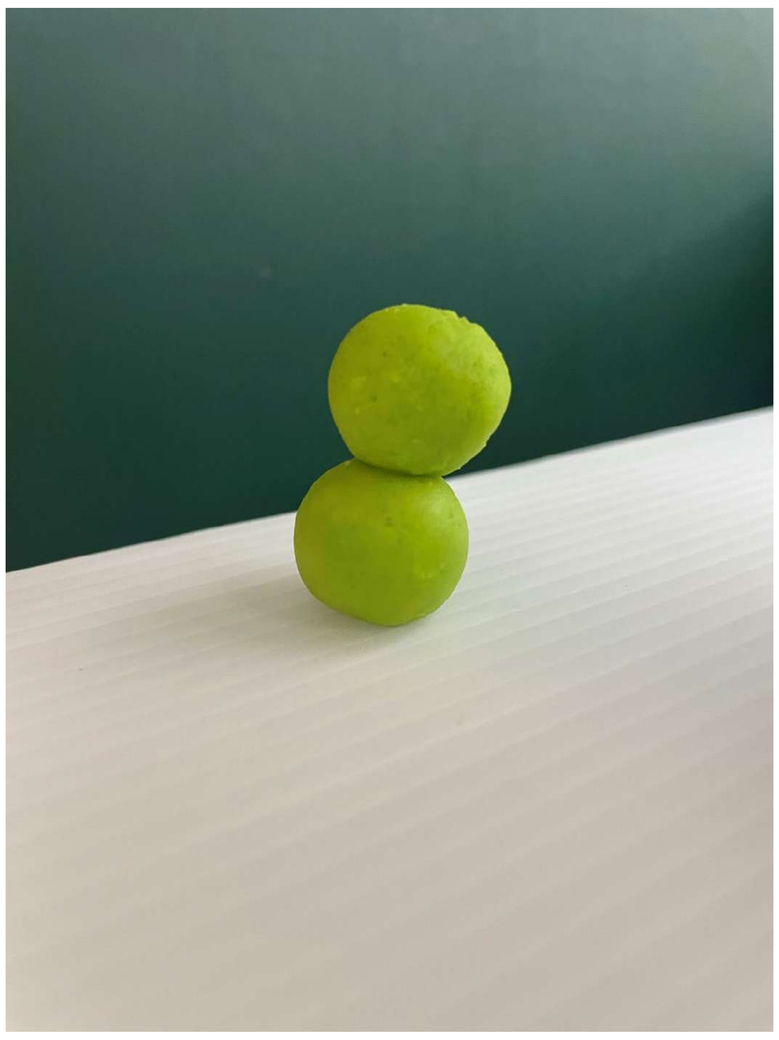
Project number 3

Author/s: Namphueng Taweepornpathomgul, Jeerasak Jitrotjanarak, Soamshine Boonyananta, Robert Armstrong, Parinton Jangtawee, Suchart Imsamraan

E

"Cu-Dough" dough for early childhood with copper nano technology synthesised using green chemistry in the right amount. Therefore, it can stop the spread of bacteria. Safe for children and extends shelf life for up to 4 times longer than before, ensuring it remains fresh and ready to use. Reduces waste and reduces resource use. There are many bright colors to help stimulate creativity. It is the use of copper nano particles synthesized using green chemistry in the appropriate amount making it safe for children. It is mixed with playdough to inhibit the growth of bacteria and viruses. This makes the dough last longer, reduces costs, and reduces waste.













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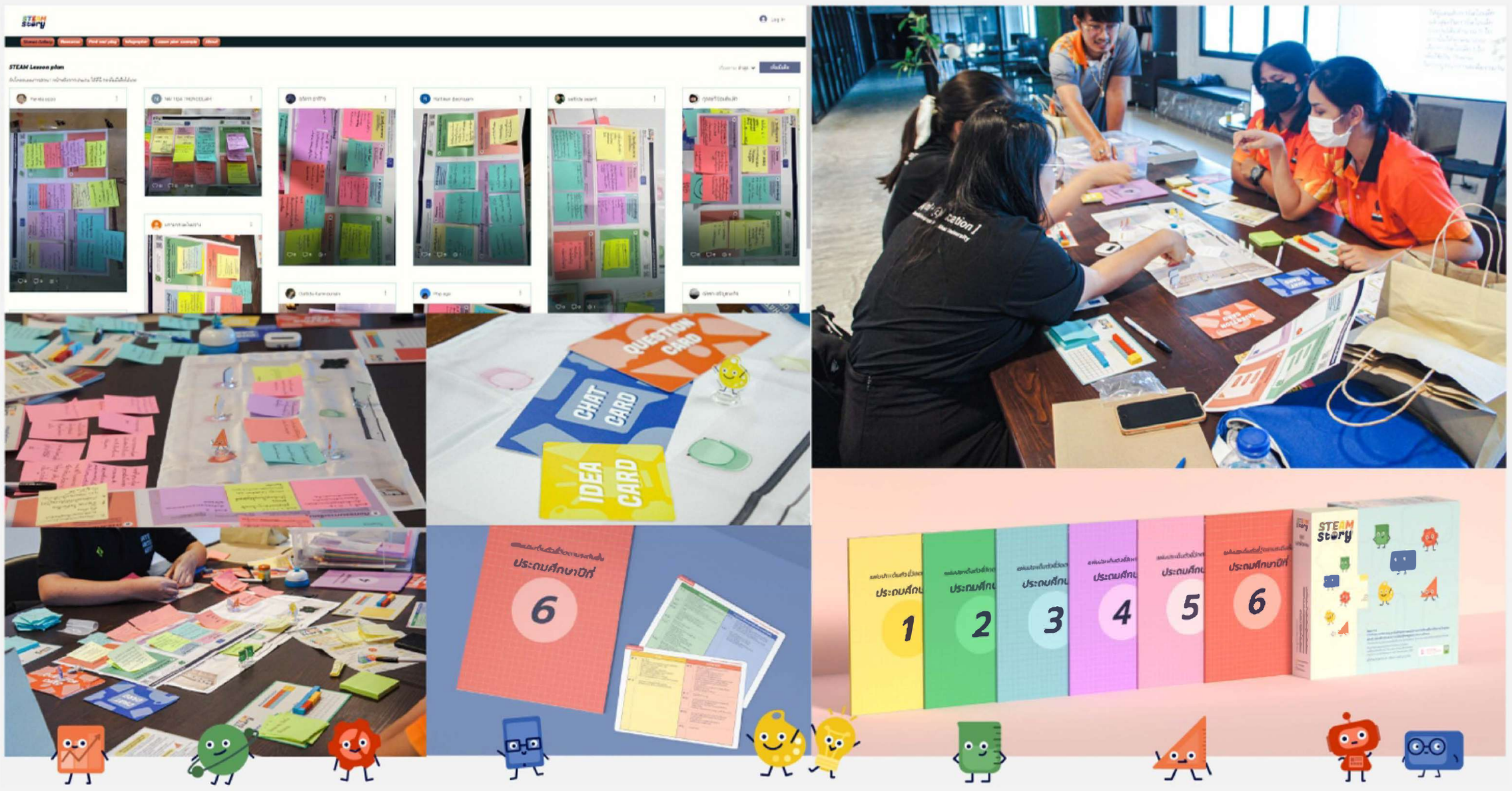
"STEAM Story" Board Game

STEAM collaborative learning and lesson plan co-creation tools

Research and innovation activity is funded by
National Research Council of Thailand (NRCT) Contract no.N41A650594

Author : Nutcha Charoenchanakit
Mentor : Asst. Prof. Soamshine Boonyananta, Ph.D. Art Education Chulalongkorn University

STEAM education combines five disciplines: Science, Technology, Engineering, Arts, and Mathematics. STEAM education is important and beneficial in providing students with a holistic view and there is a need to develop innovative tools that facilitate collaborative learning and the co-creation of STEAM lesson plans. We proposes a game-based learning approach utilizing board game to engage teachers in playing, sharing, and collaborating through game mechanics. The "STEAM Story" board game is designed for collaborative learning and STEAM lesson plan co-creation through cooperative play, knowledge exploration, idea exchange, and STEAM lesson planning. The game accommodates 4-6 players in a semi-cooperative gameplay format, with an estimated duration of 60 minutes or more. The outcome is a one-page lesson plan that includes 1. Integrated subjects. 2. Learning content 3. Theme 4. Learning Objectives 5. Learning activities 6. Evaluation. The gameplay comprises three phases:
Phase 1: Introduction to STEAM (knowledge exploration and discussion through question card and chat card),
Phase 2: Brainstorming STEAM (Ideate STEAM topic, selecting suitable themes, and Pitching), and
Phase 3: Perfect STEAM (finalized STEAM lesson plan)



the results from the satisfaction assessment show that the overall satisfaction with the prototype was high among the participants ($\bar{x}$ = 4.70). The participants self-evaluation expressed that after using the innovation their attitudes, knowledge, and ability to develop STEAM lesson plans increased significantly (α = 0.05) and the STEAM education knowledge test show that the average score before using the innovation was 11.15. After using the innovation, the average score increased to 16.00. The T-test statistical analysis yielded a value of 7.40, df = 25, Sig. = .000, indicating that the average score after using the innovation is significantly higher than before (α = 0.05). The innovation highlight can be summarized with the CHILD Model as follows:

- **C Collaboration** — Promoting co-creation: Collaborate between teachers
- **H Harmony** — Create mutual understanding: Correct understanding of integration
- **I Importance** — Acknowledge STEAM values: Motivate STEAM teaching
- **L Learning** — Impart knowledge: Design for easy access knowledge
- **D Doing** — Practice practical skills: Practice STEAM lesson planning in-game

Motion Graphic Scan Here

Contact : nutcha.c@chula.ac.th

TECHNOLOGICAL TRANSFER CENTER CTT-UCB

Author/s: Rădulescu Constanța, Bălăcescu Aniela, Călina Denis, Boncea Adrian, Anghelescu Lucica, Borcoși Corina

E

The CTT-UCB Technological Transfer Center aims to become an important structure of the regional innovation ecosystem in South-West Oltenia, acting both as a connecting element between the people/entities working in the CDI sector, the business environment and end users, but also as an accelerator of innovative products and services developed either by exploiting research results or by covering the specific needs of companies to develop/improve/test/validate/transfer a new product or technology to the market that responds to consumer problems.

CTT-UCB aims to increase the technology transfer capacity and achieve a unitary process for the development of management and the monitoring of the technology transfer activity through the need to professionalize the human resource within UCB as well as through the need to develop a culture of collaboration between the human resource from the different departments of the university, but also with public entities and economic entities.

The areas of activity of CTT-UCB are:

1. The field of Industrial Engineering and Materials, with the subfields: Systems, installations,equipment, machines/equipment for construction and other industries; Systems, processes, installations, equipment, environmental technologies/Environmental protection; Systems, equipment, technologies for the agri-food, aeronautical, sanitary sector; Advanced materials, composites; Recovered materials, materials from bioresources;

2. The field of ICT and Digitization with the subfields: Smart city, smart village; Productsinnovative in the IT field, with an emphasis on medium fields, energy, heritage, tourism; Digitization of the economy;

3. The Bioeconomy domain with the sub-domains: Safe and sustainable food, Agriculture 4.0, Technologies for organic farming, agroecology, Seed and breed improvement.









Contact: https://icdi.utgjiu.ro

ANNALS of Faculty Engineering Hunedoara – International Journal of Engineering

Research project

Author: Assoc. Prof. eng. Imre KISS, PhD

ANNALS of Faculty Engineering Hunedoara – International Journal of Engineering is a free-access international and multidisciplinary publication of the Faculty of Engineering Hunedoara, which reports on scientific and technical contributions.

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ISSN-L: 1584-2665

The development of the international dimension of higher education and scientific research, have lead to the strengthening of direct relations with researchers from the neighboring countries and to the extension of the scientific collaborations in elsewhere in the World.

Within this context, the achievement and functioning of an interactive partnership, corresponding to the exigencies of the modernization process and connection to the European space required a re-evaluation of the contents and layout of our JOURNAL, both by adopting stricter criteria maintaining the contents of the scientific materials we publish and by changing its title, which was made in order to insure the universal accessibility of the ANNALS of Faculty Engineering Hunedoara – International Journal of Engineering.

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ACTA TECHNICA CORVINIENSIS
– Bulletin of Engineering

Research project
Author: Assoc. Prof. eng. Imre KISS, PhD

E

ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering is an international and interdisciplinary journal which reports on scientific and technical contributions and publishes invited review papers covering the full spectrum of engineering.

Every year, in four online issues (fascicules 1 - 4), ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering [e-ISSN: 2067-3809] publishes a series of reviews covering the most exciting and developing areas of engineering. Each issue contains papers reviewed by international researchers who are experts in their fields.

The result is a journal that gives the scientists and engineers the opportunity to keep informed of all the current developments in their own, and related, areas of research, ensuring the new ideas across an increasingly the interdisciplinary field.

ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering [e-ISSN: 2067-3809]

We are looking forward to a fruitful collaboration and we welcome you to publish in our ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering.

The journal's coverage will reflect the increasingly interdisciplinary nature of engineering, recognizing wide-ranging contributions to the development of methods, tools and evaluation strategies relevant to the field. Numerical modelling or simulation, as well as theoretical and experimental approaches to engineering will form the core of ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering's content, however approaches from a range of environmental science and economics are strongly encouraged.

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THE BACKGROUND OF A LANGUAGE

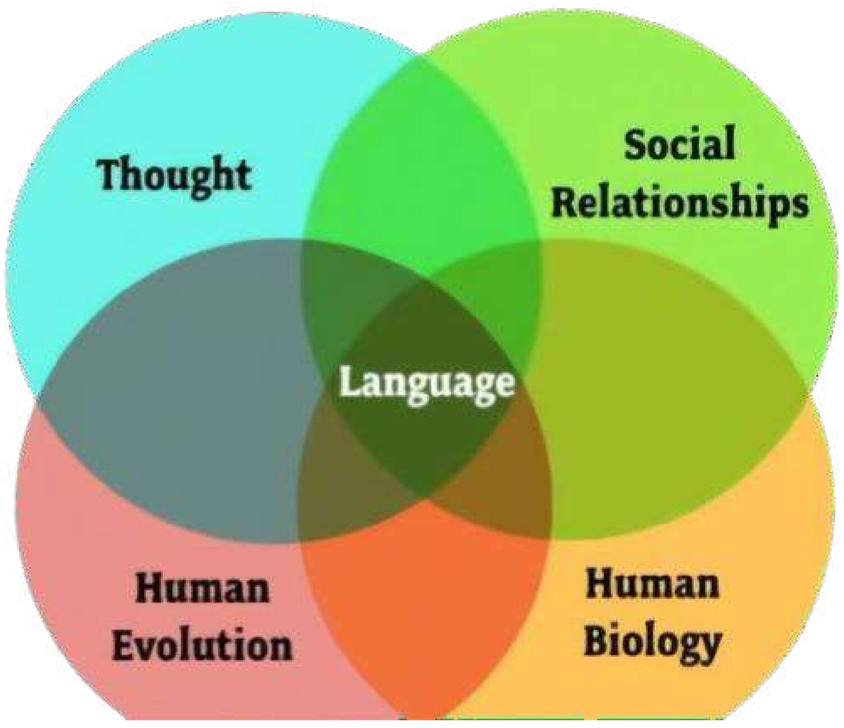
Research project

Author: Oana Găianu-Luca

E

Cicero said that „we are obliged to create new words and designate new ideas with them. Any foreign domain of common interest implies a rich and new terminology, since there are terms proper to the ideas circulated by each domain in part". The human capacity for awareness and abstract thinking is facilitated by language, often even depending on language. The ability to convey complex information, discuss the essence of events, share feelings and ideas depends on language. Language is one of the most powerful tools of communication. Very flexible, it has demonstrated over the centuries an impressive capacity for evolution and adaptation. The language contains several mechanisms that distinguish it from other forms of communication, such as communication systems developed by animals or insects. To understand people, the phenomenon of language must be understood; the nineteenth century played an important role in the evolution of philosophy and linguistics, raising numerous questions about language, language and communication.

Language, understood as the systematic use of sounds, signs and written symbols for communication between people, is a rather complicated and difficult system to analyze. Modern linguistics can adopt different perspectives on the language, depending on the purpose of the research. People are able to produce sounds and understand the sounds produced by those around them, and more gathered sounds develop certain definitions; the relationship between the linguistic form (written or spoken) and meaning is arbitrary; in the sense that there is no physical correspondence between a linguistic expression and the object to which it refers. For example, no explicit relationship can be identified between the word window and the object itself. All natural languages are creative because they respond with innovation to new experiences, situations or discoveries.





Language plays an important role in our lives. Objectively existing, the tongue has become very common that sometimes it is quite difficult to notice, being considered a natural, normal thing like breathing and walking. The effects of language are remarkable, through it man distinguishes himself from the animal; this represents the treasure, the inheritance that each generation leaves to the descendants. Thus language is born, which is the use of language in order to create communication.

The choice of language processes requires some rules that must be observed by the speaker and at the same time is made depending on the situations in which the communication takes place. The rules help to delineate styles: beletristic, publicistic, legal- administrative, colloquial and scientific. The last one represents the communication from the field of science, of technique, being born through the linguistic act initiated the specialized language. Language can be defined as a semiotic system, but also a social-human phenomenon; in the first situation the language is characterized by internal connections that establish its functionality - simultaneous placement in relations with ontological existence with the help of thinking and the collective of speakers.

In the case of definition as a social-human phenomenon, language is characterized by these relations in the action of knowledge and communication; language „travels" throughout the history of the community in which it is spoken, taking part in internal transformations.

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Exhibition catalogue

The Polish-Romanian alliance in the interwar period

E

Research project

Authors:. I. Dumitru-Cătălin Rogojanu (curator),
II. Natalia Mosor (coord.),
III. Paweł Rutkowski (coord.)
Concept, imagini și text: Prof. dr. hab.Henryk Walczak, Dr.ing. Valentin Locota,
Referent științific: CȘ I dr. habil. Gherghina Boda-Ghena

The catalog of the exhibition entitled *The Polish-Romanian alliance in the interwar period* has been published in 2024 by the Cetatea de Scaun publishing house in Târgoviște and consists of 41 black-and -white pages, following exactly the graphics of the photographs of that period. It includes several suggestive images from the press of that period, taken from the collections of the Digital Library of Bucharest, from the National Digital Archives of Poland (Narodowe Archiwum Cyfrowe) and from the US Library of Congress. These images reflect, in a diachronic and summary manner, the Polish-Romanian political alliance in the interwar period.

Some misunderstandings inherent in the diplomatic relations between Poland and Romania notwithstanding, we consider that the political, military, economic, commercial, cultural or any other kind of relations established between the two states in the period between 1918 and 1939 were good, considering their geopolitical and geostrategic interests in Central and Eastern Europe in the aftermath of the First World War. Placed between the two great world powers, Germany and Russia, after 1918, both the Second Polish Republic and the Kingdom of Romania followed a permanent policy to establish stable political-diplomatic contacts, which would strengthen their mutual trust within the

Central-European space. The cornerstone of the consolidation of Romanian-Polish relations was the signing in Bucharest, on March 3, 1921 of the *Defensive Alliance Convention between the Kingdom of Romania and the Republic of Poland* by the two foreign ministers, Prince Eustachy Sapieha and Take Ionescu.

Besides mutual help and assistance, the Polish-Romanian alliance in the interwar period was based on old traditions of political-diplomatic collaboration, on cultural affinities, common economic and commercial interests and on a deep sense of friendship between the political elites in Poland and Romania. In addition, the Romanian people showed altruism and hospitality towards Poland when it was attacked by Germany and the U.S.S.R., and in response to the request of the Polish government, the Presidency of the Council of Ministers issued a statement outlining the measures for the reception of Polish refugees. Even if Romania could not provide military aid to Poland in those dramatic circumstances, as it could find itself in real danger, we cannot fail to note the moral contribution and humanitarian aid given by the Romanian government and population to the Polish state. More than a political alliance, the Polish-Romanian relationship in the interwar period acquired a symbolic significance with a deep historical substantiality. Mutual respect, seriousness, courtesy and the strict application of diplomatic protocol during the numerous visits to both states are relevant aspects in the development of an alliance, which, beyond its political-military features, has become, as Marshal Józef Piłsudski adequately said, an **„alliance of Polish-Romanian hearts”** in this tumultuous part of Europe.



Curator: C.Ș.III dr. habil. Dumitru-Cătălin Rogojanu (Compartimentul de cercetare și documentare în studii culturale-Muzeul Civilizației Dacice și Romane Deva)
Coordonare: Natalia Mosor (Director-Institutul Polonez din București)
Paweł Rutkowski (Coordonator de proiecte-Institutul Polonez din București)
Concept și imagini: Prof. dr. hab. Henryk Walczak (Universitatea din Szczecin)
Dr. ing. Valentin Locota (Deva)
Referent științific: C.Ș.I dr. habil. Gherghina Boda-Ghena (Compartimentul de cercetare și documentare în studii culturale-Muzeul Civilizației Dacice și Romane Deva)

CATALOG DE EXPOZIȚIE
Alianța polono-română în perioada interbelică
Dumitru-Cătălin Rogojanu

Catalogul a fost realizat și editat cu ocazia vernisării expoziției ,,Alianța polono-română în perioada interbelică'', organizată de Institutul Polonez din București și Muzeul Civilizației Dacice și Romane Deva în data de 13 martie 2024.

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Navigating Education's Evolution
The Foresight Strategy in the 21st Century

Research project

Author: MIHAIL-ALEXANDRU STANESCU

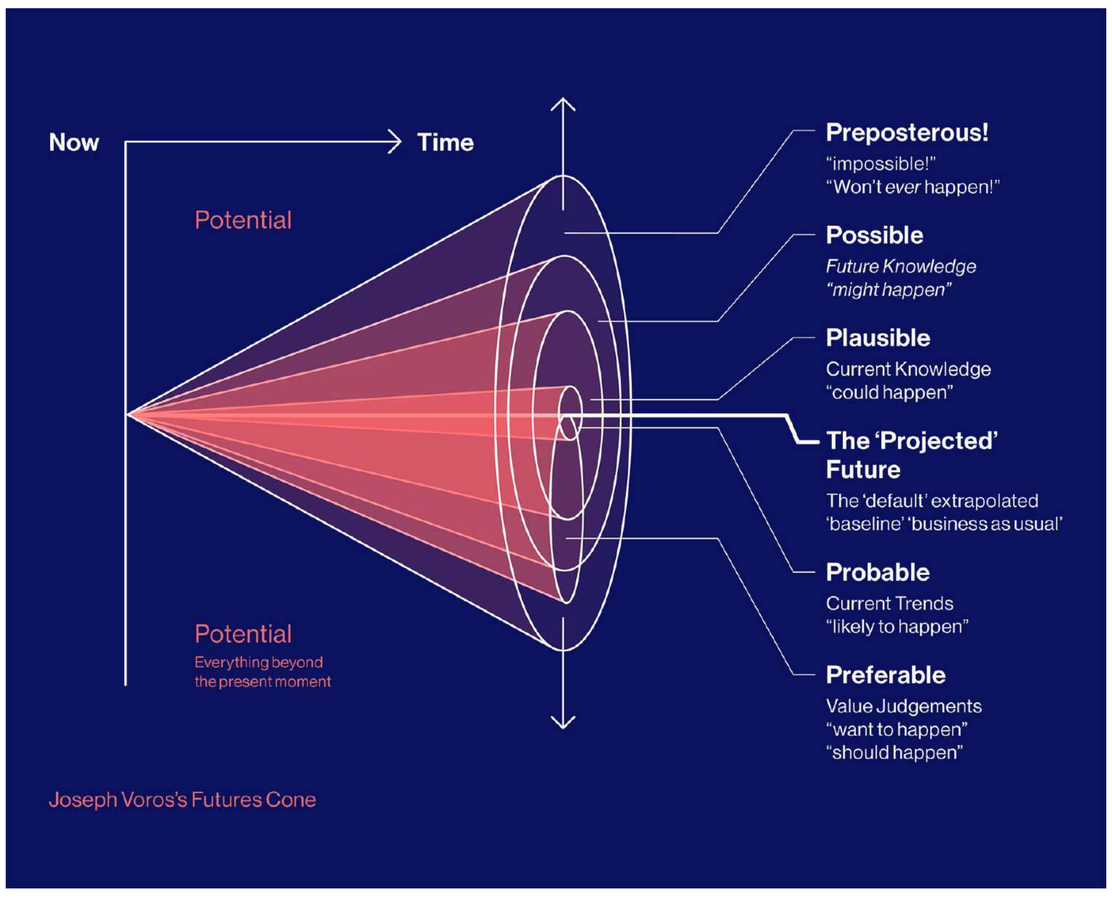
E

Education stands as a crucial aspect of individual development within society, a focal point since antiquity, constantly striving for enhancement and alignment with technological advancements. The synergy between education and scientific progress has long been acknowledged for its societal benefits. In the 21st century, amidst the fourth industrial revolution and the advent of a weightless economy characterized by digitalization, global development priorities have gravitated towards this transformative element.

Addressing one of the paramount challenges in education – student anxiety, the present initiative seeks to harmonize the level of digitization across various educational tiers. Non-formal education emerges as a promising avenue in mitigating this concern. Employing the 2*2 matrix analysis method, akin to strategic foresight practices in corporate settings, the project scrutinizes potential trajectories of digitization within a non-formal educational framework. Such an approach offers students a conducive environment to hone their skills, fostering healthier engagement with their respective fields of endeavor.

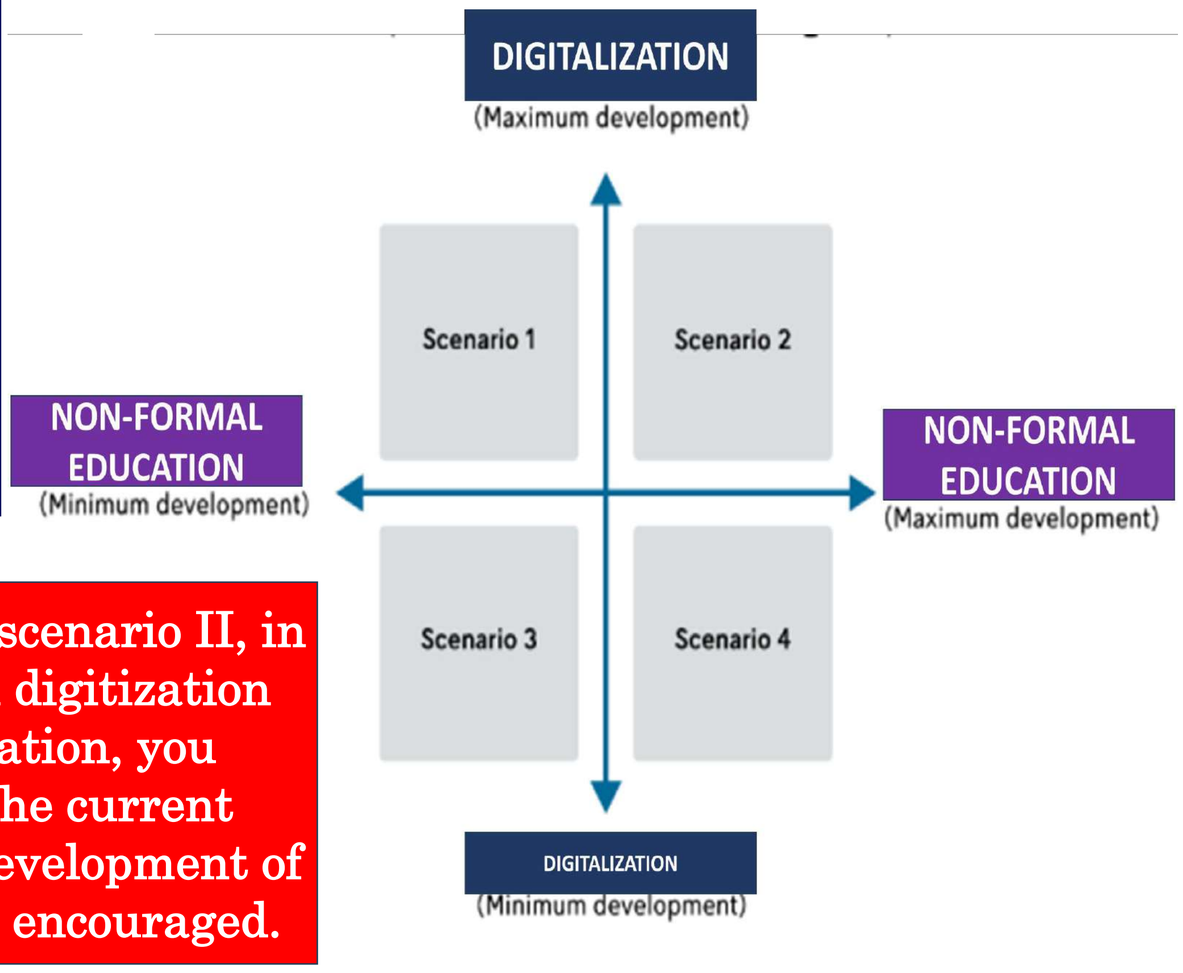


FUTURES CONES



As can be seen in this diagram, depending on the 2 key elements – DIGITALIZATION AND NON-FORMAL EDUCATION it can perceive 4 scenarios :

- ***I - DRIVER 1 & DRIVER 2 MAXIMUM***
- ***II - DRIVER 1 MAXIMUM & DRIVER 2 MINIMUM***
- ***III - DRIVER 1 & DRIVER 2 MINIMUM***
- ***IV - DRIVER 1 MINIMUM & DRIVER 2 MAXIMUM***



From the scenario analysis, the most suitable is scenario II, in which there is a maximum correlation between digitization and non-formal education. Through digitalization, you manage to satisfy the technological needs of the current century, and through non-formal methods, the development of social skills necessary for any area of activity is encouraged.

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Opportunity
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INVENTCOR
Realization
Power of Creative Mind
Deva ROMANIA

CORINA's Art

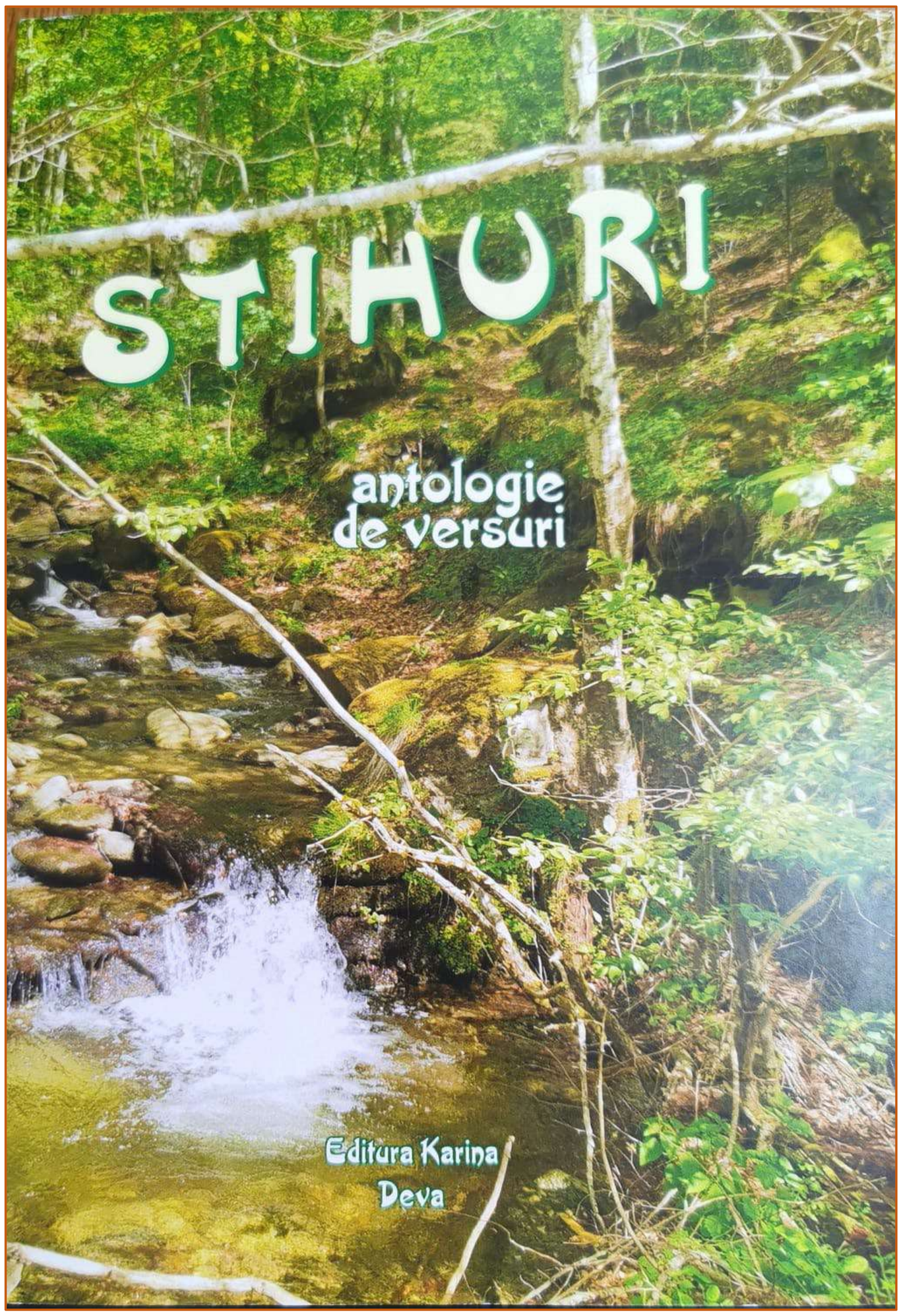
STIHURI

Authors: ***Marian Ioan Ciprian, Elena Cocârlă, Gheorghe Cornea, Simion Corneliu Cozmescu, Nicolae Bela Farcaș, Nikolaus Rudolf Pilly, Corina Gianina Popa, Constantin Ștefănescu, Eugen Teodorescu***

Illustrations: Corina Gianina Popa

Volume Coordinator: Nikolaus Rudolf Pilly

E



In this anthology of poems, we try to keep alive the flame of the cultural torch, ignited more than four decades ago, by a little book titled after the title of the poem to Emil Dușu, "Under arches of lights".

It contains the first anthological bundle of poems, a multicolored bouquet of thoughts, images, given to the reader to ponder and enjoy of beauty, of life. The "Călanul Cultural" circle continues this tradition.



Geanina Corina Popa

Stihuri

antologie de versuri

Contact: *popa.corina@hotmail.com*

TehnoART

Author: Demeter Sorin & TTC Team

E

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.



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Science Camps

E

Science workshops

Author: Tiberiu Stroia & Team

CASA STIINTEI (The House of Science) has been carrying out, for almost three years, a series of activities in which students passionate about natural sciences are invited to participate. Science camps, astronomical observation nights, zoom classes, science workshops held in the Association's laboratory and, starting this summer, scientific expeditions.

SCIENCE IS MAGIC THAT WORKS!



The study of gases

Children will obtain in the laboratory Oxygen, Hydrogen, Iodine, Acetylene, AMMONIA, HYDROGEN SULPHIDE, and Carbon Dioxide. They will learn the story of the discovery of each gas and will be able to observe, through experiment, the properties of these gases. Experiments carried out by the teacher: obtaining chlorine and ozone.







Contact: contact@casastiintiei.ro +40735 370 327

SCAN ME

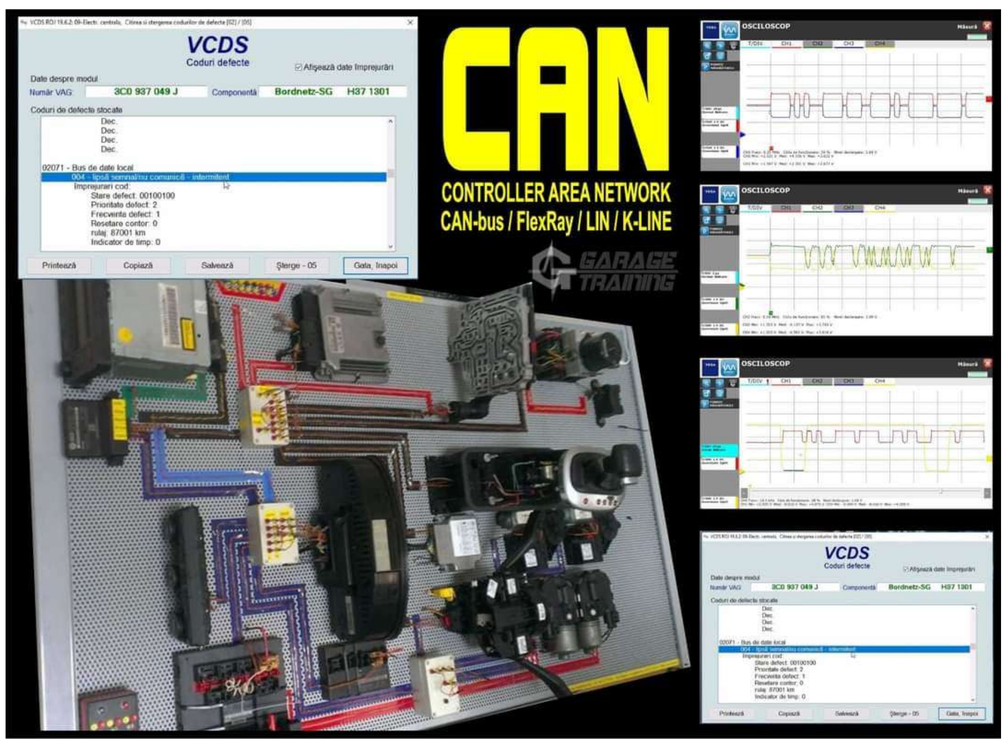
CONSTRUCTION AND DIAGNOSTICS OF MULTIPLEXED VEHICLE COMMUNICATION NETWORKS (CAN-bus)

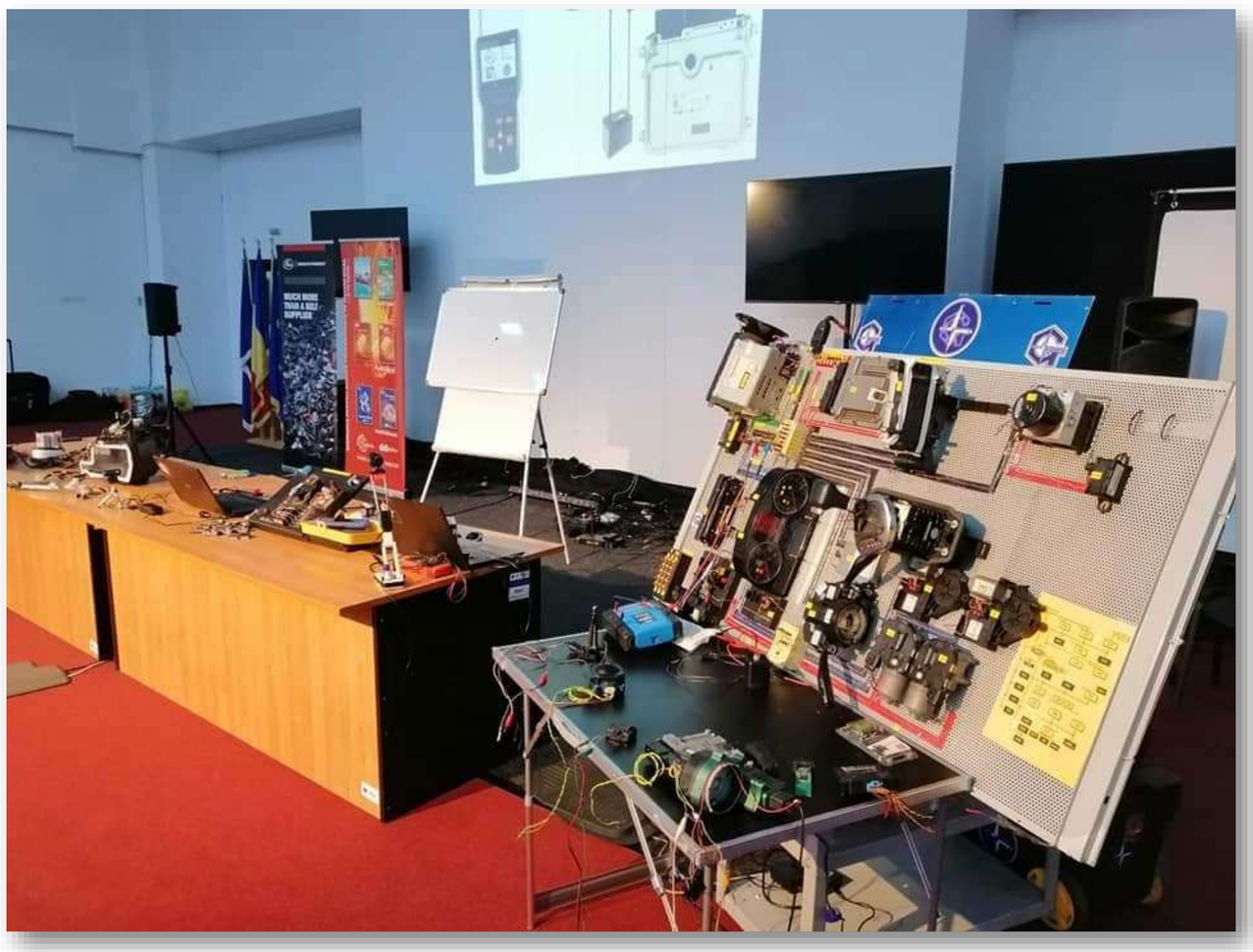
Didactic simulator

Author: *Gidali Adrian, Simon Florin*

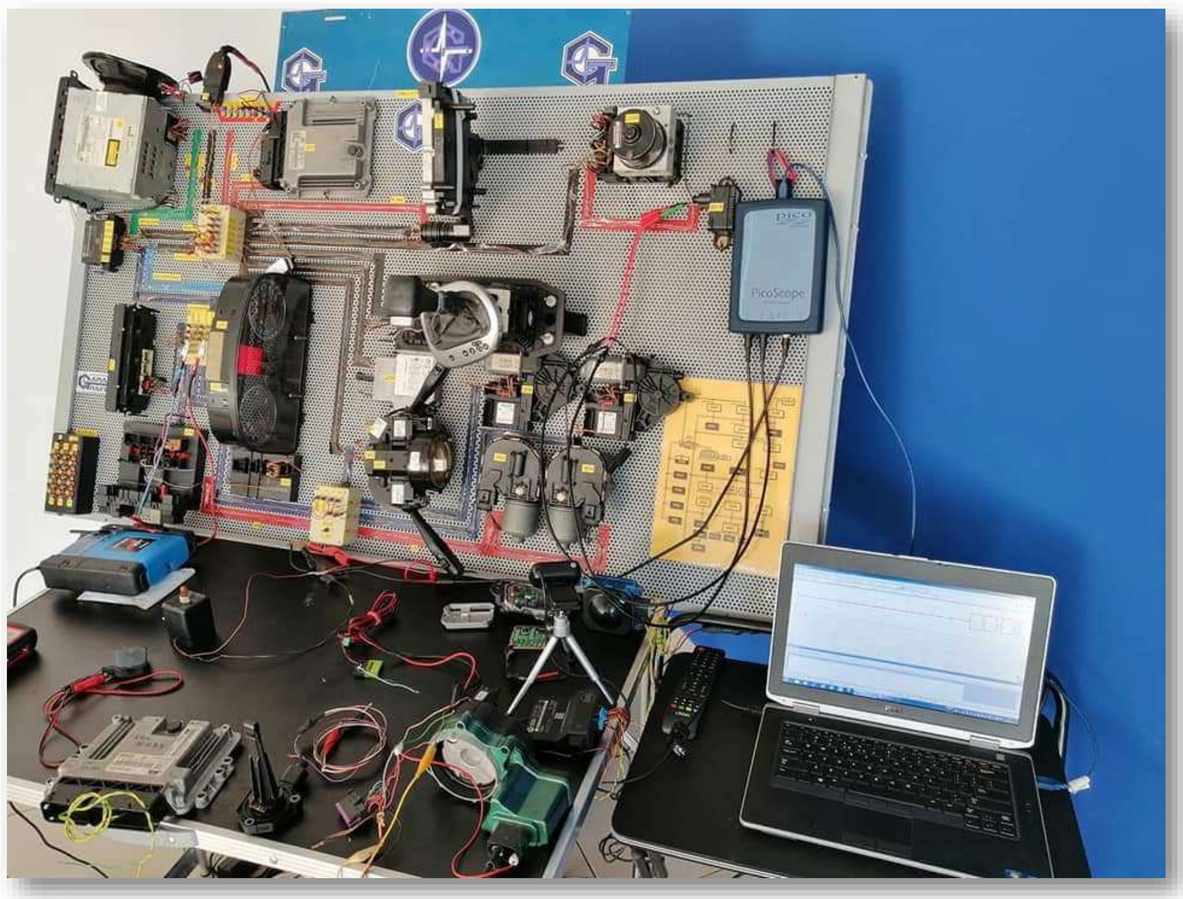
E

In order to study and verify functionality for different types of multiplexed networks or hardware analysis of frames (messages) related to different types of serial communication protocols, it is necessary to use specific measurement and control equipment (oscilloscope, voltmeter, ohmmeter, ammeter, frequency meter, dwell meter), as well as the use of serial diagnostic testers.





Since the use of these communication, measurement and control devices involves basic-medium level knowledge regarding the concepts of electricity, with an emphasis on car electricity, and since the complete CAN-bus course involves time, the support of this course is carried out in two stages, the first part is dedicated to the study and understanding of the introductory notions of automotive electricity and the way in which different sub-systems are mechatronic from the composition of modern vehicles, and the second part being exclusively dedicated to the study of the multiplexed communication networks of motor vehicles.





Contact: *cursuri.garagetraining@gmail.com*

EMPOWERING YOUNG MINDS

Author: Prof. Dr. Anuja Malik

E

THE IMPORTANCE OF EDUCATION AND CREATIVITY FOR YOUNG STUDENTS

Knowing and understanding the importance of education and creativity in young students has a profound effect on their adulthood. The benefits of instilling a love for learning and creative endeavors early in life are numerous, and the sooner we recognize this, the better our children's futures will be.



IMPORTANCE OF EDUCATION: OPENING NEW HORIZONS



- *Allows youngsters to gain knowledge, develop critical thinking skills, and become aware of the world around them.*
- *Alleviates socioeconomic barriers, offering a level playing field where anyone can learn and grow.*
- *Provides the flexibility to learn at one's own pace, irregardless of location or time constraints.*



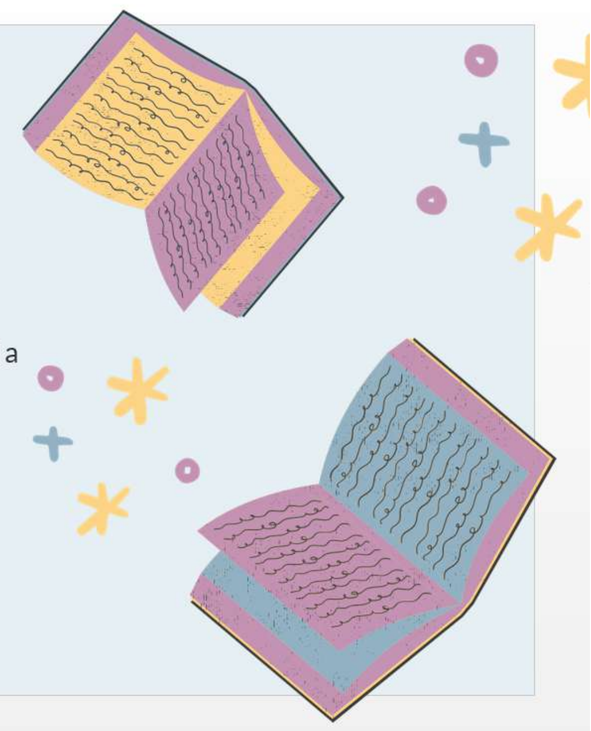
THE HARMONY OF EDUCATION AND CREATIVITY: UNLEASHING POTENTIALS

The education system should aim to foster creativity, elevating students' potential. Creativity empowers students to think out of the box, enabling them to approach problems from novel perspectives. It enhances their flexibility, adaptability, and resilience, thereby preparing them for the rapidly changing world.

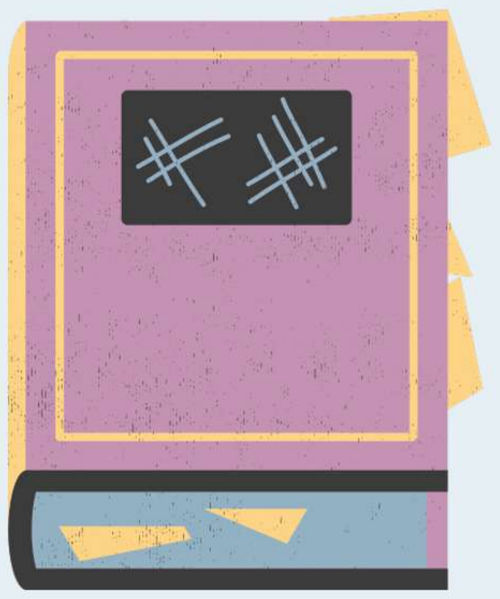
THE POWER DUO: EDUCATION AND CREATIVITY

What happens when education meets creativity? Here's the product - a versatile, resilient, and innovative young student.
When creativity is combined with a quality education, students learn how to adapt, innovate, and tackle challenges strategically. They experience the joy of learning, are more driven to explore new areas, and develop a continuous thirst for knowledge and understanding, certainly the perfect recipe for success.

FOSTERING SELF-EXPRESSION AND CONFIDENCE



Creativity and education go hand-in-hand to build a child's self-expression. Teaching kids to articulate their thoughts, feelings, and ideas confidently is integral to their development.
A system that values creativity promotes risk-taking and curiosity, which leads to confidence in their abilities.



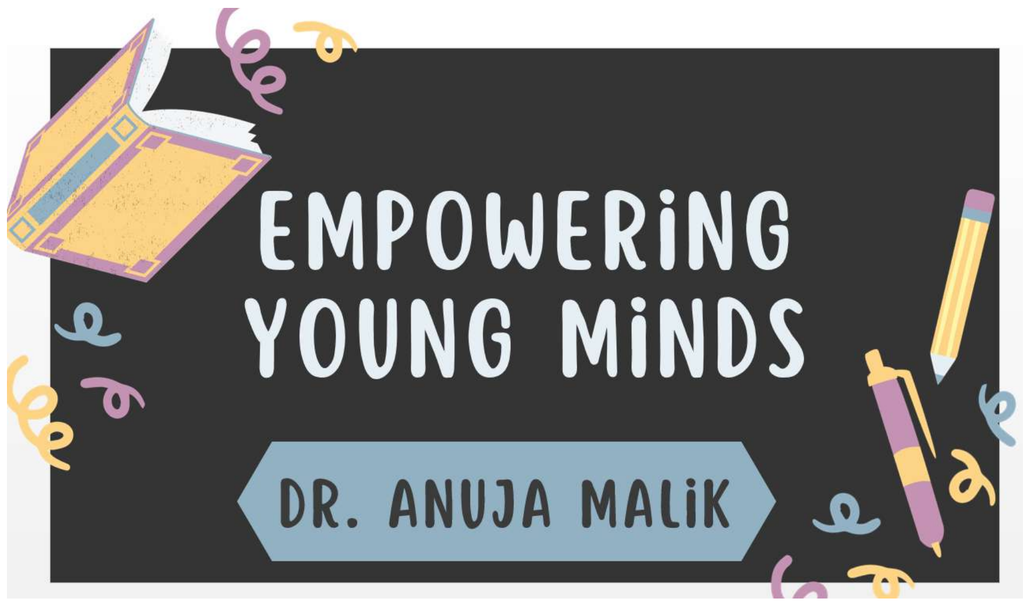
THE SOCIAL IMPACT

How can creativity in education influence the broader social fabric, you ask?
Well, it enhances cooperation, tolerance, and empathy among students. It paves the way for better interpersonal relationships and an inclusive society.
To sum up, the importance of education and creativity for young students cannot be overstated. It's crucial for their personal growth and helps prepare them to succeed in today's dynamic, interconnected world.

EDUCATION AND CREATIVITY - A STEP TOWARDS A BRIGHTER FUTURE

The significance of both education and creativity for young students cannot be overstated. Not only does it equip young minds with necessary life skills, but it also harnesses their unique potentials. The amalgamation of online or free education and creativity is a window for immeasurable opportunities that young students ought to embrace.
Meta-description: Discover the pivotal role of education and creativity in the lives of young students. Uncover how their intersection can shape a brighter future for our young generation.





Contact: anujamalik777@gmail.com

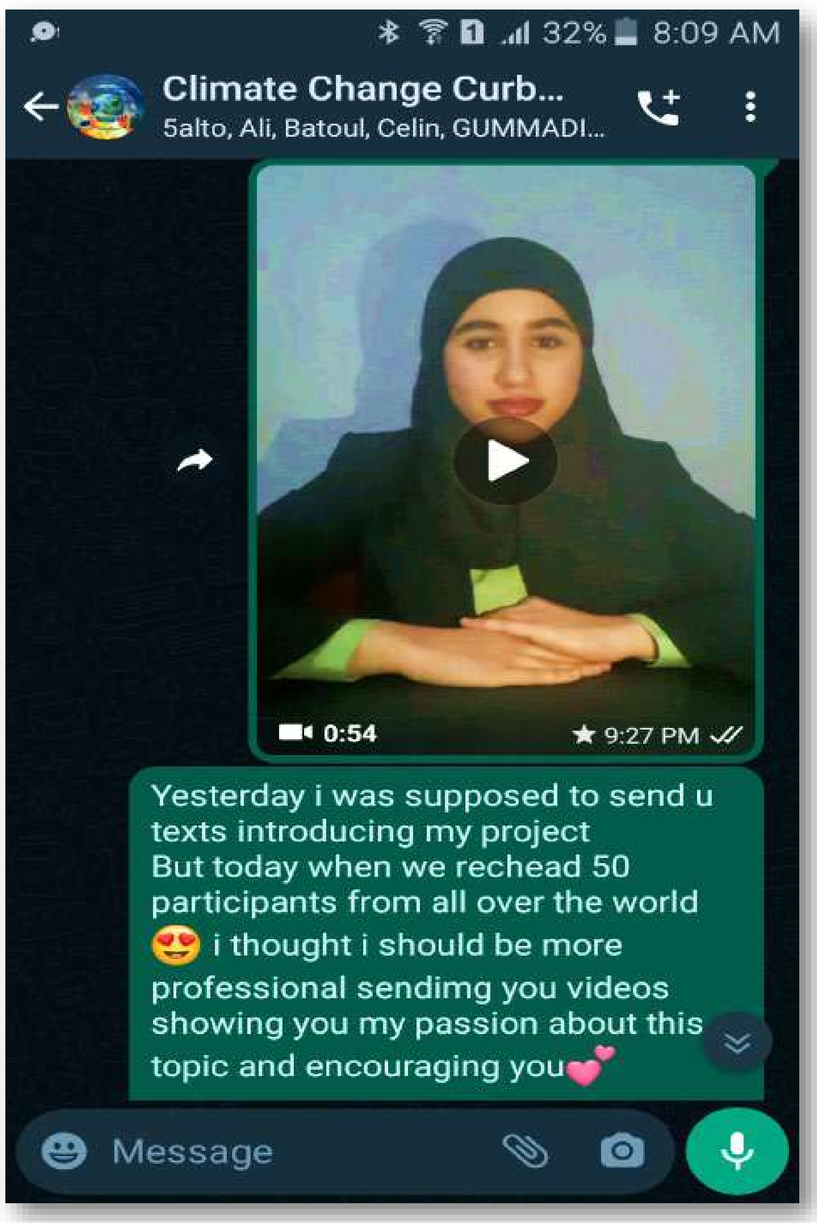
Climate Change Curb

Student Project

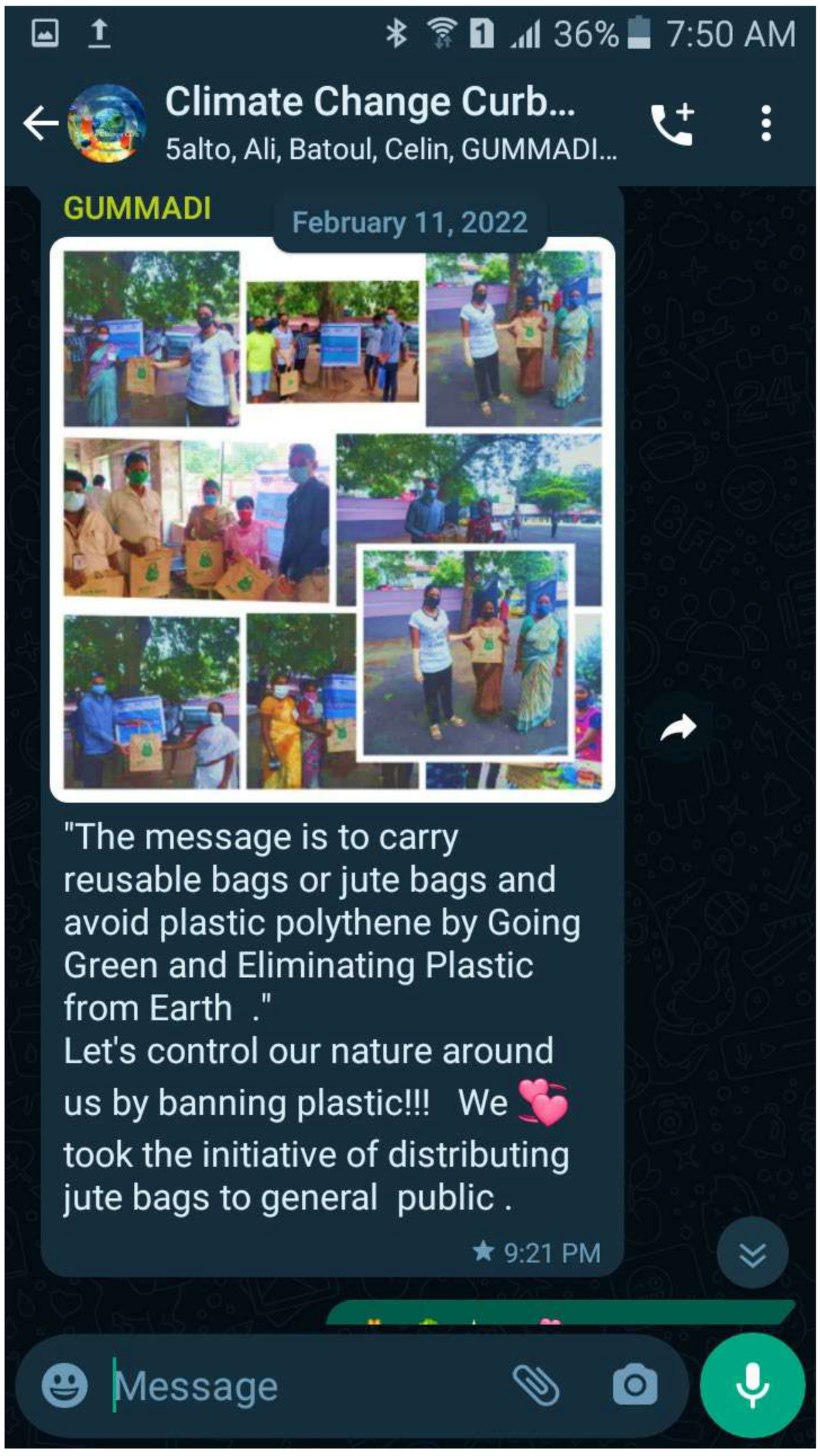
Author: Zainab Arzouni

E

I'm a 18 years old Lebanese student joining Shohour Public High School. I was always passionate about protecting and saving nature, and when I joined some online webinars about Climate Change I was shocked with the threat our environment is exposed to. Then, I wanted to make a change, to make actions, not just to spread awareness by talking or writing. I knew that trees is the only cure for Climate Change as one tree can absorb 22KG of Carbon dioxide a year which is huge, since as we know that carbon dioxide is one of the poisonous gasses causing climate change. So, since I was a known international student, I took the advantage of making a whatsapp group and invited people from around the globe, when i had 70 people from more than 9 countries, I started sending them videos of me talking introducing them to Climate Change and spread awareness, then i planted lots of trees in my country and sent them the videos, this way they were encouraged and sent their contributions, so mision was accomplished.



Climate Change Curb VIDEO







Contact: zeinabarzouni94@gmail.com

BAČKA PALANKA CULTURAL CENTER

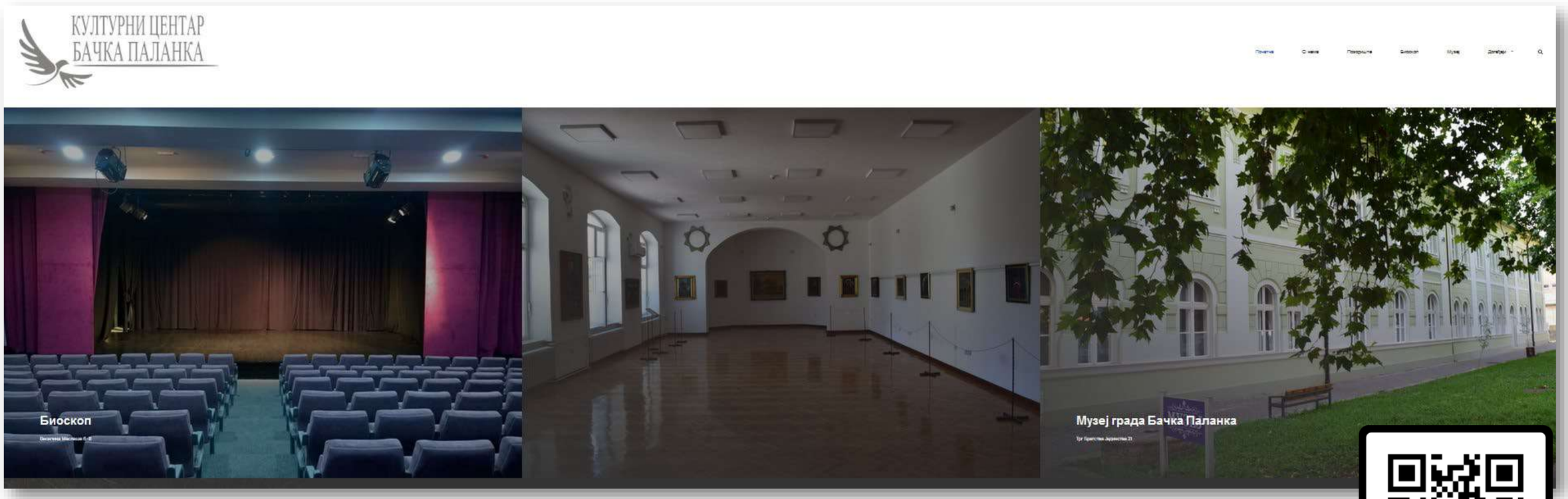
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Olja Nađ & Team

The Bačka Palanka Cultural Center was founded as a cultural institution by the decision of the Bačka Palanka Municipal Assembly in 1990 as a professional institution in the field of culture of special importance and interest. From the very beginning, this institution occupied a prominent place in the cultural life of our municipality.

The Bačka Palanka Cultural Center launched a series of events, activities and manifestations that contributed to the affirmation and better quality of life in our environment: we will only mention the traditional manifestations Blues-Jazz-Rock, Theater Autumn and Theater Spring, as well as participation in the Night of the Museum event.

The cultural center in Bačka Palanka provides its citizens with a variety of content. Within it, there is a city cinema where film screenings of recent films and performances by theater troupes are held. Also, the Gallery of the Cultural Center exhibits the works of renowned painters every day, and concerts are held.



SCAN ME



Presentation link: https://kcbp.rs/

Contact: kulturnicentarbp@gmail.com

Internal combustion engines for road vehicles. Construction and calculation. Practical approach

E

Book / Laboratory guide / ISBN 978-606-35-0553-9

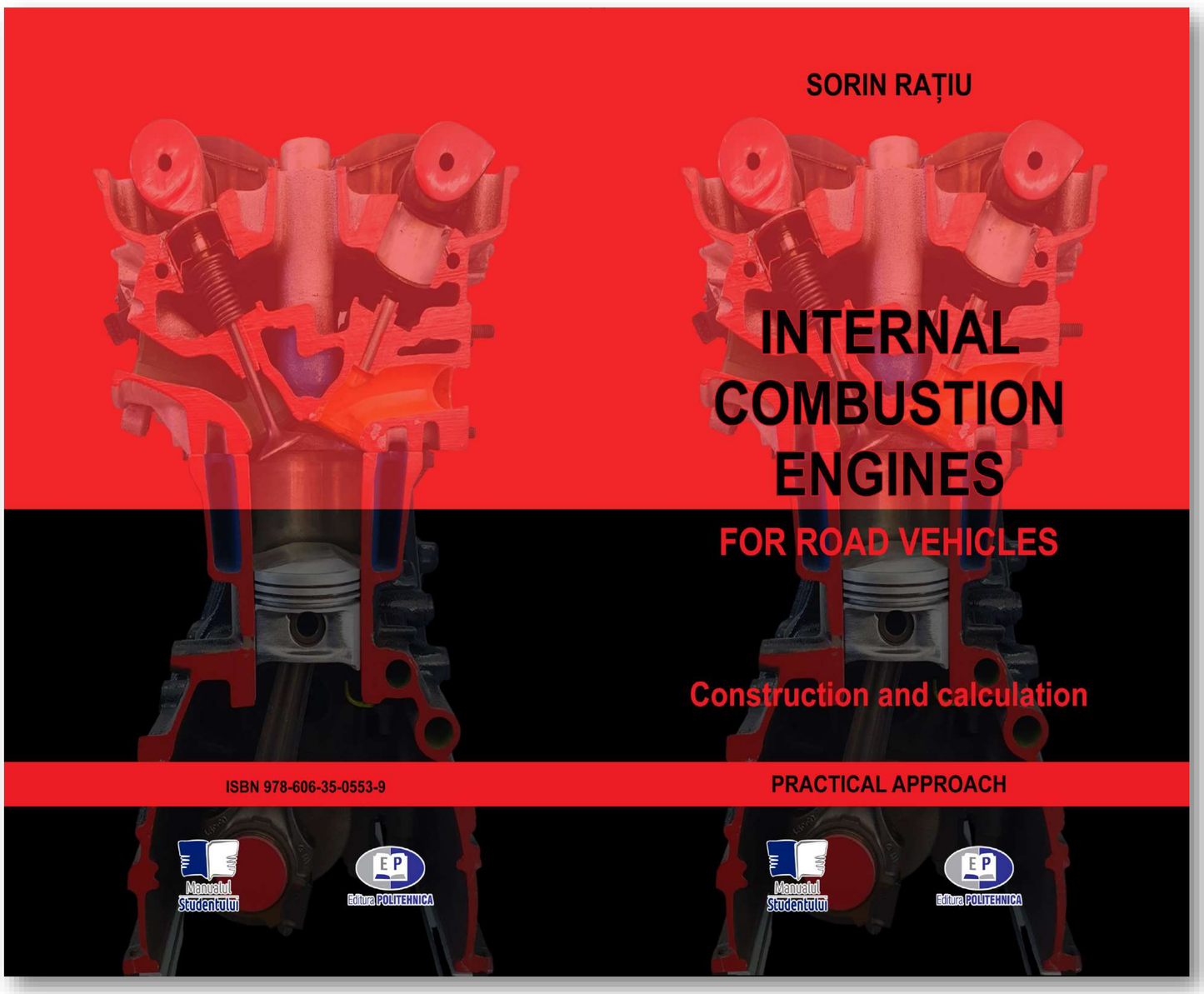
Author: Sorin Aurel Rațiu

Starting from the curriculum corresponding to the discipline "Construction and calculation of internal combustion engines", the present work was conceived as a practical approach, to serve as a tool for training the engineering skills necessary to understand the currently existing constructive solutions and the functionality of the components of modern internal combustion engines.

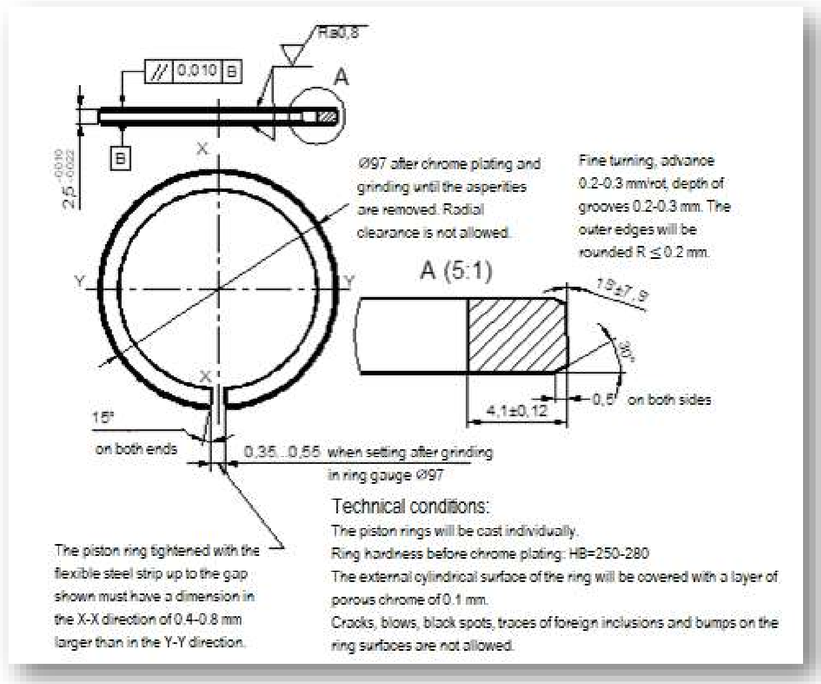
The material is mainly addressed to students who attend the Road Vehicles specialization courses within the Faculty of Engineering Hunedoara and not only, and represents a collection of practical activities aimed at completing and clarifying the constructive and functional particularities of the components of internal combustion engines presented in the same discipline, within the course.

Each practical approach contains a brief introduction to the issue addressed, a presentation of the experimental equipment used, the objective, the methodology for carrying out the practical activity, results and conclusions and finally, a small section dedicated to the self-evaluation of the knowledge acquired during the performance of the respective work.

The paper contains seven practical laboratory works. Practical problems related to the constructive and functional typology of the mobile and fixed organs of the engine mechanism are reviewed: piston, wrist pin, piston rings, connecting rod, crankshaft, engine block, cylinder, cylinder head, as well as the valve train mechanism. The practical methodology for mounting and dismounting these components is also presented, based on the equipment from the Internal Combustion Engines laboratory of the Faculty of Engineering Hunedoara.







Contact: sorin.ratiu@fih.upt.ro

F

Medicine

Paramedical

Pharmacy

Cosmetics

Hygiene

Alexandru Ioan Cuza University
Faculty of Economics
and Business Administration

Perceptions of Decision Makers in Health Institutions Regarding Welfare Conditions in the Organization

Author: **PhD student Milana Mazal Mazor**
Supervisor: ***Prof. Constantin Sasu***
UAIC Doctoral School

Marketing Doctoral Domain

F

Research Problem

What are the perceptions and attitudes of decision makers in medical institutions regarding the role of the welfare department and the welfare conditions of the employees in the organization?

Purpose Of The Study

To provide information about the perspective of the decision-makers in the issues of the employee's welfare and the conditions of his employment. Three main goals were defined for the qualitative research:

1. To characterize the welfare conditions of nurses in Israel from the point of view of decision makers in the hospitals and health funds in Israel.
2. Identify the areas of activity of welfare departments in organizations.
3. To rate the satisfaction of the decision makers with the welfare conditions for the employees in the organization where they work.

Research Method

Qualitative research - the data was performed by sorting into subject categories and locating central themes. After that, identifying the perceptions and attitudes of the participants within the themes themselves, choosing the quotes in each sub-theme.
The initial sorting into main categories and dates was carried out in accordance with the investigated fields.

The Study Population: 9 decision-makers involved in the field of welfare participated in the study in three hospitals: "Sheba", "Assaf Harofeh" and "Wolfson" and in three HMO "Maccabi", "Leumit" and "Meuhedet".

Data Collection: The interviews were conducted face-to-face in personal meetings with the decision-makers for about an hour to an hour and a half. All interviews were recorded in writing or on tape and then transcribed.

Research Tool: The study includes an in-depth questionnaire for decision makers in the field of welfare. The questionnaire consists of two main parts:
#1 part - includes 17 questions that deal with the decision makers' perception of the field of welfare in the organization where they work, including the department's role in retaining the organization's employees and improving the welfare mechanism.
#2 part - in which one question deals with the rating of the welfare conditions in the institution where the participant works while rating satisfaction on a Likert scale (1 = not satisfied, to 5 = very satisfied) of five areas related to employee satisfaction.

The Research Findings

The transcripts of the interviews and the compilation of the answers received from the participants bring up the following findings:Group 3: Department managers and nursing team managers in 3 hospitals.Total of 12 managers/nurses.

1. **Main functions of the welfare department**
   All the interviewees state that the main role of the welfare department is to take care of the welfare of the employees. In addition, treatment of social problems, safeguarding the rights of employees, assistance in handling personal, economic, social and family problems of the employee, and the development of professional advancement and raising the morale of the employees.
2. **Maintaining contact between the welfare department and the employees of the organization**
   The interviewees state that they maintain contact with the organization's employees through digital systems and media channels such as: the organization's internal systems, the institution's portal, the organization's application, text messages, WhatsApp, emails and publications from time to time.
3. **Measuring the success of the welfare department**
   Some of the interviewees indicate that there are a variety of methods for evaluating the degree of success of a welfare department such as:
   1. Identifying the number of referrals by nurses compared to the referrals of other employees.
   2. Statistical measurement of the implementation of assistance to employees (answering inquiries; subsidizing summer camps, etc.).
   3. Statistical measurement of the employees' response to the announcement of a certain benefit.
   4. The speed of the welfare department's response to the employee's appeal.
   5. Carrying out a satisfaction survey from the welfare department

   And some point out that there are currently no tools to measure success and point out the importance of creating a sense of belonging and treating employee burnout.
4. **Areas of activity of the welfare department**
   The interviewees indicate that the fields of activity of the welfare department are:
   Maintaining the terms of employment and social conditions, benefits in the life cycle of the employee and his family members, maintaining the physical and mental health of the employee, benefits in the employee's leisure area and social events, financial assistance, consolidation activities, fun days and breaks for employees, completion of education, further training and professional development.
5. **Conducting satisfaction surveys by the organization's welfare department**
   Some of the interviewees point out that when the survey is conducted, the response rate is low. The rest of the interviewees mentioned the following surveys: a burnout survey among the nurses, a satisfaction survey with the unit, a survey among new hires in the organization, a survey of people who have been working for a year in the organization and a health survey for the employee that examines what the employee expects to receive in the field.

Summary and Conclusions

The qualitative study answered the three main research questions.
The study also shows that the welfare departments in the organization should improve the service to the employee in the following areas:

1. Improving the relationship between the department and the employees of the organization.
2. Development of mechanisms and parameters for measuring the department's success.
3. Carrying out surveys on a regular basis and providing a platform for the expression of needs, expectations and learning about the employee's satisfaction.
4. Development of intimate informal channels that will allow open dialogue in order to be attentive to the employees and enable the transfer of information, understanding of needs and insights from the employees to the management level.
5. Welfare budget and optimal organizational climate. and the relationship between employee satisfaction and employee turnover while maintaining human capital.
6. Improving the basket of benefits for the families of workers on critical dates during the year.
7. Consumer Club - Development of a consumer club for personal purchases for private needs in the marketing networks.

Recommendations for future research

It seems that there would be benefit in expanding the number of participants from additional hospitals in Israel and the health insurance funds since only 9 inductees participated in this study. in addition, the study raises the need for the organization's welfare services to be accessible to employees. it is recommended that future research in this field will deal with practical aspects of accessibility and improvement of welfare department services in health institutions.

Contact: mazalr44@gmail.com

METHOD FOR IDENTIFYING THE ANTI-HEV IGG MARKER IN THE BLOOD SERUM

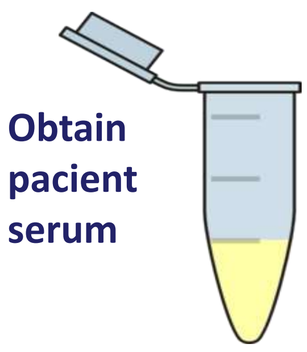
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MD 1258 Z 2019.02.28

Authors: Sajin Octavian, Iziumov Nina, Pinzaru Iurie, Guțu Veaceslav, Țurcanu Adela, Blaj Valentina

The essence of the invention involves the examination of blood serum using enzyme immunoassay on a microplate containing adsorbed AgHVE. This process entails determining the optical density values of the samples through photometric analysis at a wavelength range of 450 to 620 nm. Subsequently, the average optical density value of the samples with negative control is calculated using the formula: the average optical densities of the samples with negative control + 0.350. The ratio between the average optical density value of the patient's serum and the average optical density value of the samples with negative control is then computed. A ratio of up to 0.9 indicates a negative result, while a ratio exceeding 1.1 indicates a positive result. Samples yielding a ratio within the range of 0.9 to 1.1 undergo treatment with a 20% slurry of kaolin ($Al_2O_3 \cdot 2SiO_2 \cdot 2H_2O$). Following this treatment, the enzyme immunoassay is repeated, and the ratio of the average optical density value of the patient's serum to the average optical density values with negative control + 0.350 is determined. A ratio of up to 0.9 indicates a negative result, whereas a ratio exceeding 1.1 suggests a positive result.

Representation of the invention



Obtain pacient serum

Testing for the presence of anti-HEV IgG antibodies in serum using the ELISA





Kaolinite ($Al_2Si_2O_5(OH)_4$)

Obtaining kaolinite 20% supension



Equivocal sera are treated with 20% kaolin suspension

Reading the results:
SO/CO < 0.9 - negative
SO/CO = 0.9 → 1.1 - equivocal
SO/CO >1.1 - positive



The result is that there are no more equivocal samples, as they have determined their status

Repeated testing of the kaolin-treated serum using the ELISA method





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IDENTIFYING METHOD OF THE ANTI-HEV IGG MARKER IN BLOOD SERUM IN PEOPLE AT HIGH RISK OF INFECTION

MD 1291 Z 2019.06.30

Authors: Sajin Octavian, Pinzaru Iurie, Iziumov Nina, Stratulat Silvia, Blaj Valentina

F

The essence of the invention lies in the analysis of blood serum using enzyme immunoassay conducted on a microplate featuring adsorbed AgHEV. Optical density values are determined within the wavelength range of 450 to 620 nm to identify serum samples as positive or negative for IgG anti-HEV, with thresholds set at over 1,000 and less than 0.100, respectively. In cases where samples yield undetermined results, the serum undergoes treatment at a temperature of 56°C for 30 minutes and is then mixed in equal volumes with a 0.05 M sodium periodate solution. Following a 2-hour incubation period, a 5% glucose solution is added in a 1:1 ratio. Subsequently, the enzyme immunoassay is repeated for the treated serum samples, which are diluted in a 1:4 ratio using a standard reagent check serum sample that tests negative for IgG anti-HEV (with an optical density of less than 0.100) and a neutralizing check serum sample that tests positive for IgG anti-HEV (with an optical density of more than 1,000). The optical density values are calculated using the formula: optical density of the reagent check sample divided by the optical density of the neutralizing check sample. If the resulting ratio is less than 2, the sample for IgG anti-HEV is deemed negative; if it exceeds 2, it is considered positive.

Representation of the invention

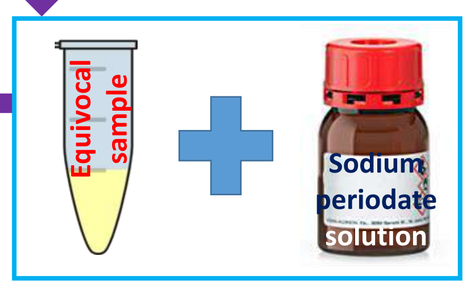
Obtain pacient serum

Testing for the presence of anti-HEV IgG antibodies in serum using the ELISA





Reading the results:
OD ≤ 0.100 - negative
OD=0.100→1.000 - equivocal
OD ≥ 1.000 - positive



2-hour incubation period





5% glucose solution

Repetead ELISA testing for the presenc of anti-HEV IgG

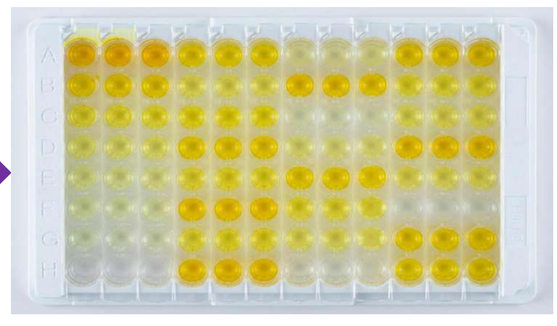
Samples are diluted in a 1:4 ratio using a standard reagent check



Determining optical density



Reading the results:
OD ≤ 2.000 - negative
OD ≥ 2.000 - positive



The result is that there are no more equivocal samples, as they have determined their status

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METHOD FOR THE IDENTIFICATION OF ANTI-HCV MARKER IN HUMAN BLOOD SERUM

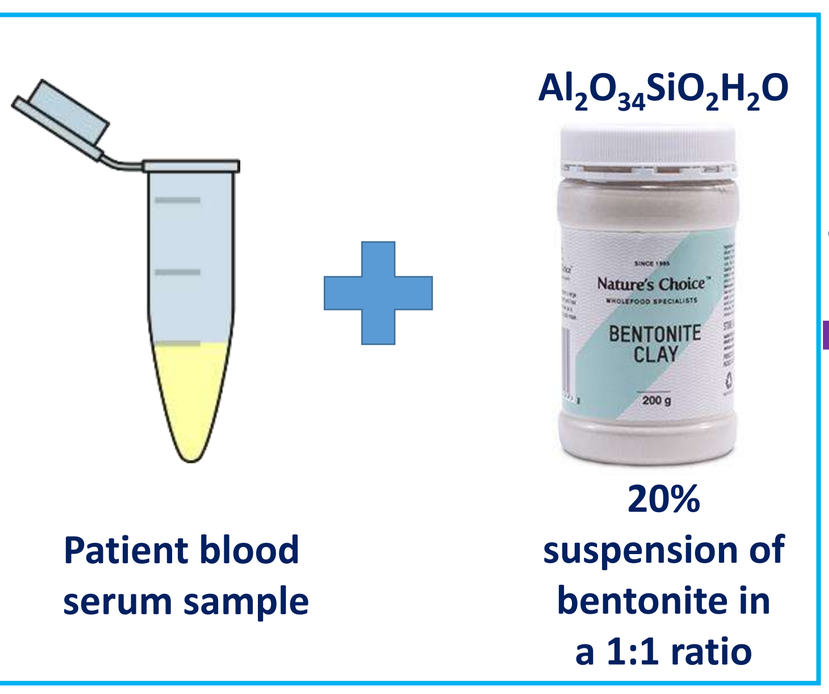
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MD 1352 Z 2020.02.29

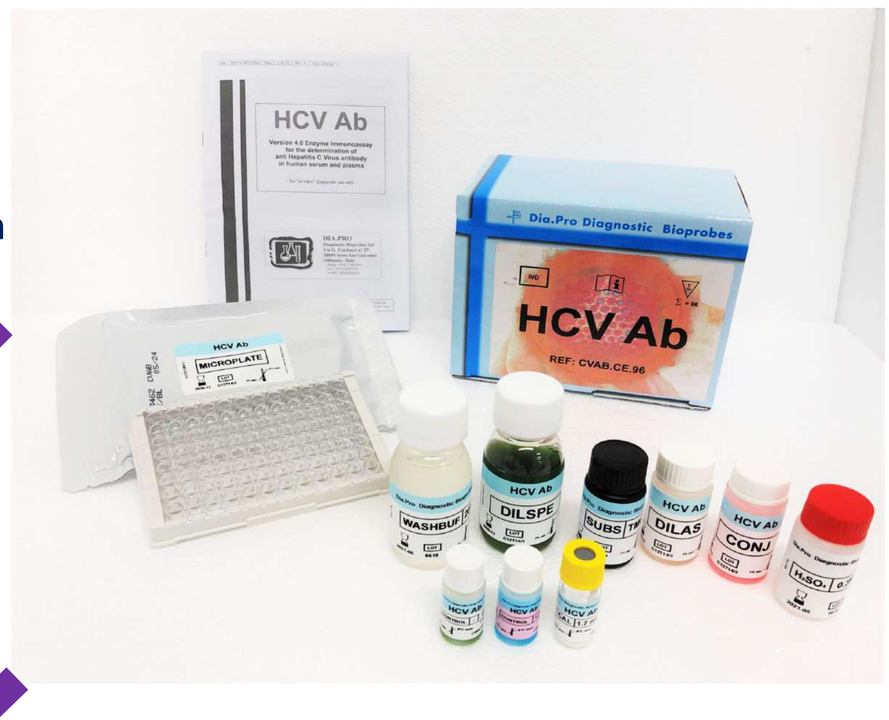
Authors: Sajin Octavian, Paraschiv Angela, Turcanu Adela, Iziumov Nina, Stratulat Siliva, Blaj Valentina

The essence of the invention lies in the treatment of blood serum samples with a 20% suspension of bentonite in a 1:1 ratio. Subsequently, the blood serum undergoes examination in an immune-enzyme test utilizing a microplate adsorbed with AgHCV. Optical density values of the samples are determined via the photometric method at a wavelength of 450 nm. Following this, the average optical density value of the negative control samples is calculated using the formula: the average of the optical densities of the negative control samples + 0.350. Subsequently, the ratio of the average optical density value of the patient's serum to that of the negative control samples is determined. A ratio up to 0.9 indicates a negative result, while a ratio greater than 1.1 indicates a positive result.

Representation of the invention



ELISA testing microplate adsorbed with AgHCV



examination in an immune-enzyme test

optical density values are determined using the photometric method at a wavelength of 450



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METHOD FOR DIAGNOSIS OF VIRAL HEPATITIS B IN PERSONS WITH ACCIDENTAL EXPOSURE

F

MD 1245 Z 2018.12.31

Authors: Sajin Octavian, Iziumov Nina, Turcanu Adela, Blaj Valentina, Cebanu Ecaterina

The essence of the invention lies in the utilization of two strips, each containing wells, wherein different types of sera are employed for the detection of AgHBs antibodies. In the first strip, human serum free of AgHBs, negative human serum to AgHBs antibodies, serum with antibodies to AgHBs with a titer exceeding 100 IU/ml, and serum from the individual being tested are utilized. Conversely, in the second strip, human serum free of AgHBs, fetal bovine serum for calibration, inactivated human serum containing calibrated AgHBs, and serum from the individual being tested are used. Following a 30-minute incubation period at a temperature range of 18 to 24°C, a diluted conjugate (1:20) of rabbit or mouse anti-species globulin and horseradish peroxidase is added to all samples. Subsequently, the samples are further incubated at 37°C for 120 minutes. Then, a chromogen solution comprising 0.02% hydrogen peroxide, 4% dimethyl sulfoxide, and 0.03% tetramethylbenzidine is added and incubated at a temperature range of 18 to 24°C for 30 minutes. Finally, optical density values are determined using the photometric method at a wavelength range of 450 to 620 nm.

Representation of the invention

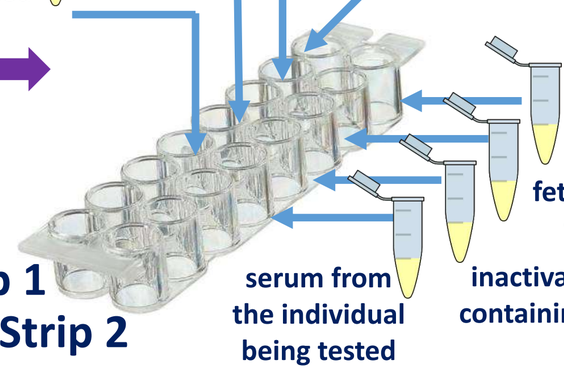


serum with antibodies to AgHBs with a titer exceeding 100 IU/ml

negative to AgHBs antibodies human serum

human serum free of AgHBs

serum from the individual being tested



Strip 1

Strip 2

human serum free of AgHBs

fetal bovine serum for calibration

inactivated human serum containing calibrated AgHBs

serum from the individual being tested

30-minute incubation period at a temperature range of 18 to 24°C





diluted conjugate (1:20) of rabbit or mouse anti-species globulin and horseradish peroxidase is added to all samples

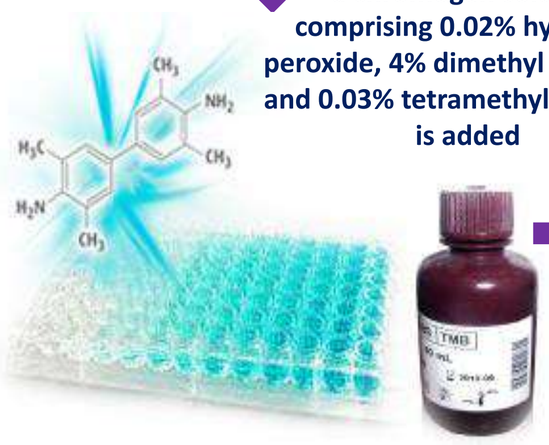




120-minute incubation period at a temperature of 37°C



a chromogen solution comprising 0.02% hydrogen peroxide, 4% dimethyl sulfoxide, and 0.03% tetramethylbenzidine is added



30-minute incubation period at a temperature range of 18 to 24°C



optical density values are determined using the photometric method at a wavelength range of 450 to 620 nm



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QVibe frequency generating therapeutic device- used in a psoriasis case

Patent/project number: No 009015340-0001, 06/05/2022

OSIM: 301241/29.12.2023

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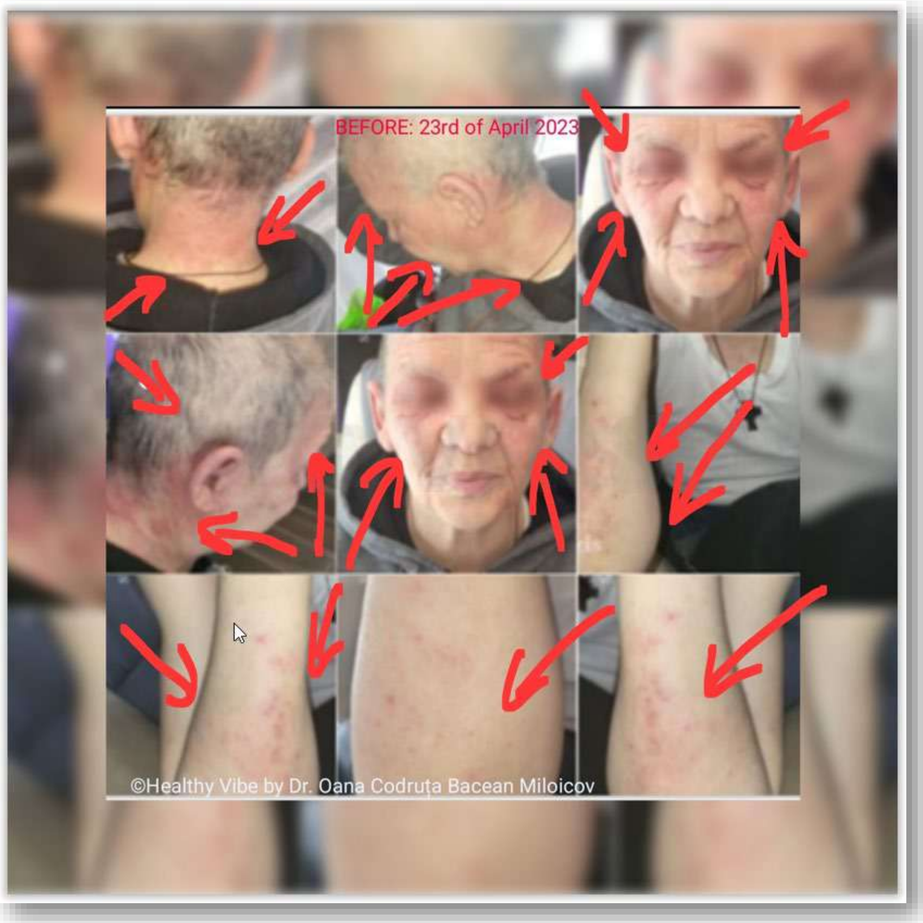
Author/s: Senior Lecturer Dr. Oana Codruta Bacean Miloicov

Institution: SC Holistic Lounge SRL

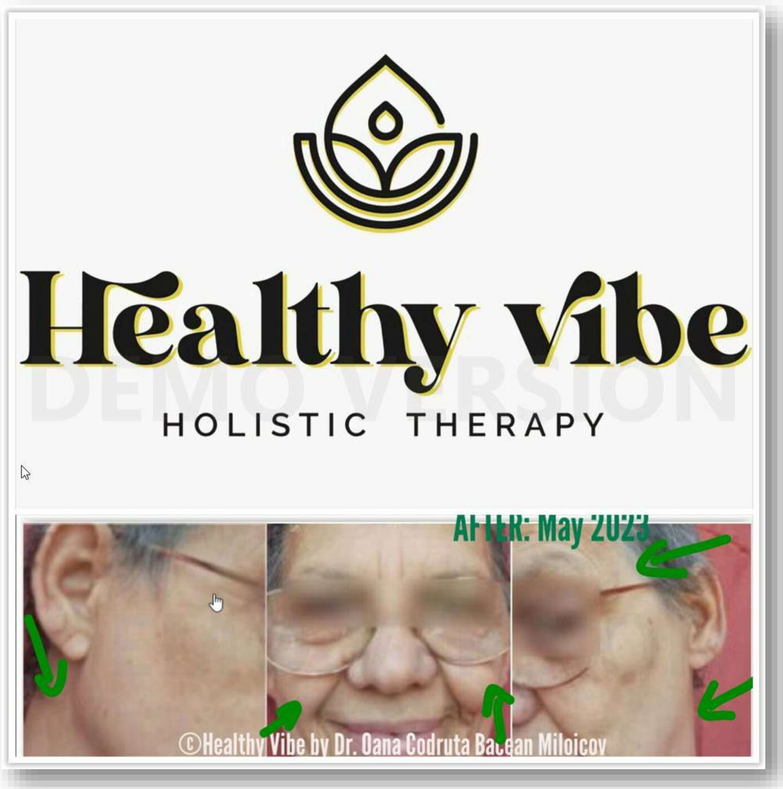
Psoriasis is a chronic autoimmune skin condition characterized by the rapid overproduction of skin cells. This results in the formation of red, scaly patches on the skin's surface. The exact cause of psoriasis is unclear, but it is believed to involve a combination of genetic and environmental factors. Psoriasis can cause discomfort and itchiness, on face, neck, arms, in this case.

Q Vibe is a therapeutic frequency generating device, an inovative concept made out of requencies that are imprinted on it, the final result is a special, unique algorithm, modified according to the pathologies of the patients. We applied the device as a therapy(local external application) for this case. The subject used the QVibe deviece everyday, the frequency recipie is a unique registered algoritm imprinted on the device that generates the frequencies as therapy; we can clearly see the difference in the pictures(BEFORE- on 23rd of april 2023) and the result in the pictures named: (AFTER- on may 2023, followup: 25 IAN 2024).

BEFORE- 23rd of april 2023



AFTER- may 2023



25 IAN 2024



It is successfully used in balancing other pathologies as (allergies/digestive problems/renal diseases/melanoma/nervous system lessions/viral or bacteriological infections/parasitic infestations/bone diseases, etc.), it optimises the state of health, according to the improvement of the clinical and paraclinical paramethers.

Contact: baceano@gmail.com +40745170879 www.healthyvibe.ro

SCAN ME

Solutie Virala ”SV”

Viral solution ”SV”

Patent/project number: OSIM 301242/29.12.2023

Author/s: Senior Lecturer Dr. Oana Codruta Bacean Miloicov

Institution: SC Holistic Lounge SRL

F

Substance composition - BASE: 5 ml Swedish Bitter, 25 ml ozonated pure water

The product is obtained by energetic imprinting with specific frequencies of known viruses; according to scientific studies, any energetically imprinted liquid generates those frequencies for a duration of approximately one month, after which the liquid no longer retains the energetic imprint. I used this aspect and reprinted another solution after the deadline.

I have used the product in hundreds of cases of viral infections, with spectacular results even from the first days; method of administration: the first two days: 7pic x 5/day, then: 7pic x 3/day, until the bottle is used up.

It is interesting that the base consists of a tincture of plants, natural and without adverse effects, but the therapy is actually made from the energetically imprinted frequencies on the solution. We started from the premise that digestion begins in the oral cavity, where absorption is very good (ex.: Nitroglycerin that is administered sublingually), as a result: statistics, kinesiological tests and the clinical evolution of the cases have shown us that the product is efficient reducing the occurrence of the symptoms, increasing immunity - much improved clinical condition after administration, significant reduction of inflammation and nasal congestion.

The remedy is energetically imprinted with the help of the only device of this type in RO, the recipie concept being registered with copyright.

Other benefits:

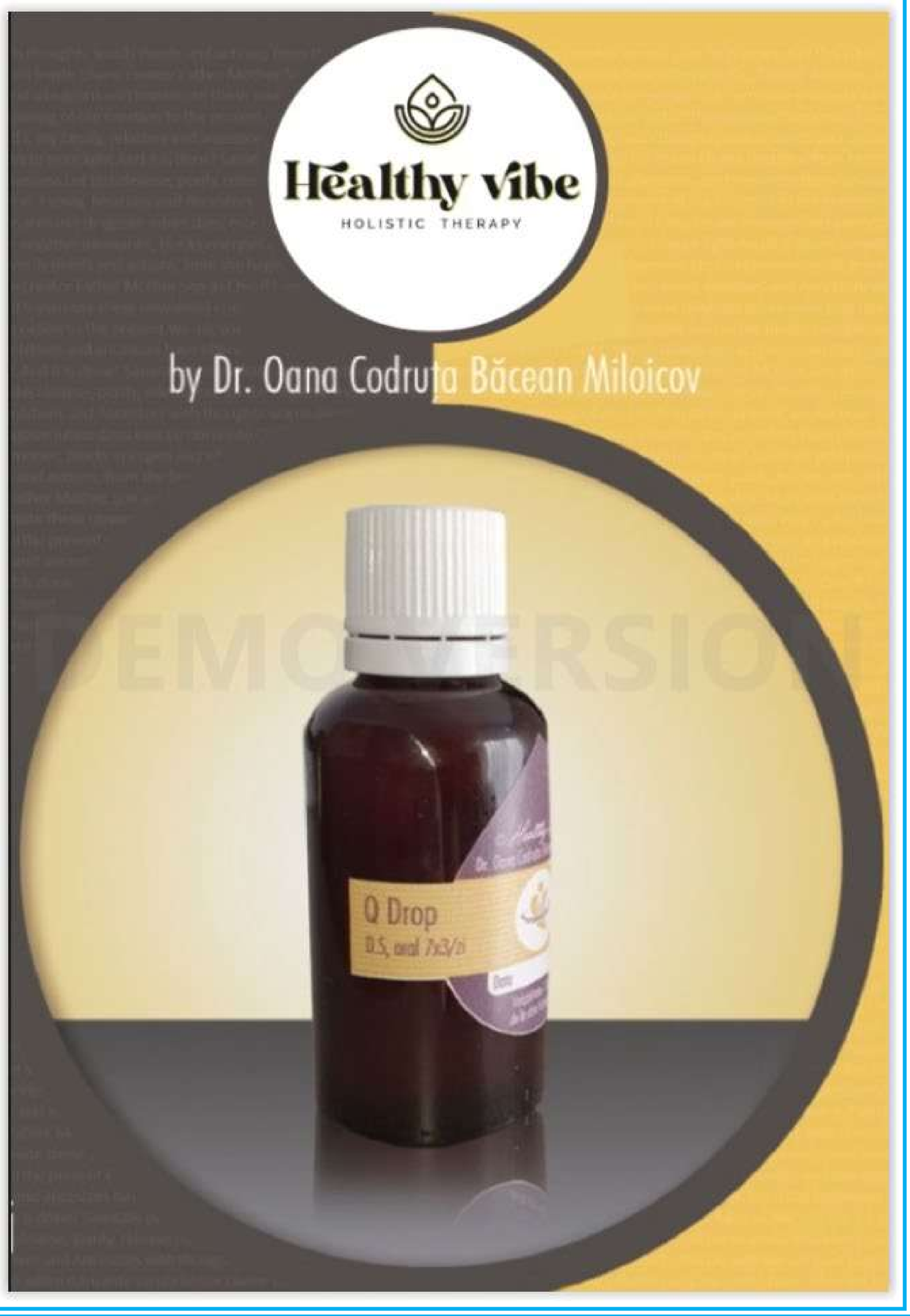
- adjuvant in upper respiratory infections (rhinitis, sinusitis, tonsillitis, laryngitis)
- adjuvant in lower respiratory infections
- anti-inflammatory
- antiviral
- can be anywhere administered
- does not require travel to get the solution, it can be send anywhere

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www.healthyvibe.ro



CO-TECH- test, measure, balance

(innovative concept of Automated Software Process for evaluation and therapy through biofeedback)

Patent/project number: OSIM 301240/29.12.2023

Author/s: Senior Lecturer Dr. Oana Codruta Bacean Miloicov

Institution: SC Holistic Lounge SRL

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CO-TECH software process automation is an innovative and copyright-protected concept that brings a new perspective to patient evaluation and therapy. By using biofeedback, this system allows for the optimization of evaluation processes, improvement of therapies, and reduction of execution times, resulting in an optimized therapeutic approach with accelerated efficiency.

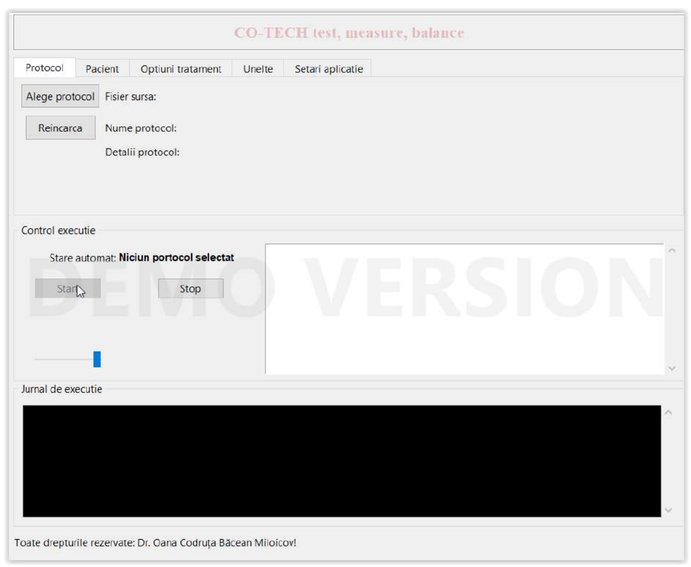
One of the core features of CO-TECH is its ability to obtain precise and detailed data about patients through biofeedback. This process involves measuring and monitoring the physiological responses of the patient in real-time. As a result, therapists can have access to essential information about the patient's health status and can adapt the treatment based on these data.

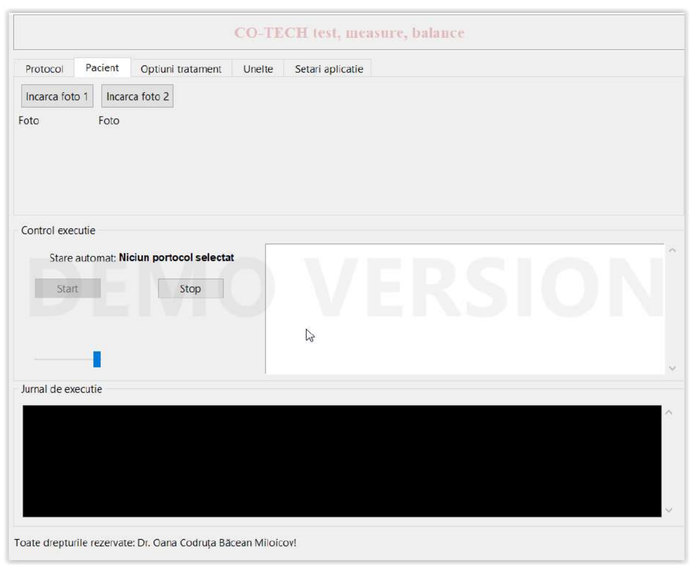
By applying CO-TECH software process automation in therapies, specialists can more accurately evaluate the patient's health condition and rapidly identify problems or difficulties they may face. Additionally, this system enables continuous monitoring of therapeutic progress, facilitating real-time adjustment and optimization of the therapy.

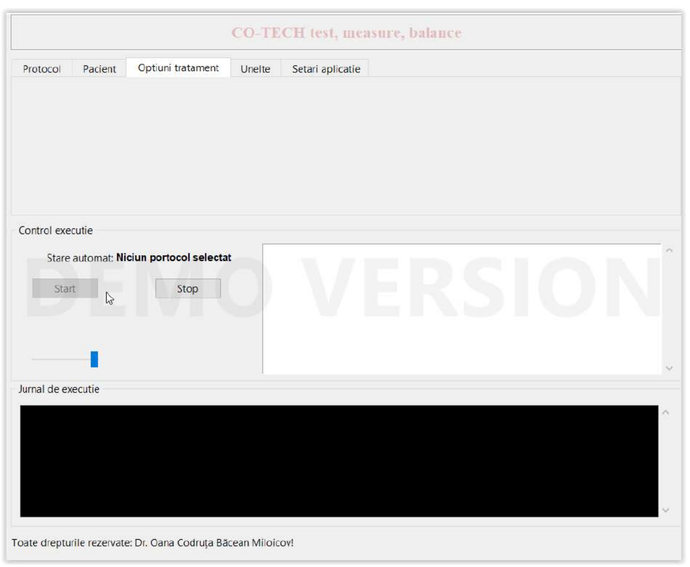
Moreover, CO-TECH software process automation brings a significant change in terms of the time required for therapies. By utilizing this innovation, therapists can considerably reduce the overall duration of therapies as they can quickly identify and eliminate inefficient or unnecessary methods. Consequently, patients will benefit from more time dedicated to other types of therapies without compromising the effectiveness of the main treatment.

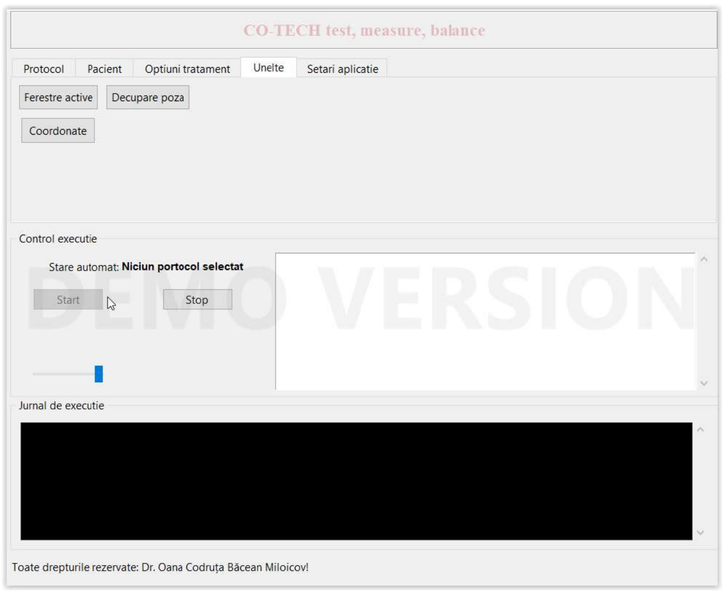
Another significant value brought by CO-TECH is its capacity to provide an optimized, personalized, and tailored therapeutic approach to each patient's needs. Through efficient resource utilization, therapists can develop specific strategies for each patient and track their evolution and health status in real-time. Through the use of CO-TECH software process automation, therapies become more efficient, faster, and personalized. This revolutionary concept offers the possibility to evaluate and treat patients more accurately, reducing therapy periods and maximizing therapeutic outcomes. CO-TECH brings benefits to the field of biofeedback evaluation, therapy improvement, and streamlining of therapeutic approaches, thus transforming the way patients are treated and cared for.

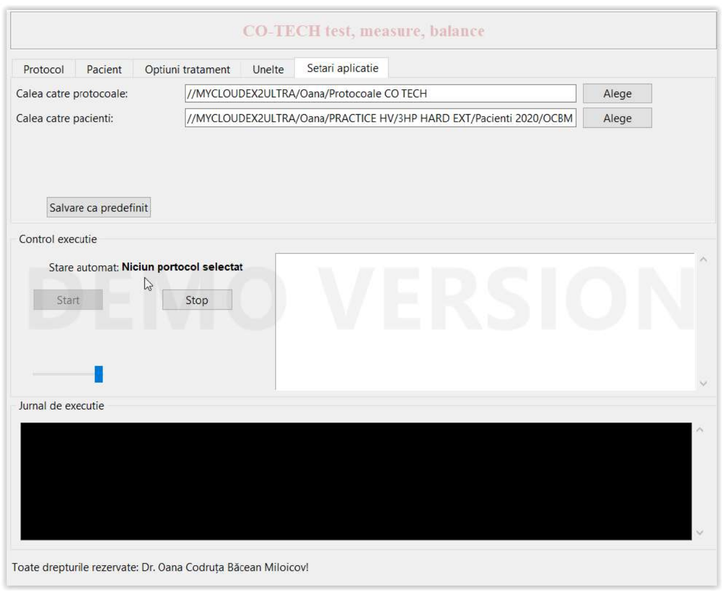
Affections that we have already used the CO-TECH- test, measure, balance concept for: depression, neoplasms, burnout, vitiligo, neurological diseases.











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SCAN ME

QVibe frequency generating therapeutic device-used against parasitic infections

Patent/project number: OSIM 301243/29.12.2023

Author/s: Senior Lecturer Dr. Oana Codruta Bacean Miloicov

Institution: SC Holistic Lounge SRL

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Intestinal parasites in children are organisms that develop and live in their intestinal tract, causing various symptoms and health problems. The causes of parasitic infestation can be varied, including consuming contaminated food or water, contact with infected animals, or lack of proper hygiene.

The effects of intestinal parasites on children's health can be quite severe. These parasites can affect nutrient absorption, causing nutritional deficiencies and delays in growth and development. They can also cause abdominal pain, diarrhea, nausea, weight loss, fatigue, and irritability. Persistent parasite infestation can compromise the child's immune system and lead to the development of other serious conditions.

To combat intestinal parasite infestation in children, an effective and non-invasive device is the Q Vibe - a therapeutic anti-parasitic frequency generator. This device provides a natural and gentle solution, eliminating the need for aggressive or invasive chemical substances in treatment.

Q Vibe works by generating and transmitting specific frequencies that are highly unpleasant and harmful to parasites. These frequencies disrupt and destroy the parasitic organisms, eliminating them from the child's body. The use of the Q Vibe device is easy and convenient, so it can be used at home or in a clinic setting.

Another advantage of using Q Vibe is its immediate effectiveness. After applying the therapeutic frequencies, the child will experience rapid relief of symptoms and an improvement in overall health. Treatment with Q Vibe is completely non-invasive and does not cause any negative side effects.







In short, the Q Vibe device provides a non-invasive, natural, and effective solution for combating intestinal parasite infestation in children. By using therapeutic anti-parasitic frequencies, this technology offers immediate benefits and completely eliminates the harmful effects of chemical substances.

Q Vibe is a therapeutic frequency generating device, an inovative concept made out of frequencies that are imprinted on it, the final result is a special, unique algorithm, modified according to the pathologies of the patients. We applied the device as a therapy(local external application) for these cases on the right hand on the radial arthery, where we can feel the pulse.
It is recomanded to use QVibe deviece everyday, all the time, especially during the night, the frequency recipie is a unique registered algoritm imprinted on the device that generates the frequencies as therapy. In cases of abdominal discomfort caused by colics, inflammation, abdominal bloating, intestinal parasites or imbalance of intestinal flora.

SCAN ME

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ANTISTRESS PROTOCOL used in a vitiligo case

Patent/project number: OSIM 301240/29.12.2023

Author/s: Senior Lecturer Dr. Oana Codruta Bacean Miloicov

Institution: SC Holistic Lounge SRL

F

The results obtained, including physical outcomes, clinical appearance, and psycho-emotional levels, demonstrate the effectiveness of this innovative copyrighted protocol. Its non-invasive nature, combined with optimized clinical parameters, enhances skin appearance and mental equilibrium, as confirmed by the results.

The therapeutic ANTISTRESS PROTOCOL has shown significant benefits in the treatment of vitiligo. Beyond its impact on the physical manifestations of the condition, it also addresses the psycho-emotional aspects that can accompany the disease.

By promoting psycho-emotional balance, this protocol helps individuals cope with the psychological impact of vitiligo. It addresses the underlying traumas stored in the subconscious, aiding in their release and healing.

Furthermore, the therapeutic ANTISTRESS PROTOCOL protocol focuses on CHACKRA balancing, which plays a vital role in overall well-being. Through this process, the energy centers of the body are harmonized, resulting in improved physical and mental health.

The protocol also includes AURA correction, which helps restore the energetic field surrounding the body. By addressing imbalances and blockages within the aura, the therapy promotes healing on multiple levels.

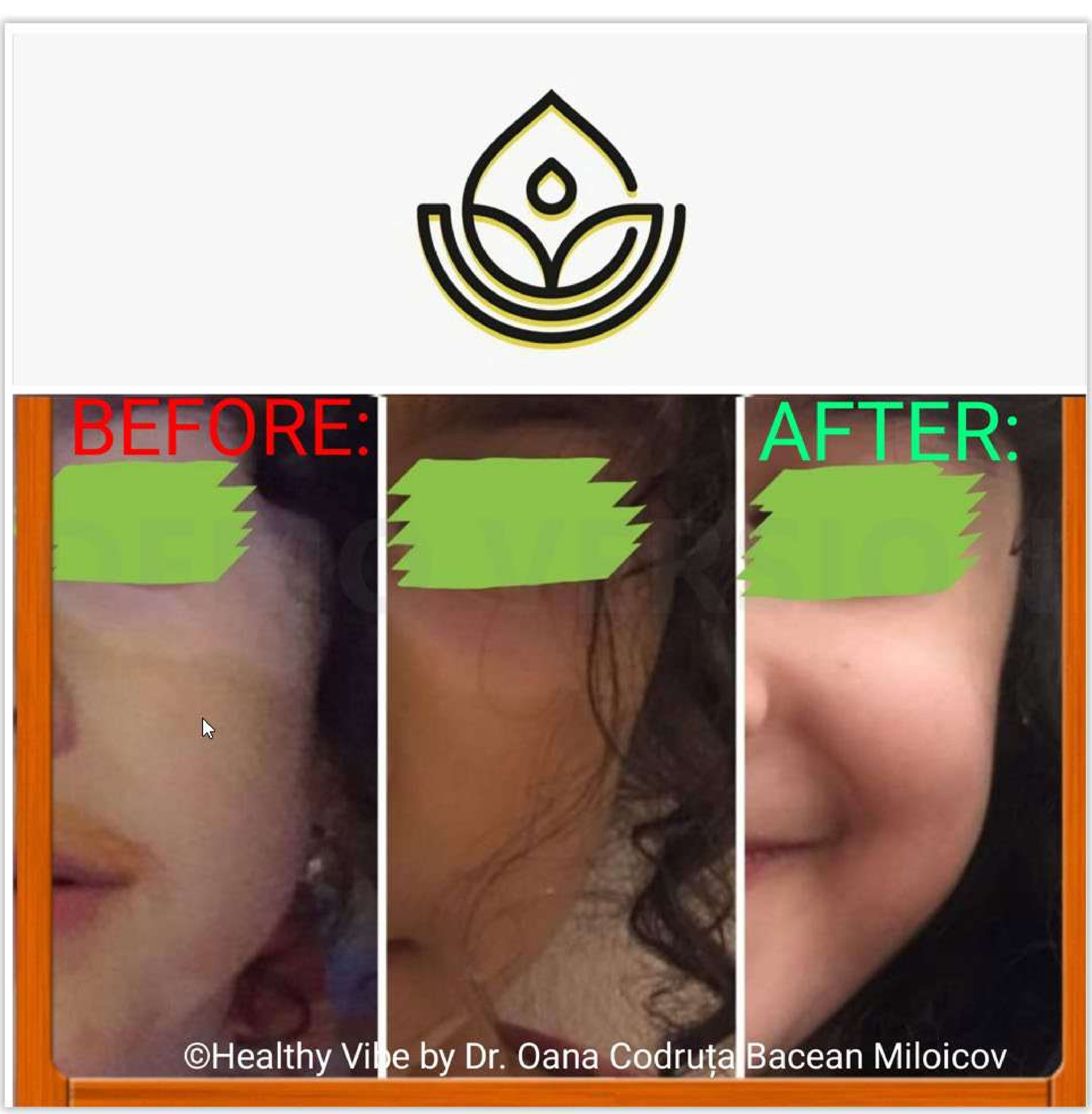
By targeting the imbalances caused by stress factors, this protocol aids in restoring the body's equilibrium. It addresses the impact of external stressors and supports the body's ability to withstand and recover from them.

The use of this innovative ANTISTRESS PROTOCOL has shown remarkable clinical and psycho-emotional improvements. It offers a non-invasive approach to treating vitiligo, enhancing both physical appearance and mental well-being. With the support of copyright protection, this protocol stands as a testament to its effectiveness and results.

The image on the LEFT- **BEFORE** represents the photo taken at the initiation of the therapy.

The image in the middle, intermediate stage.

The image on the right, the RESULT- **AFTER** obtained after three months from the initiation of the therapy.



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www.healthyvibe.ro

QVibe frequency generating therapeutic device - used in fibrillation

Patent/project number: No 009015340-0001, 06/05/2022

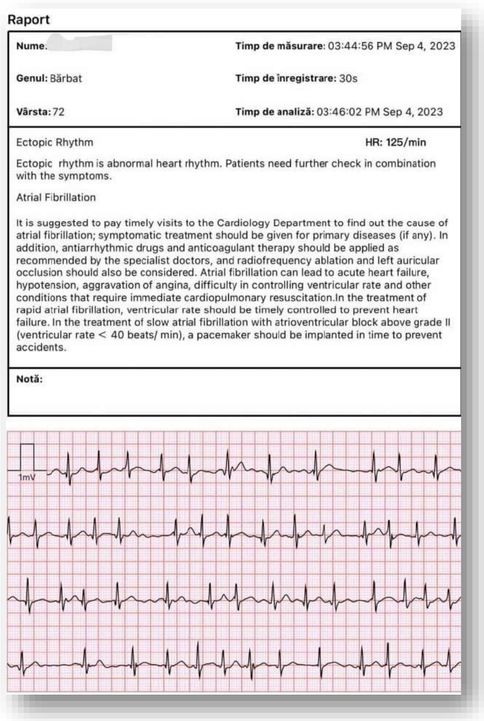
Author/s: Senior Lecturer Dr. Oana Codruta Bacean Miloicov

Institution: SC Holistic Lounge SRL

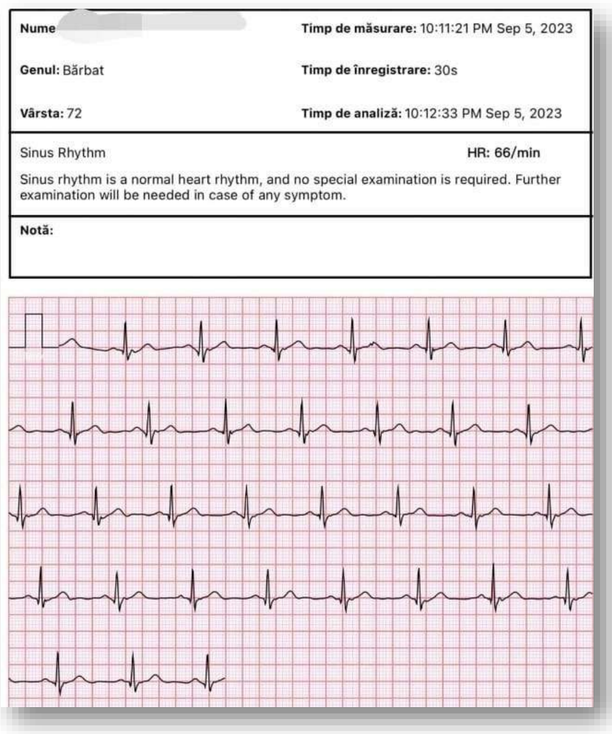
F

Fibrillation represents a cardiac arrhythmia characterized by rapid, irregular contractions of myocardial fibers, resulting in ineffective cardiac output. This condition poses a significant risk of complications including cerebrovascular accidents, congestive heart failure, and sudden cardiac death.
Traditional therapeutic modalities have primarily involved pharmacological interventions, such as antiarrhythmic agents, aimed at restoring normal sinus rhythm. In refractory cases, interventional approaches such as catheter ablation or implantation of cardiac rhythm management devices may be necessary to achieve rhythm control.
The innovative QVibe device offers a novel approach to fibrillation management, utilizing therapeutic frequencies to modulate myocardial activity. Unlike conventional therapies, QVibe provides a non-invasive and physiologically harmonious intervention.
Mechanism of Action: QVibe operates by emitting targeted frequencies tailored to counteract the pathophysiological mechanisms underlying fibrillation. Its unique formulation integrates anti-inflammatory agents to mitigate myocardial inflammation, optimize coronary perfusion, and enhance myocardial contractility and conduction. Patients can conveniently integrate QVibe into their daily regimen, benefiting from its therapeutic effects irrespective of their location. Fig- Fibrillation episode and Fig.- After using QVibe device, sinusal rhythm- NORMAL
Synergistic Effects of Dual Device Deployment: For enhanced efficacy, simultaneous usage of two QVibe devices is recommended. By wearing one device as a wristband on the right wrist and another as a necklace close to the cardiac region, direct transmission of therapeutic frequencies into the circulation is achieved, augmenting therapeutic outcomes. Fig.3 – After 10 days of using QVibe device, sinusal rhythm- NORMAL AND Fig. 4- – After aprox one MONTHS of using QVibe device, sinusal rhythm- NORMAL
Immediate Symptomatic Relief and Prophylactic Benefits: QVibe offered in this case immediate relief from fibrillation symptoms while also exerting prophylactic effects, reducing the likelihood of recurrent episodes and promoting sustained cardiovascular wellness.
Personalized Therapeutic Approach: QVibe embodies a tailored therapeutic paradigm, customized to accommodate the unique pathophysiological profiles of individual patients. Its innovative algorithmic design ensures precise modulation of frequencies, optimizing therapeutic efficacy for fibrillation management.
In summary, the advent of the QVibe device heralds a transformative era in fibrillation management. By furnishing a gentle, natural, and patient-centric therapeutic modality, QVibe empowers individuals to proactively engage in the preservation of cardiac health and enhance their quality of life.

Fibrillation episode:



After using QVibe device, sinusal rhythm- NORMAL:



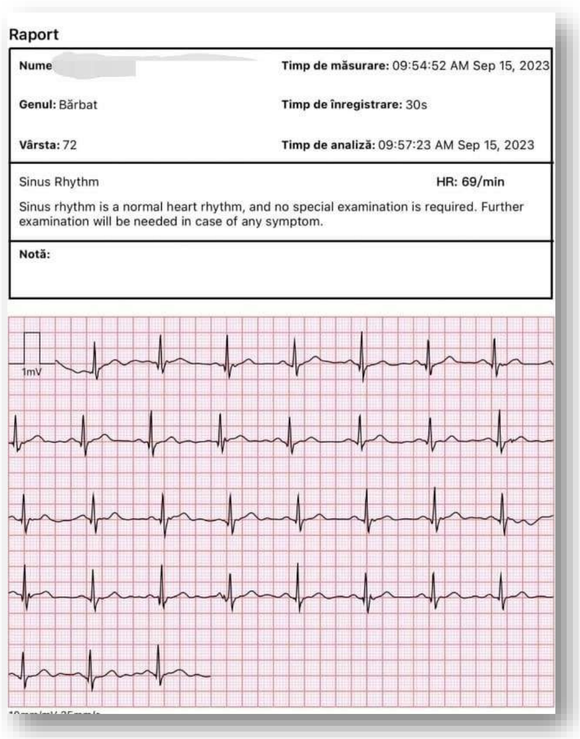


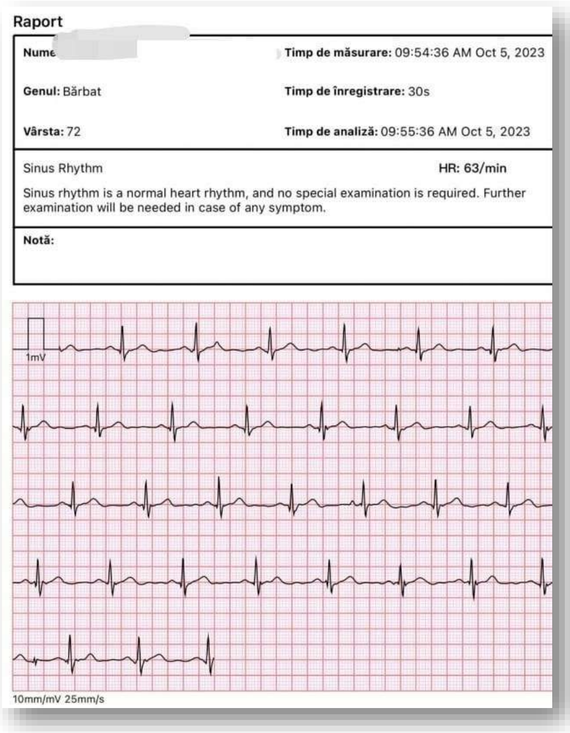












SCAN ME

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+40745170879 https://www.healthyvibe.ro/product/incarcare-dispozitiv-q-vibe-medium-circulatie/ www.healthyvibe.ro

SC Anoom Laboratories SRL

YOUR HEALTH STARTS IN THE COLON

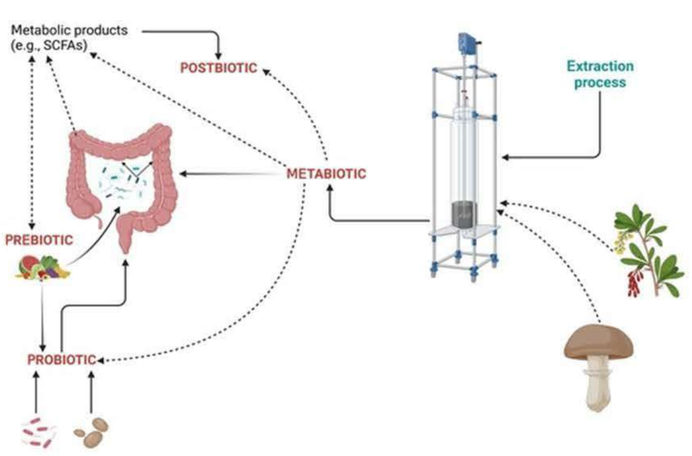
ColonX — A Metabiotic Solution for Dysbiotic Gut Microbiota

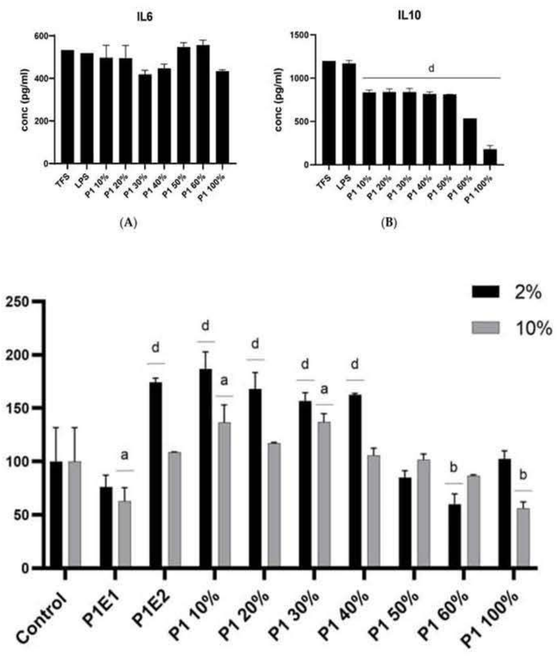
Emanuel Vamanu

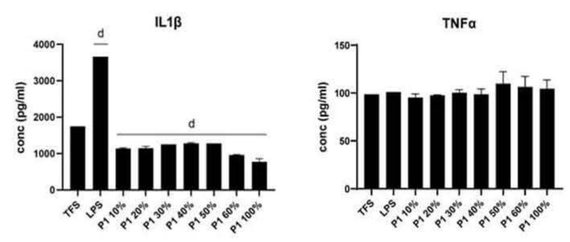
A novel product line called GreenBiom was created to target the human microbiota in chronic disorders. This was achieved by using a new extraction process derived from mushrooms. The primary product will be ColonX, derived from Boletus edulis mushrooms sourced from Romania. ColonX is a viable substitute for probiotic products and is specifically formulated to regulate the imbalanced microbiota resulting from antibiotic treatment. ColonX is a MetaBiotic product that includes polysaccharides and other natural chemicals broken down by the intestinal microbiota. This promotes the synthesis of short-chain fatty acids essential for maintaining a healthy colon.

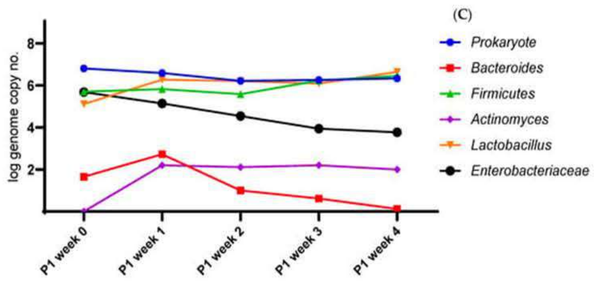
GREENBIOM

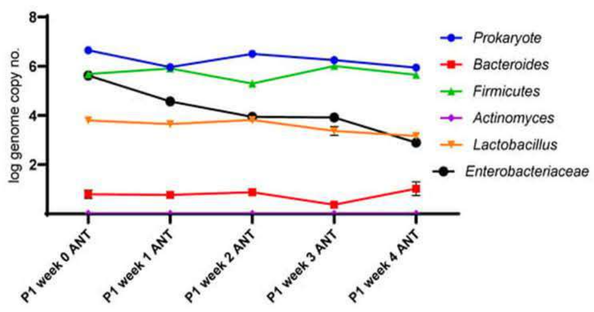












Systems
Gastrointestinal Simulation

- *The cytotoxic effect and the selective impact on the tested cytokines may lead to the development of effective adjuvants in cancer therapy;*
- *The study demonstrated a direct relationship between microbiota modulation and the anti-inflammatory response;*
- *The stimulation of some key anti-inflammatory cytokines demonstrates Boletus edulis extract's biological value;*
- *The diversity of the intestinal microbiome increased, and the metabolomic pattern was characterized by an increased concentration of organic acids acting as biomarkers;*
- *Successfully demonstrated the role of metabolomic modulation as a therapeutic target in controlling immune response and cytokine levels in target populations;*
- *The study also demonstrated the bioavailability of the bioactive compounds manifested by ameliorating some dysbiosis-related side effects at the microbiota level.*

Avram, I.; Pelinescu, D.; Gatea, F.; Ionescu, R.; Barcan, A.; Rosca, R.; Zanfirescu, A.; Vamanu, E. Boletus edulis Extract—A New Modulator of Dysbiotic Microbiota. Life 2023, 13, 1481.

Greenbiom is a Romanian manufacturer specialized in the creation of food supplements based on herbs. These products are 100% natural, GMO-free and Vegan Label certified.

Contact: www.greenbiom.ro

3D textile structure for surgical interventions

F

Visileanu Emilia, Chiriac Laura, Memecica Maria, Scarlat Razvan, Vladu Alina Florentina

The National Research & Development Institute for Textiles and Leather (INCDTP) Bucharest, Romania

SHORT DESCRIPTION

The invention refers to a knitted textile material with a three-dimensional structure, with the specific geometry of the preformed meshes, bio-absorbable, functionalized with substances with antimicrobial and biocompatible properties, for temporary support, intended for abdominal implantation, for the repair of parietal defects and to the procedures for its fabrication.

PATENT no.: A/00059/ 17.02.2021

INGUINAL HERNIA

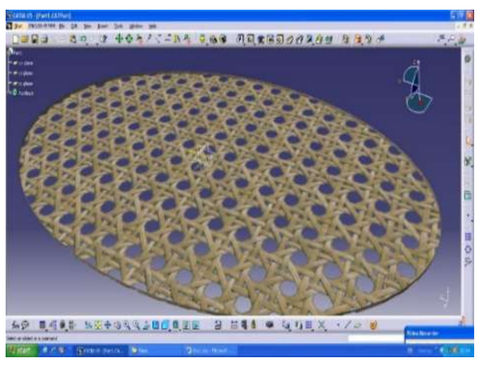
An inguinal hernia is a disorder in which the bladder or intestine protrudes through the abdominal wall or into the inguinal canal. Inguinal hernias account for over 96% of all groin hernias, and the majority of them arise in men due to an inherent weakness in this area.

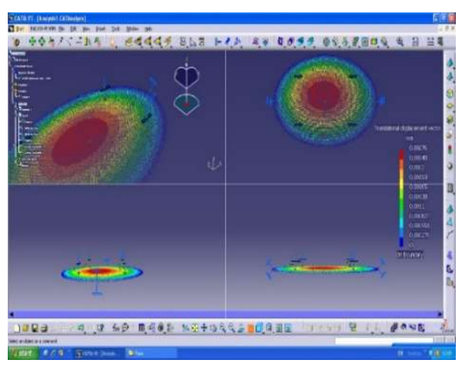
DEGREE OF NOVELTY

Design: The computer-assisted design was carried out in order to establish the design parameters of the nets for harmonization with the shape and structure of the abdominal wall.









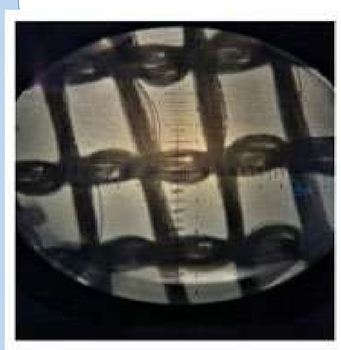
MAIN CHARACTERISTICS

The functional 3D model, according to the invention, is characterized by the fact that it has a mass between 80-100 g/m^2, falling into the standard weight category, thickness of 0.5 mm, resistance to deformation 141 kPa, resistance at break in the horizontal direction 26 N and in the vertical direction 244 N, the elongation at break in the horizontal direction 312 % and in the vertical direction 55 %, combines the physical-mechanical requirements and the dimensional stability conferred by the 3D structure of the knitted mesh, with the ability to reduce the risks of complications and favor the activity of postoperative fibroblasts, conferred by the biodegradability and biocompatibility of the polylactic acid fiber.

PROCESS PARAMETERS

Phase I: Obtaining the preformed 3D textile structure, based on incomplete row knitting technology, on a knitting machine with fineness E16 and the maximum width of the working font of 180 cm, equipped with SDS-ONE APEX3 computer and KnitPaint software specialized for the realization of the program specific to the openwork structure, having knitting speed 0.6 m/s, transfer speed 0.6 m/s, knitting pull 28-35, transfer take-down 15-17.

Phase II: functionalization by impregnation and squeezing on the padding machine through 4 successive passes, with a solution containing 1-2% collagen hydrolyzate, 0.5-1% polycaprolactone, 0.02-0.05% gentamicin sulfate, drying at a temperature of 25 ℃, cutting by thermal cutting to sizes of 10x10 cm or 20x20 cm, packing and sterilization with ionizing radiation.





ADVANTAGES

- Restoring the integration of the abdominal wall;
- Ensuring the physical-mechanical properties of the implantable meshes, the generation of reduced shearing forces with the abdominal wall after implantation;
- The possibility of use in the repair of different types of hernias: inguinal, femoral, umbilical;
- Intra-operative adaptation by cutting to the size and shape of the parietal defect regardless of anatomical differences, age and gender of the patient;
- Modeling to the shape of the implantation area in the abdominal cavity;
- Reduction of postoperative pain;
- Increasing of comfort;
- Reducing the risk of infection and local intolerance, reducing the healing time.

The market impact and potential benefits of exploitation of project results for SEMs are:

- implementation and development of advanced technology for processing resorbable and non-resorbable biopolymers in linear/ spatial structures;
- development of new methods and adequate active agents for consolidation/ functionalization of hernia scaffolds;
- increasing and diversification of products range, new niches accessing on the international market
- increasing the quality of the surgical act and the quality of surgery and reducing post-traumatic risks.

The potential benefits of exploitation of project results for the research entities are:

- implementation and development of advanced technology for processing resorbable and non-resorbable biopolymers in linear/ spatial structures;
- development of new methods and adequate active agents for consolidation/ functionalization of hernia scaffolds;
- increasing and diversification of products range, new niches accessing on the international market;
- increasing the quality of the surgical act and the quality of surgery and reducing posttraumatic risks.

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MOLDOVA STATE UNIVERSITY

The Faculty of Chemistry and Chemical Technology

Scientific Research Laboratory

Advanced Materials for Biopharmaceuticals and Technics

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HR EXCELLENCE IN RESEARCH

NEW SYNTHETIC INHIBITORS OF SUPEROXIDE ANION RADICALS

PATENT: MD 4755 / 2021.12.31

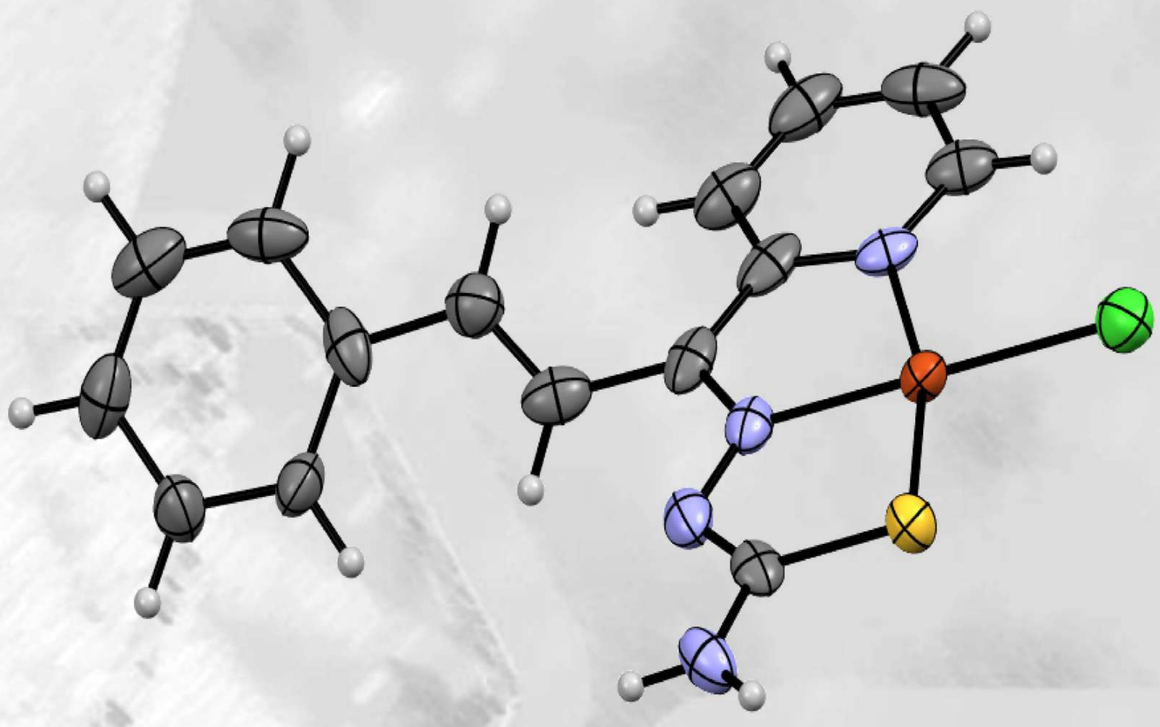
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AUTHORS: Aurelian GULEA, Valentin GUDUMAC, Victor ŢAPCOV, Valeriana PANTEA, Vasilii GRAUR, Lilia ANDRONACHE, Inna ŞVEŢ, Maria BOTNARU

APPLICATION FIELDS: F - Medicine – pharmacy – cosmetics.

AIM: Chemical synthesis, characterization of new synthetic inhibitors of superoxide anion radicals that may find application in medicine.

SOLUTION: New copper coordination compounds with thiosemicarbazone ligands have been obtained using the directed synthesis method.



The IC_{50} values towards superoxide anion radicals

Compound	IC_{50}, μmol/L
Quercetin	61.86
Prototype	0.99
Claimed substances	0.20-0.37

ADVANTAGES: The described compounds inhibit superoxide anion radicals. These agents exceed 167-310 times the analogous characteristics of quercetin that is used in medical practice, and 2.7-5.0 times analogous characteristics of the prototype. The discovered properties of these substances are of interest for medical practice for enhancement of the arsenal of superoxide anion radical inhibitors.

IMPLEMENTATION STAGE: At the laboratory level.

ACKNOWLEDGMENTS: This research was supported by the *research project: # 010602.*

MOLDOVA STATE UNIVERSITY
The Faculty of Chemistry and Chemical Technology
Scientific Research Laboratory
Advanced Materials for Biopharmaceuticals and Technics
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HR EXCELLENCE IN RESEARCH

NEW ANTIBACTERIAL AGENTS

PATENT: **MD 4883/2024.01.31; MD 4842/2023.08.31**

F

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APPLICATION FIELDS: F - Medicine – pharmacy – cosmetics.

AIM: Chemical synthesis, characterization of copper and nickel coordination compounds and their antibacterial evaluation against *Streptococcus pneumoniae*.

SOLUTION: New coordination compounds with thiosemicarbazone ligands have been obtained using the directed synthesis method.

Antibacterial activity of the claimed substances against *Streptococcus pneumoniae* (µg/mL)

Compound	MIC, µg/mL	MBC, µg/mL
Ampicillin (Prototype)	0.5	0.5
Structural analog	0.03	0.06
Patent #4842	0.0038	0.0076
Patent #4883	0.0019	0.0076

MIC - minimum inhibitory concentration; MBC - minimum bactericide concentration

ADVANTAGES: The activity of the claimed compounds against bacteria of the species *Streptococcus pneumoniae* exceed by 66-263 times analogous characteristics of the Ampicillin and 8-16 times the characteristics of the structural analog. The discovered properties of these substances are of interest for medical practice in terms of expanding the arsenal of antibacterial remedies.

IMPLEMENTATION STAGE: At the laboratory level.

ACKNOWLEDGMENTS: This research was supported by the *research project: # 010602.*

THE EFFECTUVENESS OF ACTIVE COMPOUNDS IN TEKI AND ANTING-ANTING GRASS EXTRACTS AS CANDIDA DRUGS FOR BREAST CANCER TREATMENT: A PHYTOCHEMICAL, IN VITRO, AND IN SILICO STUDY

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Patent : 000580631

Author : GHANIYYA PUTRI LUSENDRA

Cancer is still a global problem, especially in developing countries, including Indonesia. Based on the type of disease, breast cancer is most prevalent in Indonesia. This is because certain strains such as *Escherichia coli* have become drug-resistant. Ethanol extracts of teki grass (*Cyperus rotundus L.*) and anting-anting (*Acalypha indica L.*), which are commonly found in Indonesia, have often been used as anti-cancer drugs because they have substances including flavonoids, saponins, essential oils, alkaloids, and tannins. Extracts of these two plants have been found to inhibit bacterial and parasitic populations. This study aims to evaluate the antioxidant and anti-elastase properties of extracts in vitro and silico as breast cancer drug candidates with an in silico molecular docking study using the elastase protein target (1B0F). Teki grass and anting grass extracts showed strong antioxidant activity in antioxidant testing. In anti-elastase assays, it was found that the extracts of teki grass and anting grass leaves provided strong inhibition of elastase activity. In the in vitro experimental study, the antibacterial effectiveness of the two extracts against *E. coli* with one factor is the variation of extract concentration with a combination composition of 1:1, 1:2, and 2:1, distilled water as a negative control and antibiotic chloramphenicol as a positive control. This study concluded that teki grass and anting grass extracts have the potential as a source of breast cancer drug candidates.

Keywords: teki grass, anting-anting grass, in vitro, molecular docking, E. coli, breast cancer.

1. PHYTOCHEMICAL TEST

Table 1. Phytochemical Test Results of Ethanol Extracts of Teki and Anting-anting Grass

Parameter	Anting- anting	Teki	Description
Alkaloid Mayer	-	+	Positive when a white precipitate/fog is formed
Alkaloid Dragendroff	-	+	Positive if orange-red precipitate is formed
Flavonoid	+	+	Positive is there is a red-pink color change
Steroid	+	-	Positive when there is a change in color to green
Terpenoid	-	+	Positive when there is a red-purple color change
Saponin	-	-	Positive if there are foam forms
Tannin	+	+	Positive if there is a blue/purplish blue color change



Fig 1. Teki Grass

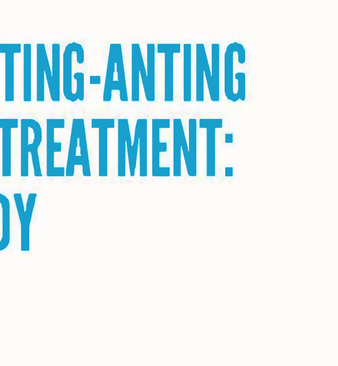


Fig 2. Anting-anting Grass

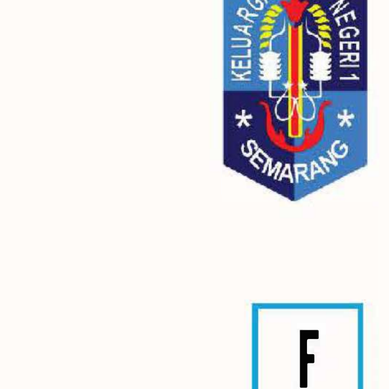


Fig 3. E. coli bacteria

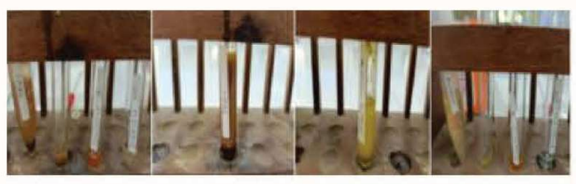


Fig 4. Phytochemical Test Results

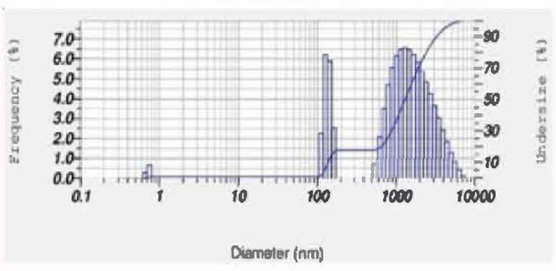


Diagram 1. PSA Test Results of Teki Grass (RT)

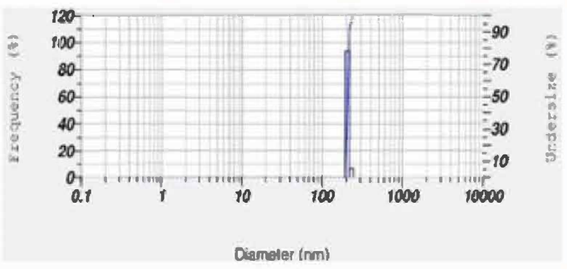
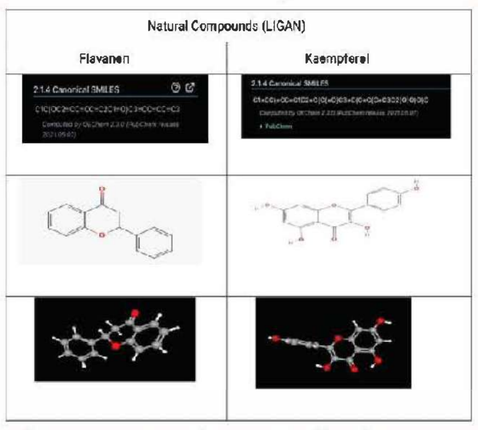


Diagram 2. PSA test results of anting-anting grass (RA)

2. IN SILICO TEST

Table 2. Natural Compounds



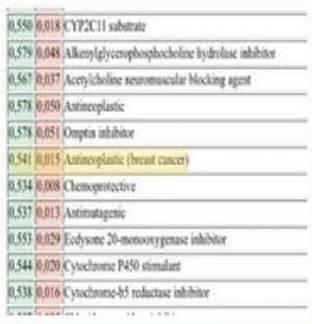


Fig 5. Flavanon



Fig 6. Kaempferol

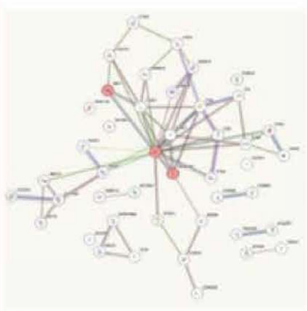


Fig 7. STRING Flavanon

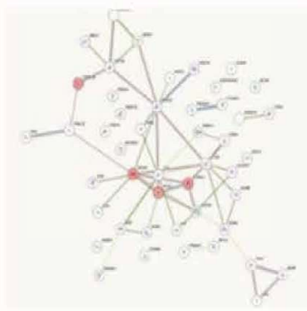


Fig 7. STRING Flavanon

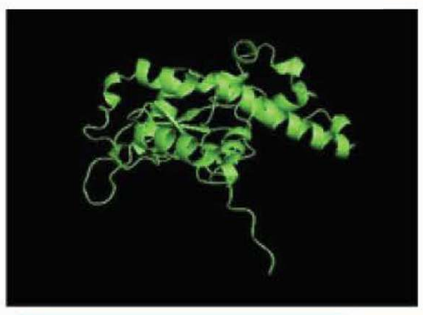


Fig 7. STRING Flavanon

Flavanone and Kaempferol compounds were tested on the Way2drug web and the following results were obtained :

ANALYSIS OF MOLECULAR DOCKING RESULTS

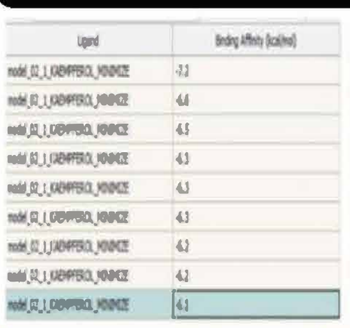


Fig 10. Binding Energy of Ligand, Source: PyRx



Fig 11. Molecular Docking, Source: PyMOL

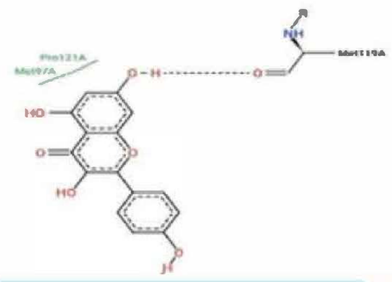


Fig 12. Compound docking results, Source: Protein Plus

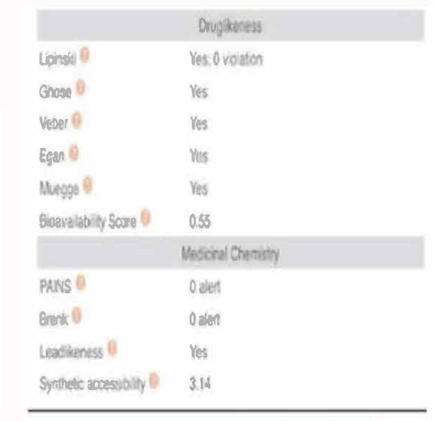


Fig 13. Drug-likeness and Medical Chemistry

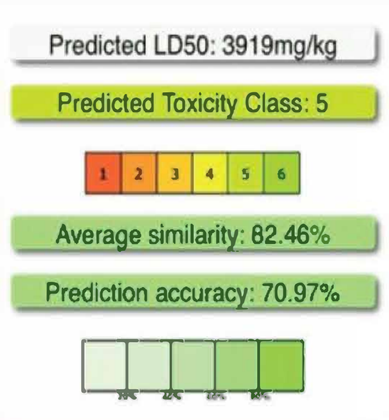


Fig 14. Predicted Toxicity Class

3. IN VITRO TEST

- Preparation of teki grass and earring grass extracts made in a ratio of 1:1, 1:2, and 2:1



Fig 15. Comparison of Teki grass and earring grass extracts

- Prepare E. coli ATCC bacteria whose turbidity is equalized with MC Farland 0.5 standard



Fig 16. E-coli ATCC bacteria

- Prepare the tools that will be used.



Fig 17. Micropipette and Cork Borer



Fig 18. Agar media before being treated with E-coli bacteria with extracts



Figure 24. E. Coli antibacterial activity of teki and anting extract

PRODUCTS

Products ; tea bags, capsuls, body cream and Jelly





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Levitron

Author: Babără Alexandru

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The purpose of this project is to develop a levitron, equipped with an electromagnet. This prototype aims to present the potential of an levitron by a magnetic levitation and the proposal to use it in Medicine.

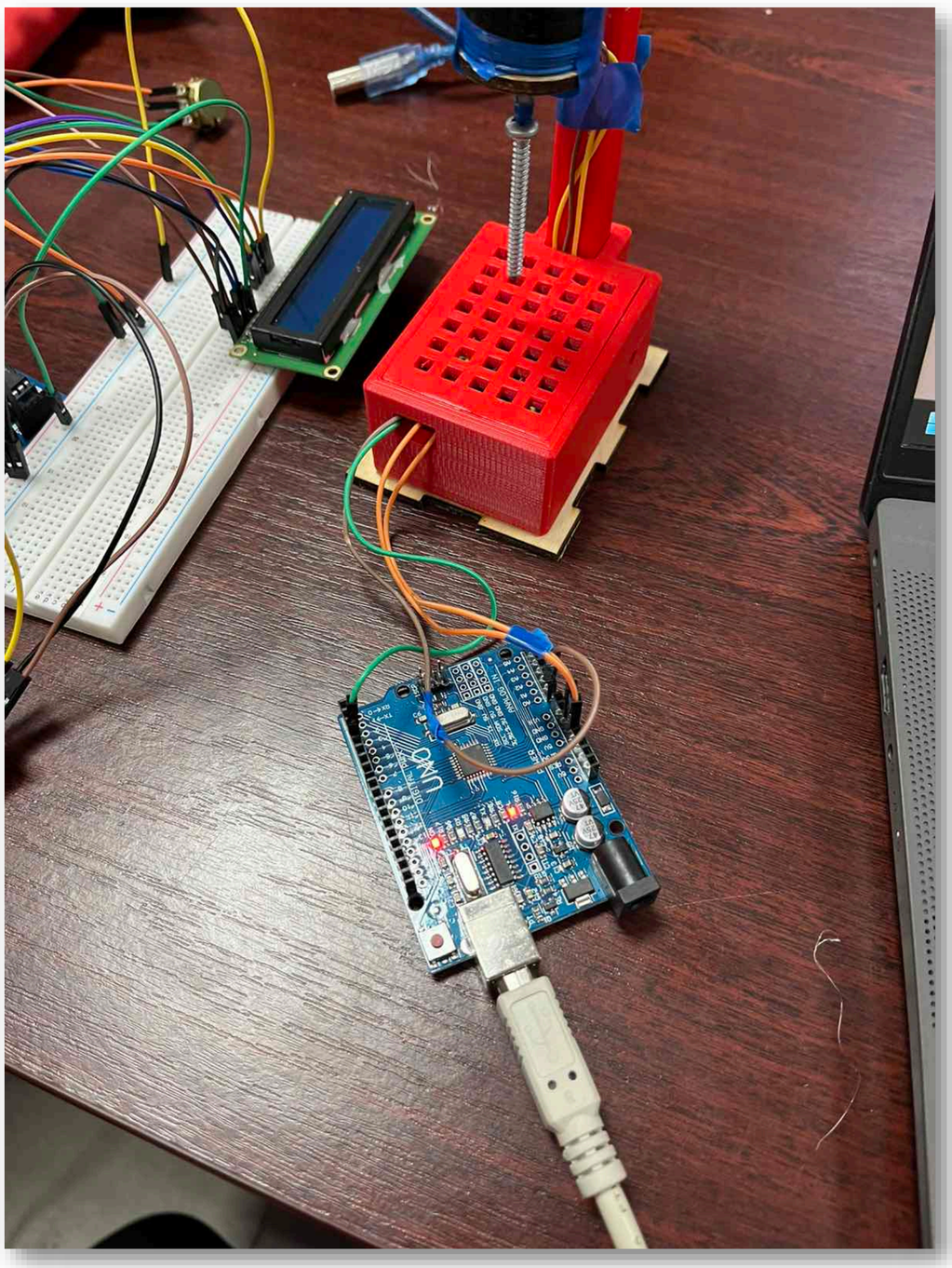
The stages of carrying out the research:

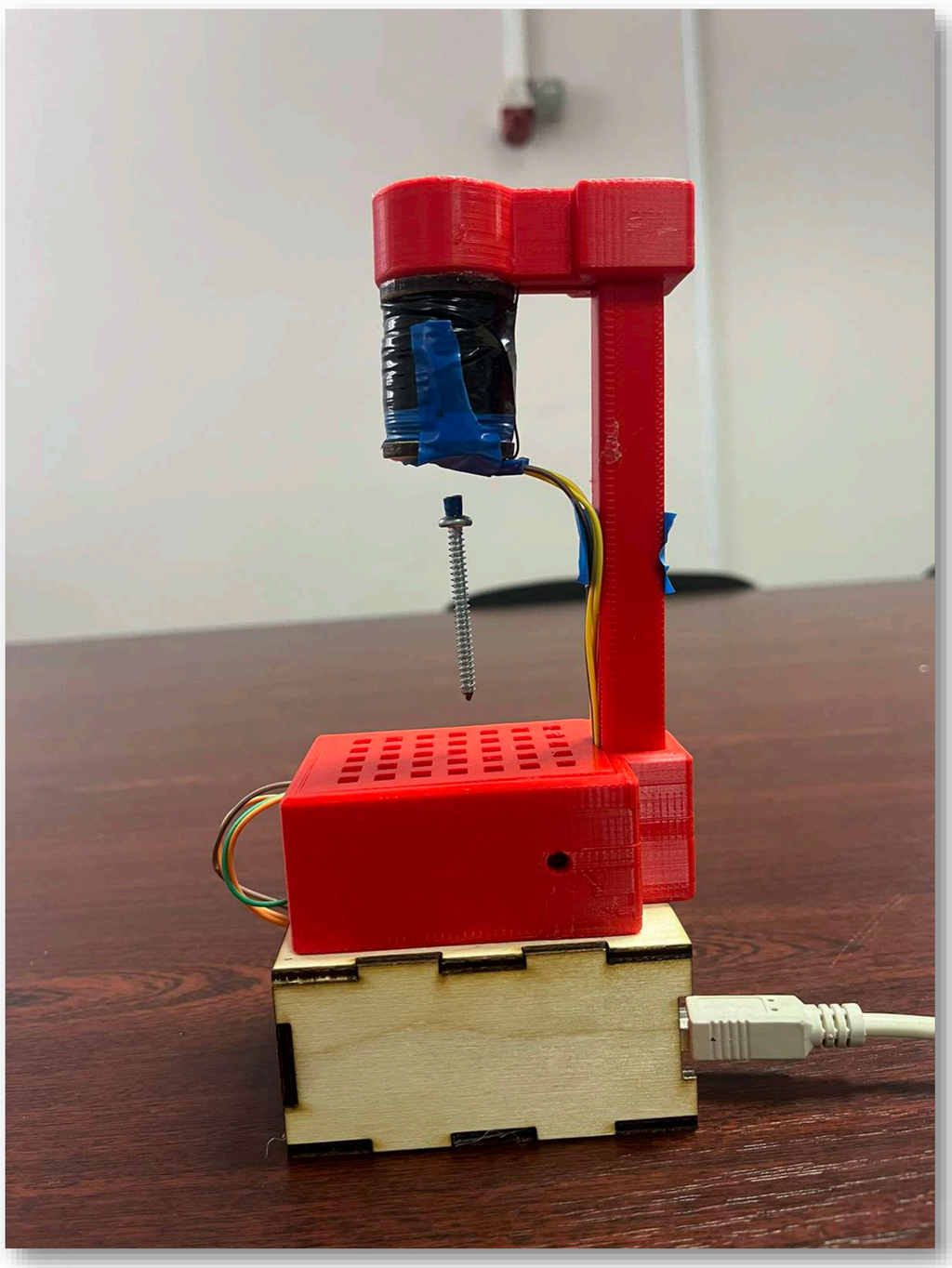
1) Studying procces; 2) Installation of Circuits;

3) Programming the Circuits; 4) Printing the Parts; 5) Assembling;

6) Introduction of Circuits; 7) Calibration of the Prototype; 8) Experimentation.

The research period took place between: September 2023 – January 2024.





The realization of this project led to obtaining a levitron wich can show the potential utilisation of this prototype in different ppurposes (medicine, space technologies) levitron is equiped with an electromagnet and circuits that activate the process of electromagnet.The magnetic levitation can be used in medicine to get a sterile way to use the medical tools. In space technologies the levitation can be used as a way to integrate it in propulsion systems.

The novelty elements of the project: Proposal to use the levitation in medical industry , like the levitron of a dentist.

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E's in food. A healthy teeth- a healthy smile

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Author/ s: TartusMădălinaMentor:
Prof. Dorogan Elena

The entire globe faces the problem of toxic food additives added to most commercial mouthwash solutions. And the solution to this mass destruction of dental health is right in our hands - an ecological product based on cheap and accessible raw materials, which can be obtained even at home.

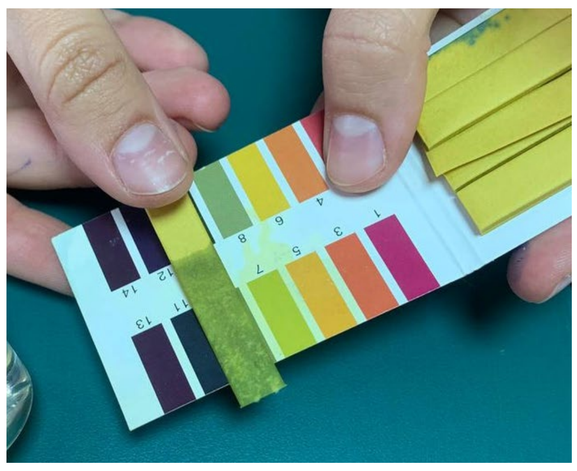
In this project, we studied 4 ingredients that are practically in everyone's home, namely honey, cinnamon, sodium bicarbonate and chlorhexidine. I opted for the addition of certain of these because, honey, in addition to having a wonderful taste, also possesses antibacterial properties, cinnamon eliminates the source of the odor, the causative oral bacteria, ensuring long-term results, sodium bicarbonate is an antibacterial, prevents dental caries, maintains an optimal pH level in the oral cavity, neutralizes acidity and chlorhexidine being a strong antiseptic, reduces bacteria in the oral cavity and prevents infections.

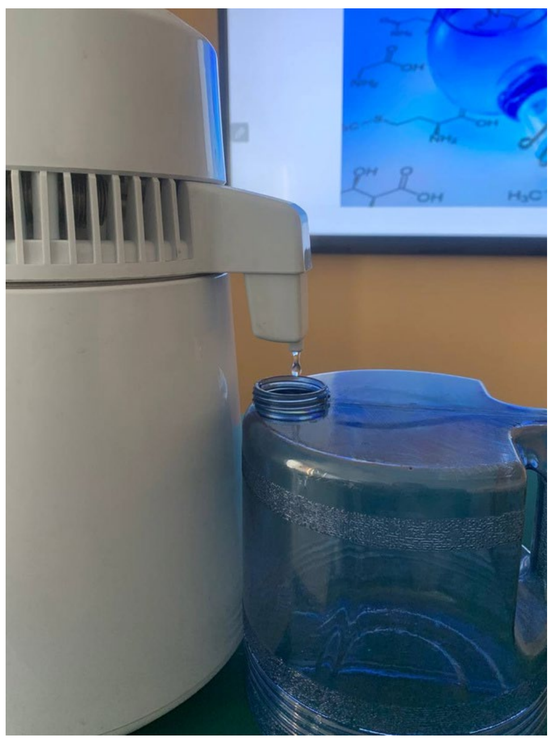
Then I made the mouthwash by the following procedure: I distilled 200 ml of water. I dissolved 15 g of honey in water, then mixed the rest of the components - 5 g of cinnamon, 5 g of sodium bicarbonate, 6 ml of 0.05% chlorhexidine. Baking soda can also be replaced with lemon. Then I stored them in the refrigerator overnight, and the next day I filtered the solution and bottled it.

By means of the potentiometric method I determined the neutral pH, which is beneficial and does not dry the oral cavity, I used the strips and the potentiometric device.



The ingredients used


Potentiometric strips


The process of distilling mouthwash


Bottled mouthwash



pH measurement with the potentiometric apparatus

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FROM SMART ELECTROCONDUCTIVE INK TO SELF-DISINFECTING ELECTRONIC SURFACES

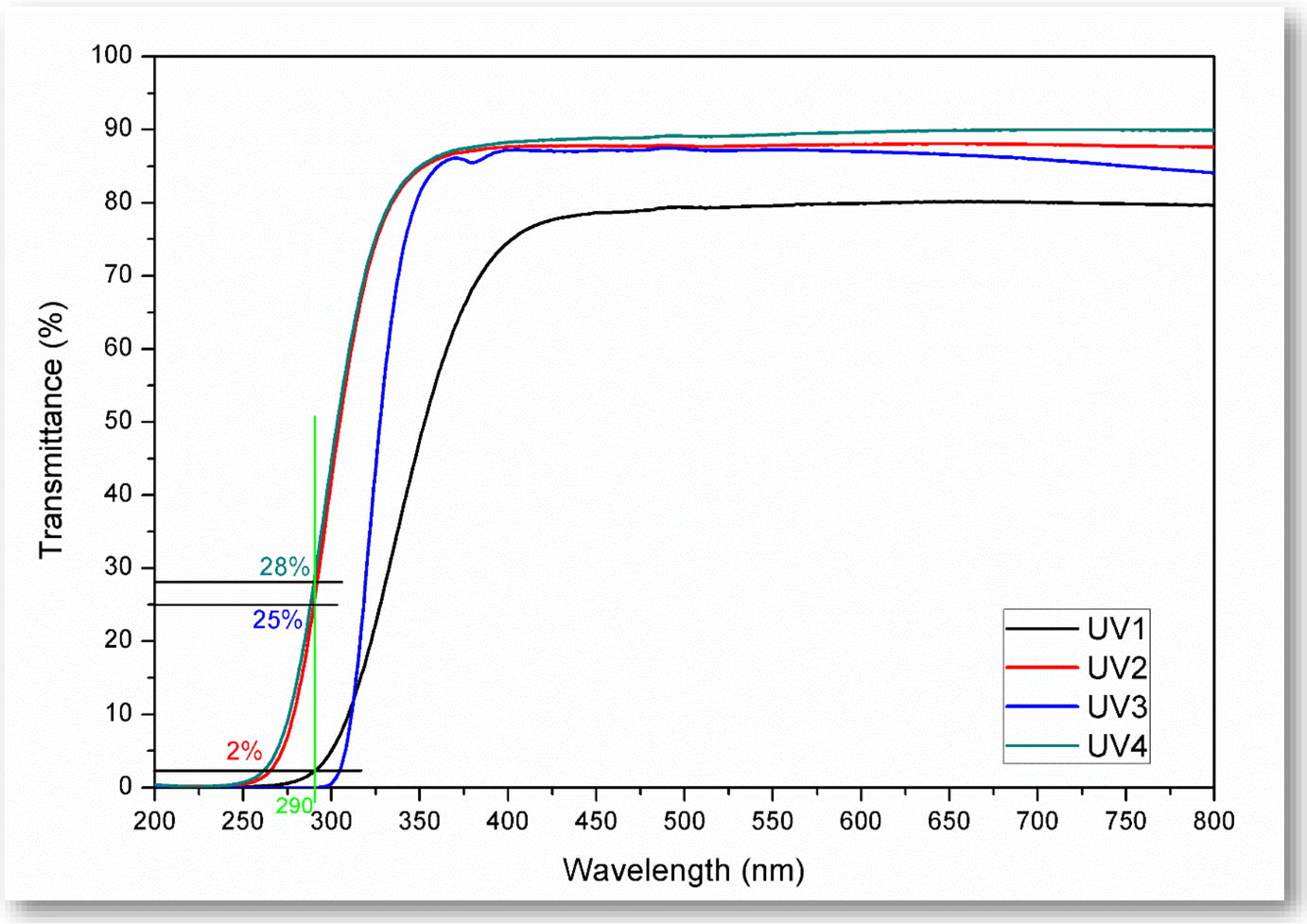
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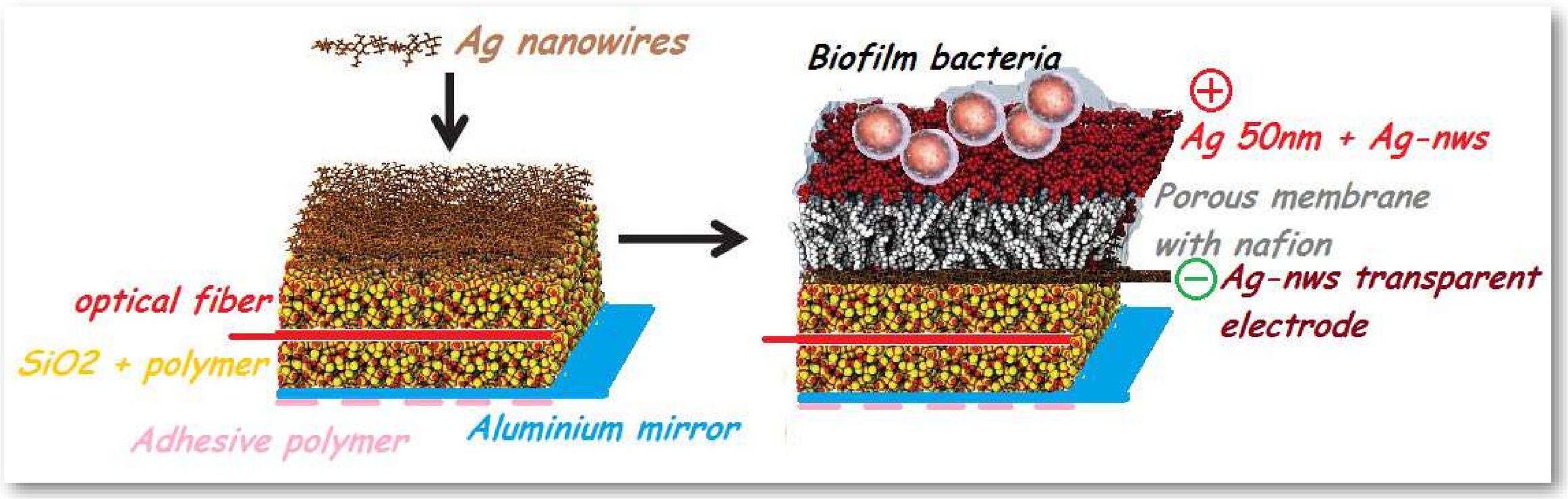
Research project

Authors: Radu Banica, Mihai Eftimie

The demonstrative experimental model of UV glass enhanced antibacterial membranes synthesis method implies the design, synthesis and complex characterization of the developed glass compositions and of Ag nanowires on the polymer. Subsequently, the layered material is obtained and currently optimised, followed by demonstration of the experimental model, evaluation of the antibacterial parameters of material. All of these are based on correlation between experimental model characteristics of synthesis method, glass' UV transmittance and antibacterial applications. The project will end with final laboratory validation of the demonstrative experimental model.







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TUIASI
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A NEW ORTHOSIS CONCEPT FOR THE REMOTE TREATMENT OF KYPHOSIS

Patent no. RO133697B1 / 29.09.2023

Author: Bioeng. Dimitrie-Cristian FODOR, PhD Student

Doctoral School of the **Gheorghe Asachi** Technical University of Iasi
Dr. Iacob Czihac Military Emergency Clinical Hospital of Iasi

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Description of the invention

Over time, the spine can deform under the influence of environmental factors, following trauma, or by adopting a vicious body position for a long time - computer pathology (Fig.1).



Fig. 1 – Cervical kyphosis (CK)

Wearing a postural correction device (PCD) is sometimes indicated as part of recovery treatment, alternating with physical therapy exercise, to increase muscle tone.

The PCD is made up of four major components represented in Fig. 2:

A – vertical elastic strut;
B – tensioning system;
C – calculation system;
D – supporting elements.

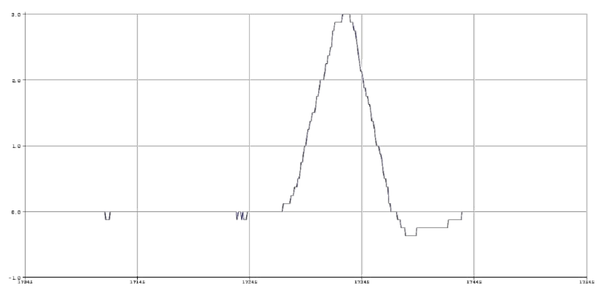


Fig. 3 – Elongation of the spine over time, in the sagittal plane

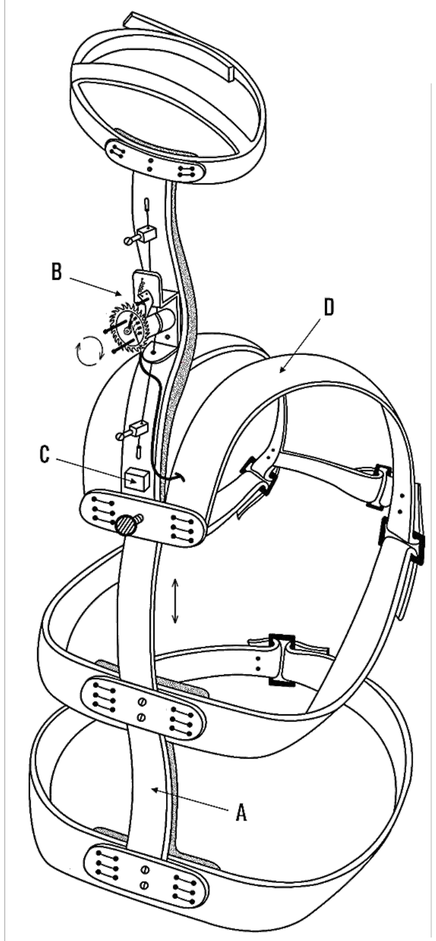


Fig. 2 - Schematic representation of PCD

The PCD will fit on the patient and transmit information from some sensors to the specialist regarding the elongation that varies during medical recovery (Fig 3). At the same time, the system can determine the patient to adopt an appropriate position, promptly informing him through vibrating/acoustic/visual signals.

Treatment scenarios

Treatment through orthopedic surveillance and postural correction is the most effective (72.26%), the need for such a non-invasive correction and telemonitoring system (without radiology) is justified (Tab. 1).

Tab. 1 – Incidence of cervical kyphosis (CK)

Potential patients	
Children (10-14 years)	Adults (M & F)
24 %	**40%**

The principle of operation

Acquired data can be sent to a host computing device (smartphone, tablet, PC) where it can be processed to provide statistical or procedural information. These data can also be recorded (Fig. 4).

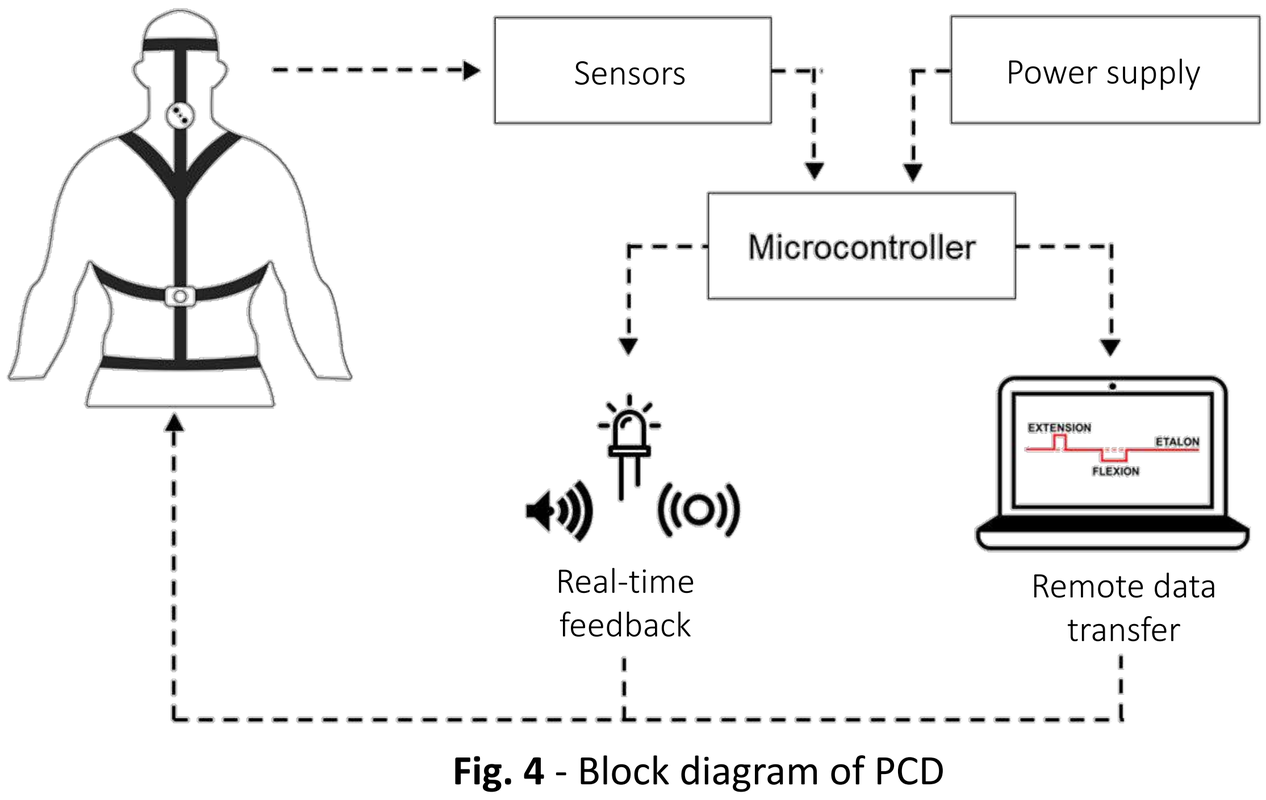


Fig. 4 - Block diagram of PCD

Conclusions

The Technology Readiness Level is assessed as TLR 5, given the fact that the technology is validated in a relevant environment by specialists in the field of medical recovery (Iasi Clinical Recovery Hospital), while also having an invention patent obtained at the Romanian State Office for Inventions and Trademarks.

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5th International Exhibition
InventCor
4-6 April 2024 – Deva, Romania

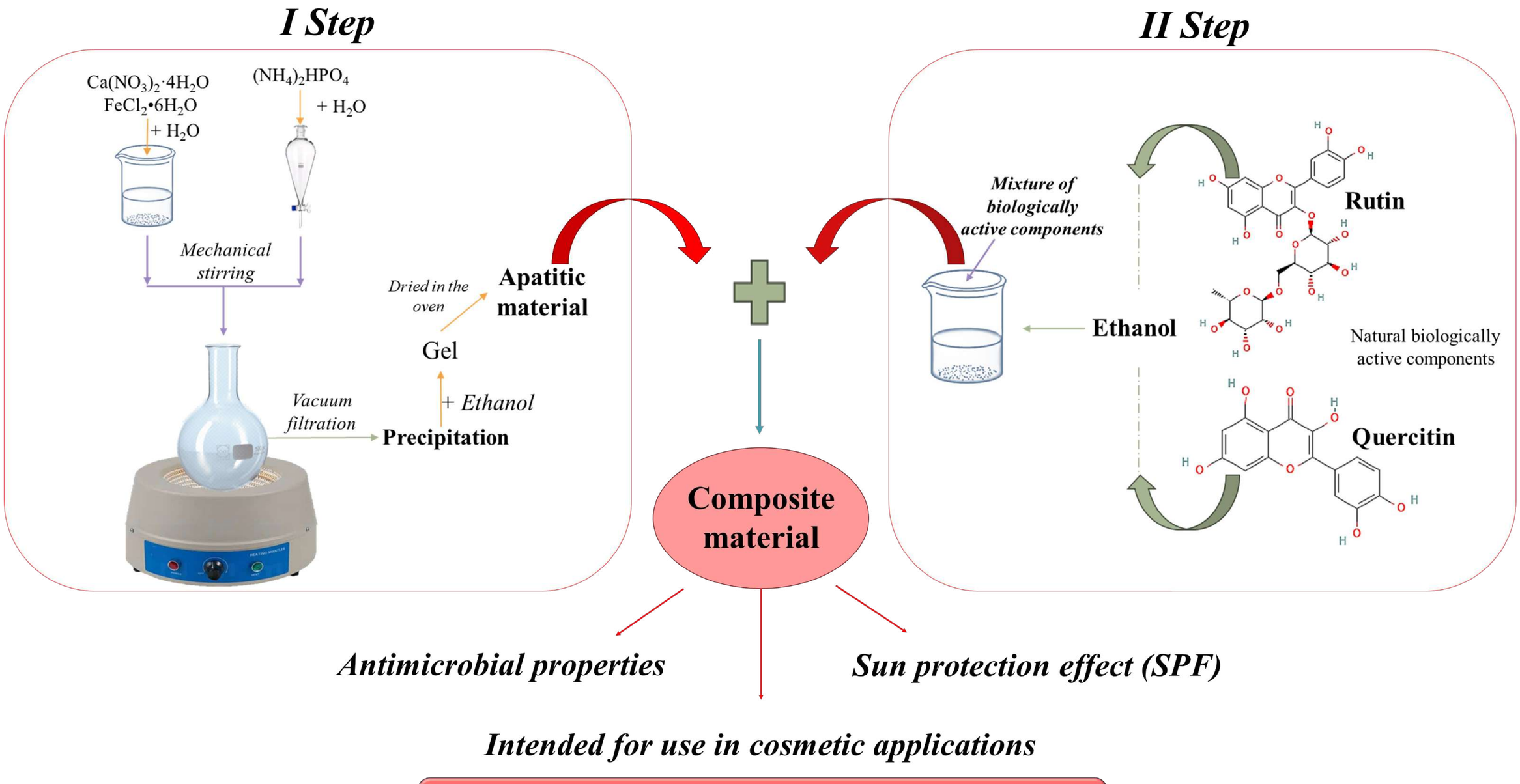
ACTIVE COMPOSITE MATERIAL WITH ANTIMICROBIAL AND SUN PROTECTION PROPERTIES WITH THE POTENTIAL FOR USE IN COSMETIC FORMULATIONS AND PROCEDURE FOR OBTAINING

Patent application No. A-00069/2024

F

Irina Fierascu, Anda Maria Baroi, Radu Claudiu Fierascu, Roxana Ioana Brazdis (Matei), Toma Fistos, Ioana Silvia Hosu, Florentina Monica Raduly

The present invention refers to a composite material with antimicrobial and sun protection effect, intended for use in cosmetic applications, consisting of an apatitic material, used as an active ingredient and natural bioactive compounds (such as quercetin or rutin). The procedure for obtaining the composite material consisting of two stages, obtaining the apatitic material by the sol-gel method, respectively obtaining the composite material.



ADVANTAGES OF THE INVENTION

- **It can be replicated in terms of its physical and structural characteristics.**
- **It is acquired through established methods, without the need for expensive production costs.**
- **It has superior antimicrobial properties**
- **It has superior solar protection properties**
- **The synthesis process does not employ any reagents that pose a threat to the environment or human health.**

ACKNOWLEDGEMENTS

This work was supported by the Ministry of Research, Innovation and Digitization,CCCDI—UEFISCDI, project number PN-III-P2-2.1-PED-2021-0273, within PNCDIIII. The support provided by the Ministry of Research, Innovation and Digitizationthrough Program 1—Development of the national research and development system,Subprogram 1.2—Institutional performance—Projects to finance excellence in RDI,Contract no. 15PFE/2021 is also gratefully acknowledged

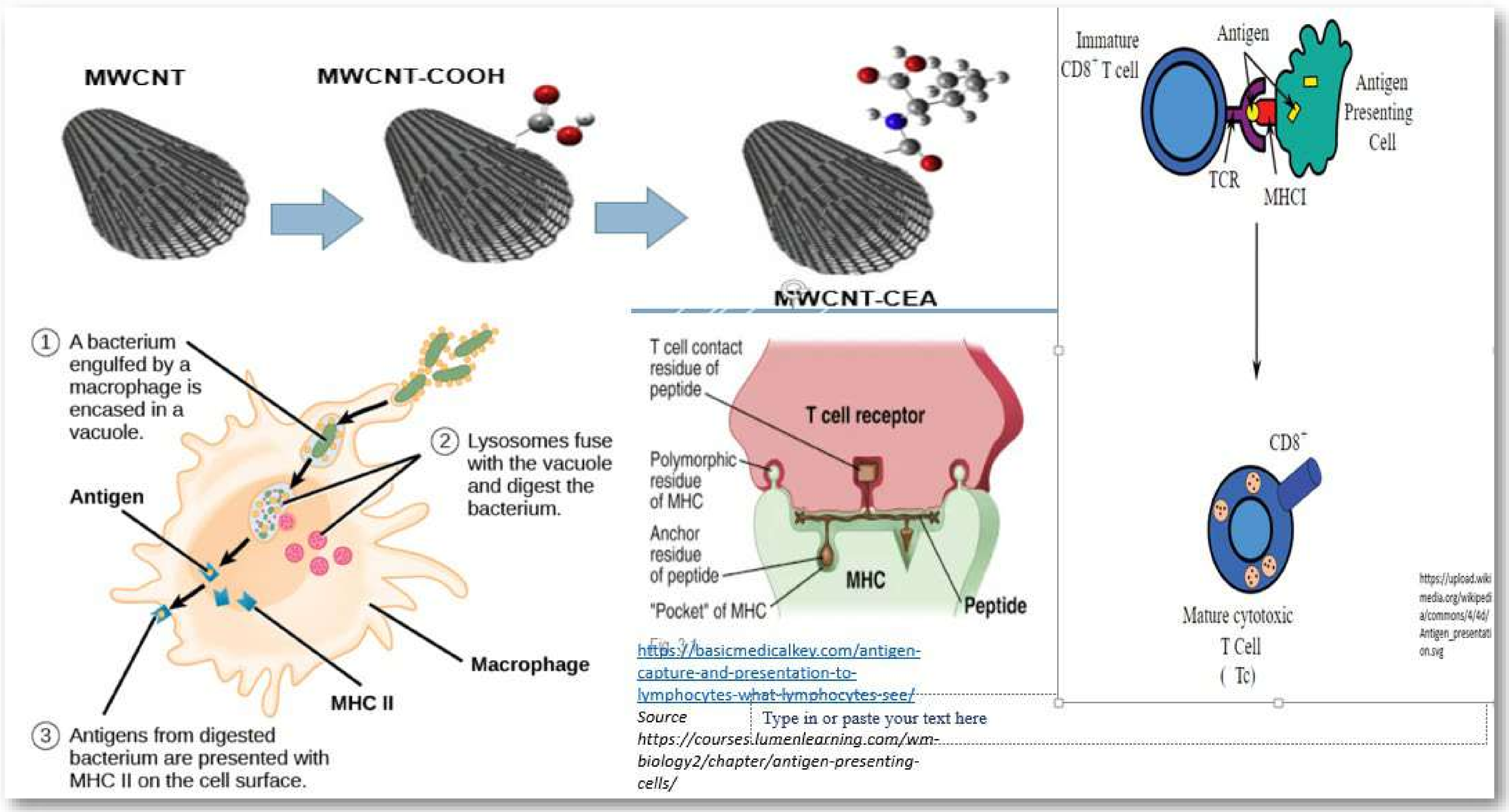
CONTACT:
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METHOD FOR OBTAINING A NOVEL DESIGN FOR PANCREATIC CANCER APPLICATIONS

Iancu Cornel, Matea Cristian, Mocan Lucian, Mocan Teodora

F

The invention relates to a process for preparing a carcinoembryonic product to be applied in pancreatic and colonic cancer immuno-prophylaxis. According to the invention, the process consists in that, in the first stage carboxylated carbon nano-tubes of MWCNT type are obtained, after which they are functionalized by covalent binding with the carcinoembryonic antigen, then the so-functionalized nanostructures are subjected to successive stages of centrifugation and redispersion by ultrasound.
50mg MWCNT (Sigma-Aldrich 724769) are dispersed by ultrasonicator in 5mL of sulfonic acid mixture for 10 minutes. Then add an additional volume of 45 mL of a sulfonitic mixture and the solution is brought to 95 ° C for 15 minutes, after which the solution is added over 150 g of ice. Carbonated carbon nanotubes obtained are subjected to a centrifugation step (3000 RPM / 10 min.). Supernatant removed, redispersed in 50 mL H2O dist. and adjust the pH to ~ 8.5. For functionalization of CEA protein carboxylated nanotubes on 9mL soil. MWCNT is added 2mL of sol. EDC / NHS [30mg: 30mg / mL] and allowed to stir for 10 minutes at room temperature, then 150µl of mercaptoethanol and 3mL of CEA 5u.M. The reaction is left to completion for 120 minutes under stirring and at room temperature. The CEA protein-functionalized carbon nanotubes (MWCNT-CEA) are subjected to centrifugation steps (15,000 RPM / 20 min.) And redispersion by ultrasonography in a H2O bidist . in order to remove secondary reaction products. The MWCNT-CEA solution is subjected to atomic force (AFM) microscopy methods. The size of nanoparticles was calculated based on profiles extracted from images, MWCNT-CEA ranging from 33 to 61nm.



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Process for Synthesis of Biofunctionalized Nanoobjects with Applicability in Tumoral Photothermal Therapy

Authors: Mocan Lucian-Constantin, Iancu Cornel, Matea Cristian-Tudor, Ilie Ioana-Rada, Mocan Teodora

F

The invention relates to a process for the preparation of β-mercaptoethanol functionalized gold nanoparticles (PME) for applications useful in optimized phototherapy of hepatic tumors.

It is known that βME is a powerful antioxidant agent used in enzyme assays and cell culture protocols because of its properties to prevent protein oxidation (1). Also, the property of denaturing ribonucleases, preventing RNA digestion, is preferred within RNA isolation protocols (2). The substance also demonstrated proliferative effects on human osteoprogenic cells (3) or beneficial, regenerative effects on the Langerhans islands (4).

Its antioxidant quality has imposed itself as a reducer of the level of oxidative stress induced by various compounds at the liver level (6). Though gold nanoparticles are among the nanostructured materials with acceptable biocompatibility levels, there is evidence that this type of nanomaterial, like other types of nanoparticles, is able to modify the redox equilibrium at the local level generating oxidative stress (7).

The known solutions have the following disadvantages: they have a low degree of biocompatibility and selectivity for liver tumors.

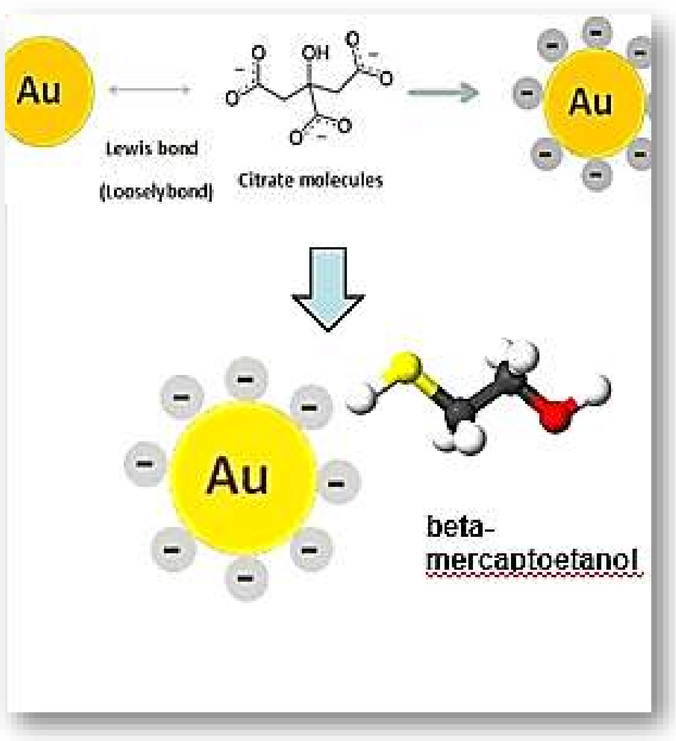
The problem solved by the invention is to increase the biocompatibility of gold nanoparticles used in the photothermal therapy of hepatic tumors.

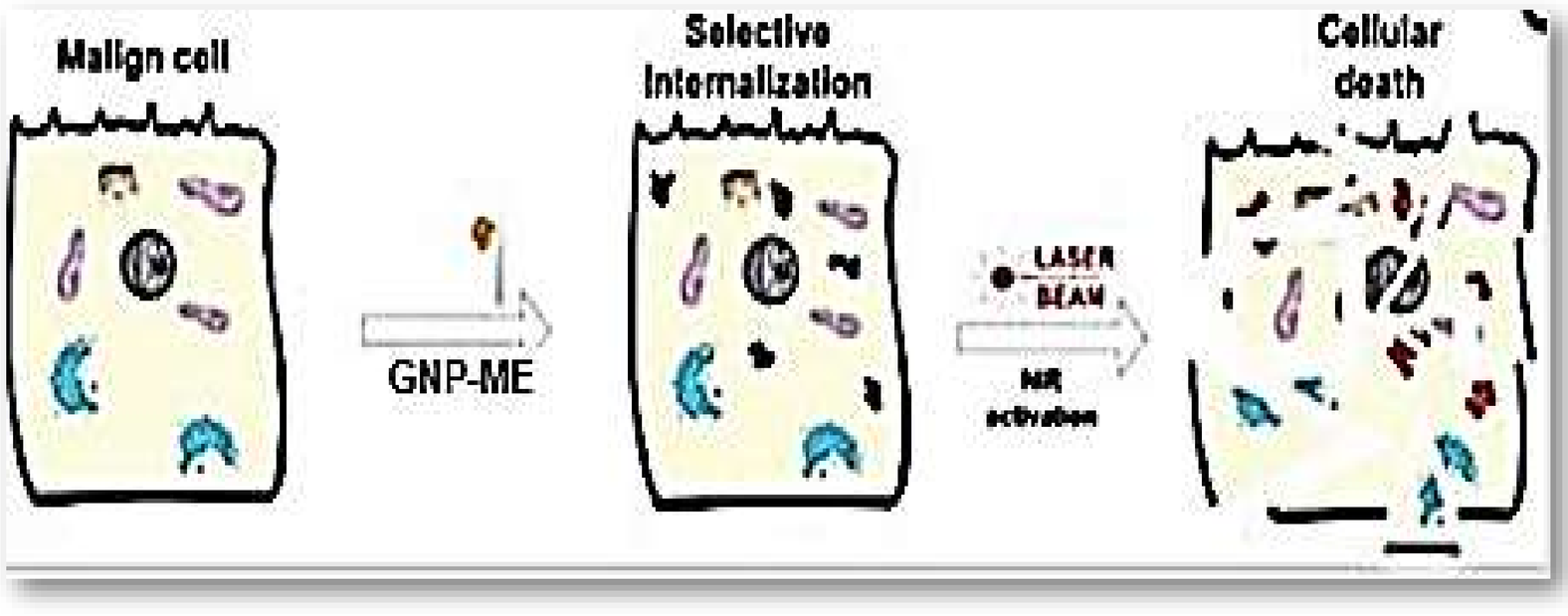
The purpose of the invention is to use gold-functional nanoparticles with βME in optimized phototherapy of hepatic tumors

The procedure according to the invention consists in that gold nanoparticles (GNP) are initially obtained in aqueous medium and stabilized with citrate, and the functionalization of gold nanoparticles with P-mercaptoethanol is carried out in two steps. In the first step, citrate-stabilized gold nanoparticles are synthesized. In the second step, P-mercaptoethanol is coupled to

The reaction was carried out at neutral pH and at room temperature for 15 minutes.

The so-functioned gold casings are subjected to successive centrifugal andultrasonic redispersion in H_2O bidist. in order to remove secondary reaction products. This new type of nanostructure obtained has applicability in optimized photothermal therapy of liver tumors, with the reduction of its oxidative effects.





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NANOTARGETING PROTOTYPE FOR ANTI-CANCER CURATIVE APPLICATIONS

PHD

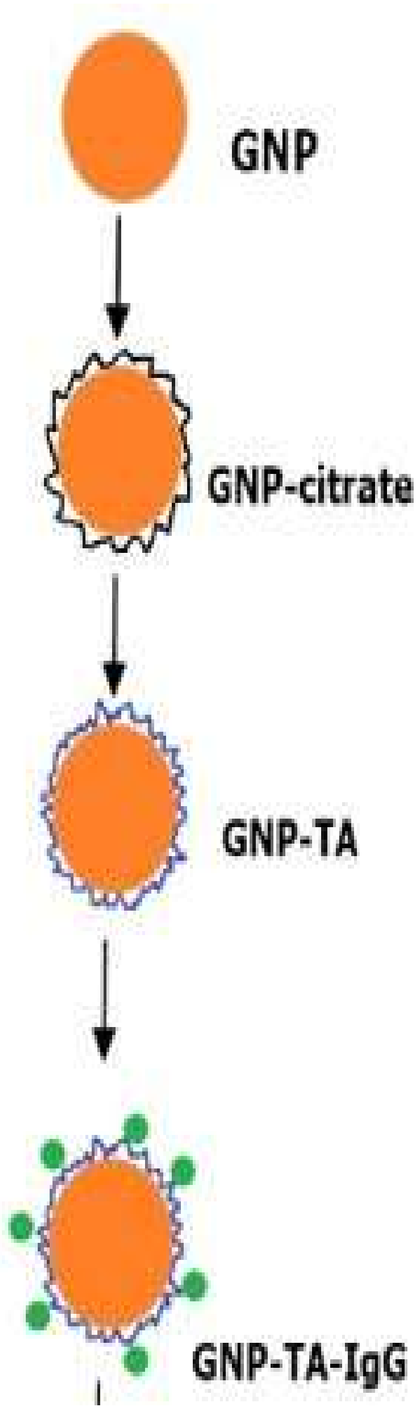
Authors: *Stefan Titu, Mocan Lucian, Romelia Pop, Teodora Mocan, Flaviu-Alexandru Tabaran, Iancu Cornel, Alexandru Irimie*

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Matrix metalloproteinase -1 has been demonstrated to interfere with cell migration, invasivenes and colagen distruction in cancer patients. In particular, the hemopexin domain of MMP-1 regulates cell behaviour and the concentration upregulation has been known to increase rate of tumor local and metastatic growth.

Also, gold nanoparticles represent FDA-approved solutions for cancer imaging and treatment, due to their high level of biocompatibility. We hereby propose an experimental model that starts with the synthesis of gold nanoparticles (modified Turkewich method). The next step of our concept is represented by binding of the anti-MMP1 hemopexin domain antibody onto the surface of nanoparticles. The newly designed construct has a signifficant potential for targeting applications (photothermal treatment, tumor imaging) in cancer field.

Gold nanoparticles stabilized with citrate (GNP-cit.) are synthesized in aqueous medium, as follows: 29mg HAuCl4*3H2O are dissolved in 50mL H2O dist. under continuous stirring and the solution heated to 1000C. Add 5 mL of sodium citrate (20mg/mL) and the reaction is allowed to continue at 1000C under continuous stirring for 2h. In the next step, the citrate ions on the GNP surface are replaced with thioctic acid, as follows: the pH of a 9 mL volume of soil is adjusted. GNP-cit. 9.8nM at pH=11 with the help of a 0.1M NaOH solution. add 90µL of soil. ethanol TA 10mM and 40µL NaCl 2M under continuous stirring, and the reaction is completed for 90 minutes. The obtained GNP-TA solution is then subjected to a 15000RPM/10min centrifugation stage. followed by re-dispersion of the sediment in H2O dist. For the covalent coupling of immunoglobulin G (IgG): adjust the pH of a 3mL GNP 9.8nM solution to pH=8.5, using a 0.1M Na3PO4 solution, add 900 µL EDC (30mg/mL) and 900 µL NHS (30mg/mL), and then, after a 10-minute fermentation, add 4mL of soil. GNP-TA under continuous stirring. The bio-nanostructure obtained GNP-TA-IgG is subjected to an additional step of centrifugation (14000RPM/20min.) and re-dispersion in H2O dist. in order to remove secondary reaction products.



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PROCEDURE FOR OBTAINING BIOCAPSULES INTENDED FOR COLON ADENOCARCINOMA IMMUNOPROPHYLAXIS

Authors: Agoston Vas Coldea Lucia, Mocan Teodora, Iancu Cornel, Mocan Lucian, Tăbăran Flaviu, Matea Cristian.

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The synthesis of gold nanoparticles (AuNP) is performed in an aqueous medium: 25mg of HAUC14 are dissolved in 50 mL of H2O bidist are brought to 100 ° C with continuous stirring, to which is added 10mL citrate solution sodium (concentration 20mg / mL). The reaction is allowed to continue to reflux for 120 minutes with stirring.

The next step is to replace the citrate on the surface of gold nanoparticles with mercaptosuccinic acid (MSA). A volume of 9mL of the AuNP solution obtained in the previous step (10nM concentration) is neutralized with a 0.1M Na2HPO4 solution, 0.1M, and lmL sol is added. MSA 50nM, and the reaction is allowed to continue for 300 seconds at room temperature with stirring.

The solution of Au-stabilized nanoparticles with mercaptosuccinic acid (AuNP-MSA) is then subjected to centrifugation steps (14,000 RPM / 20 min.) and ultrasound redispersion in 10 mL of H2O bidist. in order to remove the secondary reaction products. Then, for the operative step, 10 mL of soil are used. AuNP-MSA to which was added 4mL EDC / NHS [50mg: 50mg / mL] and allowed to stir for 15 min. at room temperature, then centrifuged, the supernatant was removed and the nanoparticles were resuspended in a volume of 10mL MUC-1mM peptide IL-1 with an in-sample sonicator.

The coupling reaction between AuNP-MSA and the MUC-1 peptide is left to completion for 30 minutes under agitation. The functionalized gold nanoparticles are subjected to successive centrifugation and re-dispersion steps in H20 bidis. in order to remove the secondary reaction products. To obtain the Allium ursinum extract, start from 3g of the Allium ursinum plant matrix which is crushed with an ultraturax homogenizer in the presence of 20mL absolute ethyl alcohol and then magnetically agitated for 15 minutes. The extract is further filtered through a 0.45 µm membrane and concentrated, under vacuum and room temperature, with a rotary evaporator to a volume of ImL.

In order to encapsulate in alginate, the two solutions: 5 ml of AuNP-MSA-MUC-1 and 500 µL of Allium ursinum extract obtained in the previous steps are added to a solution of 2% sodium alginate added dropwise with the help of a syringes in a CaCl2 bath with a concentration of 1-2.5%. The time of formation of the biocapsules in the curing bath is between 60 and 300 seconds. The thus obtained biocapsules are removed from the CaCl2 bath and are washed with H2O bidist. and subjected to atomic force (AFM) microscopy and dynamic light diffraction characterization.

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Customized dietary supplement development for bariatric patients

Daniela Ciobârcă[1], Gianina Crișan[2], Florinela Cătoi[3], Doina Miere[1], Dan Vodnar[4], Andrei Mocan[2,5], Ana-Maria Vlase[2], Mihai Babotă[6]

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INTRODUCTION



Background: Patients with obesity undergoing laparoscopic sleeve gastrectomy (LSG) are prone to develop micronutrient deficiencies (MNDs). Postoperative MNDs are often caused by a wide array of surgery- or patient-related factors as well as by potential preoperative deficiencies frequently observed in patients with obesity. Moreover, obesity is accompanied by an imbalance of the gut microbiota (GM), termed dysbiosis. MNDs can worsen dysbiosis, while also being aggravated by intestinal bacterial imbalance. Studies have shown that bariatric surgery (BS) enables a partial reverse of the preoperative dysbiosis. However, BS alone is not able to fully restore GM of bariatric patients, such that administration of probiotics following surgery might seem a promising approach to contribute to this process. Restoring of microbial balance might as well enhance the micronutrient status of bariatric patients.
Objective: To develop a dietary supplement specifically designed to prevent or correct MNDs in patients undergoing SGL by promoting the restoration of intestinal bacterial balance.

MATERIALS AND METHODS

Step 1. Probiotic powder blend

a) Bacteria cultivation


Bacteria


37°
18-24 h
MRS


Inoculus


Sterile MRS bioreactor

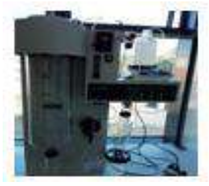
Fermentation, 18 h
37°, pH=6.5 (+20% NaOH), 150 rpm agitation


Fermented MRS bioreactor

b) Microincapsulation


Centrifugation, 4-5 min
800-1000 rpm, 4°C


Maltodextrin + glucose
Microincapsulation matrix


The spray-dryer machine



Step 2.Bilberry extract


Raw bilberry


96° ethanol


+450 mL solvent


Magnetic stirrer
800 rpm, 4h


Lyophilization of the bilberry extract


The dry bilberry extract

Step 3. Micronutrient, probiotic and bioactive compounds powder






Multi-compounds powder


Manual capsule filling machine

RESULTS

Multivitamins with probiotics and vegetal bioactive compounds with prebiotic properties, customized for bariatric patients nutritional needs



- 20 vitamins and minerals; blend of 4 probiotic strains; 2 powerful bioactive compounds with prebiotic properties

***In vitro* quality assessment of the capsules**

Table I. Physical characteristics of the capsules as mean and standard deviation

PARAMETER	CAPSULE
Weight (mg)	0.740±0.02
Length (mm)	23.5±04

Table II. Average net weight of capsules and percentage deviation

PARAMETER	VALUES
Average weight	0.620 mg
Average weight+7.5%	0.666 mg
Average weight-7.5%	

Table III. Disintegration time test results

DISINTEGRATION TIME (MINUTES)
1.58
2.1
2.17
2.22
2.26
2.29
Average time: 2.10

CONCLUSIONS

Our customized multivitamin supplement is a unique formula, containing multiple micronutrients and a pre- and probiotic component, aimed at improving the postoperative micronutrient status of patients submitted to LSG and the bioavailability of micronutrients by contributing to GM restoration to a health-associated composition.

Contact: Assist. Prof. Daniela Ciobârcă, PhD.; muresan.daniela@umfcluj.ro

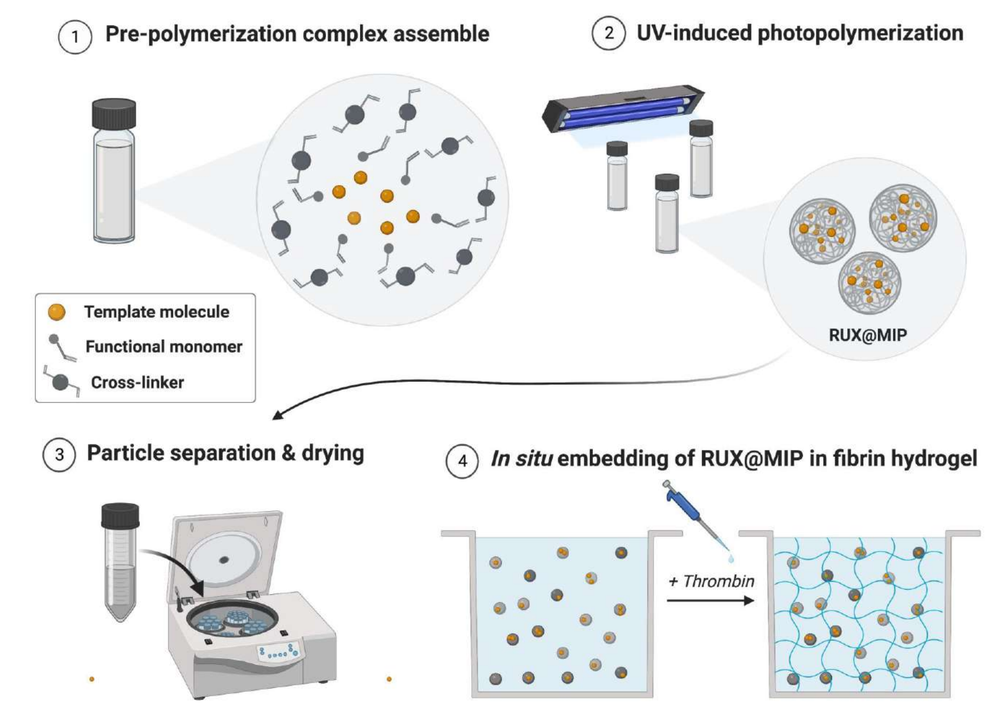
Process for obtaining a device for prolonged and controlled delivery of ruxolitinib in glioblastoma

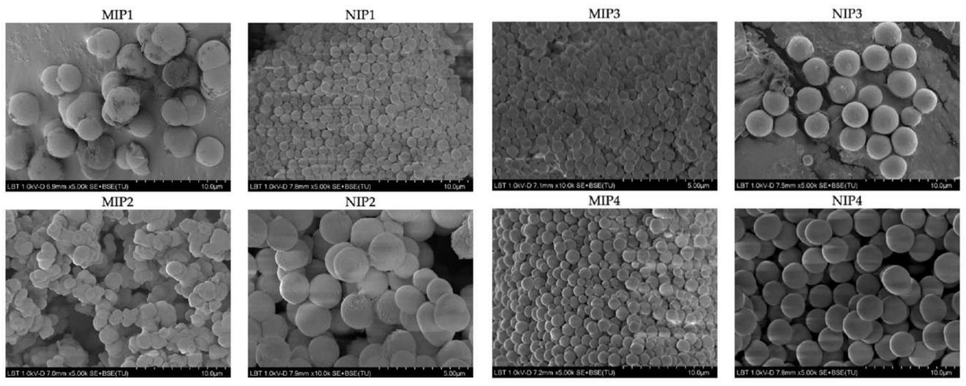
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The research was supported by a grant of the Romanian Ministry of Education and Research, CCCDI-UEFISCDI, project number PN-III-P2-2.1-PED-2019-1387 within PNCDI III, patent no. A 2022 00444/05.07.2022

Authors: Florian Ioan-Ștefan, Șușman Valeriu-Sergiu, Ede Bodoki, Soriță Olga, Pește Petru-Cosmin, Florian Ioan-Alexandru, Iacob Bogdan-Cezar, Bărăian Alexandra-Iulia, Buruiană Andrei

The invention addresses the current shortcomings of glioblastoma (GBM) chemotherapy by designing a molecularly imprinted drug reservoir tailored for post-surgical recovery. Our objective was to ensure the sustained release of the antitumor drug ruxolitinib (RUX), specifically targeting residual infiltrative cancer cells while mitigating adverse effects. In pursuit of this objective, we have effectively formulated and characterized four unique molecularly imprinted polymers (MIPs), with one progressing to *in vivo* experimentation.

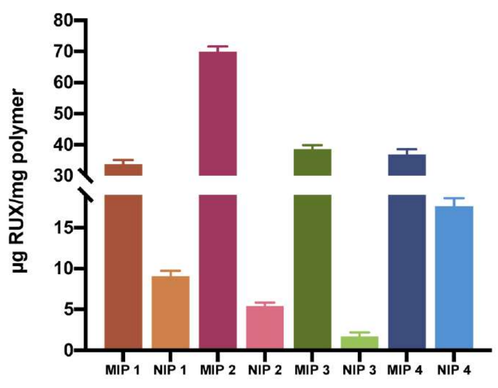




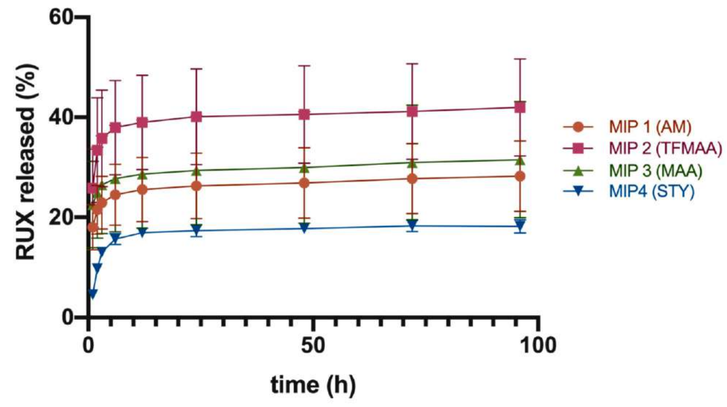
Scanning electron microscopy images

Polymer	Template	Functional monomer	Cross-linker	Initiator	Solvent
M/N1	RUX/ -	Acrylamide	Trimethylolpropane trimethacrylate	Azobis(isobutyro-nitrile)	Acetonitrile
M/N2	RUX/ -	Trifluoromethacrylic acid			
M/N3	RUX/ -	Methacrylic acid			
M/N4	RUX/ -	Styrene			

MIPs were synthesized by UV-photopolymerization using acrylamide, trifluoromethacrylic acid, methacrylic acid, and styrene as monomers, imprinted with RUX and finally loaded into a fibrin hydrogel. The trifluoromethacrylic acid-based polymer (MIP 2) was superior in terms of particle size, loading capacity (69.9 µg RUX/mg MIP), and drug release (42%).

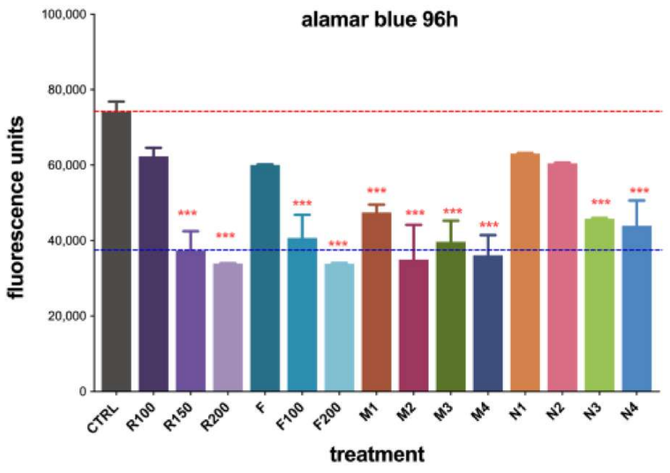


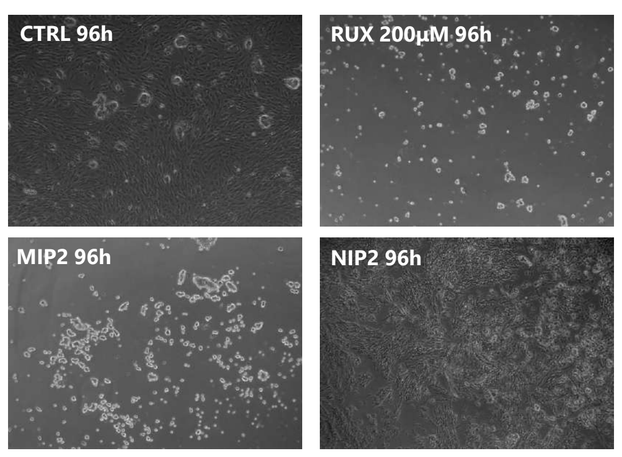
Drug loading capacity



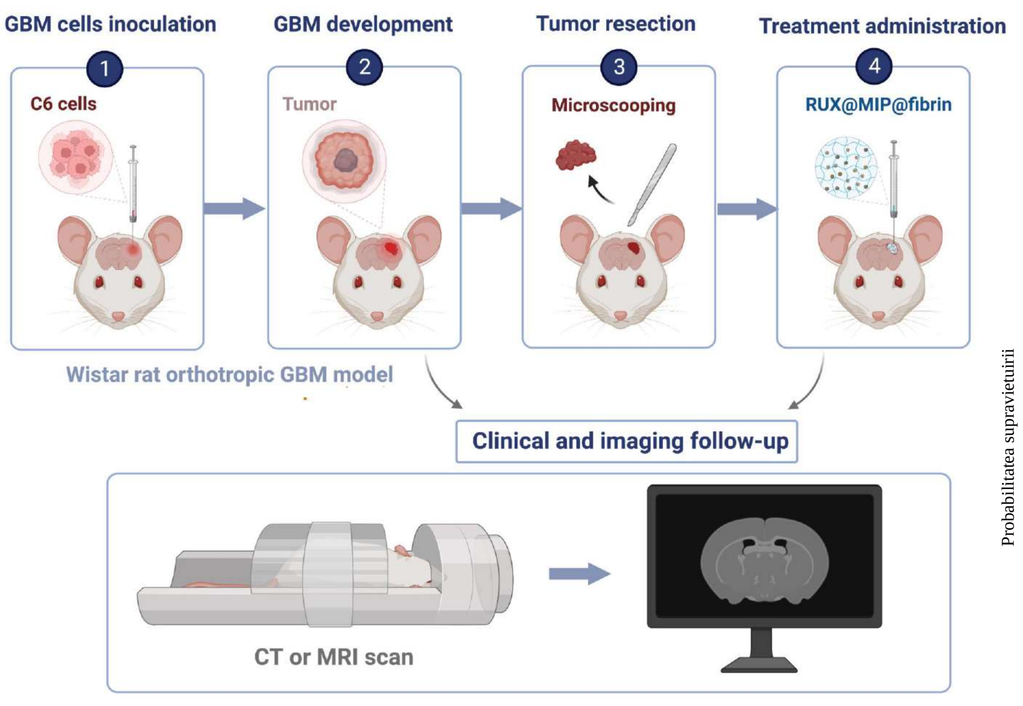
Drug release at 37°C, pH 7.4

Alamar Blue viability assay on C6 GBM cell cultures guided the selection of one MIP for further *in vivo* studies, considering both its efficacy and the potential toxicity of residual monomers. MIP 2 revealed the most favorable risk-benefit profile over the course of 96 hours, offering superior efficacy against GBM C6 cells, while its non-imprinted counterpart (NIP 2) showed low toxicity.

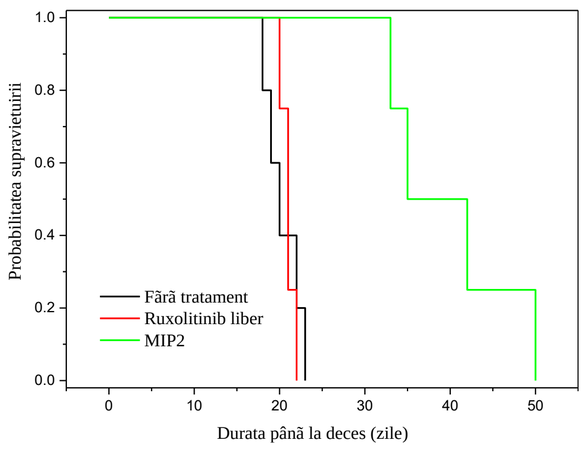




Cell viability assay and optical microscopy images at 96h



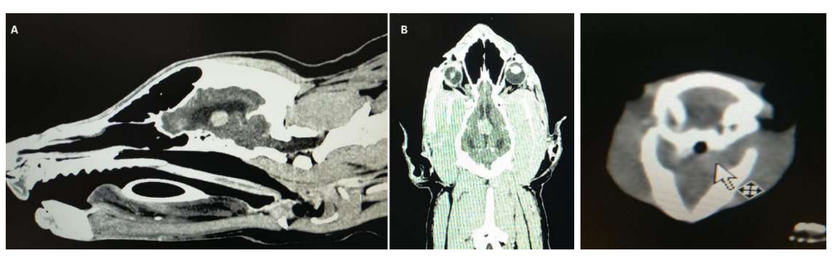
Within the *in vivo* evaluation, animals treated with MIP2 experienced a significant increase in survival time, extending from 20 to 50 days, compared to animals treated with free RUX and the untreated controls.



Kaplan-Meier survival curve



Macroscopic and microscopic aspect of the tumor



Contrast CT in sagittal (A) and coronal section (B), with visualization of the developed tumor (arrow)

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Mucoadhesive system composition for topical release of Doxycycline in the oral cavity

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This project was financially supported by the Project CNCS-UEFISCDI, PN-III-P2-2.1-PED-2019-3664 "Personalized intelligent matrices for tissue regeneration and meta-inflammation control" (PRIM_TISS), No. 348PED/03.08.2020.

Invention Authors:
Elena Dinte, Dana Maria Muntean, Aranka Ilea, Adina Bianca Boșca, Reka Barabas, Liliana-Antonela Bizo, Oana-Alina Cadar

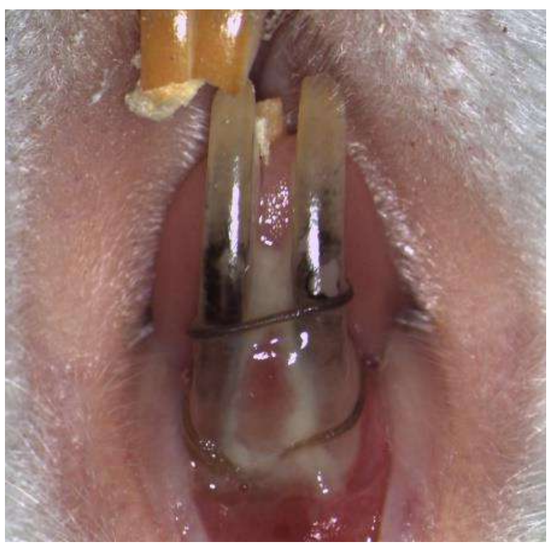
This invention addresses the therapeutic market for oral diseases, which cause pain and disability for millions of citizens. Recent studies show that more than $45 billion is spent annually in the United States due to untreated oral diseases, and between 1996 and 2013, $26.5 billion was spent on dental care for children and adolescents. Of these, periodontal disease represents a global public health problem, with an increased prevalence of over 40% in the United States of America in adults aged 30 and over, being in close correlation with systemic diseases such as cardiovascular diseases, chronic kidney diseases, metabolic syndrome, etc.[1].

The invention refers to the development of a mucoadhesive system based on polyacrylic acid and two grades of hydroxypropylmethyl cellulose, loaded with Doxycycline, which ensures its prolonged topical release, exerting a bactericidal effect for controlling infections in the oral cavity, including parodontitis. The developed system is easily applicable on the surface of the oral mucosa, in different areas (hard palate, oral floor, gums, lips, etc.), and by sealing and isolating the lesion from the oral septic environment, it promotes the healing process. The developed system have presented mechanical properties suitable for application in the oral cavity, and the selected preparation method and the storage conditions ensured the physico-chemical stability of Doxycycline. *In vivo* studies in the experimentally induced periodontitis in rats demonstrated its effectiveness in improving the clinical parameters and reducing the salivary MMP-8 levels. The developed system is beneficial to the public health, as it is well tolerated, allows the topical application of the antibiotic, thus reducing the risk of side effects associated with systemic administration, and increases patient compliance by offering the possibility of self-administration.

Disabling oral lesions



Stomatitis



Periodontitis

Distruction of the dento-maxillary apparatus alters the quality of life, increase the risk of cardiovascular diseases, chronic kidney diseases, metabolic syndrome

Invention

Flexible application in different areas of oral mucosa

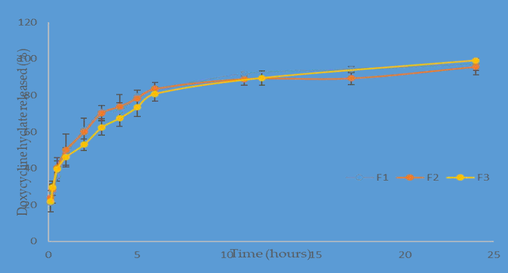


Prolonged *in vivo* mucoadhesion time

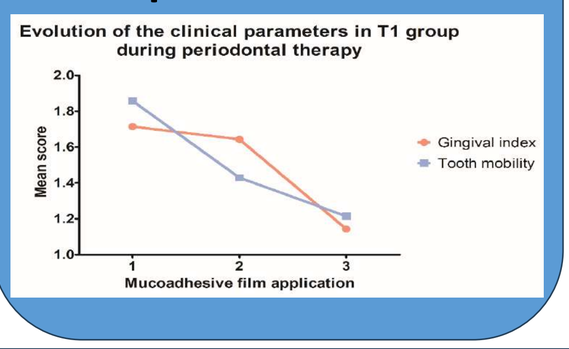


Benefits for public health
Enhanced compliance

Prolonged release of Doxycycline



Efficiency in periodontitis



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1.National Institute of Dental and Craniofacial Research, Periodontal disease in adults (age 30 or older). Available online: https://www.nidcr.nih.gov/research/data-statistics/periodontal-disease/adults (2022).

Enzyme-based Gel for Tooth Whitening and Enamel Regeneration

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[1]Babeș-Bolyai University, "Raluca Ripan" Research Institute in Chemistry, Cluj-Napoca
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Statement of problem

Dental staining can result from the accumulation of molecules with chromophore/chromogenic groups (generally conjugated or even aromatic unsaturated systems) on the surface of dental structures. The treatment of dental discoloration is mainly based on oxidative mechanisms and is currently done with peroxide-based substances. Despite their effectiveness, peroxide products can cause significant alterations to dental structures and have high toxicity, in general.

Objective

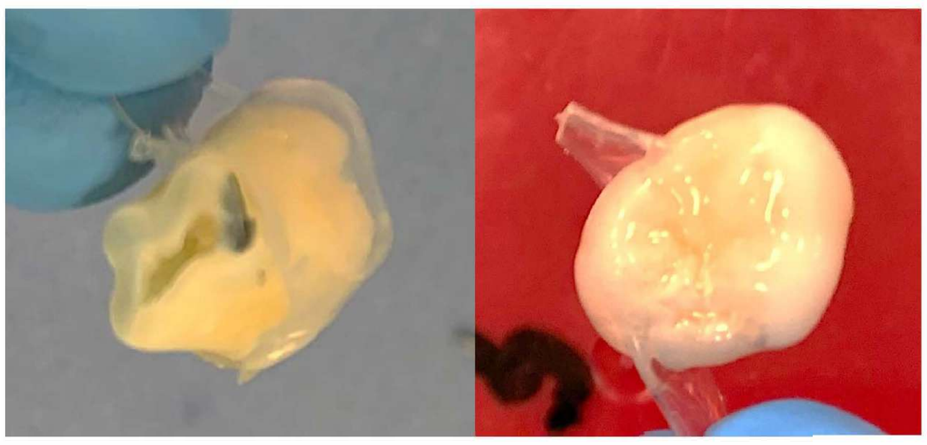
The current patent aimed to develop a gel composition with enzymes, intended for the minimally invasive treatment of localized dental discolorations.

Experimental gel composition

Nanocapsules with enzymes (bromelain), remineralization agents (hydroxyapatite), essential oils as antimicrobial agents, together with lubrizole as a gelling agent. The mixture includes lubrisol 3-6%, quince juice 35-57%, hydroxyapatite 2-3%, polyethylene glycol 400 8-17%, nanocapsules with enzymes (bromelain, papain) 6-8% and water.

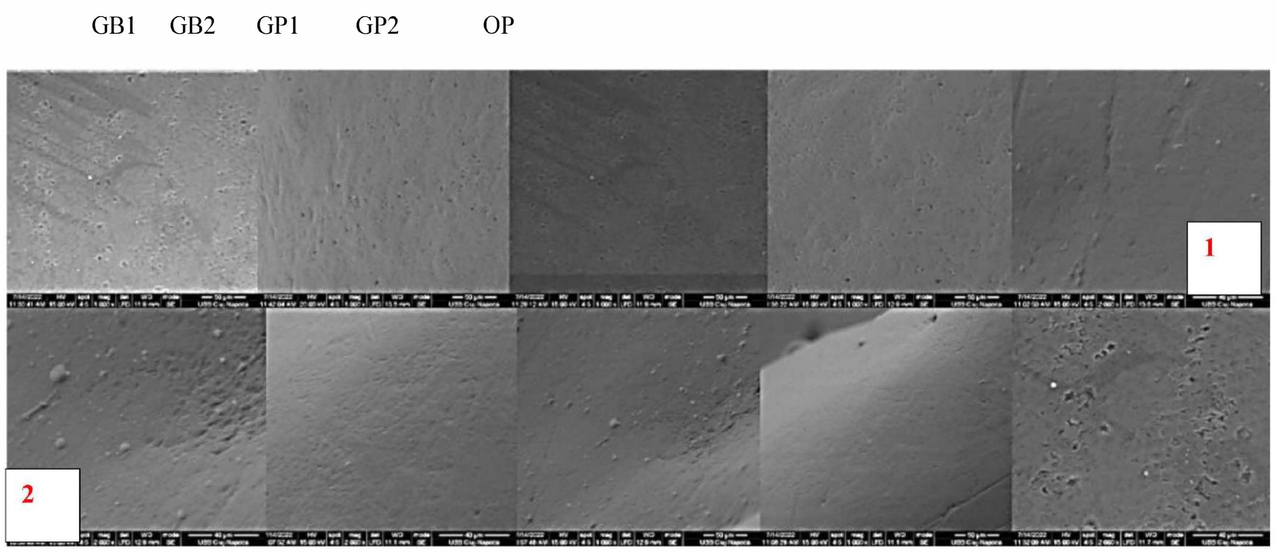
Whitening efficiency

The functionality of dental gels has been validated through their effectiveness in cases of localized intrinsic discoloration. The experimental gels (G2, G4, G2r, G4r) were tested in comparison with a peroxide-based commercial product (OP, OPr) on extracted teeth subjected to a previous staining process in curcumin solution, coffee, and Tedi juice. The CIELAB color coordinates were recorded to evaluate the effectiveness of the bleaching treatment; the differences in the L*, a*, and b* coordinates before and after bleaching were calculated. The color difference was calculated using the formula ΔE_{ab}^*, and its values were related to the perceptibility ($\Delta E_{ab}^*=1$) and acceptability thresholds ($\Delta E_{ab}^*=2.7$). All whitening gels induced a color change. However, much higher values were recorded for the commercial gel (above the acceptability threshold) for both the group with reservoir (r) and the one without. For the experimental groups, values above the threshold of acceptability were obtained only for G4r.

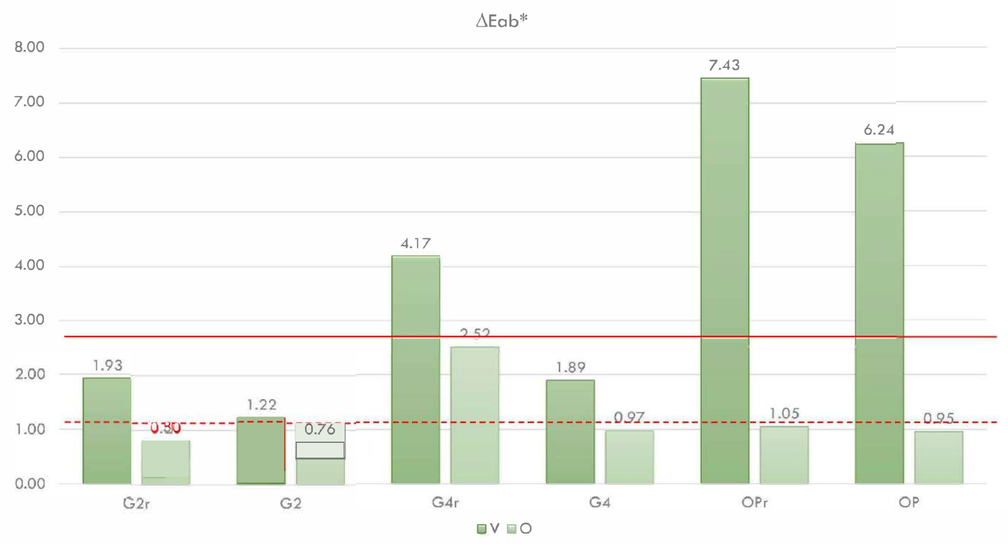


Application of the whitening gel inside the tray (left side without, right side with whitening gel)

The **morphological and surface characteristics** of the enamel structure, both in the untreated initial stage and after the bleaching treatment, were evaluated by AFM and SEM microscopy



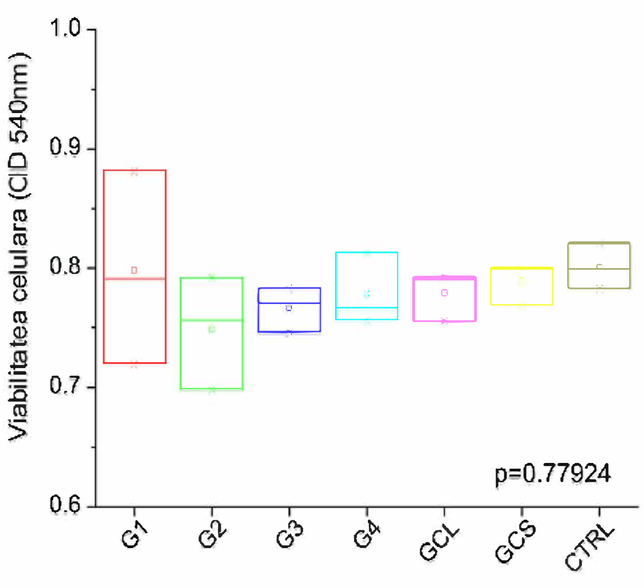
SEM on bleached enamel with the five gels (GB1, GB2 (bromelain), GP1, GP2 (papain), OP (commercial): 1. after staining in Tedi juice; 2. after staining in coffee

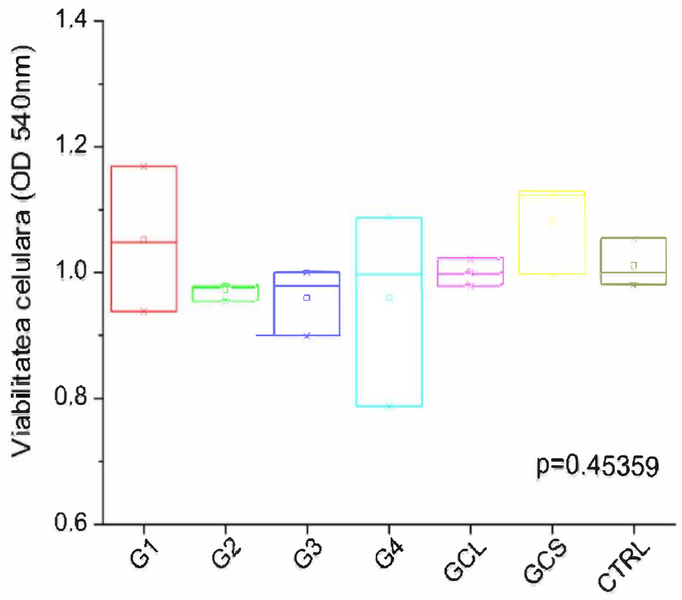


Color differences resulted after whitening (V=test group-treated enamel; O=control group-untreated enamel)

Cytotoxicity of experimental gels

The cytotoxicity test of (G1, G2 (bromelain), G3, G4 (papain), and the control gel without enzymes) was performed using human dental pulp mesenchymal stem cells (dMSC) and human keratinocyte HaCaT cell lines. Cells were cultured according to standard conditions. The potential cytotoxicity of the gels was evaluated with the (4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. To obtain cell suspensions, cells were treated with 0.25% trypsin-EDTA, and after centrifugation (1500 rpm for 5 min), 1x104 cells/well were seeded in 96-well plates in 200 µl of culture medium completely. After 24 hours, 0.1 g of each product was tested using 0.4 µm pore size suspension cell culture insert. Control samples were represented by untreated cells. Each experimental condition was performed in triplicate. Cell proliferation analysis was performed after 24 hours. After 24 h, the medium was removed and 100 µl of 1 mg/ml MTT solution (Sigma-Aldrich, St. Louis, MO, USA) was added. After 3 h of incubation at 37°C in the dark, the MTT solution was removed from each well and 150 µl of DMSO (dimethyl sulfoxide) solution (Fluka, Buchs, Switzerland) was added. Spectrophotometric readings at 450 nm were performed with a BioTek Synergy 2 microplate reader (Winooski, VT, USA). Data are presented as optical density from mean proliferation rate compared to untreated control cells. No cytotoxicity and statistically significant differences were observed.





Cytotoxicity of experimental gels with human dental pulp mesenchymal stem cells (dMSC) and human keratinocyte HaCaT cell lines

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-2019-2953, 334 PED/2020.

Patent request no. A/00453/28.07.2022

Fields of application - minimally invasive cosmetic dentistry

PROCEDEU ELECTROCHIMIC DE OBȚINERE A NANOFIRELOR DE BISMUT DIN LICHIDE IONICE PE BAZĂ DE CLORURĂ DE COLINĂ

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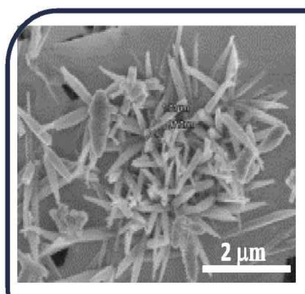
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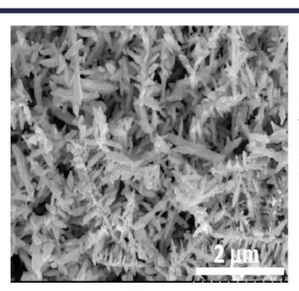
Liana Anicai, Aurora Petica, Marian Enachescu, Veronica Anastasoaie, Oana Lazar, Cecilia Cristea, Andreea Cernat, Teodor Poteca

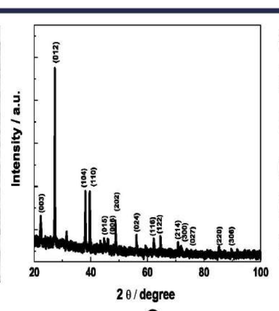
Invenţia se referă la un procedeu electrochimic de obţinere a nanofirelor de Bi (BiNWs) utilizând drept electrolit lichide ionice pe bază de clorură de colină (ChCl), cu impact minim asupra mediului, nanofirele având aplicaţii în construirea unor electrozi de detecţie electrochimică a diferiţilor analiţi. Procedeul conform invenţiei constă în utilizarea unui electrolit pe bază de amestecuri eutectice conţinând ChCl şi acid oxalic (OA) cu raportul molar de 1: 1 la care se adaugă 0,02-0,05 M $BiCl_3$ şi 0,5-0,1 g/l PVP, aplicându-se un curent continuu la densităţi de curent cuprinse între 25-50 mA/cm^2, la o temperatură de 85±5/°C, timp de 30-60 min, cu agitare magnetică, utilizând un catod din bandă de Cu şi un anod de grafit, în urma căruia se obţine un material nanostructurat care, după separarea de mediul electrolitic, este spălat cu apă deionizată şi etanol, filtrat şi uscat cu aer cald, rezultând în final nanofire cristaline de Bi. BiNWs conform invenției se prezintă sub forma unor mănuchiuri de fire uniforme, cu lungimi cuprinse între 1,5-3,6 µm, cu diametre cuprinse între 70-120 nm, cu care se realizează amestecuri omogene în soluții hidroalcoolice de Nafion 5-10% din care se obţin electrozii modificaţi adecvaţi pentru detecţia electrochimică a acidului folic şi a apei oxigenate.

REZULTATE

SEM

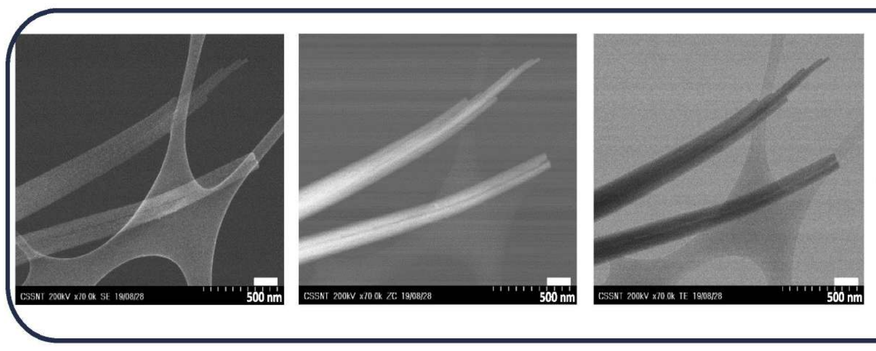






a. ChCl/OA-$BiCl_3$ – 25 mA/cm^2;
b. ChCl/OA-$BiCl_3$-EG-PVP la 50 mA/cm^2;
c. XRD pentru BiNWs din ChCl/OA-$BiCl_3$-EG-PVP la 50 mA/cm^2, 80±5°C, 60 min

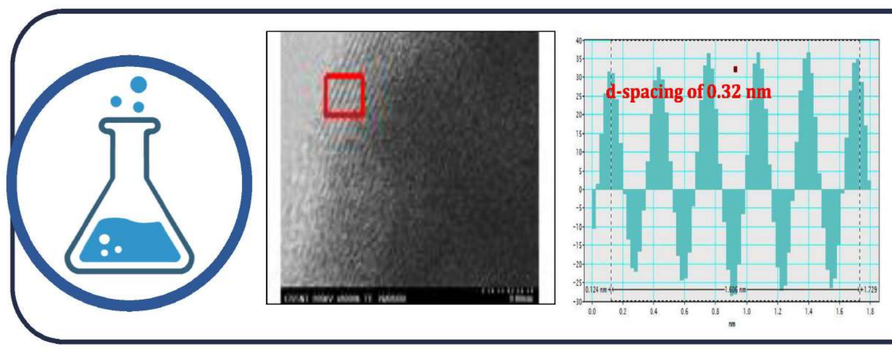
TEM



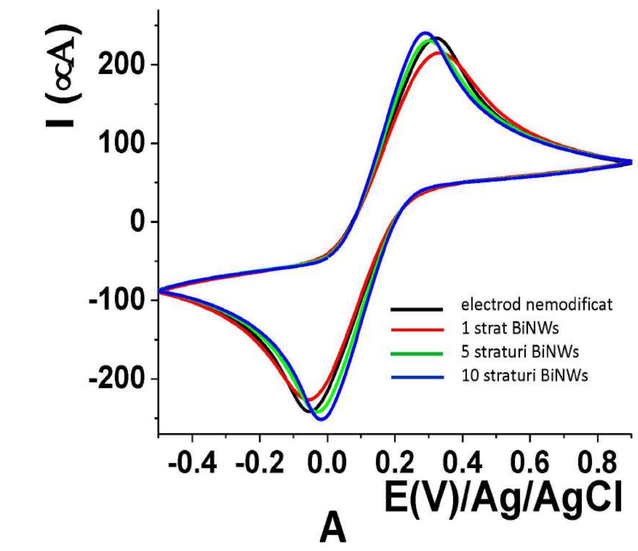
SE – electroni secundari;
ZC – contrast de fază;
TE – electroni de transmisie

(x70k)

UHR STEM

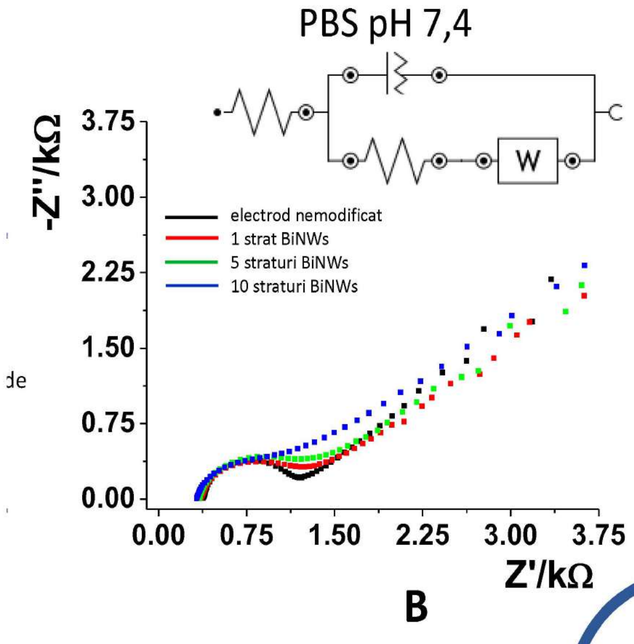


Distanțe interplanare

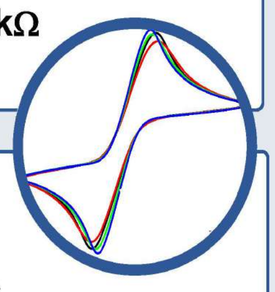


A

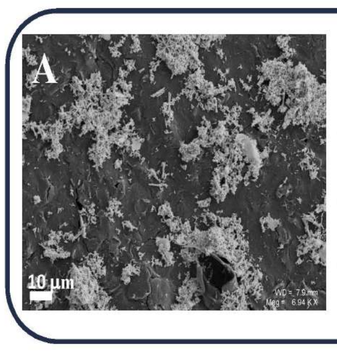
CV și **EIS** în $[Fe(CN)_6]^{3-/4-}$ 10 mM în 0,02 M PBS pH 7,4

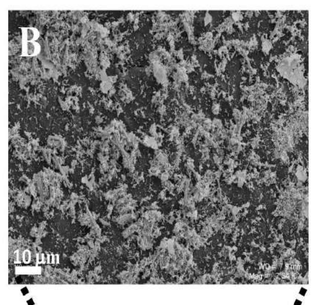


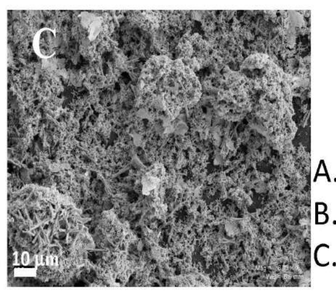
B



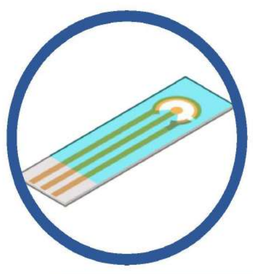
SEM

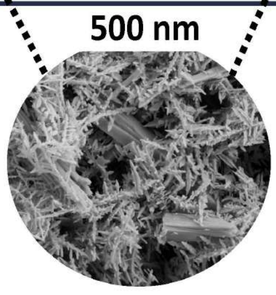




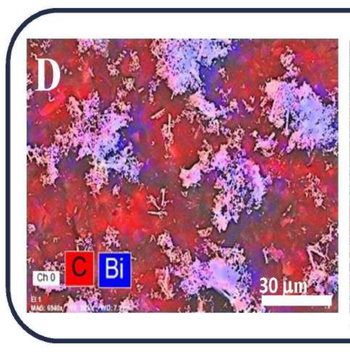


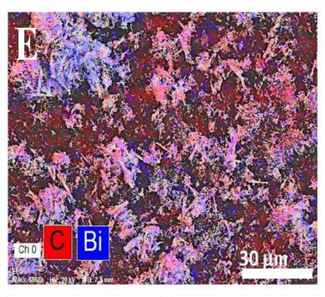
Electrod de grafit modificat cu BiNWs 1 mg/mL
A. 1 strat
B. 5 straturi
C. 10 straturi

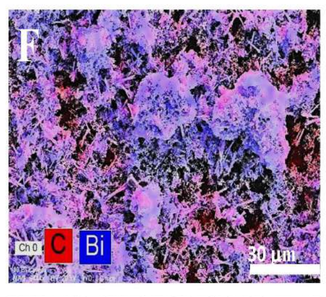




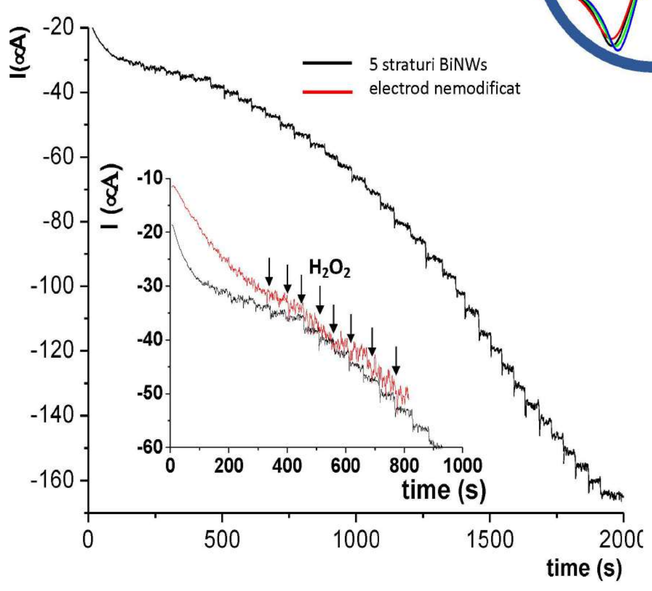
hartă EDX







Distribuția BiNWs



Cronoamperometrie în 10 mL PBS 0.02 M pH 7,4 cu adiții de 0,1 M H_2O_2 (10 μL pentru primele 5 adiții și 20 μL pentrul restul de adiții)

CONCLUZII

- Sinteză electrochimică de BiNWs cu ajutorul electroliților pe bază de ChCl și OA, cu adaus EG și PVP - agenți inductori pentru formarea unei morfologii de tip *fir*;
- SEM, STEM și XRD au confirmat formarea de BiNWs cu lungimi de 1,5-3,5 µm și diametre de până la 120-200 nm; UHR STEM a determinat un spațiu interplanar de 0,32 nm;
- BiNWs au fost utilizate pentru detecția H_2O_2 și platformele optimizate s-au dovedit a fi selective în prezența mai multor compuși din mostre reale.

Project supported by:

PreVasc

Vascular Prevention Virtual Platform

www.prevasc.ro

Authors: Mircea Ionut POPITIU, Miruna Georgiana ION, Gloria GAVRILA-ARDELEAN

F

Motivation

Cardiovascular diseases are responsible for 17.5 million deaths per year

By 2030, the number of deaths will increase to 23 million

1 in 10 people aged 30 to 70 will die prematurely from cardiovascular causes. This includes heart disease and strokes.

The good news? At least 80% of these deaths can be prevented or delayed.

* 1 in 5 Romanians over the age of 65 has peripheral arterial disease.
* 1 in 10 patients with peripheral arterial disease does not have classic symptoms.
* Patients with peripheral arterial disease have a 4-5 times higher risk of suffering a heart attack or stroke.

Solution

PREVASC

VASCULAR PREVENTION

THE NATIONAL AWARENESS CAMPAIGN FOR VASCULAR DISEASE



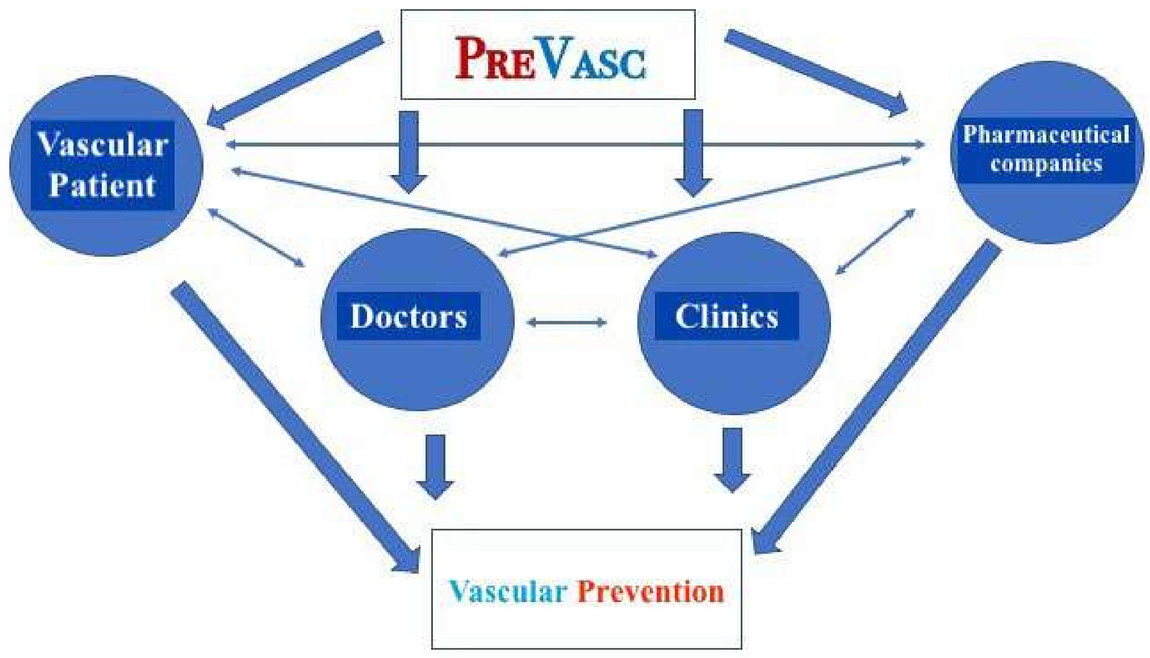
Description

What is PreVasc?

A unique and modern Romanian platform for vascular patients, doctors, clinics, and pharmaceutical companies.

An innovative online database that forms the basis of medical research in the field of vascular pathology.

A professional information system designed for use by specialists in the vascular field.



Impact - the largest online vascular prevention platform.

- Multiple vascular disease screenings were conducted, resulting in over 300 patients receiving free consultations.
- PreVasc also provides useful information to medical students in Romanian universities, considering the absence of mandatory Vascular Surgery courses and internships. This lack has made choosing this specialty after the residency exam difficult. Through this project, 1,600 medical students from Timisoara and Sibiu were surveyed, revealing that more than 80% of them expressed the desire to study and train in Vascular Surgery.

Feedback

- From patients and doctors has been overwhelmingly positive. They all recognize the importance of such a platform, which provides valuable information, integrates all relevant websites, and creates a conducive environment for vascular screening activities: arterial disease, carotid disease, aortic aneurysms, venous disease.

Originality

- PreVasc is the only online vascular prevention platform in Romania that integrates medical information and creates a link - "vascular patients-doctors-clinics-pharmaceutical companies" able to trigger the first vascular prevention project in Romania, the first database (of patients, of doctors who treat vascular pathology, and of data with vascular clinics), the first multicenter study of vascular disease, and the first journal of vascular prevention in Romania.

Collaboration

- The vascular prevention platform has been brought to life through a partnership with top international specialists in the field of Vascular Surgery and scientific research: Prof. Dr. Giacomo Clerici from Italy, Dr. Richard Stein from the USA, Dr. Vlad Alexandrescu from Belgium, and Dr. Andre Cancela from Brazil, and Prof. Dr. Mihai Ionac from Romania who believe that Romania can be saved through prevention.

Contact: mirceapopitiu@yahoo.com +40727115139

CAD DESIGNED CUSTOM ORTHODONTIC DEVICE AND MANUFACTURING PROCEDURE

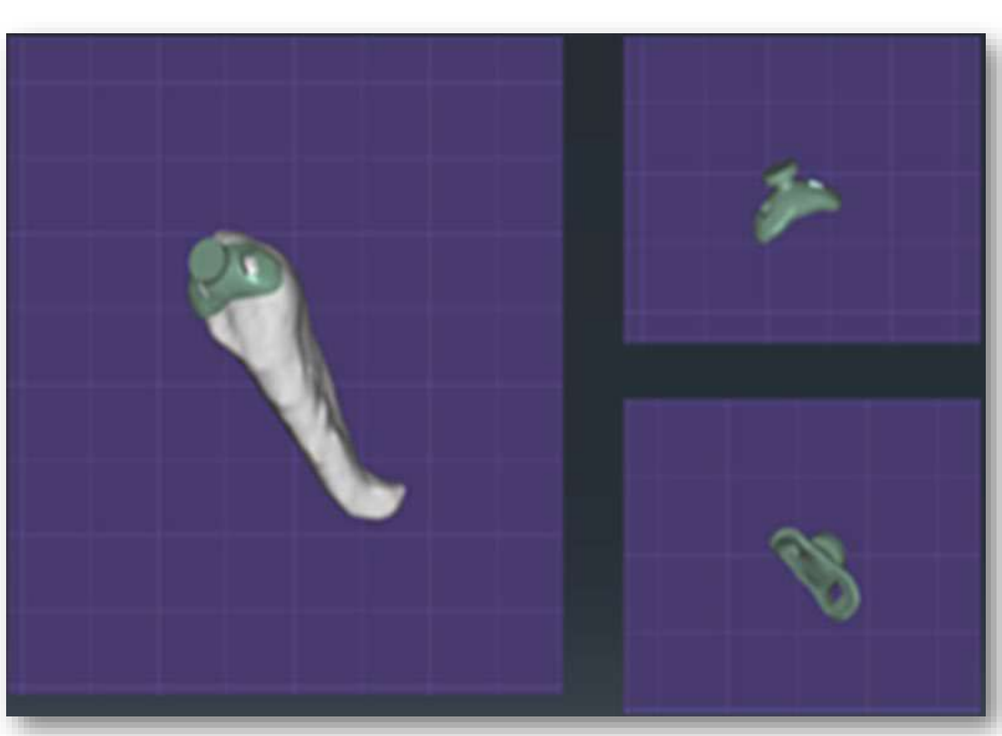
Patent appl. No a2023 00582

Nagib Riham, Borcan Florin, Szuhanek Camelia

F

Treatment of impacted teeth often implies placing a bonded attachment and using orthodontic forces to move the tooth into occlusion. The aim of the invention is to describe a novel methodology of manufacturing orthodontic attachments for impacted teeth using the latest CAD software and 3D printing technology. A biocompatible acrylic based resin was used to print a custom made attachment designed based on the volumetric data aquired through cone bean computer tomography. Custom design of the attachment simplified clinical insertion and treatment planning and 3D printing made its manufacturing easier. Customisation of the attachment design provides the posibility of individualised orthodontic treatment planning and could be applicable beyond impaction cases. 3D printing, a continuously developing technology, together with CAD software and CBCT imaging offers new possibilities in orthodontic component manufacturing.





Custom Designed Orthodontic Attachment Manufactured Using a Biocompatible 3D Printing Material

RIHAM NAGIB[1], CAMELIA SZUHANEK[1]*, BOGDAN MOLDOVEANU[2], MEDA LAVINIA NEGRUTIU[1], COSMIN SINESCU[1], SILVIU BRAD[1]
[1] Victor Babes University of Medicine and Pharmacy Timisoara, 2 Eftimie Murgu Sq., 300041, Timisoara, Romania
[2] MdentalStudio Dental Laboratory, Doctor Gheorghe Marinescu Str., 300092, Timisoara, Romania

Treatment of impacted teeth often implies placing a bonded attachment and using orthodontic forces to move the tooth into occlusion. The aim of the paper is to describe a novel methodology of manufacturing orthodontic attachments for impacted teeth using the latest CAD software and 3D printing technology. A biocompatible acrylic based resin was used to print a custom made attachment designed based on the volumetric data aquired through cone bean computer tomography. Custom design of the attachment simplified clinical insertion and treatment planning and 3D printing made its manufacturing easier. Being a first trial, more reasearch is needed to improve the methodology and materials used.

Keywords: 3D printing, computer aided design, cone bean computer tomography, orthodontics

One of the most common methods used to bring impacted teeth into occlusion is placing a bonded attachment and using orthodontic forces to move the tooth [1]. Attachments used for impacted tooth orthodontic traction evolved through the years from now obsolete methods like wire lassos and threaded pins which required crown perforation [2] to lingual buttons, chain accessories, brackets and even individualised metal attachments [3,4].

The aim of the present study is to describe a novel methodology of manufacturing orthodontic attachments for impacted teeth using the latest CAD software and 3D printing technology.

Described as a technology that will change manufacturing, 3D printing is currently widely being used in orthodontics for splints, implant guides or models [5]. Very accurate and imediately accesible volumetric data aquired through CT and CBCT imaging technology [6] and the data on material and adhesion defects through optical coherence tomography [7] could make 3D printing even easier to be incorporated in orthodontic treatment plans.

In future years this combination is expected to help provide basis for more personalised orthodontic treatment [8]. Faber et al., found that 3D printed dental models can be included in the evaluation of impacted teeth [3]. Lee et al. concluded that 3D printed replica teeth can be used in orthodontic diagnosis and treatment planning [9]. His findings are in accordance to other similar studies on the subject of orthodontic models [10,11]. Although scanning plaster models for 3D printing provided good results regardless the printing method used, intra-oral scans have some limitations in providing 3D printed diagnostic models for orthodontics due to a deficiency in the transverse plane.[12] Krey et. al was able to prove the concept of implementing an orthodontic treatment plan with individual computer designed and 3D printed brackets in the dental clinic [13].

Experimental part

A cone beam computer tomography (CBCT) taken with CRANEX 3D (Soredex, Finland) equipment for diagnostic purposes was used to extract the impacted cuspid and obtain a 3D model of the palatal surface of the tooth. OnDemand3D (Cybermed Inc., USA) software was used to segment and manually clean the 3D volume. The resulting CBCT was converted into a STL file (fig. 1). The STL file was used to design an orthodontic attachment using computer aided design (CAD) software Exocad (exocad GMBH, Germany).

Fig. 1. Side by side views of the impacted canine : CBCT image and STL file after conversion

The attachment design took into consideration the position of the impacted tooth, bone coverage and direction of the long axis, thus permitting an easier surgical intervention. The base of the attachment was custom made to fit the palatal side of the impacted cuspid, in order to obtain good adhesion and minimise adhesion failure during orthodontic traction. Two holes were incorporated in the design for retention purposes. The attachment also presented a component for the orthodontic elastic similar to the ones used on standard metal lingual buttons (fig. 2).

The final attachment design was exported for printing to the Form2 (Formlabs Inc., USA) 3D printer. NextDent C&B (Vertex-Dental, Netherlands) was the 3D printing resin material chosen for the attachment. It is a biocompatible class IIa monomer based on acrylic esters with the following specifications, presented in table 1.

The printed result was rinsed twice in an alcohol solution (96%) to get rid of any excess material, making use of an ultrasonic bath. After cleaning, the parts were dried and

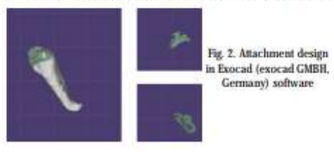
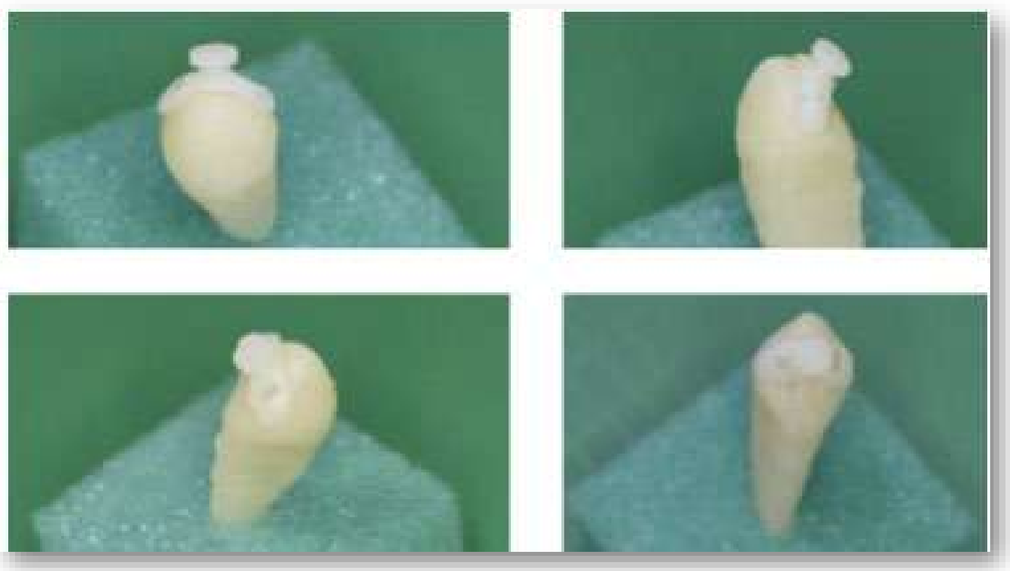
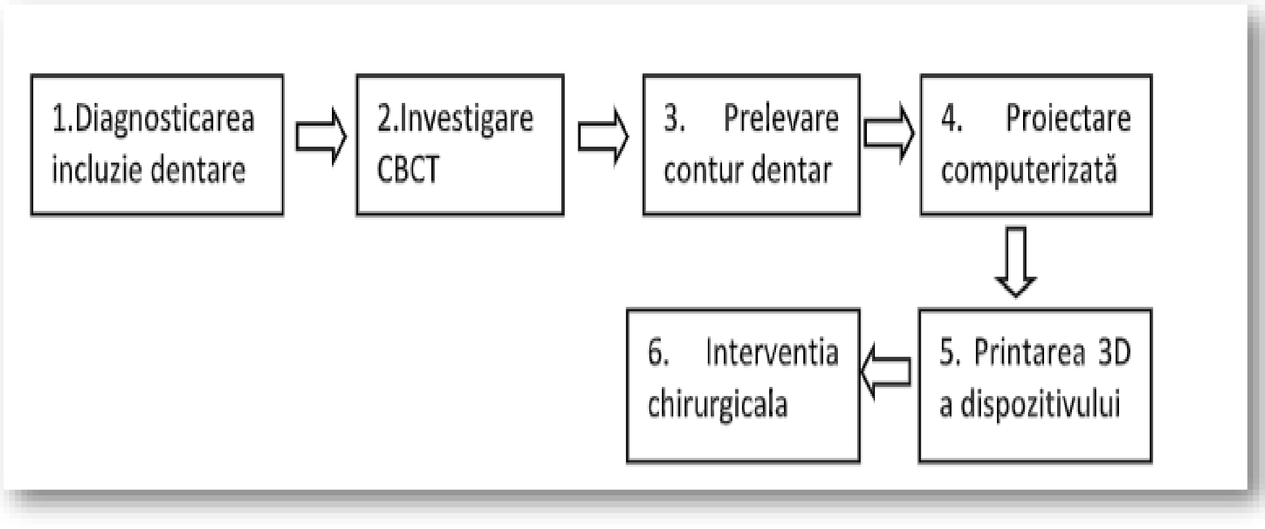


Fig. 2. Attachment design in Exocad (exocad GMBH, Germany) software

* email: cameliaszuhanek@umft.ro





Contact: Nagib Riham, +40736945780

VitalFlow Tracker

F

Scientific Research Project

Authors: Flavia-Maria MIHĂILESCU, Marian-Cristian POPA, Gabriel-Ilie LEON
Coordinator: Professor Aurel Mihail ȚÎȚU

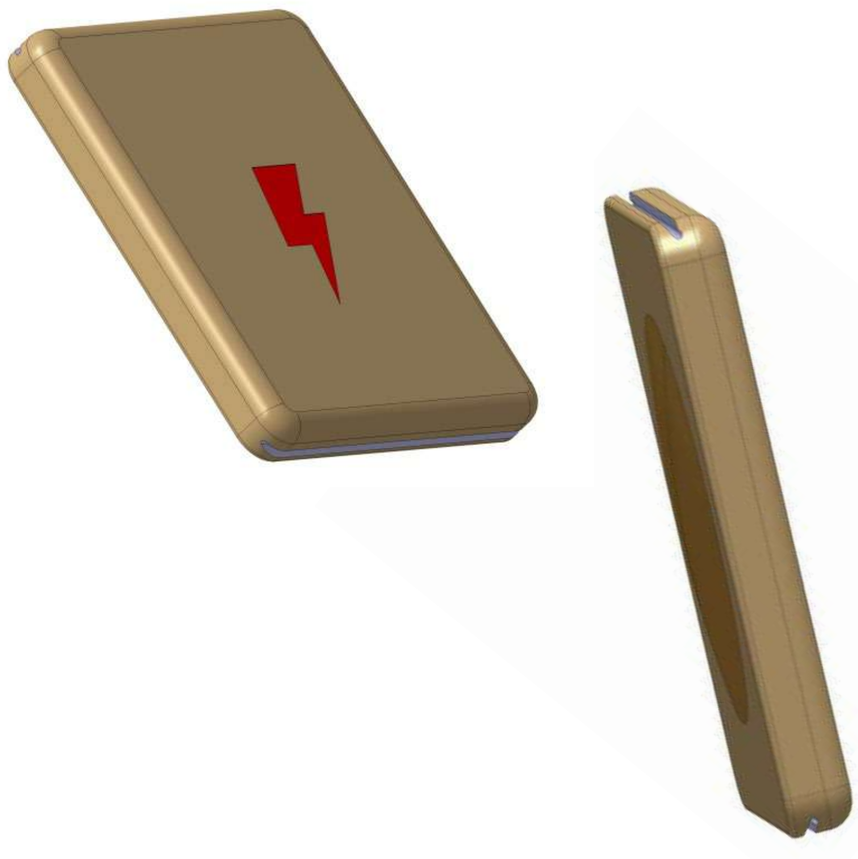
DESCRIPTION:

The VitalFlow Tracker uses state-of-the-art sensors for real-time health monitoring. By continuously measuring hormone levels and chemical compounds, it provides precise data about the wearer's physiological balance. This detailed information is accessible through a simple interface, giving users an in-depth understanding of their biochemical dynamics. The device represents an innovative combination of advanced technology and practical utility, su[illegible]onalised and proactive approach to individual h



APPLICATIONS:

The VitalFlow Tracker wristband is not only a valuable tool for individual use, but can also be integrated into the healthcare environment, helping physicians provide more personalized and efficient care to their patients. In hospitals and clinics, physicians can use the VitalFlow Tracker to continuously monitor their patients' hormone and chemical levels, providing a more complete and accurate picture of their health. This can be particularly useful for patients with chronic or complex conditions, where constant management of these levels is crucial for treatment and disease management. By using the VitalFlow Tracker bracelet in hospitals, doctors can obtain real-time information about patients' changing health status, allowing them to tailor treatment accordingly and provide prompt interventions when needed.



ADVANTAGES:

- This allows people to observe how external factors, such as diet, exercise and stress, can influence their body's chemical balance;
- It can serve as a valuable tool in the management of certain medical conditions, such as hormonal dysfunction or metabolic disorders;
- This device gives users the opportunity to take control of their health and adopt a healthier and more balanced lifestyle.



RESULTS AND DISCUSSIONS:



The VitalFlow Tracker wristband is not only an innovative solution for monitoring personal health, but also promises to revolutionise the way healthcare is delivered and managed. With its vast potential and obvious benefits, this device is at the forefront of a new era in health and medicine, putting the power of health control and management directly into people's hands.

Contact: „Lucian Blaga” University of Sibiu, PATLIB Centre of Sibiu, 4 Emil Cioran Street, Room IM 100, Phone +40 744 390 290, mihail.titu@yahoo.com

MAKING A NON-INVASIVE MEDICAL DEVICE FOR MEASURING BLOOD OXYGEN AND PULSE OF PATIENTS

Student Project

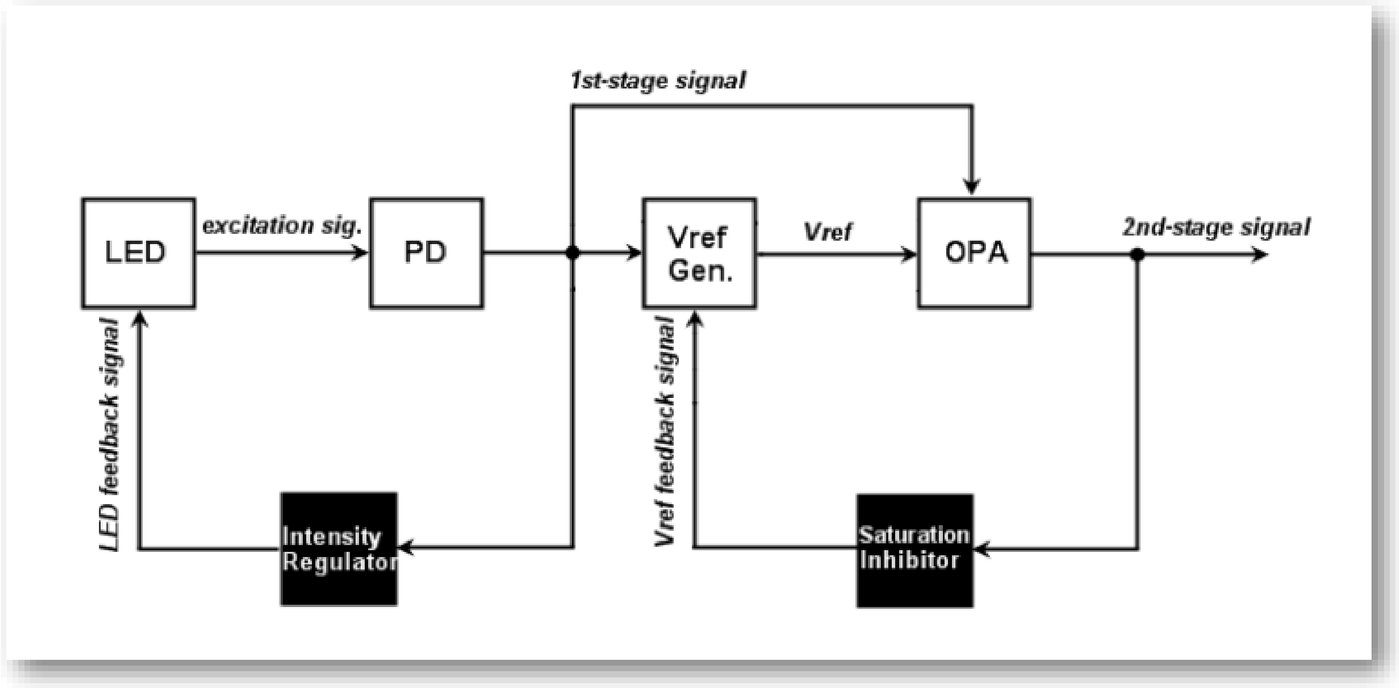
Author: Tudorescu V. Vasilica Diana

Coordinators: Lecturer PhD eng. Rădulescu Constanța

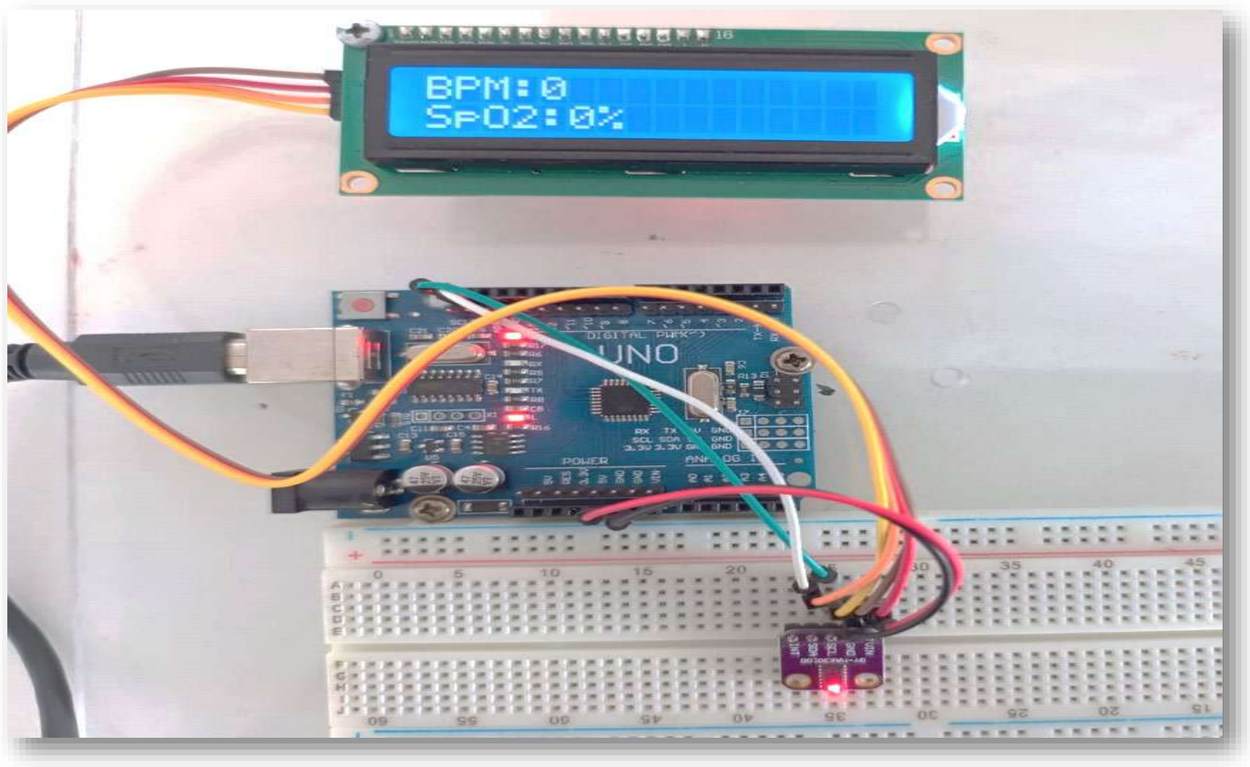
F

The objective of this project was twofold: the development of a pulse oximeter capable of measuring arterial blood oxygen saturation (SaO_2), heart rate and data display using a microcontroller, the conversion of this prototype into an oximeter capable of measuring carbon dioxide concentration (CO_2) from the blood.

This project was carried out in several stages, including the construction of the initial pulse oximeter prototype, its calibration and finally the proof of concept regarding the possibility of measuring CO_2 in the blood. The prototype made was made up of an Arduino Uno microcontroller, a Max 30100 sensor, an I^2C communication protocol, a display, LEDs with red light and infrared light. The source program code for interfacing the Max30100 pulse oximeter with Arduino was written in C for the Arduino IDE.



Control flow for pulse oximeter whit feedback functionality



The device was implemented and tested and gave an acceptable performance in measuring and monitoring the patient's SpO_2, heart rate and temperature, therefore this device can be considered as an important device to reduce decision-making time in medical engineering. This project can be extended to more specialists and different patients because this project is only for one patient.

Contact: ctt.ucb@gmail.com

Emollient cream for dry skin with grape skin/seed extract (organic culture of *Vitis vinifera* L., Fetească Neagră variety)

Patent RO 135101 B1 – 29/11/2022

Inventors: Cristiana Rădulescu[1], Cristina Mihaela Nicolescu[1], Radu Lucian Olteanu[1], Marius Bumbac[1], Lavinia Claudia Buruleanu[1], Laura Monica Gorghiu[1], Carmen Georgeta Holban[2]

Assignees: [1]Valahia University of Targoviste, 130004 Targoviste, Romania; [2]Hyperici Farm SRL Targoviste

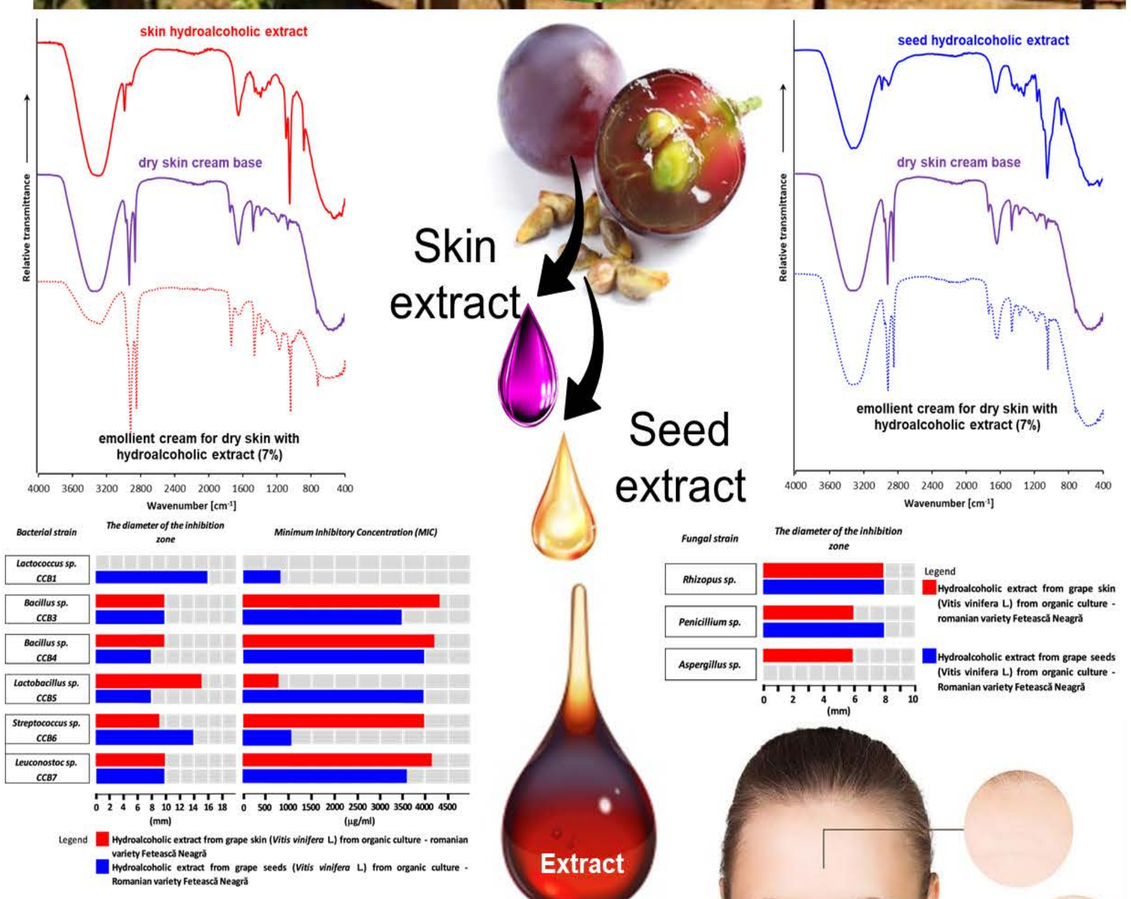
Category: F - Medicine, Paramedical, Pharmacy, Cosmetics, Hygiene

Abstract

The invention relates to an emollient cream for dry skin and its preparation procedure, with applicability in the cosmetic or dermatological field, mainly for anti-wrinkle purposes. The cream consists of 7% (volume/mass) hydroalcoholic extract from skin/seed of *Vitis vinifera* L., Fetească Neagră variety grapes, in a cream base consisting of a mixture of lanolin, cetyl alcohol and sodium lauryl sulfate.

The combination of the components of the cream results in a product that deeply nourishes and prevents skin drying (moisturizing, revitalizing, antimicrobial effect), repairs and smoothes fine expression lines, prevents aging (anti-wrinkle effect).





Potential commercial applications

- ❑ Hyperici Farm SRL provided a registered/commercial trademark for emollient, anti-wrinkle cream described in Patent RO 135101 B1.
- ❑ New formulas for natural creams, using the extracts already characterized, for the treatment of mild dry skin conditions, from the category of atopic dermatitis.
- ❑ New extracts from self-fertile local grapes, from organic cultivation, for dermato-cosmetic purposes.
- ❑ The use of grape extracts (seeds / skin) as functional foods, knowing that the sanogenic effects of polyphenols depend on the amount consumed and their bioavailability

Claims

The emollient cream for dry skin consists of a mixture of lanolin, cetyl alcohol, sodium lauryl sulfate (base cream) and hydroalcoholic extract obtained from the skin/seeds of organically grown grapes of *Vitis vinifera* L., Fetească Neagră variety, the percentage of extract used to be 7% (volume / mass).

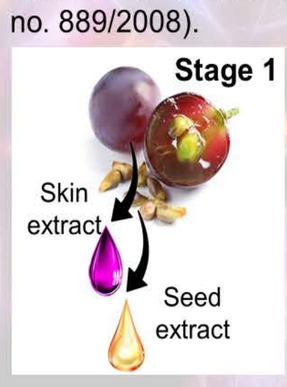
Hydroalcoholic grape skin/seed extract is characterized in that it is obtained by maceration for 24 hours (of which 3 hours with magnetic stirring), at room temperature (22-23ºC), in a percentage of 4% dry mass / volume of hydroalcoholic solvent (50% v/v).

Hydroalcoholic grape skin extract is characterized in that it has a total content of polyphenolic compounds in the range of 2.50-3.50 mg-EAG / mL (EAG = gallic acid equivalent), a total flavonoid content in the range of 3.00-4.50 mg-EQt / mL (EQt = quercetin equivalent), an antioxidant activity in the range of 0.80–1.50 mg-EAA / mL (EEA = ascorbic acid equivalent), a moderate in vitro antimicrobial inhibitory action on selected Gram-positive bacteria, with corresponding values of the minimum inhibitory concentration in the range 820-4300 µg/mL, a low antifungal efficacy compared to selected strains.

The hydroalcoholic grape seed extract is characterized in that it has a total content of polyphenolic compounds in the range of 4.50–7.50 mg / mL mg- EAG / mL (EAG = gallic acid equivalent), a total flavonoid content in the range of 4.20-7.70 mg-EQt / mL (EQt = quercetin equivalent), an antioxidant activity in the range of 10.00–12.50 mg -EAA / mL (EEA = ascorbic acid equivalent), a broad spectrum of action, in vitro, on selected Gram-positive bacteria, with corresponding values of the minimum inhibitory concentration in the range 850–4000 µg/mL, a selective and moderate antifungal efficacy against of the selected strains.

Description of the innovation

The autochthonous variety of *Vitis vinifera* L., Fetească Neagră, is the grape variety from Romania with the highest qualitative potential, with a special aroma and a content of fine tannins. Representative for this variety is that it is self-fertile (early variety), thus being cultivated in pure, organic culture, without changing the phytochemical profile of the grape. The patent states that the use of synthetic products for phytosanitary treatments is prohibited and that plant health is ensured in a preventive manner, allowing only products based on simple mineral salts (copper, sulfur, sodium silicate) or plant extracts, within the limits of the rules established by the relevant legislation (EC Regulations no. 834/2007 and no. 889/2008).



The selection of ethanol as an organic solvent was because ethanol, mixed with water, improves the solubility of the bioactive component compared to pure water. The optimal solution consists of a mixture of 50% ethanol - 50% water; in addition, ethanol is a biologically safe solvent. The presence of ethanol in the mixture contributes to the penetration of the solvent into the hydrophobic areas of the seed matrix and the precipitation of soluble proteins that would interfere with the filtration procedure. Filtrate was kept at cold / lyophilizate for analytical investigation or for incorporation into the base cream.

The base cream used to incorporate the bioactive ingredients was prepared according to the Romanian Pharmacopeia, 10th edition, and contains lanolin, cetyl alcohol, sodium lauryl sulfate and distilled water.





The extract of grape skin/seed (Fetească Neagră variety) was incorporated into the base cream prepared according to stage 2.



Analytical and clinical investigations

Hydroalcoholic extracts of grape skin / seeds (Fetească Neagră variety) were investigated in terms of pH and electrical conductivity, total content of polyphenolic compounds, total content of flavonoids, antioxidant activity, antimicrobial activity and bioactive compound (i.e., resveratrol). Comparative tests were carried out between the extracts used, the base cream and the creams that are the subject of the invention

Comparative tests were carried out between the extracts used, the base cream and the creams that are the subject of the invention. Through these experimental investigations, it was aimed to identify some changes in structure, but also to highlight the incorporation of bioactive compounds from the extracts, in the skin/seed cream - extract.

The assessment of the antimicrobial activity of hydroalcoholic extracts from grapes (skin, seeds) was carried out using the method Kirby-Bauer, which allowed the simultaneous determination of the sensitivity spectrum of microorganisms (bacteria strains and molds, respectively), as well as the value of the minimum inhibition concentration (MIC). Two methods were used to highlight the antimicrobial activity: the disc diffusimetric technique, standardized method recommended by NCCLS (National Committee for Clinical Laboratory Standardization) and the well diffusimetric technique.



For the obtained creams, *in vivo* clinical studies were carried out, the results of the study being inserted in the Report on the safety of the cosmetic product, according to Annex I of Regulation (EC) no. 1223/2009 on cosmetic products. In this regard, Analysis Bulletins (no. 209928/27.11.2020, 209929/27.11.2020) and Reports on the safety of the cosmetic product were issued.



Technical problem solved by the invention

- ❑ In obtaining an emollient cream for cosmetic and / or dermatological use, that can be used as a product containing natural bioactive compounds, with moisturizing, anti-wrinkle, antifungal and antibacterial properties.
- ❑ The use of the extract from the local variety, highly appreciated, Fetească Neagră, a variety without genetic modifications, secular, cultivated in organic vineyards, on soils without historical pollution, drip irrigation and periodic natural treatments, without artificial fertilizers.
- ❑ The special chemical composition of this variety, Fetească Neagră, with a remarkable content of resveratrol ("elixir of youth") and piceid (stilbenoid glucoside - major derivative of resveratrol), with anti-aging effect, could be a safe alternative for cosmetic purposes.

Acknowledgments: This research was funded by project ID584/2021, 43PFE/30.12.2021, Excellence and Performance for Increasing the Institutional Capacity of RDI (ProExcellence), financed by the Ministry of Research, Innovation, and Digitization,

INNOVATIVE HERBAL TREATMENT FOR ANAL FISSURES

F

Patent application – A 00198/ 2023

Author/s: Irina Mihaela Matran, Dan Lucian Dumitrașcu

The invention relates to a natural healing agent for the treatment of anal fissures, used in medicine and pharmacy. The natural healing agent for the treatment of anal fissures is a hydrophobic ointment. The route of administration is external, transmucosal – rectal. By applying the invention, the following advantages are obtained: reducing the discomfort that occurs on the skin and combating the risk of bleeding; Reduction of discomfort that occurs at the level of hemorrhoidal veins and anal mucosa, toning action of venous circulation (venotonic) and capillaro-protective; anti-inflammatory for the large intestine and internal hemorrhoids, astringent, antioxidant and anti-edematous; treatment (healing) of wounds, ulcers, stimulation of peripheral circulation, with sedative and comforting action; emollient and muscle relaxant; skin revitalization, stimulator of increased membrane permeability (due to sterols); carminative, antispasmodic, astringent, antiseptic, antibacterial, fungistatic, antipruginous, antioxidant and regenerative (regenerates epithelia, endothelium and connective tissue); It can be conditioned both in glass packaging, sanitary approved plastic vials, or as suppositories; It is 100% natural and does not contain any synthetic substances. The formula of the new cicatrizing agent for the treatment of anal fissures is as follows: cold-pressed *Persea Americana* oil, cold-pressed *Helianthus annuus* oil, *Ricinus communis* oil, essential oil of *Thymus vulgaris*, essential oil of *Anethum graveolens*, *Salvia officinalis* oil, *Mentha piperita* oil, *Calendula officinalis* oil, *Matricaria recutita* oil, *Aesculus hippocastanum* tincture, cocoa butter, honey, alcoholic extract of *Capsella bursa-pastoris*, beeswax.



Determination of the emulsion type of the new cicatrizing agent for anal fissures



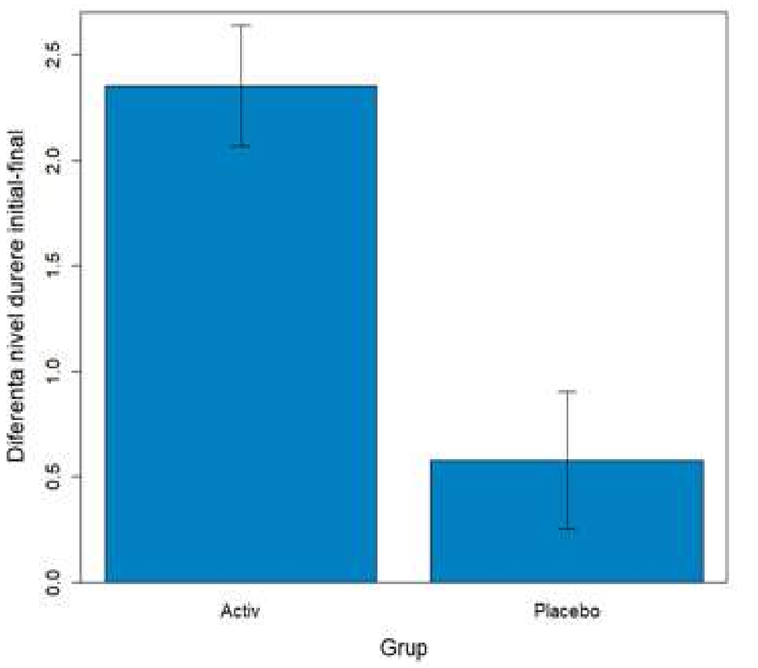
Determination of emulsion type of novel anal fissure cicatrizer in which methylene blue solution does not cross oiled filter paper



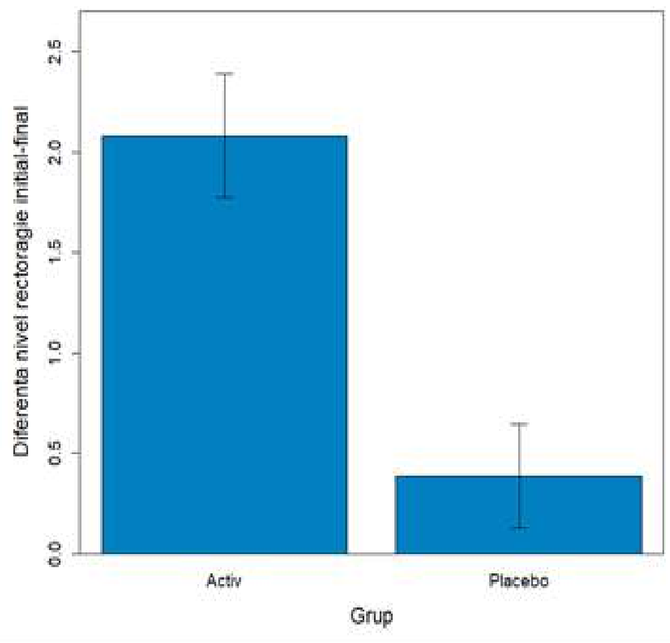
Determination of tensile capacity

Sensory qualities (color, smell): Characteristics of raw materials;
Emulsion type: Hydrophobic;
pH: 5.56;Thixotropy: Consistency and homogeneity of the cicatrizer during storage – Adequate;
Pour point: 37°C;
Stability: t°C: 15 - 25 and ϕ air maximum 75%: proper consistency and homogeneity.

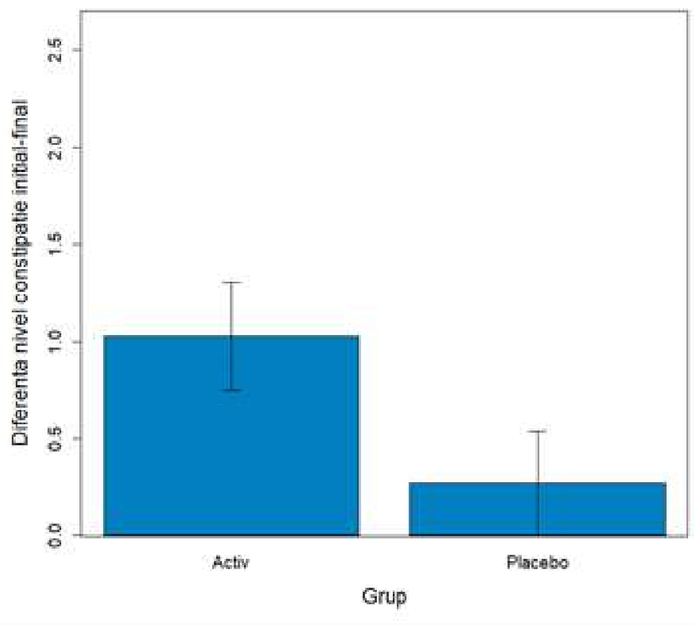
Verification of clinical efficacy: Randomized double-blind clinical trial



The difference in initial - final pain level



The difference in initial - final rectoragia level



The difference in initial - final constipation level

Discussions: The present study confirms the statistically significant and clinically important decrease in the level of pain and rectal bleeding as the primary endpoints of interest in the group receiving the active substance compared to the group receiving placebo. In addition, for the secondary endpoints of interest, both physician- and patient-reported satisfaction were observed to be statistically and clinically significantly higher in the group receiving the active substance. Although there were small clinical differences between rectal bleeding and constipation levels at baseline, these were not statistically significant. Moreover, using the comparison of the differences between the initial and final values, respectively the analysis of covariance, adjusting for the initial values, these initial differences were controlled by appropriate statistical techniques.

Conclusion: The evaluated product causes a statistically and clinically significant decrease in rectal bleeding and the level of pain, as well as the degree of satisfaction of the patient and the doctor compared to placebo. The new natural cicatrizer for the treatment of anal fissures had no side effects.

Contact: Irina Mihaela Matran, irina.matran@yahoo,com

INNOVATIVE HERBAL TREATMENT FOR ANAL FISSURES

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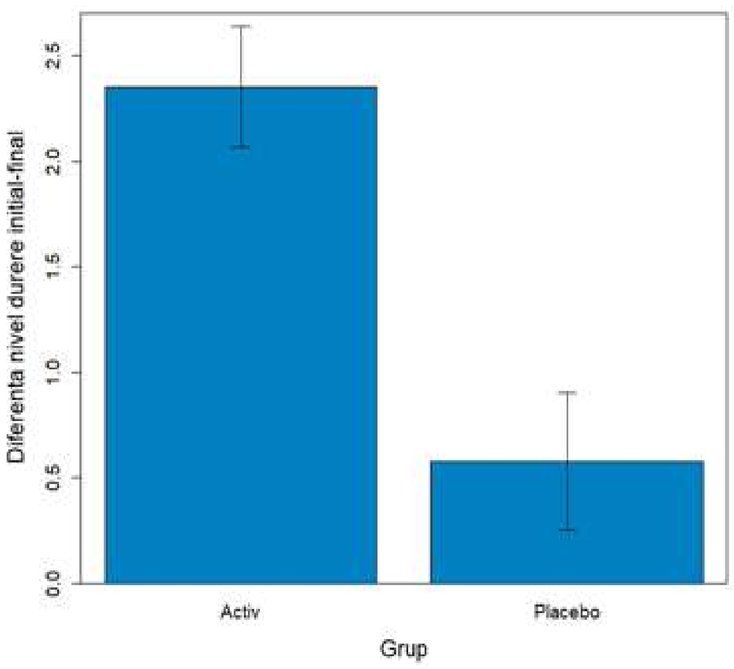
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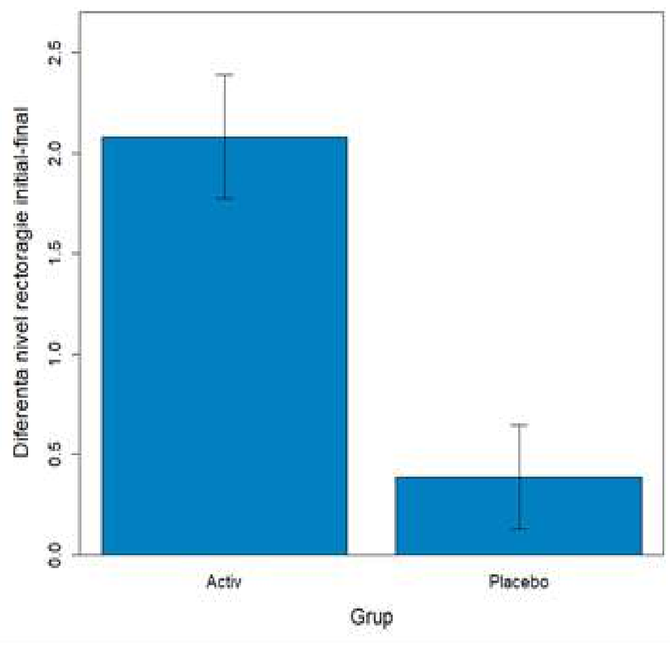
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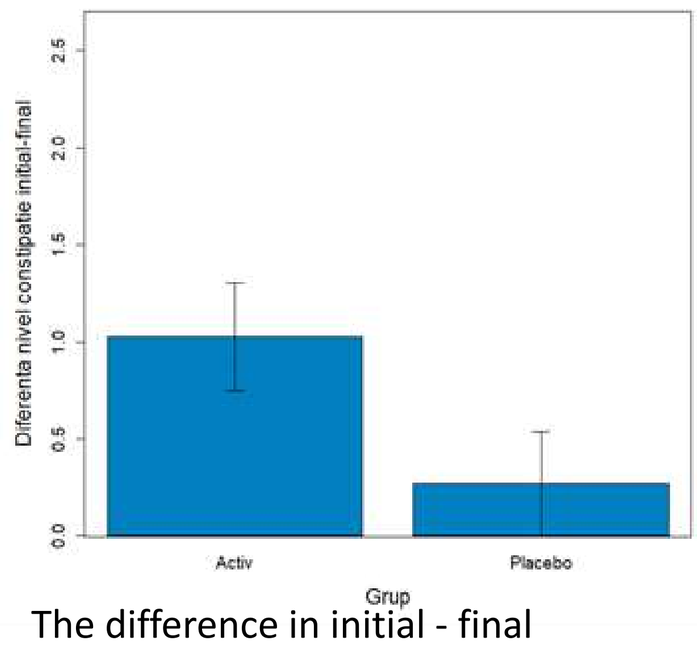
Verification of clinical efficacy: Randomized double-blind clinical trial



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Contact: Irina Mihaela Matran, irina.matran@yahoo,com

Dietary supplements recommended for alleviating of unpleasant symtoms of menopause, method of production and procedures for establishing bio-safety and biological efficacy

F

Authors:
Mihaela NEAGU[1], Cristina – Mihaela LUNTRARU[1], Alexandru SUCIU[1], Justinian – Andrei TOMESCU[1], Sevinci POP[2], Emilia MANOLE[2], Lucian ALBULESCU[2], Cristina TĂNASE[2]

C.B.I: a/2022/00228

1 - HOFIGAL EXPORT IMPORT SA
2 - INSTITUTUL NAȚIONAL DE CERCETARE-DEZVOLTARE ÎN DOMENIUL PATOLOGIEI ȘI ȘTIINȚELOR BIOMEDICALE „VICTOR BABEȘ”

The invention refers to obtaining of two dietary supplements, as capsules, one for daytime administration and the other for nighttime administration, to alleviate the unpleasant symptoms of menopause.
The novelty lies in the active principles of extracts from the medicinal plants **Red Clover, Goosefoot, Sage and Hops**, rich in **phytoestrogens** with estrogenic action and maximum efficiency, with no undesirable effects on the woman's body.









Foreword:

The products' formulas in according to the invention for day and night administration are based on concentrated plant extracts, representative of the content in various classes of phytoestrogens (isoflavones, flavones, lignans, stilbenoids, coumestanes), substances that can act as natural estrogens and help to remove those symptoms that create discomfort during menopause.



Produsul pentru zi

Dietary supplements that reduce unpleasant symptoms of the menopause period have in their composition 4 species of medicinal plants obtained from the own culture of the company Hofigal Export Import SA and contain the groups of phytoestrogens necessary for the body to be able to cope with all the disorders caused of menopause.



Produsul pentru noapte

Benefits:

- ✓ the two formulas made according to the invention act synergistically
- ✓ the bioactive compounds give an estrogenic action, regulating the hormonal balance, reducing osteoporosis
- ✓ the active principles are in a new combination, not found in the specialized literature

The problem that the invention solves is obtaining natural products from medicinal plants, in the powders form and Red Clover extract (with 8% isoflavone content), for day and night administration, with a role in alleviating the unpleasant symptoms of menopause, such as hot flashes, night sweats, fatigue, headaches, etc.

Highlighting the bio-safety and biological effectiveness (estrogenic activity) of the products according to the invention was carried out through in vitro studies at the "Victor Babeş" National Research and Development Institute in the Field of Pathology and Biomedical Sciences.

FOOD SUPPLEMENTARY BASED ON EUPATORIA CANNABIUM GOLD AND ALGINATE

Adina Segneanu[1], Ionela-Amalia Bradu[1], Titus Vlase[1,2], Gabriela Vlase[1,2]

[1]Institutul de Cercetări Avansate de Mediu (ICAM-UVT), Strada Oituz, nr. 4, Timișoara
[2]Centrul de Cercetări pentru Analize Termice de Mediu (CCATM- UVT), Strada J. H. Pestalozzi, nr. 16, Timișoara

Category: F-Medicine, Paramedical, Pharmacy, Cosmetics, Hygiene;

F

Scurtă descriere



❑ *The invention refers to a complex food supplement with beneficial effects on the human body, obtained by functionalizing the medicinal plant hemp-agrimony micronized, with gold nanoparticles, the obtained composite being inserted into a biodegradable alginate capsule. Due to the complementarity and synergy of the individual effects of the three components, the new food supplement has high curative and therapeutic properties, with increased efficiency in the treatment of several ailments.*

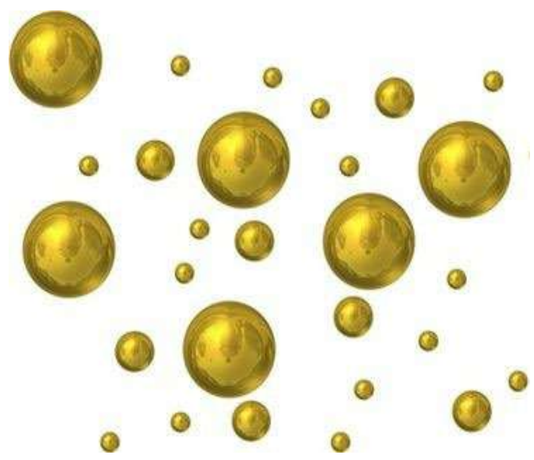
Beneficii





Cânepa Codrului

- ❑ Cânepa Codrului (*Eupatoria Cannabium, fam. Asteraceae)* are efect imunostimulator, antiseptic, antiinflamator, antispasmodic, antigripală, antitumorală, hepatoprotectoare, combate paraziții intestinsali;
- ❑ Combate efectele negative ale cancerului, cuperozei, dermatitei, reumatismului;
- ❑ Este un foarte bun diuretic, antifebril, laxativ, emolient, cicatrizant.



Nanoparticule de aur

- ❑ Dirijează medicamentele spre celulele sau țesuturile ce urmează a fi tratate deoarece, având dimensiuni foarte mici, de ordinal nanometrilor, se deplasează cu usurința prin corp;
- ❑ contribuie la eliberarea țintită a medicamentelor la locul afecțiunii sporind astfel eficiența tratamentului
- ❑ efect antiinflamator, antioxidant și antiîmbătrânire, favorizează circulația sângelui, crește capacitatea de absorbție a unor minerale si vitamine precum magneziul, fosforul, vitaminele B, vitamina D, vitamina A și vitamina E

Alginatul

- ❑ are o serie de beneficii precum eliminarea metalelor grele din organism si este antiinflamator.
- ❑ are atât rol terapeutic cât și de încapsulare a complexului planta-Au.

Avantajele invenției

❑ Se obține un supliment alimentar complex, prin punerea în comun a efectelor benefice individuale cunoscute ale plantei medicinale Cânepa codrului, nanoparticulelor de aur și alginatului astfel încât acestea se cumulează si acționează sinergic, oferind noului produs o înalta valoare curative pentru tratarea unor boli și afecțiuni.

❑ Materialele utilizate sunt caracterizate de biodisponibilitate.

Department for Research, Development and Innovation Management
Knowledge and Technological Transfer Center
entity of the ReNITT infrastructure

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F

Device for performing arterial puncture for taking a blood sample from the radial artery

Patent OSIM no.: RO133031- B1/30.06.2023

Author/s: Prof. Eng. Bogdan MOCAN, PhD habil., Technical University of Cluj-Napoca
Assoc.Prof. Dr. Mihaela MOCAN, M.D, PhD, University of Medicine and Pharmacy "Iuliu Hațieganu"

Short presentation:

The invention relates to a device for performing arterial puncture in order to collect a blood sample from the radial artery.

The device for performing the arterial puncture in order to collect a blood sample from the radial artery:

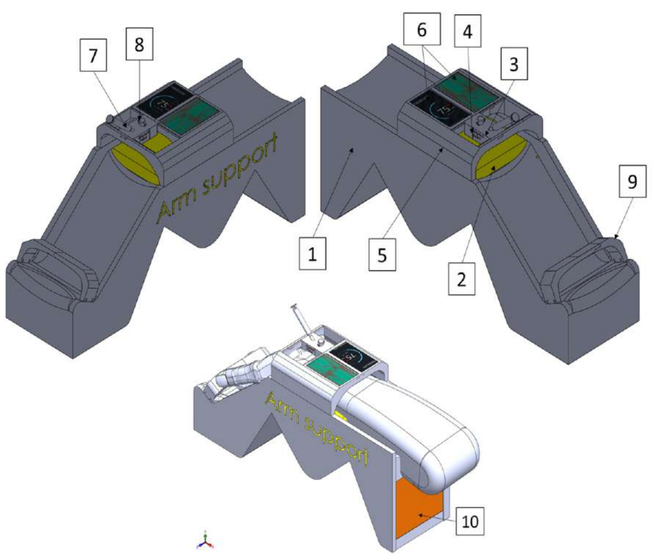
1. allows proper immobilisation of the patient's forearm,
2.facilitates accurate identification of the radial artery even in the case of a reduced peripheral pulse,
3. allows visualization of the subcutaneous area of the vein plane from the interested area to avoid vein puncture, and
4.maintain the needle orientation at a precise angle (33°) to the median horizontal plane of the patient's forearm that makes the puncture more efficient.

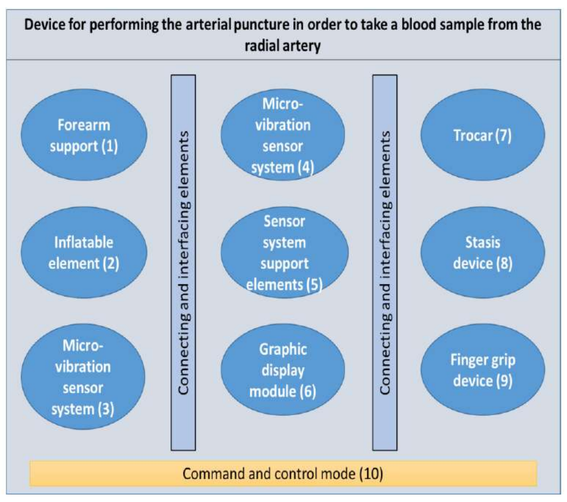
Applicability:

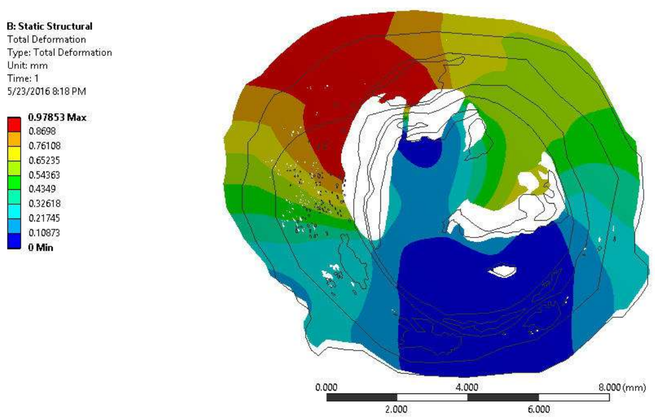
The radial artery puncture is indicated for obtaining an arterial blood sample for blood gas analysis (partial oxygen pressure, partial pressure of carbon dioxide) and EAB (pH, standard bicarbonate concentration, base deficiency). Information is essential to characterize the severity of the disease and the effectiveness of treatment in the patient with acute, severe respiratory pathology. Arterial blood analysis also allows the measurement of carbon monoxide and methaemoglobinemia in case of suspicion of carbon monoxide intoxication.

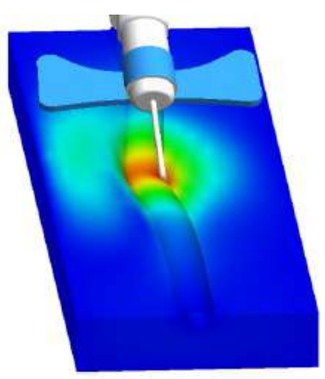
The difficulty of carrying out the radial artery blood sampling procedure manually is very high especially for resident doctors who have no experience in completing this technique. The developed device can be used successfully by experienced doctors as well as by less experienced doctors (eg. resident doctors) and increases the efficiency of the technique. The proposed device is simple, reliable and does not require special pre-use training or strict coordination with other medical services, it also has no side effects on the patient or on the doctor performing the procedure.

This technique (radial artery puncture) is part of the training curriculum of the resident doctors regardless of the specialty followed.











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mihaela.mocan@umfcluj.ro

The active components of herbal plants from aphthochtonous localities with characteristic soil and relief conditions as adjuvant therapy for people with skin cancer

Authors: Viktorija BLAZOVSKA & Team

Mentor: Dragan JOVANOV

F

The goal of research in this paper is to determine the antimicrobial activity of essential oils from plants: Green tea, Turmeric, Corn silk, Red John's wort, Ginger and their use as adjuvant therapy for the treatment of people with skin cancer.

Antibacterial activity and examination are conducted survey of 150 people. Studies on antimicrobial activity of essential oils extracted from plants and their use in the treatment of people with skin cancer were examined 3 years.

Essential oils from plants Green tea, Turmeric, Corn silk, Red John's wort, Ginger manifested different antimicrobial activity in their use depending on the used concentration of essential oil.



The achievement of the aforementioned objectives in this study, were been researched with these herbs and their essential oils as adjuvant treatments of people with skin cancer of 150 respondents aged 20 years, 20-40 years and respondents over 60 years:

- **Green tea,**
- **Turmeric,**
- **Corn silk,**
- **Red John's wort,**
- **Ginger.**













Contact: blazovskaviktorija@gmail.com

Dum-Lab-Product

F

Student Project

Author: Stroici Dumitrița

Mentor: Silvia Scortescu

The invetion is a quilted hoodie that is intended to be used as a coat and as a treatment, it is made of cotton clip, it is stapled with medicinal magnets, those it also treats back pain. Invention is recomanded for all ages.

The economic advantage , this new product reduce also muscle pains , at list young people after sports had bone system pains.



Contact: ***Silvia Scortescu + 373 798 97 247 silvia.scortescu@yahoo.com***

BRO-Recuping-Product

F

Student Project

Author: *Bostan Radu, Bostan Bogdan*

Mentor: Silvia Scortescu

The invention is a belt that holds the pants but also treats the spine, it is created only for men and boys in the process of growth, because the bones are growing and the pain is colossal and unbearable, sometimes.

The whole body hurts when the bone system grows. RECOMMEND for young boys.







Contact: *Silvia Scortescu + 373 798 97 247 silvia.scortescu@yahoo.com*

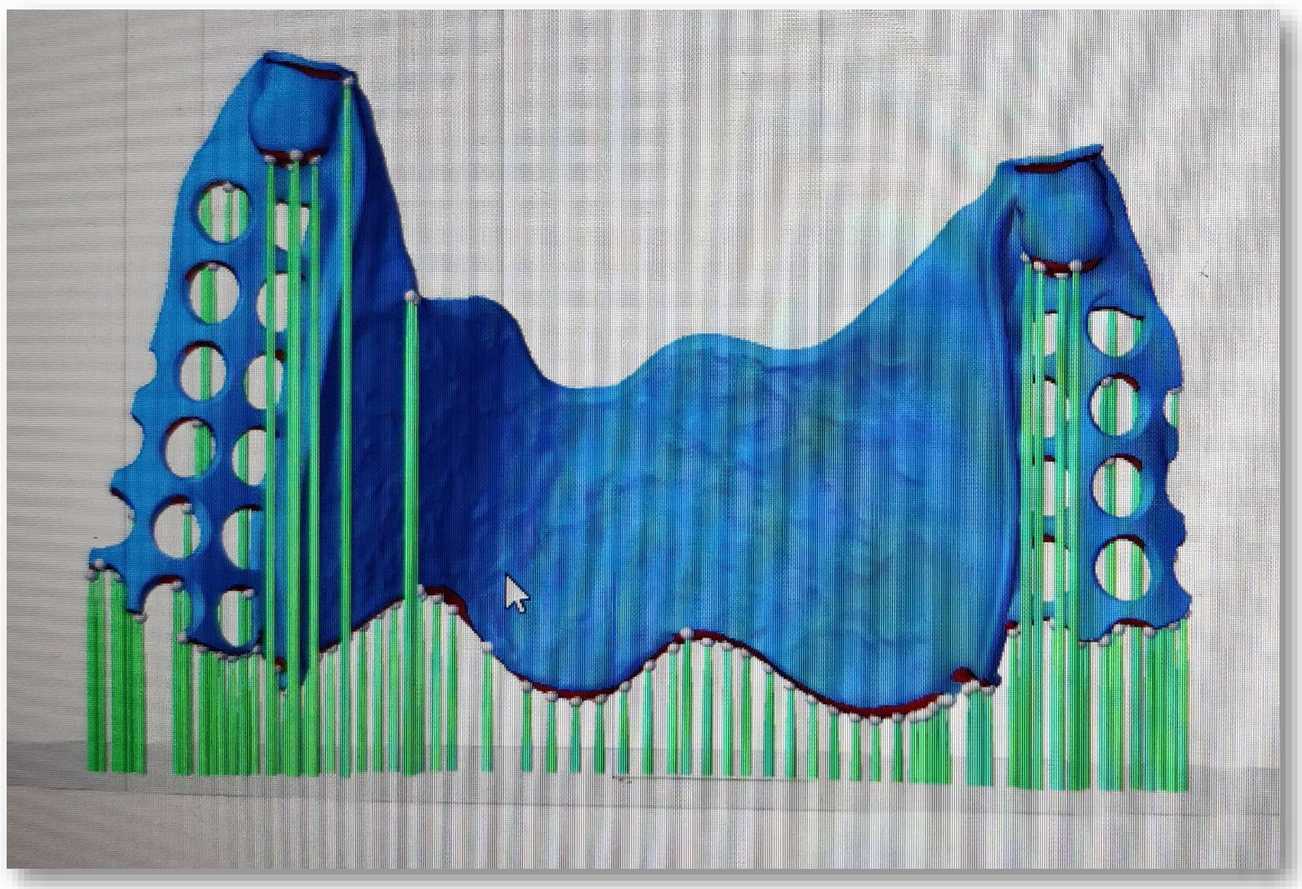
SINTER LASER MELTING

Dental medicine project

Author: Manolin Mita

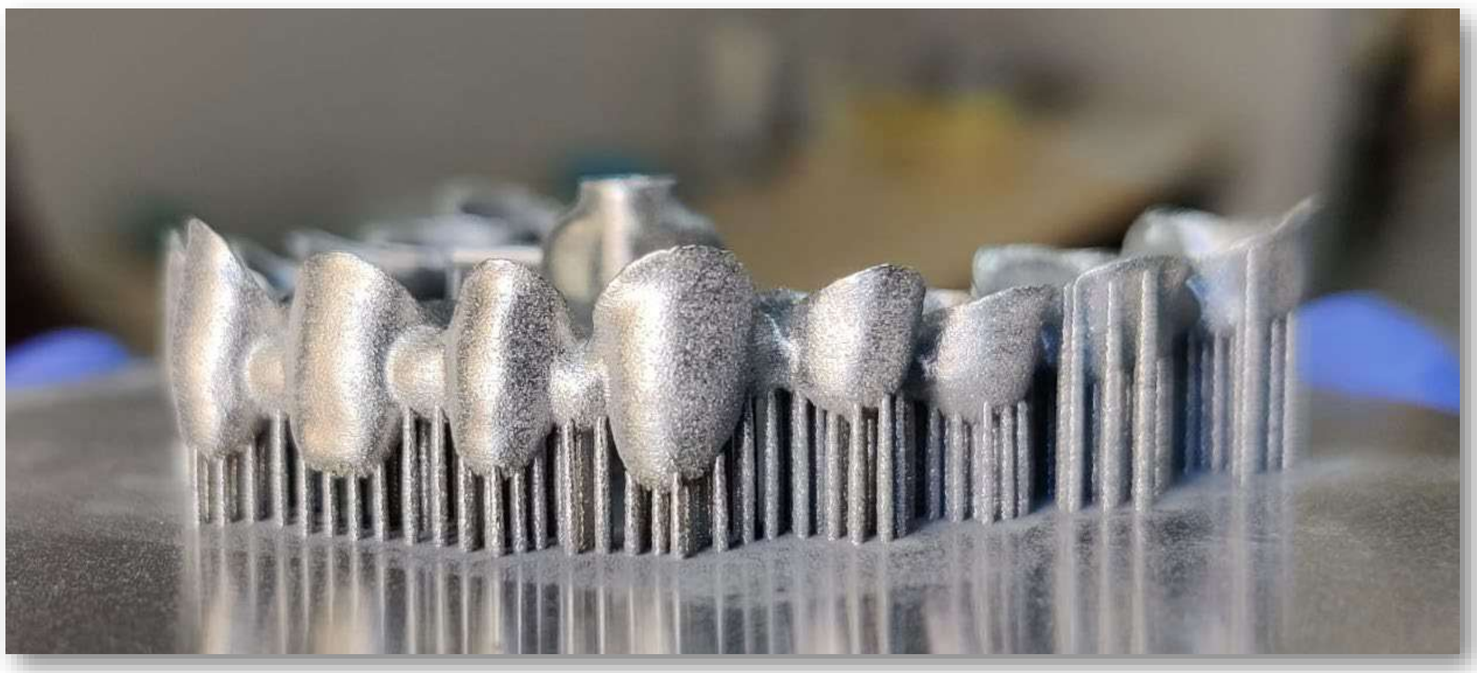
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Being in the field related to dental medicine with vast experience and because there was no center specialized in laser printing using Sinter Laser Melting technology in Hunedoara county, I ecided to take this step. 3D printing or additive manufacturing is a manufacturing process of solid objects tri-dimensionally adding layer after layer. Physical objects are produced using data a digital model, a 3D model or others sources such as an AMF* file. By using 3D printing they can be created products of almost any shape. Selective laser melting (SLM) is the leading metal 3D printing technology revolutionizing the additive manufacturing of metal parts. This digitized technology gives dental laboratories the opportunity to benefit from creating work of an exceptional quality, far beyond what humans can achieve with classic melting and casting technologies.











SCAN ME

Contact: laserprintdeva@gmail.com

ILZSU Hair Repair Serum

Product

Author/s: Varga Péterné

ILZSU®

HAIR REPAIR SERUM

Have wonderful tonsure! Stop the hair loss!

As we know the weak immune system has an effect on our body and firstly it can be seen on our look.

As soon as we realize any damages on the hair or on the scalp, such as alopecia areata, hair loss or baldness, it is important to start the treatment immediately.

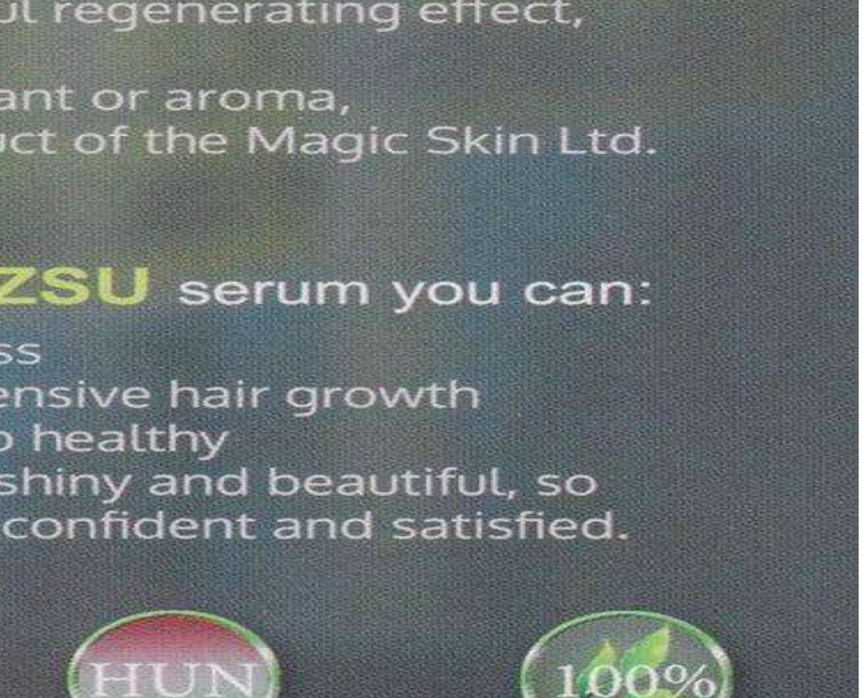
There are several proofs of the good effects of the ILZSU hair repair serum cure in many cases.

How does it work?

The scalp can be stimulated by using the serum, the blood supply can be increased, **so the hair loss can be reduced and the hair will start growing.**

Naturally, we cannot grow a tonsure on the part of the scalp, where the hair roots are dead but where roots are still alive the regeneration can be started again.

"The power of nature for a healthy hair."



Start using it on time! It is worth using the serum in case of a slight hair loss or for prevention as well in order to

ILZSU HAIR REPAIR SERUM

- It consists of 10 special herbs and their powerful regenerating effect,
- It has 100% natural ingredients,
- It is produced without any preservatives, colorant or aroma,
- It is a Hungarian and original trade mark product of the Magic Skin Ltd.

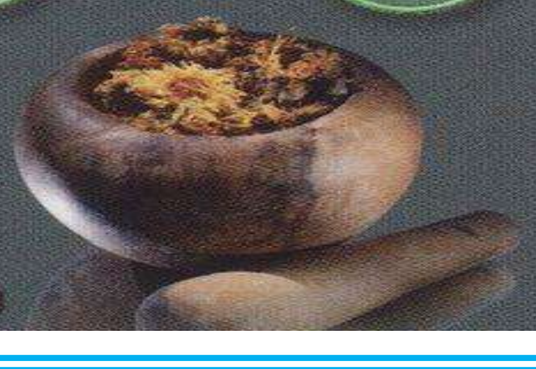


By using the ILZSU serum you can:

- stop the hair-loss
- promote an intensive hair growth
- make your scalp healthy
- make your hair shiny and beautiful, so you will be self-confident and satisfied.

HUN

100%



Skin-Magic

Cosmetic Manufacturing and Trading Ltd.

+36-70-276-4586 www.ilzsu.hu info@ilzsu.hu

G

Agriculture

Veterinary medicine

RESEARCH AND DEVELOPMENT STATION FOR POTATO TARGU SECUIESC

ROMANIAN POTATO VARIETY: *SECUIANA*

Patent APPLICATION: No. 00722 / 12.12.2023

Authors: Anca – Mihaela BACIU, Luiza MIKE

G

Potato variety obtained by sexual hybridization between *Collete* x *Laura*, followed by individual clonal selection.

The plant is tall, has stem-like foliage structure and erect habit. The flower corolla is large in size and shows medium intensity of anthocyanin coloration on the inner face. The tubercle is short-oval in shape and the eye depth is shallow. The color of the skin is medium red and that of the flesh medium yellow. It belongs to the group of semi-early varieties with an average yield of 38 t/ha, good culinary quality, classifying it in quality group B.

Resistant to cyst nematodes, black worm and virus diseases.







MINISTERUL AGRICULTURII ŞI DEZVOLTĂRII RURALE
INSTITUTUL DE STAT PENTRU TESTAREA ŞI ÎNREGISTRAREA SOIURILOR

Nr. 4610/29.05.2023

CERTIFICAT

privind înregistrarea soiului de cartof

Secuiana,

creat de Staţiunea de Cercetare-Dezvoltare pentru Cartof Târgu Secuiesc
autori: Anca Mihaela Baciu, Luiza Mike

În reţeaua Institutului de Stat pentru Testarea şi Înregistrarea Soiurilor, s-a efectuat examinarea tehnică a soiului de cartof TS11-1480-1633, în perioada 2020-2022 .

La încheierea ciclului experimental acest soi a fost înregistrat, în Catalogul oficial al soiurilor de plante de cultură din România, sub denumirea de **Secuiana**.

Soiul se poate cultiva în zonele favorabile cartofului, începând cu anul 2023.

Director General,
Mihai POPESCU

F-7.5-06 Rev. 0





Contact: www.scdctargusecuiesc.ro;
e-mail: anca.mihab@gmail.com
Address: 15 Orban Balazs Street
Post code: 525400, Targu Secuiesc / Covasna / Romania

RESEARCH AND DEVELOPMENT STATION FOR POTATO TARGU SECUIESC

ROMANIAN POTATO VARIETY: *NEMIRA*

G

Patent APPLICATION: No. 00722 / 12.12.2023

Authors: Anca – Mihaela BACIU, Luiza MIKE

Potato variety obtained by sexual hybridization between *Almera* x *Victoria*, followed by individual clonal selection.

The plant has medium height, stem-like foliage structure and erect habit. The flower corolla is small in size and shows a faint intensity of anthocyanin coloration on the inner side. The tubercle is oval in shape and has medium eye depth. The color of the shell is yellow and that of the flesh medium yellow.

It belongs to the group of semi-hardy varieties with an average yield of 42.5 t/ha, good culinary quality, classifying it in quality group B.

Resistant to cyst nematodes, black worm and virus diseases.





MINISTERUL AGRICULTURII ŞI DEZVOLTĂRII RURALE
INSTITUTUL DE STAT PENTRU TESTAREA ŞI ÎNREGISTRAREA SOIURILOR

Nr. 4611/29.05.2023

CERTIFICAT

privind înregistrarea soiului de cartof
Nemira,

creat de Staţiunea de Cercetare-Dezvoltare pentru Cartof Târgu Secuiesc
autori: Anca Mihaela Baciu, Luiza Mike

În reţeaua Institutului de Stat pentru Testarea şi Înregistrarea Soiurilor, s-a efectuat examinarea tehnică a soiului de cartof TS12-1495-1654, în perioada 2020-2022 .

La încheierea ciclului experimental acest soi a fost înregistrat, în Catalogul oficial al soiurilor de plante de cultură din România, sub denumirea de **Nemira**.

Soiul se poate cultiva în zonele favorabile cartofului, începând cu anul 2023.

Director General,
Mihai POPESCU

F-7.5-06 Rev. 0





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MECHANISM OF PLANTING WITH CONTROLLED TIGHTENING OF FOREST SEEDLINGS ON SANDY LAND SUBJECT TO DESERTIFICATION

MIRCEA Costin, NENCIU Florin
INMA Bucharest – ROMANIA

Patent Application No. A-00765 / 2023

G

ABSTRACT:

The invention refers to an innovative mechanism that has the major advantage of better controlling the planting process of forest-saplings on sandy lands, especially on difficult/degraded soils that are subject to desertification. Using a spring-loaded system to adjust the clamping force, was achieved a highly improved control over seedling planting, automatically adjusting the force according to the woody characteristics, root, stem and the dimensions of the seedling, to ensure their protection during planting.

DESCRIPTION:

Planting seedlings in sandy soils affected by desertification requires increased control, considering the challenges of low water holding capacity and winds that can dislodge these soils.

The technical problem that the invention solves is to create an improved mechanism for planting forest saplings on sandy lands affected by desertification, which provides more precise control over compaction during planting, ensuring a more efficient positioning of the sapling, without damaging the stem and its roots. The mechanism is part of a specialized machine for the mechanized planting of forest saplings. This mechanism is equipped with a controlled seedling gripper, which consists of a plunger that actuates two sets of gripping jaws for separate handling of seedling roots and stems during the planting process. These gripper jaws operate with different strokes for root and stem, and have springs with different tensions that automatically adapt to the size and woody condition of the sapling, as well as its size.



Degradated/desertified lands — Planting using the innovative system customized for sandy/desert lands — Create forest barriers with multiple functions: reduce soil displacement processes, stopping snow, increase soil moisture

COMPONENTS:

The figures show the forest sapling planting mechanism, with the ability to tighten with precision and high control both the root and the stem of the sapling, being two identical elements that work in mirror. These elements are composed of the plungers (**A**), which are mounted in the body of the hoe that moves in a vertical rectilinear movement, being each actuated by a cam. These plungers are held in the retracted position by tensioning the spring (**M**), with a force **F1** together with the two jaws (**J**) and (**J1**), which will also be pushed in the same plane, at elevation $\mathbf{l_0}$, by the forces **F2** and **F3**, which will act with different values, due to the different tensioning of the springs (**G**) and (**H**). When the planting mechanism rises on the cam (figure 3), the roller (**C**) of the left-right plungers (**A**), compresses the springs (**M**) with the force **F1** and moves the plungers with the two jaws along the length ***L***, until they meet (the case when the young is not positioned between the jaws). If there is a sapling, the different forces **F2** and **F3** are applied to grip the root and the stem, these forces being the result of the retraction by a distance of ***Dr/2*** of the jaw that grips the root of the sapling, and of the jaw that grips the stem by a distance of ***Dt/2***.

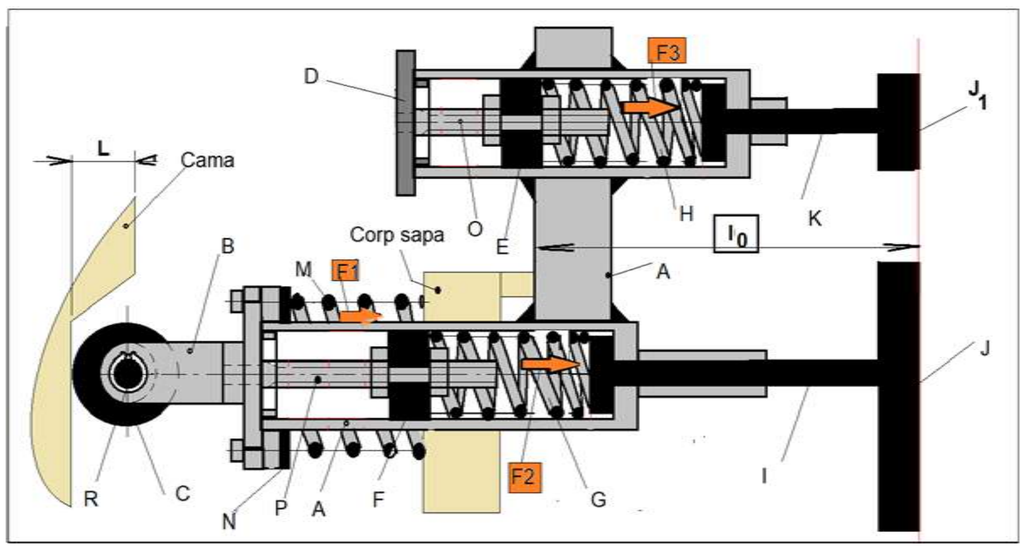


Fig.1- Using a spring-loaded system the innovative mechanism adjusts the clamping force according to the specific characteristics of the sapling, being adapted for sandy environments.

These withdrawals are caused by the resistance of the seedling and depend on the diameter of the root and its stem and are achieved by tensioning the springs (**G**) and (**H**) (fig.3). As the hoes descend, they enter the soil, with the seedling caught in the mechanism, after which the plunger (**A**) retracts together with the two jaws to the initial position, by de-tensioning the spring (**M**) to the force value **F1**. At the same time, the jaws (**J**) and (**J1**) return to their initial standby positions at the elevation $\mathbf{l_0}$ due to the release of the springs (**G**) and (**H**) at the values of the forces **F2** and **F3**. This action releases the seedling inserted vertically into the hole created in the soil, ensuring the correct positioning of the root. Planting operations then resume cyclically.

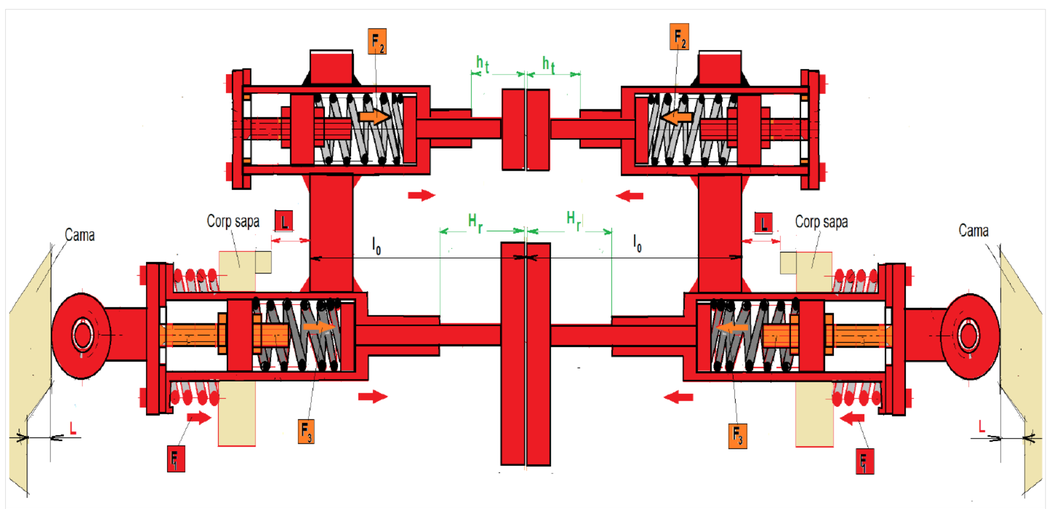


Fig.2 -Kinematic scheme of the planting mechanism - Closed position without sapling

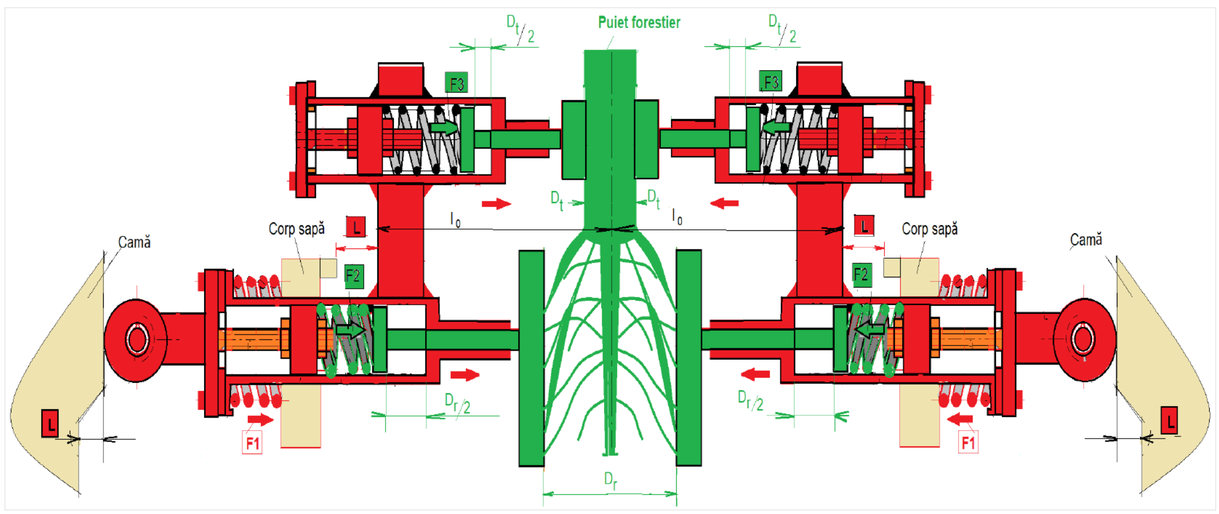


Fig.3 -Kinematic scheme of the planting mechanism - Closed position with sapling

ADVANTAGES:

- ❑ - Precise control of the seedling tightening force during planting;
- ❑ - Customization of planting conditions according to the specificities of degraded /desertified lands (e.g. adjustable piston tightening stroke for the mechanism jaws)
- ❑ - Enable different clamping forces for the stem compared to the root, which ensure a high level of protection;
- ❑ - Allows vertical planting of a wide range of small, medium or large saplings, without changing the mechanism settings.

ACKNOWLEDGEMENT:

This work was financed by the Ministry of Research and Innovation through Nucleu Program: "*Multidisciplinary research in digital agriculture for economic competitiveness and sustainable development, in the context of climate change". (SUSTAIN-DIGI-AGRI code PN 23 04)*, contract No. 9N / 01.01.2023 (nr.451623 / 30.12.2022)

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MOWING EQUIPMENT FOR ORCHARD PLANTATIONS WITH LASER TRUNK DETECTION

POPA Lucreția, CIUPERCĂ Radu, ZAICA Ana, ȘTEFAN Vasilica
INMA Bucharest – ROMANIA

Patent Application No. A-00764 / 2023

G

ABSTRACT:

The invention refers to an orchard mowing equipment with laser sensor for trunk detection, for mowing in maintained orchards, capable of mowing both between rows of trees and between trees in a row, able to provide trunk protection with artificial intelligence, integrating laser technology.

DESCRIPTION:

The current equipment intended for mowing between trees in a row which, in general, have similar constructions, performing vegetation mowing on the same principles, with the help of a rotor with radially arranged articulated knives, mechanically operated rotor, from the tractor's PTO shaft, or hydrostatically, from the hydraulic installation of the tractor, as well as the movement of the rotor in the horizontal plane when mowing between trees in a row, being equipped with a feeler, which commands the withdrawal of the mower arm when the feeler contacts the tree.

The disadvantages of most mowers known to date, consist of the following:

- the command to withdraw the mower is given when the sensor probe comes into contact with the tree trunk, which may lead to damaging the bark of the tree, further inducing the appearance of diseases, facilitating the attack of pests, which leads to a shortening of the life span and a decrease in production;
- there may be lower stumps that are not touched by the probe, which may lead to damaging the mower.

The technical problem that the proposed solution solves consists in creating a rotary mower that, in addition to mowing between trees in a row, maintains a safe distance from the tree to prevent damage to the trunk, by equipping it with an ***intelligent detection system with LiDar type laser.***

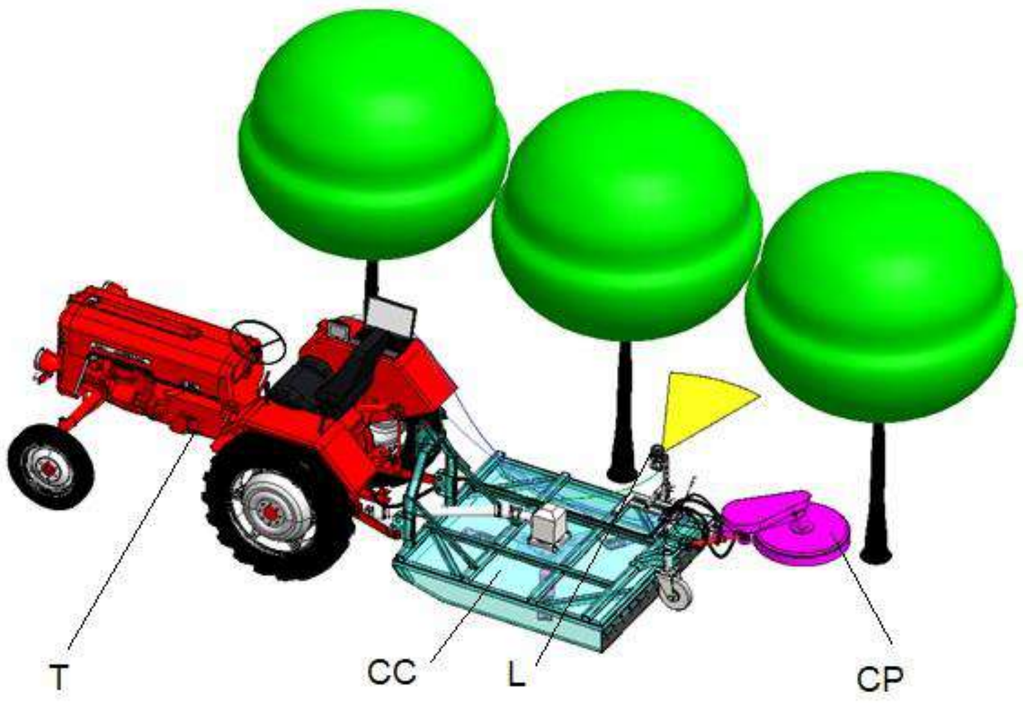


Fig.1 - Aggregate tractor mowing equipment in fruit plantations, with laser trunk detection - perspective view

COMPONENTS:

The equipment consists of a central mower, composed of a welded frame (**1**), for attachment to the suspension mechanism of the tractor, a casing (**2**), welded to the frame, made of welded pipes and sheets, a primary rotor, consisting of -a plate (**3**), on which some articulated knives (**4**) are fixed, this rotor being assembled with a parallel wedge not notched, on the axis of a conical group (**5**), within the mechanical transmission, formed by a cardan shaft (**6**), with safety coupling and a conical group (**5**), a pivoting mower, which is composed of an arm (**7**), articulated to the central mower, a rotor equipped with articulated knives (**8**), fixed on a disk (**9**), by means of an unmarked screw-nut assembly, a belt drive, consisting of a belt pulley (**10**), fixed to the shaft of the rotary hydraulic motor (**14**), with a parallel wedge, a belt pulley (**11**), fixed with a wedge on the rotor shaft (**9**), a transmission belt (**12**), a housing welded to the arm (**13**), in which the rotor (**9**) is mounted, with a cylindrical joint with radial-axial bearings, mounted on the shaft rotor, respectively in the housing of the swing mower, a hydraulic transmission consisting of a rotary hydraulic motor (**14**), a hydraulic cylinder (**15**), a two-section distributor (**16**), with electric control, some hydraulic hoses and fittings, a system of automation and control, mounted on an adjustable support (**17**), fixed to the central mower, composed of a control box (**18**), and a Lidar-type laser radar (**19**), which achieves the precise detection of the tree trunk and commands - by the means of some unmarked electric cables - the actuation of the distributor and the retraction of the swing mower, for its own protection and of the trunk.

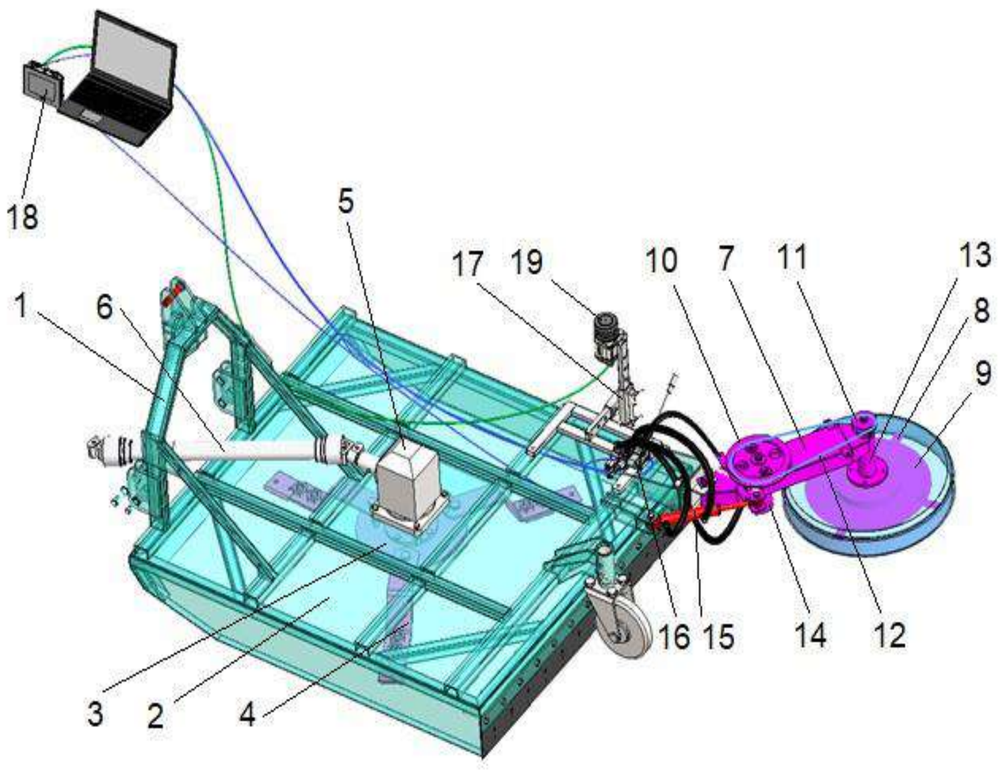


Fig.2 - Mowing equipment in orchards with laser trunk detection - perspective view.

ADVANTAGES:

- ❑ protecting the trunk of the fruit trees and, therefore, contributing to the increase in the production and quality of the fruits;
- ❑ the LiDar sensor can be adjusted in height, facilitating detection, depending on the type of plantation, protecting the mower through a precise detection of the obstacle and commanding the mower to retract in a timely manner;
- ❑ carrying out the work of mowing and mulching, according to the current requirements to maintain the grass, excluding or limiting the work of mobilizing the soil, with implications on the optimal development of the orchard and fruit production.

ACKNOWLEDGEMENT:

This work was financed by the Ministry of Research and Innovation through Financing Contract no.650PED/2022 –*"Demonstrative model of intelligent equipment for the management of orchard floor vegetation"*, Programme #2 from PN III Program: *"Increasing the competitiveness of the Romanian economy through research, development and innovation"*, Sub-programme: 2.1 – Competitiveness through research, development and innovation.

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ACTIVE ORGAN OF CHISEL TYPE, FOR SOIL WORKS

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INMA Bucharest – ROMANIA

Patent Application No. A-00763 / 2023

G

ABSTRACT:

The invention refers to a chisel-type active organ for soil tilling, intended for various equipment provided with supports for active organs used for tilling the soil without turning the layers, such as scarifiers, chisels, tillers etc.

DESCRIPTION:

In the state of the art, various active organs used on soil processing equipment are known, which have various constructive forms.

However, the disadvantages of most of these solutions consist in the fact that during the work they increase the forward resistance force to cut the soil to a certain depth and raise the soil to a small distance, especially in the case of a massive cohesive and/or wetter soil structure, from because the working organs are composed of side wings with straight edges.

The technical problem that the proposed solution solves, according to the invention, is to create an active chisel-type organ for working the soil, which, when in contact with the soil, contains elements with curved profiled edges that become the most likely areas of progressive fracturing in during tillage to produce tensile yielding of the soil, which keeps most of the tillage energy concentrated in the direction of travel and in the vertical planes, in order to increase the stability of the work and reduce the drag force to advance.

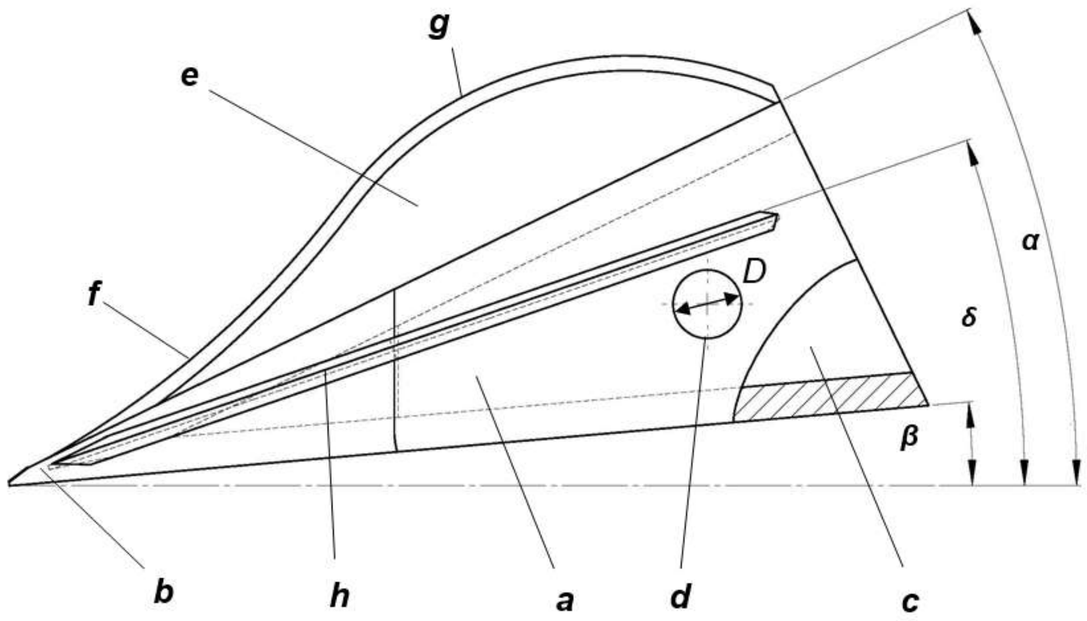


Fig.1 - Chisel-type active organ for working the soil - side view

COMPONENTS:

The chisel-type active body for tillage consists of a metal body (**a**) with high wear resistance, having a prismatic shape, which is inclined with respect to a horizontal plane in the direction of tillage by an angle (**α**) comprised between 20...30 degrees on the front side and an angle (**β**) between 5...10 degrees on the dorsal side, provided at the bottom with a sharp tip (**b**) with an angle (**γ**) between 20 ...25 degrees in the forward direction and inclined to the horizontal plane to extend to the front, back and sides, and the back with a prismatic cavity (**c**), crossed laterally by a pierced hole (**d**) with diameter (**D**), for the demountable assembly of a vertical support, not positioned on the drawing, in addition, on the front side it has a sharp curved blade type rib (**e**) with a profiled edge at the beginning with a concave curve (**f**) and continuing with a curve convex (**g**) in the forward direction, and on the sides on one side and the other are arranged symmetrically some wings (**h**) type of sharp curved blade inclined from the horizontal plane with an angle (**δ**) between 15...19 degrees with contoured edges beginning with a concave curve (**i**) and continuing with a convex curve (**j**) in the direction from the front to the outside.

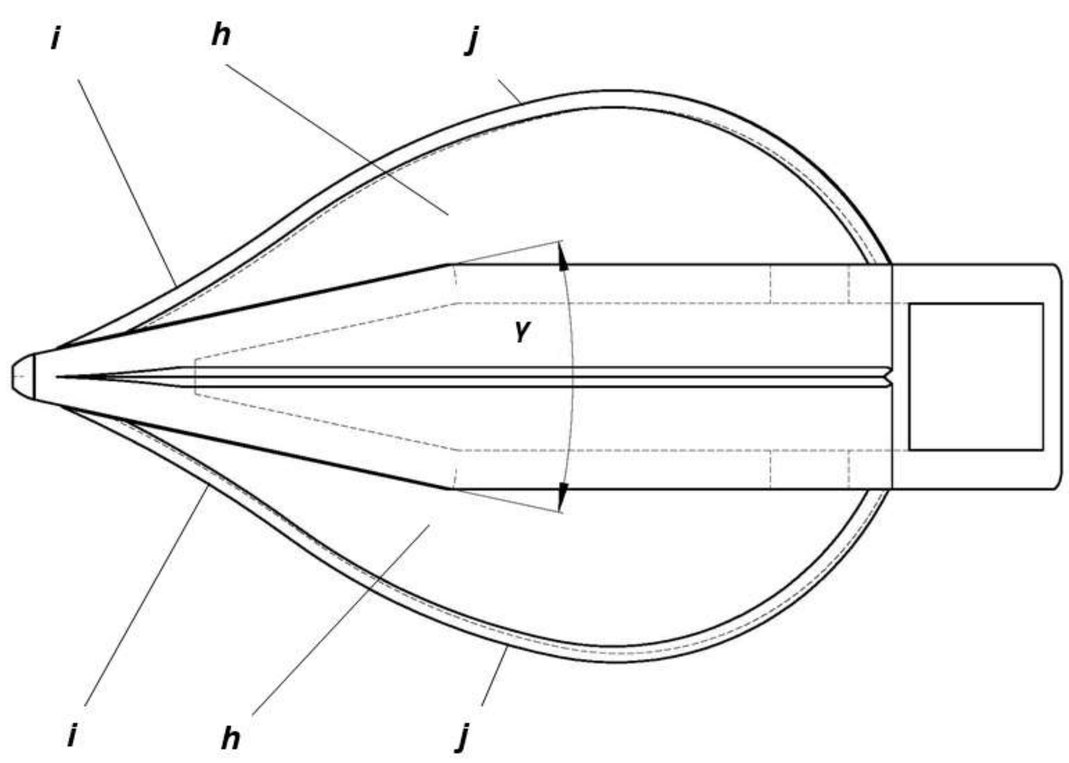


Fig.2 - Chisel-type active organ for working the soil - top view

ADVANTAGES:

- ❑ - Reduction of the traction force simultaneously with the reduction of fuel consumption with positive consequences and for the high-speed operation of the tillage equipment;
- ❑ - substantial reduction of soil compaction and elimination of hardpan;
- ❑ - increasing the working stability of the tillage equipment;
- ❑ - improving soil aeration and the ability to retain water in the soil.

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EQUIPMENT FOR THE PRODUCTION OF LIQUID BIOFERTILIZER FROM COMPOST

NENCIU Florin, DUMITRU Dragoș, OLAN Mihai
INMA Bucharest – ROMANIA

Patent Application No. A-00625 / 2023

G

ABSTRACT:

The degradation of agricultural soils due to climate change, intensive agriculture, and the use of hazardous chemicals can be mitigated through the use of complex solutions enriched with microorganisms and microelements, prepared with the help of sophisticated equipment known as bioreactors.

The invention relates to an equipment designed for the production of microbiologically enriched biofertilizer solutions, using compost as an inoculating agent, along with nutrients and water, with the aim of obtaining a stable fertilizer concentrate with a high content of beneficial microorganisms and micronutrients for agricultural crops.

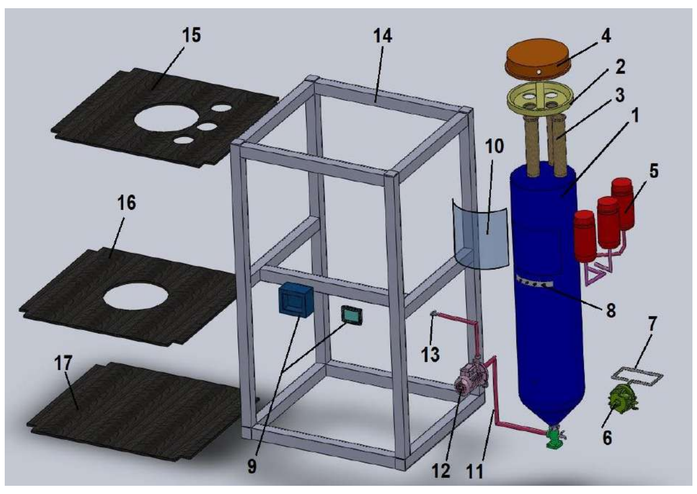
DESCRIPTION:

The bioreactor consists of a food grade stainless steel basin, equipped with an automated system for monitoring and controlling internal parameters, controlled by sensors (pH, dissolved oxygen, temperature, carbon dioxide, etc.) and a programmable logic controller (PLC) , used for industrial automation. The automation system coordinates the aeration subsystem (used for supplying oxygen to aerobic microorganisms), the system for adding chemicals (consisting of enzymes and food for microorganisms), the one for maintaining the pH in the optimal ranges, or determining the preparation time of the fertilizing solutions.

The obtained concentrate is a biofertilizer solution enriched with microorganisms and microelements and is obtained by mixing composted / digested sources, mineral fertilizers and water. The resulting fertilizer solution can be used in domestic and commercial agricultural and horticultural environments, for the purpose of improving the growth rate of plants grown in greenhouses and in field crops, combating pathogens in the soil or on plants, use in hydroponic systems, as well as in technologies to restore degraded soils following desertification.

In simpler terms, the biofertilizer concentrate is a liquid solution that contains a wide variety of nutrients and microorganisms, which favours the creation of a favourable environment for the development of symbiotic relationships between biological elements and plants.





Picture 1 – Equipment for the Production of Liquid Biofertilizer

COMPONENTS:

The equipment for the production of liquid biofertilizers from compost consists of a stainless steel extraction basin (**1**), conical in shape, which allows rapid drainage and the creation of eddies in order to mix the contents more effectively, being covered with the lower cover (**2**), provided with four holes for supporting the inoculation baskets (**3**). The role of baskets made of stainless steel mesh is to immerse in the solvent liquid the solid material intended for the transfer of microorganisms (bacteria, fungi) in the biofertilizing solution. The upper cover (**4**) is equipped with two process gas exhaust holes, resulting from the metabolic processes of microorganisms. The dosing system (**5**) has the role of automatically adding various useful substances in the process, to regulate the pH, to supplement the need for nutrients or enzymes, being in correlation with the aeration system, composed of the air pump (**6**) and from the aeration-mixing pipe (**7**). The systems are automatically coordinated by the sensors (**8**) and the PLC (**9**), and the user can also visually observe the process through the inspection window (**10**).

When the batch of liquid biofertilizer is completed, the rapid emptying system of the biofertilizer consisting of the ascending pipe (**11**), the liquid pump (**12**) and the descending pipe equipped with a valve (**13**), quickly and efficiently evacuates the obtained solution. For rigidity and quick transport, the subsystems are mounted on a metal support (**14**) and three plastic platforms for supporting the basin (**15**), (**16**) and (**17**).



A - Example of bioreactor design;
B - Application of biofertilizers using subsoil agricultural equipment

ADVANTAGES:

- ❑ the equipment integrates an automated process monitoring and control system, which maximizes the properties of the obtained concentrate, both from a nutritional and microbiological point of view, ensuring predictability of the production process;
- ❑ it solves the important problems related to the instability over time of liquid biofertilizers and eliminates the disadvantages associated with transportation;
- ❑ it integrates an efficient system for rapid evacuation of liquid biofertilizer from compost into various types of containers, thus expanding the versatility of application technologies on crops;
- ❑ it integrates a chemical supply system consisting of three specially designed containers for the automatic storage and dosing of essential elements in the process;
- ❑ increases the efficiency of the transfer of microorganisms in the fertilization solution, thanks to the innovations of the inoculation system;

ACKNOWLEDGEMENT:

This work was financed by the Ministry of Research and Innovation through Financing Contract no. 1PFE / 30.12.2021 - (PFE 1296 / 17.12.2021) - Financing by the contracting authority of the project "*Institutional development of INMA Bucharest in order to increase performance in the field of bioeconomy*", Program 1 - Development of the National Research-Development System, Sub-programme: 1.2 - Institutional Performance, PROJECT Type: Institutional Development Projects - CDI Excellence Financing Projects

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DIGITAL SYSTEM AND METHOD FOR MONITORING PESTS IN FRUIT CROPS USING SMART PHEROMONE TRAPS AND WEATHER STATIONS

PERSU Cătălin, CUJBESCU Dan, MATACHE Mihai-Gabriel,
GĂGEANU Iuliana, VLĂDUȚ Nicolae-Valentin, GHEORGHE Gabriel,
VOICEA Iulian, ANGHELACHE Dragoș
INMA Bucharest – ROMANIA

G

Patent Application No. A-00624 / 2023

ABSTRACT:

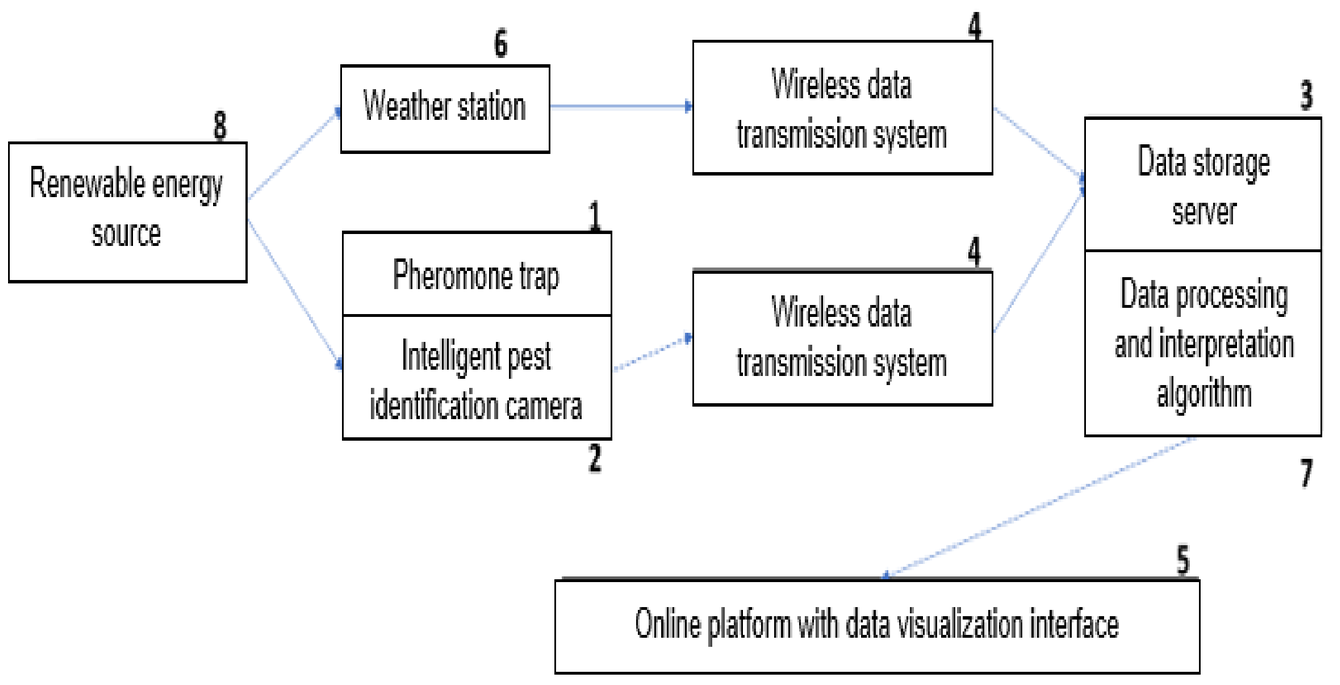
The invention refers to an intelligent equipment intended for the monitoring of pests in fruit crops using a pest capture equipment (pheromone trap) equipped with an intelligent system for their quantification (smart camera) and a weather station to facilitate the correlation of the data obtained with climatic conditions (wind, precipitation, temperature, day/night, season) in order to identify and understand the evolution and behavior of pests in relation to the monitored parameters.

DESCRIPTION:

The main disadvantage of the currently existing equipment and methods in the field is that they are focused on the identification of pests (insects) and do not focus on external climatic factors, which can influence the evolution of pests.

Another disadvantage consists in the fact that they do not refer to the monitoring of the day and night activity of the pests, as well as the correlation of the data obtained from their identification related to a certain season or to a certain period of the day (day / night).

The digital fruit crop pest monitoring system is an advanced solution that uses pheromone traps and photo technology to identify, quantify and monitor them, providing real-time detailed data on fruit crop pest populations. Integrating a weather station into this system adds an additional level of complexity and precision, allowing for more effective environmental and pest monitoring and management.



Scheme of the principle of operation of the digital system for monitoring pests in fruit crops using smart pheromone traps and weather station

COMPONENTS:

The working methodology of digital pest monitoring system in fruit crops using smart pheromone traps and weather station:

1. Placement of pheromone traps in different areas of fruit cultivation;
2. Weather station placement to monitor temperature, humidity, precipitation, wind and day/night cycles;
3. Supply to the energy source;
4. Acquisition of data from the smart camera of the pheromone trap;
5. Acquisition of weather station data;
6. Transmission of data to a server via wireless devices;
7. Using an algorithm to integrate and analyse data obtained from the weather station with data on pest behaviour obtained from the smart camera of pheromone traps;
8. The generation of warnings, the detailed reporting of the obtained results and their online upload to a platform easily accessible by the farmer or specialists in the field.

ADVANTAGES:

- **Sustainable Crop Management:** Integration of weather data and pest behaviour contributes to sustainable crop management. By applying treatments only in optimal conditions, the impact on the environment is reduced and sustainable agriculture is promoted;
- **Optimizing Control Strategies:** Digital systems allow continuous monitoring and correlation of data on pest populations with weather conditions, thus allowing optimization of control strategies. This provides a personalized and well-grounded approach to pest management;
- **Real-Time Alerts:** Online data reporting and real-time analysis allows farmers to receive immediate warnings in the event of sudden increases in pest populations or adverse weather conditions. This allows preventive measures to be taken in a timely manner.

ACKNOWLEDGEMENT:

This work was financed by the Ministry of Research and Innovation through Financing Contract no. 1PFE / 30.12.2021 - (PFE 1296 / 17.12.2021) - Financing by the contracting authority of the project "*Institutional development of INMA Bucharest in order to increase performance in the field of bioeconomy*", Program 1 - Development of the National Research-Development System, Sub-programme: 1.2 - Institutional Performance, PROJECT Type: Institutional Development Projects - CDI Excellence Financing Projects

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INTELLIGENT SYSTEM FOR APPLICATION OF PHYTOSANITARY TREATMENTS AND MONITORING OF PRODUCTION IN GREENHOUSES

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Patent Application No. A-00623 / 2023

ABSTRACT:

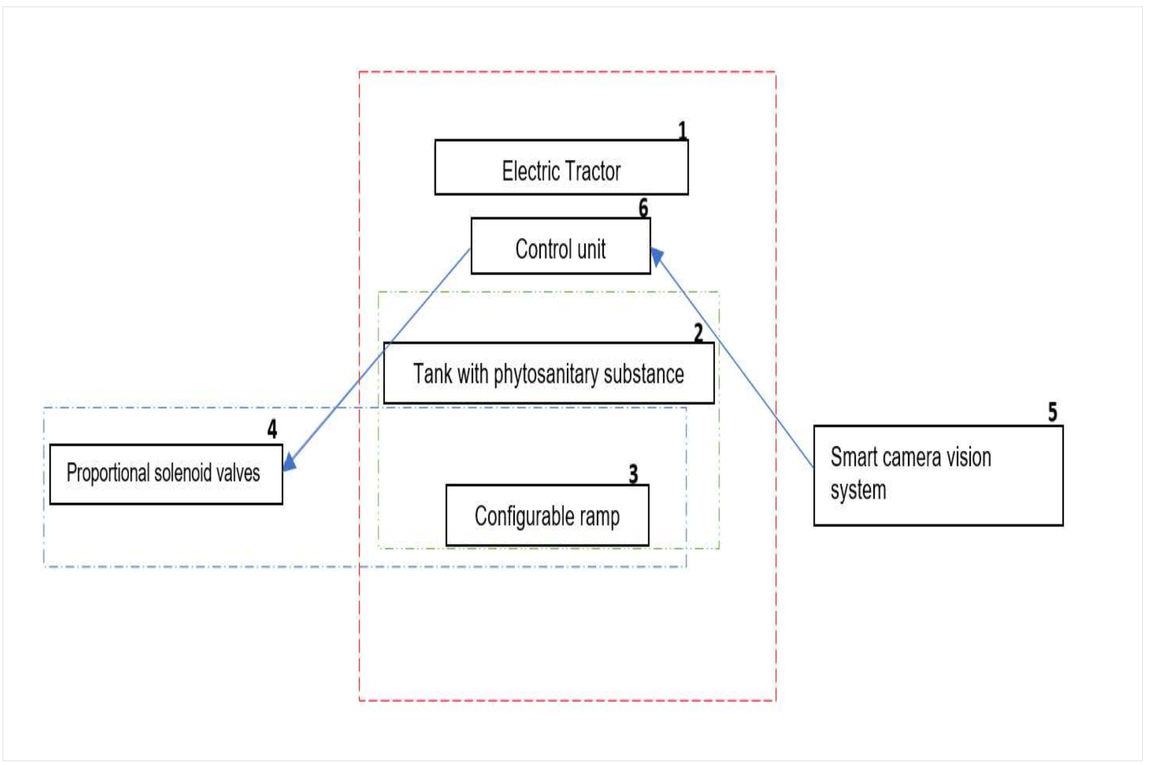
The invention refers to an intelligent system intended for the monitoring and maintenance of vegetable crops, in order to optimize the process of applying phytosanitary treatments between crop rows and to achieve a monitoring from the point of view of the vegetation study of vegetable products in closed protected spaces.

DESCRIPTION:

In recent years, both at national and worldwide level, there has been a considerable intensification of research on the introduction of intelligent systems intended for the targeted application of phytosanitary treatments as well as the monitoring of crops with *vision* systems (intelligent cameras for image acquisition and analysis), different solutions being approached with the aim of increasing productivity, greening crops, reducing crop maintenance costs and, at the same time, optimizing farm management.

The main disadvantage of the presented equipment and methods consists in the fact that they do not offer the possibility of targeted application of phytosanitary treatments, relative to the size of the plants of interest, monitored by *vision* systems for evaluating the stage of vegetation, application which, depending on the stage of development of the plant of interest, it can be done both above the plant, vertically and horizontally, between the crop rows.

The technical problem that the invention solves consists in the integration of an intelligent system intended for the application of phytosanitary treatments and the monitoring of production in greenhouses. The intelligent equipment intended for the targeted application of phytosanitary treatments in closed protected spaces and the monitoring of the vegetation stage of the crops of interest in order to optimize the amount of phytosanitary treatment applied and to estimate the productivity.



Scheme of the principle of operation of the intelligent system intended for the application of phytosanitary treatments and production monitoring in greenhouses

COMPONENTS:

The intelligent system intended for the application of phytosanitary treatments and monitoring of production in greenhouses is characterized by the fact that it ensures the optimization of the process of applying phytosanitary treatments between crop rows and the monitoring from the point of view of the vegetation stage of vegetable products in closed protected spaces, being composed of the following main components:

1. **Electric Self-Propelled Chassis:** It is the basic structure of the equipment that ensures mobility in the crop and is equipped with an electric propulsion system for autonomous movement.
2. **Tank for Phytosanitary Substance:** Its purpose is to store the phytosanitary substance.
3. **Configurable Ramp for Applying Phytosanitary Treatment:** The ramp is designed to allow the application of phytosanitary treatments both above the plants and for the application of treatments horizontally between crop rows.
4. **Proportional Electrovalves:** Electrovalves are integrated at the level of the spray nozzles and allow precise adjustment of the flow and application pressure of phytosanitary substances according to the development stage of the plants of interest, contributing to the uniform distribution of the treatments.
5. **Smart Camera Vision System:** The vision system includes a smart camera that is used to identify plants of interest and harvestable plant mass. It captures high-resolution images for plant developmental stage analysis.
6. **Control Unit:** The control unit manages all aspects of the operation of the equipment. It receives the data from the vision system, regulates the speed of the equipment and the flow of phytosanitary substance.

ADVANTAGES:

- ❑ **Improved efficiency of phytosanitary treatments:** The equipment uses vision systems to identify the plants of interest and their stage of development, thus allowing the application of precise and efficient treatments, adapted to the specific needs of the crops.
- ❑ **Flexibility in treatment distribution:** The ability to reconfigure the treatment application ramp, both vertically and horizontally between crop rows, provides a high degree of flexibility to adapt to specific greenhouse conditions and maximize crop coverage.
- ❑ **Real-time monitoring of the vegetation stage:** The vision system identifies the development stage of the plants, allowing the adaptation of treatments according to them. This helps to optimize the use of resources and reduce the wastage of phytosanitary substances.
- ❑ **Effective production management:** By monitoring and evaluating the production based on the images captured by the photo/video monitoring system, the equipment provides valuable information for optimizing agricultural processes and harvesting planning.
- ❑ **Automation and precise control:** The control unit allows the management of the travel speed and the amount of phytosanitary substance applied, ensuring a uniform and precise application of the treatments.
- ❑ **Resource savings:** By applying treatments as needed, the equipment helps to reduce the amount of plant protection substance used and minimize waste, which has a positive impact on the environment and costs.
- ❑ **Non-invasive monitoring:** The equipment allows monitoring the development stage of plants without requiring physical interventions on them, thus avoiding damage or stress caused by handling.

ACKNOWLEDGEMENT:

This work was financed by the Ministry of Research and Innovation through Financing Contract no. 1PFE / 30.12.2021 - (PFE 1296 / 17.12.2021) - Financing by the contracting authority of the project "*Institutional development of INMA Bucharest in order to increase performance in the field of bioeconomy*", Program 1 - Development of the National Research-Development System, Sub-programme: 1.2 - Institutional Performance, PROJECT Type: Institutional Development Projects - CDI Excellence Financing Projects

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EQUIPMENT FOR MONITORING COLLECTION, CROPPING AND PACKAGING OF MARINE AND LAKE SURFACE PLASTIC WASTE

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Patent Application No. A-00603 / 2023

ABSTRACT:

The invention relates to a mobile equipment with active monitoring of the working area and hydraulic actuation for the collection of plastic waste from the marine environment and from the surface of lakes, its compaction, chopping and packaging.

DESCRIPTION:

The general disadvantages of the solutions existing on the market at the present time to solve the collection of waste from aquatic surfaces, consist in the lack of both a mechanical system for capturing plastic waste from the outer space of the two arms and the collection belt, as well as an efficient system for shredding plastic waste.

The technical problem that the proposed solution solves consists in making an autonomous mobile equipment, with active monitoring, which contains two pairs of arms, where each arm in the set can be adjustable with respect to the other as an angular position with the help of a tensioner and a cylindrical joints and each pair of arms to be able to have a continuous movement at a certain angle, to create the necessary currents on the surface of the water to attract waste from outside them. For the efficient shredding of plastic waste, the shredder housing is equipped with a spur, which limits the movement of the waste during the shredding operation, and the shredder drum has two sets of knives on the same axis, the first set of profiled knives has the role of breaking the plastic waste and the knives in the second set have the role of cutting the pieces of plastic into smaller elements.

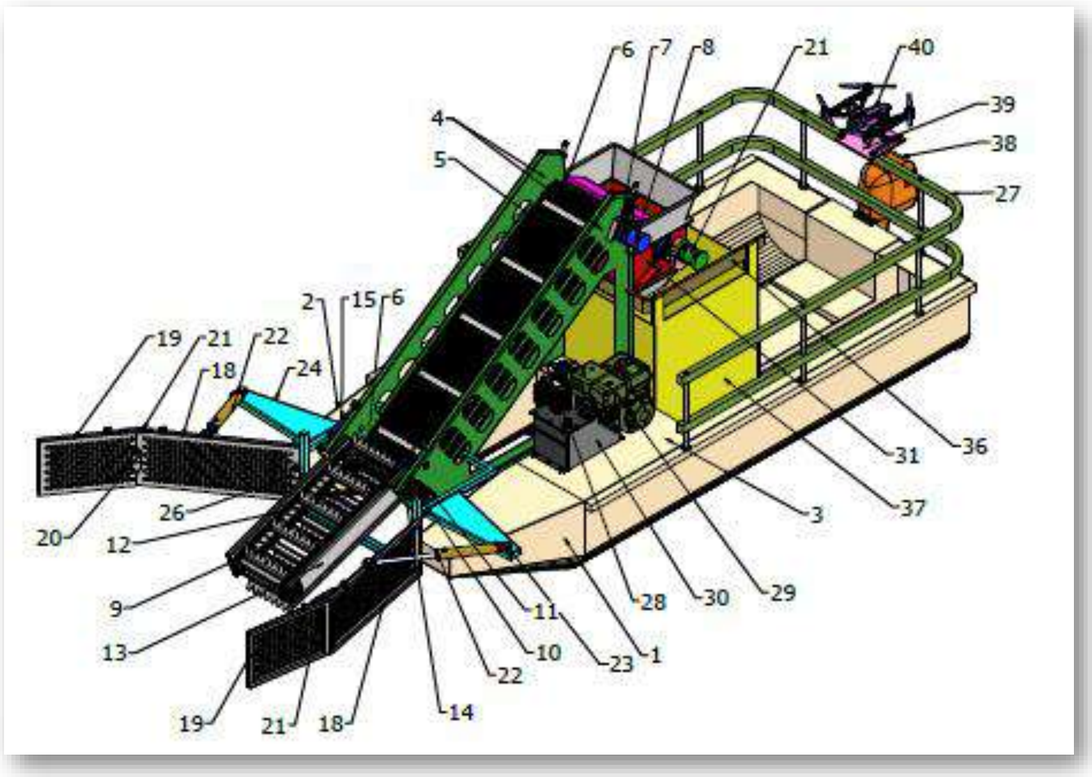


Fig.1 – Equipment for the collection of plastic waste

COMPONENTS:

The equipment consists of a marine platform that is built from two fishing boats (**1**) and (**2**) with a connecting platform (**3**) between them and which will support the work equipment that consists of a support (**4**) , which supports a conveyor belt (**5**), which is made of braided mesh and equipped with two side chains that run on two axles (**6**) equipped with chain wheels and which are positioned with the help of two bearings (**7**) with a system of adjustment. This conveyor belt is driven by a hydraulic motor (**8**). Also mounted on the support (**4**) is the collection belt (**9**) whose drive shaft (**10**) is kinematically coupled to the transport belt (**5**) by means of a Gall chain transmission (**11**). For the collection of plastic waste, this equipment is equipped with two pairs of arms (**18**) and (**19**) which are articulated and adjusted with the help of a tensioner (**21**) and actuated with the help of hydraulic cylinders (**22**) to create the currents necessary to move plastic waste in the direction of the collection belt (**9**). The equipment is equipped with a protective fence (**27**).

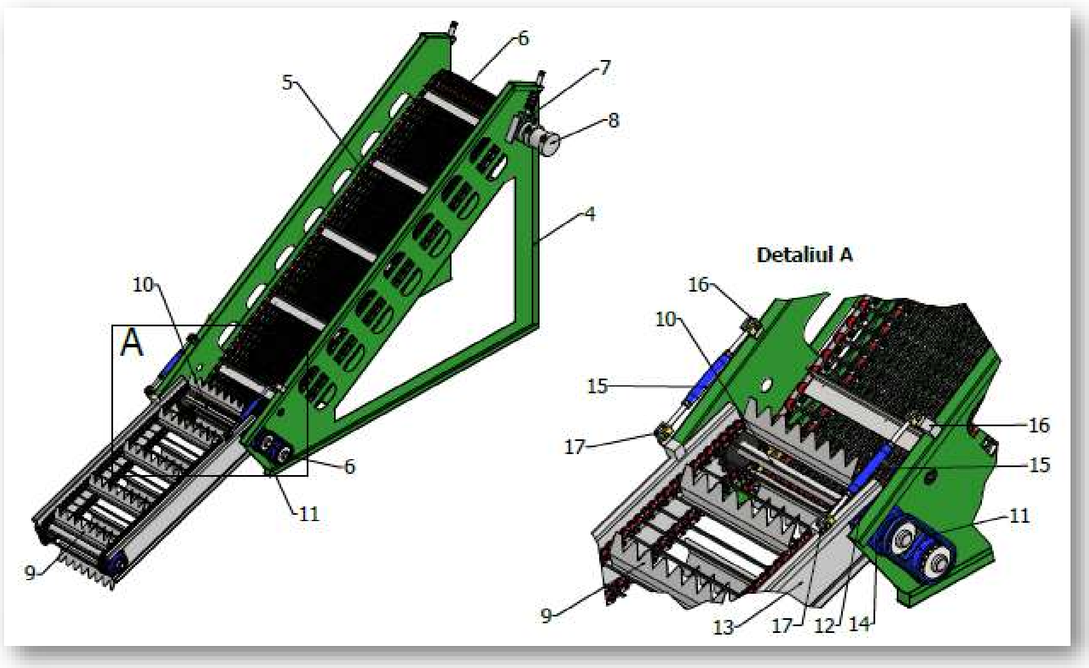


Fig.2 - Collector belt assembly and transport belt with support

Fig.3 - The constructive detail of the collecting belt and conveyor belt

To produce the hydraulic energy required for the hydraulic motors on this equipment, the system is equipped with a hydraulic pump (**28**) driven by a gasoline thermal engine (**29**), also having an oil tank (**30**). In order to shred plastic waste in order to reduce the transport volume, the waste collection equipment is equipped with a shredder (**31**) for plastic waste, which has a drum construction with two different sets of knives (**33**) and (**34**), the road being driven by a hydraulic motor (**21**). Two arms (**36**) are mounted on the support (**4**) that will support a large volume bag (**37**), which, after filling, will be lifted and unloaded from the marine platform with a hydraulic crane.

ADVANTAGES:

- ❑ the main advantage is the reduction of the volume of plastic waste after collection and the abandonment of another vessel needed to transport it;
- ❑ it has an increased collection capacity due to the fact that the two arms are continuously operated to have angular movements and thus create the currents necessary to attract the plastic waste in front of the collecting belt;
- ❑ real-time reporting of the situations of the polluted surfaces of the reservoirs, both before and after the implementation of the depollution operation using a drone;
- ❑ increasing the degree of manoeuvrability and adjustment, compared to the technical solutions described in the patents mentioned above in the state of the art.

ACKNOWLEDGEMENT:

This work was financed by the Ministry of Research and Innovation through Financing Contract no. 1PFE / 30.12.2021 - (PFE 1296 / 17.12.2021) - Financing by the contracting authority of the project "*Institutional development of INMA Bucharest in order to increase performance in the field of bioeconomy*", Program 1 - Development of the National Research-Development System, Sub-programme: 1.2 - Institutional Performance, Project Type: Institutional Development Projects - CDI Excellence Financing Projects

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MOBILE EQUIPMENT FOR PELLETING AGRICULTURAL BIOMASS

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Patent Application No. A-00601 / 2023

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ABSTRACT:

The invention presents a mobile equipment pulled by a tractor that is used for pelletizing agricultural biomass with an uneven structure: corn cobs, sunflower stalks, rape straw, etc., which are found in agriculture in much larger quantities than wheat straw and they have a caloric power superior to them. The equipment can produce pellets from these agricultural waste directly on agricultural land or as semi-mobile equipment directly at the headquarters of agricultural companies having these materials stored throughout the year. The obtained pellets can be used in the production of biochar or as fuel for thermal plants.

DESCRIPTION:

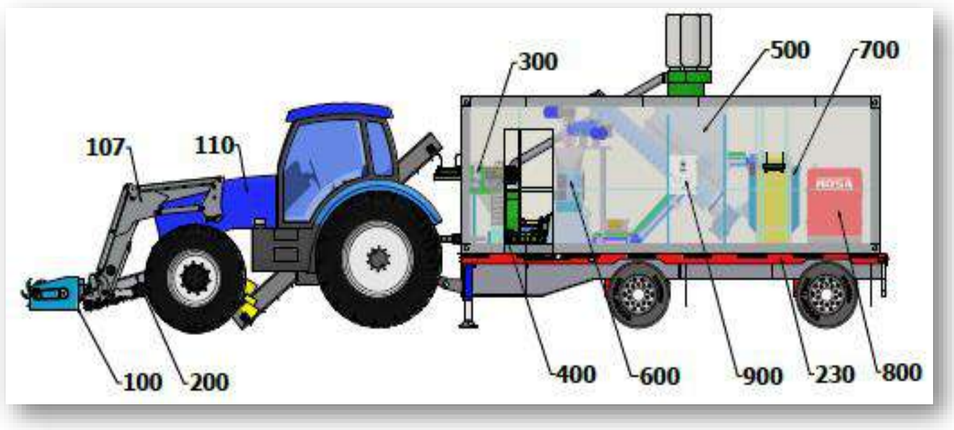
The main disadvantages of similar equipment existing on the market, consist in the fact that the respective equipment is only used for processing wheat or rape straw, which have a uniform structure, but the existing quantities compared to the quantities of corn cobs are much smaller and the equipment is complex and expensive compared to the applied field, the humidity of the processed products is limited to a maximum of 12-15%.The technical problem that the invention solves consists in the design of an equipment that has a wider range of use for several types of raw materials, allows the use of raw materials with higher humidity, but up to 15-20%, and use the mechanical energy of an already existing tractor in agricultural farms.

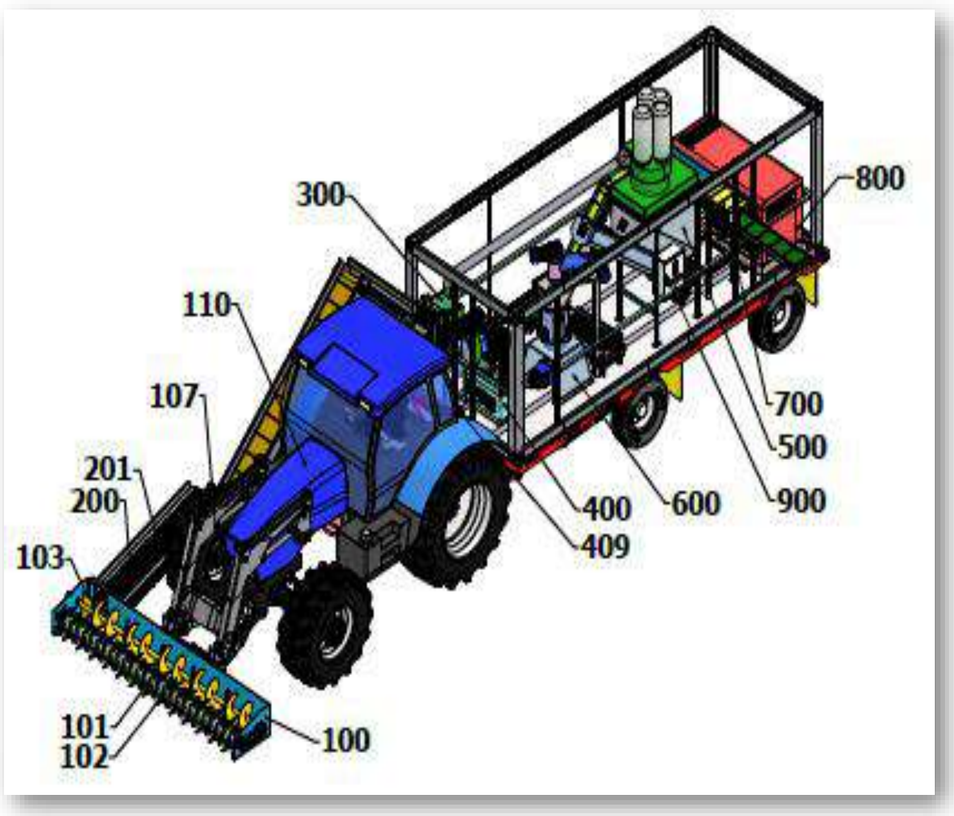
COMPONENTS:

The mobile equipment for the pelletization of agricultural biomass is composed of a system (**100**) for collecting stalks of corn, sunflower or chopped straw from the surface of the soil, being formed by the drum (**101**) which has some elastic teeth with which it collects the materials from ground level and which are then directed with a conveyor auger (**102**) to a star selector (**104**). The system (**100**) is supported by an equipment (**107**) operated with some hydraulic cylinders (**108**) and the supports (**109**) of the equipment (**107**) are positioned on a tractor (**110**). The equipment is equipped with a separation selector (**200**) for sand and a separator (**210**) for heavy bodies. Raw materials are taken up by chopping and grinding equipment (**300**) which consists of a chopper (**310**) and a hammer mill (**320**).

On the towed platform (**230**) there is mounted a reducer (**400**) with two stages of rotation which consists of the housing (**401**) with a shaft with pinions (**402**) which will drive a shaft (**403**) which will transmit a rotational movement with increased speed to a hydraulic pump (**404**) of a hydraulic group (**405**) by means of a cardan shaft (**406**). Also from the shaft (**402**) a rotational movement with increased speed will be transmitted to a shaft (**407**) and by means of a cardan shaft (**408**) to the reducer of a granulated agricultural waste press (**600**).

The pellet press (**600**) has a double pressing system with a flat die (**601**) and (**602)** each positioned on a common spindle (**603**) having a set of rollers (**604**) and (**605**) above each die (**601**) and (**602**). Above the feed mouth of the pellet press (**600**) there is mounted an auger feed system (**610**) which is driven by an electric gear motor (**611**) which takes the material discharged by the feed hopper auger (**500**) and transports it into the auger with a conical tip (**620**) which is driven by an electric gear motor (**621**). The conical tip of the auger (**620**) presses the material in the conical part of a casing (**622**) which is provided in that area with some inclined channels with a triangular profile that will determine the realization of the first pressing of the material. This pellet press system (**600**) with two sets of dies (**601**) and (**602**), each with a set of rollers (**604**) and (**605**) mounted on top. This constructive system of the pellet press (**600**) together with the conical auger (**620**) will determine the pressing and uniform density of the entire mass of material obtained by chopping corn cobs that have an uneven structure and will lead to the production of pellets of superior quality and with very good density and moisture.





Mobile Equipment for Pelleting Agricultural Biomass

ADVANTAGES:

The mobile equipment for pelletizing agricultural biomass has the following advantages:

- ❑ can use corn cobs, which are in much larger quantities than wheat straws;
- ❑ can use raw materials with higher humidity than the existing equipment in this domain;
- ❑ it uses the mechanical energy developed by an existing tractor in the agricultural farm and thus, the investment cost is greatly reduced.

ACKNOWLEDGEMENT:

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MODULAR URBAN FARM CONTAINER MODULE

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Patent Application No. A-00593 / 2023

ABSTRACT:

The invention relates to a containerized module of a modular urban farm, designed for the growth of plants in a controlled environment, in order to obtain increased yields in the production of plant material.

DESCRIPTION:

The idea of growing plants without using the soil as a growing medium and as a means of supplying water and nutrients, has been known since antiquity and appeared in Europe in the 17th century, evolving spectacularly until today.

The evolution of "earthless" crops continued in two main directions:

1) crop systems that do not use a solid growth medium, in which plant roots are partially submerged in static or circulating nutrient solutions of various depths;
2) crop systems that use solid substrates as rooting support for cultivated plants.

There is a wide range of benefits possible when growing plants in farms completely isolated from the external environment. One of the benefits of this crop is that it is not necessary to control pests and diseases. Thanks to the closed system, pests and diseases have no potential to cause crop damage. Another advantage is that the plants can be grown all year round and can be produced in close proximity to the final consumer, thus avoiding high transport costs and related CO2 emissions.

The technical problem, solved by the invention, consists in the creation of a modular urban farm containerized module, designed for the growth of plants in a controlled environment, which ensures a low consumption of electricity needed to maintain a constant temperature in the premises, allows the use of means of usual transport for the transport of goods, ensures the achievement of increased yields in the production of plant material, allows to reduce the costs of acquisition, maintenance and operation of the containerized module, reduces the consumption of electricity for the recirculation and filtration of nutrient solutions and reduces the premature wear of technical equipment that perform these operations.

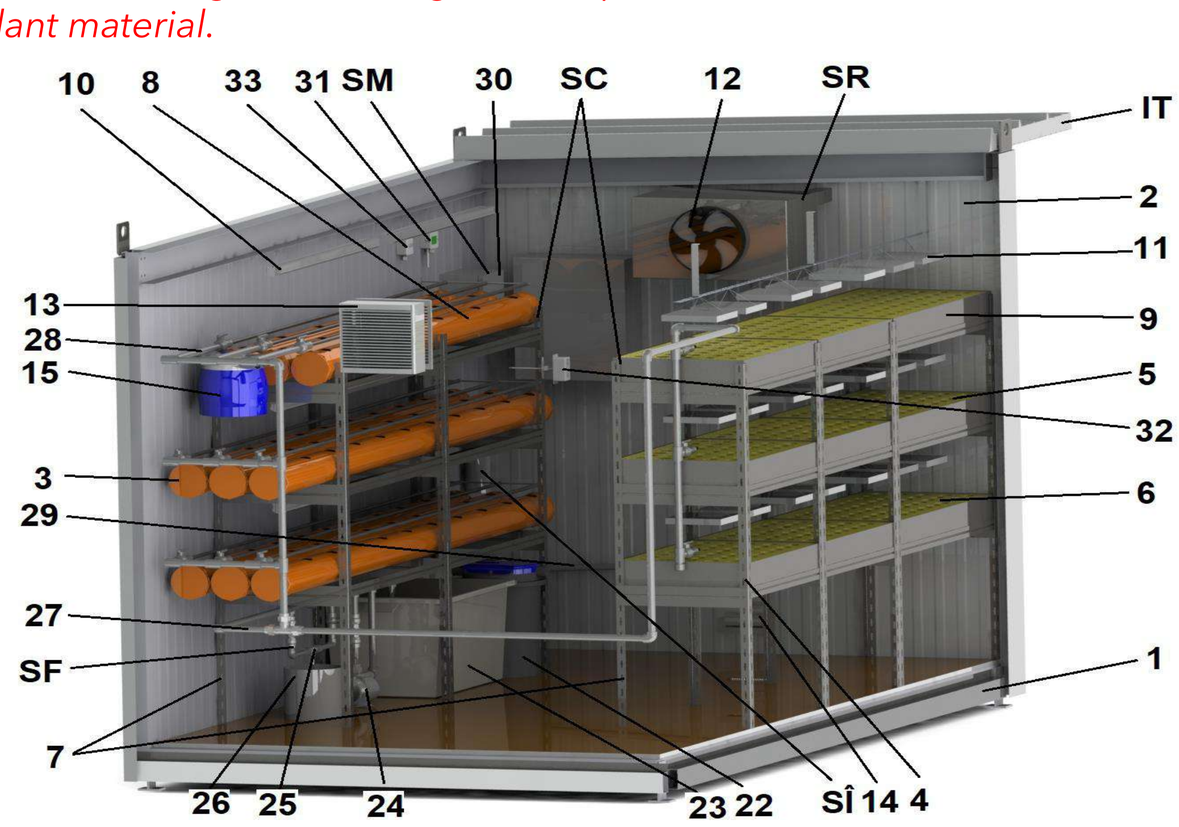


Fig.1 – The modular urban farm containerized module – isometric view

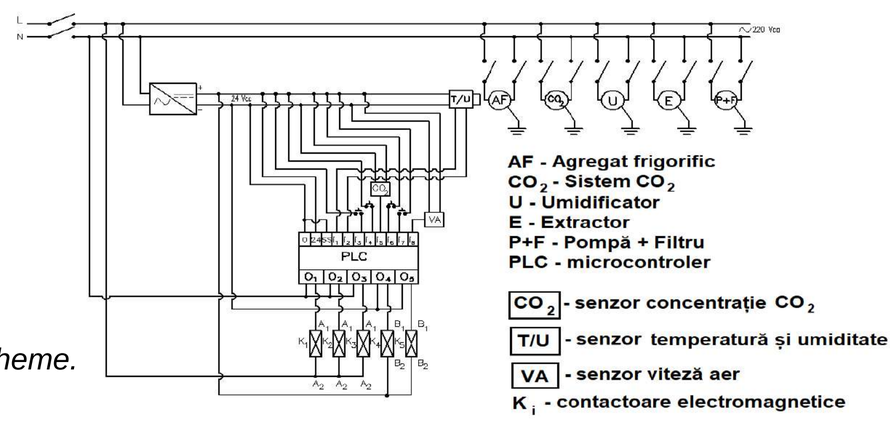


Fig.2 – Automation installation – General power supply and control scheme.

COMPONENTS:

The modular urban farm containerized module, according to the invention, consists of a thermally insulated enclosure (**IT**), a vertical plant growing system (**SC**), a cooling, ventilation and air humidification system (**SR**), a atmospheric enrichment with CO2 (**SÎ**), a fertigation system (**SF**) and an environmental monitoring and control system (**SM**). The thermally insulated enclosure (**IT**) is made of several metal frames (**1**) on which several thermally insulating panels with polyurethane (**2**) are assembled, in the form of a rectangular parallelepiped, the dimensions of which comply with the standardized prescriptions of transport containers and allows the use of usual means of transport for the transport of goods.

The vertical plant growth system (**SC**) consists of two modules that implement plant culture on different growth substrates, namely perlite from expanded volcanic rock and soil introduced into the cells (**5**) practiced in the moist floral sponge plates (**6**).

The fertigation system (**SF**) is based on both the use of a drip irrigation system and retention in trays provided with a hydrophobic material.

The monitoring and control system of environmental factors (**SM**) is configured to allow manual setting by the operator of the parameters of the air in the premises, to maintain these parameters within the limits of optimal values, characteristic of each plant species, and to limit the effects of special events on the development plants, such as the exaggerated increase in the relative humidity of the indoor air and the accidental decrease in the concentration of CO2, maintaining the advantages created by the acceleration of the plant growth process at the optimal process parameters.

ADVANTAGES:

- ensures a low consumption of electricity needed to maintain a constant temperature in the premises thanks to the use of thermal insulation panels with polyurethane in the construction of the premises;
- ensures the achievement of increased yields in the production of plant material thanks to the use of a system for enriching the atmosphere with CO2 in the growing space;
- allows to reduce the costs of acquisition, maintenance and operation of the containerized module due to the implementation of a system for monitoring and controlling environmental factors, relatively simple as data transfer and processing technology, which does not require the use of specialized personnel for the operation and maintenance of the system;
- decreases the consumption of electricity for the recirculation and filtering of nutrient solutions and reduces the premature wear of the technical equipment that performs these operations thanks to the use of growth substrates that have a high degree of water absorption and retention;
- allows obtaining and maintaining optimal conditions for plants in the growing space as a result of the implementation of an automatic control algorithm of the work process, based on PID type regulators and comparison functions for the regulation of temperature, humidity and CO2 concentration inside the thermally insulated enclosure;
- allows the use of common means of transportation for the transport of goods, as a result of the realization of the thermally insulated enclosure in the form of a rectangular parallelepiped whose dimensions comply with the standardized prescriptions of transport containers.

ACKNOWLEDGEMENT:

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METHOD FOR OPTIMIZING THE GERMINATION OF MICROGREENS

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TĂBĂRAȘU Ana-Maria, CUJBESCU Dan, GHEORGHE Gabriel
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Patent Application No. A-00592 / 2023

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ABSTRACT:

The invention relates to a method for optimizing the germination of plant seeds for their consumption as microgreens (seedlings in the early growth stage, until the appearance of the first "true" leaves), taking into account the type and density of seeds, the substrate, temperature , humidity of the substrate, air and ventilation of the germination space and determining the optimal values for these parameters with to have uniform germination and for obtaining plants of adequate quality.

DESCRIPTION:

The idea of growing plants without using the soil as a growing medium and as a means of supplying water and nutrients, has been known since antiquity and appeared in Europe in the 17th century, evolving spectacularly until today.

The Seed Germination Optimization Method for obtaining microplants (microgreens):

- ensures the determination of the influence of the size of the seeds and the number of seeds sown on the percentage of germination and the density of seedlings per space used;
- ensures the determination of the influence of the type of environment / substrate used on the germination percentage;
- ensures the determination of the influence of ambient temperature on the germination process;
- ensures the determination of the influence of substrate humidity and air on the germination process;
- ensures the determination of the influence of ventilation on the germination process;
- allows the determination of optimal values for the number of seeds (seed density per used space), substrate, environmental parameters in order to obtain microgreens type plants with adequate nutritional and organoleptic qualities.

FUNCTIONING:

The method of optimizing the germination of plant seeds for their consumption as microgreens involves the following steps:

- seed material preparation (determination of vitality, moisture and average seed size);
- substrate preparation (peat / peat with perlite, coconut fibres, cotton fibres, hemp fibres, recycled sackcloth, etc.);
- preparing the average number of seeds per space used according to the species used;
- preparation of the ambient temperature;
- substrate and ambient humidity preparation;
- preparation of the ventilation requirement of the space (mc/h);establishing the need for experiments to vary the number of seeds per space used, the substrate and environmental parameters;
- carrying out the sowing operation;
- controlled watering;
- monitoring and recording environmental parameters and seed germination;
- establishing the optimal values for obtaining a suitable germination (calculated as percentage of germinated seeds, germination time, lack of damage to the seeds/substrate due to the appearance of fungi) depending on the process parameters in order to obtain microgreens type plants with adequate nutritional and organoleptic qualities.

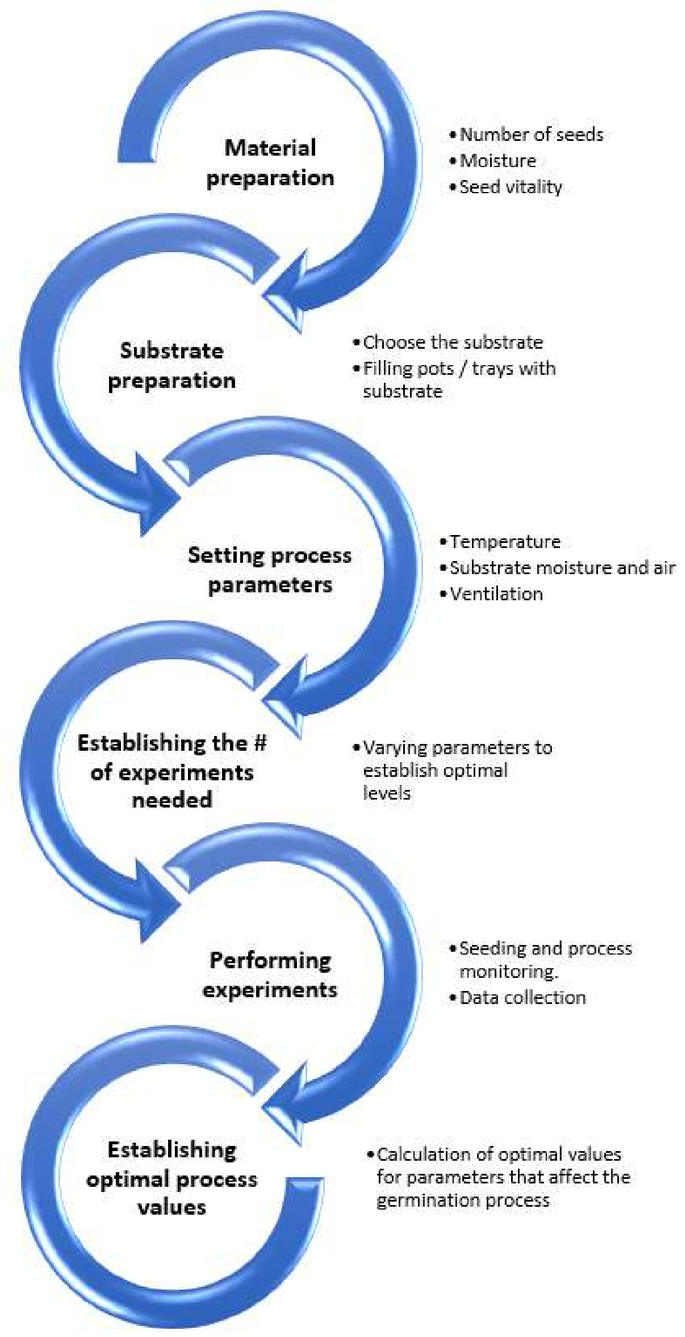
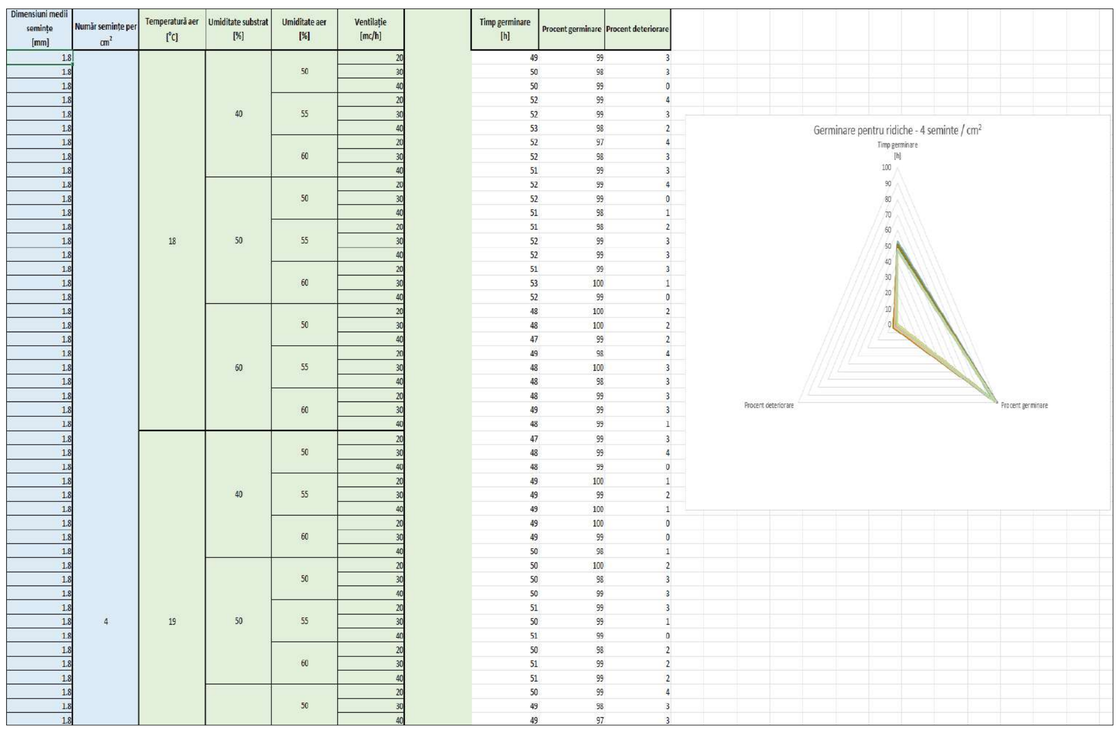


Fig.1 - The Scheme of the principle of operation of the method for optimizing the germination process of plant seeds for microgreens



Dimensiuni medii semințe [mm]	Număr semințe per cm²	Temperatură aer [°C]	Umiditate substrat [%]	Umiditate aer [%]	Ventilație [mc/h]	Timp germinare [h]	Procent germinare	Procent deteriorare
1.8	4	18	40	50	20	49	99	3
1.8					30	50	98	3
1.8					40	50	99	0
1.8				55	20	52	99	4
1.8					30	52	99	3
1.8					40	53	98	2
1.8				60	20	52	97	4
1.8					30	52	98	3
1.8					40	51	99	3
1.8			50	50	20	52	99	4
1.8					30	52	99	0
1.8					40	51	98	1
1.8				55	20	51	98	2
1.8					30	52	99	3
1.8					40	52	99	3
1.8				60	20	51	99	3
1.8					30	53	100	1
1.8					40	52	99	0
1.8			60	50	20	48	100	2
1.8					30	48	100	2
1.8					40	47	99	2
1.8				55	20	49	98	4
1.8					30	48	100	3
1.8					40	48	98	3
1.8				60	20	48	99	3
1.8					30	49	99	3
1.8					40	48	99	1
1.8		19	40	50	20	47	99	3
1.8					30	48	99	4
1.8					40	48	99	0
1.8				55	20	49	100	1
1.8					30	49	99	2
1.8					40	49	100	1
1.8				60	20	49	100	0
1.8					30	49	99	0
1.8					40	50	98	1
1.8			50	50	20	50	100	2
1.8					30	50	98	3
1.8					40	50	99	3
1.8				55	20	51	99	3
1.8					30	50	99	1
1.8					40	51	99	0
1.8				60	20	50	98	2
1.8					30	51	99	2
1.8					40	51	99	2
1.8			60	50	20	50	99	4
1.8					30	49	98	3
1.8					40	49	97	3

Fig.2 - Example of a calculation sheet for the optimal values of the parameters of the germination process

ADVANTAGES:

- increasing the degree and uniformity of germination of plant seeds for microgreens consumption;
- versatile method that can include a wide variety of parameters and provide a solution to improve the germination process for multiple systems;
- easy use and easy interpretation of results.

ACKNOWLEDGEMENT:

This work was financed by the Ministry of Research and Innovation through Financing Contract no. 1PFE / 30.12.2021 - (PFE 1296 / 17.12.2021) - Financing by the contracting authority of the project "*Institutional development of INMA Bucharest in order to increase performance in the field of bioeconomy*", Program 1 - Development of the National Research-Development System, Sub-programme: 1.2 - Institutional Performance, Project Type: Institutional Development Projects - CDI Excellence Financing Projects

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LABORATORY EQUIPMENT FOR BIOCHAR PRODUCTION FROM VEGETABLE REMAINS

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VLĂDUȚOIU Laurențiu, NIȚU Mihaela
INMA Bucharest – ROMANIA

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Romanian Patent Application No. A-00472 / 2023
European Patent Application No. 23020420.8 / 2023

ABSTRACT:

The invention presents an equipment for the laboratory that will produce biochar and synthesis gas from plant residues, the equipment being equipped with temperature and pressure control sensors that provide the information for a process computer that ensures the operation of the system.

DESCRIPTION:

The general disadvantages of similar inventions on the market consist in the fact that they represent specific technical solutions for the purpose achieved and which are not suitable for a small equipment, for the laboratory, but with a high degree of automation, which allows the adjustment of parameters for the purpose of production research of biochar from various vegetable residue recipes.

The technical problem that the invention solves consists in the design of a lab equipment that allows establishing the optimal values for the production of biochar, from various plant residue recipes, equipment equipped with a process computer for the automatic control of the system.

COMPONENTS:

The equipment consists of a mobile support (**100**) which has two rotary bearings (**105**) supporting the spindles of a double-walled housing (**200**) and an electronic control system (**400**) equipped with control elements and using a process computer (**401**) and performs the programming of the control elements in the electrical panel (**403**), the parameters are listed to a wireless printer and allow the subsequent analysis of each work sample according to the raw material and work parameters used on the laboratory equipment , the final information will be used in the sizing and regulation of an industrial equipment for the production of biochar from vegetable residues, the equipment being configured to ensure the production of biochar in the absence of oxygen from the atmosphere, also carrying out the transfer to a removable vat (**212**), of the product obtained immediately after the end of the process without coming into contact with the atmosphere, thus obtaining a quality product but also at a reduced time, without waiting for the biochar to cool down in order to discharge.

The housing (**200**) is composed of two tanks (**202**) and (**203**), with an octagonal section, insulated between them with ceramic fiber and supporting a fixed cover (**205**) and a hinged cover (**300**) on which some elements of material ignition for the production of biochar (**208**) and (**209**), the casing (**200**) to the two fans: one for ignition (**210**) and the other fan to ensure the draft necessary to ignite the entire amount of raw material, the casing having two lateral spindles for positioning in the rotating bearings (**105**): a spindle (**201a**) with a central hole, through which the absorption of air from the inside is carried out, before the production of biochar, namely after the complete ignition of the raw material, and the second spindle, mounted in the opposite direction, collinear with the first spindle, it allows the casing to be rotated with the help of a hand wheel and also the casing (**200**) is connected with the tank (**212**) into which the biochar obtained in a hot state is poured without expecting it to cool down with the equipment, provided with the discharge mouth coupled with a tank that has a separation plane that allows the biochar to be discharged without it coming into contact with the atmosphere.

The electronic control system (**400**) recommended for this equipment which is used under laboratory conditions for various assortments of plant residues and which uses the thermostat (**402**) to receive and display the values measured by a thermocouple for measuring temperature and from a sensor for measuring the pressure inside the casing (**200**) during the combustion of vegetable residues for biochar production, the information being taken by the process computer (**401**) and, based on a software created for this purpose, it will command the electrical control panel (**403**) which will act the two fans: for ignition (**210**) and for draft, will command the start and stop of the electric resistance (**208**) and will command the vacuum pump (**316**), thus monitoring the work process with the sensors for measuring pressure, temperature, weight , the processing of this information with a process computer and the automatic control of the electromechanical components that actuate the equipment for the production of biochar from vegetable residues.

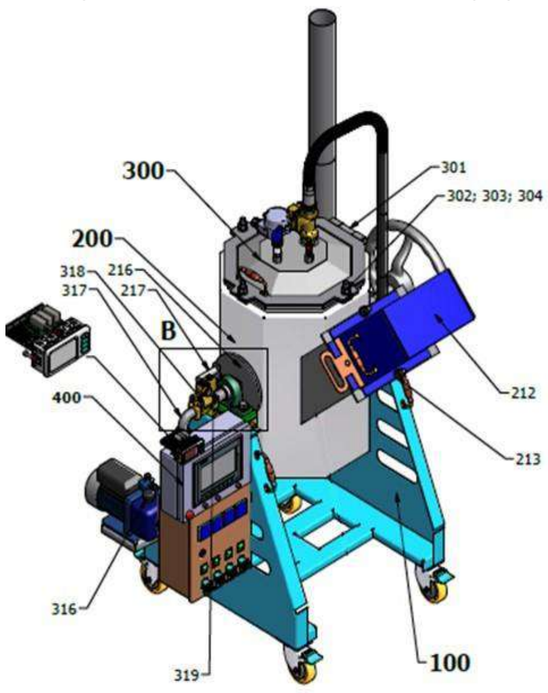


Fig.1 – 3D view

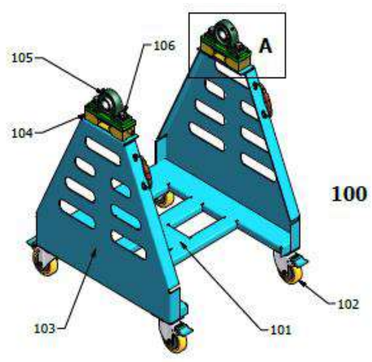


Fig.2 - mobile support

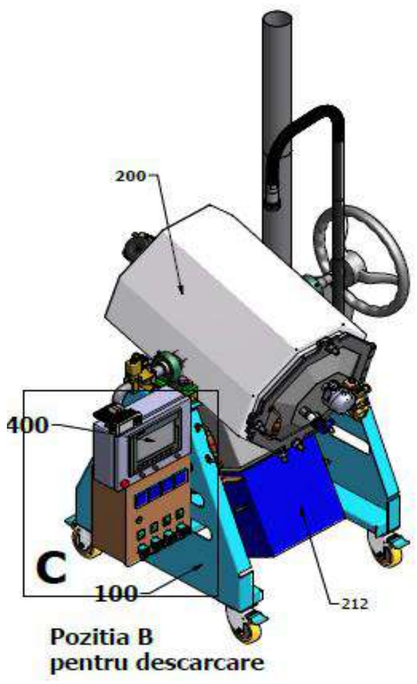


Fig.3 - view of inclined casing, ready for biochar unloading

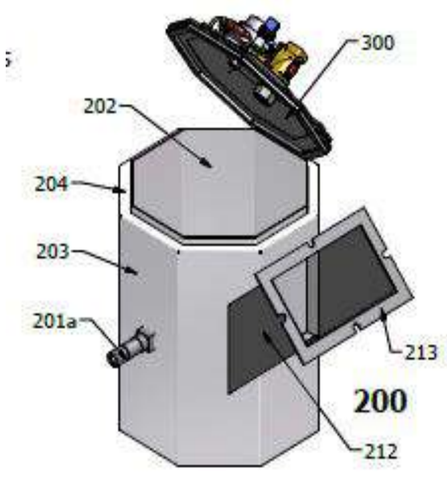


Fig.4 - equipment casing

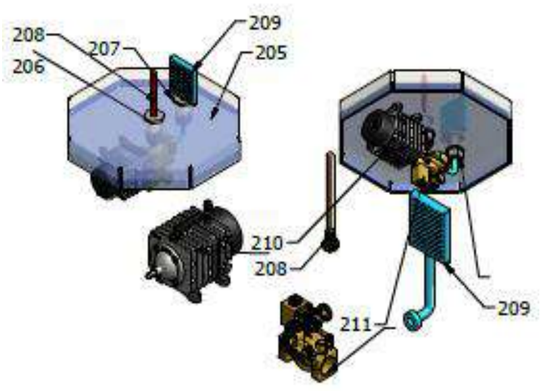


Fig.5 - the lower cover
(top and bottom view)

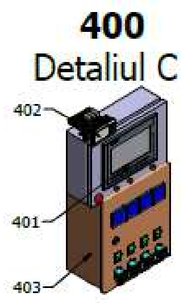


Fig.6 - electronic control system

ADVANTAGES:

- ❑ The equipment is mobile, small in size and recommended for laboratory tests, with automatic adjustment of working parameters;
- ❑ It can use plant residues with a moisture content of 30-40%, compared to known solutions that can use plant residues with a maximum moisture content of 15%;
- ❑ It does not require a biochar unloading system (conveyor auger, trays, etc.) - the produced material can be unloaded by turning the equipment with a hand wheel and tipped into a sealed tank;
- ❑ The equipment has a single enclosure, does not require a retort for heating and material drying, the raw material is introduced into the reactor vessel and the entire technological process takes place there;
- ❑ Provided with a thermal insulation with ceramic fiber and double jacket, which ensures low energy consumption.

ACKNOWLEDGEMENT:

This work was financed by the Ministry of Research and Innovation through Financing Contract no. 1PFE / 30.12.2021 - (PFE 1296 / 17.12.2021) – project: "*Institutional development of INMA Bucharest in order to increase performance in the field of bioeconomy*", Program 1 - Development of the National Research-Development System, Sub-programme: 1.2 - Institutional Performance, Project Type: Institutional Development Projects - CDI Excellence Financing Projects

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METHOD FOR SIMULATING BIOMASS COMPACTION IN THE FORM OF PELLETS

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TĂBĂRAȘU Ana-Maria, VLĂDUȚ Nicolae-Valentin
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Romanian Patent Application No. A-00413 / 2023

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ABSTRACT:

The invention presents a method for simulating the compaction of biomass in the form of pellets on a specialized device, which takes into account the parameters of the material to be pelletized and the process parameters and the determination of the optimal values for these parameters in order to mass produce pellets of adequate quality.

DESCRIPTION:

The method for simulating the compaction of biomass in the form of pellets:

- ensures the determination of the influence of the moisture of the material on the density and durability of the obtained pellets;
- ensures the determination of the influence of the compaction speed on the density and durability of the obtained pellets;
- ensures the determination of the influence of temperature on the density and durability of the obtained pellets;
- ensures the determination of the influence of the compaction pressure on the density and durability of the obtained pellets;
- ensures the determination of the influence of the size (diameter and length) of the pressing holes on the density and durability of the obtained pellets;
- allows the determination of optimal values for material and process parameters for the mass production of pellets.

FUNCTIONING:

The method for simulating the compaction of biomass in the form of pellets is carried out on a specialized stand and involves the following stages:

1. preparation of the material to be pelletized (granulation, humidity, percentage of materials in the mixture, etc.);
2. placing the pelletizing device on the stand;
3. setting the compaction die temperature;
4. feeding the mold with material;
5. fixing the pelletizing piston inside the pressing hole;
6. setting the pelletizing speed and pressure through the command and control panel;
7. starting the system and actually carrying out the biomass compaction process;
8. collecting the obtained pellet and bringing it to ambient temperature;
9. determining the characteristics of the pellets (moisture, density, durability);
10. establishing optimal values for obtaining quality pellets according to process parameters in order to mass produce pellets of adequate quality.

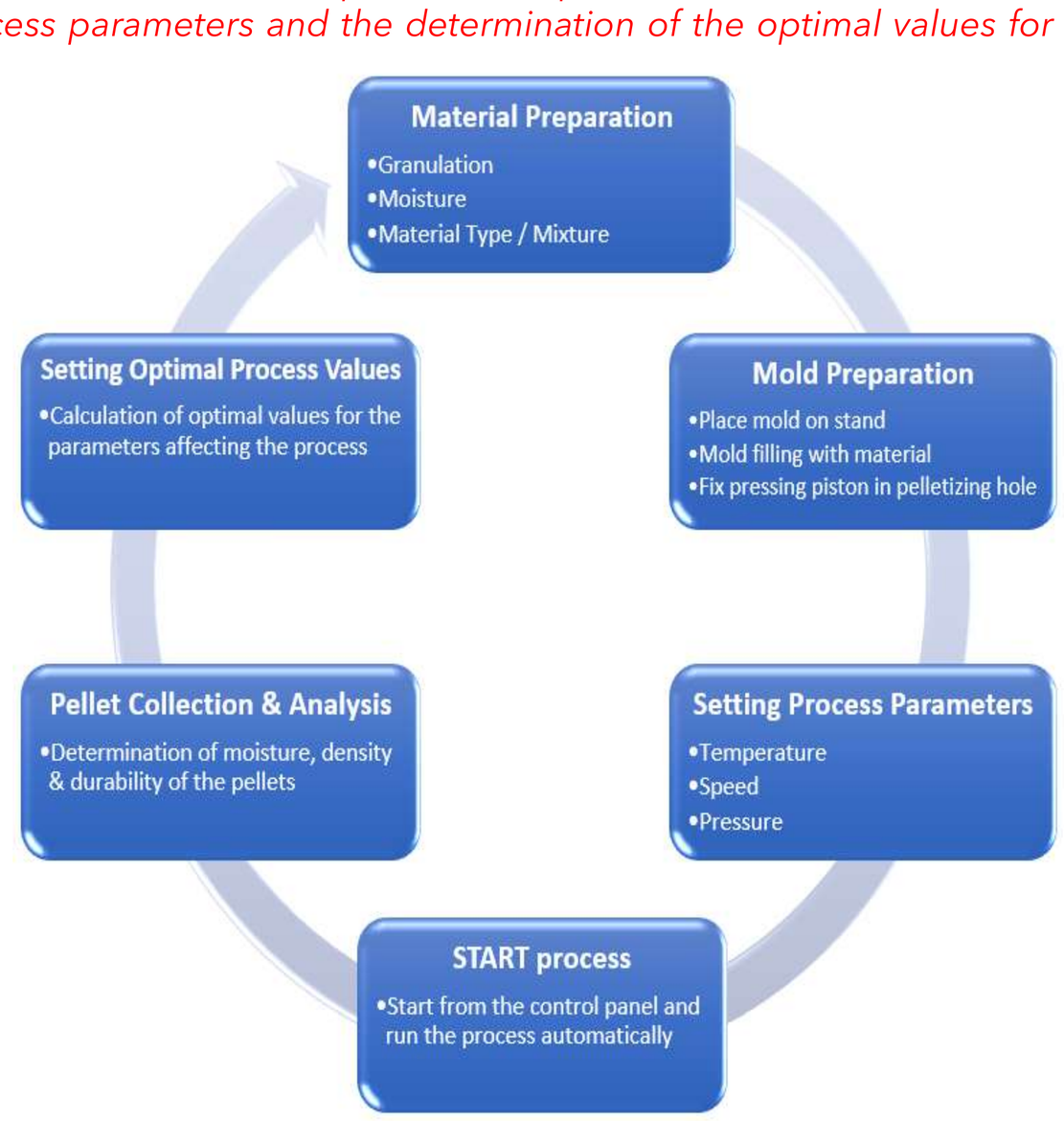
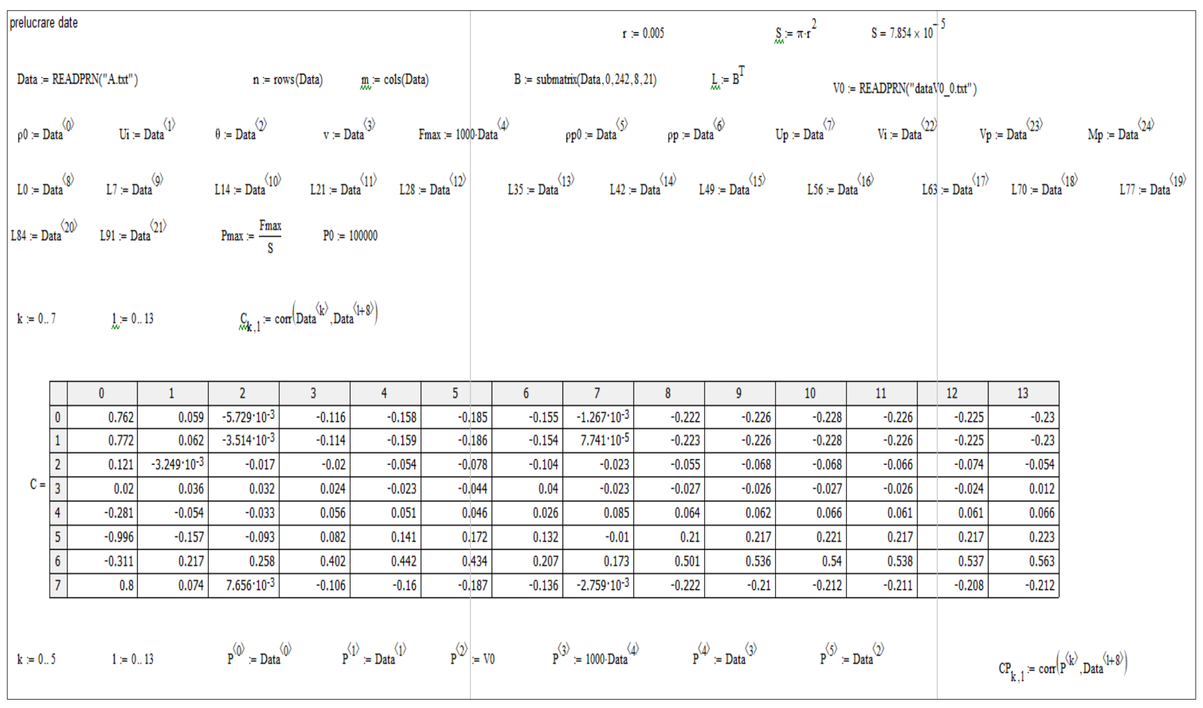


Fig.1 - Scheme of the principle of operation of the method for simulation of biomass compaction in the form of pellets



prelucrare date

$r := 0.005$ $S := \pi \cdot r^2$ $S = 7.854 \times 10^{-5}$

Data := READPRN("A.txt") n := rows(Data) m := cols(Data) B := submatrix(Data, 0, 242, 8, 21) L := B^T V0 := READPRN("data\V0_0.txt")

ρ0 := Data⟨0⟩ Ui := Data⟨1⟩ θ := Data⟨2⟩ v := Data⟨3⟩ Fmax := 1000·Data⟨4⟩ ρp0 := Data⟨5⟩ ρp := Data⟨6⟩ Up := Data⟨7⟩ Vi := Data⟨22⟩ Vp := Data⟨23⟩ Mp := Data⟨24⟩

L0 := Data⟨8⟩ L7 := Data⟨9⟩ L14 := Data⟨10⟩ L21 := Data⟨11⟩ L28 := Data⟨12⟩ L35 := Data⟨13⟩ L42 := Data⟨14⟩ L49 := Data⟨15⟩ L56 := Data⟨16⟩ L63 := Data⟨17⟩ L70 := Data⟨18⟩ L77 := Data⟨19⟩

L84 := Data⟨20⟩ L91 := Data⟨21⟩ $Pmax := \frac{Fmax}{S}$ P0 := 100000

k := 0..7 l := 0..13 $C_{k,l} := corr(Data^{\langle k \rangle}, Data^{\langle l+8 \rangle})$

C =

	0	1	2	3	4	5	6	7	8	9	10	11	12	13
0	0.762	0.059	$-5.729 \cdot 10^{-3}$	-0.116	-0.158	-0.185	-0.155	$-1.267 \cdot 10^{-3}$	-0.222	-0.226	-0.228	-0.226	-0.225	-0.23
1	0.772	0.062	$-3.514 \cdot 10^{-3}$	-0.114	-0.159	-0.186	-0.154	$7.741 \cdot 10^{-5}$	-0.223	-0.226	-0.228	-0.226	-0.225	-0.23
2	0.121	$-3.249 \cdot 10^{-3}$	-0.017	-0.02	-0.054	-0.078	-0.104	-0.023	-0.055	-0.068	-0.068	-0.066	-0.074	-0.054
3	0.02	0.036	0.032	0.024	-0.023	-0.044	0.04	-0.023	-0.027	-0.026	-0.027	-0.026	-0.024	0.012
4	-0.281	-0.054	-0.033	0.056	0.051	0.046	0.026	0.085	0.064	0.062	0.066	0.061	0.061	0.066
5	-0.996	-0.157	-0.093	0.082	0.141	0.172	0.132	-0.01	0.21	0.217	0.221	0.217	0.217	0.223
6	-0.311	0.217	0.258	0.402	0.442	0.434	0.207	0.173	0.501	0.536	0.54	0.538	0.537	0.563
7	0.8	0.074	$7.656 \cdot 10^{-3}$	-0.106	-0.16	-0.187	-0.136	$-2.759 \cdot 10^{-3}$	-0.222	-0.21	-0.212	-0.211	-0.208	-0.212

k := 0..5 l := 0..13 $P^{\langle 0 \rangle} := Data^{\langle 0 \rangle}$ $P^{\langle 1 \rangle} := Data^{\langle 1 \rangle}$ $P^{\langle 2 \rangle} := V0$ $P^{\langle 3 \rangle} := 1000 \cdot Data^{\langle 4 \rangle}$ $P^{\langle 4 \rangle} := Data^{\langle 3 \rangle}$ $P^{\langle 5 \rangle} := Data^{\langle 2 \rangle}$ $CP_{k,l} := corr(P^{\langle k \rangle}, Data^{\langle l+8 \rangle})$

Fig.2 - Example of an optimal calculation sheet for process parameters

ADVANTAGES:

- increasing the quality of compacted biomass products in the form of pellets;
- improving the durability of compacted biomass products in the form of pellets;
- easy use and easy interpretation of results;
- applicability for a varied range of biomass materials and/or material mixtures.

ACKNOWLEDGEMENT:

This work was financed by the Ministry of Research and Innovation through Financing Contract no. 1PFE / 30.12.2021 - (PFE 1296 / 17.12.2021) – project: "*Institutional development of INMA Bucharest in order to increase performance in the field of bioeconomy*", Program 1 - Development of the National Research-Development System, Sub-programme: 1.2 - Institutional Performance, Project Type: Institutional Development Projects - CDI Excellence Financing Projects

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METHOD FOR DETERMINING THE UNIFORMITY OF SOWING IN STRAW CEREAL SEEDERS

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ANGHELACHE Dragoș, CONSTANTINESCU Mihai
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Patent Application No. A-00604 / 2023

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ABSTRACT:

The invention refers to a method for determining the uniformity of sowing in sow seeders, that distribute the seeds in equidistant rows, in continuous flow.

DESCRIPTION:

The technical problem that the invention solves consists in the automated determination of the uniformity of seeding in field seeders, outside the optimal agricultural periods, for all types of seeders in rows, without making constructive changes to them.

The method for determining the accuracy of seeding of seeders of creeping plants allows the determination of the uniformity of seeding in grass seeders, on a specialized stand.

COMPONENTS:

The method of determining the sowing accuracy of the seeders of creeping plants, characterized in that, is designed as a sequence of the following operations:

1. mounting the seeder on the stand;
2. feeding the sowing hoppers with seeds;
3. simulating the inclination of the slope with the help of the pump that actuates the hydraulic cylinders mounted on the legs of the stand by means of the command and control panel;
4. translating the seed collecting boxes, from each distribution device, under the seed guiding tubes;
5. setting the rotation frequency of the wheel that actuates the distribution devices of the sowing machine by means of the command and control panel;
6. simulating the working movement of the seeder;
7. translating the collector boxes to their unloading position;
8. monitoring the amount of seeds on each individual distributor and the total amount of seeds by unloading them into a container placed on a scale;
9. displaying the results graphically on the command and control panel.

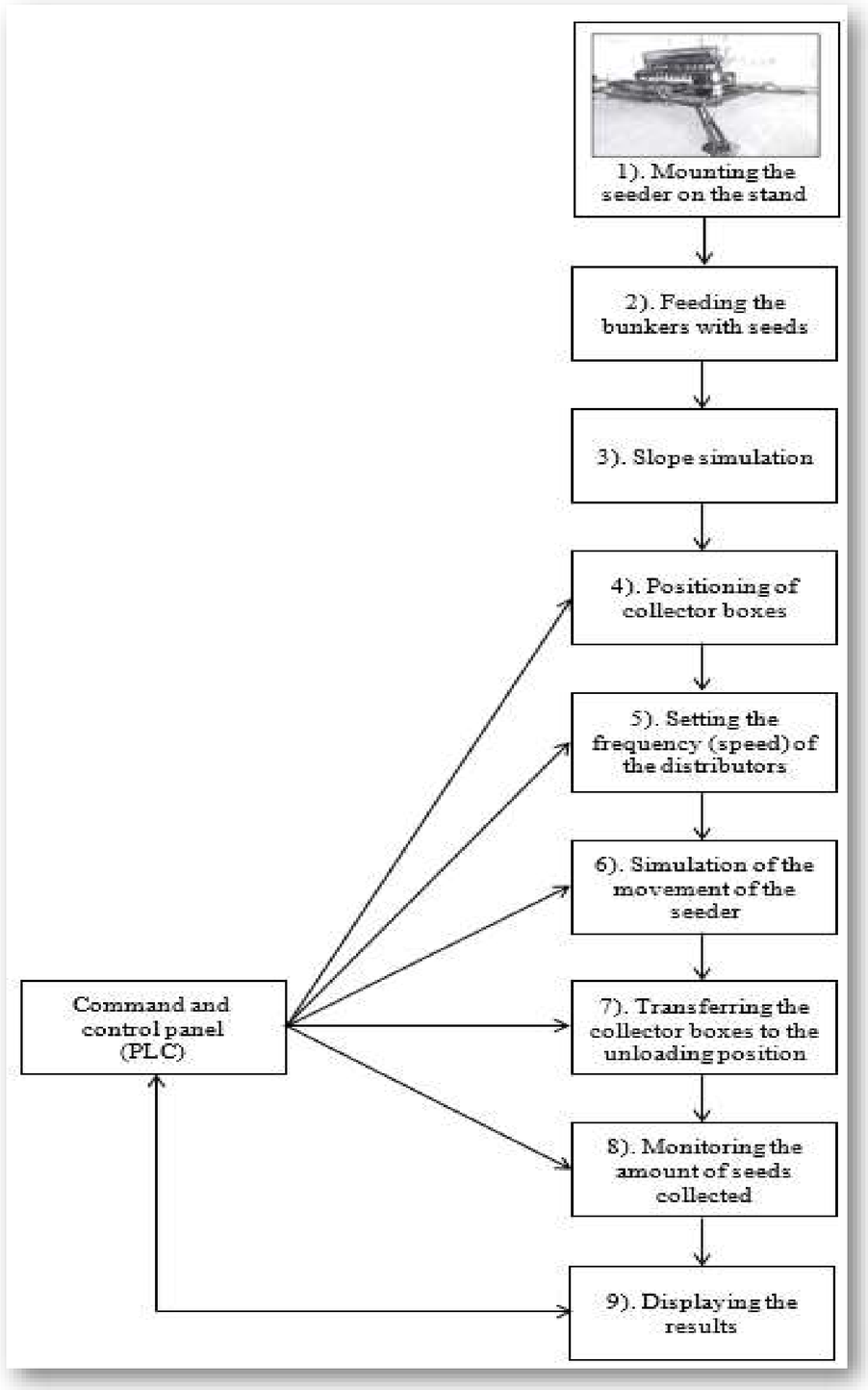


Fig.1 – Scheme of the principle of operation



Fig.2 - Results displayed on the operating terminal

ADVANTAGES:

The method of determining the uniformity of seeding in field seeders:

- ❑ ensures the determination of the influence of the **type of seeds** on the uniformity to be sown;
- ❑ ensures the determination of the influence of the **movement speed** of the seeder on the uniformity of sowing;
- ❑ ensures the determination of the influence of the **seed level in the hopper** on the uniformity of sowing;
- ❑ ensures the determination of the influence of **seed flow adjustment** on sowing uniformity;
- ❑ ensures the determination of the influence of **the slope of the land** on the uniformity of sowing;
- ❑ ensures the determination of the **uniformity of distribution** on the working width.

ACKNOWLEDGEMENT:

This work was financed by the Ministry of Research and Innovation through Financing Contract no. 1PFE / 30.12.2021 - (PFE 1296 / 17.12.2021) – project: "*Institutional development of INMA Bucharest in order to increase performance in the field of bioeconomy*", Program 1 - Development of the National Research-Development System, Sub-programme: 1.2 - Institutional Performance, Project Type: Institutional Development Projects - CDI Excellence Financing Projects

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FLOATING TECHNICAL EQUIPMENT, ELECTRICALLY OPERATED, SELF-PROPELLED, FOR HARVESTING LAKE BIOMASS

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PARASCHIV Maria[2)], TUDOR Emil[3)], VASILE Ionuț[3)], SBURLAN Ion-Cătălin[3)], MATEESCU Carmen[3)]
[1)]INMA Bucharest – ROMANIA, [2)]Politehnica University of Bucharest, [3)]INCDIE ICPE-CA

Romanian Patent Application No. A-00752 / 2022

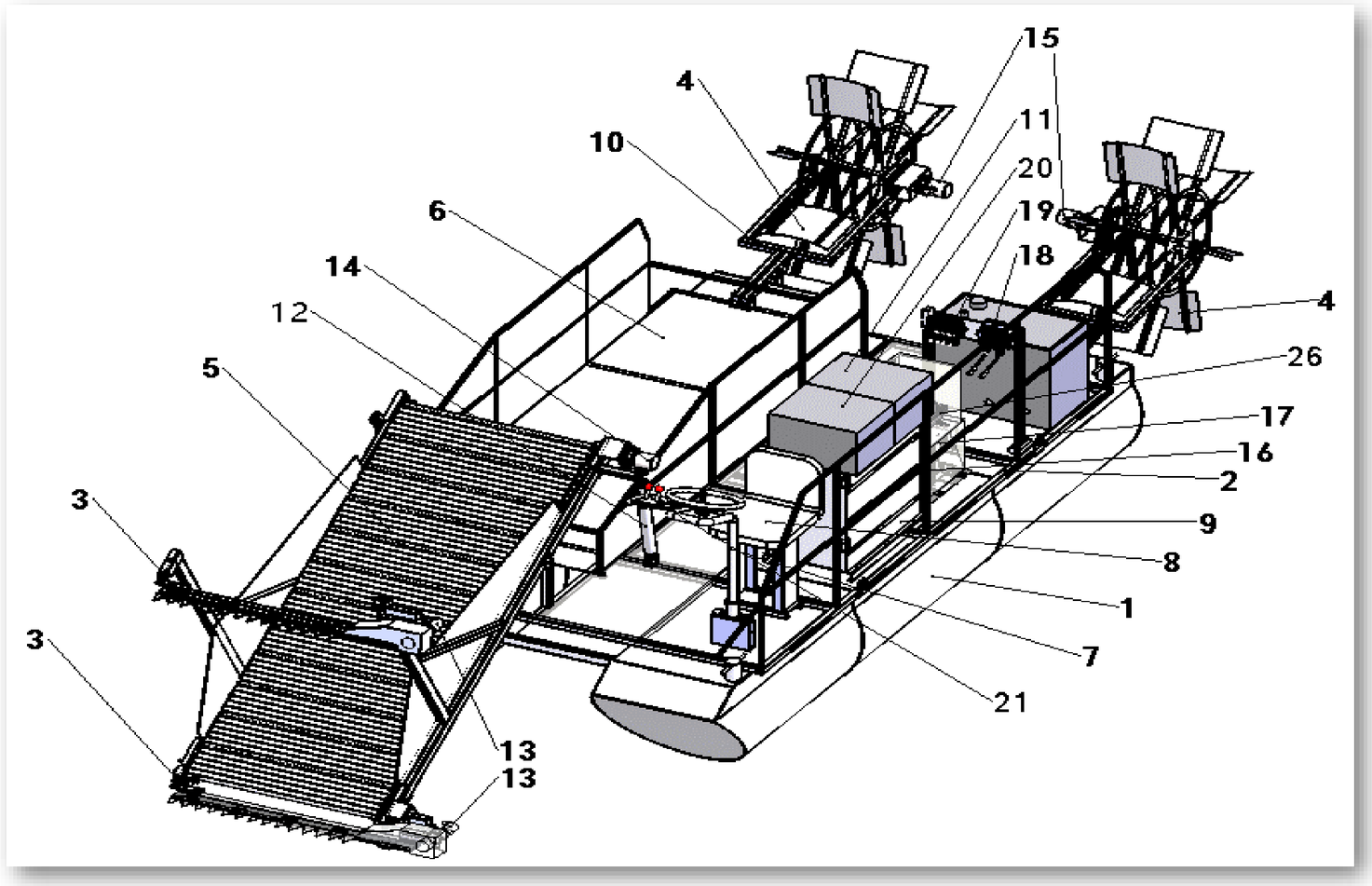
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ABSTRACT:

The invention refers to a floating technical equipment, self-propelled, electrically operated and remotely controlled, intended for cutting reed stalks or any other type of lake biomass, as well as loading / unloading it using a conveyor belt in / from a collecting bucket provided with the equipment.

COMPONENTS:

The equipment consists of the assembled floats (**1**), linked together by four metal crossbars, the welded frame (**2**) which is welded above the floats and on which the rest of the components are mounted, two double-knife cutters (**3**) operated by a hydraulic motor (**13**) of 2.3 kW power, with a cutting width of 1m, arranged 1.5 m from each other in the vertical plane, two paddle wheels (**4**) driven by two hydraulic motors (**15**) of 13 kW each, the paddle wheels having an indexing plate (**10**) for adjusting the depth of immersion of the vanes, a conveyor belt with scrapers (**5**) driven by the hydraulic motor (**14**) of 7kW, with the possibility of adjusting the degree of inclination of the belt and of the immersion depth of the lower cutter, by the means of the hydraulic cylinders (**12**), the biomass collection bin (**6**), the secondary steering system with rudder (**7**) and the driving station (**8**) for controlling the equipment on board of it, in case of not using the remote control, three electric batteries (**9**) of 11 kWh each (58Vdc), which supply - through the electrical connection elements positioned in the box (**11**) - the electric motor (**16**) driving the double hydraulic pump (**17**), which supplies on one hydraulic circuit the double-section proportional distributor (**18**) for the control of the hydraulic motors (**15**) and, on the other hydraulic circuit supplies the four-section sectional distributor (**19**) for the control of the hydraulic motors (**13**) and (**14**) and the hydraulic cylinders (**12**) by means of the control electronics (**20**) which receives the commands of the human operator transmitted by the remote control (**21**).









ADVANTAGES:

- ❑ - the equipment is ecological, the actuation is done by an electric motor that does not pollute the air or noise, being much quieter than diesel engines;
- ❑ - the machine is controlled from the remote control, so the operator has a much wider field of vision and can perform all operations safely;
- ❑ - the nominal voltage of the accumulator batteries is max. 60V, so the danger of electrocution is reduced;
- ❑ - using three batteries for power supply and connecting them in parallel by means of a rectifier bridge and individual contactors allows redundant operation and balancing the load distributed between the three batteries;
- ❑ - cutting of lake biomass is done on two floors, so it is easier to collect and store;
- ❑ - the biomass collection and storage capacity is high, as it is not left on the surface of the water, at the mercy of the currents and the wind.

ACKNOWLEDGEMENT:

The equipment was made within the sectoral project 1PS/2021 "Development of innovative technologies using artificial intelligence for the exploitation of biomass from lake areas for the sustainable support of green energy", financed by the Ministry of Research, Informatization and Digitization.
Project partners: INMA, UPB, INCDDD, ICECHIM, UDJG, INCEMC, ICPE-CA.

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KIT FOR PRECISION FOLIAR FERTILIZATION OF VEGETABLES

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GHEORGHE Gabriel, PERSU Cătălin, DUMITRU Cristinel
INMA Bucharest – ROMANIA

Patent Application No. A-00631 / 2021

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ABSTRACT:

The invention relates to a kit for precision foliar fertilization of vegetables which can be installed on classic machines with ramp intended for fertilizing outdoor vegetable crops, to foliarly fertilize both the stem and the leaves of the vegetables, in order to reduce the amount of fertilizer applied.

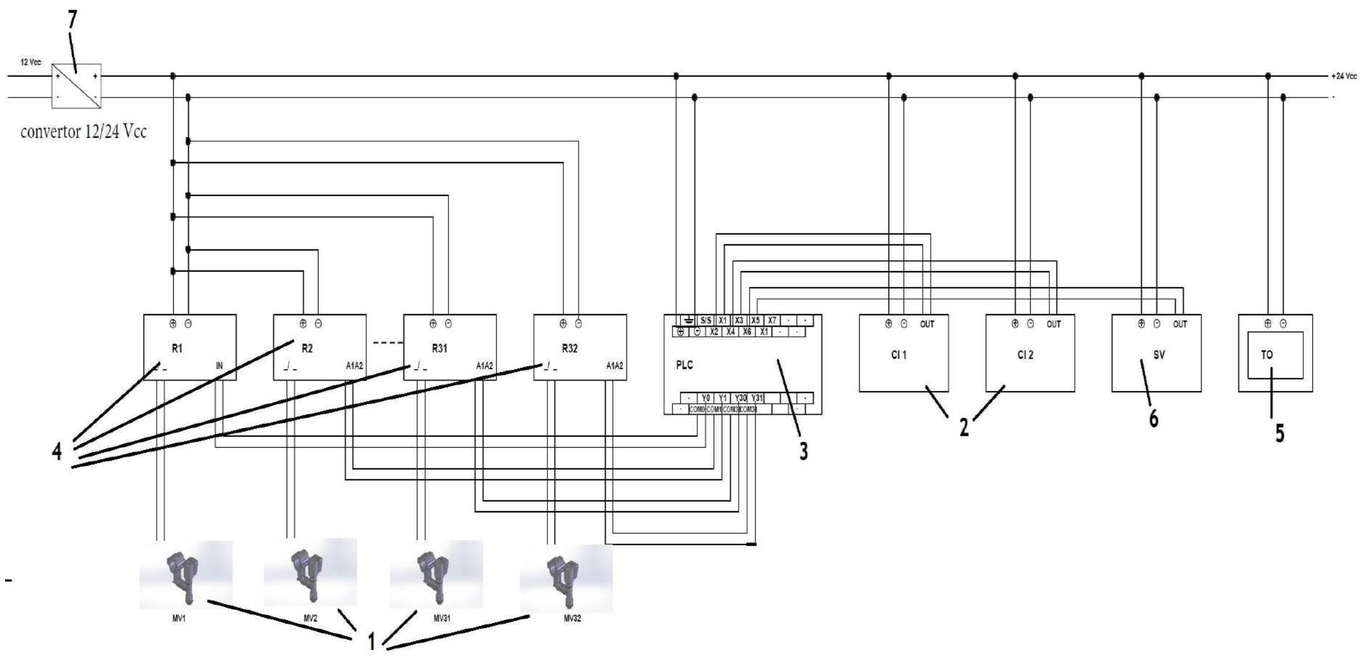
DESCRIPTION:

Currently, using conventional spraying machines (self-propelled, towed or worn), foliar fertilization is done directly on the leaves, continuously, regardless of whether there are crops or not on the sprayed surface, thus wasting large amounts of fertilizer on the soil or on the weeds.

The technical problem solved by the proposed solution, consists in the realization of an experimental model, electrically operated, that allows the individual control of each spraying nozzle separately, by means of electromagnetic microvalves controlled by a central computer, based on an algorithm that allows the identification of cultivated vegetables and weeds using real-time images taken by a smart RGB video camera and processed further using a neural network. After identifying the crop plants, the microvalves located above them are ordered to spray so that the foliar application of fertilizers and herbicides is done only on the respective plants.







COMPONENTS:

The kit for precision foliar fertilization of vegetables, according to the invention, consists of 32 nozzle holders with electromagnetic microvalves and fertilizer nozzles (**1**), which will be mounted on the ramps of a classic sprayer with a maximum of 32 nozzles, two intelligent RGB video cameras (**2**), which will have incorporated the algorithm with neural networks for the recognition of vegetable crops, a Programmable Logic Controller (PLC) (**3**) with 32 digital outputs, 32 intermediate relays (**4**) for actuating microvalves, a graphical interface with the operator (**5**) through which the operating commands can be given in the form of an operating terminal, an inductive speed sensor (**6**) and a converter (**7**) 12V DC to 24V DC.

TECHNICAL SPECIFICATIONS:

Characteristics:	Unit	Value / characteristics
Rear Track	mm	1,320.00
Wheelbase	mm	2,600.00
Electric Motor Drive	kW	12
Li-ion Battery	Vcc	96
Solution Tank Capacity	liters	400 liters
Pump Motor	kW	3
Max. Pump Flow	liters /min.	86 liters / minute
Max. Working Pressure	bar	20 bar
Agitator	-	hydraulic agitator
Lenght of Spray Nozzle Ramp	m	8
No. Of Ramp Sections	-	3
No. Of nozzle-holders and microvalves	-	32
Pressure and Flow Regulator	-	3-way

ADVANTAGES:

- ❑ - the possibility for farmers to use intelligently dosed foliar fertilizers ONLY ON cultivated vegetables just by installing the kit on already-owned classic machines;
- ❑ - constructive simplicity;
- ❑ - operational safety;
- ❑ - ease of use and performance.

ACKNOWLEDGEMENT:

This project was supported by a grant from the Ministry of Agriculture and Rural Development, contract ADER 25.2.2:
"RESEARCH ON THE DESIGN OF INTELLIGENT HORTICULTURE EQUIPMENT FOR BIODYNAMIC ANALYSIS, PREDICTION AND ACTION."

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NATIONAL SECURITY RESEARCH-DEVELOPMENT INSTITUTEMINING AND EXPLOSIVE PROTECTION – INSEMEX PETROSANI
ROMANIA

Automated installation for the accomplish-ment of thermal cycles to condition chemical fertilizers with a high nitrogen content

Patent no. BI 127875/2019

G

Authors:
Daniela Carmen Rus, Attila Kovacs, Edward Gheorghiosu, Cristian Cioară, Ilici Ștefan

The invention deals with an "Automated installation for the accomplishment of thermal cycles to condition chemical fertilizers with a high nitrogen content" for providing a thermal conditioned fertilizer test item. According to the invention, it meets the applicable requirements for the invention, it meets the applicable requirements for the carrying out of the detonability testing on a test item that has been previously sensitized by recrystallization thermal cycles.

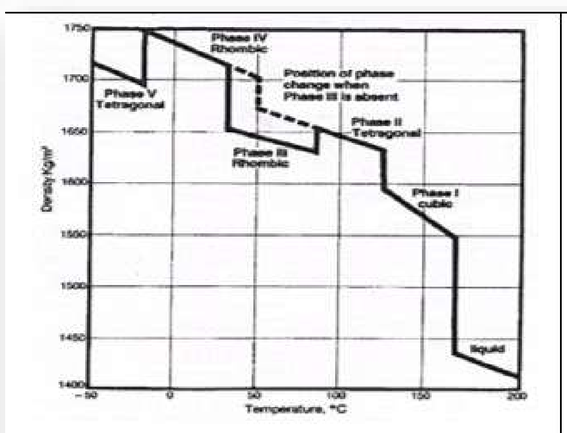


Fig.1.- Ammonium nitrate density as a function of temperaturepentru cele 5 faze de cristalizare.

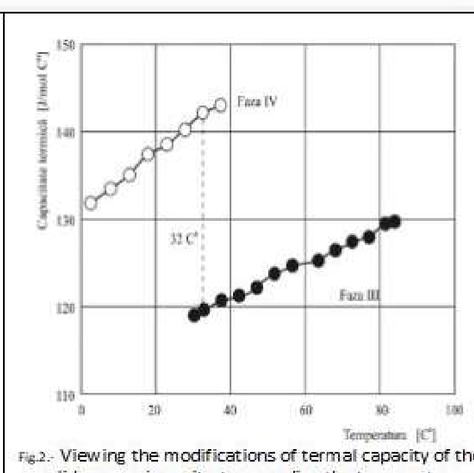


Fig.2.- Viewing the modifications of termal capacity of the solid ammonium nitrate regarding the temperature changinel the cristalization phasis from IV to III

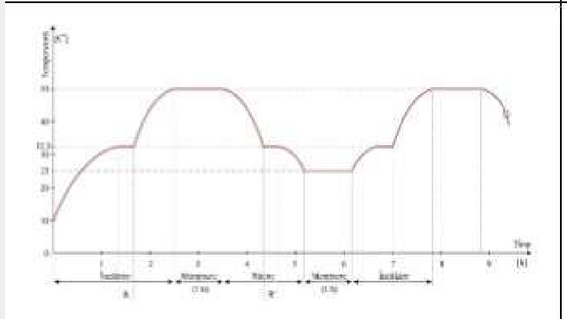


Fig.3.- Diagram of thermal cycles to be performed by the automatic installation R- recrystallization IV - III, R '- recrystallization III – IV

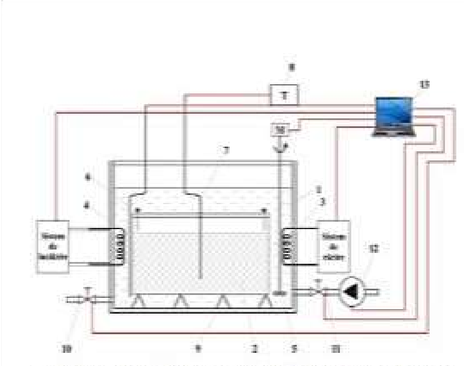


Fig.4- Block diagram of the automatic thermal cycle installation



Fig.5- SAHARA stainless steel open bath with high capacity and technical characteristics that can perform thermal cycles



Fig.6 -Stand for determining the detonability of fertilizers ammonium nitrate chemicals

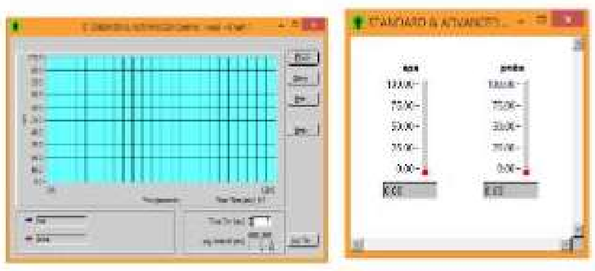


Fig.7.-Graph shows the evolution of the fertilizer sample when performing the thermal conditioning cycles with the remark that the inflection zones of the diagram are those characteristic of the recrystallization temperature.

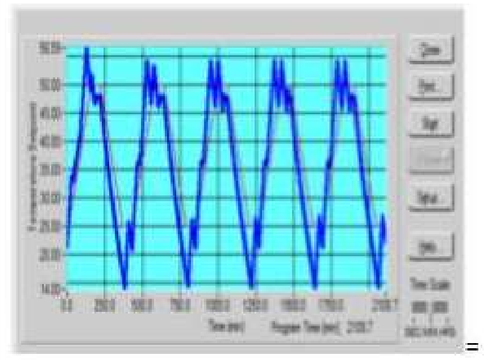


Fig.8.- Diagram of thermal cycles at the end

The automatic installation shown (fig:4) is characterized by the fact that it is made up of a water bath (1) with an adequate volume in which a sealed box of parallelepipedal stainless steel that does not allow the sample to deteriorate through wetting or chemical reactions with other substances (2), a box containing the ammonium nitrate sample inside which is placed the probe for monitoring the temperature in the center of the sample (7) connected to the temperature regulation system (8) to which is also connected a second probe for monitoring the temperature of the water (6), a system interconnected with the process computer (13) which controls the temperature and time parameters specific to the water and the sample by means of specialized software. And it regulates both the operation of the water pump (12) respectively the emptying (10) and filling (11) valves of the bathroom tub, as well as the homogenizer (5), the heat exchanger - the heating cycle (4) and the cooling cycle (3) respectively), and upon completion of conditioning the representative sample is subjected to a detonation test generated by a charge with a high intensity explosive impulse.

Daniela Carmen Rus
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SMART POT FOR MOISTURE ANALYSIS AND LIGHT EXPOSURE OF THE PLANT

Scientific Research Project

Authors: Ivan Razvan, Tereblecea Ioan, Radu Raul, Popenta Raul

Coordinator: Professor Aurel Mihail ȚÎȚU

G

DESCRIPTION: In this project, it is about a smart pot in which a probe is mounted, the purpose of which is to measure humidity, soil nutrients, as well as the light exposure of the plant, depending on the data received from the sensors mounted in this probe. This invention already exists, but we came up with an improvement to it. The probe analyzes these characteristics and depending on the type of plant. Based on the data read by the sensors, the client finds out the water requirement for the plant, the nutrients and the exposure to the sun. The data is provided in an application on the phone. The system is aimed at people who do not stay at home very much. Providing this information to a phone helps so that even a child can take care of a plant.

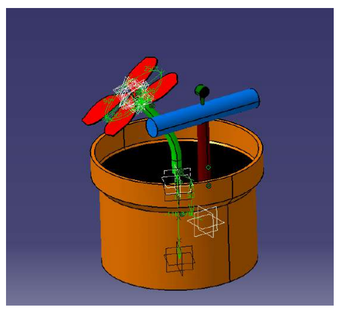
APPLICATIONS:

Our innovation proposes a clever solution to facilitate plant care, especially targeting those with busy schedules or lacking experience in plant care. By harnessing modern technology, we are developing smart irrigation and plant monitoring systems that provide an optimal growth environment without requiring constant user intervention. These devices can be remotely controlled through a mobile application, allowing users to track plant status and receive personalized care tips. Thus, our innovation not only improves plant life but also streamlines and simplifies the user experience in caring for them, even under time constraints or lack of specialized knowledge.



Variant A0

Variant A1



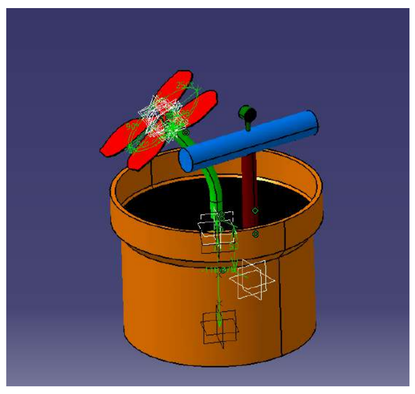
Variant A2

- Normal pot = ***A0***
- Current smart pot = ***A1***
- Our probe for every tipe of pot = ***A2***

ADVANTAGES:

.• Probe for each type of pot
•Reducing the space used
•Increasing the life of the plant
•Increassing productivity for plants
•Away from home plant care
•Starting tool for beginners
•Base of data providing information related to moisture and nutrients specific to each plant
•Daily check in about your plant
•Perfect for low lights rooms, providing growing light for your plant
•Keeping your beautiful plants healthy with minimum efforts

RESULTS AND DISCUSSIONS:



Variant A1



Variant A2

- Of the three variants considered in the modeling for the pot,our product is better for using space and also for the health of the plant
- It fits for the house plants and flowers and it depends on the application.

Contact: „Lucian Blaga” University of Sibiu, PATLIB Centre of Sibiu, 4 Emil Cioran Street, Room IM 100, Phone +40 744 390 290, mihail.titu@yahoo.com

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SILAGE STABILIZERS

Dr Aleksandra Ivetić

Institute for Science Application in Agriculture

И П Н

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Preparation healthy and safe silage

Problem

- **The basic objective of ensiling is to preserve the nutritional value of green plant**
- **Oxygen is the main cause of silage deterioration !!!**
- **Silage is prepared only once a year and used to feed domestic animals throughout the year**



PROVEN EFFECT OF SILAGE STABILIZER ON FARMS

Napredak, Delta Agrar



Horizontal silo

Kamendin doo



Round bale

PIK Bečej



Silo bag

SOLUTION

- **New components that increase milk and meat production**
- **Ensiling without losses**
- **Health safe for humans and animals**

PROVEN IN PRODUCTION

Filed national and international patent application 2020



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NEW TOMATO CULTIVAR – MATRIONA

HR EXCELLENCE IN RESEARCH

MD 309 / 2019.08.31

G

AUTHORS: Milania MAKOVEI, Vasile BOTNARI, Anatol GANEA

APPLICATION FIELDS: G - *Agriculture* (cultivation in private associations farmers and households in individual) *and Food Industry* (for processing and preparation of tomato products-tomato paste, juice, whole-fruit canning and pickling).

AIM: For cultivation in open field and in greenhouses.

Homologate in Republic of Moldova – 2019.



Matriona **cultivar of determinant type of growth (*sp*). Early-ripening variety with a short vegetation period (100 to 107 days). The leaves are large, thick and intense green. The flowers are yellow. The first inflorescence appears after the 6^{th} to 7^{th} node, the next after 1-2. It has large fruits of the red-intense colour, with high palatability qualities. Fruit weight is 140 to 200 g. It is characterized by the long-lasting retention of fruits on the plant at the biological maturity stage (10 to 15 days), highly transportable. Total yielding capacity is 58.7…64.4 t/ha.**

ADVANTAGES: Highly productive, resistant to high temperatures and drought, as well as to the most common tomato diseases.

IMPLEMENTATION STAGE: Homologated in the Republic of Moldova and grown on farmers and in private plots cultivation.

ACKNOWLEDGMENTS: The research was carried out within the Subprogram # *011102 Increasing and conservation genetic diversity, agricultural crop breeding in the context of climate change,* financed by the Ministry of Education and Research.

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HR EXCELLENCE IN RESEARCH

„MOLDOBELLA" NEW GARLIC VARIETY, *ALLIUM SATIVUM*

PATENT: MD 360 / 2021.06.30

AUTHORS: Vasile BOTNARI, Alexei CHILINCIUC

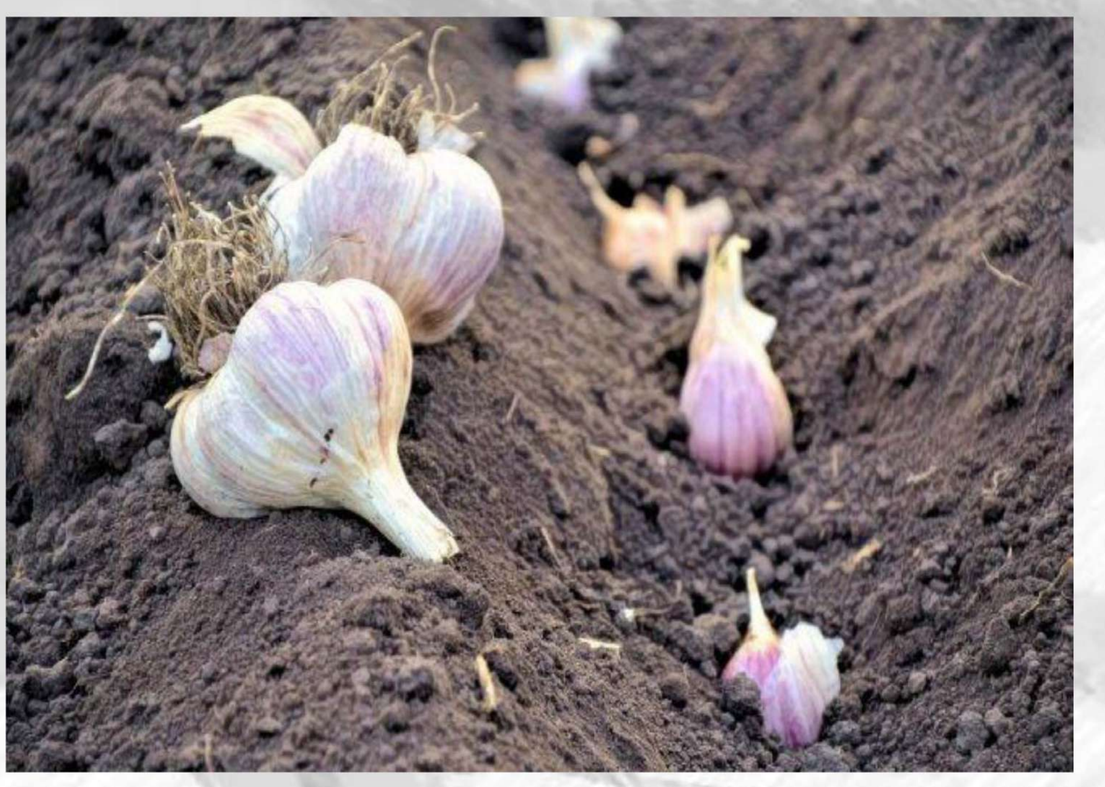
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APPLICATION FIELDS: G - Agriculture.

AIM: Effective utilization of plant genetic resources and advanced biotechnologies in order to increase the adaptability of crop plans to climate change.

The MOLDOBELLA garlic variety is of medium maturity obtained by selecting a population from a local form of garlic without floral stems. The vegetation period is 108-112 days. It is grown vegetative by planting bulbs at the end of autumn. The variety is resistant to extreme temperatures in winter and summer, tolerant to the most common diseases. The plants have a vigorous growth, form 10-12 long dark green leaves. The bulb has a pronounced density and a long shelf life. The bulb has a flat-round shape weighing 35-65 g, consisting of 12-16 bulbils weighing 3.0-7.0 g, covered with 4-5 dry white leaves with slightly pronounced purple stripes. In the absence of irrigation, the harvest constitutes 9.0-10.5 t/ha.





The variety has a long ripening period, is resistant to extreme temperatures in winter and summer, tolerant to the most common diseases.

IMPLEMENTATION STAGE: The Moldobella variety is grown in peasant farms and on individual lots.

ACKNOWLEDGMENTS: The research was carried out within the Subprogram *# 011102.*

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SVETLANA A NEW VARIETY OF *LAVANDULA ANGUSTIFOLIA* MILL. (LAVENDER)

HR EXCELLENCE IN RESEARCH

PATENT NUMBER: MD 427 / 2023.12.31

AUTHORS: Maria GONCEARIUC, Svetlana MASCOVTEVA, Violeta BUTNARAS, Pantelimon BOTNARENCO, Zinaida BALMUS, Ludmila COTELEA

APPLICATION FIELDS: G - Agriculture.

AIM: Creation of a new variety of *Lavandula angustifolia* Mill. with high quality essential oil content.

SOLUTION: The invention relates to the branch of agriculture.



Lavender variety Svetlana 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 Svetlana is a variety resistant to frost and winter, to diseases and drought resistant. Plant height is 68 cm. At the density of 12.5 – 20 thousand plants per hectare is forms up to 854–1500 floral stems per plant.

ADVANTAGES: Production of ram maternal inflorescences - 7.7 t/ha. Essential oil content – 2.323 % (60 % humidity) and 5.721% (dry. matter). Productions of essential oil constitute 179.2 kg/ha, efficiency 23.4 kg/t of essential oil per ton of fresh inflorescences.

IMPLEMENTATION STAGE: At the laboratory level.

ACKNOWLEDGMENTS: This research was supported by the research project Increasing and conservation genetic diversity, agricultural crop breeding in the context of climate change.

ACKNOWLEDGMENTS: The research was carried out within the Subprogram # 011102, *Increasing and conservation genetic diversity, agricultural crop breeding in the context of climate change.*

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THYME WITH LEMON FLAVOR OF THYMUS X CITRIODORUS (PERS.) SCHREB.)THE NEW VARIETY LILY ROZ

PATENT NUMBER: MD 428 / 2024.01.31

G

AUTHORS: Lilia CHISNICEAN, Zinaida VORNICU, Tamara JELEZNEAC, Natalia BARANOVA

APPLICATION FIELDS: G - Agriculture.

AIM: Creation of a new aromatic spice variety of *Thymus x citiodorus* with food and pharmaceutical applications.

SOLUTION: A new aromatic spice cultivar was obtened using the controlleted hibridization method.



The variety Lily roz is part of the early maturity group. Perenial semi shrab with a hegh – 26.4 cm. The diameter of the plant is 64.8 cm. Spead with 447.3 infloriscense stems. Tiny green oval leaves 5 – 6 mm. Pink flowers – intensely placed in a spiniform raceme.

ADVANTAGES: *Quality indices*: essential oil content 0.326%, (moisture 60%); 1.247% dry matter. *Productivity indices*: the average production of fresh raw material – 4.26 t/ha, pharmaceutical *herba* – 1.34 t/ha. Essential oil production – 13.9 kg/ha. Yield: 3.26 kg essential oil per 1 t raw material.

IMPLEMENTATION STAGE: At the laboratory level.

ACKNOWLEDGMENTS: This research was supported by the research project # 011102, Increasing and conservation genetic diversity, agricultural crop breeding in the context of climate change

PROCESS FOR BREEDING RABBITS

Patent: **MD 1631**

Author: **MOSCALIC Roman, CARAMAN Mariana, CREMENEAC Larisa, MAŞNER Oleg, COJUŞNEANU Oleg**

G



DESCRIPTION. The process for breeding rabbits, according to the invention, provides for the administration of a preparation based on a mixture of effective microorganisms, comprising photosynthetic bacteria, lactic acid bacteria and yeast, in an amount of 1.5 mL/L of water, daily for watering females during the gestation-lactation period and rabbits from birth to slaughter, at the same time it is used a preparation obtained by fermentation of 1 L of mixture of effective microorganisms, 44 L of water and 5 L of molasses, at a temperature of 33°C for 7 days.

ADVANTAGES OF THE INVENTION:

increasing the fertility of female rabbit by 12.24%;

◄ the decrease of 10 percentage points in giving birth to young with less than 7 kittens in the litter;

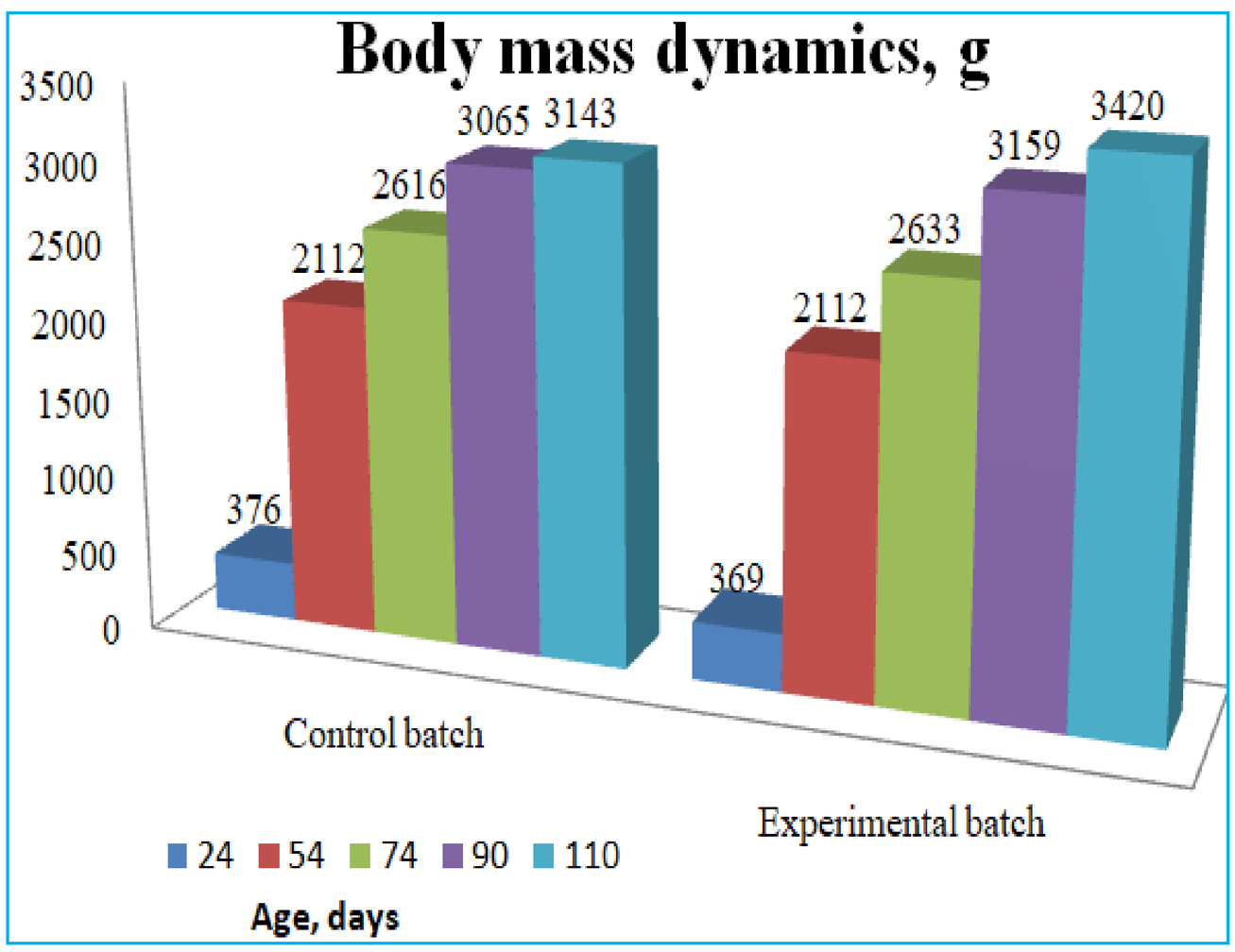
◄ reducing the mortality of young rabbits by 6.97 percentage points;

◄ the intensification of metabolic processes in the body of the young rabbits by increasing the number of red blood cells by 14.89%, the total amount of hemoglobin by 16.30% and the hematocrit by 20.95%;

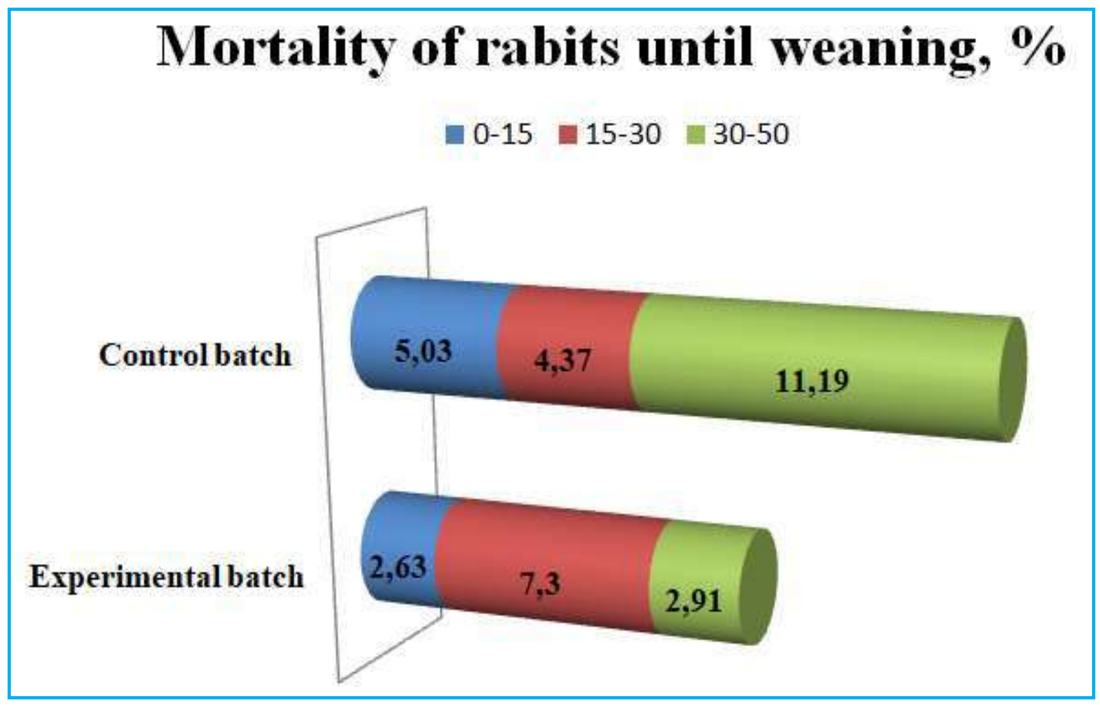
◄ increasing the body mass of rabbits at slaughter by 8.81%;

◄ increasing the yield at slaughter by 2.3 percentage points;

◄ ensuring the net profit of 27.35 lei/head.







The research was carried out within the project 20.80009.5107.12 Strengthening the "food-animal-production" chain by using new feed resources, innovative methods and schemes of health care.

Contact: v. Maximovca, d. Anenii Noi, MD-6525, tel./fax: (022) 359-350, e-mail: izmv1956@gmail.com

PROCESS FOR BREEDING YOUNG CHICKENS

Patent: MD 1656

Author: PETCU Igor, MAŞNER Oleg, SÎRBU Tamara, STARCIUC Nicolaie, CARAMAN Mariana, DEMCENCO Boris

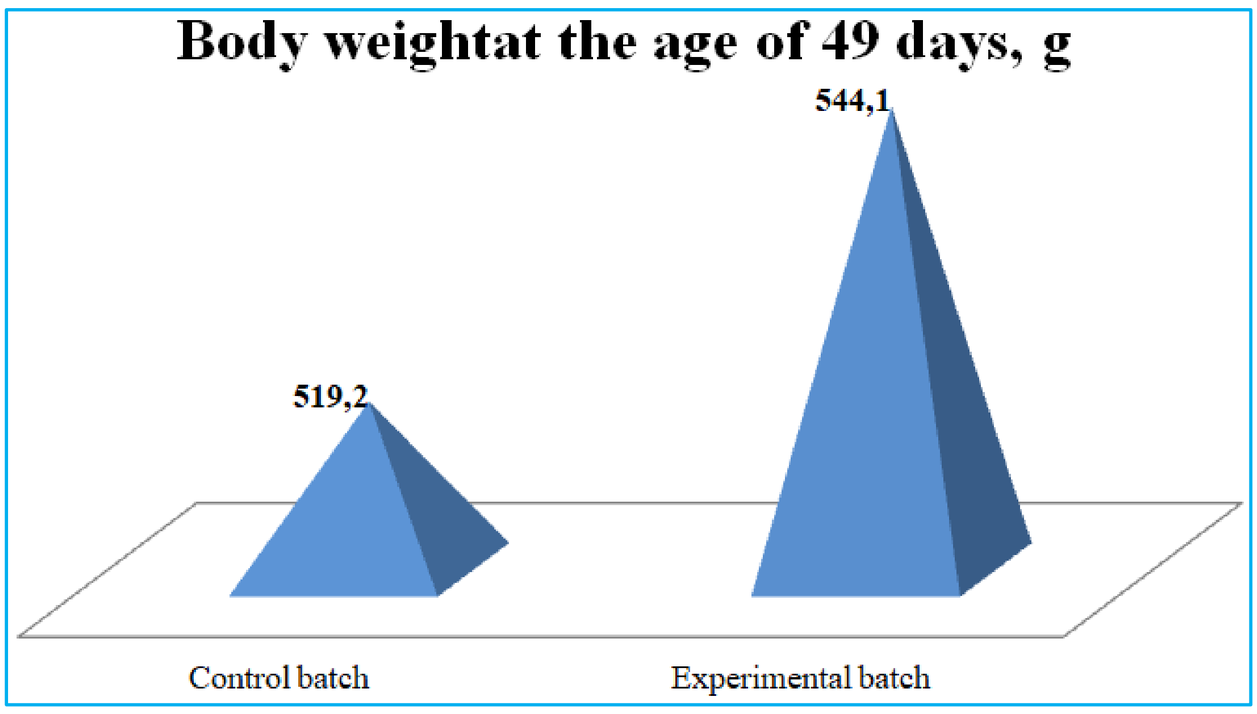
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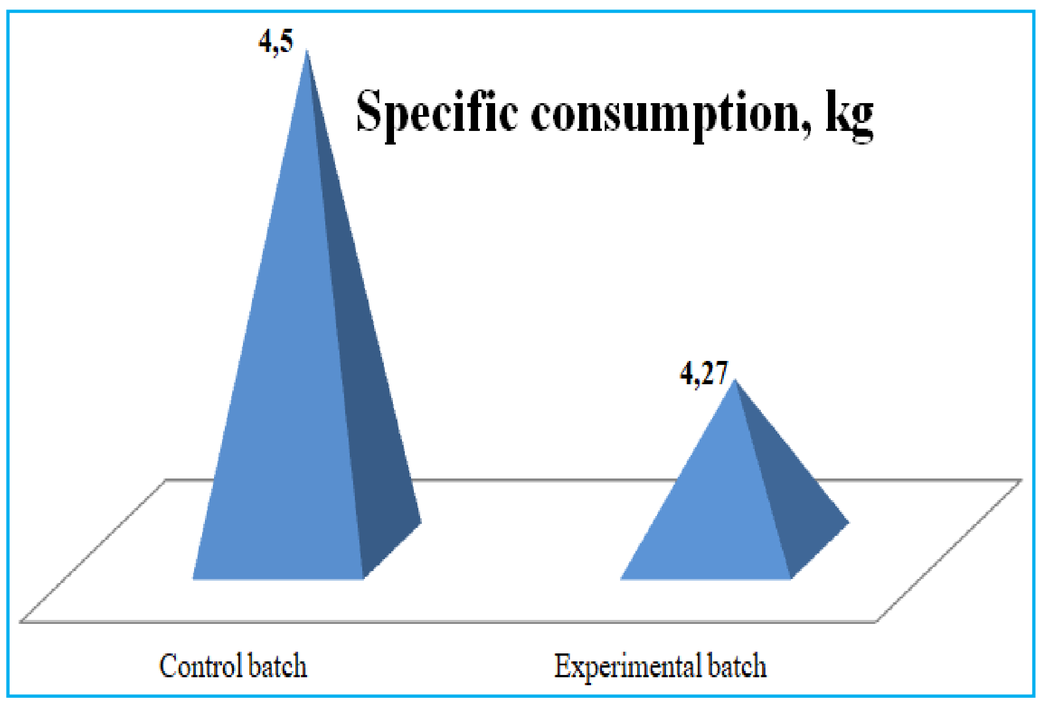
DESCRIPTION. The process for breeding young chickens, according to the invention, provides for the introduction of the culture liquid of the *Penicillium piceum* CNMN-FD-21 fungal strain, in the amount of 1 mL/L of water, daily, by watering in the age period of 1-49 days.

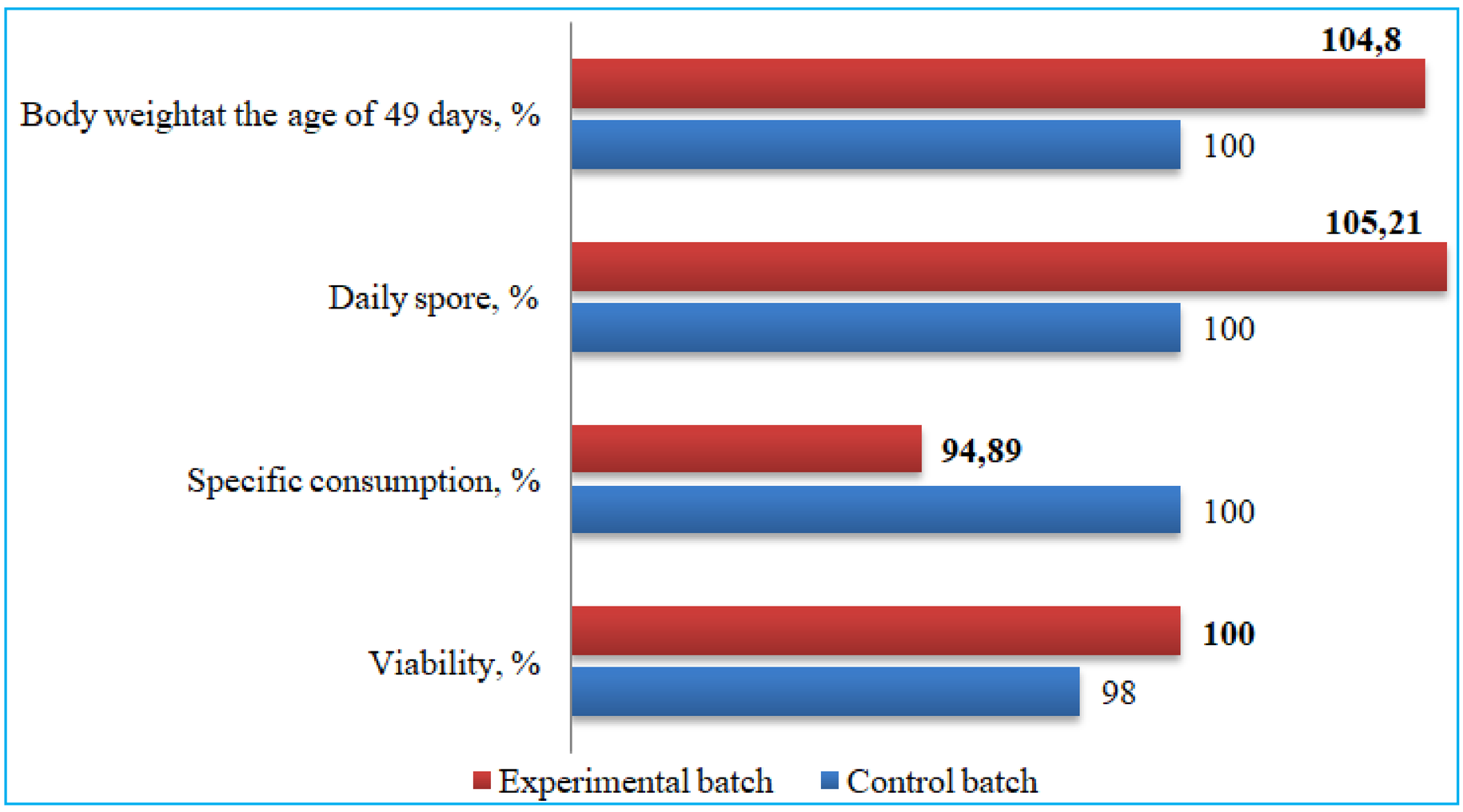
ADVANTAGES OF THE INVENTION:

◄ a 5.21% increase in daily weight gain;
◄ a 4.80% increase in body weight at 49 days of age;
◄ a 5.11% decrease in specific consumption;
◄ the economic efficiency of using the culture extract of *Penicillium piceum* CNMN-FD-21 fungal strains in the daily ration of the Argintie de Adler breed hens was 130.91 lei/100 chickens.









The research was carried out within the project 20.80009.5107.12 Strengthening the "food-animal-production" chain by using new feed resources, innovative methods and schemes of health care.

Contact: v. Maximovca, d. Anenii Noi, MD-6525, tel./fax: (022) 359-350, e-mail: izmv1956@gmail.com

PROCESS FOR GROWING CORN FOR SILAGE

Patent: **MD 1668**

Author: **CARAMAN Mariana, CREMENEAC Larisa, MOSCALIC Roman, COJUŞNEANU Oleg, MAŞNER Oleg, PETCU Igor**

G

DESCRIPTION: The invention relates to organic agriculture, crop production branch, in particular to a process for growing corn for silage. The process, according to the invention, comprises the uniform introduction into the soil before sowing of a biocompost in the amount of 10 t/ha, the biocompost being obtained by traditional fermentation, for at least 3 months, of rabbit droppings, which were daily given a preparation based on a mixture of effective microorganisms, including photosynthetic bacteria *Rhodopseudomonas ssp*., acidolactobacteria *Lactobacillus ssp*., and yeast *Saccharomyces ssp*., in the amount of 1.5 mL per 1 L of drinking water.

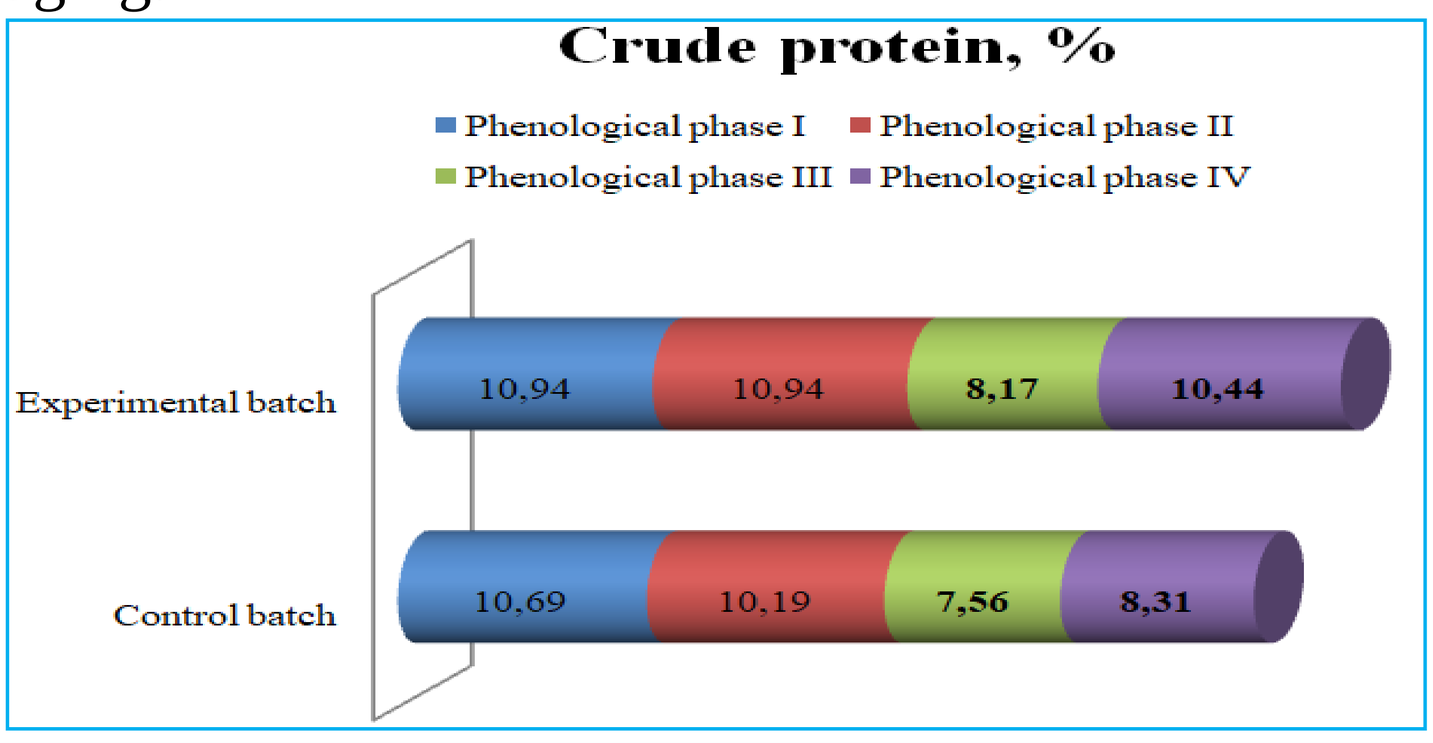
ADVANTAGES OF THE INVENTION:

◄ the increase in plants height in the 4 phenological phases, respectively by 30.00%, 32.72%, 26.09%, 9.32%;

◄ the increase in plants of dry matter, total nitrogen and crude protein, respectively by 13.99%, 19.05% and 19.05%, in the 3rd phenological phase (harvesting corn for silage). So the fodder has a higher protein value;

◄ the obtaining 46.73 % more green mass of corn during ensilaging.









The research was carried out within the project 20.80009.5107.12 Strengthening the "food-animal-production" chain by using new feed resources, innovative methods and schemes of health care.

Contact: v. Maximovca, d. Anenii Noi, MD-6525, tel./fax: (022) 359-350, e-mail: izmv1956@gmail.com

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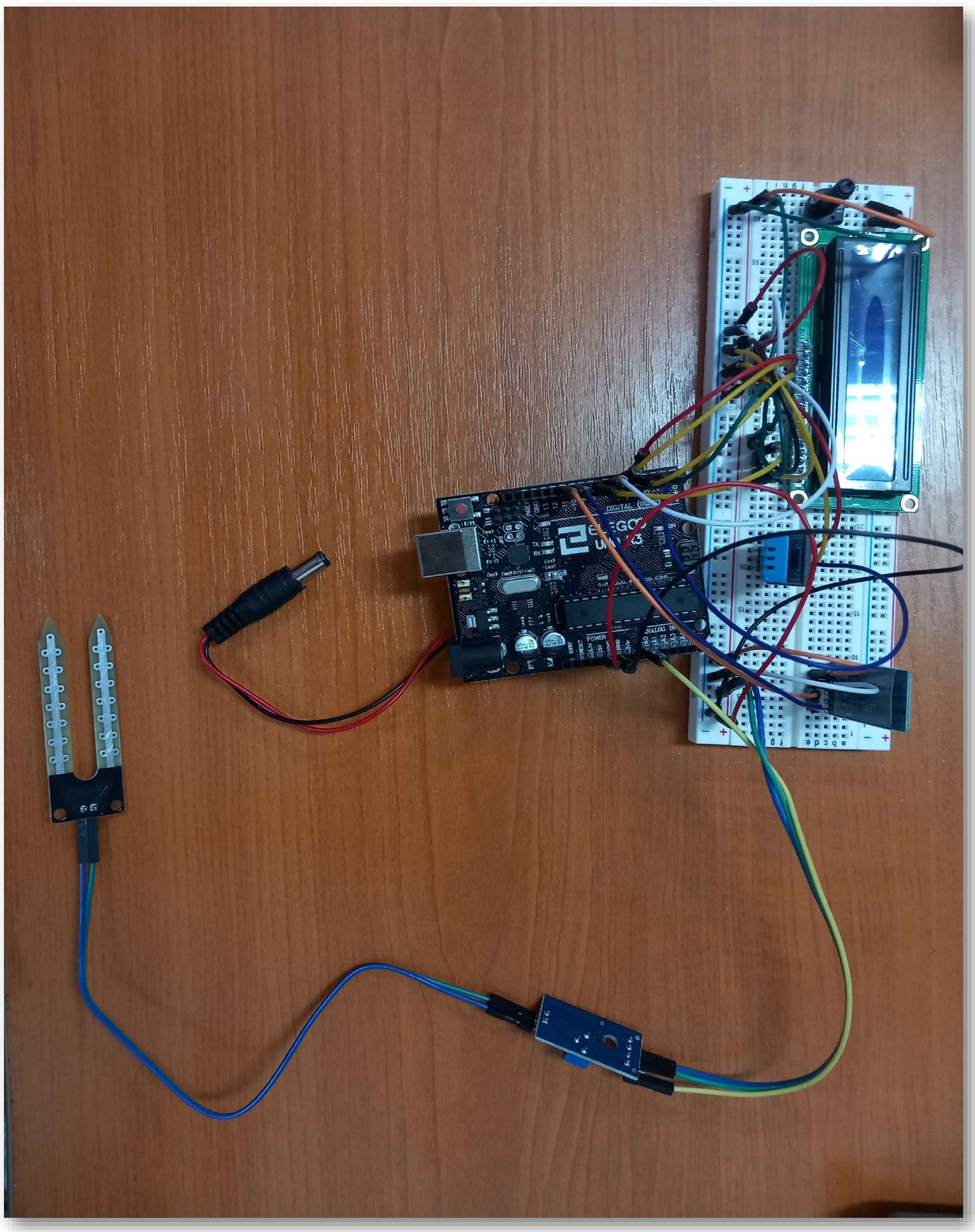
AUTOMATED SYSTEM FOR IRRIGATION CONTROL IN FARMS

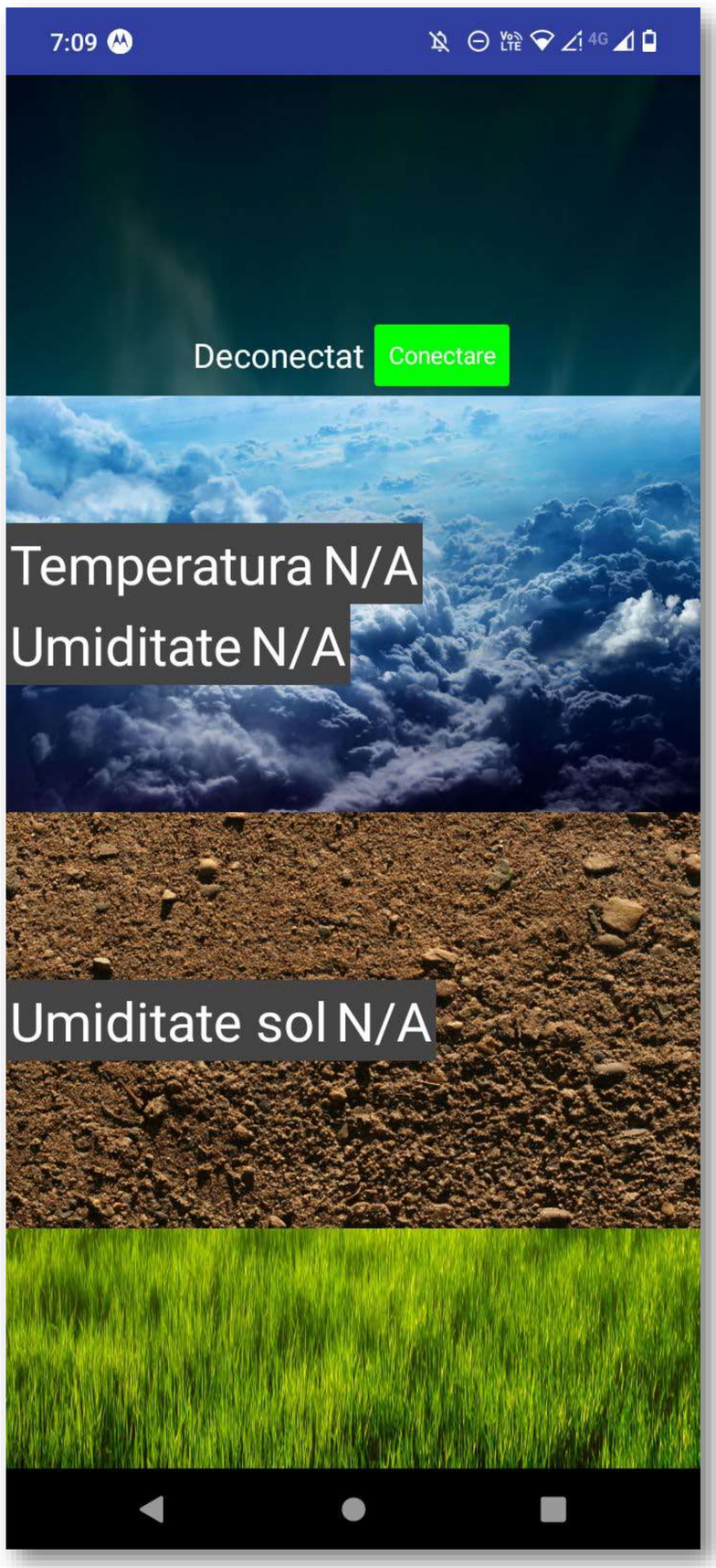
Research project

Author/s: Călușer Gala, Moldovan Maia Emilia, Petrariu Sebastian Daniel; Paul Țoța (coordinator)

G

The project consists of a programmable farm irrigation control system using an Arduino Uno development board with an AVR microcontroller. The project has the ability to provide weather data and measure soil moisture using a mobile app. Thus, it controls the irrigation mode and makes decisions using its own weather predictions.





Contact: contact@cexhd.ro

H

Foods

Drinks

Restaurants

Hotels & Spa

NEXUS TRAVEL

Travel agency

Author: Zenaida MOSNEAG & Team

H

Nexus Travel was founded in 1998 out of a desire to build our own vacations and make others enjoy them too! Over time, we have proven that we know how to respect our tourists, who remain loyal to us and become our friends.

"The best trip is always the next one“ - Live with us new unique experiences!



We offer all tourism-related services with high professionalism, promptness and responsibility:

– holidays in the country and abroad;

– booking plane tickets for all airlines and all destinations;

– medical insurance for trips abroad.

Nexus Travel is a member of ANAT.



Zakynthos
Grecia



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Spania



Dubai
Emiratele Arabe Unite



Creta - Chania
Grecia

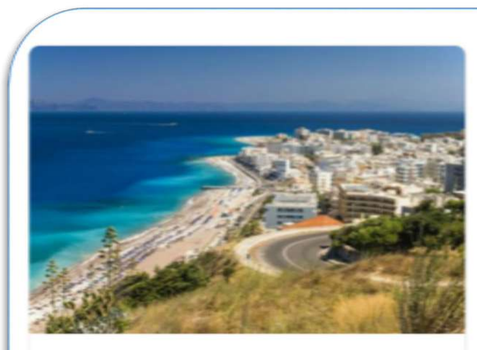
SCAN ME

Contact:

turism@nexustravel.ro

zenaida@nexustravel.ro

+40744 636 446



Rhodos
Grecia



Corfu
Grecia



Antalya
Turcia



Bodrum
Turcia

We like to think that any holiday dream can come true with us!

THE INFLUENCE OF ROSEHIP POWDER ADDITION ON MUFFINS QUALITY

H

Research project

Authors: Nicoleta Vartolomei, Simina Tănasă, Andrei Pîrvu

The purpose of this work was to study the influence of the rosehip powder addition on the muffins quality. In order to estimate the physico-chemical and sensory characteristics of complex products with the addition of vegetable powder, it was proposed to obtain muffins with rosehip powder in a ratio of 5 and 10%. The use of domestic raw materials represents a particular advantage to considerably reduce production prices, so that the market price of the finished product is also affordable.

Rosehip fruits (*Rosa canina L.*) are used in food due to their rich content in bioactive compounds such as polyphenols, essential fatty acids, galactolipids, folates, antioxidants, vitamins and minerals, especially for vitamin C (ascorbic acid), rosehips being recognized as plant source rich in vitamin C. The increased antioxidant potential of plant powder from native plant sources was argued theoretically and experimentally through the analysis of quality indicators, antioxidant activity and CIELab color parameters.

For the sensory analysis, 5 basic parameters were evaluated, namely: colour, taste, conscious, appearance, smell. The evaluation of each index was appreciated with a score scale of 1-5 points.

Following the estimation of the organoleptic indices, it was established that the muffins with the addition of 5% rosehip powder have a pleasant color and smell and favorably influenced the organoleptic indices of the obtained samples and can be proposed for consumption by potential consumers on the market.

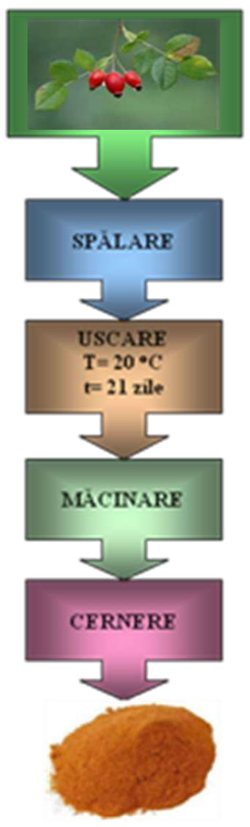
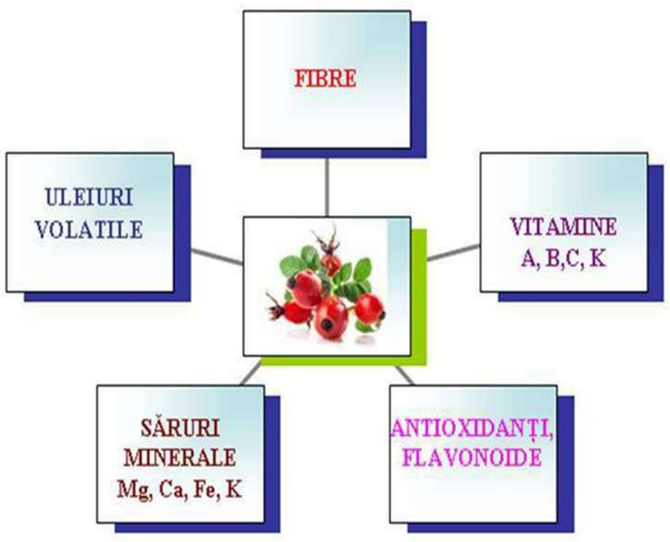


Table 1. *Physical-chemical properties of rosehip powder*

Moisture %	Carbohydrates %	Fibres %	Proteins %	Fats %	Ash %	Vitamin C mg/100 g
13.40	65.00	8.63	4.89	0.76	6.50	820





Control sample	F 550 + 5% rosehip additon	F 900 + 5% rosehip additon



CONCLUSIONS

Muffinss with the addition of rosehip powder received a higher score than the control, which means that they were accepted by the tasters.

Acknowledgements

This study was performed with the support material by ***Technological High School of Targu Ocna***

Contact: vartolomeinicoleta28@yahoo.com **+0748992827**

5th International Exhibition InventCor
04-06 April, 2024, Deva, Romania

FAST METHOD FOR ISOLATION OF MICROPLASTICS FROM MILK, YOGURT, SOUR CREAM AND BUTTER

H

Patent Application no. **RO 137927 A0**

ORIGINAL TITLE: METODA RAPIDA DE IZOLAREA MICROPLASTICELOR DIN LAPTE, IAURT, SMANTANA SI UNT

Inventors: Cristiana RADULESCU, Ioana Daniela DULAMA, Andreea Laura BANICA, Ioan Alin BUCURICA, Raluca Maria STIRBESCU, Laura Monica GORGHIU

Assignees: Valahia University of Targoviste

Field of Applicability: Food Industry

The advantage of the invention consists in its practical use in the food industry (primary analysis laboratories, complex analysis, quality control of raw materials, respectively of finished products, consumer information department/ National Authority for Consumer Protection), with the role of warning about the risk of contamination with microplastics of human, but also a warning and awareness role for suppliers and processors in order to develop the technological process and finished products.

Originality: Microplastics isolation protocol

The protocol developed by the authors allows to everyone to detect (in a lab environment) the presence of MPs in milk (including raw milk), yogurt. sour cream, and butter in any processing stage. It is the world's first protocol for MPs isolation in the milk products mentioned above that can simultaneously be used with a 100% success rate.

Importance of invention: Food safety

Food safety is one of the significant aspects to which all food companies pay attention, so ensuring the quality of the final product in terms of food safety regulations becomes one of the sustainability pillars for development. Many companies have their labs for testing the products before being sent to the market, while some others use particular accredited labs to assure food safety. Furthermore, it is well known that it takes a bit of time for raw material to become a product, and some processes are mandatory to be completed before the final product is released. In order to ensure a good quality product, it is essential to have a clear image of the entire processing line for which the main actor is the raw material. Therefore, to reach the big picture, it is crucial to have some quality control markers; this can be easily obtained using sampling and analytical methods in different processing stages.

The relevance of studying plastics in the food industry is given by their common and widespread use in the food chain as wrapping materials (in most cases) or in raw materials. Indirectly, MPs could reach the food chain as ingested by animals (via air, water or feed), passing into tissues and subsequently ending up in food as contaminants. In some cases, these contaminants could be related to the processes/equipment (i.e., aged transport pipes, conveyor belts, or unsatisfactory hygiene in the manufacturing unit space) used in the production process.

Until this moment there are no other solutions for microplastic separation from milk, only some timid results were generated through other methods, which proved to be inefficient in reproducibility or, like in some other cases incomplete presented by their authors (DNS the precise time, temperatures or quantities of reagents used in order to modify the complex matrix of milk in such a manner that the separation process to take place).

Analytical aspects: Test results

The protocol was already used by the Patent Application authors to investigate more than 52 samples (156 in triplicate) with 100% reproducibility in 3 easy steps: A. pretreatment of the samples with ultrapure reagents necessary for the digestion of the complex organic matrix and homogenization by stirring at 150 rpm, for 10 minutes; B. actual digestion by ultrasonication at 30°C, for 20 minutes; C. filtration under vacuum on filters with porosity 12-15 µm. The protocol integration in the analytical sequence as well as some of the results are presented bellow:

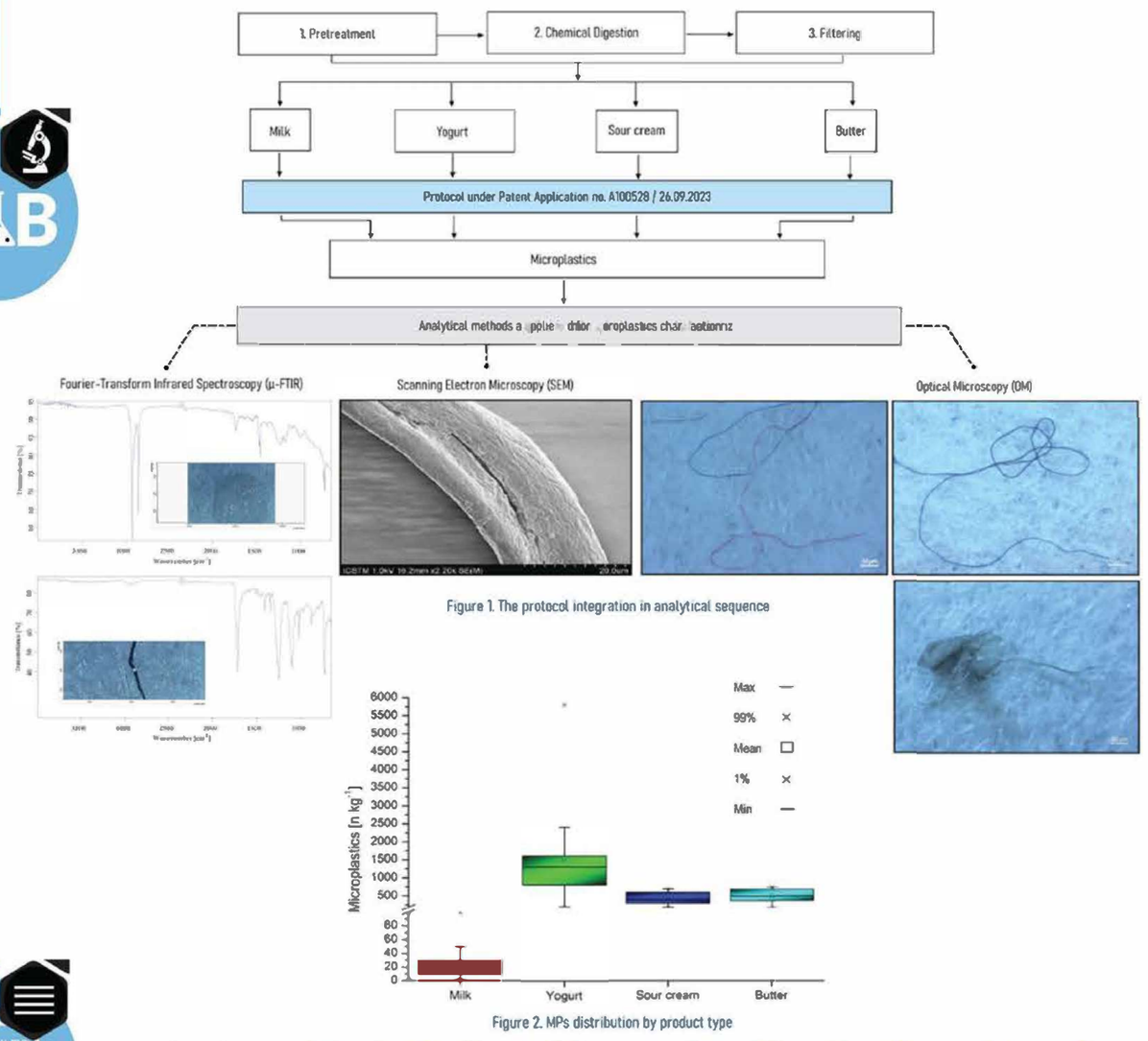


Figure 1. The protocol integration in analytical sequence

Figure 2. MPs distribution by product type

Conclusions: Technical problem solved by the invention & final thoughts

By applying the invention, the following advantages are obtained:

- reduced working time (30 minutes);
- reduced amounts of reagent;
- effective application (complete isolation of microplastics) of the procedure, depending on the nature of the product, regardless of the fat content;
- equipment that requires high costs in terms of consumables, utilities or special training of the operator is not required;
- common working parameters for all the mentioned products (milk, yogurt, cream and butter), only the amounts of samples and reagents are varied, which allows the simultaneous isolation of microplastics from different categories of samples;
- low degree of toxicity of the resulting products (residues).

Acknowledgements:

This research was funded by project ID584/2021, 43PFE/30.12.2021, Excellence and Performance for Increasing the Institutional Capacity of RDI (ProExcellence), financed by the Ministry of Research, Innovation, and Digitization

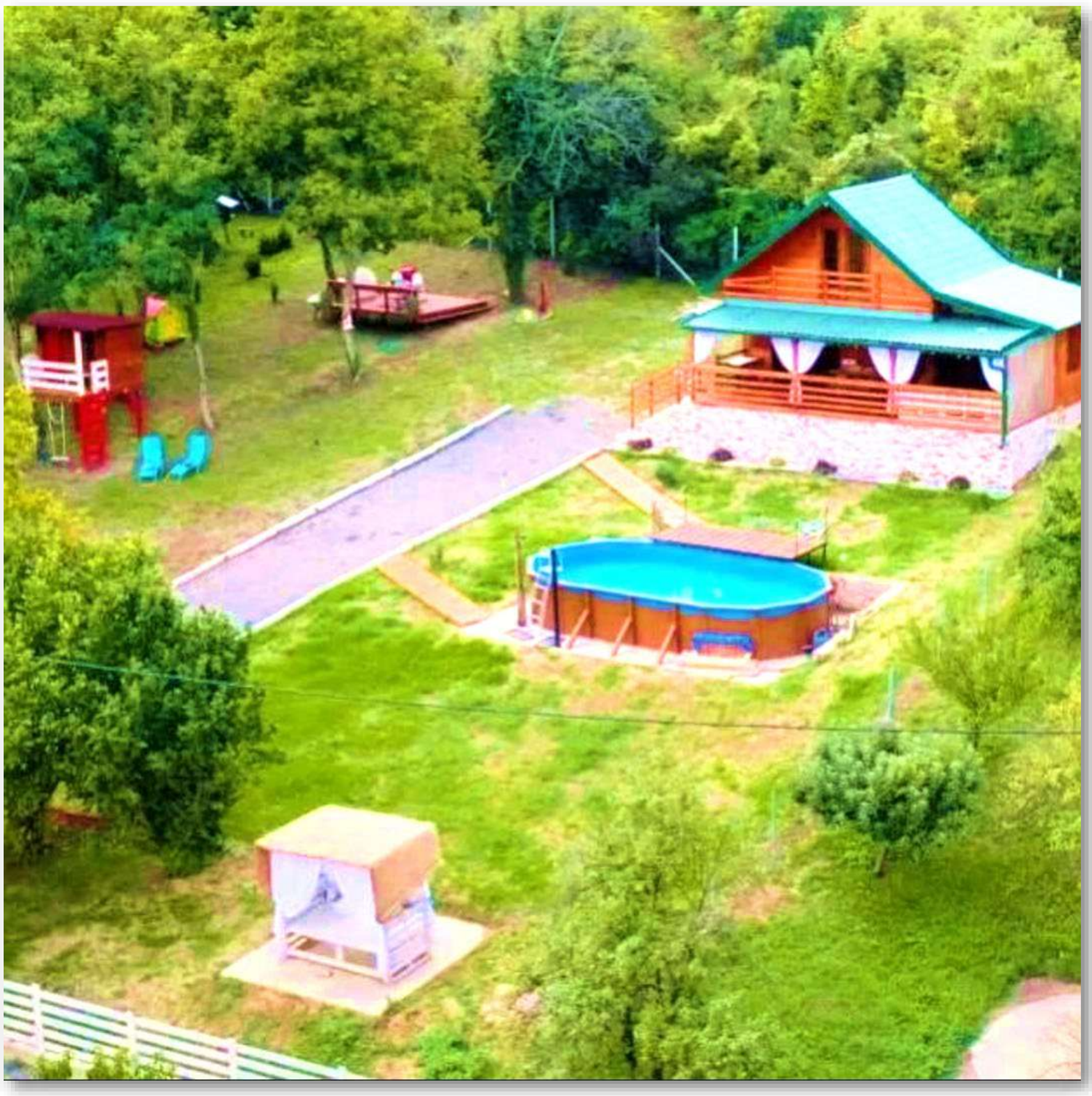
Institute of Multidisciplinary Research for Science and Technology Research Infrastructure
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Kuca za odmor Oblutak

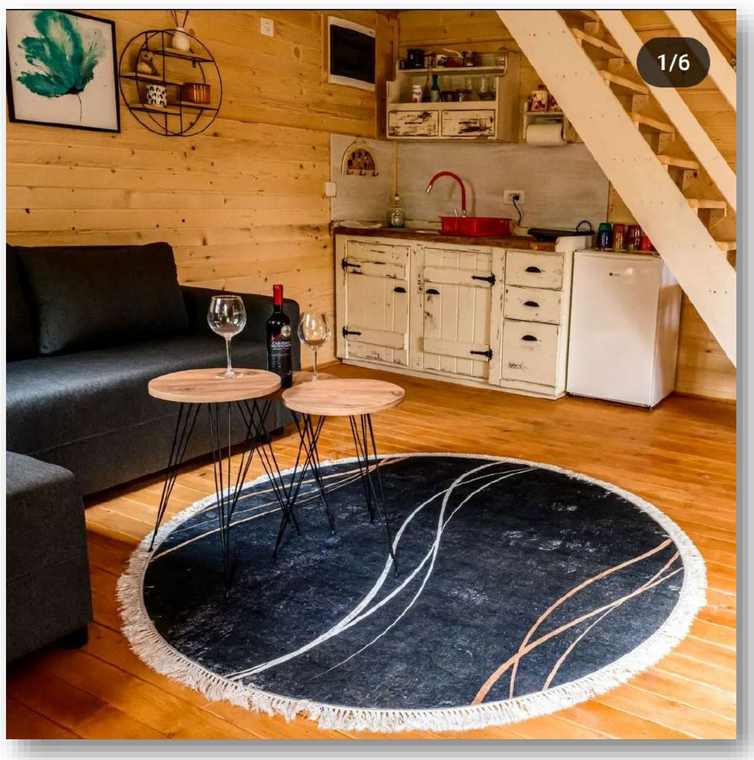
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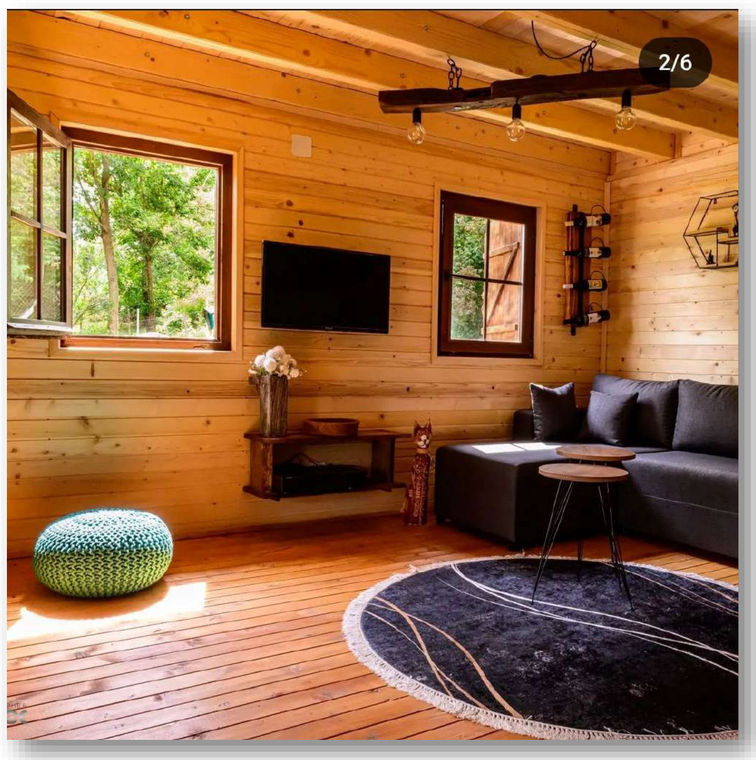
Author: Dragan PUDA

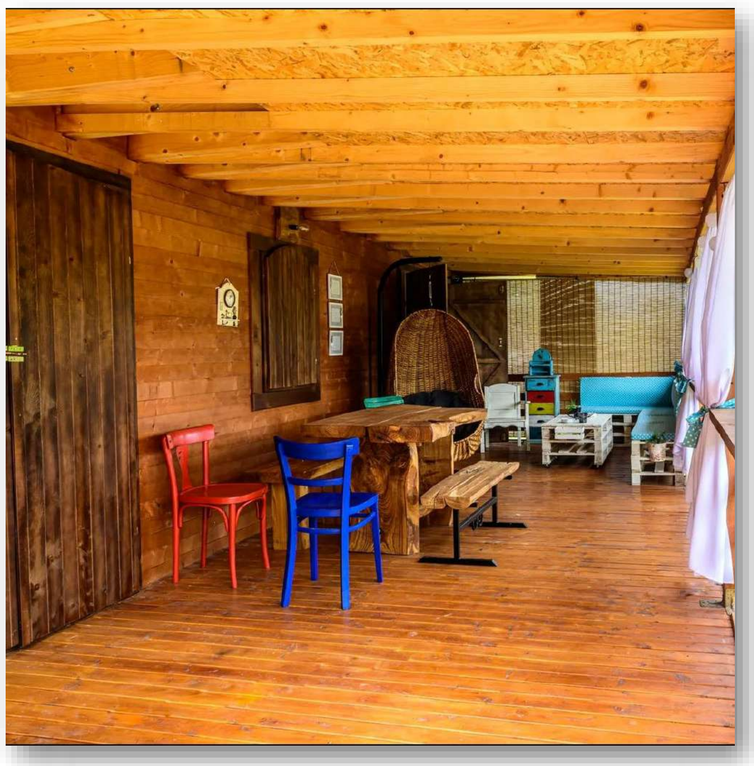
Holiday home Kuca za odmor Oblutak is located in Koruska-Duga Meda, Serbia, near Susek on the other side of the Danube river in a quiet area away from the hustle and bustle of the city, offering relaxation and refreshment for visitors.



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Contact: kucazaodmoroblutak@gmail.com

ROOTI BISTRO
&PATISERIE ARTIZANALĂ

ROOTI Bistro

Authors: Maria Angelica NOJA, Nicolaie NOJA

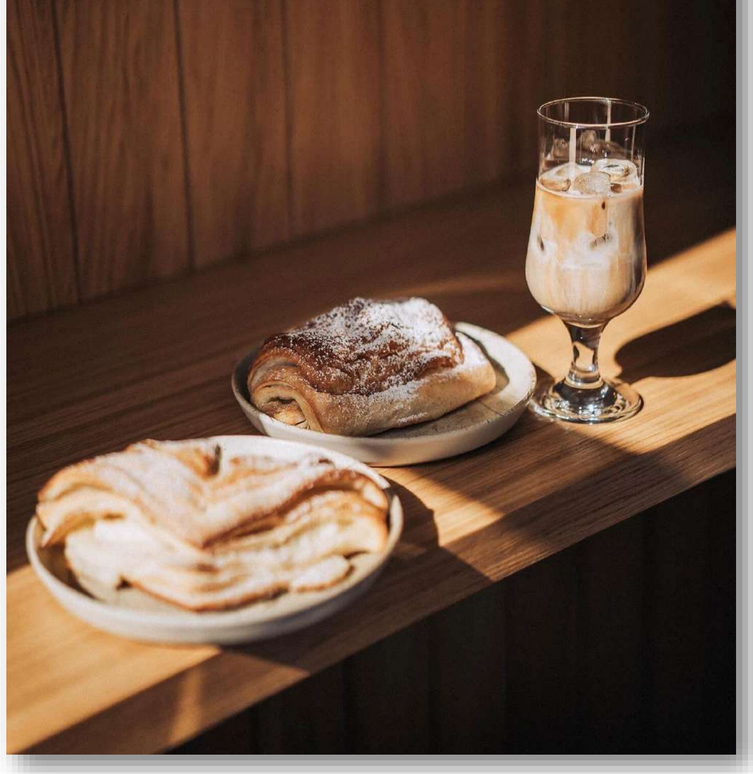
ROOTI Bistro an original concept centered around bakery and pastry production with origins of over 20 years in the field. Our specialty is the production of bread, initiated in the 90s, then we sought to diversify our activity and designed, developed and introduced in our range, pastry products intended for ROOTI Bistro.

We are dedicated to the passion of creating authentic and memorable dining experiences. Rooti is your new location in the heart of the city, where every aroma, taste and texture is made with care and passion. We proudly present to you the art of making mayo bread and artisan pastries. Our goal is to bring back authenticity and tradition through every product in our location. With every piece of tender bread and every delicacy fresh out of the oven, we invite you to enjoy an honest taste journey.

Today, ROOTI Bistro represents a landmark of ambition, personality and originality in the center of DEVA City!









rooti.bistro

Bulevardul 1 Decembrie 1918
Deva, Romania

Contact:
rootibistro@gmail.com
+40753 026 614

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La BISCUTERIE

Authors: ***Ani MOCANU, Razvan POPA***

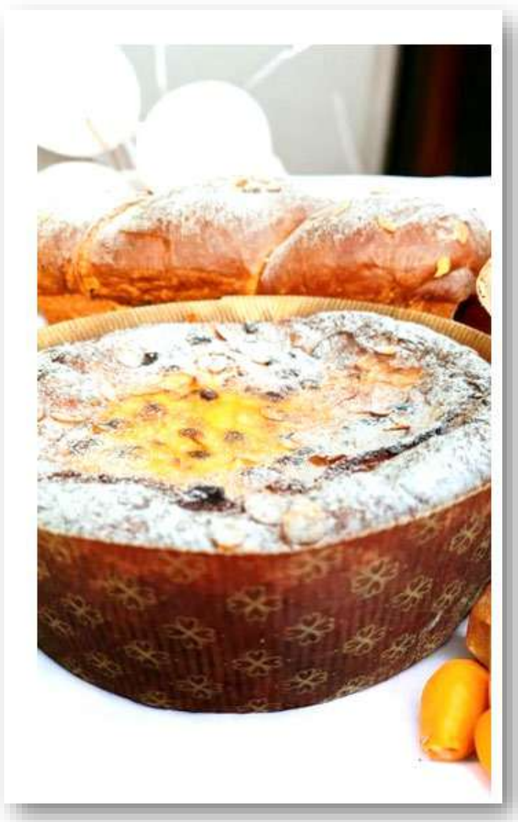
H

Passion

We, the La Biscuterie team, have managed to weave imagination, seasoned with passion for colorful innovations. Our story begins with the essence of nature, thus, through its rich gifts, it challenged our inventiveness to skillfully combine natural ingredients without processing nature, thus creating products that bring more harmony and inner joy. The delicious snacks are designed and made to improve the lifestyle, using syrups and wholemeal flours, ennobled with flavors inspired by the bouquet of the four generous seasons.











SCAN ME



Skills

We co-opted into our team nutritionists who helped us to balance our healthy delights; we procure basic ingredients only from producers who put full passion into what they offer us and rigorously respect the principle of natural ingredients not industrially processed:

Whole wheat flour - natural enzymatic correction;

Whole rye flour;

Spelled wheat flour;

Natural sweeteners: BIO natural grape syrup, unheated, obtained by evaporation, BIO agave syrup with low glycemic index;

BIO cold-pressed coconut oils, sunflower oil and other oleaginous fruits;

Natural spices, without preservatives or additives, most of them from organic farming.

Contact: +40 761 66 73 73 ***Presentation link: https://labiscuiterie.ro/***

VORONSKAYA

Authors: PRODALCOM team

H

SC PRODALCOM SA was born in the north of Moldova as a materialization and cementing of a lasting friendship between the company's shareholders. This friendship led further and contributed to the increase in the notoriety of Vorona, initially known for the monastery here and the secular woods that surround it.

The year 2017 was THE YEAR OF GROWTH for PRODALCOM:

- Refurbishment of the Vorona bottling section
- Refurbishment of the Botoșani Factory
- Opening of Suceava warehouse

The nature created it,
we just bottled it!







SCAN ME



OUR WORLD

From the company's founding in 1993, to celebrating the moments that matter to us and our community. Here you can see images and video from events that bring people together.

Contact: office@prodalcom.ro

LA LIBRĂRIE

Author/s: Sergiu STANESCU & LA LIBRĂRIA Team

H

La Librarie is a wine, liquor and coffee shop that's offering a wide range of imported or niche Romanian products. Either to serve on site, in a chill-out atmosphere, or to take away, we are here to offer some piece of advice in order to help you choose what mostly suits your gourmet appetite. You can have a cigar too, and if in a lucky day, you may enjoy an evening of wine tasting.



SCAN ME

Contact:
+40749 063 833



LINDEN HOUSE / CASA TEI

Authors: Ioana Adina SCHWACHHOFER

H

From the desire to do more, we created the original innovative concept Linden House / Casa Tei that combines the specific local tradition of the Sibiu area with the modern comfort of today's times. We are located in a residential area characterized by the original architecture of German houses with lots of greenery around and quiet near the Sibiu International Airport.

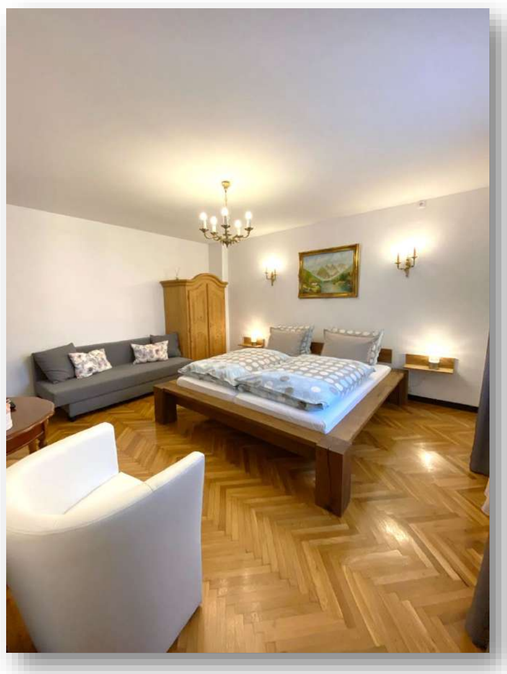
Linden House / Casa Tei is ideal for a holiday or business stay and you can quickly reach any part of our wonderful city of Sibiu by car or public transport.



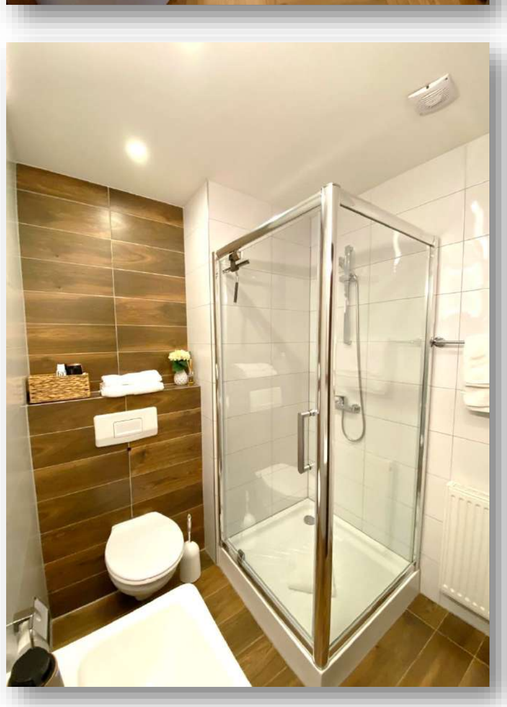


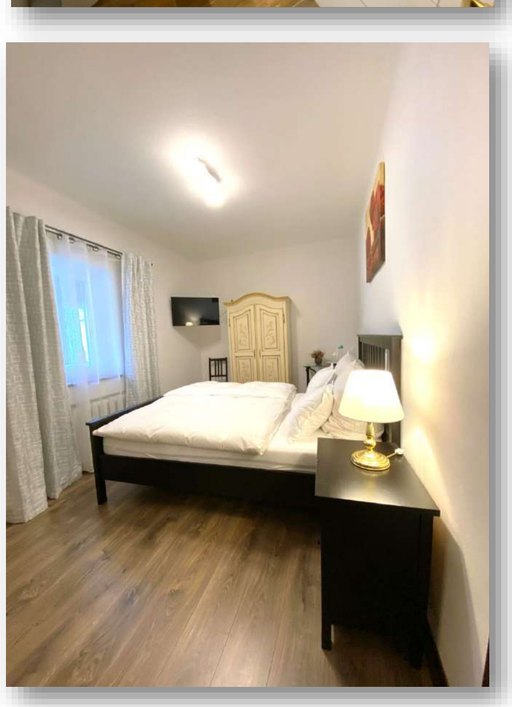
Cozy B&B services in Hermannstadt / Sibiu offering three rooms and an apartment with courtyard parking!











Contact: *+40770599717*

casatei97@gmail.com

Presentation link:

https://www.instagram.com/casa_tei?igsh=N215ZXNpMXRlaHQ3

Star Family Plate

Food Project

Authors: Irimia Marius Ionut & Team

H

A special plate with delicious Star products for you and your loved ones in your family!

The **Star Plate** is available for 2 or 4 people and of course it can be customized according to the wishes of the

We created the STAR Taste World just for you. **STAR Doner & Pizza**, a new, original concept based on quality and diversity adapted to any situation, with a portfolio of over 70 products. The service is provided directly from our location or based on the order with home delivery.



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Contact: ***+40731 588 801*** ***https://www.facebook.com/profile.php?id=100088256882595***

Opportunity
CORNELIUGROUP
Research-Innovation Association
Creation
Realization
INVENTCOR
Power of Creative Mind
Deva ROMANIA



VBUNG® Technology

No Added Additives and Preservatives

Maceration, Fermentation, Malolactic Fermentation and Aging under Continuous Pressure in Custom Wooden Barrels

WWW.VBUNGVDOOR.COM

Standard Patent AU 2018203047 from 4th of May 2017 / Application EP 3564354A1

The speed of oxidation during maceration, fermentation, malolactic fermentation and aging is much faster than the process of winemaking itself which is a huge disadvantage and requires control using manly Additives and Preservatives.

The invention refers to a Totally New ***VBUNG ® Technology*** by applying:

Isobaric Winemaking Process inside Custom Wooden Barrels
Giving Control Over Oxidation, Contamination, and Evaporation.

1. Positive pressure can be created naturally by CO2 during fermentation or artificially using any food-grade gasses allowed
2. Negative pressure can be created using a vacuum system

No added Additives and Preservatives Winemaking
=
Grapes + Custom Wooden Barrel + VBUNG ® Equipment

Custom Wooden Barrel :

1. Food Grade Silicone Rod Between Staves / Barrelhead
2. Reinforced Hoops With Bolts
3. Acrylic Barrel Head for Sunlight / Visual / Sensors

VBUNG Patented Equipment :

1. Safety Relief Valve / Spunding Valve
2. Adjustable Racking Filter / Sparger / Liquid Inlet and Outlet Port
3. O2/N2/CO2/Ar…etc. Food Grade Gasses Inlet and Outlet Port
4. Temperature / Pressure / Dissolved Oxygen …etc. Sensors/ Wireless Sensors

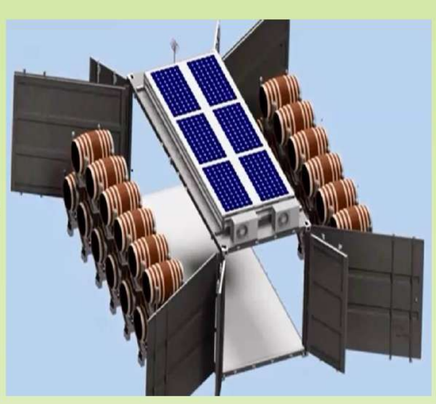
Advantages

1. Sustainable Technology and Equipment without the use of Additives and Preservatives
2. Sustainable Mobile Winery in the vineyard with solar panels, sensors, and mobile data
3. Accelerated Winemaking and Aging technological process
4. Equipment Control over Oxidation, Contamination, and Evaporation
5. New or Old Wooden barrels can be used once custom modifications are done
6. Whole bunch, Juice, or Berries can be used
7. No Juice clarification is needed (No flotation, cold settling, or centrifugation)
8. No temperature or humidity control is required (Fermentation at high temperatures for white winemaking is not a problem)
9. Direct Sunlight for the whole technological process
10. No need for topping the barrels
11. Taking out wine samples for laboratory or tasting without oxidation, contamination, evaporation
12. Barrel regeneration with compressed O2 or Air before vintage
13. Extended lifetime for wooden barrels due to custom construction
14. Can be applied to making and aging Wine, Beer, Cider, Vinegar, and aging Spirits.
15. Reduced labor, time, and cost.
16. Global potential













Adriana's Honey

Authors: Ignat-Matei Adriana
Ignat-Matei Adriana Daniela
Ignat-Matei Alexandra Roxana

H

Bee products intended for a healthy diet. In order to produce organic honey, bees are relocated to pollution-free areas as far away as possible from inhabited areas such as mountains, plains, and hills. **Types of honey: polyflora, cherries, lime, chestnut, fir, sunflower, scallops.**











In addition to honey, we also produce pollen, propolis, wax and a series of ENERGIN-like mixed products.

Capaceala is a beekeeping product that people don't really know, but it has great health benefits. As everyone understands, this is the cover of the honeycomb, with which the bees "seal" the honey deposited in each cell of the honeycombs.

In the mixture, honey with sea buckthorn fruits represents a complete cure with numerous healing properties for the body. In honey with sea buckthorn we find Vitamin A, the complex of B vitamins (B1, B2, B6, B9), Vitamins E, K, P and F, beta-carotene (more concentrated than in carrots) and other microelements such as calcium, magnesium, phosphorus, iron, potassium and volatile oils.

Contact: +40720575824 danielaign9@yahoo.com

THEREFRESH CONCEPT

PROJECT: HOSPITALITY CULTURE

Author: Florin Pirus & Team

H

Our company has been on the market for more than 12 years and we are continuously expanding.

Our activity is in the HoReCa field, we own 7 coffeeshops, a coffee roaster and a restaurant. In our cafes we offer our own brand of specialty coffee, hot chocolate, smoothie bar, catering and delivery services, in addition we are expanded with an online store where we offer our customers a varied range of products and accessories for serving and preparing tea and coffee.



Vision *TheRefresh is the place where you can really taste well-being!*

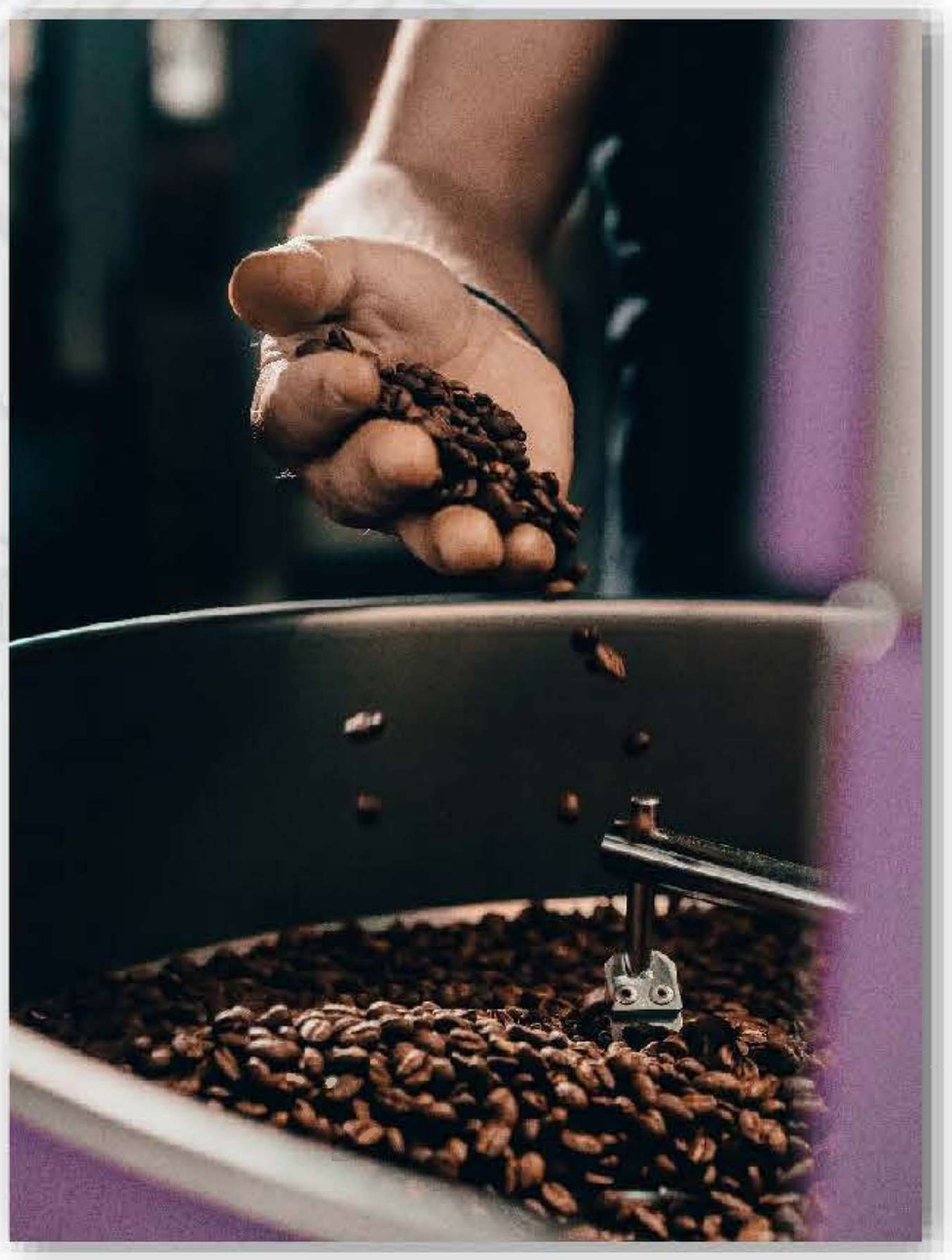
TheRefresh is more than a company or even a cafe. TheRefresh is a complex concept, which is based on the strong idea of refreshing, stimulating and educating the senses, to facilitate reaching the optimal level of energy and well-being.

TheRefresh is a concept aimed at offering customers a substitute for a healthy and balanced meal in the form of smoothies, teas and coffee.

TheRefresh is the place where the team is educated to serve all products in their finished form at the highest quality, honoring cultural factors and professional preparation methods. TheRefresh is more than a company or even a cafe. TheRefresh is a complex concept, which is based on the strong idea of refreshing, stimulating and educating the senses, to facilitate reaching the optimal level of energy and well-being.

TheRefresh is a concept aimed at offering customers a substitute for a healthy and balanced meal in the form of smoothies, teas and coffee.

TheRefresh is the place where the team is educated to serve all products in their finished form at the highest quality, honoring cultural factors and professional preparation methods.



Scan

Contact: S.C. COFFEE&BEVERAGE S.R.L
E-mail: florin@therefresh.ro Tel.: +40 721 726 116 www.therefresh.ro

R/M –Romanitza-help

Student Project

Author: Brodeţchi Ala, Raileanu Marilena

Mentor: Silvia Scortescu

H

This project represents the healing benefits of romanita, the treatment flower is a gift from nature. In this project, I present the curative and treatment effect of gastro-intestinal diseases.

I create a miracle pill with fortified wheat that is recommended in the morning on an empty stomach. This project also shows all the benefits of this miracle plant.



Contact: ***Silvia Scortescu + 373 798 97 247*** ***silvia.scortescu@yahoo.com***

PIZZA SPEED

Author: Nicolae Florin PURCEL & Team

H

PIZZA SPEED DEVA is a concept based on quality, promptitude and perseverance! our team makes sure that all our customers remain satisfied with the quality of our products and that they intent to return with love anytime!

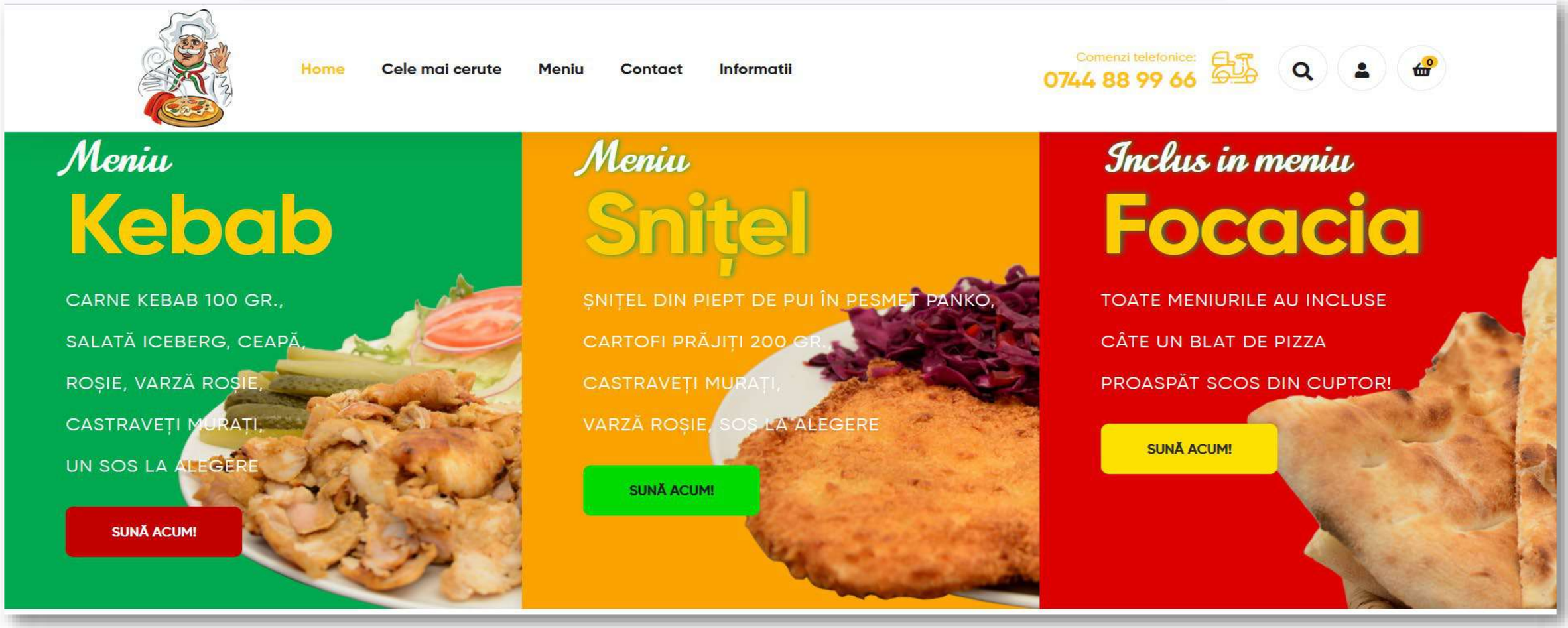








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Telefon comenzi:

0744 88 99 66

Adresa

Deva, Str. Mărăști, Complexul Croșeta

E-mail:

contact@pizzaspeed.ro

I

Textiles

Clothing

Fashion

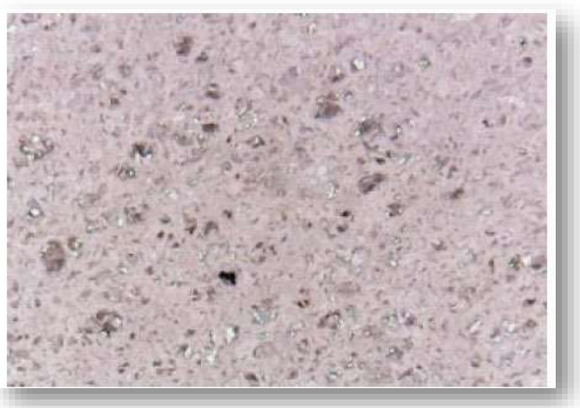
Handmade

SYSTEM FOR TRANSCUTANEOUS ELECTROSTIMULATION BASED ON TEXTILE ELECTRODES

Patent application No. A/00491/11.08.2022

Authors: Aileni Raluca Maria, Toma Doina, Popescu Adriana Iuliana

The invention refers to a system based on textile electrodes and the manufacturing process intended for electrotherapy through transcutaneous electrostimulation for the medical and sports fields. The proposed system is based on polymeric textile electrodes based on Ag or Ni coated on the RF plasma functionalized fabric support made of 100% cotton. The electrodes are fixed on knitted textile support using thermo-adhesive strips and metal staples through woven electrodes and knitted surfaces for connection to the electrostimulation device. The invention is characterized by the fact that (i) fixing the textile electrodes on knitted textile support is done with the help of adhesive tapes and by thermal pressing at temperatures between 100 - 110°C, for 5 - 10 min.; (ii) preforming the sleeve for the arm/forearm is done by thermal pressing (100 - 105 °C) for 3 - 5 min.; (iii) the connection to the device that generates low-frequency currents (0 - 100 Hz) for transcutaneous electro-neurostimulation is made by connecting the cables of the electrostimulation device to the staples fixed on the sleeve.



a. Textile electrode based on a PVA polymer particles



b. Knitted sleeve with textile electrodes based on Ag microparticles



c. Textile sleeve connected by cables matrix and Ag to the transcutaneous electrostimulation device

Knitted sleeve with integrated textile electrodes for transcutaneous electrostimulation

Advantages

- through the laminating or direct printing processes of conductive pastes based on PVA and Ag or Ni microparticles, textile electrodes can be obtained that can be used for electrotherapy using the transcutaneous electrostimulation process;
- because textile electrodes, based on conductive pastes containing Ag microparticles, are dry conductive electrodes, it is no longer necessary to use classic wet electrodes (based on electroconductive gel);
- thanks to the closing system with strips, the knitted sleeve can be mounted and removed very easily on the arm/forearm areas, ensuring the contact surface of the textile electrodes with the skin required in transcutaneous electrostimulation procedures.

Novelty

The novelty of the invention consists in the fact that the textile electrodes obtained by depositing conductive pastes based on PVA polymer matrix and microparticles of Ag or Ni are adherent to the surface of the knitted sleeve (D) and have low surface electrical resistance values (10^3 Ω), allowing the transmission of low-frequency currents (0 - 100 Hz) for transcutaneous electrostimulation.

Applications

Transcutaneous electrostimulation system based on electroconductive textile electrodes has applications in the medical and sports fields.

Acknowledgment: The Ministry of Research, Innovation and Digitalization funded this research through the Program Nucleu, Contract PN 19 17 01 01 (3D ELECTROTEX), and the participation in the International Salon INVENTCOR 2024 within Program 1 - Development of the national R&D system, Subprogram 1.2 - Institutional Performance - RDI excellence funding projects, Contract no. 4 PFE/2021.

Contact: ***CS II Dr. Ing. Aileni Raluca Maria***

E-mail: raluca.aileni@incdtp.ro www.incdtp.ro INCDTP

PROCEDURE AND INSTALLATION FOR COATING YARNS WITH FERRIMAGNETIC SUBSTANCES

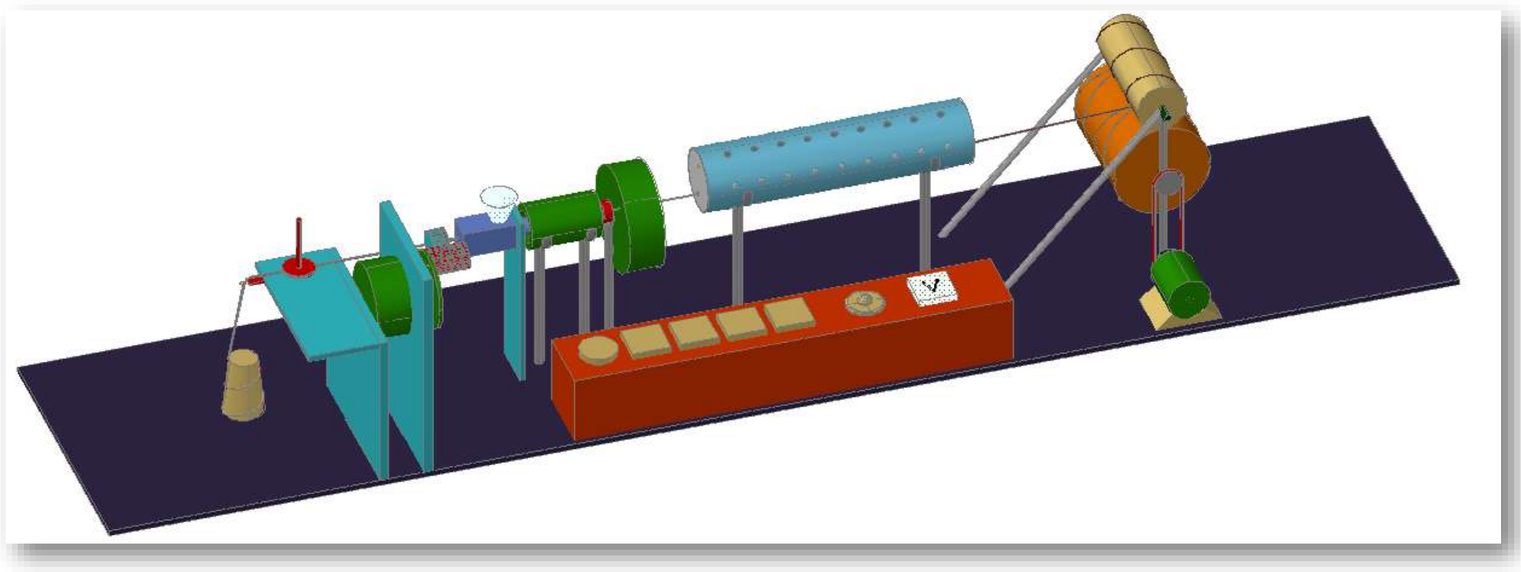
Author: Marian Catalin Grosu, Ioan Hossu, Dorin Avram

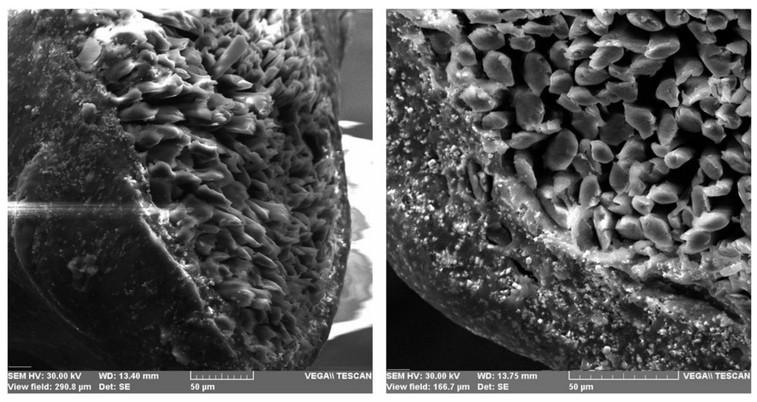
Patent no. RO 128302 B1 / 30.03.2021

The invention relates to a process and installation for obtaining coated yarns with magnetic properties, by deposition, at room temperature, a variety of textile yarns with magnetizable admixtures obtained from binders miscible in aqueous solutions or solvents and ferromagnetic or other powders. Magnetic yarns are designed as components for smart textiles, with a wide range of envisaged applications in the field of medical treatment, electronic textiles, smart clothing, sportswear, biomedicine or protective clothing.

The device comprises five sub-systems: S1 – yarn supply system, S2 – feeding, transport, storage, coating and solution calibration system, S3 – magnetizing system; S4 – heating and fixing of coated yarn system, S5 – yarn winding system.

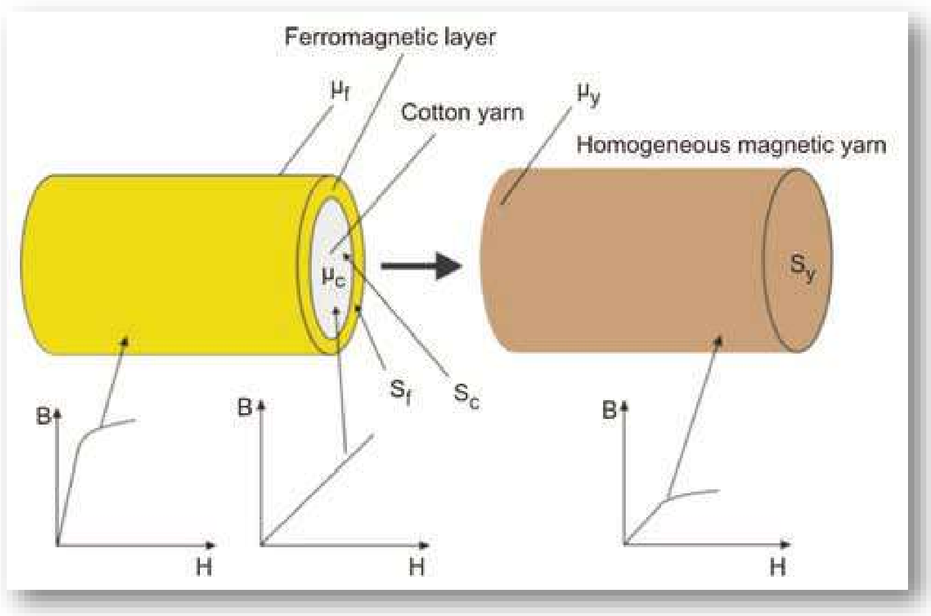
Preparation of magnetic yarns: This patented installation allows a primary orientation of the magnetic particles along the external electromagnetic field lines. Subsequently, the coated yarn was subjected to a more powerful magnetization until saturation. The deposition process occurs in the magnetic mixture feed chamber which is equipped with a special calibration device spinneret type with a circular hole (500 µm in diameter) which ensures a uniform deposition of the polymer mixture. This type of spinneret allows covering yarns having an average apparent diameter of less than 400 µm. After calibration, the coated yarn passes through a multi-polar magnetizing device having up to 0.7 T induction. The final stages of the process include heating, fixing of the coated layer, and winding. The trajectory of the yarn during the deposition process causes the magnetic solution to adhere on its surface between the fibers of the surface layer.

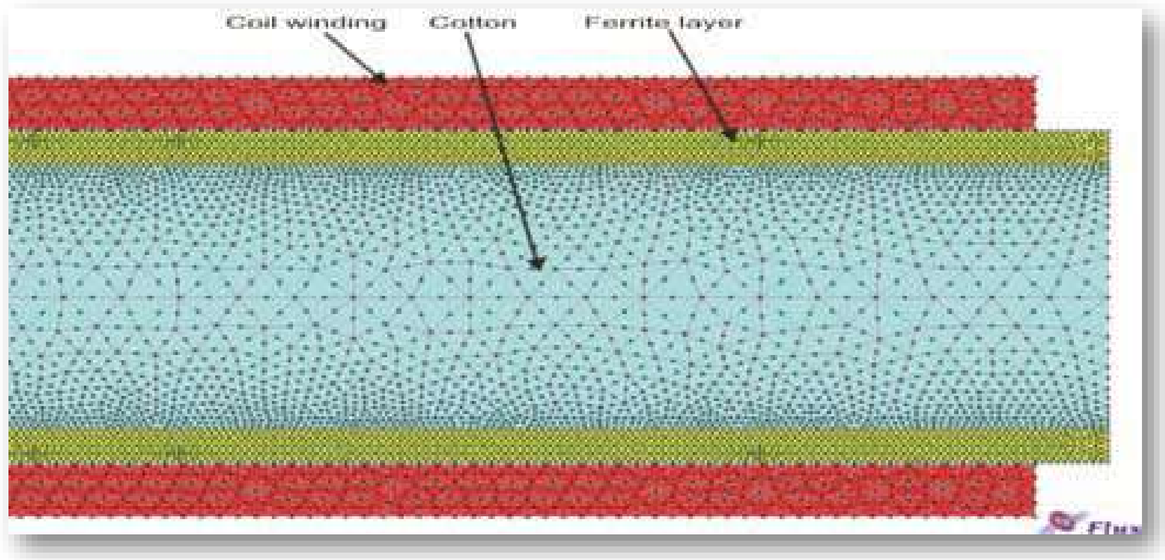




(a) (b)

The magnetization method employs a toroidal induction coil with electromagnetic excitation, powered by a DC source of 10V and 10 A. The ferromagnetic core of the coil is X-shaped. The gap is filled with an epoxy resin with a small cylindrical channel through which the yarn coated with hard magnetic ferrites passes at a speed that allows magnetization until saturation of the ferrimagnetic particles that make up the coated magnetic layer.





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Technological line for conductive yarns processing on knitting machines

Visileanu Emilia[1], Constantin Stefan[1], Scarlat Razvan[1], Carpus Eftalea[1], Mihai Carmen[1], Pislaru Mariana[2], Enache Gheorghe[2]

[1]The National Research & Development Institute for Textiles and Leather (INCDTP) Bucharest, Romania
[2]Tanex SRL Bucharest, Romania

SHORT DESCRIPTION

The invention relates to a technological line for conductive yarns processing on knitting machines

PATENT no.: 131130/28.02.2022

ESD garments

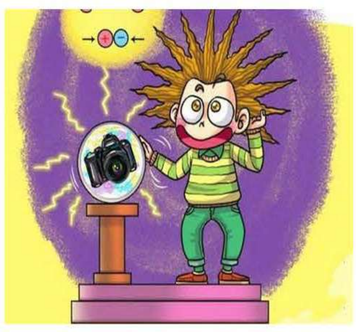
When human operators are met on the production line of devices sensible to electrostatic discharge, a different protection measure is taken into consideration, namely ESD garments, which reduce the risk of an ESD from the operator's normal clothing to the sensitive device.

An ESD garment must provide the following functionalities:

- shield against the electric fields of the insulating parts of the operator's normal clothing;
- prevent electrostatic discharges from normal clothing;
- the garment must not generate electrostatic fields or generate electrostatic discharges.

To reduce the risk of appearing failures caused by an electrostatic discharge, the garments must have properties that can minimize the amplitude of the discharge current and reduce the charge transferred to a device. In order to do that, the following factors should be taken into consideration: the resistivity of the fibres and of the whole material, the density and the structure of the material, the quantity of the charge found on the material and the surface of the discharged material.

ESD



Electrostatic discharge (ESD) is the release of static electricity when two objects come into contact. Familiar examples of ESD include the shock we receive when we walk across a carpet and touch a metal doorknob and the static electricity we feel from clothes coming out of the dryer. Lightning is also electrostatic discharge.

Technical advantages

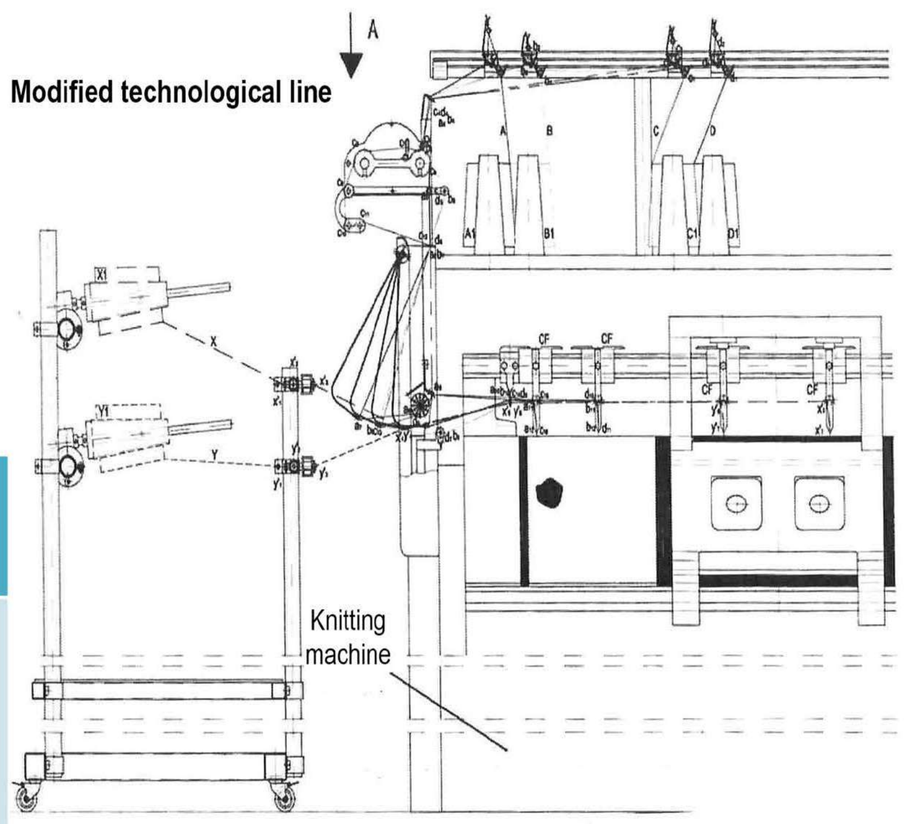
The technological line performs:

- asigură alimentarea firului conductiv diferit de cel al firelor neconductive;
- The reduction of the number of conductive yarn inflection points through forming obtuse angles by the knitting machine guiding/ control elements;
- The reduction of the number of conductive yarn contact points by knitting machine guiding/ control elements;
- preserving of the conductive yarns quality characteristics;
- simple set up and operation.

Principale elemente ale liniei tehnologice sunt:

- Dispozitivul de alimentare a firelor situat în partea laterală a maşinii de tricotat
- Cadrul metalic format din 2 suporţi orizontali, inferior şi superior şi 4 coloane vertical
- Suport bobină
- Dispoziliv de control fire

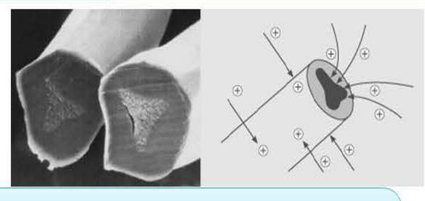
Modified technological line





Structura tricot	Strat interior - asigurare drenaj sarcini electrice	Strat preponderent izolator pentru exterior
Glat vanisat	1 fir 100% bumbac 20x3Tex + 1 fir multifilamentar din nailon saturat la suprafata cu pelicule de carbon	1fir 100% bumbac 20x3Tex+1 fir tip Nega-Stat P190, 155 dtex 24f, (filament din poliester cu miez trilobal interior de carbon)







Advantages regarding the human protection

Low-frequency magnetic fields induce circulating currents within the human body. The strength of these currents depends on the intensity of the outside magnetic field. If sufficiently large, these currents could cause stimulation of nerves and muscles or affect other biological processes. Some studies show a link between exposure to EMF and increased rate of Leukemia, cancer, brain tumors and other health problems.

CLAIM

Dispozitiv de alimentare a firelor conductive la masinile de tricotat rectilinii format dintr-un cadru metalic pozitionat langa masina de tricotat, pe aceeasi parte pe care se afla dipozitivul de tensionare a firelor pe care sunt montate:

- **suport bobine care asigura sustinerea bobinelor in pozitie optima de lucru;**
- **dispozitiv de ghidare si control fire care asigura tensionarea optima a firelor, reducerea numarului de inflexiuni, eliminarea unghiurilor mai mici sau egale cu 90° si a punctelor de contact dintre fire si elementele de ghidare.**

RESULTS

- Noi soluții pentru problemele sociale legate de sănătatea publică și securitatea muncii
- Cercetari asupra influentei tehnologice de tricotare bistrat asupra descarcarii electrostatice
- Dezvoltarea industriei textile locale bazate pe tehnologii personalizate de tricotat
- Model experimental de echipament pentru protectie electrostatica

ACKNOWLEDGEMENT

This work was supported by a grant of the Romanian National Authority for Scientific Research, CNDI–UEFISCDI, project PCCA 179 (2012) "*Haine ESD realizate din fibre cu miez conductor tricotate bistrat*"

CONTACT
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MULTIFUNCTIONAL HARNESS CONTAINER ASSEMBLY FOR SPORT PARACHUTES

Patent application No. A 00862/24.10.2017

Authors: Salistean Adrian, Niculescu Claudia Cornelia, Popescu Georgeta, Olaru Sabina

I

The invention relates to a multifunctional container assembly for a sports parachute. Main objective was the development of a versatile harness container for sportive skydivers able to host a wide variety of parachute's volumes. The assembly according to the invention consists of two compartments, upper and lower, for the canopy of the reserve parachute and, respectively, for the canopy of the main parachute, having variable volumes; the variation of the volume of the first compartment for the reserve parachute is achieved by adjusting the length of a closing loop of the upper parachute compartment.

The second compartment for the main parachute is made at the maximum volume, the volume variation of the lower compartment for the main parachute is made by using an additional filling, which completes the volume difference between the compartment and the parachute.

Parachutes packing size range

Reserve parachute volume:
min. 6769 cm^3, max.7752 cm^3

Main parachute volume:
min. 6785 cm^3, max. 9340 cm^3



Adaptive harness / container assembly

Advantages

- The container have a variable volume for main and reserve parachute (patent pending), one size container can fit up to three standard size parachutes thus there is no need for extra containers to accommodate these parachutes;
- Developed for student use with AAD (automatic activation device);
- Ergonomic design (spine fit);
- Three point adjustment harness (chest, legs and height) for almost any body shape and size.

Student AAD device









Three ring main parachute release system





Test drop off (various size canopies)

The publication of the scientific paper is funded by the Ministry of Research, Innovation and Digitization within Program 1 - Development of the national R&D system, Subprogram 1.2 - Institutional Performance - RDI excellence funding projects, Contract no. 4 PFE/2021.

Contact: *adrian.salistean@incdtp.ro - National R&D Institute for Textile and Leather - INCDTP*

HACKTEX - Innovative smart textiles & entrepreneurship

Research project

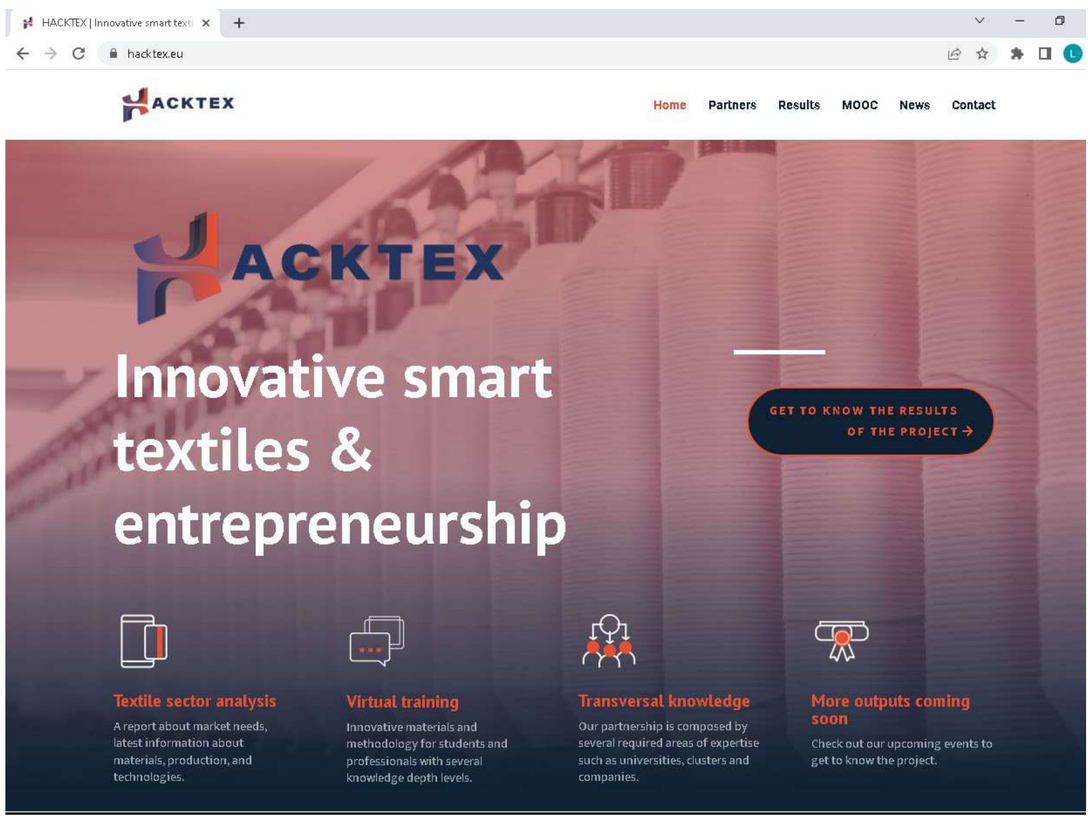
Authors: Luminița Ciobanu, Savin Dorin Ionesi, Lidia Alexa

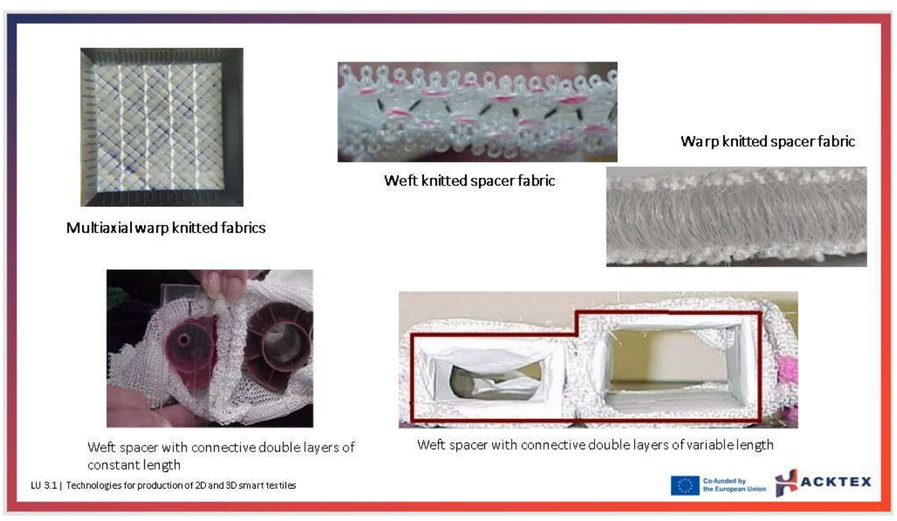
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This is an EU-funded project, HACKTEX - Innovative smart textiles & entrepreneurship, no. 2021-1-RO01-KA220-HED-000027527. All information on the results of the project reflects the contributions of all partners – TUIASI - Romania, AEI Textils - Spain, CRE.THI.DEV. - Greece, CIAPE - Italy, Universitat Politecnica de Catalunya - Spain, University of West Attica - Greece, University of Borås - Sweden, TITERA - Germany.

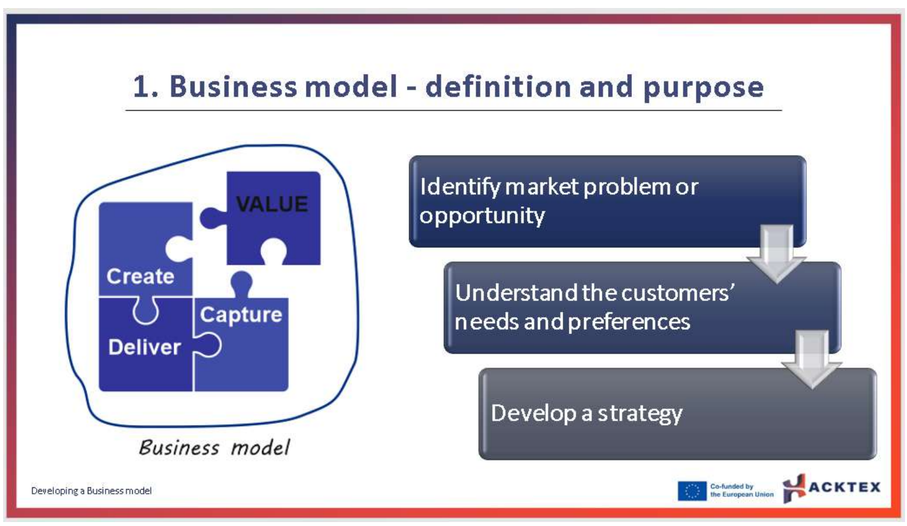
Smart textiles represent a large group of advanced textiles with new functions obtained using high-performance raw materials and specialized treatments. The HACKTEX project develops the tools necessary for skills enhancement targeted to higher education in relation to innovation in order to obtain its objectives: support higher education students to acquire skills in transdisciplinary innovation based on smart textiles; foster student cooperation multidisciplinary approach in hands-on projects; provide knowledge, skills, and competences using virtual learning methodologies and tools; promote the application of good practices for the enhancement of innovative skills; strengthen collaboration between universities with the advanced textiles industry.

Using videos and reading materials, the MOOC on smart textiles discusses the basics of this domain, specific raw materials, textile processes required to produce smart textiles, characteristics and specific standards, as well as issues related to sustainability.





SCAN ME



The guide on entrepreneurship covers the steps needed to develop a business model that will help research results transition toward the market. The virtual training materials are to be tested in a training session (Bootcamp), where 20 students from all 4 partner universities will participate in Boras, Sweden to classes, practical activities, visits to relevant companies, and a hackathon on developing business models adapted to smart textiles.

The MOOC on smart textiles and the virtual guide on entrepreneurship will be uploaded on a platform and are to be accessed for free by anyone interested in the field of smart textiles.

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

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DECORATIVE ACCESSORIES

Patent: MD No. 1970; 1917

Author/s: Malcoci Marina, Malcoci Maria-Eudochia

I

Accessories are essential elements to complete and enhance outfits. Being both objects that are used to add beauty, style, and personality to a person. How they are used may vary depending on individual preferences and personal style. Currently, accessories have a wide variety of models, shapes and can be made from different materials.

Figure 1 shows a bow tie and a collar. The bow tie can be worn in different contexts, from formal events to more casual occasions, both on the female and male side. The way of fastening the bow tie can be easily changed (elastic, pin, ribbon), which makes it possible to wear it in different ways (around the neck, as a bow in the hair, as a bracelet on the hand etc.).

The collar can be added to clothes in your wardrobe to personalize them and create new styles. This collar can be easily detached or attached to varios types of clothing and can add extra elegance or originality to the lady´s outfit. The advantage of the collar is that it can be combined with different types of clothes, from shirts to dresses and sweaters. And they can easily turn a simple outfit into a stylish one.

Figure 2 shows 12 martisores. Martisor is the sign of spring, eagerly awaited by everyone from small to large. It is a product loaded with symbolic meanings. The martisor is worn on the chest during the first days of March, and is offered with wishes of health, luck and joy. Red and white thread is used in making it, along with various symbols or amulets such as flowers, figurines etc.

All the accessories were made by hand, applying decoration techniques such as: embroidery, perforation, gluing applications.

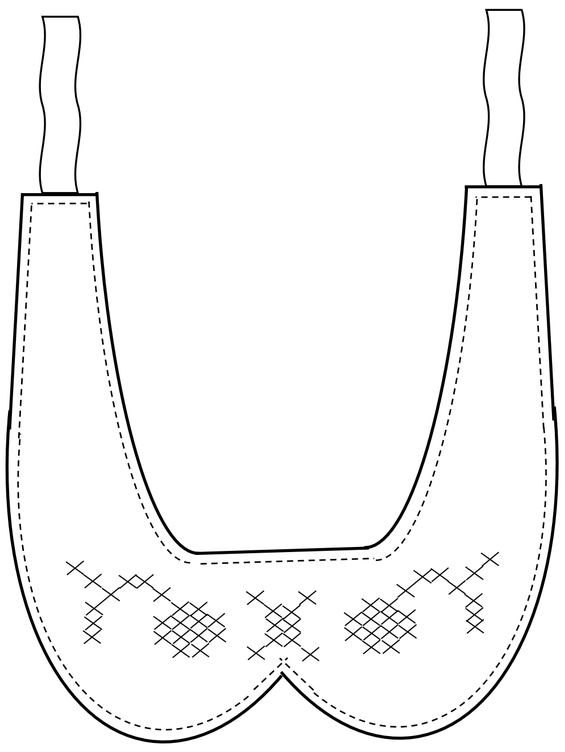


Figure 1. Collar and bow tie, No. 1970



Figure 2. Martisoare, No. 1917

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Creation
Realization
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Power of Creative Mind
Deva ROMANIA

Floret Fashion's

FLORET FASHION COLLECTION

Author: Nicoleta Sofronovici

I

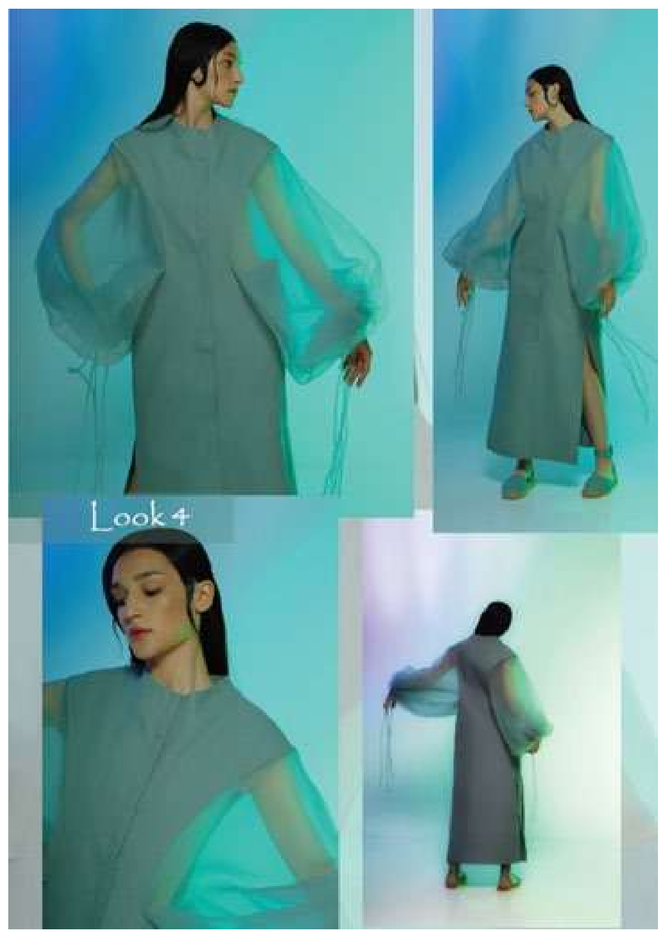
The women's fashion collection is based on a contemporary theme, presented through formal and decorative means with a message carrying activist undertones and advocating peaceful protest regarding the awareness and accountability of the population towards the disappearance of biodiversity and the plant world. Materials used include denim, knitwear, combinations of textures, and decorative-structural and plastic expressions to outline straight, oval, rectangular, and trapezoidal silhouettes. The color palette revolves around shades of mint green and grays, with closure systems featuring slits, buttons, and snaps. The clothing pieces include pinafores, pants, blouses, dresses, and ponchos.













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Presentation link: https://www.youtube.com/watch?v=X2ndDo0WOdw

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THE SAVING OF SHOES

Scientific Research Project

Authors: Benchea Iulia, Blanga Nicoleta, Mutiu Robert, Poplacean Bogdan

Coordinator: Professor Aurel Mihail ȚÎȚU

INTRODUCTION

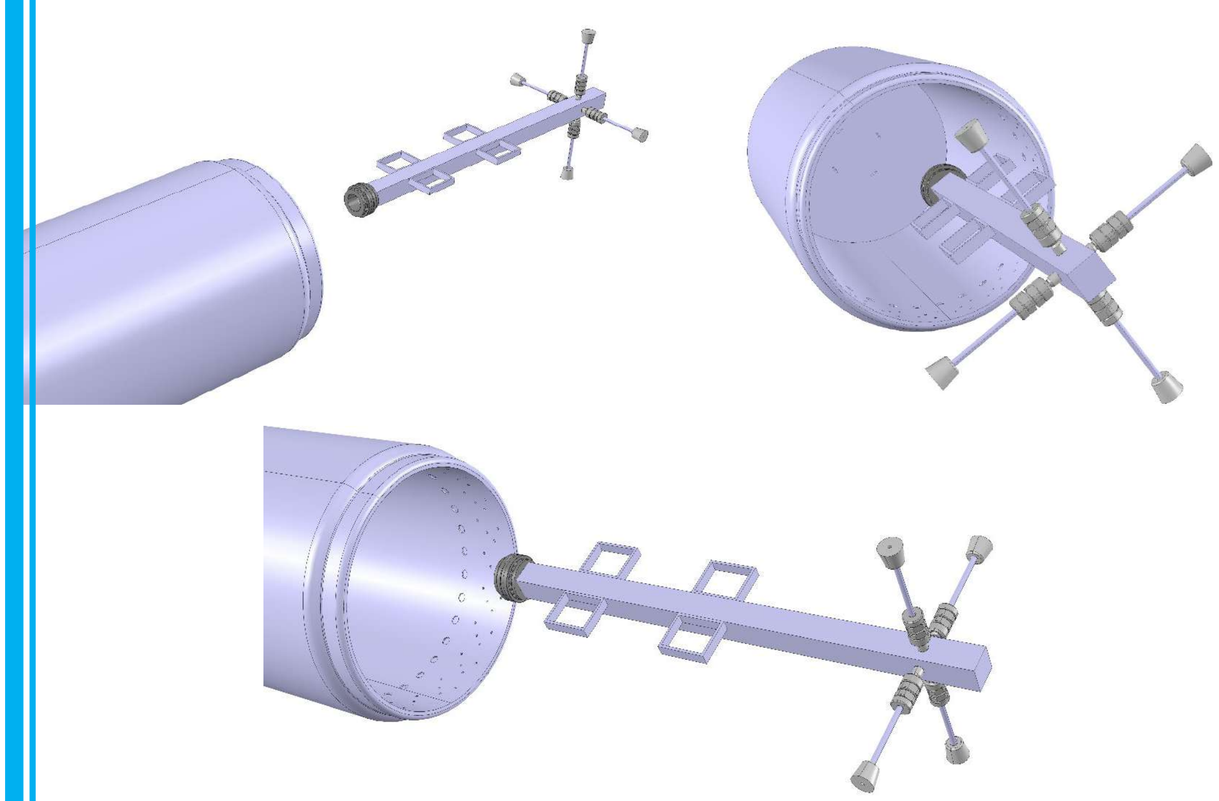
In a constantly evolving world, comfort and efficiency in daily activities have become essential priorities. Innovation in the field of household appliances has brought ingenious solutions to the creation of our daily lives. Our project focuses on developing a revolutionary module for the washing machine that offers superior performance, prevents the shoe from any damage, and reduces environmental impact. This invention is the result of a collective effort and passion for innovation and technology. Through this project, we aim to bring about a significant change in the experience of washing machine users by providing them with an efficient, practical and sustainable solution.

This invention is intended to protect the tube of the washing machine from the shocks produced by the shoe, while also maintain the integrity of it during washing. The module will be removable, easy to insert into the tube and made of a stainless alloy. This support allows a more efficient drying process by keeping the shoes fixed after the washing is completed.

APPLICATIONS:

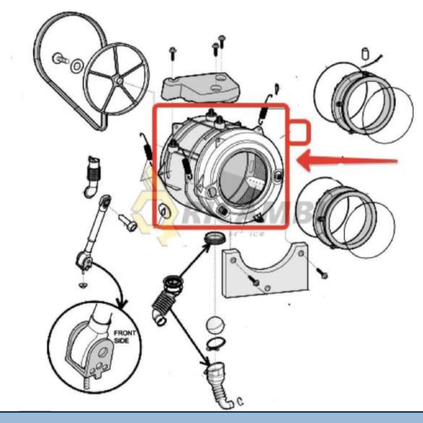
It can be mounted on any type of washing machine with horizontal opening.

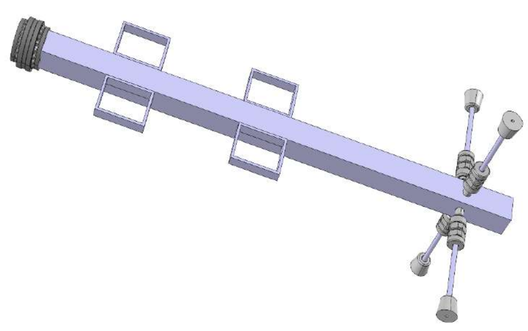
It can be installed where the washing machine is already installed without changing its position or previous mode of operation: kitchen or bathroom.



ADVANTAGES

- Easy assembly and disassembly
- The parts that make up the device have a low cost
- Any type of footwear can be washed
- Less effort and time required
- More efficient cleaning
- Positioning and fixing the shoes without hitting the tube or the glass door of the washing machine
- Low noise
- It can be mounted on any type of washing machine with a side door



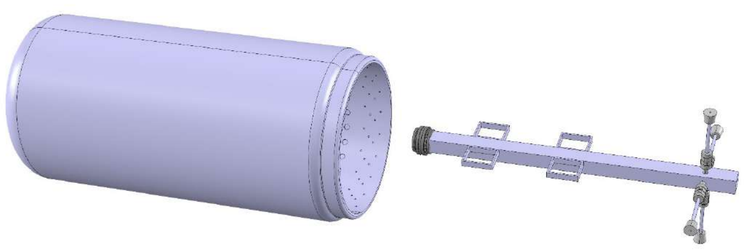


RESULTS AND DISCUSSIONS:

Concept description

Due to the fact that the washing machine is indispensable in any home, being used very often in washing different types of shoes, I have conceived an idea for more efficient way of washing footwear without damaging them.

The components of the shoe adapter are: a fastening system made from 4 articulations attached to the washing machines tube. In the back it is fixed with the help of screws and bearings that allow the shoe placement device to rotate in the direction or against the tub. Therefore, rotation is relative. Another important component is the one that fixes the shoes while maintaing a better position. This device is composed of 3 removable parts. It can be mounted without special tools, just with the help of some imbues. Disassembly is carried out in the same way as for mounting with imbues.

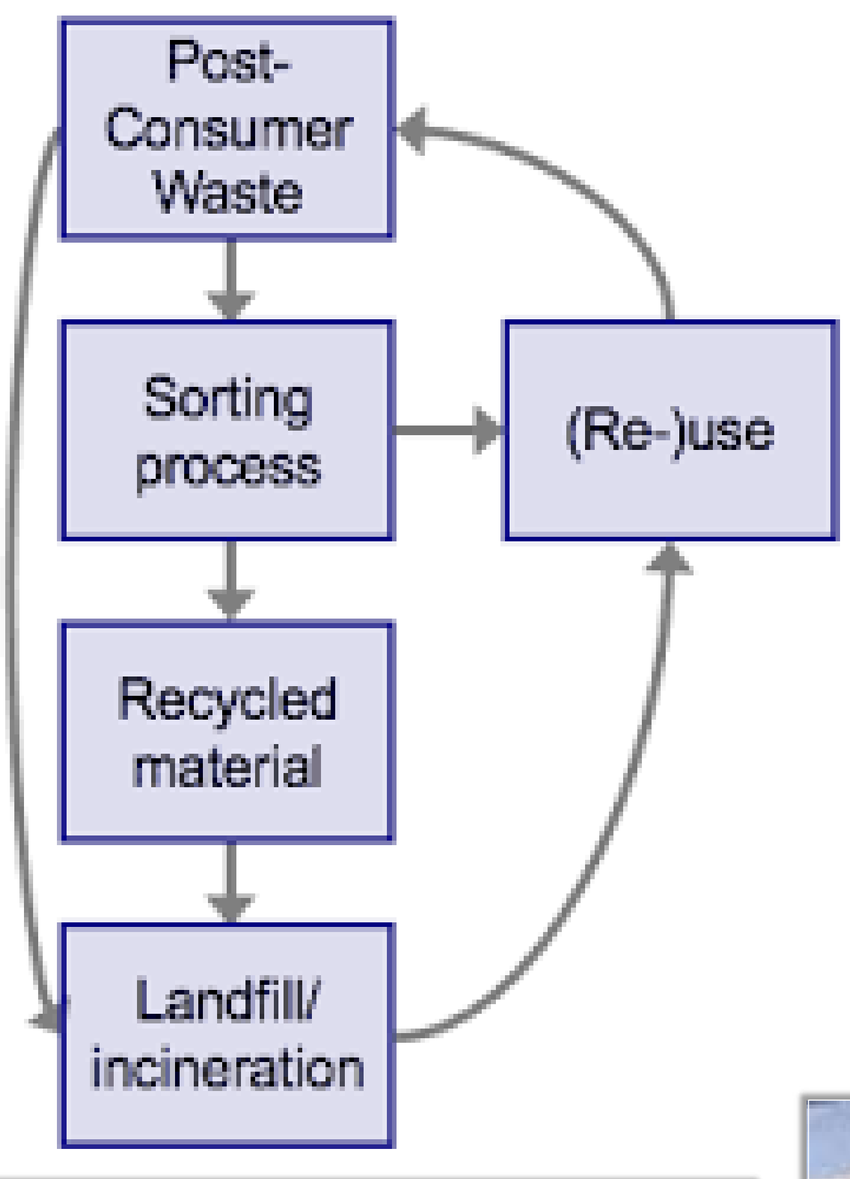


Contact: „Lucian Blaga” University of Sibiu, PATLIB Centre of Sibiu, 4 Emil Cioran Street, Room IM 100, Phone +40 744 390 290, mihail.titu@yahoo.com

DENIM FABRIC REINFORCED COMPOSITE MATERIALS

Research project
Imre KISS, Vasile CIOATA,
Mihai Paul TODOR, Ciprian BULEI

The production methods of TEXTILE COMPOSITES are more attractive over conventional unidirectional laminate composite because of their high production rate. Yarn interlacing which improves structural stability and damage tolerance makes textile composite attractive. Textile composites are used typically because of their high strength-to-weight and stiffness-to-weight ratios. This family of materials, at the center of the cost and performance spectra, offers significant opportunities for new applications of polymer composites. They are manufactured from woven fabrics are formed of arrangement of fibers and matrix.











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INDUSTRIAL SEWING MACHINES

I

Author: Mădălina Bianca BISTRIAN

Industrial sewing machines are designed to provide fast, smooth, vibration-free sewing at any speed. The newest machines are completly sealed to eliminate oil stains from the materials. They have simplified control panels that allow the user to adjust the sewing speed to suit their experience level. They come equipped with an integrated Direct-Drive servo motor.

The servomotor is coupled to the machine head by its own coaxial shaft that reduces vibrations and noise; this allows the user to stitch at any speed powerful enough to sew from thin to thick materials. The passion to keep up with technology helped me to succeed in creating the most spectacular dresses in my own PERLET workshop.







Contact: bismadalinabianca@gmail.com **+40735299651**

Presentation link: **https://www.facebook.com/perletbymadalinabianca/?locale=ro_RO**

SCAN ME

CHARMING MOMENT
Craft Art & Handmade

IULIA BARTOK

This passion for making decorative products it started for me 10 years ago, from the desire to express my creativity and my abilities. Most of my inspiration comes from nature. To create the products I use different work techniques: decoupage technique, painting and handcrafting.

Some of the materials used to make handmade and handcraft products are: textiles, paper, rise paper, foam sheets, acrylic paints, varnishes, wood, candles and dried plants.

Creativity and inspiration in unique handmade and handcraft products made with love!















Contact: iulia.bartok@gmail.com

MOFT STUDIO SRL

PATRICIA'S HANDMADE

Handmade creations

I

Author:Patricia Nelega

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.













Contact: ***+40721 603 933*** https://www.facebook.com/moftstudio/

Opportunity
CORNELIUGROUP Research-Innovation Association
Creation
Realization
INVENTCOR
Power of Creative Mind
Deva ROMANIA

Mihaela Fashion's

Mihaela's Wonderful Beads

Bead Embroidery Project

Author: Mihaela MARARU

I

Bead embroidery has been my passion for more than 20 years, at first I embroidered simple things like bracelets, then I perfected my technique and made accessories for clothing items. Over time, I sewed icons, paintings, purses, bags, backpacks. The most spectacular creations of mine are the clothes sewn with embroidered beads, in some cases I used over 80,000 beads. The bead can be attached by a simple stitch of material, but a smaller bead can also be used to obtain a small column, for a more voluminous column, a column of two or more beads can be sewn.

The beads of different colours and sizes, sewn separately next to each other, look very nice, they can be placed inside a metallic outline, in the middle of an outline sewn with contrast beads or they can be scattered chaotically on the canvas, creating bright spots on the embroidery.



SCAN ME





Contact: https://www.facebook.com/profile.php?id=100063499954796

A CREATIVE APPROACH TO WASTE RECYCLING

Research project

Author: Denisa LALA

I

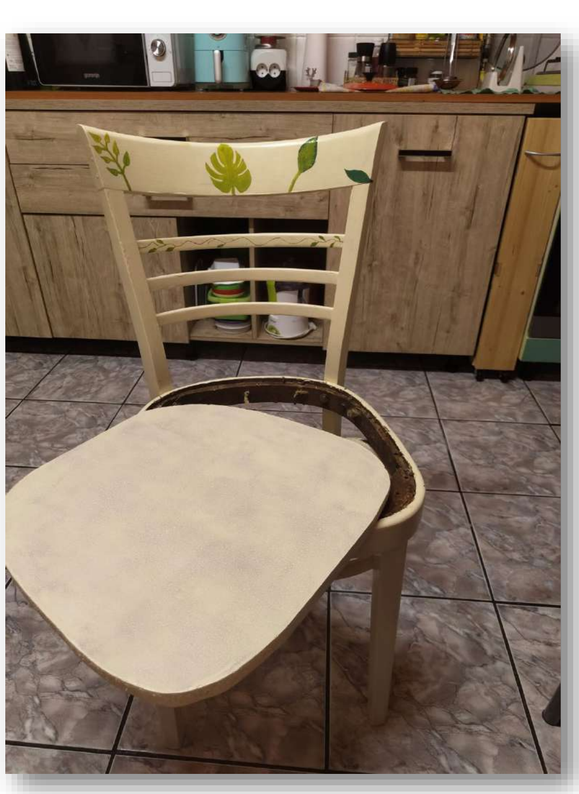
With so much waste being produced every single day, our planet is suffering and if we can do anything to relief this ~suffering~, it is taking some of the objects that we have already used and give them a new purpose.

My proposal is taking used furniture, empty metal cans etc. that people were going to throw away, and transforming them into objects with a new life. Colorful chairs or shelves, bright plant pots, all created from what would have otherwise gone to the landfill.

Many people complain that they don't make furniture as durable as they used to, in this age of consumerism and of fast fashion – even in the furniture industry. So why not take an old but still sturdy chair, give it a good sanding, a fresh coat of paint and change its upholstery? This will prevent the chair (made of wood, nails and fabric whch may or may not get recycled) from ending up in a landfill and will help someone enjoy a sturdy, old piece of furniture in the color of their choice, for years to come.











The same can be applied to tables, closets, nightstands, shelves etc. Sky is the limit!

As for empty metal cans, many restaurants buy their ingredients in bulk and sometimes these cans end up in the appropriate recycling bin (the yellow one), but many times they ust end up in the black bin.

Their „trip" to the landfill can be stopped if we give them a good wash, a fresh coat of paint and use them as creative pots for our plants.

Contact: Denisa Lala, denisalala@gmail.com +40723138329

Lemnaria lui Radu

Unique wooden creations

Author: Radu Fachin

I

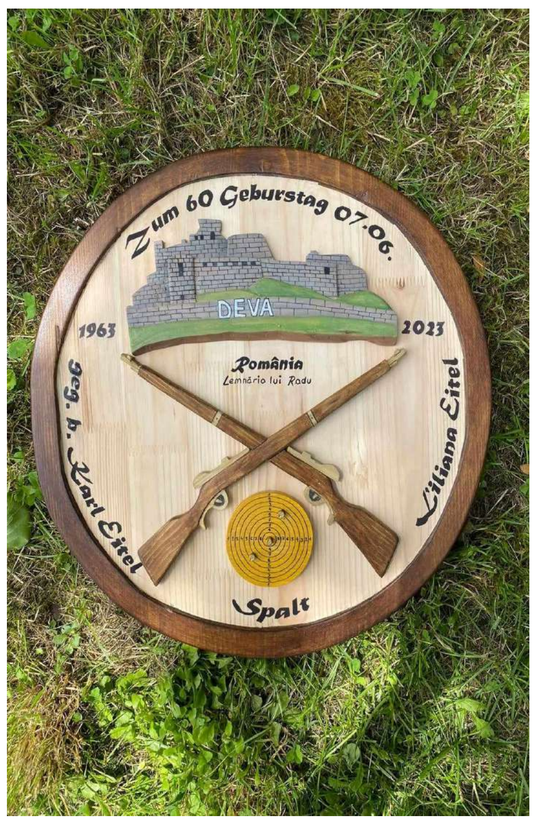
I am a passionate woodworker, a dedicated artisan with 8 years of experience in the field of woodworking, and eager to learn new techniques and skills. My work reflects a passion for craftsmanship and meticulous attention to detail.

The Art of Wood Personalization - Creations with Soul. One of my specialties and significant challenges in every project is crafting personalized items for clients. Over time, I've honed my skills to create miniature houses, faithful replicas of grandparents' homes, meticulously crafted based on photos. These mini houses bring a piece of history and emotion into our clients' living rooms.

Recycled Wood for a Sustainable Future. I am a staunch advocate for the use of recycled wood. In my workshop, wood becomes more than just raw material; it's a valuable resource we handle responsibly, contributing to environmental preservation.

Transforming Wood into Art and Utility. Wood is my favorite material for crafting captivating games, charming decorative items, and personalized toolkits for businesses and trades. Each piece of wood is carefully and passionately transformed, adding utility and turning it into a unique work of art.

I look forward to contributing my creativity and extensive experience in the art of woodworking to future projects. Handcrafted wooden items are more than mere objects; they bring stories and emotions into the homes and lives of our clients. Thank you.







Contact: +40.735.966.509
Website: https://www.lemnarialuiradu.ro/
Instagram: https://www.instagram.com/lemnarialuiradu/
Facebook: https://www.facebook.com/lemnarialuiradu/

Handmade Concept

Author/s: Chereches Alexandra
Epure Oana-Roxana

"INSPIRED BY THE FEAR OF BEING AVERAGE"

Welcome to our world of creation, passion, and innovation! We are two energetic and creative girls who have turned our dream into reality - we have founded the Handmade Concept brand, where art and design come together in a symphony of color, textures, and unique ideas.

WHAT WE DO

***1. Mural Paintings*: We transform the walls of your spaces into living works of art. From abstract landscapes to personalized illustrations, each wall becomes a story of its own.**






***2. Soulful Artwork*: Our canvas artworks tell stories and evoke emotions. You can choose from our collection or we can create personalized paintings tailored to your tastes and dreams.**







***3. Unique Fashion Pieces:* We provide personalized fashion options. From hand-painted jackets and sneakers to original print t-shirts and delicate embroideries, your wardrobe will become an authentic expression of your personality.**








WHAT SETS US APART

- Limitless Creativity- Meticulous Quality- Innovation in Every Project- Custom Creations

Join us on our artistic journey and discover the power of art and design to transform your world!

Contact:
Handmade concept
handmade.concept.artist
handmade.concept
+40767885187

SILK THREADS BLENDING MACHINE

Author/s: Venkatesh Penumarthi

ANDHRA PRADESH - INDIA

H

Introduction

The tradition of handloom in Andhra Pradesh is so ingrained in its culture that it serves as the state's identity. There are several villages in Andhra Pradesh, each of which has its own distinctive method of weaving and pattern.

Very often the handloom is given the same name as that of the village where it is weaved.Dharmavaram town located in sri satya sai district is the silk hub of the Andhra pradesh state . Here thousands of people are making a living by weaving silk cloths especially sarees . The process of weaving is quite a strenuous job. It is causing severe health hazards to weavers in the long run. Our project is to reduce the problems faced by weavers in our region. Usually when a saree is completely woven, new silk threads are blended onto the old ones in a frame just like shown here. This is done manually by specialist weavers using hands and gum. It is a tedious process. So, we are designing a simple blending for weavers to mould threads onto the weaving frame.

For many years, weavers have been doing this blending job manually. They need to continuously sit for 2 to 3 days to complete the work. It is a slow process and causes wrist and neck pain to workers . so , our machine can speed up this process by using electricity. This machine also reduces physical strain to workers.

TOOLS AND RESOURCES

In our setup , we are using components such as BO Motor , two pedal wheels , 9V battery and other mechanical tools such as drill bit, wrenches, soldering gun etc. we also visited the real time weaving set up to see if practically this machine can be useful for them or not . We had found some technical problems in implementation since the silk threads are very delicate. We can't use the rotating fan with longer wheels, because it may cut the neighbouring threads. So with the help of a 3D printer we specially designed the rotating wheel for the blending machine.

We interacted with some weavers locally and asked for their opinion. According to their opinion, the Government should provide the proper facilities and loans to the weavers under the schemes implemented. The raw materials should be supplied at an affordable cost.. Using their advice , we designed our blending wheel . This device consumes less electrical energy and has so many advantages.

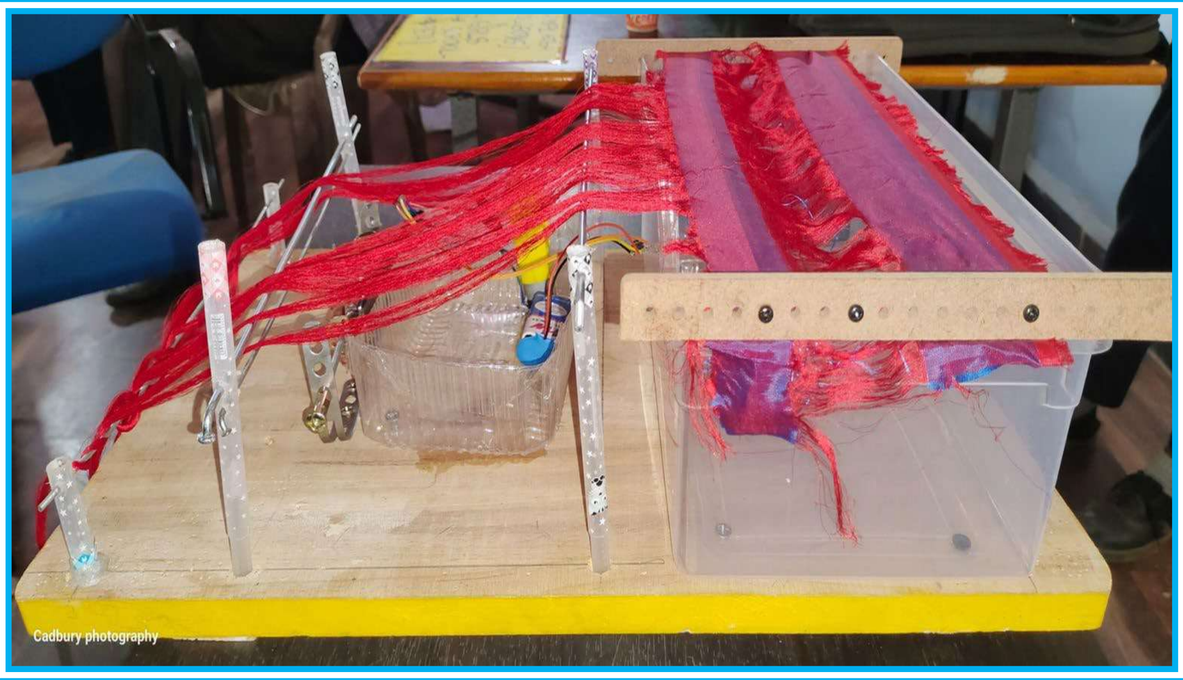
ADVANTAGES

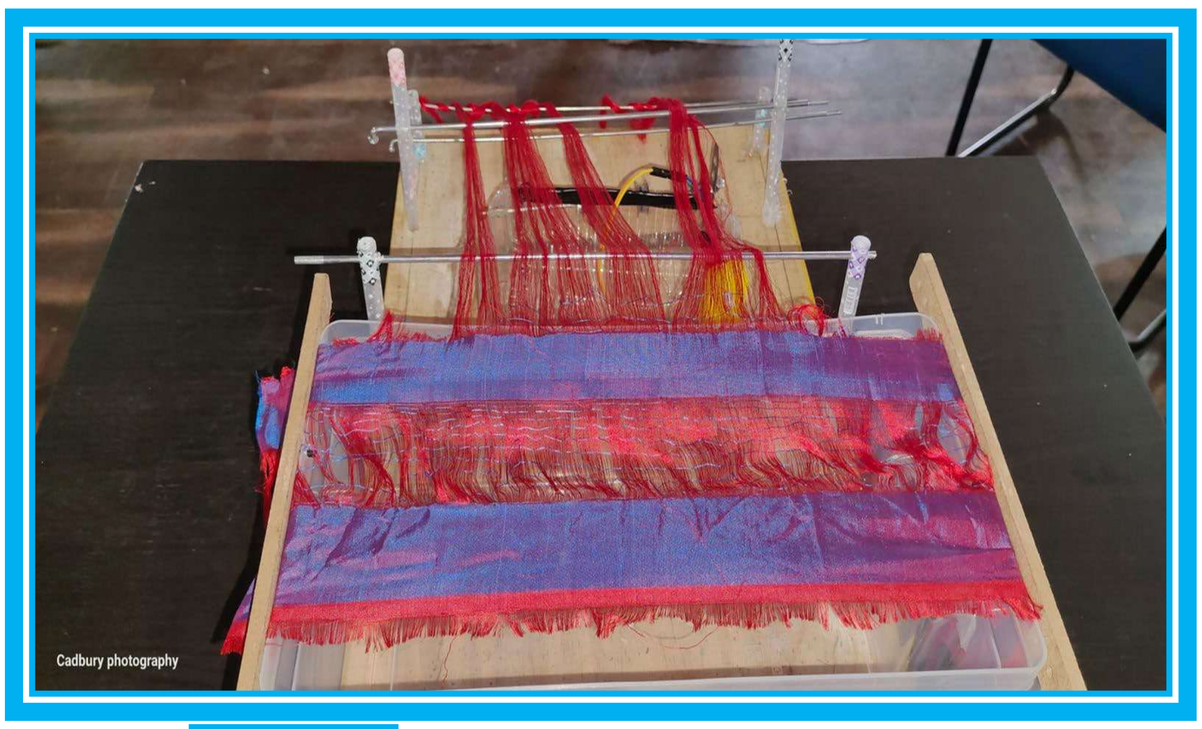
Reduces physical strain uniform blending of threads customised designs improved quality Maximum efficiency.











Contact:7386185111

Gmail: penumarthivenkatesh05@gmail.com

Detail about Dharmavaram Silk Weaving, silk threads blending machine

https://en.wikipedia.org/wiki/Dharmavaram_handloom_pattu_sarees_and_paavadas

J

Kids Corner

Games

Toys

Outdoor activities

Matei Corvin
Technological High School
Hunedoara

THE KIDS GOT TALENT

Kids project

Authors: Corvina Lego Team - Ilyes Ianis, Gravuj Tiberiu, Cobîrzan Kaliopia, Patraș Andrei, Lupu Patrick, Rotaru Adelin
Mentor: Tiberiu DISCA

With the help of Lego pieces and robots, the children recreate the talent show they participated in.

From pianist, dancer, conductor to athletes, everyone wants to show their talent.









Contact: disca.tiberiu@yahoo.com
+40762299833

Matei Corvin
Technological High School
Hunedoara

Celebrating Eminescu's day

Kids project

Authors: Alphabot Junior Team - Tirian Matei, Artean Sara, Prodan Mădălina, Dragoș Albert, Baciu Tudor, Șovioală Lucas
Mentor: Tiberiu DISCA

From Lego pieces and robots, the children want to recreate the show for Eminescu's day.

A librarian who will recite a poem, a patriotic writer, a mobile stage, an alternative source of electricity will try to recreate the atmosphere of culture.









Contact: disca.tiberiu@yahoo.com
+40762299833

Stone Blade Trailer of Video Game

Game Art Project

Pavle Trišović

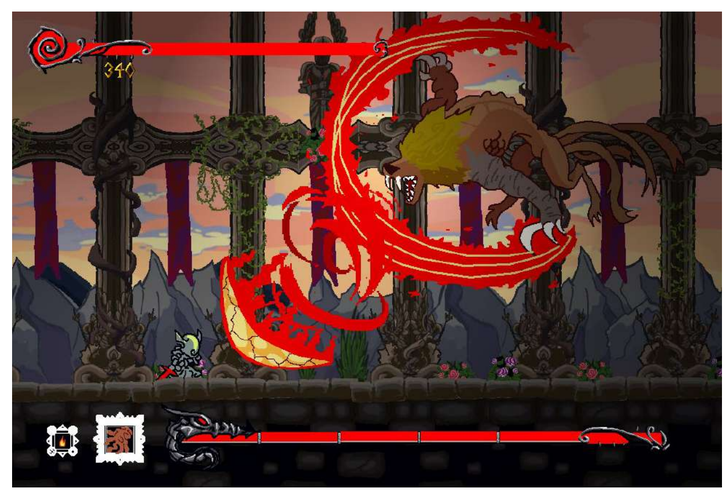
J

SMASH into Stone Blade. An epic action-adventure game, where you'll fight monstrous enemies, befriend strange and otherworldly travelers, journey through a brilliant and ancient world, and discover it's secrets - all in a hand drawn pixel art-style.

You play as a Stone Warrior, once acting as sword and shield for the Five Kings - now seeking vengeance against them for sacrificing his kin to win their war. To succeed in his quest the Stone Warrior must absorb the powers of his enemies and use them as his own.













The dash is a power up that is a valuable resource for the player. They can use it to cross a level quickly or get out of enemy fire. It's upgraded version, the Wolf Cloak dash, allows the player to avoid all damage while dashing.

Wall jumping is essential in order to cross any level or discover hidden areas. It's upgrade - the Beast Claws - allows the player to stick to a wall.

The double jump will be obtained from the Grasshopper Legs - you gain the power of the elegant grasshopper and of course you can select any spell to use in combat.

Contact: +381631033990 pavle.trisovic@fsu.edu.rs

Presentation link: https://youtu.be/UIvM_BmZzMw

SCAN ME

Kids Corner

Alessia the ballerina



J

Kid Project

Author: Alessia Marie SALA

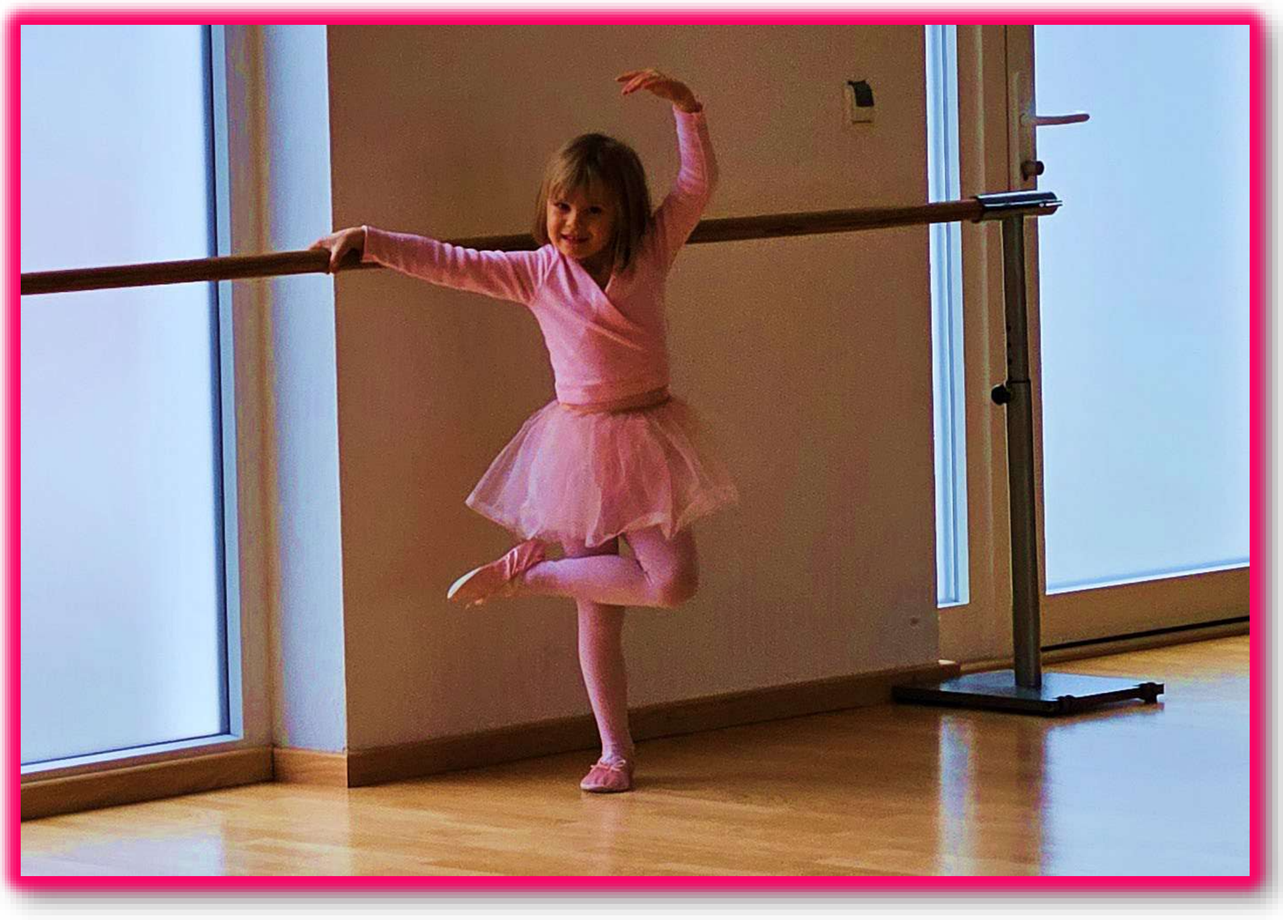
My name is Alessia Marie SALA, I'm five years old and one of my passions is dancing, that's why I'm taking the ballet class.

I like to do pirouettes and different positions together with my colleagues under the careful guidance of the ballet teacher. For five months I have been attending the ballet classes organized by the Regensburg ballet circle.









PAINTED DECORATED AND CARVED EGGS

Author: Irén Szlávikné Buzás



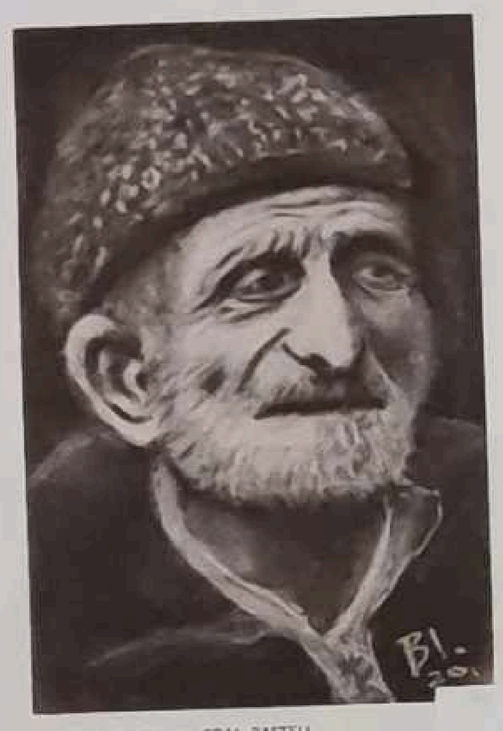
MY SON - PASTEL PORTRAIT 20X26CM





DECORATED EGGS

J



OLD MAN, 25X30 cm, COAL ,PASTELL

MRS IRENE BUZAS SZLAVIKNE

egg-decorator-carver and picture painter,
retired English teacher

I am from HÓDMEZŐVÁSÁRHELY, HUNGARY.
I have decorated, carved, painted hen-turkey-goose and ostrich eggs for many years, and I have about 300 own patterns and works. The other art is painting (all kinds of themes: sceneries, people, animals using oil, coal, acryllic , pastel paints), that I love and my works could be seen, or can be seen in many exhibitions here and abroad thanks to mainly Ötlet Club 13 Association and AMKA (Szeged, Hódmezővásárhely, Budapest, Barcs, Abony, Szolnok, valamint Serbia, Croatia and Romania.)

SZLÁVIKNÉ BUZÁS IRÉN

tojásfestő-faragó és képfestő, nyugd. angoltanár

HÓDMEZŐVÁSÁRHELYI nyugdíjas angol-rajztanár vagyok és sok éve díszítek tyúk-pulyka-liba és strucc tojásokat festve, karcolva, s több mint 300 féle saját mintám van.
A másik művészeti ág - a FESTÉSZET, amelyet szintén nagyon kedvelek (mindenféle témakör: tájak, ember- és állat portrék, épületek, növények és tárgyak.)

Többféle anyaggal és technikával dolgozom (olajfestek, akril, porpasztell, tempera, grafit és szén).

Munkáimat – főként az ÖTLET CLUB 13 EGYESÜLETNEK és az AMKA-nak köszönhetően 26 éve sok hazai és külföldi kiállításon mutathattam be. (Szeged, Hódmezővásárhely, Szolnok, Abony, Barcs, valamint Szerbia, Horvátország és Románia.)

www.artmajeur.com /Művészek listáján:Buzás Szlávikné Irene/



MOTORBIKE TRIUMPH – 40X30 cm, PASTELL



BEGGAR WOMAN -40X30cm, OIL ON CANVAS



CORNFIELD WITH WILD FLOWERS – ACRYLLIC-30X40cm



Csibész - Our friends' dog who died - 28x20 cm pastell



HORSE, 30X 25 cm, ACRYLLIC



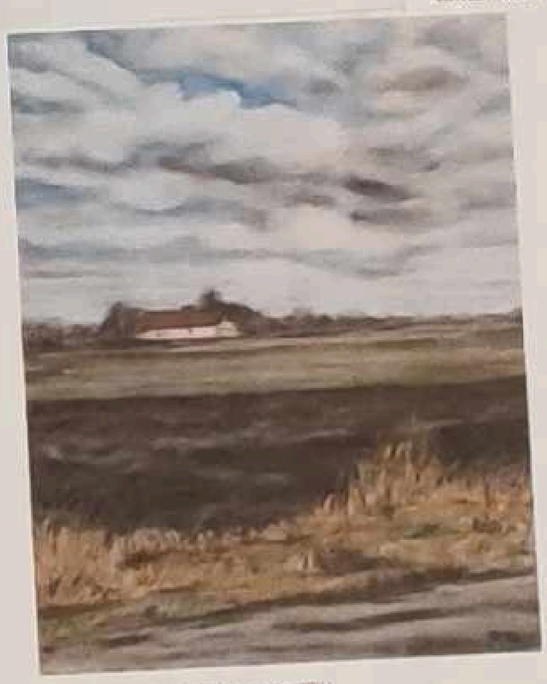
LONELY OLD HOUSE, 30X40cm, OIL ON CANVAS



SEA AND CLOUDS, 40X50 cm, OIL ON CANVAS



GATE-HANDLE -30X25 cm PASTELL



MY HOMELAND, 40X30 cm, PASTELL



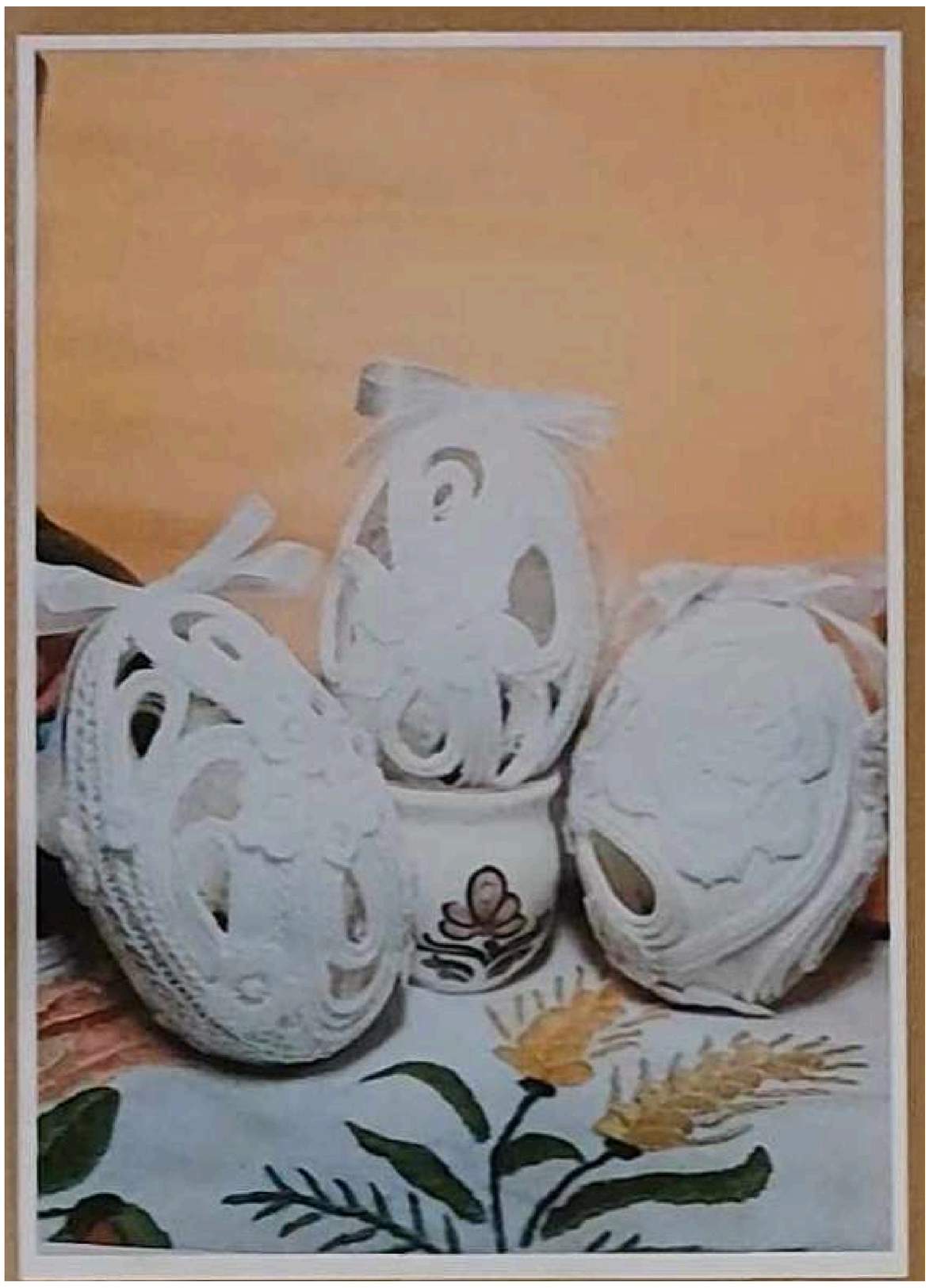
SEA WAVES – 25X20cm, ACRYLLIC

HANDICRAFTS - TAPESTRY, NEEDLE PAINTING

Author:
id. Sándorné Zsiros

J

Gobelin: It is made with half cross stitches. Half and quarter meshes in order to develop the finest details. It is made with split embroidery thread. Needle-dyeing: It is done with split embroidery thread from 2 threads. Stitched closer to each other, we embroider "painted with a needle".





Contact: otletclub.idea@freemail.hu
Presentation link: https://otletclub.5mp.eu/web.php?a=otletclub

HAND-EMBROIDERED CREATIVE POSTCARDS WITH YARN GRAPHICS TECHNIQUE

J

Author: Dánielné Darázsi

The presented postcards were made using the String art technique. I work with cardboard (120-160g) and first choose a pattern. When I have the pattern, I place it on the cardstock and use a beading needle to poke holes in the paper every 1-2 mm (0.04-0.08 inches).

After that, I start sewing with different stitch distances. I use 1mm thick Mettler Poly Sheen String.





The seam should be tight, but make sure that the holes do not tear next to each other. After finishing the "sewing", I cover the back side of the stitches with another paper. Only the decoration remains with decorative stickers, beads and ribbons.

I also make pictures and bookmarks using this technique.

Contact: otletclub.idea@freemail.hu

Presentation link: https://otletclub.5mp.eu/web.php?a=otletclub



DISCOVER ZANZIBAR with MUDI

J

Travel Guide

Authors: Muhammed Suleiman Yussuf

I'm 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.









Zanzibar is an archipelago located off the east coast of Africa and consists of the main island of the same name, Zanzibar or Unguja as the locals call it, and Pemba. The word Zanzibar comes from the Persian language and translates as "coast of black people" and Pemba translates as "green island".

Zanzibar is located approximately 6000 kilometers from Romania, the islands being sought after both for the wonderful beaches and reefs, and for the exotic destination.

Contact: https://www.facebook.com/ghidturisticdespre.zanzibar
tshabalalajunior17@gmail.com **+255 783 396 944**

SCAN ME

CLUB EVOLUŢII cu Alexandra Marcu

Outdoor project

Authors: Alexandra Marcu & Team

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.













Why do we love the mountain?!

Because it's an escape between the blocks, an opportunity to socialize and although it often challenges us to get out of our comfort zone, it seems at the same time it gives us the feeling of well-being and safety!

Club Evolutions - Personal development through mountain education!

Contact: *alexandraflaviamarcu@gmail.com* ***+4 0723 219 655***

Kids Corner

Alex's 3D Paper Craft

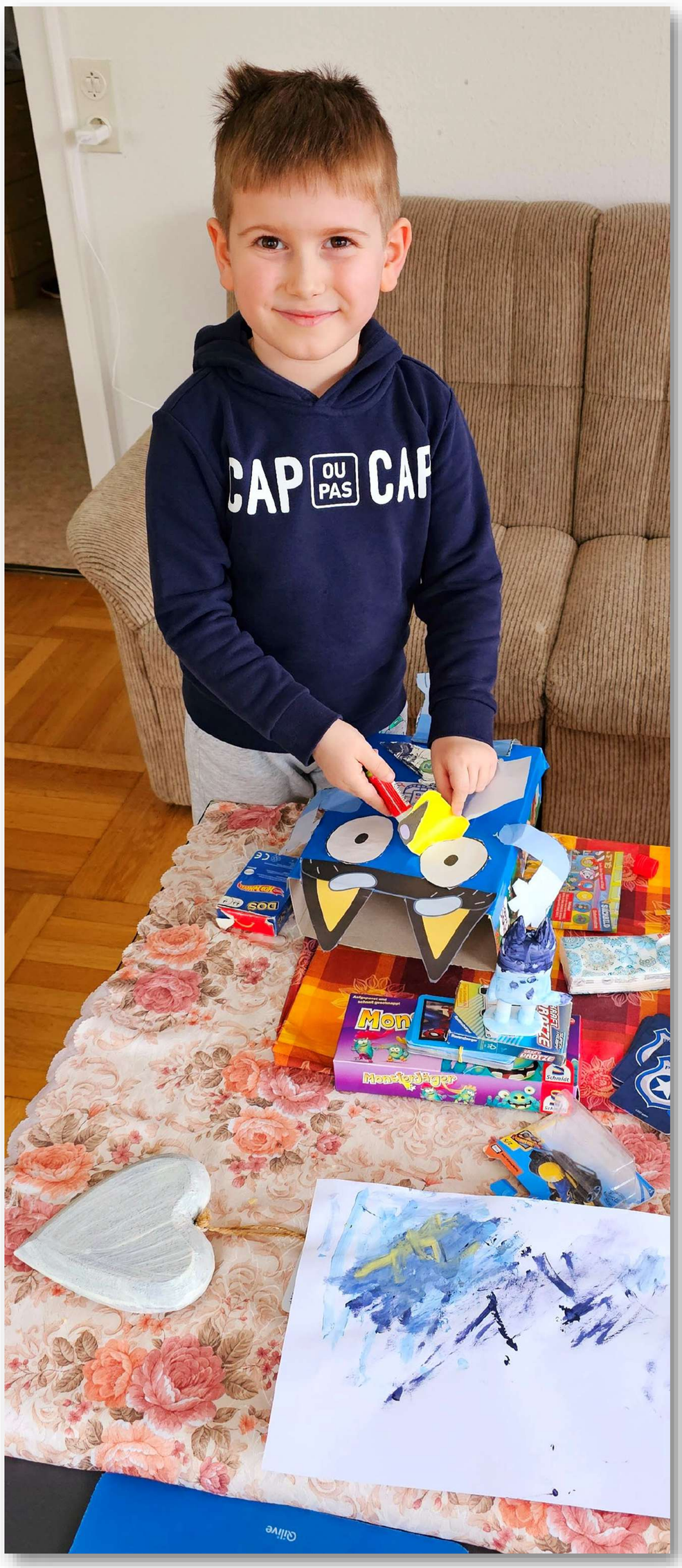
J

Kid Project

Author: Alexandru Rotea

Bandit Heeler is a fictional character who is one of the main protagonists of the Australian preschool animated television series Bluey, created by Joe Brumm. Employed as an archeologist, he enjoys playing with his daughters, Bluey and Bingo, and takes any role he plays in a game they devise seriously despite often being seen as reluctant and unwilling to partake in their games. I like to design and make the characters from my favorite cartoons out of cardboard, paper, stickers, aluminum foil and other recyclable materials.

My project is the Bandit made according to the instructions from Bluey magazine.









Kids Corner

Football my passion



J

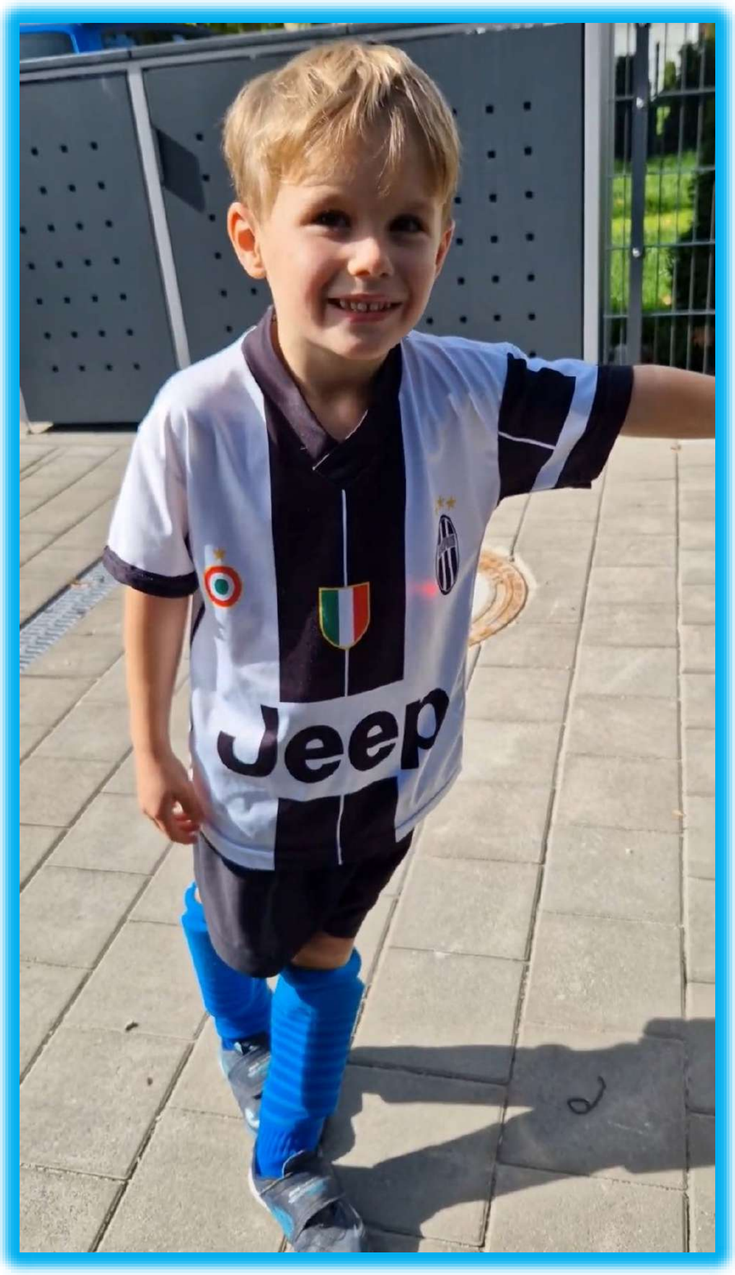
Kid Project

Author: Christian SALA

My name is Christian SALA, I am five years old and football is my passion. I like this sport a lot and after kindergarten I play football with my friends in the park near our house. I am registered at the Football Club of the locality where I live. We practice twice a week and on weekends we have matches with teams from other towns.









Kids Corner

Sebastian's Custom Lego Cars

Kid Project

Author: *Sebastian ROTEA*

J

My project features Custom Lego Cars, this means creating a new car model from an existing Lego Auto set using the same parts.

Thus I have the pleasure to present you 8 models:

- the first car is a Nissan Silvia with a modified engine with a supercharging group;
- the second car is a Mercedes AMG One;
- the third car is a Mclaren F1 GTR;
- the fourth car is a Nissan GT-R from 2 fast 2 furios;
- the fifth car is a Lamborgini Countach;
- the sixth car is a Mclaren F1 car;
- the seventh car is a Aston Martin Valkyrie;
- the eighth car is a Audi Quattro.















DECORATIVE ACCESSORIES

Patent: MD No. 1970; 1917

Author/s: Malcoci Marina, Malcoci Maria-Eudochia

I

Accessories are essential elements to complete and enhance outfits. Being both objects that are used to add beauty, style, and personality to a person. How they are used may vary depending on individual preferences and personal style. Currently, accessories have a wide variety of models, shapes and can be made from different materials.

Figure 1 shows a bow tie and a collar. The bow tie can be worn in different contexts, from formal events to more casual occasions, both on the female and male side. The way of fastening the bow tie can be easily changed (elastic, pin, ribbon), which makes it possible to wear it in different ways (around the neck, as a bow in the hair, as a bracelet on the hand etc.).

The collar can be added to clothes in your wardrobe to personalize them and create new styles. This collar can be easily detached or attached to varios types of clothing and can add extra elegance or originality to the lady´s outfit. The advantage of the collar is that it can be combined with different types of clothes, from shirts to dresses and sweaters. And they can easily turn a simple outfit into a stylish one.

Figure 2 shows 12 martisores. Martisor is the sign of spring, eagerly awaited by everyone from small to large. It is a product loaded with symbolic meanings. The martisor is worn on the chest during the first days of March, and is offered with wishes of health, luck and joy. Red and white thread is used in making it, along with various symbols or amulets such as flowers, figurines etc.

All the accessories were made by hand, applying decoration techniques such as: embroidery, perforation, gluing applications.

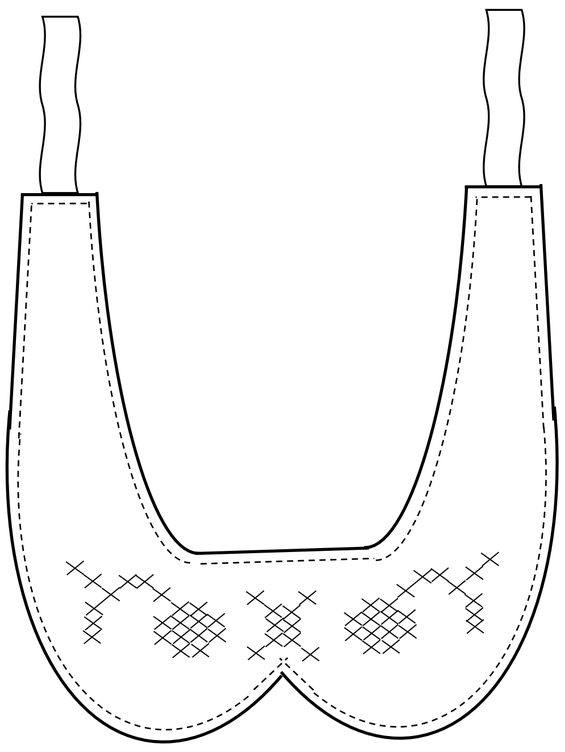


Figure 1. Collar and bow tie, No. 1970



Figure 2. Martisoare, No. 1917

Contact: marina.malcoci@gmail.com +37369062399

FUNCTIONAL MODELSHIPS

Authors: Calugar Sebastian, Calugar Damian,
Popa Albert,Popa Robert
Mentor: Coach Popa George

J

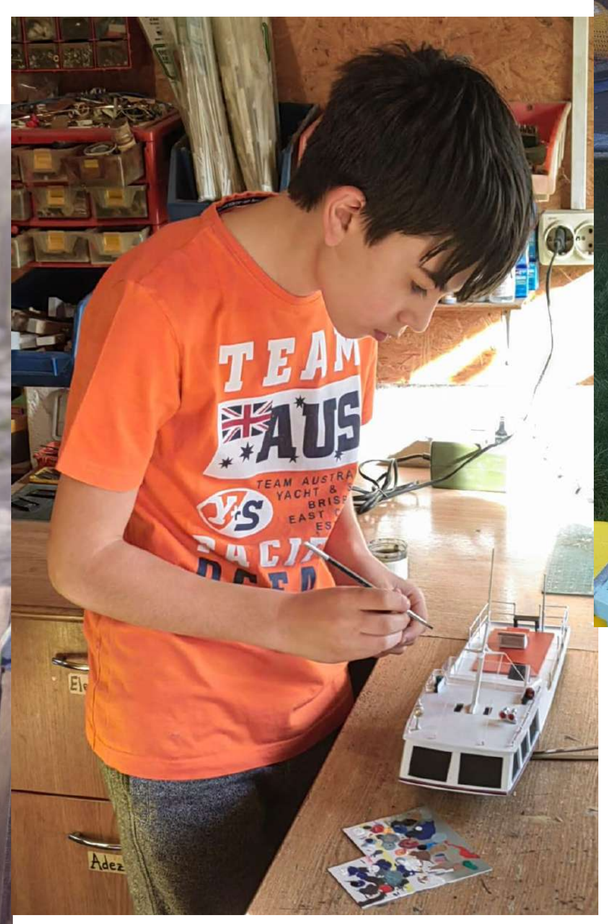
Under the CS CFR Simeria sportclub flag, since March 2023, is running a modelship building section. This sport raises juniors' technique abilities and skills by transposing into practice what they are learning during classes.

In 2023 the newly born section has brought very good results. Popa Albert and Popa Robert have won the National Champion titles in NS and C classes and one bronze medal at World Championship, class C at Jablonec, Czech Republic.

The model boats presented by them are remote controlled and they were built either from scratch or by using assembly kits, under the master's supervision, multiple national and world champion, Popa George.



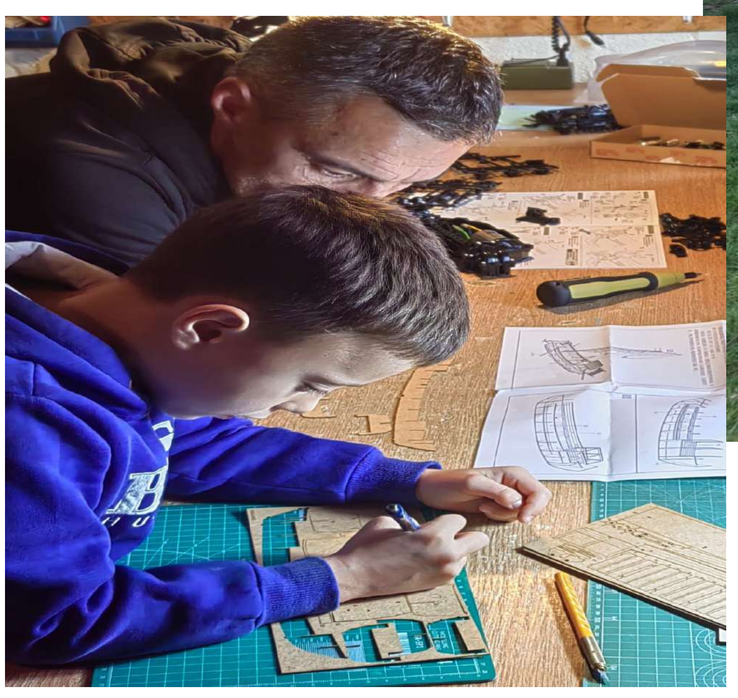












Contact: https://www.facebook.com/geo.popa.754

Kids Corner

Colors and drawings by Livia Maria

Kid Project

Author: Livia Maria MACARIE



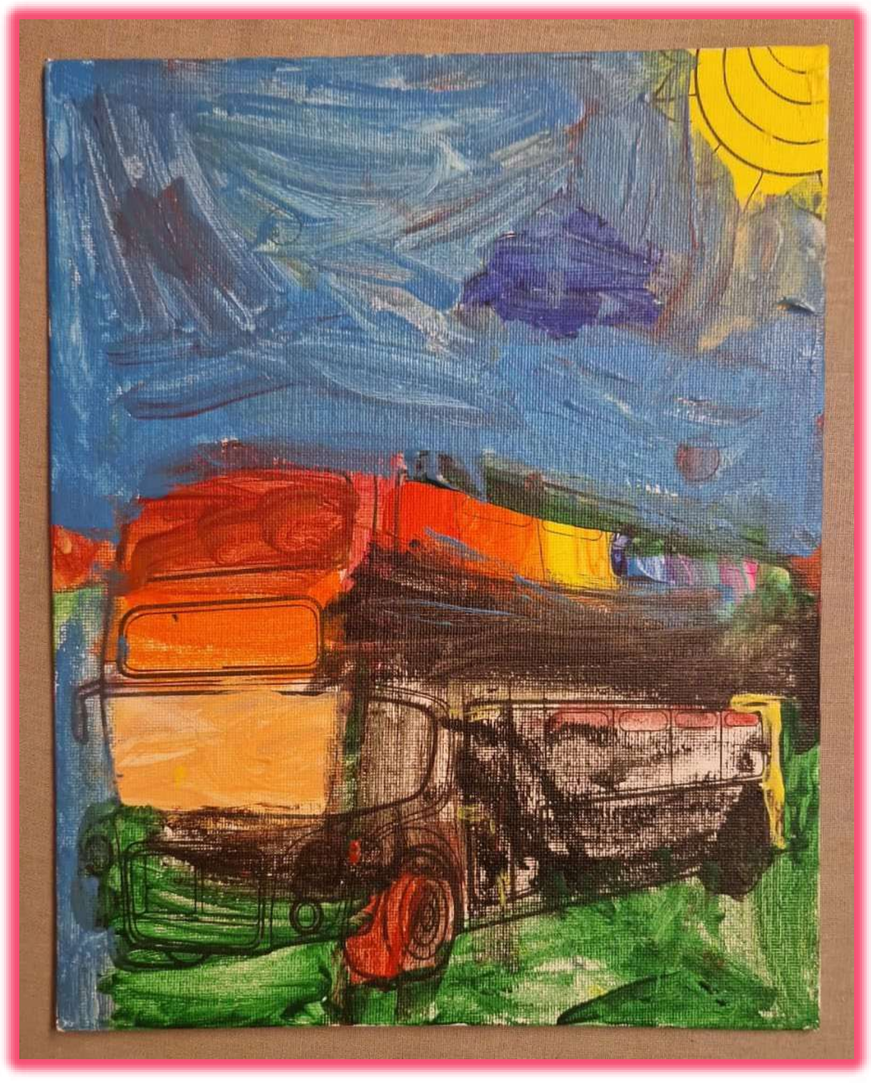
J

My name is Livia Maria MACARIE, I am 7 years old, I am in the 1st grade and I study at Grundschule Rotthalmünster, in Germany. In my spare time, I really like to draw, and below are some of my creations.

When I draw, I feel like I'm traveling in my own magical world where I can be whatever I want and do whatever I like. It's an adventure full of color and fantasy!









Kids Corner

Andi's drawings



J

Kid Project

Author: Andi BERBECE

I am a little explorer, I have almost 2 years old and I love drawing and all animals. Together with the kindergarten teacher, I make drawings for my age, especially for festive events such as March 1, the spring celebration, the Martisor tradition, Mother's Day and others. I am in the small group at Happy Bell Kindergarten, Deva









E

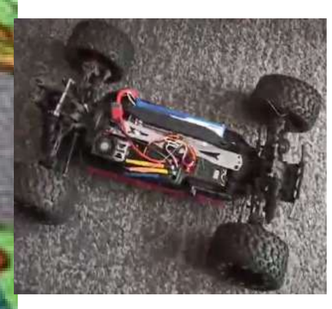
ELECTRIC VEHICLE DRIVING SIMULATOR

Authors: Macovei Marius, Lup Lucian, Dumitraș Alina-Lucreție, Ștefan Daniela-Maria

The driving electric vehicles learning module is designed to provide participants with the knowledge and skills needed to drive electric vehicles safely and efficiently.

From the basics of electric vehicle technology to advanced aspects of driving and maintenance, this comprehensive module provides a complete understanding of all aspects of the electric car.





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Tel./Fax: 0254/ 230739
E-mail: deva_trans2003@yahoo.com
http://www.cttdeva.ro

Valea Morilor Park

J

evolution and perspectives in promoting the historical, cultural, sports and touristic potential of the capital of Moldova

Student Project

Authors: ***Muntean Sandu, Diulgherov Arina, Spivacenco Lavinia***
and History Professor Muntean Angela

Schinoasa and Motocross is a tourist project area with fertile lands and green area, here you can identify new plants for research that you cannot find anywhere else, including more than 12 types of soil, we recommend the green area with the huge park that includes about 200 species of plants, the air is very clean and the picturesque area that takes you deep into the earth will attract maximum attention, we recommend to visit us.

Nature's Gift Schinoasa and Motocross are visited by locals visitors, but every year here are organized most Enduro-moto events. This lands are very attractive.



Contact: ***liceuluniversul@gmail.com***

Ialoveni-PaduR-Research

J

Student Project

Author: Scorțescu Marius-Silviu, Scorțescu Silvia

The green forests of Ialoveni project reserch , it is so beautiful,in this project we talk about heaven on earth, you can admire from the beautiful hills, nature and green trees, the area is inlaid with flowers and rare plant species over 300 species, here the soils are clay, small rivers that flow downhill, the fauna and flora are amazing , the air is like in the mountain area.

The Ialoveni forests are God's landscape on earth.



Contact: ***Silvia Scortescu + 373 798 97 247 silvia.scortescu@yahoo.com***

AIRSOFT
BY WOLVES SPORTS CLUB

Airsoft project

J

Authors: *Florin TOPOR & Team*

The Deva Wolves Sports Club through the taekwon-do, archery and airsoft sections promotes movement and competitive spirit by participating and organizing games and competitions of these sports disciplines.

The Deva Wolves Sports Club organizes various demonstration events in which participants and visitors have the opportunity to witness a presentation of the combat tactics used in airsoft, of the equipment, but also of replicas of real military weapons and devices. Those who love this sport could sign up for the target shooting session in a controlled environment and in complete safety.

Airsoft is a sport that helps develop team spirit and fair play, building character!









Presentation link: https://youtu.be/QYdjh3YGD4g?si=4zfVpus7tgjgvbWG

Posters Catalogue

5th International Exhibition INVENTCOR

4-6 April 2024 – Deva, Romania

K

Innovative ART

Music

Video

Photography

Publicity

THE CONCEPT OF SUSTAINABLE SYSTEMS MARKETING AND ARTIFICIAL INTELLIGENCE (AI) IN PHOTO AND VIDEO

Student project

Authors: Mădălina MIHOC, Iuliana-Teodora VĂDUVA

Mihoc Studio is a photo-video company that offers both digital and hard copy material.

The description of the problem is very simple, because recycled paper is a scarce resource on the market, the demand for recycling paper is higher than the supply.

The collection of paper for recycling is poor in Romania, so that only a little more than half of this waste ends up being recovered and transformed into new products.

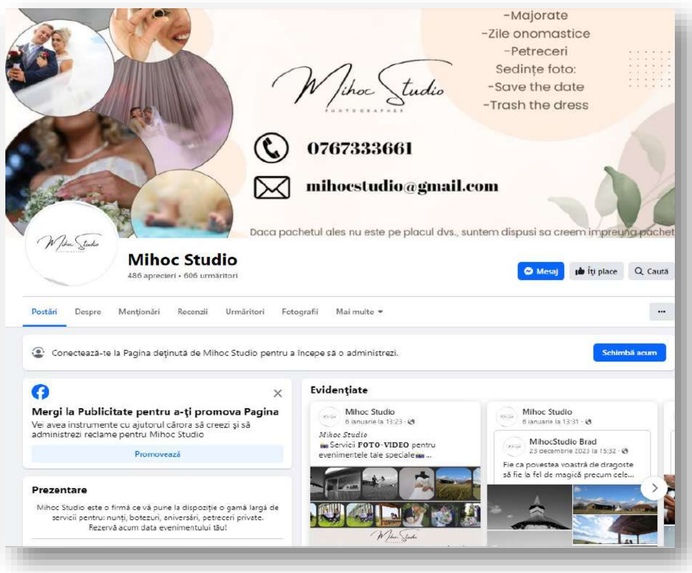
Our solution is to create sustainable products, services and experiences. One of the simplest decorative objects made from paper is origami. It is only necessary to follow a few steps and we will obtain various shapes from paper that will delight our customers. Origami can be made from coloured paper or from white paper, written paper or wrapping paper.

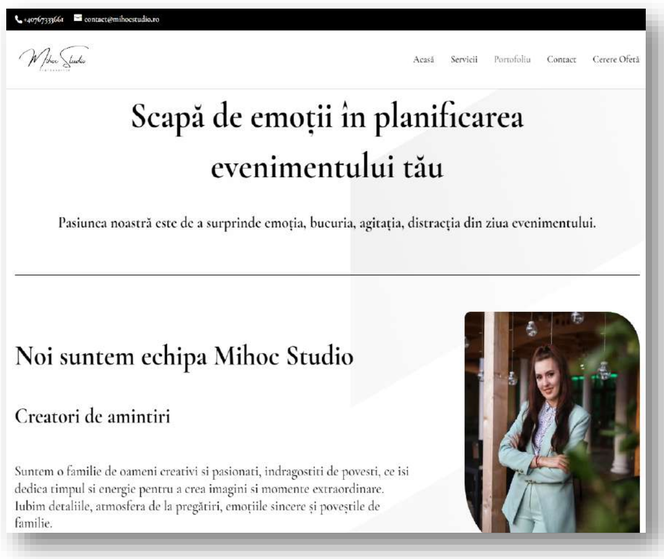














Mihoc Studio found a solution to this problem, so we decided to recycle and reuse paper. Printing can also result in defective pictures. These defects can be generated by the printer, but also in some cases where the brightness is not the desired one. In addition to photo paper, we also have documents that are no longer useful. The equipment used is: shredder, shredder/blender, frames, mesh, paper, water pot. All these papers of different thicknesses, sizes and layouts become waste.

With a shredder we shred the paper, and with a kitchen shredder we have ground the previous product, where we also added water to make the pulp.

The paper used is not plasticized. Plasticised and contaminated paper it is harder to recycle. With the help of a screen and a sponge I attached the ground paper, and after this process, I put everything to dry.

This way we created: pages for the album, letters, cards, decorations that we can cut and paint as we want, bookmarks.

In conclusion, the development of a strategy is influenced by the status of the business: where it is in the current market, what resource potential it has.

Contact: madalina@mihocstudio.eu +40767333661
vaduvaiulianateodora@gmail.com +40724980731

SCAN ME

CONTEMPLATION IN SHADOWS

Photography project

Author: Stoica Adrian

K

A photograph veiled in darkness and laden with significance, "Contemplation in Shadows" brings together the essence of mystery and the delicacy of a profound gaze. Wrapped in a jute veil that shrouds her head and shoulders, she creates an aura of mystery, hinting at an untold story. In her hand, a flower becomes a symbol of fragility and the ephemeral passage of time. The soft light highlights the textures of the jute and her skin, creating a contrast that underscores beauty in a unique form.

Gazing directly at the viewer, the woman exudes a deep sadness, and the dancing shadows on her face accentuate the contemplative expression.

It's a scene where each element seems to contribute to the whole, suggesting a search for deeper meaning and reflection on the unseen mysteries of existence.

"Contemplation in Shadows" is a dialogue between light and darkness, an introspection into human emotions, and an invitation for the viewer to unravel the hidden secrets and subtleties within the shadows of this artistic composition.



SCAN ME

Contact:

adistoica21@gmail.com

www.adistoica.ro

DJ RobyX

Student project

Author: Robert SĂCUIU

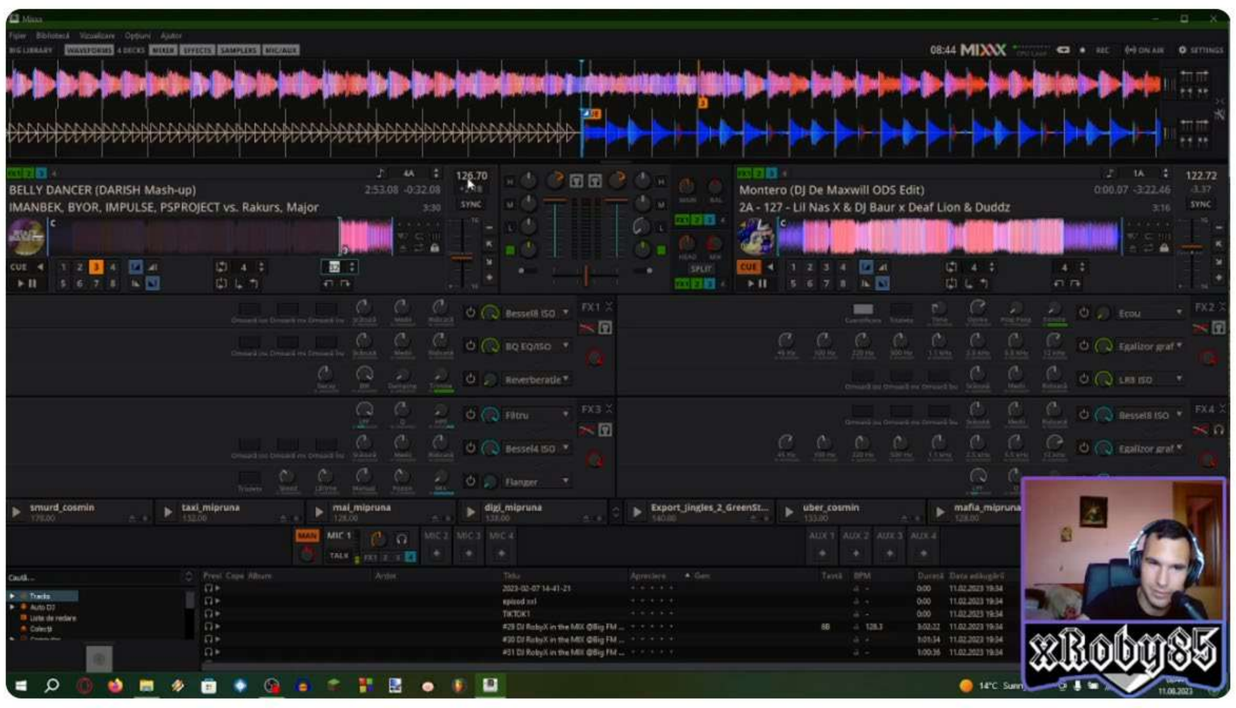
K

One of my passions, which is music, started when I discovered the radio. In general, I mix the commercial music that has become popular with us because I am otherwise tired of those songs compared to some underground (non-commercial) songs, because I grew up with them and because there are more people who listen and because otherwise you are more attracted. Besides that, since I also had a passion for video games, I'm thinking of mixing music and songs to make you think about what is related or appropriate to video games, and if you can feel like you're in a cool place. I generally mix tracks from the 90s to today and from the following other non-commercial genres in parts: Electro House, Future House, Big Room Techno, etc.





SCAN ME





@djrobyxro

DJ RobyX

At the moment I'm doing mixes for some shows on some radio stations that I post on Hearthis.at, I'm doing mashups (meaning a combination of two songs), mix shows (combination of 3 or more songs), I was motivated to I do it after I saw a Romanian friend doing mashups.

Contact: robisacuiu@gmail.com

BREAKING THROUGH THE CLOUDS

THE RISE OF CLOUD ADOPTION IN SAUDI ARABIA

Research project

Kifaa Alanazi

Supervised By: Dr. Neyara Radwan

K



The Rise:

- **In 2019**, the Saudi Arabian government launched the Saudi Cloud Strategy to promote the use of cloud computing. The strategy aims to expedite the adoption of cloud computing in both public and private sectors, enhance cybersecurity, and create new employment opportunities.
- The Saudi Cloud Strategy aligns with Saudi Vision 2030 and the National Transformation Program 2020, aiming to revolutionize the Kingdom's economy and society.

Vision of Saudi Arabia in GCC:

- To make Saudi Arabia a regional hub in advanced computing technologies and a growth engine for the ICT sector.
- The Cloud Computing Special Economic Zone embraces Saudi Vision 2030's objectives towards expanding and strengthening the ICT and innovation infrastructure in KSA.
- While turning the Kingdom into a regional tech hub by creating an appealing investment environment for leading global cloud computing companies to begin their commercial operations in Saudi Arabia, and promote the use of Cloud Computing across the Kingdom.

What is Green Cloud Computing ?

- ✓ Maintain environmental sustainability by using computers and green technology devices such as energy-saving devices and improving the consumption of resources and electronic waste. Technical devices divided into two parts software and hardware.
- ✓ Software, is necessary to strengthen energy storage programs, while hardware that not only reduces energy consumption but can be recycled.
- ✓ Another researcher says that green computing is the design and manufacture of computers with little or no impact on the environment so that it promotes the recycling of electronic waste and spare parts.

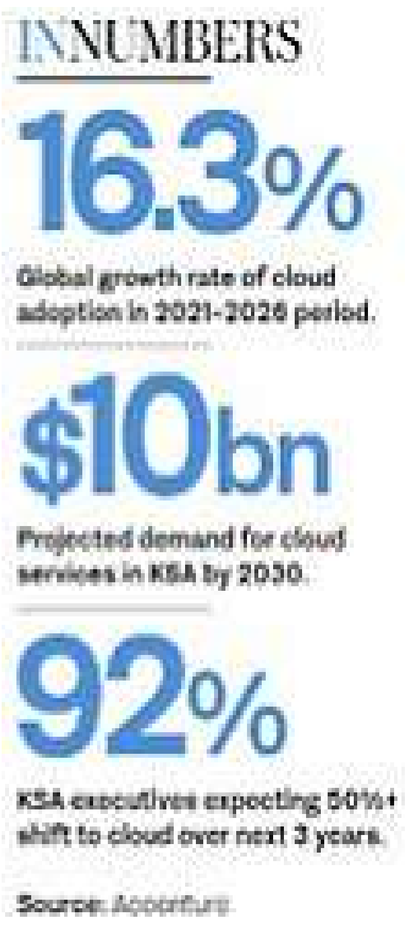
Implementation Steps:

❑ Energy-Efficient Data Centers:

- ✓ GreenTech solutions invested in building energy-efficient data centers equipped with state-of-the-art cooling systems and energy management solutions.
- ✓ By optimizing power usage effectiveness (PUE) and utilizing renewable energy sources, such as solar power, the company reduced its carbon footprint significantly.

❑ Virtualization and Server Consolidation:

GreenTech solutions implemented virtualization technologies to consolidate servers and optimize resource utilization. By reducing the number of physical servers required



Contact: Dr. Neyara Radwan
College of Applied Sciences,
Al Maarefa University, nradwan@um.edu.sa

Jam's Art

IN LOVE

Innovative ART Project

K

Author: Jamina RIEDEL

This is the story about two different pieces. They come together, late in their life. The black stone, beautyfull, shining, strong but broken. The plasticfilm, more than hundreds, heated and colded, pressed and bented but empty inside.

They met on an iron base, in intimate embrace, life is created in all colours of the rainbow!







Contact:
jaminaa12@gmail.com

Presentation link:
https://www.saatchiart.com/account/artworks/1104419

SCAN ME

SPRING SYMPHONY

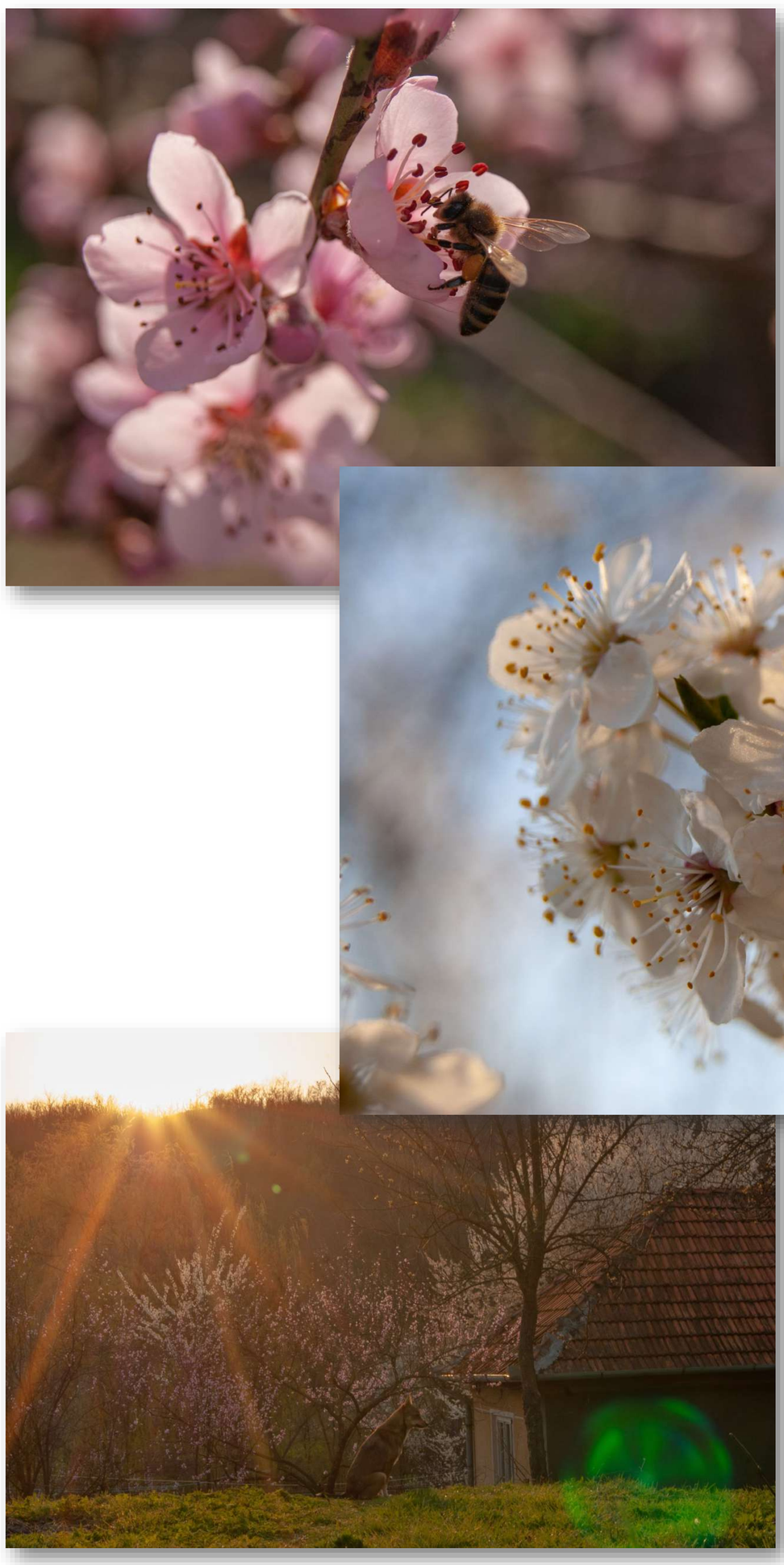
Photography project/Innovative art

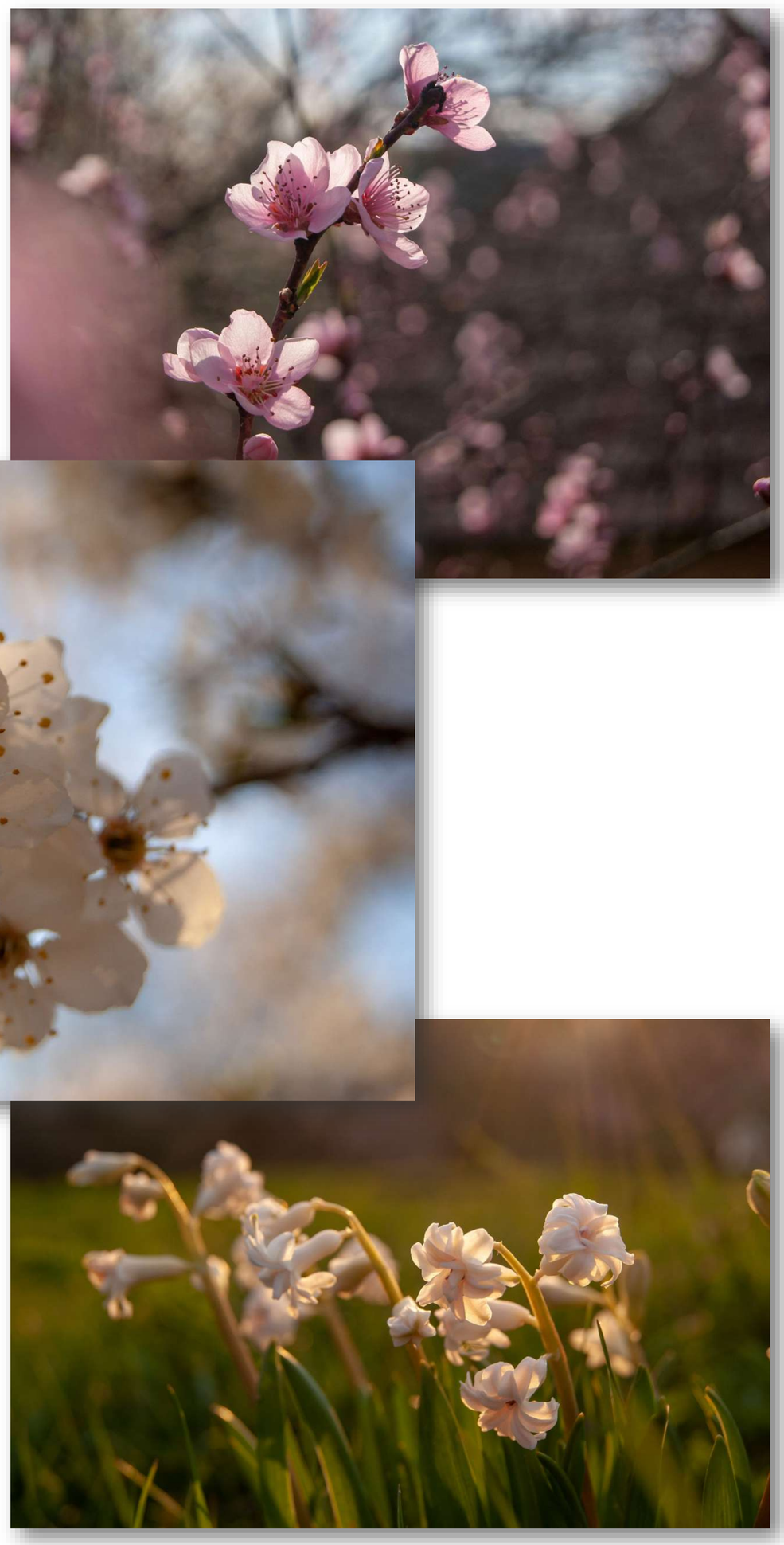
Author/s: Diana Miruna Armioni

K

"Spring Symphony" invites you to immerse yourself in the enchanting beauty of spring blossoms captured through the lens. Explore a kaleidoscope of colors, textures, and intricate details as nature orchestrates its annual symphony of renewal and vibrancy.

From delicate petals to lush landscapes, each photograph celebrates the ephemeral yet timeless grace of springtime blooms. Let these captivating images awaken your senses and inspire a deeper appreciation for the fleeting wonders of the season.







Contact: armionimiruna@yahoo.com

Caretta's Art

TRANSFIGURATION

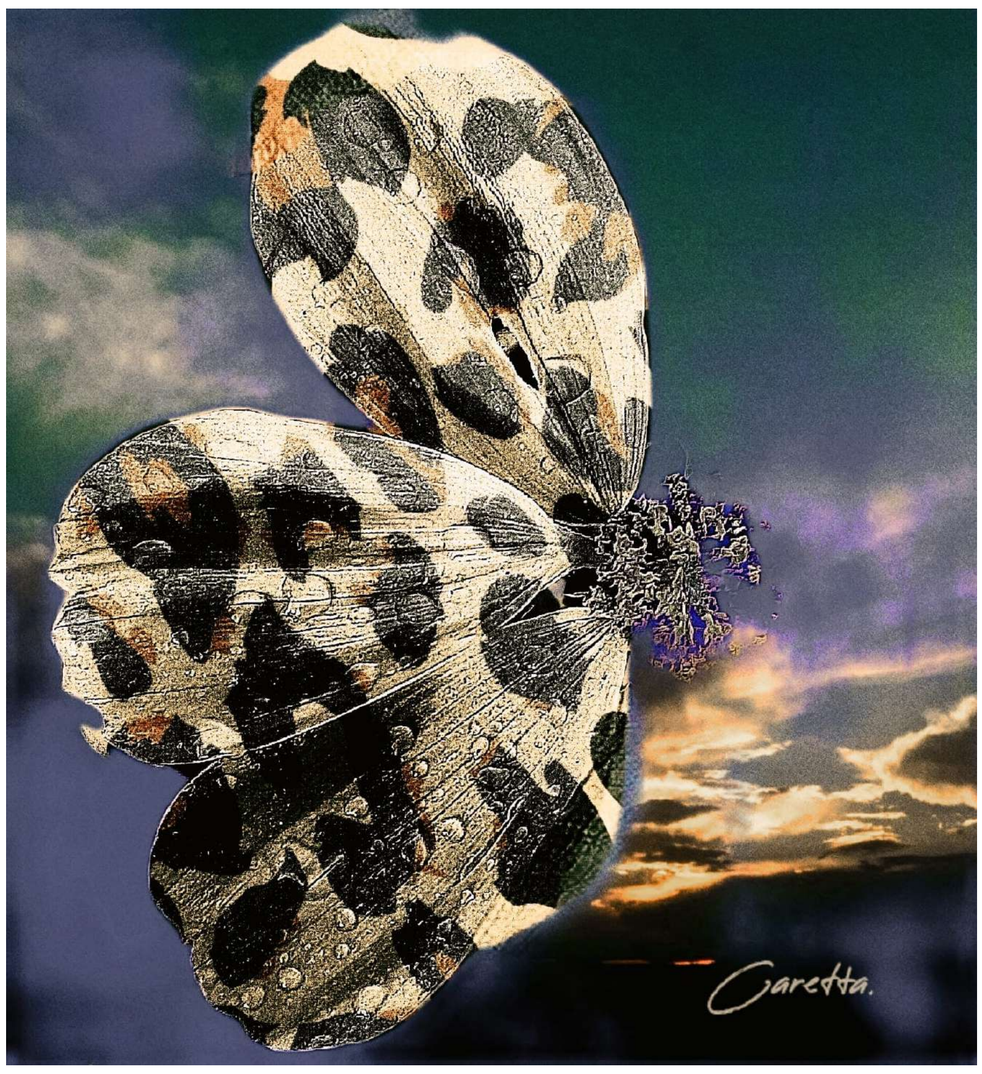
Innovative ART Project

Author: Maria Liliana ZAGREAN

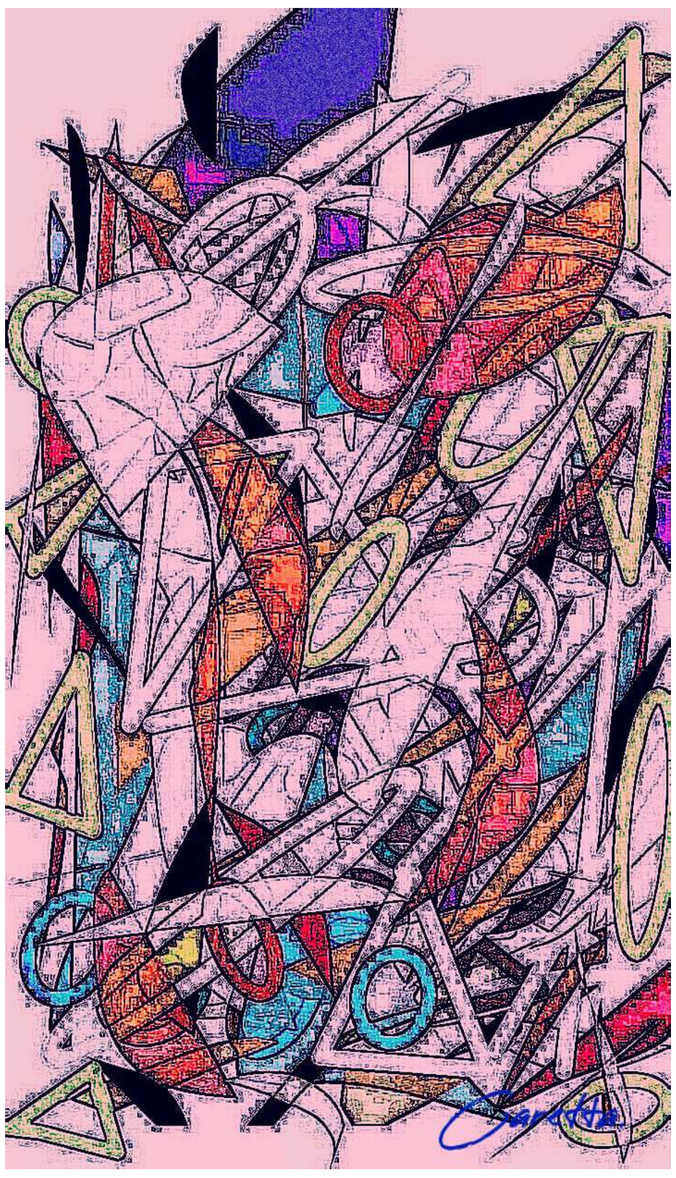
K

I don't create the abstract, nature create it for me, and this is reflected in my works of art. On an empty road with a shy point that easily tries to turn into lines that take on different shapes and color.

Since I was a child, I was fascinated about the wonder around us. The changing colors of the seasons, they make myself live a magic dream and as intensely live dreams become reality, 14 years ago, I had the opportunity to purchase a professional camera.



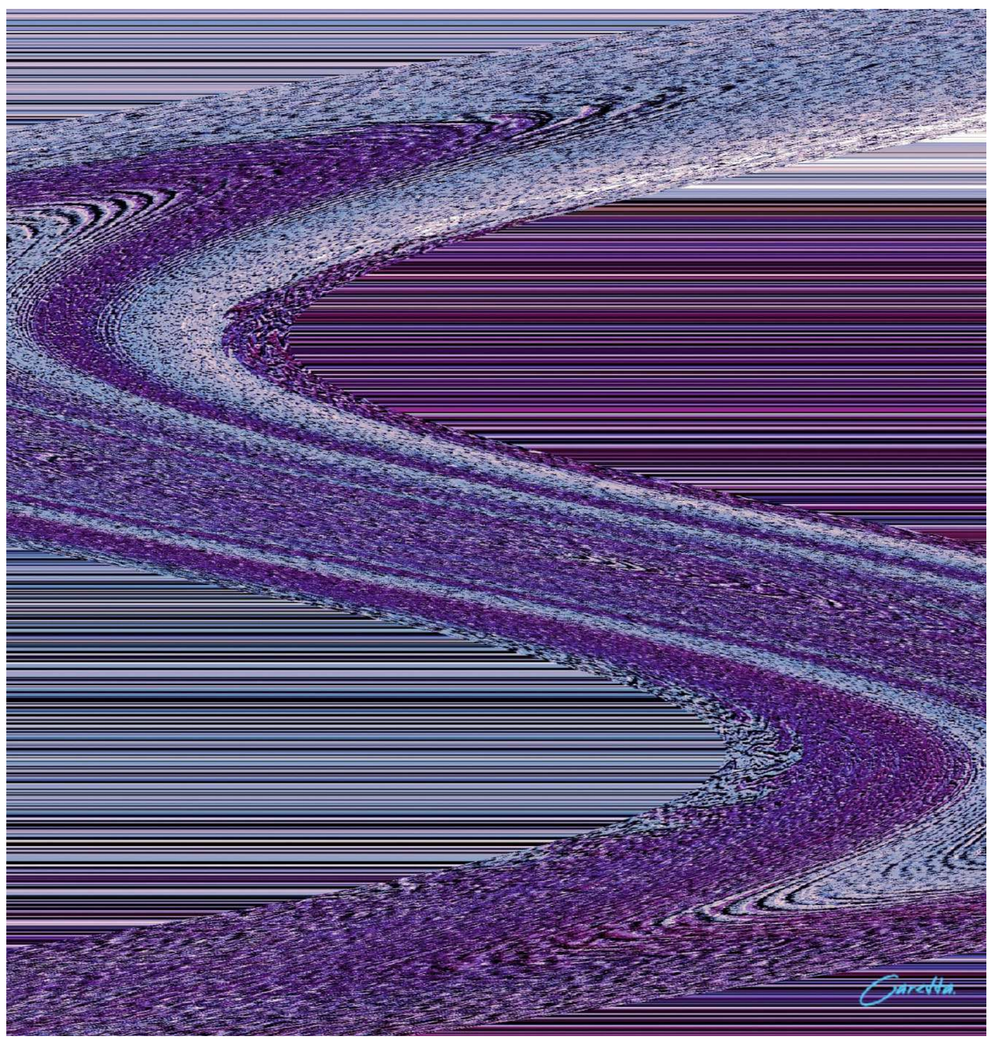
Fly to heaven



Inspired by Lissitzky
Running ahead of the bike



Opening the hard way



Waves of lavender

SCAN ME



The freedom of the sleepwalker

Contact: caretta.foita@ gmail.com

CREATING AN APPLICATION FOR AN INTERIOR DESIGN PROJECT IN THE KINGDOM OF SAUDI ARABIA, 2024

Research project

Authors: Hassan Ahmed Bashammakh, Bader Ahmed Bashammakh

Supervised by Dr. Neyara Radwam

College of Applied Sciences, Al Maarefa University, Saudi Arabia

K



Mobile Interior Design Business

Our mobile interior design business aims to enhance the lifestyle by integrating cutting-edge artificial intelligence into the latest designs. With our service, you gain access to a diverse selection of furniture shapes and paint options tailored to your room's dimensions. Additionally, our platform facilitates virtual meetings, allowing for seamless collaboration. For personalized consultations, we offer an optional feature within the App for a small additional fee.

1 Research Business Market



Define your project objectives by identifying the underlying issue and devising solutions.

Understand the demand for your project idea among the target audience.

This initiative aims to heighten awareness and streamline decor coordination, eliminating the necessity for a designer and associated expenses.

Its primary focus is to generate diverse and unique designs.



2 Write Business Plan



Uncover and comprehend customer preferences, delivering the most current and exceptional options that can be regularly refreshed.

This application allows for the presentation of the latest designs across various categories, offering customers numerous choices with well-organized ideas for modern design.

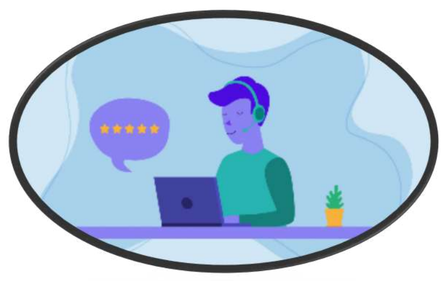
3 Obtain sufficient knowledge of Competitors



Thorough market analysis is conducted, keeping abreast of the latest developments and competitors' strategies to foster positive growth.

Within the design application, designs are curated using AI , tailored to fit the shape and size of each room effectively.

4 Offering the Service with the Capability to Receive Suggestions



Gathering people's feedback and suggestions bolsters their trust in the application, incorporating their past experiences in interior design.

Utilizing 3D technology enables visualizing spaces with furniture and paint colors, enhancing the overall experience.

5 Launch the Application & Check the Bulletin to Stay updated



Offering comprehensive project information along with user-friendly supplies and technology facilitates ease of use. The design application offers a plethora of features and innovative design suggestions to help users achieve their desired designs effortlessly.
The experience is intuitive and accessible, with the added benefit of being free to use.

Contact

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Al Maarefa University

nradwan@um.edu.sa

GITURO

A GUIDED LIGHT-EMITTING DIODE GUITAR INSTRUMENT

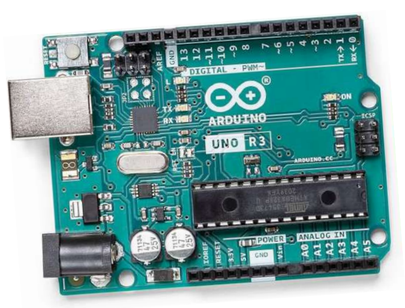
Team Trifolium

Mentor: Dr. Dary E. Dacanay

K

The idea of the Gituro was made for the beginners who find online guides confusing and expensive, plus to give people with physical or mental challenges the ability to learn and play the guitar with less difficulty. Gituro is an attachment for the guitar that will guide you with the chords using LED lights on the Fretboard along a song. Gituro has an onboard computer and LED strips to put on the Fretboard, you will be able use your phone to connect it with a Bluetooth via an app and will be asked to choose a song to play and practice.

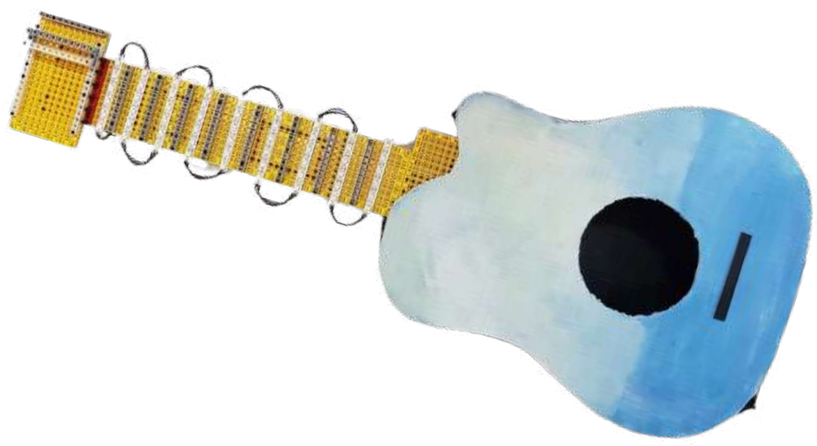
Microcontroller



Bluetooth Chip



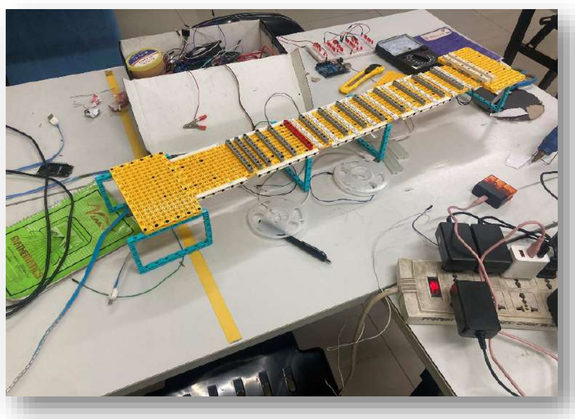


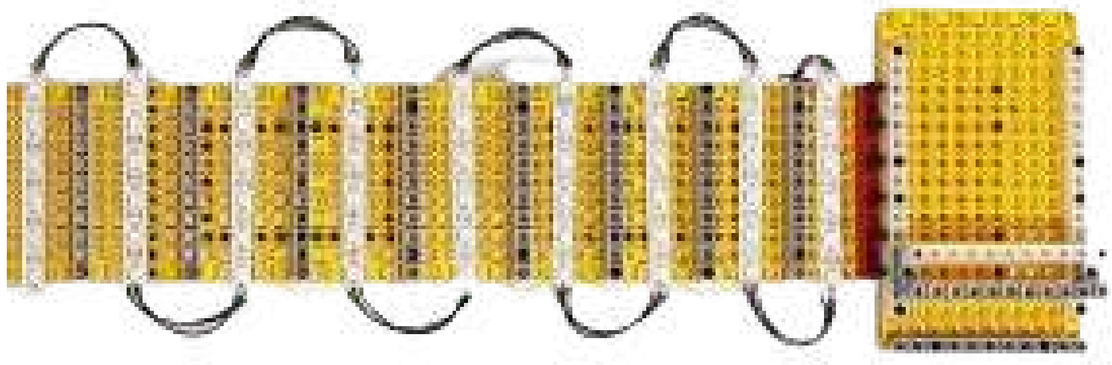


Gituro is oriented towards beginners and physically troubled learn through Gituro's app is easily interface and individuals, that are incapable of hearing are able to Gituro. accessible and simple to learn. The apps user friendly language support makes it accessible to anyone. The app will run on community made content, which means you can make your own songs!We conducted survey to 100 students from our school about their experiences in playing the guitar and these are the results, 45% of student who considered playing the guitar but got intimidated, 28% of the students who attempted but gave up, 7% were successful at playing the guitar, and 20% who did not consider playing the guitar. The respondents are all students of St. Patrick School of Quezon City from Junior High to Senior High.









Presentation link: ***https://youtu.be/ruSJV8AfMG0***

Benefits of Gituro

Gituro is for visual learners or the people looking to learn the guitar. It can help beginners visually identify the chord positions to make the process of learning and memorizing chords better and more memorable. The gituro can appeal to a wider audience making it an attractive choice for musicians or beginners to seek a new and affordable way to learn a guitar. One of us had a brilliant idea to implement a web interface so we switched our board from Arduino to another one with WIFI capabilities and used that as a web server. Online classes and tutorial is now accessible with gituro.

Contact: stpatrickschoolqc@gmail.com www.stpatrickschoolqc.edu.ph **02-7-7592274**

THE CONTRIBUTION OF A MECHATRONIC SYSTEM FOR WITHDRAWAL AND ARRANGEMENT OF MICROPHONE CABLES IN THE CONTEXT OF AUDIO SYSTEM OPTIMIZATION

Scientific Research Project

Authors: Aurel Mihail ȚÎȚU, Daniel BÂLC, Emanuel BÂLC

K

DESCRIPTION

The mechatronic system for withdrawal and arrangement of microphone cables is designed to fold onto the proposed surface, allowing for the pulling of the microphone with its associated cables and then retracting the cables once they are inserted into the stand mount, as can be seen in the following figure.



This mechatronic system aims to have a common interface with the conventional one so as not to alienate the user engaged in microphone usage. The mechatronic system involves the introduction of a microswitch into the stand mount similar to the one in the figure, which, when activated, triggers the system.



When the microphone is inserted into the support, the microswitch is activated, sending a signal to the system's base controller, which then activates the microphone cable retraction motor. The cable retracts on a bearing system with a protective sleeve, preventing it from falling off the cable's path until, following the unwinding, the second microswitch, mounted on the retraction support, signals to stop the retraction at the desired length, as depicted in the figures below.





The mechatronic system for microphone cable retraction and organization brings multiple benefits and utilities in various contexts of the audio industry. By automating the cable arrangement process, this system significantly reduces the time and effort required for configuring audio equipment, thereby enhancing operational efficiency. Eliminating cable tangling contributes to improved audio performance, ensuring a more pleasant sound experience for users. additionally, optimizing resource management, including time and space, facilitates efficient redistribution and increases productivity in audio production processes. Through the integration of mechatronic technology, this system reflects a commitment to innovation and technical progress in the audio industry, offering modern and efficient solutions for managing audio infrastructures.

THE SOLUTION PROVIDED BY THE MECHATRONIC SYSTEM FOR WITHDRAWAL AND ARRANGEMENT OF MICROPHONE CABLES

In environments such as recording studios, performance venues, or live events, where there is a multitude of cables that need to be organized to ensure smooth workflow and mitigate risks of accidents or degradation of sound quality, the mechatronic system for cable retraction and organization proves to be an asset in managing and organizing cables.

The possibility of cable tangling, especially with repeated use or in crowded environments, is no longer a concern, thanks to each cable being securely fastened along the predetermined path and the microphone being set in its stand mount.

In a crowded audio environment, quickly finding the right cables for necessary connections can be easily achieved with the help of the mechatronic system for cable retraction and organization. Especially in emergency situations such as cable failure due to aging, prompt identification is easily accomplished, and cable replacement can be done smoothly.

By implementing the mechatronic system for cable retraction and organization, the risk of cable damage is significantly reduced. advanced technology and precise handling methods ensure the protection of cables against bending or tearing during frequent use or in crowded environments, thereby contributing to maintaining their integrity and avoiding interruptions in the sound flow.

The implementation of the mechatronic system for cable retraction and organization contributes to increasing the level of safety in audio environments. Cables are installed and organized according to safety standards, thus preventing risks of accidents or incidents such as tripping or obstructing event participants. This professional approach ensures a safe and protected working environment for all involved.

Introducing the presented system into audio system usage reveals its capability for efficient utilization of available space in audio environments. The compact technology and intelligent organization methods reduce the bulk of exposed cables and minimize space occupancy, thereby optimizing the utilization of every square meter. Consequently, a more open and airy environment is created without compromising the functionality or quality of the audio systems.

CONCLUSIONS AND DISCUSSIONS:

By implementing the mechatronic system for microphone cable retraction and organization, multiple benefits are observed in the audio industry. Improved operational efficiency is evident due to the automation of the cable arrangement process, thereby reducing the time and effort required for configuring audio equipment. additionally, audio performance is enhanced by eliminating cable tangling, ensuring a more pleasant sound experience. Through resource management optimization, time and space can be efficiently redistributed, contributing to increased productivity and operational efficiency. The mechatronic system represents an innovative and intelligent solution for managing audio infrastructures, reflecting a commitment to innovation and technical progress in the audio industry. Thus, the implementation of this system brings significant benefits in terms of performance, efficiency, and quality, meeting the modern needs of audio production.

Contact: „Lucian Blaga” University of Sibiu, PATLIB Centre of Sibiu, 4 Emil Cioran Street, Room IM 100, Phone +40 744 390 290, mihail.titu@yahoo.com

Opportunity
CORNELIUGROUP Research-Innovation Association
Creation
INVENTCOR
Realization
Power of Creative Mind
Deva ROMANIA

Bradean's Channel

GAMING IS FUN

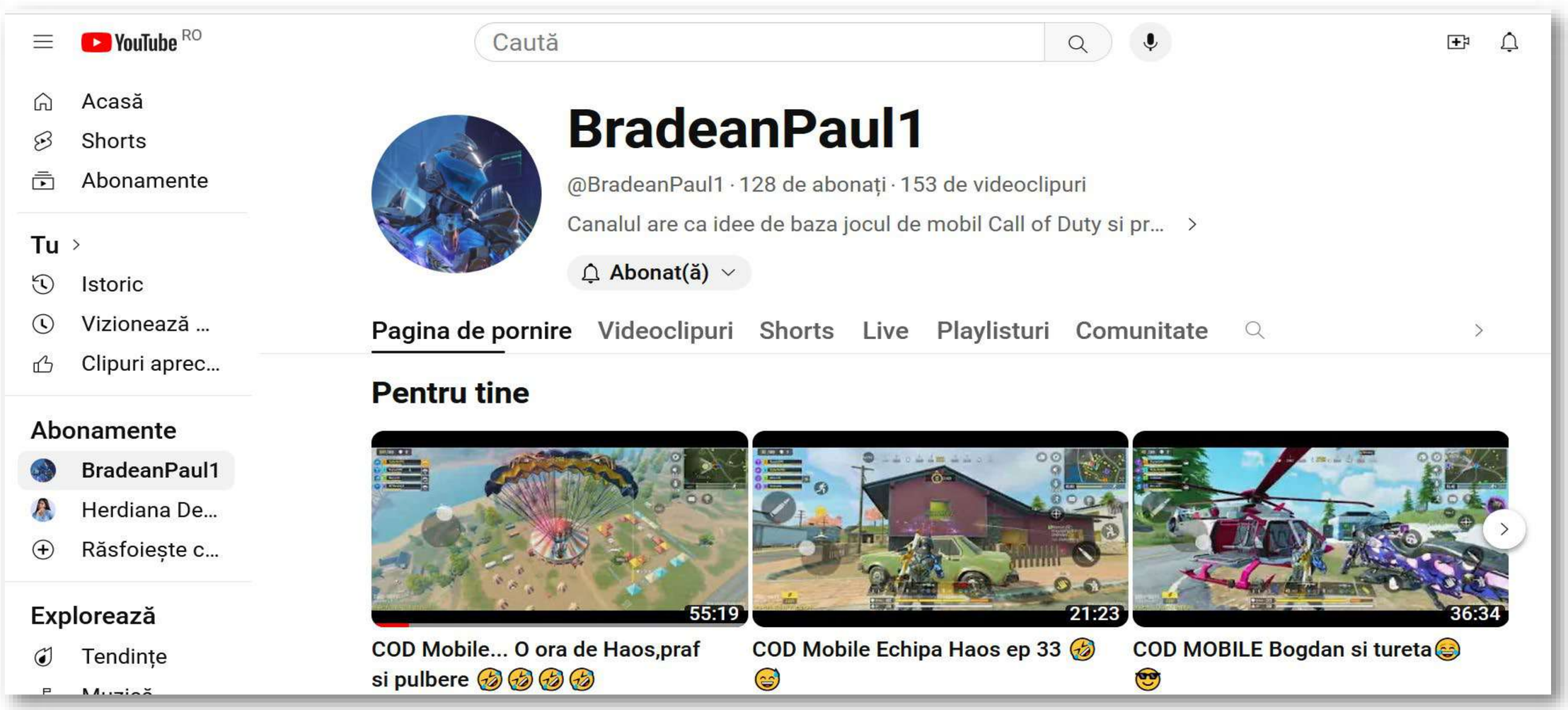
Game Project

Author: Paul BRADEAN

E

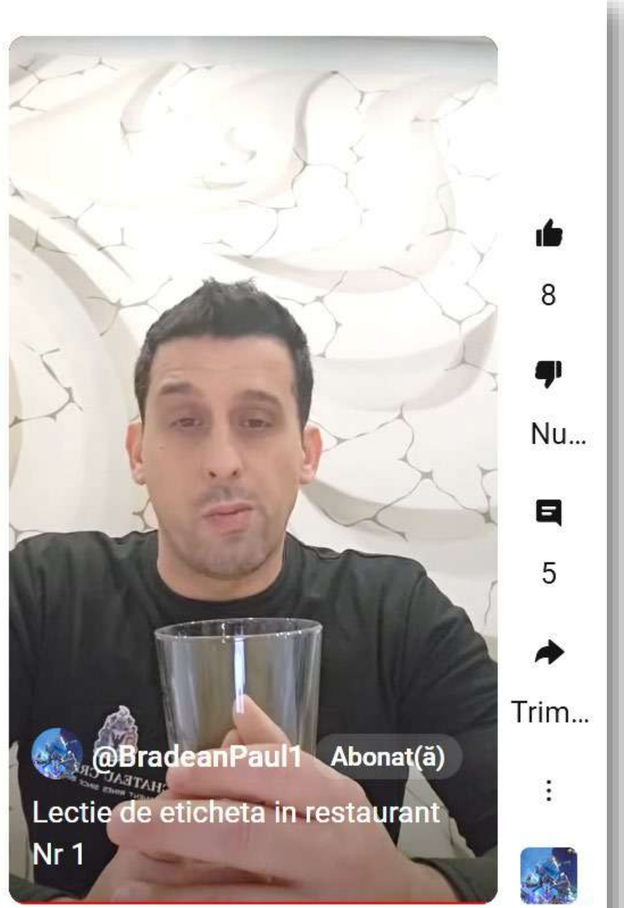
The channel has as its basic idea the mobile game Call of Duty and presents to the followers the head-to-head matches of the players from the clan, (Team Chaos), trying to remind the gamers that the games are made for fun and to take into account fair play.

At the same time, it will be gradually introduced (Etiquette Lesson) where we will present restaurant etiquette from both points of view, both of the employee and of the Horeca customers.





COD Mobile... O ora de Haos,praf si pulbere



Contact: *bradean_paul@yahoo.com* ***TikTok paulbradean1***

Presentation link: https://www.youtube.com/watch?v=RSiAxsAp67Q

SCAN ME

CORINA's Art

THE POETRY OF CREATION

Author: Corina Gianina Popa (Uieț)

K

The miracles of everyday life in the battle against the elements. Water, sun, sky, earth, sunset, grace, the wonders of the Creator.















Contact: popa.corina@hotmail.com

“Ordinary”

Student Project

Author: Maksimović Milica

K

I tried taking pictures of the beautiful scenery of my hometown. What I ended up with were pictures that inspire a dream-like sense of adventure, like anything’s possible. Rather than representing my hometown, it’s more of a look into how I view my surroundings.

Without capturing any important landmarks, I simply took my camera with me on a walk, taking pictures at odd angles and getting inspiration from the “ordinary” world around us.

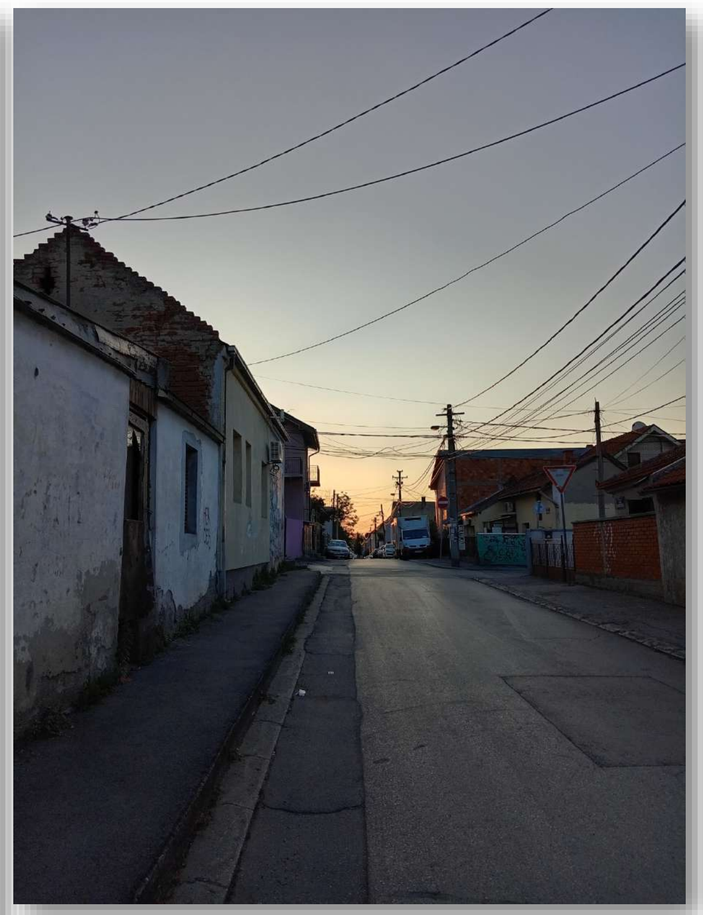
I made shots that were interesting to me, and I hope you can enjoy them too and find some inspiration from them.











Contact:

milicamaksimovic200@gmail.com

+3811622955510

THE SYMPHONY OF COLORS

Art & Painting

- IULIA BARTOK -

Painting is my passion and I do it with great enthusiasm and seriousness. Through painting I can express my imaginative and creative side which offers me the chance to delight people's eyes.

Most of my paintings are personalized and made according to clients requirements, representing: favorite activities, pets, portraits, favorite locations, flowers, favorite music. I paint on textiles, ceramics, glass and leather using proper and quality materials.

Customized products: Glass painting / Ceramic painting / Leather painting / Canvas painting



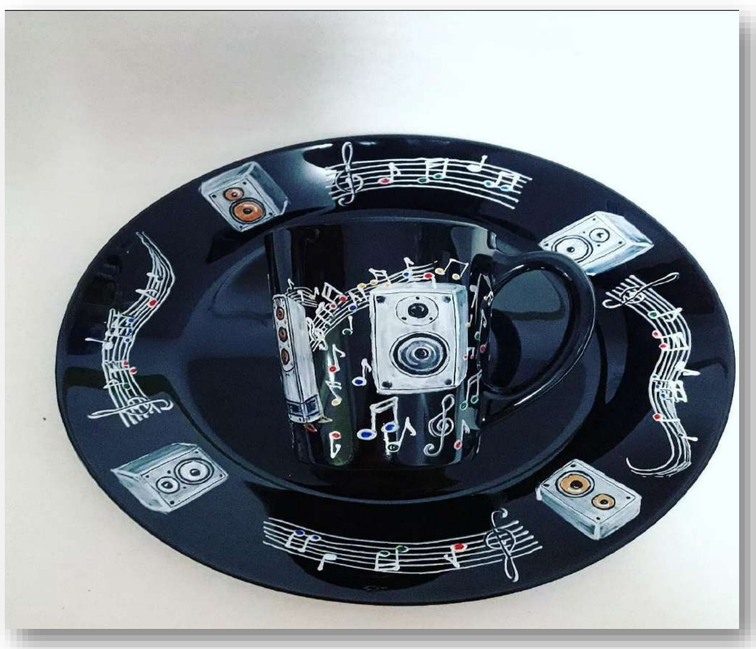












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Romanian Folk Tales

AI Generated Art

Author: Irina Fachin

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“Romanian Folk Tales” unveils a digital tapestry of Romania’s rich folklore through AI artistry. The exhibit features young Romanians adorned in traditional costumes, their garments rendered with striking detail against fantastical landscapes. Each artwork is a digital homage to the nation’s heritage, blending historical motifs with contemporary art techniques.

The gallery space becomes a bridge between eras, where AI interprets timeless stories in a visual format. The portraits are more than mere images; they are narratives that celebrate Romania’s cultural saga, re-envisioned with a touch of modernity. Visitors are invited to traverse this fusion of past and future, where each piece resonates with the echoes of folklore.

Expanding the narrative, the exhibition offers a unique perspective on tradition and technology. It’s a creative exploration that challenges the boundaries of art and storytelling. As viewers move from one piece to the next, they engage with a visual feast that redefines the essence of Romanian folk tales for a new generation.







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SCAN ME

EM Art Gallery-Deva

Gallery

Author: Mircea POPITIU

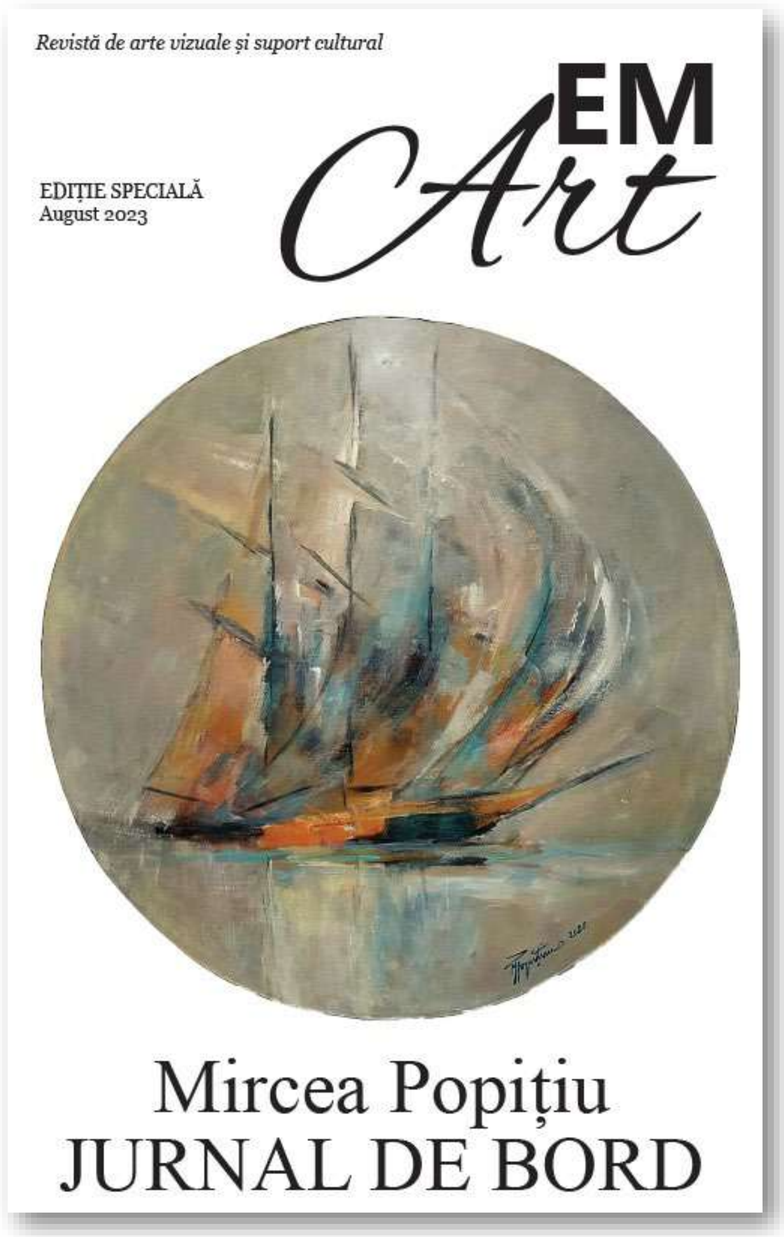
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EM Art Gallery-Deva was born from the desire to promote contemporary visual artists, on December 5, 2018. From the beginning to the present, more than 50 contemporary professional artists have been exhibited, the gallery registering as the first private gallery in Hunedoara County!

Artists from the main cities in Romania and artists from France, the USA and the Republic of Moldova exhibited on the EM Art Gallery!

Out of the desire to do more, we have created a magazine of visual arts and cultural support entitled EM Art.









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SCAN ME

ADVERTISING ROBOT

Research project

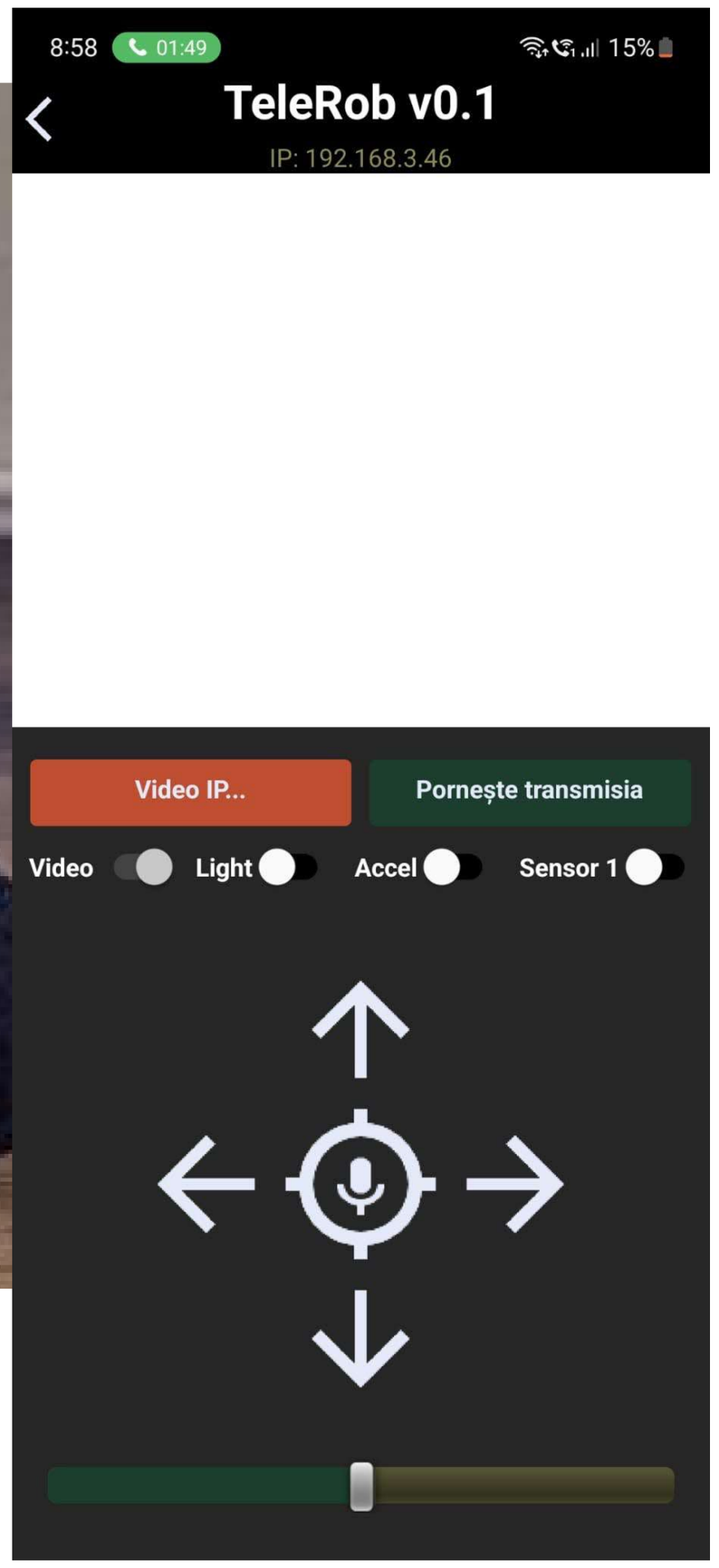
Author/s: Petrariu Sebastian Daniel (student);
Paul Țoța (coordinator)

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This project consists of an advertising robot, consisting of a modular chassis and controlled via an ESP32 development board with a microcontroller.
Through a mobile app, the robot can be controlled by a human user or an autonomous system can be initiated.

A tablet is mounted on the robot and displays randomly selected or pre-programmed advertising clips in a loop.





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