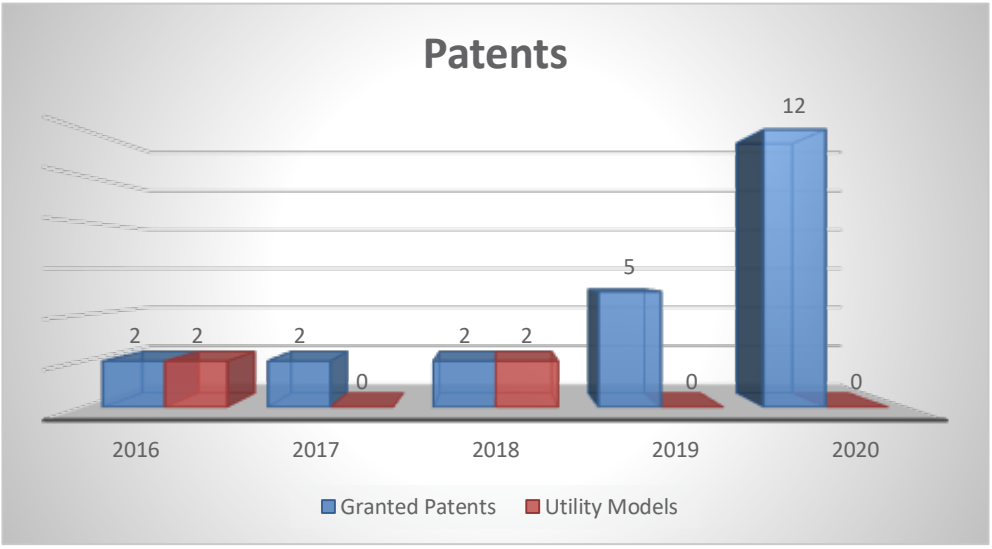
PATENTS

EVOLUTION OF PATENTS UNDER AFFILIATIONS OF UPT 2016 - 2020



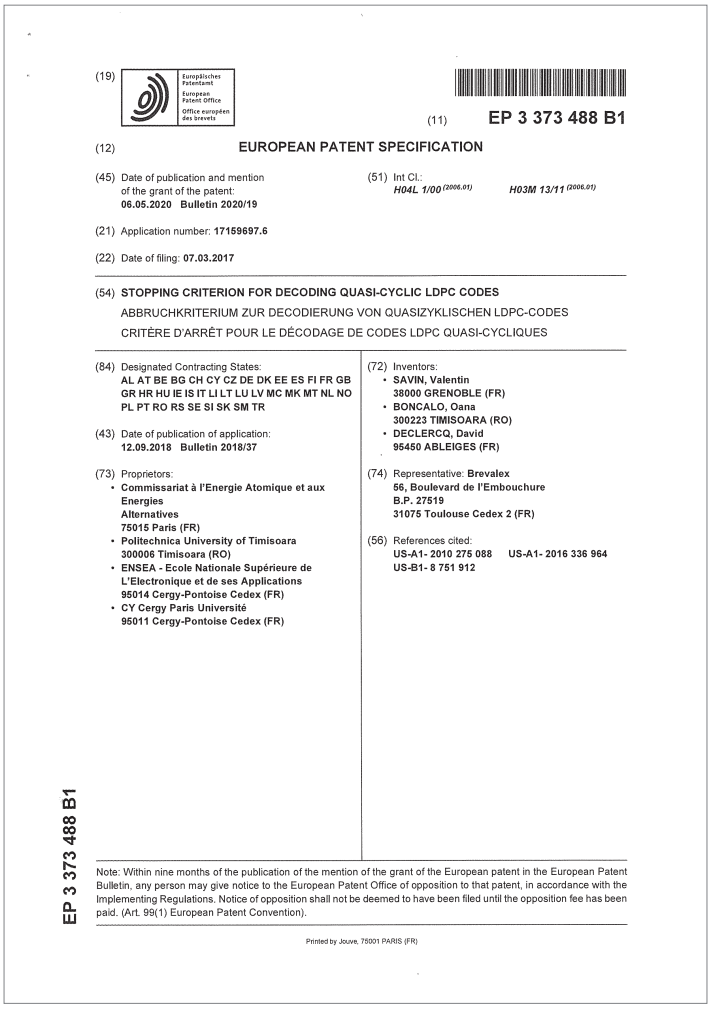
The innovative capacity of the Politehnica University Timisoara is supported by teachers and scientific researchers through patents and utility models invented, presented in this section.

Granted Patents

INVENTORS: VALENTIN SAVIN, OANA BONCALO, DAVID DECLERCQ

PATENT NO. 3373488 / 2020

STOPPING CRITERION FOR DECODING QUASI-CYCLIC LDPC CODES



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(11) EP 3 373 488 B1

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(45) Date of publication and mention of the grant of the patent: **06.05.2020 Bulletin 2020/19**

(51) Int Cl.: *H04L 1/00* (2006.01) *H03M 13/11* (2006.01)

(21) Application number: **17159697.6**

(22) Date of filing: **07.03.2017**

(54) **STOPPING CRITERION FOR DECODING QUASI-CYCLIC LDPC CODES**
ABBRUCHKRITERIUM ZUR DECODIERUNG VON QUASIZYKLISCHEN LDPC-CODES
CRITÈRE D'ARRÊT POUR LE DÉCODAGE DE CODES LDPC QUASI-CYCLIQUES

(84) Designated Contracting States: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**

(43) Date of publication of application: **12.09.2018 Bulletin 2018/37**

(73) Proprietors:
- **Commissariat à l'Energie Atomique et aux Energies Alternatives**
  75015 Paris (FR)
- **Politechnica University of Timisoara**
  300006 Timisoara (RO)
- **ENSEA - Ecole Nationale Supérieure de L'Electronique et de ses Applications**
  95014 Cergy-Pontoise Cedex (FR)
- **CY Cergy Paris Université**
  95011 Cergy-Pontoise Cedex (FR)

(72) Inventors:
- **SAVIN, Valentin**
  38000 GRENOBLE (FR)
- **BONCALO, Oana**
  300223 TIMISOARA (RO)
- **DECLERCQ, David**
  95450 ABLEIGES (FR)

(74) Representative: **Brevalex**
56, Boulevard de l'Embouchure
B.P. 27519
31075 Toulouse Cedex 2 (FR)

(56) References cited:
US-A1- 2010 275 088 **US-A1- 2016 336 964**
US-B1- 8 751 912

EP 3 373 488 B1

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Printed by Jouve, 75001 PARIS (FR)

The present invention relates to the field of LDPC (Low-Density Parity Check) codes and concerns more particularly an early stopping criterion for decoding Quasi-Cyclic LDPC codes.

In the following, it will be assumed for the sake of simplification but without loss of generality, that the LDPC code is binary, that the code is defined over $GF(2)$. However, it will be clear for the man skilled in art that the invention equally applies to non-binary LDPC codes defined over $GF(2^b)$ where b is an integer such that $b>1$.

The idea underlying the present invention is to propose a new on-the-fly measure for terminating the decoding iterations of a layered LDPC decoder, for example a QC-LDPC decoder. This measure is used for defining a new family of stopping criteria, hereinafter referred to as In-Between Layers Partial Syndrome (IBL-PS).

Basically, the IBL-PS is a partial syndrome defined by two consecutive layers (bilayer). More specifically, if we denote $\mathbf{H}_{r,\,r+1}$ the $2L$ x N sub-matrix of the parity-check matrix $\mathbf{H}$ constituted by the concatenation of the matrices $\mathbf{H}_r$ and $\mathbf{H}_{r+1}$, for $r = 0, \ldots, R - 1$ (assuming that the layers are indexed modulo R, i.e. the layer following the layer $R - 1$ is the layer 0), the IBL-PS syndrome between layers r and $r + 1$ is defined as:

$$\mathbf{s}_{r,r+1} = \mathbf{H}_{r,r+1}\hat{\mathbf{x}}_r^T$$

where $\hat{\mathbf{x}}_r = \left(\hat{x}_{r,1}, \hat{x}_{r,2}, \ldots, \hat{x}_{r,N}\right)$ is the hard decision vector (signs of AP-LLRs) after processing layer r and before processing $r + 1$. It is important to understand that the IBL-PS is calculated on the same word (vector $\hat{\mathbf{x}}_r$) output by the decoding of layer r.

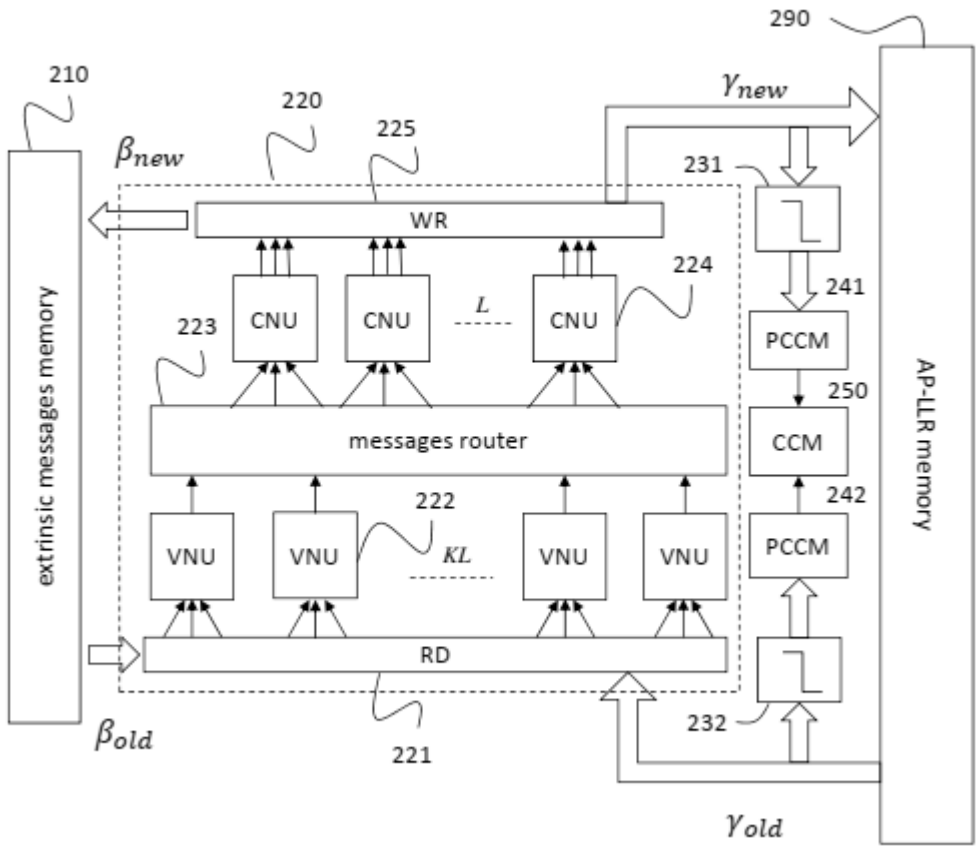
The IBL-PS criterion is defined by:

$$if\ \exists r \in \{0, \ldots, R-1\}\ \text{such that}\ \mathbf{s}_{r,r+1} = \mathbf{0}_{2L}\ \text{decoding stops}$$

More generally, we define a family of stopping criteria involving a plurality of IBL-PS syndromes, denoted IBL-PS(θ) where $\theta \geq 1$ defined by:

$$if\ \exists r \in \{0, \ldots, R-1\}\ \text{such that}\ \mathbf{s}_{r,r+1} = \mathbf{s}_{r+1r,r+2} = \ldots = \mathbf{s}_{r+\theta-1,r+\theta} = \mathbf{0}_{2L}\ \text{decoding stops}$$

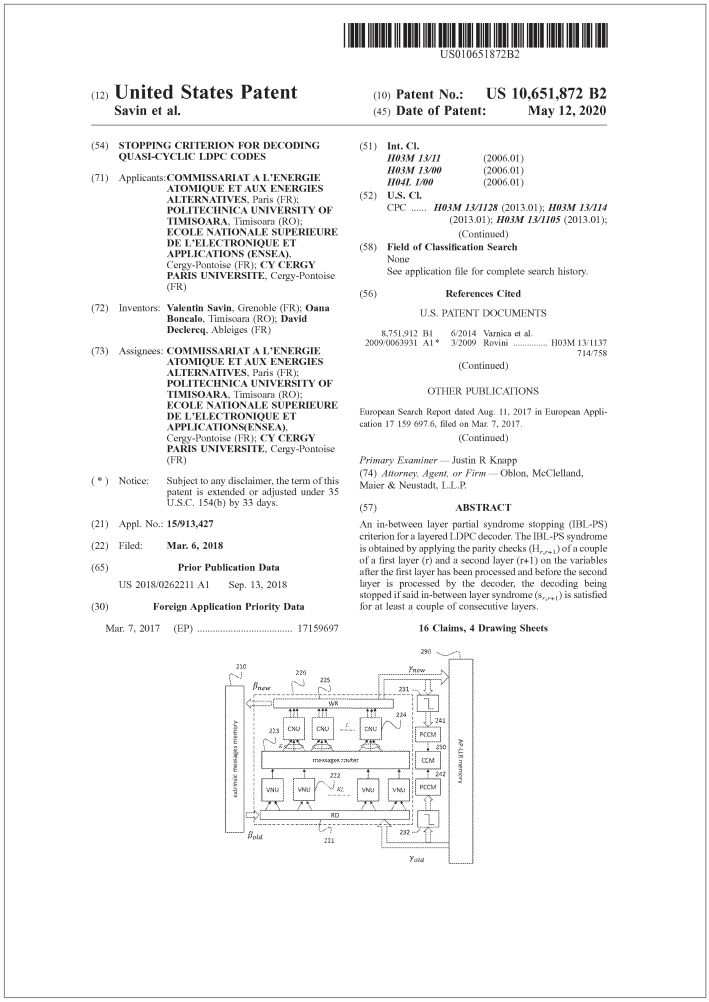
In other words, if the IBL-PS syndromes calculated for a plurality of θ consecutive layers are null, then the decoding is stopped. Within the family of stopping criteria IBL-PS(θ), the minimum value for θ is $\theta = 1$, and corresponds to the lowest latency case, since the decoder will stop as soon as any IBL-PS in satisfied. However, increasing the value of θ will render the stopping criteria safer and safer.



INVENTORS: VALENTIN SAVIN, OANA BONCALO, DAVID DECLERCQ

PATENT NO. US 10651872 B2 / 2020

STOPPING CRITERION FOR DECODING QUASI-CYCLIC LDPC CODES



US010651872B2

(12) **United States Patent**
Savin et al.

(10) **Patent No.: US 10,651,872 B2**
(45) **Date of Patent: May 12, 2020**

(54) **STOPPING CRITERION FOR DECODING QUASI-CYCLIC LDPC CODES**

(71) Applicants: **COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES**, Paris (FR); **POLITECHNICA UNIVERSITY OF TIMISOARA**, Timisoara (RO); **ECOLE NATIONALE SUPERIEURE DE L'ELECTRONIQUE ET APPLICATIONS (ENSEA)**, Cergy-Pontoise (FR); **CY CERGY PARIS UNIVERSITE**, Cergy-Pontoise (FR)

(72) Inventors: **Valentin Savin**, Grenoble (FR); **Oana Boncalo**, Timisoara (RO); **David Declercq**, Ableiges (FR)

(73) Assignees: **COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES**, Paris (FR); **POLITECHNICA UNIVERSITY OF TIMISOARA**, Timisoara (RO); **ECOLE NATIONALE SUPERIEURE DE L'ELECTRONIQUE ET APPLICATIONS(ENSEA)**, Cergy-Pontoise (FR); **CY CERGY PARIS UNIVERSITE**, Cergy-Pontoise (FR)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 33 days.

(21) Appl. No.: **15/913,427**

(22) Filed: **Mar. 6, 2018**

(65) **Prior Publication Data**

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(30) **Foreign Application Priority Data**

Mar. 7, 2017 (EP) 17159697

(51) **Int. Cl.**
H03M 13/11 (2006.01)
H03M 13/00 (2006.01)
H04L 1/00 (2006.01)

(52) **U.S. Cl.**
CPC ***H03M 13/1128*** (2013.01); ***H03M 13/114*** (2013.01); ***H03M 13/1105*** (2013.01);
(Continued)

(58) **Field of Classification Search**
None
See application file for complete search history.

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(Continued)

Primary Examiner — Justin R Knapp
(74) *Attorney, Agent, or Firm* — Oblon, McClelland, Maier & Neustadt, L.L.P.

(57) **ABSTRACT**

An in-between layer partial syndrome stopping (IBL-PS) criterion for a layered LDPC decoder. The IBL-PS syndrome is obtained by applying the parity checks ($H_{l,c_{\nu,l+1}}$) of a couple of a first layer (*l*) and a second layer (*l*+1) on the variables after the first layer has been processed and before the second layer is processed by the decoder, the decoding being stopped if said in-between layer syndrome ($s_{v,l+1}$) is satisfied for at least a couple of consecutive layers.

16 Claims, 4 Drawing Sheets

The present invention relates to the field of LDPC (Low-Density Parity Check) codes and concerns more particularly an early stopping criterion for decoding Quasi-Cyclic LDPC codes.

In the following, it will be assumed for the sake of simplification but without loss of generality, that the LDPC code is binary, that the code is defined over $GF(2)$. However, it will be clear for the man skilled in art that the invention equally applies to non-binary LDPC codes defined over $GF(2^b)$ where b is an integer such that $b>1$.

The idea underlying the present invention is to propose a new on-the-fly measure for terminating the decoding iterations of a layered LDPC decoder, for example a QC-LDPC decoder. This measure is used for defining a new family of stopping criteria, hereinafter referred to as In-Between Layers Partial Syndrome (IBL-PS).

Basically, the IBL-PS is a partial syndrome defined by two consecutive layers (bilayer). More specifically, if we denote $\mathbf{H}_{r,\,r+1}$ the $2L$ x N sub-matrix of the parity-check matrix $\mathbf{H}$ constituted by the concatenation of the matrices $\mathbf{H}_r$ and $\mathbf{H}_{r+1}$, for $r = 0, \ldots, R - 1$ (assuming that the layers are indexed modulo R, i.e. the layer following the layer $R - 1$ is the layer 0), the IBL-PS syndrome between layers r and $r + 1$ is defined as:

$$\mathbf{s}_{r,r+1} = \mathbf{H}_{r,r+1}\hat{\mathbf{x}}_r^T$$

where $\hat{\mathbf{x}}_r = \left(\hat{x}_{r,1}, \hat{x}_{r,2}, \ldots, \hat{x}_{r,N}\right)$ is the hard decision vector (signs of AP-LLRs) after processing layer r and before processing $r + 1$. It is important to understand that the IBL-PS is calculated on the same word (vector $\hat{\mathbf{x}}_r$) output by the decoding of layer r.

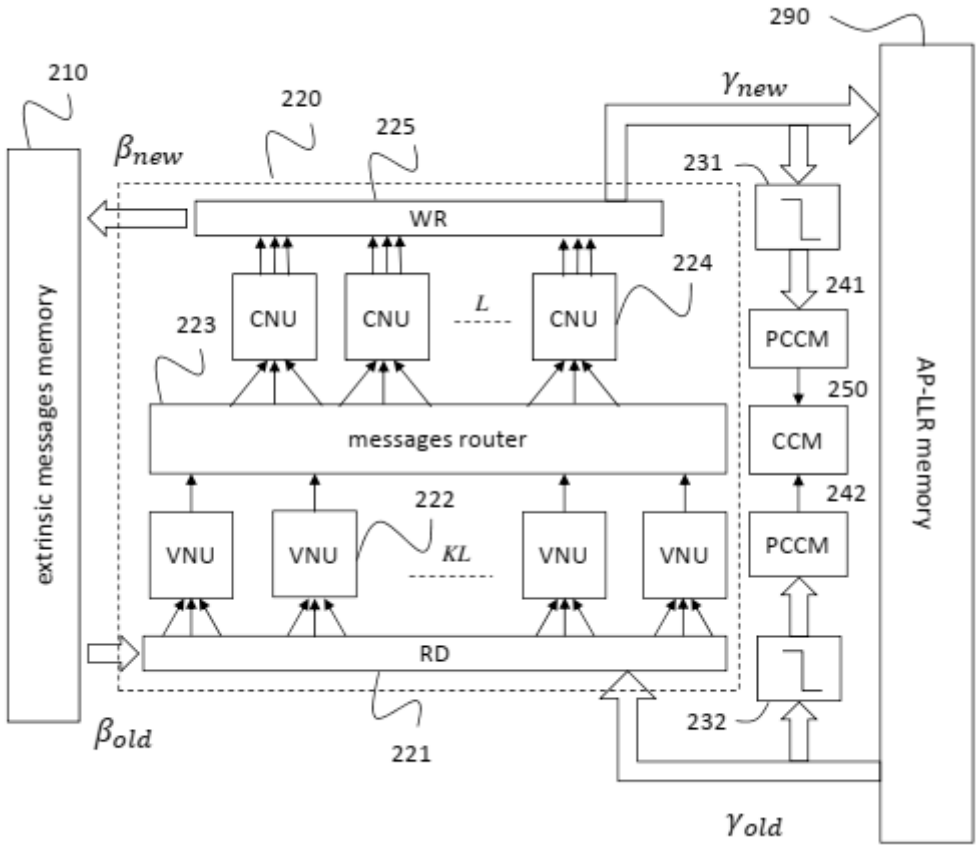
The IBL-PS criterion is defined by:

$$if\ \exists r \in \{0, \ldots, R-1\}\ \text{such that}\ \mathbf{s}_{r,r+1} = \mathbf{0}_{2L}\ \text{decoding stops}$$

More generally, we define a family of stopping criteria involving a plurality of IBL-PS syndromes, denoted IBL-PS(θ) where $\theta \geq 1$ defined by:

$$if\ \exists r \in \{0, \ldots, R-1\}\ \text{such that}\ \mathbf{s}_{r,r+1} = \mathbf{s}_{r+1r,r+2} = \ldots = \mathbf{s}_{r+\theta-1,r+\theta} = \mathbf{0}_{2L}\ \text{decoding stops}$$

In other words, if the IBL-PS syndromes calculated for a plurality of θ consecutive layers are null, then the decoding is stopped. Within the family of stopping criteria IBL-PS(θ), the minimum value for θ is $\theta = 1$, and corresponds to the lowest latency case, since the decoder will stop as soon as any IBL-PS in satisfied. However, increasing the value of θ will render the stopping criteria safer and safer.



INVENTORS: CRACIUNESCU CORNELIU MARIUS, BUDAU VICTOR, MITELEA ION

PATENT NO. 128675 / 2020

ACTUATOR WITH THERMO-MAGNETIC CONTROL OF POSITION

ROMÂNIA

OFICIUL DE STAT PENTRU INVENŢII ŞI MĂRCI

BREVET DE INVENŢIE

Nr. 128675

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: UNIVERSITATEA POLITEHNICA DIN TIMIŞOARA, TIMIŞOARA, TM, RO

Titlul invenţiei: ACTUATOR CU CONTROL TERMO-MAGNETIC AL POZIŢIEI

Inventatori: CRĂCIUNESCU CORNELIU MARIUS, TIMIŞOARA, TM, RO; BUDĂU VICTOR, TIMIŞOARA, TM, RO; MITELEA ION, TIMIŞOARA, TM, RO

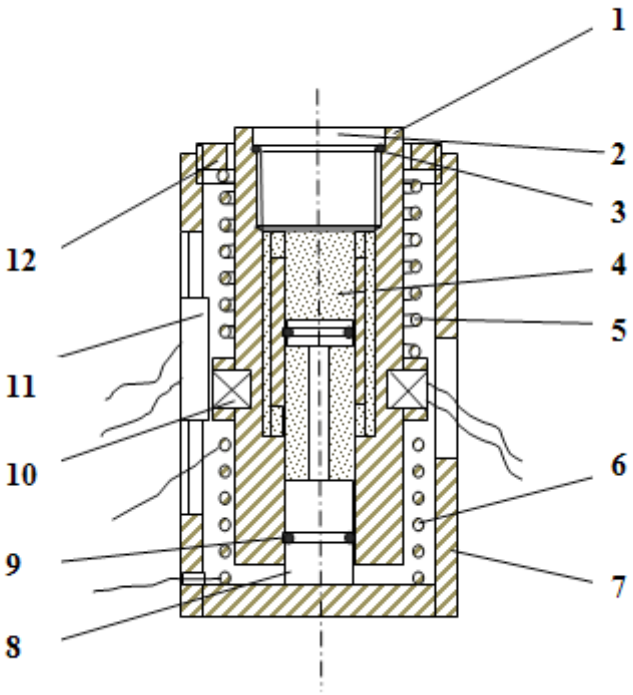
Descrierea invenţiei, revendicările şi desenele la care se face referinţă în acestea, fac parte integrantă din prezentul brevet de invenţie.
Durata brevetului de invenţie este de 20 ani, cu începere de la data de 23/11/2012, cu condiţia plăţii taxelor anuale de menţinere în vigoare a brevetului.

Confirm cele de mai sus prin semnarea şi aplicarea sigiliului
Director General

Bucureşti, Data eliberării 28/02/2020

The invention refers to an actuator which allows reaching distinct positions in non-motorized actuators, by combining the contribution of a shape memory alloy and a magnetorheological fluid.

According to the invention, the actuator with thermal and magnetic position control uses a movable rod (1) inside which a magnetorheological fluid (4) is transferred by a piston (8) during actuation by an antagonistic mechanism consisting of a spring (5) and a shape memory alloy spring (6) which rests on the actuator body (7). The locking of the actuator in a position, established by locating the position sensor (11), is achieved by modifying the characteristics of the magnetorheological fluid (4) under the action of the magnetic field produced by the electromagnet (10).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INVENTORS: GONTEAN AUREL STEFAN, CERNAIANU MIHAIL OCTAVIAN

PATENT NO. 129498 / 2020

INTELLIGENT CONTROL DEVICE FOR LIGHT SWITCHES

ROMÂNIA

OFICIUL DE STAT PENTRU INVENȚII ȘI MĂRCI

BREVET DE INVENȚIE

Nr. 129498

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: UNIVERSITATEA POLITEHNICA DIN TIMIŞOARA, TIMIŞOARA, TM, RO

Titlul invenției: DISPOZITIV CU COMANDĂ INTELIGENTĂ PENTRU ÎNTRERUPĂTOARE CU MARTOR LUMINOS

Inventatori: GONTEAN AUREL ŞTEFAN, TIMIŞOARA, TM, RO; CERNAIANU MIHAIL OCTAVIAN, CRAIOVA, DJ, RO

Descrierea invenției, revendicările şi 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 15/11/2013, cu condiția plății taxelor anuale de menținere în vigoare a brevetului.

Confirm cele de mai sus prin semnarea şi aplicarea sigiliului
Director General

București, Data eliberării 28/02/2020

The invention relates to a device for switches with light indicator, integrated in a lighting control system controlled by microcontroller, for the lighting of domestic or industrial rooms in order to reduce electricity consumption.

The intelligent control device for light-switched switches according to the invention consists of:

- some classic switches (with return) 1 equipped with some LED lights -LED- 2
- some connecting wires 3
- a control microsystem 4, with a (internal) resistor 6 of pull-up, configurable
- a power driver block 5
- photoresist sensors 7 and proximity sensors 8.
- a current limiting resistor 9

According to the scheme shown in figure 1, the microcontroller 4 will generate interruptions periodically, at 10 ms. This range is chosen for compatibility with European triac or IGBT lighting control systems, where a zero-crossing detector synchronizes the operation of the controller every 10 ms. For a DC lighting system, the 10 ms interval is generated by an internal microcontroller timer.

The I / O1 pin is configured in output mode; most of the time the output is in logic state 0 and the control LED 1 is off. When the warning light is desired, the output is set to logic 1.

A pull-up resistor (configurable, internal to most current microcontrollers) is connected internally to the I / O1 pin. Every 10 ms, the I / O1 pin is switched to input mode for a few microseconds (depending on the clock frequency of the microcontroller) and read (1 logic if switch 1 is open, respectively 0 logic if 1 is closed). The few microseconds in which the indicator light is off are not noticeable to the user. The external resistor 9 limits the current through the output pin of the microcontroller.

The selective control of the illumination of the indicator lights 2 is done by analyzing the following situations:
1. Analyzing natural light with an optical detector. A single external sensor, for example a photoresistor 7, informs one of the control systems of the external illumination level and depending on this level the decision is made to switch all the warning lights on or off. This (simple) approach does not solve the problem of differentiated switching on / off of the warning lights; but it has the advantage of low cost.
2. Analyzing the illumination of each room with an internal sensor, for example with a photoresistor 7, which informs the control system on the lighting level in the respective room. This approach allows differentiated illumination of the indicator light in that room.
3. Detecting a person's approach with a PIR 8 proximity sensor that controls the indicator light. The additional presence of a light sensor 7 also eliminates the illumination of the light indicator during the day.
In the case of an intelligent, multiprocessor system, distributed throughout the building and used for lighting control, the building will have a network of PIR 8 sensors and 7 light sensors in the rooms to control the lighting according to the specific conditions in each room. In this case the communication between the control systems is realized by means of a transceiver and a dedicated bus, using the I / OCOM pins of the microcontroller 4.

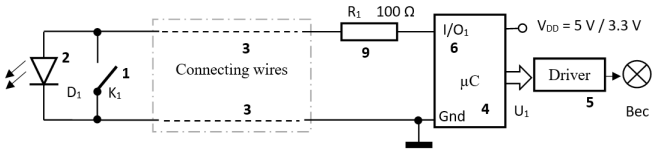


Figure 1. Block diagram of the device - 2-wire connection

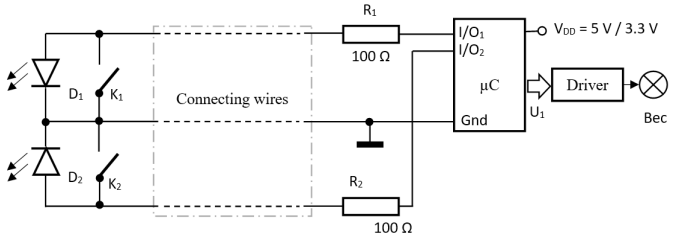


Figure 2. Block diagram of the device - 3-wire connection (allows light intensity control)

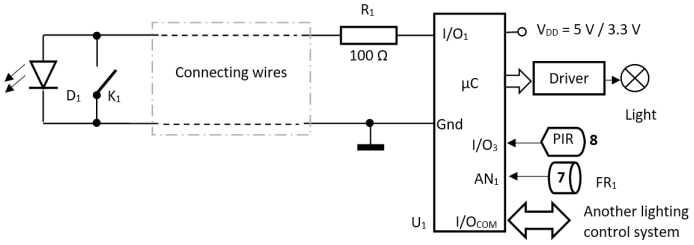


Figure 3. Complete device - 2-wire connection

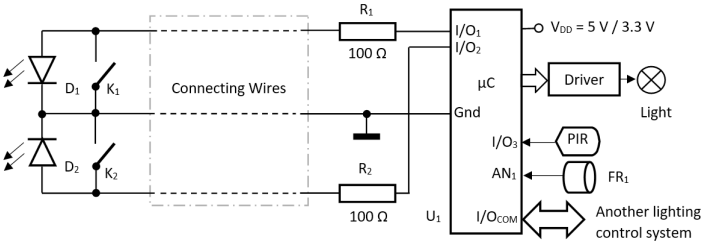


Figure 4. Complete device - 3-wire connection (allows light intensity control)

INVENTORS: BĂNICĂ RADU NICOLAE, KELLENBERGER ANDREA ROZALIA, URSU DANIEL HORAŢIU, CSEH LILIANA, LINUL PETRICĂ, VASZILCSIN NICOLAE

PATENT NO. 132480 / 2020

PROCESS FOR THE SYNTHESIS OF SILVER NANOWIRES COATED WITH LOW MELTING POINT METAL NANOPARTICLES, SELECTED FROM INDIUM AND TIN

ROMÂNIA

OFICIUL DE STAT PENTRU INVENŢII ŞI MĂRCI

BREVET DE INVENŢIE

Nr. 132480

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: UNIVERSITATEA POLITEHNICA DIN TIMIŞOARA, TIMIŞOARA, TM, RO

Titlul invenţiei: PROCEDEU DE SINTEZĂ A NANOFIRELOR DE ARGINT ACOPERITE CU NANOPARTICULE METALICE CU PUNCT DE TOPIRE SCĂZUT, SELECTATE DINTRE INDIU ŞI STANIU

Inventatori: BĂNICĂ RADU NICOLAE, DEVA, HD, RO; KELLENBERGER ANDREA ROZALIA, MOŞNIŢA VECHE, TM, RO; URSU DANIEL HORAŢIU, TIMIŞOARA, TM, RO; CSEH LILIANA, TIMIŞOARA, TM, RO; LINUL PETRICĂ, COMUNA ŞIBOT, AB, RO; VASZILCSIN NICOLAE, TIMIŞOARA, TM, 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 14/10/2016, cu condiţia plăţii taxelor anuale de menţinere în vigoare a brevetului.

Confirm cele de mai sus prin semnarea şi aplicarea sigiliului
Director General

Bucureşti, Data eliberării 30/04/2020

OFICIUL DE STAT PENTRU INVENŢII ŞI MĂRCI • ROMÂNIA •

The invention relates to a synthesis method of silver nanowires decorated with low melting point metallic nanoparticles, such as indium or tin, which can be used for making conductive paths on suports in the the construction of solar cells or optoelectronic devices.

A great challenge in the actual research of solar-to-electricity conversion is the construction of flexible solar cells without using indium tin oxide (ITO). Silver nanowires (AgNWs) are a promising candidate to replace ITO due to their high electric conductivity and corrosion resistance, but there is still the issue of increased resistance on wire contacts.

The proposed solution, which is subject of one national patent, involves deposition of low melting point metallic nanoparticles on the surface of silver nanowires, allowing to weld the nanowires and to obtain a network with high electrical conduction paths.

This invention can be used in the field of solar cells or optoelectronic devices such as flexible light emmiting diodes (LEDs), organic thin film transistors or electronic paper by depositing functionalized silver nanowires with low melting point metal nanoparticles on flexible substrates, followed by sintering them at low temperatures and obtaining high conductivity paths, necessary for the construction of such devices.

The technical problem of the invention is to develop a process for functionalizing silver nanowires with low melting point metal nanoparticles, in order to allow their sintering at low temperatures on various flexible or rigid supports. The developed process is simple, allows the deposition of metallic nanoparticles with low melting point directly on the surface of silver nanowires, by reducing the corresponding metal ions, without the need to use an intermediate molecule to allow their anchoring on the nanowires.

The process according to the invention consists in the fact that in a first stage the silver nanowires with diameters of 100 . . . 500 nm and lengths of over 20 micrometers are obtained, by the solvothermal technique, after which in a second stage on the synthesized silver nanowires quasispherical indium (In) or tin (Sn) nanoparticles with dimensions of 2 . . .50 nm are deposited directly at temperatures of 25 . . .90°C, resulting in silver nanowires functionalized with indium or tin nanoparticles that allow subsequent sintering at low temperatures.

The novelty of the invention is that the indium and tin nanoparticles used in the process of the invention have lower melting points than silver nanowires, so that subsequent sintering can be performed at a lower temperature.

The invention has the following advantages:

(i) the functionalization of silver nanowires takes place by a simple process;

(ii) allows the deposition of metallic nanoparticles with a low melting point directly on the surface of silver nanowires;

(iii) the deposition of nanoparticles takes place directly, by reducing the corresponding metal ions, without the need to use an intermediate molecule to allow their anchoring on the nanowires;

(iv) the indium and tin nanoparticles used in the process of the invention have lower melting points than silver nanowires, so that subsequent sintering can be performed at a lower temperature.

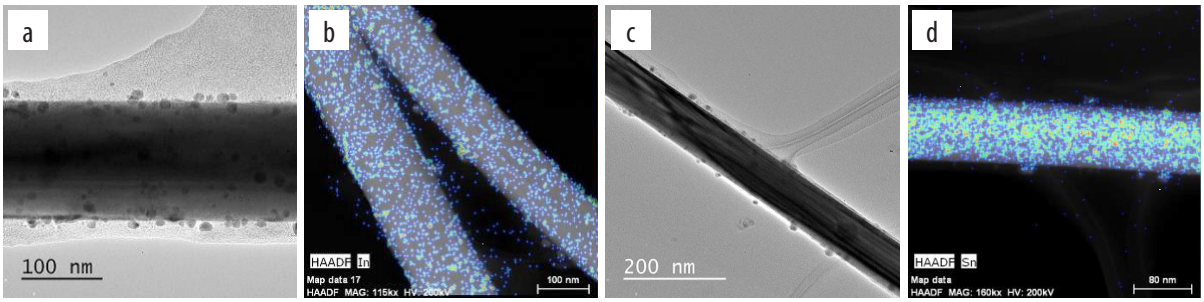


Fig. 1. TEM images and EDX mapping of silver nanowires decorated with low melting point metallic In (a, b) and Sn (c, d) nanoparticles.

INVENTORS: PAVEL STEFAN, BORZA IOAN, BRATU EMANUEL ADRIAN, DOBOSI IOAN SILVIU, GAINA PAULINA IOANA, STREIAN FELICIA, TALPOS-NICULESCU SERBAN

PATENT NO. 129343 / 2020

WASTE WATER DECONTAMINATION SYSTEM IN THE DENTAL UNIT

ROMÂNIA

OFICIUL DE STAT PENTRU INVENŢII ŞI MĂRCI

BREVET DE INVENŢIE

Nr. 129343

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: UNIVERSITATEA POLITEHNICA DIN TIMIŞOARA, TIMIŞOARA, TM, RO

Titlul invenţiei: INSTALAŢIE PENTRU DECONTAMINAREA APEI REZIDUALE DIN UNITUL DENTAR

Inventatori: PAVEL ŞTEFAN, TIMIŞOARA, TM, RO; BORZA IOAN, TIMIŞOARA, TM, RO; BRATU EMANUEL ADRIAN, TIMIŞOARA, TM, RO; DOBOŞI IOAN SILVIU, TIMIŞOARA, TM, RO; GĂINĂ PAULINA IOANA, TIMIŞOARA, TM, RO; STREIAN FELICIA, TIMIŞOARA, TM, RO; TALPOŞ NICULESCU ŞERBAN, TIMIŞOARA, TM, 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 05/09/2013, cu condiţia plăţii taxelor anuale de menţinere în vigoare a brevetului.

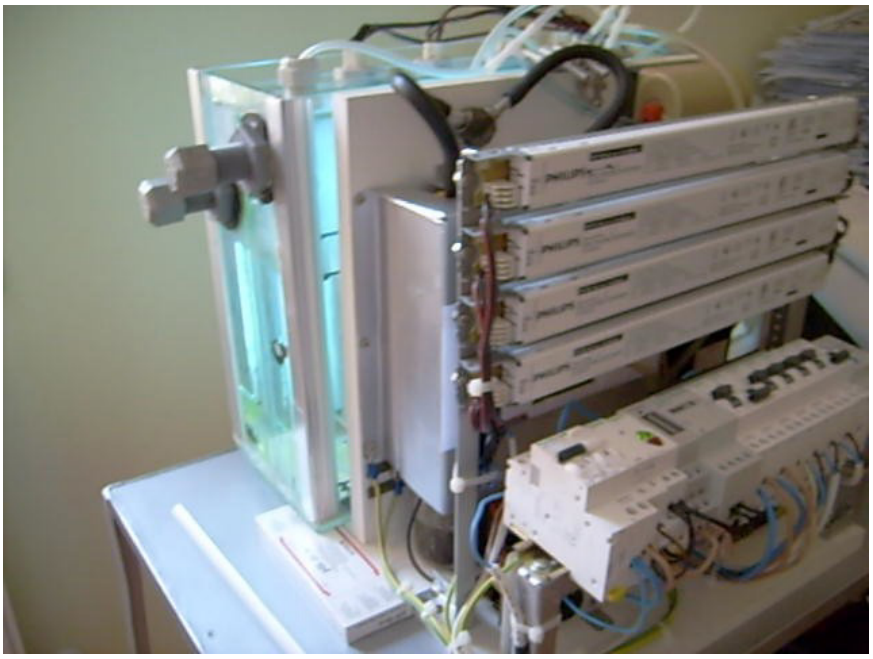
Confirm cele de mai sus prin semnarea şi aplicarea sigiliului
Director General

OFICIUL DE STAT PENTRU INVENŢII ŞI MĂRCI · ROMÂNIA ·

Bucureşti, Data eliberării 28/08/2020

The invention concerns a system for the decontamination and treatment of waste water in the dental unit, water that is to be purged in the sewers. The technical problems to be solved regard the creation of a system that could, once attached to the dental unit, the collection of the contaminated waste water, its treatment and sterilization, and, finally, the evacuation of the water under hygienic and safety conditions. The system must perform the tasks simultaneously and efficiently. The newly invented system to perform the decontamination of waste water from the dental unit, is composed of an assembly of closed and segmented (divided) recipients that are equipped with baffles that allow the injection of a air and ozone mix into a first set of decontamination activation cells, to be followed by further decontamination by UV germ-killing lamps (C class) in the next activation cells; and finally, evacuated into the sewer system when the physical, chemical and microbiological parameters are reached. The newly invented system for the decontamination of waste water from the dental unit presents the following advantages:

- Uses decontamination agents produces into the installation (ozone) and long term use devices (germ-killing UV lamps);
- The decontamination is efficient as it uses just approx. 1kW/hour electrical energy for 16 hours of functioning;
- The maintenance operations are very simple and require just the replacement of germ-killing UV lamps after 10,000-15,000 hours of functioning;
- The system can be easily monitored while working;
- Safety during functioning;
- Allows for the avoidance of environmental pollution resulting from the use of chlorine as disinfectant.



INVENTOR: PANĂ ADRIAN

PATENT NO. 131297 / 2020

CONTROL METHOD FOR AN AUTOMATIC CAPACITIVE COMPENSATOR MEANT TO IMPROVE THE POWER FACTOR AND TO BALANCING THE LOAD IN THREE-PHASE FOUR-WIRE ELECTRICAL NETWORKS

ROMÂNIA

OFICIUL DE STAT PENTRU INVENȚII ȘI MĂRCI

BREVET DE INVENȚIE

Nr. 131297

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: UNIVERSITATEA POLITEHNICA DIN TIMIŞOARA, TIMIŞOARA, TM, RO

Titlul invenţiei: METODĂ DE CONTROL PENTRU UN COMPENSATOR CAPACITIV AUTOMAT DESTINAT ÎMBUNĂTĂȚIRII FACTORULUI DE PUTERE ȘI ECHILIBRĂRII SARCINII ÎN REȚELE ELECTRICE TRIFAZATE CU PATRU CONDUCTOARE

Inventatori: PANĂ ADRIAN, TIMIŞOARA, TM, 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 16/11/2015, cu condiţia plăţii taxelor anuale de menţinere în vigoare a brevetului.

Confirm cele de mai sus prin semnarea și aplicarea sigiliului
Director General

Bucureşti, Data eliberării 30/09/2020

OFICIUL DE STAT PENTRU INVENȚII ȘI MĂRCI · ROMÂNIA ·

If a single-phase capacitor connects between two of the phases of a three-phase electrical network, it will cause a reactive power absorption, in equal parts on the two phases, which is obvious. However, there will be an effect on the circulation of real power, the capacitor absorbing real power from the network on one of the phases and returning it to the network on the other phase. And this fact is, even for an electrical engineer, less obvious. It can be stated that a single-phase capacitor connected between two phases makes, in addition to a shunt capacitive compensation of the reactive power, a redistribution of the real power between the two phases of the network. These statements also apply to a three-phase assembly of single-phase capacitors connected in a delta connection. Such an assembly can be transformed into an unbalanced capacitive compensator, which in addition to improving the power factor, can balance the active and reactive load on the three phases of the network. In the case of a three-phase four-wires network, the compensator must also contain a circuit with the Yn connection. When the concentrator (6) goes down, it detaches by cutting (punching, through contour) material from the strip, as sufficient amount to form the product to be manufactured.

The patented method is based on an original mathematical model that establishes the analytical relationships between the six equivalent susceptances of the two three-phase circuits of the compensator (Δ and Yn) and the real and imaginary components of the load sequence currents. The method is applied for the control of an automatic capacitive compensator, having the following original elements:

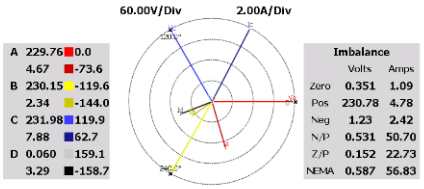
- defines as input quantities of the control process, the rms values of the real and imaginary components of the sequence currents of the load,

- defines as control quantities of the control process, the compensation levels of the positive, negative and zero sequence components of the load currents,
- defines as output quantities of the control process, the values of the six equivalent susceptances of the compensator, calculated with analytical relations that establish the direct connection with the input quantities,
- uses in the control process a sequence of operating steps in order to obtain negative or zero values for the output quantities by iterative correction of the control quantities,
- adjusts the susceptances (capacities) of the compensator so as to obtain an optimal distribution of the capacitive reactive power of compensation between the two functions of the compensator, the one of improving the power factor and the one of load balancing,
- achieves the optimal distribution of the capacitive reactive power of compensation on the positive sequence between the two three-phase circuits of the compensator, provided the minimization of the number and value of the susceptances that must be canceled due to the fact that they cannot be brought in the capacitive domain.

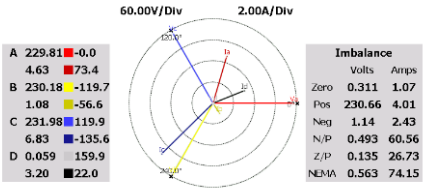
Fig. 1. Functional experimental model (Electrical Networks Laboratory, Department of Electrical Power Engineering, UPT).

The patented method is meant to be implemented through the medium of a specialized software in the control system of a three-phase capacitive compensator, consisting of single-phase power capacitor banks, included in two three-phase circuits, one in Δ connection, the other in Yn connection, to allow a variable unbalanced three-phase capacitive compensation, in order to fulfill, in addition to the "classic" function of power factor improvement, that of balancing the load of the three-phase four-wire network.

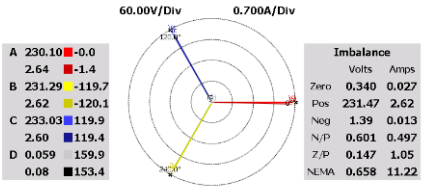
The method is implemented in a functional experimental model (fig. 1). Figure 2 shows the recorded values of characteristic electrical quantities for three sections of the three-phase circuit of the experimental model: at the load terminals (a), at the compensator terminals (b) and at the terminals of the load-compensator assembly (c).



a) Unbalanced three-phase load



b) Unbalanced capacitive compensator



c) Load-compensator assembly

Fig. 2. Values of characteristic quantities for three sections of the three-phase circuit

The experimental model and the patented method are the results of industrial research activities, funded by the Government of Romania, the Ministry of National Education, through Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI), within the program: PN-II-PT-PCCA-2013–4, UPT - ICPE S.A. partnership. Currently, the method is being implemented, on an industrial scale, in a series of prototypes, within a new project carried out in partnership with ICPE S.A., financed by the PN-III-CERC-CO-PTE-2-2019 program.

INVENTORS: MANEA FLORICA, POP ANIELA CARMEN, BACIU ANAMARIA SIMONA, REMES ADRIANA ILEANA

PATENT NO. 129026 / 2020

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

ROMÂNIA

OFICIUL DE STAT PENTRU INVENȚII ȘI MĂRCI

BREVET DE INVENȚIE

Nr. 129026

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: UNIVERSITATEA POLITEHNICA DIN TIMIŞOARA, TIMIŞOARA, TM, RO

Titlul invenţiei: ELECTROD ŞI PROCEDEU DE DETECŢIE ELECTROCHIMICĂ RAPIDĂ A ARSENULUI (III) DIN SOLUŢII APOASE

Inventatori: MANEA FLORICA, TIMIŞOARA, TM, RO; POP ANIELA CARMEN, SATU MARE, SM, RO; BACIU ANAMARIA SIMONA, ALBA IULIA, AB, RO; REMEŞ ADRIANA ILEANA, ŞIMLEUL SILVANIEI, SJ, 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 27/05/2013, cu condiţia plăţii taxelor anuale de menţinere în vigoare a brevetului.

Confirm cele de mai sus prin semnarea și aplicarea sigiliului
Director General

București, Data eliberării 30/10/2020

OFICIUL DE STAT PENTRU INVENȚII ȘI MĂRCI · ROMÂNIA ·

The invention reffers to the elaboration of an electrode and a process for the electrochemical detection of arsenic (III), a highly toxic pollutant from aqueous solutions. Also, the working electrode and the process of the invention can be used both for the detection of other pollutants from water (heavy metals and organic pollutants) and for other applications (the analysis of pharmaceutical products, food quality control and safety, clinical analysis).

The issue to be solved by the invention is to develop a product and a method based on the electrochemical method of fast detection of arsenic (III) from aqueous solutions using a relatively inexpensive electrode material, with a long operating time, exhibiting high electroanalytical performance: the lowest limit of detection, sensitivity, reproducibility, accuracy.

The electrode and the method of fast electrochemical determination of the arsenic (III) from aqueous solutions according to the invention consists of the use of an electrode called working electrode, a counter electrode in assembly with a reference electrode, which based on the anodic stripping method and using the square wave voltammetry technique allow the contact with the arsenic (III) contaminated water in the presence of an electrolyte, leading to the working electrode electrochemical response in the presence of the pollutant. The working electrode is a composite electrode obtained by dispersing carbon nanotubes in an epoxy matrix and then, electrochemically modified with silver nanoparticles.

The detection and determination of arsenic concentration is done by anodic stripping using the square wave voltammetry technique and consists of two stages described by the following reactions and operating parameters:

In stage 1, the cathodic reduction of the species As (III) to As (0), in according with the reaction As3++3e- -> As0, occurring from the application of a potential of -0.4 V/SCE for 120 seconds, which depends on the value of the potential applied and the reaction time having an effect on the electrochemical response of detection As (III) in the second stage;

In stage 2, the effective determination of the As (III) content in the solution, based on the electrochemical response obtained by the anodic stripping process, corresponding to the concentration of arsenic (III) in the solution to be analyzed, at the potential of -0.01 V/ESC, during the square wave voltammetry scanning.

The electrode and the method of fast electrochemical detection of arsenic (III) from aqueous solutions according to the invention has the following advantages: very high electroanalytical characteristics (the lowest limit of detection, sensitivity, reproducibility, accuracy), low cost of materials used for the working electrode elaboration, long operating time (at least 1 year).

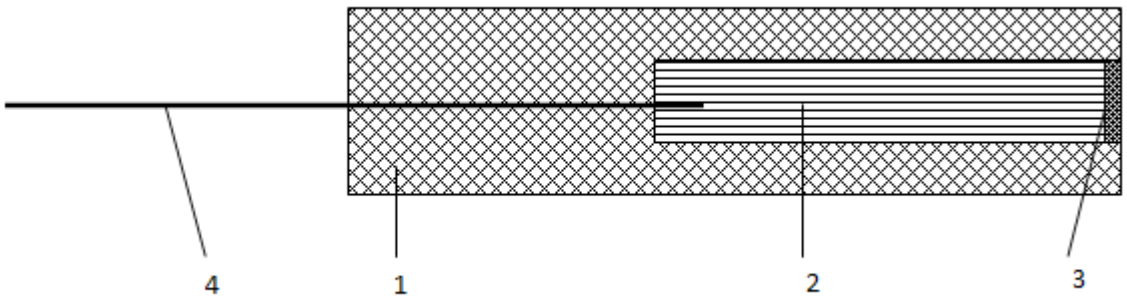


Figure 1. Schematic representation of the electrode

1 - cylinder holder,
2 - the active cylinder consisting of carbon nanofibers dispersed into an epoxy matrix,
3 - a disc-shaped front side decorated by electrochemical deposition of silver nanoparticles,
4 - copper wire to assure connection

INVENTORS: WÄCHTER MIHAIL REINHOLD, IOANA IONEL, NEGREA PETRU

PATENT NO. 131485 / 2020

PROCESS FOR INTEGRATION OF DRY FLUE GAS DESULPHURISATION BY-PRODUCT INTO DENSE SLURRY MIXRURE FOR HYDRAULIC TRANSPORT THROUGH PIPELINE SYSTEMS

ROMÂNIA

OFICIUL DE STAT PENTRU INVENȚII ȘI MĂRCI

BREVET DE INVENȚIE

Nr. 131485

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: UNIVERSITATEA POLITEHNICA DIN TIMIŞOARA, TIMIŞOARA, TM, RO

Titlul invenţiei: PROCEDEU DE INTEGRARE A SUBPRODUSULUI DE LA DESULFURAREA USCATĂ ÎN ŞLAM DENS PENTRU TRANSPORTUL HIDRAULIC PRIN SISTEME DE CONDUCTE

Inventatori: WACHTER MIHAIL REINHOLD, TIMIŞOARA, TM, RO; IONEL IOANA, TIMIŞOARA, TM, RO; NEGREA PETRU, TIMIŞOARA, TM, 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 16/11/2015, cu condiţia plăţii taxelor anuale de menţinere în vigoare a brevetului.

Confirm cele de mai sus prin semnarea şi aplicarea sigiliului
Director General

Bucureşti, Data eliberării 27/11/2020

The technical problem of the invention is to provide a more efficient and less expensive process for integrating the dry desulphurization by-product into the dense slurry mixture recipe, by which the self-hardening time of the slurry and the hydraulic characteristics of the pipeline can be controlled.

The process of integrating the dry desulfurization by-product into the dense slurry mixture recipe for hydraulic transport through pipeline systems offers a technological solution for the management and storage in the coal fly ash landfill disposal of the desulphurization by-product resulting from the technological process of flue gas treatment for coal-fired power plants.

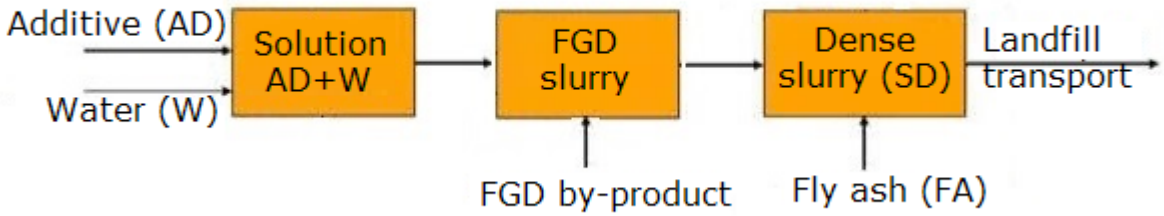
The dense slurry prepared according to the invention solves the problem of preparing the dense slurry mixture recipe which also encompasses the desulphurization by-product, resulting in a slurry fluid which can be hydraulically transported through pipes to the slag and ash landfill disposal specific to coal fired power plants.

The process does not influence the self-hardening properties of dense slurry, prevents the phenomenon of deposition on the pipe line walls, reduces the cost of transport and storage of desulfurization by-product, involves a low cost of implementation, are low energy consumption in operation compared to other methods and is environmental friendly.

The process for integrating the dry desulphurization by-product into the dense slurry mixture recipe for hydraulic transport through piping systems according to the invention uses an additive which simplifies the technological installation for stabilizing the desulphurization by-product and involves low energy consumption during operation.

The invention consists in a process for stabilizing the by-product of dry desulphurization by integrating it into a new dense slurry mixture recipe, which offers the possibility of transport and discharge into the landfill disposal through piping systems. Process flow diagram is depicted in Figure 1.

Figure 1



The process involves the use of a retardant additive in the dense slurry mixture recipe in order to control the rate of chemical cementation reactions, so as to maintain the optimal hydraulic piping properties of the dense slurry prepared after this process for a predetermined time. The delay time of the chemical cementation reactions must be long enough to ensure the time of preparation of the dense slurry in the facility as well as the time required for transport through pipes on the landfill disposal.

Following the results obtained experimentally for the recipe that does not use additives, it was found that the dense slurry comprising the by-product of dry desulfurization does not have hydraulic characteristics of hydraulic transport through pipes. The solidification time of the dense slurry in this case is less than 30 min, which led to the clogging of the pilot installation with which the experiment was performed, a fact highlighted in figure 2.

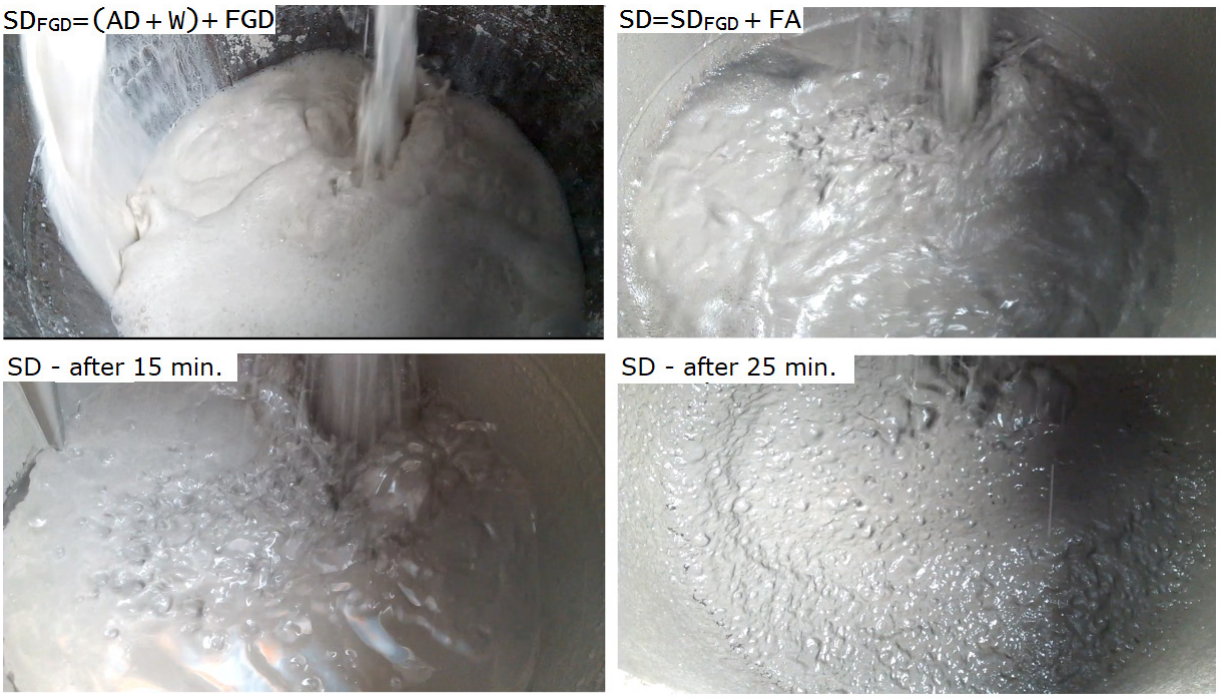


Figure 2.

INVENTORS: WÄCHTER MIHAIL REINHOLD, IOANA IONEL, NEGREA ADINA GEORGETA

PATENT NO. 131486 / 2020

PROCESS FOR TREATMENT MUNICIPAL SOLID WASTE INCINERATION REDIUSES BY SOLIDIFICATION/STABILIZATION INTO ASH ROCK

ROMÂNIA

OFICIUL DE STAT PENTRU INVENȚII ȘI MĂRCI

BREVET DE INVENȚIE

Nr. 131486

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: UNIVERSITATEA POLITEHNICA DIN TIMIŞOARA, TIMIŞOARA, TM, RO

Titlul invenției: PROCEDEU DE TRATARE A REZIDUURILOR PROVENITE DIN INCINERAREA DEŞEURILOR MENAJERE PRIN SOLIDIFICARE - STABILIZARE ÎN ROCA DE CENUŞĂ

Inventatori: WACHTER MIHAIL REINHOLD, TIMIŞOARA, TM, RO; IONEL IOANA, TIMIŞOARA, TM, RO; NEGREA ADINA GEORGETA, TIMIŞOARA, TM, 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 16/11/2015, cu condiția plății taxelor anuale de menținere în vigoare a brevetului.

Confirm cele de mai sus prin semnarea și aplicarea sigiliului
Director General

București, Data eliberării 27/11/2020

OFICIUL DE STAT PENTRU INVENȚII ȘI MĂRCI · ROMÂNIA ·

The technical problem of the invention is to achieve a more efficient and less expensive residue treatment process using a stabilizing binder existing in coal combustion residues, in a process that activates the chemical cementation reactions by intense hydraulic mixing, resulting an ecologically inert final product.

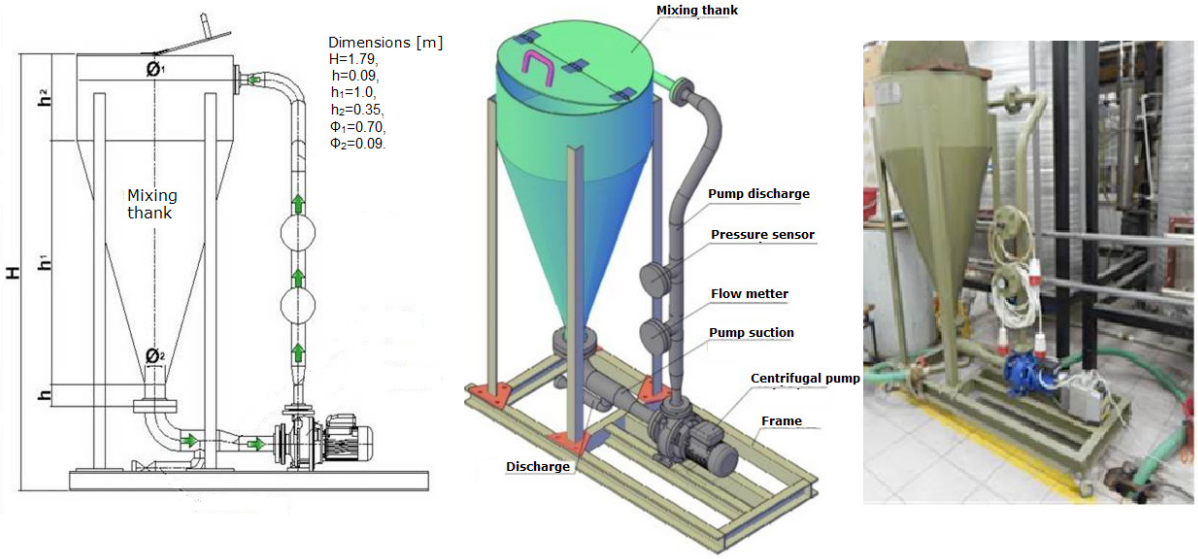
The process of treating residues from the incineration of municipal solid waste by solidification-stabilization in ash rock is an ecological method of landfilling these types of residues, or residues with similar content and toxicity.

The material stored in the form of ash rock, protects the contamination of the environment by eliminating the migration of heavy metals in the soil and groundwater due to the leaching phenomenon. Based on this process, new concepts can be developed regarding the methods of landfilling waste related to the incineration of municipal solid waste.

The binder material used does not involve production costs. By applying this method, it is possible to deposit in the same landfill both the combustion residues related to the incineration of municipal solid waste and those from the combustion of coal. This eliminates the need to manage and monitor of one landfill disposal. The method can be easily implemented on an industrial scale.

The process for treating the residues from the municipal solid waste incineration by solidification - stabilization in the ash rock, according to the invention, uses as stabilizing binder material the by-products from the combustion of lignite coal, represented by electro static precipitator fine ash (pozzolanic material) and desulfurization by-product FGD (calcium-based). The final product of the invention is ash rock, which incorporates and fixes in its structure, by chemical cementation reactions, the heavy metals contained in the toxic residues.

Figure 1.

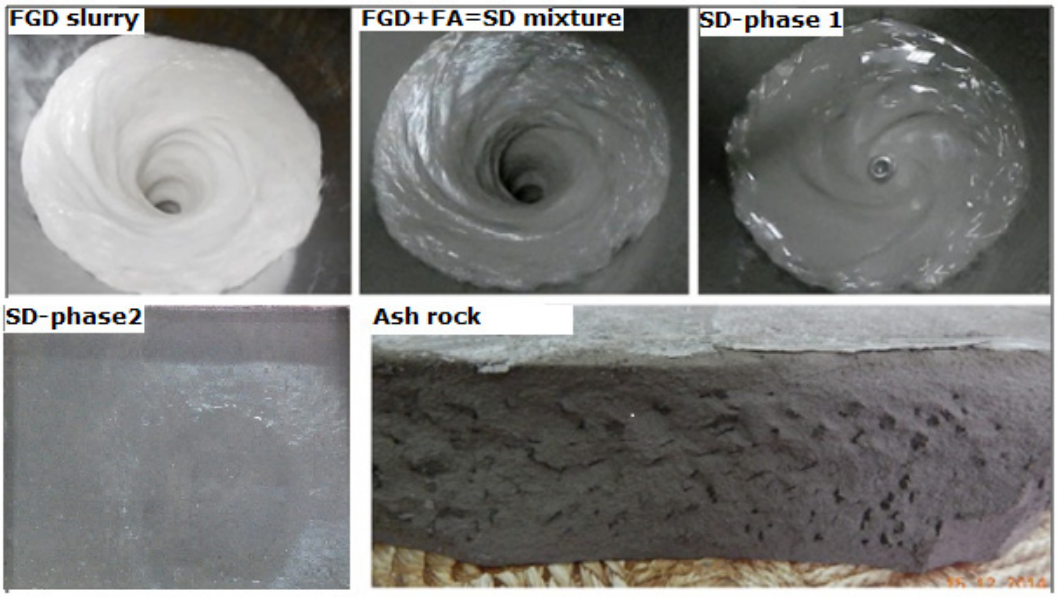


a. Dimensions design b. Design model c. Build model

The preparation of the dense slurry is achieved under hydraulic conditions which ensure the activation of the pozzolanic elements contained in the fly ash, and their chemical reaction with the calcium-based compounds contained in the FGD by-product. For this purpose, the mixture is made in the installation of Figure 1, by cycles of recirculation of the dense slurry with a centrifugal pump for slurries. The mixing tank through its specifically shape and the tangential direction of the pump discharge jet to the walls of the tank form a vortex which ensures a homogeneous mixture between the solid particles and water.

The process involves the production of a homogeneous bi-phasic fluid in the form of dense slurry with cementing properties, obtained by predetermined recipes for mixing water, binder material and toxic residues. The self-hardening properties of the dense slurry is based on the chemical cementation reactions, generated by the pozzolanic elements SiO2, Al2O3 and Fe2O3; and calcium-based compounds CaO, Ca(OH)2, CaSO3 and CaSO4; contained in the coal fly ash, respectively in the by-products related to the flue gas desulphurization unit specific to the coal energy recovery process. Process stages are depicted in Figure 2.

Figure 2.



INVENTORS: GUI VASILE, ALEXA FLORIN, CALEANU CATALIN-DANIEL, POPA GHEORGHE-DANIEL, DAVID CIPRIAN, SIMION GEORGIANA

PATENT NO. 127779 / 2020

METHOD FOR TRACKING THE HAND FINGERS FOR HUMAN-MACHINE COMMUNICATIONS MEANS

ROMÂNIA

OFICIUL DE STAT PENTRU INVENȚII ȘI MĂRCI

BREVET DE INVENȚIE

Nr. 127779

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: UNIVERSITATEA POLITEHNICA DIN TIMIŞOARA, TIMIŞOARA, TM, RO

Titlul invenţiei: METODĂ DE URMĂRIRE A DEGETELOR MÂINII PENTRU MIJLOACE DE COMUNICARE OM-CALCULATOR

Inventatori: GUI VASILE, TIMIŞOARA, TM, RO; ALEXA FLORIN, TIMIŞOARA, TM, RO; CĂLEANU CĂTĂLIN-DANIEL, TIMIŞOARA, TM, RO; POPA GHEORGHE-DANIEL, TIMIŞOARA, TM, RO; DAVID CIPRIAN, SATU MARE, SM, RO; SIMION GEORGIANA, LUGOJ, TM, 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 27/02/2012, cu condiţia plăţii taxelor anuale de menţinere în vigoare a brevetului.

Confirm cele de mai sus prin semnarea şi aplicarea sigiliului
Director General

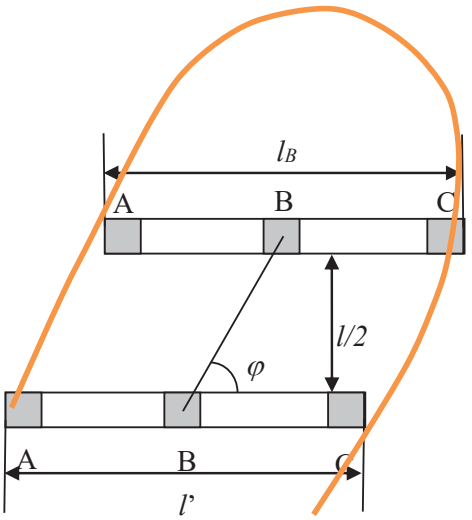
Bucureşti, Data eliberării 30/12/2020

OFICIUL DE STAT PENTRU INVENȚII ȘI MĂRCI · ROMÂNIA ·

Naţională" S.A.

The invention relates to a method for tracking the hand fingers and human-computer communication means based on gestures made with the hand. According to the invention, the method consists in a series of operations for digitally processing the signal generated by a monocular video camera (1) connected to or included in a PC-type computer which allows the tracking of the extended fingers of a hand gesticulating on a complex background, at a distance variable in relation to the video camera (1), where the system is automatically initialized when the open hand is exposed in front of the video camera (1); for each finger there is generated a set of four parameters allowing the generation of 4D trajectory on the basis of 2D images.

The method has an advanced robustness in conditions of camouflage or partial occlusion of the hand. Its implementation on a computer for personal use, according to the invention, leads to a higher computational efficiency than the known methods.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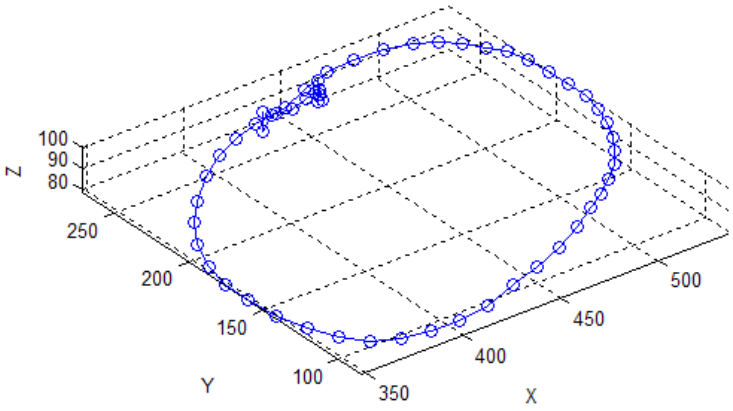
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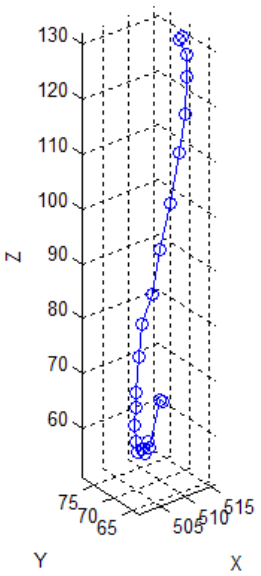
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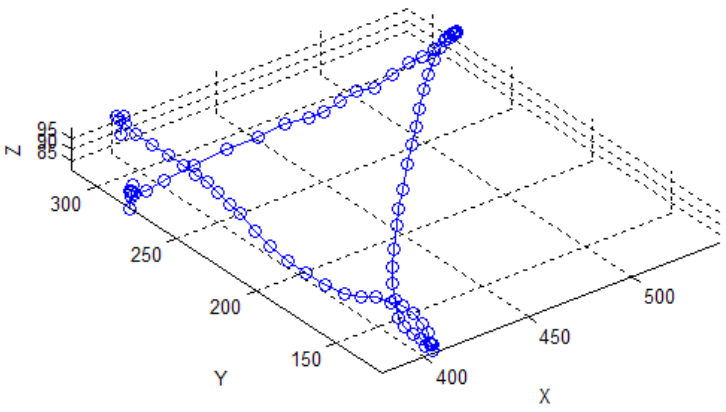
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INVENTORS: BANICA RADU, URSU DANIEL, MOSOARCA CRISTINA, RACU ANDREI, LINUL PETRICA, NYARI TEREZIA, SVERA PAULA, PASCARIU MIHAI-COSMIN, NEGREA PETRU, SASCA VIOREL ZOLTAN, HEDES ALEXANDRU

PATENT NO. 132634 / 2020

PROCESS FOR THE SYNTHESIS OF PdS /$Cd_xZn_{1-x}S$ VISIBLY ACTIVE PHOTOCATALYSTS USING LOW PURITY PRECURSORS

ROMÂNIA

DUPLICAT

ELIBERAT COTITULARULUI BREVETULUI DE INVENȚIE NR. 132634

OFICIUL DE STAT PENTRU INVENȚII ȘI MĂRCI

BREVET DE INVENȚIE

Nr. 132634

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: INSTITUTUL NAȚIONAL DE CERCETARE-DEZVOLTARE PENTRU ELECTROCHIMIE ȘI MATERIE CONDENSATĂ - INCEMC TIMIȘOARA, TIMIȘOARA, TM, RO; UNIVERSITATEA POLITEHNICA DIN TIMIȘOARA, TIMIȘOARA, TM, RO; INSTITUTUL DE CHIMIE TIMIȘOARA AL ACADEMIEI ROMÂNE, TIMIȘOARA, TM, RO; BEESPEED AUTOMATIZARI S.R.L., CHIȘODA, TM, RO

Titlul invenției: PROCEDEU DE SINTEZĂ A FOTOCATALIZATORILOR ACTIVI ÎN VIZIBIL DE TIP PdS/$Cd_xZn_{1-x}S$ UTILIZAND PRECURSORI CU PURITATE SCĂZUTĂ

Inventatori: BANICA RADU, DEVA, HD, RO; URSU DANIEL, TIMIȘOARA, TM, RO; MOSOARCA CRISTINA, TIMIȘOARA, TM, RO; RACU ANDREI, TIMIȘOARA, TM, RO; LINUL PETRICA, COMUNA SIBOT, AB, RO; NYARI TEREZIA, TIMIȘOARA, TM, RO; SVERA PAULA, TIMIȘOARA, TM, RO; PASCARIU MIHAI-COSMIN, ARAD, AR, RO; NEGREA PETRU, TIMIȘOARA, TM, RO; SASCA VIOREL ZOLTAN, TIMIȘOARA, TM, RO; HEDEȘ ALEXANDRU, TIMIȘOARA, TM, 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 07/12/2016, cu condiția plății taxelor anuale de menținere în vigoare a brevetului.

Confirm cele de mai sus prin semnarea și aplicarea ștampilei
Director General

București, Data eliberării 30/12/2020

The invention relates to a method for obtaining a series of high efficiency chalcogenic photocatalysts, $Zn_{1-x}Cd_xS$ (ZCS) and PdS/$Zn_{1-x}Cd_xS$ (PZCS) by using waste from the battery industry.

Technical problem solved by the invention, as it results from the description, consists in obtaining high-efficiency, visibly active photocatalysts, $Zn_{1-x}Cd_xS$ (ZCS) and PdS/$Zn_{1-x}Cd_xS$ (PZCS), with a high degree of crystallinity, using low purity precursors from waste from the battery industry.

The process for obtaining high-efficiency, visibly active photocatalysts, $Zn_{1-x}Cd_xS$ and PdS/$Zn_{1-x}Cd_xS$, according to the invention, eliminates the disadvantages of the known processes, in that a suspension based on impure cadmium hydroxide is obtained, steel of spent batteries such as Ni-Cd, ZnS, $PdCl_2$ and deionized water;

The homogenized suspension is introduced into the autoclaving system, achieving a 70% degree of autoclave filling and subsequently the heating takes place at the synthesis temperature of 200ºC, for 70 h.

As a source of cadmium (SC), it is used during the synthesis of ZCS and PZCS type photocatalysts, potassium cadmium hydroxide, 2.6% nickel, carbon and iron (less than 1%). $Cd(OH)_2$ was obtained in an earlier step by mechanical scraping of cadmium hydroxide from the steel fittings of spent Ni-Cd batteries.

Hydrothermal synthesis is used to increase the crystallinity of ZCS and PZCS photocatalysts, but also to ensure their high purity.

In fig. 1, an example of a photocatalytic experiment is presented, using 100 mg of photocatalytic Pd type analyzer (0.2% by mass $Cd_{0.8}Zn_{0.2}S$ (PZCS) and simulated sunlight obtained with the aid an Oriel solar simulator equipped with AM 1.5 type radiation filter. The area of the illuminated surface was of about 12.8 cm^2. The irradiance was about 100 mW / cm^2 and was determined using a calibrated silicon solar cells. The aqueous solution used as the reaction medium had a concentration of 0.5 M Na_2S and 0.25 M Na_2SO_3. The flow of hydrogen measured under standard conditions of temperature and pressure, released during the photocatalytic reaction carried out at 60°C, according to fig. 1, is over 144 L / Kgcat*h.

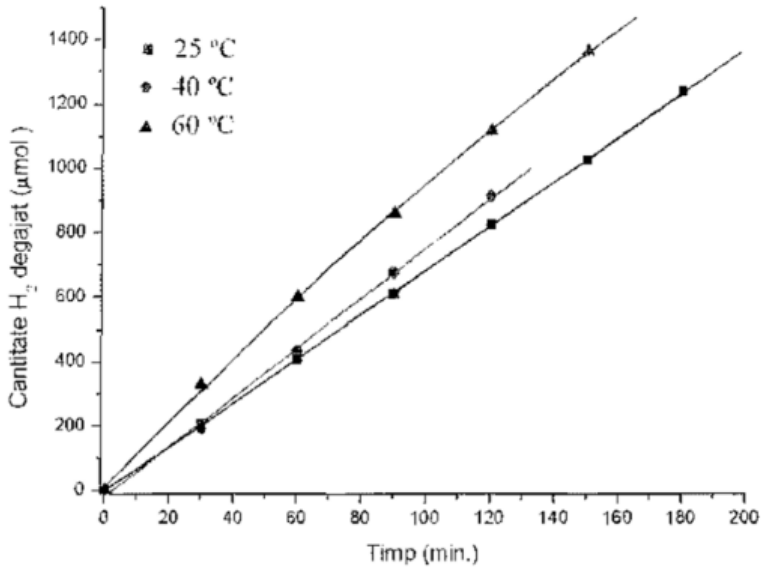

Fig. 1