

A 3D PRINTED BIOMECHANICAL ELECTROLARYNX DEVICE FOR VOICE REHABILITATION OF LARYNGECTOMEES

IITM Technology Available for Licensing

Problem Statement

- Electrolarynx devices suffer from reduced intelligibility, monotonous speech, and unnatural sound quality, impacting communication effectiveness for laryngectomy patients.
- Current electrolarynx solutions **lack fine control over pitch and loudness variation**, limiting the user's ability to express emotions and nuances in speech.
- Existing electrolarynx devices often **require continuous manual activation**, causing inconvenience and restricting the user's mobility and activities.

Intellectual Property

- IITM IDF Ref. 1723
- IN 497157 - Patent Granted

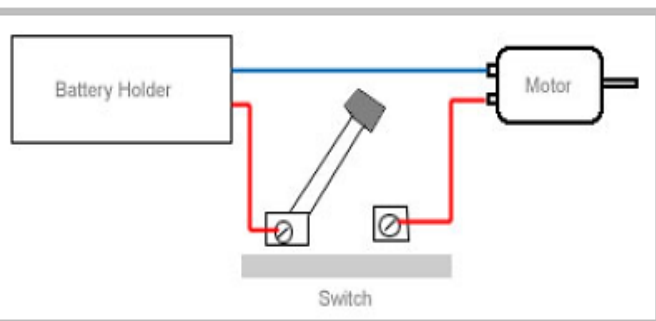


Fig 2. Illustrates the simplified diagram of the electrical portion.

Technology Category/ Market

Category - Assistive Devices

Applications - Voice Rehabilitation, Assistive Technology for Speech Impairments.

Industry - Medical Devices, Healthcare

Market- Global Voice Restoration Devices Market was valued at US\$ 531 million in 2022 and is estimated to reach US\$ 602 million by 2031, growing at a **CAGR of 9.6%**.



Fig 1. illustrates the motor with the eccentric plate and piston.

Technology

- The present invention relates to a speech aid device and more particularly relates to a biomechanical electrolarynx device for voice rehabilitation of laryngectomees after laryngectomy

The present invention aims to create a cost-effective, lightweight, and user-friendly electrolarynx system for voice rehabilitation of laryngectomy patients.

It features a mechanical electrolarynx device comprising a transducer powered by an electric motor, converting electrical energy into mechanical vibrations to stimulate the patient's vocal cords.

Through a custom-designed transducer mechanism, vibrations are transmitted to the patient's throat, enabling speech production with minimal modulation from tongue and mouth movements.

TRL (Technology Readiness Level)

TRL - 4: Technology validated in lab scale.

Research Lab

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Key Features / Value Proposition

1. Cost Efficiency: :

- Offering a cost-effective solution for voice rehabilitation post-laryngectomy, reducing financial burden on patients.

2. Lightweight Design:

- Providing a portable and ergonomic electrolarynx system, enhancing user comfort and mobility.

3. User-Friendly Interface:

- Simplifying operation and maintenance for laryngectomy patients, ensuring ease of use and accessibility.

4. Low Power Consumption:

- Maximizing battery life with efficient energy utilization, minimizing downtime for recharging.

5. Enhanced Speech Quality:

- Improving speech intelligibility and naturalness through mechanical vibration technology, promoting effective communication.

6. Customized Transducer:

- Tailoring vibration patterns to stimulate vocal cords, optimizing speech production with minimal effort from users.



Fig 3. Shows the views of triangular transducer plate with the piston.

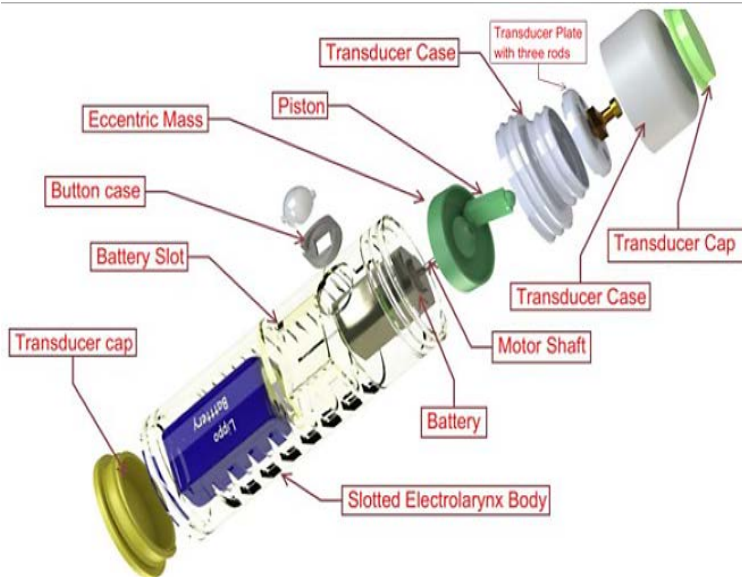


Fig 4. Shows the views of triangular transducer plate with the piston.

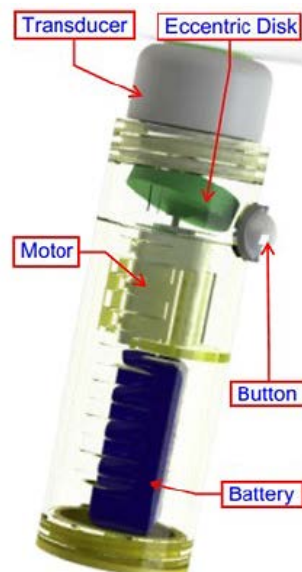


Fig 5. illustrates the inner transparent views of the present invention.

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