

Design and Fabrication of Treadmill Tricycle

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Abstract:- This project work modifies a treadmill to better fit the requirements of users. Treadmill bicycle is designed for those humans who love to run outside. Treadmill equipped on tricycle frame and formulates a big innovation named 'TREADMILL TRICYCLE'. As the rider walks on the treadmill, the belt butts up against the rear wheel propelling the bike forward. Treadmill tricycle is designed for runners as the ideal treadmill device, this device combines the best exercise running and cycling to deliver a low-impact, high-performance exercise outside home. We think that this device is perfect for healthy runners. The exercise experience on this device is almost same as running than any other exercise type available today.

I. INTRODUCTION

Treadmill is a popular type of home exercise equipment, which provides a simple, aerobic workout. Those who want to begin new exercise routine prefer to choose treadmills because most individuals tolerate walking regardless of back conditions and fitness problems. As strength and endurance are developed, the treadmill can be used for jogging and/or for interval training.

For walking or running while being at the same place treadmill is generally used. Before the development of powered machines treadmills were introduced, to do work by using the power of human or machines, mostly animal or person operated treading steps of tread wheel to grind grain. For people sentenced to hard labor in prisons treadmills were used as punishment devices. For the power and punishment mechanisms the terms treadmill and tread wheel were used interchangeably.

We can say that Treadmill cycle is Treadmill commuting cycle. Technology upgrades and customization can be made Fun and easy by using Modular components. Treadmill cycle is a similar to a three wheeled transportation device and it is easy to ride like bicycle or moped.. Pedal less cycle is a new vehicle format for the everyday commuter. Treadmill cycle gives a great user experience.

The Treadmill Cycle is totally new way of moving. Motion of Cycle from one place to another place will be done by human effort only. Treadmill bike is basically a new concept for travelling and exercising.

As it works through human efforts it helps to maintain our health. The speed required for traveling faster is provided by the gears present in it. That makes this bike different from the simple bicycle.

II. LITERATURE REVIEW

"Physical activity," "exercise," and "physical fitness" are three different terms that describe different concepts. Many times they are confused with one another, and the terms are sometimes used interchangeably. This paper gives definitions to distinguish them. Any bodily movement produced by skeletal muscles that result in energy expenditure is known as Physical activity. The energy expenditure is measured in kilocalories. In daily life physical activity can be categorized into occupational, sports, conditioning, household, or other activities. Exercise is a subset of physical activity that is planned, structured, and repetitive and has as a final or an intermediate objective the improvement of physical fitness. It is a set of attributes that are either health- or skill-related. The degree to which people have these attributes can be measured with specific tests. These definitions are offered as an interpretational framework for comparing studies that relate physical activity, exercise, and physical fitness to health. ^[1]

A new continuous treadmill protocol (USAFSAM) has been designed using a constant treadmill speed (3.3 miles/hour) and regular equal increments in treadmill grade (5 percent/3 min). The constant treadmill speed requires only initial adaptation in patient stride, reduces technician adjustments and produces less electrocardiographic motion artefact than do protocols using multiplexor higher treadmill speeds, or both. The regular equal increments in treadmill grade are easy to implement and provide a larger number of workloads than do protocols that are discontinuous or require larger changes in work load. ^[2]

An experimental validation of the lateral dynamics of a bicycle running on a treadmill is presented in this paper. From a theoretical point of view, bicycling straight ahead on a treadmill with constant belt velocity should be identical to bicycling on flat level ground with constant forward speed. However, two major differences remain: first, stiffness's of the contact of the tire with the belt compared to the contact on flat level ground; second, the belt velocity is fixed with respect to the world, irrespective of the change in heading of the bicycle on the treadmill. The admissibility of these two differences is checked by comparing experimental results with numerical simulation results. The numerical simulations are

performed on a three-degree-of-freedom benchmarked bicycle model [3]

Exercise is inevitable to keep health in good status. There are few scientific studies to show the differences between different types of exercises in health and disease. In our study we compared the treadmill exercise and bicycle exercise and their effect on heart rate attained, blood pressure in twenty one healthy volunteer aged between eighteen to twenty years. We recorded these subjects' blood pressure before exercise and after exercise; heart rate before exercise, during exercise and after exercise. Also we enlisted the advantages and disadvantages of treadmill exercise and bicycle ergo meter exercise, so that these two types of exercise can be appropriately used for health promotion, diagnosis of diseases and for rehabilitation of the individuals. [4]

III. OBJECTIVES

- To prevent chain failure by using gear mechanism.
- Thus it is based on human power there will not be any fatal injury as the person will be in control of it.
- To avoid consumption of electricity since it is based on human power.
- To provide a alternative to exercise while travelling for shorter distance.

IV. COMPONENT

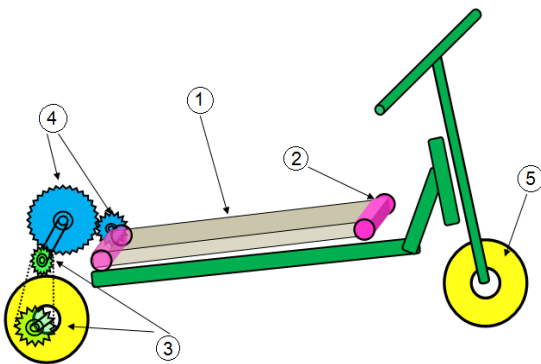


Fig 1:- below shows components of Treadmill Tricycle

A. Treadmill Belt

The thin moving belt and rigid plate held between the two surfaces of the belt is the walking surface of a treadmill.

If you are preparing for running or jogging on your treadmill then the treadmill belt size is an important in your treadmill. For walking, the belt size is not of much importance. 19" wide by 50" long is the standard size for belts. The belt goes onto a deck, which includes part of the frame and your console. So your running space may be 16 by 45 even if your belt is 19 x 50. Again, if you are preparing on

only walking on your treadmill, this size is ok. However, for running you will want a wider and longer belt.

B. Roller

Without moving forward bicycle rollers are type of bicycle trainer that make it possible to ride a bicycle indoors. However, rollers do not confine to the bicycle frame, and the rider must balance himself/ herself on the rollers while training. Normally in bicycle rollers there are three cylinders, drums, or "rollers" (two for the rear wheel and one for the front wheel), on top of which the bicycle runs. To match the bicycle's wheelbase a belt that joins the spacing of bicycle rollers can normally be adjusted. The front roller is adapted to be ahead of the hub of the front wheel.

C. Sprocket

Profiled wheel which has teeth, cogs, or sprockets that mesh with a chain or track is known as sprocket or sprocket wheel. Any wheel upon which radial projections retain a chain passing over it, the name 'sprocket' applies to it. It is different from a gear and differs from a pulley, in that sprocket which has teeth and pulleys are smooth.

D. Spur Gear

Spur gears are the simplest type of gear. Cylinder or disk with teeth projecting radially is present in spur gears. The teeth are not straight-sided the edge of each tooth is straight and aligned parallel to the axis of rotation. These gears mesh together perfectly only if fitted to parallel shafts. The tooth loads create no axial thrust. At moderate speeds Spur gears are best but at high speeds it makes noise.

E. Wheel

A wheel is a component in Circular shape which rotates on an axle bearing. From the six simple machines the wheel is one of the major components of the wheel and axle, Heavy objects can be moved easily allowing movement or transportation while supporting a load with the help of wheels along with the axles. For other objectives such as a ship's wheel, steering wheel, potter's wheel, wheels are also utilized.

Friction is reduced with the help of wheels by facilitating motion by rolling together with the use of axles. By using gravity or by the application of another external force / torque a moment can be applied to the wheel about its axis, for rotations of the wheel.

The outer edge of a wheel will be holding the tire. It will construct the outer circular design of the wheel on which the inside edge of the tire is mounted on vehicles such as automobiles.

V. CONCLUSION

This system can be efficiently used anywhere whether it is outdoor or indoor. This utilizes highly fuel-saving technology which is a major requirement. We can

replace tricycle as an energy efficient vehicle for those who cannot drive a bicycle. In large college campus we can use this for travelling from one building to another. Thus we have found an alternative of conventional treadmill since it uses electricity.

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