

Modification & Development of Handicap cycle with used of electrical SystemVipul Patel^[1], Disha Patel^[2], Kalpesh Chheladiya^[3]^{[1], [2]} Mechanical Engineering Department, Dr. Subhash Technical Campus^[3] Electronics & Communication Engineering Department, Dr. Subhash Technical Campus

Abstract — As we all know the fuel prices especially the petrol is raising steadily day by day. Again the pollution due to vehicles in metro cities & urban areas is increasing continuously. To overcome these problems, an effort is being made to search some other alternative sources of energy for the vehicles. Again, it is also not affordable to purchase vehicles (mopeds, scooters or motorcycles) for all the class of society. Keeping this in mind, a search for some way to cater these economically poor people as well as to provide a solution for the environmental pollution was in progress. The battery assisted bicycle developed is driven by DC motor fitted in front or rear axle housing & operated by electrical energy

Keywords—wheel chair, battery assisted bicycle, BLDC Motor, Solar Power Tricycle, Voltage Regulator

I. INTRODUCTION

In this research work, the aims is to Modify a convenient and affordable modern electric bicycle for old and physically disabled people, for providing to these special peoples an opportunity to travel from one place to another place easily at negligible cost and safely^[2]. Mobility is an important basis for many economic and private activities and thus a crucial part of our life. In many industrialized countries, the demand for mobility is mostly covered by road traffic. Modern vehicles and a well-developed network of roads allow for a high degree of individual mobility.

However, this mobility also leads to substantial environmental problems: In Germany, for instance, transport is responsible for over 20% of the energy consumption and CO₂ emissions. Global warming and scarcity of traditional resources are becoming major problems in the current scenario. Due to the economic challenges India is facing in automotive sector the hybrid bicycle market has a huge growth potential. People try to move towards "clean" energies.

These facts among others will leverage the electric bicycle industry on the top of the agendas not only in India. Moreover the vision of an electric engine, which supports the muscular strength, became reality. Bicycles with such a supporting electric engine belong to the innovative vehicles, which are wholeheartedly suitable for everyday life.

In face of continuous climate discussions and permanent traffic jams, electric bikes have the potential of solving such issues and making a more energy efficient and environment friendly mobility possible.⁽²⁾ Accordingly a continuous trend towards electric bicycles can be expected simultaneously in whole of India. So it becomes very necessary to manufacture the electric cycles so cheaply that the common people in our country can afford to buy it.

In human life transportation is playing very important role from ancient time, due to transportation and communication facilities we say that, world is coming closer and closer. Day by day new vehicles with variety of models are coming into market. Normal person i.e. person without any disability can avail this vehicles easily. But in our society the number of disabled persons is also considerable, some of them born with disability, some get disabled due to accidents large number of persons get disabled due to war activities and due to many other factors.

II. HISTROY & LITERATURE SURVEY

This invention relates to tricycles in general, and more particularly relates to tricycles that are operated by both foot and electric motor power. For the most part, the prior art has provided tricycles as to for children with such tricycles being operated solely by foot power. Transporting heavy loads often becomes hard work, especially when travelling uphill.

A. Wheels Electric Car



Fig. 1. Wheels Electric Car

Electric cycles and scooter users have been identified as vulnerable road users by most of state road transport authorities. Motorized cycles and electric wheel chairs are increasingly used as an alternate form of transport for older people and for people with disabilities.

Thus, the instant invention provides a battery-powered electric motor drive to be used in place of, the conventional pedal drive. The choice of whether to use one or the other of the two drives or to use them in combination is easily made by the rider. Use of both drives in combination is especially advantageous on starting and when travelling uphill, in that the use of pedal power reduces load on the motor.

B. Motorized Tricycle

Depending upon disabled part of body, different provisions are available like crutches, wheelchairs, tricycles, customized vehicles.



Fig. 2. Motorized Tricycle

Crutches are most commonly used for walking for shorter distances, then manual wheelchairs and hand-cranked tricycles are useful for the persons with leg disability and automatic wheelchairs are designed such that persons with hands & legs disability can be benefited.

C. Efficient Hybrid Tricycle

Tricycle rickshaw is a very cheap means of short distance transportation both in city and in rural areas. Tricycle rickshaw is generally propelled by human energy. A study has been performed with the existing model and design of tricycle rickshaws.

It has been observed that traditional rickshaws use age-old technology, poor mechanical design and hence non-ergonomic in maneuverability.

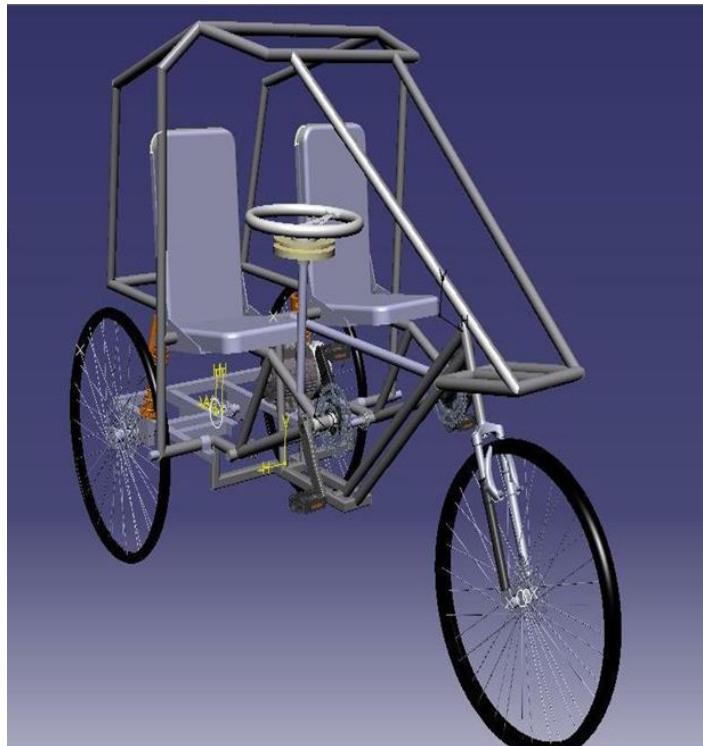


Fig. 3. Efficient Hybrid Tricycle

III. IMPLEMENTATION OF THE PROJECT WORK

Use of both drives in combination is especially advantageous on starting and when travelling uphill, in that the use of pedal power reduces load on the motor thereby reducing consumption of power from the battery when drain therefrom would otherwise be at its highest.

Using pedal power to the exclusion of motor power provides maximum exercise for the rider. Conversely, using motor power to the exclusion of pedal power provides operation with the least effort for the rider.

Accordingly, a primary object of the instant invention is to provide a novel construction for a velocipede provided with a battery-operated motor.

Another object is to provide a tricycle in which both pedal power and electric motor power are supplied to the rear axle, and the rear wheels are free to rotate at different speeds as the tricycle negotiates a curve.

Another object is to provide a tricycle of this type having a split rear axle, with pedal power being furnished to one axle portion and motor power being furnished to the other axle portion.

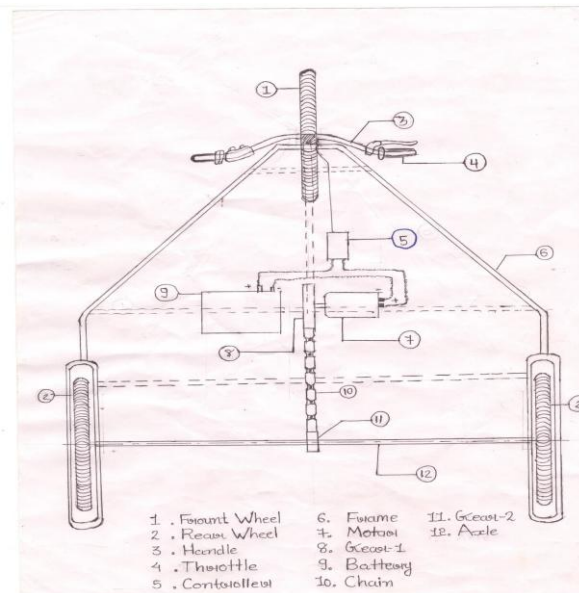


Fig. 4. Modification diagram

A further object is to provide a tricycle of this type in which pedal power and motor power are applied through overrunning clutches and differential gearing to drive the rear wheels of the tricycle.

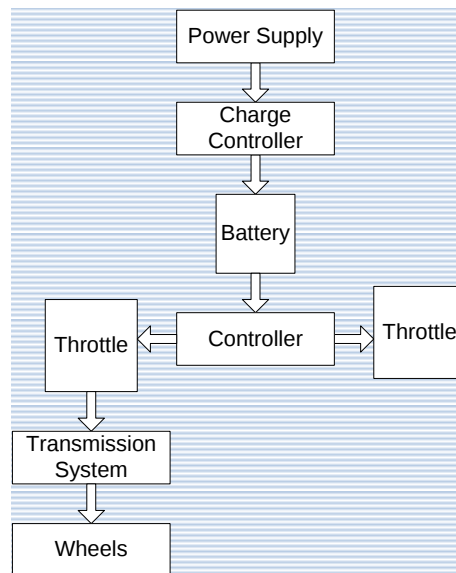


Fig. 5. Methodology

Hardware list and specification

Table 1 Hardware list and specification

Motor	Brushless dc motor, 24 volt, Maximum load current is. Power rating is 250 W, 250 rpm
Battery	24V
Charging time	6hr
Maximum speed	33km/hr
Frame	C.I. in parts with high strength requirements.
Wheels	Front 20 x 1.75. Rear 23 x 2.00.
Tire	Front 23 x 2.50. Rear 20 x 2.00 / 2.25 moped strength.
Size	Length 2.3 M. Width - 1.2 M.
Weight	Chassis 98 Kg.
Load Capacity	120 kg

CONCLUSION

After half completing the project named “Modification & Development of Handicap cycle with used of electrical System”, we conclude that it is very useful Travelling one place to another place for handicap person.

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