

Treadmill Bicycle

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Abstract - Treadmill bicycle is a totally new concept of moving. The gear ratio is boosting your walking pace up to the speed of the regular bike. When you are walking on the treadmill bicycle, you push the treadmill backward with your feet. The movement of the treadmill will drive the sun gear fitted on the treadmill roller which will further drive the mechanism. The bicycle has balanced base.

Keywords – Gear ratio, Gear mechanism, Treadmill, Fork Assembly.

1. INTRODUCTION

Treadmill bicycle is totally based on mechanical components i.e. purely on gear ratio. A sun gear is attached on the treadmill roller which drives the gear on a shaft which is further transmitted to another shaft again by increasing the gear ratio by 2.5 times. This shaft is coupled with the gear fitted on wheel. The arrangement of the wheel with the second shaft is in such manner that the direction of rotation of wheel and gear on shaft are opposite so that wheel rotates in forward direction. We can also use battery to store power while we are running on it, and then the power of battery can be used for running the vehicle. The main feature of the treadmill bicycle which makes it different from cycle is that it contains gear mechanism.



Fig.1.Mechanism

2. SYSTEM MODEL

Exercise is a subset of physical activity that is planned, structured and repetitive and has as a final or an intermediate objective the improvement or maintenance of

physical fitness. Physical activity is defined as any bodily movement produced by skeletal muscles that result in energy expenditure. Energy can be measured in term of kilocalories. 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 artifact than do protocols using multiple or higher treadmill speeds, or both.

In our designing work has been divided into two parts mainly,

1:- System Design

2:- Mechanical Design

System design mainly concern with ergonomics, space requirements, arrangement of various components on the main frame of treadmill, arrangement of tread belt and rollers, position of braking system, arrangement of motor, sprockets, ease of maintenance, scope of further improvements, ground clearance etc.

For design parts, detailed design is done and dimensions thus obtained are compared to next highest dimensions which are readily available in the market. This simplifies the assembly as well as post production servicing work.

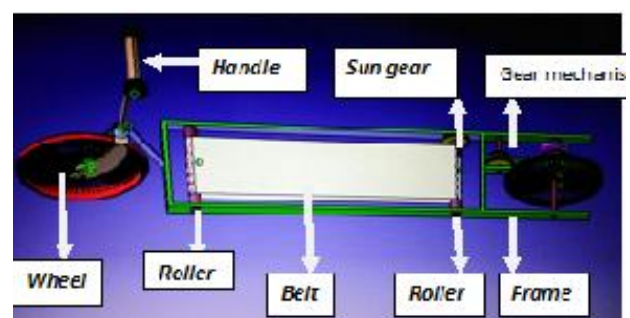


Fig.2. Design in Catia.

3. PREVIOUS WORK

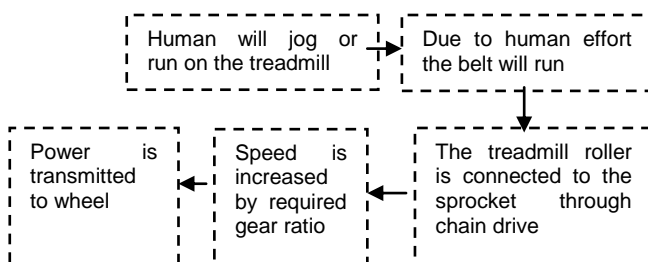
Dutch engineer Bruin Bergmeester created an the electric bike four years ago in Holland which lets riders get about by walking on a treadmill called Lopifit. According to Lopifit's website, bike enthusiast Bergmeester came up with the idea while training in the gym, pondering: 'How can I use the treadmill outdoors?'

4. PROPOSED METHODOLOGY

Millions of people used bicycle everyday although very little modification has been done till now, very little research has been done in order to modify the basic structure of bicycle into the most effective design which is the best for human comfort. Modification has been tested on the racing track where many uncontrollable factors may affect the result. It is important to identify the energy output while riding different types of bicycles. Design change in the model should not make the cycle look bulky.

Treadmill bicycle is a combination of bicycle and treadmill, it help us to perform two works at a time firstly transport ,which is the most essential activity of a person in day to day life. Secondly since the treadmill bicycle works on human efforts it saves time for exercising. The main feature of the treadmill bicycle which makes it different from cycle is that it contains gear mechanism which helps to travel at a faster rate than the cycle with less human efforts as compared to cycle. It is also cheaper than a normal bike which also makes it economic. No fuel is consumed. By it because of this reason it is economic and environment friendly.

Block Diagram:



5. SIMULATION/EXPERIMENTAL RESULTS

Treadmill is a totally new way of moving. The bicycle when operated we observed that the gear ratio is boosting your walking pace up to the speed of regular bike.



Fig.3. Treadmill Bicycle.

While walking on the treadmill bicycle, you push the belt of treadmill backward with your feet. The movement of the

treadmill belt will drive roller along with the sun gear fitted on it and also the other mechanism. We also found that the bicycle is easy to operate and to balance as well while running. Treadmill bicycle results as a vehicle that is faster than walking and easier to ride than a bicycle.

6. CONCLUSION

Treadmill bicycle uses human energy for new mode of transportation with minimal expenditure of energy. Since Treadmill Bicycle containing simple mechanism which makes it cost effective with improved velocity ratio. Hence obtaining more displacement.

7. FUTURE SCOPES

The treadmill bike will prove to be a future vehicle as no fuel is used for travelling through this and it is pollution free. Treadmill is cheaper than the normal bike which also makes it efficient and economic. As we know the bike works on more on human effort it helps to eliminate health issues like obesity and lung diseases, driving it daily through a short distance can help to maintain good health as we know it does not use any fuel of which the cost is increasing frequently nowadays becoming very costly this will be a good option for travelling in the near future. It can be driven by any person of different ages. Due to scarcity of fuel, treadmill bike will benefit greatly 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.

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