ISSN 2349-6193
Impact Factor: 2.805

IJESMR

International Journal OF Engineering Sciences & Management Research

KINETIC ENERGY RECOVERY SYSTEM

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Keywords: Regenerative braking, Flywheel energy storage, Flywheel bicycle, Mechanical KERS, Smart Braking.

ABSTRACT

The bicycle invention had an enormous effect on society in the culture and advancing modern industrial method. But a today there is decrease in use of bicycle because the main drawback of conventional bicycles is that more efforts are needed while travelling and energy used by bicycle is more. To minimizing this problem we using kinetic energy recovery system by designing the flywheel for recovering the moving bicycle energy to convert the loss in kinetic energy into gain in kinetic energy to bicycle. When riding a bicycle large amount of kinetic energy is lost while breaking. To use this energy we useflywheel to store the energy which is lost during breaking and reuse it to helps rider at starting the bicycle. By using the flywheel which is more suitable to the frame properties to store energy and rider compatibility the efforts of the rider can be minimize. The rider can charge the flywheel during downward motion on slope area and boost the bicycle. These project primary dealswith one of the method for kinetic energy recovery from the Flywheel which is develop in a bicycle. The flywheel increases maximum acceleration and nets 15% pedal energy savings during a ride.

INTRODUCTION

A bicycle, often called cycle, is a human-powered, pedal-driven, single-track vehicle, having two wheels attached to a frame, one behind the other. As of 2002, number grew more than a billion in world, double as many as vehicles. They also provide a popular form of recreation, and have been adapted for use as general fitness, military and police applications, courier services and racing. The basic shape and configuration of a typical right or safety bicycle, has changed little since the first driven model was developed around 1885. Several components that at last played a important role in the development of the automobile were firstly invented for use in the bicycle, including ball bearings, pneumatic tires, chain-driven sprockets, and tension-spooked wheels.

Bicycles can be categorized in many different ways:- By function, by number of riders, by construction, by gearing or by means of propulsion. The more common types include normal bicycles, racing bicycles, long travel bicycles, all hybrid bicycles, cruiser bicycles. Less common are tandems, low riders, fixed gear, folding models.

On a flat road, the rider maintains a fixed after travelspeed to get from recycle. Globally all roads are flat with impediments such as intersections, cars, and turns that force the rider to decrease speed, then accelerate. A flywheel is use to store temporarily kinetic energy from the bicycle when the rider needs to slow down. The energy stored in the flywheel can be used to convert into gain in kinetic energy with minimum effort of rider. By this way the rider recovers the energy normally lost. In addition to increased energy efficiency, the flywheel-system bicycle is more funny to ride when the rider has the ability to boost speed of bicycle.

MATERIALS AND METHOD

Materials

- Bicycle
- Frame For attaching flywheel.
- Flywheel
- Bearing
- 2 Sprocket wheel
- Chain Drive

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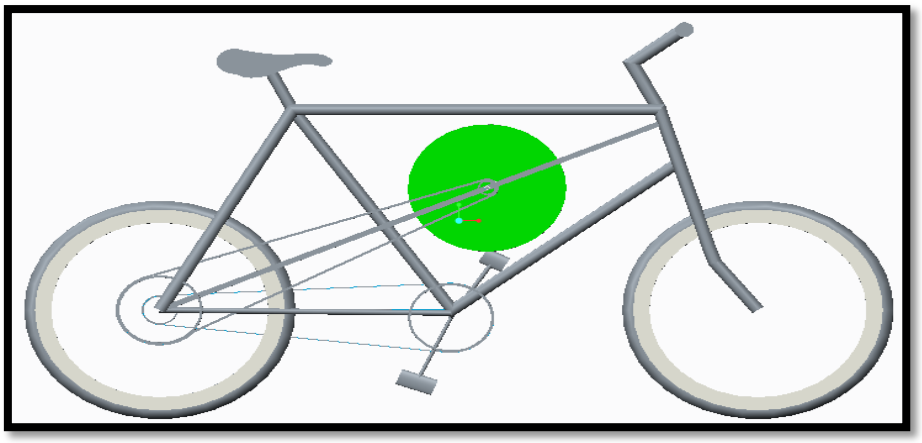

Fig. Design of kinetic energy recovery system in bicycle

Method

By studying the various literatures regarding to the project we come to know that, the weight of flywheel is more as compare to the efficiency of the bicycle. The design is based on the weight of flywheel and design of the bicycle body. As we are going to reduce the weight of flywheel, the stresses produce in connecting rod will also decrease and power required to drive the bicycle will also reduced.

The material used for fabrication of the flywheel is cast iron which is brittle virtually non-malleable metal that is considered generally inflexible. The stiffness and dampening properties of cast iron make it an excellent material for flywheel.

By fabricating the flywheel and designing it according to the main frame and design of bicycle we got good stability of the bicycle. The frame had modified by adding steel tube which is of square shape. One end is welded at the handle end and the other at the rear frame of bicycle

Table1: Component and specification

SR.NO	COMPONENT NAME	QUANTITY	MATERIAL
1	Flywheel	1	C.I.
2	Chain sprocket	1	Steel
3	Chain wheel	1	----------
4	Bearing	1	M.S
5	Foundation Frame	1	C.I
6	Hub	1	C.I
7	Axle	1	----------

RESULT

It was found that if an ordinary cycle is fitted with flywheel to store energy, then almost 65-70% of the total energy, which was being wasted, can easily be recovered. The remaining 30-35% of energy cannot be recovered due to the presence of friction in bicycle .

CONCLUSION

The kinetic energy recovery system is very efficient for implementing on the bicycle, but it depends upon the weight of the flywheel which is used for system unit. And we also concluded that the distance covered by the ordinary bicycle is less as compaired to the bicycle in which KERS system is used.

ISSN 2349-6193
Impact Factor: 2.805

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ACKNOWLEDGEMENTS

I take this opportunity to thank all those who have contributed in successful completion of this Report of seminar would like to express my sincere thanks to my guide **Prof. Gade D.S.** who has encouraged me to work on this topic and valuable guidance wherever required. I wish to express my thanks to,**Prof.Gunjal Y.S.** Principal, Jaihind Polytechnic, Kuran, for their support and help extended. Finally, I am thankful to all those who extended their help directly or indirectly in preparation of this report.

REFERENCES

1. *Chibulka.J.,"Kinetic Energy Recovery System by means of Flywheel Energy Storage", Advanced Engineering Vol. 3,No. 1, pp. 27-38,1998*
2. *Prof. N. Kavi, "Design Of Flywheel For Improved Energy Storage Using Computer Aided Analysis", Bachelor Of Technology In Mechanical Engineering, National Institute Of Technology Rourkela,769008 (2008-2009).*
3. *N. Kumbhojkar[1], K. Mohite[2], A. Kulkarni[3], S. Patil[4] Design And Implementation Of Kinetic Energy Recovery System (Kers) In Bicycle Volume 6, Issue 4, April (2015), Pp. 101-108*