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## Electrical Power Generation from Foot Step and Storage

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### ABSTRACT:

Man has needed and used energy at an increasing rate for the sustenance and wellbeing since time immemorial. Due to this a lot of energy resources have been exhausted and wasted. 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 where the railway station, temples etc., are overcrowded all round the clock. In this paper the force energy is produced by human footsteps and the force energy is converted into mechanical energy by rack and pinion mechanism, electricity is produced by dc generator. And this power source has many applications as in agriculture, home application and street lighting and as energy source for sensors in remote locations.

This paper is all about generating electricity when people walk on the Floor. Think about the forces you exert which is wasted when a person walks by. The idea is to convert the weight energy to electrical energy..The Power generating floor intends to translate the kinetic energy to the electrical power. Energy Crisis is the main issue of world these days. The motto of this research work is to face this crisis somehow. Though it won't meet the requirement of electricity but as a matter of fact if we are able to design a power generating floor that can produce 100W on just 12 steps, then for 120 steps we can produce 1000 Watt and if we install such type of 100 floors with this system then it can produce 1MegaWatt. Which itself is an achievement to make it significant.

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### 1. Introduction

For an alternate method to generate electricity there are number of methods by which electricity can be produced, out if such methods footstep energy generation can be an effective method to generate electricity.Walking is the most common activity in human life. When a person walks, he loses energy to the road surface in the form of impact, vibration, soundetc. Due to the transfer of his weight on to the road surface, through foot falls on the ground during every step. This energy can be tapped and converted in the usable form such as in electrical form. This device, if embedded in the footpath, can convert foot impact energy into electrical form.

Human-powered transport has been in existence since time immemorial in the form of walking, running and swimming. However modern technology has led to machines to enhance the use of human-power in more efficient manner. In this context, pedal power is an excellent source of energy and has been in use since the nineteenth century making use of the most powerful muscles in the body. Ninety-five percent of the exertion put into pedal power is converted into energy. However, human kinetic energy can be useful in a number of ways but it can also be used to generate electricity based on different approaches and many organizations are already implementing human powered technologies to generate electricity to power small electronic appliances.

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### 2. LITERATURE REVIEW

For generation of power is finished by utilizing piezo plate. When a power is connected on the piezo plate the state of the piezo plate changes which prompts the generation of voltage. Piezo electric impact is depicted as a straight electromechanical collaboration between the mechanical and the electrical state in crystalline materials with no reversal symmetry. This voltage is then given to unidirectional diode. A unidirectional diode is a gadget utilized for permitting the voltage to travel just in one bearing. It is most usually found in electronic circuits where it serves as associations between two or more components. It is found in the modern control level for such atomic force plants, and electric force era. The boost DC-DC converter is the propensity of an inductor to oppose changes in current by making and devastating an attractive field, the yield voltage is constantly higher than the

input voltage. The idea is that when the switch is closed, current moves through the inductor in clockwise generating so as to bear and the inductor stores some vitality a magnetic field. Polarity of the left half of the inductor is positive. Electrochemical pseudo-capacitors use metal oxide or leading polymer anodes with a high measure of electrochemical pseudo capacitance. Hybrid capacitors, for example, the lithium-particle capacitor, use cathodes with contrasting qualities: one displaying for the most part electrostatic capacitance and the other generally electrochemical capacitance. This boosted voltage is then gone through the SUPER CAPACITOR the capacitor here is utilized as a part of request to low the losing because of transportation of charge the voltage then coming after the capacitor is given to the battery to charge. This technique for generation of power is very easy. It can be utilized as a part of rural zones additionally where accessibility of power is less or exceptionally low. It can be utilized to drive both AC and in addition DC load. In developing nation like India we can utilize this strategy for power generation with a specific end goal to uncover the heaps from Renewable and non-Renewable wellspring of energy..

### 3. OBJECTIVES

The objective is to convert foot step, walking and running energy into electrical energy by using transducer and use it in an electronic device that requires low power. Utilize the power for helping up the road lights, additionally for activity reason, sign boards of streets and another public places.

#### A. Materials

The following materials were used in our project.

The main blocks of this project are:

1. Reciprocating mechanism
2. Generator
3. Charging Circuit
4. Battery
5. Led

#### 1. Reciprocating mechanism:

Reciprocating motion, also called reciprocation, is a repetitive up-and-down or back-and-forth linear motion. It is found in a wide range of mechanisms, including reciprocating engines and pumps. The two opposite motions that comprise a single reciprocation cycle are called strokes. A crank can be used to convert circular motion into reciprocating motion, or conversely turn reciprocating motion into circular motion. For example, inside an internal combustion engine (a type of reciprocating engine), the expansion of burning fuel in the cylinders periodically pushes the piston down, which through the connecting rod, turns the crankshaft. The continuing rotation of the crankshaft drives the piston back up, ready for the next cycle. The piston moves in a reciprocating motion, which is converted into circular motion of the crankshaft, which ultimately propels the vehicle or does other useful work. The vibrations felt when the engine is running are a side effect of the reciprocating motion of the pistons as the crank and connecting-rod usually are not enclosed.

#### Generator :

An electrical generator is a machine which converts mechanical energy (or power) into electrical energy (or power). Induced e.m.f is produced in it according to Faraday's law of electromagnetic induction. This e.m.f causes a current to flow if the conductor circuit is closed. Hence, two basic essential parts of an electrical generator are:

- a) Magnetic field.
- b) Conductor or conductors which can move as to cut the flux.

#### Rechargeable battery:

A rechargeable battery, storage battery, or accumulator is a type of electrical battery. It comprises one or more electrochemical cells, and is a type of energy accumulator. It is known as a secondary cell because its electrochemical reactions are electrically reversible. Rechargeable batteries come in many different shapes and sizes, ranging from button cells to megawatt systems connected to stabilize an electrical distribution network. Several different combinations of chemicals are commonly used, including: lead-acid, nickel cadmium (NiCd), nickel metal hydride (NiMH), lithium ion (Li-

ion), and lithium ion polymer (Li-ion polymer).

#### **Charging Circuit:**

From the above circuit diagram, we can see that the 18v AC is being converted to 18V pulsating DC which is in turn converted to smooth DC with the help of the Capacitor. This 18V Smooth DC is converted to 12V DC by the Voltage Regulator 7812. At the output of the regulator, we get some spikes which are not desirable. These spikes are removed with the help of another capacitor used. We can get 12V Steady DC at the output terminal which can be indicated if the LED glows.

#### **LED**

High power LED's from Philips Lumileds Lighting Company mounted on a 21 mm star shaped base metal core PCB. High power LED's (HPLED) can be driven at currents from hundreds of mA to more than an ampere, compared with the tens of mA for other LED's. They produce up to over a thousand lumens. Since overheating is destructive, the HPLEDs must be mounted on a heat sink to allow for heat dissipation. If the heat from a HPLED is not removed, the device will burn out in seconds. A single HPLED can often replace an incandescent bulb in a flashlight, or be set in an array to form a powerful LED lamp.

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## **4. RESULT**

The project "Foot step power generation system" was designed such that to generate electrical power as non- conventional method by simply applying force on the Foot step. Non-conventional energy using Foot step is converting mechanical energy into the electrical energy using reciprocating mechanism.

For this project the conversion of the force energy in to electrical energy. The control mechanism carries Rack and pinion. D.C generator, battery, simple reciprocating mechanism control. We have discussed the various applications and further extension also. The D.C generator used in this project is Permanent Magnet D.C generator. This DC geared motor such that its output is given to the reverse polarity preventer cum polarity corrector.

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## **5.CONCLUSION**

Integrating features of all the hardware components used have been developed in it. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Secondly, using highly advanced IC's with the help of growing technology, the project has been successfully implemented. Thus the project has been successfully fabricated and tested.

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## **REFERENCES**

The sites which were used while doing this project:

1 www.wikipedia.com

2. www.howstuffworks.com