

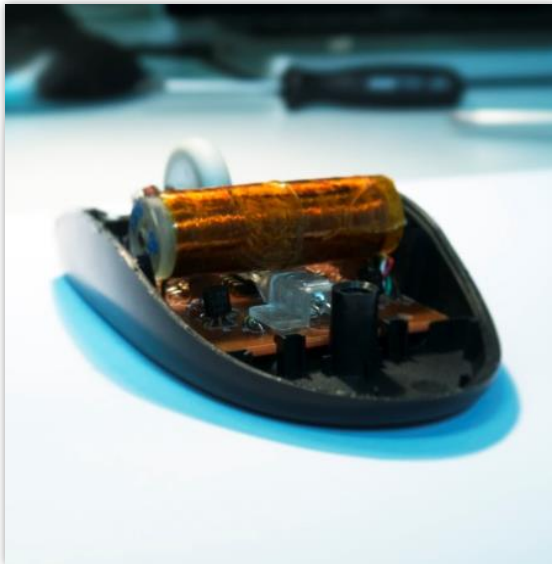
Method for generating electrical power from the movement in a computer mouse

Abstract

The developed system, adapting the energy harvesting unit to the particular application, allows for making a computer mouse electrically autonomous. Moreover, the versatility of the design procedure, which combines methods for signal analysis, the modeling of the system and the optimization of the operating parameters, enables the development of devices that are suitable for a large variety of applications.

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energy harvesting

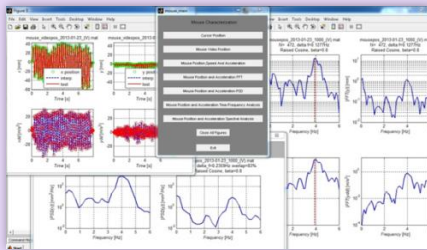
electromechanical conversion

vibrational motion

multi-physics optimization

computer mouse

Method for generating electrical power from the movement in a computer mouse



Description

Through the recovery of energy wasted by other phenomena, the presented invention derives power from an alternative non-traditional source, the vibrational motion of an object, for transforming it into available electricity to directly feed a computer mouse. The desire to recover energy from this kind of source stems from different factors, mainly the need of reducing the electric power demand from traditional sources, such as batteries, and the necessity, if applied to other wireless devices, to make them electrically

autonomous so that they can be placed in isolated positions or which are difficult to reach. The type of energy harvester considered exploits the electromechanical conversion generated by a moving magnet which linearly slides inside a coil in response to vibrational excitation. The effectiveness of the design procedure allows for making a computer mouse electrically autonomous, exploiting low energy content vibrations and remaining in the dimensional constraints typical of a standard battery.

Applications

The considered energy harvester device allows for making a computer mouse electrically autonomous, exploiting a low-intensity vibrational input and occupying a small volume thanks to the high energy density that it is able to recover. A number of applications concern all those electrical devices having a medium-to-low energy consumption and subject to low or high-intensity vibrational input, even in the case of very stringent dimensional constraints.

Advantages

Compared to the traditional sources of energy used to power wireless computer mice, batteries, the use of the energy harvester object of this invention gives the device an infinite life duration. Moreover, it is a green solution that allows for a considerable saving in terms of non-recyclable batteries, which are highly polluting wastes and difficult to treat. It has been calculated that the average user consumes about a pair of batteries in two months. The possibility of feeding electrical wireless devices with a source that

guarantees an endless service life extends the application range to many situations. The design procedure, integrating signal analysis techniques, component modeling and optimization of the geometric parameters can adapt its characteristics to any vibrational input or dimensional constraint, identifying the optimal solution for the considered use case. The proposed invention offers an opportunity to create new applications in segments such as the wearable electronics field, cellphones or mobile computers.