

141. Foot Step Power Generation System

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Abstract

This paper is all about the generation of electrical energy through non conventional way when people walks on Floor there some forces exerts these forces usually wastes during the walking. So my idea is to convert mechanical energy of footsteps that is exerted by person during walking into electrical energy by using transducers that is known as “Foot step power Generation System”.

The power generating floor is used to interpret the kinetic energy into electrical power now a days demand of electrical energy is increasing and Energy crises became the root issue in all over the world and conventional sources are not enough for total demand of electrical energy.

The principle goal of this research work is to face these energy disasters, despite the fact that it won't meet the requirements but at least to vary and reduce the dependency on conventional electricity generation. as matter of fact weather we are able to design a power generating floor that may produce 1000 watt on just 12 steps then for 120 steps it may produce 1000watt or 1 unit and weather we install such type of 100 floors such a system can produce 1Mega Watt of power.

It can be implemented on substations and on several public places that can make difference in electrical power generation of country can make huge difference.

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1. Introduction

In this paper the generation of electrical energy is described by using the weight energy. Person can amaze simply knowing that how much energy a person has by simply walking on the floor with normal speed. So the people usually have thousands steps in a day. While people walks they lose huge amount of energy that their weight energy of foot may be used and converted into electrical energy. The actual electro-kinetic floor is really an approach to make electrical energy by using kinetic energy of person who walks on the floor. The energy that is usually produced by the floor which can make the environment sound without any pollution such kind of energy will cost effective indeed the power floor does not need any fuel or any type of energy source only by using the kinetic energy which based on the person weight who moves on the floor. Regarding this modern world now a days energy and power are the basic key factors as the energy demand is increasing day by day so ultimate solutions of renewable energy are implemented. In case of our project we have used a technique of Generating power through foot step which is the source of renewable energy that is obtained by walking on footpaths, stairs, platforms and such a system is installed mainly in populated areas.

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The basic principle of 'Foot step power generation' is based on piezoelectric sensor in order to employ this system we will adjust wooden plates above and below the piezoelectric sensor and moving springs when person will walk on that mat the force will be applied in the result magnet will be fixed under the top wooden sheet and moves into the cavity. While this cavity is fixed at the bottom wooden sheet of mat. As completing the above procedure, we made ourselves to be able to design a compatible system by the help of which we could run the load, Home appliances by AC output voltage. And our task is to charge battery with the help of DC output and then using inverter to convert DC into AC for normal usage.

Finally, conclusion is such type of design and techniques of Generating power are very useful to compare the supply and demand of energy globally.

2. Background

Many researchers have worked on the conversion of dynamic energy into electrical energy by human locomotion Jeff krupenkin and Ashley Taylor proposed a new technique which is called reverse electro wetting in which the motion of liquid on dielectric material coated. The conductive substrate will cause to create electrical energy [8], if there is any vibration on above platform due to human locomotion that will be cause to produce electrical energy. One of the scientists of Hull University worked on transferring the motion of man into electrical energy. so many experiments had performed by this person in Japan also to harnesses the energy from footsteps.

They had installed flooring tiles on Tokyo in Japan at different bus stations. He observed that at the average weight of 60 kg 0.1 watt of power was generating in single second. On other hand with different mechanism for generation of electricity from foot step power generation process is given by Tom Jose V [7]. He had used rick and pinion gear system attached dynamo with its gear mechanisms shown in Fig.

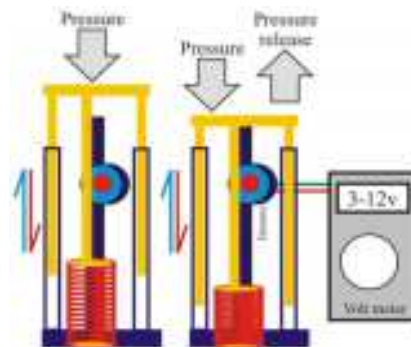


Fig.1 Generation by applying pressure © google

In above Fig. gear is connected with fly wheel that will turn and rotate the dynamo. The power which is produced that can be stored in batteries in this manner we can be able to monitor and control the generated power above Fig. 1 clearly explains.

When pressure force is applied it pushes the tile on the surface of ground that rotate the shaft approximately up to twice by single tile push. The movement of shaft turn the gear box which build up it 15 times (1:15) then its movement will be smooth by the help of fly wheel which temporary store the movement that is convey with DC generator that generate 12volt ,40A at 100 rpm.

The generated energy will be stored in the batteries then using the inverters it can be utilized.

3. Literature Survey

3.1. Purpose

There are some methods to generate electrical energy from the footsteps. Such as Gear wheel and fly wheel are methods to generate electrical power. This method works on the principle and in it mechanical parts are used because this is placed where there are so many people and the energy is produced by their

movements on the floor.

Generation of power is done by footsteps from the crowd on floor and piezo plate scheme is used below the floor, then there will be sheet which cover the piezoplate and also spring will be there for vibrating force on piezo sensor.

The piezo plate will be struck in the floor such a plates will generate power in the form of electric current. The power which is produced by footsteps can be used as additional features like street light or light which is used at the place of pedestrian's .so the pedestrians should give credit the energy which is produced by their movement.

3.2. Literature Analysis

To generate electrical power by using footsteps. The footsteps are more than enough to produce electrical energy. Following are the few method of generating power like the steps of fly and gear wheel method and piezo plate is also used in these steps.

- To arrange the electrical components and equipment properly to convert the mechanical energy into electrical energy
- After arranging the electrical system in proper manner that will transfer mechanical energy into electrical energy
- Then spring is attached to piezo with the help of Sheet in this manner spring arrangement is done, spring is used to vibrate the piezo by force then power will be generated
- After that voltage which is produced through the steps can be rectified and after betry charger circuit the DC voltage will be stored in the 12-volt battery of lead acid
- Further this battery will be attached with inverter. Designing of inverter is such a way which convert the betry voltage that is 12volt DC into 220 AC
- Finally, the AC voltage can be used in many appliances like charging the laptop battery as well as to charge the handset; it may also have used to lightening up energy saver.
- If we need more power in this method then use more steps for more energy also the ability of battery and inverter should be increase, then output will be increased

3.2.1. Aspects

The main features of power generation through foot step by piezo electric are that the power generated by transform ring mechanical energy into electrical by movement of people on the floor where piezo plate is placed. Piezo electric power system is safe and secures to use it is totally risk free method this system will not produce any problem and discomfort for people.

Foot step power generation through piezoelectric process have electrical and mechanical parts but it hasn't so many losses. This system has low cost if the system is damaged so no issue the cost of equipment is very low. This system has also ability to store the electrical power in the batteries. Foot step power generation system is cheap reliable and efficient method.

3.2.2. Upcomming Extent

Now world is stirring to the renewable resources due to worldwide heating so this project foot step power generation through piezo electric has vast extent. Other renewable sources are also used such like sterling plant, biogas, wind turbine etc. But if we compare them with foot step power generation through piezo electric sensor so this will be inexpensive, useful, efficient and reliable as compare to other renewable resources.

3.3. Block Diagram

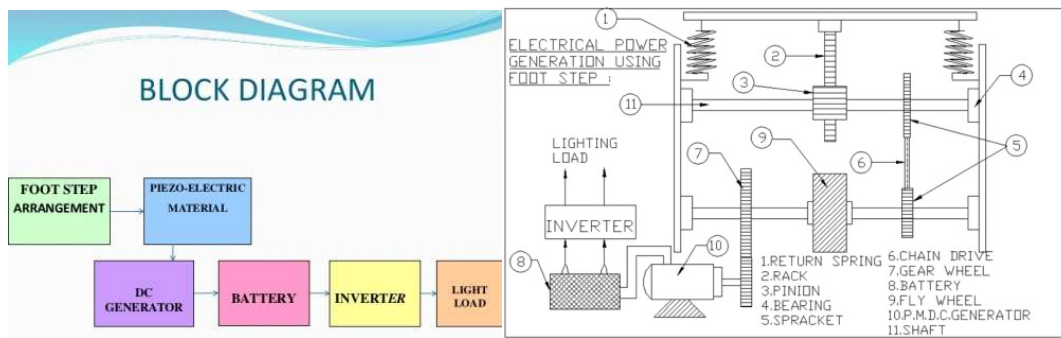


Fig.2. (a) Block diagram (b) Circuit diagram

4. Operational Description

In this system gear is attached with flywheel shown in Fig.2. (b) which will use to rotate the shaft that shaft is attached with DC generator in order to generate DC current that will be stored in the batteries.

When an individual pass, it will push the tile on the ground surface that turn the shaft beneath the tile, the turn is limited by clutch bearing which is underpinned by holders. The primary shaft will rotate almost twice by single tile push. The movement of prevailing shaft turn the gearbox shaft which buildup it 15 times then its movement will be smoothed by the help of fly wheel that store the movement temperedly that will be transferred to DC generator which produce 12vvolt 40amp at 100rpms

Generated energy is stored in the batteries and inverter circuit is also used to convert DC into AC so that we can run the home electrical load. Indeed, a microcontroller based home mechanization framework is used which control rooms with full protection. Whole frame work is put on the iron bars which are called channels.

5. Application

- Public places
- Foot paths
- Universities
- In airports
- In car parking system
- In railway stations
- Shopping Mall
- In street lights
- In bus stations
- In lift system

6. Conclusion

Since the power generation using foot step get its energy needs from no conventional source of energy there is no need of power from the mains and there is less pollution in this source of energy it is very essential to the places, all roads and as well as all kind of foot step which is used to generate non conventional energy such as electricity. As a common fact 11% Non conventional energy which contributes our primary energy. Weather this project is employed then we can not only overcome the energy shortfalls issues but this will also contribute to create sound global environmental change

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