

Side Stand Retrieval System for Two Wheeler Motorbikes

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Abstract: - Two wheeler motorbikes are a part of most of the people's day to day life especially in India. Many of their accidents occur due to the collision of side stand of vehicle not retracted before the vehicle moves. This is usually attributed to the action going unnoticed. In this purview, a side stand retrieval system, essentially a mechanism, for two wheeler motorbikes has been developed. The mechanism is so designed such that it retracts the side stand of the two wheeler motorbike, immediately when the wheels of the vehicle move, thus avoiding any accidents resulting in collision of the side stand with the speed breakers or uneven surface of the road. The mechanism works purely on mechanical means.

Keywords - Two wheeler motorbike; Side stand; Retrieval system; Mechanism

I. INTRODUCTION

In modern world, automobiles play a major role in daily life. Meanwhile, two wheelers used for daily commute viz. Motorbikes and scooters are major share in the automobile sector. Motorbikes are generally equipped with one side stand one center stand for supporting the vehicle when it is parked.

Most of the duration in a given day, the vehicle would be parked with the side stand since it is easy to operate and easily accessible. If this side stand, even after the vehicle starts moving, is not retracted, it may lead to serious accident and/or injury to the rider. About 36% of the accidents occur due to this reason.

In the existing mechanisms and arrangements developed, a small flat rod is kept attached and pivoted between the gear actuator lever and the side stand of the motorbike. When the gear is actuated, the side stand gets automatically retracted or a small stepper motor is connected between the side stand and the engine. When the engine is started the stepper motor gains power and it retrieves the side stand automatically. Certain motorbikes have digital display showing the side stand not retracted [1, 2, 3, 4].

In purview of the above, a new mechanism which automatically retracts the side stand when the vehicle starts moving has been developed.

II. COMPONENTS AND 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 side stand retrieve system consists of four major components, namely, the axle, the sprocket pinion, the lifting lever and the pushing lever.

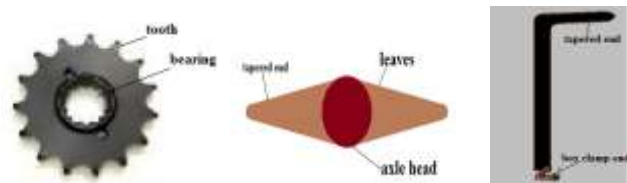


Fig.1 Components of the side stand retrieve system
Table 1 Specifications of the sprocket

Material	High carbon steel
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Pitch	12.7mm
Width	30 mm
Teeth	16
Balls	High carbon, high chromium steel

Table 2 Specifications of the axle

Length	30 mm
Thickness	10 mm
Diameter of clamp	28 mm
Diameter of stand	25 mm
Pivoted angle	55°
Bolt diameter	8 mm

Table 5 Specifications of the spring

Material	Mild steel
Shape	Cylindrical rod
Length	50 mm
Diameter	13 mm
Inner diameter of supporting axle	15 mm
Outer diameter of supporting axle	17 mm
Length	30 mm
Thickness	3 mm

No. of coil	32
Diameter of coil	2 mm
Diameter of wire	15 mm
Inner diameter of coil	12 mm
Mean coil diameter	13.5 mm
Type	Closed coil helical spring
Extension length	17 mm*2 = 34 mm
Material	Stainless Steel

Table 3 Specifications of the lifting lever

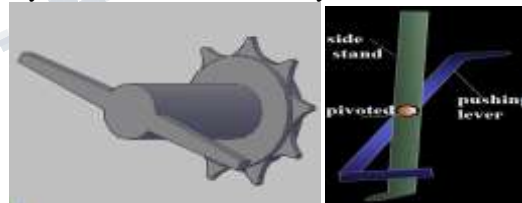
Length of lever	95 mm
Thickness	10 mm
Tapered angle	45°
Chamfered angle	20°
Position	Parallel to the sprocket
Welded length	13 mm
Material used	Mild steel

Table 4 Specifications of the pushing lever

Material	Mild steel
Length of lever	180 mm
Thickness	3 mm
Diameter of hole	8 mm

ASSEMBLY

The components are assembled as two parts, the inciter assembly and the retriever assembly.



Figs. 2 and 3 The inciter assembly and the retriever assembly

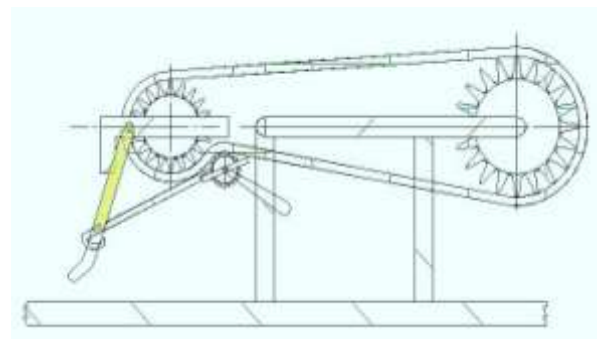


Fig. 4 Complete assembly of the components

III. WORKING

When the vehicle 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 center of the side stand gets engaged with the inciter assembly's lifting lever. During this condition, the inciter assembly is at rest and retriever assembly gets engaged with tapered end of lifting lever.

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 gets pulled and the coil of spring gets tensed while the stand is resting on ground. This is the condition of system during resting stage. When the vehicle is started, the engine's pinion transmits power to the rear wheel via the chain drive. The inciter assembly which is kept at the center of the chain drive rotates as the sprocket gets engaged with chain drive. So when the sprocket rotates, the lifting lever mounted with the axle also rotates. Hence the lifting lever gets engaged with the pushing lever and therefore the pushing lever pushes the side stand and the spring tensed in the side stand gets compressed quickly. As a result, the side stand gets retrieved and the sprocket is disengaged from the chain with the help of sprocket disengaging lever.

IV. CONCLUSIONS

The side stand retrieval system works on two assemblies, the inciter assembly and the retriever assembly. The system can be extended for use in all types of motorbikes, with slight modifications in the mating of parts. The specifications of the components so used may also vary. The side stand retrieval system avoids accidents encountered due to not lifting the side stand of the vehicle by the rider when the vehicle is in motion. The system serves as a safety component in vehicles which may be incorporated appropriately.

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REFERENCES

- [1] Steven Shooter, "Reverse Engineering to Design Forward" American Society for Engineering Education, 2008.
- [2] Sokovic M and Kopac J, "Reverse Engineering (RE) as Necessary Phase by Rapid Product Development," Journal of Materials Processing Technology, Vol. 175, pp. 398-403, 2006.
- [3] Dr K Tirupathi Reddy and Syed Ataf Hussain, "Modelling and Analysis of Two Wheeler Connecting Rod", International Journal of Modern Engineering Research, Vol. 2, Issue 5, pp. 3371, 2012
- [4] H E Ren and H E Jian Qing, "Analysis of Braking Ability of Automobile Equipped with Eddy Current Retarder", Zhenjiang, Jiangsu, China.
- [5] Valery Rudnev, "Gear Technology", 2013.
- [6] Gopinath K and Mayuram M M "Machine Design", Indian Institute of Technology, Madras.
- [7] Kolchin and A V Demidov, "Design of Automotive Engines", MIR Publications, 1984.