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FABRICATION OF THREADMILL BICYCLE

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Abstract - *This Project is entitled "Fabrication of Treadmill Bicycle". Innovative hybrid systems are a response to the growing demand for environmentally sustainable fitness and mobility options. One such idea is the Treadmill Bicycle, a novel human-powered vehicle that combines the concepts of a treadmill and a bicycle. The treadmills are not used to harness power; rather, they are fitness devices that allow us to run or walk a shorter distance while using the same principle.*

Through the concept of a treadmill, human energy is converted into motion by the machine. People can use this equipment for fitness and for short-distance transport. The system consists of a treadmill belt fixed to a frame and linked to the back wheel by a chain or gear system. The drive train spins when the user walks or runs, allowing for forward propulsion. The treadmill bicycle is environmentally beneficial because it does not utilize any organic fuels. Pollution of any kind is not encouraged by treadmill bicycles.

Keywords: Treadmill Frame, Walking Belt, Rollers, Bearing, Sprocket, Wheel.

1. INTRODUCTION

Walking and cycling are two common fitness activities. A treadmill allows indoor exercise, but it limits natural movement and outdoor exposure. A bicycle enables travel, but requires pedaling power. The Treadmill Bicycle combines these two ideas into a single unit, where walking action serves as the driving unit. The project focuses on creating a lightweight system, improving user comfort, and offering an eco-friendly mobility option.

1.1 PROBLEM STATEMENT

A traditional bicycle requires pedaling, and some users are not** comfortable with it. There is a need for a system that supports natural walking and still allows movement from one place to another.

1.2 OBJECTIVES

The objective of this project is to develop a mechanically stable and energy-efficient Treadmill Bicycle capable of transforming linear walking motion into rotational drive. The aim includes designing a robust frame, optimizing the belt-roller mechanism, reducing frictional losses, and ensuring safe, smooth operation. Additionally, the project seeks to create a cost-effective prototype suitable for practical demonstration and short-range human-powered mobility.

II. COMPONENTS AND DESCRIPTION

Treadmill Frame

The Tread Mill frame supports the Belt, Rollers, and Drive Mechanism. It holds the user's weight and maintains alignment during walking. It is a Main Component in a treadmill bicycle to carry the entire load and also transmit** power to run the bicycle.

Figure 1. Treadmill Bicycle

Walking Belt

A walking belt is a strong rubber belt that moves the rollers to provide a surface for walking. When the user walks on the Belt that rotates smoothly, it transfers the motion to the rollers. It acts as the main moving platform in the treadmill bicycle and helps to convert the walking movement into rotational motion.

Figure 2. walking belt

Rollers

Rollers are cylindrical shafts placed at the front and rear of the treadmill belt. As the user walks, the belt rotates these rollers. The rear roller is connected to the chain drive, making it the key component that converts the belt's motion into rotational power. Rollers must be smooth, perfectly aligned, and supported by bearings for efficient movement.

Figure 3. Roller

Bearings

Bearings are mechanical elements that support rotating shafts while reducing friction. In this project, bearings are fitted at the ends of the roller shafts to ensure smooth, low-resistance rotation. This helps to move the Belt in freely and increase the efficiency of motion transfer, and also to prevent the energy losses due to friction.

Figure 4. Bearing

Sprocket and Chain Drive

Sprockets are toothed wheels that engage with the chain. The roller sprocket converts the belt's rotational energy into chain motion, while the rear wheel sprocket uses that motion to rotate the wheel. The size and tooth count of the sprockets determine the speed and torque of the bicycle.

Figure 5. Sprocket

Bicycle Wheel

The Bicycle wheel acts as the final output component of the transmission system. When the roller rotates and drives the chain, the torque is transferred to the rear wheel. As a result, the wheel turns and pushes the bicycle forward. A standard bicycle wheel is used because it is lightweight, easy to maintain, and provides good traction.

Figure 6. Bicycle Wheel

CAD MODEL

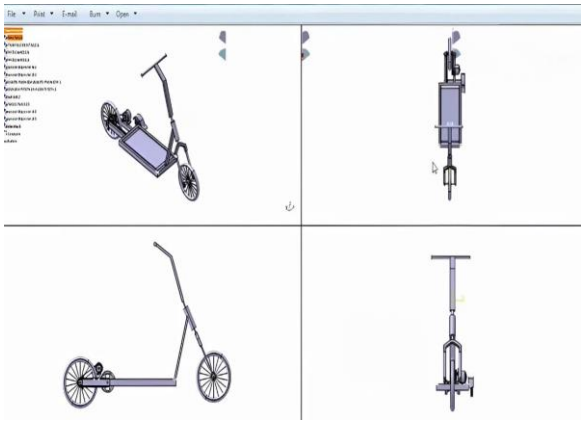

Figure 7. CAD MODEL

III. WORKING PRINCIPLE

When the user walks on the belt, the belt moves in the opposite direction. This motion rotates the rollers, especially the rear roller that is connected to a sprocket. The sprocket drives the chain, which turns the wheel sprocket and rotates the rear wheel. As the wheel rotates, the bicycle moves forward. Steering is handled using the handlebars, and braking is done using the bicycle's braking system. The entire movement relies on human walking power.

IV. ADVANTAGES

The Treadmill Bicycle uses no fuel and creates zero pollution. Users can exercise outdoors while also moving from one place to another. It encourages physical fitness and offers a simple mobility method for short distances. The mechanism is easy to maintain and provides a smooth walking-based driving experience.

V. APPLICATIONS

The treadmill bicycle is a * kind of vehicle that can be used in parks, campuses, residential areas, and open pathways. It is also useful for fitness training, therapy sessions, and the demonstration of mechanical energy conversion in educational projects.

VI. FUTURE SCOPE

The system can be improved by adding a light frame, better belt materials, and shock-absorbing mounts. A solar panel and a small battery-powered assist motor can help the user on slopes. Digital meters for speed, distance, and calories can also be included. With further development, the model can be turned into a hybrid fitness-transport vehicle.

VII. CONCLUSION

The Treadmill Bicycle is a simple and effective design that integrates walking and mobility in one system. The prototype shows that walking motion can be successfully converted into forward travel using a belt, roller, and chain arrangement. The concept supports eco-friendly travel and offers a healthier form of movement. With future upgrades, the model can become a modern, fitness-focused personal vehicle.

VIII. REFERCENCES

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