Scooty Throttle Accidental Raise Cutoff System

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ABSTRACT

It's pretty common that these days' accidents occur due to carelessness of people. It is seen that people get injured due to slight negligence. The automobile industry also has witnessed such incidents, the most common kind of accidents is incautious acceleration of gearless bikes in stopping condition, making the driver lose control over the vehicle. It causes severe injuries to passengers or pedestrians and also causes damage to the vehicle.

In this work it is proposed to develop a system that will cut off the accelerator in such conditions. The system works by collecting output from sensors that are placed on both sides of the handle, and on the seat. The sensors on the handle sense the presence of the driver using a fingerprint sensor and also the sensors pass a signal through the driver's body making the human body a part of circuit that completes the accelerating cycle. And also, there is a passenger detecting sensor provided in the driver side seat which senses the driver's presence and only initiates ignition if the driver is present.

For this project, we conducted a survey and found that around 10% of people have gone through this kind of situation and through literature survey found that there is no technology available till now to make up for this situation. This technology is helpful for reducing the accidents to great extent.

Keywords: Sensors, Handle, Seat

1 Introduction

Two wheelers became an integral part of transportation in India since its introduction. It is a convenient form of transportation for most people and the clutch less two wheelers or the scooties become popular among the common people. Since then, we have witnesses' accidents that occur due to minute mistakes of the drivers. One such mistake is raising the throttle accidentally during the static condition. Here we are introducing an innovation "SCOOTY THROTTLE ACCIDENTAL RAISE CUTOFF SYSTEM".

The possibility of scooty accidental throttle rise cut off system is made by combining output from seat weight sensor and fingerprint sensor. The seat weight sensor which is placed under the driver side of the seat will calculate the weight of the passenger. The signal from the weight sensor is transmitted to Arduino Uno Atmega 328. At the same time the TTP223-1 Channel Capacitive touch sensor detects whether both hands are on the handle by transmitting electrical signals through the driver body to make sure the both hands are of the same person. The signal from this also transmitted to the Arduino Uno Atmega 328. Based on the signal from these, the Arduino Uno Atmega 328 activates the solenoid which is connected with a carburetor butterfly valve and the vehicle will operate as normal.

2 Characteristics

2.1 Solenoid

Solenoid (figure1) means electromagnetic lock, electric lock and latch used for lock. There are two kinds of opening mode and opening lock lever, which can be selected according to the difference. The closing power model only opens when the solenoid is energized. Such doors are closed and do not open when power or

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connection is not working, which provides very good security. This type is only used where there is a need for counter-terrorism. Locking power mode locks the door when the solenoid valve is energized. If the power is cut off, the door will open. This type is opened in the event of fire or accident and accident and used for emergency exit or evacuation from fire, it takes priority over the protection safety to prevent violence. Hold mode operates both the lock and unlock functions by applying a positive or negative pulse voltage to the solenoid and keeping the de-energized state in any position. This type is characterized by energy savings because the solenoid does not need to be on all the time. For continuous and irregular testing, continuous testing is designed to be able to supply the test electrical equipment for several hours without exceeding the test temperature rises when the measurement is not uniform. The specified time is above the temperature limit.

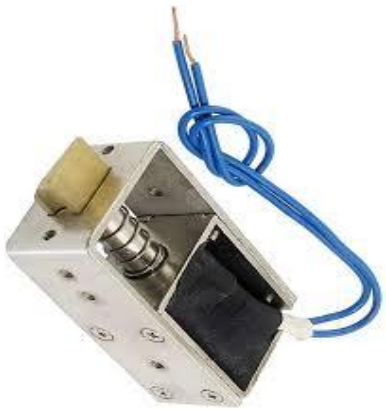

Figure 1: *Solenoid*

2.2 Arduino

Arduino (figure 2) is an open-source microcontroller that is easily accessible to all. Launched in 2005, this system is developed to help students and creators to make prototypes and mechanism in most inexpensive way using the sensors and actuators. It is an open-source computing platform with simple microcontroller board, for building and programming electronics and mechanical projects. It can act like a There are many devices like microcontroller, Arduino controller is used here for the controlling the input and output response and analyse it to gives a solenoidal action rolling outputs. It is also possible to send and receive data over the internet using the various Arduino shields discussed in this article. Arduino generates the code using hardware called Arduino board and software called Arduino IDE (Integrated Development Environment). These microcontrollers are 8-bit Atmel AVR microcontrollers made by Atmel or 32-bit Atmel ARMs and can be easily developed using C or C++ in the Arduino IDE. Unlike other microcontroller boards in India, Arduino boards entered the electronics market only a few years ago and only for small projects. Electronics is now slowly taking over the role of Arduino in their work. The development board can also be used to write (upload) new code to the board, just load it with a USB cable. Arduino IDE provides a simple integration program that runs on a PC and allows users to write Arduino programs in C or C++.

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Figure 2: *Arduino*

2.3 Conductivity Sensor Switch

The conductivity sensor switch (figure 3) replacement module can be used to check if the material is conductive. Its maximum resistance is 10MΩ. It can detect objects such as coins, wires, and metals, as well as materials such as the human body, fruits, and plants. By touching the positive and negative terminals of the conductive switch, the output state of the module will change. We use it in our project to detect the presence of a person's hand on the handle of the scooter.

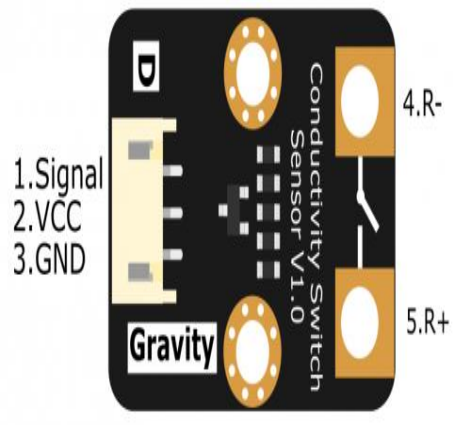

Figure 3: *Conductivity Sensor Switch*

2.4 Seat Switch

A seat switch (figure 4) is electrical device that turns on when its input reaches a certain pressure setting. Switches can be designed to make up or down contact. Pressure switches are widely used to control and monitor systems that use high pressure fluids in industry. Another type of change is the use of visual energy; For example, felt bumpers are used to open doors and trigger security alarms in commercial building and safe house.

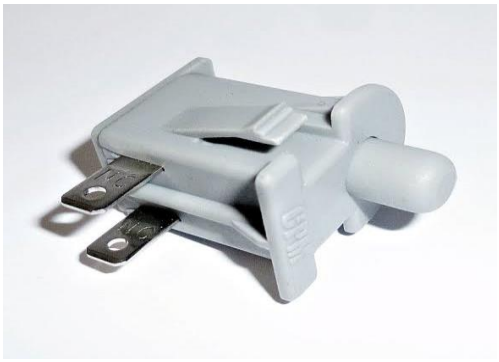

Figure 4: *Seat Switch*

3 Wiring Diagram

The system (Figure 5) is made with a Solenoid, Arduino, Conductivity Sensor, Seat Switch. The two terminals of Conductivity sensor switch are connected to the metallic handle grip of the scooter, where the sensors output is connected to the Arduino. A 12V supply is taken from the ignition switch to power the Arduino, its output is connected to the Relay. The Relay takes the input from Arduino and output is given to the Solenoid. But in the circuit between the Relay and Solenoid there is the seat switch connected in series to the power line. When the handles are touched by a person the conductivity sensor detects that and gives the input to the Arduino. Arduino then runs the program and gives its output to the relay. When the relay is activated, it gives the 12V supply to the solenoid. But in between the circuit there is a seat switch, which gives the input of a person being seated on the seat. Thus, when the 2 criteria are met the solenoid lock is released.

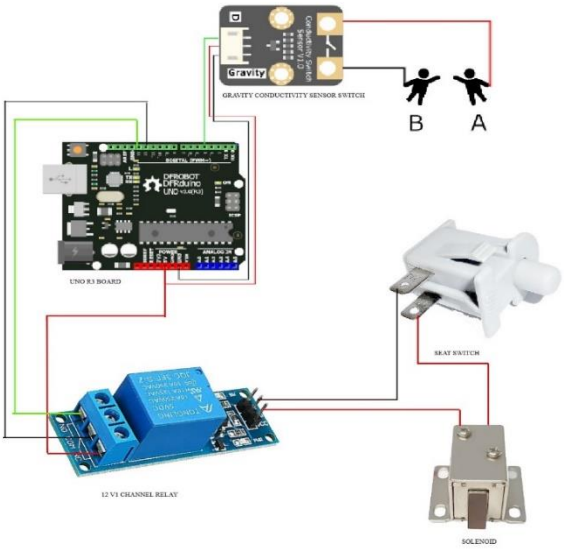

Figure 5: *Wiring Diagram*

4 Conclusion

The project was initiated to eliminate the accidental rise of a scooty throttle that may occur due to the negligence of driver which may lead to lethal injuries to the driver or the pedestrians. So, we developed a system that can avoid these kind accidents by allowing the driver to accelerate the vehicle only if he/she meets a certain parameter such as the both hand of driver should be in the handle and he/she should be seated in the seat, which means the driver is to be a condition that he/she is willingly driving the vehicle

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References

[1] Jianquan Wang, Basim Hafidh, Haiwei Dong, Abdulmotaleb El Saddik "Sitting Posture Recognition Using a Spiking Neural Network" IEEE Sensors Journal, 2022.

[2] Mrs. K.Sangetha,Ms. V.Priyadharshini, Ms. S.Swathi, Ms. S.Jothika, Mr. Muthuvel Ramesh." SMART DRIVER MONITORING SYSTEM TO AVOID ACCIDENTS USING ARDUINO" Industrial Engineering Journal ISSN: 0970-2555 Volume: 52, Issue 5, No. 2, May: 2023

[3] R. Hari Sudhan M. Ganesh Kumar A. Udhaya Prakash S.Anu Roopa Devi P. Sathiya, "Arduino Atmega-328 Microcontroller" International Journal Of Innovative Research In Electrical, Electronics, Instrumentation And Control Engineering Vol. 3, Issue 4, April 2015

[4] Won-Sung Sohn. "Design and Evaluation of Computer Programming Education Strategy using Arduino" Advanced Science and Technology Letters Vol.66 (Networking and Communication 2014), pp.73-77

[5] Lajos Nagya, Tamás Szabóa , Endre Jakaba, "Electro-dynamical modeling of a solenoid switch of starter motors" sciverse science direct Procedia Engineering 48 (2012) 445 – 452

[6] M. Papoutsidakis, A. Chatzopoulos, C. Drosos, K. Kalovrextis. "An Arduino Family Controller and its Interactions via an Intelligent Interface" International Journal of Computer Applications (0975 – 8887) Volume 179 – No.30, March 2018

[7] Mingming Zhao, Georges Beurier, Hongyan Wang, Xuguang Wang "Driver Posture Prediction Using Pressure Measurement and Deep Learning" IRCOBI Asia 2020

[8] Mingming Zhao, Georges Beurier, Hongyan Wang, Xuguang Wang. "Exploration of Driver Posture Monitoring Using Pressure Sensors with Lower Resolution" Sensors 2021