

FREE ENERGY GENERATION BY USING FLYWHEEL

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ABSTRACT

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.

Keywords: Chain Drive, Coils, Contactless energy generation, Freewheel, Flywheel, Neodymium Magnets, Rechargeable Battery.

LINTRODUCTION

This is a mechanical device which uses the flywheel to store energy in the form of inertia. Let us explain all the system. In this system we apply extra energy source to start the main motor like electricity or by applying the mechanical energy. In this system a 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 intriguing thing about this system is that grater electrical can be drawn from the output generator than appears to be drawn from the input drive to the motor. The inertia of flywheel can be increase by increasing the radius of flywheel, weight of flywheel.

Firstly, the requirement for an effective system needs to be a suitable flywheel with as large a diameter as is practical, 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 high as possible, and of course, the wheel increases if the flywheel weight is concentrated as far out toward the rim of the flywheel as is possible. Needs to be exactly at right

angles to the axle on which it rotates and exactly centered on the axle. The main motor is low speed and low voltage input motor and the generator is high speed and high voltage output generator. So, 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, inverter, any extra needed circuits etc. to run the system and take the efficiency output.

II. CONTACTLESS ENERGY GENERATION WITH FLYWHEEL

Currently, this significant (in our opinion) amount of energy is actually wasted and transformed into heat. Instead, in this study, a prototype scavenging system (dedicated to fitness/stationary bikes) to collect and (re)use this energy is presented. Specifically, we depict the design of a low budget system that uses existing, discrete components and is able to scavenge some of the energy spent by the biker. The experimental results show that the system is functional, but its efficiency is limited by (mechanical) losses before the collection. "FREE ENERGY GENERATION BY USING FLYWHEEL" When riding vehicle a great amount of kinetic energy is lost while breaking. To use this energy where using a flywheel to store the energy which is normally lost during breaking and reuse it to help propel the rider when starting. By designing the flywheel which is more suitable to the frame properties and rider compatibility the efforts of the rider can be reduce. The rider can charge the flywheel during downward motion on hilly road and boost the vehicle when accelerating. These project preliminary deals with one of the method for recovering the kinetic energy from the Flywheel, which is implemented in a vehicle. In this we are concentrating on the mass of the flywheel and redesigning it.

III.DESIGN OBJECTIVE OF PROJECT

As the basic law of Physics says energy can neither be created nor be destroyed it can only be converted from one form to another. During huge amount of energy is lost to atmosphere as heat.It will be good if we could store this energy somehow which is otherwise getting wasted out and reuse it next time we started to accelerate. Flywheel concept with wheel refers to a system in which the kinetic energy of the vehicle is stored temporarily, as an accumulative energy, during deceleration, and is reused as kinetic energy during acceleration or running. Flywheel concept with wheel is a small, yet very important, step toward our eventual independence from fossil fuels. These kinds of brakes allow batteries to be used for longer periods of time without the need to be plugged into an external charger. These types of brakes also extend the driving range of fully electric vehicles. Flywheel concept with wheel is a way to extend range of the electric vehicles. In many hybrid vehicles cases, this system is also applied hybrid vehicles to improve fuel economy. A normal car is only about 20% efficient; meaning some 80% of the energy it expends is wasted as heat created by friction. Flywheel concept with wheel could

reclaim as much as half of that wasted energy, which equates into more motion produced by the fuel we are paying for instead of using that fuel to create heat that is being dissipated uselessly into the environment.

IV. WHATS NEW?

Electric trains, cars, and other electric vehicles are powered by electric motors connected to batteries. When we're driving along, energy flows from the batteries to the motors, turning the wheels and providing us with the kinetic energy we need to move. When we stop and hit the brakes, the whole process goes into reverse: electronic circuits cut the power to the motors. Now, our kinetic energy and momentum makes the wheels turn the motors, so the motors work like generators and start producing electricity instead of consuming it. Power flows back from these motor-generators to the batteries, charging them up. So a good proportion of the energy we lose by braking is returned to the batteries and can be reused when we start off again. In practice, regenerative brakes take time to slow things down, so here our system zero friction no physical contact of vehicle connected, the flywheel plate just connected parallel with the type shaft to get the good output continuously even when there is braking.

V. HARDWARE DESCRIPTION

Firstly, the requirement for an effective system needs to be a suitable flywheel with as large a diameter as is practical. The construction needs to be robust and secure as ideally, the rate of rotation will be high as possible. Neodynamic magnets are used to generate magnetic flux, rotating magnet (rotor) which distorts and cuts through the magnetic lines of flux of the rotor. When the rotor cuts through lines of magnetic flux it makes electricity. An electromagnetic coil is an electrical conductor such as a wire in the shape of a coil; coil generates an EMF (voltage) in the conductor.

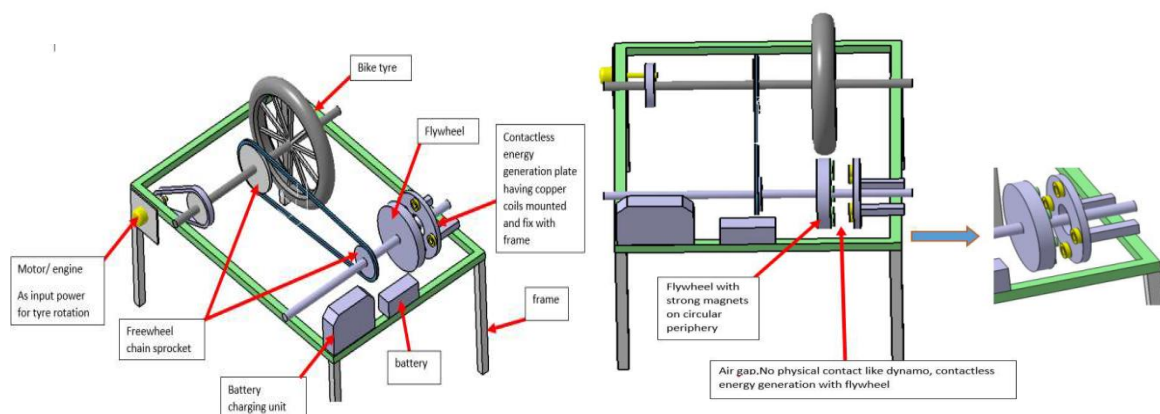


Fig.1

Components:

- Flywheel
- Chain drive
- Motor
- Neodymium magnets
- Coils
- Battery
- Freewheel



Fig.2

5.1 FLYWHEEL:

Why we need flywheel?

Engines are most efficient when they're producing power at a constant, relatively high speed. The only trouble is, the vehicles and machines when they drive need to operate at all kinds of different speeds and sometimes need to stop altogether. Clutches and gears partly solve this problem. But what clutches and gears can't do is save the energy, we waste energy when brake is applied and give it back again later. That's a job for a flywheel. Flywheels resist changes in rotational speed by their moment of inertia. The amount of energy stored in a flywheel is proportional to the square of its rotational speed. The way to change a flywheel's stored energy is by increasing or decreasing its rotational speed applying a torque aligned with its axis of symmetry.

5.2 CHAIN DRIVE

Chain drive is a way of transmitting mechanical power from one place to another. It is often used to convey power to the wheels of a vehicle, particularly bicycles and motorcycles.

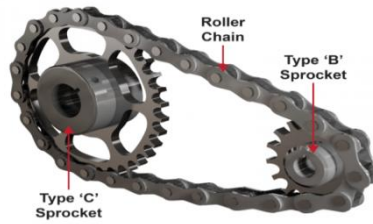


Fig.3

5.3 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.



Fig.4

5.4 COILS

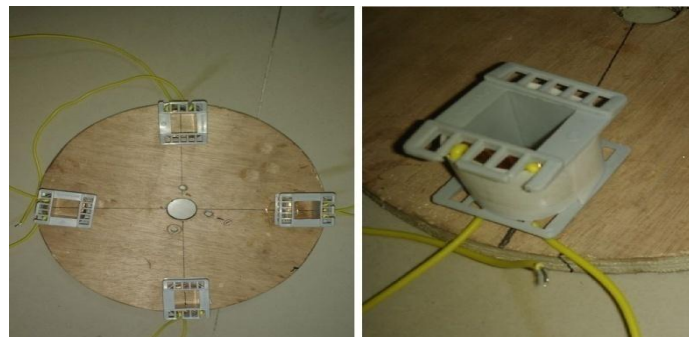


Fig.6

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 resistance.

5.5 FREEWHEEL

In mechanical or automotive engineering, a freewheel or overrunning clutch is a device in a transmission that disengages the driveshaft from the driven shaft when the driven shaft rotates faster than the driveshaft. An overdrive is sometimes mistakenly called a freewheel, but is otherwise unrelated.

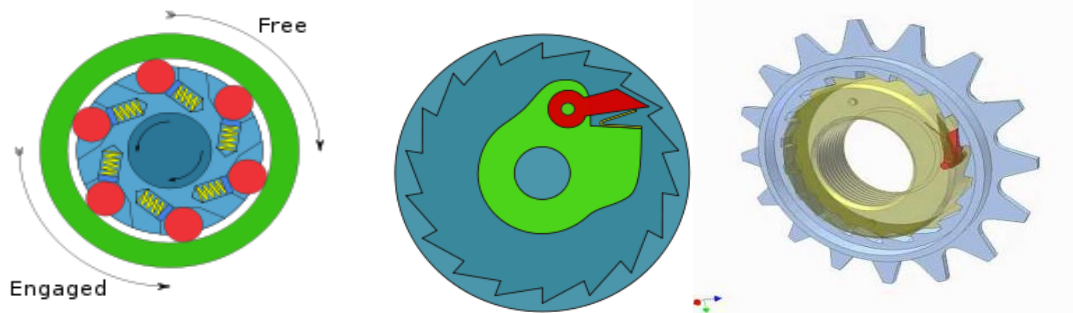


Fig.7

The condition of a driven shaft spinning faster than its driveshaft exists in most bicycles when the rider holds his or her feet still, no longer pushing the pedals. In a fixed-gear bicycle, without a freewheel the rear wheel would drive the pedals around. An analogous condition exists in an automobile with a manual transmission going downhill, or any situation where the driver takes his or her foot off the gas pedal, closing the throttle; the wheels want to drive the engine, possibly at a higher RPM. In a two-stroke engine this can be a catastrophic situation as many two stroke engines depend on a fuel/oil mixture for lubrication, a shortage of fuel to the engine would result in a shortage of oil in the cylinders, and the pistons would seize after a very short time causing extensive engine damage.

VI.CALCULATION

- BELT DRIVE TRANSMISSION:

$$\frac{\text{RPM of Motor}}{\text{RPM of shaft 1}} = \frac{\text{Diameter of shaft pulley}}{\text{Diameter of Motor pulley}}$$

- CHAIN DRIVE TRANSMISSION:

$$\frac{\text{RPM of Shaft 1}}{\text{RPM of shaft 2}} = \frac{\text{No of teeth on larger pulley}}{\text{No of teeth on smaller pulley}}$$

According to design Magnets will also rotate with same speed as flywheel.

Power transmitted by shaft,

$$P = 2\pi NT / 60$$

Where, N → Rpm of shaft 1

T → Torque transmitted

P → Power Available

We add the extra thing in the system like transformers, inverter, any extra needed circuits etc. to run the system and take the efficiency output.

VII.RESULTS AND DISCUSSIONS

In this project we are running flywheel at 800 rpm and generating 9 to 12 volts dc current which charge the 12 volts battery and we add the extra things in the system like transformers, inverter, any extra needed circuits etc. to run the system and take the efficiency output.

VIII.FUTURE SCOPES

We are primarily developing the project for charging electric vehicles battery while travelling in remote place and it can be expanded by increasing the magnets and coils in quantity and reducing the space in between the disks on which magnets and coils are placed, by this maximum line of force is cut by the coil and flux will generate more and induced voltage will be maximum. Using this project on motor cycle we can charge battery which takes 1 to 1:30 hour to get full charge. By using this project we are going to remove the disadvantage of conventional power generator which make use of dynamo as a power generator which produces friction and decrease the speed of vehicle. In this project we have overcome this friction and produce clean energy.

IX.CONCLUSION

We can conclude that, the system arrangement generates electricity without any friction with 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 battery of electrical vehicle; we also understand the concept of electromagnetism and how to generate power by just placing the magnet and coil of equal quantity on different disks without making any contact. The voltage output taken from the assembly is totally dependent on the rpm of the wheels so voltage is fluctuating so a battery is used to provide a constant power supply. A battery

connected to the generator assembly is continuously charged when shaft moves at 80- 90 rpm which is normal speed of vehicle. By this assembly battery is continuously charging.

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