iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** II **Month of publication:** February 2022

DOI: https://doi.org/10.22214/ijraset.2022.40459

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue II Feb 2022- Available at www.ijraset.com

Review on Design of Solar Power Tricycle for Physically Handicap Person

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Abstract: ***Solar energy plays an important role in day-to-day life of human. The main components of this project are solar panel, Battery, BIDC motor, charge controller. The main purpose of this project is to design and development a solar power tricycle vehicle for physically handicapped person. In this paper, we have discussed how to utilise solar power through the solar panel drive the brushless DC motor.***
Keywords: Tricycle, solar tricycle, solar powered vehicle, solar panel.

I. INTRODUCTION

The basic Tricycle is a three wheeled design for disabled person.They use only one hand to steer and other to rotate the pedal. Main content of the tricycle is solar panel , Brushless BLDC motor controller and battery. The power transmission of solar tricycle is simple. World is moving towards automation where human effort descrissed .But physically challenged people left challenged. By using solar energy to obtain power required for powering the automobile design various conclusive effects. Renewable energy powered by vechicles or other appliances bring down Globalwarming and depletation of non renwable sources. Hence in this paper we discuss about solar power tricycle for physically challenge people using solar energy for tricycle is an eco-friendly approach. It typically consist of seat supported on three wheels attached to the body of cycle. It decrease the usage of conventional fuels which decereases pollution, tricycle is design to achieve a Speed of 20-25Kmph.



Fig. Design of solar Tricycle

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Volume 10 Issue II Feb 2022- Available at www.ijraset.com

II. LITERATURE REVIEW

In order to perform this project, literature review has been made from various sources like journal, books, article and others. This chapter includes all important studies which have been done previously by other research work. It is important to do the literature review before doing the project because we can implement if there are information that related to this project.

DANIEL DOURTE, et.al [1] described in his paper about the development "ELECTRIC TRICYCLE"
The aim of this project is to add an electric power train and control system to the current hand-powered tricycle to provide tricycle users with improved levels of mobility. The design objectives required a simple and affordable design for the power train and controls, a design that needed to be reliable, sustainable, and functional .

M. REDDI SANKAR, et.al [2] described in his paper about the development "DESIGN AND DEVELOPMENT OF SOLAR ASSISTED TRICYCLE"
The solar assisted bicycle developed is driven by DC motor fitted in front or rear axle housing & operated by solar energy. The solar panels mounted on the carriage will charge the battery & which in turn drive the hub motor. When the bicycle is idle, the solar panel will charge the battery.
This arrangement will replace the petrol engine, the gear box & the fuel tank in case of a two wheeler or a chain sprocket, chain & gear shifting arrangement of a conventional bicycle being used by most common man.

N.SASIKUMAR,et.al [3] described in his paper about the development "SOLAR ENERGY SYSTEM IN INDIA"
Conventional energy sources like coal, oil, natural gas, etc., are limited in quantity, and if these continue to be depleted at the present rate, these will be exhausted in the coming decades. Energy demand is resulting in the creation of fossil fuel based power plants leading to substantial greenhouse gas emissions having an adverse impact on global warming and climate change Solar energy offers a clean, climate-friendly, abundant and inexhaustible energy resource to mankind.

ABDULKADIR BABA HASSAN,et.al [4] described in his paper about the development "DESIGN AND FABRICATION OF A MOTORIZED PROTOTYPE TRICYCLE FOR THE DISABLE PERSONS"
This project design is embodied on a motorized tricycle for disabled Persons. The tricycle was specifically designed to suit wheelchair occupants of healthy Upper torso with pelvic to foot restraint. It is also designed to suit a commonly available Wheel chair. The level of relationship between the disabled people in the society has highly being jeopardized; therefore this project was designed to correct the difficulties in mobility of the wheelchair users. The main aim of the project design is to ease mobility for the physically challenged and also provide adequate comfort they desire.

T1LAKISWARAN A/L SAMURGAM,et.al [5] described in his paper about the development "DEVELOPMENT OF BATTERY POWERED TRICYCLE"
The main purpose of this project is to develop a battery powered electric motor tricycle which can be used as a simple transportation and for economy reasons, to develop a battery powered electric motor tricycle which can be used as a simple transportation and for economy reasons. A motorized tricycle is a three wheeled tricycle with an attached motor used to assist with pedaling.

YOGESH SUNIL WAMBORIKAR,et.al [6] described in his paper about the development "SOLAR POWERED VEHICLE"
The renewable energy is vital for today's world as in near future the nonrenewable sources that we are using are going to get exhausted. The solar vehicle is a step in saving these nonrenewable sources of energy. The basic principle of solar car is to use energy that is stored in a battery during and after charging it from a solar panel. The charged batteries are used to drive the motor which serves here as an engine and moves the vehicle in reverse or forward direction.

ARUN MANOHAR GURRAM, et.al [7] described in his paper about the development "SOLAR POWERED TRICYCLE "
Personal mobility means freedom for the physically challenged. One of the best inventions in the medical field that helped both the elderly and the handicapped is the mobility vehicle. The fact that they are no longer depending on someone else to perform daily duties is a big step forward. On the journey to mobility and freedom, motorized scooters and tricycles are the tools to finish that journey.

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SHUH JING YING, et.al [8] described in his paper about the development "POWER ASSIST HAND TRICYCLE WITH BATTERY FOR DISABLED PERSONS"
A hand tricycle is originally designed to be used by a disabled person with lower extremity weakness but with power in his or her hands and arms. This tricycle is modified by the addition of an electric motor and battery to help power the vehicle. Thefunctions of the original design are not altered. The battery, motor, speed reducer and clutch are properly arranged.

CHETAN MAHADIK, et.al [9] described in his paper about the development "AN IMPROVED & EFFICIENT ELECTRIC TRICYCLE SYSTEM WITH THE POWER OF REAL-TIME INFORMATION SHARING".
This paper presents the development of an associate degree "Electric tricycle System" with an innovative approach. The aim of this paper is to show that the normal tri-cycle can be upgraded to electric one by some means– that including the development of a regenerative braking system and innovative BLDC motor control. The main components of the electric tricycle are brushless DC motor, motor controller, photo-voltaic, dry cell battery and solar panel. Also throttle and extra features such as horn, speedometer, and LED signal etc. The power source for this system is given by dry cell battery.

QINGFENG SU, et.al [10] described in his paper about the development, "GREEN SOLAR ELECTRIC VEHICLE CHANGING THE FUTURE LIFESTYLE OF HUMAN"
Electric vehicle with more advantages of no noise, no pollution, saving energy and reduce carbon dioxide emissions is to powerdriven vehicle with a motor drive wheels moving. Solar electric vehicle can make to reduce our greenhouse gas emissions and other pollution. All advantages of solar electric vehicle make research and application of solar electric vehicle as a "hot spot" of automotive industry and the trend of future cars.

K. Kalyani Radha, et.al [11] described the tricycles are used for transportation, possessing discomfort with physical exertion required to pedal over roads and uneven terrains to the physically challenged people with traditional tricycles which are arranged with extremely high gear ratio. A power assist could go a long way toward improving tricycle comfort and ease of use for drivers by easing the burden on the disable person.
Surajkumar Reddy, et.al [12] described Modified Tricycle for Handicapped people" is a paper based on assisting and supporting handicapped individuals with one functional leg to easily ride bicycles and to make them feel confident performing work like healthy people. In this project the conventional Tricycle design was improved and some of its parts were modified in order to suit the utilization by such category of people.
Snehal and Amit et.al [13] developed the solar tricycle especially for the handicapped person. In this paper discussed that how solar power is utilized for providing the power to the tricycle, which will reduce the efforts of the handicapped person. The solar tricycle mainly consists of Solar panel, Brushless DC motor, Battery, Charge controller and Throttle.
Abhishek K. Saw, et.al [14] described the solar power tricycle project and includes the methods and considerations regarding the proper working of the tricycle. The main content of this paper is Solar PV panel, Brushless PMDC motor, Charge controller and battery. This paper will discuss about the main idea of the component and here we compared the different component.
Ajit B. Bachche et al.[15] "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.
Henry M. Gannon, et al [16] "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.
Glenn C. Streif, et al .[17] "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.
Arvind Prasad et.al [18] "POWERED TRICYCLE" They studied report on the efficiency and durability of batteries and solar panel's.
Md. Shahidul Islam et.al [19] "DESIGNING SOLAR TRICYCLE FOR DISABLE
PEOPLE" They Develop a tricycle with a user-selectable manual/electric propulsion mode and an auxiliary solar power supply system.

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Nida Riaz et.al [20] "ELECTRICAL TRICYCLE WITH RETRACTABLE SOLAR PANELS" highlights the importance of non-conventional source i.e. solar energy and uses it for the advancement of tricycle technology.

III. PROBLEM IDENTFICATION

At this situation it is very hard to travel one place to another for physically handicap people . Alone they cannot be travel any where they need help of normal people to travel .

So, we want to overcome this situation . By making solar power tricycle at an optimal cost. So that physically handicap people can afford this vehicle and live life easy and productive..

IV. AIM AND OBJECTIVE

A. Aim

Design and development of solor power operated tricycle for physically handicap person.

B. Objective

The main objective of project to design the solar tricycle are follows.

1) Design and development of components of the tricycle.
2) Design of solar panel to grab the required energy.
3) Drawing of to draw various components using software.
4) Fabrication and development of the system.
5) Experimental & Testing.

V. CONCLUSION

In order to achieve to above mentioned objective the following methodology is decided

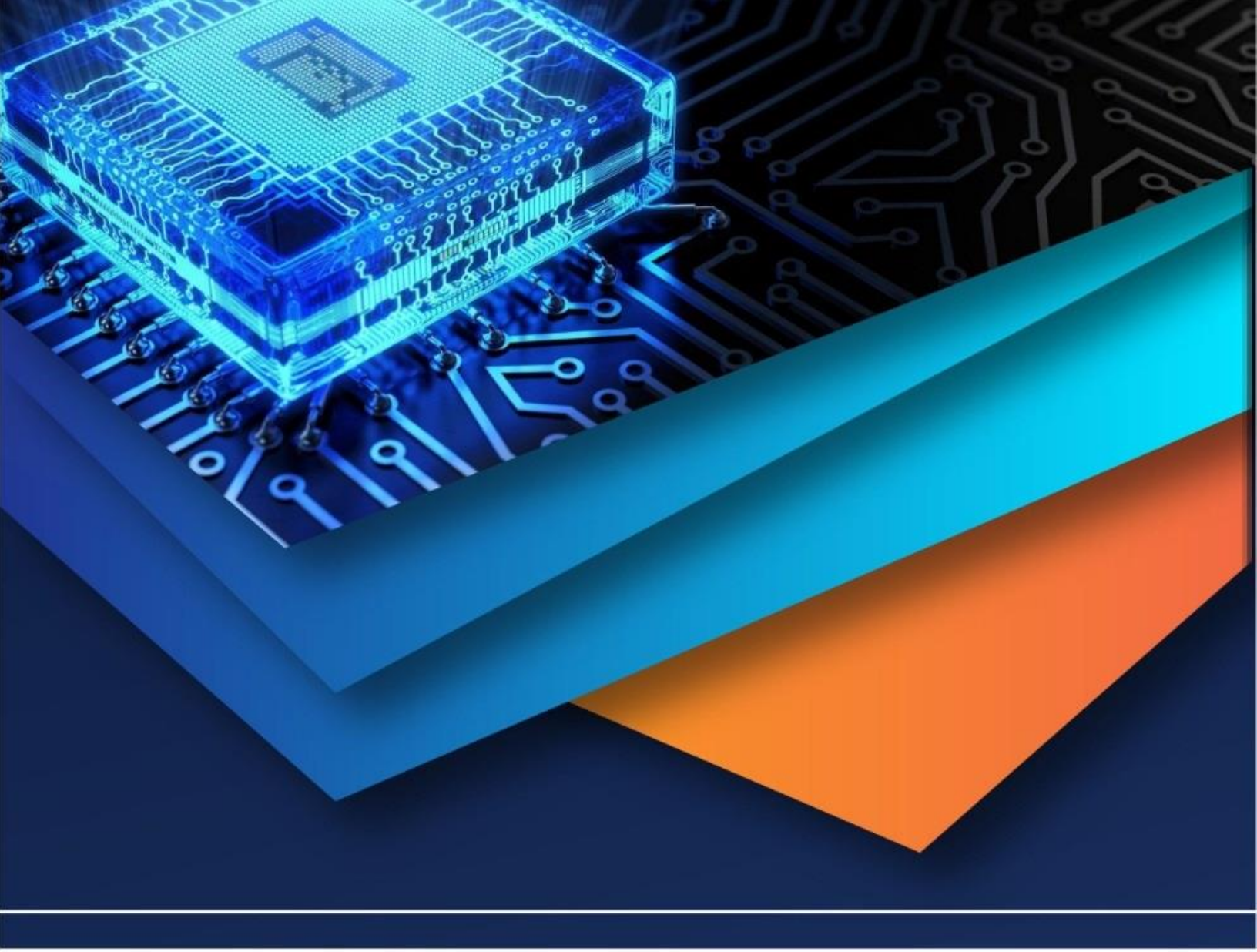
1) First to study the present system & search of literature available on it.
2) After that designing & analysis of various component of the system.
3) Designing of solar power component required for the system and fabrication of complete system for further experimentation.

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