FABRICATION OF SIDE STAND ACCIDENT FREE ELEMENT

GOWTHAMAN.S.M[1], MURUGA POOBATHI.K[2], VASU.N[3], MOHAN KUMAR.N[4]

1 ASSISTANT PROFESSOR, DEPARTMENT OF MECHANICAL ENGINEERING, KNOWLEDGE INSTITUTE OF TECHNOLOGY,

2 DEPARTMENT OF MECHANICAL ENGINEERING, KNOWLEDGE INSTITUTE OF TECHNOLOGY,

3 DEPARTMENT OF MECHANICAL ENGINEERING, KNOWLEDGE INSTITUTE OF TECHNOLOGY,

4 DEPARTMENT OF MECHANICAL ENGINEERING, KNOWLEDGE INSTITUTE OF TECHNOLOGY.

ABSTRACT

Our project is designed and fabricated to reduce the accident occurring due to carelessness in two wheelers using simple mechanical springs in side stand. Spring mechanism is employed in such a way that only when side stand is taken, the foot rest will be released for drivers use. This project is very useful to reduce accident and it is low cost and it can be implemented in all two wheeler.

INTRODUCTION

In normal bikes, there will be separate side stand and foot rest. They are not interconnected. In our project by using simple spring and rods, we have fabricated a design which will avoid accidents due to careless use of side stands. By using three simple springs, we are controlling the action of side stand and foot rest. Two springs will be of same diameter. One more spring is safety spring. This spring is used in case of any sudden damage of other two springs. The foot rest and side stand will be displaced 90 degree from each other. When side stand is operation, the foot rest will remain set aside the frame. Unless the foot side stand is released, the foot rest will not be released for driver's use.

By using this method of installation in the side stand. The accidents due to carelessness to hold side will be surely reduced.

PROBLEM STATEMENT

While the two-wheelers is concerned accidents occurs due to riding the vehicle in high speed, ignores to use helmets, does not maintains the speed limit and forgets to lift the side stand while riding the vehicles. These are the major source for accidents.

Forgetting to lift the side stand causes huge accidents in rural areas partly in urban areas too, but accident due to side stand does not have proper preventive measure. If you see the accident status 36% of the accidents occur due to this problem.

DEFINITION OF COMPONENTS

RIVETS:

A rivet is a permanent mechanical fastener. Before being installed, a rivet consists of a smooth cylindrical shaft with a head on one end. The end opposite the head is called the tail. On installation the rivet is placed in a punched or drilled hole, and the tail is upset, or bucked (i.e., deformed), so that it expands to about 1.5 times the original shaft diameter, holding the rivet in place. In other words, pounding creates a new "head" on the other end by smashing the "tail" material flatter, resulting in a rivet that is roughly a dumbbell shape. To distinguish between the two ends of the rivet, the original head is called the factory head and the deformed end is called the shop head or buck-tail.

Because there is effectively a head on each end of an installed rivet, it can support tension loads (loads parallel to the axis of

the shaft); however, it is much more capable of supporting shear loads (loads perpendicular to the axis of the shaft). Bolts and screws are better suited for tension applications

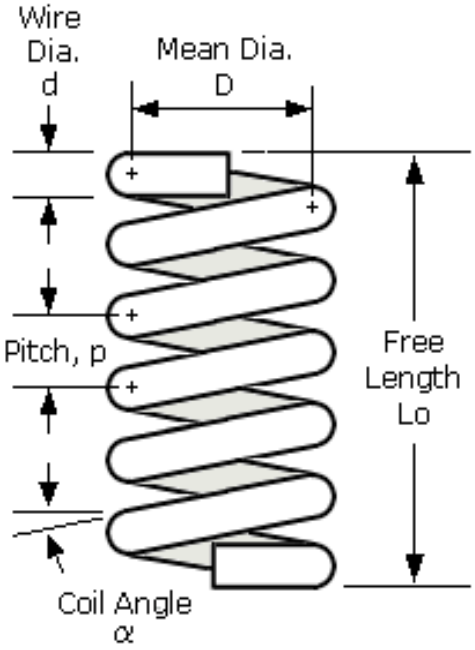
U-CLAMP:

A clamp is a fastening device to hold or secure objects tightly together to prevent movement or separation through the application of inward pressure. There are many types of clamps available for many different purposes. Some are temporary, as used to position components while fixing them together, others are intended to be permanent. In the field of animal husbandry, using a clamp to attach an animal to a stationary object is known as "rounded clamping." A physical clamp of this type is also used to refer to an obscure investment banking term; notably "fund clamps." Anything that performs the action of clamping may be called a clamp, so this gives rise to a wide variety of terms across many fields.

SPRING:

A coil spring, also known as a helical spring, is a mechanical device, which is typically used to store energy due to resilience and subsequently release it, to absorb shock, or to maintain a force between contacting surfaces. They are made of an elastic material formed into the shape of a helix which returns to its natural length when unloaded. One type of coil spring is a torsion spring: the material of the spring acts in torsion when the spring is compressed or extended. The quality of spring is judged from the energy it can absorb. The spring which is capable of absorbing the greatest amount of energy for the given stress is the best one. Metal coil springs are made by winding a wire around a shaped former - a cylinder is used to form cylindrical coil springs.

NOMENCLATURE OF HELICAL SPRING



C = Spring Index D/d

d = wire diameter (m)

D = Spring diameter (m)

Di = Spring inside diameter (m)

E = Young's Modulus (N/m2)

F = Axial Force (N)

G = Modulus of Rigidity (N/m2)

L 0 = Free Length (m)

L s = Solid Length (m)

n t = Total number of coils

n = Number of active coils

p = pitch (m)

τ = shear stress (N/m2)

τ max = Max shear stress (N/m2)

θ = Deflection (radians)

FABRICATION PROCESS:

- First, the side stand and the foot rest are welded together in such a manner that they have a 90 degree displacement from each other. Their movement too will have 90 degree displacement.
- Then, this linked mechanism of side stand and foot rest will be welded with clamp and rivets
- This whole set up will be connected to the vehicle frame.

METHODOLOGY:

Before the vehicle is started, the side stand will be operation. As mentioned before, there is link and 90 degree displacement between side stand and foot rest. When the side stand is released, there is a 90 degree displacement. So, the foot rest will come into operation. Or else it will be never released for driver's use. In order to due this operation there will be two springs. First spring is connected between foot rest and clamp of the vehicle frame. Second spring is connected between side stand and foot rest. When one spring is in compression, another spring will be elongated. When side stand is released, the first spring will be elongated and the second spring will be compressed. This makes the foot rest to come into action. When the side stand is bringing into operation, the first spring will be compressed and second will be elongated.

SPRING SPECIFICATION

- Diameter of the spring : 11mm
- Diameter of the spring wire : 1.88mm
- No of turns of the spring : 43
- Total length : 83mm
- Mean diameter : 9.12mm

SPRING FOR FAILURE CONDITION	SPRING FOR OPERATE CONDITION
Load: 90N	Load: 10N
Deflection: 66mm	Deflection: 33mm
Stiffness:0.013KN/mm	Stiffness:0.003KN/mm

ADVANTAGES:

- Simple design.
- Less weight.
- No component change in the two wheeler.
- Low cost.
- Weight of the project is only two spring.
- Maintenance cost is low.
- The component gives tension free drive.
- Easy replacement.
- No power is required.
- No sensors are used.

CONCLUSION:

Our project is mainly aimed to reduce accidents due to careless usage of side stands. Since the cost employed for this mechanism is very low, it can be normally employed in all kind of vehicles without any difficulties and increase of cost of manufacturing. If it is employed in all the two wheelers, we can efficiently reduce the accidents.

PHOTO:

Fig: Stand on working condition

Fig: Stand on rest condition