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Study and Fabrication of Shaft Driven Bicycle

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Abstract: *The development of the chain drive helped make the modern bicycle that we know moment possible. More lately, bikes with a shaft drive have been developed and it's changing the bike industry. Chain driven bicycle and shaft driven bicycle both have unique advantages and can produce nearly the same effectiveness. This paper illustrates the design and fabrication of shaft driven bicycle and its feasibilities for the – Hybrid Electric Bicycle Project'.*

Keywords: Bicycle

I. INTRODUCTION

A bicycle is a vehicle that needs human effort in order to move from one place toanother. Advancement is drawn in bicycles in order to make it cost effective, and to minimize human effort. For such an advantage, a chainless bicycle is manufactured that is driven without utilizing the metal chain. Shaft driven bicycle is a setup which transmits the power to the wheel without chains. This project uses a drive-shaft for the transmission of power from the pedals to the wheels. The project is to construct a bicycle using a shaft-driven system rather than using chain-driven. In this system, Bevel gear is used in place of chain-ring, also shaft rod in place of chains,and another two bevel gears which mounted on the front and rear shaft and the hubassembly. For the maintenance of Gears, it requires periodic lubrication.

II. DESIGN OF COMPONENTS

The design of shaft driven bicycle is such a typical task. The design is based on parameters like ergonomics, speed of treadmill bicycle, weight of rider, etc. The components are used inthis shaft driven bicycle are:

- Frame
- Drive shaft
- Bearing
- Steering system
- Wheels

2.1 Frame

It is made from the casting body along with some of the forged factors. Welded in blockish shape which serves as the base to hold all the accessories and weight of the cargo to be conveyed and the weight of the person driving the unit. Also, it should be suitable to overcome the stresses, which are coming due to friction, irregular road conditions and load on the frame. It is with the relation and bus to propel it and the platform plates. It is drilled and tapped enough to hold the support plates.

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2.2 Drive shaft

Driveshafts have come a long way since that 1890 century patent, and the term is now almost exclusively use in most of vehicles. A shaft- driven bicycle is a bicycle that usesa drive shaft instead of a chain to transmit power from the pedals to the wheel. Recently,due to advancements in internal gear technology, a small number of modern shaft- driven bicycles have been introduced.

2.3 Bearing

A bearing is a machine element that constrains relative motion to only the desired motion, and reduces friction between moving parts. Today's ball and roller bearings are used in many applications which include a rotating component. Examples includeultra-high-speed bearings in dental drills, aerospace bearings in the Mars Rover, gearbox and wheel bearings on automobiles, etc. In this project ball bearings are used to transmit the power from paddle to the wheel smoothly.

2.4 Steering system

Steering is used to guide the direction of any vehicle. A system formed by various components like fork, handle bar, stem, etc. (specially for bicycle). Handle bar is usedto guide the vehicle and also to mount break levers and hand grips. Stem is a component which connects the handle bar and fork.

2.5 Wheels

Wheel is a component of circular shape which rotates on axle. Force is applied on theaxle and this causes the wheel to rotate. Wheel is a discovery of utmost importance, which makes movements of machine very easy. The whole assemble

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of tire, hub andaxle is responsible for the forward motion of the bicycle. There are two tires in a bicycle one at the front and the other at the rear

III. CONCLUSION

After precisely examining the two-driving system, the chain and shaft drive, the shaft drive was named for the Project. lower cost, further inflexibility, and easy variations were the crucial reasons of choosing the shaft drive. The platoon members will use the shaft drive on a conventional cycle. colorful gear rates will be tested under colorful cycling conditions and any necessary variations on the drive medium will be made to achieve the optimal effectiveness.

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