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Hybrid Power Generation Utilizing Solar Panel and Piezoelectric Tangle

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Abstract - *This paper is all about generating electricity when people walk on the Floor. Think about the forces you exert which is wasted when a person walks. The idea is to convert the weight energy to electrical energy The Power Generating floor intends to translate the kinetic energy to the electrical power. Energy Crisis is the main issue of world these days. The motto of this research work is to face this crisis somehow. Here in this paper we have also added a solar panel with the footsteps power generation setup which will help us in meeting the needs of electricity in the future. So this hybrid system can be installed easily anywhere depending upon the need of electricity in that region. Using this idea we can generate power up to 1MegaWatt with proper designing and specifications of the floor and the panel. Which itself is an achievement to make it significant.*

Key Words: **electrical energy, energy crisis, kinetic energy, solar panel, hybrid system, power generating floor, weight energy**

1.INTRODUCTION

This manuscript describes about generating the electrical energy by using the weight energy, one can simply be shocked by knowing how much energy a person can have by simply walking on the floor with a normal speed as people's steps (thousands upon thousands a day) utilize and channel kinetic energy too.

Whenever a person walks, manages to lose energy towards the floor by means of influence, vibration, and audio and so on, a result of the move of excess weight to the floor. That energy may be used and converted into electrical energy. The actual electro-kinetic floor is really an approach to making electrical energy by using the kinetic energy of the person who walks on the floor.

This paper also includes power generation with solar panel which is added in the system making it a hybrid power generating system. The solar energy is a non-polluting and environmental friendly power source and can be installed almost anywhere. The system has dual power source making the system more efficient.

The energy produced by this hybrid system will be environment friendly without having smog. Producing this type of energy will be cost effective also. The power floor does not need any fuel or perhaps any sort of energy resource, simply making use of kinetic energy. Based upon your excess weight from a person moving on the floor.

2.INITIATIVE

Working on the idea to harness human locomotion power, MIT (USA) architecture students James Graham and Thaddeus Jusczyk recently unveiled what they are calling the 'Crowd Farm' a setup that would derive energy from pounding feet in crowded places. This technology is a proposal to harness human power as a source of sustainable energy. Population of India and mobility of its masses will turn into boon in generating electricity from its (population's) footsteps. Human locomotion in over crowded subway stations, railway stations, bus stands, airports, temples or rock concerts thus can be converted to electrical energy with the use of this promising technology.

A little modification to this idea was to introduce a solar panel in the system making it a dual power source. The purpose of dual power source is that if by any chance the piezoelectric mat does not work we will still be getting electrical energy from the solar panel and on non sunny days we will get power from the mat.

3.OPERATIONAL DESCRIPTION

Whenever force is applied on the piezoelectric mat that force is converted into electrical energy using the piezoelectric effect which is used to drive DC loads. The solar panel also converts the sunlight falling on the panel into electrical energy. The output from both the sources is DC. The amount of current produced from the combination of

these sources is stored in the lead acid battery. The battery is connected to the inverter.

A voltage booster can be added to boost up the voltage from the sources. The inverter is used to convert the DC power to AC power. This AC power is then used to activate various loads.

According to the requirement of the loads the power is converted. It can be used as DC as well as AC power. A microcontroller of PIC16 family is used to display the amount of voltage generated by the dual source on the lcd. The power generated in this way is eco friendly and not harming the environment. This system of power generation can be installed anywhere in public places.

4.PROPOSED SYSTEM HARDWARE

Elements of Block Diagram:

- Piezoelectric Mat
- Solar Panel
- Voltage Booster
- Battery
- DC loads
- Inverter
- AC loads
- PIC16F877A
- LCD Display

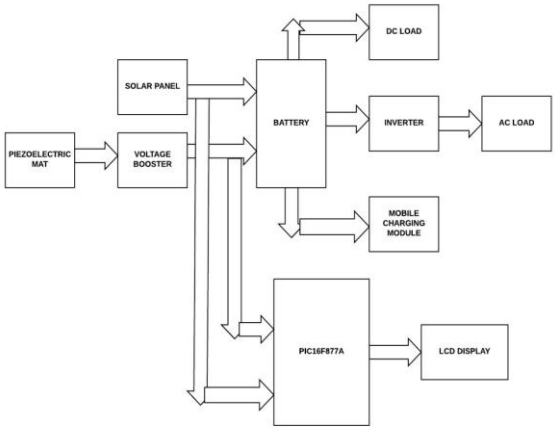

Fig -1: Block Diagram of Hybrid Power Generation Utilizing Solar Panel and Piezoelectric Tangle.

- Piezoelectric mat is a mat of piezoelectric crystals. In this project we have made use of 6 crystals. The number of crystals used can be increased according to the requirement. The total output we are getting is approximately up to 20 volts.
- Solar Panel is the additional power source we are adding over here to make the system hybrid and getting a dual power source. Here we use an 8 volts solar panel.
- Voltage Booster is a circuit used in the system to boost up the voltage we are generating from both the sources.
- Battery is used to store the power from the voltage booster for the loads we are going to connect to the system.
- Inverter is a circuit used to convert the DC power into AC power for the AC loads. So we can also connect AC loads to the systems.
- Loads can be connected to the system as per our requirement making the system flexible for use.
- PIC16F877A is the micro controller of family PIC16F which is a 40 pin IC. In this project it is interfaced with the lcd display. The function of the micro controller is to display number of volts generated by the piezoelectric mat and the solar panel on the lcd display.
- LCD Display is used for the display of value of voltage.

5.RESULTS

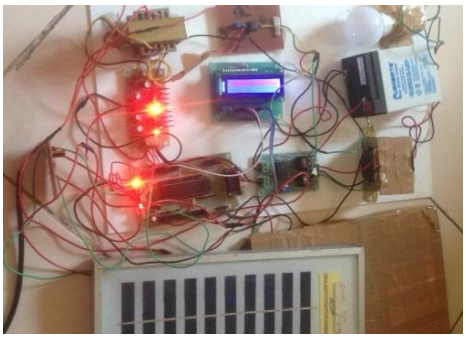

Fig -2: Circuit of Footsteps Power Generation with Solar Panel

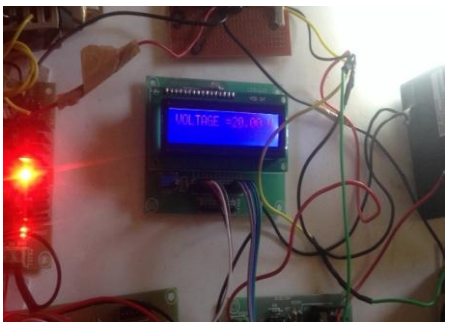

Fig – 3: LCD showing Output of the circuit

6. CONCLUSIONS

The project "Hybrid Power Generation Utilizing Solar Panel and Piezoelectric Tangle" to run AC and DC loads has been successfully tested and can be implemented which is the best economical, affordable solution to the energy crisis.

As India is a developing country where energy management is a big challenge for huge population. By using this project we can drive AC as well as DC loads according to the footsteps falling on the mat and intensity of sun.

ACKNOWLEDGEMENT

It gives us a great pleasure in presenting "Hybrid Power Generation Utilizing Solar Panel and Piezoelectric Tangle" as our B.E project.

Even the best efforts are waste, without the proper guidance and advice of our project guide Prof. Mrutyunjay Patted for the consistent guidance, co=operation, inspiration, practical approach and constructive criticism, which provided us the need impetus to work hard.

It is with great pleasure and efforts that we are able to complete this project. We have tried our best to complete it in all respects.

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