

FOOT STEP POWER GENERATION

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Abstract - As the interest of vitality is expanding step by step, so a definitive answer for arrangement with these sorts of issues is simply to execute the sustainable wellsprings of vitality Humans are utilizing the sustainable power source which are sun powered, wind and so on however despite everything we couldn't fulfill our capacity needs, in view of that we need to produce power through every single imaginable ways. The target of this work is to deliver control through strides as a wellspring of sustainable power source that we can get while strolling or remaining on to the specific courses of action like trails, stairs, plate shapes and these frameworks can be introduce uniquely in the more populated regions. In this task the power vitality is created by human stride and power vitality is changed over into mechanical vitality by the rack and pinion instrument. Power is created by DC generator. We are assume to examine existing strategies for stride control age that are rack and pinion course of action and piezoelectric precious stones and expected to changed the current framework.

Key Words: trails, Stairs, plate shapes, and rack and pinion ...

1. INTRODUCTION

Proposition for the usage of waste vitality of foot control with human movement is especially pertinent and critical. Man has required and utilized vitality at an expanding rate for his sustenance and prosperity as far back as he went ahead the earth a couple of million years prior. Crude man required vitality basically as sustenance. He inferred this by eating plants or creatures, which he chased. Along these lines he found flame and his vitality needs expanded as he utilized wood and other bio mass to supply the vitality requirements for cooking just as for keeping himself warm. With the progression of time, man began to develop land for farming. He added another measurement to the utilization of vitality by taming and preparing creatures to work for him. With further interest for vitality, man started to utilize the breeze for cruising ships and for driving windmills, and the power of falling water to turn water for cruising ships and for driving windmills, and the power of falling water to turn water wheels. Till this time, it would not be right to state that the sun was providing all the vitality needs of man either legitimately or in a roundabout way and that man was utilizing just sustainable wellsprings of vitality. This procedure includes number of straightforward setup that is introduced under the strolling stage. At the point when individuals stroll on this stage their body weight packs the setup which turns a dynamo and current is produced. The control creating stage is stuffed zone with moving populace, vitality is delivered at bigger dimensions. More noteworthy development of individuals will produce more vitality. This entire human vitality being squandered if can be made workable for use it will be extraordinary creation and power delivering stage will be exceptionally valuable vitality sources in jam-packed nations.

2. LITERATURE SURVEY

“Electrical Power Generation Using Foot Step for Urban Area Energy Applications”:

In this undertaking project we are producing electrical power as non-traditional technique by just running on the train in the stride. Non-traditional vitality framework is extremely fundamental right now to our country. Non-traditional vitality utilizing stride needs no fuel input capacity to create the yield of the electrical power. This venture utilizing straightforward drive instrument, for example, shake and pinion gather and chain drive system.

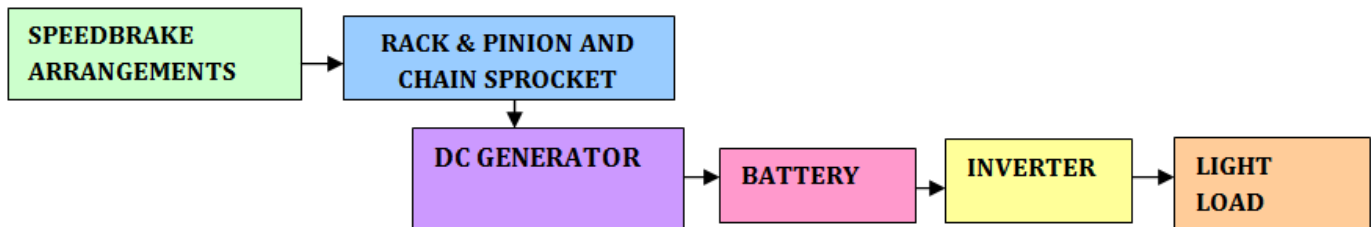
For this task the change of the power vitality in to electrical vitality. The control component conveys the rack and pinion, D.C generator, and battery and inverter control. We have talked about the different applications and further expansion moreover. So this undertaking is executed to all stride, the power age is extremely high. The underlying expense of this plan is high.

2. COMPONENTS AND DESCRIPTION

The block diagram of the speed brake power generation is shown in figure. The main components of this project are,

- ☐ *Speed Brake arrangement*
- ☐ *Rack and pinion arrangement*
- ☐ *Sprocket and chain Drive*
- ☐ *Fly wheel*
- ☐ *D.C generator*
- ☐ *Battery*

BLOCK DIAGRAM



☐ SPEED BRAKE ARRANGEMENT:

This is made up of mild steel. The complete set up is fixed in a box. The two L-angles frame is fixed in the above two ends of the box. Below this l-angle window, the actual speed brake arrangement is constructed. This L-angle window pushes the speed brake when the time of vehicle moving on these arrangement.

☐ RACK AND PINION ARRANGEMENT:

This block is the important part of the unit as it houses the rack and pinion. This rack and pinion attachment gives the rotary motion to the chain sprocket. This block converts linear motion into rotary motion. Rack and pinion gear system is used to transmit linear motion into rotary motion. The rack is a portion of a gear having an infinite pitch diameter and the line of action is tangent to the pinion.

☐ SPROCKET AND CHAIN DRIVE:

This is a cycle chain sprocket. The chain sprocket is coupled with another generator shaft. The chain converts rotational power to pulling power, or pulling power to rotational power, by engaging with the sprocket.

☐ FLY WHEEL:

Fly wheel is used to increase the rpm of the system. The generator is coupled with this shaft, so that increase the RPM of the generator.

☐ MANENT MAGNET D.C. GENERATOR:

There are two types of generators – DC generators and AC generators. Both DC and AC generators convert mechanical power to electrical power. A DC generator produces direct power, while an AC generator produces alternating power. Both of these generators produce electrical power based on the principle of Faraday’s law of electromagnetic induction. This law states that when a conductor moves in a magnetic field it cuts magnetic lines of force, which induces an electromagnetic force (EMF) in the conductor. The magnitude of this induced EMF depends upon the rate of change of flux (magnetic line force) linkage with the conductor. This EMF will cause a current to flow if the conductor circuit is closed.

☑ BATTERY

An electric battery is a device consisting of one or more electrochemical cells that convert stored chemical energy into electrical energy. Each cell contains A Positive terminal, or cathode, and a negative terminal, or anode. Electrolytes allow ions to move between the electrodes and terminals, which allows current to flow out of the battery to perform work.

- Battery capacity: 12V, 1.3Ah.
- This is chargeable one
- Battery charging time: 20min.
- Working condition: 2hours.

3. WORKING PRINCIPLE

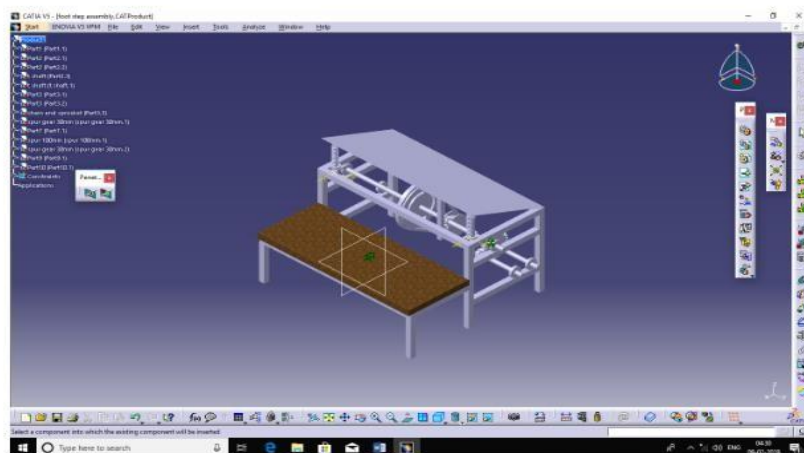
The complete diagram of the foot step power generation is given below. Only one step is inclined in certain small angle which is used to generate the power. The pushing power is converted into electrical energy by proper driving arrangement. The rack & pinion, spring arrangement is fixed at the inclined step. The spring is used to return the inclined step in same position by releasing the load. The pinion shaft is connected to the supporter by end bearings as shown in fig.

The larger sprocket also coupled with the pinion shaft, so that it is running the same speed of pinion. The larger sprocket is coupled to the small cycle sprocket with the help of chain (cycle). This larger sprocket is used to transfer the rotation force to the smaller sprocket. The smaller sprocket is running same direction for the forward and reverse direction of rotational movement of the larger sprocket. This action locks like a cycle pedaling action.

The fly wheel and gear wheel is also coupled to the smaller sprocket shaft. The flywheel is used to increase the rpm of the smaller sprocket shaft. The gear wheel is coupled to the generator shaft with the help of another gear wheel. The generator is used here, is permanent magnet D.C generator. The generated voltage is 12Volt D.C. This D.C voltage is stored to the Lead-acid 12 Volt battery.

The battery is connected to the inverter. This inverter is used to convert the 12 Volt D.C to the 230 Volt A.C. This working principle is already explained the above chapter. This 230 Volt A.C voltage is used to activate the light, fan and etc. By increasing the capacity of battery and inverter circuit, the power rating is increased. This arrangement is fitted in shopping complex, college and wherever the large people walking on the foot steps simultaneously.

DESIGNED MODEL



5. ADVANTAGES AND DISADVANTAGE

ADVANTAGES

- ☑ Power generation is simply running on this arrangement.
- ☑ Power also generated by running or exercising on the brake.

- ☒ No need fuel input.
- ☒ Battery is used to store the generated power.
- ☒ Depending upon the power generator and number of them, power output is very high.
- ☒ Highly efficient in more crowded places.
- ☒ This process depends on human resources which is available in plenty in our country which makes our country a favorable place for this project.
- ☒ Promising technology for solving power crisis to an affordable extent.

DISADVANTAGES

- ☒ Slight inclination is required in the speed brake.
- ☒ Mechanical moving parts are high.
- ☒ Initial cost of this arrangement is high.
- ☒ Care should be taken for batteries.

6. CONCLUSIONS

In concluding the words of our project, since the power generation using speed brake get its energy requirements from the Non-renewable 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 useful to the places all roads.

It is able to extend this project by using same arrangement and construct in the steps so that increase the power production rate by fixing in school and colleges, etc.

7. FUTURE SCOPE

This arrangement is slightly modified to construct in foot step and this arrangement is fixed in

- ☒ Schools.
- ☒ Cinema theatres.
- ☒ Shopping complex and many other buildings.

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