Patent Search

Invention Title	METHOD OF SYNTHESISING HYBRID METAL NATURAL FIBER COMPOSITE AND 3D PRINTING THEREOF
Publication Number	09/2021
Publication Date	26/02/2021
Publication Type	INA
Application Number	202141006976
Application Filing Date	19/02/2021
Priority Number	
Priority Country	
Priority Date	
Field Of Invention	MECHANICAL ENGINEERING
Classification (IPC)	B33Y0070000000, B22F0003000000, C04B0026120000, B33Y0010000000, C08L0097020000

Inventor

Name	Address	Country	Nationality
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Dr.A.Saravanakumar	Professor, Department of mechanical engineering, K.S.R.M. College of engineering, Kadapa, Andhra Pradesh, Indla 516003.	India	India
Dr.K Santarao	Assistant Professor, Department of mechanical engineering, GMR Institute of Technology, Rajam, Andhra Pradesh, India 532127.	India	India
Mr. AlagalaHarikrishna	Assistant Professor, Department of mechanical engineering, K.S.R.M. College of engineering, Kadapa, Andhra Pradesh, Indla 516003.	India	India
Mr. M.MohanReddy	Assistant Professor, Department of mechanical engineering, K.S.R.M. College of engineering, Kadapa, Andhra Pradesh, Indla 516003.	India	India
Mr. R.RamaKrishna Reddy	Assistant Professor, Department of mechanical engineering, K.S.R.M. College of engineering, Kadapa, Andhra Pradesh, Indla 516003.	India	India

Applicant

Name	Address	Country	Nationality
Dr. Balaji. D	Assistant Professor in department of Mechanical Engineering, KPR Institute of Engineering and Technology, Arasur, Coimbatore, Tamil Nadu, India 641407.	India	India
Dr.A.Saravanakumar	Professor, Department of mechanical engineering, K.S.R.M. College of engineering, Kadapa, Andhra Pradesh, Indla 516003.	India	India
Dr.K Santarao	Assistant Professor, Department of mechanical engineering, GMR Institute of Technology, Rajam, Andhra Pradesh, India 532127.	India	India
Mr. AlagalaHarikrishna	Assistant Professor, Department of mechanical engineering, K.S.R.M. College of engineering, Kadapa, Andhra Pradesh, Indla 516003.	India	India
Mr. M.MohanReddy	Assistant Professor, Department of mechanical engineering, K.S.R.M. College of engineering, Kadapa, Andhra Pradesh, Indla 516003.	India	India
Mr. R.RamaKrishna Reddy	Assistant Professor, Department of mechanical engineering, K.S.R.M. College of engineering, Kadapa, Andhra Pradesh, Indla 516003.	India	India

Abstract:

Abstract: - The invention is all about the synthesisation of weird metal alloy with natural fiber powder along with simple 3D printing method. During synthesisation, need to identify the suitable binder in this case, which plays pivotal role. The synthesised material should be in suitable state to print, for that simple 3D printing technique is used along with modification of supplying the heat from the printer bed. The post process is carried out after printing it should be coated with a layer of same metal and or metal alloys. It is required to keep in the oven to evaporate the binder which is added to composite. The composite after evaporation of binder become harder than the printed one. It has to be examined for the internal defects. The other pivotal parameter to look into this printed composite specimen possesses better strength.

Complete Specification

Claims: -
1) I claim,
A method of synthesising hybrid metal natural fiber composite and 3D Printing thereof:
comprises of,
A metal mixture (1);
A transfer unit (2);
A printing head (3); and
A printed specimen (4);
wherein, the metal mixture (1) is mixture of metal alloy, natural fiber powder and binder
therein, it has thetransfer unit (2) which is fitted to the 3D printer on a printing head (3)
therein, the final product is printed as the printed specimen (4).
2) The method of synthesising hybrid metal natural fiber composite and 3D Printing thereofas claimed in claim 1, wherein,the method of synthesising the weird combination of metal with natural fiber powder which pave path to novel material development in turn they used for versatile applications.

View Application Status

Department of Industrial Policy and Promotion
Government of India

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Government of India

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Application Details	
APPLICATION NUMBER	202141006976
APPLICATION TYPE	ORDINARY APPLICATION
DATE OF FILING	19/02/2021
APPLICANT NAME	1 . Dr. Balaji. D 2 . Dr.A.Saravanakumar 3 . Dr.K Santarao 4 . Mr. AlagalaHarikrishna 5 . Mr. M.MohanReddy 6 . Mr. R.RamaKrishna Reddy
TITLE OF INVENTION	METHOD OF SYNTHESISING HYBRID METAL NATURAL FIBER COMPOSITE AND 3D PRINTING THEREOF
FIELD OF INVENTION	MECHANICAL ENGINEERING
E-MAIL (As Per Record)	
ADDITIONAL-EMAIL (As Per Record)	balaji.ntu@gmail.com
E-MAIL (UPDATED Online)	
PRIORITY DATE	
REQUEST FOR EXAMINATION DATE	19/02/2021
PUBLICATION DATE (U/S 11A)	26/02/2021

Application Status	
APPLICATION STATUS	**FER Issued, Reply not Filed**

View Documents

Filed → RQ Filed → Published → Under Examination → Disposed

In case of any discrepancy in status, kindly contact ipo-helpdesk@nic.in

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Document Name	Created Date/Uploaded Date
202141006976-FER.pdf	06/01/2022
202141006976-Abstract_As Filed_19-02-2021.pdf	19/02/2021
202141006976-Claims_As Filed_19-02-2021.pdf	19/02/2021
202141006976-Description Complete_As Filed_19-02-2021.pdf	19/02/2021
202141006976-Form18_Examination Request_19-02-2021.pdf	19/02/2021
202141006976-Form1_As Filed_19-02-2021.pdf	19/02/2021
202141006976-Form2 Title Page_Complete_19-02-2021.pdf	19/02/2021
202141006976-Form3_As Filed_19-02-2021.pdf	19/02/2021
202141006976-Form5_As Filed_19-02-2021.pdf	19/02/2021
202141006976-Form9_Early Publication_19-02-2021.pdf	19/02/2021

ET539479365IN

D | 14792

FORM 1 THE PATENTS ACT 1970 (39 of 1970) and THE PATENTS RULES, 2003 **APPLICATION FOR GRANT OF PATENT** (See section 7, 54 and 135 and sub-rule (1) of rule 20)	(FOR OFFICE USE ONLY) 700292187

	Application No.	202141006976
	Filing date:	19/02/2021
	Amount of Fee paid:	1750/-
	CBR No:	6067
	Signature:	
1. APPLICANT'S REFERENCE / IDENTIFICATION NO. (AS ALLOTTED BY OFFICE)		

2. TYPE OF APPLICATION [Please tick (✓) at the appropriate category]

Ordinary (✓)		Convention ( )		PCT-NP ( )	
Divisional ( )	Patent of Addition ( )	Divisional ( )	Patent of Addition ( )	Divisional ( )	Patent of Addition ( )

3A. APPLICANT(S)

Name in Full	Nationality	Country of Residence	Address of the Applicant	
1. Dr. Balaji. D	Indian	India	Address	Assistant Professor in department of Mechanical Engineering, KPR Institute of Engineering and Technology, Arasur, Coimbatore
			State	Tamil Nadu
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2. Dr.A.Saravanakumar	Indian	India	Address	Professor, Department of mechanical engineering K.S.R.M. College of engineering, Kadapa
			State	Andhra Pradesh
			Country	India

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4. Mr. AlagalaHarikrishna	Indian	India	Address	Assistant Professor, Department of mechanical engineering K.S.R.M. College of engineering, Kadapa
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5. Mr. M.MohanReddy	Indian	India	Address	Assistant Professor, Department of mechanical engineering K.S.R.M. College of engineering, Kadapa
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6. Mr. R.RamaKrishna Reddy	Indian	India	Address	Associate Professor, Department of mechanical engineering K.S.R.M. College of engineering, Kadapa
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3B. CATEGORY OF APPLICANT [Please tick (✓) at the appropriate category]				

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Natural Person (✓)	Other than Natural Person		
	Small Entity ( )	Startup ()	Others ( )

4. INVENTOR(S) [Please tick (✓) at the appropriate category]

Are all the inventor(s) same as the applicant(s) named above?	Yes (✓)	No ()

If "No", furnish the details of the inventor(s)

Name in Full	Nationality	Country of Residence	Address of the Inventor	
1. Dr. Balaji. D	Indian	India	Address	Assistant Professor in department of Mechanical Engineering, KPR Institute of Engineering and Technology, Arasur, Coimbatore
			State	Tamil Nadu
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			E-mail id	balaji.ntu@gmail.com
2. Dr.A.Saravanakumar	Indian	India	Address	Professor, Department of mechanical engineering K.S.R.M. College of engineering, Kadapa
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3.Dr.K Santarao	Indian	India	Address	Assistant Professor, Department of mechanical engineering GMR Institute of Technology Rajam
			State	Andhra Pradesh
			Country	India
			Pin code	532127
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4. Mr. AlagalaHarikrishna	Indian	India	State	Andhra Pradesh
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			E-mail id	mummadi.mohan@gmail.com
6. Dr. R.RamaKrishna Reddy	Indian	India	Address	Associate Professor, Department of mechanical engineering K.S.R.M. College of engineering, Kadapa
			State	Andhra Pradesh
			Country	India
			Pin code	516003
			Mobile	9490633226
			E-mail id	rrkarps@gmail.com

5. TITLE OF THE INVENTION

Method of synthesising hybrid metal natural fiber composite and 3D Printing thereof

6. AUTHORISED REGISTERED PATENT AGENT(S)	IN/PA No.	
	Name	
	Mobile No.	
7. ADDRESS FOR SERVICE OF APPLICANT IN INDIA	Name	Balaji. D
	Postal Address	Assistant Professor in department of Mechanical Engineering, KPR Institute of Engineering and Technology, Arasur, Coimbatore
	State	Tamil Nadu, India
	Mobile	7338714790
	E-mail id	balaji.ntu@gmail.com

8. IN CASE OF APPLICATION CLAIMING PRIORITY OF APPLICATION FILED IN CONVENTION COUNTRY, PARTICULARS OF CONVENTION APPLICATION

Country	Application Number	Filing date	Name of the applicant	Title of the invention	IPC (as classified in the convention country)

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9. IN CASE OF PCT NATIONAL PHASE APPLICATION, PARTICULARS OF INTERNATIONAL APPLICATION FILED UNDER PATENT CO-OPERATION TREATY (PCT)

International application number	International filing date

10. IN CASE OF DIVISIONAL APPLICATION FILED UNDER SECTION 16, PARTICULARS OF ORIGINAL (FIRST) APPLICATION

Original (first) application No.	Date of filing of original (first) application

11. IN CASE OF PATENT OF ADDITION FILED UNDER SECTION 54, PARTICULARS OF MAIN APPLICATION OR PATENT

Main application/patent No.	Date of filing of main application

12. DECLARATIONS

(i) Declaration by the inventor(s)

(**In case the applicant is an assignee**: the inventor(s) may sign herein below or the applicant may upload the assignment or enclose the assignment with this application for patent or send the assignment by post/electronic transmission duly authenticated within the prescribed period).

I/We, the above named inventor(s) is/are the true & first inventor(s) for this Invention and declare that the applicant(s) herein is/are my/our assignee or legal representative.

(a) Date

(b) Signature

(c) Name: 1. Dr. Balaji. D

(a) Date

(b) Signature

(c) Name: 2. Dr. A. Saravanakumar

(a) Date

(b) Signature

(c) Name: 3. Dr.KSantarao

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(a) Date

(b) Signature A. HariKrishna

(c) Name: 4. Mr. AlagalaHarikrishna

(a) Date

(b) Signature

(c) Name: 5. Mr. M.MohanReddy

(a) Date

(b) Signature

(c) Name: 6. Mr. R.RamaKrishna Reddy

(ii) Declaration by the applicant(s) in the convention country

(In case the applicant in India is different than the applicant in the convention country: the applicant in the convention country may sign herein below or applicant in India may upload the assignment from the applicant in the convention country or enclose the said assignment with this application for patent or send the assignment by post/electronic transmission duly authenticated within the prescribed period)

I/We, the applicant(s) in the convention country declare that the applicant(s) herein is/are my/our assignee or legal representative.

(a) Date

(b) Signature(s)

(c) Name(s) of the signatory

(iii) Declaration by the applicant(s)

I/We the applicant(s) hereby declare(s) that: -

€ ✓I am/ We are in possession of the above-mentioned invention.

€ ✓The ~~provisional~~/complete specification relating to the invention is filed with this application.

€ ✓The invention as disclosed in the specification uses the biological material from India and the necessary permission from the competent authority shall be submitted by me/us before the grant of patent to me/us.

€ ✓There is no lawful ground of objection(s) to the grant of the Patent to me/us.

€ ✓I am/we are the true & first inventor(s).

€ I am/we are the assignee or legal representative of true & first inventor(s).

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- € The application or each of the applications, particulars of which are given in Paragraph-8, was the first application in convention country/countries in respect of my/our invention(s).
- € I/We claim the priority from the above mentioned application(s) filed in convention country/countries and state that no application for protection in respect of the invention had been made in a convention country before that date by me/us or by any person from which I/We derive the title.
- € My/our application in India is based on international application under Patent Cooperation Treaty (PCT) as mentioned in Paragraph-9.
- € The application is divided out of my /our application particulars of which is given in Paragraph-10 and pray that this application may be treated as deemed to have been filed on DD/MM/YYYY under section 16 of the Act.
- € The said invention is an improvement in or modification of the invention particulars of which are given in Paragraph-11.

13. FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION

(a) ✓Form 2

Item	Details	Fee	Remarks
Complete/ provisional specification)#	No. of pages		
No. of Claim(s)	No. of claims and No. of pages		
Abstract.	No. of pages		
No. of Drawing(s)	No. of drawings and No. of pages		

In case of a complete specification, if the applicant desires to adopt the drawings filed with his provisional specification as the drawings or part of the drawings for the complete specification under rule 13(4), the number of such pages filed with the provisional specification are required to be mentioned here.

(b) Complete specification (in conformation with the international application)/as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies).

(c) Sequence listing in electronic form

(d) Drawings (in conformation with the international application)/as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies).

(e) Priority document(s) or a request to retrieve the priority document(s) from DAS (Digital Access Service) if the applicant had already requested the office of first filing to make the priority document(s) available to DAS.

(f) Translation of priority document/Specification/International Search Report/International

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Preliminary Report on Patentability.

(g) Statement and Undertaking on Form 3

(h) ✓Declaration of Inventorship on Form 5

(i) ✓Power of Authority

(j).....

.....

Total fee □.....in Cash/ Banker's Cheque /Bank Draft bearing No..... Date on ..... Bank.

I/We hereby declare that to the best of my/our knowledge, information and belief the fact and matters slated herein are correct and I/We request that a patent may be granted to me/us for the said invention.

Dated this.....day of.....20.....

Signature: A. HariKrishna

Name: 1. Dr.Balaji. D, 2. Dr. A. Saravanakumar, 3. Dr.KSantarao4. Mr. AlagalaHarikrishna

Signature:

Name: 5. Mr. M.MohanReddy 6. Dr. R.RamaKrishna Reddy

To,

The Controller of Patents

The Patent Office, at.....

Note: -

* Repeat boxes in case of more than one entry.
* To be signed by the applicant(s) or by authorized registered patent agent otherwise where mentioned.
* Tick (✓)/cross (x) whichever is applicable/not applicable in declaration in paragraph-12.
* Name of the inventor and applicant should be given in full, family name in the beginning.
* Strike out the portion which is/are not applicable.

For fee: See First Schedule";

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700292189

FORM 5
THE PATENTS ACT, 1970
(39 of 1970)
DECLARATION AS TO INVENTORSHIP
[See section 10(6); rule 13(6)]

We, **1. Dr. Balaji. D,** having address at, Assistant Professor in department of Mechanical Engineering, KPR Institute of Engineering and Technology, Arasur, Coimbatore, Tamil Nadu, India, Indian National
2. Dr. A. Saravanakumar, having address at, Professor, Department of mechanical engineering, K.S.R.M. College of engineering, Kadapa – 516003, Andhra Pradesh, India, Indian National
3.Dr.K Santarao, having address at, Assistant Professor, Department of mechanical engineering GMR Institute of Technology, Rajam – 532127, Andhra Pradesh, India
Indian National
4.Mr. Alagala Harikrishna, 5. Mr. M.Mohan Reddy, 6. Dr. R.Rama Krishna Reddy, having address at, Department of mechanical engineering, K.S.R.M. College of engineering, Kadapa – 516003, Andhra Pradesh, India, Indian National

I am the true and first inventors of the invention disclosed in the Complete Specification filed in pursuance of our Application titled **"Method of synthesising hybrid metal natural fiber composite and 3D Printing thereof"**

Dated this

APPLICANT

Signature:
Name: 1. Dr.Balaji. D, 2. Dr. A. Saravanakumar, 3. Dr.K Santarao 4. Mr. Alagala Harikrishna

Signature:
Name: 5. Mr. M.Mohan Reddy 6. Dr. R.Rama Krishna Reddy

To
The Controller of Patents,
The Patent Office,
At Chennai

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