Indian Institute of Information Technology, Design and Manufacturing Jabalpur

INTELLECTUAL PROPERTY FILING FORM

Please use this form for all types of IP (Patent, Copyright, Design, Marks, even know-how)

Title: Device for Insulin Self-Administration with Integrated Time and Location Monitoring.

SECTION-I (ADMINISTRATIVE & TECHNICAL DETAILS)

1. **Please list inventor(s) who have <u>contributed</u> in the main inventive step of the invention.**

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2. What is the area of the invention?

Healthcare Devices, Biomedical Engineering, IoT for Medical Monitoring, Embedded Systems

3. What is the problem in the area?

- Diabetic patients often forget previous injection sites, leading to tissue damage which in turn affects how our body absorbs insulin.
- Lack of reminders for next insulin dose can cause overdose/underdose.
- No affordable, integrated systems currently provide dosage tracking and site monitoring in real time.

4. What is the objective of your invention?

- To create a smart insulin pen cap that logs last injected site and time.
- To provide real-time alerts for next dosage using an OLED screen.
- To ensure better injection site rotation for safety and effectiveness.
- To design a portable, low-cost assistive device for diabetes management.
- To integrate all essential features—such as dosage tracking, reminders, and administration—in a single device, eliminating the need for patients to rely on multiple tools or systems.

5. What is Novelty?

- OLED screen on pen cap displaying last site, list of options for next site, last time and next dose time.
- Uses RTC and EEPROM for persistent logging and alerting.
- Button-based input and reset with minimal power draw.
- Modular cap design compatible with existing insulin pens.
- Customizable injection site selector for patient ease.
- Customisable next dosage time.

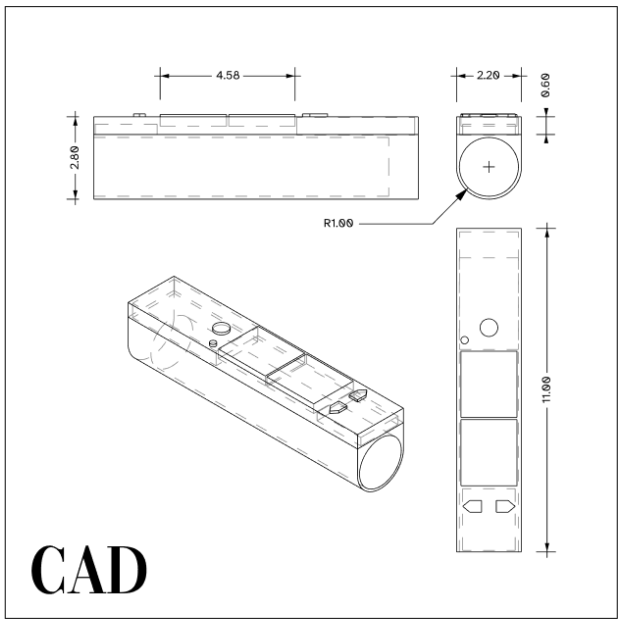
6. What is the utility (advantages) of the present invention over comparable inventors available in literature including patents?

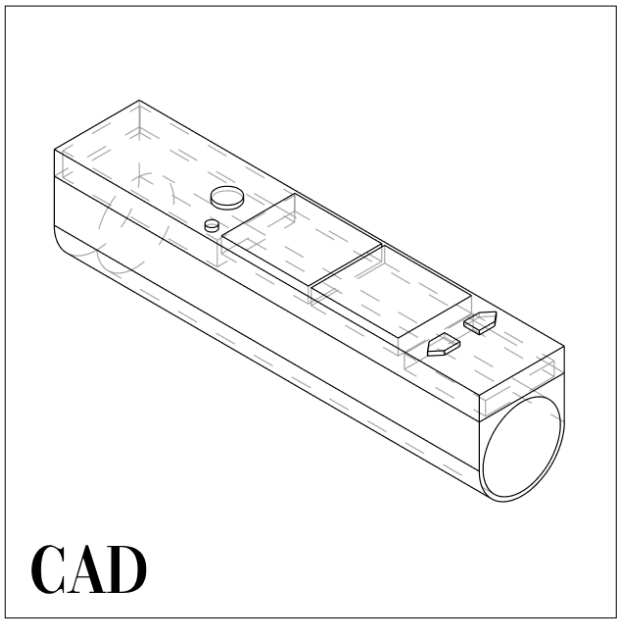
- Promotes better site rotation habits to prevent Lipohypertrophy.
- No app or smartphone required – all info on-device.
- Cheaper alternative to advanced insulin tracking systems.
- Lightweight and rechargeable via USB.
- The device features a long-lasting battery and ensures data persistence even during power loss.
- Designed for the elderly and individuals with busy lifestyles, the device helps prevent missed doses by automating routine tasks often overlooked in daily life.

7. Has the invention been tested experimentally (proof-of-concept/Prototype)? (If yes, please add the details)

YES.

3D Renders and CAD images (Original Design):





Prototype (Scaled up and 3D printed):

3D Model (Scaled Up Prototype):

- Functional prototype with ESP8266 R1-D1 Mini, OLED screens, button input, and RTC.
- Validated time tracking and memory logging after resets.
- Successfully simulated dose reminder logic and site storage.
- Cap housing modelled and tested for fit on standard insulin pens.

8. Can you think of applications of your invention?

- Daily diabetes management for Type 1 and Type 2 patients.
- Rural healthcare settings with minimal tech access.
- Paediatric and geriatric diabetes care assistance.
- Integration with hospital EHRs or caregiver systems.

SECTION-II (IPR Ownership)

1. **Was the intellectual property created with the significant use of funds or facilities of IIITDM Jabalpur?**

   Yes

2. **Please describe the source of funding for the invention (Name of the funding agency and copy of agreement, letter of intent if any, must be enclosed with this form).**

IIITDM Jabalpur

3. **Have you presented/published in any Journal/conference if yes, please give details?**

NA

4. **Was the intellectual property created in the course of or pursuant to a sponsored or a consultancy research agreement with IIITDM Jabalpur? If yes, please enclose a copy of MOU with concerned project.**

NA

5. **Was the intellectual property created as a part of academic research leading towards a degree or otherwise?**

Yes

6. REVENUE SHARING AMONG INVENTORS: Please disclose the extent of contribution of each inventor in the invention in percentage terms for revenue sharing.

NAME OF THE INVENTOR (S)	% SHARE	SIGNATURE
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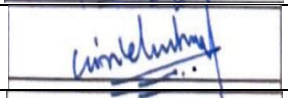
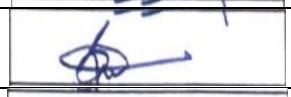
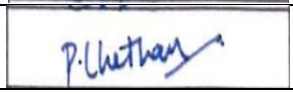
Malyala Sri Gana Sathwik		
Ashwathy Santhosh		
Giridhara Prashad		
Sitra Vishnu Bhargav		
Vishnu Urugonda		
Porika Chethan		

SECTION-III (Commercialization)

1. Who are the Target companies, both in India or abroad?

- **Insulin pen manufacturers (e.g., Novo Nordisk, Sanofi, Pfizer)**
- **Medical IoT startups**
- **Assistive healthcare device firms**
- **Government or NGO health initiatives**

Development stage:

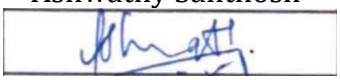
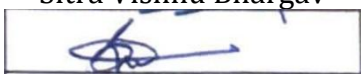
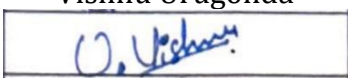
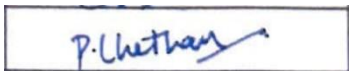
In your opinion which of the three best describes the current stage of development of the invention as it relates to its marketability:

---------- Embryonic (needs substantial work to bring market)

------ Partially developed (could be brought to market with significant investment)

------- Off-the-shelf (could be brought to market with nominal investment)

Undertaking: - The affiliation of Intellectual Property will be of IIITDM Jabalpur and rules of the Institute will be binding as applicable.

Dr. Avinash Chandra Pandey		
Malyala Sri Gana Sathwik 	Ashwathy Santhosh 	Giridhara Prashad 
Sitra Vishnu Bhargav 	Vishnu Urugonda 	Porika Chethan 

Signature of all Inventor(s) with date

Recommended

(Dean RSPC)

Token number from Office Dean (RSPC):

Approved/Not Approved

(Director)