FINGER PRINT VEHICLE STARTER

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ABSTRACT

Abstract:This paper focuses on the ignition of vehicle using fingerprint sensor and liquid crystal display, we are generating the same results along with same proficiency and accuracy in it by reducing its cost factor, so that it is easily affordable by customers and we can widely spread and implement the security in different domains. This approach would be fruitful to users who want to possess valid and authenticated entry.

Keyword : - *Fingerprint Sensor, scanner etc….*

1. INTRODUCTION

Vehicles have been used in one form or other since the invention of wheel. With the invention of wheel, came in the 2nd most advanced technology, The Steam Engine. With the development of steam engine vehicle took the form of what we see today. In earlier times crank shaft mechanism were used to ignite the vehicles. Leaving that conventional method behind came in the concept of igniting the vehicles using key. And now, Keys are being replaced by Push start buttons. This project was started with the sole purpose of eliminating keys as conventional method of starting the vehicle. With the introduction of Biometrics in the 18th century, security advancement in technology has gone up to various levels [1]. In the 18th century it was used to verify the employees working for the British Empire. Since then Biometrics has taken its toll. Biometrics is formed from the Greek words 'Bio' and 'Metrics' where 'Bio' means 'life' and 'Metrics' means 'to measure'. The four major methods used in Biometrics are: Palm, Fingerprint, Iris, Voice, Face etc. There are many more methods, but these four are the most important. Biometrics are used in Schools, Banks, Colleges, and Universities etc. One of the growing industries is the automotive industry. One of the first companies to introduce finger print recognition in cars was Mercedes, which was then followed by Volkswagen. But now a days almost all the car makers are implementing Biometric based security. Fingerprint sensors are quite cheap in comparison to other Biometric sensors. And they are relatively easier to maintain also. The reason for going into biometrics is that its chances of being duplicated are very less. There two main purpose for this project. First being the eliminating the use of key completely for igniting the vehicle. Furthermore even the entry into the car can be done without the use of keys by using a technology called RFID (Radio Frequency Identification). The second purpose is to cut the cost for this technology that only the premium car makers are imposing in the market. This can work can work with any four wheeler vehicle. This project has been simplified to such an extent that it can also be implemented in two wheelers as well. The paper is divided into

sections as follows. Section 2 describes the System in detail. Section 3 explains the Hardware and the Software used. Results in Section 4 and at the end we conclude with the conclusion and references.

1.1 Fingerprint Basics

IntroductionAll humans have minute raised ridges of skin on the inside surfaces of their hands and fingers and on the bottom surfaces of their feet and toes, known as 'friction ridge skin'. The friction ridges provide a gripping surface in much the same way that the tread pattern of a car tyre does (http://www.crimtrac.gov.au/fingerprintanalysis.htm). Friction ridge skin constitutes the only skin on the body without hairs. Fingerprints are patterns of ridges and valleys on the surface of the finger. Like everything in the human body, these ridges form through a combination of genetic and environmental factors. The genetic code in DNA gives general orders on the way skin should form in a developing fetus, but the specific way it forms is a result of random events. The exact position of the fetus in the womb at a particular moment and the exact composition and density of surrounding amniotic fluid decides how every individual ridge will form (http://www.computer.howstuffworks.com/fingerprintscanner.htm). This development process occurs in such a way that, in the entire course of human history, there is virtually no possibility of the same exact pattern forming twice. Consequently, fingerprints are a unique marker for every person, even identical twins. No matter how similar two prints may look at a glance, a trained investigator or suitable software can pick out clear, defined differences. This is the basic idea of fingerprint analysis, in both crime investigation and security (http://www.computer-.howstuffworks.com/fingerprintscanner.htm).The two fundamental principles underlying the use of fingerprints as a means of identifying individuals are: immutability and individuality or uniqueness.

1.2 Minutiae Based Approach in Fingerprint Recognition

Introduction Most automatic systems for fingerprint comparison are based on minutiae matching Minutiae are local discontinuities in the fingerprint pattern. A total of 150 different minutiae types have been identified. In practice only ridge ending and ridge bifurcation minutiae types are used in fingerprint recognition .

2. Interfacing through the PC Parallel Port

Fingerprint recognition systems based on minutiae consist mainly of three stages: Image acquisition/pre-processing, locating the minutiae, and comparing the minutiae list of both fingerprints, often solved as a constrained graph matching problem. This process has many stumbling blocks. Each of the processing steps requires careful fine-tuning of parameters and handling of ambiguous cases. Thus, the whole process of comparing two fingerprints may become rather time-consuming (Anton, 2002; Koichi et al, 2005).

Fig -1: FINGER PRINT APPARATUS

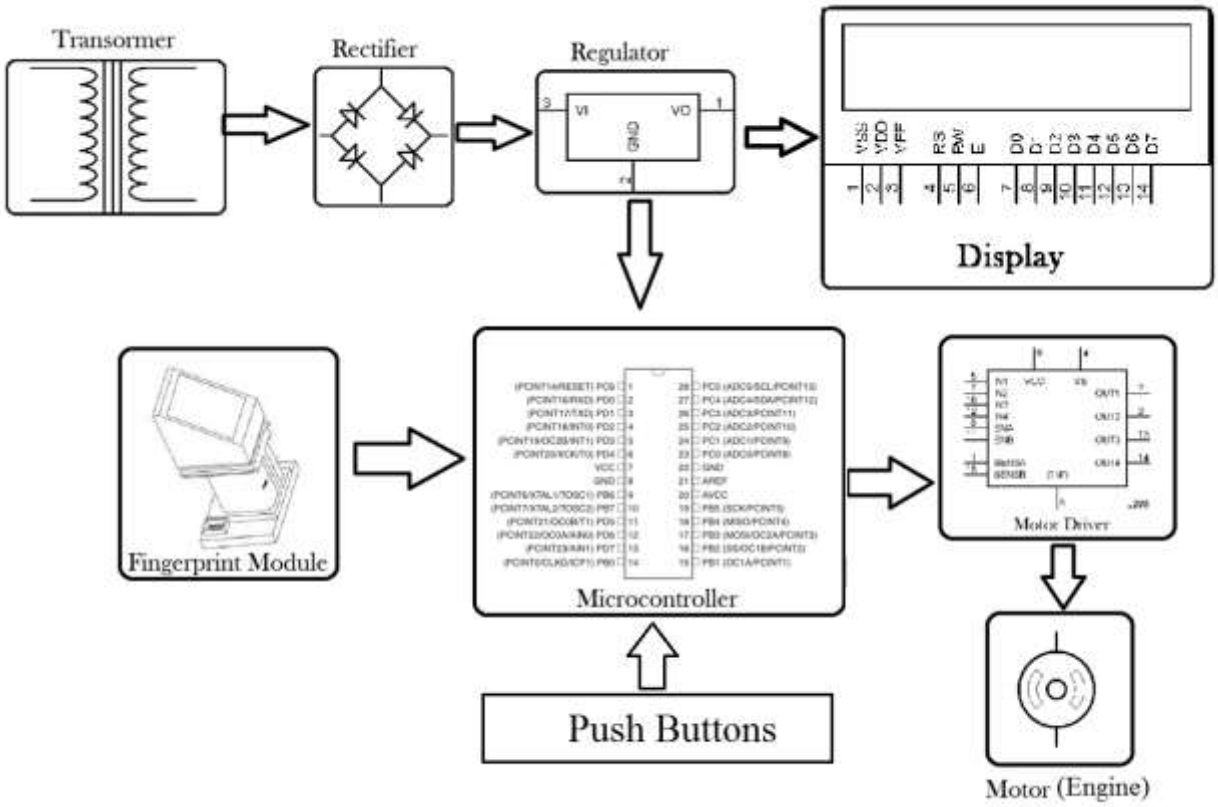

Fig -2: Block diagram

2.1 Parallel Port Programming

Programming languages like Visual Basic, Visual C, Visual C++, C#, Delphi etc are fast and easy tools for developing user friendly applications. They however lack important functionalities like direct access to the parallel port. Writing programs that communicate with the parallel port is easier with operating systems such as DOS (Desktop Operating System) and Windows 95/98 through the use of functions such as inporb and outporb or _inp() or _outp() in program codes. However newer operating systems such as Windows 2000, XP, NT etc do not allow this simplicity. This is as a result of the security privileges and restrictions they assign to different types of programs running on them. They classify all programs into two categories, namely: User mode and Kernel mode. User mode programs run in ring 3 mode and kernel mode programs run in ring0 mode .

2.2 Ignition Systems of Vehicles

The ignition system of an internal-combustion engine is an important part of the overall engine system that provides for the timely burning of the fuel mixture within the engine. All conventional petrol (gasoline) engines require an ignition system. The ignition system is usually switched on/off through a lock switch, operated with a key or code patch.The ignition system works in perfect concert with the rest of the engine of a vehicle. The goal is to ignite the fuel at exactly the right time so that the expanding gases can do the maximum amount of work that in line with the processes to make the vehicle move. If the ignition system fires at the wrong time, power will fall and gas consumption and emissions can increase. The part of the ignition system that first initiates the process of moving a vehicle is the key system in conjunction with the kick starter. A wire from the battery in the vehicle connects to the kick starter and other wires connect the kick starter to the key system. When the car key in the ignition system is turned once, two wires coming from the kick starter to the key system are bridged. This causes the engine and some other parts of the vehicle to be put in a READY or ON state. Turning the key again makes a third wire to temporarily join the already bridged wires, causing voltage to flow from the battery to the necessary parts vehicle so as to enable the vehicle move.

3. Fingerprint Based Ignition System Design

The program codes driving the fingerprint recognition software for ignition system control was written in visual basic 6.0 Enterprise Edition and ran on a PC. It uses a set of fingerprint images stored in an image folder in its directory. The test images can be enrolled into its database after it has gone through the stages of image enhancement, minutiae extraction and image post-processing (eliminates false minutiae). An image to be recognized is loaded into the image area and its extracted minutiae is compared with all the images in the database in the case of a 1 to many match, and with just a particular image in the case of a 1 to 1 match. A sufficient number of similar minutiae points between the two images compared, indicates that the input fingerprint image has a match which exists in the database. An insufficient number of similar minutiae points between the two images compared imply that the input fingerprint image has no match which exists in the database. The results from the matching process are communicated to a section of the recognition software which manipulates two data pins of the parallel port. A fingerprint match causes the data pins to be in a high logic level and ideally output about 5volts while a fingerprint mismatch makes the data pins to be in a low logic level and ideally output 0volts. An interface control circuit was constructed to link the PC parallel port to the ignition system of a vehicle. This circuit provides a high degree of electrical isolation between the PC and the ignition system which operate at different voltage levels, through the use of components called optocouplers. The circuit also provides capabilities for the controlling the ignition system via the interconnection of electronic components such as relays, bipolar junction transistors, resistors and diodes.

3.1 The Parallel Port Interface Control Circuit

Introduction The circuit was constructed using two optocouplers, two relays, four resistors, two diode, two NPN transistors, and jumper wires. The mechanism of the ignition system comprise amongst other things, three wires that are connected to the key system and used with the keys to ignite the vehicle. Two of these wires are bridged when the key is turned first, causing current to flow from the car batteries to all parts of the car requiring some form of electricity for operation. When the key is turned again, the third wire bridges momentarily with the two wires already connected. This causes the cranking of the engine, which ignites the vehicle.

4. CONCLUSIONS

This paper mainly focuses on the ignition of vehicle using sensors, which would provide ease to users in different circumstances, such as in case they forget the keys inside the vehicle or at the other current place. The use of fingerprint sensors provides the authentication to valid and registered users.There are many improvements or functionalities that could be added on to the current version of this system to make it more efficient in terms of security and portability [11]. The vehicle ignition is highly affected in case the registered user finger is defaced or defected or colored, the system won't allow the user to ignite the vehicle. To overcome this limitation we need to add on other features such as it scans the iris or heartbeat of the concerned user and after that it allows permissibility to the user, which would enhance the level of security up to a new apex. Our proposed works deals with the project in 2 modules that consists of an LCD crystal display which shows and display the value and the other one it comprises of fingerprint sensor which takes input from the user side. The results and observation described in the previous section assures the optimal and working results generated by the system.it improves the existing system by reducing the cost of the existing and overcoming the conventional system. As an application of it we can implement the same basic concept in other domains also , which requires more security from thefts such as authorized user entry only, verified users access in unauthorized regions only. Addition of more functionality would make it useful to be applied in other domains also.

5. REFERENCES

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