

Treadmill Bike

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ABSTRACT

A treadmill machine is used for walking or running. Treadmills were introduced before the development of powered machines, to harness the power of animals or humans to do work, often a type of mill that was operated by a person or animal treading steps of a tread wheel to grind grain. In later times, treadmills were used as punishment devices for people sentenced to hard labour in prisons. The terms treadmill and tread wheel were used interchangeably for the power and punishment mechanisms. Recently, treadmills are not used to harness power generation, but it use as an exercise machine for running or walking in one place. Rather than the user powering the mill, the machine provides a moving platform with a wide conveyor belt driven by an electric motor or a flywheel. When a user walks on the belt it moves to the rear. he rate at which belt moves is same as user walking or running. So that the speed of running and walking may be controlled and measured. The more expensive, heavy-duty versions are motor-driven (usually by an electric motor). The latter is known as manual treadmills. The treadmill is a largest selling exercise equipment According to Sports & Fitness Industry Association. So the treadmill industry counts with hundreds of manufacturers throughout the World.

Keywords: Treadmill, Bike, motor Bicycle

I. INTRODUCTION

Generally, a treadmill is used for walking or running while staying in the same place. More recently, treadmills are not used to harness power, but as exercise machines for running or walking in one place. So our idea is to use the power generated due to the human effort during exercise for moving motion. The treadmill bike is a totally new way of moving it is done by the combination of electric and mechanical part i.e. battery and gear .A motion of bike from one place to another place will be done by human effort. The electric assist in the combination of the gear has three gear pair boosting your walking pace up the regular bike. With the electric assist, it takes no more efforts than a walk in the park. Treadmill bike is basically a new concept for traveling and exercising.

II. DESIGN PROCESS :

The experimental setup consists of a treadmill setup which has a belt moving between two rollers. The motion to the conveyor setup is given by a hub motor. The hub motor is operated by a battery. The battery in turn is powered up by the solar panel. The sunrays falling on the solar panel is directly converted into the electrical energy and is stored up in the battery which later delivers power to the hub motor. The hub motor delivers motion to the treadmill setup through the pulley and the belt drive mechanism. The power from the motor is delivered to the rollers such that the entire setup moves acting as an electric bike. As the bike moves, the traveler can able to walk on the belt so that separate time for walking may not be allotted. The shaft of the treadmill roller and the wheels of the electric bike are connected by means of

sprocket and chain drive so that when the person walks, the wheels attain motion and the entire vehicle moves. The power is transmitted with the help of the spur gears. The spur gears are used for increasing the rotational motion.

III. ELECTRO VEHICLE

Electro vehicles are the vehicle which runs on electrical power. The wheels of this types of vehicle are rotated with help of an electric motor. This motor is powered by the electric source which can be electric battery, generator to convert fuel to electricity or solar panel. EVs include road and rail vehicles, surface and underwater vessels, electric aircraft and electric spacecraft. Electric Vehicles are came into existence in the 19th century. Electricity is the best method for motor vehicle propulsion, It provides comfort and ease of operation that could not achieved by the gasoline. Electric power has remained commonplace in other vehicle types, such as trains and smaller vehicles of all types.

IV. HYBRID VEHICLE

The vehicle which uses two or more methods of power is known as a hybrid vehicle. Like internal combustion engine to drive an electric generator that powers an electric motor. e.g. in diesel-electric trains using diesel engines to drive an electric generator that powers an electric motor, and submarines that use diesel when surfaced and batteries when submerged.

V. IMPORTANCE OF TREADMILL ELECTRICAL BIKE

1. The treadmill is a relatively easy piece of exercise equipment to use.

2. The treadmill has a predictable surface that is much easier to negotiate than sidewalks, curbs or trails and the risk of tripping is reduced.
3. All aspects of the workout can be controlled by the user: speed, incline, warm up period, cool down period, and energy spend
4. Generally, users can design custom program to fit the time they have to exercise
5. Multiple users can use the same equipment without adjusting the structure
6. Running on a treadmill generally burns calories faster than most other forms of in-home exercise, such as biking.

There are lots of benefits of exercise, increase in the strength of the heart, weight loss, and decreased insulin resistance. Walking or running on a treadmill is good exercise and it puts less stress on the body than walking or running on a flat outdoor surface. Treadmills also offer the facilities for careful monitoring of the heart rate and blood pressure for patients that are in poor health or have heart problems. This information helps the patient determine how much exercise they can do and when it's time to stop. Here is some information about the health benefits of exercising on the treadmill.

The treadmill bicycle is a totally new way of moving. With the electric assist, it takes less effort to walk than "a walk in the park". It is the combination of the DC motor, Hall Effect Sensor and amplifier boosting your walking pace up to the higher speed. Increased use of fuel has resulted in an increase of pollution and degradation of natural resources. With increasing population and their need, it has become necessary to control the use of fuel and decrease the pollution; so as to make it avail it's important to our coming generation. Due to heavy busy schedule, people are not able to give attention to their health and physical fitness. As it uses no fuel so it saves energy simultaneously it can be used as treadmill and Bicycle. No need to use it as a conventional treadmill in a closed room; you can roam on roads also.

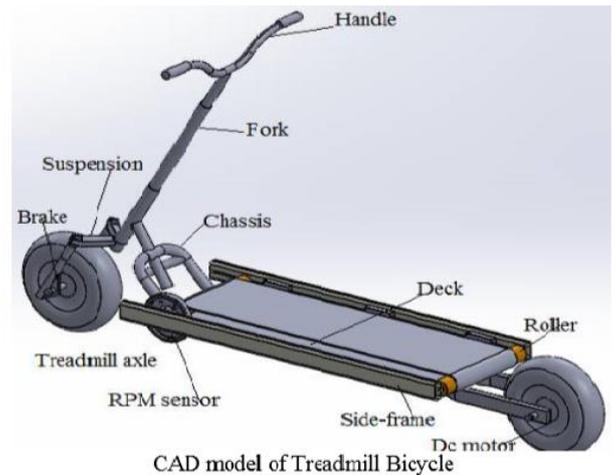
VI. WORKING OF TREADMILL ELECTRIC BICYCLE

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 aluminum 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.

The treadmill cycle is driven manually, more or less the same effort is required to drive the bike as the effort required in treadmill, and it consisting of dc motor and batteries are connected to it to run when various gear arrangements and two shafts provided to change the motion. The treadmill cycle will be the best segment.



Designed Components

1. Chassis
2. Fork
3. Axle of bicycle
4. Axle of treadmill
5. Bicycle handle
6. Treadmill roller
7. Treadmill side frame

Standard components

1. Brake
2. Belt
3. Bearing
4. Electric motor
5. Wheels

VII. MATERIAL USED

The materials used in this project are detailed as follows:

1. low carbon steel
2. Nylon rubber fabric.
3. Plywood
4. Wood mica

Mild steel consists of a tiny low share of carbon. it's robust and difficult however not promptly tempered, additionally referred to as plain-carbon steel. it's the foremost common type of steel due to its worth low whereas it provides material properties that are acceptable for several applications. mild steel contains around zero.05–0.25% carbon creating it malleable and ductile. steel encompasses a comparatively low strength, however it's low cost and straightforward to form; surface hardness may be accumulated through carburizing. And nylon is a lot of specifically open-chain or semi-aromatic polyamides. they'll be melt-processed into fibers, films or shapes. the primary example of nylon (nylon half-dozen, 6) was created on February twenty eight, 1935, by Wallace Carothers at DuPont's center at the DuPont Experimental Station. Nylon polymers have found important industrial applications in fibers (apparel, flooring and rubber reinforcement), in shapes (molded elements for cars, electrical instrumentation, etc.), and in films (mostly for food packaging). Plywood may be a sheet material factory-made from skinny layers or "plies" of wood veneer that are pasted along with adjacent layers having their wood grain turned up to ninety degrees to at least one another. it's associate built wood from the family of factory-made boards which incorporates medium-density wallboard (MDF) and wallboard (chipboard). Decorative laminates or wood transparent substance are laminated product primarily used as furnishings surface materials or wall panel. It will be factory-made as either high- or unaggressive laminate, with the 2 methods not abundant completely different from one another apart from the pressure applied within the pressing process.

VIII. ONCLUSION

We developed a branch and bound approach which is coupled with quick, effective bounds to optimize the "Treadmill Electric Bicycle" which serves the purpose of exercise and traveling and also reduce the use of non-renewable energy resources. By this project, we are creating a platform in which mechanical energy is converted into linear motion. By using our simple walking nature, we are changing it to a good running speed by which we are not only saving energy but also recreating a formula of using the small investment to a big amount of achievement. This prototype can be a good promoted area to use the energy being wasted on treadmills in fitness centres. By using this prototype, we can not only save energy but also create a new idea of energy distribution in electrical field which is a common need for everyone in future.

IX. ACKNOWLEDGMENT

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