

Side Stand Retrieval System Using Trigger Mechanism

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Abstract – The objective of our project is to prevent accidents occurring due to two-wheeler side stand. We devised to employ recent advances in fabrication to create a new hardware of extremely small and low cost. This project “Side Stand Retrieval System” will explain the mechanism to lift the stand as soon as the vehicle starts moving. Inspired by simplicity and success of trigger mechanism, we have designed [1] a new hardware to lift the stand. The procedure involves three main components, the clutch, stand and trigger device. The stand activates the trigger and clutch acts as trigger, to lift the stand. When clutch is applied to shift the gear, the stand retrieves back to its own position. We evaluated and refined to final design, compressing the spring, which is most effective method. This study will conclude that project is in development and improvements, in terms of cutting edge design, raw materials and fabrication can be achieved through some advanced machining processes.

Index Terms – Retrieve, Trigger, mechanisms, Springs, clutch.

1. INTRODUCTION

The automobile takes a great part in the development, since it plays one of a major key in daily life. While automobile is concern two-wheeler i.e. (motorcycles and bike) it plays very important role because it saves the time of traveler by reaching the target place very faster. Although it saves the time it does not safe the life of rider if rider is careless, there are some sad facts on them such as accidents.

While the two-wheelers are concerned accidents [2] occurs due to riding the vehicle in high speed, ignore 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, because all the other source of accident has preventive measure, but accident due to side stand do not have proper preventive measure.

2. LITERATURE REVIEW

The whole construction of this system is simple and efficient. The arrangement and position of components makes the system to function. The clutch actuating trigger mechanism is loosely based on firearm trigger mechanism. A modern firearm trigger has many mechanisms [3,4,5] like single action, double action,

double action/single action, release trigger, set trigger, single set trigger, double set trigger, pre-set (striker or hammer), and pre-set hybrid. In our system we have used single action trigger. We have a primary trigger (clutch), secondary trigger, sear, sear spring and side stand.

Basically a single-action (SA) trigger performs the single action of releasing the hammer or striker to discharge the firearm each time the trigger is pulled. In single-action revolvers such as the Colt Dragoon Revolver require the hammer to be cocked by hand every time the weapon is fired. Similarly, in our side-stand retrieval once the side-stand is retrieved again the hammer should be cocked to sear. The cocking is again accomplished by side-stand itself when we bring down the side-stand to its initial position. The slight change in our mechanism is that we have 2 triggers, a primary (clutch) and a secondary trigger. When we actuate the clutch the force is transmitted through a string which passes through a pulley and again connected to secondary trigger. Then finally sear is activated which in turn releases the hammer thereby lifting the side-stand simultaneously. Tension springs [6] and compression springs [7,8] look similar therefore it is understandable to confuse to the two however they are actually designed to perform different functions. Tension springs are mainly used to hold two components together whereas compression springs are used to keep components from meeting. Both springs have a coil spring design for strength and elasticity, but used in different manner.

3. EXPERIMENTAL SETUP

This design includes three main components. Out of which two components are pre-installed on a bike, Clutch and Side stand.

New component will be the Trigger device and installed on setup as shown in figure 2.

Trigger device has the following parts:

- Base plate

- Slider
- Guider
- Trigger
- Sear
- Supporting rod

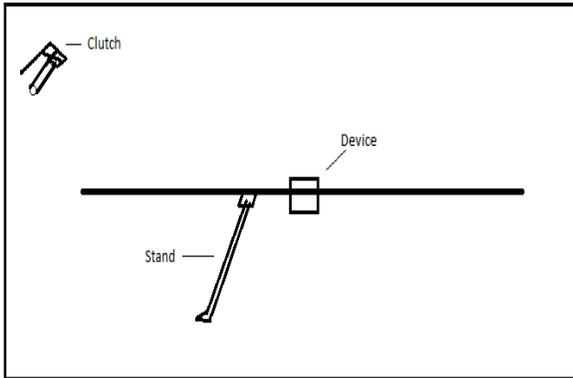


Fig 1: Setup with component

3.1 Base plate

- The base plate is made with 7.5x7.5x1.0 cm
- The elevated part above base is designed with a height of 1.4 cm and width 1cm.
- Guider is designed with 1cm width and grooved with 0.6 cm for slider part to slide along its length.
- A hole with a diameter of 3mm is drilled for passage of wire.
- Sear and trigger are designed accordingly

3.2 Slider part

- A block is made with height of 2cm, width 3cm and thickness 1.3cm.

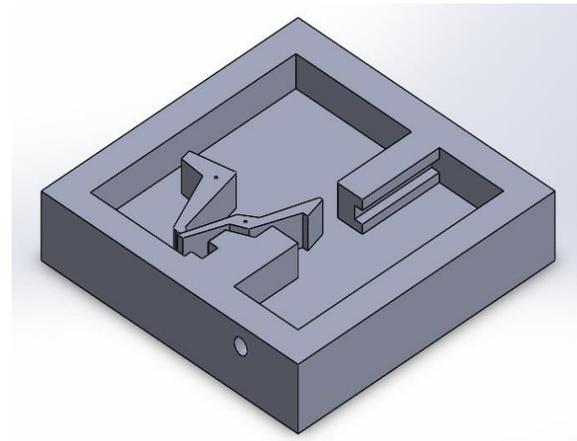


Fig 3: Isometric view of the design

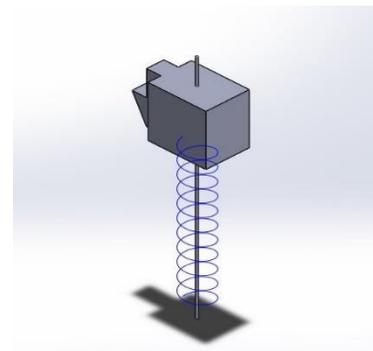


Fig 4: Design of Slider part

- The left side portion of the slider is designed with 1cm width and 2cm height in the desired shape.
- A hole of 4.5mm diameter is drilled for inserting supporting rod.

3.3 Guider Part

- A rectangular block of specified dimensions is designed.
- Groove is made by extruded cut of 8mm.
- Along this rectangular groove the slider part will slide.

3.4 Design of Trigger and Sear

- These two parts prototypes were made with Polystyrene and wood. After testing those parts, the final dimensions were fixed accordingly.
- Proper Dimensions were traced from graph paper.
- According to the dimensions, 2-d layer is drawn on the base plate and extruded with thickness of 1.4mm.

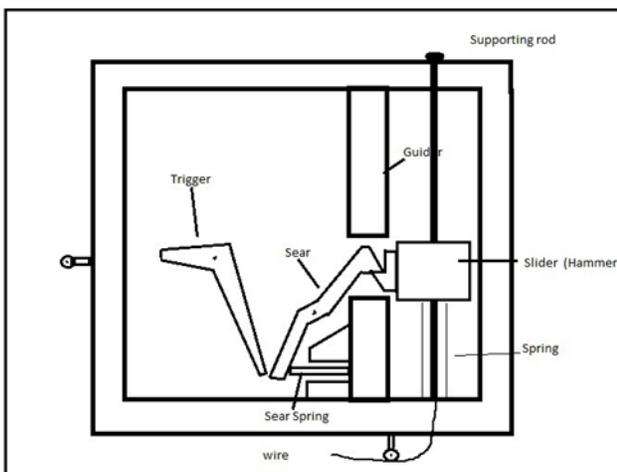


Fig 2: Top view of Trigger device

- To show the rotating joints, a small diameter circle is drawn and extruded cut to get that design.

3.5 Final Setup

The Three main parts present in this system are:

- Clutch
- Side Stand
- Device

All these components are well arranged in a frame. The frame is welded up of iron and forms a system with these components as shown in the figure 7. Here, the clutch and the

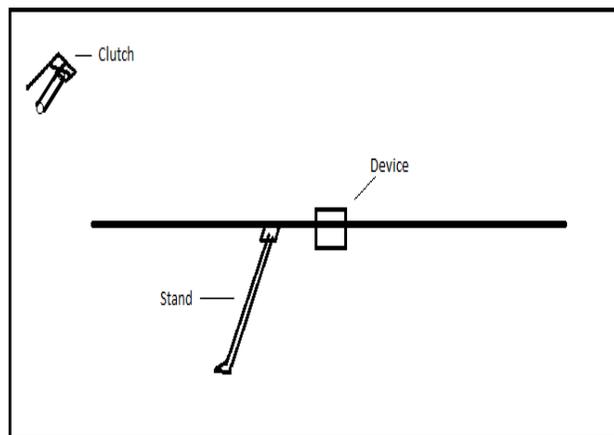


Fig 7: Figure of Final Setup

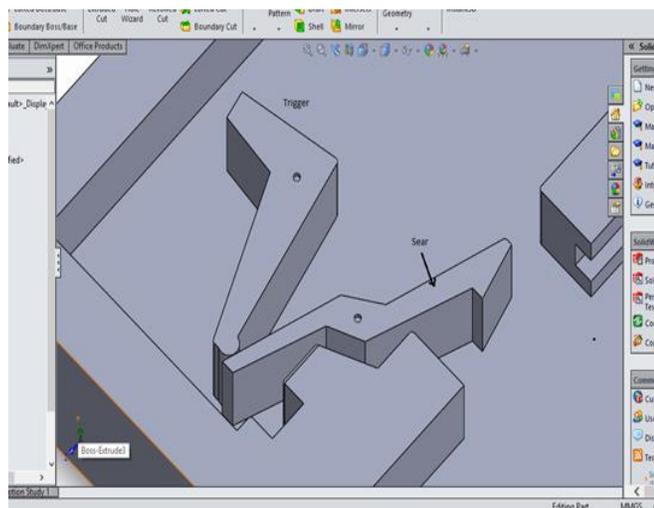


Fig 5: Guider part design

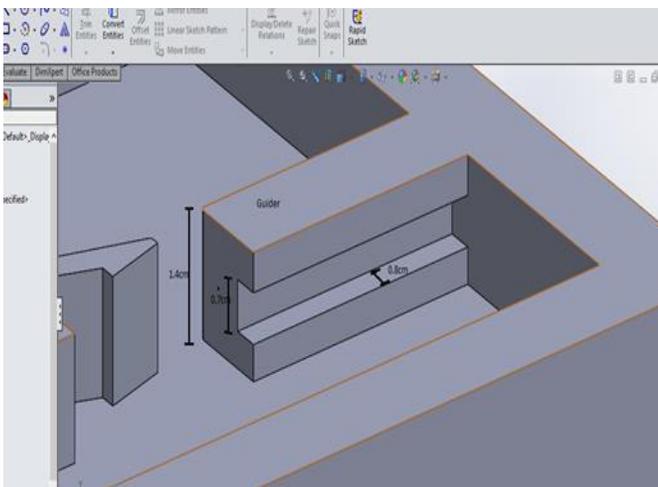


Fig 6: Design of Trigger and Sear

Side stand are input and outputs of the system. All the mechanism and functioning of this system lies in the device mentioned.

4. RESULTS AND DISCUSSIONS

The main purpose of our system is to implement a retrieval system with simple mechanism and easily available components. With this project, we strongly admit as one of the most optimal and effective solution for the major problem at minimum resources.

While testing various mechanisms to use for stand retrieval, we chose trigger mechanism which can achieve nearly all functionalities we planned to implement originally.

5. CONCLUSION

As one can see from reading, the primary goal of this project is to use an effective mechanism for stand retrieval in order to prevent accidents. Right from the start of our project we have developed this idea in different stages, finally we designed the mechanism, which is simplified, easy and cost effective.

We conclude that our research is in development stage, further improvement can be achieved using advanced machining processes and can be implemented successfully in our two wheeler motorcycles.

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