

## Power Generation on Door Opening and Closing

Rohan Patil<sup>1</sup>, Harsh Vernekar<sup>2</sup>, Sushil Khade<sup>3</sup>, Ajay Rakshale<sup>4</sup>, Pravin Patil<sup>5</sup>

<sup>1</sup>3<sup>rd</sup> Year Mechanical Engineering, DKTE's Textile and Engineering Institute, Ichalkaranji, Maharashtra, India

<sup>2</sup>3<sup>rd</sup> Year Mechanical Engineering, DKTE's Textile and Engineering Institute, Ichalkaranji, Maharashtra, India

<sup>3</sup>3<sup>rd</sup> Year Mechanical Engineering, DKTE's Textile and Engineering Institute, Ichalkaranji, Maharashtra, India

<sup>4</sup>3<sup>rd</sup> Year Mechanical Engineering, DKTE's Textile and Engineering Institute, Ichalkaranji, Maharashtra, India

<sup>5</sup>3<sup>rd</sup> Year Mechanical Engineering, DKTE's Textile and Engineering Institute, Ichalkaranji, Maharashtra, India

\*\*\*

**Abstract-** *Comfort coupled with safety and simplicity is what man strives for. Our idea has been to bring about both. The culmination of our effort has resulted in development of a new "POWER GENERATION ON DOOR OPENING AND CLOSING." As the today's world requires a lot of energy in different phases to run their livelihood. So this idea describes about the conversion of muscular energy into mechanical energy which can be again converted into useful electrical energy. This conversion can be carried out using a simple belt drive and a generator(dynamo). So the energy which is going unutilized one or the other way can be used for many applications where doors are frequently opened and closed such as shopping malls, ATMs, hospitals, etc. so energy can be utilized properly.*

**Key Words:** Door opening, Generator, Energy Conversion, Electricity, Free Energy.

### 1.INTRODUCTION

Man has needed and used energy at an increasing rate for his sustenance and well-being ever since he came on 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. Subsequently he discovered fire and his energy needs for cooking as well as for keeping himself

warm. He added a new dimension to the use of energy by domesticating and training animals to work for him.

Door based power generation unit is specially planned for utilizing the available non-conventional energy source. That is tremendously available energy in low intensity with ample quantity can be utilized. It converts reciprocating motion into rotary motion. The rotational power is stored in flywheel and flywheel rotate alternator that generate electricity.

This invention relates to means for utilizing the surplus energy which is expanded by opening and closing the doors, by causing that surplus energy to be applied to the generation of power for employment in useful manner. This source of power can be used at the mall, hotels, colleges and most likely at the ATM machine rooms.

### 2. NEED OF THE SYSTEM

The need of designing and manufacturing such a system, which will utilize free muscular energy, to convert it in to electricity. Electric power is the basic and important requirement of the world so there must be a system which converts free energy into electrical energy.

### 3.WORKING PRINCIPLE

This idea basically helps to conserve the muscular energy which is wasted while opening and closing. In this the angular movement of the door is converted into rotary motion. This rotary motion is achieved by using the belt and pulley arrangement. The two pulleys are used one is bigger pulley which is connected to the shaft passing through the door hinges. The v- belt is used to transmit the power and motion from bigger pulley to smaller pulley. The purpose of using V-belt is Centre distance between larger and smaller pulley. Thus the angular movement of door is converted into rotary motion and this rotary motion of the smaller pulley is given to the generator. The function of the generator is to convert mechanical energy into electrical energy.

The Dynamo consists of 3 major components: the stator, the armature, and the commutator (fig 1). The stator is a fixed structure that makes magnetic field;

The conversion of mechanical into electrical energy is usually done in order to use this electrical energy into various applications such as to glow the small bulbs, to charge the mobile phones or even to store this energy into batteries. Large dynamos require an electromagnet. The armature is made of coiled copper windings which rotate inside the magnetic field made by the stator. When the windings move, they cut through the lines of magnetic field. This creates pulses of electric power. The commutator is needed to produce direct current. In direct current power flows in only one direction through a wire, the problem is that the rotating armature in a dynamo reverses current each half turn, so the commutator is a rotary switch that disconnects the power during the reversed

current part of the cycle. Brushes are part of the commutator; the brushes must conduct electricity as they keep contact with the rotating armature. The first brushes were actual wire "brushes" made of small wires. These wore out easily and they developed graphic blocks to do the same job

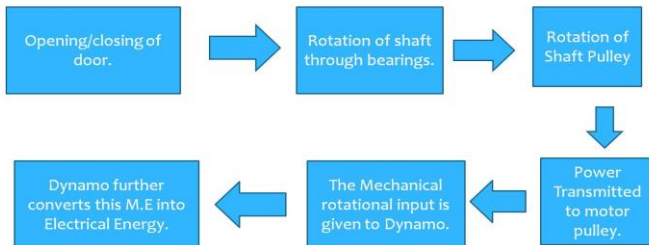
The main disadvantages of the mechanical systems are that there are frictional and vibrational losses occurring during transmission of the power. Also the storage of the mechanical energy is difficult. The efficiency plays important part in the transmission of power and the efficiency of mechanical systems is also poor, thus the generator is used to convert the mechanical energy into electrical energy.

The generator is used here, is permanent magnet DC synchronized motor. The generator voltage is 12volt D.C. This voltage is further amplified using IC MC34063 DC-DC convertor and is stored to the Lead Acid 12volt battery.

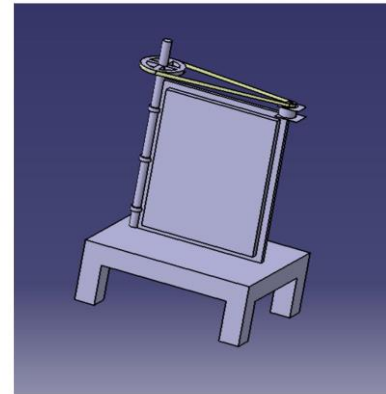
The battery is connected to the inverter. This inverter is used to convert the 12 Volt DC to the 230volt AC. This working principle is already in above chapter. This 230volt AC voltage is used to activate the light fan, bulb, etc. By increasing the capacity of battery an inverter circuit, the power rating can be increased. This arrangement can be fitted in the shopping complex, college and wherever the larger number of people walking through the door simultaneously.

### 5.DESIGN OF THE IDEA USING CATIA

#### WORKING PRINCIPLE

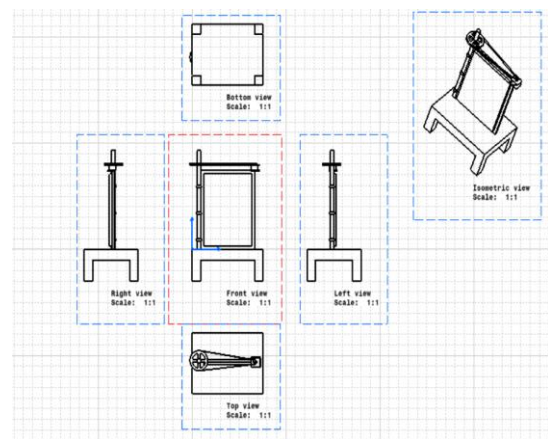


#### ISOMETRIC VIEW



### 4.COMPONENTS REQUIRED:

Sheet metal	1
Dynamo	1
Pulley(Big)	1
Pulley(Small)	1
V-belt	1
Shaft	1
L-angle	1
Ball Bearing	3



### 6. CONCLUSIONS

We conclude that the energy which is going waste one or the other way can be utilized to generate power using simple mechanism. As today’s world is completely dependent on different types of energies and these energies are going to disappear or exhaust one or the other day so we need to use free energy in order to run our basic appliances which require electricity for its working.

### 7.REFERENCES

- 01. B. B. Bryan, (April 12, 1927), Utilization of Surplus Energy Using Revolving Doors, US-1624656
- 02. J.-L. Menet, (21 February 2004), A double-step Savonius rotor for local production of electricity: a design study, ELSEVIER
- 03. Luciano Vasija, (May 22, 2001), Method of Generating Electricity, US-6236118.
- 04. Hrishikesh Hinge, P.E. Chaudhary, (02<sup>nd</sup> March 2016) "Door based power generation system and automatic opening of door", International Journal of Current Engineering and Technology.

### BIOGRAPHIES



Mr. Rohan R. Patil  
3<sup>rd</sup> Year Mechanical Engineering,  
DKTE's Textile and Engineering  
Institute, Ichalkaranji



Mr. Harsh R. Vernekar  
3<sup>rd</sup> Year Mechanical Engineering,  
DKTE's Textile and Engineering  
Institute, Ichalkaranji



Mr. Sushil L. Khade  
3<sup>rd</sup> Year Mechanical Engineering, DKTE's  
Textile and Engineering Institute,  
Ichalkaranji.



Mr. Ajay A. Rakshale  
3<sup>rd</sup> Year Mechanical Engineering,  
DKTE's Textile and Engineering  
Institute Ichalkaranji



Mr. Pravin L. Patil  
3<sup>rd</sup> Year Mechanical Engineering,  
DKTE's Textile and Engineering  
Institute Ichalkaranji