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Research on Motorized Vehicle for Disable People

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Abstract — In today's consequence people travel to the moon but somethings that we forgot is about the people who is not even proficient to travel by themselves which is shameless thing that we don't think about disable people. Disable people who don't even walk by their legs is our effort area to resolve their problems. So we refer a different papers in which they are solve their many problems by made a tricycle but by surveying we found that they have a lot of problems still in there cycles. So we are going to resolve their problems by making motorized vehicle, change in steering mechanism, brakes, seating arrangement, emergency siren, vehicle accessories etc. Through this facilities they feel comfort driving.

Keywords- Handicapped, Tricycle, Motorized, Shelter, Emergency Siren.

I. INTRODUCTION

Handicap is the "loss or limitation of opportunities to take part in the life of the community on an equal level with others; encounter a person with disability and social, physical environment. Is an inability to accomplish something one might want to do? The term emphasizes the focus on shortcomings in the environment and in many tasks and activities."

There are mainly two types of disable people, one who is mentally disable and the other which we are focusing is physically disabled. People disabled by many body parts like who is eyes (blind), ears (deaf), mouth (dumb), hands, legs etc., and the one who's body don't grow. We are working on the disable people who can't walk because of their legs or lower body cant response from their born or by incidentally. Some people's legs not working 20-30% who can walk with some support by using wheelchairs which is mostly use for inside places but some people's body are totally not working. They can travel by self-drive vehicle, tricycle. For transportation this tricycle is effectible for them but it consumes more energy and also need more efforts to drive it.

Fig. 1 Wheelchair

Fig. 2 Tricycle

1.1 Disabled Tricycle

It is a human-powered three wheeled vehicle for disable people through which they can ride. It is a single chain drive hand operated tricycle which has three wheel for self-balancing. The structure of tricycle is made from mild steel for robustness. It also contain mild steel seat for sitting as well as resting. It has a single handed steering mechanism and the breaking system is by a spring loaded rubber break. The tricycle includes a tube tire. And it is sufficient to travel.

2.1 Problem Definition

The problems occurs in this tricycle are as below:

a. Driving is hard due to continuous drive by a single hand
b. Vibration occurs because of absent of shock absorber
c. Aged people and the people who suffering from health problem can't drive vehicle by hand
d. Problems occurs in summer and monsoon because of unviability of roof
e. Shocks produce by front side break only.
f. Unviability of horn, side light and head light makes sure chances of accident
g. Punctures, bending of wheel rim, air filling, breakage of spokes consumes more energy to travel for repair it
h. Breakage of welding joints and bending of chassis occurs due to unviability of smooth road
i. Can't indicate anyone in case of emergency.

Fig. 3 Problems in Tricycle

Due to motorized vehicle the problems can be resolve with motor and battery which consumes less human power to travel. So implementing the proper designed vehicle with motorization can improve the travelling experience of disabled people and aged people. Thus we develop a vehicle with facilities of motor, battery, horn, head light, side light, tubeless tires, etc.

II. DISCRIPTION OF VEHICLE

The motorized vehicle includes motor and battery to reduce the driving effort as well as join a dynamo with it to charge the battery while the vehicle in a running condition. To avoid puncture and frequent air filling we provide a tubeless tires to the vehicle. Avert jerk we use 9 springs below the seat for comfort. Added heavy thick customized spokes to pretend breaking. Acrylic sheets roof is also there for relaxation in the summer and monsoon season to avoid sun light and rain. We design a comfortable steering and rear view mirror for getting ease turn and better driving experience. We also add a head light, side light for night driving as well as horn and emergency siren for traffic and emergency condition related to health of there. We use their old single hand drive mechanism also in this vehicle for their long journey in case of low battery they can travel by own. So by this all mechanisms the disable people can easily travel their journey either its long or short also by disabled people or alder person both.

2.1 Working Principles

Power supply form battery get into the controller as per the accelerated by handicapped. As they increase the voltage the dc controller increase their rpm of motor. That moment the ampere of the motor is steady and the voltage is changeable. DC controller Controls motor rpm as per requirement by voltage. Motor connected with up gear through belt drive. Up gear is larger than motor gear so it increases rpm at lower load. As same that up gear parallel with another gear and that gear connected with free wheel by chain mechanism. That free wheel is paralleled with 4th wheel. That wheel is operated by hand & spring mechanism which is spring loaded lever. So when it requires lever ups it touches road and downs lever unmount. When motor rotates clockwise the vehicle go front and at anticlockwise vehicle turns reversed.

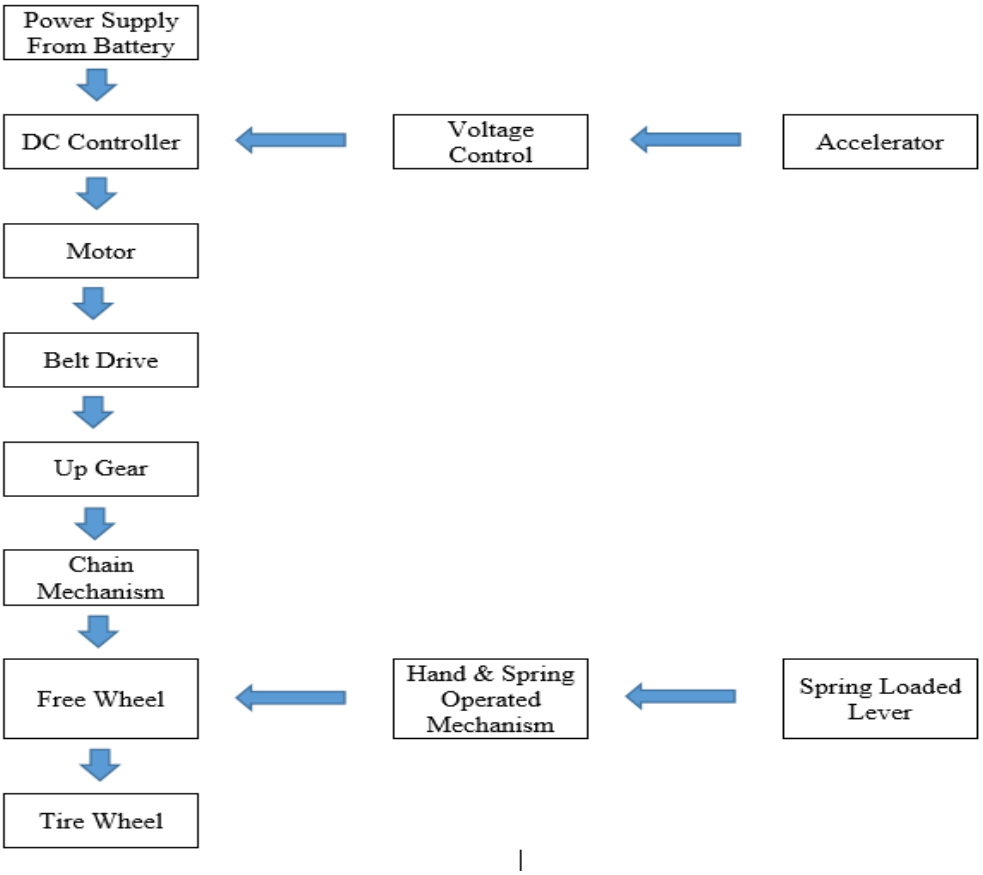

Fig.4 Process Diagram

2.2 Unique Parts

A. **Emergency Siren**

It is for emergency use for handicapped who had an issues of their health. So for indicate others that they need help or they suffer from pain they can use that emergency siren to inform surrounding people and get help of them.

B. Customized Seat

Sponge seat by lather cover for their comfort and 9 springs below the seat to attempt jerk of rod and other vibration effect of vehicle. To avoid that 9 springs below seat absorbs that jerk and vibration for their comfort.

C. Hand & Spring Operated Mechanism

It is a mechanism for 4th wheel to attach with rod or not. It is operated by spring loaded lever through which that 4th wheel moved up or down. That mechanism is operated by mechanical linkage, rods, spring etc. as lever ups the wheel down and lever downs the wheel unattached.

D. **Steering**

Customized steering for their frequent use to turn out. Handling is comfortable or moving is easy and lighter.

Fig. 5 Actual Model of Vehicle

III. VEHICLE PARAMETERS

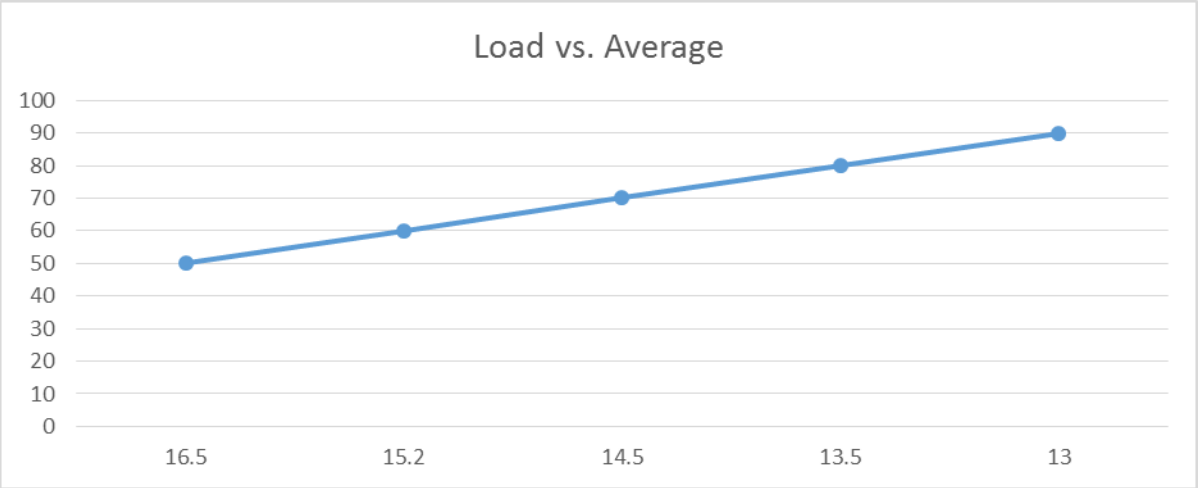

Fig. 6 Graph of load vs average

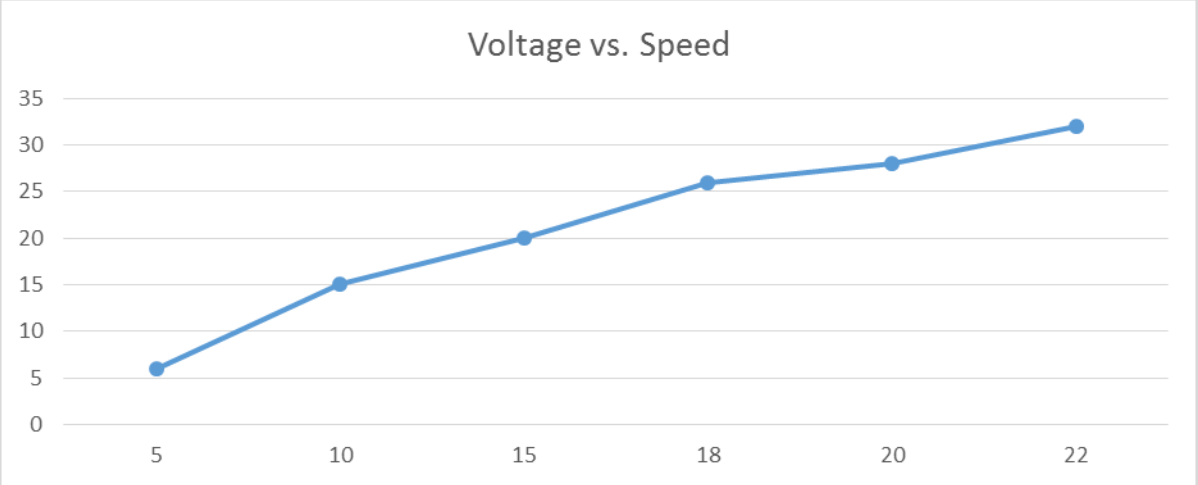

Fig. 7 Graph of voltage vs speed

The graph shows that as load increases average of the vehicle is decreases because of the load of the handicapped person so heavy weight people can travel less than lighter person. Another graph is here to show the voltage and speed. At the starting point the speed is low because the vehicle is an initial stage but as the voltage increases the speed of the vehicle increases and at certain point the small displacement in voltage can make large speed difference.

IV. CONCLUSION

As stock in vehicle we are changing the system for better driving experience we feel that by hand & spring operated mechanism. That gave person comfort till some distance by motorization. By sponge seat they feel comfort without jerk and vibration. We use 9 springs but at long time springs didn't give steady seating condition. Vehicle have two drive system one is electric and another is manual so if any person go to long distance then they can use motor after the finish charging they don't have to suffer they can drive it manually as they drive earlier. Because of roof they safe from sunshine and rain but it increase load because of wind. We provide centered customized steering system which don't move normally so by this the operation is single handed. And with the help of side light, head light, horn, emergency siren etc. they can drive better and easily.

IV. REFERENCES

[1] [Tatyaso A. Garande, Prof. P. D. Sonawane, Prof. Dr. S. T. Chavan, and Prof. G. S. Barpande, Review of Motorized Tricycle for the Disabled Person, International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064**,** 2013-2014, Vol 4, Issue 2, 2015, 316-320.

[2] Po Er Hsu, Yeh Liang Hsu, Kai Wei Chang, and Claudius Geiser, Mobility Assistance Design of the Intelligent Robotic Wheelchair, International Journal of Advanced Robotic Systems, Vol. 9,2012.

[3] F. Leishman, O. Horn, G. Bourhis, Smart wheelchair control through a deictic approach , Robotics and Autonomous Systems 58 (2010) 1149-1158, 2010.

[4] M. Reddi Sankar, T. Pushpaveni, V. Bhanu Prakash Reddy, "DESIGN AND DEVELOPMENT OF SOLAR ASSISTED BICYCLE", International Journal of Scientific and Research Publications, (Volume 3, Issue 3), (March 2013) ISSN 2250-3153, (Page No. 781-786).

[5] Abdulkadir Baba Hassan (Department of Mechanical Engineering, Federal University of Technology, Minna, Niger State, Nigeria) "DESIGN AND FABRICATION OF A MOTORIZED PROTOTYPE TRICYCLE FOR THE DISABLE PERSONS" IOSR Journal of Engineering , (Vol. 2(5)), May 2012 (Page No. 1071- 1074).

[6] Shuh Jing Ying, Stephen Sundarrao. "POWER ASSIST HAND TRICYCLE WITH BATTERY FOR DISABLED PERSONS" International Journal of Advanced Technology in Engineering and Science Volume 02, Issue No. 06, June 2014 ISSN (online): 2348 – 7550 (Page No. 173-177)

[7] Arun Manohar Gurram, P.S.V Ramana Rao, Raghuveer Dontikurti "SOLAR POWERED WHEEL CHAIR: MOBILITY FOR PHYSICALLY CHALLENGED" International Journal of Current Engineering and Technology Volume 2, No.1 (March 2012) ISSN 2277 – 4106 (Page No. 211-214)