MOVE MOTION CHARGER

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***Abstract*— In today's frenetic lifestyle, sedentary work for long hours in the same position has seriously hampered our health. The proposed project presents an idea of a wearable piezoelectric device based on the motion pressure generated through walking, that can be an alternate and efficient means for powering mobile phone batteries, and/or various other devices which require a low or medium effort to be functional[1]. As the mechanism of the device is based on mechanical energy produce through walking; the device tends to promote healthy human metabolism, active lifestyle and physical fitness. Therefore, it can be viewed as an e-health gadget that encourages walking exercise as a means to charge mobile phone batteries. Walking is the best and one of the most common activities in day to day life of a human being. As per the study of biomechanics, we came to apprehend that ground reaction force (GRF) exerted from the foot when converted into voltage can give enough power supply to run a low or medium voltage difference requiring device, such as a mobile phone[2]. While walking,**

jogging or running, a person exerts some energy from foot in the form of vibrations which are sensed and converted by this device into electric form. Piezoelectric crystal does the task of generating output as electrical energy out of the mechanical energy exerted through foot moment and captured through the device[3].

Piezoelectric materials have the capability of intercepting mechanical energy from surroundings, especially vibrations and transform it into electric energy that can be used as the power supply in real-time or other appliances like mobile phones, power banks, various small handy biomedical instruments etc. Key Words: piezoelectric, mobile phone charging, Energy conversion.

INTRODUCTION

In today's world, people's health is being blatantly neglected due to busy lifestyles. People are falling prey to many health and coronary problems as a result of their poor work-life balance and sedentary lifestyles. Researchers have shown that walking is one of the most important and health-enhancing exercises. Development of technology may have various benefits, yet it has made us lazier and physically unfit than ever too[4]. Here through this project, we propose a mobile phone charging device based on mechanical energy produced through the simple task of walking, that promotes physical exercise done by the user and also provides for an alternate source of energy, which can be stored and later can be used in various devices. Out of all the devices and gadgets, mobile phones have now become the most

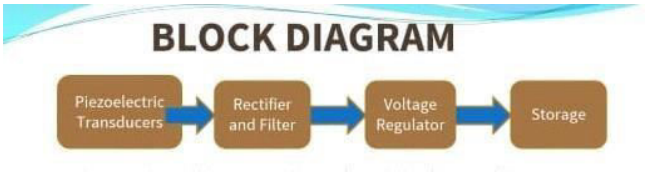
integral part of one's life[5]. Charging a mobile phone is a time-consuming process. It requires a user's time and constraints in charging mobile phones. The increase in energy consumption in mobile phones is an alarming rate. A predicament emerges when such an immense use of mobile phones is not completely sustained by their fast discharging batteries. Charging a mobile phone, although a trivial seeming activity does require a user's attention, it has other requirements too such as, an appropriate socket and electrical connectivity. Especially for tourists, mountaineers and villages, charging mobile phones proves to be a daunting task, unfortunately. These difficulties are encountered in charging the mobile phone from time to time.

EXPERIMENT AND RESULTS

The basic principle involved is the conversion of mechanical power through the thrust produced by walking into electrical signals and storing them. Now, in terms of vibrations, this mechanical energy is supplied to the piezoelectric disc that converts these vibrations into useful and storable electric power. The transducer produced output is then rectified and regulated to produce a sustainable value which is also sufficient enough to charge a mobile phone battery. Thus the input energy is solely a mechanical one that originates from the user's motion and gets transformed into the required signals via the proposed piezoelectric harvesting system. The charging time of the mobile phone depends on various factors, such as the frequency and amplitude of vibration provided to the transducer[6]. So, if the speed of the user's motion is increased the output of the device can be enhanced. For measuring this output we have developed an Android application which can give information about the input of solar and piezoelectric transducer and the output of the battery.

Model Overview

The circuit of the device mainly consists of a piezoelectric harvesting system, Solar cell, regulating IC. A capacitor (1000 uF) is used to store the electric charge so that when the person is not in motion the power is continually supplied. The piezoelectric disc is furnished in the interface separating the base and upper part of the sole. The entire circuit is fabricated on a small chip and is outfitted at the rear part of the shoe. Several connectors for charging mobile phone batteries can be taken out from the shoe. A switch is also present in the circuit for the user to determine whether he wants to direct the energy into his mobile phone.



CONCLUSION

When the piezoelectric discs are connected in parallel instead of series for yielding better results[7], we obtain more current instead of a voltage difference, which is desirable for charging the battery. Thus in all, we conclude that with this process, we can extricate and store the energy from the human motion, transform it into electric energy and utilize it in real-time applications such as charging the devices.

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