



A Review Paper on ‘Design and Fabrication of Treadmill Bicycle’

Ravi Kumar Karsoliya¹, Harivansh Gorana¹, Sandeep Jhamb²

¹UG Student, Department of Mechanical Engineering, Arya Institute of Engineering and Technology, Jaipur, India

² Head of Department, Department of Mechanical Engineering, Arya Institute of Engineering and Technology, Jaipur, India

ABSTRACT

This review paper deals with the idea of modification of bicycle into a fitness equipment called treadmill bicycle with the help of electrically assisted. Treadmill bicycle is the type of bicycle in which treadmill belt is used for walking. Treadmill is connected between the rear wheel and front wheel. When the person walks on the treadmill, the rollers will rotate and the motion will be transmitted to a sprocket, which is connected at the end roller. Treadmill bicycle consists of parts like wheels, treadmill belt, BLDC motor, battery etc. Treadmill bicycle is used for traveling and for the purpose of fitness.

Keywords- Treadmill Bicycle, BLDC motor, Electrically Assisted, Rollers, Sprockets, etc.

INTRODUCTION

Treadmill is an exercise equipment, which provides a simple workout. This project uses treadmill as a main equipment for the fitness purpose.

Treadmill bicycle is a customization of a bicycle in which belt is attached between the rear and front wheel and a BLDC motor is used for electrically assisted, motor in connect with the gear with the help of chain. This walking E bike is an upgraded version of a conventional treadmill. This bike lets the people connect with nature while running on a treadmill. So, this approach transforms the experience of running on a stationary treadmill into a more dynamic form.

The Treadmill bicycle is totally new way of moving from one place to another place, which is done by human effort only. Treadmill bike is basically a new concept for travelling and exercising. In this if a person walking on the Belt area of the cycle which Rotates the Sprocket Connected at the End Roller of the System. Now the Sprockets Rotates the Wheels with the help of Chains and Gear mechanism. The main thing to note is that the wheel is connected to the BLDC Electric powered Motion Assisted motor. This idea of bringing the treadmill and a conventional bicycle will provide a better lifestyle for this generation and also, for the future generation. By bringing the walking and riding feature together it will benefit the people having a busy schedule and don't have time to work out. On the other hand, it is fun to ride anyone can ride the walking E- bike smoothly. This invention will completely change the way transportation works.

LITERATURE REVIEW

This paper focuses on the idea of harnessing the different resources of energy in the modern world. As of now, human beings have evolved and it became essential for them to travel from one place to another. This has to be very fast to keep up with the fast-moving world and also sustainable. So, to encourage this idea of traveling effectively and also not depleting the environment, Kojman, J.D.G., and A.L. Schwab described in their paper about validating the lateral dynamics of bicycle. They presented that bicycling on a treadmill belt should be similar to the conventional bicycle. Therefore, utilising the concept of treadmill into more effective manner. This will allow people to actually be fit and also be productive [1].

According to Prof. P. R. Gajbhiye, Prof. Dhananjay G. Dange, Shubham. C. Hingnekar, Raunak. V. Kondalwar, Nazeefuddin Jamal, Mohit. G. Sonwane, Mohit. G. Shete in their research paper they explained how the conventional treadmill is not as much efficient to actually consume all the energy, but most of the energy is a waste. So, by making a bicycle with a trait like treadmill can significantly improve the energy conservation and also improve the productivity while maintaining the health [2].

METHODOLOGY

Main components which are using in treadmill bicycle are follows as.

1. main frame
2. Treadmill belt
3. Rollers
4. Motor
5. E bike kit

- A. MAIN FRAME- Majorly there are two type of frame material are used one is steel frame and another is aluminium frame, aluminium frame is better than the steel frame in strength and durability within the same weight.
- B. TREADMILL BELT- Majorly nylon belt is used in treadmill. This belt is anti-slip which will help the user to walk on it efficiently.
- C. ROLLERS- there are mainly two types of material are used in rollers one is pvc rollers and another is metal rollers,pvc rollers are quite cheaper and less in weight, and metal rollers are heavy in weight.
- D. MOTOR- In this BLDC motor is used for electrically assisted. If we are using 36V/600W BLDC (Brush less Direct Current) Motor than it gives a maximum Torque of 1.8 Nm and maximum Load current of 21.4 Amp., This motor produces the maximum of 480 RPM after reduction. This motor is selected because the maximum torque required to get the bicycle from 0 to 25 km/hr with a total load of 150 KG in 20 Seconds is 1.35 Nm.
- E. E BIKE KIT- The e-bike kit consists of several components which are as follows –
 - Control Unit.
 - Throttle.
 - Brakes
 - Wires for connection.

WORKING-

The working involves walking on the Belt area of the cycle which Rotates the Sprocket Connected at the End Roller of the System. Now the Sprockets Rotates the Wheels with the help of Chains and Gear mechanism. The main thing to note is that the wheel is connected to the BLDC Electric powered Motion Assisted motor.



Fig. 1 Treadmill Bicycle

CONCLUSION

The whole purpose of the Treadmill bicycle is to be commuting yet fitness-oriented vehicle. It comes with a very modern looking design which is going to please every age group. It is easy and fun to ride.

The people with very busy schedule will also be benefited as they can go to work and grocery shopping with this Treadmill bicycle and they can achieve their fitness goals while doing there day to day activities.

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