

Twicycle: The mechanism To Drive Bicycle With Hands & Legs

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Abstract- In normal bicycle only legs are used to drive the bicycle and it cannot give upper body exercises and we cannot drive bicycle when leg pain occurs. In normal bicycle there is problem of hill climbing due to less power. In twicycle we can drive the front wheel by using chain drive mechanism. Twicycle is a two wheel drive bicycle. Twicycle gives upper body as well as lower body exercise. Twicycle reduce leg efforts of rider because hand efforts are used to drive the front wheel. Twicycle gets more speed than normal bicycle which helps to climb the hill, adjusting chest arm used to support the body of rider. While testing the twicycle on irregular roads, vibration was occurring due to which bearing nuts were loosen. So, to eliminate this loosening double nut tightening method was used in which locking state is achieved and which prevents loosening of nut. Twicycle is easy to operate and it is eco-friendly.

Keywords- Twicycle, Normal Bicycle, Chain drive.

I. INTRODUCTION

Cycling is one of the best workouts you can get. While it is great for the muscles of your lower body and for keeping fit, it doesn't do nearly as much for your upper body. Twicycle means the cycle which is operated by legs as well as hands for getting full body workout like Biceps, Triceps. A twicycle is working on the principle on human body of muscular energy is converted into the rotational energy of wheel to getting speed than we reaching anywhere. This twicycle is run through the help to chain. We replace handle of normal bicycle and make it new design of handle, and this handle fit to the bearing (P205) this bearing is fitted to strip plate by using nut & bolts. We can replace the bearing and handle while maintenance repairing. In handle we weld to the crank away from the center of distance 10mm. The chain should be perfectly in tension if chain is loose then chain will slip down from crank. This bicycle required to transfer power by using chain drive. In this chain drive driver gear is crank wheel and driven gear is sprocket wheel. We make it different design of handle passes through the bearing for getting required rotary motion of handle. The rotary motion of handle the power transmitted to the crank so crank is rotating the

rotary motion of crank is transmitted to the sprocket by using chain drive. For getting efficient braking system we fitted vee-alloy brake with alloy lever and Shoe band brake is fitted to the front wheel. We make the new mechanism by using pedals.

This mechanism to get rotary motion of handle without brake wire wounds to the handle. This mechanism is assembled to the front wheel of bicycle. This twicycle is more economical and simpler in design.

This twicycle simpler in used to human required to climb the hill or mountains it is easy to use to getting required power and human also using full body workouts like in upper body Abs, Biceps, Triceps and in Chest also. So there is no use for fuel. It is environment friendly.

II. OBJECTIVES

- 1) To drive the front wheel using chain drive mechanism.
- 2) To modify the existing handle design.
- 3) To make an chest arm for supporting the body.
- 4) For fitting the sprocket to front wheel it needs to replace the front wheel hub with rear wheel hub.
- 5) To reduce the legs effort on bicycle and use hand efforts to drive the twicycle.

III. WORKING MODEL

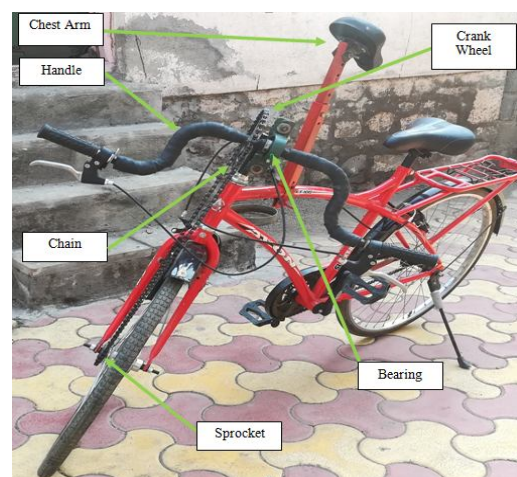


Fig. 1 Working model of twicycle

IV. WORKING PRINCIPLE

Twicycle is working principle on converting the muscular energy of human body into the rotational energy of the wheel to getting speed then we reach anywhere. Twicycle is a new type of bicycle that gives both arms and legs a workout. Twicycle is operate arms as well as legs. The front drive arrangement does it mounted near the rider face. Then provide the chest arm for balancing the body. When riders rotate the handle then chain is rotating & front wheel is moved. When distributing weight to both wheels when going up to hills then avoid loss of traction power then chest arm provide full support to upper body during cycling when with arms and prevent rider from the contact with crank wheel.

V. CATIA MODEL

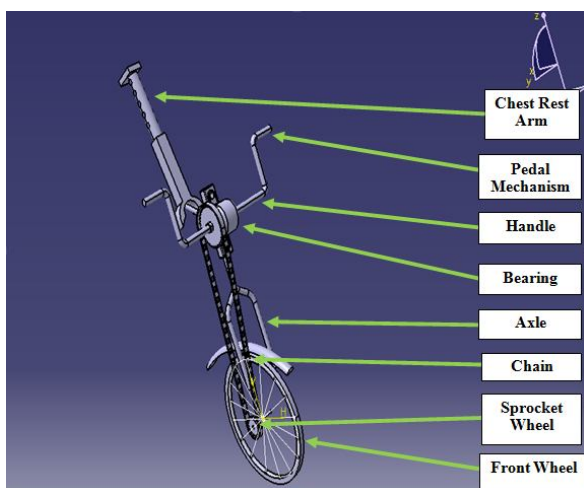


Fig. 2CATIA model of twicycle mechanism

VI. ADVANTAGES

1. Full Body workout:-Twicycle is operated both leg as well as arms so it is useful for exercise of upper body as well as lower body.
2. Easier to hill climbing:-Twicycle make hill climbing easier and faster.
3. Long ride:-It is operated both so your leg gets tired you can continue with your arms.
4. Better traction:-It has better traction power.
5. It is light in weight.
6. Its manufacturing cost is less.
7. Independent drive system:-In twicycle two independent drive system one is use for front wheel & second one is used for rear wheel.

VII. RESULT AND DISCUSSION

A. For hill climbing:-

1. Rotation of wheel when one rotation of handle is 2
2. If efforts of legs required to normal bicycle is 100% then efforts required in twicycle is 77.77%
3. Leg efforts are reduced by 22.22%
4. Effort required to hand is 27.15%

B. For plain road:-

1. Rotation of wheel when one rotation of handle is 2
2. If efforts of legs required to normal bicycle is 100% then efforts required in twicycle is 62.22%
3. Leg efforts are reduced by 37.77%
4. Effort required to hand is 41.09%

VIII. CONCLUSION

1. By using twicycle we can drive the front wheel using chain drive mechanism.
2. Modified track type handle bar was used to operate the front wheel.
3. Adjusting chest arm was designed for supporting of the body.
4. Rear wheel hub is fitted to front wheel for mounting sprocket to transmit power to front wheel.
5. Leg effort of bicycle was reduced using twicycle by 22.22% and hand efforts were required by 27.15%. This helps to getting exercise at upper body.

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