

Design of Concept Wheel

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Abstract— Wheel is designed to fit into the frame and hold tyre. Wheels are used in the vehicles like bicycle, bike, cars etc. Focusing mainly on bicycle we have decided to design a wheel that can be made portable whenever needed. In this way it will allow user to keep it in a backpack or carry it from one place to another occupying less space. It is a concept wheel that would open new possibility of futuristic foldable vehicle. Its simplicity and compact design make it unique and highly portable.

Key words: Portable Wheel, Futuristic Foldable Vehicle

I. INTRODUCTION

Wheels are the most essential moving parts of bicycle. These wheels have undergone many changes in terms of its size, shape and environment in which they are used. Likewise the tyres used for the wheel also have undergone many changes such as rough road tire, racing wheels, mountain biking wheels. Even though lots of evolution have occurred in the cycle wheel but the rim of the wheel is the only part that has undergone limited changes in these 100 years. The construction of wheel includes wheel hub, rim, spokes and tyre.

The problem is a bicycle wheels can't possibly fold. So you either have to shrink the wheels, clown-style, or you carry around a "portable" bike with a pair of massive wheels. So we are presenting a folding wheel that can fit perfectly on normal bicycles.

A. Objectives

- Our wheel is designed such that it is easy to assemble and disassemble.
- After disassemble our wheel occupies less space and can be easily carried.
- It is used in folding bicycles and folding wheelchairs.

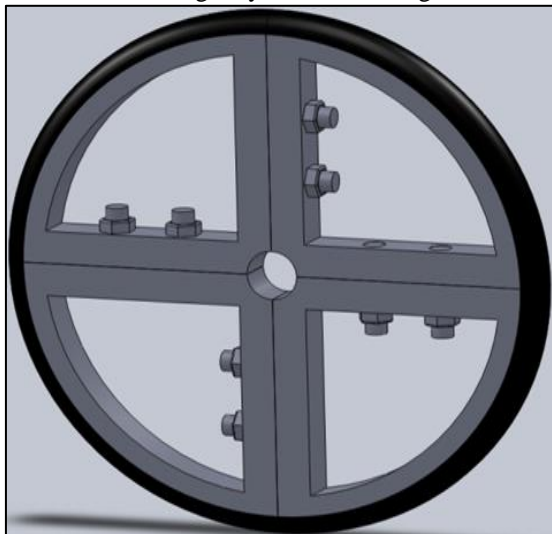


Fig. 1: Wheel

II. LITERATURE SURVEY

Here an attempt is made to review the status of literature in modification of wheel based on various criteria. Modification in wheel had an impressive mark in the field of bicycling. This project has also reduced the cost involved in the concerned design. A folding wheel revolve has been developed to build a better mobility with the demands of today and tomorrow. Revolve occupies up to 60% less space when folded and can be used in all conditions. When folded it allows the user to easily store it at home, in a backpack, in a trolley or in a trunk.

III. DESIGN

A. Wheel Geometry

Wheel is divided in four equal parts as quadrant. Wire spokes are replaced with rigid spokes. Each quadrant is attached with two bolts. Nut and bolt mechanism is used to hold the wheel. Wheel is designed with standard dimensions.

Name of Component	Dimension
Diameter of Wheel	24''
Hub Diameter	70mm
No. of Spoke	4

Table 1: Specification of Wheel

B. Hub

A hub is the center part of a bicycle wheel. It consists of an axle, bearings and a hub shell.

C. Spokes

The rim is connected to the hub by several spokes under tension. Original bicycle wheels used wooden spokes that could be loaded only in compression, modern bicycle wheels almost exclusively use spokes that can only be loaded in tension.

D. Rim

The rim is commonly a metal extrusion that is butted into itself to form a hoop, though may also be a structure of carbon fiber composite, and was historically made of wood. Some wheels use both an aerodynamic carbon hoop bonded to an aluminum rim on which to mount conventional bicycle tyres.

IV. ASSEMBLY OF WHEEL

Wheel is assembled by mating all the four parts. Each part has two bolts which are used to attach another part. Then nut is used to fasten the parts. Like this procedure is carried out to assemble the wheel.

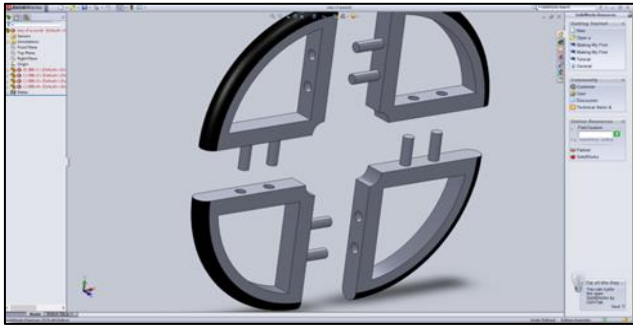


Fig. 2: Assembly of Quadrants

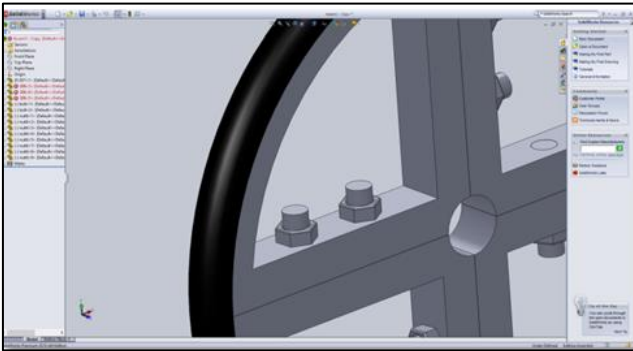


Fig. 3: Nut and Bolt Mechanism

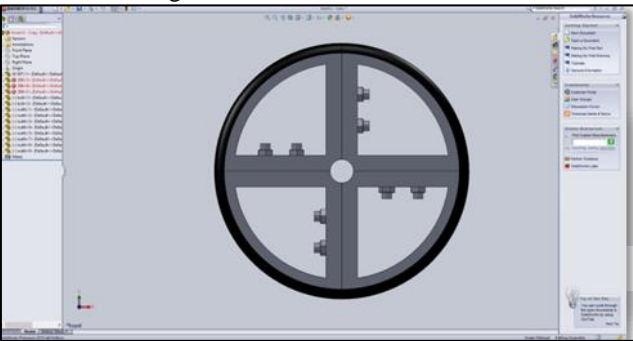


Fig. 4: Assembled Wheel

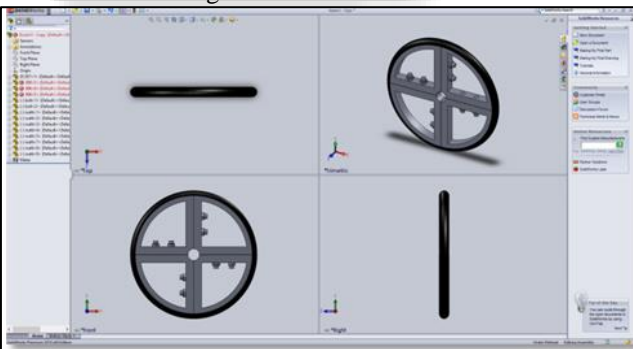


Fig. 5: Different views of Wheel

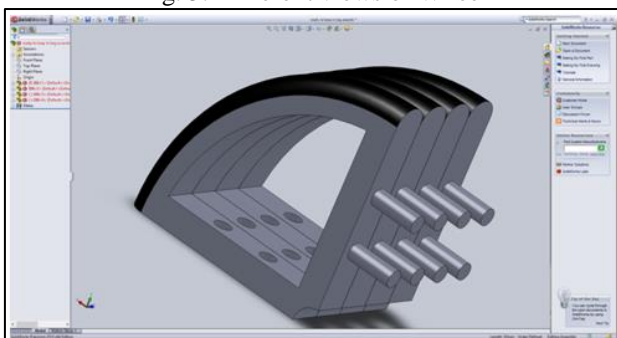


Fig. 6: Wheel arranged such that it requires less space

V. CONCLUSION

This paper has presented a design mechanism of wheel which is used for folding bicycles and folding wheelchairs. This project has been designed to make the wheel portable and solve the problem of space occupancy. It will make an impressive mark in the field of bicycling.

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