REVIEW PAPER ON SOLAR ELECTRIC TRICYCLE

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Abstract— Solar plays a vital role in our day to day life. We have developed the solar tricycle especially for handicapped person Comfort of the person in the tricycle is an important and we have given importance to it. The main content of the tricycle is Solar PV panel, Brushless wiper motor, Charge controller and battery. This will discuss about the main idea of this project and to get a larger picture on what is the problem in the current technologies.

Nowadays fuel prices throughout the world is increasing day by day thus a solar tricycle provides an alternative by harnessing solar energy to charge the battery to run the motor

Since India is blessed with nine months of sunny climate thus concept of solar tricycle is very friendly in India. Solar hybrid tricycle can become a very vital alternative to the fueled automobile Thus its manufacturing is essential

Index Terms— Handicaps cycle, Solar Electric Tricycle.

1 INTRODUCTION

There are several types of tricycle that can be categories that is paddle tricycle, motorized tricycle, and electric tricycle. The weakness of the tricycle make people do not like to used tricycle. First, paddle tricycle needs a lot of energy to paddle the tricycle. The user will surely be tired after used the tricycle. This will not suitable for student to use to go to the class because they will be tired when they are in the class and will lost their concentration while hearing the lecture. Next, motorize tricycle that used fuel as it prime mover. The tricycle use fuel that is costly. As a student, their allowance is limited and only can be used for their study material and for their food to survive at the campus. Besides that, motorize tricycle will make pollution that can be very bad for our environment especially in this period that global warming happen to the earth. Lastly, electric tricycle that generate by battery can be only be sufficient for about an hour. The user needs to find power supply to recharge the battery or else they need to paddle the tricycle that used more energy compare to the normal tricycle because of the weight.

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2 OBJECTIVES AND METHODOLOGY

2.1 Objectives

The main objective of the project is to design the Solar Electric Tricycle with following features:-

- To develop a vehicle that use renewable energy, environmentally friendly and cheap.
- To develop an electrical tricycle that can charge the battery when it is not in used.
- To develop low speed tricycle, but for a longer distance.

2.2 Methodology

The concept of DFM (Design for Manufacture) is not new, it dates back as early as 1788 when LeBlanc, a Frenchman, devised the concept of inter-changeable parts in the manufacture of muskets which previously were individually handmade. DFM is the practice of designing products keeping manufacturing in mind Design for manufacture" means the design for ease of manufacture for the collection of parts that will form the product after assembly. Similarly DFA is called Design for Assembly

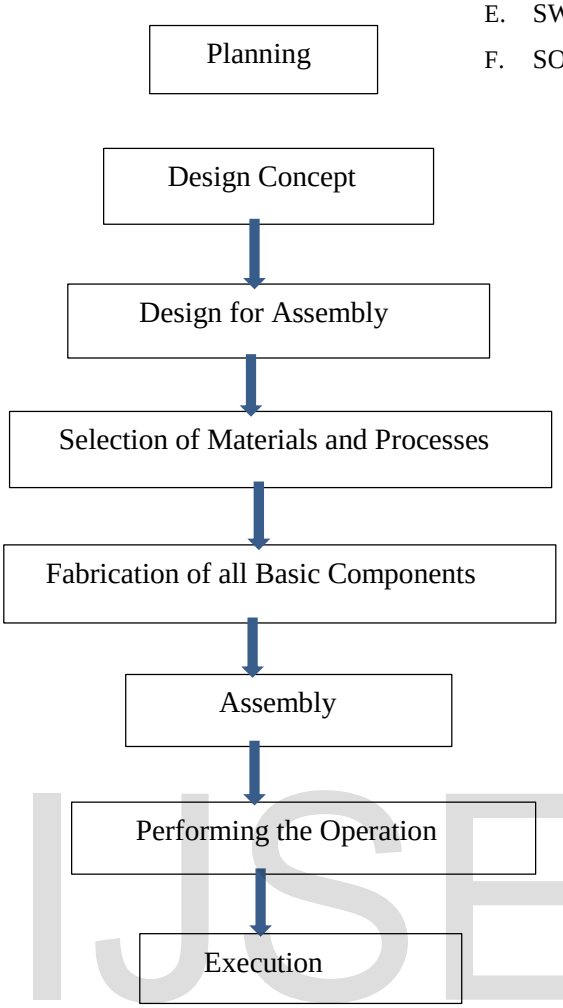

Figure 2.1: Flowchart of design and development of Solar Electric Tricycle .

1. Solar Array which collects solar energy and convert it to electrical energy
2. Power trackers to achieve the proper voltage to be stored in batteries.
3. Batteries to stir power.
4. Motor controller which adjusts the power input to the motor.
5. An electric motor which drives the vehicle

3 COMPONENTS OF Solar Electric Tricycle

The materials and methodology section describe in detail all the materials that have been used in the project to conduct a study as well as the procedures that are undertaken.

COMPONENTS USED

A. DC WIPER MOTOR-12V,60RPM
B. BATTERY-12V,8AH
C. WHEELS
D. MILD STEEL
E. SWITCH
F. SOLAR PANEL-12V

- **Wiper Motor**

This type of motor produce a magnetic field in the rotor by using permanent magnets attached to it and commutation is achieved electronically. Wiper motors are designed for two speed operation. The motor consists of three brushes namely; common, low speed and high Speed. Two of the brushes will be supplied for different mode of operation. 12v high torque low rpm electric motor

- **BATTERY**

The lead–acid battery, invented in 1859 by French physicist Gaston Planté, is the oldest type of rechargeable battery. Despite having a very low energy-to-weight ratio and a low energy-to-volume ratio, its ability to supply high surge currents means that the cells have a relatively large power-to-weight ratio. These features, along with the low cost, makes it attractive for use in motor vehicles to provide the high current required by automobile starter motors.

- **Solar panel**

Solar energy creates absolutely no pollution. This is perhaps the most important advantage that makes solar energy so much more practical than oil. Oil . Solar energy is a completely renewable resource. This means that even when we cannot make use of the sun‘s power because of nighttime or cloudy and stormy days, we can always rely on the sun showing up the very next day as a constant and consistent power source.

4 Literature survey

The following papers have been surveyed by us in context to our Project,

Ajit B. Bachche et al.[1] “Solar hybrid tricycle”

- They studied the fuel prices like the petrol is rising steadily day by day.
- To overcome these troubles, an effort regarding this is made to search some other alternative sources of energy for the vehicles.
- The solar assisted tricycle is driven by DC hub motor mounted in front or rear axle housing & operated by battery charged using solar energy.
- The solar panels placed on the carriage will charge the battery & which in turn drives the hub motor.
- When the tricycle is idle, the solar panel charges the battery. During their testing they considered a hub motor of 250W 24V capacity**.**

Henry M. Gannon, et al:“Multi wheeled vehicle”

- Their study was related to a multi-wheeled vehicle not limited to a tricycle.
- The preferred arrangement consists of a standard conventional tricycle with multi-speed transmission, plus an electrical generating system and a solar charging arrangement.
- This preferred arrangement is normally powered by a combination of motor and pedaling, coupled such that either or both may provide power at any instance.

Glenn C. Streif‘, et al .[3]“Solar intensifying collector’s”

- They studied a bicycle which runs on solar energy consists of an solar intensifying collectors.
- It also includes pair of rechargeable batteries.
- The panels are provided with the energy intensifying lens which intensifies the solar rays received from sun.
- Solar bicycle is an modification of conventional bicycle and driven by electrical energy.

Arvind Prasad et al.[4] “Powered Wheelchairs”

- They studied report on the efficiency and durability of batteries and solar panel’s.

Arun Manohar Gurrama et al.[5] “Solar Powered Wheelchair:Mobility For Physically Challenged” To fabricate a solar powered wheel chair at an optimal cost which can be utilized in both indoor and outdoor environments.

Md. Shahidul Islam et al.[6] "Designing Solar Three-Wheeler For Disable People" They Develop a wheelchair with a user-selectable manual/electric propulsion mode and an auxiliary solar power supply system.

Nida Riaz et al.[7] "Electrical Wheelchair With Retractable Solar Panels" highlights the importance of non conventional source i.e.solar energy and uses it for the advancement of wheelchair technology.

Conclusion

We can say our project can be a success considering the changes we had to make in the spring once we actually found out how the hybrid solar tricycle was for. We can achieve our five aims, and we believe that we have a system that will be effective in providing mobility for persons who have disabilities. One of the major lessons we have learned is that designing an appropriate technology is a huge challenge. Appropriate is more than just availability for replication, it considers longevity, reliability, and efficiency.

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