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शासकीय जर्नल

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DATE: 03/11/2023

पेटेंट कार्यालय का एक प्रकाशन
PUBLICATION OF THE PATENT OFFICE

12) PATENT APPLICATION PUBLICATION

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(43) Publication Date : 03/11/2023

(54) Title of the invention : AN INVASIVE CONTINUOUS GLUCOSE MONITORING DEVICE WITH ARTIFICIAL INTELLIGENCE

<p>(51) International classification :A61B0005145000, A61B0005000000, G16H0040670000, G16H0040630000, A61P0003100000</p> <p>(86) International Application No :PCT// Filing Date :01/01/1900</p> <p>(87) International Publication No : NA</p> <p>(61) Patent of Addition to Application Number :NA Filing Date :NA</p> <p>(62) Divisional to Application Number :NA Filing Date :NA</p>	<p>(71)Name of Applicant : 1)Brainware University, Kolkata Address of Applicant :398, Ramkrishnapur Rd, Near Jagadighata Market, Barasat, Kolkata, West Bengal 700125. ----- Name of Applicant : NA Address of Applicant : NA</p> <p>(72)Name of Inventor : 1)Mrs. Nitu Saha Address of Applicant :Assistant Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125. ----- 2)Dr. Gunjan Mukherjee Address of Applicant :Associate Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125. ----- 3)Dr. Kaushik Chanda Address of Applicant :Associate Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125. ----- 4)Mr. Somnath Dey Address of Applicant :Assistant Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125. ----- 5)Mr. Subhadip Nandi Address of Applicant :Assistant Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125. ----- 6)Ms. Anudeepa Gon Address of Applicant :Assistant Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125. ----- 7)Ms. Suparna Karmakar Address of Applicant :Assistant Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125. ----- 8)Ms. Dolan Ghosh Address of Applicant :Assistant Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125. -----</p>
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(57) Abstract :

The present invention relates to an invasive continuous glucose monitoring device with Artificial Intelligence. The described invention is a breakthrough in the realm of glucose monitoring, integrating advanced sensor technology with artificial intelligence. It ensures users have an easy-to-use, accurate, and secure method of monitoring their glucose levels, aiding in more effective diabetes management.

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

“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 ()		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	
Brainware University, Kolkata		Indian	India	398, Ramkrishnapur Rd, Near Jagadighata Market, Barasat, Kolkata, West Bengal 700125.	
3B. CATEGORY OF APPLICANT [Please tick (✓) at the appropriate category]					
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)					
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2. Dr. Gunjan Mukherjee	Indian	India	Associate Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125.
3. Dr. Kaushik Chanda	Indian	India	Associate Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125.
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5. Mr. Subhadip Nandi	Indian	India	Assistant Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125.
6. Ms. Anudeepa Gon	Indian	India	Assistant Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125.
7. Ms. Suparna Karmakar	Indian	India	Assistant Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125.
8. Ms. Dolan Ghosh	Indian	India	Assistant Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125.
5. TITLE OF THE INVENTION			
"AN INVASIVE CONTINUOUS GLUCOSE MONITORING DEVICE WITH ARTIFICIAL INTELLIGENCE"			
6. AUTHORISED REGISTERED PATENT		IN/PA No.	

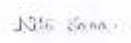
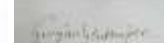





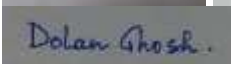
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		Mobile No.			
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		Mobile No.		9831960033	
		Fax No.			
		E-mail ID		registrar@brainwareunive rsity.ac.in	
8. IN CASE OF APPLICATION CLAIMING PRIORITY OF APPLICATION FILED IN- CONVENTION COUNTRY, PARTICULARS OF CONVENTION APPLICATION					
Country	Application Number	Filing date	Name of the applicant	Title of the invention	IPC (as classified in the convention country)
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 30/08/2023

(b) Name	(c) Signature
1. Mrs. Nitu Saha	
2. Dr. Gunjan Mukherjee	
3. Dr. Kaushik Chanda	
4. Mr. Somnath Dey	
5. Mr. Subhadip Nandi	
6. Ms. Anudeepa Gon	
7. Ms. Suparna Karmakar	
8. Ms. Dolan Ghosh	

(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).~~
- ~~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: 14		
No. of Claim(s)	No. of claims: 10 No. of pages: 02		
Abstract	No. of pages: 01		
No. of Drawing(s)	No. of drawings: 00 No. of pages: 00		

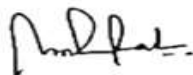
In case of a complete specification, if the applicant desires to adopt the drawings filed with his provisional specification as the drawings or part of the drawings for the complete specification under rule 13(4), the number of such pages filed with the provisional specification are required to be mentioned 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 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 30th day of August 2023



**Registrar
Brainware University
Barrasat, Kolkata- 700125**

Signature:

Name: Mahua Pal

Applicant: Brainware University, Kolkata

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

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 PATENTS ACT, 1970

(39 of 1970)

&

The Patent Rules, 2003

COMPLETE SPECIFICATION

(See section 10 and rule 13)

TITLE OF THE INVENTION

“AN INVASIVE CONTINUOUS GLUCOSE MONITORING DEVICE WITH
ARTIFICIAL INTELLIGENCE”

Applicant:

5

Brainware University, Kolkata,

398, Ramkrishnapur Rd, Near Jagadighata Market, Barasat, Kolkata, West

Bengal 700125.

The following specification particularly describes the nature of the invention and the
manner in which it is performed:

FIELD OF THE INVENTION

[001] The present invention relates to medical devices, particularly a continuous glucose monitoring (CGM) device that utilizes artificial intelligence for enhanced glucose level analysis, more particularly an invasive continuous glucose monitoring device with Artificial Intelligence.

BACKGROUND OF THE INVENTION

[002] The following description provides the information that may be useful in understanding the present invention. It is not an admission that any of the information provided herein is prior art or relevant to the presently claimed invention, or that any publication specifically or implicitly referenced is prior art.

[003] Current methods of monitoring glucose levels involve regular finger prick tests, which can be inconvenient and painful. Continuous glucose monitoring devices are available, but the integration of artificial intelligence can offer enhanced accuracy and predictive capabilities.

[004] Accordingly, on the basis of aforesaid facts, there remains a need in the prior art to provide development of an invasive continuous glucose monitoring device with Artificial Intelligence. Therefore, it would be useful and desirable to have a system, method, apparatus and interface to meet the above-mentioned needs.

SUMMARY OF THE PRESENT INVENTION

[005] The present invention discloses a non-invasive continuous glucose monitoring (CGM) device that utilizes artificial intelligence (AI) algorithms to accurately monitor and predict blood glucose levels in individuals with

diabetes. The device combines advanced sensor technology, machine learning algorithms, and user-friendly interfaces to provide real-time glucose monitoring and personalized insights.

5 **[006]** In one aspect of the present invention, the present invention provides a non-invasive continuous glucose monitoring device equipped with artificial intelligence, which offers real-time glucose data analysis, predictions, and recommendations. The device also offers integration capabilities with mobile applications and ensures data security and privacy.

10 **[007]** In this respect, before explaining at least one object of the invention in detail, it is to be understood that the invention is not limited in its application to the details of set of rules and to the arrangements of the various models set forth in the following description or illustrated in the drawings. The invention is capable of other objects and of being practiced and carried out in various ways, according to the need of that industry. Also, it is to be understood that
15 the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

20 **[008]** These together with other objects of the invention, along with the various features of novelty which characterize the invention, are pointed out with particularity in the disclosure. For a better understanding of the invention, its operating advantages and the specific objects attained by its uses, reference should be made to the accompanying drawings and descriptive matter in which there are illustrated preferred embodiments of the invention.

DETAILED DESCRIPTION OF THE INVENTION

25 **[009]** While the present invention is described herein by way of example using embodiments and illustrative drawings, those skilled in the art will recognize

that the invention is not limited to the embodiments of drawing or drawings described and are not intended to represent the scale of the various components. Further, some components that may form a part of the invention may not be illustrated in certain figures, for ease of illustration, and such omissions do not limit the embodiments outlined in any way. It should be understood that the drawings and detailed description thereto are not intended to limit the invention to the particular form disclosed, but on the contrary, the invention is to cover all modifications, equivalents, and alternatives falling within the scope of the present invention as defined by the appended claims.

As used throughout this description, the word "may" is used in a permissive sense (i.e. meaning having the potential to), rather than the mandatory sense, (i.e. meaning must). Further, the words "a" or "an" mean "at least one" and the word "plurality" means "one or more" unless otherwise mentioned. Furthermore, the terminology and phraseology used herein is solely used for descriptive purposes and should not be construed as limiting in scope. Language such as "including," "comprising," "having," "containing," or "involving," and variations thereof, is intended to be broad and encompass the subject matter listed thereafter, equivalents, and additional subject matter not recited, and is not intended to exclude other additives, components, integers or steps. Likewise, the term "comprising" is considered synonymous with the terms "including" or "containing" for applicable legal purposes. Any discussion of documents, acts, materials, devices, articles and the like is included in the specification solely for the purpose of providing a context for the present invention. It is not suggested or represented that any or all of these matters

form part of the prior art base or were common general knowledge in the field relevant to the present invention.

[010] In this disclosure, whenever a composition or an element or a group of elements is preceded with the transitional phrase “comprising”, it is understood that we also contemplate the same composition, element or group of elements with transitional phrases “consisting of”, “consisting”, “selected from the group of consisting of”, “including”, or “is” preceding the recitation of the composition, element or group of elements and vice versa.

[011] The present invention is described hereinafter by various embodiments with reference to the accompanying drawings, wherein reference numerals used in the accompanying drawing correspond to the like elements throughout the description. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiment set forth herein. Rather, the embodiment is provided so that this disclosure will be thorough and complete and will fully convey the scope of the invention to those skilled in the art. In the following detailed description, numeric values and ranges are provided for various aspects of the implementations described. These values and ranges are to be treated as examples only and are not intended to limit the scope of the claims. In addition, a number of materials are identified as suitable for various facets of the implementations. These materials are to be treated as exemplary and are not intended to limit the scope of the invention.

[012] The invention pertains to specialized exercise equipment for rodents, particularly focusing on a circular treadmill enhanced with automation and

sensory controls for optimized functionality, more particularly an automated circular treadmill with advanced sensory control for rodents.

[013] In accordance with another embodiment of the present invention, Managing blood glucose levels is crucial for individuals with diabetes, but traditional methods often involve invasive procedures such as finger stick tests. The proposed non-invasive CGM device aims to revolutionize glucose monitoring by utilizing the following innovative features:

[014] Optical Sensor Technology: The device incorporates advanced optical sensors that can non-invasively measure glucose levels through the skin. These sensors utilize light-based techniques such as near-infrared spectroscopy or optical coherence tomography to obtain precise glucose readings.

[015] Artificial Intelligence Algorithms: The CGM device is equipped with AI algorithms that analyze the sensor data, along with additional inputs such as physical activity, meal intake, and medication usage. The algorithms continuously learn from the user's data to improve accuracy and provide personalized insights.

[016] Real-Time Monitoring and Alerts: The device provides real-time glucose monitoring, displaying current glucose levels on a user-friendly interface. It also offers customizable alerts to notify the user of hypo- or hyper glycemic events, enabling timely interventions and preventing complications.

[017] Predictive Analysis: Leveraging the power of AI, the CGM device employs predictive analysis to forecast future glucose trends. By considering historical data, environmental factors, and individual patterns, the device can

anticipate potential glucose fluctuations and provide proactive recommendations.

[018] Mobile Application Integration: The CGM device integrates with a dedicated mobile application that offers comprehensive data visualization, trend analysis, and personalized recommendations. The application provides users with a holistic view of their glucose profiles, empowering them to make informed decisions about their diabetes management.

[019] Data Security and Privacy: The device ensures robust data security and privacy measures, including encryption, user authentication, and adherence to regulatory standards. The user has full control over their data and can choose to share it with healthcare professionals for better management and remote monitoring.

[020] The non-invasive CGM device with AI algorithms represents a significant advancement in glucose monitoring technology. It offers a convenient, user-friendly, and accurate solution for individuals with diabetes, enabling them to monitor their glucose levels continuously and make timely adjustments to their lifestyle and treatment plans.

[021] This innovative patent idea addresses the need for non-invasive, real-time glucose monitoring in the medical sector, providing individuals with diabetes an improved method for managing their condition and promoting better overall health outcomes.

[022] The present invention provides a continuous and accurate method of monitoring blood glucose levels in individuals with diabetes, without the need for invasive blood sampling. Traditional glucose monitoring methods, such as

fingerstick tests, can be uncomfortable, inconvenient, and require frequent blood sampling.

[023] The non-invasive continuous glucose monitoring device, coupled with artificial intelligence (AI) technology, addresses this issue by providing a means to continuously monitor glucose levels in a more user-friendly and seamless manner. The device utilizes innovative techniques, such as optical sensors or other non-invasive methods, to measure glucose levels in the body without the need for blood samples.

[024] By incorporating artificial intelligence algorithms, the device can analyze and interpret the collected glucose data in real-time. This enables it to provide accurate and timely glucose level readings, as well as actionable insights and predictions related to glucose fluctuations. The AI component can learn from the user's data over time, improving the accuracy of predictions and personalized recommendations.

[025] Overall, this technology aims to enhance the quality of life for individuals with diabetes by providing a non-invasive, continuous, and intelligent glucose monitoring solution that can help them manage their condition more effectively and make informed decisions about their diet, exercise, medication, and overall lifestyle.

[026] The unique feature of a Non-Invasive Continuous Glucose Monitoring Device with Artificial Intelligence offers several technical and commercial advantages:

[016] Non-Invasive Measurement: The device eliminates the need for invasive blood sampling, making it more convenient and comfortable for users. This

reduces the discomfort associated with traditional glucose monitoring methods, such as finger pricks.

[027] Continuous Monitoring: Unlike traditional methods that provide periodic measurements, the continuous monitoring feature enables users to have real-time information about their glucose levels. This allows for better management of blood sugar fluctuations and the ability to detect trends and patterns.

[028] Accuracy: By incorporating advanced optical sensors or other non-invasive measurement techniques, the device aims to provide accurate glucose level readings. The integration of artificial intelligence algorithms further enhances accuracy by analyzing the collected data and refining predictions over time.

[029] Real-time Insights and Predictions: The AI component of the device can provide real-time insights and predictions related to glucose fluctuations. Users can receive personalized recommendations on managing their glucose levels, such as dietary adjustments, exercise suggestions, or medication reminders.

[30] Improved User Experience: The non-invasive nature of the device and its continuous monitoring capability enhance the user experience compared to traditional methods. This can lead to higher user satisfaction and increased adoption rates.

[031] The device can be designed to be portable and easily integrated into the user's daily routine. This allows individuals to monitor their glucose levels anytime and anywhere, promoting better diabetes management.

Enhanced Compliance: The device's user-friendly features, continuous monitoring, and personalized insights can improve user compliance with

glucose monitoring protocols. This can lead to better glycemic control and reduced risk of complications associated with diabetes.

[032] While the initial cost of the device may be a consideration, the long-term cost benefits can be significant. By avoiding the need for frequent test strips or other disposable supplies associated with traditional methods, the non-invasive continuous glucose monitoring device with AI can potentially reduce overall healthcare costs for individuals and healthcare systems.

Market Differentiation: The integration of artificial intelligence and continuous glucose monitoring technology can differentiate the device from competitors in the market. This unique combination of features may attract more users and healthcare providers seeking advanced solutions for diabetes management.

[033] These technical and commercial advantages collectively position the Non-Invasive Continuous Glucose Monitoring Device with Artificial Intelligence as an innovative and promising solution for diabetes management, offering improved accuracy, convenience, and personalized insights for individuals with diabetes.

[034] It is to be understood that the above description is intended to be illustrative, and not restrictive. For example, the above-discussed embodiments may be used in combination with each other. Many other embodiments will be apparent to those of skill in the art upon reviewing the above description.

[035] The benefits and advantages which may be provided by the present invention have been described above with regard to specific embodiments. These benefits and advantages, and any elements or limitations that may

cause them to occur or to become more pronounced are not to be construed as critical, required, or essential features of any or all of the embodiments.

5 **[036]** While the present invention has been described with reference to particular embodiments, it should be understood that the embodiments are illustrative and that the scope of the invention is not limited to these embodiments. Many variations, modifications, additions and improvements to the embodiments described above are possible. It is contemplated that these variations, modifications, additions and improvements fall within the scope of the invention.

We Claim:


1. A non-invasive continuous glucose monitoring (CGM) device comprising: a. Advanced optical sensors or other non-invasive sensors for measuring glucose levels through the skin. b. A processor configured to execute artificial intelligence (AI) algorithms designed to analyze the sensor data. c. A display interface to show real-time glucose levels and alerts.
5
2. The device as claimed in claim 1, wherein the optical sensors utilize light-based techniques including, but not limited to, near-infrared spectroscopy or optical coherence tomography.
- 10 3. The device as claimed in claim 1, wherein the AI algorithms are further configured to incorporate additional inputs from the user, including but not limited to, physical activity, meal intake, and medication usage.
4. The device as claimed in claim 1, further comprising a mechanism to generate customizable alerts notifying users of hypo- or hyperglycemic events.
- 15 5. The device as claimed in claim 1, wherein the AI algorithms are trained to learn continuously from the user's data, thereby refining accuracy and predictive capabilities over time.
6. The device as claimed in claim 1, further comprising a predictive analysis mechanism to project future glucose trends based on historical data, environmental factors, and individual patterns.
20
7. The device as claimed in claim 1, further integrated with a mobile application configured to provide: a. Data visualization, b. Trend analysis, c. Personalized recommendations based on glucose data.

8. The device as claimed in claim 1, wherein data security and privacy measures are implemented, including encryption, user authentication, and adherence to regulatory standards, giving users control over their data.
9. The device as claimed in claim 1, wherein the user can opt to share their data with healthcare professionals for better management and remote monitoring.
10. The device as claimed in claim 7, wherein the mobile application is configured to provide comprehensive insights into the user's glucose profiles, aiding in informed decision-making regarding diabetes management.

10 **Dated this 30th day of August 2023**

Applicant

Brainware University, Kolkata



Registrar

Brainware University

Barasat, Kolkata- 700125

Signature:

Name: Mahua Pal

15

ABSTRACT

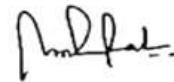
AN INVASIVE CONTINUOUS GLUCOSE MONITORING DEVICE WITH ARTIFICIAL INTELLIGENCE

[037] The present invention relates to an invasive continuous glucose monitoring device with Artificial Intelligence. The described invention is a breakthrough in the realm of glucose monitoring, integrating advanced sensor technology with artificial intelligence. It ensures users have an easy-to-use, accurate, and secure method of monitoring their glucose levels, aiding in more effective diabetes management.

Dated this 30th day of August 2023

Applicant

Brainware University, Kolkata



**Registrar
Brainware University
Barasat, Kolkata- 700125**

Signature:

Name: Mahua Pal


FORM 3
 THE PATENTS ACT, 1970
 (39 of 1970)
 and
 THE PATENTS RULES, 2003
STATEMENT AND UNDERTAKING UNDER SECTION
8
 (See section 8; Rule 12)

1. Name of the applicant(s).	We, Brainware University, Kolkata having office at, 398, Ramkrishnapur Rd, Near Jagadighata Market, Barasat, Kolkata, West Bengal 700125.
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2. Name, address and nationality of the joint applicant.	<p>(i) that I/We have not made any application for the same/substantially the same invention outside India</p> <p>Or</p> <p>(ii) that I/We who have made this application No... dated alone/jointly with....., made for the same/ substantially same invention, application(s) for patent in the other countries, the particulars of which are given below:</p>
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Name of the Country	Date of Application	Application No.	Status of the Application	Date of Publication	Date of grant
-	-	-	-	-	-

3. Name and address of the assignee	<p>(iii) that the rights in the application(s) has/have been assigned to none</p> <p>..... that I/We undertake that upto the date of grant of the patent by the Controller, I/We would keep him informed in writing the details regarding corresponding applications for patents filed outside India within six months from the date of filing of such application.</p> <p style="text-align: right;">Dated this 30th day of August 2023</p>
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<p>4. To be signed by the applicant or his authorized registered patent agent.</p>	 Registrar Brainware University Barasat, Kolkata- 700125 Signature: Name: Mahua Pal
<p>5. Name of the natural person who has signed.</p>	<p>Brainware University, Kolkata Name of the Applicant</p>
	<p>To The Controller of Patents, The Patent Office, at Kolkata</p>
<p>Note.- Strike out whichever is not applicable;</p>	

FORM- 5
THE PATENTS ACT, 1970
(39 of 1970)
&
The Patents Rules, 2003
DECLARATION AS TO INVENTORSHIP
[See Section 10(6) and Rule 13(6)]

1. NAME OF THE APPLICANT(S)

We, **Brainware University, Kolkata** having office at, 398, Ramkrishnapur Rd, Near Jagadighata Market, Barasat, Kolkata, West Bengal 700125.

hereby declare that the true and first inventor(s) of the invention disclosed in the complete specification filed in pursuance of ~~my~~/ our application numbered _____ dated 30-08-2023 is/are

2. INVENTOR(S)

(a) NAME	(b) NATIONALITY	(c) ADDRESS
1. Mrs. Nitu Saha	Indian	Assistant Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125.
2. Dr. Gunjan Mukherjee	Indian	Associate Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125.
3. Dr. Kaushik Chanda	Indian	Associate Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125.
4. Mr. Somnath Dey	Indian	Assistant Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125.

5. Mr. Subhadip Nandi	Indian	Assistant Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125.
6. Ms. Anudeepa Gon	Indian	Assistant Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125.
7. Ms. Suparna Karmakar	Indian	Assistant Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125.
8. Ms. Dolan Ghosh	Indian	Assistant Professor, Dept. of Computational Sciences, Brainware University, 398, Ramkrishnapur Road, Barasat, Near Jagadighata Market, Kolkata, West Bengal 700125.

~~3. DECLARATION TO BE GIVEN WHEN THE APPLICATION IN INDIA IS FILED BY THE APPLICANT(S) IN THE CONVENTION COUNTRY:—~~

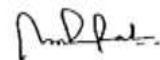
N.A.

~~We the applicant(s) in the convention country hereby declare that our right to apply for a patent in India is by way of assignment from the true and first inventor(s).~~

Dated this 30th day of August 2023

Applicant

Brainware University, Kolkata



Registrar

Brainware University

Barasat, Kolkata- 700125

Signature:

Name: Mahua Pal

To,
The Controller of Patents
The Patent Office, Kolkata

FORM 9

THE PATENT ACT, 1970
(39 of 1970)
&
THE PATENTS RULES, 2003

REQUEST FOR PUBLICATION

[See section 11A (2) rule 24A]

I/We **Brainware University, Kolkata** hereby request for early publication of my/our [Patent Application No.]
TEMP/E-1/67416/2023-KOL

Dated **30/08/2023 00:00:00** under section 11A(2) of the Act.

Dated this(Final Payment Date):-----

Signature

Name of the signatory

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

This form is electronically generated.