



Miniature Flexible Arterial Cuff for Implantable Power Generation (VA Reference No. 08-080)

Novel energy harvester providing electrical power to an implantable medical device without the necessity of batteries or wireless-power

Technology

Power generation device for implantable medical microsystems

Inventor

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Key Features

- Eliminates need for batteries or wireless-power
- Results in increased power generation and decreased mechanical resistance of the artery/graft
- Manufactured with biocompatible material to naturally curl around an artery or arterial graft

Stage of Development

Reduced to practice with prototypes developed

Patent Status

Patent application filed

Keywords

Medical device
- Implant
- Arterial graft

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Technology

The Department of Veterans Affairs has developed an arterial cuff energy harvester that can be integrated into implantable microsystems for the monitoring of diseases and conditions such as heart disease, heart failure, aneurysms, and diabetes without the drawbacks of battery-based or wirelessly powered systems.

Description

The novel device developed by the VA has the potential to enhance the development of portable, adaptable, and cost-effective medical implant technologies.

The device when wrapped around an artery or arterial graft generates energy from the expansion and contraction of the artery/graft. The arterial cuff is formed from a biocompatible, flexible material and piezoelectric polymer with metal electrodes utilized to collect the generated energy.

The arterial cuff energy harvester has the potential to address the current energy limitation of existing devices and devices in development, and there is not currently an energy harvesting technology on the market.

Competitive Advantages

A major limitation of implantable medical device microsystems is the finite source of electrical power with batteries and wireless powered devices having a number of disadvantages.

This invention:

- Eliminates the necessity of batteries and wireless-powering in implanted systems, resulting in the first completely autonomous implanted microsystem.
- Can be fabricated using standard fabrication processes or through microfabrication.
- When inserted could be either wrapped around an artery or arterial graft or be directly integrated into a graft.

Status

The Department of Veterans Affairs is looking for a partner for further development and commercialization of this technology through a license, and the VA inventors are available to collaborate with interested companies through a Cooperative Research and Development Agreement (CRADA).