# DESIGN AND FABRICATION OF FOOT CONTROLLED WHEELCHAIR FOR HANDICAPPED PERSON

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***Abstract:*** The Foot Operated Steering mechanism is a mechanism controlled by a foot or both the feet in order to steer the vehicle in the desired direction. Hence the aim is to focus on the Foot controlled wheelchair which can be used for handicapped people. The system will be using 360-degree wheel with foot lever arrangement, electric drive connected wheels, battery and DPDT switches (Double-pole, Double-throw) to control the activation. This system is compact and thus will be used to travel from one place to another place. The controlling of the vehicle could do easily by using legs and the complete turning of the vehicle during the driving is also done. The project is success to be a great extent. This system will be cost effective and easy to operate. In accordance to this vision we are going to developed this project for people those are unable to drive vehicle because they are physically challenged.

Keywords:

## INTRODUCTION

Now a day's transportation has become great difficulty and individual to reach the destination on time. Everyone has their own vehicle and people with all body parts are fortunate. But it is unfortunate for partially disable people with hands. Disability is the repercussion of an impairment which can be mental, physical, emotional, vision, sensory. Disabilities can occur in upper extremities as well as in lower extremities. Thus, these people become more dependants and lose their confidence. Due to this effect, they stand a great disadvantage in using public as well as private transportation facilities. A national level survey conducted in India by the Central Government of India once in ten years revealed that, around 27 million people which are about 2.21% of the Indians are differently able. Among them, around 14.98 million were men while 11.84 million were women. Thus, the percentage of disabled people in rural area was higher than those in urban areas. A total of 5.43 million people were identified with disabilities in movement which was the highest among other categories such as hearing, seeing etc. in terms of numbers of people affected.

## LITERATURE REVIEW

Mr. Praveen D Dethan, Syam M Nair, Nandu Vijayakumar Sarath Kumar S, Vishnu S (2019)

Transportation has become an integral part of people's day to day life. At certain times, in large countries like India, people are forced to travel long distance from their work place to their place of residence. People with upper limb amputation and hands have difficulties in travelling and cannot travel these long distances. They use devices such as wheel chair, crutches and artificial limbs for mobility. These however cannot be used for long distance outdoor transportation Therefore, the aim of this project is to design and fabricate 'Foot operated system' for armless people. The Foot Operated Steering mechanism is a mechanism controlled by foot or both the feet in order to steer the vehicle in the desired direction. This system consists of a steering which can control brake along with steering. The main objective of the project is to design a foot operated system for handicapped people.

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the entire design and working of the "foot operated vehicle" throughout the semester. The contents include a description of the design and selection process including all

important information about the vehicle. Due to rapid industrialization and development of the economy the expectation of the customer and their ability and willingness to pay for the product has changed drastically.

## METHODOLOGY

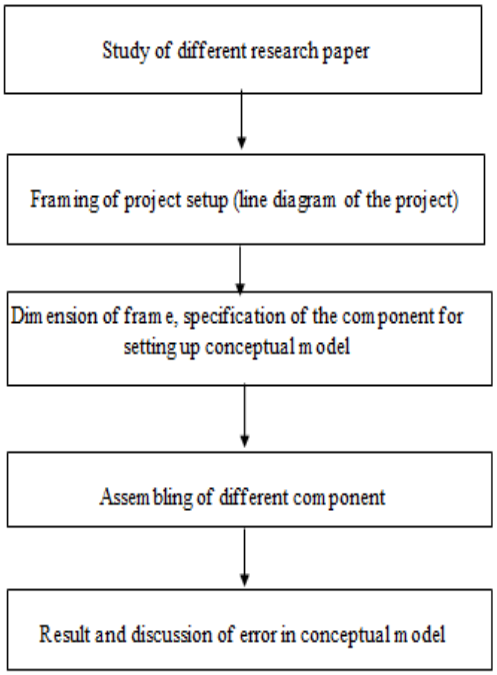


Fig 1: Flowchart

## COMPONENTS

| S.NO. | COMPONENTS | QUANTITY |
|---|---|---|
| 1 | DC motor | 2 |
| 2 | Battery | 2 |
| 3 | Wheel | 2 |
| 4 | Sheet metal | As Per Recruitment |
| 5 | Two-way switch | 1 |
| 6 | Shafts | As Per Recruitment |
| 7 | Metal strip | As Per Recruitment |
| 8 | Bearing | 6 |
| 9 | Frame | As Per Recruitment |
| 10 | Pedal | 2 |
| 11 | Chain sprocket | As Per Recruitment |

TABLE 1: Components

## COMPONENTS SPECIFICATION

1. Motor
    a. Volt= 24v
    b. Ampere = 19.2amp
    c. RPM=360rpm
2. Battery= 12v,7.5AH
3. Wheel rim diameter = 10 inch
4. Sheet metal
    a. Material = Mild steel
    b. Size = 40*39cm
    c. Thickness = 1mm
5. Two-way switch = 16A
6. Shafts
    a. Shaft diameter = 12mm
    b. Material = Mild steel
    c. Length = 26inch
7. Metal strip
    a. Length = 50cm
    b. Width = 5cm
    c. Thickness = 4mm
8. Bearing
    a. Inner dia = 12mm
    b. Outer dia = 37mm
9. Metal frame
    a. Dimensions = 1*1inch
10. Pedal and chain sprocket
    a. Sprocket outside diameter= 62mm

## WORKING METHODOLOGY

- To overcome from this disability, we had design this model. In this project we had replaced steering wheel by pulley.
- When the operator is seated on vehicle and shifts two-way switch to single position, circuit gets closed between battery and dc drive and when we press the pedal it tends to make the rotor of motors to rotate about its axis.
- The obtained rotation allows the rear axle to rotate and causes the wheels mounted with it to rotate. This cause the vehicle to displace easily from one place to another with less human effect. To turn

left, hold the left pedal and give power to the right wheel as required.

- To turn right, hold the right pedal and give power to the left wheel as required. We use warm and warm gear motor, so we not required bake to stop the vehicle. Only wheel rotates while accelerated.

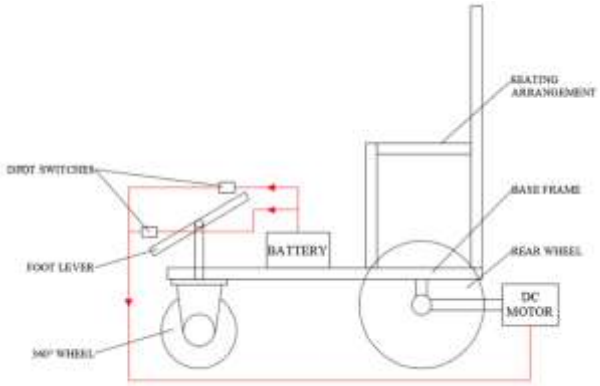


**Fig 2: 2D layout**

**Fig 3: Front View of Assembly Model**

**Fig 4: Actual View of Model**

## CONCLUSION

In this project the replacement of conventional steering system by introducing a foot operated steering for a slow speed vehicle for disabled people to travel long distance. The Foot Operated controlled wheelchair is a mechanism controlled by foot or both the feet in order to steer the vehicle in the desired direction. The main objective of the project is to design a foot operated system for handicapped people. The final product is tested as per the difficulties facing by a handicapped person. The controlling of the vehicle could do easily by using legs and the complete turning of the vehicle during the driving is also done. The project is success to be a great extent.

## ADVANTAGES

- Easily Attachable
- Environment Friendly
- No Noise
- Increase in comfort level of the patient.
- No special training required to operate them.
- Simple in design and construction.

## APPLICATION

- Institutions and office
- Industries
- Home

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