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Design and Development in Electric Vehicle

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ABSTRACT: *Humans are progressively impacting the climate and the temperature of the Earth by burning fossil fuels and ruining forests. Pollutants released into the atmosphere by combustion engine cars are rising on a daily basis. Electric cars might be a viable alternative, solving issues such as escalating pollution, global warming, diminishing mineral wealth, and more. These vehicles may be powered through a collector system by electricity from off-vehicle sources or maybe inbuilt with a battery, or electric generator to convert fuel to electricity or else. In this thesis, the development of electric vehicle is presented. Such vehicle will only reuse the power supplied to it while working and only renewable sources while halt resulting in solving the issues mentioned.*

Keywords: Dynamo Motor, Control Unit, etc.

I. INTRODUCTION

Vehicles have become a critical element of our way of life. On a routine basis, it is one of the best modes of transportation. We are increasingly relying on automated systems as technology improves. As a response, engineers strive to convert manual systems into automatic ones to make people's lives easier. This form of research and development initiative is popular in the automobile industry. Humans are increasingly influencing the climate and the earth's temperature by burning fossil fuels and cutting down forests. The pollutants produced in the air due to combustion engine vehicles are increasing day-by-day with the increase in the utilization of personal conveyance rather than using public transport. Electric vehicles are a possible replacement for current-generation automobiles, addressing the issue of rising pollution, global warming, depleting natural resources, etc.

Electric Vehicles are means of transport that consume eclectic energy as fuel instead of traditional fuels such as petrol, diesel, and CNG. But in India, we don't have as many charging stations available as we need yet. Furthermore, the charging of EVs takes a lot of time at the station, and with light-weight batteries, there is the issue of range. The batteries and electricity needed for charging are not always generated from renewable energy sources. They might cause some amount of pollution indirectly.

II. WORKING

The charging device turns received torque into electrical energy. The electrical energy would either be transmitted to the battery or to the electric motor directly. The battery stores the electrical energy acquired from the charging unit. The charging device turns received torque into electrical energy. The electrical energy would either be transmitted to the battery or to the electric motor directly. The battery stores the electrical energy acquired from the charging unit.

While revolving, the driven wheel, to which the charging unit is coupled, delivers torque to the charging unit. The charging unit has now been designed to receive the torque from the driven wheel and convert it into electrical energy. Received torque is converted into electrical energy by the charging unit. The electrical energy is either supplied to the battery or straight to the electric motor. The charging unit's electrical energy is stored in the battery.

The charging unit powered by the sun is electrically connected to a power source. The solar powered charging unit consists of a number of solar panels that create electric current when exposed to solar energy. The speed controller regulates the torque output of the electric motor, hence managing the speed of the electric vehicle. An identical flywheel couples the motor with the dynamo.

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III. OBJECTIVES

- The primary goal is to build an electric automobile, with secondary goals include minimizing the use of fossil fuels in its operation.
- The electric car emits no air pollution, which is a major concern at the time of disclosure.
- Increasing use of fossil fuels leads to increased imports of such fuels from other countries, which harms the economy since a large amount of foreign currency is spent on imports.
- Golf TDI (Diesel) - 140g CO2/km, whereas E-Golf achieves 119g CO2/km.
- The majority of ICE emissions occur during the usage phase, that is, during the fossil fuel supply chain and burning.
- During this period, the diesel generates 111g CO2/km, but the electric drive emits just 62g CO2/km due to energy generation and delivery.

IV. METHODOLOGY

The electric car has a rear wheel that is connected to an electric motor that receives torque and delivers the vehicle displacement. The driven wheel, which is attached to the vehicle, turns as a result of displacement.
The charging unit, which is attached to the driven wheel, receives the torque. The charging device is programmed to convert torque into electrical energy, which is stored in the battery.
The charging device generates electrical energy, which is stored in the battery and delivered to the electric motor. The electric motor converts electrical energy from the battery into torque, which is then supplied to the driving wheel to propel the vehicle forward.

Figure 1: Experimental Setup

V. COMPONENT SELECTION

1. **BLDC Motor:** BLDC Motor: Brushless DC gear motors have been used as the driving source for various types of equipment and devices. The demand for smaller machines with higher output power and lower energy costs has increased in recent years. The same expectation has been held for motors, but the additional demand for easy installation, connection, and operation has also increased. In order to meet such demands, a compact, lightweight and high efficiency brushless DC motor was combined with an improved, easy to use driver.
2. **Li-ion Battery:** A lithium-ion battery or Li-ion battery is a type of rechargeable battery composed of cells in which lithium ions move from the negative electrode through an electrolyte to the positive electrode during discharge and back when charging. Li-ion cells use an intercalated lithium compound as the material at the positive electrode and typically graphite at the negative electrode.
3. **Alternator:** An alternator is an electrical generator that converts mechanical energy to electrical energy in the form of alternating current. For reasons of cost andsimplicity, most alternators use a rotating magnetic field with a stationary armature. Occasionally, a linear alternator or a rotating armature with a stationary magnetic field is used.
4. **Mono-Crystalline Solar Panel:** Monocrystalline solar panels are the oldest type of solar panel and the most

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developed. These monocrystalline solar panels are made from about 40 of the monocrystalline solar cells. These solar cells are made from pure silicon. Monocrystalline solar cells appear black because of the way sunlight interacts with pure silicon. While the cells are black, there's a variety of colors and designs for the back sheets and frames. The monocrystalline cells are shaped like a square with the corners removed, so there are small gaps between the cells.

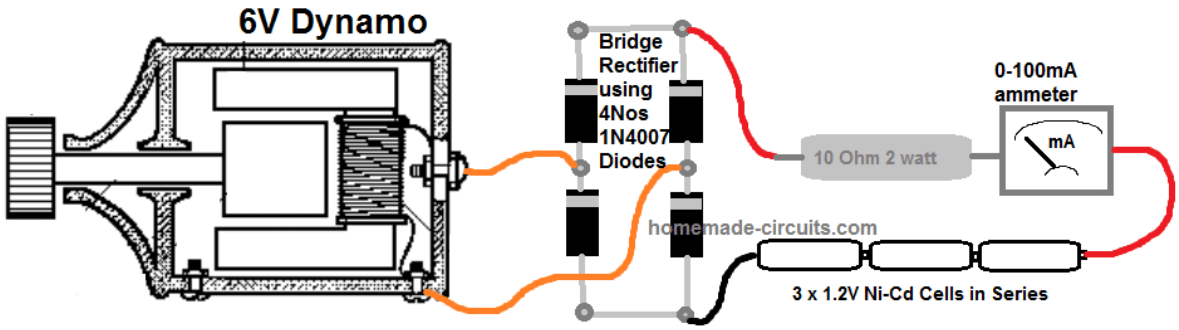

Figure 2: Block Diagram of Dynamo

VI. CONCLUSION

This application will be a valuable asset to the automobile sector and will benefit consumers greatly. Also, vehicle range has always been a huge concern for long-distance travel, but with this concept, the car will no longer require fuel to operate continuously, thus resolving that issue as well. To conclude, this dissertation could be used to develop an electric car that self-charges the system and runs on no additional fuel.

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