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ENERGY PRODUCING SHOES

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***Abstract*—** This project is to design a charger that able to implement into shoe in order to generate electricity to charge gadget during walking. For this project I was mainly focus on design a shoes charger for cell phone. This project will use a DC motor for generate electricity for charging cell phone during walking. This motor will act as a generator or power source of this smart shoe's charger. The purpose of developing this project is to solve the problems of time consume for waiting cell phone fully charge. Besides this project design also can convert our wasted energy during walking into a usable electrical energy. From the result the generator will produce about 2-4 V DC voltage from the walking action. Due to this output voltage is no achieve the desired voltage of charging. So, a DC/DC boost converter circuit will be design to increase the output voltage to the desired charging level.When a person walks, pressure is exerted on the ground and this pressure can be converted into electrical energy and it can be used to power electronic devices. In this project a Mobile charging system is designed.

***Keywords*—** Piezoplates,Capacitor

I. INTRODUCTION

In the recent years there has been an increasing interest in research and development of advanced smart phone technology. But as technology evolves so are the problems associated with it, and one among those is the fast draining of battery. Almost every smartphone user wishes he had more battery life. Now, imagine your phone getting charged where ever you go. This is possible by Piezo electric wireless power transfer mobile charging technique. The keys to this technique are the piezoelectricity .

Everyday people are always rushing in doing jobs or works. Therefore, they will have less time to spend on waiting to charge their gadget. So most of people desire have a movable charger that can charge the electronic device even we carry the gadget device around doing job. Besides, people also can charge their gadget (cell phone) for make an emergency call even cell phone is out of power.

II. MATERIAL AND METHOD

The basic principle used in this research is harvesting of energy from the piezoelectric material (disk) into electrical energy through walking. The vibrations or pressure that comes from walking, produce mechanical energy which is exerted onto the piezoelectric disk. The piezoelectric then will transform that mechanical energy into electrical energy or power. Basically, the output electrical power produced from that piezoelectric disk is in AC voltage form. Then, the output from the piezoelectric was rectified using bridge rectifier to change it into a DC (direct current) voltage so that it can be used for electrical appliances. The energy produced by the piezoelectric disk is directly proportional to the input mechanical energy. The more pressure (weight) or force exerted onto the disk at one time, the higher the output. However, too much pressure will break the piezoelectric disk.

To convert the mechanical energy to electrical, a basic circuit must be built with a built-in rectifier to convert AC current to DC current. From the design above, the switch and LED was removed. Capacitor was used because energy produced from the piezoelectric material is quite instantaneous which makes it difficult to read. However, after much observation, capacitor also does not help much because the charge stored, will also quickly discharge. In addition, the circuit design also includes a basic

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bridge rectifier to convert the AC voltage to DC voltage. Finally, from the circuit diagram, a small prototype was developed . The piezoelectric element was made replaceable because there will be multiple size of disks to be considered so that the optimum output was obtained.

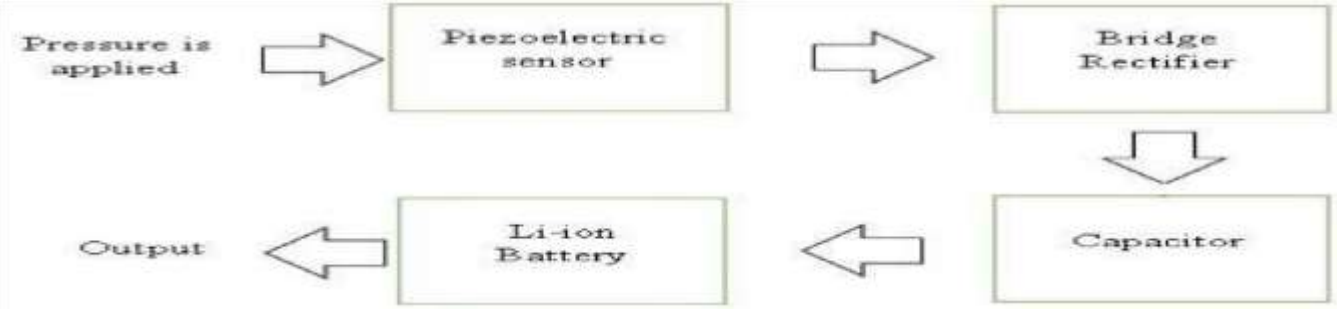

Figure 1: Block Diagram

In the above mentioned algorithm it is shown that ,when the pressure is applied to the piezo plates .The piezoelectric sensor sense the piezoplates due to pressure generated and then the energy is transferred to the bridge rectifier .The energy from bridge rectifier is then transferred to capacitor .To store the electrical energy capacitor is used. The energy stored in capacitor will store small amount of energy, so to increase the amount of stored energy we have used Li-ion battery and then the further output will be given by li-on battery.

2.2Internal architecture

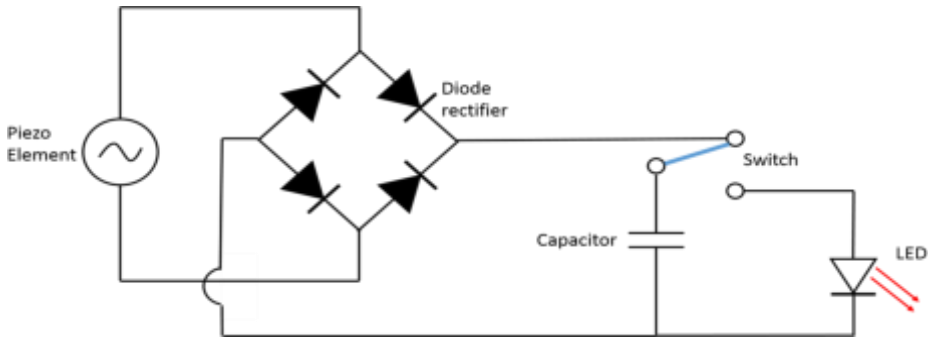

Figure 2: Internal Architecture

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III. CONCLUSION

In particular, piezo ceramic materials are especially interesting due to their low cost, flexibility and easy integration into elements such as clothes and shoes. Through the simple configuration and electronics, energy harvesting is possible. In order to get energy values suitable for the functioning of electronic appliances, improvements in the material in order to optimize the energy transfer and precise determination of the geometry and number of the piezo electric generators should be performed.Depending on the pressure the load of the human body the voltage will be produced during walking. The produced voltage has both positive wave and negative wave. The bridge rectifier provided to remove negative wave. The rectified voltage sends to the voltage regulator and then it will store in battery.

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