

Automatic Side Stand Retrieve System

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Abstract— Automobiles are having important role as it reduces human effort and time mostly bikes. Even if they are helpful there are some sad events like accidents due to careless of rider. Most of accidents occur due to forgetting to lift side stand. To overcome this problem many advance measure have taken, but they are useless. So, for that it should be implemented practically in all types of bikes. This system “Automatic Side-Stand Retrieve System” is designed based on the working principle of bikes. As all bikes transmit power with the help of chain drive, so this setup is kept in between chain drive. Paper is giving mechanism for side retrieve system.

Key words: Automobile, Automatic Side Stand Retrieve System

I. INTRODUCTION

A. Introduction to Automobile

Now a day’s living status of human being is developing. The automobile takes a great part in the development, since it plays one of a major role in daily life. While automobile is concern motorcycles and bikes, it plays very important role because it saves the time of traveler by reaching the target place very faster. There are so many chances of accidents because of carelessness of two wheeler rider. [1]

B. Sources of Accidents

The motorcycles and bikes concerned accidents occur due to riding the bikes with high speed. The major accidents occur due to forgetting to lift the side stand, because all the other source of accidents has preventive measure, but accidents due to side stand do not have proper preventive measure. [2]

C. Existing Methods

Methods like ECU and mechanical projects had been invented for prevent the accidents.

D. ECU (Electronic Control Unit):

It contains a 32 bit and 40 MHz processor. Its microprocessor is very fast as that of our personal computer. ECU decides timing and functioning of engine and its parts. It plays role in dashboard, this indicates the gear shifting, side stand, to wear helmet E.g., Hero Honda’s Karizma ZMR. But the people ignore to listen those indicators and safety rules; hence many mechanical projects have been invented for retrieve the side stand.

E. Mechanical Project

In existing mechanical project many things had been invented for lifting the side-stand automatically.

- A flat rod is kept attached and pivoted between the gear actuator lever and the side stand of the bike. As the gear is actuated, the side stand gets lifted automatically.

- A stepper motor is connected between the side stand and the engine. When engine is started the stepper motor gets power and retrieve side stand.

These are some methods to retrieve side stand automatically when the vehicle moves but these methods can’t use practically due to their limitations. ECU methods are using only in costlier bikes but it does not implement in normal domestic bikes due to their cost.

F. Limitations of Existing Methods

When we come across those mechanical projects we could note some limitations like wearing of gears, causing injuries in legs while actuating gears Major limitations is, we are unable to use these systems in various types of two-wheelers. Hence, to solve this problem we thought and designed “sprocket side stand retrieve system”. This system can be used in any type of two-wheelers (mopeds, geared, non-geared, hand geared bikes).Based on the working principle of bikes (i.e. the power is generated in the engine and it transmits power to the pinion and makes it to rotate).

G. Proposed Method

The pinion transmits power to the rear wheel pinion and vehicle gets its motion. This principle is followed in all type of two-wheelers, based on this automatic side stand retrieve system is designed because this system works with the help of power of chain drive. This system consists of four components as they are connected by two link mechanism. [2]

II. METHODOLOGY

A. Construction

The arrangement and position of components makes the system to function. Each and every component has its own property and responsibility. The systematic design of system is made in order to consume only very less power at starting for some time to retrieve the stand. The whole construction of this system is simple and efficient. When stand retrieves there is no power consumption. Construction of the proposed “Automatic side stand retrieve system” consists of four main components.

1) Components & Its Design:

- Shaft
- Sprocket pinion
- Lifting lever
- pushing lever

a) Shaft:

The power obtained from the chain drive is transmitted to the appropriate component without power loss. The shaft is welded centrally to the sprocket. Shaft is the metallic rod made up of hard material. Lifting lever and sprocket are mounted on shaft. The shaft is hold by a holder. The holder is welded with the frame. The holder is used to avoid

vibrations and to provide support to the axle. The holder has small metallic tube and a rectangular metal plate. The metal plate is welded perpendicular to the tube.

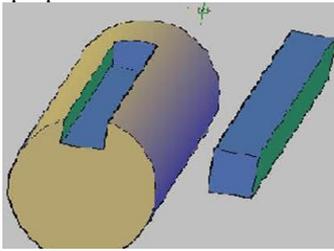


Fig. 1: Shaft with Key Way

The diameter of tube is slightly greater than the shaft diameter about 2 to 4mm. This is for allowing the axle to rotate freely without friction with the tube. Sprocket is the major component of this system because it is power transmitting device.

The other end of the metal plate is welded at the frame. The whole metallic members of holder are of mild steel. The one end of shaft is welded with sprocket and other end with lifting lever and thus the power is transmitted from sprocket to lifting lever. It gets power from the chain drive and makes this system to work.

b) Sprocket Pinion

It is the device which transmits the linear motion into rotary motion by means of the tooth found on it. The sprocket with ball bearings which is mounted on the chain drive is said to be free wheel. Since it is a free wheel it allows rotate free from central portion in a direction.



Fig. 1: Sprocket with bearing

This type of sprocket is used to transmit power to rear wheel by engaging the toothed area with chain drive and also allows rotating in counterclockwise when pedaled counterclockwise direction. This action of sprocket allows attached lifting lever to adjust itself when it does not engages with pushing lever properly.

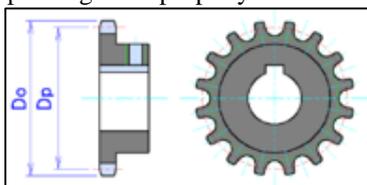


Fig. 2: Sprocket with nomenclature

As the sprocket gains the power from chain drive, it should have the ability to sustain the heavy loads of engine. So to sustain those loads, it is made of high carbon steel. The ball bearings are made up of high chromium steel. Hence all these material should have following properties for sprocket.

- Heavy duty
- Smooth running
- Tempered
- Long life

Hence the sprocket is heart of this system.

c) Lifting Lever

Lifting lever is also a main component of the system. The lifting lever is the rectangular rod made of MS-rod, which consists of two lifting lever which is mounted with the edge of shaft. The lifting leaves should be parallel to the sprocket pinion. The lifting lever ends of the composed of two metal rods, where both are welded at either sides of the axle. The free lifting leaves are tapered well. The ends are machined well for tapered shape for smooth engaging with pushing lever. This smooth engagement leads proper retrieving of side-stand.

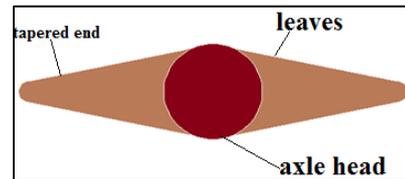


Fig. 3: Lifting lever

This tapered surface helps the lifting lever to sustain engine impact. When stand moves vertical, the pushing lever get engage with lifting lever. As the angle of lifting lever can be of any degree, it's impossible to engage both the rods properly. Due to effect of free wheel and tapered surface, the lifting lever can adjust itself.

d) Pushing Lever

Pushing lever is the component pivoted centrally to the side stand. The pushing lever is metallic c-shape rectangular plate, and top end is welded with a small piece of rectangular rod. Lifting lever lifts the pushing lever which lifts the side stand. Since this rod engages over tapered edge of lifting lever, thus the lifting occurs smoothly. The pushing lever is made of MS-flat rod with the length according to the distance of side stand arrangement.

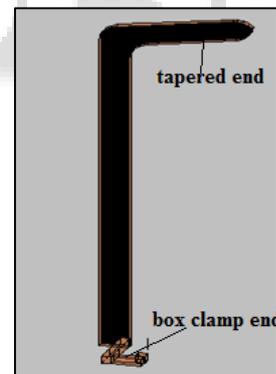


Fig. 4: Pushing Lever

Its top end is extended perpendicularly so as to engage with lifting lever. The bottom end of the lever is made as C-clamp, which keep attached to the side stand as shown in fig5. These are four main components using in this system. Sprocket side stand retrieve system lifts the stand automatically when the rider forgets to retrieve the side stand while riding the bike.

B. Working Principle

It is based on the working principle of the two-wheelers. All bikes transmit power from engine's pinion to the rear wheel i.e. rotary motion of the pinion is converted in the linear motion of the chain. Sprocket of the rear wheel absorbs the linear motion of chain and again converted into rotary motion. That rotary motion of the rear wheel makes the bikes to move.

If Sprocket is kept between the chain drive, it make the sprocket to rotate. The working of this system is depends on this sprocket. It takes the power from the chain and make specially designed component (lifting lever) to rotate. This rotation allows pushing lever to get engage the side stand to retrieve. The working of Automatic Side Stand Retrieve System is explained below. When chain rotates anti-clockwise, then sprocket rotates in clockwise direction because both are engaged.



Fig. 5: Working Principle Diagram

III. CONCLUSION

Automatic side stand retrieve system will surely a useful retrieve system. Since the setup is compact it doesn't affect the performance of the vehicle and power is obtained from chain drive. Definitely this system could be used in all type of bikes for retrieving the side stand, it will be the major system to control accidents due side stand problem and protect the careless rider. These systems can be implemented in all types of bikes by changing small dimensions in size and this system is economical, so it will not affect the economic level also. While compare to other system this Automatic side stand retrieve system will be the life saver.

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