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Application Details

APPLICATION NUMBER	202141001092
APPLICATION TYPE	ORDINARY APPLICATION
DATE OF FILING	10/01/2021
APPLICANT NAME	Institute of Aeronautical Engineering
TITLE OF INVENTION	Durable Ultra-low Power Cardiac Pacemaker Device
FIELD OF INVENTION	BIO-MEDICAL ENGINEERING
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E-MAIL (UPDATED Online)	
PRIORITY DATE	
REQUEST FOR EXAMINATION DATE	--
PUBLICATION DATE (U/S 11A)	26/02/2021

Application Status

APPLICATION STATUS	Awaiting Request for Examination
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➡ Filed ➡ Published ➡ RQ Filed ➡ Under Examination ➡ Disposed

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Patent Search

Invention Title	Durable Ultra-low Power Cardiac Pacemaker Device
Publication Number	09/2021
Publication Date	26/02/2021
Publication Type	INA
Application Number	202141001092
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Field Of Invention	BIO-MEDICAL ENGINEERING
Classification (IPC)	A61N0001372000, G06F0030398000, A61N0001378000, A61N0001370000, H03M0001000000

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Abstract:
 ABSTRACT: Title: Durable Ultra-low Power Cardiac Pacemaker Device The present disclosure proposes a durable ultra-low-power cardiac pacemaker device with a long battery life that is designed to operate on ultra-low power. The proposed device is a cost-effective pacemaker with a circuit board equipped with small-sized components which in turn reduce the size of the circuit board. The design process aids to reduce power consumption in the circuit board of the implantable cardiac pacemaker to improve battery life by maintaining short channel effects. Further, the pacemaker device is designed by utilizing 7nm technology node in manufacturing circuit board of the cardiac pacemaker device to enhance the battery life besides reducing the size of the circuit board. The present disclosure develops a framework for the qualitative design that reduces the complexity of the electronic blocks and various passive components which in turn reduces the size of the motherboard. Further, the proposed design process provides a cost-effective circuit board for cardiac pacemaker with reduced power consumption.

Complete Specification

Claims: CLAIMS:
 I / We Claim:
 1. A process of designing a circuit board of an ultra-low power cardiac pacemaker device, comprising:
 designing devices or necessary circuits;
 simulating each block of said devices or circuits using power reduction techniques;
 implementing 7 nm technology node to said simulated devices or circuits;
 utilizing mathematical modelling to obtain a compact model with ultra-low power and high-performance devices or circuits; and
 fabricating a circuit board with said obtained compact model,
 whereby said process provides a pacemaker device with low power consumption while simultaneously maintaining small size of the components.
 2. The process of designing a circuit board of an ultra-low power cardiac pacemaker device as recited in claim 1, wherein said fabricated circuit board provides reduced drain current, reduced die area, and operates at deep sub threshold region of operation.
 3. The process of designing a circuit board of an ultra-low power cardiac pacemaker device as recited in claim 1, wherein said power reduction techniques utilized to simulate each block of said devices or circuits include either ultra-low power techniques or leakage power reduction techniques.
 4. The process of designing a circuit board of an ultra-low power cardiac pacemaker device as recited in claim 1, wherein said fabricated circuit board is further simulated to test for durability and reliability.

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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)					
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				Country	India
				Pin code	500043
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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			Country	India
			Pin code	560037

5. TITLE OF THE INVENTION

Durable Ultra-Low Power Cardiac Pacemaker Device

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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: 18.12.2020

(b) Signature(s):

(c) Name(s): Dr. Mahisha G Mr. Alamuri Venkateshwara Gupta Mr. A Jagadish Babu Aditya Narayana Rao G. Prathyusha

(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 prays that this application may be treated as deemed to have been filed on DD/MM/YYYY under section 16 of the Act.
- The said invention is an improvement in or modification of the invention particulars of which are given in Paragraph-11.

13. FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION

a) Form 2

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


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

- b) Complete specification (in conformation with the international application)/as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies).
- c) Sequence listing in electronic form
- d) Drawings (in conformation with the international application)/as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies).
- e) Priority document(s) or a request to retrieve the priority document(s) from DAS (Digital Access Service) if the applicant had already requested the office of first filing to make the priority document(s) available to DAS.
- f) Translation of priority document/Specification/International Search Report/International Preliminary Report on Patentability.
- g) Statement and Undertaking on Form 3
- h) Declaration of Inventorship on Form 5
- i) Power of Authority
- j)

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..... Bank

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

Dated this 18th day of December 2020

Signature: 

Name: Hima Bindu Atti

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";