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Smart Power Generation Using Footsteps with Automatic Day Light Control System

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Abstract: Due to our busy lifestyles, our fitness is an adventurous one now a day. We have designed a device with the use of piezoelectric quartz that furnishes as an alternate ability for powering mobile devices. Additionally, it can also be intended for lights solutions like flashlights and emergency torch. One extra characteristic which has been incorporated in this is a battery which is used to shop the charge when the smartphone is one hundred percentage charged or there is no need for emergency lighting.

KEYWORDS: Piezoelectric quartz, smart phone, LED, Battery

I. INTRODUCTION

In the era of modern world, witnessing a rapid increase in strength costs and an exponential reduce in the resources such as fossil fuels, there arises a want to improve strategies for sensible use of power which lay emphasis on protecting the environment as well. One of the new methods to accomplish this is through energy harvesting. It is just a system that captures energy in small amount that would be lost otherwise. Modern technology needs a huge amount of electrical power for its various operations like communication [1]. The purpose of this project is to build a device that can generate energy which was used to get lost. This device is extraordinarily simple however fairly useful. This gadget when utilized on massive scale can generate very high quantity of energy which then can be used for upliftment of the civilization. But the techniques involved are highly expensive, space accommodating and dangerous to environment. For implementation of these techniques large space is needed, so that deforestation and rehabilitation of settlements is to be done, which in turn influences entire ecosystem.

II. RELATED WORKS

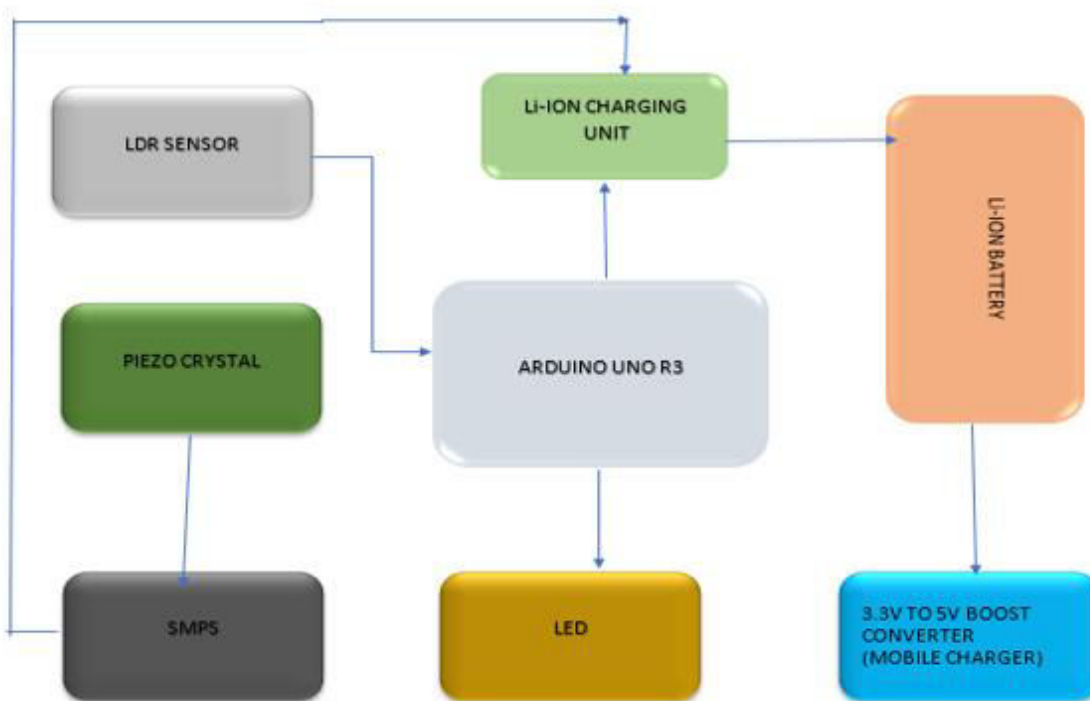
2.1 Energy Harvesting the usage of Piezoelectric Materials

Parul Dhingra from dept. Of ECE of M. I T Manipal explained It is evident that harnessing power through piezoelectric materials company a cleaner way of powering lights systems and specific equipment. It is a new approach to lead the world into enforcing greener utilized sciences that are aimed at protecting the environment. Piezoelectricity [6] energy harvesting structures are one time installment and they require very less maintenance, reliable communication [2] making them rate efficient. One of the limitations of this science is that its implementation is no longer feasible in sparse populated areas as the foot site visitors is very low in such areas. Further experimentation has to be carried out for its implementation on a giant scale, with a surroundings friendly interface circuit at a low rate in universities.

2.2 Power Harvesting System in Mobile Phones and Laptops the use of Piezoelectric Charge Generation:

Karthik Kalyanaraman has proposed electricity communications system [3] for mobile phones and laptop keyboards have been introduced in this paper. The format introduced right here will be notably positive in offering an alternate capability of electricity furnish for the noted devices at some stage in emergency. Further, the method in this paper can be extended to many other applications the area there is scope for similar type of electrical energy conservation. The piezoelectricity [7] generation device used for the latest application is a PZT. The extent of the material used is 0.2cm^3 , the output electricity produced is 1.2W The energy/power density is $6\text{mW}/\text{cm}^3$. The output voltage is 9V . This voltage can be used to produce the required extent of value after being processed.

III. PROPOSED ALGORITHM



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Block Diagram of the proposed system

Piezoelectric quartz crystal is placed in the sole of the shoe, as it is considered as the maximum power point. The piezoelectric is connected to the Arduino to know how much power is generated by the piezoelectric [11] generators. The power generated by piezo crystal is stored in battery. To know the feedback of the battery, it is also connected to Arduino. The piezo crystal is connected to Li-ion charging circuit to boost the power generated by it. The Li-ion charging circuit is connected to the battery where the generated power is stored. To charge mobile from the battery, USB port is connected. A switch control is given between battery and USB port, to avoid wastage of energy. The power in the battery is also used to glow LED. The LED can glow only if there is power in the battery. LED will automatically turn on when the surrounding is dark. For that, LDR sensor is used, so that it can sense whether the surrounding is dark or light. A WiFi is used to upload all this information to the cloud. By that, we can see the status of the battery in our mobile. Once the electrical energy is generated, it can be used to power mobile phones and if the surrounding is dark, the emergency light or torch will automatically turn on. The excess power after the mobile is charged and when there is no need for light, the remaining energy will be stored in the battery.

IV. CONCLUSION AND FUTURE SCOPE

Future scope of our project is perfect. It can be utilized in any place where there is mechanical stress. Also, this system can be employed under a walkway, so whenever human beings walk on the way, it will lead to the generation of power. This piezoelectric gadget can be employed beneath the railway tracks so as when a train passes over it, it will lead to the generation of electric power. The power generated with the aid of this device will be very large as the pressure applied with the aid of the trains would be very high. This gadget can be applied below the roads so when the vehicles pass over the road, it will lead to the technology of electrical power. This power can be then used to strength streetlight. The plan of the proposed energy conservation system for smart phones and laptop keyboards has been in this paper. The plan right here will be pretty high quality in presenting an alternate capability of energy furnish for the stated gadgets throughout emergency further, the method introduced in this paper can be extended to many other applications where there is scope for similar sort of energy conservation.



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