



COMFORT MOTORCYCLE MODEL FOR PHYSICALLY CHALLENGED PERSON WITH REVERSE PROCESS

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ABSTRACT

In today's world, transportation has become one of the prime requirements of people for moving self or goods from one place to another. We have even come across people travelling long every day for reaching their work place. Mobility has thus become an essential part of our lives with much development and improvements happening in this field. In these conditions it becomes more difficult for physically challenged people to commute and to perform their day to day activities like working, education, shopping etc. as they have to constantly depend on others for getting assistance to alight and board the vehicle. In this project a feasible design solution in form of a user friendly three wheeler vehicle, which allows physically challenged people to commute

on their own and perform their activities without anyone's assistance, has been proposed. The questionnaire was framed keeping the needs of physically challenged people in mind. Layout and detail design was carried using solid works. The finalized model was analyzed to validate for stiffness and Ergonomics. Ergonomics study using Jack software was carried out considering the 5th and 95th percentile manikins to take care of the ergonomic issues. On finalizing the design, prototype building activity was initiated. A full scale working prototype model was manufactured for physical validation of the design function. Outcome of this project is the solution of transport for physically challenged community using which they can commute and lead an independent and normal life



INTRODUCTION

Bike manufacturers are moving towards the high technology in updating their products by introducing new attractive features in the bikes so that the ride is enjoyable. The comfort level is increasing in the latest bikes and provides a pleasure while driving. Their updates are fully focused on the abled persons not focused on the disabled customers. The leading companies are looking for their profit and showing less interest in providing services to disabled peoples. It's very important that vehicles used by physically challenged person should have the facility of taking the bike in reverse direction. Hexagonal shaped frame made of 40mm square pipe with the thickness of 2.5mm consisting of 3 knuckle joints, used for mounting the chassis of the bike. The knuckle joint provides suspension to the rear wheels individually. Knuckle joint is a type of joint which the motion is restricted to two directions either right or left and up or down respectively. In order to avoid the friction between two components, we are using the 40mm ball bearing for our project. The result is to increase the flux density in to the region directly above the conductor and to reduce the flux density in the region directly below the conductor. It is found that a force acts on the

conductor, trying to push the conductor downwards as shown by the arrow. If the current in the conductor is reversed, the strengthening of flux lines occurs below the conductor, and the conductor will be pushed upward

LITERATURE SURVEY

K.U.Sreehari et al [1], At times when the front wheel goes into a trench it is very difficult to take the wheel from parking. Even normal people face much problem to take the vehicle out of the parking. In case of handicapped people who drive two wheelers with extra support wheels, face much problem to take the vehicle out of parking by pushing the vehicle with leg like normal people do. In order to take the vehicle out of parking, they need others help or they should do it alone. As a help to them we have created a gearbox which could perform forward motion as well as reverse motion. It includes the selection of a suitable reverse gear mechanism for two wheelers. The fabrication process deals with designing suitable gear wheels, and assembling it in the gearbox which provides easy assembly and manufacturing at low cost. This paper details the design and fabrication of a mechanism that can provide reverse motion in two wheelers



N.VENKATESH et al [2], In fast growing modern world many types of vehicles are being innovated. But until now it is a major problem for the physically challenged peoples to move back the vehicles and to “U” turn the vehicles. Even to a small distance they cannot move the vehicles backside. So To eliminate this problem we invent the reverse gear mechanism in two wheeler. The challenged peoples can easily reverse the vehicles without getting down from the vehicle by easily operating hand lever

Abhijith B. A et al [3], This paper has been conceived having observed the difficulty faced by physically handicapped persons riding a two-wheeler. 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 order to take the vehicle out of the parking they need to seek others help or they should push it out of the parking. Also, for physically handicapped people it is impossible to take reverse from the parking. As a help to them we have designed a gear position which will be fit to the vehicle without altering the existing gear. This paper deals with the design of such a gear position and the assembly process of the gear to the vehicle

Ajit A. Mohekaret al [4], Mobility of physically disabled persons is a concerning social issue nowadays. Various hand driven tricycles, wheelchairs, retrofitted vehicles etc. are commonly available for disabled people as a mode of transportation. Existing means of transportation for disabled people require a disabled person to dismount from the wheelchair. A retrofitted tricycle is designed to overcome this problem by allowing the disabled person to wheel up or down his wheelchair onto or down the tricycle.

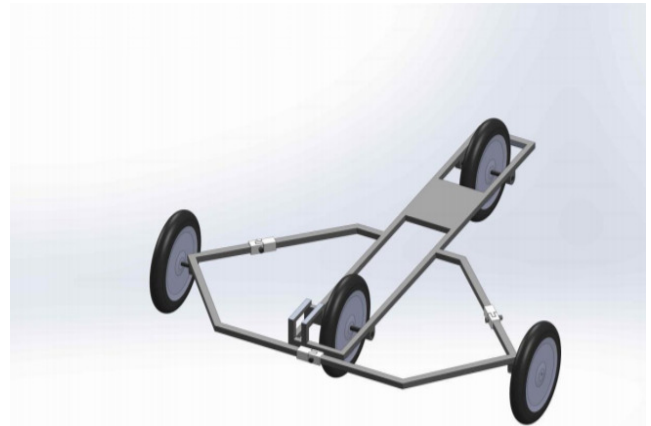
METHODOLOGY

The Paper is specifically designed and fabricated for the convenience of physically challenged people who are disabled by their legs. As in this date there are many options for transportation available for physically challenged persons like, Motorized wheel chair, Hand powered tricycle, Scooters etc. The problem associated with motorized wheel chair is that it way too costly and is not suitable for commuting. Hand powered tri-cycle requires heavy human effort. So, disable people, now days are preferring scooters more than any other mode of transportation since it is comfortable and cost efficient. The major problem associated with the



scooters that are available in India is that they don't have provision for reversing the scooter which is very much necessary for a disable person. In order to overcome this drawback, we've designed and fabricated a scooter with reverse mode. Here, we've taken a 110cc Kinetic Honda Y2Kseries for the development. The two wheeler is been altered and transformed into a three wheeler. The chassis containing the additional two wheels are carved out of steel pipes. The additional chassis has been attached with the body of scooter with two shock absorbers. An external box has been coupled to the output shaft of the motor. The output shaft of the motor is acting as the input shaft for the box and the output shaft of the box is connected with a differential which is further connected to the rear wheels with the help of yoke rods. For changing the mode (forward/reverse) a lever is placed on the right side of the scooter,

conveniently placed for a person to engage



WORKING

A DC motor is placed in the rear end of the vehicle which is powered by 12V DC battery. In the vehicle rear end the reverse arrangement is placed. A lever is attached in the frame to shift the forward direction to reverse direction. In reverse direction the A is meshed to C. In forward direction the A is meshed to B and C. A switch connection is made to the battery for the running of the vehicle. By throttling the motor,



the reverse direction can be achieved. The motor can serve to run the bike in both the directions. Hence it saves power and increases the overall mileage. By introducing the knuckle joints we can ensure independent suspension and hence the bike can be driven at rough roads with less risk.

REVERSE PROCESS USING SWITCH

The aim of this Paper is to reverse operation for two wheeler vehicle for handicapped via Engine. The main purpose of this concept is used to implement the reverse process using switch. In this project we have fabricated the simple equipment for the handicapped persons by using simple arrangements. These equipment's are so useful to the handicapped persons travel in reverse direction in this vehicle (two wheeler). A method of controlling a reverse change of an automobile, said automobile comprising an internal combustion engine; an automatic transmission connected to an output rotation shaft of said engine so as to transmit the rotational output of said engine to drive wheels of said automobile through any selected one of a plurality of ratios; a load device selectively connectable to said output rotation shaft of said engine via selectively- connecting means; and

means for generating a change control signal for selecting one of said ratios of said automatic transmission in accordance with one of operational conditions of said automobile and said engine said method comprising the steps of controlling said selectively-connecting means when said change signal-generating means generates the control signal for reverse the in said automatic transmission, in such a manner that said selectively connecting means connects said load device to said output rotation shaft of said engine

MOVEMENT OF CONDUCTOR

The result is to increase the flux density in to the region directly above the conductor and to reduce the flux density in the region directly below the conductor. It is found that a force acts on the conductor, trying to push the conductor downwards as shown by the arrow. If the current in the conductor is reversed, the strengthening of flux lines occurs below the conductor, and the conductor will be pushed upwards (figure -IV). Now consider a single turn coil carrying a current as shown in the above figure. in view of the reasons given above, the coil side A will be forced to move downwards, whereas the coil side B will be forced to move upwards. The



forces acting on the coil sides A and B will be of same magnitude. But their 3 direction is opposite to one another. As the coil is wound on the armature core which is supported by the bearings, the armature will now rotate. The commutator periodically reverses the direction of current flow through the armature. [5] proposed a system, this fully automatic vehicle is equipped by micro controller, motor driving mechanism and battery. The power stored in the battery is used to drive the DC motor that causes the movement to AGV. The speed of rotation of DC motor i.e., velocity of AGV is controlled by the microprocessor controller. This is an era of automation where it is broadly defined as replacement of manual effort by mechanical power in all degrees of automation. The operation remains an essential part of the system although with changing demands on physical input as the degree of mechanization is increased.

DESIGN CALCULATIONS

Design Of Frame:

Moment of inertia of the section

$$I_{xx} = bd^3/12$$

$$= 35 \times 35^3 / 12 \quad I = 1.2505 \times 10^5 \text{ mm}^4$$

From psg data book, for steel C60

$$\text{Sp. weight} = 0.0783 \text{ N/cc}$$

$$= 0.0783 \times 10^6 \text{ N/m}^3$$

We know that sp. weight = weight/volume

$$0.0783 \times 10^6 = \text{weight/area} \times \text{length}$$

$$\text{Area} = 3.5^2 - 2.5^2$$

$$= 6 \text{ cm}^2 = 6 \times 10^{-4} \text{ m}^2$$

$$\text{Length} = 2.39 \text{ m}$$

$$\text{Volume} = 6 \times 10^{-4} \times 2.39$$

$$= 1.434 \times 10^{-3} \text{ m}^3 \quad 0.0783 \times 10^6$$

$$= \text{weight} / 1.434 \times 10^{-3}$$

$$\text{Weight} = 0.0783 \times 10^6 \times 1.434 \times 10^{-3}$$

$$= 112.28 \text{ N}$$

$$\text{Weight} = 11.44 \text{ kg}$$

CONCLUSION

We hope these upgraded features will be highly useful for the physically challenged people and they can easily afford these modifications. Physically challenged persons are not “DISABLED” persons, but are



“DIFFERENTLY ABLED” people. They are one among us and it is important to ensure them at most comfort in all the ways. It’s our first attempt to make them to feel comfortable in driving a two wheeler. Most of the defects are rectified positively. Bike manufacturers should consider the disabled people, so that they can launch special bikes suitable for the pc people, having the required features. Government also should take necessary action by issuing orders which could encourage the bike manufacturers

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