

Roll Stuhl 6

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Abstract- Individuals in their senior years find it challenging to complete their own tasks efficiently and successfully. They become completely incapable of doing it efficiently in comparison to their youthful age. This is because of prevalent impairments such as Atrophia. Bearing in mind the difficulties that the elderly face, we have devised an innovative solution in the form of a robot that can not only function as a standard wheel chair, but also assists in making them more comfortable by shifting their postures in the wheel chair with reclining. With the help of the rocker bogie mechanism, our bot can easily climb upstairs. Taking all of this into account, we created a light-weight wheel chair with a Rocker Bogie Mechanism that allows mobility in a variety of terrains. On uneven terrain, each wheel can make synchronous contact with the ground, allowing this device to maintain a steady condition.

Keywords: rocker bogie mechanism, reclination, self Assisting wheel chair, Bluetooth module.

INTRODUCTION

Man must find a way to earn a living in order to live on Earth. As time passes, we must remember those who are less fortunate. We need to figure out how to help someone who has lost their legs, hands, and other body parts. They were overly reliant on others for everything; therefore we must comprehend their feelings and create a means for them to live their lives. It is tough for them to go from one location to another. An individual's mobility is being constrained. Sew got the bright notion of looking for a wheelchair with a Rocker Bogie mechanism.

The main issue for the majority of elderly and disabled persons is their mobility. They were completely reliant on others for everything, and an individual's mobility was severely limited. As a result, there is a need to provide elders with improved mobility and freedom so that they can travel safely from one location to another.

The most revolutionary aspect of our bot is that it will not only function as a standard wheelchair for older people, but it will also aid them in every duty with its particular feature of reclining, allowing them to make themselves comfortable through adjusting. It is capable of climbing stairs and

assisting the user in traversing tough terrain with minimal effort.

LITERATURE SURVEY

Rocker A bogie mechanism is largely employed in the mar's rover to navigate challenging terrain while retaining stability. It is the preferred technique for rovers and spacecraft at NASA. It has two arms with a wheel attached to each of them. A moveable joint connects both arms. This makes it feasible to have a suspension system that distributes the weight of the vehicle as evenly as possible, especially on uneven or bumpy terrain. The design features a differential drive system with spring-free suspension that enables bogie to move over uneven terrain. Older people find it challenging to complete their own tasks properly and efficiently. Comparatively early in life, they completely lose the ability to complete their work effectively. Common disabilities like atrophie are to blame for this.

Man must find a way to make money if he is to live on earth. As time passes, we must keep in mind those who are less fortunate. Such a person needs support because they lack legs, hands, and other bodily components. We need to comprehend their feelings and give them a means to live their lives because they were too reliant on others. They have a hard time moving from one place to another. A person's mobility is being constrained. Swe imagined finding a wheelchair equipped with a Rocker Bogie mechanism.

COMPONENTS

1.SOFTWARE: AURDINO IDE

The Arduino UNO is an open-source microcontroller board created by Arduino.cc that is based on the Microchip ATmega328P microprocessor. Sets of digital and analogue input/output (I/O) pins are included on the board. The board features 6 analogue I/O pins, 14 digital I/O pins, six of which may produce PWM, and it can be programmed using the Arduino IDE (Integrated Development Environment). The code can be sent to the Arduino micro controller through the Arduino wire.

2.THE BLUETOOTH MODULE (HC-05):

It is utilised in numerous consumer applications, including wireless keyboards, wireless mice, wireless headsets, and game controllers. Depending on the transmitter and receiver, atmosphere, geography, and urban settings, the range can go up to about 100m. It converses with devices using serial communication. It uses a serial port to connect with the microcontroller (USART). A Bluetooth module called HC-05 is created for wireless communication. This module can be set up as either a master or a slave.

3. LCD DISPLAY (16x2):

An LCD display that is 16x2 may show 16 characters on each of its two lines. Each character on this LCD is presented using a 5x7 pixel matrix. The information from the heartbeat sensor is obtained and shown on the screen using this LCD display.

4.L298N H-Bridge Motor Driver:

The H-motor Bridge's drivers L298N is used to power DC motors because they require more current than the Arduino can provide. The L298N motor controller's H-bridge configuration is beneficial for controlling the rotational direction of DC motors. Using an H-bridge also allows us to provide the motors their own power supply, which is a benefit. Due to the fact that two DC motors require a 5V power source, which is simply not enough when utilising an Arduino board, this is very crucial. There are motor terminals A and B available. They are connected to the microcontroller. Motor A is connected to Terminals 1 and 2, as opposed to Motor B, which is connected to Terminals 3 and 4.

5. pulse rate sensor

An optical heart rate sensor measures pulse waves, which are modifications in a blood vessel's volume brought on by the heart's pumping action. An optical sensor and green LED are used to measure the volume change in order to identify pulse waves.

6.jumper wires

A jump wire, also known as a jumper, jumper wire, or DuPont wire, is an electrical wire, or group of them in a cable, with a connector or pin at each end (or sometimes without them - simply "tinned"), and it is typically used to connect the parts of a breadboard or other prototype or test circuit, internally or with other machinery or components, without soldering.

7. Wheels

Wheels are what we use to move the robot (quantity 6).

8.TT motors

Plastic gear motors, sometimes known as "TT," are a simple and inexpensive way to make your projects move. It includes two 200 mm wires with 0.1" male breadboard compatible connectors and a 1:48 gear ratio. A TT direct current gearbox motor is what it is. Ideal for connecting to breadboards or terminal blocks. These motors can run on voltages between 3 and 6, with higher voltages obviously moving them a little more swiftly. We obtained these figures by operating an engine off of a reliable power supply.

9.Side Shaft Motors

These motors are what power the bot's wheels. There are two 200 rpm motors here. These motors have two power supply terminals, a positive and a negative one. Our application requires high torque and low rpm, which is what these motors have. Roads even have certain speed limiters and other things.

10.Battery

A nine-volt battery, sometimes known as a 9-volt battery, is an electric battery with a nominal voltage of 9 volts. The actual voltage varies from 7.2 to 9.6 volts, depending on the battery composition. There are batteries of numerous forms and sizes; one well-liked size is the pp3, which was initially utilised in early transistor radios. The pp3 is fashioned like a rectangular prism with rounded corners and has two polarised snap connections on top. Toys, watches, and household products like smoke and gas detectors are just a few examples of the many applications where this kind is widely used.

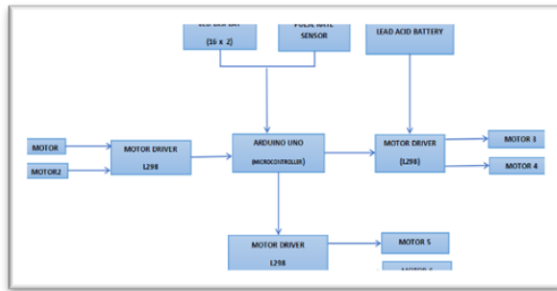
11.Potentiometer

It is described as a three-terminal resistor that creates a variable voltage division and has either sliding or spinning contacts. The potentiometer needs only have two terminals—one end and the wiper—in order to be used as a rheostat or variable resistor.

12.Bread Board

A breadboard is a thin plastic board used to store wired-together electrical components, such as transistors, resistors, chips, etc. used to create electronic circuit prototypes.

BLOCK DIAGRAM

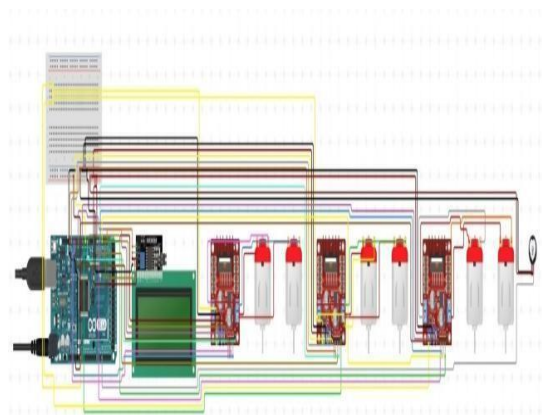


WORKING

To assist the elderly and physically disabled. Individuals who are physically disabled find it difficult to go around on their own as they become older, so we created a bot to assist them. Our creative idea entails creating a robot that can assist the elderly by reclining in a chair for them when they are seated. We mechanically designed it to be operated by hand. To check someone's heartbeat, an Arduino UNO is connected to a heartbeat sensor. This sensor measures pulse waves, which are variations in the blood vessel's volume. These waves are picked up by a sensor and presented on an LCD screen, along with a BPM estimate, so that they can be promptly saved in an emergency. Our bot created They used side shaft motors instead of wheels for stair climbing. The motor driver L298N, which is connected to the Arduino Uno, is used to regulate the rotation and movement of motors.

With its unique feature of reclination, which can be manually handled by individuals in accordance with their convenience, it can not only function as a regular wheelchair but also make people comfortable. People's heart rates are monitored using a pulse rate sensor, and the results are shown on an LCD. Moreover, it has the ability to climb stairs.

CIRCUIT VIEW



to help the physically handicapped and aged. As people get older, it gets harder for physically challenged people to get around on their own, therefore we made a bot to help them. Our first thought is to build a robot that can support the elderly by reclining on a chair when they are seated. It was mechanically created to be manually operated. An Arduino UNO is linked to a heartbeat sensor to monitor someone's heartbeat. Pulse waves, which are fluctuations in the blood vessel's volume, are measured by this sensor. These waves are detected by a sensor, displayed on an LCD screen with an estimated BPM, and given the ability to be immediately saved in an emergency. Our bot produced It was used

Output:



CONCLUSION

The ROCKER BOGIE robot makes it possible for elderly and physically challenged persons to ride in comfort and safety without needing assistance from others. We can also improve the steadiness of the wheel chair when it is riding over rough terrains by putting shock absorbers. The wheelchair user will then be able to travel more comfortably. To track the person's location, we can additionally add the GPS and GSM devices. Therefore, it is important to provide older persons with greater mobility and independence so that they can travel more safely.

FUTURE WORK

We can also improve the wheelchair's steadiness when travelling on uneven terrain by installing shock absorbers. The individual in the wheelchair can then travel more comfortably. In order to track

the person's whereabouts, we can additionally include GPS and GSM modules.

REFERENCES

- [1] Daisuke Chugo, TaketoshiMishima., 2007, “ Mechanical Design of Step- Climbing Vehicle with Passive Linkages”, 8th International Conference on Climbing and WalkingRobots, pp.287-294.
- [2] R. Rajasekar, K P Pranav Karthik, S. Senthil Kumar, A. Sivakumar, 2013 “Design and Fabrication of Stair climbing Wheelchair”, ISSN 2278 – 0149 Vol. 2, No. 2.
- [3] NitinYadav, BalRamBharadwaj, Suresh Bharadwaj., 2015 “ Design Analysis of Rocker Bogie Suspension System and Access the possibility to implement in Front Loading Vehicles, ” IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE) Volume 12, Issue 3 Ver. III, PP 64-67.
- [4] Chinmaya Sukhwal , 2016, “Conceptual Design of Stair Climbing Wheel chair using Catia,” International Journal of Engineering Research & Technology (IJERT) Vol.5 Issue 03, March-2016.