A review paper on design and fabrication of monowheel vehicle

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ABSTRACT *Mono wheel as the name indicates consists of only one wheel .Driver of the wheel sits inside the wheel and the main principle involved is application of GYROSCOPE. The main aim of Monowheel is that it reduces the space occupied when a single occupied vehicle is necessary. The main discipline of engineering that is applied is mechanical engineering where we find applications of topics like stress calculation, trusses, gyroscopic couple, and concepts of a circle etc .It can be both human powered or motor driven type*

Keywords: *Place Gyroscope, Monowheel, Trusses, Analysis.*

1. Introduction

A Monowheel is a one-wheeled single-track vehicle similar to a unicycle. However, instead of sitting above the wheel, the rider sits either within it or next to it. The wheel is a ring, usually driven by smaller wheels pressing against its inner rim. Most are single-passenger vehicles, though multi- passenger models have been built. Hand-cranked and pedal powered mono wheels were patented and built in 19th century. Some modern builders refer to these vehicles as monocycles, though that term is also sometimes used to describe motorized unicycles. Today, mono wheels are generally built and used for fun and entertainment purposes, though from the 1860s through .to the 1930s, they were proposed for use as serious transportation In view of the efficiency of bicycles, it is natural to ask if a one-wheeled vehicle provides any advantages. A one-wheeled vehicle is potentially more efficient than a two-wheeled vehicle since frictional losses at the wheels and in the drive train is reduced. However, just as a bicycle is dynamically more challenging to ride than a tricycle, a vehicle with a single wheel poses yet more challenges to stability and control there are two main types of single- wheeled vehicles. In a unicycle, the rider sits above the wheel. These vehicles are recognizable by most people. Less well known is the monocycle, where the rider sits inside the wheel. Like the bicycle, the unicycle and monocycle are statically unstable. Since the center of gravity (cg) is lower for the monocycle, this vehicle is potentially easier to ride than the unicycle. Nevertheless, piloting a monocycle is a challenging task. In this article, we discuss the history of the monocycle. Although many potential problems were inherent in their design, monocycles were adapted to accept motors. Garavaglia is credited with motorizing the first monocycle in 1904. Inventors and entrepreneurs soon began to promote the anticipated benefits of one-wheeled conveyances in contemporary publications and promotional materials

2. Principle

It works on the principle of gyroscopic effect and laws of motion. It consists of a big wheel called as ring inside which driver is being seated. The ring wheel is driven by a small rubber wheel which is in contact with the inner rim. Chain and sprocket is used for power transmission Rubber driver wheel is used.

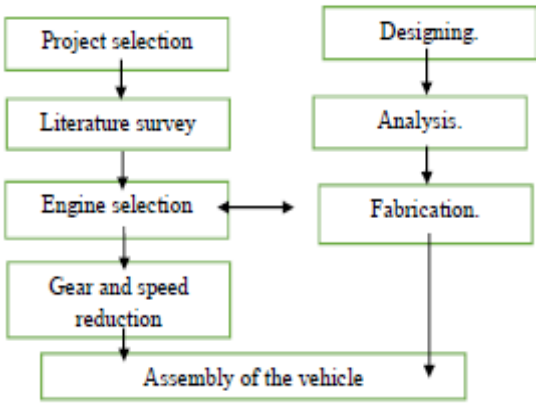
2.1 Working

It works on a principle of Gyroscopic effect. A gyroscope is a device that can be used to maintain orientation based on the principles of angular momentum. It is a mechanism by means of which a Rotor is Journal to spin Around an Axis. If a spinning gyroscope is placed such that its axis is horizontal and loosely supported from one end, the gyroscope does not fall. It rather maintains its horizontal axis and the unsupported end starts moving in a circular manner about the horizontal axis. The resultant rotation is perpendicular to the gravitational torque and the axis of rotation. The speed of precession of a gyroscope inversely varies with its angular momentum. The power from the engine drives the powertrain system designed which runs the outer wheel and the inner wheel keeps tumbling against the outer wheel.

3. Project requirement

- Metal tubes
- Nylon roller bearing
- Machining
- 4 stroke engine
- Rubber driver roller
- Chain and sprocket kit
- Tyres
- Brake assembly

4. Methodology



4.1 fig showing flow chart of process

5. Design

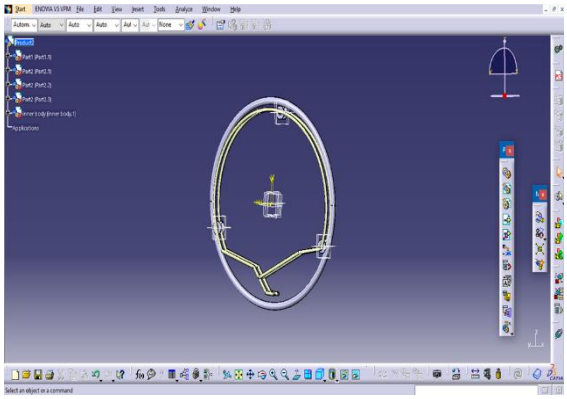


Fig 5.1 showing design of monowheel

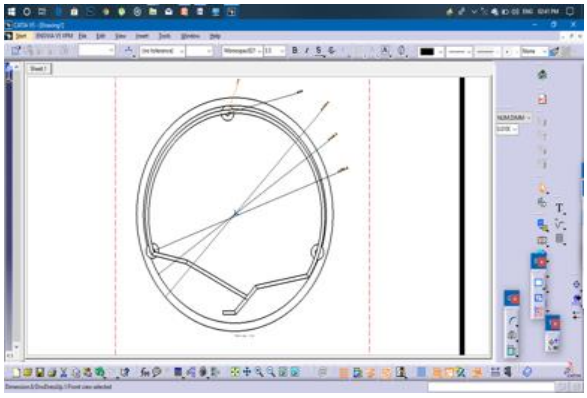


fig 5.2 showing draft image of monowheel

5.1 Dimensions

- Nylon bearing dia – 100mm ,thickness-150mm
- Roller bearing dia- 35mm , thickness-10mm
- Outer wheel circumferential dia-1553.5
- Inner wheel (frame) circumferential dia- 1370.6, Thickness -2mm
- Outer frame pipe dia – 50 mm
- Inner frame pipe dia – 30 mm
- Engine used – 100cc horizontal displacement engine.
- Chain and sprocket is used for power transmission.
- Rubber driver wheel is used

6. Conclusion

The concept is a one-wheeled recreation and commuting vehicle, aimed 18 to 45 age group that promises a whole new experience on the road. The project intended to be an approach of this complex subject after which some very important equations and different other characteristics resulted that defines this project.

Acknowledgement

Author is thankful to project Mr. Santhosh Kumar K (project guide), Assistant Professor, Department of Automobile Engineering, srinivas institute of technology, mangaluru, who has been author's source of inspiration. He has been especially enthusiastic in giving his opinions and critical reviews.

The selection of this project work as well as the timely partial completion is mainly due to the interest and persuasion of author's project coordinator Mr. Jerome Anthony A, Associate Professor, Department of Automobile Engineering, srinivas institute of technology,mangaluru, author will remember his contribution forever.

Author is also thankful to Dr. Ramakrishna N. Hegde, Professor and Head of the Department of Automobile Engineering, srinivas institute of technology, mangaluru, for his support.

A special thanks to beloved Principal Dr. Shrinivasa Mayya D. for his constant help and support throughout.

Finally, thanks to all the teaching and non-teaching staff of Department of Automobile Engineering, srinivas institute of technology for the help rendered.

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