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LITERATURE SURVEY ON BANK LOCKER SECURITYSYSTEM

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Abstract - The main aim of this paper is to provide the high level security of bank locker by using robotics. As we have major threat over the security we depend upon bank to guard our inestimable properties. In this method we use our debit card and the pin as the key to access our locker using kiosk. The Robotic arm act according to the instruction given by kiosk to take and place our locker from the vault.

Keywords:RFID,GSM, Fingerprint, Motion sensor, Kiosk.

I. Introduction

In this survey paper we have explained about various bank lockers security systems. Present world people are more concerned about the security of their belongings. It is not possible for us to carry all our valuable stuffs every time. So the safest place for placing these things is a bank locker. In recent trends many modern technologies are used to keep bank locker safe. With the development of technology, solutions have been found to overcomethis issue. Manual lockers are replaced by electronic gadgets such as motion sensor, RFID, GSM, electronic nose etc... All these technologies have their own pros and cons**.**

II.Literature Survey

A. Security Using Fingerprint And Iris Scan

In this tactics there is a three level security system is designed.The first level uses RFID, second level uses fingerprint scanner and the third level uses IRIS[4]identification.When the user swipes the tag at the initial stage,if the tag is valid as the second step is placing the finger on the fingerprint scanner. If the fingerprint is accepted, the user has to go through the third level of IRIS scan shown in the Fig1. IRIS scan is one of technologies which uses pattern recognition technique to identify the pattern of human retina. The eye pattern thus captured is compared with the pattern already stored in the database. If the pattern if found to be a match, then the user is allowed to access the locker. The technique consumes time at initial stage.

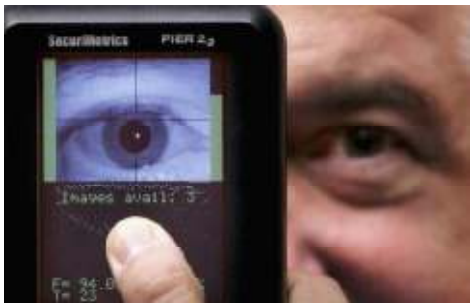

Fig 1: Iris scanning system

B. Security Using Odour Identification:

Everyone in this world has a unique odour. Identification of odour and security question is an extra level security system [1]. The distinctive odour helps the system to distinguish and identify a persons. Every time when the user has to access the locker he/she must undergo the above test shown in Fig 2.The system questions the user and if the answersare right then the odour test is followed .The system compares the odour pattern of the user with the already stored pattern in the database. A device called electronic nose is used for this test. Electronic nose is based on the technology of e-sensing that reproduces the human sense of sensing smell. The electronic nose has sensors such as MOSFET,Conducting polymers and quartz crystal microbalance.

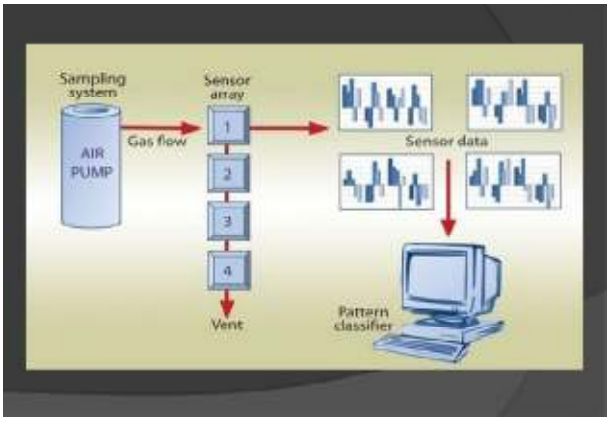

Fig2: Biological and electrical nose

C.Security Using Pattern Analyser

Two levels of security are implemented in this system.one security level is on machine side and the other level is on door side. In this system the authentication of a person done by the use of RFID and a camera. The user has to swipe the RFID tag to

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access the locker as the initial step. The second step for authentication is done using the camera shown if Fig3.which is installed in the strong room. The camera captures the pattern password using open CV. The pattern captured is thus compared and recognized. The second level of authentication involves the use of vibration sensors and temperature sensors near the door for security purpose.

Fig 3: Camera

D. Security Using Motion Sensor

Motion sensors has a vital role in security systems. Motion sensor[3] is a device which detects the motion or different movements around it as shown in Fig4. The sensor sends signals, thus altering the control panel whenever an intruder is trying to open the locker.Active sensors emits signals such as infrared signals,sound signals and microwave signals. A few sensor uses vibrations and ultrasonic waves to detect motion.

Fig 4: Motion recognition

E.Security Using LdrAndGsm

This system makes use of GSM and LDR. LDR works on the principle of photoconductivity. LDR is a light dependent resistor shown in Fig5. It is also known as photo resistor. Increasing the intensity of the light decreases the resistance of the LDR. With insufficient light lockers are kept in the strong room.There is no light inside the locker when it's closed. To detect whether the locker is closed or opened LDR circuit is designed. When the locker is open ,light rays enters the locker .LDR gets affected by light ,and a signal is transmitted to the controller by LDR. Message is sent to the locker holder by the controller via GSM.

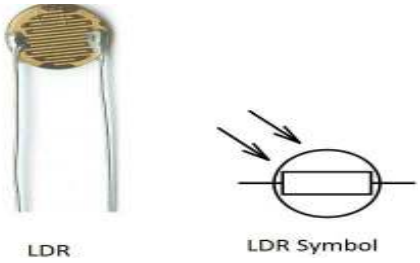

Fig 5: LDR

F. Security Using Near Field Communication (Nfc)

Near field communication technology along with a fingerprint scanner is used in this system shown in Fig6.NFC feature is inbuilt in all smart phones[5]. NFC is a wireless technology that is used to transfer information when a device having NFC is brought near to the other device. In this system microcontroller module is interfaced with NFC smart phone. Thumb of the locker holder is placed on the fingerprint scanner in smart phone .Once the finger print is found correct, the password is generated.

Fig 6: Smart phone using NFC

G. Security Using Heat Sensor, Rfid, Gsm

RFID tag, heat sensor and GSM is used in this security system. RFID tag has to be swiped by the locker holder which has all the details of the locker holder like name, address etc… If the tag is valid then the respective locker will be provide by the bank manager through the conveyer set up. Heat sensor is used when the locker is tried open using, any instrument or machine. As the rise in temperature is sensed an alarm is triggered.

H.Security Using Face Recognition

Face recognition technology[2] is used in this security to find the bank holder. When a person enters the strong room, the camera in the room captures the picture. The image of the person is fed as the input to one of the face recognition algorithm as shown in Fig7. Skin colour is used to recognize the person among the other facial features. This system has few drawbacks due to difference in facial expression,image orientation and it also has to maintain huge database.

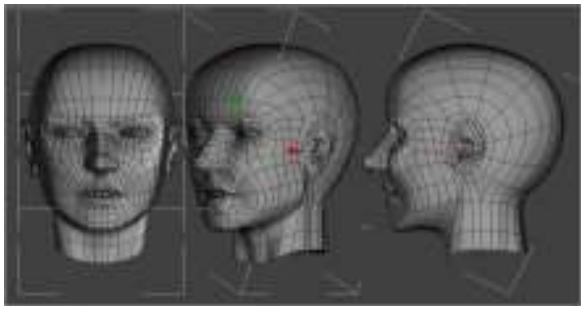

Fig 7: Face Recognition

III.SecurityUsing PIR and IR sensor

There are two security levels in this system. PIR sensor and IR proximity detection are used in the first and second levels respectively.Programmable system on chip technology is used to interface these two detection algorithms.PIR sensor used to detect infrared light waves emitting from objects around it,where as IR proximity detection detects the nearby objects.IR proximity sensor detects objects closer to the sensor. The main component in IR sensor in Fig 8.is IR LED which radiates infrared radiations that are reflected when an object is in vicinity of sensor. The main drawback is that there are some colours and objects that absorbs infrared rays and hence there is no reflection

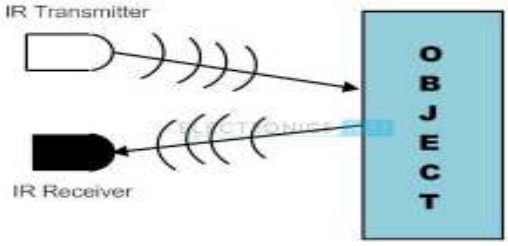

Fig 8: IR Sensor

Table 1: Analysis of different security systems

S.NO	Proposed security system	Technology applied	Disadvantage
1.	Fingerprint and Iris based system	Automated biometric method using mathematical pattern recognition.	Sensitive by eye lashes, lenses and reflections.
2.	Security question and odour test	Electronic nose	Loss of sensitivity occurs in the presence of atmospheric vapour or alcohol.
3.	Security using pattern analyser	RFID tag and camera	Pattern maybe abused as it is not accurate
4.	Motion recognition system	Gesture recognition	Even an unknown person passing the area is sensed.
5.	Security using LDR and GSM	LDR	Obscured when its cover by something which prevent it from light interaction.
6.	Security using NFC	Smart phone	Less reliable when there is a break in the interface between the controller and phone.
7.	Security using RFID and heat sensor	RFID tag	The external electromagnetic interface can limit the RFID remote reading
8.	Face recognition system	Biometric method of identification	Can be easily abused and is not always a1ccurate.
9.	Security using PIR and IR sensor	IR transmitter and receiver	It needs a straight non interrupted path

IV.Proposed System

The security of bank locker can be taken to the higher level by Robotics. As we enter the locker room we must swipe our Debit card and authorize by a biometric authentication. After this process we must swipe our Debit card at Kiosk and enter our ATM pin to access our locker. In the vault room the robotic arm identifies our locker and brings to the kiosk. The steel lid on the kiosk slides back to use our locker. We can open the locker using the unique key provided by the bank. Even we may use additional personal lock with it. Once we are done with our work we can lock our locker by pressing Exit button. The system even alerts you when our locker is not locked properly or any obstruction in its path. We may leave the room when Thank you message flashes in kiosk. At the back end the robotic arm place our locker in the vault.

A.Block Diagram

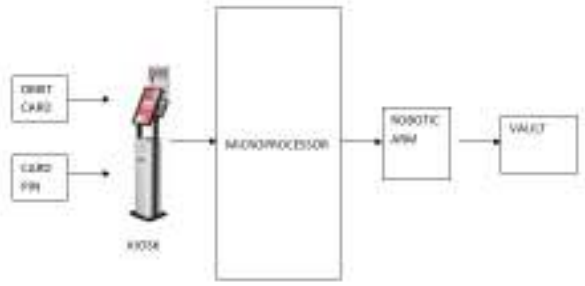

Fig9: Kiosk

B. Working

As the first step we must swipe our Debit card and authorize by a biometric authentication to enter into the locker room. As we entered into the locker room we might see a Kiosk. We must swipe our Debit card and enter our ATM pin in the kiosk as shown in Fig9. The Debit card which consists of our information such as our name, account details, locker detail. This process may allow us to access our locker. Some of us may have more than a locker. In such a case we can select the locker which we want at the current time by Kiosk. As our locker which is selected in the kiosk is send as the input for the robotic arm as shown in Fig10. At the backend the robotic arm which is placed adjacent with the moving trolley fetches the input from the Kiosk. As the input is received the trolley moves in the specified path which is fed in the memory of microprocessor for the given locker number. The sliding door near the kiosk slides down and the locker taken by the arm is placed over the sliding door. We can open the locker using the unique key given by the manager. As our work is over we must lock our locker and press Exit button. Here the robotic arm takes the locker and place it over the vault. This system may provide a alert as the is locker is not locked properly or any obstacles over the robotic arm path. When the robotic arm places the locker in the vault the kiosk may display the Thank you message we can leave the locker room

Fig 10: Robotic arm

IV.Conclusion:

Thus it is a real time embedded system providing security to bank lockers and like systems. As this system provides the high level security over our vaults. Thus this system is an ideal way of securing bank lockers. It provides assurance to bank locker holders that only authenticate users can access lockers thus overcoming all possible frauds.

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