

Fixed Dose Pen

Safe and cost-effective dose delivery pen for convenient self-injection

BACKGROUND AND CHALLENGE

Treatment of various ailments require injecting medication using DISPENSING DEVICES at intervals prescribed by medical practitioners. Efficacy of treatment is based on capability of the device to dispense accurate dose of medicine to prevent contraindications in patients and additional patient safety measures such as locking device at its recommended lifetime.

Currently, hand held medical devices especially the injection systems are heavily patented which results in higher device costs as it involves high cost manufacturing operations and premium royalty.

We took up this challenge to design and develop a safe, accurate and cost-effective fixed dose, liquid drug delivery device platform which can be licensed directly to the pharma companies

SCOPE OF WORK

- Patent Research & Landscaping
- Innovation & Mechanism Concept Development
- Industrial Design, Human Factors & Usability Engineering
- Detailed Engineering Design, Tol-stack analysis, DFM, DFA
- Functional Prototype Build & Testing
- Design Verification, DHF release for Regulatory submission
- Patent applications filed in India, internationally under PCT

TATA ELXSI INNOVATION LAB (INTERNAL)



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SOLUTION

- An innovative cam-drum mechanism in the device, allows the users to set a fixed dose and deliver it accurately every single time
- The ratchet and pawl lever mechanism within the cam drum ARRESTS WRONG DOSE SETTING. The design causes the cam drum to become locked if a patient attempts to dispense less than or more than the fixed dose, thereby preventing delivery of the wrong dose. The user would be able to set the dose only after injecting the dose fully.
- The unique END-OF-LIFE mechanism prevents the user from re-using the device after the preset number of doses are delivered. After a specified number of doses of medication is dispensed, the thumb pad is locked and cannot be pulled out, which gives the indication to dispose off the dose delivery pen.
- The components of the mechanism are engineered and developed using just plastics, helps in maintaining cost advantage over competition, which uses metal components
- No dose dial window required to set dose, which in turn, prevents human error in dose setting



IMPACT

This Insight-driven, intuitive, easy-to-use and cost-effective fixed dose drug delivery pen has the potential to shape every facet of drug delivery experience in the future and deliver affordable healthcare globally

This device can be used with wide range of drugs, has long term benefits and is future ready with IoT integration compatible with smart features

This qualifies as a generic to the leading brand, with exact user steps

Patent portfolio for design extensions such as different fixed doses or variable 3 doses. Replication is difficult as the rotary cam drum is unique and protected by strong claims