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Power Generation by Hybrid Model

Prof .P .Y. Kumbhar, Ankita Dhanashetti, Mubeen Chitgupkar, Meghanjali Bidave

Abstract: - As there is lack of conventional energy on the earth. One another way to generate power is by non-conventional energy. In this experiment power is generated by non-conventional energy sources like solar energy, wind energy and some another kind ofenergy that is usually get watsted by human being i.e from human energy. We are focusing mainly on pressure energy by human along with solar and wind energy. One can now experiment on other types of energy like vehicle pressure on road, train's pressure on railway track etc. In this experiment piezoelectric crystals are used for the purpose of generating power. One step ahead we can implement it on the road so that by pressure of car and other vehicle and solar energy we can generate power and use it in many applications like road lights, traffic lights etc. We can implement the same principle on the Railway track to generate power by pressure of wheel of Trains..

Keywords- Piezoelectric Sensor, Solar Panel, Wind turbine, 8051 Microcontroller, LCD, Embeded C ,

1. INTRODUCTION

The manuscript describes about generating the electrical energy by using the weight energy, solar energy, and wind energy. Here our main moto is to generate the maximum power by the human energy by means of pressure. One can simply shocks 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.

The power floor is not like traditional floor. The energy produced by this floor 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

In this project we are generating electrical power as non- conventional method by just walking or running on foot step. Non-conventional energy system is very essential at this time to our nation as there is lack of conventional energy.

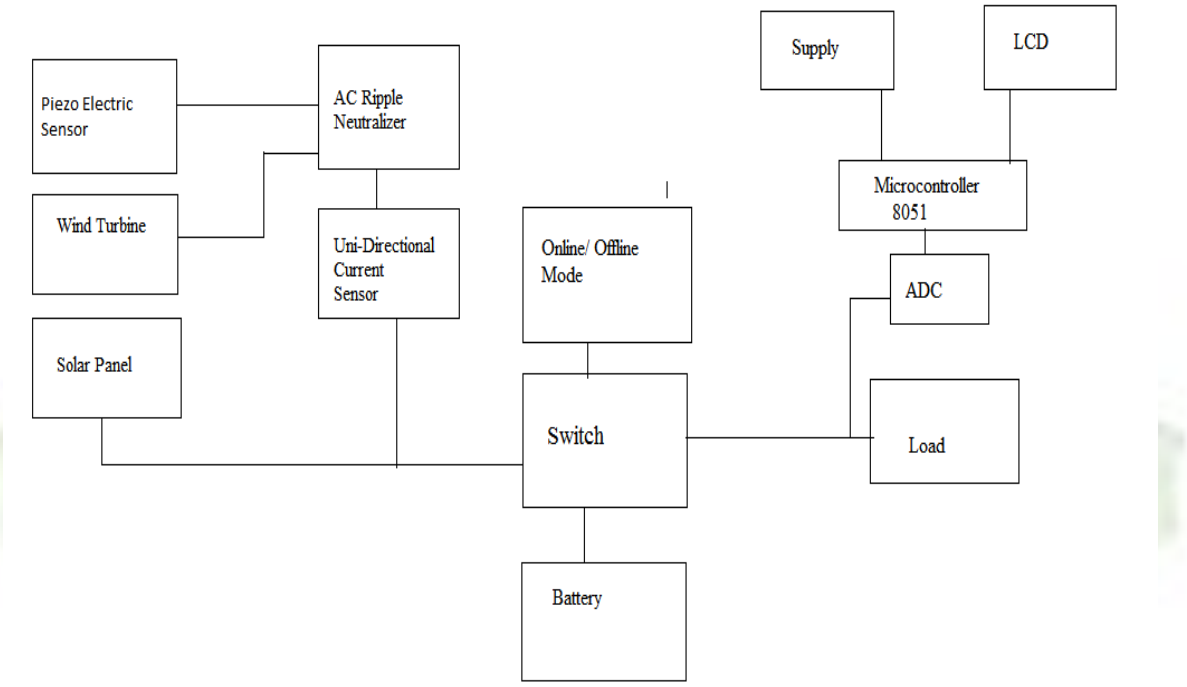
Non-conventional energy using foot step is converting mechanical energy into the electrical energy. Due to this a lot of energy resources have been exhausted and wasted. Proposal for utilization of waste energy of foot power with human locomotion is very much relevant and important for highly populated countries like India and China where the roads, railway stations, bus stands, temples, etc. are all over crowded and millions of people moved around the clock. The sensor that converts this mechanical energy of human into electrical energy is piezoelectric sensor. This sensor acts as asource for generation of power by pressure applied by the human.

As we are calling it as hybrid model that is why we are using other non-conventional energy sources as solar energy and wind energy. Solar panelsand wind turbines are using for this purpose. The energy we get from the all three sources and use combine to generated the power.

The control mechanism carries the piezoelectric sensor, solar panel, wind source, switch, AC ripple neutralizer, unidirectional current controller, rechargeable battery and an inverter is used to drive AC/DC loads.

2 DESCRIPTION OF PROJECT

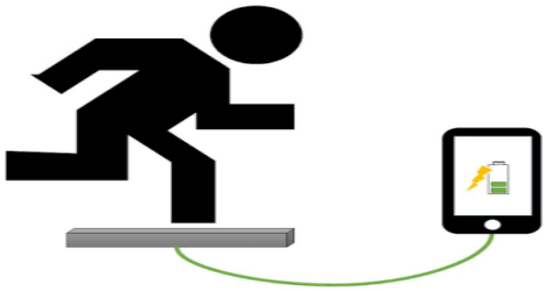
2.1 Block Diagram:



2.2 Piezoelectric Sensor:

A piezoelectric sensor is a device that uses the piezoelectric effect to measure pressure, acceleration, strain or force by converting them to an electrical signal. Piezoelectric sensors have proven to be versatile tools for the measurement of various processes. They are used for quality assurance, process control and for research and development in many different industries it was only in the 1950s that the piezoelectric effect started to be used for industrial sensing applications.

Since then, this measuring principle has been increasingly used and can be regarded as a mature technology with an outstanding inherent reliability. It has been successfully used in various applications, such as in medical, aerospace, nuclear instrumentation, and as a pressure sensor in the touch pads of mobile phones. In the automotive industry, piezoelectric elements are used to monitor combustion when developing internal combustion engines. The sensors are either directly mounted into additional holes into the cylinder head or the spark/glow plug is equipped with a built in miniature piezoelectric sensor.



2.3 Solar Panel

We are using the solar panels along with the piezoelectric sensors to generate more power. As we are making our project to use non-conventional energy sources therefore we adde solar energy to generate the power.

2.4 Wind Energy

As wind energy is non-conventional energy source therefore we are using wind turbine to generate the power from the wind energy so as to make this project Hybrid.

2.5 Microcontroller 8051

Here we are using microcontroller 8051 to display the output power from all three sources. First ADC converts the analog signal into digital form which is generated by the hybrid model. This digital signal is given to the controller. The controller 8051displays the power generated by the each source according to our program specified.

3. WORKING:

Whenever pressure put on the piezo it generates energy .Here we use 4*4 piezo tile, which generates enough energy to charge our battery.
The sources which we are using in our project:

1.Piezo tile
2. Solar panel
3.Wind source

When we run the project message will come on lcd is that select the mode .In this we have two modes

1. Online mode
2 .Offline mode

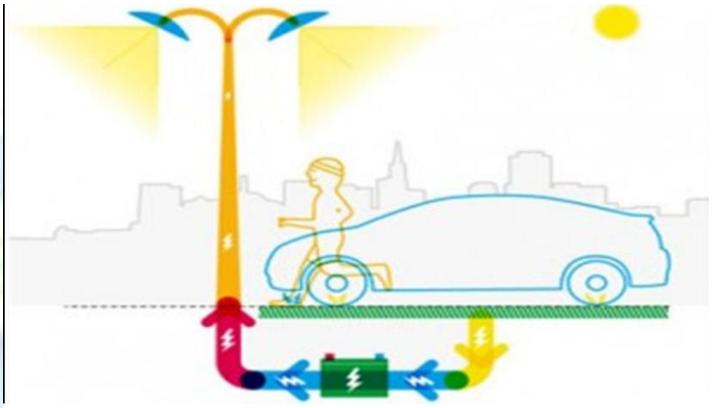
Online mode gives direct energy to the load which is generted by source .Offline mode in which we store the energy which generated by hybrid model in battery.We are using manual switch to select online /offline mode.
Also we are using 4 solar panels having rating of 6 volts and 2 watts, which generates 6v which charge our battery.We are using a dc motor of 6v in wind source having low torque so that it moveswith high speed and generates power .Ac rippleneutriliazer is simple capacitor which reduces any noise present in incoming energy.After that there is a unidirectional current controller as name indicates the circuit allow one direction current flowing.

Energy generated by each source is given to current sensors which is a simple divider circuit. The output from divider circuit is given to ADC.ADC is a analog to digital converter which converts analog signal into digital.This digital signal is given to microcontroller which display all the measurements.We are using LCD for displaying purpose.

4. APPLICATIONS

1 Generated power can be used for agriculture, home application, and street-lighting.
5. Foot step power generation can be used in emergency power failure situation.
6. Railway, Metros, Rural application etc.
7. In any crowded area like temple ,station etc
8. In disco, installed under the floor to generate light effects.
9. In shoes as small energy generator.
10. Also used with solar system as a backup power.

5. RESULT



As shown in the above fig. the street lamp gets glowed by supplying power from the hybrid model.

SR NO.	COMPONENT	Output Voltage
1	Piezo tile	12v
2	Solar panel	12v
3	Wind source	2v

6. CONCLUSION

The project 'Power Generation By Hybrid Model" is successfully tested and implemented which is the best economical affordable energy solution to common people.This can used for many applications in rural areas where power availability is less or totally absence as india is adelevoping country where energy management is a big challenge for huge population. By using this project we can have both AC as well as DC loads according to the force we apply on the piezoelectric sensor and energy generated by solar and wind sources.

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