



## 3 Wheel Handicaped Steering Propulsion Cycle

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### ABSTRACT

The mobility of people with physical disabilities can currently represent a serious social problem. Many manual tricycles, wheelchairs, adapted vehicles, etc. They are usually provided to people with disabilities as a means of transportation. A simple wheeled vehicle can be a simple machine that is pedaled sideways by disabled people at regular intervals and used from the center at regular intervals to adjust the seating position. You only use one hand to control the handle while the other hand is used to turn the pedal. Our aim is to design and produce a casual wheeled vehicle for disabled people, powered by a new linkage mechanism that connects to the steering column and transforms into a crank to give victims the advantage of leverage as well as proper balance and weight distribution to offer. and the center of gravity to turn the shaft gears to obtain fuel. Since he can use both hands on the steering wheel, better handling of the vehicle is guaranteed.

Keywords: : Tricycle, Steering Propulsion, Slider crank mechanism

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### 1. Introduction

There are many technological advances in wheelchair use that go beyond manually turning the wheels. Ordinary wheelchairs for the disabled and tricycle users for ordinary people use manual steering, steering or pedal.

Manual guidance is becoming increasingly important as the number of wheelchair users increases and efficient mobility is required to maintain a quality of life comparable to the general population. Several attempts have been made to improve manual wheelchair propulsion, such as by replacing wheels and tires, adding gears, and developing alternative propulsion systems. However, experts and consumers largely agree that innovations in the drive sector are still necessary. Improved training technologies will reduce physical fatigue and effort controllability. Upper extremity pain and injuries are common in wheelchair users. Shoukler-related injuries have been shown to occur in 51% of wheelchair users. In addition, the prevalence of elbow, wrist, and hand pain was 16%. When pushing a wheelchair, users must use large amounts of force to push the wheelchair forward. In addition, the force component directed at the hub does not contribute to forward movement, but is necessary to provide friction between the hand and the pressure ring. There are currently two common types of

driver assistance devices available on the market. One is the normal assist, which uses gear ratios to reduce the effort required to push the vehicle, and the other is the assist, which uses a battery-powered motor to reduce the effort.

Mechanical advantage is a measure of the strength gain achieved by a tool, mechanical device, or machine system. Ideally, the device conserves the input power and simply converts the kinetic forces to achieve the desired output force gain. An ideal mechanism transmits force without addition or subtraction. This means that the ideal mechanism contains no energy source, is frictionless, and consists of rigid bodies that do not bend or wear.

#### 1.1 Working

The tricycle has a single sliding mechanism operated by a steering system. Compared to the latest traditional chain mechanism pedal chairs, there is a tendency to use a single sliding mechanism instead. There are several ways to guide a chair manually in the literature.

These include traditional manual, lever, crank and others. Systematic analysis has played an important role in the development and design of wheelchairs, examining vehicle mechanics and their interaction with the human musculoskeletal system to better understand the wheelchair program. A modification of the drive mechanisms was used and an unusual technique was developed to reduce the impact of the standard chair drive technology on the living standards of people who cannot work



Fig. 1 - (a) 3 WHEEL HANDICAPED STEERING PROPULSION CYCLE

### 1.2 Problem Statement

The demand of two completely different environments place specific and mutually exclusive demands on seating system. The most important points are the delimitation of the area unit, as it cannot be used for all indoor/ outdoor activities. Some type of area units are advanced and expensive. With a manual seat, the efficiency is low. They requires enormous consumption of human energy (increasing figure) and distance to be covered.

### 1.3 Components of machine

1. Weels
2. Nut bolt
3. Axle
4. M.S Circular Pipe
5. M.S Channal pipe
6. M.S Road
7. Stearing
8. Break

## 2. Illustrations

### 2.1 Mechanism

A crank is an arm connected at right angles to a rotating shaft by a reciprocating motion transmitted or received by the shaft. It is used to convert circular motion into reciprocating motion and vice versa. The arm can be a curved part of the shaft or a separate arm or disk attached to it. Connected to the end of the crank via an axle is a rod, commonly referred to as a connecting rod. The upper end of the rod attached to the crank moves in a circular motion, while the opposite end is usually limited to a linear sliding motion.

The term often refers to a human-powered crank used to manually turn a shaft, as in a bicycle crankset or a drill press with a stand and drill bit. In this case, the person's arm or leg acts as a connecting rod, exerting a reciprocating force on the crank. The movement of the top of the control stick is approximately proportional to a function of the crankshaft angle measured from top dead center (TDC). Therefore, the reciprocating motion produced by the crank and the constantly rotating rod is approximately

simple periodic movements. Technically speaking, the relative motion of the bar deviates slightly from the curved motion throughout the cycle due to the dynamic angle of the bar. This distinction becomes important in high- where balancer sgafts may be required to reduce vibration caused by " secondary harmonic unbalance."

The size dependence of the crank, i.e. the size ratio between the force exerted on the axle and thus the force exerted on the shaft, changes during the crank cycle.

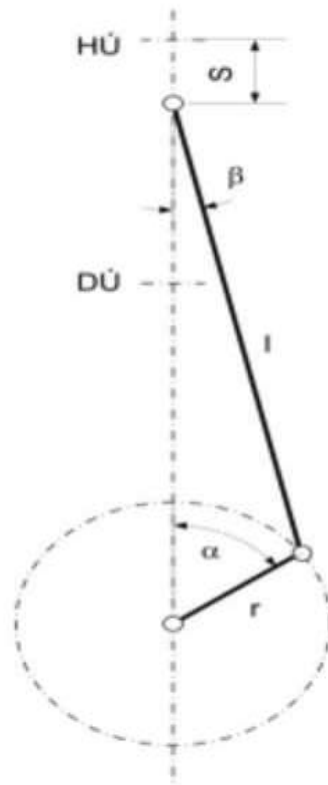


Fig –(b) Crank Slider Mechanism

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### 3. Equations of the quick return mechanism

In order for the crank to rotate fully the following condition must be satisfied,  $L > R + E$

Where, 'R' is the crank length

'L' is the length of the link connecting crank & slider

'E' is the offset of the slider between its two extreme positions i.e. Path length

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### 4. Applications

1. It are often used in the field for the drive for the normal persons, to move with in the campus in the smooth road.
2. It is best helpful for the small town drive for anybody together with the handicap.
3. It are often used for material transportation without mistreatment fuel propulsion.
4. It can be used by the handicap for the normal transport and even for the selfutilized handicap persons for their daily resource.

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### 5. Conclusion

In our project we utilized single slider mechanisms for operating tricycle hence it is most useful and economical as compared to the other tricycle.

The tricycle is made of materials easily available in the market. This tricycle is particularly useful for the elderly and disabled. It is simple in design and easy to use. The effort required to operate the tricycle is less, that is the advantage of this tricycle. The cost of the tricycle is lower than other tricycles. The handbike is also recommended as a good training alternative for early rehabilitation, even for weakened people, during rehabilitation. In this context, there is a need for further research into the optimal design of an exercise bike and its adaptation to different user groups. In addition to optimizing the

wheelchair's user interface, particular attention should be paid to maximizing overall user efficiency and further reducing the vehicle's mechanical losses to ensure a truly optimal level of mobility. The current dynamic development of hand-cranked tricycles in developed countries is expected to benefit not only young and active wheelchair users, but also people with less education or greater limitations. Ultimately, active and frequent use of non-manual wheelchairs may help prevent some secondary complications in today's wheelchair user population.

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