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SHAFT DRIVEN LAPIFIT

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Abstract: This study has been undertaken to investigate the determinants of stock returns in Karachi Stock Exchange (KSE) using two assets pricing models the classical Capital Asset Pricing Model and Arbitrage Pricing Theory model. To test the CAPM market return is used and macroeconomic variables are used to test the APT. The macroeconomic variables include inflation, oil prices, interest rate and exchange rate. For the very purpose monthly time series data has been arranged from Jan 2010 to Dec 2014. The analytical framework contains.

Index Terms - Component, formatting, style, styling, insert.

Abstract- The treadmill bicycle is a totally new way of moving. Increased use of fuel has resulted in 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 conventional treadmill in closed room; you can roam on roads also.

Millions of people use 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.(1,2) 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 changes in the model should not make the cycle look bulky

The main objectives of the project are:

- To maintain fitness among people in their busy hectic life.
- To provide a transport medium for travelling.

Keywords- treadmill, lapifit, speed. bicycle

INTRODUCTION

Problem Statement: While working out in gym people use treadmill for jogging and running. The main disadvantage of this treadmill is, it is stationary at particular place so sometimes people get bored by jogging at same place without any exposure to natural atmosphere. For travelling over short distances people often use a commercial vehicle which causes pollution and unnecessary wastage of fuel. So, we came to a solution for this type of problem by providing wheels to the treadmill and the concept is termed as walking bicycle.(3)



Lopifit is totally a new way to get around. The unique experience of walking is a lot of fun guaranteed to make you smile.

Benefits of walking/running on lopifit:

- Helps to build strong bones, as it is a weight bearing exercise.
- Strengthens muscles.
- Improves cardiovascular fitness.
- Burns plenty of kilojoules.
- Helps maintain a healthy weight.

On the lopifit, you'll be able to cover large distances while walking calmly. Lopifit is also known as the modification of simple bicycle in which the bicycle pedals are replaced by the treadmill. Treadmill requires comparatively less efforts as compare to pedals. The main reason behind this is that most bikes require the knee to bend close to 90 degrees, so people with special knee conditions that limit bending may not be able to make a full revolution.(5) The Lopifit, one of the latest cycling innovations, is an electric walking bike recently introduced to the United States. The cheap bike was invented in year 2012 by Bruin Bergmeester in Holland and this year Lopifit US distributes to the United States, Mexico and the Caribbean.

Lopifit is a technique used to generate the high wheels rpm with little human efforts exerted in the form of input power. And for that purpose Lopifit is consists of a treadmill which is a device generally used for walking or running while staying in the same place. 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 labors in prisons. The terms treadmill and tread wheel were used interchangeably for the power and punishment mechanisms.

But now a day 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 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 conventional treadmill in closed room; you can roam on roads also.

Experimental procedure

Cycling is considered as one of the best exercise to eliminate the disease such as blood pressure and obesity. The Dutch has deep love affair with the bicycle which it was probably deemed a good idea to mixing concepts of treadmill with that of bike. We know treadmill is one of the modern equipment for excising in modern era. So it was new idea to merge the treadmill and cycle in order to exercise as well as to move from one place to another.

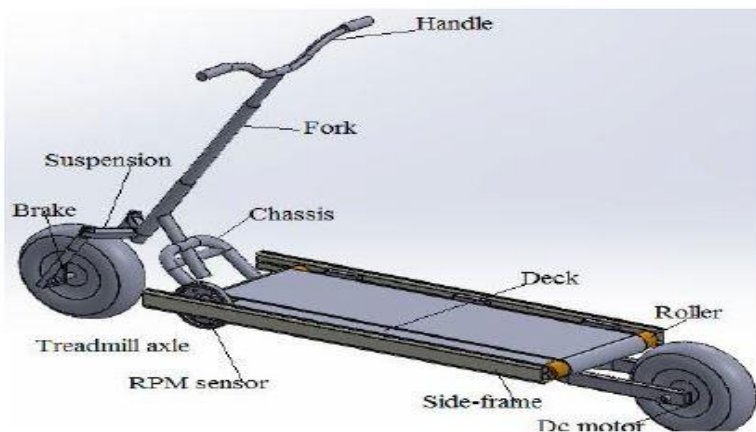
Treadmill bike is a combination of bicycle and treadmill, it help us to perform two works at a time firstly transport ,which is the most essential activity of a person in day to day life. Secondly since the treadmill bike works on human efforts it saves time for exercising. The main feature of the treadmill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

Designed Components

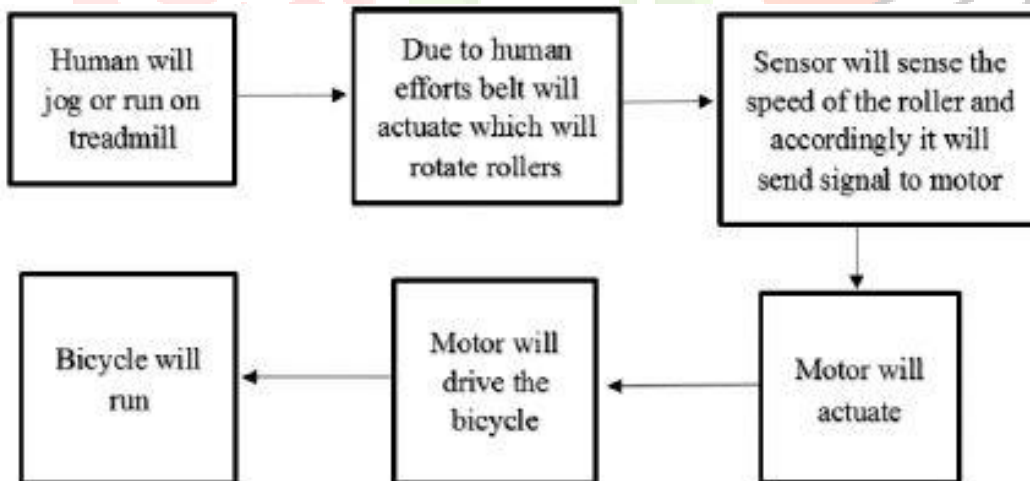
- Chassis
- Fork
- Axle of Bicycle
- Axle of Treadmill
- Bicycle Handle
- Treadmill Roller
- Treadmill Side-Frame

Standard Components

- Brake
- Belt
- Bearing
- Electric Motor
- Wheels



Working of lopifit:



VEHICLE DIMENSIONS

Weight of vehicle = 27kg

Length of vehicle = 104i

Height of vehicle = 51kg

Ground Clearance = 5i

Frame length = 44.5i

Width = 17.5i

Frame Height = 3i

Frame thickness = 1.5mm

Frame inclination = 8.39°

no. of roller = 17

15 small 4i dia each

2 big-6.3i

Handle inclination = 74.35°

Cycle pipe diameter = 5i

Handle width = 25i

Belt width = 11.97i

Belt length = 35.5i

Rear wheel radius = 13.5i

Front wheel radius = 13.5i

Rear wheel sprocket radius = 2i

Number of teeth in wheel sprocket = 18

Frame sprocket radius = 1.5i

Number of teeth in frame sprocket = 18

Central distance between two sprockets = 18.5i

Radius of gear attached on frame = 1.67i

Number of teeth in gear attached to frame = 25

Radius of gear attached on roller = 2.73i

Number of teeth in gear attached on roller = 41

Calculations and Results

Assumption:

$$V_1 = 10 \text{ Km/hr } (2.778 \text{ m/sec})$$

$$V_1 = r_1 \omega_1$$

Where

ω_1 = Angular velocity of rear roller = Angular velocity of gear 1

r_1 = Radius of rear roller

$$\omega_1 = 2.778 / 0.08 \text{ rad/Sec}$$

$$\omega_1 = 34.725 \text{ rad/Sec}$$

Now

$$\omega_1 / \omega_2 = T_1 / T_2$$

Where

ω_1 = Angular velocity of gear 2

T_1 = No. of teeth on gear 1

T_2 = No. of teeth on gear 2

$$\omega_2 = \omega_1 * T_2 / T_1$$

$$\omega_2 = 41.67 \text{ rad/Sec}$$

now, $\omega_3 = \omega_2$

$\omega_3 =$ Angular velocity of sprocket 3

Thus

$$\omega_3 = 41.67 \text{ rad/Sec}$$

$$\omega_3 / \omega_4 = T_4 / T_3$$

Where

$\omega_4 =$ Angular velocity of sprocket 4

$$41.67 / \omega_4 = T_4 / T_3$$

$$\omega_4 = 26.787 \text{ rad/Sec}$$

Again

$$\omega_4 = \omega_5$$

Where

$\omega_5 =$ Angular velocity of wheel 5

$$\omega_5 = 26.787 \text{ rad/Sec}$$

Peripheral velocity of the wheel

$$V_2 = r_5 \omega_5$$

Where

$r_5 =$ radius of wheel

$$r_5 = 0.3429 \text{ m}$$

$$V_2 = 9.1852 \text{ m/sec}$$

$$V_2 = 33 \text{ Kmph}$$

Now

$$T_1 * \omega_1 = T_5 * \omega_5$$

$c =$ Input torque = 10Nm

$$T_5 = 12.96 \text{ Nm}$$

Conclusions

The project that we have made has many advantages in this busy world. Firstly it can be used as a medium of transport. Since, the product has gear mechanism, with very less efforts, a distance can be covered. Secondly it's very useful for health. Daily usage of this product can reduce blood pressure, cardiovascular disease risk and it can induce health in the user and he can live a healthy life. This product is very useful and eco-friendly because this is battery driven and it doesn't need any fuel to run. Therefore it doesn't do any pollution.

The four main advantages and significance of this project are as follows:

Exercise: Treadmill bicycle helps in maintaining proper physique. Physical fitness is of utmost importance in day to day life. People often get bored while exercising in a closed room such as gym. By using treadmill bicycle one can exercise outdoors in fresh air.

Fuel saving: People often use vehicle for travelling over short distance. This causes unnecessary wastage of fuel. Due to use of treadmill bicycle over short distance a large amount of fuel can be saved.

Travelling: Treadmill bicycle can be used for travelling over short distances. One can also exercise while travelling over short distance.

Eco-friendly: Treadmill bicycle does not require any fuel. Therefore it does not emit any pollutants. So it is an eco-friendly vehicle.

References

1. Caspersen CJ, Powell KE, Christenson GM. Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. Public Health Reports. 1985; 100(2):126-131.
2. Wolthuis, R. A., Froelicher, V. F., Fischer, J., Noguera, I., Davis, G., Stewart, A. J., & Triebwasser, J. H. (1977). New practical treadmill protocol for clinical use. The American journal of cardiology, 39(5), 697-700.
3. Kooijman, J. D. G., and A. L. Schwab. "Experimental validation of the lateral dynamics of a bicycle on a treadmill." ASME 2009 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference. American Society of Mechanical Engineers, 2009.
4. Kisan, Ravikiran, et al. "Treadmill and bicycle ergo meter exercise: cardiovascular response comparison." Global Journal of Medical Research 12.5 (2012).
5. Dr Ravikiran Kisan MD, Dr Swapnali Ravikiran Kisan MD, Dr Anitha OR MD & Dr Chandrakala SP MD, "Treadmill and Bicycle Ergo meter Exercise Cardiovascular Response comparison", Global Journal of Medical research, Volume 12 Issue 5 Version 1.0 June 2012 Online ISSN: 2249-4618 & Print ISSN : 0975-5888.
6. Gain Ratios; a new way to think about bicycle gears" (PDF). Retrieved 2014-03-28.
7. "Cyclists Touring Club: internal gear ratios". Archived from the original on 2 July 2011. Retrieved 2011-06-29
8. Material Technology By O.P. Khanna
9. Strength of Material By Sadhu Singh

