

Electricity Generator Pen (EGP)

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Abstract: This paper tries to present new way to generate Electricity by using existing technology along with daily usable small physical material components by applying basic science laws and formulae.

Index Terms—Electricity, Faraday's law, magnet, copper coil

I. INTRODUCTION

Electricity is the greatest gift of science to mankind.

Electricity is a source of energy. It is produced by battery or a coil of wires. Electricity generation is the process of creating electricity from other forms. Basically electricity is generated by the movement of a loop of wire or disc of copper between the poles of a magnet.

To provide the large amounts of steady power demanded by modern societies, large power plants have been built. Most power plants make electricity with a machine called a generator.

Generators use the principle of electro-magnetic induction, which exploits the relation between magnetism and electricity.

In this paper we use same principle for electricity generation but we use small scale electricity generator which help to light up small bulbs.

II. IDEA TO GENERATE ELECTRICITY

Our Idea Is Based On Generating Electricity By Converting Mechanical Energy To Electrical Energy.

Actually Our Idea Is

“When We Writing On Paper Using A Pen The Motion Of Pen Will Produce Some Amount Of Energy Which We Can Convert This Energy Into Electrical Energy”

III. HOW ELECTRICITY WILL GENERATE

We use Faraday's law of induction to generate electricity. Faraday's law of induction is a basic law of electromagnetism predicting how a magnetic field will interact with an electric circuit to produce an Electromotive

Force a phenomenon called electromagnetic induction. It is the fundamental operating principle of transforms, inductors and many types of electrical motors.

Following figure will represent our idea by using Faraday's Law

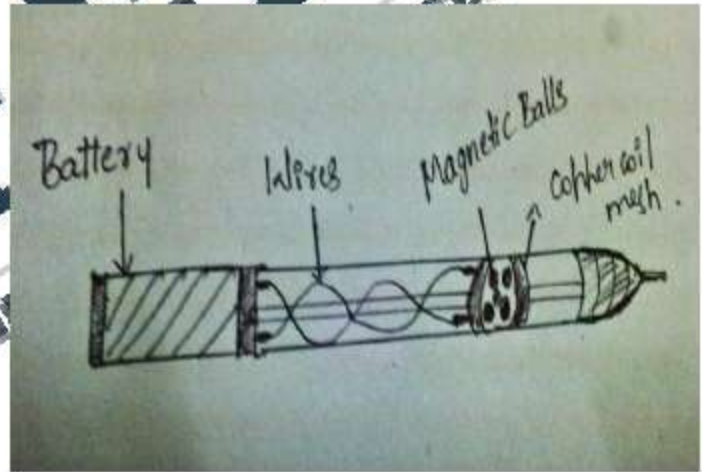


Fig. 1 electricity generator pen model.

In the above figure we use simple ball pen. We place magnetic balls inside the thin copper coil mesh in such a way that balls can move around the mesh. We place this copper coil mesh along with magnetic balls inside the pen. When we start to write using this pen the magnetic balls inside the copper coil mesh starts to move around the mesh. This will generate some amount of electricity because of electromagnetic induction.

Electric power which is generated during this process will transfer through wires connected to copper mesh to battery which connected at the end of pen.

IV. HOW MUCH ELECTRICITY CAN BE GENERATING

The amount of electricity generated can be calculate based on following formula. The voltage generated by a magnet and a coil is given by

Electric power=Number of turns in coil ×Rate of change of flux with respect to time

The flux of interest is the flux that goes through the coil. Ball shaped coil which contains ball shaped magnets will generate high voltage if thickness of coil increased we can get more voltage. The magnet strength also affects the voltage.

V. BATTERY TECHNOLOGY

After implementing our Electricity Generator Pen we need to store that electric power in battery. Generally people thinks it's not possible to charge the battery by writing one or two minutes.

Now a days battery technology improved lot .mobile batteries uses less amount of energy but stores and uses that energy longer time. Lot of researches are going on battery technology. New batteries are developed now a days which can charged in 10 to 20 seconds and can be used for many hours.

Hence this future technology will help to improve our model.

VI. ADVANTAGES OF EGP

- Easy to implement.
- Less cost
- More efficient
- Less time consumption
- Smaller in size.
- No need of secondary source to generate electricity.

- Generate electricity anywhere and anytime

VII. REAL-LIFE APPLICATIONS OF EGP

1. If a man lost in forest or desert he can use EGP to light up a small bulb and try to find a path to safe place.
2. Soldiers who working in borders can use EGP to light up a bulb in cold weather also.
3. Students who are in village suffer from electricity problem during rainy season they can use EGP which will help to light up a bulb to read a text from text books.

VIII. FUTURE ENHANCEMENT

- 1) In beginning stage we used normal magnetic balls inside the pen to increase the speed of movement of magnetic balls we can use nano particles which comes under nanotechnology it help us to produce more electric power using less physical energy.
- 2) In beginning stage EGP uses normal papers for writing but in future we can design a metal paper which can be wrapped around pen and can removed when we need to generate electricity after we can wrap around the pen this will save trees

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