

ELECTRICAL POWER GENERATION USING FOOT STEP FOR RURAL/URBAN AREA ENERGY APPLICATIONS

Project Reference No.: 45S_BE_0049

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Keywords:

Power generation, Faradays Law of Electromagnetic Induction, Magnet, Gear system Shaft, Crank, Spur type gears.

Introduction:

The world is running on electricity generated by burning naturally available fuels like coal, natural gasses etc. These bio-fuels can hardly quench the thirst of electricity of the world approximately for the next 100 years. On the other hand, burning these bio-fuels cause massive environment pollution. To prevent these nonconventional sources like wind, tidal, hydro etc are getting more popular in the field of energy generation. The need of power and the population both are increasing day by day. This device uses people as the fuel in the form of bodyweight. Power generation by foot step is already exists by piezoelectric effect. For piezoelectric effect output is very small and number of crystal to increase to get sufficient output and also cost effective. This idea is completely different because it uses "FARADAYS LAW OF ELECTRO MAGNETIC INDUCTION" for cutting the flux by the coils. In this project we are generating electrical power as non conventional method by simply walking or running on the foot step . Non conventional energy system is very essential at this time to our nation. Non conventional energy using foot step is converting mechanical energy to electrical energy.

Objectives:

In this project we have presented the design methodology of electrical power generation using foot step for urban area energy applications.

- Man has needed energy at an increasing rate for his sustenance and well-being ever since he came on the earth. Due to this lot of energy resource have been exhausted and wasted.
- Proposal for the utilization of waste energy with foot power human locomotion is very much relevant and is very important for highly populated countries in INDIA and CHINA, where the roads, railway stations, bus stands and temples are overcrowded and millions of people moving around the clock.

- By using this principle, the energy can be utilized in the whole area where the mechanical energy is being converted to electrical energy.

Methodology:

Materials: Arduino, 16X2 LCD Display, Voltage Sensor, Potentiometer, Battery, Rectifier, Limit Switch, Shafts, Springs, Bearings, Chain Drive, Sprocket, Dynamo, Spur Gear, Rack and Pinion Assembly.

- During a casual walk when a person or loads press the arrangement, then the upper surface of the iron plate move downwards.
- Due to the movement of the plate the crank shaft getting mobility and further it drives gear arrangements, spur type gears are more preferable.
- According to theory two meshing gears transmits rotational motion. The smaller gear is rotating faster.
- This rotation motion is connected to motor, where it converts mechanical energy into electrical energy.
- Now according to the “Faradays law of electromagnetic induction” for cutting the flux by the coils, there will be some current flow measured from the copper wires, which is AC by nature. Now to convert it to DC there is a need to use RECTIFIER circuit and finally fed to the battery for storing the generated power.

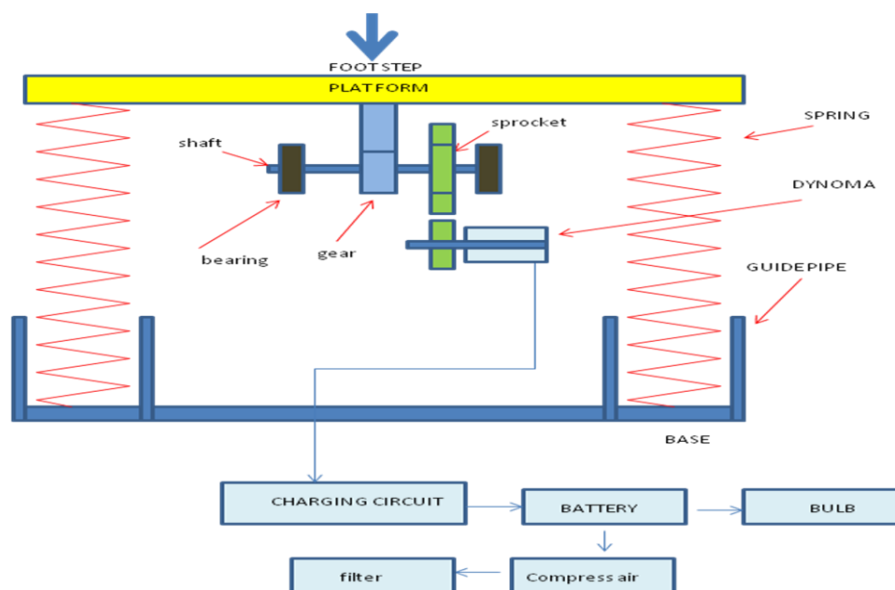


Fig: Simplified model of the design

Result and Conclusion:

2.6 volt and 12 mA electrical power is generated from one foot step. So, for a 1-hour total 112.3 watts of power is generated and this generated power can be used to light led array and to run dc fan after rectifying the ac or can charge batteries.

Future Scope:

We can use this for charging electric vehicle using RFID model.