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Advanced Footstep Power Generation System using Bluetooth and Android Application

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Abstract: ***In this paper, we have presented the design of Advanced Footstep Power Generation System (AFPGS) that uses piezo sensors to generate power from human footsteps and control the generated energy via phone. Day by day, the population of the country is increasing and the requirement of the power is also increasing. At the same time the wastage of energy is neglected in many ways The system allows for a platform for placing footsteps. The piezo sensors are mounted below the platform to generate voltage from footsteps. It displays the charge generated and display on phone which is connected via Bluetooth. The user can control the power generated by sending a voice command such as light on else phone off to control the charging process.***
Keywords: Advanced Footstep Power Generation System(AFPGS), Bluetooth, Mobile charging, Footstep, Phone, Voice Command.

I. INTRODUCTION

Advanced Footstep Power Generation System is used to generate electricity from by walking on foot step. This framework can be utilized with various strategies like use with weighting scale and so on.

To decrease the expense for power age and no need fuel input. This is a Non-ordinary framework Since the person came to earth of barely any millions back their needs and utilization of electrical vitality is becoming exceptionally quick for their continue and solace. With the extra requests of vitality, man started utilizing wind for boats thus drive windmills yet now these techniques are not totally the requests.

Man has utilized a gigantic measure of vitality for his day by day needs. Hence, a lot of vitality has been depleted and squandered. Stride power age framework is intended to be exceptionally valuable at open spots like railroad stations where parcel of individuals continue strolling as the day progressed.

In the stride power age framework, the floor sensors catch the electrical vitality delivered by the weight and convert it into an electrical accuse of the assistance of the piezo transducers which thusly is utilized as a force source. Along these lines the piezoelectric advances are utilized in ground surface. The force source hence produced has a huge measure of utilizations in home application, horticulture, road lighting and as a vitality hotspot for sensors in remote areas.

II. EXPERIMENTAL SETUP AND WORKING

The Figure 1 shows block diagram of the system. The system consists of a hardware connection and software application with Bluetooth. Initially user will connect and pair the device with footstep machine using Bluetooth to the system, if not paired it need to paired in the setting of smartphone and connect.

After that only user will have access to system.

After that system will send voltage value and footstep count according to the footstep pressure. Using voice Bluetooth module, we give signal to microcontroller board. Microcontroller will send signal to footstep machine and android app. where if footstep is pressed then it sends the charge to the microcontroller and store that charge to the battery in the form of voltage supply (V) from Bluetooth module sent to microcontroller and from microcontroller signal will be sent to android app, so that system will show details on android app to the user.

If a person walks on footstep machine, then the LED on the footstep glows and acknowledge the user that the voltage and footstep count is generated. It will measure the amount of voltage.

The charge gets stored in the battery and the user can utilize the charge through the USB port and charge his/her mobile, power bank etc. The user can then give the voice command on the app as home automation system and control the charge on the AFA (Advanced Footstep App).

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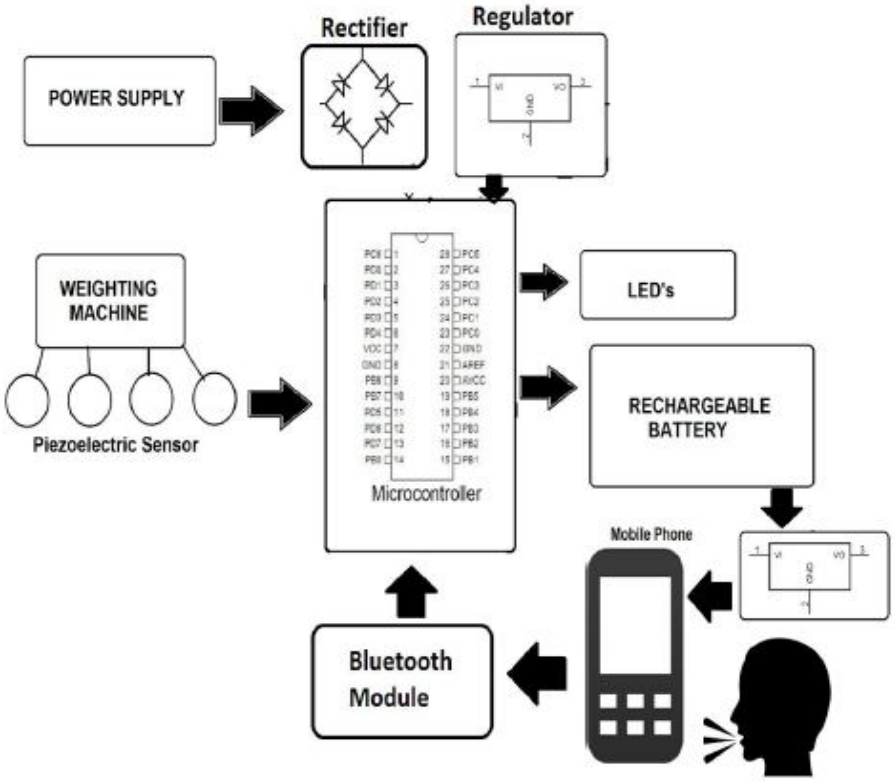


Fig 1: Block Diagram of AFPGS

As Figure 2 show the pressure port is connected with the base as well as crystal that hold the sensors and wire is connected to the output voltage and thus we charge a battery using power from user footsteps, display it on mobile using microcontroller circuit and allow for mobile charging through the setup he power of AC output will be used in running of load. The main objectives of this project are: To generate electricity through the human foot to provide electricity in rural areas to promote the non-conventional energy source to save conventional energy sources to store the electricity for further use to produce electricity at the cheapest cost.

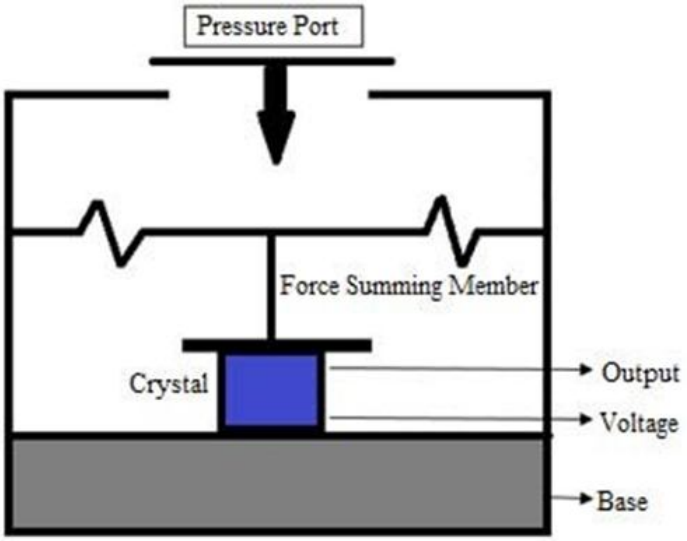


Fig 2: Piezo electric crystal sensor

The physical foot interface is laid on the arrangement of chain sprockets and the spring connected to the piezoelectric sensors. The sensors produce AC voltage that is converted to DC supply using DC generators; the DC outputs are stored in two batteries (six volts each) that are connected to an inverter that converts 12V to 220V AC.

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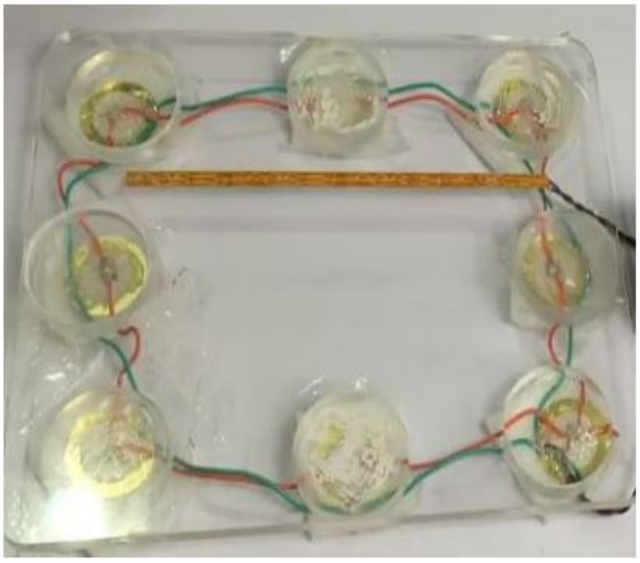


Fig 3: Footstep Plate with LED Strip

As Figure 3 shows. If a person walks on footstep machine, then the LED on the footstep glows and acknowledge the user that the voltage and footstep count is generated. It will measure the amount of voltage. The charge gets stored in the battery and the user can utilize the charge through the USB port and charge his/her mobile, power bank etc. The user can then give the voice command on the app as home automation system and control the charge on the AFA (Advanced Footstep App).

III.ADVANTAGES

A. Walking on footstep machine will generate power that can be stored on battery.
B. User can monitor power generation in voltage.
C. Main Advantage of this System is that user can give voice command and activate lights, charge on/off their devices etc.
D. Compact -- It is quite compact and can be placed anywhere.
E. Easy to use -- As mention before the controlling part is easy it can be operated from android phone just by clicking on particular instruction shown in GUI screen.
F. Ability to connect devices having Bluetooth version 4.0+.

IV. APPLICATIONS

A. This system can be easily used to charge our mobile phones.
B. This system can be used in the situation of emergency power failure.
C. While entering and exiting the mall our system can be used to generate power.
D. As thousands of people travel through train, so we can scatter piezo electric footplate all over the station generating a hefty amount of power.
E. While exiting the theatre hall, a large group of people walk together so we can generate enough power lit up the passage of the multiplex.

V. CONCLUSION

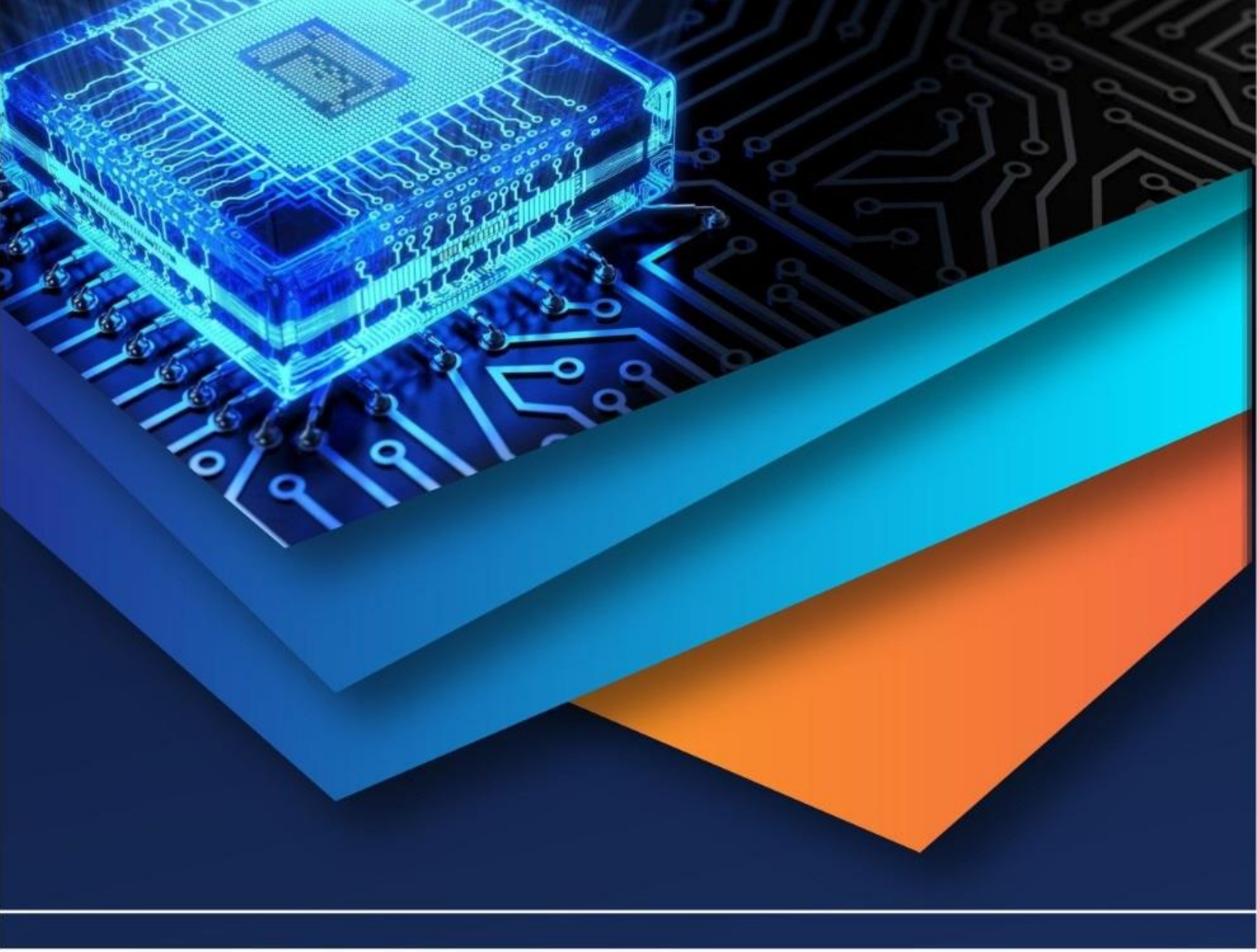
In this paper we've calculated the diverse methodologies for foot step generation using piezoelectric sensors. The Experimental setup is discussed with all sub equipment's. The outcomes had been discussed in terms of output voltages. The plot between current and voltage indicates the volume of power generated. The diverse deserves are energy generation is virtually taking walks on the step and no want of fuel, electricity will also be generated via going for walks or workout on the step and battery can also be used to save the traditional power. In future works one may additionally try to overcome following limiting elements as it's far simplest applicable for the particular location and limited energy is generated the usage of the traditional ICs present in market. In future we may additionally put into effect the equal method in treadmills, staircases and places with frequent human second with their industrial utilization version.

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