

BICYCLE LOCKING SYSTEM USING PASSWORD AND THEFT DETECTION

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ABSTRACT

Electronic locks have become more common in buildings and vehicles. The goal of the project is to design an electronic lock. The bicycle locking system is developed for providing advanced locking system for the bicycles and providing immediate notification of theft. Currently, bicycle theft has increased and often goes unnoticed. To increase the use of cycles the bicycle theft should be reduced. This Bicycle locking system works with the help of an electronic circuit having a password as the key to the bicycle lock. A metal wire is connected in such a way that the wire goes from in between the tyre spokes and into the system. So if someone tries to steal the cycle by breaking the lock it is sensed by theft detecting system and alarm is raised. Hearing the siren the owner can get alert and try to avoid theft from happening. The wire is used for the demo purpose but a strong metal pipe can be used to lock tyre. This wire is connected on to the system through RCA connector This locking system will decrease the theft of cycles and increase the use of cycles.

Keyword : - electronic lock, theft, key, password

1. INTRODUCTION

Currently, bicycle theft often goes unnoticed. Findings from the International Crime Victim Survey (ICVS)[1] indicate that bicycle theft is the highest per bicycle owner in cities where bicycles are most popular. The use of cycles will increase the use of sustainable transportation mode and will make less use of non renewable resources. One of the challenges of this locking system is the need of battery life. To use the lock, the system requires continuous power supply. Further researches can be done to use solar for charging battery. The lock has its advantages also. It is antitheft, cost efficient and easier than mechanical locks. This paper describes the use of password for locking and alarm raising for theft detection.

2. PROTOTYPE SYSTEM

The prototype system was made with the help of wire. But in real world applications, metal wire is used. The preferred type of lock is U-lock because this type of lock is used widely in bicycles. The size of lock is a result of controlling board size used. It is covered with a protective covering. A transformer is used to step down the input voltage. The power supply circuit and controller are kept inside the box. The keypad for password and LCD display is kept outside the box to enter the password. The electric power is used for opening the lock and detecting the theft. The system requires continuous supply of battery because if someone tries to break the lock the alarm must be raised. The siren requires battery supply. Use of solar batteries for the locks will save the use of power supply.



Fig -1: Circuit Of the system

3. Block diagram of the system

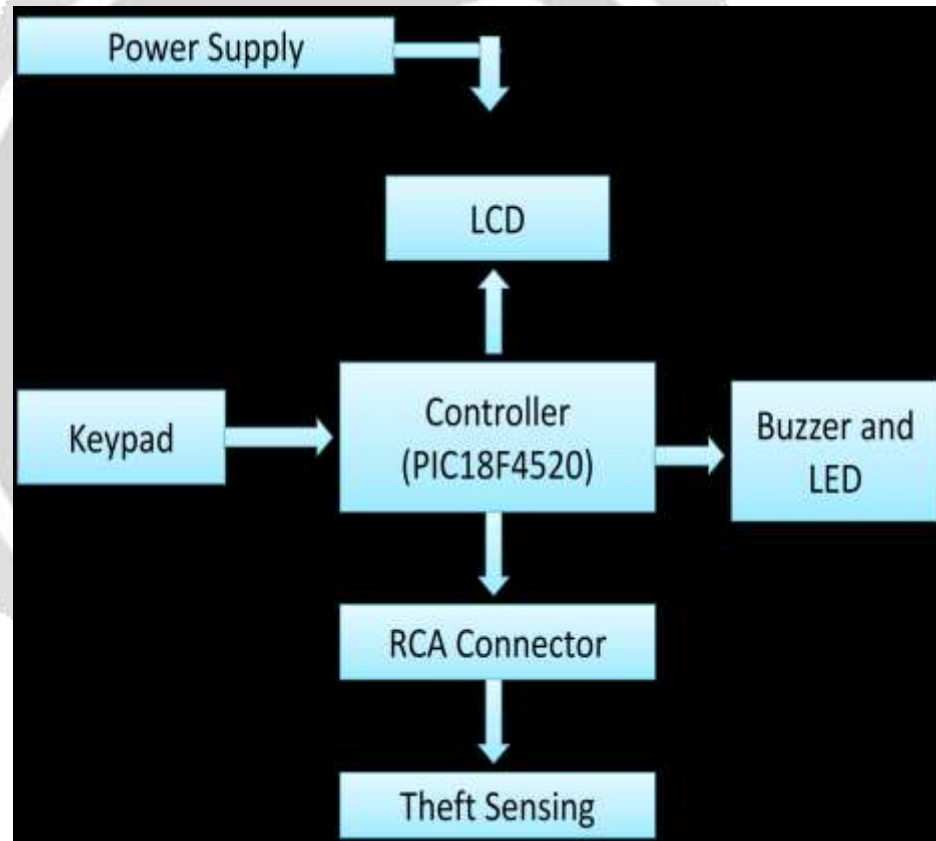


Fig -2: Block diagram of system

- When power supply is turned ON, the LCD displays 'ENTER PASSWORD'. The LCD, LED, Buzzer and keypad is interfaced to the microcontroller PIC18F4520.
- The keypad interfaced is 4x4 keypad and has values from 0 to F (i.e. 0 to 16).
- The theft can be sensed by the breaking of the metal wire connected or even if someone enters the wrong password.
- The buzzer is used as a siren raiser while the Led glows when a correct password is entered.

The pic controller is programmed is detect the theft and and check if the password is correct or not.[2]

3.1 Flowchart of controller program

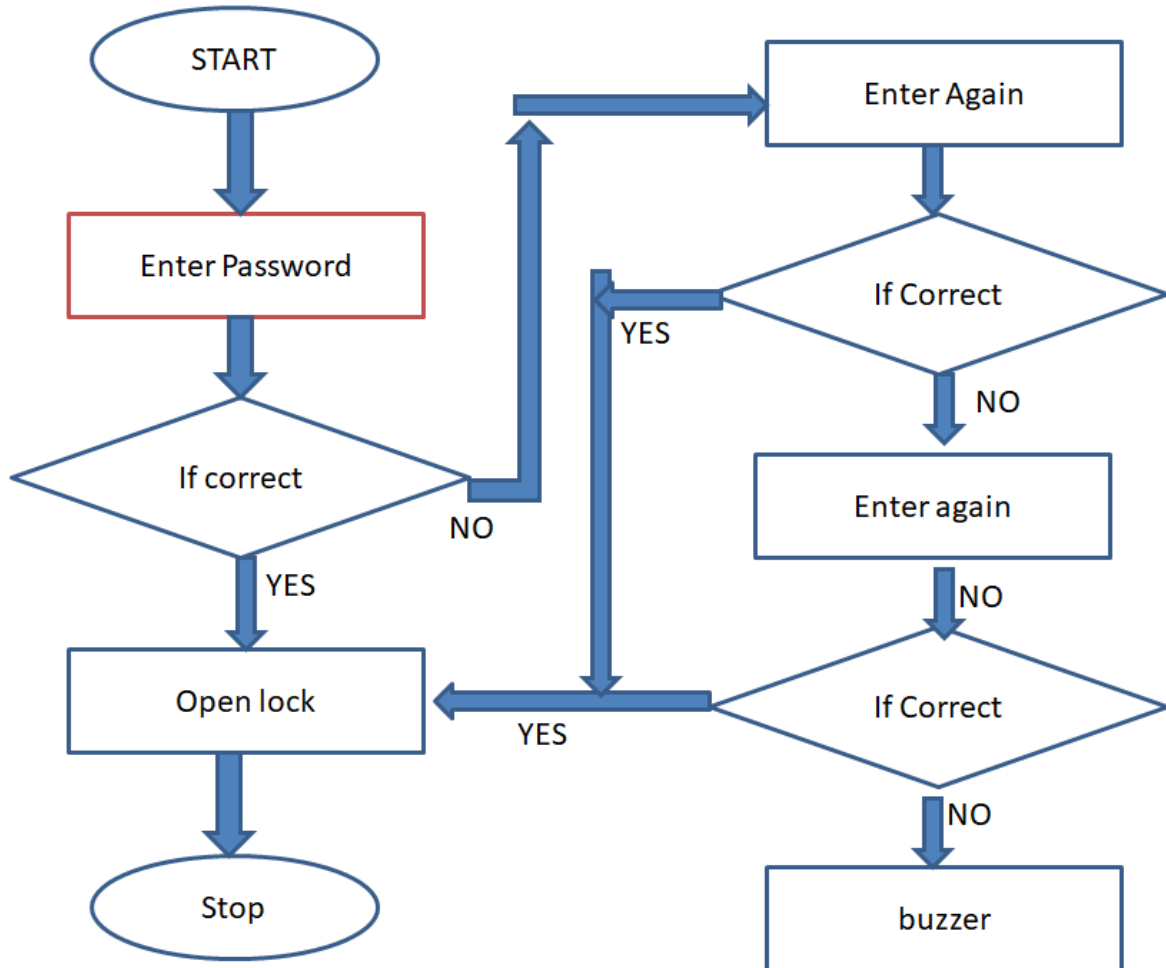


Fig -2: flowchart of controller program

5. RESULTS

- When correct password is entered the LCD displays “lock opens” and green LED glow.
- If someone tries to break the lock the buzzer will sound.
- If wrong password is entered then the buzzer will sound.



Fig -3: Result of the prototype system

6. CONCLUSIONS

The lock is useful to detect and make alert about the theft. The siren warns about the theft and it can be avoided. Cycling is widely regarded as a very effective and efficient mode of transportation optimal for short to moderate distances and therefore more people can move towards it if the theft is avoided using locks.

5. REFERENCES

- [1] Van Lierop, D. Grimsrud, M. & El-Geneidy, A. (2015). Breaking into bicycle theft: Insights from Montreal, Canada. *International Journal of Sustainable Transportation*, 9(7), 490-501 [2]. Reference [2] Muhammad Ali Mazidi, "The PIC Microcontroller and Embedded Systems", 3rd edition 2004, Pearson Education Inc.