Innovative Bikes

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Abstract- Nowadays people use to travel all the way with the help of automobile (i.e. four wheelers and two wheelers). The counting of two wheelers had been increased since 2000's. Even though the cost of fuels increased the pupil never try to reduce the usage of motor bikes. To overcome this problem many organizations developed electric bikes in the existence but due to some electrical problems the usage of electric bikes had gone out of existence. When we see this problem in environmental point of view, the motor bikes generates more amounts of carbon monoxide and carbon dioxide gasses which causes air pollution. In this paper we are going introduce some technologies to make the electrical bikes more efficient and reliable. The technology used here is to charge the batteries of electric bikes during the running time i.e. charge consumed during the process of running is converted to charge the batteries of electric bikes.

KEY EQUIPMENTS USED:

- ELECTRICAL MOTOR
- AUTO TRANSFORMER
- MICOPROCESSOR

I.INTRODUCTION

In this project we are going to see how does the battery of an electrical bike is charged during the running time. In this the motor which is used for riding is coupled with another motor which is a generator. In this the mechanical energy in the running motor is converted into the electrical energy in the generator with the principle of electromagnetic induction. Then the electrical energy is fed back into the battery to charge the battery. A microprocessor is connected between the generator motor and auto-transformer. Here microprocessor is used to organize the flow of current from generator motor to auto-transformer.

EXISTING SYSTEM

The electric bikes which are running around the cities are pollution less but battery backup is little bit worsened, which is an important part in the electrical bikes. In India electrical problems are being a big issue so it is very difficult to charge the battery in the day to day life. Hence it needs a technique to enhance the battery backup.

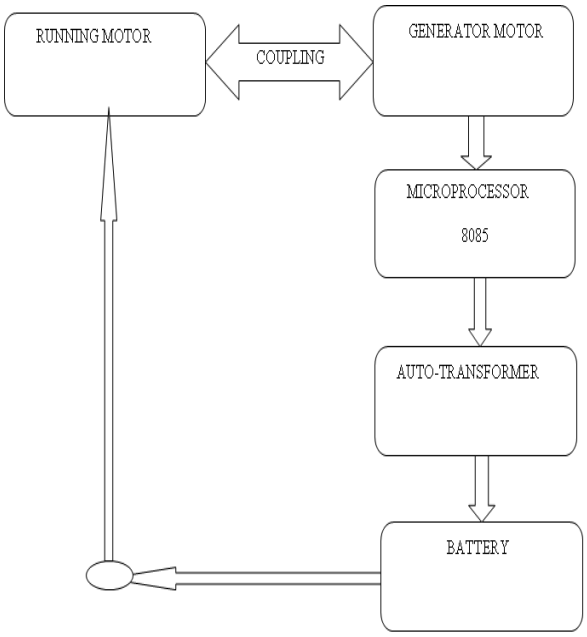
PROPOSED SYSTEM

We propose the system in which the battery of the electrical bike is charged during the running time. In this the charge used for the purpose of running the vehicle is converted and is again transferred to the battery or charging it.

SYSTEM BLOCK DIAGRAM

The basic components of the system are

- Running motor
- Generator motor
- Microprocessor
- Auto-transformer
- Battery



1]. RUNNING MOTOR:

It is a normal electrical motor which is used for running of the electrical bikes. As we know motor converts electrical energy into mechanical energy. A DC motor relies on the fact that like magnet poles repel and unlike magnetic poles attract each other. A coil of wire with a current running through it generates an electromagnetic field aligned with the center of the coil. By switching the current on or off in a coil its magnetic field can be switched on or off or by switching the direction of the current in the coil the direction of the generated magnetic field can be switched 180°. A simple DC motor typically has a stationary set of magnets in the stator and an armature with a series of two or more windings of wire wrapped in insulated stack slots around iron pole pieces (called stack teeth) with the ends of the wires terminating on a commutator. The armature includes the mounting bearings that keep it in the center of the motor and the power shaft of the motor and the commutator connections. The winding in the armature continues to loop all the way around the armature and uses either single or parallel conductors (wires), and can circle several times around the stack teeth. The total amount of current sent to the coil, the coil's size and what it's wrapped around dictate the strength of the electromagnetic field created. The sequence of turning a particular coil on or off dictates what direction the effective electromagnetic fields are pointed. By turning on and off coils in sequence a rotating magnetic field can be created. These rotating magnetic fields interact with the magnetic fields of the magnets (permanent or electromagnet) in the stationary part of the motor (stator) to create a force on the armature which causes it to rotate. In some DC motor designs the stator fields use electromagnets to create their magnetic fields which allow greater control over the motor.

2].GENERATOR:

It works on the principle of faradays law.

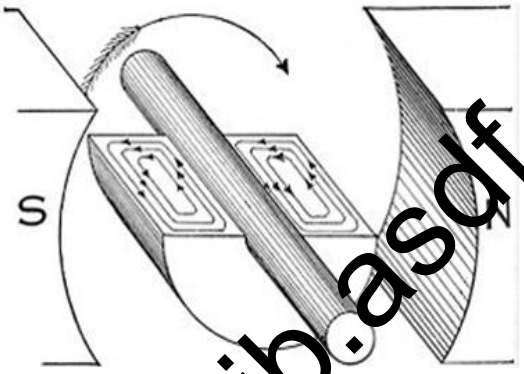
In electricity generation, a generator is a device that converts mechanical energy to electrical energy for use in an external circuit. The source of mechanical energy may vary widely from a hand crank to an internal combustion engine. Generators provide nearly all of the power for electric power grid.

The reverse conversion of electrical energy into mechanical energy is done by an electric motor, and motors and generators have many similarities. Many motors can be mechanically driven to generate electricity and frequently make acceptable generators

PRINCIPLE:

FARADAYS LAW OF ELECTRO- MAGNETIC INDUCTION:

Faradays law of electromagnetic induction states that when a coil of wire or conductor is rotated in between the magnetic field an emf is induced in the conductor.



The EMF generated by Faraday's law of induction due to relative movement of a circuit and a magnetic field is the phenomenon underlying electrical generator. When a permanent magnet is moved relative to a conductor, or vice versa, an electromotive force is created. If the wire is connected through an electrical load, current will flow, and thus electrical energy is generated, converting the mechanical energy of motion to electrical energy.

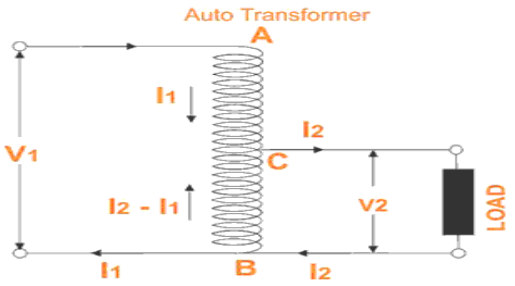
3].MICROPROCESSOR:

Microprocessor used here is 8085 which is programed to work as a switch between the generator and auto-transformer. Microprocessor is semiconductor device which is used to perform arthematic and logic unit. It transfers voltage from generator to auto-trasformer. The varying voltge generated by the generator is sensed and it is connected to the coresponding voltage level in auto-transformer.

4].AUTO-TRANSFORMER:

An **autotransformer** (sometimes called ***autostep down transformer***) is an electrical transformer with only one winding. The "auto" (Greek for "self") prefix refers to the single coil acting on itself and not to any kind of automatic mechanism. In an autotransformer, portions of the same winding act as both the primary and secondary sides of the transformer. The winding has at least threetaps where electrical connections are made. Autotransformers have the advantages of often being smaller, lighter, and cheaper than typical dual-winding transformers, but the disadvantage of not providing electrical isolation. Other advantages of autotransformers include lower leakage reactance, lower losses, lower excitation current, and increased KVA rating.[1]

Autotransformers are often used to step up or step down voltages in the 110-115-120 V range and voltages in the 220-230-240 volt range—for example. providing 110 V or 120 V (with taps) from 230 V input, allowing equipment designed for 100 or 120 volts to be used with a 230 volt supply (as in using US electrical equipment with higher European voltages).



$\frac{V_1}{N_1} X N_2$ and from the figure above, this voltage is V_2.

$$\text{Hence, } \frac{V_1}{N_1} X N_2 = V_2$$

$$\Rightarrow \frac{V_2}{V_1} = \frac{N_2}{N_1} = \text{Constant} = k$$

5].BATTERY:

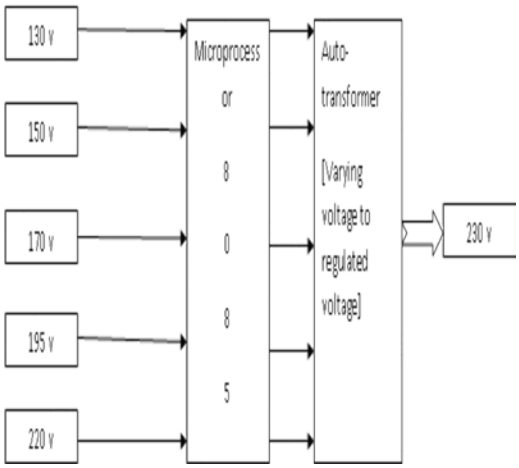
Battery is a device which consists of one or more electro chemical cells that converts stored chemical energy into an electrical energy. It stores the electrical energy for future uses. It is a main backup source of the electrical bikes for running. It is a rechargeable battery in which, when the charge of the battery gets lowered the battery can be recharged. Batteries play a main role in all electronic equipment's.

WORKING:

As the shaft of running motor and the shaft of generator was coupled, the rotation of the running motor makes the generator to rotate. When electric bikes are started running the running motor takes the required power from the battery for running as the motor was coupled with the generator the generator's shaft was rotated. Due to the effect of faraday's principle in generator a huge amount of varying voltage is generated. Then the varying voltage is send into the microprocessor where it works as the switch and it connects it to the equivalent summing voltage in the auto-transformer to get the ideal voltage to charge the battery. Then the regulated voltage from auto-transformer is send to the battery for charging.

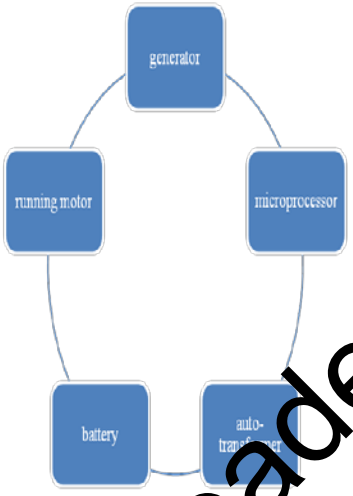
WORKING AT MICROPROCESSOR:

In this the varying voltage is connected to the ports of the microprocessor . the microprocessor identifies the input voltage and it acts as the switch to connect to the particular voltage level in inverted auto-transformer for regulation of the voltage.



WORKING CYCLE:

The working process involves running motor , generator , microprocessor , auto-transformer and a battery. As the working process begins in the running motor and ends with the running motor , this process is termed as cyclic process.



ADVANTAGES:

- It is free from fuels.
- It is free from pollution.

APPLICATIONS:

- It can be used in two wheeler transportation.
- This idea can be implemented for any other rotaing devices such as fan and etc.

CONCLUSION:

As it does not need any kind of external power supply to charge the battery, it will play an important role in the world where the current scarcity is high.

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