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Frictionless Energy Generation using Flywheel

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Abstract: ***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.***

Keywords: Electricity generation, Gravity, Neodymium magnet, flywheel, copper winding.

I. INTRODUCTION

This is a mechanical device, which uses the flywheel to store energy in the form of inertia. In this system, we applied an additional energy source to start the main motor like electricity. In this system, main motor is used to drive a series of pulley and belt arrangement, which forms a gear train arrangement which produce a twice/ thrice speed at the shaft of generator. The significant thing about the system is that the electricity generated at the output of the shaft is more than that of input. The inertia of flywheel can be increased by increasing the radius of flywheel and weight of flywheel. Firstly, the requirement for an effective system needs to be a suitable flywheel with a large diameter and vast majority of the weight needs to be close to rim. The construction needs to be robust and secure as ideally. The rate of rotation will be as high as possible as the weight on the flywheel is concentrated outward of the rim which needs to be exactly at right angles to the axle on which it rotates and exactly centred on the axle. The main motor is at low speed, low voltage input motor, the generator is high speed, and high voltage output generator. Therefore, when we apply an extra energy to the main motor it starts running, which causes to rotate the flywheel. When the motor is reaches the highest speed (constant speed) we switch the power by applying the electrical energy generated by the generator. We add the extra thing in the system like transformers, rectifier, inverter etc. to run the system and take the efficiency output.

II. PROBLEM STATEMENT

1) *Loss of Power:* In other system there are the various losses. Which include heat loss; friction loss etc. As this are the major loss of energy for this, frictionless energy must be needed.
2) *More Friction:* As the components are having direct contact which cause friction and friction causes the heating effect of components and due to direct contact friction also causes the wear and tear. Due to the friction we also have to exert more power to overcome the friction power and due to which noise also produce in the machine. Due to friction losses engine consumed more fuel which cause wastage of energy. So, we cannot convert all input power to the output energy.
3) *Wastage of Energy:* When energy is transfer between two bodies this total energy usually results in maximum kinetic energy loss of the system.
4) *Less Quantity of fuel on Earth:* There is a limited amount of fossil fuel. Which found in rare places each of those regions contains less than 15 percent of the world's proven reserves Worldwide, oil reserve is still quite a bit left, so that supply can be exponentially increase to cope with demand at least up until 2020. According to EIA forecasts the average production of crude oil will be 29.2 million barrels per day (b/d) from April to December 2020. Demand for oil is accelerating rapidly worldwide while supplies remain finite.

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III. LITERATURE REVIEW

1) Akshay Sawant, Pratik Solanke, Mandar Deshpande presented paper on "Frictionless power generation using bicycle". The paper describes the research and analysis of frictionless power generation using magnets. 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.
2) Santosh Bawage, Akash Khote, et all presented paper on "Design and fabrication of contactless energy generation using flywheel for EV". In this paper the author tells how we can design and fabricate a model of contactless energy generation using flywheel for electric vehicle. As per the Government announcement of electrifying the vehicles upto 2030 there will be need of Charging Stations everywhere from metropolitan cities to remote areas. The practical scenario is that there will be many problems in fully development of charging stations across the country. This is the main reason the idea behind the generation of energy within the vehicle itself without any contact and to avoid the pollution.
3) Yuvraj Lad, Suraj Pendhe, Sagar Raut et all presented paper on "Free energy generation using flywheel". This paper tells us about new idea for the frictionless energy generation using flywheel by converting kinetic energy directly to electric energy to generates electricity without using dynamo. 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 tyre but we are developing this idea that could generates electricity without any friction with flywheel.
4) Kumad Pant, Jyoti Mehra, Ketan Naula, et all presented paper on "Electricity generation using flywheel". This paper presents an analysis which shows that FES (Flywheel Energy Storage) is a promising alternative for mitigating energy storage problem. 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.
5) Akhil Bhat, Shrikrushna Borbale, S.H. Joshi presented paper on "Contactless energy generation using flywheel". This Paper represents the investigation of free energy using flywheel arrangement. The energy lost due to the friction in dynamo is utilised to generate free energy. This extra free energy is used to run other electrical devices. It comprises of A.C. engine of half strength limit which is utilized to drive an arrangement of belt and pulley drive which in turn rotates the shaft on which the wheel is mounted. The interesting thing about this framework is that more prominent electrical yield power can be acquired from the alternator that gives off an impression of being drawn from the information engine. It is finished with the assistance of Gravity wheel. The gravity wheel or flywheel is combined with the rigging train so as to create free energy. This free energy is free of cost.
6) Anand Babu K., Hemant Dayalu D., M Hariprasad, et all presented paper on "Design and fabrication of magnetic generator using neodymium magnets." Generally, a generator made of coils circuits powered by the current. But there is a generator that generates and stores energy in the battery without the help of initial current. This generator is made by using neodymium magnets to run and generate energy and store it in the battery. There is no effect on the environment while generating this kind of energy. We have used the 3D modeled roller to reduce the weight of the entire setup which in turn helps us gain more voltage. Such a generator can produce up to 5 volts that can be increased by a step-up transformer. The energy generated by this generator can be used for different purposes like to charge mobile phones, Laptops, to operate a table fan, etc. This generator can also be used as an electricity generator for electrical vehicles.

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7) June Tharaple Lwin. presented paper on "Design and calculation of flywheel free energy generating system with motor generator". This study deals with the concept of free energy system and its generation using flywheel system. The energy storing capacity of flywheel is used to generate extra amount free energy. This extra energy is used to run the other electrical home appliances. It consists of A.C. motor of 1.5 horsepower capacity is used to drive a series of belt and pulley drive which form a gear-train and produces over double rpm at the shaft of an alternator. The intriguing thing about this system is that greater electrical output power can be obtained from the output of the alternator than appears to be drawn from the input motor. It is done with the help of gravity wheel. The gravity wheel or flywheel is coupled with the gear-train in order to produce more extra energy or free energy. The overall study is done with various parameters of flywheel to obtain the maximum free energy output (4.167 kW= 5kW) of the system.
8) Sandeep Thakare, Swapnil Zode, Shubham Ingale et all presented paper on "Self generator free energy flywheel". The idea of this project explores the possibility of combining three units i.e. Torsional vibrations, Flywheel and Mechanical drive into a single unit, such that the device generates energy. Free energy means the zero cost energy. Mechanical energy which drives windmill by using the blowing force of wind, or Solar energy in solar cell which is converts into DC current and store in batteries. Other energies obtained are from wind power, water power & telluric power. Free energy generator is used to generate these types of energy. This is how we can try to make the environment and a common man comfortable. It is an energy efficient system as it offers the benefits. This can be used for the commercial as well as domestic purposes.

IV. OBJECTIVES

1) *To Save Energy:* Flywheel is used in this project due to which kinetic energy is saved while normal & breaking the vehicle.
2) *To Reduce Friction:* Dynamo mechanism or regenerative braking system are not used in this project. We have used coils & magnet concept to generate electricity.
3) *No air and Environment Pollution:* No fuel is required to run this project due to which no exhausts of pollutants take place.
4) *Easy Power Generation:* As the vehicle is running the power generation takes place by itself and no need of extra efforts to generate power.
5) *Low Cost:* Main constrain is a Low-cost device middle class or small-scale industries or society can use it with the vehicles.

V. DESIGN COMPONENTS

Component used in this project are

1) Neodymium Magnet
2) Flywheel
3) Chain Drive
4) Freewheel
5) Belt drive
6) Battery
7) Bearing
8) Coil

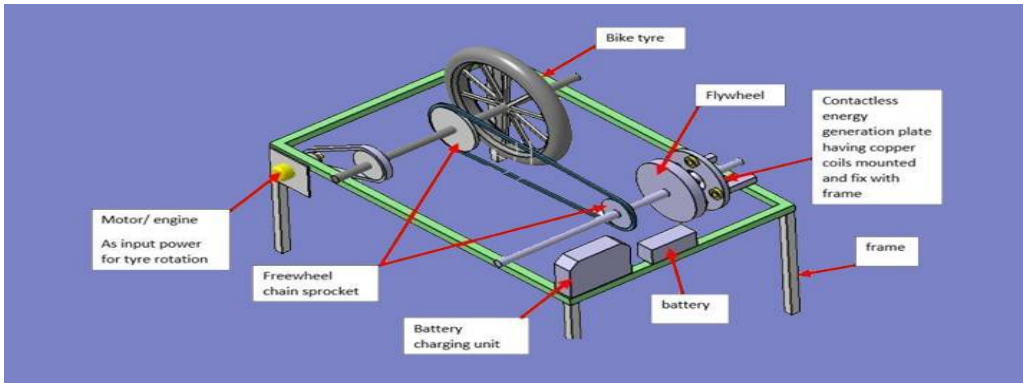


Fig Working Setup

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VI. FUTURE SCOPE

We are primary objective of developing this project is for charging electric vehicles battery while travelling in remote place or villages, and it can be expanded by increasing the number of magnets and coils and reducing the space in between the rotating element (disk) on which magnets and coils are placed, by this maximum line of force is cut by the coil and maximum flux and induced voltage is generated. Using this project on motor cycle we can g charge which takes 1 to 1:30 hour to get full charge. By using this project we are going eliminate the disadvantages of conventional power generator which make use of dynamo as a power generator which produces friction and decrease the speed of bicycle. In this project we have eliminate direct contact of dynamo which cause friction, and produces clean energy.

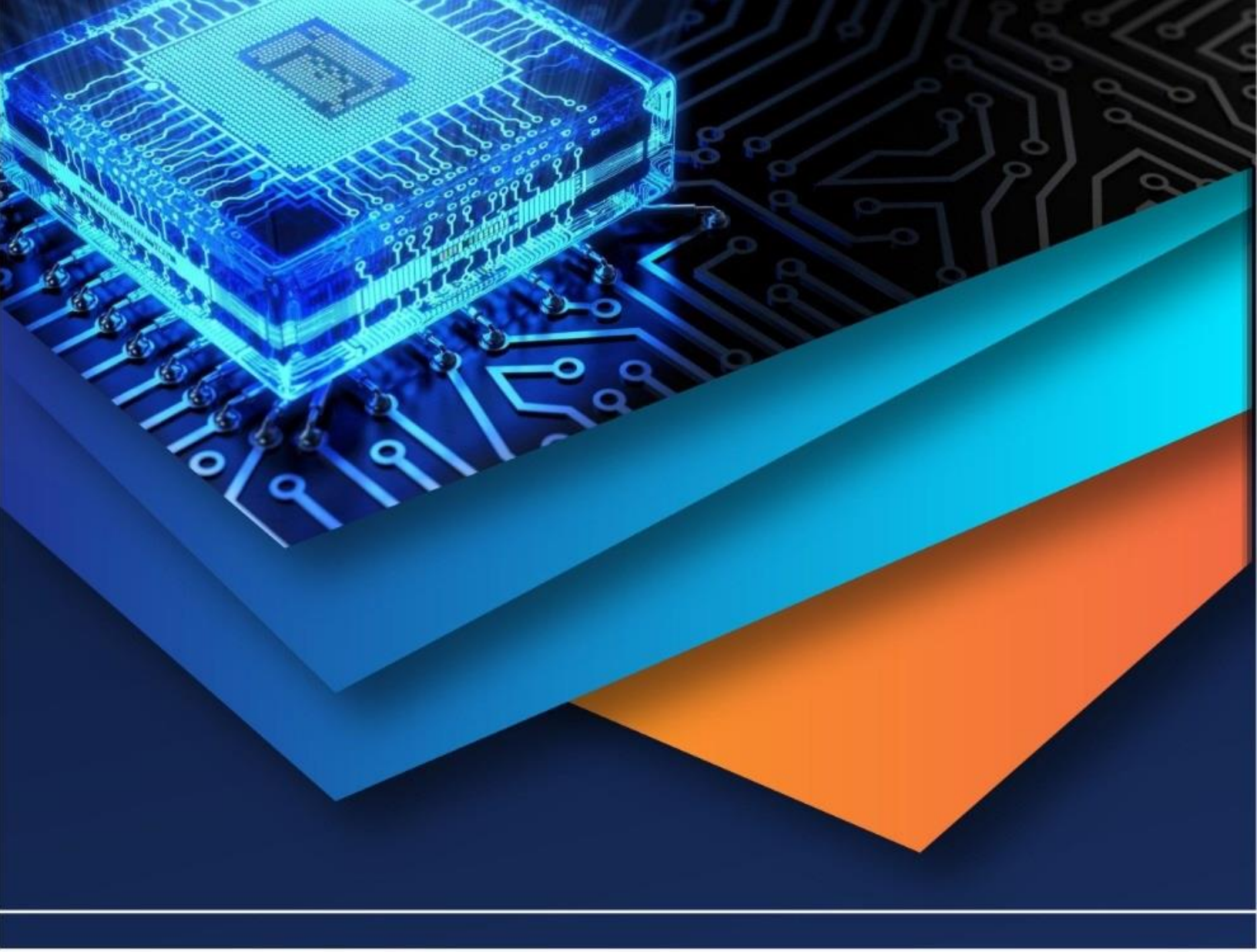
VII. CONCLUSION

We can easily conclude that, this system arrangement generates electricity without any friction, with the help of rotating element “flywheel” and it can be utilized in the maximum amount. We have successfully designed the project and implemented on frame, the generated power is utilized to charge the mobile phones and mobile devices; we also grasp the concept of electromagnetism and how to produce electric power by just placing the magnet and coil of equal quantity on different disks without making any direct or physical contact. The output which is voltage output taken from the assembly is totally dependent on the speed (rpm) of the wheels so voltage is fluctuating so a battery is used to provide a constant power supply to our device say cell phone. A battery connected to the generator assembly is continuously charged when shaft moves at 80- 90 rpm which is normal speed of bike. By this assembly battery is continuously charging.

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