UP-Stimulator [Utah Slanted Electrode Array Pudendal Nerve-Stimulator]

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Technology description

Invention Summary

This invention consists of a novel technique for controlling urination, or micturition. It consists of implanting the Utah Slanted Electrode Array (USEA) into the pudendal nerve to provide the capacity to selectively contract and relax the two major muscle groups involved in normal voiding, the detrusor and external urethral sphincter respectively. Upon stimulation, the UP-Stimulator (USEA Pudendal Nerve Stimulator) contracts the bladder muscle while simultaneously relaxing the urethral sphincter to give controlled urination. The UP-Stimulator can be implanted with a minimally invasive surgery, and does not require transaction of sensory nerves. This novel therapy greatly improves upon current treatments for bladder dysfunction.

Value Proposition

Access to the pudendal nerve can be obtained through dissection of the ischional fossa resulting in a minimally invasive surgical technique

·Stimulation of the pudendal nerve does not require transaction of sensory nerves, therefore patients will retain residual sensation, reflex erection, lubrication and ejaculation

·Unlike long-term or intermittent catheterization, pudendal nerve stimulation will not require a socially incompatible catheter bag

·By using the USEA to simultaneously block the external urethral sphincter activation while activating the bladder detrusor, micturition will be continuous

Market Opportunity

Bladder dysfunction affects 17 million Americans including patients with spinal cord injury and neurological diseases. Current treatments include long-term catheterization, extensive urinary tract reconstruction, or functional electrical stimulation of the sacral root. Catheterization is accompanied by many side effects, including: insertion difficulty, repeated urinary tract infections, urethral damage and inflammation, and social incompatibility. For many patients, indwelling or intermittent catheterization is still ineffective or unmanageable. The UP-Stimulator will be used as a practical application for treating patients with bladder dysfunction. For these patients, this invention will allow them to control when they urinate with the press of a button. This application is more practical than current therapies available for the millions of patients currently suffering bladder dysfunction. As a secondary application, this invention may be used in canines with spinal cord injuries. Dogs are currently treated by long-term catheterization. With the use of the UP-Stimulator, dog owners would not be burdened by catheterizing their animals potentially causing other problems as already discussed. National and international medical technology industries that are dedicated to treating bladder dysfunction will be affected by this technology. This may include industries involved in neuroprosthetics, treatments for spinal cord injury and multiple sclerosis, and functional electrical stimulation.

Institution

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