SMART SECURITY AND ALERT SYSTEM FOR VEHICLES

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ABSTRACT
Now days, the security of vehicles is of prime concern. This system will provide restricted access only to the authorized person. The first layer of protection in this system is fingerprint matching and alcohol detection. The Alcohol detection system will stricture the drunken person. We have designed locking or unlocking system using fingerprint module. This system helps to activate, authenticate and detect the user in the real time for security of vehicle. The second layer of security system is fuel theft detection. In this layer by using GSM, the message will send to the owner if the fuel theft is detected.

KEYWORDS: Fingerprint matching, Alcohol sensor (MQ3), GSM, float sensor, PIC microcontroller

INTRODUCTION

The most significant feature is the vehicle security from theft and it has been ensured by providing three layers of anti-theft protection. The access to the vehicle is limited to authorized person only, whose database is stored in the system. The biometric scheme is used as the primary layer of protection. Second layer of protection is alcohol detection. The third layer of protection is produced by level sensor and GSM (Global System for Mobile Communication) technology.
The safety of vehicle is extremely essential. The first layer of protection in the system is a Fingerprint recognition, based on which the locks are operated. The matching of fingerprint is done on the basis of ridges. If the finger ridges match, relay is opened for fuel supply. If finger matches failed, it will result in vehicle getting immobilized. The main focus while developing the bike anti-theft system was to integrate the above features equally.

LITERATURE SURVEY

As mention in [1], the message will send to the owner when fingerprint matches and engine starts. In our project we are using same technique to ignite engine. As discussed in previous papers[2] when fingerprint matching fails, then message will send to owner indicating the theft attempt and in our system we are using same technique for fuel theft detection. In [3], the message will send to the owner indicating level of fuel in tank but in this project, we are using level sensor to detect fuel theft if sudden change occurs in level of fuel in tank and then only message will send to the owner. In [4], when the level of alcohol exceeds certain level then an alert message will sent.

METHODOLOGY

Although, various researches has done to minimize the problem of insecurity of vehicles. The previous security systems were work as only alarm system. But those systems were specifically made for cars only. Previous systems were expensive and not much reliable. Now days, fingerprint module is widely used for security purpose in offices, institutes, banks etc. So we chose fingerprint module as main perspective of system. As we know, drink and drive cases are
Frequently happens in cities, so to reduce this problem our system will be more reliable. These days, cases of theft are increasing. So the proposed system is designed to reduce these problems. The aim is to build a system which operates required functions at reasonable cost. In the proposed system, we are combining three methods to secure two wheeler.

BLOCK DIAGRAM AND ITS DESCRIPTION:

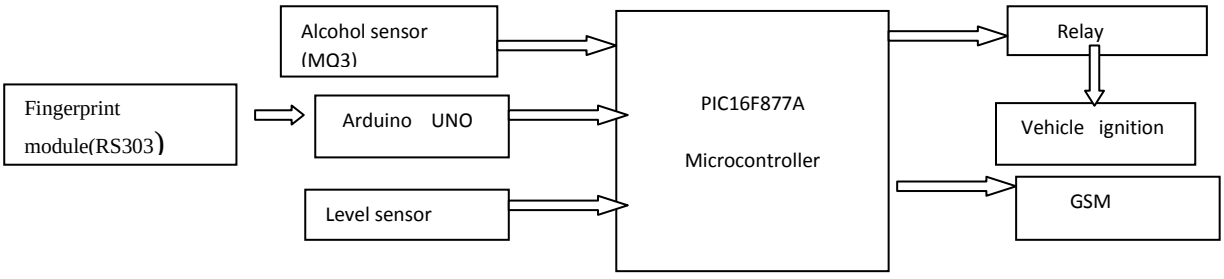


Figure (1): Block diagram

As shown in figure (a) alcohol sensor, fingerprint module and level sensor are interfaced to pic microcontroller. First of all user have to enroll his fingerprint in the fingerprint module. Then the module will scan the fingerprint and compare with stored database. Along with it, alcohol sensor will check whether the user is drunk or not. Fingerprint module is interfaced to arduino and its output is given to the pic microcontroller. If fingerprint does not match then relay will not ignite engine. The level sensor is used to detect the level of petrol. If sudden change occurs in the petrol level, then level sensor will send a signal to microcontroller and it will send a message to the owner by using GSM. LCD is used to indicate the user through messages if finger is not kept properly and if alcohol is detected. The user will come to know that the fingerprint is not scanned properly.

Fingerprint module (RS303): This module requires 5V and 100mA supply. Scanning speed is less than 0.5s. Fingerprint processing includes two parts: fingerprint enrollment and fingerprint matching (the matching can be 1:1 or 1:N). While enrolling, user needs to enter the finger two times. Fingerprint module will generate template of size 512 bytes.

Alcohol sensor(MQ3): This sensor needs 5V and 150mA. Tin dioxide is used as sensing element. When alcohol is detected, coil in sensor gets heated, depending on that heat, analog voltage is generated at the output.

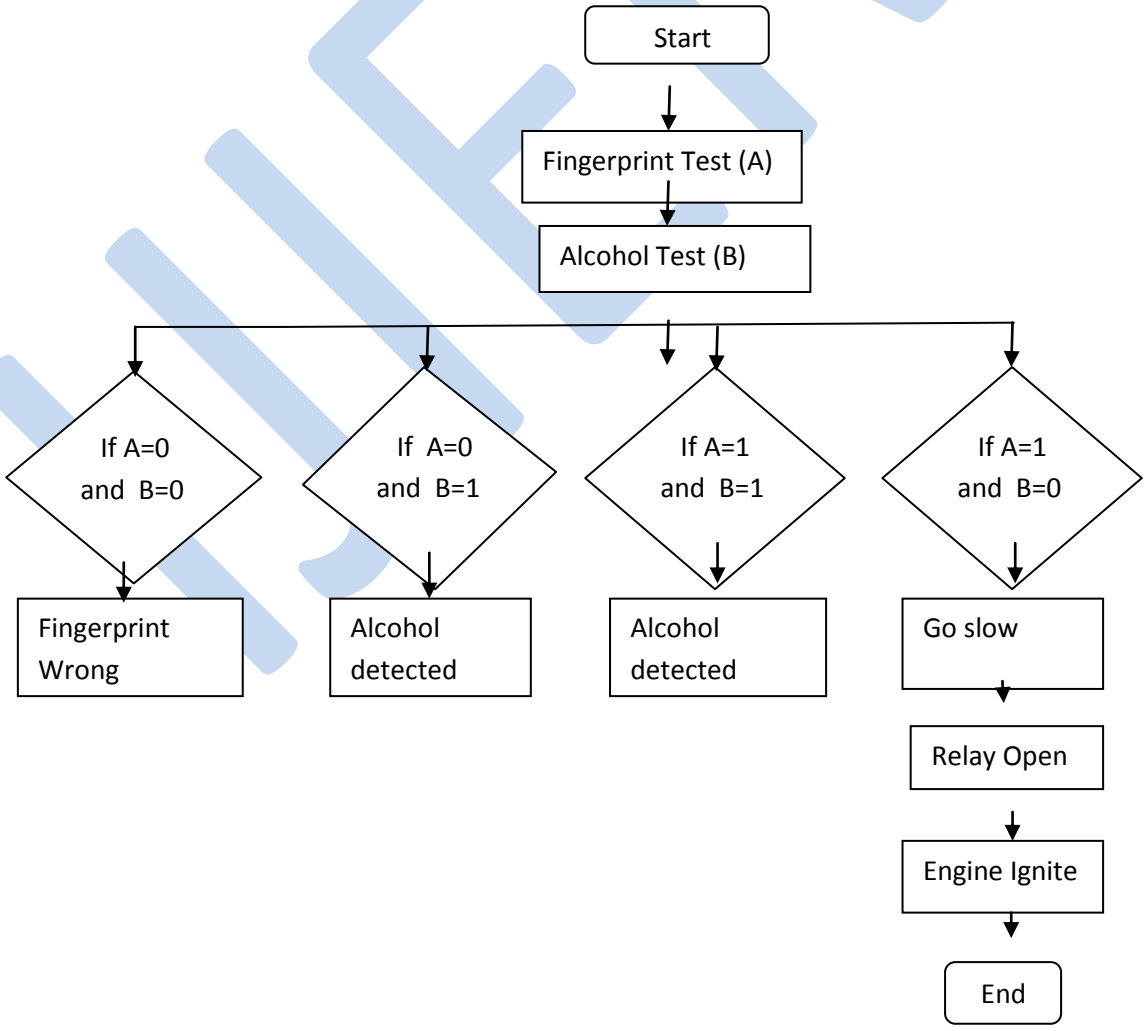
Level sensor: Float sensor has magnetic reed which changes its position depending on level of fuel in tank.When tank is full, output of float sensor is 0V and when tank is empty float sensor gives 5V at the output. When sudden change occurs in level of fuel message will send to the owner through GSM indicating theft attempt.

Arduino: In this system we are using Arduino UNO. Operating Voltage is 5V and 3.3 V. Flash Memory is 32 KB. SRAM 2 KB, EEPROM 1KB, Clock Speed is 16 MHz .It is open source IDE.

GSM module

Ardino UNO module

FLOWCHART:



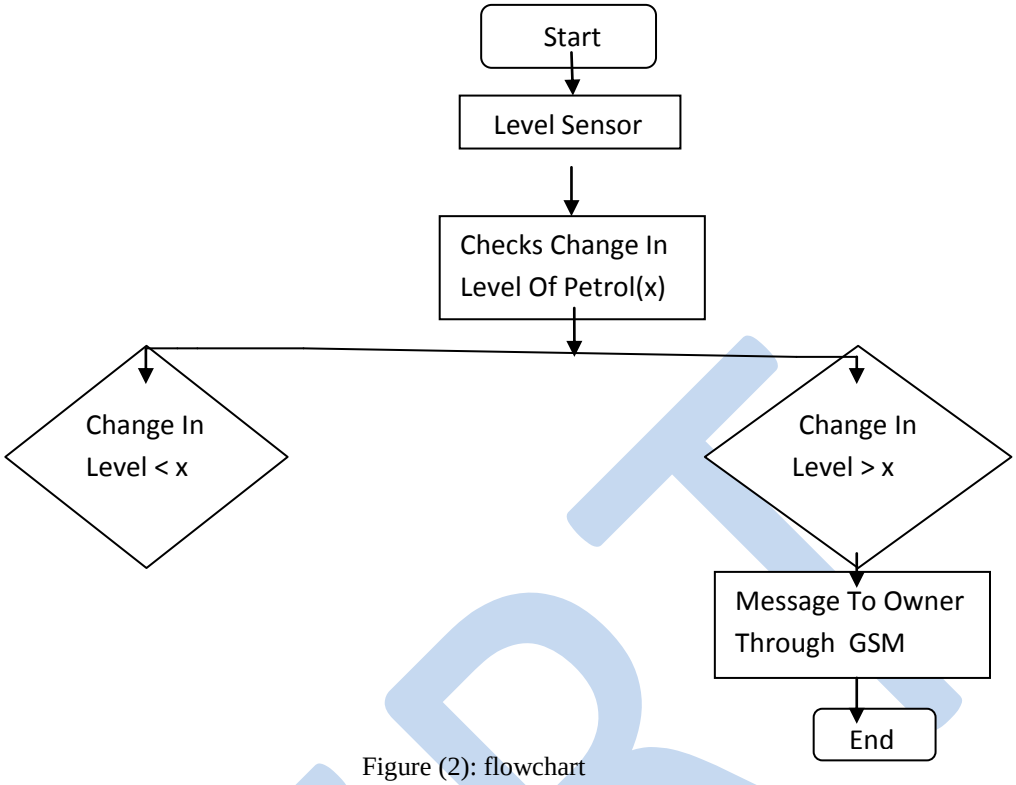
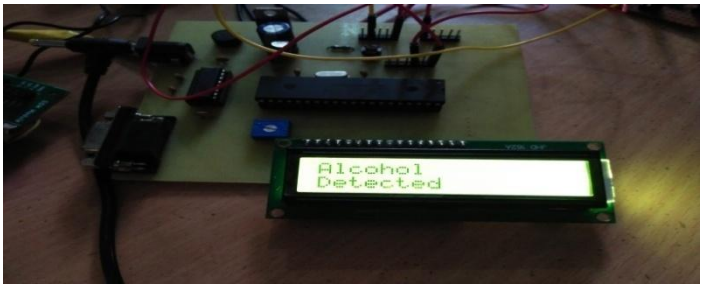


Figure (2): flowchart

RESULT AND DISCUSSION

Depending on status of fingerprint matching and alcohol detection, following messages will be displayed on LCD, depending on programming conditions. Due to that, user will come to know that finger is not kept properly. When sudden change is detected in the level of fuel, message will send to the owner.



Fingerprint module output	Alcohol test	Messages
Not matched	Found	Alcohol detected
Not matched	Not found	Fingerprint wrong
Matched	Found	Alcohol detected
Matched	Not found	Go slow

The level sensor can be placed in the tank of fuel. Only fingerprint module will be accessible to the user and it can be placed on the front panel of vehicle. The power supply given to system should be continuously on. This limitation of the system can be overcome by using power down mode.

CONCLUSION

By using biometric identification, the system will act as smart system. It is also user interactive. The system is more reliable by integrating three safety systems in one system. It will also limit drink and drive incidences due to alcohol detection. Due to smaller size, it can be placed anywhere in the vehicle. The system will provide more secured access and awareness towards theft.

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