

Automatic Center Stand for Two Wheelers Using Lead Screw

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Abstract: - This paper is titled as “Automatic Center Stand for Two Wheelers Using Lead Screw”. The main difficulty of two wheelers is to mounting the vehicle in center stand. This will be difficult in case of High weight two wheelers. If we put the vehicle in side stand at a inclined area the vehicle is lean to that side and moreover there is a chance to fall in case of improper arrangement. This project is reducing human effort and providing new idea to develop automatic center stand. Here the system consists of a dc motor that helps to lift the vehicle by giving power to the lead screw. Here we are using a lead screw mechanism to lift the vehicle in middle stand. A DPDT switch is provided to control the operations.

Keywords:- DC Motor, Lead Screw.

I. INTRODUCTION

In India, almost 80% males and 20% females are driving two wheeler. Among those major percentage are old persons . Females and old persons are difficult to mounting the two wheeler on center stand is challenging and hence this made us to develop this project for reducing the human effort when mounting two wheeler on center stand. Moreover, when we applying side stand, it increases the accidents by forgetting to lift side stand while driving causes dangerous injuries and also when parking two wheeler on side stand takes more parking space.

A center stand is the main part of the two wheeler; it helps the two wheeler to be kept upright position. In generally center stand is situated under the chassis of the two wheeler with the help of bolt, nut and spring when we applying force on center stand it become contact with the ground. The center stand is generally located near the rear wheel of two wheeler. The use of two wheelers increasing year by year the production rate is also increasing and it is not going to reduce any time soon. Then they are apply side stand, by this the vehicle is lean into one side. Here we introduce automated center stand which is easy to apply.

II. OBJECTIVE

- Minimizing human effort
- For easy handling of old peoples
- Reduce fatigue in stand

III. MAIN COMPONENTS

- DC MOTOR
- LEAD SCREW
- DPDT SWITCH
- BATTERY
- FRAME

➤ DC MOTOR

Dc motors are used to produce rotational motion and it powdered with direct current from battery. A DC motor converts electrical source into rotational motion. The power supply is given from battery and it gives mechanical power for up and down action of stand. In this project we take 12V dc motor because in two wheelers 12V battery is used.



Figure 1. DC Motor

➤ LEAD SCREW

A lead screw is simply a thread rod and a nut, but instead of being used for fastening it is used to translate rotary motion into linear motion. Due to this factor it is a key difference in the design of lead screw as opposed to the thread rod. Lead screws utilize a couple of thread forms. These are includes square thread, buttress thread, trapezoidal threads. Here we are using lead screws for linear movement of middle stand in up and down direction.



Figure 2. Lead Screw

➤ **DPDT SWITCH**

A Double Pole Double Throw (DPDT) is the main component of the center stand and it is used for the up and down motion of the center stand by the help of changing polarity of the direct current. It consist of six poles and for this project we need special connection in DPDT switch. In this switch we can provide three outcomes that's are up and down motion and off the operation.



Figure 3. DPDT Switch

➤ **BATTERY**

Battery is a electrochemical cell that is used to store electricity and provide electricity when we needed. Battery consists of one or more electrochemical cell for providing electricity. Lead acid battery is commonly used battery in automobile industry. For this project we are using existing battery in two wheeler, such as 12V battery.



Figure 4. Battery

➤ **FRAME**

A frame is a structure which provides the bones to the design. Here we give the CAD Drawing of the general frame work. Figure 5 shows the automatic center stand by using lead screw mechanism.

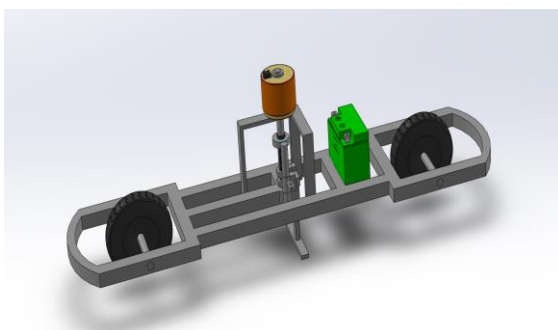


Figure 5. Frame by CAD Drawing

IV. WORKING

When the DPDT switch is turned on, the electricity from the battery Supplies to the dc motor. The DC motor shaft is connected with lead screw, when the motor drives lead screw also drives. Here a mechanism activates that is called the lead screw mechanism. With the help of power from the DC motor the nut in the lead screw rotates, by the help of this the lead screw moves linearly in up and down direction. By the linear movement of the center stand, it touches the ground, then the action of lead screw mechanism it act a force to the ground so that the vehicle gets lifted gradually. On full displacement of lead screw, the stand is in applied position. By the help of DPDT switch we can reverse the polarity. On reversing the polarity rotation takes in reverse direction. Then the stand lowering, the scooter back on to the wheels.

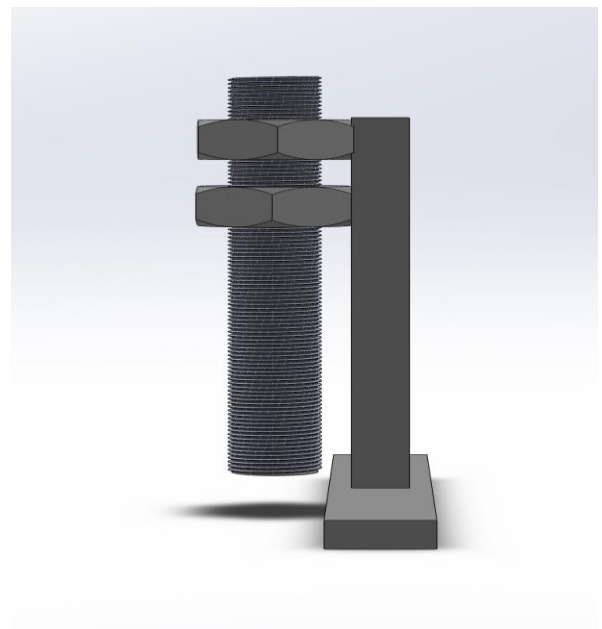


Figure 6. Initial position

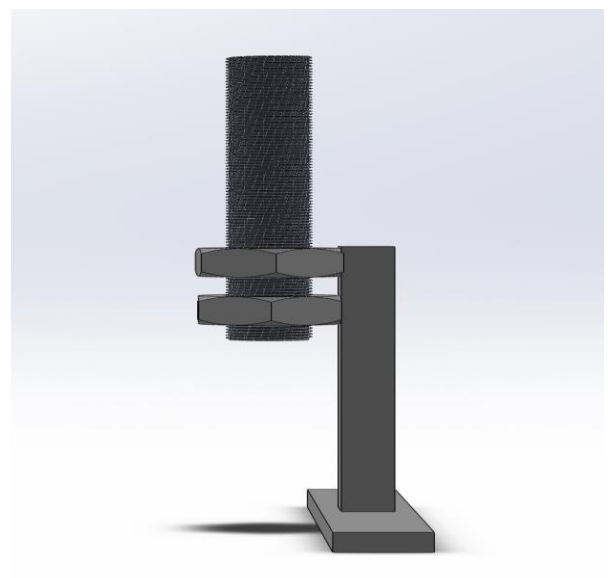


Figure 7. Final position

V. ADVANTAGES

- Requires no human effort
- Requires less parking space
- Easy to operate for women and old persons
- Easy to use for handicaps
- No need of maintenance after installation.

VI. CONCLUSION

Here we are proposed an automated center stand for scooters. The new design is very easy to apply and doesn't requires lots of human efforts. The project helps in reducing the painful task of applying center stand (especially for ladies and old peoples) also reducing the parking space.

VII. ACKNOWLEDGMENT

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