

# Foot Step based PPower Generation

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**Abstract - Power generation is one of the issues. Now –a-days number of power sources are present, non-renewable and renewable, but still we cannot overcome our power needs. Among these human population is one of the resources. In this project we are generating power by running or walking. Power can be generated by walking upon stairs. This system can be installed in homes, schools, colleges, where the people move around the clock. When the people walk on the steps or that of platform, power is generated by using weight of person. This mechanical energy applied on the crystal into electrical energy. When there is some vibrations, stress or straining force exert by foot on flat platform.**

**Key words: Renewable Energy power, Electrical Energy, Mechanical Energy, Foot Step**

## I. INTRODUCTION

In this we are generating electrical power as non-conventional method by simply applying pressure on floor. Every person will walk. When a person walks, he or she loses energy. That energy can be used and convert into usable form such as power. There are many places where there is no electricity so we are generating electrical power by means of renewable energy, by simply applying pressure on the floor where foot step is arranged non-renewable energy is very less so renewable energy is very much in demand now a days. As the availability of conventional energy reducing day by day, there is need to find alternate energy sources. All most all countries and states are facing this problem; they are unable to provide the power according to the demand. The power produced by different industries is not even sufficient for domestic appliances in this critical situation we need to find the alternative and one of that is by applying pressure on the sensor we can generate the power and that power can we can know how much power stored in the battery by using Node MCU.

## II. LITERATURE REVIEW

“Tom Jose V, BinoyBoban, Sijo M T” proposed that that manufactured a model made from stainless steel, recycled car tires and recycled aluminium, also includes a lamp embedded in the pavement that lights up every time a step is converted into energy. The average square of pavement produces about 2.1 watts of electricity[1].

“Joydev Ghosh, Amit Saha, Samir Basak, Supratim Sen” proposed that the design methodology of electrical power generation using foot step for urban area energy applications[2]

“Vipin Kumar Yadav, Vivek Kumar Yadav, Rajat Kumar, Ajay Yadav” proposed that the study of electricity generation through the step mechanism. For obtaining the electricity through the step mechanism a prototype model is developed and studied. The electrical power generation system is configured to generate electric power via movements of the humans [3].“Julie Borah” proposed that how piezoelectric effect enables us to convert the kinetic energy produced bythe human footsteps to electrical energy that can be used for various applications[4].

“Md.Azhar, ZitenderRajpurohit, Abdul Saif, NallaAbhinay, P.SaiChandu” proposed that Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/12V step down transformer[5]

“Patel Kamlesh, Pandya Krunal, Patel Ronak, PrajapatiJaydeep,Mr. SorathiyaMehul” proposed that the force energy is produced by human foot step and force energy is converted into mechanical energy by the rack and pinion mechanism[6].“Mrs. KrupalDhimar, Miss. Krishna Patel, Miss. Zeel Patel, Miss. Nisha Pindiwala”

proposed that There for possible solution for this to provide sufficient amount of power using renewable energy. Among these resources, human population is the only far and away and all weather resource that has not been utilized[7].“A.R.Kotadiya, B.D.Parmar” proposed that to produce power through footsteps as a source of renewable energy that we can obtained while walking or standing on to the certain arrangements like footpaths, stairs, plate forms and these systems can be install specially in the more populated areas [8]. “Akshat Kamboj, AltamashHaque, Ayush Kumar, V. K. Sharma, Arun Kumar “ proposed the design ofpower generation using footstep based on available piezoelectricsensors. Human race requires energy at very rapid rate for theirliving and wellbeing from the time of their arrival on this planet[9], “Muhammad AamirAman, Hamza Umar Afridi,Muhammad ZulqarnainAbbasi, Akhtar Khan,Muhammad Salman “ proposed The production of electric power from the foot step movement of the peoples andthe pressure exerted during

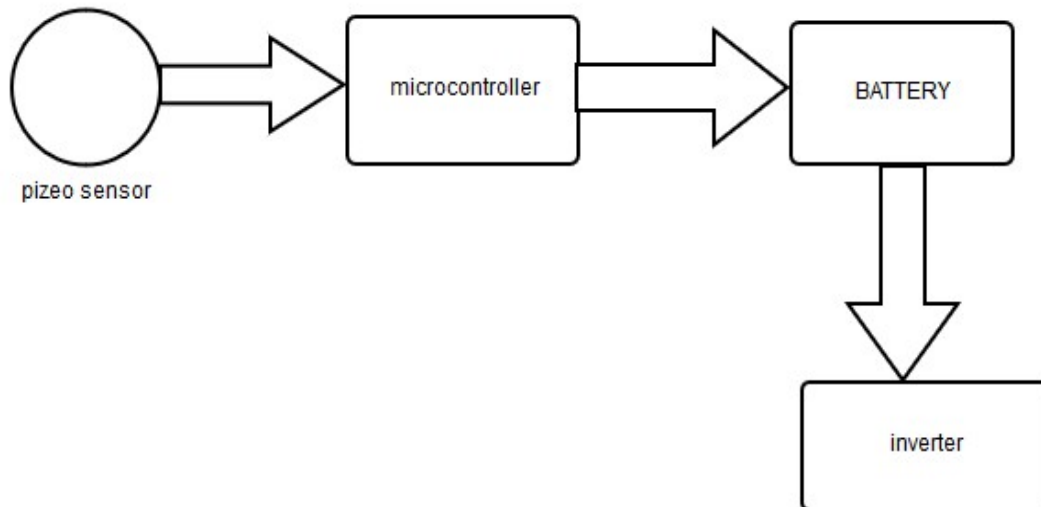
walking which is fritter away. The mechanical power transformation into electrical power as the pressure exerted by the footstep and by using transducers[10].

### III. EXISTING SYSTEM

Based on various literature reviews mentioned above the existing systems describes that The Footstep Power Generation, here we proposed a power generation technique through rack and pinion arrangement we are converting Mechanical energy into Electrical energy. We are trying to utilize the wasted energy in a useful way. By using Rack and Pinion arrangement we are converting to and fro motion of the steps into rotational motion of the dynamo. In first foot step we are using rack and pinion arrangement directly to rotate the dynamo. But in second step we are using chain drive mechanism to obtain better efficiency. Through Dynamo the rotational energy is converted into electrical energy. This electrical energy output will be shown by glowing the LEDs. There are some disadvantages in existing systems which cause complexity while going through processing like: **Efficiency**- Producing of electricity is not much efficient, **Cost effective**-Installation cost of machines is very high, **Accuracy**-This system does not give accurate voltage readings and power is not stored reasonably in batteries.

### IV. PROPOSED SYSTEM

Piezoelectric materials have the ability to produce electrical energy from mechanical energy for example they can convert mechanical behavior like vibrations in to electricity. Such devices are commonly referred to as energy producers and it can be used in different places like temples, railway platforms, etc. This power can be stored in the batteries for future use. A piezoelectric sensor is a device that uses the piezoelectric effect to measure changes in pressure, acceleration, temperature, strain, or force by converting them to an electrical charge. Our project consisting of two modules, the first module is to build the footstep arrangement which can bear nearly hundred kg's of weight so that there will be no damages will happen to the footstep arrangement. The following diagram for the Foot step arrangement



Our project consist of two modules in this first module to store the energy here we are arrange the circuit with the help of sensors, MCU (Micro Controller Unit), and battery here If pressure applied on the foot arrangement then piezo sensor will convert the mechanical to electrical so that power will be generated that power will be stored in the battery

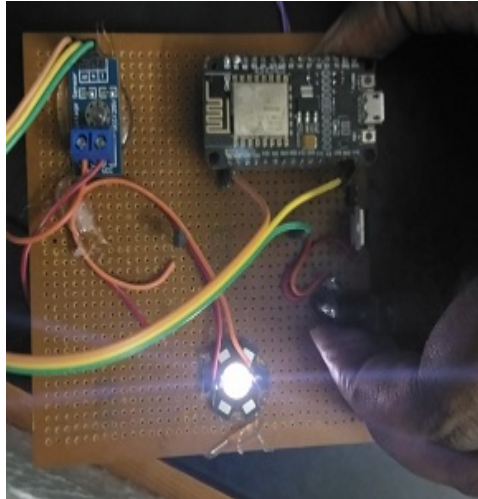


Figure : Foot Step Arrangement

In the second module we can observe how much power is stored in the battery and maintain data base and also produce whenever needed

**BENEFITS IN PROPOSED SYSTEM**

There are some advantages in proposed system which have been overcome the existing systems like:

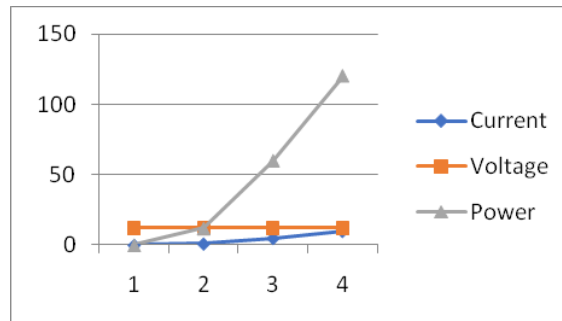
- No need fuel input.
- This is a Non-conventional system.
- The battery is used to store the generated power.
- Gives accurate values of voltage readings and generates more power.
- Cost effective is less when compared to other existing systems.
- Installation can be done in anywhere easily like public places.

**V. RESULT**

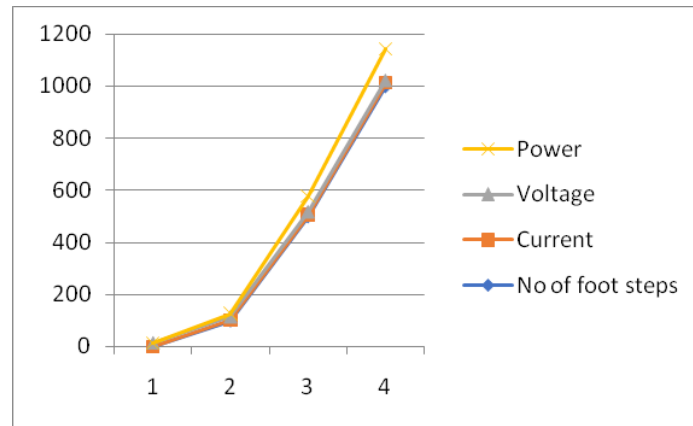
Our system gets more accuracy to generate power and it is shown in a graphical representation format having power generation rate by sensors and no of person steps and it shows the energy generated in terms of values, the graph is shown below. The Output voltage can be calculated by using formula :

**Power = Current \* Voltage --- Equ - 1**

No of foot steps	Current	Voltage	Power
1	0.01	12	0.12
100	1	12	12
500	5	12	60
1000	10	12	120



Total current = No of footsteps \* Current for single footstep – Equ - 2



## VI. CONCLUSION

The project “FOOT STEP BASED POWER GENERATION” is successfully tested and implemented which is the best economical, afford-able energy solution to common people. This can be used for many applications in rural areas where power availability is lesser totally absence As India is a developing country where energy management is a big challenge for a huge population. By using this project, we can generate power according to the force we applied on the Piezo electric sensor.

## REFERENCES

- [1] Tom Jose V, BinoyBoban, Sijo M T “*Electricity Generation From Footsteps: A Regenerative Energy Resource*” IJSR, Volume 3, Issue 3, March 2013 pp: 498-502, ISSN 2250-3153.
- [2] Joydev Ghosh, Amit Saha, Samir Basak, Supratim Sen “*Electrical Power Generation Using Foot Step For Urban Area Energy Applications*” published in IEEE Explore in April-2013
- [3] Vipin Kumar Yadav, Vivek Kumar Yadav, Rajat Kumar, Ajay Yadav “*Power generation through step*” IJSCR Volume 5, Issue 5, and ISSN 2229-5518 in May-2014
- [4] Julie Borah “*Generation of Electricity By Means Of Footsteps*” IJRASET, Volume 4 Issue II, and ISSN 2321-9653 in February-2016
- [5] Md. Azhar, Zitender Rajpurohit, Abdul Saif, Nalla Abhinay, P. Sai Chandu “*Generation of Electrical Energy from Foot Step Using Rack and pinion Mechanism*” IJMETMR, Volume 3 Issue 4, and ISSN 2348-4845 in April-2016
- [6] Patel Kamlesh, Pandya Krunal, Patel Ronak, Prajapati Jaydeep, Mr. Sorathiya Mehul “*Design of Foot Step Power Generation System*” IJSRSET, Volume 4 Issue 5, and ISSN 2394-4099 in April-2017
- [7] Krupal Dhimar, Miss. Krishna Patel, Miss. Zeel Patel, Miss. Nisha Pindiwala “*Foot Step Power Generation System*” IRJET, Volume 4 Issue 4, and e-ISSN 2395-0056 and p-ISSN :2395-0072 in April-2017
- [8] A.R. Kotadiya, B.D. Parmar “*Modification And Implementation Of Foot Step Power Generation System In Weighing Scale Of The Gym*” IJEDR, Volume 6 Issue 3, and ISSN :2321-9939 in April-2018.
- [9] Muhammad Aamir Aman, Hamza Umar Afridi, Muhammad Zulqarnain Abbasi, Akhtar Khan, Muhammad Salman “*Power Generation from Piezoelectric Footstep Technique*” J.Mech.Cont.& Math. Sci., Volume 13 Issue 4, and ISSN (Online) : 2454 -7190 ISSN (Print) 0973-8975 in Sep-Oct -2018.
- [10] Akshat Kamboj, Altamash Haque, Ayush Kumar, V. K. Sharma, Arun Kumar “*Design of footstep power generator using piezoelectric sensors*” International Conference on Innovations in information Embedded and Communication Systems (ICIIECS) in March-2017.
- [11] Marshiana .D, Elizabeth Sherine, N. Sunitha, Vinothkumar C “*Footstep Power production using Piezoelectric Sensors*” Research Journal of Pharmacy and Technology, Volume No:9, Issue No:7 in July-2016.
- [12] B. Munaswamy, Ch. Prudhvi, V. Srikanth, B. Kirankumar E. Pradeep Kumar “*Mechanical Footstep Power Generation*” IJETA, Volume No:5, Issue No:2 and ISSN :2393-9516 in Mar-April-2018.
- [13] Miss. Mathane Nitashree V., Miss. Salunkhe Arati L, Miss. Gaikwad Sayali S “*Foot Step Power Generation Using Piezoelectric Material*” IJARECE, Volume No:4, Issue No:10 and ISSN :2278 – 909X in October-2015.
- [14] Aathira S Babu, Dona Joseph, Harikrishnan G, Sumitha Mariyam Raj “*Foot Step Power Generation-Power Generating Slabs*” IJESL, Volume 8 Issue 06 Series. II || PP 04-10 and ISSN :2319 – 6726 in June-2019.
- [15] Mr. Vishwanil V. Sarnaik, Mr. Akshay P. Karnewar, Mr. Akshay S. Jidge, Mr. Tejas P. Pawar “*Footstep Power Generation*” GRD Journal, Volume 2 Issue, PP 09-13 and ISSN :2455-5703 in June-2017.