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Implementation of Mechanical Power on Footstep Power Generation System

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ABSTRACT: Nowadays energy and power are the one of the basic need in this modern world. Energy demand is increasing day by day. On the other hand, the many energy resources are getting exhausted and wasted. Proposal for utilization of waste energy of foot power with human locomotion is very relevant in populated countries like India where roads, railway stations, bus stands, temples, etc. are overcrowded and millions of people move around. This whole energy is wasted. If this energy made possible for utilization it will be a great invention. In this project we are converting non-conventional from just walking foot step into electrical energy. This project uses simple drive mechanism such as rack and pinion assembly. The control mechanism carries the rack & pinion; D.C generator, battery and LED strip to show output. We have discussed the various applications and further extension

KEYWORDS: Footstep, Conventional Energy, Non-conventional Energy system.

I. INTRODUCTION

In this project the weight which follows up on the stride is utilized to produce electrical vitality. At the point when a man strolls over the stride, a power follows up on the progression. One can basically be astonished by knowing how much vitality a man can have simply by strolling on the floor with typical speed. At whatever point a man strolls, figures out how to lose vitality towards the floor by implies abundance weight to the floor. That vitality might be utilized and changed over into electrical vitality. The Mechanical energy (weight) is changed over into electrical vitality utilizing drive system, for this situation rack and pinion. Produced vitality can be put away in batteries. At that point the yield of the battery is utilized to help the lights in the room.

Question that each time precedes each nation i.e. the need of non-customary vitality sources or frameworks. Why we require these frameworks and the appropriate responses are the developing utilization of vitality has brought about the nation winding up progressively subject to petroleum derivatives, for example, coal, oil and gas. Rising costs of oil and gases and their potential deficiencies have raised vulnerabilities about the security of vitality supply in future, which has genuine repercussions on the development of the national economy. The primary factor is expanding utilization of petroleum derivatives additionally causes genuine natural issues. Henceforth there is essential need to utilize sustainable power sources like sun oriented, wind, tidal, biomass and vitality from squander material.

Presently let us go to its some working guideline, this gadget if implanted in strides of railroad stages, city shopping centres, city pathways etc. can change over the weight effect of individuals into electrical vitality. At the point when a person on foot will advance on the best plate of this gadget, the plate will go down and this descending movement brings about revolution of the pole of the alternator which produces electrical vitality. After expulsion of power the best plate comes back to its unique position because of springs.

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II. PROBLEM STATEMENT

Design and fabrication the model of foot step power generation. Also to fabricate the model of the same which would able to show the characteristics of the systems and working according to need.

III. RELATED WORK

[1] "Power Generation in Car Suspension Framework" by C.Nithiyesh Kumar, K.Gowtham, M.Manikandan, P.Bharathkanna, T.Manoj Kumar In this exploration paper creator considered three techniques for stride control age in particular piezoelectric strategy, rack and pinion technique and fuel cylinder strategy relatively and found that the rack and pinion system is more productive with direct cost of task and upkeep

[2] "Age of Electrical Vitality from Stride Utilizing Rack and Pinion Instrument" by Md.Azhar, Zitender Rajpurohit, Abdul Saif, Nalla Abhinay, P.Sai Chandu In this exploration paper creators utilized directed 5V control, 500mA power supply. Scaffold write full wave rectifier is utilized to redress the air conditioner yield of optional of 230/12V stage down transformer. A rack and pinion is a kind of direct actuator counting a couple of apparatuses which change over rotational movement into straight movement. The "pinion" draws in teeth on the rack. In this paper, since the power age utilizing stride get its vitality prerequisites from Non-inexhaustible wellspring of vitality. There is no need of energy from outer sources (mains) and there is less contamination in this wellspring of vitality. It is exceptionally helpful to the places like all streets and additionally all sort of stride which is utilized to produce the non-ordinary vitality like power.

[3] "Electrical Power Age Utilizing Stride for Urban Territory Vitality Applications" by Joydev Ghosh, Amit Saha, Samir Basak, Supratim Sen. In this exploration paper creators utilized 80 volts and 40 Mama from one loop have been produced from a model as first innovation. The second creation gives 95 volts and 50 Mama from one loop and this produced power can be utilized to light Driven cluster and to pursue DC fan redressing the air conditioner or can charge batteries. For high proficiency in the axel of the second outfit, they fitted a solid magnet vertically, so when the rigging will turn because of human body weight the magnet moreover pivot. The magnet is set in a circle compose copper curl. At the point when the magnet begin pivoting as indicated by the Faraday's law of electromagnetic enlistment, there will be initiated emf in the curl.

[4] "Power age through advance" by Vipin Kumar Yadav¹, Vivek Kumar Yadav¹, Rajat Kumar¹, Ajay Yadav In these exploration paper creators utilized types of gear with following particular: Engine Voltage:10 volt Write: D.C. Generator, RPM:1000 rpm, Rigging 1-Gentle Steel,No. of teeth:59(big gear),No. of teeth:36(small gear),Type: Goad Rigging, No. of rigging used:2 Spring 1-Load bearing capacity:60-90 kg, Mellow Steel,Total displacement:5 inch, Bearing 1-Sort: Metal roller, Bearing no.N35,Shaft 1-Breadth: 15 mm-Material: Gentle steel writer presumed that with these strategy vitality transformation is basic effective and contamination free.

[5] "Power Age Stride" by Shiraz Afzal, Farrukh hafeez This paper is tied in with producing power when individuals stroll on the Floor on the off chance that we can outline a power creating floor that can create 100W on only 12 stages, at that point for 120 stages we can deliver 1000 Watt and on the off chance that we

IV. WORKING

The complete diagram of the power generation using foot step is given below. The pushing power is converted into electrical energy by proper driving arrangement. The rack & pinion, spring arrangement is fixed at the upper plate and lower plate. The spring is used to return the plate in same position by releasing the load. The gear wheel is coupled to the smaller motor shaft. The generator is used here, is permanent magnet D.C generator. This arrangement is fitted in FOOT STEPS; the complete arrangement is kept inside the floor level except the pushing arrangement. Basic Components:

It consists of the following main parts:

1. MS plate

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2. MS Pipes
3. Rack and pinion
4. DC motor
5. FRAME
6. LED lights Etc.

4.1 Specifications

Sr.No.	Components	Details
1.	Base and upper plate	Mild steel -300*300 mm (300*2)
2.	Fixed Cylindrical pipes	MS pipes, 30 mm dia.-100 mm length (200*4)
3.	Moving pipes	MS pipes ,20 mm dia. 100 mm length (200*4)
4.	Springs	Alloy Steel Wire(200*4)
5.	Rack and pinion	Cast iron, module 1.5
6.	DC motor	12 volt, 60 rpm
7.	Stair frame	MS l angle frame

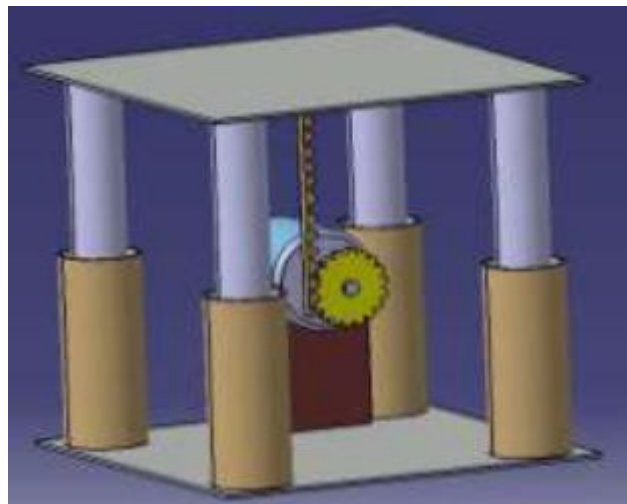


Fig 5.1 Foot Step Power Generation System

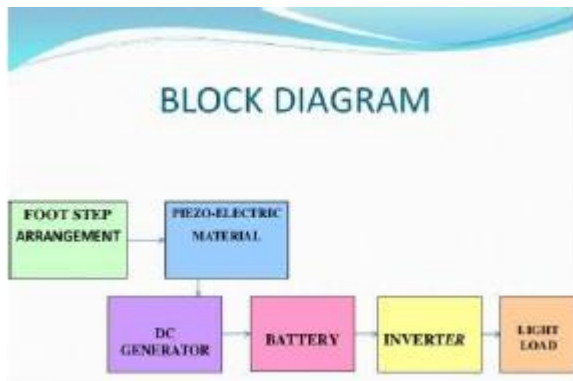


Fig 5.2 Block Diagram

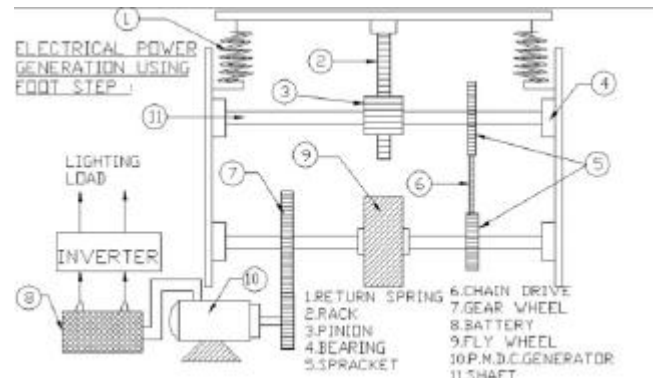


Fig 5.3 Circuit Diagram

4.2 Operational Description

In this system gear is attached with flywheel shown in Fig.5.3 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 12v volt 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.

V. APPLICATIONS

1. This can be actualized on railroad stations, transport stops, airplane terminals to produce electric power by human physical action.
2. Additionally can be actualized in parking garages, electric elevators.
3. This system can be executed on gymming instruments like cardio machine for control age and the power age rate is high.
4. We can utilize this instrument in vehicle suspension framework.
5. In provincial zones etc. High Initial Cost

VI. CONCLUSION

In finishing up the expressions of our undertaking, since the power age utilizing stride gets its vitality prerequisites from the non-renewable wellsprings of vitality. There is no need of energy from the mains and there is less contamination in this wellspring of vitality. It is extremely valuable to the spots like all streets and additionally all sort of stair case which is utilized to create the nonconventional vitality like power. It can broaden this venture by utilizing same course of action and build in the strides/speed breakers to build the rate of energy generation rate.

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- [3] "Electrical Power Generation Using Foot Step for Urban Area Energy Applications" by Joydev Ghosh, Amit Saha, Samir Basak, Supratim Sen.
- [4] "Power generation through step" by Vipin Kumar Yadav1, Vivek Kumar Yadav1, Rajat Kumar1, Ajay Yadav
- [5] "Power Generation Footstep" by Shiraz Afzal, Farrukh hafeez



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[6] "POWER GENERATION FROM STEPS" by Ramesh Raja R, Sherin Mathew

[7] "Electricity Generation from Footsteps; A Regenerative Energy Resource" by Tom Jose V*, Binoy Boban*, Sijo M T*.