Obstructive Sleep Apnea Treatment Device Design

Oral Neurostimulator Implant Treats Sleep Apnea

A neuro-muscular stimulator implanted inside the mouth stimulates the hypoglossal nerve and the genioglossus muscle to prevent obstructive sleep apnea (OSA) or breathing obstruction caused by inadequate motor tone of the tongue and/or pharyngeal wall muscles. The device consists of an implantable stimulator lead connected to an exposed part, positioned in the lower jaw, that acts as an access point between the implanted lead and an outside power source (rechargeable battery) and electrical pulse generator. The power supply provides power to the access port counterpart and the electrical connection, thereby powering the electrical coupling at the muscle or nerve to prevent obstruction of an airway due to obstructive sleep apnea. The outside power source and stimulator can be packaged as a removable “retainer” worn by the patient at night and removed in the morning. Other designs of the device may feature an implantable stimulator lead and pulse generator that are not connected physically to an exposed portion, or even a configuration where power is transferred wirelessly using magnetic field, focused ultrasound beam or other technology.

Comparable Efficacy with Less Extensive Surgery and Lower Cost

One of the most common OSA treatments is a continuous positive airway pressure (CPAP) machine. While effective, CPAP technology suffers from low patient compliance due to the uncomfortable mask, high pressured air, noise and limited movement. Oral and nasal devices are less effective, and surgical options like reconstructing the airways or embedding conventional implantable neurostimulators often require extensive surgery and are expensive and prone to failure. This unique neurostimulator device is expected to provide
an effect comparable to currently approved neurostimulators but will be implanted through a less extensive surgical procedure, and at a lower estimated cost.

**BENEFITS AND FEATURES:**

- Stimulates the hypoglossal nerve and the genioglossus muscle
- Prevents obstructive sleep apnea (OSA) or breathing obstruction caused by inadequate motor tone of the tongue and/or pharyngeal wall muscles
- Comparable efficacy
- Less extensive surgery; lower cost
- May increase patient compliance

**APPLICATIONS:**

- Obstructive sleep apnea
- Sleep apnea
- Breathing obstruction

**Phase of Development** - Prototype developed

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