Automatic Bike Stand with Smart Helmet

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ABSTRACT

Two-wheelers are most prone to accidents due to their fragile nature. One of the issues of motorbike accidents is that people forget to slide their side stands back in place on starting the bike and people also forget to carry helmet.

So here we propose smart helmet with automatic side stand if the rider does not wear helmet, then bike would not start. when we wear the helmet switch press and send the signal to encoder which encode the signal then after it will transmit to RF transmitter and RF transmitter release the signal in air the RF receiver will catch the signal the and decode the signal then decode signal send to Arduino UNO then Arduino UNO send signal to the relay and relay will connect and disconnect the wire (the wire which coming from key slot) when it connected side stand will move and there is red switch which stop the side stand when it touches.

In modern developing world, automobile plays important role especially two-wheeler i.e. (motorcycles&bikes) plays a major role. Even though they are helpful there are some sad events like accidents due to careless of rider.

Some accidents occur due to forgetting of lifting side stand. To avoid such accidents, cause due to uplift the side stand, we may be producing the new advance in bike that as we press the gear lever to lift the side stand. So, we have made the project of "Automatic Side-Stand with smart helmet" is to be designed based on the working principle of bikes. This mechanism is operated manually means on the feet power of rider. After starting the bike immediately when the rider puts the first gear, the side stand lifts automatically.

Keywords: Two-wheeler, RF transmitter, RF receiver, Arduino UNO

I. INTRODUCTION

The thought of developing this project come to do so good thing towards the society day by day two-wheeler accident are increasing lead to losses of many life.

According to survey of India there are around more than 700 accident occurring due bike accident per year. The reason may be many such as no proper driving knowledge no fitness of the bike fast riding of the bike and drunk and drive etc.

sometimes the person injured the accident may not be directly responsible for accident it may be fault of rider but end of the day both drivers involve in the accident who is going to suffer if the accident are one issue lack of treatment of proper time is another reason for death.

In all over world everywhere motorcycle is used. The side stand plays major roll while the vehicle is in rest

position. But it has some disadvantages takes place as while the driver starting the motorcycle, there may be possibility of forget to release the side stand this will caused to unwanted troubles.

This is a new type of side stand which is automatically retracting the side stand through some mechanical and electronic arrangement. In this system microcontroller, , dc battery is used. sense the rotation of the wheel and sends the signal to the microcontroller which is actuate the dc motor which is caused the disengage the stand from the road.

A motorcycle side stand is nearly universal method of allowing a motorcycle rider to park his vehicle easily. If this stand is in the park position while the motorcycle is ridden through left turn a serious hazard exists.

A new type stand side stand which is automatically retracting side stand is invented to prevent such type of accidents. Side stand mounted behind bottom bracket and can be bolted on either clamping the chain stays, or welded in to place as an integral part of the frame.

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 side stand is 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 towards the rear. Some touring bicycles have two: one at the rear, and a second in the front. . A side stand is 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 towards the rear. We may have witnessed motorcycle accidents because of the surface hindrance of retracted positioned side stand. One of the most common problems that are encountered in using the side stand is negligence or carelessness to kick back the side stand The negligence may be due to absence of mind. The side stand lock link relates to the field of automobiles industry, especially for two wheeler vehicles using side stand apart from the aim center

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 motor cycle.

II. LITERATURE REVIEW

The first step in the invention of this glorious machine can be tracked down in 1791 at Parisian Park a toy-like machine named Hobby Horse as a plaything for rich. Improvement in it is seen in 1817, now front wheel can be turned by a handle. This was named as Draisienne after German Baron von Draise or a Velocify. The first treadle led true bicycle appeared in 1830 which was ridden with both feet"s entirely off the ground by the earliest known side-stand was designed by Albert Berruyer in 1869, and since then side-stands have been independently reinvented many times. It was mounted below the handlebars so was much longer than more recent designs. A shorter model was patented by Eldon Henderson in 1926.In the 1930s, a "smaller, more convenient" side-stand was developed by Joseph Paul Treen. In 1891, Pardon W, tilling hast patented a design for a stand which was mounted on the pedal, but folded up flat under the pedal when not in use. Side-stands on bicycles fell out of fashion in the 1970s, as the bicycles became lighter, and many riders were concerned about extra weight.

According to the recent Research paper in 2016 titled '2 Helmet using for accident detection and reporting system', The author specially developed this project to improve the safety of the bikers.

The objective of this project is to study and understand the concept of RF transmitter and RF receiver circuit. The major disadvantage of this project is they are not using any display device for showing the current status. Also, the cost of helmet is

still high since helmet is designed for only one purpose.

According to the Research paper in 2015 titled 'Microcontroller based smart wear for driver safety', In this paper author has discussed on the speed of the vehicle. The author has worked only on the phenomenon of accident.

Research paper in 2016 titled 'Smart Helmet', In this paper the main objective of author is to force the rider to wear the helmet. In this competitive world one of the surveys says that the death trolls due to motor bike accidents are increasing day by day out of which most of these casualties occurs because of the absence of helmet.

Traffic police cannot cover remote roads of city. That's why over primary objective is to make the usage of the helmet for two wheelers" compulsory ". Thus, no one other than the owner himself, who doesn't have "password" which would have been created by the owner, can use the bike. In this author has proposed the feature that the bike will not start unless the bike rider does not wear the helmet.

Arduino is also used in this project which is an open-source tool for making computer that can sense. According to the Research paper in 2015 titled 'Smart Helmet', In this project the author has proposed the smart helmet because of growing bike accident. People get injured or might be dead because of not wearing helmet. Continuously no one follows road rules. So, to overcome this problem this helmet is been designed. The middle-class families prefer to buy motor bike over four wheelers, because of the low prices, various variety available in the market.
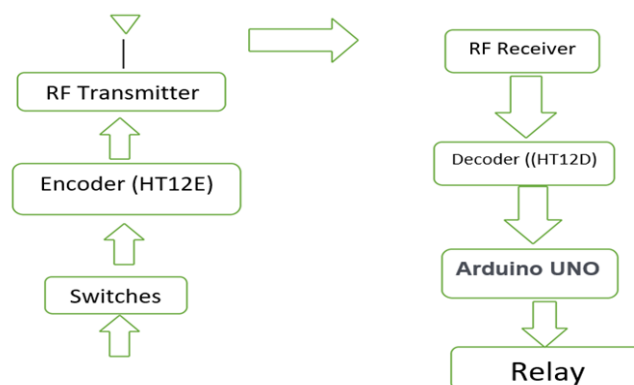
Author has also used encoder that receives parallel data in the form of address bits and control bits the other author has used smart system for helmet. But in this project author have not focused on the major issue that will occur in future regarding the alcohol and many other

III. EXPERIMENTAL SETUP

A. Working Principal

TheTwo-wheelers are most prone to accidents due to their fragile nature. One of the issues of motorbike accidents is that people forget to slide their side stands back in place on starting the bike and people also forget to carry helmet. So here we propose smart helmet with automatic side stand if the rider does not wear helmet, then bike would not start.

When we wear the helmet switch press and send the signal to encoder which encode the signal then after it will transmit to RF transmitter and RF transmitter release the signal in air the RF receiver will catch the signal the and decode the signal then decode signal send to Arduino UNO then Arduino UNO send signal to the relay and relay will connect and disconnect the wire (the wire which coming from key slot) when it connected side stand will move and there is red switch which stop the side stand when it touches

B. Defination of Components

I. Battery

It is used to supply 12volt power dc to motor

We could not use the battery more than 12 volt because it is hazards

II. DC Motor

Motor is used to convert electrical energy to mechanical energy

Here it used to lift the side stand

DC motor is designed for two-speed operation. It consists of three brushes namely: common, low speed,

high speed. Two of the brushes will be supplied for a different mode of operation. The DC motor does not oscillate back and forth, it rotates continuously in one direction like most others motors. The rotational motion is converted to the back-and-forth wiper motion by a series of mechanical linkage. This type of motor is called a gear head or motor end has the advantage of having lots of torque. The dc motor works on 12-volt D.C. battery

III. Pushbutton

A limit switch is configured to detect when a system's element has moved to a certain position. A system operation is triggered when a limit switch is tripped

It is a momentary or non-latching switch which causes a temporary change in the state of an electric circuit only while the switch is physically actuated. An automatic mechanism (i.e., a spring) returns the switch to its default position immediately afterwards, restoring the initial circuit condition. There are two types:

A 'push to make' switch allows electricity to flow between its two contacts when held in. When the button is released, the circuit is broken.

A 'push to break' switch does the opposite, i.e. when the button is not pressed, electricity can flow, but when it is pressed the circuit is broken. This type of switch is also known as a normally close. (Examples: Fridge Light Switch, Alarm Switches in Fail-Safe circuits).

Many Push switches are designed to function as both 'push to make' and 'push to break' switches. For these switches, the wiring of the switch determines whether the switch functions as a 'push to make' or as a 'push to break' switch.

IV. Relays

It is used to change the direction of the motor.

V. Arduino UNO

It is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board that can be integrated into a variety of electronic projects. This board can be interfaced with other Arduino boards, Arduino shields, Raspberry Pi boards and can control relays, LEDs, servos, and motors as an output.

VI. RF Module

An RF module (short for radio-frequency module) is a (usually) small electronic device used to transmit and/or receive radio signals between two devices. In an embedded system it is often desirable to communicate with another device wireless

VII. Side Stand

A side stand is a device on a bicycle or motor cycle that allows the bike to be kept upright without leaning against another object or the aid of a person. Aside stand is usually a piece of metal that flips down from the frame and contacts the ground.

VIII. Micro Controller

A **microcontroller** (**MCU** for *microcontroller unit*) is a small computer on a single metal-oxide-semiconductor (MOS) VLSI integrated circuit (IC) chip. A microcontroller contains one or more CPUs (processor cores) along with memory and programmable input/output peripherals. Program memory in the form of ferroelectric RAM, NOR flash or OTP ROM is also often included on chip, as well as a small amount of RAM. Microcontrollers are designed for embedded applications, in contrast to the microprocessors used in personal computers or other general purpose applications consisting of various discrete chips.

In modern terminology, a microcontroller is similar to, but less sophisticated than, a system on achip (SoC). An SoC may connect the external microcontroller chips as the motherboard components, but an SoC usually integrates the advanced peripherals like graphics processing unit (GPU) and Wi-Fi interface controller as its internal microcontroller unit circuits.

Microcontrollers are used in automatically controlled products and devices, such as automobile engine control systems, implantable medical devices, remote controls, office machines, appliances, power tools, toys and other embedded systems. By reducing the size and cost compared to a design that uses a separate microprocessor, memory, and input/output devices, microcontrollers make it economical to digitally control even more devices and processes. Mixed signal microcontrollers are common, integrating analog components needed to control non-digital electronic systems. In the context of the internet of things, microcontrollers are an economical and popular means of datacollection, sensing and actuating the physical world as edge devices.

Some microcontrollers may use four-bit words and operate at frequencies as low as 4 kHz for low power consumption (single-digit milliwatts or microwatts). They generally have the ability to retain functionality while waiting for an event such as a button press or other interrupt; power consumption while sleeping (CPU clock and most peripherals off) may be just nanowatts, making many of them well suited for long lasting battery applications. Other microcontrollers may serve performance-critical roles, where they may need to act more like a digital signal processor (DSP), with higher clock speeds and power consumption.

IV. CONCLUSION

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 solved 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 required 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, it's easy to installed in any gear bike and economical

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