Multi-Access Lock System

Abstract:

The Multi-Access Lock System is a door lock system for multiple users. The lock system has an LCD display for the user interface, a key pad, and a magnetic card reader for data entry. The lock system allows the user to unlock the door in one of the following ways: by swiping a preexisting card from their wallet; by entering a security code that is hard for others to guess but easy for them to remember; or for extra security the user can use a combination of both swiping a card and entering a security code.

Description:

The Multi-Access Lock System has different features such as an LCD display, a keypad, a magnetic strip reader, a micro processor for storage and data processing, as well as a door locking mechanism. See Figure #1. The locking system is capable of having multiple users. The system will have a scroll down menu, which will be displayed on the LCD screen to give the administrator access to the user information. This scroll down menu will display the user name and their security code. The administrator grants access to new users, edits user’s information, and delete existing user from the access list. The administrator can add new users to the lock system by swiping his/her card and entering a security code. After administrative access has been obtained the user can enter his/her personalized user name and password. After the new user is added to the access list, they can gain access by entering their security code on the key pad and/or by swiping a magnetic strip card. To edit or delete an existing user the administrator gains access to the system then scrolls through the list and selects the user to edit or delete.

The microprocessor will retrieve the data from the key pad and the magnetic strip reader module. The microprocessor will process the data if the security code is entered from the key pad and/or the magnetic strip module. If the entered code does not match the code stored in memory, access will be denied. If the entered code does match, the microprocessor will send a signal to unlock the door. The user name and security code will be stored in non-volatile memory. The magnetic strip reader module and the key pad will send information to the microprocessor. The locking mechanism will receive a signal from the microprocessor and it will unlock the door.

Figure #1
Background and Benefits:

One benefit of this product is that it eliminates the need for keys; it is very expensive to rekey a lock when keys are lost. Another benefit is that it allows the user the ability to unlock the door in a variety of ways. For example, each user can simply select a card with a magnetic stripe from their wallet to swipe, or they can select a security code that is easy for them to remember, or use a combination of both card and security code.

Comparison to similar products:

This proposed product has similar and different features then other products on the market. Most products on the market have LED for their interface and have either a magnetic strip reader, or a keypad. The Multi-Access Lock System has both a magnetic strip, a keypad, and a LCD user interface.

A similar product is the DL2700 from Trilogy. It has multiple level users, is battery powered, water proof, and can be programmed with a large number of user codes. The Multi-Access Lock System has all the same features with the addition of an LCD Display and a magnetic strip reader to access the lock. The Multi-Access Lock System can be designed to operate in a waterproof enclosure. http://www.alarmlock.com/dl2700.html

The Apollo Stand Alone Mag-Stripe Card /Keypad Access System is similar to the Multi-Access Lock System in the following ways: they both have non-volatile memory for storing the security codes; a magnetic strip reader; a key pad; and both have the ability to use different cards. The Apollo system can only use two cards a credit card or the card designed for the system. The Multi-Access Lock can use a variety of different cards. The Multi-Access Lock System has a LCD display as a user interface. The Apollo system has only three LED’s for magnetic strip reader status. The Apollo system costs $629.00 and the special cards are an additional $79.00per twenty-five. http://www.nokey.com/stanalcredca1.html

Societal and global impact:

This product will be designed to use recycled plastic magnetic strip cards or to utilize your existing cards already in your wallet. The proposed system uses an old or existing card eliminating the need to make more plastic products. By increasing the number of electronic devices on the market this increases the number that will need to be disposed of. To help offset this concern the Multi-Access Lock System will be designed to be long lasting and a durable device. The greatest impact is that the Multi-Access Lock System gives the consumer a way to secure their valuables.

Demonstration:

The project will be designed as a stand alone unit that will be placed in an enclosure. The presentation will use a bread board for the interconnection between external hardware, the key pad and the LCD display. The development board will be used as the controller for the entire system, driving the LCD; reading from the magnetic strip reader, keypad; and controlling the solenoid.