

## Fabrication of Self Propelled Tricycle

Bharat N. Madankar<sup>1</sup> Rakesh S. Patil<sup>2</sup> Arvind R. Gabhane<sup>3</sup> Nilima N. Tembhurkar<sup>4</sup>

Prof. Anmol Ramteke<sup>5</sup>

<sup>1,2,3,4</sup>Student <sup>5</sup>Professor

<sup>1,2,3,4,5</sup>Department of Mechanical Engineering

<sup>1,2,3,4,5</sup>MPCE Bhilewada, Bhandara, 441904, India

*Abstract*— We all have seen the wheel chair that normally the patients or the handicapped people use, it needs someone to push or the person on the chair has to apply force directly on the wheels which make him tired and strained and if the patient want to go to the table he has to get down and shift to other chair. Thus to eliminate these problems of a patient or a handicapped person we have designed a three wheeled device. This tricycle relates to a portable self- propelled device without using either electric or fluid power. In some embodiments .it also helps to take a turn too easily than the normal wheelchair. It has a tiller pulling of which makes the tricycle to move forward and backward and it's made so portable that the person using it can move independently in home and outdoor applications. Normal wheel chairs we find a paddle which is a more laborious job. In some other the person sitting on it must himself strive hard to move by rotating the wheels with his hands. Depending upon the lever pumped forward or reverse motion is obtained a modest back and forth pumping of the lever is sufficient to move the chair and occupant to easily keep up with friends another pedestrians. Mobility of physically disabled persons is a concerning social issue nowadays. Various hand driven tricycles, wheelchairs, retrofitted vehicles etc. are normally obtainable for disabled folks as a mode of transportation. The basic wheeled vehicle could be a machine style, pedalled by disabled persons within the aspect and seat within the middle for sitting arrangement. They use only one hand to steer the handle because other hand is used to rotate the pedal. Our aim is to design and fabricate a low cost tricycle for the handicap people to be propelled by the novel link mechanism attached to the steering column converting into cranking, using the advantage of leverage, with proper balance and distribution of mass and centre of gravity to crank the wheel shaft for propelling. As he can use both the hands on the steering, better control of the vehicle is ensured.

**Keywords:** Lever and Crank Mechanisms

### I. INTRODUCTION

There are heap of technological advancement, in wheel chair propulsion aside from manual wheel turning. traditional|a traditional|a standard} wheel chair used for handicap and also the wheeled vehicle users for normal individuals use hand drive or propulsion or lever propulsion. The manual propulsion has become more and more vital as a result of the population of propulsion of people victimization wheelchairs is growing and needs economical quality to keep up a high quality of life akin to the overall population. Many tries are created at rising manual wheel chair propulsion, like changes within the wheels and tires, adding gears and planning different propulsion systems. Still, consultants and shoppers typically agree that innovation in propulsion remains required. Improved propulsion technologies can scale back physical fatigue and energy maneuverability. Pain and higher

extremity injury is common among manual wheel chair users. Shoulders connected injuries are shown to be gift in up to fifty one of manual wheel chair users. Additionally, the prevalence of elbow, wrist joint and hand pain has been rumored to be Sixteen Personality Factor Questionnaire. Throughout wheel chair propulsion, users should exert massive forces so as to propel the chair forward. Additionally, the part of force that's directed in towards the hub doesn't contribute to movement however is important so as to produce friction between the hand and also the push rim. There are 2 fashionable varieties of propulsion assist devices on the market these days. One may be a manual assist that uses gear rations to cut back the trouble needed to propel the vehicle and the other is a power assist that uses a battery powered motor to the effort.

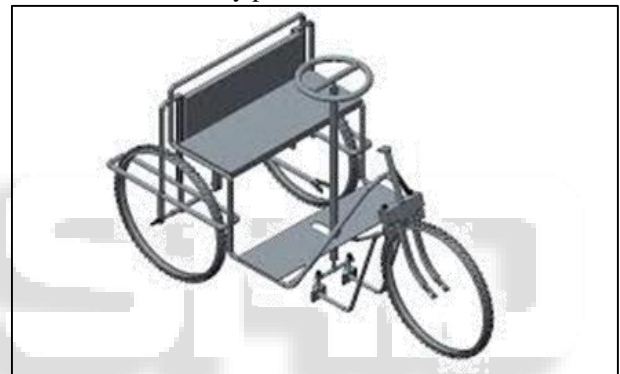


Fig. 2.2: Fabrication of tricycle

Mechanical advantage may be a live of the force amplification achieved by employing a tool, robot or machine system. Ideally the device preserves the input power and simply trades off forces against movement to obtain a desired amplification in the output force. An ideal mechanism transmits power while not adding to or subtracting from it. This means that ideal mechanism does not include a power source, and is frictionless and constructed from rigid bodies that do not deflect or wear.

### II. METHODOLOGY

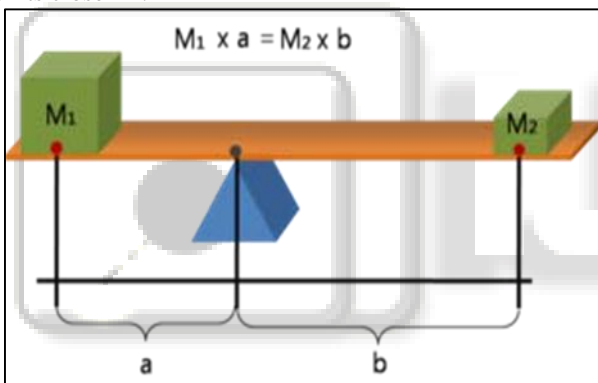
#### A. Components

- 1) Seat with back rest mild steel tubular section
- 2) Front fork: mild steel
- 3) Front wheel axel: C30 steel
- 4) Wheel rim with tyre tube: standard
- 5) Structure: mild steel
- 6) Hinge bush for seat: mild steel
- 7) Connecting rod: C30 steel
- 8) Steering column: mild steel
- 9) Steering wheel: standard
- 10) Rear support frame: mild steel tube
- 11) Front support frame: mild steel tube
- 12) Rear axle: C30 steel
- 13) Cranking offset assembly: C30 steel and mild steel

### III. WORKING

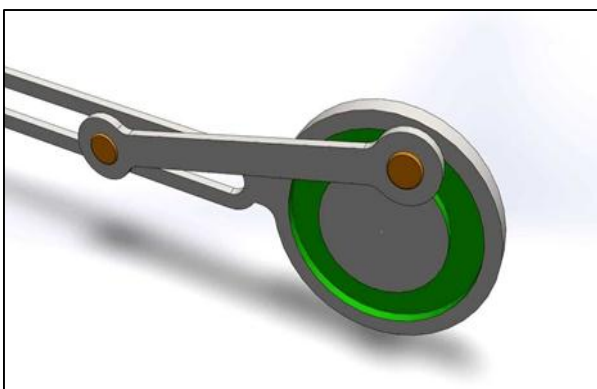
This is a single seater three wheeled vehicle with front wheels being steered by the steering column. The steering column has the outer tube which is hinged at the base and the other side extension of the steering column is pulling and pushing the cranking mechanism of the rear wheel. The internal rod of the steering column is hinged to the link mechanism to the front wheel to steer the wheel as the steering handle is being rotated which is held at the top side of the steering column. The steering column is holding the steering rod within the bearings. The cranking mechanism is on one of the rear wheel axle. The rear wheels are held on two different axles. The bearing housing of the rear axles are welded to the frame. The entire frame is made of mild steel square tube of 20mmx20mm.

The steering column when pulled or pushed, the steering column pivoted at the base from a distance. This is termed as a lever that pivots on a fulcrum attached to the fixed frame. The lever operates by applying force at the steering handle, at distance from the fulcrum or pivot. As the lever pivots on the fulcrum, points further from this pivot move faster than points closer to the pivot. The power into and out of the lever must be the same, so forces applied to points farther from the pivot must be less than when applied to points closer in.



### IV. HARDWARE DESCRIPTION

#### A. Crank Mechanisms:



A crank is Associate in Nursing arm connected at a right angle to a shaft by that reciprocal motion is imparted to or received from the shaft. It is accustomed convert circular motion into reciprocal motion, or vice versa. ... Attached to the end of the crank by a pivot is a rod, usually called a connecting rod (conrod).

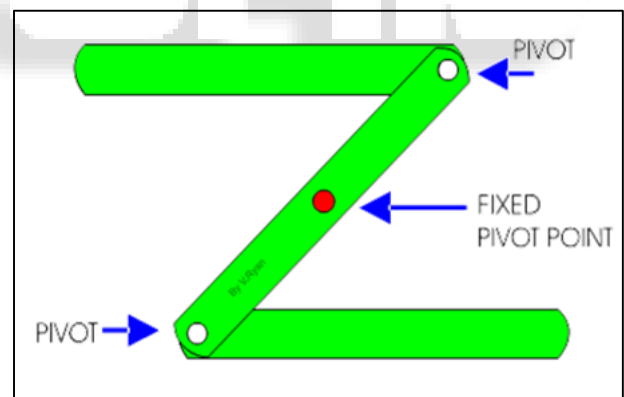
#### B. Steering:



A wheel (also known as a wheel or a hand wheel) could be a form of steering management in vehicles and vessels (ships and boats).

Steering wheels square measure employed in newest land vehicles, together with all mass-production cars, further as buses, lightweight and significant trucks, and tractors. The wheel is that the a part of the steering mechanism that's manipulated by the driver; the remainder of the steering mechanism responds to such driver inputs. This can be through direct mechanical contact as in recirculating ball or rack and pinion steering gears, while not or with the help of hydraulic steering system, HPS, or as in some trendy production cars with the help of computer-controlled motors, called electrical power Steering.

#### C. Linkages:



A mechanical linkage is associate degree assembly of bodies connected to manage forces and movement. The movement of a body, or link, is studied exploitation pure mathematics therefore the link is taken into account to be rigid. The connections between links are sculpturesque as providing ideal movement, pure rotation or slippery as an example, and ar referred to as joints

#### D. Pedestal Bearing:



Plummer block bearing conjointly called Pedestal Bearing or bearing housing, may be a pedestal accustomed offer support for a shaft with the assistance of compatible bearings accessories. Housing material for a support is often made from forged iron or solid steel.

#### V. ADVANTAGES

- Lightweight.
- Compact.
- Directly responsive to user force on push rims and provide most precise feedback.
- Provides propulsion options for users: push the tire, the rim, tire & rim, or one arm drive technology.
- Easily understood and adaptable.
- Mechanically simple.
- Wide acceptance from users.
- Least expensive.
- Rim can have several different types of coating (changes look and feel).
- Provides the user a mechanical advantage (through gearing or equivalent).
- Provides less tire some way of propelling.
- The user can go faster and farther (in outdoor use).
- Levers are ergonomically better for the user (less body stress induced by propulsion forces then for push rim).
- The user stays cleaner when using a lever system.
- Steering (for some individuals) can be easier.
- Steering can be adapted to one arm drive.
- The system is not limited just to large wheels.

#### VI. CONCLUSION

- 1) The tricycle prototype can be built to carry out to determine the working and efficiency of the tricycle over existing wheel chair hence the experiment over the prototype gives the result of effortless operations of vehicle by physically disabled persons. For the propulsion of the wheel chair with tiller mechanism which can be provided the easy movement of wheel chair over an existing vehicle with the help of different mechanism and combination of technology which can have greater advantage to the physically disabled persons to propel the vehicle.

- 2) From above conclusion it is decided that use of lever power tricycle is suitable for handicap person and also for normal person and mechanical work is most comfortable for use.

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