

# Auto Adjustable Parking Stand for Two Wheeled Vehicle

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**Abstract** – All vehicles (two wheelers) are mostly provided with side stand. These side stands are not adjustable and are not much user friendly while parking the vehicle on non-planar road surface or in rainy weather conditions. In simple means the side stand doesn't meet our requirement when the vehicle has to be parked on non-planar ground surface. Many times the side stand are too short/fixed height to park the vehicle when both wheels are on little bit higher level than the middle portion of vehicle. Because of this type of conditions people get easily irritated and has to do some other adjustments to park the vehicle which takes lot of time and human efforts. Due to the fixed height of side stand whenever the vehicle is parked near non-uniform surface with respect to front and rear wheel, the entire weight of vehicle is on one side which reduces the life of side stand and it leads to the breakage.

To avoid the above failure the system comprises with an adjustable side stand.

This paper discuss about the safety feature added in two wheeler by which the difficulty in parking will be avoided.

In this stand the auto locking at variable point is provided to meet the height requirement and to retract the stand, another lever is provided, which instantly retracts the stand with the help of tension spring connected to side stand main rod. There will be holes/slots provided in stand rod for locking purpose at different heights and this main rod will be connected with short cylindrical pipe containing the lock mechanism. The parking time will be reduced and the life of side stand will be improved, which increases the efficiency of side stand.

## 1. INTRODUCTION

Two wheelers are most suitable and accepted for transportation, since two wheelers are economical, needs less space for driving and parking, and can be easily used in rough terrain in cities as well as in villages. Therefore, two wheelers have become the basic need of every home for rural, as well as urban areas. They are generally provided with stand for supporting the vehicle when they are not in use.

A motorcycle side stand is a nearly universal method of allowing a motorcycle rider to park his vehicle unattended easily. The side stand is useful for parking the vehicle on rough surfaces, less space for parking, and mainly it takes less time and effort for parking, therefore side stand is predominantly used for the two wheelers. One of the most common problem encountered in using the side stand is when front and rear wheel are on little bit

higher level than the middle portion of vehicle, then people get easily irritated and has to do some other adjustments to park the vehicle which takes lot of time and human efforts. This paper discuss about the safety feature added in two wheeler by which the problem of difficulty in parking will be avoided.

In this stand the auto locking at variable point is provided to meet the height requirement and to retract the stand, another lever is provided, which instantly retracts the stand with the help of tension spring connected to side stand main rod. So it does not affect the vehicle efficiency and also suitable for any two-wheeler vehicles. The design of the vehicle is not affected only simple mechanism is added to the vehicle which eliminates the human efforts.

## 2. HISTORY

Various researchers, technicians and academicians have suggested the various ideas implemented in the side parking Stand. There are some journals which talks about only the automatic retraction of side stand and its safety features, but could not say about issue related to the parking of two wheeled vehicle. The parking takes lot of time and causes irritation. This problem needs to be addressed and there should be some system which makes parking of two wheeler easy. The problems in present parking system in motorcycles or other two wheelers using side stand include the following:

1. The side stand does not meet the height requirement in non-planar ground surface condition.
2. In rainy seasons or in wet ground surface condition, the side stand gets submerged in soil & hence side stand becomes shorter in length.
3. Due to such Un adjustable side stand used in current vehicles, it can be damaged by falling on to the ground.

## 3. OBJECTIVE

The main objective of this idea is to provide a system for parking the vehicle with adjustable height requirements and to provide an unfolding side stand arrangement in the vehicle, which will directly retract the side stand similarly like piston cylinder mechanism. This feature will also reduce the human efforts and also reduce the time required for parking the two wheeled vehicle. Here we propose an idea for adjustable side stand which is operated by only mechanical means without using any electronic circuit and

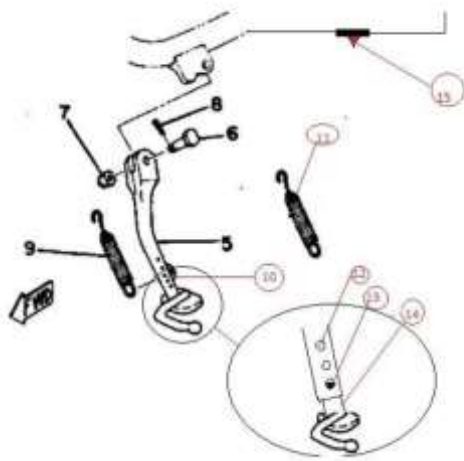
any external power. So that it will also add an additional luxury in the existing parking systems.

**4. CONSTRUCTIONAL DETAILS**

In the Figure 1,

The number indicates (adjustable stand in regular folding stand):

- 6, relates to bolt
- 7, relates to nut
- 9, relates to tension spring required in regular side stand.
- 10, relates to regular stand consisting adjustable stand at one end.
- 11, relates to another tension spring required to retract adjustable stand rod that is inside the regular stand.
- 12, relates to holes on adjustable stand for locking purpose.
- 13, relates to a locking knob used for locking purpose.
- 14, relates to adjustable rod placed inside the side stand pipe.
- 15, relates to pointed knob used to retract the extended stand as soon as the whole stand is retracted.



**Fig-1**

In the figure 2,

The number indicates (fully adjustable stand that is un-foldable):

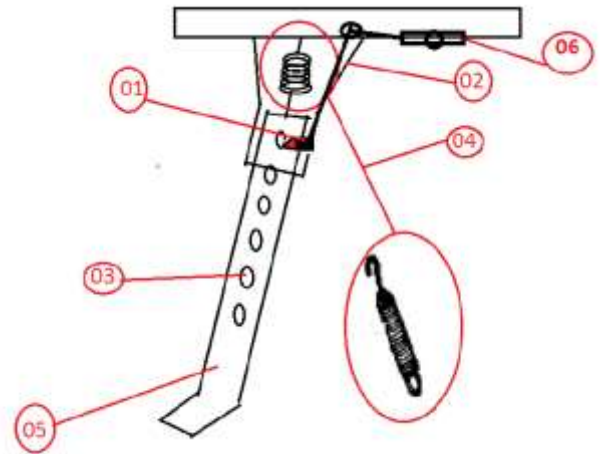
- 1, relates to locking mechanism.
- 2, relates to hollow cylindrical pipe.

3, relates to holes on main stand rod for locking purpose at different heights.

4, relates to tension spring used for retracting purpose.

5, relates to main side stand rod.

6, relates to a lever or mechanism used for unlocking or retracting purpose.



**Fig-2**

Above figure represent adjustable side stand in two wheeled vehicle.

The present innovation relates to parking system with adjustable height mechanism in the side stand. This innovation is based on mechanically operated with help of spring and locking mechanism in side stand of two wheeled vehicle.

The principle components of the system are locking mechanism fitted in a hollow cylinder, one tension spring, main stand rod with holes at different height, a lever is used to retract the stand. The dimension of the fully retractable stand (un-foldable) can be from 420 mm to 520 mm rod length & for stand consisting both (that is foldable & semi adjustable) the retracting or adjusting height will be in between 50 to 100 mm as per requirement. This type of adjustment done in regular stand (foldable & semi adjustable) from fig.1 Retracts the adjusted height automatically as soon as the side stand is folded or released back. The price of required combination is not much costly than the regular stand used for parking.

**5. WORKING**

According to this idea, there is a system provided for easy parking of two wheeled vehicles mainly on non-planar ground surface condition. The system comprises with all mechanical adjustment done in side stand mechanism. Typically said the side stand system is equipped with a spring, rod and locking mechanism which can be adjusted to different height/length as per the requirement. Typically said the main rod is connected to hollow

cylindrical pipe consisting locking mechanism. Rod and cylinder forms a sliding (fully constrained) pair. Stand rod consist of some holes with respect to different height adjustments. The downward motion of side stand is free to slide in cylindrical pair but the locking mechanism restricts the upward motion of side stand, once the side stand is placed. Further for releasing/retracting the stand, one tension spring is connected to main stand rod, which comes in tension when the stand is placed/applied for parking the vehicle. As soon as the lever provided for retracting the stand is operated, the lock gets disengaged and the main side stand rod get released/retracted due to the tensile force of spring.

Another method for adjusting the height with help of regular side stand is nothing but providing small adjustable rod inserted at the end of regular side stand cylindrical pipe & can be further adjusted as per the height requirement. This another type of stand consists a triangular knob placed on the vehicle body at released position of the stand. As soon as the person retracts/releases (fold back to its position) the parking stand the triangular knob hits the locking mechanism & unlocks the locked adjusted side stand.

## 6. ADVANTAGES

- It reduces the human efforts.
- It is economical.
- It does not require any external electronic circuit and power supply.
- It adds the safety feature in the vehicle.

## 7. CONCLUSIONS

This system can be implemented in all types of two wheeled vehicle at very low cost, so that it will not affect the economic level.

With the help of this system one can park his/her two wheeled vehicle on side stand at required height, so that even on rough or non-planar surface, vehicle can be parked properly.

This system will be able to reduce the human effort during parking in rainy season.

## 8. ACKNOWLEDGEMENT

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## 9. REFERENCES

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