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RESEARCH ARTICLE OPEN ACCESS

Self-Energized Bicycle with Bullet Alternator and GPS Tracking

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Abstract:

The concern of this cycle is used to avoid air pollution and to act as renewable energy sources. Usually normal E-bicycles are not self-charging. These normal bicycles are needed to be charged once the battery gets used off and after that the rider should pedal to reach the destination. So, in this project, a self-energizing system is used. Air pollution is the biggest headache faced by metro cities nowadays. The exhaust gas from the vehicles contains harmful gases like Chloro-Fluoro Carbon (CFC), Carbon monoxide (CO). These harmful gases cause "Global Warming" and increase the Green-house gases. IC engines are mainly responsible for pollution.

Keywords **— Self-Energizing, Eco-friendly, Internet of Things, GPS Tracking.**

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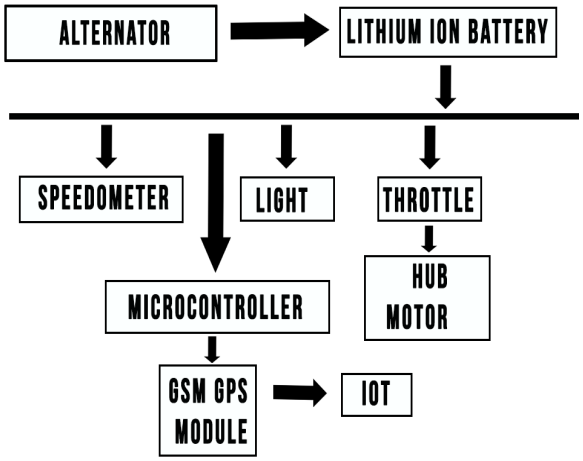
I. INTRODUCTION:

This project is mainly used to avoid air pollution and to act as renewable energy sources. Usually normal E-bicycles are not self-charging. These normal bicycles are needed to be charged once the battery gets used off and after that the rider should pedal to reach the destination. So, in this project, a self-energizing system is used. Air pollution is the biggest headache faced by metro cities nowadays. The exhaust gas from the vehicles contains harmful gases like CFC, Carbon monoxide (CO). These harmful gases cause "Global Warming" (i.e.) increase of Green-house gases. IC engines are mainly responsible for pollution.

II. BLOCK DIAGRAM:



3. WORKING MECHANISM:

The battery is initially charged to the maximum level. With the help of level of charge

present in the battery the hub motor rotates. As the hub motor rotates the back wheel also rotates and the cycle starts moving .From the construction, a bullet alternator which is attached with the back wheel also rotates. Due to this rotation the alternator generates some amount of charge ~9V is then passed through the bridge rectifier and it is then fed to the battery which is the capacity of24V. With the switching mechanism attached to battery whenever the battery no.1 gets drained is then switched to the newly charged battery no.2. This process goes in a cyclic manner.

4. CONSTRUCTION:

In this project a normal bicycle is made into a self-energized bicycle by the following procedures,

- A Hub motor with the specification of 24V 250W is attached at the front wheel and an alternator with the capacity of 12V 50W is attached to the back wheel.
- A battery with the capacity of 24V is attached to the hub motor through the motor controller.
- The motor controller is attached with the throttle and it controls the speed of the hub motor.

5. MODEL FOR SELF ENERGIZED BICYCLE:

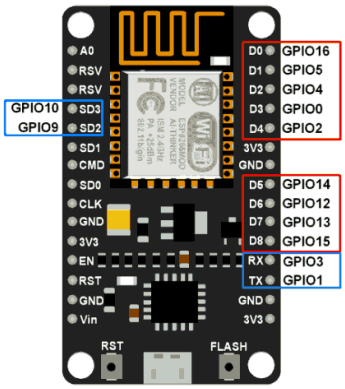
A. Text Font of Entire Document

Part no	Naming	Specification
1	Hub motor	24v 250w
2	Alternator	12v 50w
3	Battery	24v
4	Controller	
5	Throttle	

6. IOT MECHANISM:

In this bicycle node MCU ESP8266 board is used along with the GPS of NEO 6m module. The GPS module is mainly used to track the location based on the current latitude and longitude positions. Once the GPS module gets the location regarding latitude and longitude position it is transmitted through transmitter and it is then received by the receiver in the node MCU ESP8266. At first the collected information can be viewed using serial monitor in the Arduino IDE.

Fig: NEO 6M MODULE



CONNECTIONS:

Node ESP8266	Neo-6M
3V3	VCC
GND	GND
TX	RX
RX	TX

7. HUB MOTOR:

Hub motor electromagnetic fields are supplied

to the stationary windings of the motor. The outer part of the motor follows, or tries to follow, those fields, turning the attached wheel. In a brushed motor, energy is transferred by brushes contacting the rotating shaft of the motor. Energy is transferred in a brushless motor electronically, eliminating physical contact between stationary and moving parts. Although brushless motor technology is more expensive, most are more efficient and longer-lasting than brushed motor systems. A hub motor typically is designed in one of three configurations. Considered least practical is an axial-flux motor, where the stator windings are typically sandwiched between sets of magnets. The other two configurations are both radial designs with the motor magnets bonded to the rotor; in one, the inner rotation motor, the rotor sits inside the stator, as in a conventional motor. In the other, the outer-rotation motor, the rotor sits outside the stator and rotates around it. The application of hub motors in vehicular uses is still evolving, and neither configuration has become standard. Electric motors have their greatest torque at startup, making them ideal for vehicles as they need the most torque at startup too. The idea of "revving up" so common with internal combustion engines is unnecessary with electric motors. Their greatest torque occurs as the rotor first begins to turn, which is why electric motors do not require a transmission. A gear-down arrangement may be needed, but unlike in a transmission normally paired with a combustion engine, no shifting is needed for electric motors. Wheel hub motors are increasingly common on electric bikes and electric scooters in some parts of the world, especially Asia.

8.RESULT and CONCLUSION:

The output of 12v is obtained from the alternator. The GPS NEO 6m module is tracking the latitude and longitude of the cycle. The power from the battery is distributed constantly throughout the unit

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