

Fabrication and Analysis of Sprocket Side Stand Retrieval Systems

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Abstract:

Motorcycles are generally provided with stand for supporting the motor cycles when they are not in use. The standard usually comprises a bar or rod which is pivotally attached to the lower portion of the motor cycle frame and is movable to a late rally, downwardly extending position so that the motor cycle can be tilted against and rest upon the bar. When the motor cycle is in use the bar is swung upwardly and along the frame so that it will not interfere with the running of the motor cycle. Often the cyclist neglects to move the standard to its raised position and when a banked turn is made the standard strikes the ground and causes the motor cycle to be thrown to the ground, generally with serious consequences to both the cyclist and the motor cycle. In automatic side stand retrieval system, the side stand automatically gets retrieved if the rider forgets to lift the side stand while moving the bike. Its working is based on the working principle of the 2-wheelers. In motor bike power is transmitted from engines pinion to the rear wheel i.e. (rotary motion of the pinion makes the linear motion of the chain. That linear motion of the chain is absorbed by rear wheel sprocket and converted into rotary motion). That rotary motion of the rear wheel makes the bikes to move. Based on this side stand retrieval system is designed. If sprocket is kept between the chain drive, it make the sprocket to rotate. The working of this system is based on the sprocket. It gains the power from the chain and make specially designed component (Lifting lever) to rotate. This rotation incites engaged pushing lever to push the side stand to retrieve. When chain rotates in anti clock wise direction the inciter assemblies sprocket absorbs the power and rotates in clock wise direction.

Key Words: retrieval, sprocket, Lifting lever, motor cycles.

I.INTRODUCTION

PROPOSED METHOD:

Based on the working principle of two-wheeler (i.e the power is generated in the engine and it transmits power to the pinion and makes it to rotate. The pinion transmits power to the rear wheel pinion and makes the vehicle to move). This is the basic principle followed in all type of two-wheelers, based on this “SPROCKET SIDE STAND RETRIVAE SYSTEM” is designed because this system works by getting power from chain drive. This sprocket system consists of four components, which is assembled as two set up which would be explained briefly.

PHOTOS:



FIG: sprocket side stand retrival system

CONSTRUCTION:

The whole construction of this system is simple and efficient. The arrangement and position of components makes the system to function. Each and every component has its own property and responsibility. The power obtained from the chain drive is transmitted to the appropriate component without power loss. The systematic design of system is made in order to consume only very low amount of power initially for few seconds to retrieve the stand. Then the power consumption does not occur after retrieving the stand. Construction of the proposed “sprocket side stand retrieve system” consists of four major components.

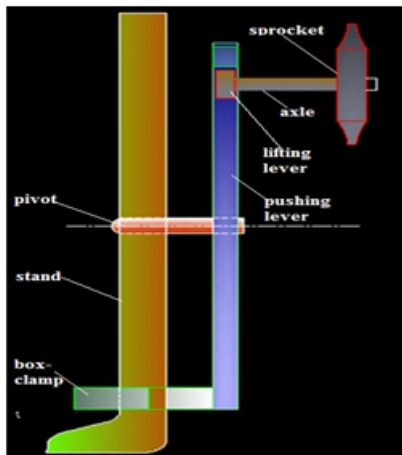


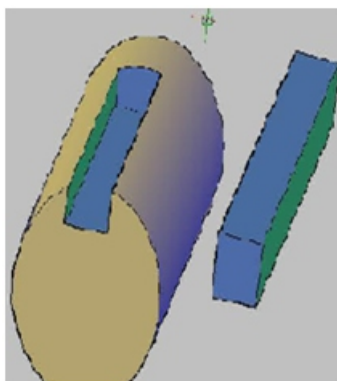
FIG:side view of sssrs

COMPONENTS&ITS DESIGN:

- 1.Axle
- 2.Sprocket pinion
- 3.Lifting lever
- 4.pushing lever

AXLE:

Axle is the metallic rod made up of mild steel. It connects the lifting lever and sprocket centrally. The axle is welded centrally to the sprocket. The axle is hold by a holder. The holder is welded with the frame. The holder is used to prevent vibration and to provide support to the axle. The holder has small metallic tube and a rectangular metal plate.



SPROCKET PINION:

Sprocket is the major component of this system because it is power transmitting device. It gets power from the chain drive and makes this system to work. It is the device which transmits the linear motion of meshing chain drive into rotary motion by means of the tooth found on it. The sprocket with ball bearings is said to be free wheel.



Fig: Sprocket with bearing

LIFTING LEVER:

Lifting lever is the third major component of the system .the lifting lever is the rectangular rod made of ms-rod, which consists of two lifting leaves which is mounted with the edge of axle. The lifting leaves should be parallel to the sprocket pinion. The lifting lever is composed of two metal rods,where both are welded at either sides of the axle. The free ends of the lifting leaves is tapered well. The ends are machined well for tapered shape for smooth engaging with pushing lever.

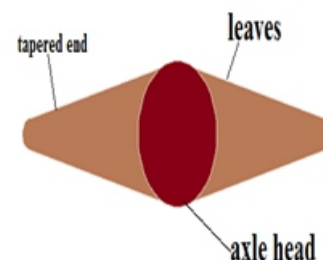
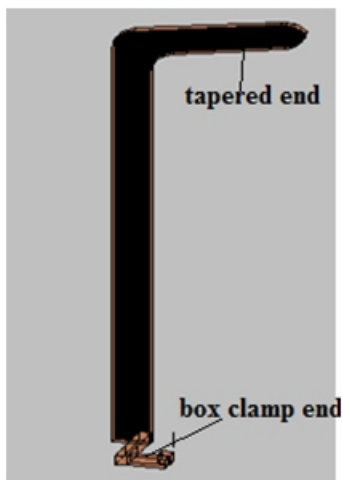


Fig: Lifting lever

PUSHING LEVER:

Pushing lever is the component pivoted centrally to the side stand. The pushing lever is metallic rectangular plate,whose bottom end is bended in shape of C and top end is welded with a small piece of rectangular rod. This small piece of rod is used for getting lifted by the lifting lever. Since this rod engages (or)lays over tapered edge of lifting lever, thus the retrieving occur smoothly.



ASSEMBLY OF COMPONENTS:

1. Inciter assembly
2. Retriever assembly

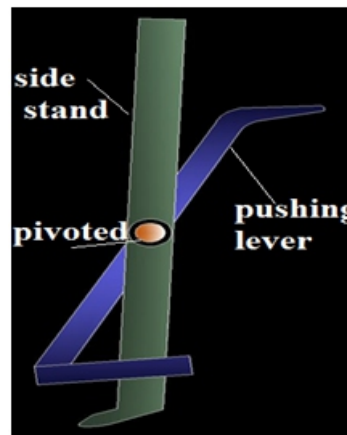


Fig: retriever assembly

INCITER ASSEMBLY:

Inciter assembly consists of axle, sprocket and lifting lever. The Sprocket is mounted on the centre of the axle and the lifting lever is welded at the front side of axle as shown in figure.

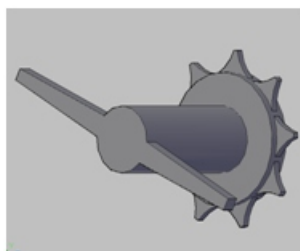


Fig: Inciter assembly

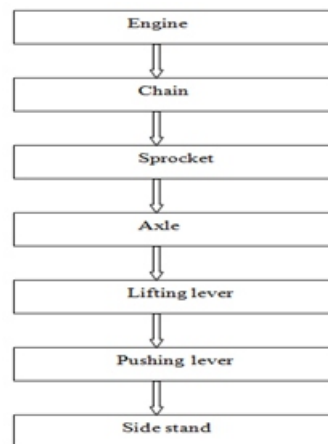
This inciter assembly is main assembly because it receives the power from the chain and incites the retriever assembly to retrieve the side stand because this inciter assembly is kept under the chain as such that the sprocket attached centrally with the axle get engage with chain drive.

RETRIEVER ASSEMBLY:

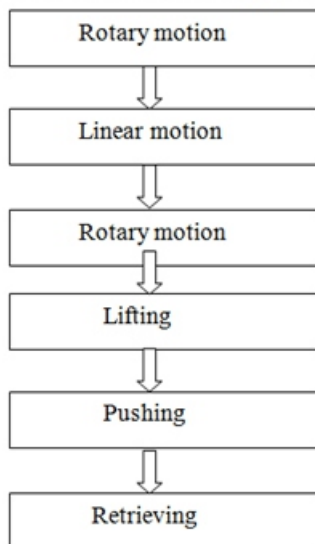
Retriever assembly consists of pushing lever and side stand. The pushing lever is centrally pivoted with the side stand as the pushing levers tapered end is at the top side and clamp is at the bottom as shown in figure.

POWER SOURCE:

This chapter deals with the power source of the working component and how the each component and assembly of component works is explained below with flow chart.



Flow chart: Power|source of component



**Flow chart :
Action flowWORKING PRINCIPLE:**

Sprocket side stand retrieve system retrieves the side stand automatically if the rider forgets to lift the side stand while moving the bike. It works based on the working principle of the two-wheelers.

Every bikes transmit power from engine’s pinion to the rear wheel i.e. rotary motion of the pinion makes the linear motion of the chain. that linear motion of the chain is absorbed by rear wheel’s sprocket and converted into rotary motion. That rotary motion of the rear wheel makes the bikes to move. Based on this Sprocket side stand retrieve system is designed.

If Sprocket is kept between the chain drive, it make the sprocket to rotate so, using the sprocket as the major component this system works. It gains the power from the chain and make specially designed component (lifting lever) to rotate.

This rotation incites engaged pushing lever to push the side stand to retrieve. When chain rotates anti-clockwise direction the inciter assemblies sprocket absorbs the power and rotates in clockwise direction. The working of “Sprocket-Side Stand Retrieve System is explained below in both (resting & riding condition of two-wheeler)

RESTING CONDITION:

When two-wheeler is in resting condition i.e.when rider actuates the side stand of the vehicle to ground, the pushing lever that is pivoted at the centre of the side stand gets engage with the inciter assemblies lifting lever. During this condition the inciter assembly is at rest and retriever assembly (pushing lever’s tapered end get engage with tapered end of lifting Lever).

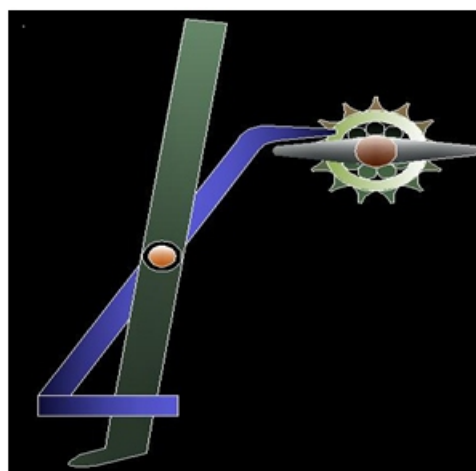


Fig : Resting condition

Pushing lever’s length can be changed according to type of bikes and distance calculated between the side stand and chain drive. Closed coil helical spring which gets pulled ,the coil of spring get tensed during stand resting in ground .This is the condition of system during resting stage.

RIDING CONDITION:

When two-wheeler is started, Engine’s pinion transmits power to the rear wheel by the chain drive. The inciter assembly which is kept at the center of the chain drive gets rotates as the sprocket gets engage with chain drive. so, when the sprocket rotates the lifting lever mounted with axle rotates.

hence the lifting lever lifts engaged the pushing lever and therefore the pushing lever pushes the side stand by clamping it with the C shaped clamp stand holder and hence the spring tensed in the side stand get compressed quickly as a result side stand get retrieves

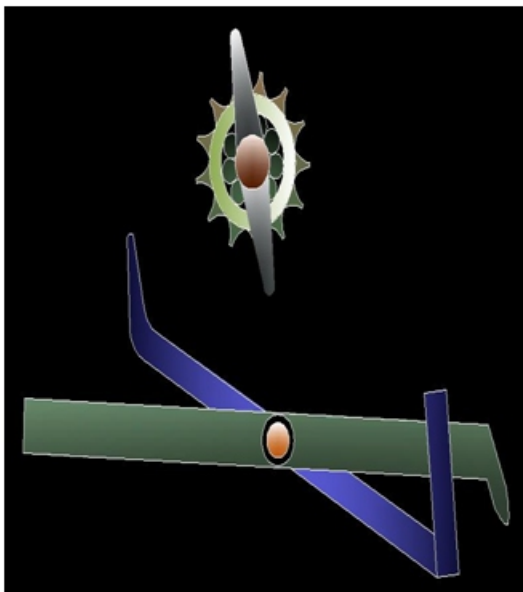


Fig : Riding condition

CONCLUSION:

“Sprocket- side stand retrieve system” will definitely good retrieve system. since the setup is compact it does not affect the performance of the vehicle. because of the power is obtained from chain drive. Definitely this system could be used in all type of two-wheelers(Tvs-XL, all front, back, hand geared)for retrieving the side stand ,it will be the major system to control accidents due side stand problem and protect the careless rider. These system can be implemented in all types of bikes by changing small variation in size and cost of this system also very low and so it will not affect the economic level also.while compare to other system this SPROCKET SIDE STAND RETRIEVE SYSTEM will be the life saver.

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