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Development of Vehicle Ignition Lock System with Driving License and Alcohol Sensor

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ABSTRACT: Our project's goal is to reduce accidents and make human driving safer. This project was created using an Arduino board, an RFID module, and an alcohol sensor. More tasks can be handled by Arduino UNO than by traditional controllers. The first and most popular type of card identification is RFID modules. Adopting it for use as a type of security in already-existing systems is a crucial step in investigating its advantages. This research project focuses on replacing the traditional way of employing keys with the use of a licence or RFID card for vehicle ignition. The following modules could be used to segment the prototype system. The ignition system module and the hardware interface module for the RFID module that accepts card numbers. The RFID module enables the database to store the card number or licence number of authorised users of the vehicle. Before any user can light the vehicle, his or her licence number is compared to the licence number in the database, and users for whom the database contains no matches are prevented from doing so. Sending the proper signals to the parallel port of the computer and then to the interface control circuit enables control of the vehicle's ignition system. The project's alcohol sensor was used to measure the amount of alcohol in breath samples. Since the sensor's fine sensitivity range is only about 2 metres, it can be used with any vehicle and is simple to conceal from suspects. This is installed inside the vehicle. The project is made to ensure the security of passengers inside vehicle.

KEYWORDS: Vehicle ignition, Driving license, Alcohol sensor, Safety vehicle, Locking system

I. INTRODUCTION

Driving without a licence is a serious issue in many nations. According to a survey, unlicensed drivers, drunk drivers, and drivers who don't buckle up often cause accidents. Authenticating a driver's licence is one of the greatest ways to guarantee the safety of the vehicle. By employing this technique, we can stop unlicensed drivers from operating motor vehicles, which lowers the number of collisions. This project intends to develop an architecture that checks the driver's licence for validity and makes a firm judgement about whether to switch on or off the ignition system based on that determination. This project's primary goal is to grant or refuse permission to operate a vehicle based on a driver's licence. To operate a car, a driver must possess a valid driver's licence. This lessens the likelihood of someone operating a car without a valid licence and helps to prevent traffic accidents.

The goal of this project is to make vehicles like cars, trucks, and other motor vehicles safe and secure. Today, alcohol is a factor in accidents in almost every nation on earth. The purpose of the car's alcohol detection system is to keep the occupants safe. The term "radio-frequency identification," or RFID, describes a system in which a reader uses radio waves to read digital data contained in RFID tags or smart labels (described below). RFID is comparable to barcoding in that data from a tag or label is taken by a device and saved in a database. Barcode asset tracking software is inferior to RFID in a number of ways. The key distinction between the two is that although barcode data requires alignment with an optical scanner, RFID tag data may be read without doing so.



II. LITERATURE SURVEY

This paper to have flexible communication among all these components multiplexing is important. Multiplexing plays an important role in working of a vehicle and makes vehicle more efficient. Similarly developing safety measures to prevent drunk and drowsy driving is also a major challenge for car industry.[1]

This paper author has Development of to increase the safety on roads it is necessary to provide a system which prevent the drunken person from driving the vehicle. In this project alcohol ignition lock is placed in front of the driver seat. The sensor will lock the ignition after detecting the alcohol beyond the limit. For security of vehicle there is a system in which only car owner can get access to the car by inserting the four digit PIN. This will protect the vehicle from theft.[2]

Majority of accidents, which occur, are due to drunk driving. In the past decade, the number of motor vehicles in developing countries is increasing a lot. Official investigation reports of traffic accidents pointed out that dangerous driving behaviour, such as drunk and drowsy driving, account for a high proportion among all the accident causes. In order to avoid these kinds of unexpected accidents, it is necessary to develop an appropriate in-vehicle system with warning modules that can directly improve driving safety.[3]

In the past decade, the number of motor vehicles in developing countries is increasing a lot. Official investigation reports of traffic accidents pointed out that dangerous driving behaviour, such as drunk and drowsy driving, account for a high proportion among all the accident causes. In order to avoid these kinds of unexpected accidents, it is necessary to develop an appropriate in-vehicle system with warning modules that can directly improve driving safety with alcohol detection.[4]

Owing to Radio Frequency Identity jamming of the push-button system experienced in cars which can easily be stolen within the car key frequency range as a major challenge facing this system, there is a need to find a solution to this problem. This now motivates the efforts geared towards designing a fingerprint based system that always requires the user's finger even if there is any invading or unauthorized act in a car to proffer solution to car theft and unauthorized use.[5]

The issue of car hijacking or snatching on highway, car theft due to easy access to car's functional system can be reduced by using a biometric system for starting the car's engine as the necessity of protection and access restriction in many luxurious assets is now very important. Biometric systems have in a long time served as a strong security system in many different applications and it can also be implemented in automobile industry.[6]

III.COMPONENTS OF VEHICLE IGNITION LOCK SYSTEM

1.Arduino: Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards ('shields') or breadboards (for prototyping) and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, which are also used for loading programs. The microcontrollers can be programmed using the C and C++ programming languages, using a standard API which is also known as the Arduino Programming Language, inspired by the Processing language and used with a modified version of the Processing IDE.

2. MQ3 Alcohol sensor: The MQ3 alcohol sensor is one of the series of MQ gas sensors, which can detect and monitor the alcohol gas present in the atmosphere. It is capable of detecting 25-500ppm alcohol gas concentration in the air. This article gives a brief description of the pin configuration, specifications, and Arduino interfacing of the MQ3 alcohol sensor.

3. LCD Display: LCD or Liquid Crystal Display is a flat electronic display which is very commonly used in digital watches, calculators, laptops, televisions etc. It make use of light modulating properties of liquid crystal and polarization of light for its operation. Low power consumption, less thickness and less weight of LCD enables its use in battery powered and portable applications.



4. RFID Modules: The term RFID stands for Radio Frequency Identification, as the name defines the operation of the device is based on the Radio frequency signals. The RFID systems consists of RFID Reader and a tag which is normally used in identification and tracking of objects. Before discussing more about the RFID, let’s see the uniqueness of this technology and its general application. Today in most cases barcodes are used for identifying an item in a warehouse or a supermarket using a barcode scanner, this existing system can be upgraded with the RFID technology. Similar to barcode the RFID can also give unique identification number to all products but the added advantage is unlike the barcode system’s line of sight, this system can detect the RFID tag within its proximity range. Meaning you do not need a human to search for the barcode and point the barcode scanner on it.

5. DC Motor: A DC motor in simple words is a device that converts direct current(electrical energy) into mechanical energy. It’s of vital importance for the industry today, and is equally important for engineers to look into the working principle of DC motor in details that has been discussed in this article. In order to understand the operating principle of dc motor we need to first look into its constructional feature.

6. Buzzer: A buzzer takes some sort of input and emits a sound in response to it. They may use various means to produce the sound; everything from metal clappers to electromechanical devices. A buzzer needs to have some way of taking in energy and converting it to acoustic energy. Many buzzers are part of a larger circuit and take their power directly from the device’s power source. In other cases, however, the buzzer may be battery powered so that it will go off in the event of a mains outage. Some devices that provide emergency power have buzzers on them so that the user knows that they are running on backup power and not on mains power.

IV.METHODOLGY

As the driver enters in to vehicle, the RFID should keep on RFID reader in order to read the driving license. Once the driving license is detected the next step is to detect the alcohol. If license is not detected the microcontroller cut-off the ignition similarly, in the case alcohol presence the ignition of the vehicle cut-off. To ON the ignition the license should be detected and alcohol should not be detected so further the engine get started. In this method, the system will also alert the user about the validity period of the driving license. The above input and output study of the proposed hardware system demonstrates that the vehicle can be ensured that it is been driven only by the persons who have valid license and one who have not consumed alcohol.

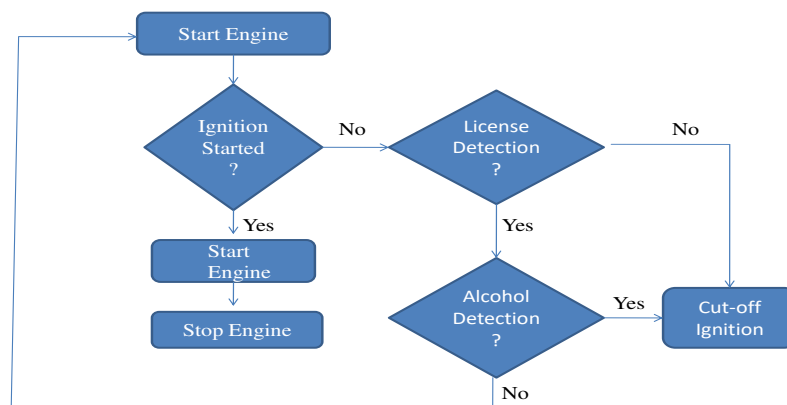


Fig.(a) Flow chart of driving license and alcohol detection

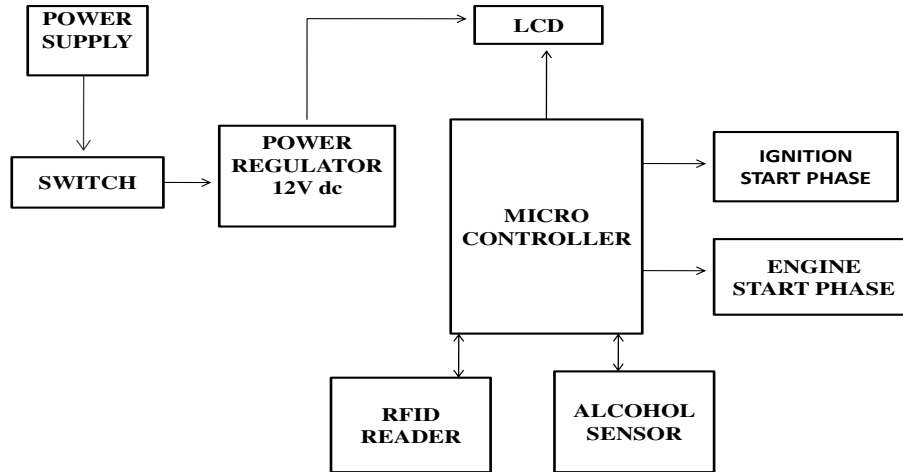


Fig.(b) block diagram of Vehicle ignition with Driving License and alcohol detection

V. CONCLUSION

Developed a method for alerting drivers when alcohol is detected in automobiles. Using platforms like Arduino, alcohol sensor, dc motor, and LCD display, an effective solution is given for creating the smart system for vehicles that would perceive numerous vehicle parameters over a consistent time period. The advantages of low volume and excellent dependability apply to the entire system. The future potential of this system is to regulate accidents and lower the rate of accidents. It innovates with the current technology in cars and enhances the safety features, making it a successful advancement in the automotive sector.

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