

Design And Fabrication of Treadmill Cycle

¹Pranav Gujar, ²Rohan Kokate, ³Sagar Patil, ⁴Tejas Khanapure, ⁵PreethaKumari

^{1,2,3,4} Student, Department of Mechanical Engineering, Lokmanya Tilak College of Engineering, Navi Mumbai, Maharashtra, India

⁵ Professor, Department of Mechanical Engineering, Lokmanya Tilak College of Engineering, Navi Mumbai, Maharashtra, India

Abstract— The following paper deals with 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.

IndexTerms—On the cutting edge, Commuting,

I. INTRODUCTION

One of the most popular types of home exercise equipment is the treadmill, which provides a straightforward, efficient aerobic workout. For many, treadmills are a good choice to begin a new exercise routine because walking is well tolerated by most individuals regardless of fitness level and for most back conditions. As strength and endurance are developed, the treadmill can be used for jogging and/or for interval training. Treadmill cycle is a tread mill commuting vehicle. Modular components make technology upgrades and customization fun and easy. Treadmill cycle is a three-wheeled transportation device. It is used similarly to a moped or bicycle and is just as easy to ride. Pedal less cycle has been engineered to have a very low centre of gravity, making it the most stable three-wheeled vehicle available. Pedal less cycle is a whole new next generation vehicle format for the everyday commuter. It's a solution. And it is a global product, addressing the need for compact personal transportation for all markets around the world. Treadmill cycle truly delivers a great user experience in a product that is both practical and on the cutting edge.

II. PROBLEM DEFINITION

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.

III. OBJECTIVE

Treadmill cycle is the new way of locomotion. It makes workout more interesting and competitive. There is no need to get stuck in the gym at a corner when you can roam while you workout. Secondly, looking from the ever-growing problem of pollution, this cycle turns out to be eco-friendly without emission of harmful pollutants. Moreover it saves fuel thus helping in saving the natural resources. Lastly, in this metropolitan world, people are ignoring their health and fitness. This cycle would be a boon for such fitness deprived people having hectic schedule.

IV. METHODOLOGY

The working of the treadmill cycle is majorly based on the principle of conversion of the linear motion applied by the human being on the treadmill into the rotary motion of the wheels with the help of gear system and motor mechanism. In addition to the linear motion applied by the human being, energy from the sun will also be converted with the help of solar panels. The main chassis of the treadmill consists of square pipes welded together to form the outer portion of the chassis. In the inside of the chassis are the two types of rollers--- plastic and steel rollers that will have a rolling motion when the forward motion is applied on the belt over the rollers. The big rollers are present at the front and rear part of the chassis provide a tightening effect on the belt due to which a proper grip is maintained between the belt and the rollers. As the human being moves straight ahead on the treadmill it causes the belt to move in the anticlockwise direction when seen from the left. The rollers will also move in the same direction as the belt.

The big end roller also consists of gear mechanism at its either ends. On the shaft of the big end roller are mounted the small gears on the either side of the roller. Bearing present on the inner of the small gear makes the rotation of the same smooth and frictionless.

With the help of the pedestal bearings on the either side of the chassis near the end roller causes a smooth and easy mounting of the big gear mounted on the shaft above it. With proper measurement the big gear can be kept in mesh with the smaller gear for

the smooth operation of the gear system. Since the gear system are in mesh it causes the big gear to rotate in the anti-clockwise direction, which is the desired motion required for the cycle to move ahead.

There is also a small chassis extending from the main chassis to the wheels. This chassis also consists of the sub assembly for mounting of the pedestal bearings, and similarly on this bearings is mounted a hollow shaft which is connected to the hub of the two rear wheels. The rotation of the hollow shaft causes the wheel to move in the direction of motion.

To this shaft is mounted the sprockets as well at the center of the shaft, these sprockets are also grub screwed to the shaft and, also welded to the shaft so that the position of the sprockets donot change on the shaft and remain at the same place. Also these sprockets are connected with the sprockets on the shaft of the big gear with the help of chains. This mechanism is called as the chain sprocket mechanism. Hence as the big gear shaft rotate in the anticlockwise direction, it causes the sprockets too to rotate in the same direction, and with help of the chain drive mechanism it causes the sprockets on the hollow shaft also to rotate in the same direction and hence causes the wheels to move ahead in the desired direction of the motion.

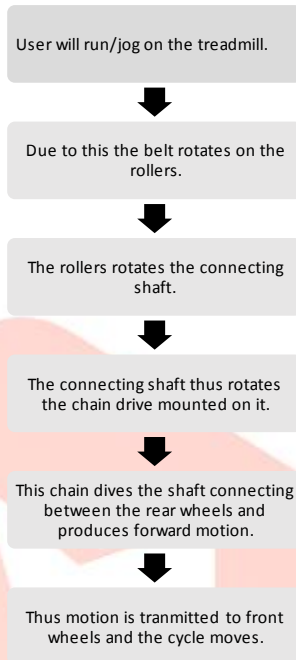


Fig.1 Flowchart of working of treadmill cycle.

Materials and Standard Component:

SR NO	PART NAME	MAT	QTY
1	RECT PIPE 50 X 25	MS	30 KG
2	SHAFT 20 MM	EN 8	10KG
3	TREADMILL BELT	RUBBER	1 NOS
4	WHEEL	STD	2 NOS
5	CHAIN	STD	1 MTR
6	SPUR GEARS	MS	2 NOS
7	SPROCKET	STD	2 NOS
8	PADESTIAL BIEARING	MS	8 NOS
9	BYCYCLE HANDLE	MS	1 NOS
10	NUT BOLT WASHER	MS	36 NOS
11	STUDS	MS	3 M
12	ROLLERS	MS	2
13	SHEET METAL	SS	4 M ²
14	WELDING ROD	-	30 NOS
15	COLOUR	-	250 ML

REFERENCES

- [1] Harsh Mankodi, "Analysis of a Treadmill Based Human Power Electricity Generator", submitted to The University of Minnesota-Twin Cities, June 30, 2012.
- [2] Tilakiswaran A/L Samugam, "Development Of Battery Powered Tricycle", submitted to The UNIVERSITI MALAYSIA PAHANG, November, 2007.
- [3] "Human Powered Vehicle Challenge (HPVC) - Engineering Competitions – ASME- ASME," American Society of Mechanical Engineers (ASME).
- [4] J. B. J. Soldati, L. A. Szmuchrowski, D. N. Rocha, F. L. J. Correa, T. S. P. Sono, C. B. S. Vimieiro, and M. Pinotti, "Development of an adaptable system for a stationary bike to convert mechanical energy into electric power applied in indoor cyclism training," in 6th International Conference on Technology and Medical Sciences, TMSi 2010, October 21, 2010 - October 23, 2010, Porto, Portugal, 2011.
- [5] http://www.betterhealth.vic.gov.au/bhcv2/bhcarticles.nsf/pages/running_and_jogging.
- [6] <http://www.mensfitness.com/training/cardio/9-ways-max-out-your-treadmill-workout>.
- [7] Tom Gibson, "These Exercise Machines Turn Your Sweat Into Electricity", IEEE Human Power Generation, June 21, 2011.