

Design and Fabrication of Foot Step Power Generator

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Abstract- In this project electrical power is generated using non-conventional method by simply running on the foot step. eg. Railway stations. Non conventional energy system is very essential at this time to our nation. Non-conventional energy using foot step needs no fuel input power to generate the output of electrical power. This project is made using simple drive mechanism such as rack and pinion assembly.

For this project the conversion of the forced mechanical energy into electrical energy. The control mechanism carries the rack and pinion, D.C generator, battery. This project is implemented to all foot step.

The generated power is stored by means of battery and this is used for activating the connected loads. This is one of the compact and efficiency systems for generating electricity which can be easily installed in many region.

INTRODUCTION

Man has needed and used resources at rapid rate for his sustenance and well being ever since he came on earth. Primitive man required energy primarily in the form of food. Subsequently he discovered fire and his energy needs increased as he started to make use of wood and other biomass to supply the energy needs for cooking as well as for keeping himself warm.

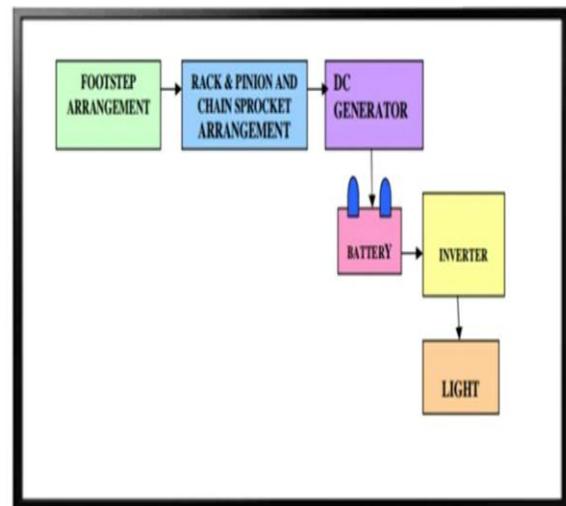
With further demand for energy, man began to use the wind for sailing ships and for driving windmills, and therefore of falling water to turn water for sailing ships and for driving windmills, and the force of falling water totum water wheels. Till this time, it would not be wrong to say that the sun was supplying all the energy needs of man either directly or indirectly and that man was using only renewable sources of energy.

The power floor is not like traditional floor. The energy produced by this floor will be environment friendly without having smog. Producing this type of energy will be cost effective also. The power floor

does not need any fuel or perhaps any sort of energy resource, simply making use of kinetic energy. Based upon your excess weight from a person moving on the floor.

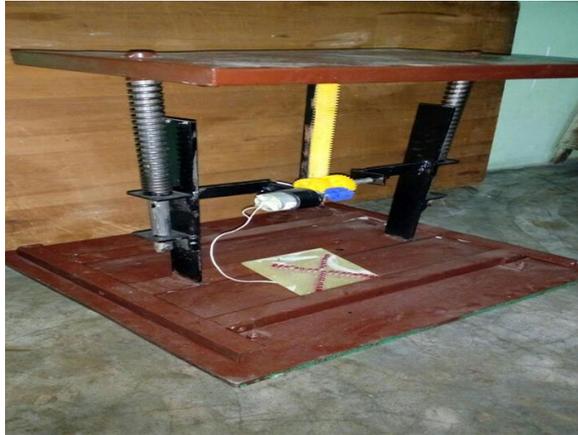
Proposal for the utilization of waste energy of foot power with human locomotion is very much relevant and important for highly populated countries like India and China where the roads, railway stations, bus stands, temples, etc. are all over crowded and millions of people move around the clock. This whole human/bio-energy being wasted if can be made possible for utilization it will be great invention and crowd energy farms will be very useful energy sources in crowded countries. Walking across a "Crowd Farm," floor, then, will be a fun for idle people who can improve their health by exercising in such farms with earning. The electrical energy generated at such farms will be useful for nearby applications.

BLOCK DIAGRAM:-

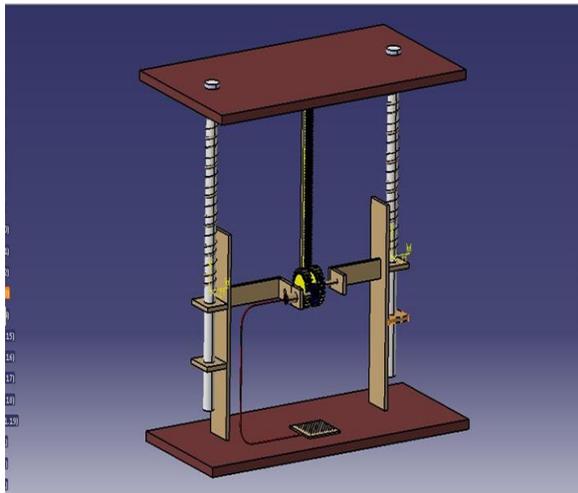


BLOCK DIAGRAM OF FOOT STEP POWER GENERATION

ACTUAL MODELE:



DESIGN DIAGRAM:



WORKING PRINCIPLE

In this setup mechanical energy is converted into electrical energy using a D.C. generator. Here the vertical motion of the top of the rack is converted into the rotational motion, which rotates the shaft of generator and generates electricity. This set up requires very basic mechanical components such as gear shaft bearing. There are also some electrical components such as battery, inverter etc.

SPECIFICATION:

1. Top Plate:-210mm X 390mm, Thickness:-10mm
2. Steel Rod:- 330mm (length), 15mm (diameter)
3. Base Plate:-170mm X 410mm
4. Spring:-20mm (coil spring) 10 gauge (thickness) 80kg/sq.inch (capacity)
5. Rack :- 23mm parallel teeth (PLASTIC)
6. Gears:-25teeth (drive) Big Gear, 15teeth (driven) Small Gear

7. Motor:-12volt, 500rpm, 5mm (shaft dia.)
8. Column:-40mm (width), 32mm (height), 5mm (thick)

CALCULATION:

Mass of pedestrain = 65 kg
 Distance travel by plate = 10cm
 So, work done on plate by impact
 = weight of body * distance
 = 65 * 9.81 * 0.1 J
 = 63.765 J
 So, power output
 = workdone/sec
 = 63.765/60 Watts
 = 1.06275 Watts

This much power is generated just by one foot step, by calculating on an average Of foot step impacts on the device we tabulated the data by taking a 100W bulb with 230V.

OBSERVATION:

Sr.No	Load(Kg)	Power (W)
1	50	0.82
2	55	0.9
3	60	0.98
4	65	1.06
5	70	1.14

ADVANTAGES

- Maintenance cost is low.
- Conversion of mechanical energy into electrical energy is easy.
- There is no any use of fuel.
- Free from all types of pollution.
- Its construction is simple

APPLICATIONS

- This can be implemented on railway station to generate electric power .
- In bus station.
- In car parking system.
- In Airports.
- In Lift system.
- In car lifting system.
- In street lights and Electric escalator

CONCLUSTION

This technique produce the electric power without dirtying our surrounding. The waste energy supplied by human is used in this frame-work. This energy source is ceaseless & renewable. Since in this project of power generation there is not any fuel input requirement for the generation of electrical power. Thus it can also be concluded that this mode of power generation system is eco-friendly, i.e, no pollution is caused during the generation of power using this type of model. Hence due to such advantages, this system can be embedded at any of the public places like railway platforms, busy foot-paths, malls etc. Implementing this system, we can easily reduce our dependency on the conventional sources of energy, thus can be considered beneficial from that point of view.

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