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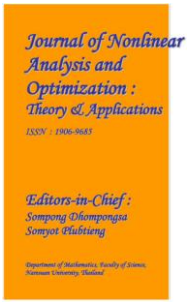

DESIGN OF FINGERPRINT TRICYCLE USING RENEWABLE RESOURCE

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Abstract—
Non-renewable energy is already causing problems with the supply of electricity. Today the main emphasis is placed on the production of electricity from renewable resource. In this project, a feasible design solution in the form of an easy-to-use three-wheel. An electric vehicle capable of being accessed with a fingerprint. This electric vehicle utilizes solar and a self-changing dynamo is used to charge the battery. The battery of tricycle is charged by a self-adjusting dynamo and solar power. The primary disadvantage of solar-electric vehicles is that they can retain energy in the event of precipitation. in our project, Parallel charging is used to charge the battery. Initially, the tricycle uses solar energy that is stored in its batteries. The dynamo helps the battery store energy while the tricycle is operating. We are adding a cabin to the tricycle in order to improve its efficiency. Our vehicle's ability to store energy during the rainy seasons, when there is less sunlight, is its primary benefit.
The main controlling device of the whole system is a Microcontroller. Fingerprint module, relay along with vehicle ignition and LCD are interfaced with it. The Microcontroller reads the input from the finger print module and provide access to ignition system if it is valid. The status will display on LCD. When compute two control buttons, to store and remove the fingerprints. With the help of key, the vehicle gets started.

keywords: Solar panel, Dynamo, Fingerprint module, LCD display, Microcontroller.

INTRODUCTION

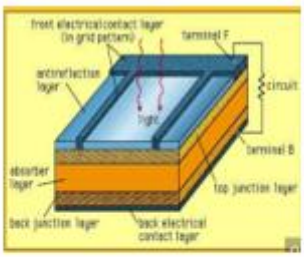
The primary goal of building an electric tricycle is to create a lightweight, cost-effective vehicle that may be used in small towns. To minimize weight and expense, we created several different subsystems with this in mind.
The electric car has a mild steel chassis, a controller circuitry, and a biometric entry system.

This vehicle includes a self-charging dynamo and a solar panel to charge the EV battery. The vehicle's back wheels are fitted with dynamos. While driving, the dynamo turns mechanical energy into electrical energy, which is then stored in the EV battery via the charging circuit. The solar panel is mounted on the back of the EV car and is supported by an iron frame. The solar energy is used for battery charging.

HARDWARE COMPONENTS

EQUIPMENT NAME
Solar panel…….48V,2OWatt.
Charging circuit……230V INPUT…12V DC
Battery…….48v,80watt.
Hub motor……48v,800watts power with speed 35 KM.
Wheels….10 Inch Wheel
Steering.
Throttle.
Vehicle setup….MS steel metal
Dynamo…….48Vv,40watts
Microcontroller……PIC16f72Microcontroller.
Fingerprint module……. r303 finger print module.
LCD display……16*2 LCD display
Two buttons……push buttons.et button

Solar:
A solar cell (also known as a photovoltaic cell) is a solid-state device that uses the photovoltaic effect to convert sunshine energy directly into electricity. Solar modules, commonly known as solar panels, are made up of cell assemblies. These solar modules' energy output, often known as solar power, is an illustration of solar energy. Polycrystalline solar panels with a voltage of 48V and a power rating of 20W are employed.



1. When photons from sunshine strike a solar panel, semi-conducting materials like silicon absorb them.
2. Negatively charged electrons are broken free from their atoms, allowing them to flow through the substance and generate electricity. Allow the electrons to only travel in one direction due to the unique makeup of solar cells. In a silicon solar panel, the complimentary positive charges that are also produced (like bubbles) are known as holes, and they move in the opposite direction from the electrons.
3. Direct current (DC) power is produced from solar energy using a system of solar panels.

Dynamo

Fig: Dynamo

A straightforward DC generator rotates around and generates a steady stream of direct current power, just like a DC electric motor uses DC electricity to produce continuous, rotating motion. DC generators use commutators, much like DC motors do. Although it may appear complicated, it is only a metal ring with splits that, on a periodic basis, switches the electrical connections from the generator coil while also switching the current. As we saw above, a basic loop of wire automatically reverses the current it creates every half-turn just by rotating, and the commutator's purpose is to cancel out the impact of the coil's rotation, making sure that a direct current is produced.

Charging circuit:

Fig: Charging circuit

The 48-volt, 20-watt solar panel and dynamo are employed in the circuit above. As we can see, the generated DC voltage is stored in the battery with the aid of a rectifier and a 1000 MF capacitor. If the LED illuminates, we can see that the rechargeable battery is receiving DC voltage at the output terminal.

In this case, reverse current protection is provided via diodes. Diodes operate with a forward bias.

Rechargeable Battery:

A rechargeable battery, storage battery, or accumulator is a type of electrical battery.

Fig: Rechargeable Battery

It is a form of energy accumulator that consists of one or more electrochemical cells. Button cells to megawatt systems connected to stabilize an electrical distribution network—rechargeable batteries exist in a wide variety of sizes and configurations. Because their electrochemical processes are reversible, rechargeable batteries are referred to as secondary cells.

The overall cost of use and environmental impact of rechargeable batteries are less than those of disposable batteries. Some varieties of rechargeable batteries are offered in the same dimensions as disposable ones. Rechargeable batteries are more expensive initially but can be recharged for very little money and are very useful.

Throttle:

Fig; Throttle

The throttle plate opens when the gas pedal is depressed, letting air into the engine. The butterfly shuts and effectively chokes off (throttles) air passage into the combustion chamber when the gas pedal is

let off. This procedure successfully regulates the engine's speed, which ultimately affects the vehicle's speed.

Steering:

Fig: Steering

Using a hand-operated steering wheel that is mounted in front of the driver, a driver can steer a car according to standard automotive steering arrangements by turning the front wheels in the desired direction. The driver can direct the front wheels by turning the steering wheel, which is fastened to a steering column that is connected to gears, rods, and pivots.

Fig: Back wheel

The rare wheels start slipping or proactively based in the vehicle condition or drive mode selection.

HUB motor with front wheel:

Fig: Front wheel with hub motor

The wheel hub motor, which is also known as a wheel motor, wheel hub drive, hub motor, or in-wheel motor, is a type of electric motor that is integrated into a wheel's hub and directly drives it. The hub motor's stationary windings receive electromagnetic fields from the motor.

While rotating the affixed wheel, the motor's outer portion attempts to follow those fields. In a brushed motor, energy is delivered when brushes meet the motor's moving shaft. Electronic energy transfer prevents physical contact between stationary and moving parts in brushless motors.

Despite being more expensive, brushless motor technology is typically more effective and durable than brushed motor systems.

Controller Circuit:

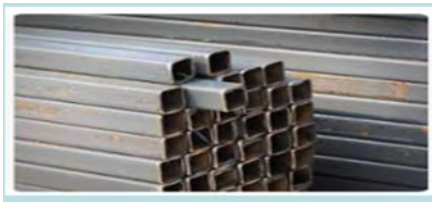
Fig: Controller

Through several sensors, it receives data in the form of signals from input components, such as the throttle and brake. After that, it analyses the signals it has received and converts them into instructions for the output components, such as the motor.

Battery charger:

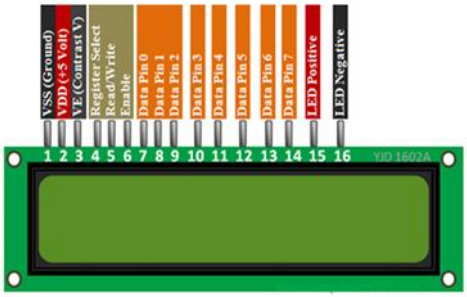
Fig: Battery charger

Connect the charger to the battery and plug it in.
Allow the battery to charge before proceeding. The battery in newer models contains an LED warning light that can turn red when it is extremely low or completely depleted, yellow when a charge is about to be required, or green when it has been fully charged.
MS Steel Metal:



To fabricate the vehicle using MS steel metal.

LCD Display:



One of the most common devices attached to a micro controller is an LCD display. An LCD is an electronic display module which uses liquid crystal to produce a visible image.

PIC Microcontroller:

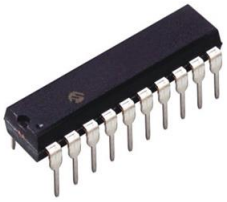


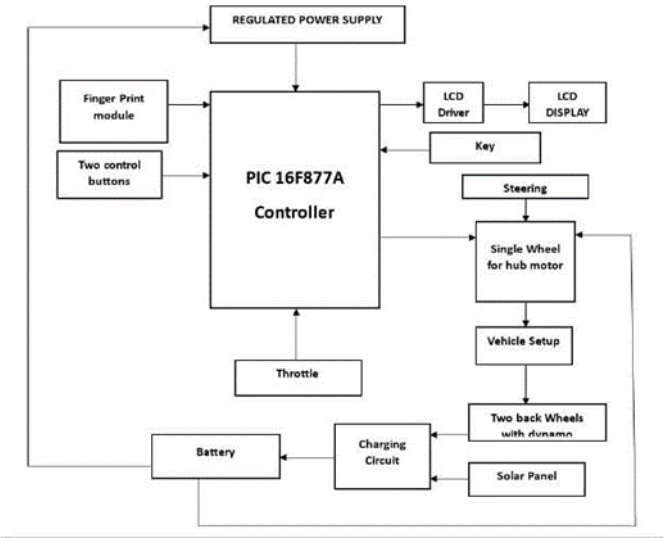
Fig: PIC microcontroller

A PIC programmable interface controller serves as the design's control component. A microcontroller is like a computer on a chip and has basic microprocessor components in addition to some specialized features like a corporator and an Analog/Digital converter. The PIC32 advanced series of microcontroller devices is the one used in the author's work. This microcontroller's data memory (RAM) contains 64 KB, while its programme memory has 256 KB. PIC 16F877 Microcontroller is what we use.

Implementation:

The battery of this electric vehicle is charged by solar energy and a self-charging dynamo. This vehicle is powered by its batteries.

A microcontroller serves as the primary controlling element of the entire system. It is interfaced with a fingerprint module, relay, LCD display, key, and vehicle ignition. If the input from the finger print module is valid, the microcontroller reads it and grants access to the ignition system. On the LCD, the status will show.



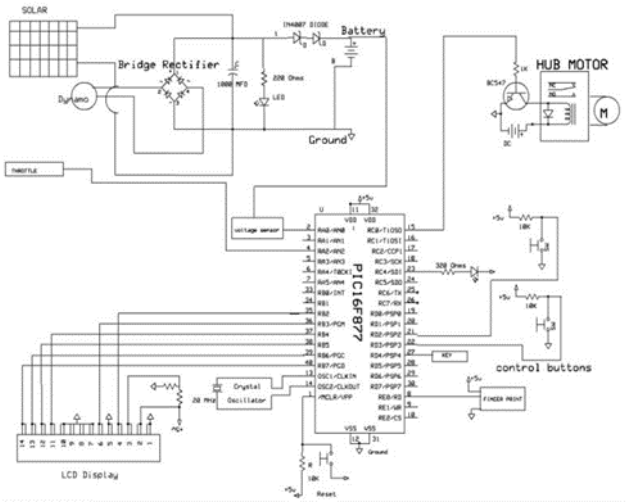
From regulated power supply of range (0-60) V range is connected to microcontroller. The supply voltage from the battery is 24Vis supplied to microcontroller, where controller needs only 5V supply which will convert with the help of the transformer, rectifier filter and regulator.

When fingerprint is accessed through microcontroller it will display on LCD. To store fingerprint, we are using two control buttons to store.to pin of RE0/RD the fingerprint module is connected, RD2 and RD3 the control buttons are given connection.

When ignition get stated, the signals are sent to wheel of the hub motor through controller and vehicle get started.

Solar energy and dynamo are charged and given to the charging circuit. In charging circuit, charging of the battery takes place simultaneously and given to the battery to store the energy. From the battery again to supply. The energy from the battery is sent to hub motor to start the vehicle.

CIRCUIT DIAGRAM & WORKING:



In this project, we must first insert the key and then the finger print to start the tricycle. To store fingerprints, we installed an enabling key to store print. The LCD will display "please place the finger"

if the fingerprint has already been stored; it will say "fingerprint accessed please takeoff" and allow you to proceed with the takeoff. If not, we need to flip the key on and off to determine if it still matches. The battery will be charged via three different sources: It takes nearly 3 hours to fully charge the two dynamos that are series connected at the location of wheels. There are four 12V batteries in use. These are connected in series, as is the power supply that the controller received from the MCB.It will take 3 hours to fully charge the battery. We have 20-watt solar panels attached to batteries that operate on 24 volts.

Furthermore, the throttle provided input to the controller, which in turn powered the hub motor. HUB Motor runs at 35 km/h with an operational voltage of 48 or 80 watts. The vehicle can carry weights up to 250kg.

The battery will display a red light while it is charging. It will display a green light when it is completely charged. Additionally, we are utilizing two chargers: charger 1 is connected to the output of the solar panel, while charger 2 is connected to the output of the dynamo. For security purposes, we are employing MCBs. To stop additional harm to the vehicle in the event of a heavy load. We employ MCB.

Batteries are charged by solar power and dynamo power. Battery energy will be used by the microcontroller to power the hub motor via signals.

Moreover, the hub motor drives the vehicle's front wheels. When sunlight is scarce during the wet or windy season, a dynamo is used to charge the batteries. This is one of our project's main advantages.

OUTPUT

CONCLUSION

This project aims to improve the standard tricycle and make it more efficient. To function electrically electric vehicles (EVs) require two different forms of battery charging: solar and dynamo. Because there is less sunlight during rainy weather, solar power sources cannot operate. Fortunately, this tricycle has a self-charging dynamo to charge the battery. By employing a fingerprint to start the tricycle's ignition, we have increased the tricycle's security. The tricycle’s ignition will start if the

fingerprint matches the stored image in the database after converting the image to binary. If the stored image in the database does not match with the fingerprint, then the tricycle will not start.

FUTURE SCOPE

We intend to add a temperature sensor to know the battery temperature, which protects the vehicle from harm despite. The temperature of battery increases beyond the certain limit, the buzzer turns on and then automatically vehicle protect from high temperature.; we also intend to add a voltage sensor to know the voltage value; and we intend to add a cabin in the back for carrying items to improve efficiency of the vehicle.

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