Renewable Power Generation Using Piezo Sensor For Home Or Industrial Applications

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ABSTRACT:*Proposal for the 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 move around the clock.This whole human/bio-energy being wasted if can be made possible for utilization it will be great invention and crowd energy farms will be very useful energy sources in crowded countries.*

Keywords:*Arduino, Piezo-Sensor, Renewable Energy.*

I. INTRODUCTION

Man has needed and used energy at an increasing rate for his sustenance and wellbeing ever since he came on the earth a few million years ago. Primitive man required energy primarily in the form of food. He derived this by eating plants or animals, which he hunted. With the passage of time, man started to cultivate land for agriculture. He added a new dimension to the use of energy by domesticating and training animals to work for him. With further demand for energy, man began to use the wind for sailing ships and for driving windmills, and the force of falling water to turn water for sailing ships and for driving windmills, and the force of falling water to turn water wheels. Till this time, it would not be wrong to say that the sun was supplying all the energy needs of man either directly or indirectly and that man was using only renewable sources of energy.

This whole human/bio-energy being wasted if can be made possible for utilization it will be great invention and crowd energy farms will be very useful energy sources in crowded countries. Walking across a "Crowd Farm," floor, then, will be a fun for idle people who can improve their health by exercising in such farms with earning. The electrical energy generated at such farms will be useful for nearby applications.

II. LITERATURE SURVEY

From [1] and [2], the generation of electricity through the Piezo Sensor is used. The measurement of the amount of static current and voltage generated through the Piezo sensor by means of human walking is shown.

In [3], the concepts on the evolution of the Electrical Power Generating Systems (EPGS) is given.From [4], the concept of utilization of the renewable source of energy in the power generation like the wind mill and its functioning is implemented.

III. HARDWARE SETUP

The proposed system consists of a piezo sensor, Arduino and a load. The Arduino is a single-board microcontroller, intended to make the application of interactive objects or environments more accessible. The hardware consists of an opensourcehardware board designed around an 8-bit Atmel AVR microcontroller, or a 32-bitAtmel ARM. The piezo sensor can sense the vibrations and can generate the small electrical pulses that can be stored for many applications. The load can be either DC or AC which can be achieved using an inverter circuit. A Li-Ion Polymer battery is used for storing and charging purpose through the electrical pulses generated by the piezo sensor.
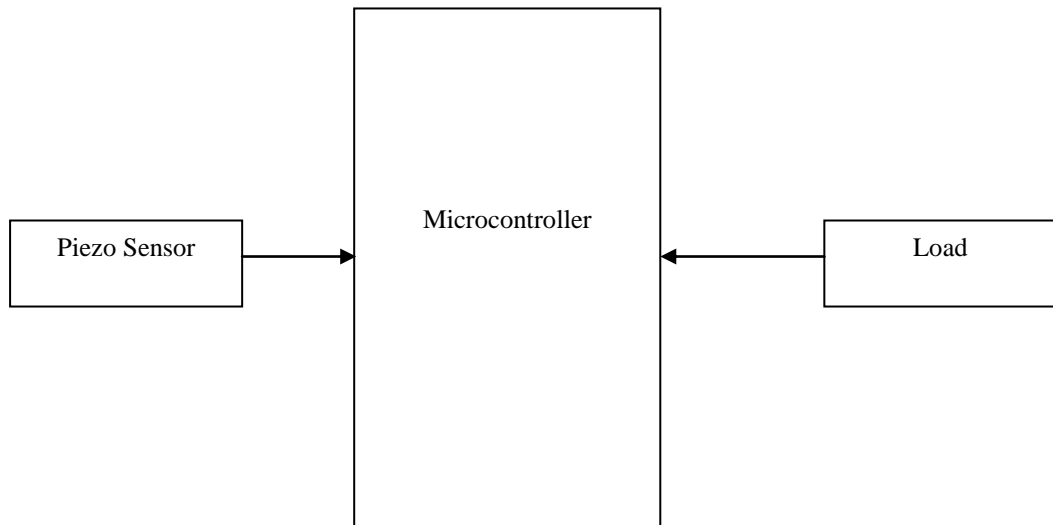
Fig.1: Block Diagram

IV. SOFTWARE SETUP

The Arduino has an operating voltage of 5V. It has 14 digital I/O pins and 6 analog pins. It has a flash memory of 32 KB of which 0.5KB is utilized by the bootloader. It has 2KB of SRAM and 1KB of EEPROM. Its maximum clock speed is 16MHZ. According to the flow diagram (Fig.2) as shown below, the piezo sensor is attached with some kind of mechanical arrangement for generating electrical pulses and this electrical pulses are then utilized for storing the charge in the Li-ion polymer battery. This stored charge can be then used in home appliances or in industrial appliances.

When the battery is in charged condition and the user switched ON any appliance the Arduino gets initialized and the signal is boosted using a voltage sampler. The Arduino can be also programmed to display the

Voltage on the LCD. This Arduino has the future of reprogramming that means if the present code is insufficient to the user's desired application, the code in the microcontroller can then be erased and stored with the desired new code.
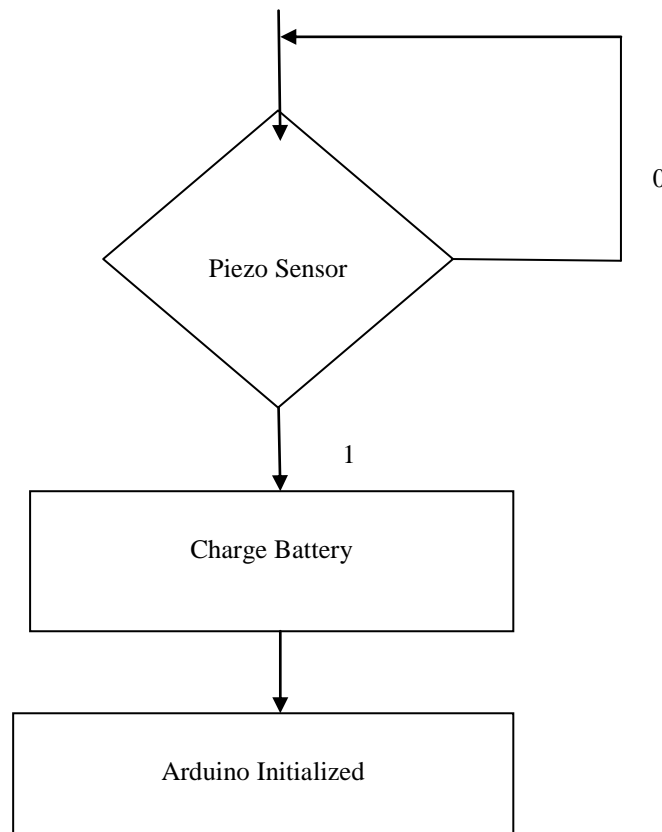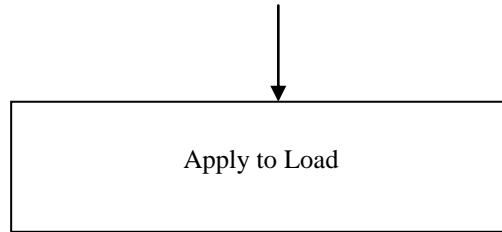
Fig.2: Flow diagram

V. CONCLUSION

This is a basic prototype for this system which can be implemented at home or any public place and the load can be applied for home or industrial application. Hence it provides eco friendly energy without polluting the environment. It also reduces wastage of energy as the energy from manpower is utilized.

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