Prudent Breaking system

INTRODUCTION

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As we see now a day, lots of accident occurs due to drink and drive, because of what there is hell of loss of people, people get injured, people may die also. People can't control their habits so we think to bring some solution to this common problem and contribute our efforts towards society.

Our project deals with Automatic Braking System with the help of Microcontroller and some other components

When the driver is drunk, he may lose his grip from steering wheel, or he may fall on the steering wheel. So driving then he may lose his control due to the alcohol avoid this we made a project in which when driver holds the steering then the switches of the steering gets pressed and hence as per the program set in the microcontroller is executed and the solenoid switch starts, but as the driver takes OFF his hand out of the steering or lose his grip due to some uncomfortable conditions then the switches get released & the process of automatic braking starts with activation of buzzer to acquaint the driver that he has lost his grip over steering wheel and the parking lights and danger lights gets switched ON so as to avoid any further accidents

The switches are placed on the Upper and sideways of the steering wheel so as to balance the pressure of hand over the steering wheel, so as the driver puts his hand on the steering wheel, due to this the switches gets pressed and microprocessor will activate the solenoid switch

If the driver loses his grip, the switches get depressed due to which microcontroller activate the process of applying break on the car automatically with the activation of buzzer and danger lights.

1.2 OBJECTIVES

- This type of automated breaking system could be more helpful in day to day life, where the number of accidents due to reckless unconscious driving are increasing.

- The use of microcontrollers to implement the automated breaking is very efficient and uses minimal power to operate.

- This car safety system can be integrated in every car out on the road with very low manufacturing cost.

1.3 ORGANIZATION OF REPORT

Chapter 1 gives an introduction and objective of implementation of Prudent Breaking System. Chapter 2 describes the past technology and modification. Chapter 3 provides brief explanation of project. Chapter 4 describes the components and its features. Chapter 5 explains the implementation and design of project. Chapter 6 includes the result. Chapter 7 includes the conclusion and future scope.

LITERATURE REVIEW

Prudent braking is a technology for automobiles to sense an imminent collision with another vehicle, person or obstacle; or a danger such as a high brakes or by applying the brakes to slow the vehicle without any driver input. Sensors to detect other vehicles or obstacles can include radar, video, infrared, ultrasonic or other technologies. GPS sensors can detect fixed dangers such as approaching stop signs through a location database.

METHODOLOGY

3.1 INTRODUCTION

The entire project is based on the optimal use of sensors to control the automobile with the help of microcontrollers. These microcontroller compute the input signals from the sensors and generate output for braking.

The LCD(16x2) Display, displays the current status of this system. In case of control loss, it displays the warning message immediately to get the attention of the driver. The buzzers also got activated in this event.
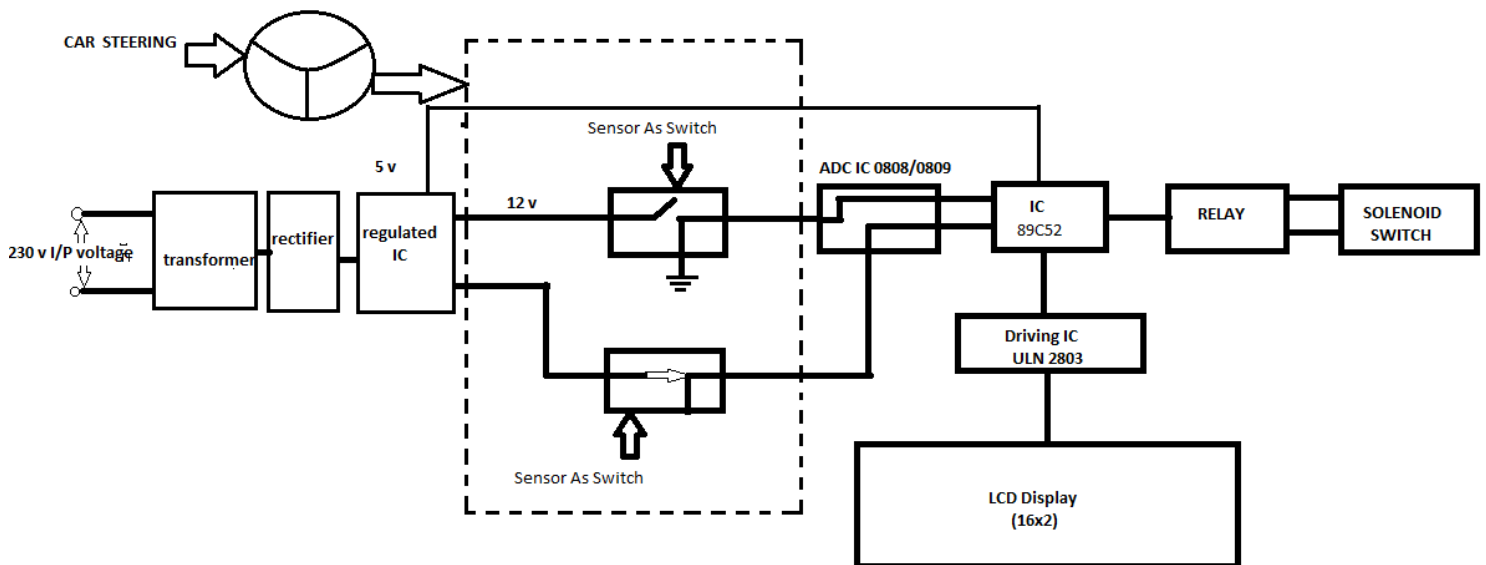

Figure 3.1 -Block Diagram

This contains 3 main blocks. Sensors, microcontroller IC and solenoid switch block. The sensors block contain the mesh of multiple sensors to sense the area of hand on the steering wheel. Which will be input to next block. The next block is microcontroller IC block. In this block, there are various controlling ICs which controls the output devices by logical operations. Solenoid switch is main device which actually apply the brakes of the automobile. The device works on the electromagnetic current induction through the coils.

3.2 Circuit Diagram
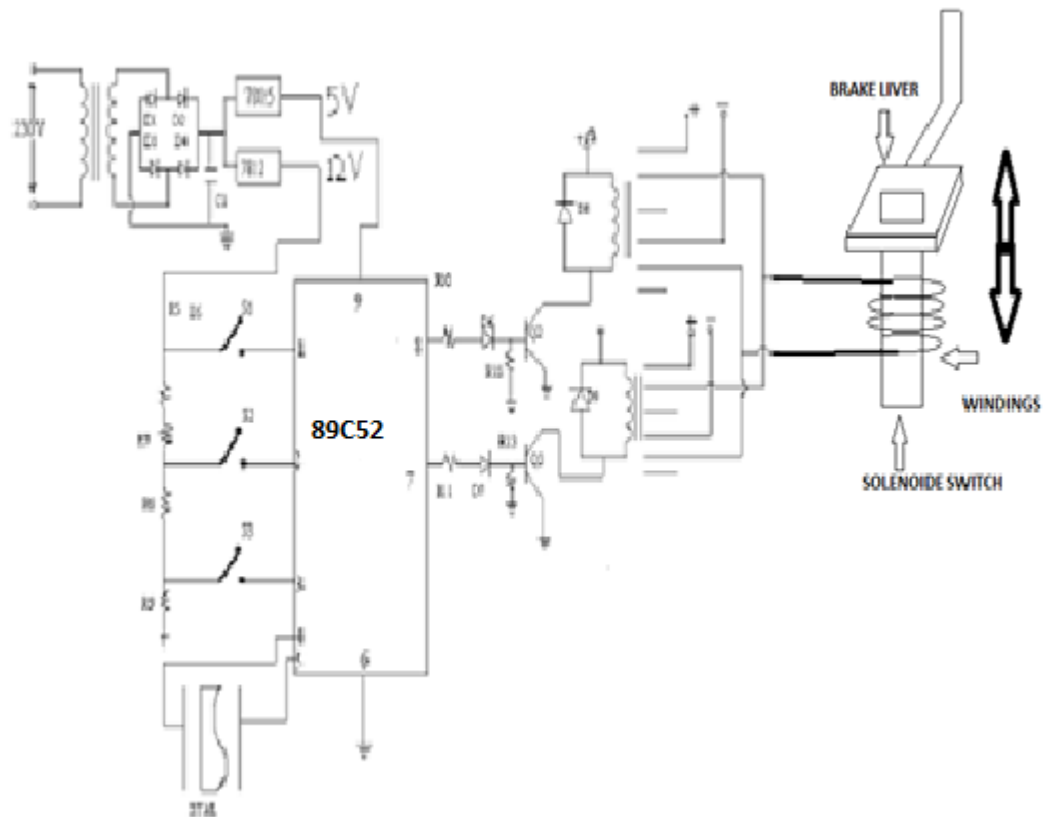
The above circuit diagram mainly consist of following components

1. Microcontroller 89C52

2. Infrared Sensors

3. Transistors

4. Regulator IC

5. LCD Display

6. Driving IC ULN 2803

7. Solenoid Switch

3.3 Principle of Working

The working of this project totally depends on the pressure applied by the driver on the steering wheel. When the driver puts his hands ON the steering wheel, pressure gets exerted on the steering wheel. Due to this the push-to-ON switches connected on the upper and sideways of the steering wheel gets pressed and hence GND gets connected to the input of microcontroller.

As the input of microcontroller is logic '0' so the microcontroller sends logic '1'on output pins i.e. PORT 0 pins. All the 8 pins viz. P0.7 to P0.0 receives logic '1' (All the 8 pins receives the signal so as a backup if any of the pin malfunctions). The solenoide switch is connected to one of the pins.

The logic '1' output on the PORT 0 pins will give logic '1' to the base of the transistor. As logic '1' is applied to the base of the transistor, so it becomes ON and the current is applied to relay through transistor and microcontroller. Initially as there was logic '0' on microcontroller pin, the relay was de-energized.

After receiving current to the relay it energizes the coil and due to this, magnetic field forms and the contact is connected to NC position where the solenoide switch is connected and due to this the more starts to run, simultaneously with the solenoide switch two green LED's indicating the front lights of the car also blows.

Whenever the driver pulls OFF his hand back, the pressure from the steering wheel is released and hence from the switches. Due to this +5V gets connected to input of microcontroller, and it sends logic '0' on the PORT 0 pins. Due to this the logic '0' gets applied to the base of the transistor and hence it goes OFF and the relay gets denergized.

As magnetic field collapses the contact gets switched to NO position and the solenoide switch gets disconnected. When the solenoide switch gets disconnected i.e when it becomes OFF, two red LED's blows up indicating the rear danger lights of a car. With the two LED's a buzzer also rings a bell indicating the driver to gain control over the steering wheel, and if he doesn't response the solenoide switch goes OFF.

The solenoid switch again starts to function whenever driver exerts pressure on the steering wheel. The biggest advantage of this system is the use of relays as a switching unit because relays are accurate, cheap and most of all, it isolates the 130RPM solenoid switch from the microcontroller . which can harm the microcontroller IC.