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Alcohol Detection and Motor Locking System

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ABSTRACT: Now-day's accident due to alcoholic drink consumed by car drivers has increasing and drivers are often not found by police. So in this project we designed a system using microcontroller and using a MQ3 alcohol sensor that will stop the engine of the vehicle if it detects the alcohol consumed by the driver. So we are introducing a system that will detect a drunken driver by alcohol sensor through driver breath fitted on steering in front of driver. As well proposed system also focuses on providing a system to monitor cars and when alcohol is detected at starting of ignition of car then car's ignition will immediately turn-off and if alcohol is detected after starting and while driving then application will reduce the fuel supply.

KEYWORDS: Microcontroller, LCD, Reception, Alcohol sensor (MQ3), Relay

I. INTRODUCTION

Every hour, 40 people which are beneath the age of 25 die in highway accidents. And as according to the world fitness organization, road traffic accidents caused an about 1.24 million deaths international within the yr. 2010, slightly down from 1.26 million in 2000. That is one person is died for every 25 seconds. Only 28 international locations, representing 449 million people (7% of the world's population), have well enough legal guidelines that cope with all five danger elements (pace, drink-using, helmets, seat-belts and toddler restraints). Over a third part of street site visitors dying are in low- and middle-earnings countries are among pedestrians and cyclists. However, less than 35% of low and center-earnings nations have regulations in area to guard those road users [6]. The important aim of this device is to keep away from the fee accidents which can be usually occurred due to drunkenness of driving force. This device stumble on the drunkenness of driving force and save you them from riding, so this attempt to provide one form of security or protection mechanism to driving force and save stay. There also are lot of coincidence purpose together with excessive pace of automobile, drinking, drowsiness of driver, seat belt adjustment, and keep away from the use helmet that's all cause twist of fate

II. RELATED WORK

In [1], they had use PIC 16876A controller, Alcohol sensor, LCD Display And Alarm system to notify driver only, ignition system was immediately off when detected alcohol. In [2], GSM and GPS were used to send location and alcohol detected related message to relative of driver. Location was normally in longitude and latitude which was difficult to locate. Ignition system directly turn off when detected alcohol. In [3], IR LED 894 was used. It produces high intensity IR ray's, which means it absorb alcohol of only high content from air, so this symbolizes that this mechanism will work only when driver is over drunk for lower concentration of alcohol it was detected accurately.

In [4], IR sensor was used to detect obstacle which comes in front of this sensor (vehicle), and when obstacle detected vehicle was stop. It was also monitoring the toxic gases such as CO₂, LPG, Alcohol from inside area of the vehicle. If there is high content of gases then SMS had been send to authorized person to notify only. In [5], it describes

a real-time online prototype driver-fatigue monitor. It uses remotely located charge-coupled-device cameras which was equipped with active infrared illuminators to acquire video images of the driver. Various visual cues that typically characterize the level of alertness of a person are extracted in real time and systematically combined to infer the fatigue level of the driver. The visual cues employed characterize eyelid movement, gaze movement, head movement, and facial expression. If the eye of driver is being continuously closing it mean eye-blink frequency is beyond the normal state and it is in sleeping condition then ignition system would be off immediately.

III. SYSTEM ARCHITECTURE

Here AT89S51 is used as Microcontroller Unit (MCU) which acts as the heart for the system. The system is divided into two parts; one part is for detecting, and another for controlling the parts installed in the car. The working of the system is when the driver sits, in position sensor gets activated and send alert abnormal condition to detect alcohol for the driver. Then the detection process starts and displays the amount of alcohol taken on Liquid Crystal Display (LCD). If the amount of alcohol detected is normal, the vehicle can start. If detects more than the alcohol allowed makes the vehicle cannot work if driver ignores the command and tries to start the car immediately breaks will activate and makes the wheels not to rotate. The ignition will begin only when the key touches +ve and -ve terminals with low o/p at the key terminal, the key fails to complete the circuit where it results in fuel supply cut-off to the engine. Thus the engine stops working or doesn't start depending on the position of the car.

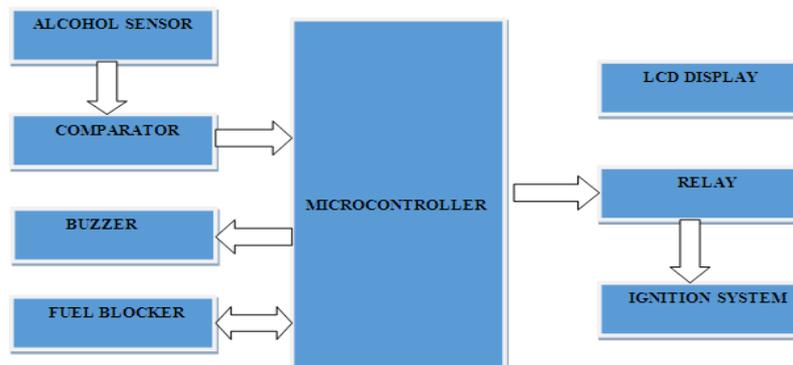


Fig.1: Block diagram of alcohol detection and Engine locking with fuel blocker

1. AT89C51:

Now let us talk about this popular 8051 chip. It has on chip ROM in the form of flash memory. This is ideal for fast development since flash memory can be erased in seconds compared to the twenty minutes or more needed for the 8751. For this reason the AT89C51 is used in place of the 8751 to eliminate the waiting time needed to erase the chip and thereby speed up the development time. To use the AT89C51 to develop a microcontroller-based system requires a ROM burner that supports flash memory; however, a ROM eraser is not needed. Notice that in flash memory you must erase the entire contents of ROM in order to program it again. This erasing of flash is done by the PROM burner itself.

2. Alcohol Sensor:

The alcohol sensor will detect the alcohol content from human (driver) breath and send its value to microcontroller. Alcohol sensor (MQ3) is suitable for detecting alcohol concentration just like your common breathalyzer. It has a high sensitivity to small value of BAC and fast response time, provides an analog resistive output based on alcohol. It has SnO₂ as a gas sensitive material to sense alcohol.

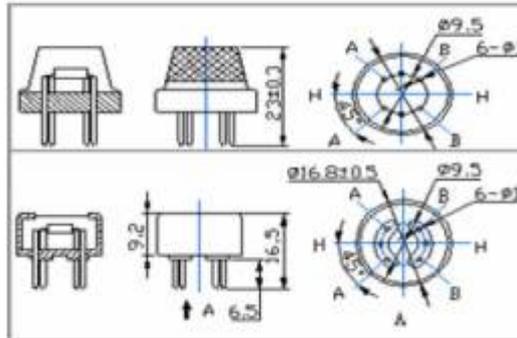


Fig. 2: Overview of MQ-3 Sensor.

3. LCD Display:

The LCD display is fitted inside the car and this LCD display is act as indicator to driver and other people who are sitting inside the car. This display gives indication of alcohol level detected by alcohol sensor, this also provide warning message to driver to stop car or vehicle within particular time afterward car will automatically stop, indication of smoke/gas detected in car.

4. Fuel Supply Blocker:

When alcohol is detected while driving then instead of stop ignition system directly while driving state, signal is passed to fuel blocker and fuel supply is cut-off. This results in fuel supply cut-off to the engine. Thus the engine stops working or doesn't start depending on the position of the car.

5. Relay:

Relay is used to turn off the ignition system by passing low power signal to ignition system .that's mean when alcohol detected power signal is triggered.

The advantage of the system is that the driver cannot even tamper with it. Because the fuel supply valve is open only when all the components are working properly. So if anyone tampers with it or if the alcohol content is above a particular limit, fuel is not supplied and the vehicle cannot be started.

- Also when the fuel supply is cut-off, the car doesn't stop abruptly. This helps to prevent collision with the vehicles coming behind.
- This circuit detects the alcohol directly
- This circuit is simple in construction.
- Readily available ICs are used.
- Responsibility of the circuit is high.
- High Accuracy

Applications:

1. "Alcohol Detector project" can be used in the various vehicles for detecting whether the driver has consumed alcohol or not.

2. This project can also be used in various companies or organization to detect alcohol consumption of Employees

Finally it is decided to write code for the 8051 microcontroller. It doesn't matter whether we have chosen Assembly or C Language for ourselves but what matters now is that we need an environment specially designed for 8051. Basically we are looking out for IDE (Integrated Development Environment) that will help us to build and compile programs. KEIL IDE is basically an assembler and a compiler or whatever you name it. We can write either an Assembly or C language code and KEIL will take care of the rest for us. Furthermore, it supports many of the 8051 variants that we will face.

Burning / Programming and HEX files

We all are familiar with the term installing software on our Windows based system but in 8051 microcontroller, we refer to this process as burning / programming the device which is similar to installing some software on it. So let's get



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used to this terminology. The burning or programming process is accomplished using a burner / programmer which are both combination of hardware and software. When we program the 8051, the code is permanently stored in its ROM (please check here for complete information regarding the ROM in 8051) and will stay there until erased or re-programmed.

We cannot go on programming it with anything we want. The 8051 can be programmed only with file type known as the HEX files. Don't get confused by the name. Hex files are generated very easily. If we have written a simple program in some language and generated its output then we know what compilation is. If we haven't, we suggest to get familiar with some programming language first. So here is the deal: we write a program for the 8051 in some language and then using specific compilers, we generate a hex file for the code we have written which is ready to be burned.

IV. RESULTS AND DISCUSSION

The following procedure explains the procedure of flow

- o When driver starting car/vehicle then alcohol sensor start sensing at condition vehicle speed equal to zero.
- o If alcoholic driver detected then immediately ignition system will turn off along with message about detection is send to relevant of driver for notification and notification will be displayed on LCD.
- o A flag is set when first condition is passed without detection of alcohol.
- o When speed of vehicle is greater than zero. i.e. vehicle started to driving then again along with alcohol, start to sense collected parameter values are send to microcontroller.
- o If alcohol detected in this case then signal is send to fuel blocker by microcontroller for blocking fuel supply to ignition system.so driver feel's that vehicle is going to stop and then place car at appropriate location .

Strategies to be used for proposed system:

1. Starting vehicle by driver.
2. Check alcohol sensor of vehicle.
3. If it is zero then start sensing by various sensors & notifies detection .In this case alcohol is mainly checked if it detected then stop ignition.
4. If speed is greater than 2 kmph then again sensing started. Detection of various parameters will be sense by sensor & will benotify.
5. At a same time if alcohol is detected then fuel supply will blocked.
6. Vehicle will stop¬ifies detection and displays in LCD.

V. CONCLUSION& FUTURE SCOPE

Our system efficiently checks the accident occurs or not and drunken driving. By implementing this system in vehicle, a safe journey is possible which would decrease the injuries during accidents and also reduce the accident rate due to drunk driving. This system has also accident prevention technology which would reduce the accident of the vehicle in crowd areas. Proposed system will resourcefully detect alcohol through driver breath and stop the vehicle by interrupting the ignition, instead of directly stopping the vehicle. We can implement a mechanism to cut off fuel supply instead of stop ignition system directly because direct stop of ignition system on detecting an alcohol may be dangerous as driver driving a vehicle at a high speed and it may lead to chance of accident, so after cutoff fuel supply driver will place at a proper position.

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