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Design & Implementation of Electric Wheelchair to Control A Speed & Movement of Electrical Chair

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Abstract:

A wheelchair is used to help people with disabilities to perform daily activities in order to reduce their dependence on others. Adding something to the wheelchair is not just a combination, it can be a tool for rejuvenating users. This shift in the focus of the paper made on the market wheelchair. User varity variants to improve the mobility of an electric wheelchair and make it simultaneous reset. People with different disabilities face many difficulties in life, they have to rely on a third party to move from one place to another. The electric wheelchair is an initiation and testing unit for a wheelchair-friendly wheelchair. To provide support, many scientists have toiled long hours. The introduction of a wheelchair is a great blessing for them but it is still holding them back. This project aims to provide them with a clean and inexpensive solution in the form of Electric Wheelchairs.

Keywords **—WheelChair, DC Motor, Battery, Timing Gear, Timing Belt.**

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I. INTRODUCTION

In society we all see handicapped people. They are facing so many difficulties, injuries, during a day to day life. They always need a help from others. They are not independent. Our purpose of doing this project is to help them in such a manner that they can feel independent. To a population several research are used as a technical ways original developed to a mobile emote it is handling to &cretes to smart wheelchair in own ideas. Nonabuletary children lack to aacces a healthy of stimully on afforded to a elf protect a children it will be humbling to the energy of children as it has been attached. A smart wheelchair is designed to a comfortable to that person to a assistance of users or a handicapped person it is a number of ways to use to a travelling free to a person performance of specific tasks. Ex. Passing through a doorway, around a home. Autonomously transporting a users between locations on that place.

II. LITERATURE REVIEW

A. Reduction Gear Box

Equipment used to convert the flexible shaft output of a large engine to the one needed to rotate the propeller. The gearboxes consist of brushing teeth on the wings and wheels that transfer power from the drive shaft to the driven shaft and reduce speed.

Fig.1. Reduction Gear Box

B. Timing Belt

The timing belt, timing chain, or cambelt is a component of an internal fire engine that synchronizes the rotation of the crankshaft and camshaft so that the engine valves open and close at the right times during each cylinder stroke and termination. Engine timer or series interference is also important in protecting the piston from hitting valves. A time belt is usually a dental belt - a driving belt with teeth inside. The time chain is a roller chain.

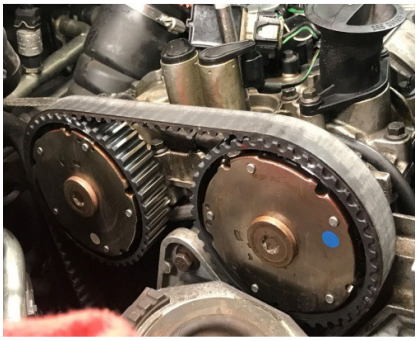

Fig.2. Timing Belt

C. Timing gear

Timing Gear is a component of an internal fire engine connected by a series, gears, or a crankshaft belt on one side and a camshaft on the other. Marked with a slight increase around its rotation corresponding to the time levels from the exact camshaft and crankshaft timing position. These marks help the engineer reset the time to set the time degrees for camshaft and engine builders.

Fig.3. Timing Belt

D. Plummer Block

The high performance of the iron plummer block shows excellent durability and is easy to handle. They can be fitted with circular roller bearings (very high power) or automatic ball bearings. They can be used with cylindrical bore bearings or tapered bore bearings and adapters.

Fig.4. Plummer Block

E. DC Motor

A DC car is any category of rotating electric motors that convert current electrical energy into electrical energy. The most common types depend on the energy produced by the magnetic field. Almost all types of DC motors have certain internal mechanisms, either electromechanical or electronic, to periodically change the current direction in the vehicle component.

Fig.5 DC Motor

F. DC Transformer

The DC converter is made by adding a number of overlay cables to AC Transformer. DC transformers will be very useful in the emerging world powered by DC battery. DC motors, of any voltage, will be driven from DC cells of any voltage, with only DC Transformer interface.

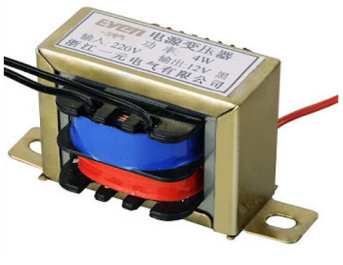

Fig.6. DC Transformer

G. Battery

A battery is a power source containing one or more electrochemical cells that have an external connection to power electrical devices such as flashlights, cell phones, and electric vehicles. When a battery supplies power, its main terminal is the cathode and its non-anode terminal. A signal that there is no source of electrons will travel through an external electrical circuit to a good circuit. When a battery is connected to an external power line, the redox reaction converts high-power generators into low-power products, and the free power difference is brought to the external circuit as electrical power. Historically the term "battery" was applied directly to a multi-cell device, but the use has arisen to include single-cell devices.

H. Bearing

The main purpose of bears is to protect the metal directly from the metal contact between the two moving parts. This prevents friction, producing heat and finally, the deterioration of parts. It also reduces power consumption as the sliding movement is replaced by lower collision rolls.

Fig.7. Bearing

III. SYSTEM MODELLING

A. *Block design*

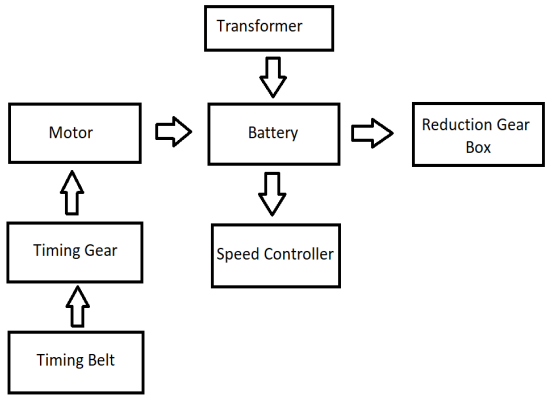

Fig. A Block diagram

B. *Specification*

Motor:850 Kilo Watt (BLDC Motor) 4000 RPM
Controller: System Development
Wiring Harness:1. Colour Code (Yellow, Black, Green, Red)2. Size:1 ½ inch inside diameters.
Battery: Battery lithium iron battery 48 volt 12ah, Charging time -6 hour, Running speed 40 km

C. *Result*

This EWC resulted into successful project which is cost effective & light weight. This minimized expense is pretty affordable for most of the medium class people & it can be even cheaper when taken for mass production.

IV. CONCLUSIONS

This is a EWC resulted in to prosperous projectwhichiscostefficacious&lightweighttoawheel chair. This minimizedexpenseisprettyaffordabletoinwhichamos tof mediumclasspeople's&ampitan be even more frugal to be a mass engenderment cofthatwheelchair.

REFERENCES

[1] M.H.MuhammadSidik1,2,S.A.CheGhani1,M.Ishak1, W.S.W. Harun1, N. Daud 31. Faculty of MechanicalEngineering,UniversitiMalaysiaPahang,26600 Pekan,Pahang,Malaysia2.UniversitiKualaLumpurMalaysiaFranceInstitute,Seksyen14,JalanTerasJernang,43650BandarBaruBangi, Selangor.3.DepartmentofRehabilitation,KuliyyahofAlliedHealthScience,InternationalIslamic University of Malaysia, 25200 Kuantan, Pahang, Malaysia mohdhanafi88@gmail.com, anwarcg@ump.edu.my

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[3] JesseLeaman,andHungM.La,SeniorMember,IEEE

[4] HumariaSalmin,HafizRakibul,PratikKumarKundu,B.M.FahmidJahurShuvo,K.B.M Nasiruzzaman&RahmanMD.Moshiour(Feb.2014),InternationalJournalofmultidisplinaryscience&Engineering.

[5] PreethikaBritto,Indumathi.J,SudeshSivarasu(2010),"Automationofwheelchairusingultrasonicand bodykinematics",NationalConferenceComputationalInstrumentation.

[6] RichardSimpson,"TheSmartWheelchairComponentSystem"