A SYSTEM FOR NEGLIGENT BIKE RIDERS

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Abstract— **Out of all the organs in our body, the heart and the brain are the most vital ones. When a motorcyclist is involved in an accident, it is the brain that might be at a greater risk of injury. A brain injury can result due to skull fracture, a concussion, brain hemorrhage, which can result in death Even if a part of the brain has been damaged, it might result in the loss of speech or motor skills. In order to protect the brain one must wear a helmet. A motorcycle helmet protects the skull and the brain from extensive damage. But in recent year most of the person not wear the helmet. In our project FSR sensor and Alcohol sensor is used. By using this system, we alert the person who is driving the vehicle in order to prevent him from the accidents. Whenever the person will not wear helmet or drink an alcohol then the FSR and alcohol sensors sense that information and sends it to transmitter. The Receiver, which is present in the vehicle, receives the information and automatically stops the vehicle. This system is useful in protecting the persons from an accident.**

Keywords— **FSR- FORCE SENSITIVE RESISTOR, RF TX-RADIO COMMUNICATION TRANSMITTER, RF RX-RADIO COMMUNICATION RECEIVER, μC-MICROCONTROLLER.**

I. INTRODUCTION

The significant rise in the number of two wheelers is happened during last decade in turn, increased the number of accidents involving two-wheelers. The most striking thing researchers have found studying the vehicle crash statistics and motorcycle injuries is that a large number of motorcycle accidents occurred due to the road user's fault viz. the lesser use of helmets, drunk driving and using mobile phones during driving.

In this paper, an automotive embedded system that can guarantee the safety of the driver is presented. The system which combines the alcohol detection, helmet detection and detecting mobile usage during driving. The system effectively controls the uniqueness of the driver, and avoids fraudulent practices of driver, and then significantly reduces the rate of the accidents and overcomes the shortcoming of the existing systems. This is an automatic detection system, the inconvenient blowing in the most systems is removed, and then the driver does not need any additional steps in the whole process.
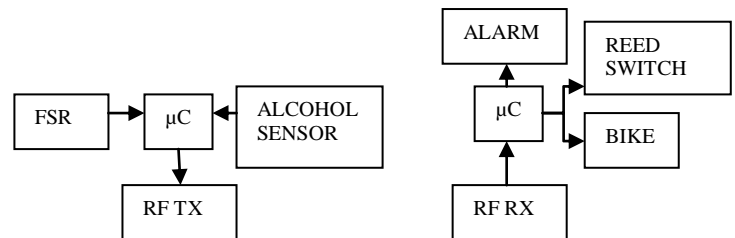
II. SYSTEM DESIGN

Fig 1 Transmitter section　　　Fig 2 Receiver section

The entire system design includes eight parts which is shown in fig. Figure 1 shows the Transmitter section; Figure 2 shows the Receiver section.

After activating, FSR detects the presence of helmet by change in the resistance value and it gives to the controller. Alcohol sensor detects whether the driver is drunk and data sent to the controller. The information transmitted to the bike by RF system. RF RX receives the information from the RF TX. When information is ok it checks the reed switch Reed switch is used for detecting the presence of mobile phones. After comparing the data from the entire sensor the relay is on. Hence bike is ready to operate. If condition fails relay off and alarm starts to inform the rider.

III. SYSTEM HARDWARE DESIGN

The system hardware is mainly composed of the signal components, the control unit and the implementation components.

A. Signal Components

Signal components comprise the alcohol concentration signal, the helmet signal and the reed switch signal, and then send them into the MCU.

1) Alcohol Detector

Alcohol detector includes a alcohol sensor, a filter circuit and an A/D converter. The semiconductor direct heated alcohol sensor TP-3C is selected; its circuit is shown by Fig 3. The sensitive organ is sintered by nanometre SnO_2 and extender, slight bead structure and simple circuit, and it can transform the conductible change into the export signal which is corresponding with the alcohol concentration. The sensor has 0 ~ 5V steady voltage output, little disturbance of outside, high sensitivity, rapid response and recovery [3]. Therefore, it does not need to use amplification circuit, and directly sends the output voltage into the MCU by the A/D converter to compare with the safety threshold, thereby to determine whether the driver is drunk. The A/D converter adopts 12-bit ADS574 chip, the chip is the next generation of ADC574A. It

has its own sampling and holding function, and can work with a single 5V power. Its precision and sampling frequency can meet the requirements of the system.
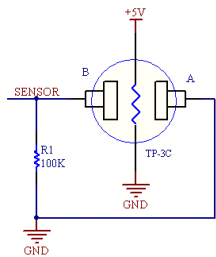

Figure 3 TP-3C sensor circuit

2) *Force Sensitive Resistor*

FSRs are sensors that allow you to detect physical pressure, squeezing and weight. They are simple to use and low cost. FSR's are basically a resistor that changes its resistive value (in ohms Ω) depending on how much its pressed. These sensors are fairly low cost, and easy to use but they're rarely accurate. They also vary some from sensor to sensor perhaps 10%. So basically when you use FSR's you should only expect to get ranges of response.
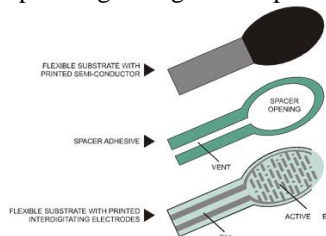

Figure 4 Force Sensitive Sensor

3) *Reed Switch*

A reed sensor is a device built using a reed switch with additional functionality like ability to withstand higher shock, easier mounting, additional intelligent circuitry, etc. In this system reed sensor is used to sense the presence of mobile phone.

B. Control Unit

In this paper AT 89C51 is used as a controller and controller acts as a sontrol unit.

Microcontrollers are "Embedded Device". It can control the features or actions of the product. for control applications; it has Up to 4K bytes of on-chip Program Memory, 128 Another name for a microcontroller is "embedded controller." It can control all the function what are all interfaced. Microcontroller is an 8-bit CPU optimized bytes of on-chip Data RAM. In this paper we are use the Microcontroller as control unit to control the vehicle operation.

C. Implementation Components

The implementation components include an engine starting controller and a sound-light alarm. The starting controller can control the starting of the engine, which circuit is shown by Fig 5. This aim is achieved by the normally open switch

(Relay K1) in the low-voltage ignition circuit. When the Relay K1 keeps close, the vehicle can start. If open, because low-voltage ignition circuit is disconnected, the vehicle cannot start.
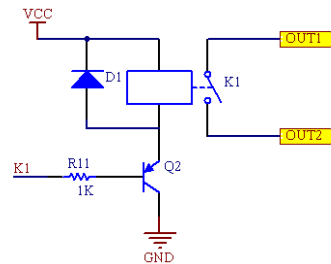

Figure 5 Starting Controller circuit

The sound-light alarm device includes an audio alarm, a light alarm and a switch S1. L1 is a red warning light, L2 green, Sp is a warning speaker, every resistors with current-limiting are used to protect the circuit. This circuit is shown by Fig 6.
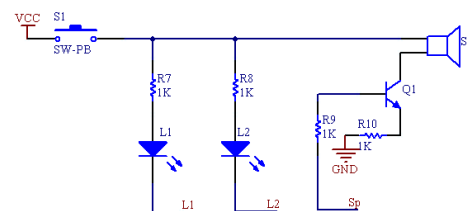

Figure 6 Sound-light alarm

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IV. SYSTEM PROGRAM DESIGN

The program design of the automotive embedded system to guarantee the uniqueness of the driver is based upon the 'embedded C'. The system program flow is shown by Fig 7. The alcohol detection determines whether the alcohol concentration in the helmet has exceeded the standard, FSR detects the presence of helmet by change in the resistance value and it gives to the controller. Controller compares the value with threshold value. Then controller detects the presence or absence of helmet. Reed switch is used for detecting the presence of mobile phones. The whole system program skilfully combines the three functions, can further effectively prevent the accident and further increase the safety.

FIGURE 7 SYSTEM PROGRAM FLOW
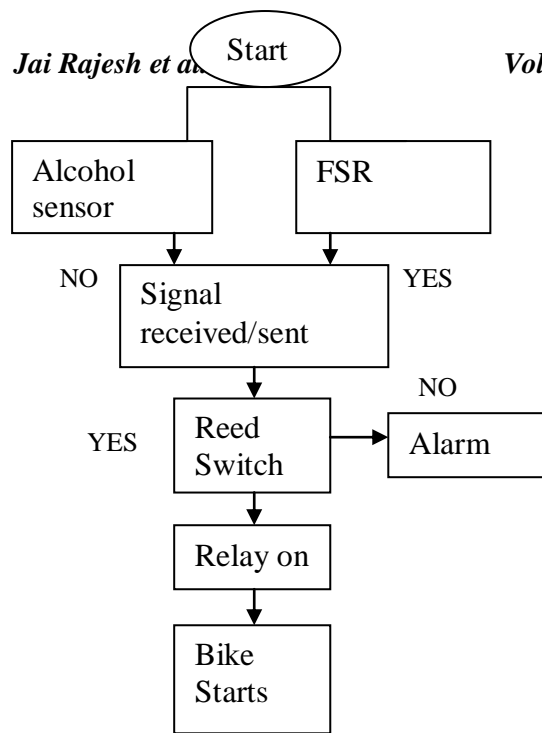
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V. CONCLUSIONS

The paper introduces an innovative model that the alcohol detection, helmet detection and mobile usage detection are combined skilfully; it controls the uniqueness of the driver, prevents the drunken driving behaviour and further increase the safety. The virtues of this paper include various features like

1) Ingenuity
2) Simplicity of design
3) Easy implementation

This automotive embedded detecting device based on 'embedded c' is easy to operate, also has high efficiency, stability and excellent human-machine interface, and has broad application prospects.

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