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Regenerative E- Bicycle

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ABSTRACT

Our main objective in this paper is to power up the electric cars with dynamos. The major disadvantage we are facing in the electric car is that the charge in the battery which gives the supply for motor gets discharge and hence it should be stopped or parked in the area where the current should be easily taken. But the biggest problem is that when the car get loses its full charge while driving in an area where the current could not be taken easily or there is no sort of current in that area then you can't able to reach your palace.Hence to change this problem the dynamos are used to solve it. Dynamo is a device which is capable of changing mechanical energy into electrical energy .Hence by using this character of the dynamo the problem can be solved. The description of this technique is that by placing one dynamo in each wheel so that each dynamo will produce a charge through the rotatory motion given by the wheels of the car and these charges is stored in a separate battery and that can be used for the emergency purpose and this process is cyclic. When car losses its charge while running on the charge produced by the dynamo, the dynamo will not stops its work, it again produce a charge so that you can go for a longer distance.

Keywords :- Dynamos, Emergency purpose, Electric charge, Battery, Gear system dc motor Lithium ion battery pack

I. INTRODUCTION

An electric car is an automobile that is propelled by one or more electric motors, using electrical energy stored in batteries or another energy storage device. Electric cars were popular in the late 19th century and early 20th century, until advances in internal combustion engine technology and mass production of cheaper gasoline vehicles led to a decline in the use of electric drive vehicle Basic Configuration of an Electric Bicycle System the basic configuration of an electric bicycle drive consists of a controller that controls the power flow from the battery to the electric motor. This power flow acts in parallel with the power delivered by the rider via the pedal of the bike. Global warming and scarcity of traditional resources are becoming major problems in the current scenario. Due to the economic challenges India is facing in automotive sector the hybrid bicycle market has a huge growth potential. Electric cars have several benefits compared to conventional internal combustion engine automobiles, including a significant reduction of local air pollution, as they have no tailpipe, and therefore do not emit harmful tailpipe pollutants from the onboard source of power at the point of operation; reduced greenhouse gas emissions from the onboard source of power, depending on the fuel and technology used for electricity generation to charge the batteries; and less dependence on foreign oil, which for the United States and other developed or emerging countries is cause for concern about vulnerability to oil price volatility and supply disruption.

Materials and methods

1.1. The materials used in the project are:

1.1.1. Dynamo

Dynamo is an electrical generator that creates direct current using a commutator. Dynamos were the first electrical generators capable of delivering power for industry, and the foundation upon which many other later electric-power conversion devices were based, including the electric motor, the alternating-current alternator, and the rotary converter. A dynamo is an electrical generator that creates direct current using a commutator. Dynamos were the first electrical generators capable of delivering power for industry, and the foundation upon which many other later electric-power conversion devices were based, including the electric motor, the alternating-current alternator, and the rotary converter. Which converts mechanical to electrical energy.

Figure: 1 DYNAMO

1.1.2. Lithium ion battery

The charger passes current to the battery. Lithium ions move from the cathode to the anode through the electrolyte The battery is charged by a potential difference between the two electrodes. A discharge circuit is formed between the anode and the cathode. Lithium ions stored in the anode move to the cathode. Energy is used because lithium-ion batteries can have a variety of positive and negative electrode materials, the energy density and voltage vary accordingly Batteries with a lithium iron phosphate positive and graphite negative electrodes have a nominal open-circuit voltage of 3.2 V and a typical charging voltage of 3.6 V. Lithium nickel manganese cobalt (NMC) oxide positives with graphite negatives have a 3.7 V nominal voltage with a 4.2 V maximum while charging. The charging procedure is performed at constant voltage with current-limiting circuitry.

Figure : 2. Lithium ion battery

1.1.3 Dc motor

DC motor is any of a class of rotary electrical motors that converts direct current (DC) electrical energy into mechanical energy. The most common types rely on the forces produced by induced magnetic fields due to flowing current in the coil. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current in part of the motor. Workings of a brushed electric motor with a two-pole rotor (armature) and permanent magnet stator. "N" and "S" designate polarities on the inside axis faces of the magnets; the outside faces have opposite polarities. The + and - signs show where the DC current is applied to the commutator which supplies current to the armature coils. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by

changing the strength of current in its field windings. Small DC motors are used in tools, toys, and appliances. The universal motor, a lightweight brushed motor used for portable power tools and appliances can operate on direct current and alternating current. Larger DC motors are currently used in propulsion of electric vehicles, elevator and hoists, and in drives for steel rolling mills. The core function of a DC motor controller is to periodically read the throttle setting and adjust the current being supplied to the motor.

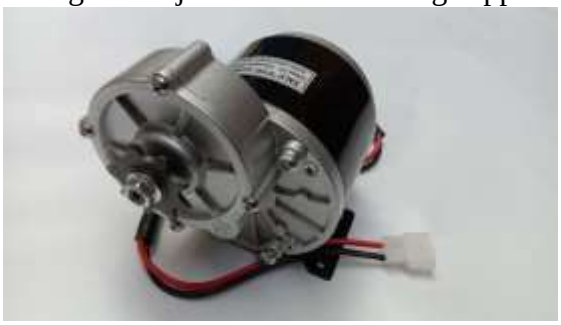

Figure : 3 Dc motor

1.1.4 Gears

The smaller the chainring the easier it is to pedal and the higher the torque (and lower the speed), the larger the chainring the harder it is to pedal and the higher the speed (and lower the torque). The rear cassette is the exact opposite. The smaller cog is the hardest to pedal and is the lowest torque but it gives faster speeds in return, while the largest is the easiest to pedal, and gives slower speeds, but it gives the highest torque in return. All the gears in between are a transition from one extreme to the other.

Figure : 4 Gears ,Chain

Working

WELDING PROCESS

The basic idea is to attach a motor to the cycle for its motion. A motor that is powered by a battery and that can be switched on during difficult terrains and switched off and pedal to get the battery re-charged during motion in a flat terrain self-recharging a battery with a motor alternator unit that too with the simple cranking motion of the cycle was not viable, we had to utilize a mechanism that can come in handy here and that was by using the flywheel rotation technique suitable freewheel sprocket gears are fixed to the shafts of the dynamo and BLDC motor. The rear wheel of the bicycle is disassembled from the frame in order to fix an additional freewheel sprocket gear to the wheel axle.

The modified wheel is then re-assembled. The carrier of the bicycle is modified by welding four metal strips to the carrier frame to house the motor. Suitable holes are drilled into the metal strips to fix the motor with the aid of nut and bolt. A chain of adequate length is used to connect the freewheel sprocket gear of the motor and the additional rear freewheel sprocket.

The sprockets are so installed such that the motor drives the rear wheel in the forward direction. (Anti-clockwise). Another metal frame is fabricated and welded to the front V-frame of the bicycle to house the battery, dynamo and the controller.

Since the ready-made front axle was short to incorporate a new freewheel sprocket, a longer front axle was prepared from mild steel in the workshop. This front axle with a new freewheel sprocket is assembled to the bicycle so that it rotates effectively while pedal.

The dynamo is fitted to the fabricated frame with the help of nut and bolt. The freewheel sprockets of the dynamo and front axle are aligned and fixed. The freewheel sprockets of the dynamo and the freewheel sprocket of the front axle are connected
by a chain of suitable length. One of the battery and the motor speed controller are fitted on the fabricated frame of the front V-frame of the cycle.

CUTTING PROCESS

GRINDING PROCESS

Conclusion

During the completion of project I was able to understand how an Electric vehicle will work by consuming the energy of a battery. Amongst these parts, a detailed knowledge on Electric vehicles and Regenerative systems. The main function of our E-Bicycle is to regenerate power from its own mechanism and store within the battery and utilize it. So, by using these type of electric vehicles we reduce the emission which is releasing from the vehicles and protect our environment. Hence their research says that the discharge of the battery can be filled up by the dynamos and thus by seeing this the dynamo is solving two problems which are discharge problem and emergency problem in the electric cars and this shows the efficiency of the dynamo or the importance of the dynamo in cars.

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