

# Fabrication of Automatic Side Stand Lifting Mechanism

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**Abstract** – In a current world two wheelers plays main role of transport or travelling. They are useful but also responsible for some sad events like accident by mistake of drivers. The need of prevention of the rider on this type of condition, which is happened many times, which avoid by using such mechanism in bike. Major accident obtained due to forget lifting the side stand. To avoid this problem we do the project practically for “Automatic Side Stand Lifting Mechanism System”. This project is based on simple mechanism. This mechanism operated by the total manually means on the feet power of rider. So it is not required any external power and it is more economical also easily installable in bike. In our India 20- 22% accident happened due side stand which is not removed by the rider after starting a bike. For preventing that problem we installed this mechanism.

**Index Terms** – Automatic, Lever, Stand, Connecting rod, Gear, Mechanism etc.

## 1. INTRODUCTION

In present scenario the living status were developed. Two wheeler role is main part of world. Auto mobile stand designed for just supporting of bikes it consisting of spring. It helps to retrieves the system. If we see the ratio of accident is continuously increases in that the main causes of accident are speed and unconsciousness driving. In that mostly accident occurred due to forget lifting the stand. So we had made the project of automatic side stand lifting mechanism system. It requires minimum power and operated totally manual power so no need to any external power such as battery or chain drive power. So it not affect efficiency of vehicle power. It suitable for all kind of two wheeler bikes. So no needed for special design of automobile stand. In day today life technology is updated. This project consists of only few components such as connecting rod, catch lock hook, spring, pushing lever and link. The catch lock hook is used to locking and de-locking the side stand. Therefore it is necessary to have a separate attachments, which can be connected or attached to the bike for automatically lifting the stand and this can be possible with pressing gear lever. In addition, this is easily welded or connected to most of bikes, but the limitation is that it is possible only for those bikes having foot gear arrangement. This is new advancement in bike with the facility to lift the side stand automatically. This may avoid unnecessary accidents. This is a simple mechanism that does not affect the original

position of the bike. This is very cheap in the cost to apply on the bike.

## 2. LITERATURE SURVEY

Sanjeev N K, has worked on Bike Side Stand Unfolded Side Lock Link. In this system the side stand lock link makes the contact with the gear lever thereby indicating the person handling the vehicle about the unreleased side stand when the rider tries to apply the gear in unreleased state of stand and prevent him from being endanger or to have unsafe ride of motorcycle. The bike side stand unfolded side lock link for two wheeler is one of the life saving mechanism which prevents the ride from riding the bike in unreleased position of the ride stand. This prevent rider as well the vehicle to lose the centre of gravity by imbalance or surface hindrance due to retracted position of side stand and thereby saves life of the rider. The developed side stand lock link can be fitted to any motorcycle with slight dimensional changes in the link.

Also some sensor or microcontroller system installed in the bike to lift the side stand or gives alert by making the sound.

### 2.1 HISTORY

In some bike was consist alarm system for the side stand. It make noise if we not lifting the stand. But that is failure due to battery problem and cable (wire) connection problem. Also other mechanism was installed but it require external power for operating that system. Which is taken from chain drive due to regular power loss takes place.

### 2.2 OBJECTIVE

- To study the method of fabrication side stand removal system.
- To fabricate according to selected method.
- To study the future implementation on the system.

### 2.3 SCOPE OF STUDY

- In the future this can be applicable in all types of bike which have gear.
- We can install sensor based automatic side stand mechanism.

- Also we used actuators to lift the side stand smoothly by the switch operated.
- Also its installable in auto transmission vehicle.

## 2.4 BENEFITS FROM STUDY

- It avoid accident which occurs due to uplift the side stand.
- Its operate without any loss of engine power/battery power.
- It is easily operated and required less maintenance cost.

## 3. WORKING PRINCIPLE

The working consists of three mechanisms. Main mechanism is spring mechanism by which stand is lift up automatically without any manual effort. Second one is locking mechanism which is use for locking and de-locking of the stand. Last one is lever mechanism which can operate the spring. As we press the gear lever which is attached to the hook catch lock get stretched pull the lock by which lock gets de-locked. With this hook it escapes from lock and stand gets lifted automatically by spring action manually. As we press the lever the wire which is attached to the hook catch lock get stretched and pull the lock by which lock gets de-locked. With this hook it escapes from lock and stand gets lifted automatically by spring action.



Fig -1 Working Model

## 4. COMPONENT OF SYSTEM

### 4.1 Hook Catch Lock



Fig. -2 Hook catch lock

Hook catch lock is useful for locking and de-locking of side stand. As we press the gear lever connected with rod to hook de-locked the side stand and with the help of spring action the side stand lift up automatically. In that hook make a slot which used for locking the side stand. It is made up of mild steel and well finish slot.

4.2 Lever- Lever is the simple machine used to lift the weight by less effort or force. A rigid bar resting on a pivot, used to move a heavy or firmly load with one end when pressure is applied to the other lift or move with lever. A load is the thing which you are lifted. A fulcrum is the thing that makes the load lighter. An effort is the person pushing to make the object move.



Fig. -3 Lever

4.3 Spring- A spring is an elastic object used to store the mechanical energy. Spring is usually made out of hardened steel. Small spring can be wound from pre-hardened stock, while larger ones are made from annealed steel and hardened after fabrication. Some non-ferrous metal are also used including phosphorous, bronze and titanium for parts requiring corrosion resistance and beryllium copper for spring carrying electric current.

Most of the preceding discussion of compression spring applied equally to helical spring in compression. But, in extension spring, the coils are usually close wound so that there is an initial tension or so termed preload.

Therefore, no deflection occurs until the initial tension built into the spring is overcome that is the applied load  $F$  becomes larger than initial tension. The rate of spring is change in the force it exerts, divided by the change in deflection of the spring. That is, it's the gradient of the force versus deflection curve. An extension or compression spring has units of force divided by distance, for example N/mm. torsion spring has units of force multiplied by distance and divided by angle, such as N-m/rad. The inverse of spring rate is compliance that is if a spring has a rate of 10N/mm, it has a compliance of 0.1mm. the stiffness of spring in parallel is additive, as is the compliance of spring in series. Depending on the design and required environment, any material can be used to construct a spring, so long the material has the required combination of

rigidity and elasticity, technically a wooden bow is a form of spring.



Fig. - 4 spring

Springs are relatively highly stressed machine parts, which require materials of high tensile strength and high yield strength. Most used materials are carbon steels, alloy steels, corrosion-resisting steels, phosphor bronze, spring brass and others

**4.4 Side Stand-**A side stand is a device on a bicycle or motorcycle that allows the bike to be kept upright without leaning against another object or the aid of a person. A “smaller, more convenient” kickstand was developed by Joseph Paul Treen, the father of former Louisiana Governor, Dave Treen. A side stand usually a piece of metal that flips down from the frame and makes contact with the ground. It is generally located in the middle of the bike or toward the rear. A side stand style kickstand is a single leg that simply flips out to one side, usually the non-drive side, and the bike then leans against it. Side stands mounted to the chain stays right behind the bottom bracket or to a chain and seat stay near the rear hub. Side stand mounted right behind the bottom bracket can be bolted on, either clamping the chain stays or to the bracket between them, or welded into place as an integral part of the frame.



Fig. -5 side stand

The side stand lock link relates to the field of automobiles industry, especially for two-wheeler vehicles using side stand apart from the Main centre stand provided there in for the resting of the vehicle. The side stand lock link makes the contact with the gear lever there by indicating the person handling the vehicle about the unreleased side stand when the rider tries to apply the gear in unreleased state of stand and prevents him from being endanger or to have unsafe ride of motorcycle.

**4.5 Connecting rod-**The connecting rod does this important task of converting reciprocating motion of the piston into rotary motion of the crankshaft. It consists of an upper forked section which fits on the crosshead bearings while the lower part fits on the crankpin bearing.

Normally connecting rods are forge-manufactured and the material used is typically mild and medium carbon steel. The ends where the rod is connected to the X-head or crankpin have bearings which are made of white metal working surface and shims (thin packing's) are used to make the necessary adjustments.

In our system the connecting rod is the intermediate member between the lever and the catch lock hook. Its primary function the push and pull from lever to catch lock hook. The connecting rod is under tremendous stress, actually stretching and being compressed with every movement. Steel is normally used for construction of automobile connecting rods because of its strength, durability and lower cost.



Fig. -6 connecting rod

## 5. CONSTRUCTION OF SIDE STAND

The assembly of modified side stand of bike mainly consists of following components: Gear lever with shaft, Side stand, Hook catch lock, Spring, Hook attach on side stand, Bike. The assembly consists of joint attached of the side stand, hook catch lock, gear lever and spring with hook. We only assemble the

parts in proper manner. Hook catch lock is placed on a plate and of small plates having a hole attach to the shaft of the gear lever. Connecting rod having two free ends is fixed at the position one is at the Lever and another is to hook catch lock. The spring makes an angle which is attach to the side stand. External lever is attached to one of the corner of the stand.

#### 6. WORKING

The side stand mechanism is a simple mechanism installed in bike to lift the side stand automatically after shifting the gear from neutral gear to first. It was total manually operated system. Its work on the lever arm mechanism when we pull down the side stand it lock into the catch lock hook and when we start the bike for riding and push the lever by our feet to shifting the gear that lever power transfer through the connecting rod to the catch lock hook and catch lock hook is de-locking and due to action of spring side stand is lifted. For lifting side stand no any power required it work on spring action. In this way Automatic side stand mechanism is work.

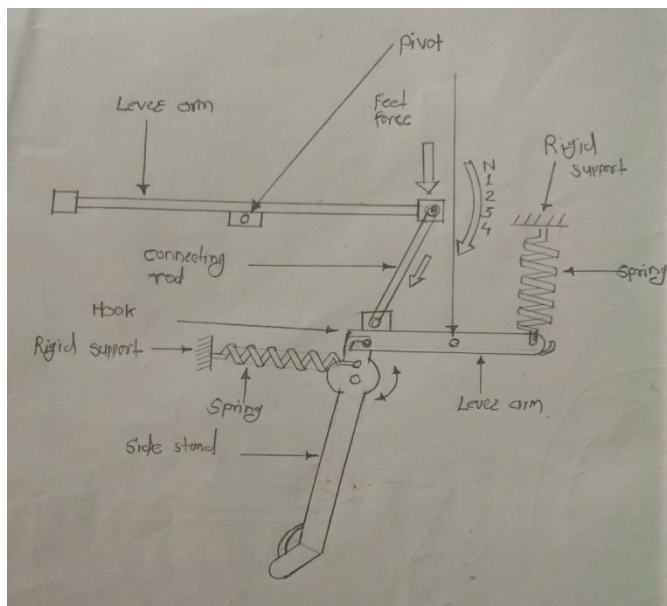


Fig. -7 Actual layout of mechanism

#### 7. ADVANTAGES

- It is easily installed.
- It is rigid versatile.
- It is low cost application.
- Near about less maintenance.
- It is light in weight.
- Electrical supply not required.
- It does not affect the structure of a vehicle.

#### 8. DISADVANTAGES

- It is not suitable for auto transmission vehicle.
- It is not for self started bike.

#### 9. APPLICATION

- It can be used in all type of bikes and motorcycle which have gears, this same gear can be used to operate lift the side stand.
- Many people while driving the vehicles forget to lift up stand and hence accident takes place with the help of these application road accident can be avoided.

#### 10. CONCLUSIONS

During the time of riding a bike with side stand in its uplift may create problems and accident but with the help of our accessories we solve this problem. The objective of this project is to provide the rigid and safety mechanism without changing in any standard design of bike. It does not disturb the performance of the vehicle. And it is different than other mechanism. Other system requires battery power or chain power but it is not require any external power. Moreover it should be economical for every class of society. it is new product it will promote employment and vast field development for new engineer in day period. By using this system we avoid the accident which happened due to the side stand. Also its easy to installed in any gear bike and economical.

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