IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

FOOT STEP POWER GENERATION FOR RURAL ENERGY APPLICATION TO RUN A.C. AND D.C. LOADS

[1]Kethavath Gopal, [2]Adaikkalam Daniel Praneet, [3]M Narsimha, [4]Faiz Ali

[1,3,4] Assistant Professor, Dept. of Mechanical Engineering,Mahaveer Institute of Science and Technology,Hyderabad,TS,India.

[2] Assistant Professor,Dept. of Mechanical Engineering,Holy Mary Institute of Technology and Science, Hyderabad, TS, India.

ABSTRACT:

Now a days, the population of the country increased and the requirement of the power is also increased. At the same time, the wastage of energy also increased in many ways. This paper presents the production of electric power from the foot step movement of the peoples and the pressure exerted during walking which is fritter away, is the main theme. electrical power is achieved by transforming the mechanical power as the pressure exerted by the footstep and by using transducers is basically called as "Foot step power generation system". Power is produced by the power generating floor and it is basically the production of electrical energy from kinetic energy. In present days electricity demand is increasing and it is unable to overcome this global issue by using the traditional power generating sources. The main aim is to overcome the power crisis throughout the world although it is not enough to fulfill over excessive demand of electrical energy but it will be able to change and decrease reliance on old method of generating electricity. To overcome this problem, the energy wastage is converted to usable form using the piezoelectric sensor. This sensor converts the pressure on it to a voltage. By using this energy saving method, foot step power generation system we are generating power.

Keywords: Piezoelectric Transducer, PVDF (Polyvinylidene Fluoride), Foot step power generation.

1. INTRODUCTION

Man has needed and used energy at an increasing rate for his sustenance and wellbeing ever since he came on the earth a few million years ago. Primitive man required energy primarily in the form of food. He derived this by eating plants or animals, which he hunted. With the passage of time, man started to cultivate land for agriculture. He added a new dimension to the use of energy by domesticating and training animals to work for him. With further demand for energy, man began to use the wind for sailing ships and for driving windmills, and the force of falling water to turn water for sailing ships and for driving windmills, and the force of falling water to turn 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.

Other people have developed piezo-electric (mechanical-to-electrical) surfaces in the past, but the Crowd Farm has the potential to redefine urban space by adding a sense of fluidity and encouraging people to activate spaces with their movement. The Crowd Farm floor is composed of standard parts that are easily replicated but it is expensive to produce at this stage. This technology would facilitate the future creation of new urban landscapes athletic fields with a spectator area, music halls, theatres, nightclubs and a large gathering space for rallies, demonstrations and celebrations, railway stations, bus stands, subways, airports etc. like capable of harnessing human locomotion for electricity generation.

1.1 Literature survey

Binoy Boban (2013).et.al...,presents In this research work a system is designed which generate power through non-conventional energy source technique such a walking on the gardens, grounds, and floors etc. This system is established in heavy populated areas [1].

Muhammad Aamir Aman (2018).et.al.., reverse electro wetting technique is used wherein the flow of liquid on dielectric material coated. Electrical energy is produced by conductive substrate. Due to human locomotion if there is any vibration on above platform that will be cause to produce electrical energy[2].

Muhammad Aamir Aman (2018).et.al..,Electric power will be generate in form of electric current by the striking of piezo plate on the floor. Power generated by the footsteps is used for the additional features pedstrain for the energy which they produced[3].

1.2 Project overview:

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/bioenergy 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.

FOOT STEP POWER GENERATION MODEL

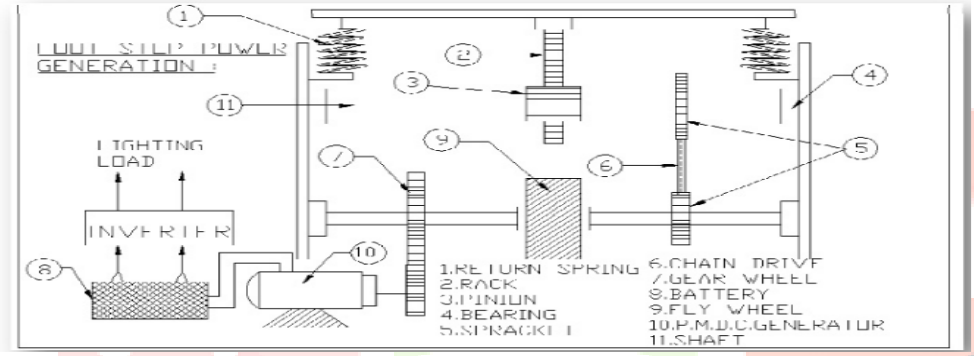

Fig.1.1 Line diagram

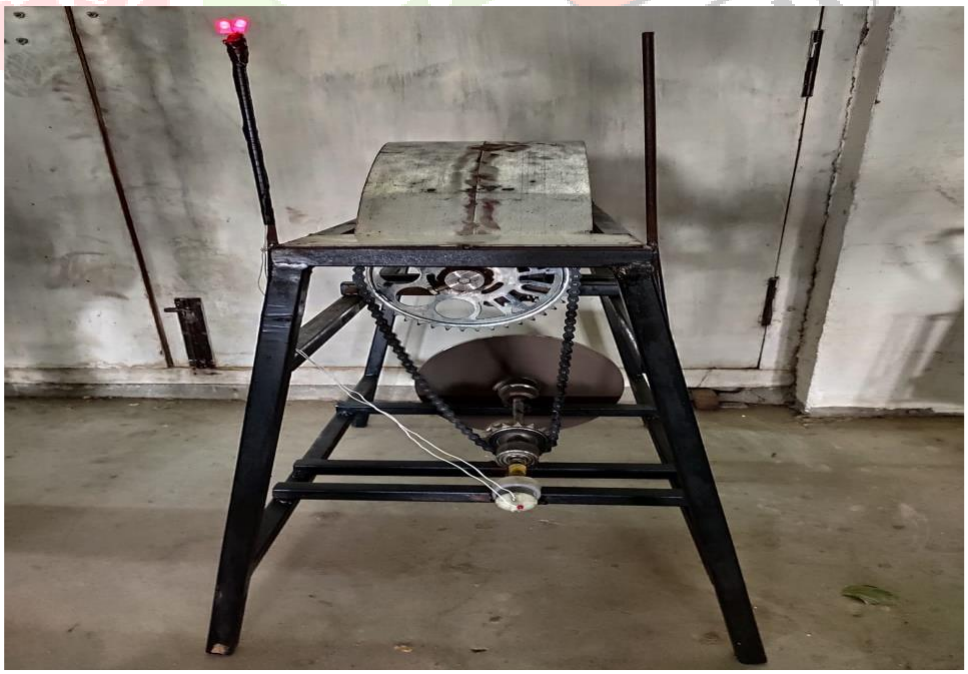

Fig.1.2 Power generation by using speed breaker

3: HARDWARE DESCRIPTION

3.1 Foot step arrangement

WORKING OF FOOT STEP GENERATOR:

Step1: when force is applied on the plate by virtue on stamping on the plate the force spring gets compressed
Step2: the rack here moves vertically down
Step3: The pinion meshed with the rack gear results in circular motion of the pinion gear
Step4: for one full compression the pinion Moves 1semicircle
Step5: when the force applied on the plate released the pinion reverses and moves another semi-circle
Step6: the generator attached to the pinion hence results in the sinusoidal waveform (for single Generator)

3.2 Rack and Pinion and chain sprocket arrangement

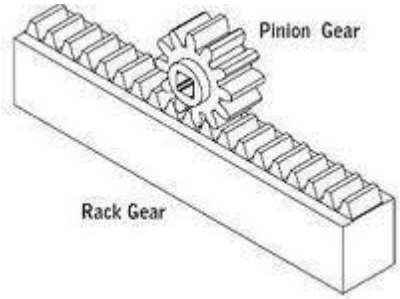

Fig.3.1 Rack and pinion

3.3. PMDC Generator

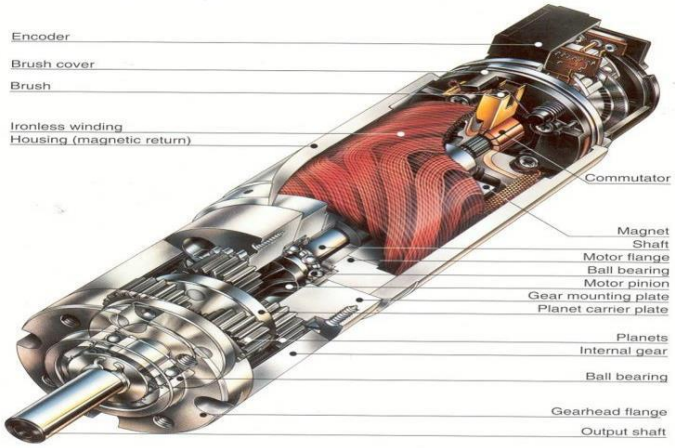

Fig.3.2 PMDC GENERATOR

Working:

The commutator rotates with the loop of wire just as the slip rings do with the rotor of an AC generator. Each half of the commutator ring is called a commutator segment and is insulated from the other half. Each end of the rotating loop of wire is connected to a commutator segment. Two carbon brushes connected to the outside circuit rest against the rotating commutator. One brush conducts the current out of the generator, and the other brush feeds it in. The commutator is designed so that, no matter how the current in the loop alternates, the commutator segment containing the outward-going current is always against the "out" brush at the proper time. The armature in a large DC generator has many coils of wire and commutator segments. Because of the commutator, engineers have found it necessary to have the armature serve as the rotor(the rotating part of an apparatus) and the field structure as the stator (a stationary portion enclosing rotating parts)

3.4. Battery

RECHARGEBLE BATTERIES:

A rechargeable battery or storage battery is a group of one or more electrochemical cells. They are known as secondary cells because their electrochemical reactions are electrically reversible. Rechargeable batteries come

in many different shapes and sizes, ranging anything from a button cell to megawatt systems connected to stabilize an electrical distribution network. Several different combinations of chemicals are commonly used, including: lead-acid, nickel cadmium(NiCad), nickel metal hydride (Nigh), lithium ion (Li-ion), and lithium ion polymer (Li-ion polymer).

Fig 3.3: Rechargeable Batteries

3.5. Light Loads

A bulb is a short stem with fleshy leaves or leaf bases. The leaves often function as food storage organs during dormancy. A bulb's leaf bases generally do not support leaves, but contain food reserves to enable the plant to survive adverse conditions. The leaf bases may resemble scales, or they may overlap and surround the center of the bulb as with the onion. A modified stem forms the base of the bulb, and plant growth occurs from this basal plate. Roots emerge from the underside of the base, and new stems and leaves from the upper side.

Other types of storage organs (such as corms, rhizomes, and tubers) are sometimes erroneously referred to as bulbs. The correct term for plants that form 0underground storage organs, including bulbs as well as tubers and corms, is geophytes. Some epiphytic orchids (family Orchidaceous) form above-ground storage organs called pseudo bulbs that superficially resemble bulbs.

4. ADVANTAGES AND APPLICATIONS

Advantages

1.Reliable
2.Economical
3.Eco-Friendly
4.Less consumption of Non- renewable energies.
5.Less floor area.

Applications

1.Foot step generated power can be used for agricultural, home applications, street-lightening.
2.Foot step power generation can be used in emergency power failure situations.
3.Metros, Rural Applications etc.,

CONCLUSION

The project "Foot Step Power Generation For Rural Energy Application To Run A.C. And D.C. Loads" is successfully tested and implemented which is the best economical, affordable energy solution to common people. This can be used for many applications in rural areas where power availability is less or totally absence. As India is a developing country where energy management is a big challenge for huge population. By using this project we can drive both AC as well as D.C loads according to the force.

References:

1. Binoy Boban, Tom Jose V, Sijvo MT, "Electricty generation from footsteps; A Generative energy Resources"International journal of sciventic and research Publication 1-3,March 2013.
2. Muhammad Aamir Aman"Photovoltaic (PV) System Feasibility for Urmar Payan a Rural Cell Sites in Pakistan" J.Mech.Cont.& Math. Sci., Vol.-13, No.3, July-August (2018) Pages 173-179.
3. Muhammad Aamir Aman"To Negate the influences of Undeterministic Dispersed Generation on Interconnection to the Distributed System considering Power Losses of the system" J.Mech.Cont.& Math. Sci., Vol.-13, No.-3, July-August (2018) Pages 117-132.
4. Tom Jose V, Binoy Boban, Sijo M T "Electricity Generation from Footsteps; A Regenerative Energy Resource" International Journal of Scien tific and research publication, pp 1-3, March 2013.
5. Alla Chandra Sekhar, B Murali Kishore, T Jogi Raju Electromagnetic Foot Step Power Generation International Journal of Scientific and Research Publications, Volume 4, Issue 6, June 2014.