Reverse Gear Mechanism in Two Wheeler for Handicapped
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Abstract:
In our country, there are many thousands of physically challenged persons who use the same old vehicles meant for handicapped persons. Normally, a handicapped vehicle does not have reverse gear. We want to overcome these difficulties of handicapped people by implementing our project, presented in this paper, whose main aim is to help physically challenged persons to move their vehicle in reverse without the help of others. Even normal people face much problem to take the vehicle out of the parking at that time. In case of the handicapped people who drive two wheelers with extra support wheels, face much problem to take the vehicle out of the parking by pushing the vehicle with legs as we do. In order to take the vehicle out of the parking they need to seek others help or they should push it out of the parking. As a help to them we have designed a gear box which will be fit to the vehicle. It is fitted to the side of the vehicle and helping in the backing of the vehicle. When the driver wants to move the vehicle backward what he needs is just to move the rod in the newly designed gear box in one direction and when the driver wants the vehicle to move in the forward and reverse direction.

I. INTRODUCTION
This project aims to help the handicapped people for their easy convenience for travelling. They are facing many problems related to their transportation. Presently, handicapped people drive two wheelers with extra support wheel they face difficulty in reversing the vehicle while travelling by using this mechanism the handicapped people can easily move the vehicle backward. At present, there is no system available to back the vehicle. At times when the front wheel gets into a trench it is very difficult to take the vehicle from parking. Even normal people face much problem to take the vehicle out of the parking at that time. In case of the handicapped people who drive two wheelers with extra support wheels, face much problem to take the vehicle out of the parking by pushing the vehicle with legs as we do. In order to take the vehicle out of the parking they need to seek others help or they should push it out of the parking. As a help to them we have designed a gear box which will be fit to the vehicle. It is fitted to the side of the vehicle and helping in the backing of the vehicle. When the driver wants to move the vehicle backward what he needs is just to move the rod in the newly designed gear box in one direction and when the driver wants the vehicle to move in the forward and reverse direction.

II. OBJECTIVES
The objective of this reverse gear mechanism is to reduce the difficulty of the handicapped one to move their vehicle backward. By introducing this system the handicapped can move their vehicle backward without stepping down from the vehicle. The main objectives of the mechanisms are,

1. To eliminate the partiality and complexity nature over handicapped people from the society.
2. To get back the hopeful of handicapped to show the strength of them to society.
3. To improve the ability of handicapped person to live with confidence without considering disability of them

In some cases the handicapped need help from other people, to move out of from some parking. By using this mechanism they do not need any help from others, this will help them to live a confident life.

III. MANUFACTURED MODEL

IV. WORKING
Here three shafts and five bevel gears are used, bevel gear of 13 teeth and is of cast iron. And also the gear is miter gear arrangement, second shaft have a keyways cutting for the easy engagement and disengagement of the gears. Gear 2 act as the driver gear which is connected to the sprocket of the chain
drive. Gear 1 and gear 3 helps to change the direction of the rotation. The changing of the gear is done by a lever. As in first figure, for reverse operation gear 2 and gear 3 are engaged. Here the power is transmitted at 90°, and through the shaft it is transferred to the 4th gear. Gear 5 is connected to the output wheel. Gear 4 and gear 5 is engaged and power is transferred to the output. For forward operation the gear 1 and gear 2 are engaged. The power is transmitted by miter gear arrangement. Then the power is transferred from gear 4 to gear and to the output. And forward motion is achieved.

V. SPECIFICATION OF PARTS

a. Engine

<table>
<thead>
<tr>
<th>TYPE</th>
<th>Two stroke single cylinder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>3.2 kw</td>
</tr>
<tr>
<td>Max. torque</td>
<td>8.0@3500rpm</td>
</tr>
<tr>
<td>Displacement</td>
<td>69.9</td>
</tr>
</tbody>
</table>

c. Chain drive

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MATERIAL</th>
<th>NO.OF TEETH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver</td>
<td>Cast iron</td>
<td>12</td>
</tr>
<tr>
<td>Driven</td>
<td>Cast iron</td>
<td>40</td>
</tr>
</tbody>
</table>

d. Bearing

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MATERIAL</th>
<th>SIZE</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bearing</td>
<td>Stainless steel</td>
<td>1 inch 1d</td>
<td>4</td>
</tr>
</tbody>
</table>

VI. ADVANTAGES AND DISADVANTAGES

Advantages
- Reduce manual effort
- Quick operation
- Requires simple maintenance cares
- Repair and replacement is easy
- Checking and cleaning are easy
- This mechanism can be used in any moped vehicle
- Since there is no complex structure is used, it is easy to handle

Disadvantages
- Occupy more space
- Since there is will be slight variation in weight it will affect the performance of the vehicle

VII. CONCLUSION

Reverse gear mechanism for a two-wheeler is designed and fabricated and installed in two stroke automatic transmission scooter. After analyzing performance of the mechanism, following conclusions were drawn. Through this project we have shown that a handicapped person can use a motorcycle easily if it is converted into a specialized vehicle properly. The vehicle was specially fabricated and a lot of work has been put into the fabrication of the frame. The directional stability of the vehicle is not at all affected and another mentionable fact is that the ride quality has improved with the addition of the extra
shock absorbers in the frame. The vehicle is able to travel over undulated roads with aplomb and without stability problems. The project designed and fabricated by us is aimed for modification of two wheelers for handicapped vehicles. And we successfully overcome some of the problems present in the existing vehicles such as steering problem, tire wear, traction, etc. Also, we provided a reversing mechanism which can be actuate with the help of a lever, this will help the physically handicapped persons to reverse the vehicle without any help. The vehicle has proved its capability and we hope that it will be able to set a benchmark in the handling and comfort factors for the physically challenged people.

VIII. REFERENCES

[1]. A Low Cost Mobility Solution for Physically Challenged People; "Pranchal Srivastava, Raj Kumar Pal"


