

# Lopifit Treadmill Bicycle

Kuldeepak Kumar <sup>1</sup>, Vishwanatha N R <sup>2</sup>, Rajashekhar G Sannamani <sup>3</sup>

Assistant Professor, Department of Mechanical Engineering, Navkis College of Engineering, Hassan, Karnataka, India<sup>1</sup>

Assistant Professor, Department of Mechanical Engineering, Navkis College of Engineering, Hassan, Karnataka, India<sup>2</sup>

Assistant Professor, Department of Mechanical Engineering, Navkis College of Engineering, Hassan, Karnataka, India<sup>3</sup>

**ABSTRACT:** Walking Bike is a totally new way of moving. With the electric assist it takes no more effort to walk than “a walk in the park”. The electric assist in combination with the gear is boosting your walking pace up to the speed of the regular bike. In this bicycle the frame of the bicycle is completely modified and the treadmill is placed in between the two wheels, on which user will walk. When you are walking on the walking bike, you push the treadmill backward with your feet and the belt moves to the rear. At the rear roller the RPM Sensor is attached to the roller, from where the sensor senses the speed of the roller and sends the signal to the motor. The motor now supports you to continue the walking movement. Using break, motor speed will reduce slowly. The walking bike has a sturdy and balanced base. If there are little pebbles on the road it will just cruise along a regular bike. The rubber of the treadmill has anti slip structure which will prevent you from sliding of bike.

“This project inspired to build a vehicle that is faster than walking and easier to ride than a bicycle”.

**KEYWORDS:** Treadmill, Boosting, Anti slip structure, Bicycle, Dynamo and RPM sensor.

## I. INTRODUCTION

Aim is to make a cycle run through a manual treadmill such that in a very less effort more work can be done. The treadmill bicycle is completely a new way of moving which is designed mostly for runners. Basically, using a treadmill is similar to running, hiking or walking. The forerunner of exercise treadmills was designed to diagnose heart and lung disease, and was invented by Dr. Robert Bruce and Wayne Quinton at the University of Washington in 1952. Dr. Kenneth H. Cooper's research on the benefits of aerobic exercise, published in 1968, provided a medical argument to support the commercial development of the home treadmill and exercise bike. While working out in the gym people use treadmill for the purpose of jogging and running. The main drawback of treadmill is that it is stationary. That becomes boring for user to run in a still surrounding with natural exposure to environment. Similarly cycling in the conventional way is common and not possible for all age groups as old people prefer walking. Even for travelling short distance people prefer vehicles that cause pollution and wastage of energy in terms of fuel. So, we came up with the concept of walking tricycle. What makes the walking treadmill bike with electric assist awesome? It has the same fat burning benefits of a regular treadmill, but lets you exercise outdoors or even en route the work.

Based on study, Men burn 124 calories running roughly a mile on a treadmill, and 88 while walking. Women, on the other hand, burn 105 and 74 respectively. It allows you to stay physically active while travelling at the same time. You can practically exercise at anytime of the day.

If you drive out often, you get to exercise just as often. You are basically killing two birds with one stone when you ride the treadmill bike. It features a rugged design and all terrain tires that let you stroll down rough roads or run through evergreen forests.

If you want to explore roads less travelled, you can do so using the walking treadmill bike with electric assist. It lets you jog or take a walk without getting your shoes dirty or modified. Because of its hard wearing belt that offers grip, you don't need to worry about slipping or falling off the treadmill.

It has a variable resistance feature that caters to people of all ages that are fit and balanced enough to ride walking treadmill bike with electric assist. But even if you are not that active, you can start with the treadmill bike. It comes with a brake that immediately shuts off the motor and a freewheel function that you can activate when going downhill. It has safety features that you would not normally find on a regular bike.

## II. RELATED WORK

These are the related work carried out on the above topic

Conversion of a conventional bicycle into treadmill bicycle. In this bicycle the frame of the bicycle is completely modified and the treadmill is placed in between the two wheels, on which user will walk. As the user walks or runs on the treadmill the belt moves to the rear. At the rear roller rpm sensor is attached to the roller from where sensor will sense the speed of the roller and accordingly it will send signal to motor. The motion of motor is transmitted to the front wheel by which we can get the motion of wheel and bicycle runs.

Conversion and combination of a conventional tricycle and the most popular home exercise equipment, the treadmill, into a commuting vehicle. In this tricycle, the frame of the tricycle is entirely modified and treadmill is placed between three wheels, on which the user will run. As the user walks or runs, the belt moves over the rollers that are attached to the shaft with a chain drive. This chain drives the rear wheels of the tricycle which produces motion for the front wheels and thus the tricycle runs.

Concept of treadmill was invented for generating mechanical energy with the help of animals such as horse, dogs etc. First treadmill was introduced by Roman Empire for heavy loading like conveyer belt which we use in industries. Some of those invention required electric power for initial torque. After study the history of treadmill bicycle emerged an idea to develop new concept of treadmill which will manually operated so that no external energy source is required to run treadmill bicycle. The main objective while developing this concept is “A Treadmill with more outputs in less time along with surface cleaning”.

## III. LOPIFIT TREADMILL BICYCLE

When we walk or run on the walking surface it gives rotation to rear wheel of bicycle and treadmill bicycle is moving forward. The walking surface of a treadmill consists of the thin moving belt and a rigid plate placed between the two surfaces of that belt in order to provide backing when the transverse load of footfalls is applied. The original and unmodified treadmill used a sheet of 0.75 inches pressed particle board as a support plate.



This was attached to the frame of the treadmill at four points with wood screws placed near the four corners of the sheet. While resting on the rails in a lowered position, the plate received vertical support from small metal risers at the mounting points and from two rubber pads placed under the longest edge of the surface midway between the hard mounting points. According to the manual provided with the treadmill, the design intent behind this flexible multi-point mounting system was to reduce the overall stiffness of the plate by providing less support than that provided by direct attachment to two solid rails. In actual practice, the thickness and stiffness of the particle board surface were more than required to remove all discernable deflection from the system. Users were unable to distinguish the difference in stiffness when additional aluminium supports were inserted between the sheet and the rails, in order to remove the compliant effect of the rubber supports. We concluded that modifications would be necessary to achieve an ideally compliant walking surface capable of reducing the impact forces related with walking and running. Additionally, the bottom face of the particle board sheet held two outwardly angled metal brackets. These were oriented such that the belt would slide over them consecutively when the system was active. Treadmill Bicycle is one type of bicycle in which a man walks on the treadmill and then treadmill moves backward. It is a moving bike which is combination of electric and mechanical parts. This motion of treadmill actuates the electric motor and motor rotates the shaft of rear wheel using chain drive and battery. It is used for the purpose of transport from one place to another place. It is moved by human efforts like walking on the treadmill. So, it is used for the purpose of travelling and exercising.



IV. TECHNICAL SPECIFICATION

| PARAMETERS             | LECTRIX                                     |
|------------------------|---|
| <b>MOTOR</b>           |   |
| Motor Type             | Brushless DC                                |
| Motor Power            | <250W                                       |
| <b>BATTERY</b>         |   |
| Type                   | VRLA  |
| Voltage                | 48V   |
| Capacity               | 20Ah  |
| <b>CHARGER</b>         |   |
| Rating                 | 48V, 2.5A                                   |
| Charging time          | 8-10 hrs                                    |
| <b>OPERATIONAL</b>     |   |
| Maximum Speed          | <25 Kms/hr                                  |
| Range(Distance/Charge) | 70 km*(under standard test ride conditions) |
| Vehicle kerb weight    | 84 gs                                       |

V. CONCLUSION

We developed a branch and bound approach which is coupled with quick, effective bounds to optimize the “Walking Bike” which serves the purpose of exercise and travelling and also reduce the use of non- renewable energy resources.

The design of control architecture was an important aspect of study because a strong interaction between the many different parts was needed. Walking bike has some advantages and some disadvantages. The main disadvantage of walking bike is its discharging battery. Due sudden discharge of battery in between of travelling leads to face many problems to overcome this disadvantage we can do some improvements in present model. Another way is generation of electricity by using dynamo generator. The mechanical energy generated by human due to walking on tread belt is converted to electrical energy by using dynamo generator. It will produce a small amount of energy. Small increment of energy in rechargeable battery will move the bike continuously. It can be driven by any person of different ages. Due to scarcity of fuel, treadmill bike will benefit a great extend to human life. It also helps in exercising which is required for a person to be fit, so treadmill bike also saves time for exercising. Controller, hub wheel and throttle for extra modification have been used.

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