



SOLAR WHEEL CHAIR

Authors: Ankush Sharma¹, Himanshu Rana², Akul Khari³, Aditya Kumar Singh⁴

Guide: Mr. Harikesh Tiwari

College: IIMT College of Polytechnic, Greater Noida

ABSTRACT: "In Today's time, we are improving towards the Hybrid industry, So, considering this we thought that why should we build on a wheel chair that runs on battery. The name of this Chair we have kept Solar Wheel Chair, this chair will work on battery, will also run on battery This Wheel Chair can probably become a very useful Chair in the upcoming time because the price of Electric wheel Chair is increasing day by day.

In this Chair, we have used this mechanism that we have installed the battery in this chair will be charged with help of solar when will be fully charged, then we will also use it,

KEY WORDS: solar panel, battery, solar wheel chair, hybrid industry.

INTRODUCTION Now a day in rural areas, people are not getting sufficient power or no power supply. Disable people with low income from these areas cannot use costly electric wheel chair, so they face difficulties with mechanical wheelchair. The cost of the available electric wheelchair is very high, nearly

Rs. 40000/- [1] in India. Middleclass disable people are unable to afford such type of wheelchair. For the use of these chairs need charging the battery frequently according to the capacity of the battery. In rural areas, where people are not getting sufficient power or no power supply, disable people cannot use electric wheel chair, so they face difficulties with mechanical wheelchair. Disable people from remote rural places are used mechanical wheelchair. People using electric wheelchairs; have to pay more for charging the battery in a continuous interval. Disable people from remote rural places are used mechanical wheelchair. People using electric wheelchairs; have to pay more for charging the battery in a continuous interval. We have fabricated a prototype solar wheel chair with an optimal cost for physically disabled people to make their normal life easy. Solar power is used for charging the battery of available electric wheel chair to reduce the cost of electric charging system [2-4]. A silicon solar panel can be installed on the top of the wheel chair for charging the battery and/ or directly use the solar power during day time. Such system may reduce the overall cost of the Wheel chair.

DESCRIPTION

The complete circuit diagram of the whole prototype. The brain of the complete circuit is the Arduino board where the program of the joystick control will be uploaded. There are four solar panels connected with each other and the output of the total solar panel is 11 volt and 600mA. Then that power is stored in the battery via

charging circuit. 3 Li-ion batteries are connected in series; the output voltage of each battery is 3.7 volt. The output voltage of the battery is 12 Volt. That voltage is going to the Arduino board and activating the circuit. Then the Arduino is distributing the voltage to many components, such as stepper motor driver, H-bridge and two joysticks. The stepper motor is getting power from the stepper motor driver; two dc motors are getting power from the H-bridge (L2930 IC). An additional buzzer is connected parallelly with the battery.

FUNCTIONS AND TYPES

SOLAR CELL

Solar cells are described as being photovoltaic irrespective of whether the source is sunlight or an artificial light. They are used as a photodetector (for example infrared detectors), detecting light or other electromagnetic radiation near the visible range, or measuring light intensity.

BATTERY RECHARGEABLE

A lithium-ion or Li-ion battery is a type of rechargeable battery which uses the reversible reduction of lithium ions to store energy. The anode (negative electrode) of a conventional lithium-ion cell is typically graphite made from carbon. The cathode (positive electrode) is typically a metal oxide. The electrolyte is typically a lithium salt in an organic solvent.

DC MOTOR

A DC motor is any of a class of rotary electrical motors that converts direct current (DC) electrical energy into mechanical energy. The most common types rely on the forces produced by induced magnetic fields due to flowing current in the coil. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current in part of the motor.

STEPPER MOTOR

A stepper motor, also known as step motor or stepping motor, is a brushless DC electric motor that divides a full rotation into a number of equal steps. The motor's position can be commanded to move and hold at one of these steps without any position sensor for feedback (an open-loop controller), as long as the motor is correctly sized to the application in respect to torque and speed.

TAPE

A staple in my tool box. To be clear, for projects dealing with electrical wiring in a home, I don't feel knowledgeable or comfortable enough to tackle.

RESISTOR

A resistor is an element or component which reduces the electrical and supply the electricity to the electrical or electronic goods in a controlled manner. It also saves these goods from the damage that may occur due to excessive supply of electricity. These resistors are analogous to the water supplying pipes. A resistor is like a thin pipe which reduces the water flow.



CONCLUSION:

The whole prototype of the solar powered wheel chair is about 1-1.5 kg in weight, and it can carry up to 5 kg weight. The solar panel takes approximately 8-9 hours to charge the battery fully. The left joystick is controlling the stepper motor which is controlling the left and right movement of the wheelchair, which is basically acts as steering control system, and the right joystick is the controlling the speed and forward & backward movement of the wheelchair.

Solar wheelchairs are powered by solar panels. Solar panels convert sunlight into electrical energy. Solar wheelchairs use electrical energy to power the motors that drive the wheels.

REFERENCES

1. Electrical wheelchair cost: www.amazon.in
2. Bangladesh Bureau of Statistics (BBS), www.bbs.gov.bd/home.aspx
3. S. N. Sakib, S. P. Mouri, Z. Ferdous and M. S. Kaiser, A study on Low Cost solar powered wheel chair for disabled people of Bangladesh, Conference proceeding of ICCIT 2015, held at MIST Bangladesh. DOI: 10.1109/ICCITechn.2015.7488037.
4. Top 10 countries using solar power, <https://pureenergies.com/us/blog/top-10-countriesusing-solar-power>.
5. Yao F (2007) Measurement and of wheelchair propulsion ability for people with spinal cord injury. Link: <https://bit.ly/2T3LJHL>
6. Amundson JS, Amundson SG (1991) A joystick controlled wheelchair. Biomed Sci I27: 13-133. Link: <https://bit.ly/3yvLYvk>
7. B (2013) Wheelchair control by head motion. Serbian J Electra Eng 10: 135-151. Link: <https://bit.ly/3v9PMar>