Piezoelectric Nanowire Based Hearing Aids

A mechanism which merges the miniature of nanowire structure and the piezoelectricity of ZnO to function as a hearing aid

Georgia Tech inventors have created a mechanism which merges the miniature of nanowire structure and the piezoelectricity of ZnO. The device mimics the mechanism of how a hair cell works, which could potentially be applied as an advanced category of hearing aid device option. This invention includes a vibration sensor and a substrate. A first electrical contact and a spaced apart second electrical contact are both disposed on a first surface of the substrate. The elongated piezoelectric nano-scale structure extends outwardly from the first surface of the substrate and is disposed between, and in electrical communication with, the first electrical contact and the second electrical contact. The elongated piezoelectric nano-scale structure is oriented so that a voltage potential exists between the first electrical contact and the second electrical contact when the elongated piezoelectric nano-scale structure is bent from a first state to a second state.

Summary Bullets

- Smaller size
- More power efficient

Solution Advantages

- Smaller size
- More power efficient

Potential Commercial Applications

- Hearing aids

Background and More Information

One out of ten people suffer from hearing loss worldwide, constructively and sensorineurally. People are affected in various ways, from mild impairment to profound deafness, and affecting both children and adults. Hearing aid devices offer people with hearing loss a significant way to improve the quality of their life. The majority of hearing loss falls in the sensorineural hearing loss (SNHL) category, which is normally caused by

damage to inner hair cells, outer hair cells, which then causes a cochlear malfunction. The typical device for addressing SNHL uses digital signal processing for preprocessing of the sound signals. However, these devices have drawbacks such as a relatively large size and high power consumption.

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Publications

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