System of Lock Security based on Android Platform by using PAN

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Abstract
Abstract- this paper proposes a multilevel protection in security devices and use PAN protocols for reconfiguring passwords. The PAN protocols used are Microcontroller and Bluetooth. Smart phone based on android platform are used here because they provide flexible ways of integration of GUI with android package kit (APK). The MIT app inventor is used for assisting improvement of android. Thus, an economic friendly, smooth, theft-proof and secured form of safety locks has been provided here.

Keywords: bluetooth, APK, MIT inventor, graphical user interface, personal area network, microcontroller.

I.   INTRODUCTION:

A lot of issues are reported about the theft of conventional locks whose keys are duplicated by nameless tools. These problems are triumphed by using lockers that are based on android and use microcontroller for offering security of multiple level and purchaser is able to address elements paths by better GUIs. These locks are used for schools, ignition starters of automobiles, banks etc. Android applications are used for incorporating these locks easily and offers increased security. This leads to the reduction in crime rates and blocking unauthorized access to anybody's premises. The walls of premises incorporates safety locks in hardware circuits. So there isn't any opportunity for anyone for the assumption of location of protection lock of Wi-Fi. The entrance of any men or women who is trying to skip the security face difficulties in doing that because password has special characters and it is of particular duration. The login templates help in blanketing the passwords of an individual[1].

II.   HARDWARE AND SOFTWARE:
A.   HARDWARE:
A wi-fi based android security locks are prepared by digital modules for security locks and the subsections given below described briefly.

1.   Arduino UNO:

Fig. 1 Development of Arduinouno

A security system based on android which has password and Bluetooth and microcontroller for reconfiguration. This is a platform helps in product development, rapid prototyping and

various conventional designed packages. It is enough to design safety tools by seeing all necessities and components for safety[2][3].This paper utilizes several element functions such as Bluetooth & android platform, EEPROM for storing the password if user makes adjustments, UART protocol for connecting Arduino.

2. Bluetooth

It is used for communication over short distances by using a Bluetooth module since it is a "Personal Area Network device (PAN)". The Bluetooth module works over a frequency range of 2.4 to 2.524 GHz. It features serial communications by master and slave mode. The HC-05 module is used for the design of Wi-Fi lock device. HC-05 integrate smoothly with Arduino. Safety parameters are provided by a connecting device. The issue faced by Bluetooth HC-05 is that of default password and there is a need to change baud price otherwise anyone can access this safety device unauthorized. Thus, there is a need to configure a desired password with the name of person by AT commanding[4].

Fig. 2 HC-05 Bluetooth module

3) Relay

Relays are type of switches that are operated electrically and is a type of electromagnetic device which works on 12V to 24V having a mini electromagnetic lock with a relay coil working between controller and an actuator as an intermediate for opening and locking a system.

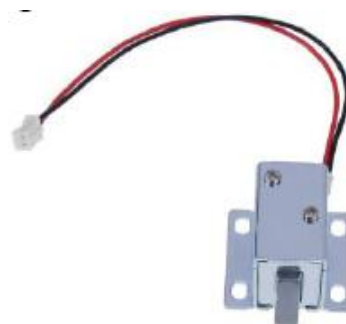Fig. 3 Electromagnetic relay

4) Mini electromagnetic Lock

Fig. 4 Mini electromagnetic control in Rrimin lock cylinder

The lock frame results from intake voltage of low power of stable and hard type, iron clot, working in specifications of 6V/12V/24V. It has symmetrical design released by strength instantaneous trigger, processes vividly, regardless of advantages, anti-prying, open design generation, drilling. This 5V relay module gets included.

5) Step down converter

Fig. 5 LM2596 step down DC DC converter

A regulated and protective supply is required because hardware security locks are capable of working at a supply voltage of 5V. This can be achieved by using the device given below.

B.   SOFTWARE

For android, microcontroller and APK are programmed. An IDE is needed for the integration of tools and library functions for designing.

1)   Arduino IDE

Fig. 6 Arduino IDE

The code is developed by an open-source software of Arduino (IDE) and uploaded to boards based on Arduino for the programming version of 1.8.3 [2].

2)   MIT app inventor

Fig. 7 App inventor

An online application development based on android using a technique of block code helping in rapid development of apk[5].

III.   METHODOLOGY

A security lock system based on android application having reconfigurable option of password using microcontroller and Bluetooth. The architecture of wireless system of lock security has been described in figure 6. After the installation is finished, a Bluetooth security lock Apk is installed in an android smartphone and after that the pairing of HC-05 Bluetooth module is done by providing a valid password for establishing a connection over security lock. After the connection of Bluetooth module is done, the connected devices contain the connected module in its list and then the module is selected and security passwords are sent to the destination lock.

The hardware EEPROM has the valid password saved into it. The sound alerts and lock status is provided by a device using status leds when a wrong password is entered, lock is closed/opened and the alert is created in the area because someone is trying to access the device in an unauthorised way. The device password is changed any time by valid user by choosing the password configuration's option for securing the password[6]. Thus, even if an unauthorized user access the mobile of a user then also the password cannot be changed or accessed. A prefix is added every time user sends a password and it is known only to device's developer and it offers an advantage of automatically opening and closing of user by the use of a timer function and user does not waits for closing or opening the lock or in case closing the lock is forgotten. This paper aims at providing a low cost and multi-level security system and user hands all this conveniently. An efficient security is provided in this prototype in comparison with traditionally used locks[7].
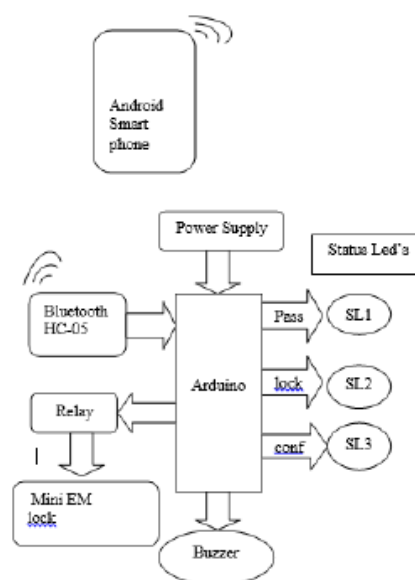

Fig. 8 Block diagram based on security system based on Android

The architecture of complete wireless lock security system has been described in figure 8. Initially a security lock apk is installed by the user

in an android smartphone after the installation is done.

IV. FLOW CHART

The open button (PB) and close button (CB) are used to operate over a lock as shown in figure 9 and a security system of lock has password reconfiguration as shown in figure 8.

The multi-level security for accessing the security lock which is needed to be entered by the user is explained in figure 8.
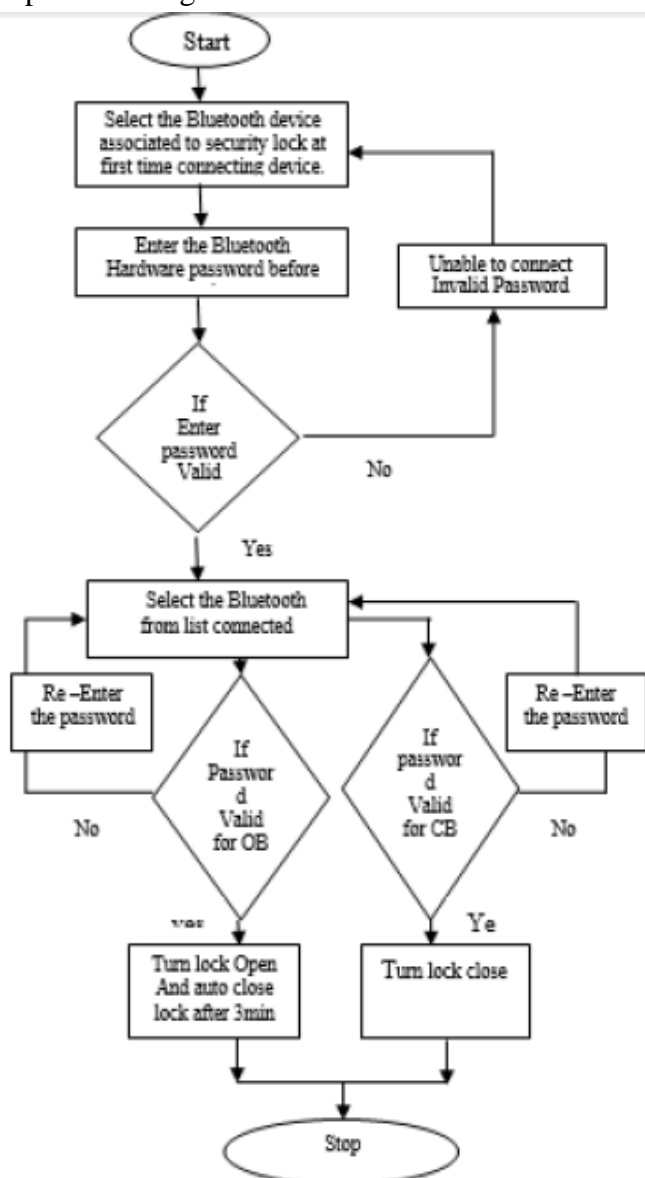
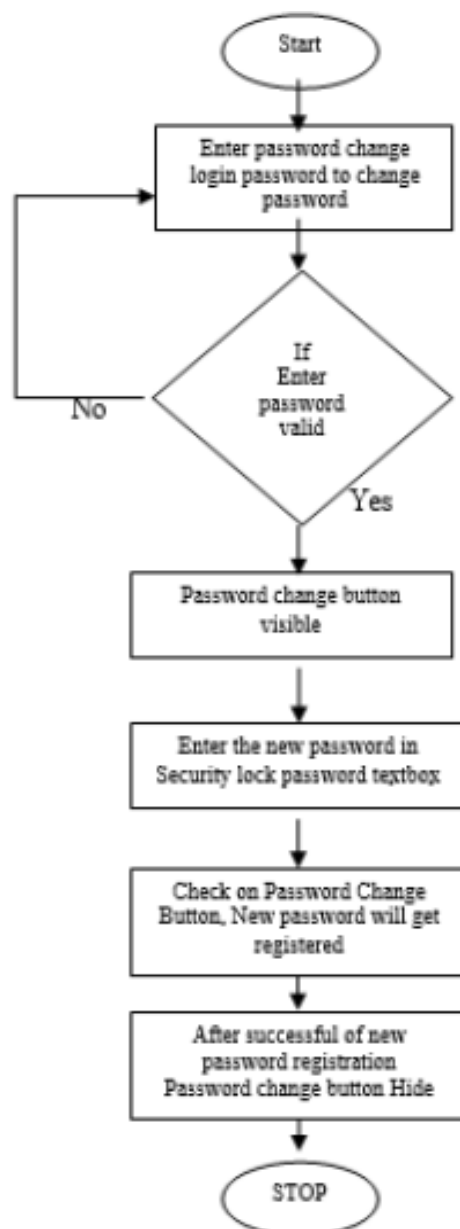

Fig. 9 Workflow of security lock system

Fig. 10 Workflow of password configuration

V. RESULT

The results of designed devices and their complete working has been demonstrated in pictures given below. According to the device testing and output results, images are attached.

A. Modules of Prototype:

Fig. 11 Buzzer in status LED's for altering during times of unauthorized access

Fig. 12 Android based security system and its internal circuitry
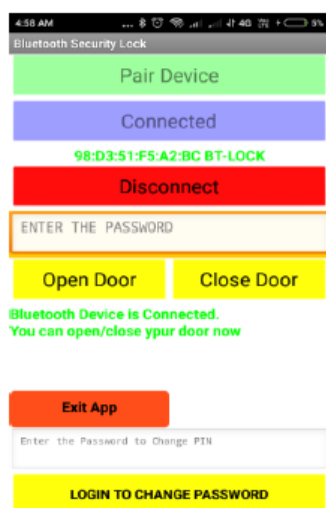

Fig. 13 Electromagnetic lock (mini)

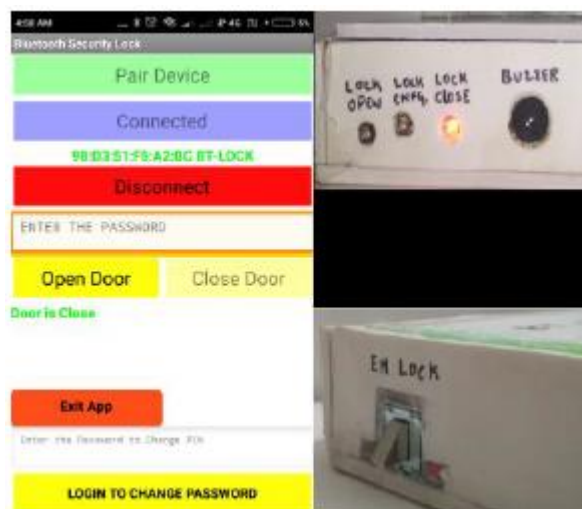Fig. 14 Smartphone integrating GUI with Security Lock

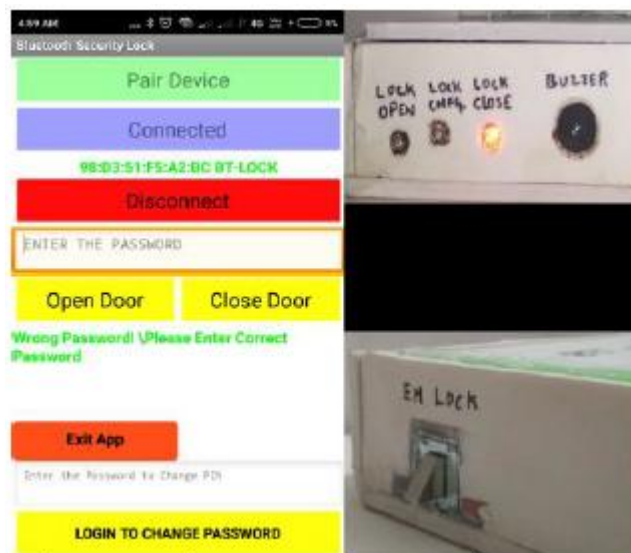Fig. 15 Status of lock when CLOSE command is given

Fig. 16 Status of lock when WRONG password is given

Fig. 17 Status of user when NEW PASSWORD is set

VI. CONCLUSION

This paper proposes a primary idea of managing domestic protection for door lock keys by using a lock device of solenoid as prototype for outside and inside key locks. An additional smoothness and safety is provided for android mobile users. Since this approach is based on open source platform like Arduino and android, it is free. So it is not expensive to implement this and also it is economically affordable. Device can be set up easily by using Wi-Fi Bluetooth inside a microcontroller. The prototype is efficaciously designed for manipulating the usage of Bluetooth enabled smartphone and HC-05 Bluetooth module. The prototype used in this paper is simple but it can be implemented in several regions.

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