

THERMOELECTRIC MICRO-GENERATOR FOR ENERGY HARVESTING

DISCLOSURE OF INVENTION

CSIC and UPV have developed a thermoelectric micro-generator capable of collecting and transforming thermal energy into electric power. The generator consists of P-N semiconductor junctions, and the structure has connections via through-holes that allow the construction of thermocouples along the three dimensions. This design provides a high packing density as well as being configurable. Interested partners to complete the development of technology and patent license are sought.

INDUSTRIAL APPLICATION SECTORS

Devices capable of converting thermal energy into electricity on a small scale are currently attracting considerable attention for their potential use in wireless sensor networks, in "wearable technology" or even use of exhaust gases from internal combustion engines. These applications in this invention are oriented to "Energy Harvesting" devices.

It will become increasingly common application of this technology that leverages not currently generate energy and better energy efficiency in certain devices, such as cars.

TECHNICAL ADVANTAGES AND BUSINESS PROFITS

A thermocouple is a device which includes two portions of semiconductor material (one type P and other N) and which are joined by one of their ends, this union temperature has being increased respect to the free ends. The temperature difference results in a voltage difference between the electrical terminals.

To improve the electrical power obtained is used to electrically connect in series and thermally in parallel several thermocouples. The output voltages which are capable of producing the present devices are relatively low compared with other types of generators. There is therefore a need to integrate more thermocouples per unit area. The main features of this technology are:

- The microstructure developed allows greater integration density of generators.
- The technique of through holes simplifies the routing minimizing the electrical and thermal losses.
- The microstructure developed is configurable and allows to adjust both the current and the output voltage
- The microstructure accepts the incorporation of dynamic connections that give the device robustness and fault tolerance.

THERMOELECTRIC MICRO-GENERATOR FOR ENERGY HARVESTING

DEVELOPMENT STATUS OF TECHNOLOGY

The above-described technology is developed experimentally. Note that several studies in which its industrial applicability is described.

INDUSTRIAL PROPERTY RIGHTS

The technology for thermoelectric micro-generator is protected by patent. This patent is co-owned CSIC-UPV.

TYPES OF COLLABORATION

Seeking interested partners to complete the development of technology and patent licensing to companies for industrial exploitation.

RELATED IMAGES

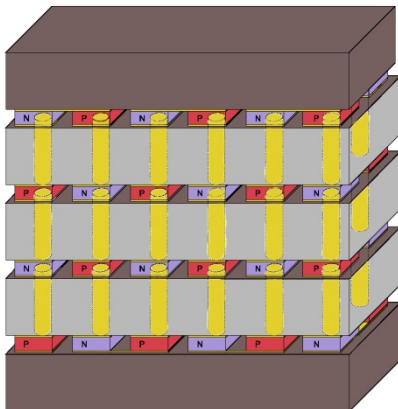


Image 1: Internal structure of thermoelectric micro-generator.

CONTACT

Josep Calaforra Guzman
Delegación del CSIC en la Comunidad Valenciana.
C/ Cronista Carreres 11, 2º C
46003 Valencia.
Tel.: 96 362 27 57 ext.102
jcguzman@dicv.csic.es
www.dicv.csic.es