

Method for Intracochlear and Vestibular Magnetic Stimulation

A method of stimulating the cochlea and vestibular system using targeted magnetic fields

Inventors from Georgia Tech have created an implantable array as well as developed a method of stimulating the cochlea and vestibular system using targeted magnetic fields. The device induces a magnetic field in the surrounding tissue and excites neurons to stimulate peripheral processes without mechanical transduction. It will be able to communicate with other systems such as external microphones and speech processors as well as enable a sense of hearing by exciting the spatial areas currently not receiving stimulation through sound vibrations.

Summary Bullets

- **Provides hearing**- magnetic fields couple with auditory neurons to produce excitation perceived by the brain as a sound signal
- **Better sound quality**- more precise frequency resolution produces better sound quality
- **More reliable signal and decreased sound quality degradation**- intervening tissues between array and auditory neurons are no longer a carrier for signals, which will prevent attenuation signal interference

Solution Advantages

- **Provides hearing**- magnetic fields couple with auditory neurons to produce excitation perceived by the brain as a sound signal
- **Better sound quality**- more precise frequency resolution produces better sound quality
- **More reliable signal and decreased sound quality degradation**- intervening tissues between array and auditory neurons are no longer a carrier for signals, which will prevent attenuation signal interference
- **Cost effective**- non-direct electrical stimulation allows for a greater range of materials that can be used to produce the implantable magnetic array
- **Multi-functional**- aids in hearing but also in treating semi-circular canal dysfunction

Potential Commercial Applications

- **Aiding hearing disabilities**- provides a sense of hearing to patients suffering from sensorineural hearing loss
- **Other dysfunctions**- can prevent the onset of vertigo resulting from semicircular canal dysfunction

Background and More Information

Cochlear implants simulate the auditory nerve and provide a sense of sound to a person who is profoundly deaf or severely hard of hearing. More than 45,000 are sold annually and the demand is predicted to grow steadily over time due to an aging global population, increased diagnosis of acquired hearing loss, improvements in cochlear implant technology, and significant potential growth in emerging markets. Current technologies can be improved in terms of sound quality, tissue reaction, and production costs.

Inventors

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IP Status

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Publications

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