



हरकोर्ट बटलर प्राविधिक विश्वविद्यालय

नवाबगंज, कानपुर - 208002, उ.प्र., भारत

HARCOURT BUTLER TECHNICAL UNIVERSITY

NAWABGANJ, KANPUR - 208002, U.P., INDIA

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100 YEARS  
1921 - 2021

## **HEI Response: Metric ID 3.4.3**

### **Response:**

The information is updated after considering only the patent granted/published in last five year as instructed in the DVV query

### **HEI Final Input: Metric ID 3.4.3**

3.4.3.1. Updated Total number of Patents published / awarded year-wise during the last five years.

17

HEI Final Input :

2021-22	2020-21	2019-20	2018-19	2017-18
5	11	1	0	0

## **Table of Contents**

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(Prof. S.K. Sharma)  
Registrar  
Harcourt Butler Technical University  
Kanpur-208002

## **1. The updated List of Patents**

**E- Link**



**<https://hbtu.ac.in/naac/HAIResponse/3.4.3.xlsx>**

## 2. Proof of the Patents

Note: Order of the documents are as per the file uploaded on NAAC portal for 3.4.3


### Department of Civil Engineering

1

 Office of the Controller General of Patents, Designs & Trade Marks Department of Industrial Policy & Promotion, Ministry of Commerce & Industry, Government of India		 INTELLECTUAL PROPERTY INDIA PATENTS   DESIGNS   TRADE MARKS GEOGRAPHICAL INDICATIONS	
Application Details			
APPLICATION NUMBER	202111000641		
APPLICATION TYPE	ORDINARY APPLICATION		
DATE OF FILING	07/01/2021		
APPLICANT NAME	<b>1 . MR. RAMANSH BAJPAI</b> <b>2 . DR. DEEPESH SINGH</b>		
TITLE OF INVENTION	"LIGHT TRANSMITTING GEOPOLYMER CONCRETE USING INDUSTRIAL WASTE"		
FIELD OF INVENTION	CHEMICAL		
E-MAIL (As Per Record)			
ADDITIONAL-EMAIL (As Per Record)	Vijay.sharma@sanshadow.com		
E-MAIL (UPDATED Online)			
PRIORITY DATE			
REQUEST FOR EXAMINATION DATE	--		
PUBLICATION DATE (U/S 11A)	12/02/2021		

2

(12) PATENT APPLICATION PUBLICATION	(21) Application No.202111006012 A
(19) INDIA	
(22) Date of filing of Application :12/02/2021	(43) Publication Date : 19/02/2021
(54) Title of the invention : AN IMPROVED SINGLE SLOPED SOLAR STILL FOR DESALINATION & DEFLUORIDATION	
(51) International classification	(71)Name of Applicant :
:F28D0020000000,	1)MR. KRISHN PRATAP SINGH
H01L0045000000,	Address of Applicant :Department of Civil Engineering,
A61K0008020000,	Harcourt Butler Technical University (HBTU), Kanpur, Uttar
C02F0001140000,	Pradesh, India-208002 Uttar Pradesh India
C02F0101140000	2)DR. DEEPESH SINGH
(31) Priority Document No	(72)Name of Inventor :
:NA	1)MR. KRISHN PRATAP SINGH
(32) Priority Date	2)DR. DEEPESH SINGH
: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	
(57) Abstract :	
The present invention relates to a improved single slope solar still for desalination & defluoridation used with phase changing material (PCM) has 10.42% to 14% higher yield efficiency. The present invention is provided with a layer of Phase Changing Material below the basin to store the thermal energy during the day time and use it after sunset period to enhance the yield efficiency and has fluoride removal efficiency between 90%- 100%.	
No. of Pages : 26 No. of Claims : 3	

  
**(Prof. S.K. Sharma)**  
 Registrar  
 Harcourt Butler Technical University  
 Kanpur-208002

# Department of Computer Science & Engineering

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## CERTIFICATE OF GRANT INNOVATION PATENT

**Patent number:** 2020103214

The Commissioner of Patents has granted the above patent on 23 December 2020, and certifies that the below particulars have been registered in the Register of Patents.

**Name and address of patentee(s):**

Raghuraj Singh of Department of Computer Science &, Engineering, Harcourt Butler Technical University Kanpur India

Parma Nand of Sharda University, 48, FF, Jaipuria Enclave Kaushambi Ghaziabad UP India

Prashant Kumar Mishra of Department of Computer Science and, Engineering, Pranveer Singh Institute of Technology Kanpur (Uttar Pradesh) India

Vibhash Yadav of Department of Information Technology Rajkiya Engineering College Banda UP India

Pawan Kumar Pal of Department of Computer Science and, Engineering, PSIT College of Engineering Kanpur (Uttar Pradesh) India

Charu Awasthi of Department of Computer Science and, Engineering, Pranveer Singh Institute of Technology Kanpur (Uttar Pradesh) India

Ashendra Kumar Saxena of College of Computing Sciences and IT TMU Moradabad UP India

Danish Ather of Faculty of Engineering & Technology Sharda University Andijan Uzbekistan

Ajay Rastogi of Teerthanker Mahaveer University, NH 24 Delhi Road Moradabad UP India

Ambuj Kumar Agarwal of Department of, Computer Science and Engineering, Chitkara University Institute of Engineering & Technology, Chandigarh- Patiala (NH- 64), Village, Jansla, Rajpura, Punjab 140401 India

**Title of invention:**

INHA- Combined Health Monitoring: Intelligent IoT- Based Combined Health Monitoring, Notification, Alert, Home Automation System

**Name of inventor(s):**

Singh, Raghuraj; Nand, Parma; Mishra, Prashant Kumar; Yadav, Vibhash; Kumar Pal, Pawan; Awasthi, Charu; Saxena, Ashendra Kumar; Ather, Danish; Rastogi, Ajay and Agarwal, Ambuj Kumar

**Term of Patent:**

Eight years from 4 November 2020

NOTE: This Innovation Patent cannot be enforced unless and until it has been examined by the Commissioner of Patents and a Certificate of Examination has been issued. See sections 120(1A) and 129A of the Patents Act 1990, set out on the reverse of this document.




Dated this 23<sup>rd</sup> day of December 2020

Commissioner of Patents

**PATENTS ACT 1990**

The Australian Patents Register is the official record and should be referred to for the full details pertaining to this IP Right.

  
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# Department of Electronics Engineering


1



Patent Search			
Patent Search Patent E-register Application Status Help			
Invention Title	MULTIPLICATIVE INTERLEAVING WITH TREE ALGORITHM (MITA) INTERLEAVER FOR OFDM-IDMA		
Publication Number	50/2020		
Publication Date	11/12/2020		
Publication Type	INA		
Application Number	202011052331		
Application Filing Date	01/12/2020		
Priority Number			
Priority Country			
Priority Date			
Field Of Invention	COMMUNICATION		
Classification (IPC)	H04L 1/00 H04B 1/707 H04L 27/26		
Inventor			
Name	Address	Country	Nationality
Priyanka Agarwal	7/116A, Radhey Apartments, Flat No A-5, Swaroop Nagar, Kanpur-208002, UP, India	India	India
Prof Manoj K Shukla	Professor, Electronics Engineering, Harcourt Butler Technical University (HBTU), Nawabganj, Kanpur-208002, UP, India	India	India
Dr.Rohit Tripathi	Associate Professor, Electronics and Communication Engineering, 21/4 Vishnupuri Colony, Nawabganj, Kanpur-208002, UP, India	India	India


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Patent Search			
Patent Search Patent E-register Application Status Help			
Invention Title	METHOD FOR PRODUCING P8TTT-C14 FIBERS		
Publication Number	04/2021		
Publication Date	22/01/2021		
Publication Type	INA		
Application Number	202111001815		
Application Filing Date	14/01/2021		
Priority Number			
Priority Country			
Priority Date			
Field Of Invention	POLYMER TECHNOLOGY		
Classification (IPC)	C07D 495/04 G01N 21/31 D01F 1/10		
Inventor			
Name	Address	Country	Nationality
Dr. MANISH KUMAR SINGH	Assistant Professor, Dept. of Electronics Engg. HBTU Kanpur, UP, India-208002	India	India
Dr. MANOJ KUMAR SHUKLA	Professor, Dept. of Electronics Engg. HBTU Kanpur, UP, India-208002	India	India

  
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 Harcourt Butler Technical University  
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inPASS Indian Patent Advanced Search System		INTELLECTUAL PROPERTY INDIA PATENTS   DESIGNS   TRADE MARKS GEOGRAPHICAL INDICATIONS	
Patent Search			
Patent Search Patent E-register Application Status Help			
Invention Title	ADVANCED REMOTE BIOMETRIC ATTENDANCE SYSTEM FOR PREVENTING THE SPREAD OF COVID19 INFECTION		
Publication Number	13/2021		
Publication Date	26/03/2021		
Publication Type	INA		
Application Number	202111011435		
Application Filing Date	17/03/2021		
Priority Number			
Priority Country			
Priority Date			
Field Of Invention	ELECTRONICS		
Classification (IPC)	G07C0001100000, G06K0009000000, G06F0021350000, G06Q0010100000, H04B0001708500		
Inventor			
Name	Address	Country	Nationality
Dr Rohit Tripathi	Associate Professor, Electronics & Communication, Galgotias University, Plot No. 2, Yamuna Expressway Opposite, Buddha International Circuit, Sector 17A, Greater Noida, Uttar Pradesh 203201	India	India
Prof. Manoj Kumar Shukla	Rajkiya Engineering College, Kannauj, Kannauj, Uttar Pradesh-209732	India	India

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Patent Search			
Patent Search Patent E-register Application Status Help			
Invention Title	WEARABLE EYE MOVEMENT DETECTION DEVICE AND METHOD		
Publication Number	05/2021		
Publication Date	29/01/2021		
Publication Type	INA		
Application Number	202111003126		
Application Filing Date	22/01/2021		
Priority Number			
Priority Country			
Priority Date			
Field Of Invention	COMPUTER SCIENCE		
Classification (IPC)	G06F 3/01 A61B 3/113 G06K 9/00		
Inventor			
Name	Address	Country	Nationality
Rohit Tripathi	Electronics & Communication Engineering department, Galgotias University, Plot no-2, Sector 17-A, Yamuna Expressway, Greater Noida, Gautam Budh Nagar, Uttar Pradesh 201310	India	India
Manoj Kumar Shukla	Electronics Engineering Harcourt Butler Technical University (HBTU), Nawabganj (State Govt. University) Kanpur-208002 U.P., India	India	India

  
**(Prof. S.K. Sharma)**  
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## Patent Search

Patent Search Patent E-register Application Status Help

Invention Title	TOKENLESS VOTER VERIFICATION SYSTEM AND METHOD THEREOF
Publication Number	43/2020
Publication Date	23/10/2020
Publication Type	INA
Application Number	202011044601
Application Filing Date	13/10/2020
Priority Number	
Priority Country	
Priority Date	
Field Of Invention	COMPUTER SCIENCE
Classification (IPC)	G06F 21/32 H04L 29/06 G07C 9/37

## Inventor

Name	Address	Country	Nationality
Dr. Rohit Tripathi	Associate Professor, Electronics & Communication Engineering, 21/4 Vishnupuri Colony Nawabganj, Kanpur-208002, U.P., India	India	India
Prof. Manoj Kumar Shukla	Professor, Electronics Engineering, Harcourt Butler Technical University (HBTU), Nawabganj (State Govt. University) Kanpur-208002 U.P., India	India	India
Dr. Subodh Kumar Tripathi	Assistant Professor, Electronics & Communication Engineering, Meerut Institute of Engineering & Technology, NH-58, Baghpat Road, Bypass Crossing, Meerut, UP, India. Pin code: 250005	India	India





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# Department of Mechanical Engineering


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**INTELLECTUAL PROPERTY INDIA**  
PATENTS | DESIGNS | TRADE MARKS  
GEOGRAPHICAL INDICATIONS

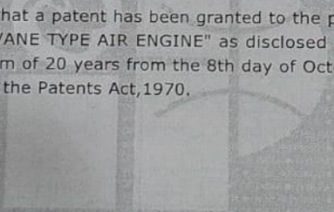
  
सत्यमेव जयते  
भारत सरकार  
GOVERNMENT OF INDIA  
पेटेंट कार्यालय  
THE PATENT OFFICE  
पेटेंट प्रमाणपत्र  
PATENT CERTIFICATE  
(Rule 24 Of The Patents Rules)


क्रमांक : 011124995  
SL No :

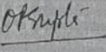


पेटेंट सं. / Patent No. : 342731  
आवेदन सं. / Application No. : 2412/DEL/2010  
फाइल करने की तारीख / Date of Filing : 08/10/2010  
पेटेंटी / Patentee : 1.BHARAT RAJ SINGH 2.ONKAR SINGH

प्रमाणित किया जाता है कि पेटेंटी को उपरोक्त आवेदन में यथाप्रकटित "ROTARY & VANE TYPE AIR ENGINE" नामक आविष्कार के लिए, पेटेंट अधिनियम, 1970 के उपबंधों के अनुसार आज तारीख 8th day of October 2010 से बीस वर्ष की अवधि के लिए पेटेंट अनुदान किया गया है।  
It is hereby certified that a patent has been granted to the patentee for an invention entitled "ROTARY & VANE TYPE AIR ENGINE" as disclosed in the above mentioned application for the term of 20 years from the 8th day of October 2010 in accordance with the provisions of the Patents Act,1970.

  
**INTELLECTUAL PROPERTY INDIA**  
PATENTS | DESIGNS | TRADE MARKS  
GEOGRAPHICAL INDICATIONS

  
अनुदान की तारीख : 28/07/2020  
Date of Grant : 28/07/2020

  
पेटेंट नियंत्रक  
Controller of Patent

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, 8th day of October 2012 को और उसके पर्याप्त प्रत्येक वर्ष में उसी दिन देय होगी।  
Note - The fees for renewal of this patent, if it is to be maintained will fall / has fallen due on 8th day of October 2012 and on the same day in every year thereafter.

  
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(12) PATENT APPLICATION PUBLICATION

(21) Application No.202011024535 A

(19) INDIA

(22) Date of filing of Application :11/06/2020

(43) Publication Date : 07/08/2020


(54) Title of the invention : ORIGAMI FACE SHIELD

(51) International classification	:A42B 3/22	(71)Name of Applicant :
(31) Priority Document No	:NA	1)Jitendra Bhaskar
(32) Priority Date	:NA	Address of Applicant :Type IV, D-1, HBTU West campus
(33) Name of priority country	:NA	Nawabganj Kanpur Uttar Pradesh India
(86) International Application No	:NA	2)Jyotika Singh
Filing Date	:NA	(72)Name of Inventor :
(87) International Publication No	: NA	1)Jitendra Bhaskar
(61) Patent of Addition to Application Number	:NA	2)Jyotika Singh
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

There has been shortage of personal protective equipment (PPE) due to very high demand everywhere during this Pandemic COVID-19. The face shield is PPE important equipment for limiting the spread of droplets. Present invention is for making origami based reusable and foldable face shield. The Face shield includes a transparent plastic sheet cut out having slits. Face shield is folded from a single sheet in the form of a cut out. Origami structure is stiff that avoids the contact of transparent shield on forehead. The curved origami structure rests on the top of head unlike others on forehead. The face shield is washable for reusable. Storage of face shield is very easy even in very bulk quantity because it remains in the form of flat sheet initially and in cylindrical folded shape for keeping in cylindrical packing box for reuse and for travelling.

No. of Pages : 11 No. of Claims : 19



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# Department of Biochemical Engineering


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Office of the Controller General of Patents, Designs & Trade Marks  
Department of Industrial Policy & Promotion,  
Ministry of Commerce & Industry,  
Government of India



Application Details	
APPLICATION NUMBER	202111027214
APPLICATION TYPE	ORDINARY APPLICATION
DATE OF FILING	18/06/2021
APPLICANT NAME	1 . ESHA DWIVEDI 2 . DR. LALIT KUMAR SINGH
TITLE OF INVENTION	SYSTEM AND METHOD FOR MICROBIAL TRANSFORMATION OF LIGNIN DERIVED PHENOLIC COMPOUNDS INTO CIS, CIS-MUCONIC ACID
FIELD OF INVENTION	BIO-CHEMISTRY
E-MAIL (As Per Record)	smartpatenting@gmail.com
ADDITIONAL-EMAIL (As Per Record)	smartpatenting@gmail.com
E-MAIL (UPDATED Online)	
PRIORITY DATE	
REQUEST FOR EXAMINATION DATE	--
PUBLICATION DATE (U/S 11A)	16/07/2021

  
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Registrar  
Harcourt Butler Technical University  
Kanpur-208002

# Department of Chemical Engineering

1

(12) PATENT APPLICATION PUBLICATION (21) Application No. 202111011376 A  
 (19) INDIA  
 (22) Date of filing of Application :17/03/2021 (43) Publication Date : 19/03/2021

(54) Title of the invention : MICROWAVE WATER DISTILLATION DEVICE

(51) International classification	:C11B0009020000, B01D0005000000, H05B0006640000, A61K0008920000, B01D0011020000	(71)Name of Applicant : 1)Dr. ASHWANI KUMAR RATHORE Address of Applicant :Type IV/D-15, HBTU Colony, West Campus, Vikas Nagar, Kanpur, U.P.-208002, India Uttar Pradesh India
(31) Priority Document No	:NA	2)Dr. DEEPAK SRIVASTAVA
(32) Priority Date	:NA	(72)Name of Inventor :
(33) Name of priority country	:NA	1)Dr. ASHWANI KUMAR RATHORE
(86) International Application No	:NA	2)Dr. DEEPAK SRIVASTAVA
Filing Date	:NA	3)MANOJ SHUKLA
(87) International Publication No	:NA	4)YASHVARDHAN SINGH RATHORE
(61) Patent of Addition to Application Number	:NA	5)Dr. RAJESH KATIYAR
Filing Date	:NA	6)Dr. ANIL KUMAR VARMA
(62) Divisional to Application Number	:NA	7)SHUBHAM SHUKLA
Filing Date	:NA	8)Dr. S K SHARMA
		9)Dr. KAVITA SRIVASTAVA

(57) Abstract :  
 A method for extracting essential oil from the plant material using a water distillation device (100), the method comprising steps of: mixing a plant material with water in a flask (108); placing the flask (108) into the microwave chamber (106) of the microwave oven (102); applying an ultra-sonication on the mixture kept in the flask using the sonicator; heating the mixture by applying the microwave radiations into the microwave chamber (106) of the microwave oven (102); collecting the condensed essential oil from the spiral condenser (104) after a predefined rest period.

No. of Pages : 17 No. of Claims : 10

2

(12) PATENT APPLICATION PUBLICATION (21) Application No.202111004220 A  
 (19) INDIA  
 (22) Date of filing of Application :01/02/2021 (43) Publication Date : 12/02/2021

(54) Title of the invention : TOUCH-FREE DUAL LIQUID DISPENSING APPARATUS AND METHOD OF USING THE LIQUID DISPENSING APPARATUS


(51) International classification	:E03C0001050000, A47K0005120000, F04B0049060000, G01N0033180000, F01L0013000000	(71)Name of Applicant : 1)SHUBHAM SHUKLA Address of Applicant :Darziyana Dahilamau, Pratapgarh, U.P -230001, India Uttar Pradesh India
(31) Priority Document No	:NA	2)Dr. ASHWANI KUMAR RATHORE
(32) Priority Date	:NA	3)MANOJ KUMAR SHUKLA
(33) Name of priority country	:NA	4)DEEPAK SRIVASTAVA
(86) International Application No	:NA	(72)Name of Inventor :
Filing Date	:NA	1)SHUBHAM SHUKLA
(87) International Publication No	:NA	2)Dr. ASHWANI KUMAR RATHORE
(61) Patent of Addition to Application Number	:NA	3)YASHVARDHAN SINGH RATHORE
Filing Date	:NA	4)N. B. SINGH
(62) Divisional to Application Number	:NA	5)DEEPAK SRIVASTAVA
Filing Date	:NA	6)MANOJ KUMAR SHUKLA

(57) Abstract :  
 A liquid dispensing apparatus (102) for automated dispensing of water as well as a hand cleansing liquid, the apparatus (102) comprising: an outlet nozzle (114) adapted to dispense water as well as hand cleansing liquid; a first sensor (116) configured to sense a presence of a body of a user; a second sensor (118) configured to sense a presence of a hand of the user; a controller (120) configured to: receive sensed signals from the first sensor (116) and the second sensor (118); determine the presence of the user base on the sensed signal; generate a pump activation signal to activate a pump (112) to dispense a predefined drop of the hand cleansing liquid; generate a valve activation signal to activate a valve (110) to allow the flow of water; generate a valve deactivation signal as soon as the user removes his hand away from the outlet nozzle (114).

No. of Pages : 25 No. of Claims : 10

  
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inPASS Indian Patent Advanced Search System		INTELLECTUAL PROPERTY INDIA PATENTS   DESIGNS   TRADE MARKS GEOGRAPHICAL INDICATIONS		
Patent Search				
Patent Search		Patent E-register	Application Status	Help
Invention Title	DEVELOPMENT OF EPOXY COMPOSITES REINFORCED BY WASTE KANS GRASS (SACCHARUM SPONTANEUM) FILLER BY HAND-LAYUP METHOD			
Publication Number	10/2021			
Publication Date	05/03/2021			
Publication Type	INA			
Application Number	202011051143			
Application Filing Date	24/11/2020			
Priority Number				
Priority Country				
Priority Date				
Field Of Invention	POLYMER TECHNOLOGY			
Classification (IPC)	B29K0063000000, C08J0005040000, C08J0009000000, H01L0023290000, B29C0045140000			
Inventor				
Name	Address	Country	Nationality	
PROF. (DR.) SHISHIR SINHA	Department of Chemical Engineering, Indian Institute of Technology, Roorkee, ROORKEE- 247667	India	India	
DR. GIRDHARI LAL DEVNANI	Department of Chemical Engineering, Indian Institute of Technology, Roorkee, ROORKEE- 247667	India	India	

  
**(Prof. S.K. Sharma)**  
 Registrar  
 Harcourt Butler Technical University  
 Kanpur-208002




# Department of Food Technology

1

(12) PATENT APPLICATION PUBLICATION		(21) Application No.202211020382 A
(19) INDIA		
(22) Date of filing of Application :05/04/2022		(43) Publication Date : 15/04/2022
(54) Title of the invention : METHOD FOR EFFICIENT SEPARATION/DETACHMENT OF FLAKES FROM THE AMLA SEED		
(51) International classification	:C11B0001040000, A61K0036470000, B29B0017020000, C22B0007000000, A23L0002020000	(71)Name of Applicant : 1)Rishika Tewari Address of Applicant :Department of Food Technology, Harcourt Butler Technical University, Nawabganj, Kanpur – 208002, Uttar Pradesh, India ----- 2)Dr. Vivek Kumar 3)Dr. H.K Sharma
(86) International Application No	:NA	Name of Applicant : NA
Filing Date	:NA	Address of Applicant : NA
(87) International Publication No	: NA	(72)Name of Inventor : 1)Rishika Tewari Address of Applicant :Department of Food Technology, Harcourt Butler Technical University, Nawabganj, Kanpur – 208002, Uttar Pradesh, India ----- 2)Dr. Vivek Kumar Address of Applicant :Department of Food Technology, Harcourt Butler Technical University, Nawabganj, Kanpur – 208002, Uttar Pradesh, India ----- 3)Dr. H.K Sharma
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

2

(12) PATENT APPLICATION PUBLICATION		(21) Application No.202111029989 A
(19) INDIA		
(22) Date of filing of Application :04/07/2021		(43) Publication Date : 30/07/2021
(54) Title of the invention : EXTRUDED FRIED SNACK FROM TARO		
(51) International classification	:A23J0003260000, A23L0007130000, A21D0013420000, A23L0019180000, A23L0029244000	(71)Name of Applicant : 1)VIVEK KUMAR Address of Applicant :Department of Food Technology, Harcourt Butler Technical University, Kanpur, Uttar Pradesh 208002, India Uttar Pradesh India
(31) Priority Document No	:NA	2)H. K. SHARMA
(32) Priority Date	:NA	3)ANJALI SRIVASTAVA
(33) Name of priority country	:NA	(72)Name of Inventor : 1)VIVEK KUMAR
(86) International Application No	:NA	2)H. K. SHARMA
Filing Date	:NA	3)ANJALI SRIVASTAVA
(87) International Publication No	: NA	4)MANISHA PARASHAR
(61) Patent of Addition to Application Number	:NA	5)ALAK KUMAR SINGH
Filing Date	:NA	6)AKSHAY KUMAR SINGH
(62) Divisional to Application Number	:NA	
Filing Date	:NA	
(57) Abstract : A taro bhujia (112), the taro bhujia (112) comprising: flour mixture (110) consisting essentially of mashed taro corms (102), gram flour (104), corn flour (106), moth flour (108), salt and oil, wherein the flour mixture (110) comprises about 62 to 78 grams of		

  
**(Prof. S.K. Sharma)**  
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 Harcourt Butler Technical University  
 Kanpur-208002

# Department of Plastic Technology

## 1

(12) PATENT APPLICATION PUBLICATION (21) Application No.202111011903 A  
 (19) INDIA  
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(54) Title of the invention : HIGH TOUGHNESS EPOXY/BAMBOO CHAR COMPOSITE REINFORCED WITH SILANIZED TiO<sub>2</sub> NANOPARTICLES

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(57) Abstract :

A method for the formation of a toughened nanocomposite of epoxy resin and bamboo charcoal reinforced with silanized TiO<sub>2</sub> nanoparticles, the method comprising steps of: mixing epoxy resin with bamboo charcoal to create a solution in a container; applying a process of sonicating upon the prepared solution for 30 minutes; adding silanized TiO<sub>2</sub> nanoparticles into the solution to create a mixture; applying a process of ultrasonication upon the mixture for 40 minutes; performing a process of degassing using a vacuum oven for 40 minutes; adding a curing agent into the degassed mixture in a fixed ratio of 4:1; pouring the mixture into a predefined mold; and curing the molded samples for 24 hours at room temperature.

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