पेटेंट कार्यालय
शासकीय जर्नल

OFFICIAL JOURNAL
OF
THE PATENT OFFICE

निर्गमन सं. 11/2021	शुक्रवार	दिनांक: 12/03/2021
ISSUE NO. 11/2021	FRIDAY	DATE: 12/03/2021

पेटेंट कार्यालय का एक प्रकाशन
PUBLICATION OF THE PATENT OFFICE

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :02/03/2021

(21) Application No.202141008703 A
(43) Publication Date : 12/03/2021

(54) Title of the invention : DESIGN AND DEVELOPMENT OF TWO WHEELER MUD GUARD USING GLASS AND JUTE FIBER

(51) International classification	:C08J0005060000, B29K0105060000, C08J0005040000, G01N0003200000, G01N0003040000
(31) Priority Document No	:NA
(32) Priority Date	:NA
(33) Name of priority country	:NA
(86) International Application No	:NA
Filing Date	:NA
(87) International Publication No	: NA
(61) Patent of Addition to Application Number	:NA
Filing Date	:NA
(62) Divisional to Application Number	:NA
Filing Date	:NA

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2)Dr. P. BADARI NARAYANA
3)Dr. S. NARASIMHA KUMAR
4)Mr. B. GOVINDA REDDY
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2)Dr. P. BADARI NARAYANA
3)Dr. S. NARASIMHA KUMAR
4)Mr. B. GOVINDA REDDY

(57) Abstract :
This invention is based on utilization of synthetic and natural fibers in polymer composites. In this research work mechanical testing and methods are used to study the material properties of mud guard fibre - reinforced polyester composites with varying fibre contents. The overall objective of this paper is to find out and compare the difference of two material which have different properties and conditions, namely the first one acrylonitrile butadiene styrene and the composite material glass fiber and Jute fiber with epoxy resin. These composites are subjected to give high strength and light weight fiber composite material. In this project a mechanical testing like tensile flexural and impact test conducted on a mud guard, composite material and Acrylonitrile Butadiene Styrene. In this research a prototype model of mud guard was prepared by our team by using the composite material and the different tests are conducted on it to know the different properties and Values and.it is compared with the existing material, then the results are concluded.

No. of Pages : 22 No. of Claims : 6

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GOVERNMENT OF INDIA

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Department of Industrial Policy and Promotion
Ministry of Commerce and Industry

Application Details

APPLICATION NUMBER	202141008703
APPLICATION TYPE	ORDINARY APPLICATION
DATE OF FILING	02/03/2021
APPLICANT NAME	1 . Dr. A. RAVEENDRA 2 . Dr. P. BADARI NARAYANA 3 . Dr. S. NARASIMHA KUMAR 4 . Mr. B. GOVINDA REDDY
TITLE OF INVENTION	DESIGN AND DEVELOPMENT OF TWO WHEELER MUD GUARD USING GLASS AND JUTE FIBER
FIELD OF INVENTION	POLYMER TECHNOLOGY
E-MAIL (As Per Record)	
ADDITIONAL-EMAIL (As Per Record)	akunuruaveendra@mrec.ac.in
E-MAIL (UPDATED Online)	
PRIORITY DATE	
REQUEST FOR EXAMINATION DATE	--
PUBLICATION DATE (U/S 11A)	12/03/2021

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CHALLAN : TR-5
DOCKET NO :18427

Date/Time : 02/03/2021 03:03:41

Agent Number:

To,
DR. A. RAVEENDRA
DEPARTMENT OF MECHANICAL ENGINEERING, MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS), MAISAMMAGUDA (H), GUNDLAPOCHAMPALLY VILLAGE, MEDCHAL MANDAL, MEDCHAL-MALKAJGIRI DISTRICT, HYDERABAD, TELANGANA STATE - 500100. akunuruveendra@mrec.ac.in

Sr. No.	CBR No.	Reference Number /Application Type	Application Number	Title/Remarks	Amount Paid
1	7607	ORDINARY APPLICATION	202141008703	DESIGN AND DEVELOPMENT OF TWO WHEELER MUD GUARD USING GLASS AND JUTE FIBER	1750
2		E-101/1767/2021-CHE	202141008703	Correspondence	0
3		E-2/712/2021-CHE	202141008703	Form2	0
4		E-3/6790/2021-CHE	202141008703	Form3	0
5		E-5/812/2021-CHE	202141008703	Form5	0
6	7607	E-12/814/2021-CHE	202141008703	Form9	2750
Total :					4500

Received a sum of Rs. 4500 (Rupees Four Thousand Five Hundred only) through

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Cash	---	---	---	4500

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G.A.R.6
[See Rule 22(1)]
RECEIPT

Docket No 19100 **Date/Time 2021/03/04 02:54:40**

To
Dr. A. RAVEENDRA
DEPARTMENT OF MECHANICAL ENGINEERING, MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS), MAISAMMAGUDA (H), GUNDLAPOCHAMPALLY VILLAGE, MEDCHAL MANDAL, MEDCHAL-MALKAJGIRI DISTRICT, HYDERABAD, TELANGANA STATE-500100, INDIA. akunuruaveendra@mrec.ac.in

CBR Detail:

Sr. No.	Ref. No./Application No.	App. Number	Amount Paid	C.B.R. No.	Form Name	Remarks
1	E-18(iii)/844/2021-CHE	202141008703	1600	43043	FORM 13	DESIGN AND DEVELOPMENT OF TWO WHEELER MUD GUARD USING GLASS AND JUTE FIBER

TransactionID	Payment Mode	Challan Identification Number	Amount Paid	Head of A/C No
N-0000739320	Online Bank Transfer	20122000005879	1600.00	1475001020000001

Total Amount : ₹ 1600
Amount in Words: Thousand Six Hundred Only

Received from Saurabh Kumar Jain the sum of ₹ 1600 on account of Payment of fee for above mentioned Application/Forms.

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From
Dr. A. RAVEENDRA
DEPARTMENT OF MECHANICAL ENGINEERING,
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Mobile: 9502294258
e-mail: akunururaveendra@mrec.ac.in

Date: 02/03/2021

To
The Controller of Patents,
The Patent Office, Chennai
Sub: Submission of Patent Application with Complete Specification

Title: DESIGN AND DEVELOPMENT OF TWO WHEELER MUD GUARD USING GLASS AND JUTE FIBER

Applicants & Inventors: -

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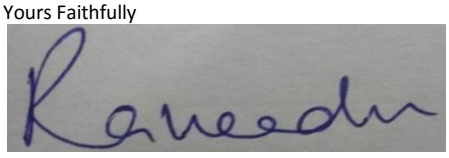
Mr. B. GOVINDA REDDY	DEPARTMENT OF MECHANICAL ENGINEERING, MAHATMA GANDHI INSTITUTE OF TECHNOLOGY,KOKAPET (VILLAGE), GANDIPET (MANDAL), CHAITANYA BHARATHI (PO) RANGA REDDY DIST. HYDERABAD, TELANGANA 500075 Mobile: 9849994424 e-mail: bgrmech@gmail.com	Indian

Sir/Madam,
We are submitting herewith following documents towards filing of a patent application
1. Form-1
2. Form 2 and Complete Specification
3. Form- 3
4.Form-5
5.Form-9
You are requested to take the same on record and issue a receipt for the same.

Thanking You

Yours Faithfully



Dr. A. RAVEENDRA

"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)

Application No.	
Filing date:	
Amount of Fee paid:	
CBR No:	
Signature:	

1. APPLICANT'S REFERENCE / IDENTIFICATION NO. (AS ALLOTTED BY OFFICE)	

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

Ordinary (√)		Convention (x)	PCT-NP (x)		
Divisional ()	Patent of Addition ( )	Division ( )	Patent of addition ()	Division ( )	Patent of Addition ( )

3A. APPLICANT(S)

Name in Full	Nationality	Country of Residence	Address of the Inventor	
Dr. A. RAVEENDRA	INDIAN	INDIA	House No.	DEPARTMENT OF MECHANICAL ENGINEERING, MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)
			Street	MAISAMMAGUDA(H), GUNDLAPOCHAMPALLY VILLAGE, MEDCHAL MANDAL, MEDCHAL-MALKAJGIRI DISTRICT
			City	HYDERABAD
			State	TELANGANA
			Country	INDIA
			Pin code	500100
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			City	HYDERABAD
			State	TELANGANA
			Country	INDIA
			Pin code	500075
Dr.S. NARASIMHA KUMAR	INDIAN	INDIA	House No.	DEPARTMENT OF MECHANICAL ENGINEERING, CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (AUTONOMOUS)
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			City	HYDERABAD
			State	TELANGANA
			Country	INDIA
			Pin code	500075
Mr. B. GOVINDA REDDY	INDIAN	INDIA	House No.	DEPARTMENT OF MECHANICAL ENGINEERING, MAHATMA GANDHI INSTITUTE OF TECHNOLOGY
			Street	KOKAPET (VILLAGE), GANDIPET (MANDAL),CHAITANYA BHARATHI (PO) RANGA REDDY DIST.,
			City	HYDERABAD
			State	TELANGANA
			Country	INDIA
			Pin code	500075

Natural Person (√)	Other than natural Person		
	Small Entity (x)	Startup (x)	Others (x)

4. INVENTOR(S) [Please tick at the appropriate category]		
Are all the inventor(s) same as the applicant(s) named above?	Yes (√)	

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

Name in Full	Nationality	Country of Residence	Address of the Inventor

5. TITLE OF THE INVENTION

DESIGN AND DEVELOPMENT OF TWO WHEELER MUD GUARD USING GLASS AND JUTE FIBER

6. AUTHORISED REGISTERED PATENT AGENT	IN/PA No.	- NA-
	Name	

7. ADDRESS FOR SERVICE OF APPLICANT IN INDIA	Name	Dr. A. RAVEENDRA
	Postal Address	DEPARTMENT OF MECHANICAL ENGINEERING, MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS), MAISAMMAGUDA(H), GUNDLAPOCHAMPALLY VILLAGE, MEDCHAL MANDAL, MEDCHAL-MALKAJGIRI DISTRICT,HYDERABAD, TELANGANA 500100
	Telephone No.	
	Mobile No.	9502294258
	Fax No.	
	E-mail ID	akunururaveendra@mrec.ac.in

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)
NA	NA	NA	NA	NA	NA

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
NA	NA

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
NA	NA

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

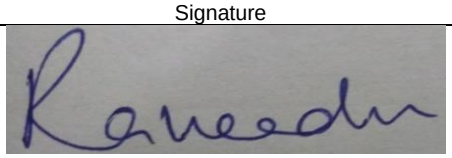
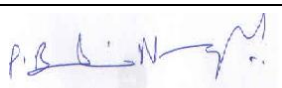
Main application/patent No. : NA	Date of filing of main application : NA

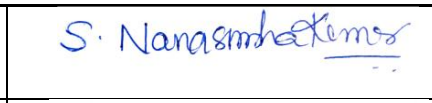
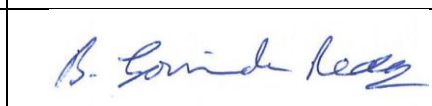
12. DECLARATIONS

(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).

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

Name	Signature	Date
Dr. A. RAVEENDRA		02/03/2021
Dr. P. BADARI NARAYANA		02/03/2021

Dr.S. NARASIMHA KUMAR		02/03/2021
Mr. B. GOVINDA REDDY		02/03/2021

(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)

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

(a) Date
(b) Signature(s) -------NA----------
(c) Name(s) of the signatory

(iii) Declaration by the applicant(s)

- We the applicant(s) hereby declare(s) that: -
- 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.
- We are the true & first inventor(s).
- We are the assignee or legal representative of true & first inventor(s).
- ~~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 our invention(s).~~
- ~~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.~~
- ~~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.~~

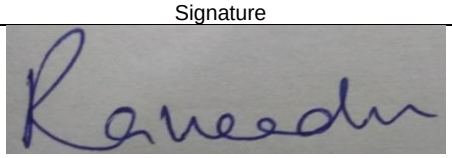
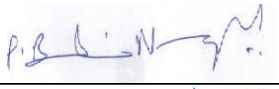
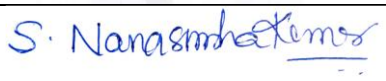
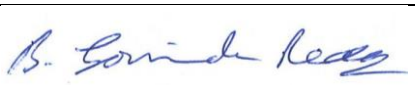
13. FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION (a) Form 2

Item	Details	Fee	Remarks
Complete specification	No. of pages :22		
No. of Claim(s)	No. of claims : 06 and No. of pages :01		
Abstract	No. of pages :01		
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/InternationalPreliminary Report on Patentability.~~
(g) Statement and Undertaking on Form 3
(h) Declaration of Inventorship on Form 5
(j)……..
Total fee

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

Name	Signature	Date
Dr. A. RAVEENDRA		02/03/2021
Dr. P. BADARI NARAYANA		02/03/2021
Dr.S. NARASIMHA KUMAR		02/03/2021
Mr. B. GOVINDA REDDY		02/03/2021

To,
The Controller of Patents
The Patent Office, at CHENNAI

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";

Form 2

THE PATENT ACT, 1970

(39 of 1970)

&

The Patent Rules, 2003

COMPLETE SPECIFICATION

(Section 10 and Rule 13)

DESIGN AND DEVELOPMENT OF TWO WHEELER MUD GUARD USING GLASS AND JUTE FIBER

Name	Address	Nationality
Dr. A. RAVEENDRA	DEPARTMENT OF MECHANICAL ENGINEERING, MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS), MAISAMMAGUDA(H), GUNDLAPOCHAMPALLY VILLAGE, MEDCHAL MANDAL, MEDCHAL-MALKAJGIRI DISTRICT,HYDERABAD, TELANGANA 500100 Mobile: 9502294258 e-mail: akununuraveendra@mrec.ac.in	Indian
Dr. P. BADARI NARAYANA	DEPARTMENT OF MECHANICAL ENGINEERING, MAHATMA GANDHI INSTITUTE OF TECHNOLOGY, KOKAPET (VILLAGE), GANDIPET (MANDAL), CHAITANYA BHARATHI (PO) RANGA REDDY DIST., HYDERABAD, TELANGANA 500075 Mobile: 7013835309 e-mail: badari.p@gmail.com	Indian
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The following specification particularly describes the invention and the manner in which it is to be performed.

FIELD OF INVENTION: MECHANICAL ENGINEERING

Present invention provides a process for making reinforced composite material made from natural fibers, Synthetic fibers and polymers. In particular this invention relates to design and development of two wheeler mud guard using glass and jute fiber.

PRIOR ART DISCUSSION

Composite materials have been in use for many a variety of applications and have been developed in a variety of configurations. Such materials show some extraordinary properties in terms of mechanical strength, thermal properties etc. With the discovery of nano materials, research in this area has been phenomenal and newer composites are being continuously developed. Generally the composite materials may be made from a combination of metals, nonmetals, plastics with the shapes of the finished materials may be in any geometrical form. The basic form of any or all the constituents of a composite may be in particles, whiskers, fibers, resins etc.

Fiber reinforced polymer composites have received widespread attention in the past four decades because of their high specific strength and modulus. Commonly, composites using high strength fibers such as graphite, aramid and glass are used in broad range of applications from aerospace structure to automotive parts and from building materials to sporting goods. But, this type of composites was imported from overseas and need high cost to produce it.

This situation has led to the development of alternative materials. In recent years, a significant amount of interest has been shown in the potential of natural fibers to replace glass fiber in composites. This is the alternative way which is more economical and can be very cost-effective than using synthetic fibers. Although these fibers may not be as strong as carbon and aramid, their main advantages are low cost and biodegradability. Some attempts have been made in recent years to incorporate natural products from plants in the form of fibers. However, a composite purely from all ingredients being natural source from plants is still not a reality.

Reference may be made to a US patent publication US2004/0234803 to Catherine Joyce. The inventor discloses a multi fiber composite consisting of a combinant structure of cellulosic wood or polymeric fibers mixed with non fibrous materials. The disclosure relates to economic and environmental efficiencies to wood, non woods paper making and other polymeric operations. The disclosed invention also provides application to various categories of products like automotive, construction, food and non-food items. And personal care items. However, the said disclosure is not clearly stating use of any other natural fiber other than wood. This still is not a beneficial use as wood means deforestation and hence threat to environment. The fiber of the invention may also nit have bi degradability property.

In yet another patent publication US2008/02206537 to Joris, the disclosed invention relates to preparation of thermosetting or thermoplastic polymers reinforced with natural fibers. The disclosed materials have been proposed fro use in construction industry. The natural fibers use din the disclosed invention include hemp, jute bamboo, coco, hemp and preferably flax.

Depending on the end use, the disclosed invention further educates that the natural fiber may be added with any other man made fiber like aramid, ceramic and the like. However, the disclosure still might have limitation of bio degradability.

In yet another patent publication US 2009/0118396, to Stephan .J Faehner and Michael. J Pisczor, the invention relates to enhancement of cellulosic properties to wood by adding natural fibers. The natural fibers used include alfalfa, bagasse, bamboo, coconut husks, cornstalks, cotton, cotton gin waste, flax, hemp, kenaf, oat hulls, peanut hulls, rice hulls, hemp, switch grasses, wheat stalks or other types of cellulosic materials. The amount of natural fibers used in the modification of wood powder is in a range of 5-95%.The disclosure is limited to modification of wood only by adding natural fibers listed.

It is an object of the present invention to provide a hybrid reinforced composite material which obviates the drawbacks of the existing ones.

Another object is to provide a process for making hybrid reinforced composite material.

Another object of the present invention is to provide the composite material capable of being molded in any useful form.

Yet another object of the present invention is to provide a solid material from the fiber composite capable of being drilled holes in it.

Still further object of the present invention is to provide a composite material capable of being used to make any product with or without mechanical flexibility.

The objective includes the process to make the composite and also the variety of products in automotive, furniture, upholstery, house hold goods and computer goods.

Further objective of the present invention is to provide house hold articles of use from the hybrid composite

This invention focuses on establishment of superior mechanical and material properties of the hybrid composite

The invention is now described in detail as hereunder.

SELECTION OF MATRIX:

Epoxy resin used - Araldite LY556

Density - 1.15 to 1.20 [g / cm^3]

Hardener used - HY951

Density - 1.13 [g / cm^3]

Curing temperature - Room temperature

The Epoxy resin and Hardener are mixed by 10:1 weight ratio

RAW MATERIAL USED IN HAND LAY-UP METHOD:

MATERIAL USED

MATRIX - Epoxy LY556

REINFORCEMENT - Glass fiber (cloth-10mill) and Jute fiber (Yawn)

HARDENER - Araldite HY951

Properties of Raw Material

PROPERTIES	**JUTE**	**GLASS**	**EPOXY**
Density (g/cm^3)	1.3	2.5	1.08-1.2
Young's Modulus	77	55.5	3.7
Moisture absorption at 24 hrs	6.9	0.5	_
Aspect ratio	152-365	100-140	_
Specific gravity (gm/cc)	1.3	2.5	1.8
Tensile strength (MN/m2)	3400	442	85
Specific modulus (GN/m2)	28.8	42.7	_

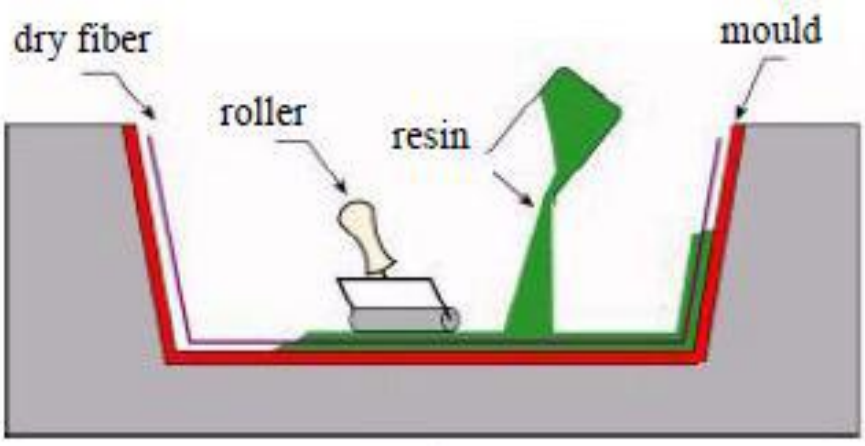
PREPARATION OF EPOXY AND HARDENER:

The matrix used to fabricate the fiber specimen was epoxy LY556 of density 1.13 g/cm^3 at 25°C mixed with hardener HY951 of density 0.97 to 0.99 g/cm^3. The weight ratio of mixing epoxy and hardener was followed as per the supplier Norms that is 100ml of epoxy resin with 10ml.

FABRICATION OF COMPOSITE (hand lay-up method):

- Hand Lay-up method is followed for fabrication.
- A 3mm thick silicon rubber mould is been created with 300mm length and width.

The composite is been fabricated further as shown.



Hand lay-up method

Hand lay-up method procedure:

- The Releasing agent is applied uniformly on the lower mould surface.
- The resin and hardener are mixed in a separate glass jar at a ratio of 10:1.

- The resin and reinforcement are applied alternatively to get the final product.
- The mould is closed and the composite material is pressed uniformly for 32 hours under room temperature.
- After this composites are fully dry, then it is separated from the mould.

CALCULATION OF PROCESS SHEET:

Density of Glass Fibre = 2.5×10^{-3} gm/mm^3

Density of Jute Fibre = 1.3×10^{-3} gm/mm^3

Density of Epoxy Resin = 1.2×10^{-3} gm/mm^3

Total Volume of Plate = Length × Breadth × Height

= 300 × 300 × 3

= 270000 mm3

Volume of Matrix = 270000 × (60/100)

= 162000 mm^3

Mass of Matrix = Volume × Density

= 162000 × 1.2 × 10^{-3}

= 194.4gm

Volume of Fiber = 270000 × (40/100)

= 108000 mm^3

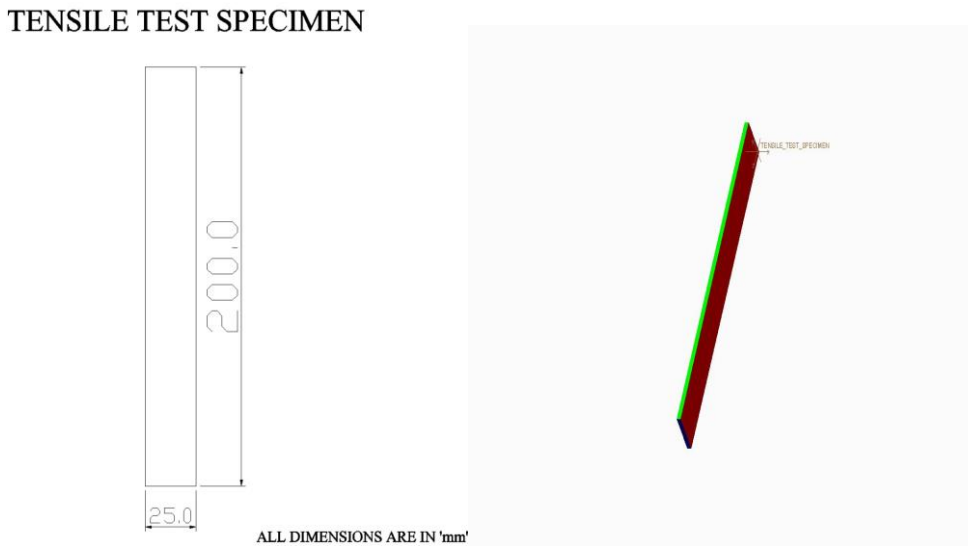
Mass of Fiber = 162000 × (1.93×10^{-3})

= 312.66 gm

Total Mass of the Plate = 253.53 gm

Working Procedure

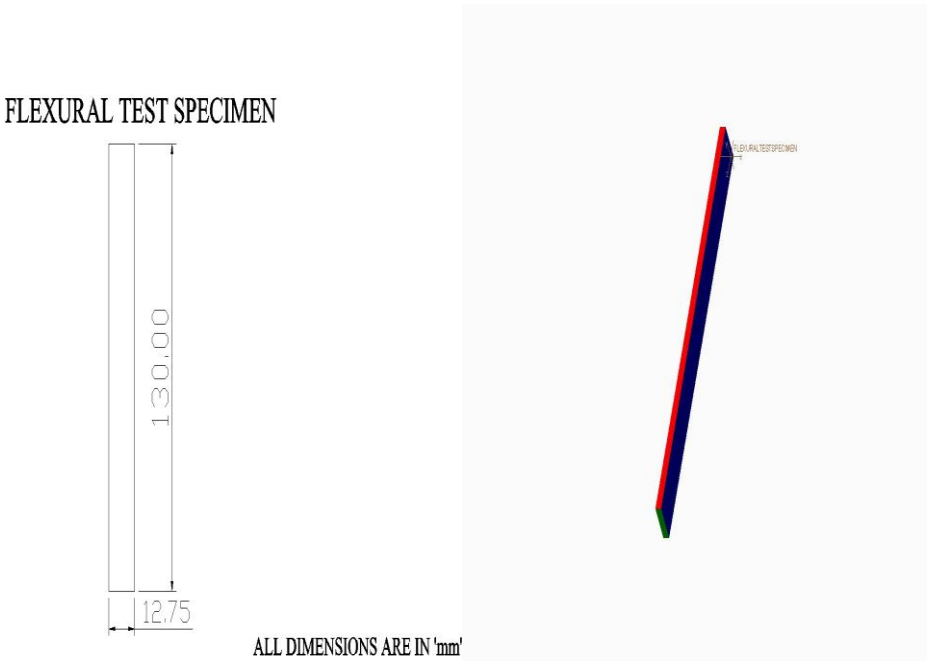
ASTM DIMENSIONS OF TEST SPECIMEN:



Tensile Test Specimen

Tensile Test:

The specimen is tested under Hydraulic Testing Machine by Keeping the loading rate constant. A tensile load is Applied on the specimen until it fractures. During the tensile Test, certain elongation were done on the material due to the Load which will be recorded. A load elongation curve is Plotted by an x-y recorder, so that the tensile behavior of the Material will be calculated over here.

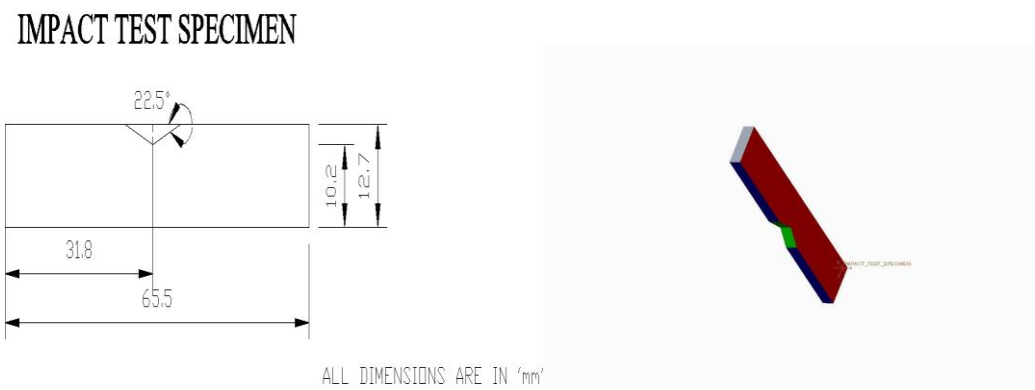


Flexural Test Specimen

Flexural Test:

Flexural Test

- The flexural specimens were prepared as per the ASTM D790 standard.
- The length, width and thickness of the specimen were 100, 13 and 3mm.
- Flexural strength = $3pl/2bt^2$.



Impact Test Specimen

Impact Test:

Impact Test

- ASTM Standard – D 256
- The impact test is the ability of the material to withstand the sudden shock loads
- This test is conducted in a Izod method of impact testing as shown.
- The specimen made as per the specification would be kept in the machine and the load will be released.
- The absorbed energy would be indicated in the dial.

TESTING RESULT VALUE:

Sample	Fiber and resin volume ratio	Tensile strength (mpa)	Flexural strength (mpa)	Impact Strength (Joule)
1.	40:60	36.98	30.28	1.75

CALCULATIONS:

Tensile Load = 1.671 N

Tensile Strength of glass fiber = load / area

= 1.671 / (13 x 3)

= 42.84 Mpa

Tensile load of jute fiber = 1.214 N

Tensile Strength of jute fiber = load/area

= 1.214 / (13 x 3)

= 31.12 Mpa

Total Tensile strength of composite = 36.98 Mpa

Flexural load of Glass fiber = 4.915 N

Flexural strength of glass fiber = $\{3PL / (2 \text{ x } b \text{ x } t^2)\}$

Where; P = load = 0.915 N

b = breadth =13mm

t = thickness = 3mm

L = length = 45mm

= (3 x 4.915x 45/(2 x13 x 9))

= 28.35 N/mm^2

Flexural load of Glass fiber = 4.114 N

Flexural strength of glass fiber = $\{3PL / (2 \times b \times t^2)\}$

= {3 x 4.114 x 45 / (2 x13 x 9)}

= 46.8N/mm^2.

Total Flexural strength of glass and jute fiber = (28.35 + 46.8) / 2

= 30.28 MPA

Impact strength of glass fiber = 2.5 J

Impact strength of Jute fiber = 1 J

Total impact strength of composite = 1.75 J

COMPARISON OF TESTING RESULT:

SI NO	TEST RESULT	ABS (ACRYLONITRILE/ BUTADIENE / STYRENE)	COMPOSITE MATERIAL
1.	TENSILE TST(MPA)	33	36.96
2.	FLEXURAL TEST(MPA)	28	30.28
3.	IMPACT TEST(JOULE)	2.94	1.75

PREPARATION OF PROTOTYPE MODEL:

The releasing agent used is hard wax which is applied over the mould such that the wax is equally spread and it is dried for about half an hour.

- Epoxy and hardener are thoroughly mixed in a separate beaker. The composite material is prepared by using Hand Layup Technique.

- While performing hand layup technique care should be taken to avoid formation of voids within the composite.
- After that mould was kept for about 24 hours to get hardened. After 24 hours the mould was kept in an oven for 20 minutes such that the releasing agent gets melted and it will be easy to remove the composite material from the glass mould.
- And then the composite material was kept in the oven for about one hour for curing purpose.
- After curing the material is kept under weights so that the material gets a uniform shape like the shape of the mould cavity.
- After the completion of fabrication work , the same product is drawn in solid works and imported to ansys.
- By using Ansys software the different test's like load test, tensile test , shear test , hardness test , etc.., where taken.

ABS (ACRYLONITRILE BUTADIENE STYRENE):

ABS is formed by combining three monomers – Acrylonitrile, Butadiene, and Styrene. This medium priced thermoplastic offers a combination of impact and abrasion resistance, tensile strength, dimensional stability, heat resistance, rigidity, low temperature properties, chemical resistance and good electrical characteristics. ABS is ideal for turning, drilling, sawing, milling, die-cutting, cold stamping, and shearing.

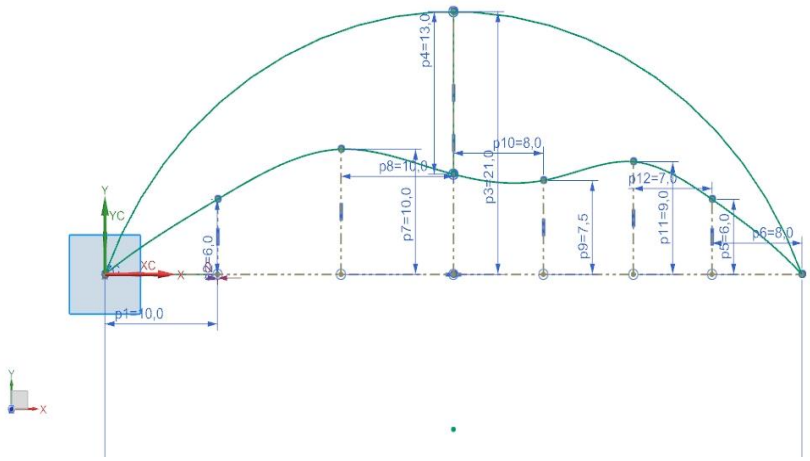
This material is easy to glue and paint with non petroleum-based products. Petroleum based products should not be used because they will cause the material to craze. ABS is also one of the few non-metallic materials that can be readily electroplated. ABS is produced in thin gauge sheet with Haircell/Smooth finish and a Smooth/Smooth finish. ABS is also produced in an Industrial grade in thicker plate and rod.

APPLICATION:

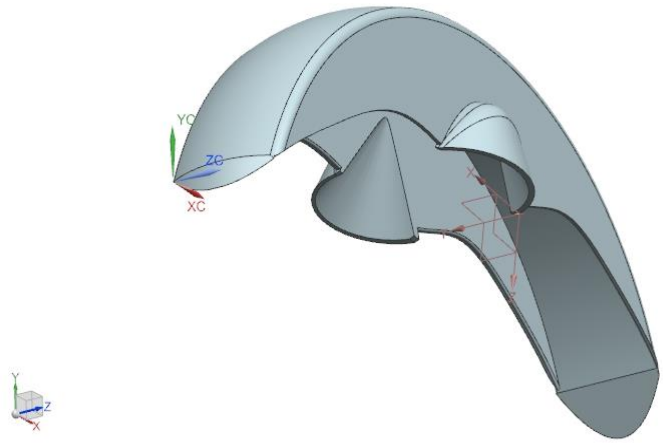
ABS's light weight and ability to be injection molded and extruded make it useful in manufacturing products such as drain-waste-vent (DWV) pipe systems, musical instruments (recorders, plastic clarinets, and piano movements), golf club heads (because of its good shock absorbance), automotive trim components, automotive bumper bars, medical devices for blood access, enclosures for electrical and electronic assemblies, protective headgear, whitewater canoes, buffer edging for furniture and joinery panels, luggage and protective carrying cases, small kitchen appliances, and toys, including Lego and Kre-obricks.

ABS Mud guard

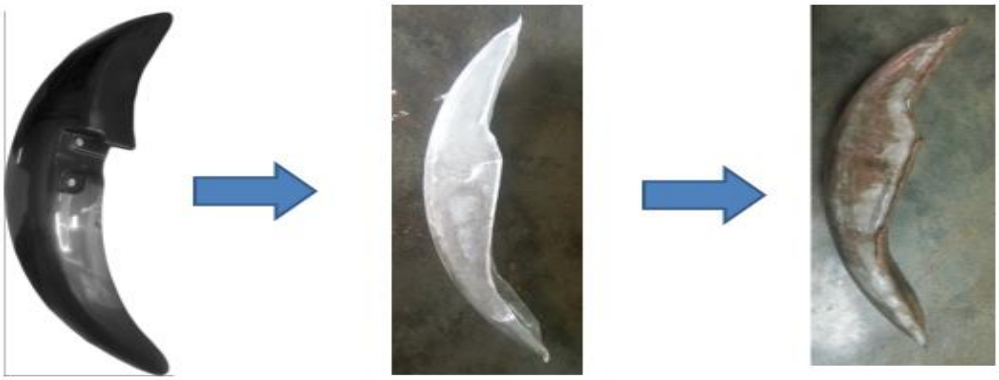
MODELLING OF COMPOSITE USING SOLIDWORKS



3D MODEL OF PROTOTYPE



FABRICATION OF PROTOTYPE



Fabrication of Prototype

By comparing the existing material (abs) with composite (glass& jute& epoxy), we get better result like tensile, flexural and impact tests. It is cheaper than existing model and less weight. Due to limited resource available we have made a prototype. Further research being done to check the feasibility for mass production of the model. For further improvement, the results of this single polymer is compared with the results of another Jute Fiber with Glass Fiber reinforced hybrid composite**.** Material cost also very less when compared to ABS.

CLAIM (S)

1) A reinforced composite materials for two wheeler mud guard which composite comprises glass and Jute fibers being mixed in a matrix of bio epoxy resin using a catalyst to effect complete mixing of the said fibers to yield the said hybrid reinforced composite, the said hybrid composite capable of being moulded to any geometrical object.

2) The invention of reinforced composite material is of light weight.

3) A hybrid composite as claimed in claim 1, wherein the flexural properties of the composite is not be affected by moisture.

4) A hybrid composite as claimed in claim 1, wherein the impact strength of composite is not affected due to moisture conditions.

5) A hybrid composite as claimed in claim 1, where in the Good thermal and acoustic insulating properties.

6) A hybrid composite as claimed in claim 1, where these fibers are Producible with low investment at low cost, which makes the material an interesting product for low-wage countries. Friendly processing, no wear of tooling, no skin irritation.

ABSTRACT

DESIGN AND DEVELOPMENT OF TWO WHEELER MUD GUARD USING GLASS AND JUTE FIBER

This invention is based on utilization of synthetic and natural fibers in polymer composites. In this research work mechanical testing and methods are used to study the material properties of mud guard fibre – reinforced polyester composites with varying fibre contents. The overall objective of this paper is to find out and compare the difference of two material which have different properties and conditions, namely the first one acrylonitrile butadiene styrene and the composite material glass fiber and Jute fiber with epoxy resin. These composites are subjected to give high strength and light weight fiber composite material. In this project a mechanical testing like tensile flexural and impact test conducted on a mud guard, composite material and Acrylonitrile Butadiene Styrene. In this research a prototype model of mud guard was prepared by our team by using the composite material and the different tests are conducted on it to know the different properties and Values and it is compared with the existing material, then the results are concluded.

FORM 3
THE PATENTS ACT 1970
(39 of 1970)
&
The Patent Rules, 2003
STATEMENT AND UNDERTAKING UNDER SECTION 8
(See Section 8, rule 12)

NAME OF APPLICANTS & INVENTORS

DESIGN AND DEVELOPMENT OF TWO WHEELER MUD GUARD USING GLASS AND JUTE FIBER

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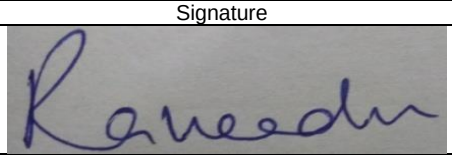
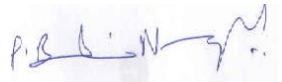
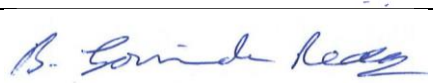
Hereby declare, We have not made any application for the same / substantially the same invention outside India.

Name	Signature	Date
Dr. A. RAVEENDRA		02/03/2021
Dr. P. BADARI NARAYANA		02/03/2021
Dr.S. NARASIMHA KUMAR		02/03/2021
Mr. B. GOVINDA REDDY		02/03/2021

To
The Controller of patents, The Patent office at CHENNAI.

FORM 5
THE PATENTS ACT, 1970 (39 of 1970)
&
THE PATENTS RULES, 2003
DECLARATION AS TO INVENTORSHIP
(See section 8, rule 12)

1. Name of Applicant & Inventors

Name	Address	Nationality
Dr. A. RAVEENDRA	DEPARTMENT OF MECHANICAL ENGINEERING, MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS), MAISAMMAGUDA(H), GUNDLAPOCHAMPALLY VILLAGE, MEDCHAL MANDAL, MEDCHAL-MALKAJGIRI DISTRICT,HYDERABAD, TELANGANA 500100 Mobile: 9502294258 e-mail: akunururaveendra@mrec.ac.in	Indian
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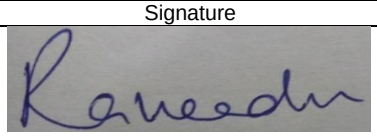
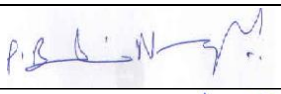
Hereby declare that the true and first inventor of the invention disclosed in the complete specification filed in pursuance of my application numbered _____ dated _____

TITLE OF THE INVENTION: DESIGN AND DEVELOPMENT OF TWO WHEELER MUD GUARD USING GLASS AND JUTE FIBER

3.Declaration to be given when the application in India is filed by the Applicant in the convention country: -
I the applicant in the convention country hereby declare that our right to apply for a patent in India is by way or assignment from the true and first inventor.

Name	Signature	Date
Dr. A. RAVEENDRA		02/03/2021
Dr. P. BADARI NARAYANA		02/03/2021
Dr.S. NARASIMHA KUMAR		02/03/2021
Mr. B. GOVINDA REDDY		02/03/2021

To
The Controller of Patents, The Patent office at CHENNAI.

FORM 9
THE PATENTS ACT, 1970
(39 of 1970)
&
THE PATENTS RULES, 2003
REQUEST FOR PUBLICATION
(See section 11A(2); rule 24A)

We (state name, address and nationality of Applicant & Inventors)

DESIGN AND DEVELOPMENT OF TWO WHEELER MUD GUARD USING GLASS AND JUTE FIBER

Name	Address	Nationality
Dr. A. RAVEENDRA	DEPARTMENT OF MECHANICAL ENGINEERING, MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS), MAISAMMAGUDA(H), GUNDLAPOCHAMPALLY VILLAGE, MEDCHAL MANDAL, MEDCHAL-MALKAJGIRI DISTRICT,HYDERABAD, TELANGANA 500100 Mobile: 9502294258 e-mail: akunururaveendra@mrec.ac.in	Indian
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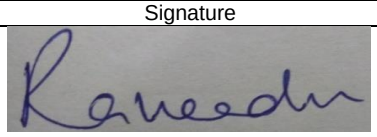
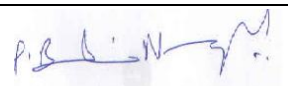
Hereby request for early Publication of our application for Patent No. _____ dated _____ under section 11A(2) of the act.

Name	Signature	Date
Dr. A. RAVEENDRA		02/03/2021
Dr. P. BADARI NARAYANA		02/03/2021
Dr.S. NARASIMHA KUMAR		02/03/2021
Mr. B. GOVINDA REDDY		02/03/2021

To
The Controller of Patents, The Patent office at CHENNAI.

FORM 13

THE PATENTS ACT, 1970

(39 of 1970)

and

THE PATENTS RULES, 2003

APPLICATION FOR AMENDMENT OF THE APPLICATION FOR PATENT/ COMPLETE SPECIFICATION/ANY DOCUMENT RELATED THERETO

[See section 57; sub-rule (1) of rule 81]

1.Name of the applicant(s).

We, request leave to amend the application/any document related thereto/complete specification with respect to application for **patent No 202141008703** dated **02/03/2021** as highlighted in the copy hereto annexed.

Name	Address	Nationality
Dr. A. RAVEENDRA	DEPARTMENT OF MECHANICAL ENGINEERING, MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS),MAISAMMAGUDA(H), GUNDLAPOCHAMPALLY VILLAGE,MEDCHAL MANDAL, MEDCHAL-MALKAJGIRI DISTRICT,HYDERABAD, TELANGANA 500100 Mobile: 9502294258 e-mail: akunururaveendra@mrec.ac.in	Indian
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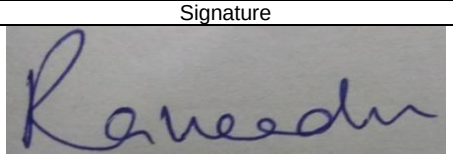
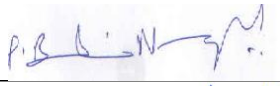
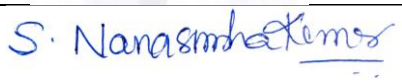
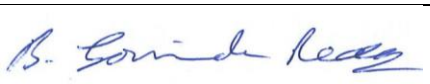
Our reason for making this request are as follows:-
Spelling/Initial Mistake (i.e.,Applicant & Inventor of Mr. GOVINDA REDDY **initial is " B ")**

Requesting to change **Mr. B. GOVINDA REDDY** instead of Mr. P. GOVINDA REDDY.

	I declare that no action for infringement or for the revocation of the patent in question is pending before Appellate Board or a Court. I declare that the facts and matters stated herein are true to the best of my knowledge information and belief.
2.To be signed by the applicant(s) or patentee(s) or by his authorized registered patent agent	<table><tr><th>Name</th><th>Signature</th><th>Date</th></tr><tr><td>Dr. A. RAVEENDRA</td><td>  </td><td>04/03/2021</td></tr><tr><td>Dr. P. BADARI NARAYANA</td><td>  </td><td>04/03/2021</td></tr><tr><td>Dr.S. NARASIMHA KUMAR</td><td>  </td><td>04/03/2021</td></tr><tr><td>Mr. B. GOVINDA REDDY</td><td>  </td><td>04/03/2021</td></tr></table>
3. Name of the natural person who has signed	To The Controller of Patents, The Patent Office, Chennai
Note.- For fee: See First Schedule.”;	