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System of Tricycle Mechanics Powered by Batteries

Ghuge Kailas Dattatray, Korade Kailas Ashok, Ahire Rupesh Bhagwan, Ganesh D. Katale
Department of Mechanical Engineering
Matoshri College of Engineering and Research Centre, Nashik India
Savitribai Phule Pune University, Pune, India

Abstract: *A three-wheeled bicycle with an attached engine is known as a motorised tricycle. Tricycles are classified as vehicles since they are propelled by electric motors or small internal combustion engines. Some are self-propelled if the user does not cycle, while others need pedalling. Electric bikes are powered by rechargeable batteries. These are charged from the mains, with the option of regenerative braking, charging while pedalling, or charging while sliding downhill. Electric motorised bicycles may be pedal-controlled or power-on-demand, with the motor controlled by a handlebar-mounted throttle. To detect pedalling, they may include a motor or torque sensor. The tricycle for this project is battery-operated and electrical, with no pedals. The mass of an electric vehicle has an impact on its performance, range, and cost. Heavy tricycles need a greater amount of power from the electric motor. It's critical to build a light, robust, and rigid frame to reduce the tricycle's weight. Choosing the right electric motor and battery mass may help you save weight, improve transmission efficiency, and triple your vehicle's range.*

Keywords: Battery, Tricycle, Electricity, Bicycle

I. INTRODUCTION

A motorised tricycle is a kind of three-wheeled bicycle that also incorporates an internal combustion engine into its design. Tricycles are considered vehicles in the vast majority of situations, and their propulsion may come from either electric motors or tiny engines that run on internal combustion. Some of them need the user to pedal in order to go ahead, while others are able to move forward on their own thanks to the engine. Batteries that can be recharged provide the electricity for electric bikes. These may get their power from the utility supply, which is also referred to as the mains, or they can get their power from regenerative braking, which enables them to get their power while the user is pedalling or sliding downhill. A throttle that is attached to the handlebars of an electric motorised bicycle with power-on-demand technology allows the rider to regulate the speed of the bicycle's engine. The throttle is not included in electric motorised bicycles that are controlled by the pedals. It is possible for them to have either a motor or a torque sensor, or both, in order to determine whether or not someone is pedalling. In the context of this project, the participant will use a battery-operated and electrically driven tricycle that does not have pedals. The weight of an electric vehicle may have a significant impact on its performance, as well as its range and cost. The electric motor on the heavier trike has to have a higher power rating. It is vital to design a frame that is not only light but also sturdy and robust in order to lower the total weight of the trike. This may be accomplished by making the frame as stiff as possible. If you choose an electric motor mass and battery mass that are of better quality, you will be able to more than double the driving range, lower the weight of the trike, and enhance the efficiency of the transmission. In addition, you will be able to improve the transmission's performance.

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II. BATTERY SYSTEM

The movement of electrons along a conductive route, such as a wire, is what creates electricity, as you surely already know. A circuit is a journey that follows the same route over and over again. Anodes (-), cathodes (+), and electrolytes (-) make up batteries. Cathode (the negative side of a typical battery) and anode (the positive side) are connected to an electrical circuit. The battery's chemical processes result in an electron accumulation at the anode. The anode and cathode are separated by an electrical current. This discrepancy might be seen as an unstable accumulation of electrons. For this reason, electrons are attempting to reorganise themselves in order to eliminate the disparity. But it's done in a certain manner by them. Electrons are attracted to one other and attempt to avoid each other. The cathode is the only destination in a battery. The electrolyte, on the other hand, prevents the battery's electrons from travelling directly from the anode to the cathode. Because a wire is connected to both cathodes, electrons may flow from one to the other. The electrons in the wire seen in the image above light up the light bulb as they go through it. Electric potential may be thought of in this sense as a force that drives electrons to move around in a circuit. To put it another way, electrons are no longer being supplied by the anodes and cathodes in these electrochemical processes. As a result, a battery's capacity is finite.

III. WORKING

A nonconventional energy source such as a solar panel will constantly be charging your battery for you.. LEDs on the charge board will indicate that the battery is being charged. Whenever the battery is fully charged, the LED will always be off, and the charging LED will display you a red indicator when the battery is low. The green LED will light up when the battery is fully charged by the solar panel. The supply will continue to motor through the charger if the weight is coupled to the lift of load and the start button is pressed. At this point, the motor will begin to turn. A clockwise and counter clockwise rotating motor is required, and when the motor begins to rotate, weight connected to the grille will be lifted. Changing the motor's rotational direction is possible after it reaches the desired height. When the weight is reduced, we will be able to place the weight where we want. Pedals connect to a big driving gear wheel of a bicycle, which everyone has seen or used. Gears at the rear of the vehicle are rotated, which in turn rotates the wheel at the back. A bicycle's forward motion is governed by the rotation of the rear wheel. Chain-driven gears may be found in a wide range of devices, including equipment, motorbikes, automobile engines, and many more. There are several links in a chain that are linked together by steel pins. A chain may be used to convey rotational motion from one gear wheel to another because of this arrangement. The primary benefit of a chain drive over a conventional gear system is its simplicity. Chain and two gear wheels are all that is need for long-distance transmission. In order to transfer motion, a typical gear train requires a large number of gears to mesh with each other. A permanent magnet, rotating electric motor powers the wiper motor. The output shaft and gear are driven by an idler gear and shaft, which are both machined into the armature shaft. The wiper linkage is linked to the output arm through the wiper linkage. The linkage is compelled to go back and forth when the electric motor rotates the output arm. Electrical windings on or inside the wiper motor control switch are linked to resistors that set the motor's speed. Using a control switch, the driver may choose which circuits of the wiper motor to use. Figure 1 depicts the design of a single-speed motor. Self-lubricating sintered bushes are used to install the armature with eight holes. Eight-segment commentators are often positioned at the driving end and are rubbed with two carbon brushes installed in opposite directions. The steel yoke is linked to two powerful permanent magnets using an adhesive, which is occasionally coated externally with non-ferrous metal to prevent it from corrosion. On the other end of the armature, there is a steel worm that spins a plastic wheel at a speed of roughly l/10 of the armature's rotation speed. The worm wheel drives a pinion gear straight from the motor's output. Rubber seals are installed on the motor's joint faces to keep moisture out. The arcing at the brushes generates gas, which is expelled via a polythene pipe.

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IV. ADVANTAGES & DRAWBACKS.

Advantages

1. Utilization of non-conventional energy source to overcome energy crisis.
2. Saving in convention energy source.
3. Real design prototype of big material handling equipment.
4. Non pollutant.
5. Noiseless.
6. Safety in handling.
7. Can be utilizing where electrical power source is not available.
8. Utilization of solar energy with mechanical advantage is giving us more
9. Output in less input.
10. It is simple operating system.
11. It is accurate.
12. The system is non programmable.
13. The battery back-up is provided.
14. Cost is less.
15. Construction is very simple and Suitable.

Drawbacks.

1. Required higher cost as motor technology.
2. The battery energy is depends upon backup.
3. Battery is most important part of project.

Application

- Lift the load
- Cary material one place to another place
- Material shifting & material handling equipment
- Can be utilizing where electrical power source is not available.
- Utilization of solar energy with mechanical advantage is giving us more Output in less input.
- Educational purpose.
- Engineering work shop.
- Industrial purpose.

V. CONCLUSION

Our goal was to raise as much weight as possible while using the least amount of electricity possible, so order to lower the cost of the solar panel and motor. Thus, we are able to achieve our goal by designing a gearbox that maximises mechanical benefits. A gearbox prevents maximal torque from being immediately transferred from an external source to the motor shaft, as we had previously seen in the gear box design. As a result, the needed speed and torque are increased near the end of the shaft. As a result, the motor rotates with the least amount of stress on its shaft and the greatest amount of solar capacity.

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