
DESIGN AND FABRICATION OF BLDC ELECTRIC CYCLE

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ABSTRACT

The main aim of this review paper is to present the idea of harnessing the various energy and use it in today's existence of human life. Now- a-days there are so many vehicles on road, which consumes more fuel and also hazards our environment. It is our responsibility to reduce the consumption of fuel and its hazardous emission products. Taking this into consideration it is our small step towards reducing the use of more fuel consuming vehicles and attracts the eye of people towards its alternatives i.e. Electric bicycle. So we intend to design a cycle which would run on an alternative source and also reducing human efforts called as Battery Operated Cycle. In this paper we design an alternative mode of transport for betterment of social and environment.

Index Terms—Recycle cells, Fuel consumption, Alternative source, Electric bicycle

1. INTRODUCTION

Recycling materials for electric cycles is an important step towards reducing environmental harm. As we strive towards a more sustainable future, it is crucial to consider the impact of the products we use and discard. By repurposing materials from old electric cycles, we can decrease our reliance on raw materials and minimize waste. Moreover, recycling helps to conserve energy and reduce emissions in comparison to the production of new materials. In this context, recycling materials for electric cycles plays a significant role in promoting environmental consciousness and creating a more sustainable society.

2. OBJECTIVE

Electric Bicycle is the upcoming trend which will drive the world to greener yet keep it going on the current pace it is running on. It will also reduce the carbon footprint, giving some relief to already melting earth by being powered by renewable and also by regenerative mode of power storage. Not just this, this project is also been made for medical purposes, like heart rehabilitation centres which want their patients to exercise a normal breathing pattern by mild exercise which can easily be provided by the help of Electric bicycle. This project is a step forward to the fast-peddalling world.

3. LITERATURE REVIEW

The higher price of EVs could contain EV embracing. Other barriers for embracing of EVs initiate were the non-availability of EVs and lack of EV models. Literature shows that the lack of knowledge and unqualified car dealership may discourage EV adoption. And here come the idea that how the availability of Electric vehicles get available in large scale, So in case of Electric bicycle the normal conventional Bicycle is get converted in to the Electric Bicycle which directly reduce the cost of the Electric Bicycle and cost reduction will result in the adoption of the electric Vehicles technology in a larger scale. As in most of the cases people have old bicycle which may get converted into electric Bicycle with certain changes. As electric Bicycle uses battery which help to run the motor of the bicycle which give range of 30 to 50 Km on a single charge with a speed of 20km/h to 25km/h and to full charge the battery takes 6 to 8 hours and if we compare it with Fuel powered vehicles like Bike, Car, Etc. the electric bicycle directly reduce the fuel cost and result in big saving of fuels and money also. point of view, it leads to a very expensive transport solution, requires significant thoroughfare space, and may require licensing for use in certain locations Electric quad bikes are likewise expensive, bulky to park and have few advantages over an electric Bicycle.

In fact, all of the devices mentioned are expensive, certainly significantly more so than a standard Bicycle, and most work on the premise of simply adding a motive power source to a Bicycle- type system. However it is by no means certain that lack of such power assistance is the main reason why Bicycles may not have been more widely adopted in many campus environments. Thus, adding motive Power alone may not lead to the more widespread adoption of electric Bicycle-type transport.

4. ELECTRIC CYCLE

Electricycle is a recycling method that focuses specifically on electronic waste, such as old computers, cell phones, and televisions. This method involves disassembling the electronic devices and separating the materials into categories such as plastics, metals, and precious metals like gold and silver. These materials are then reused in the manufacturing of new electronic devices. Recycling electronic waste not only conserves natural resources but also prevents harmful substances from entering the environment. By utilizing electricycle, we can reduce the amount of electronic waste in landfills and create a more sustainable future.

5. PROTOTYPE OF ELECTRIC CYCLE



Figure No 1: BLDC Electric Cycle

6. METHODOLOGY

BATTERY RECYCLING PROCESS

Step 1: Features

Supply Output

- Nominal voltage – 24.1 v
- Maximum voltage – 25.7 v
- low voltage - 23 v

Safety Features

- Over-Discharge Protection
- Over-Charge Protection
- Short-Circuit Protection

Step 2: Stuff I Used

- 18650 Battery
- I have salvage this battery from a laptop
- 18650 Battery Holders
- 20A BMS Board

Step 3: The Things You Need To Know

- It is necessary to use same capacity battery little up and down will be ok (example - 1750 mah , 1740 mah , 1730 mah) If you want to know how to check your real battery capacity.

- And it is very necessary to keep all the battery at same voltage " I found a best way to do this by connecting all the batteries in parallel and leave it overnight "Be careful while doing this don't reverse the polarity.

Step 4: Attaching the BMS & Battery Holder

- Put 3 battery on the 18650 Battery Holder
- Use a double sided tape to stick BMS on the Battery Pack

Step 5: Connection

- Connect all the battery as shown in the schematic.

Step 6: How To Charge Them

- you can just use a 25.7v lithium battery charger to charge this battery pack.
- By the way I'll make a lithium battery charger later on so stay tuned for that.

Step 7: Finishing

- Now check the output voltage

7. COMPONENTS

- 18650 Battery
- Tp4056 Linear Li-Lon Battery Charger
- 18650 Battery Capacity Tester
- Battery Management System (BMS)
- BLDC Motor
- Motor Controller 24v
- E bike Twist Throttle

7.1 18650 Battery

An 18650 is a lithium ion rechargeable battery. Their proper name is "18650 cell". The 18650 cell has voltage of 3.7v and has between 1800mAh and 3500mAh. 18650s may have a voltage range between 2.5 volts and 4.2 volts, or a charging voltage of 4.2 volts, but the nominal voltage of a standard 18650 is 3.7 volts. There are two types; protected and unprotected. We absolutely recommend protected cell 18650 batteries. Protected cells include a protection circuit that stops the cell from being overcharged. Unprotected cells can be overcharged and burst and potentially cause a fire unless there are specific electronics to protect the battery. The popular LG HG2 and INR and Samsung 25r and 35e are UNPROTECTED batteries, only use them in a device designed to use unprotected 18650s. We also recommend you stick with high quality brand name 18650s. Knock offs may lie about high mAh (capacity). The average 18650 battery charge time is about 4 hours. Charge time can vary with amperage and voltage of the charger and the battery type.

7.2. Tp4056 Linear Li-Lon Battery Charger

The TP4056 1A Li-Ion Lithium Battery Charging Module – Micro B USB is a 3.7V lithium battery charger module has on board Micro USB interface. With Micro-USB on board connector, you can directly connect to computer USB port for battery charging. If USB is not available you can use an external source voltage at IN+/IN- pads, great for DIY projects. It is small size and lightweight

7.3. 18650 Battery Capacity Tester

ZB2L3 battery capacity tester discharge type 1.2-12V external load capacity of the battery and other tests 18650 Tools, single-function, by controlling the load off and get real-time integrated discharge current capacity results

Maximum support 15V 3A discharged through the discharge voltage and current, itself does not discharge Maximum capacity statistics support 9999Ah Automatically identify and develop appropriate battery termination voltage can also be manually adjusted.

7.4. Battery Management System (BMS)

Acrylic is a transparent plastic material with outstanding strength, stiffness, and optical clarity. Acrylic sheet is easy to fabricate, bonds well with adhesives and solvents, and is easy to thermoform. It has superior weathering properties compared to many other transparent plastics.

7.5. BLDC Motor

A battery pack is a set of any number of (preferably) identical batteries or individual battery cells. They may be configured in a series, parallel or a mixture of both to deliver the desired voltage, capacity, or power density. The term battery pack is often used in reference to cordless tools, radio-controlled hobby toys, and battery electric vehicles.

7.6. Motor Controller 24v

The list of speed control comprises a wide range of appliances, beginning with household electrical appliances used in the garden and garage, and ending with large industrial plants with conveyor belts, pumps and machine tools. We will quickly see how essential and important this type of speed control is for various machines.

7.7. E bike Twist Throttle

It features linear control over E-Bike motor and lets you change the speed of the vehicle according to your requirement. It obtains a direct connection with the E-Bike Controller Circuitry through the wire attached to it.

8.RESULT AND DISCUSSION

Our project may provide a solution for this existing problem since charging of the battery is done as the vehicle runs. It is very much suitable for young, aged people and caters the need of economically poor class of society. The most important feature of this e-bike is that it does not consume valuable fossil fuels thereby saving the money.

9. CONCLUSION

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In conclusion, using recycled materials in the production of electric cycles is a sustainable and eco-friendly approach that benefits both the environment and the economy. By reducing the amount of waste sent to landfills and conserving resources, manufacturers can lower their environmental impact and reduce production costs. Additionally, consumers can feel good about purchasing a product that is made from recycled materials and contributes to a cleaner and healthier planet. Overall, recycling materials in the production of electric cycles is a win-win solution for all involved parties.

10. REFFERANCE

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