

Article

Energy Floor using Piezoelectric Sensor

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A B S T R A C T

In day to day life we face the major problem that shortage of electricity in rural areas. In this work there is use of piezoelectric sensor which translate mechanical pressure into electric charge. This planned system generate electric power as non-predictable method by walking, dancing and running on foot step. As considering India's growth Non conventional energy system is very essential. In this paper there is utilization of wastage of human foot step energy to generate electric power.

Keywords: Piezoelectric sensor, Rectifier, Battery, load

Introduction

Now a day's shut down of electricity is main issue. Demand of electricity is augmented day by day. On one hand there is gap between request and supply of electricity. Non-conventional energy is an easy way to solve such problems of electricity generation. Technology development is carried out to use energy harvesting that is solar energy, windmills etc. In this we discuss on generation of micro energy by vibration and pressure using piezoelectric sensor. In day to day life walking is the maximum mutual activity. By walking human loses energy in the form of vibration on surface. This energy can be tapped and converted into electric form.

In this paper we use a piezoelectric material as a converting medium. These material have property that is develop electric charge on their surface when any motorized pressure is applied on them. Piezoelectric sensor is works on piezoelectric effect to amount pressure, strain and force by changing them into electric charge. There has been growing application and demand for new control system that involve piezoelectric material. This system is economical, reliable, simple to use. As no requirement of any external power source, it is self-generating.

Literature Review

In¹ Researcher group has proposed Electrical power generation through foot steps. on roads and sidewalks. The present project deals with the generation of electricity through traffic pressure by placing piezoelectric generators on the roads the axial load of the traffic pressure deforms the generator and thus produces the electric energy as an output, this output may use for the street lighting, and many more aspects.¹ This paper present simulation based system to support the concept of generating energy from human walk using piezoelectric sensor.^{2,3} Due to rise in electricity ingesting. In this project they advanced piezoelectric generator. Project describe the use of piezoelectric material in order to harvest energy from people walking vibration for generating energy.^{4,5}

Piezoelectric sensor are characterized by consuming a transduction element complete up of piezoelectric material. They are named active sensor because, no outside energy is wanted to obtained an output signal⁶ Piezoelectric material can convert mechanical into electrical energy. Since bio technology practices enable large scale manufacture conceivable. Piezoelectric material potentially offer a

humble and ecologically friendly approach to piezoelectric energy generation.

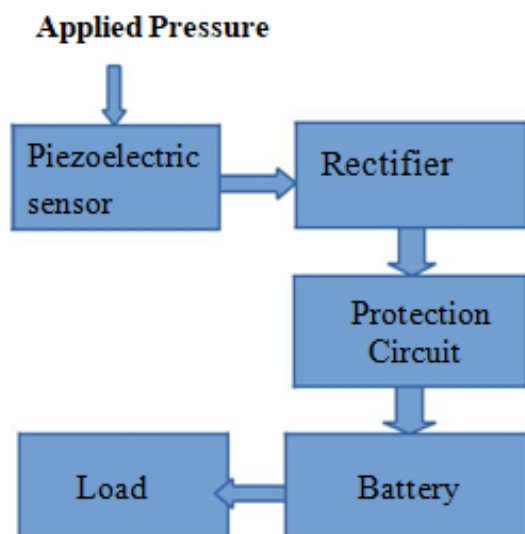
Piezoelectricity found in useful application such as the construction and generation of high voltage electronic frequency generation. They said that most of piezoelectric electricity sources produce power on the order of miliwatt. This paper present Types of piezoelectric technology and it's uses and features (Table 1.).

Table I

No	Company Technology	Uses and Features
1	Waynergy Floor	- Energy directly consumed or stored - Indoor/ outdoor applications
2	Sound Power	- Power Sources for many Application. - Utilized in the emergency stairs
3	Sustainable Energy Floor (SEF) 2	- Power street lights and signing systems - Modules can be fully customized

Proposed System

Block Diagram



Working

As the piezoelectric material has two properties one is direct effect and other is converse effect. Direct effect is property that develop electric change on their surface as any mechanical stress is practical and converse effect is that develop motorized stress by any electric change. Whenever any mechanical pressure like force, vibration, acceleration is applied on piezoelectric sensor it convert into electric energy. This converted energy is in the form of

ac. To convert it into dc rectifier is used. The output energy is stored in battery. Protection circuit is used as provision to check overcharging of battery. This stored energy is used to drive led, bulb, street light, mobile charger etc.

Conclusion

The paper is best economical, reasonable and easy solution for energy generation. This generated energy can be used in rural areas where power availability is less. The generated energy used to drive dc load according to force applied on piezoelectric sensor.

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