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Review of Free Energy Generation using Flywheel

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Abstract - *This Paper manages the investigation of free energy and its age utilizing flywheel framework. The energy putting away limit of flywheel is utilized to produce additional measure of free energy. This extra energy is used to run the other electrical appliances. It comprise of A.C. engine of half strength limit is utilized to drive a progression of belt and pulley drive which structure a rigging train and creates over two fold rpm at the pole of an alternator. The intriguing thing about this framework is that more prominent electrical yield power can be acquired from the yield of the alternator than 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 vitality. This free vitality is free of expense.*

Key Words: **Flywheel, energy generation, storage**

1. INTRODUCTION

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 typically delivered by non-sustainable sources, for example, petroleum, lamp fuel and atomic which sadly make contamination, this is the fundamental reason creating energy utilizing a bicycle or Cycle tire. Electric trains, autos, and other electric vehicles are fueled by electric engines associated with batteries. When we're driving along, energy streams from the batteries to the engines, turning the haggles us with the motor energy we have to move. When we stop and hit the brakes, the entire procedure goes into switch: electronic circuits slice the ability to the engines. Presently, our active energy and force makes the wheels turn the engines, so the engines work like generators and begin delivering power as opposed to devouring it. Power streams over from these engine generators to the batteries, energizing them. So a decent extent of the energy we lose by braking is come back to the batteries and can be reused when webegin off once more. Practically speaking, regenerative brakes set aside some effort to back things off, so here our framework zero erosion no physical contact of vehicle associated, the flywheel plate simply associated parallel with the sort shaft to get the great yield persistently notwithstanding when there is braking.

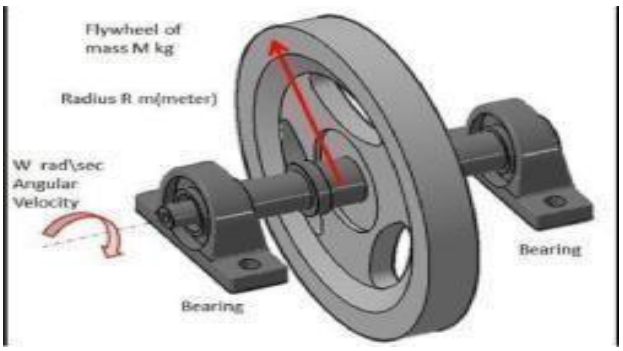
1.1 Objective

The objective of this project is to recover energy of flywheel by using principle of energy recovery system from flywheel and produce sufficient energy to run the project set up and also some additional energy to run external power supply. An AC motor is starts with the help of AC supply. The shaft speed varies with help of pulleys with different diameters. After getting maximum speed at generator shaft, the initial AC input supply is replaced by the output supply of generator.

2. COMPONENT DETAILS 2.1FLYWHEEL:

A flywheel is a mechanical gadget explicitly intended to

effectively store rotational energy. Flywheels oppose changes in rotational speed by their snapshot of latency. The measure of energy put away in a flywheel is corresponding to the square of its rotational speed. The best approach to change a flywheel's put away energy is by expanding or diminishing its rotational speed applying a torque lined up with its symmetry.

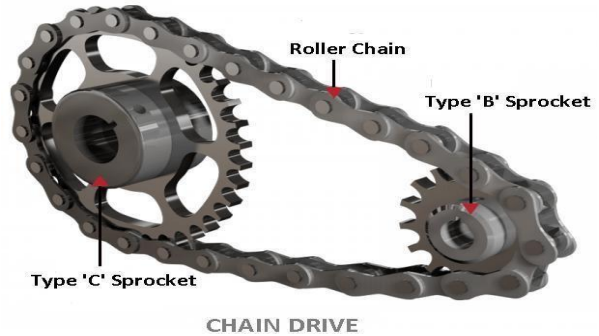


Flywheels are made from many different materials, the application determines the choice of material. Small flywheels made of lead are found in children's toys. Cast iron flywheels are used in old steam engines. Flywheels used in car engines are made of cast or nodulariron, steel or aluminium . Flywheels made from High strength steel or composite s have been proposed for use in vehicle energy storage and braking systems.

2.2 CHAIN DRIVE

Chain drive is a method for transmitting mechanical power starting with one spot then onto the next. Usually used to pass on capacity to the wheels of a vehicle, especially bikes and cruisers. It is likewise utilized in a wide assortment of machines other than vehicles.

Frequently, the power is passed on by a roller chain, known as the drive chain or transmission chain, ignoringa sprocket gear, with the teeth of the apparatus coinciding with the openings in the connections of the chain. The rigging is turned, and this pulls the chain putting mechanical power into the framework.



CHAIN DRIVE

2.3 NEODYMIUM MAGNET

The Neodymium metal component is at first isolated from refined Rare Earth oxides in an electrolytic heater. The "Uncommon Earth" components are lanthanides (likewise called lanthanides) and the term emerges from the phenomenal oxide minerals used to disconnect the components. The Rare Earth components are copious for example Neodymium component is more typical than gold. The Neodymium, Iron and Boron are apportioned and put in a vacuum acceptance heater to frame a composite. Different components are additionally included, as required for explicit evaluations for example Cobalt, Copper, Gadolinium and Dysprosium (for example to help with erosion obstruction).The neodymium magnet is given a defensive covering. It is basic that the drying is intensive generally water is bolted into the plated Neodymium magnet and the magnet will consume from the back to front.

Changeless magnets will be magnets that are for all time charged. They are not the same as electro-magnets in that electro-magnets possibly have attractive properties when an electrical flow is moving through them. Lasting magnets, then again, are constantly attractive.

NEODYMIUM MAGNETS

2.4 BATTERY:

A car battery is a battery-powered battery that provisions electrical vitality to an engine vehicle.

It is otherwise called a SLI battery (starting-lighting- ignition) and its fundamental reason for existing is to begin the motor. When the motor is running, control for the vehicle's electrical frameworks is provided by the alternator. Typically, starting releases under three percent of the battery limit. SLI batteries are intended to discharge high blast of present and after that be immediately energized. They are not intended for profound release, and a full release can diminish the battery's life expectancy.

2.5 COILS:

An electromagnetic loop is an electrical transmitter, for example, a wire in the state of a curl, winding or helix. Either an electric flow is gone through the wire of the curl to create an attractive field, or on the other hand an outer time-changing attractive field through the inside of the curl creates an EMF (voltage) in the conductor. A current through any conductor makes a roundabout attractive field around the conductor because of Ampere's law. The upside of utilizing the curl shape is that it builds the quality of attractive field delivered by a given current. The attractive fields created by the different turns of wire all go through the focal point of the loop and include (superpose) to deliver a solid field there.

2.6 RECHARGABLE BATTERY:

A battery-powered battery, stockpiling battery, auxiliary cell, or gatherer is a sort of electrical battery which can be charged, released into a heap, and revived commonly, while a non-battery-powered or essential battery is provided completely charged, and disposed of once released. It is made out of at least one electrochemical cells. The expression "gatherer" is utilized as it aggregates and stores vitality through a reversible electrochemical response.

Battery-powered batteries are delivered in various shapes and sizes, running from catch cells to megawatt frameworks associated with balance out an electrical circulation arrange. A few unique blends of cathode materials and electrolytes are utilized, including lead– corrosive, nickel cadmium (NiCd), nickel metal hydride (NiMH), lithium particle (Li-particle), and lithium particle polymer (Li-particle polymer).Rechargeable batteries at first cost more than dispensable batteries, however have a much lower all out expense of proprietorship. Recharged reasonably ordinarily before they need supplanting. Some battery-powered battery types are accessible in indistinguishable sizes and voltages from dispensable sorts, and can be utilized conversely with them.

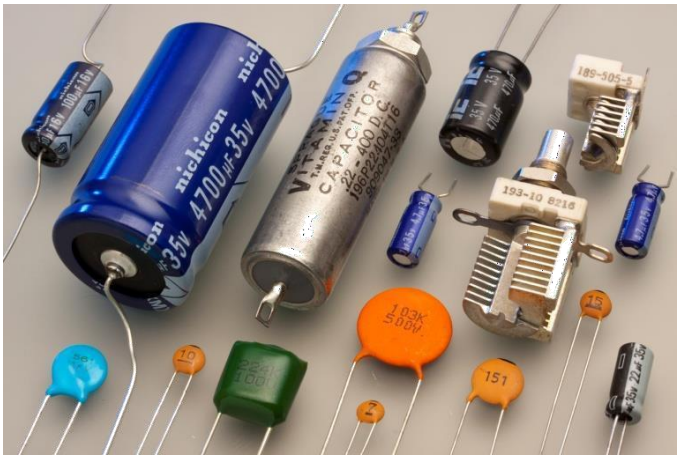
2.7 VOLTAGE MULTIPLIERS:

The least difficult of these circuits are a type of rectifier which accept an AC voltage as inputs and outputs a multiplied DC voltage. The exchanging components are simple diodes and they are headed to switch state just by the rotating voltage of the information. DC-to-DC voltage doublers can't switch along these lines and require a driving circuit to control the exchanging. They as often as possible likewise require an exchanging component that can be controlled simply, for example, a transistor, instead of depending on the voltage over the switch as in the basic AC-to-DC case. Voltage doublers are an assortment of voltage.

2.8 CAPACITORS:

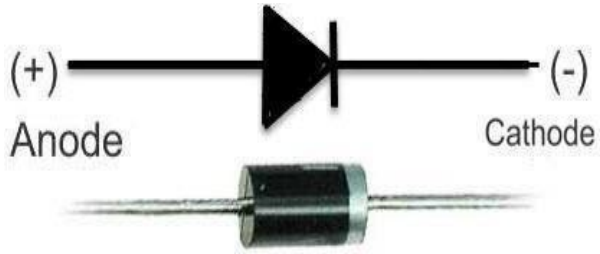
Capacitors have numerous utilizations in electronic and electrical frameworks. They are ubiquitous to the point that it is uncommon that an electrical item does exclude somewhere around one for some reason. A capacitor can store electric energy when it is associated with its charging circuit. What's more, when it is disengaged from its charging circuit, it can scatter that put away vitality, so it very well may be utilized like a transitory battery. Capacitors are generally utilized in electronic gadgets to keep up power supply while batteries are being changed. (This avoids loss of data in unpredictable memory.) Conventional electrostatic capacitors give under 360 joules for each kilogram of energy thickness, while capacitors utilizing creating innovation can give more than

2.52 kilojoules per kilogram. In vehicle sound frameworks, huge capacitors store energy for the enhancer to use on interest .A uninterruptible power supply (UPS) can be furnished with support free capacitors to broaden service



2.9 DIODE:

A diode is a gadget which possibly permits unidirectional stream of current whenever worked inside an evaluated determined voltage level. A diode just squares current in the switch heading while the turn-around voltage is inside a restricted range generally invert hindrance breaks and the voltage at which this breakdown happens is called switch breakdown voltage. The diode goes about as a valve in the electronic and electrical circuit.



2.10 FREE WHEEL:

In mechanical or car building, a freewheel or invading grasp is a gadget in a transmission that separates the driveshaft from the determined shaft when the determined shaft pivots quicker than the driveshaft. An overdrive is some of the time erroneously called a freewheel, yet is generally inconsequential.

LITERATURE SURVEY

In the exploration paper of author Jamie Patterson titled Flywheel vitality stockpiling framework we examined improvement and exhibit of a total model Flywheel Power System (FPS) and fruitful verification of the possibility of this vitality stockpiling innovation. The subsequent stage being developed will be last framework adjustments for the change from research facility to handle testing, and interface designing for a field explore.

In the exploration paper of author B. Sneha and Dr. M.Reddy titled Generation of intensity from bicycle pedal we considered the Generation of Power from Bicycle Pedal. We likewise discovered that the supply of petroleum products are rare and their use as vitality source cause ecological degradation in expansion to this as the total populace expands the vitality request is additionally expanding step by step, so we are in a hunt of new sustainable power sources. In this paper author we likewise contemplated a simple method for producing power at little dimensions by utilizing bike pedal was broke down. Dynamo joined to the cycle pedal can fills in as an instrument for changing govermechanical vitality from pedal to electrical vitality. For running of apparatuses we have to changeover this dc capacity to air conditioning power by utilizing inverter. Output of the dynamo or generator relies upon the accelerating speed. An equipment model of this model is created and tried for different burdens.

In the exploration paper of author Jitendra D.Jaiswal and Kapil Kalambe titled Review of free vitality generator utilizing flywheel we considered free vitality and its age utilizing flywheel framework. The vitality putting away limit of flywheel is utilized to create additional sum free vitality. This additional vitality is utilized to runs the other electrical machines. It comprise of A.C. engine of half strength limit is utilized to drive a progression of belt and pulley drive which structure an apparatus train and delivers over twofold rpm at the pole of an alternator. The charming thing about this framework is that more noteworthy electrical yield power can be acquired from the yield of the alternator than has all the earmarks 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 all the more additional vitality or free vitality and clarifies generally speaking investigation of flywheel with different parameters of flywheel to get the most extreme free vitality out of the framework. This free vitality is getting free of expense.

In the exploration paper of author Abhik Bose titled Analysis of flywheel we examined the significance of the flywheel plan determination choice and its commitment in the vitality stockpiling execution. This commitment is exhibited on the model cross-segments utilizing PC supported examination and streamlining strategy. This Proposed particular are gotten for least weight. In this paper author Abhik Bose demonstrated that the required plan detail is extremely near the plate with uniform thickness. Computer supported examination and streamlining strategy results demonstrates that reasonable structure of flywheel geometry configuration could both significantly affect the Specific Energy execution and limit the operational burdens applied on the pole/heading because of decreased mass at high rotational velocities.

In the exploration paper of author Ismail Kholeif titled Review of free vitality age utilizing flywheel we considered that the circle edge type flywheel for light weight. The mass of the flywheel is limited subject to limitations adequate snapshot of

inactivity and permissible burdens. The turning circles of uniform thickness and thickness is connected to each plate and the edge isn't reliant on reasonable condition at the intersection. Appropriate limit states of outward anxieties are connected.

In the examination paper of author A.K. Tandon and S.S.Murthy titled Analysis of self-energized enlistment generator we contemplated squirrel confine offbeat engines are utilized as the electromechanical vitality convertor. The prierate power an offbeat engines called nciple of self- excitation connected to the non-concurrent enginestogen as self- energized enlistment generator (SEIG), when an appropriate capacitance is associated with over the stator twisting of an acceptance machine and self-excitation happen under positive conditions. SEIG is reasonable applicant

In the exploration paper of author V.Praveen and M.Arun titled Kinetic Energy Recovery System utilizing bike we considered that (KERS) is a framework for recuperating the moving vehicle's active vitality under braking and furthermore to change over the typical misfortune in dynamic vitality into increase in motor vitality. When riding a bike, a lot of motor vitality is lost while braking, influencing begin to up genuinely strenuous. Here we utilized mechanical dynamic vitality recuperation framework by methods for a flywheel to store the vitality which is regularly lost amid braking, and reuse it to help push the rider when beginning. The rider can charge the flywheel when abating or plunging a slope and lift the bicycle when quickening or climbing a slope and depicts the flywheel expands most extreme increasing speed and nets 10% pedal vitality reserve funds amida ride where speeds are somewhere in the range of 12.5 and 15 mph.

In the examination paper of author Tai-Ran Hsu titled A Flywheel based regenerative slowing mechanism for regenerative vitality recuperation utilizing flywheel we considered storage& discharge framework created at lab. It very well may be recoup and store regenerative vitality created by braking movement of generator with exchanging rotating speed, for example, the rotor of a breeze turbo generator subject to not constantly admission of wind and the axels of electric autos amid the continuous braking and drifting. Discharging of the put away regenerative vitality in the flywheel by the alternator is effectively changed to power. An idea model called the SJSU-RBS, plan, fabricated and tried by understudies with capable help of a specialized workshops in author's school. Another regenerative slowing mechanism, the SJSU-RBS was created with the plan, development and structure of a proof-of-idea model. It includes a fast turning flywheel/alternator unit with a remarkably planned dynamic stopping mechanism and an epicyclical rigging train. This new SJSU-RBS can be promptly permitted to control plants driven by sustainable power sources from exchanging source, for example, sun powered, wind.

In the examination paper of author Micheal Mathew titled Design of flywheel for improved vitality stockpiling utilizing PC supported investigation we comprehended Flywheels fill in as active vitality stockpiling and recovery gadgets with the capacity to convey high yield control at innovations accessible today in different phases of improvement, particularly in cutting edge mechanical regions, i.e., spacecraft's. Today, the vast majority of the examination endeavors are being spent on improving vitality stockpiling ability of flywheels to convey high power at exchange times, enduring longer than customary battery fueled innovations. For the most part, the execution of a flywheel can be ascribed to three components, i.e., material Strength, geometry (cross-area) and rotational speed. While material Strength specifically decides active vitality level that could be created securely Combined (coupled) with rotor speed, this investigation exclusively centers around investigating the impacts of flywheel geometry on its vitality stockpiling/convey capacity per unit mass, further characterized as Specific Energy.

3. CONCLUSION

We can conclude that the system arrangement generates electricity without any friction with flywheel and it can be utilized to maximum amount as there is no direct contact of flywheel .We have successfully designed and implemented design. The voltage output taken from resultant output totally depends on rpm of the wheel. A battery connected to generator is continuously charged when the shaft moves. The main advantage of Free energy generator using flywheel isthat it can generate energy without used of any extra equipment and this free energy generation is non- hazardous and environmental friendly. Can be use in various applications like electric fuel car, household, industrial and increase the efficiency of traditional electrical.

4. ACKNOWLEDGEMENT

The overall session of the project completion has been a more experience providing us with great insight into learning various design concept, software, engineering concepts & benefits of team work. As rightly said, for the successful completion of any type project, an effective & timely guidance is the very important asset. Our project would not have been materialized without the co-operation of many of the people involved.

REFERENCES

[1] S.S. Murthy, O.P. Malik, A.K. Tandon, " Analysis of self-excited induction generators," Proc. IEE, Vol. 129, Pt. C, no.6, pp. 260-265, November1982.

[2]. Uchiyama, T. and Naruse, M. Three-dimensional vortex simulation for particulate jet generated by free falling particles. Chem. Eng. Sci. 61: 1913-1921.

[3] Tur, O., Ustun, O. and Tuncay, R.N. "Application Note on Regenerative Braking of Electric Vehicles as Anti- Lock Braking System," Ansoft Europe, French Office, [2005].and solid particles. Proc. 6th Int. Conf. Multiphase Flow, on CD-Rom.

[4]. Uchiyama, T. and Yagami, H.,Numerical simulation for the collision between a vortex ring,(2008)

[5] V. Praveen, M. Arun, Kinetic Energy Recovery System In Bicycle, Volume 3 (4): 309-316 Ijpret, 2014; [6]Michael Mathew , Design Of Flywheel For Improved Energy Storage Using Computer Aided Analysis, Department Of Mechanical Engineering National (IOT),(2009)

[6] Michael Mathew , Design Of Flywheel For Improved Energy Storage Using Computer Aided Analysis, Department Of Mechanical Engineering National (IOT),(2009)

[7] Akhilesh Barwahe :-''Electricity Generation Using Flywheel'''Volume 4 Issue IV, April 2016 IC Value

[8]. Uchiyama,T.andYagami,H., vortex simulation for the interaction between a vortex ring,(2004)

[9] H. Ibrahim, A. Ilinca, and J. Perron, ―Energy Storage Systems― Characteristics and Comparisons‖, J. of Renewable and Sustainable Energy Reviews, Vol. 12, 2008.