

POWER GENERATION SYSTEM USING NON CONVENTIONAL METHOD FOR DOMESTIC & COMMERCIAL APPLICATIONS

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Abstract—In present situation the demand for generation of power by non conventional method is increasingday by day.

The use of power electronic gadgets has been rapidly expanding during the past few years, as so many of these portable electronic devices are being utilized to make our lives more comfortable, there is a growing interest among us in the idea of gathering alternative renewable energy from the environment. Here we focus on such a advanced system that we are monitoring the physical activities to accumulate the energy. Piezoelectric materials can be employed as which can be for generating an electrical energy, which can be stored and used to power the devices.

Keywords-Piezoelectric Transducers, Battery, Relay, Voltage Booster, Inverter Circuit

I. INTRODUCTION

At present the demand for electricity for human in daily activities is exponentially increasing day by day. For its various processes, modern technology needs a vast amount of power in the form of energy. Electricity demand is increasing at an exponential rate, resulting in a large gap between a supply and demand. As a result researcher and innovators working in the field of energy harvesting are attempting to reduce alternative energy sources and their potential applications. As a result, the primary goal of current technology is to provide a pollution-free method of generating electricity for the growing human population that has no environmental impact. In this technology, the piezoelectric phenomenon is used to generate electricity. An electric charge can be created when pressure is applied to a material that exhibits a piezoelectric effect. Piezoelectric material act as a

transducer which generates electricity when pressure is applied on the path it converts into electrical power.

II. RELATEDWORK

Literature survey includes the paper which we have referred for our project. This particulare chapter contain about the authors and their contribution on the several concepts.

In [1] the author proposed the system with the use of Embedded Technology which made the system reliable. The system used an AT89S52 from the popular 8051 family of Atmel Microcontrollers, which had the disadvantage of not having an in-built ADC and not supporting SPI protocols.

In [2] the author proposed a technique for power generation using piezo sensor through treadmill stride, where threadmill was used in fattiness industries when force was applied to the moving belt, it generates energy. The drawback of this system was expensive and need of external source.

In [3] paper presents bending mechanism support. They used 3D model in which transducers undergo bending process and it bends during the finger press test. The limitation was it generates less amount of voltage as it was small in size.

In [4] the author implements using movable springs which are placed below and above the piezoelectric sensors. Monitoring circuit and LCD display is used for observe the stored energy.

In [5] Proposed system the Faradays law of Electromagnetic Induction is used to cut flux with coils. A spur gear mechanism is used to generate AC voltage with a magnet attached to shaft. As there will be some current flow measured from the copper wires, which are inherently alternating current (AC). Rectifier circuit is used to which convert it into DC and it is fed to the Battery to store.

III. METHODOLOGY

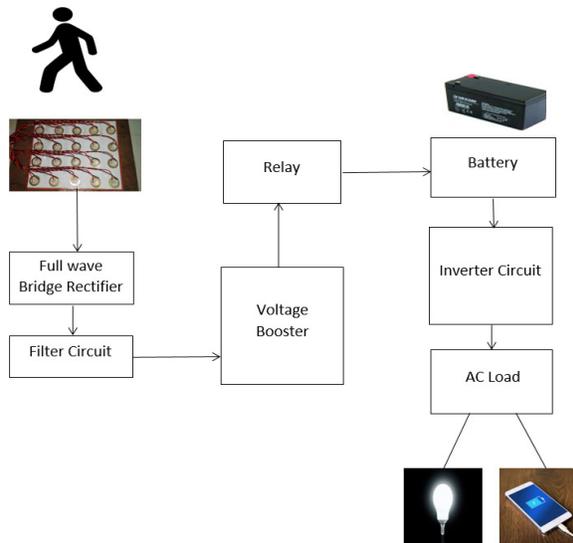


Fig. 1 Block Diagram of the System

The Proposed system focuses on producing energy in a non-conventional method and storing it in batteries, which can be used for variety of purposes. The piezoelectric transducers are arranged in such a way that the output voltage is maximum. This generated voltage is stored into a rechargeable battery. The piezoelectric sensor serves as the system's fundamental operating principle. To put this system in place, we must adjust the wooden plates above and below the sensors. Non-conventional energy is converting an mechanical energy into electrical energy by using footsteps.

In this system, the path consists of six piezoelectric sensors which are connected in both series and parallel. The piezoelectric sensors will convert mechanical energy into electrical energy when pressure is applied to them. To convert AC to DC, a bridge type fullwave rectifier is used. The filter circuit that is capacitor is used to filter out the signals which have a low frequencies. DC Voltage Booster is used to step up an input voltage to some higher level as per the required load. DC-DC converter is voltage doubler. Further it is connected to relay, the purpose of using relay is whenever we use the load and turn off the circuit some current reverse back which may damage the circuit, to avoid this we are using relay. The generated voltage is stored into the battery which is rechargeable lead acid 12 volt battery connected to the inverter circuit. This inverter converts DC to AC, thus the alternating current is used to power the loads.

IV. ADVANTAGES

- The system is non-conventional.
- It is reliable, cost-effective and eco friendly.
- Producing power is an easy by walking on a path.
- An alternative way of power generation.
- No external power required.
- Self generation.
- No need of fuel input.

V. APPLICATIONS

- This can be used for a variety of applications in rural areas where there is scarcity of power.
- Generated power can be used for hospitals, office building, supermarkets and school.
- This system has many domestic applications, some of them are: Mobile Charging, Corridor lighting, emergency power failure.

VI. RESULT



Fig. 2 Results of the Project

We developed and implemented a low-cost power generation system with piezoelectric sensors, and the voltage is generated as a result of the applied pressure. Based on the pressure applied to the piezoelectric sensor, a significant amount of voltage is produced which can be used for a variety of applications.



Fig. 3 Hardware Model

VII. CONCLUSION

The project power generation system has been successfully tested, and it is the most cost-effective and affordable energy solution for the general public. Energy management is a major challenge in India because it is a developing country with a large population. This can be used for a variety of purposes in rural areas where power is scarce or non-existent. The use of wasted energy from human mobility is especially important in densely or crowded areas. To generate electrical power non conventionally, the power generation arrangement is used which convert mechanical energy into electrical energy by using footsteps. By this the energy conservation and piezo sensor new method of power generation is proposed.

VIII. FUTURESCOPE

As in the future the demand will increase for power and conventional sources may reduce or may not exist only so there will be a necessary of non-conventional sources hence, we can implement in future as an alternate power generation system. Utilizing waste energy is very relevant and important in the future for populated countries.

In the future, we can apply this principle to speed breakers where vehicles rush too fast, increasing input torque and ultimate output. And also, this principle can be used at very busy stair place and dance floors, night clubs as the dancer's feet compress it, and piezoelectric materials make contact and generate electricity. Depending on the impact of the dancers, feet and produce efficient useful electrical power for large purpose.

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