International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 2 Feb 2022, pp: 251-256 www.ijaem.net ISSN: 2395-5252

# Frictionless Power Generation Using Flywheel and Magneto System in Electric Vehicle

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Submitted: 25-01-2022 Revised: 05-02-2022 Accepted: 08-02-2022

**ABSTRACT**:
Now days as we see the condition of Indian population it is increasing day by as people are increasing, at the same time rate of conductance of using electricity also has been increased. In today's generation electric cars are the future auto-motives. Using those needs high consumption of electricity is required. So in future the problem of cut off and power charging may occur & we will be required in huge amount of potential voltage. So, in order to reduce the requirement this project will help in substitute power cum alternator to its own vehicle in electric cars, so we develop a power generation concept from which we can generate the power with a rotating wheel without any physical contact of elements using magnets.

**KEYWORDS:**Flywheel, Neodymium Magnets ,CopperCoiling,Rectifier ,Battery Storage System

## I. INTRODUCTION

Access to sustainable energy has a direct relationship with job creation, industrialization, health, climate change, food production, and consequently economic growth. However, more than one billion people in different parts of the world still lack basic access to modern energy services. According to Africa Energy Outlook Report, more than 620 million people, representing two-thirds of the population in the region, still live without electricity. The mean electricity consumption per capita cannot even keep a single 50-watt light bulb on. Inability of grid-based power generation capacity to sufficiently and reliably meet the increasingly growing energy demands has encouraged large-scale ownership of expensive generators that run on. Energy storage systems (ESS) can be used to balance electrical energy supply and demand. The process involves converting and storing electrical energy from an available source into another form of energy, which can be converted back into electrical energy when needed. The forms of energy storage conversion can be chemical, mechanical, thermal, or magnetic. ESS enables electricity to be produced when it is needed and stored when the generation exceeds the demand. Storage is beneficial when there is a low demand, low generation cost, or when the available energy sources are intermittent. At the same time, stored energy can be consumed at times of high demand, high generation cost, or when no alternative generation is available. Energy demand continues to increase, as demanded by the households and industries with high growth rates in BRIC and developing countries. This has led to increases in energy prices and traditional energy generation methods are less able to adapt, exacerbating the issues due to market deregulation, power quality problems, and pressures to limit carbon dioxide emissions. Renewable energy sources (RES) and potential distributed generation (DG) are considered as supplements or replacements for traditional generation methods however, there are major challenges associated with energy supply coming from renewables, due to their intermittent nature

## II. PROBLEM STATEMENT

1. Need of electricity in future, is a huge requirement because of new & automatic technologies invading day by day.
2. Charging an electric car needs high proportional of cost.

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3. Producing of electricity procedure may harm environmental regard-ness for example power plant like thermal, which creates a huge pollution.
4. And mainly when the vehicle is in motion condition there is huge energy wasting, we can alternatively use it to produce Electricity, which can be used for minor applications or we can store it in a battery for its own use.
5. Charging a electric vehicle, requires charging station in short distance, our project minimizes the overall time to continue charging for a time period

**Objective**

- To research about the problems which encounters while the electric vehicle runoff to drainage?
- To revise the problem to its modification by invading new ideas.
- To revise the probable solution by surveying for required components & technology to its availability in market.
- To analytically calculate the required components for its use.
- To design a development model using CATIA v5 software.
- To purchase the material on available resource by minimizing its cost and selection criteria.
- To fabricate and assemble the model for a designed parameters & test for its purpose-ness.

## III. WORKING

**1) Components**

**NEODYMIUM MAGNETS**

- The Neodymium metal element is initially separated from refined Rare Earth oxides in an electrolytic furnace.
- The "Rare Earth" elements are lanthanides (also called lanthanides) and the term arises from the uncommon oxide minerals used to isolate the elements.
- The Rare Earth elements are abundant e.g. Neodymium element is more common than gold.

**FLYWHEEL**

Flywheels are rotating mechanical devices to store kinetic energy. They capture the momentum in a rotating mass and release the energy by applying torque to a mechanical load.

**BELT DRIVES**

- A belt is a loop of flexible material used to link two or more rotating shafts mechanically, most often parallel.
- Belts may be used as a source of motion, to transmit power efficiently or to track relative movement.
- Belts are looped over pulleys and may have a twist between thepulleys, and the shafts need not be parallel.

**COIL**

- The number of windings per coil produces a design challenge.
- The more windings will increase the voltage produced by each coil but in turn it will also increase the size of each coil. In order to reduce the size of each coil a wire with a greater size space can be utilized.
- Again another challenge is presented, the smaller the wire becomes the less current will flow before the wire begins to heat up due to the increased resistance of a small wire.
- Each one of our coils has a measured resistance of 40 Ω; a smaller gauge wire would further reduce this

**PROPOSED SYSTEM**

**Schematic diagram**

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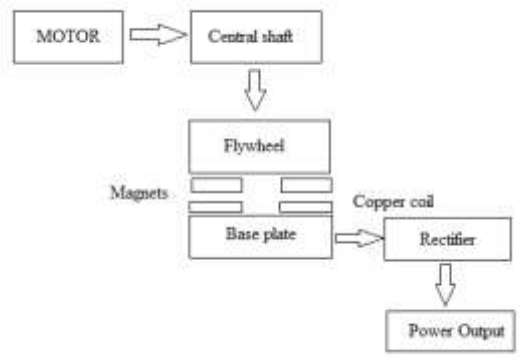
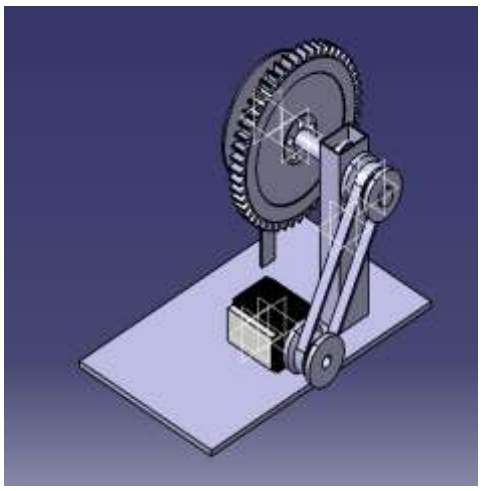
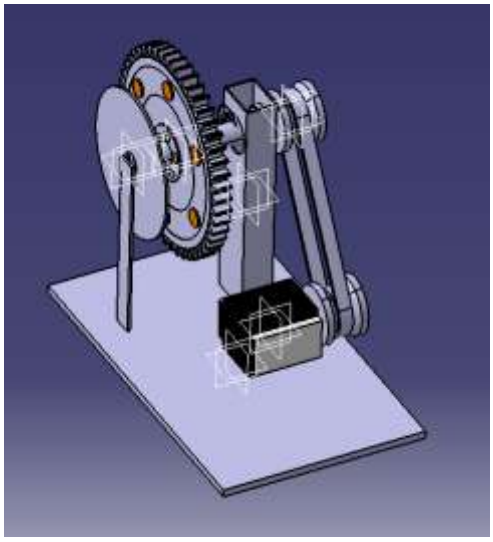
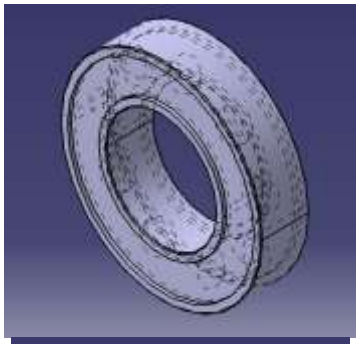


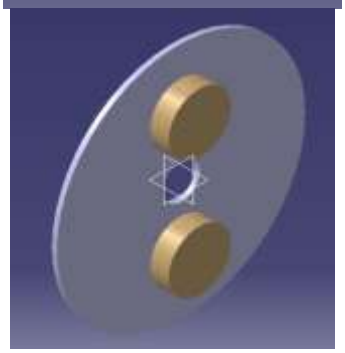

- The construction starts with a Dc motor mounted on a frame with rigid clamping.
- As the motor is driven the central shaft attached via transmission starts to rotate.
- A flywheel is mounted on the same shaft which contains magnets.
- At parallel side base plate with an another shaft is held on the frame with copper coil.
- As the motor starts, central shaft rotates with an flywheel because of magnets attached on the flywheel, as flywheel rotates it will store the kinetic energy while it is in running condition & will release the K.E.
- As alternating current (AC) passes through a magnetic field an electrical current is generated. Then this is converted to DC output via the rectifier.

**PROPOSED SYSTEM**









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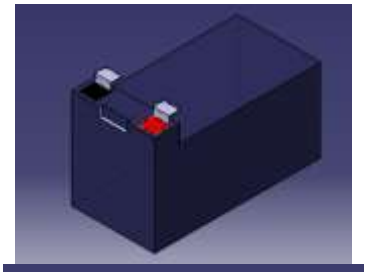

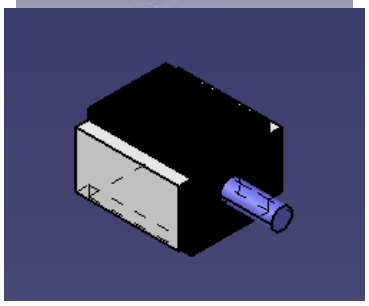

## IV. LITERATURE REVIEW:

**2.1 Electricity Generation using Flywheel by Kumud Pant1, Jyoti Mehra1, Ketan Naula1, Sunil Singh1 and Mr. Ambedkar Rai2 International Journal on Emerging Technologies (Special Issue NCETST-2017) 8(1): 582-584(2017)**

Flywheel Energy Storage (FES) technology works by accelerating a flywheel to a very high speed and maintaining the energy in the system as rotational energy. Most FES system uses electricity to accelerate the flywheel. In this work we use mechanical energy. To achieve our target in this work we use a DC generator to convert a rotational energy into DC electrical output. This paper presents an analysis which shows that FES is a promising alternative for mitigating energy storage problem.

**2.2 Frictionless Energy Generation Using Flywheel by Kunal.U. Shinde, [2]Aniket Satpute, [2]Kaiwalya Zanker, [2]Sanjay Verma, [2]Tushar Mahale International Journal of Disaster Recovery and Business Continuity Vol.11, No. 3, (2020), pp. 2104–2109**

The production and application of energy are vital to the economies of all countries and it is needed for many activities such as: lighting and phone charging and driving the bike and lot of other stuff. Energy which is conventionally produced by non-renewable sources such as petrol, Kerosene and nuclear which unfortunately create pollution; this is the main reason the idea of producing energy using a bike or Cycle Tyre. In current scenario cycling competitions, as well as for gym purpose throughout the year. We could Generates sufficient energy to charge small and large devices. By use of conventional tools the problem arises is that, for utilization of required amount of energy we need to take the aid of physical contact with rotating element like some generating mechanism or generator to overcome this problem we are developing energy using flywheel

**2.3 Free energy generation by using flywheel by Mr. Yuvraj Kisan Lad1, Mr. Suraj Uddhav Pendhe2, International Journal of Advance Research in Science & Engineering Volume No.07, Special Issue N0.03, April 2018**

The production and use of energy are vital to the economies of all countries and it is needed for many activities such as lighting and phone charging and driving the bike and lot of other stuff, Energy is usually produced by non-renewable sources such as petrol, kerosene and nuclear which unfortunately create pollution, this is the main reason the idea of producing energy using a bike or Cycle tyre. Since there are cycling competitions that are conducted throughout the year we could Generates sufficient energy to charge small and large devices. But the problem is lots of other existing energy generation mechanism or generators generate energy by taking some physical contact with tire but we are developing this idea that could generates electricity without any friction with flywheel.

**2.4 A Review of Flywheel Energy Storage System Technologies and Their Applications by Mustafa E. Amiryar * and Keith R. Pullen * Applied Science 2017,7,286**

Energy storage systems (ESS) provide a means for improving the efficiency of electrical systems when there are imbalances between supply and demand. Additionally, they are a key element for improving the stability and quality of electrical networks. They add flexibility into the electrical system by mitigating the supply intermittency, recently made worse by an increased penetration of renewable generation. One energy storage technology now arousing great interest is the flywheel energy storage systems (FESS), since this technology can offer many advantages as an energy storage solution over the alternatives. Flywheels have attributes of a high cycle life, long operational life, high round-trip efficiency, high power density, low environmental impact, and can store mega joule (MJ) levels of energy with no upper limit when configured in banks. This paper presents a critical review of FESS in regards to its main components and applications, an approach not

captured in earlier reviews. Additionally, earlier reviews do not include the most recent literature in this fast-moving field. A description of the flywheel structure and its main components is provided, and different types of electric machines, power electronics converter topologies, and bearing systems for use in flywheel storage systems are discussed. The main applications of FESS are explained and commercially available flywheel prototypes for each application are described. The paper concludes with recommendations for future research.

**2.5 Energy harvesting from body motion using rotational micro-generation by Edwar. Romero-Ramirez Michigan Technological University**

Research on energy scavenging from body motion has been investigated to evaluate the feasibility of powering wearable or implantable systems. Energy from walking has been previously extracted using generators placed on shoes, backpacks, and knee braces while producing power levels ranging from milli-watts to watts. The research presented in this paper examines the available power from walking and running at several body locations. The ankle, knee, hip, chest, wrist, elbow, upper arm, side of the head, and back of the head were the chosen target localizations. Joints were preferred since they experience the most drastic acceleration changes. For this, a motor-driven treadmill test was performed on 11 healthy individuals at several walking (1-4 mph) and running (2-5 mph) speeds. The treadmill test provided the acceleration magnitudes from the listed body locations. Power can be estimated from the treadmill evaluation since it is proportional to the acceleration and frequency of occurrence. Available power output from walking was determined to be greater than 1mW/cm³ for most body locations while being over 10mW/cm³ at the foot and ankle locations. Available power from running was found to be almost 10 times higher than that from walking. Most energy

**2.6 Experimental Design and Optimization of Free Energy Generator by using Neodymium Magnets by Vinoth M A 1, Sivasankar P 2& Lingaraj N 3 International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE) Vol. 3, Special Issue 9, March 2017**

This paper deals with the fabrication of freem energy generator which runs on almost no input and gives a valuable amount of electrical energy which can be used to for many purposes. This research paper revolves around the construction, working and applications of free energy generator & its future enhancements. Here, Disc shaped neodymium magnets were placed in such a way that all the north poles or south poles are facing one direction. This magnet also produces a magnetic field, so both the magnetic fields repel each other, which causes the fins to move. By using the magnetic force of magnets continuous motion is generated which leads to generate an electric power. But at the same time there is misconception of free energy generator. By this research work, I certainly say that this free energy generator which leads a drastic change in today's modern world and this experimental design proves to be a pioneer in the field of research of free energy.

**2.7 Frictionless power generation using bicycle by Akshay Sawant1, Pratik Solanke1, Chakradhar Aher1, Ganesh Damdhar1, Mandar Deshpande1 International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE) Volume 5, Issue 5, May 2016**

The intention of this project is to build a straight forward human powered generator from a used bicycle and to use it to power light bulbs, cell phones, laptops, and other small appliances. This project will help to develop engineering skills while learning about a clean way of generating electricity and satisfying our basic requirement. We are going to use the hard drive magnet and inductive coil to generate electricity due to which our mobile phone will be charge and followed by ac to dc converter. This is totally clean way of generating energy. As fuel is not a renewable energy source and the prices are increasing day by day. It will not be affordable by a common man after some period. Here no fuel is required to generate electricity, so everybody can afford this method for power generation also it eliminates the emission of CO2 which will reduces the pollution. Conventional methods for generating electricity make use of dynamo and wind turbine, but they have disadvantage that they produce friction and reduces speed which require more efforts. For the project to work we need strong electromagnets so we have used Neodymium magnets and also used coil. The basic idea of this project comes from the functioning of motor, that is how it rotates in the magnetic field and cut's the magnetic line and how flux is introduced into the coil. The motivation behind the project is to generate electricity without having any friction and without using natural resources.

**2.8 Power Generation Using Maglev Windmill by Ajinkya Kulkarni, Sumedh Kulkarni and Ranjit Bhosale International Journal of Electronics Engineering Research. ISSN 0975-6450 Volume 9, Number 6 (2017) pp. 815-821**

Magnetic levitation or maglev technology is a technique which is used to lift the objects with the help of magnetic fields. Pressure of the magnetic field is used to supress the effect of gravitational and other forces. As wind is a form of renewable source of energy, it can be used to generate electricity by converting kinetic energy into electric energy with the help of wind turbine. The advantage of a maglev windmill over a conventional one is, mechanical friction is totally eliminated as the rotor is floating in the air due to levitation.

## V. FUTURE SCOPE

This project will be having huge demand when electric era begins & power requirement becomes a huge problem. Our procedure of generating electricity is reliable, easy & contactless with minimum cost. Our project can be used in most of the automotive vehicles like train wheels, heavy trucks, three wheeler & etc.

## VI. CONCLUSION

Initialization cost is low (one time installment)
Maintenance cost is less.
Reliable form of power generation because of contacts less.
Simple in construction with minimum extra components & materials.
Free power generation.

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