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INVISIBLE FENCING WITH HIDDEN WATCH DOG

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Abstract: The primary goal of this initiative is to offer high-level domestic security systems to the general public. Thesedays, breaking into locked homes is rather popular because it is relatively simple for the criminals and requires little effort on their part. Therefore, thisproject work is developed with a covert watch dog to prevent these forms of muggings. The fundamental idea behind the system is to recognize a passing person using IR sensors coming from any of the four directions, at which point the speech chip is activated toautomaticallyannouncethespokenmessage.

The device also aims to guarantee privacy by making it impossible for unauthorized people to open the door in any situation. This type of automatic door with a top-secret code can be used in significant locations where top-notch security is required. Strong rooms, home laboratories, etc. These days, the majority of security systems that offer password protection are relatively widespread. Scratch cards or RFID cards are sometimes used toidentify users. But since all of these ways have become incredibly dated and people aresearching for new approaches, this project work was created to provide some excitementwhile the codeisbeingdecoded usinginvisibledevicesplacedinsidethewall.

Keywords: IR sensors, high security.

I. INTRODUCTION:

In addition to domestic applications, the primary goal of this project work is to provide ahigh-level security solution for various organisations. The circuit is made up of an infraredsignal generator and detector that can be put parallel to one another and in each of the four directions of the home's premises, respectively.

The idea is to make these sensors invisible to potential intruders. When someone enters thebuilding and walks close to the sensors, the system rapidly gathers the information that was interrupted and automatically announces a voice message through the voice chip as acknowledgement. Cryptography is one of the main elements of security technology. Confidentiality and genuineness are its two traditional goals. People are able to communicate confidential information to designated receivers by employing encryption methods. These algorithms all rely on private keys. Only the keys are thought to be secret; the algorithms are always supposed to be open. The magnetic switches that are attached to the controller serve as the project's keys. The controller completes the remainder of theprocedure by turning on these switches in a specific order. Unauthorised people have an extremely tough time locating and entering a certain guarded zone.

II. LITERATUREREVIEW:

This project is mostly for advanced security systems, according to our literature review.People used to be reluctant to leave their homes unattended because they worried aboutburglars. The robbers used to break the latch on the door even though it was locked so theycould access the houses. Later, door lock systems based on passwords entered the market.Security mechanisms have improved in some way, but not entirely. Although password-based lock systems are simple to use, they can be compromised if the password is flimsy orsimple to figure out. With the completion of this project, a full-fledged advanced security system will be possible; intruders will be unable to determine where the security system is in place. Except for the person who implemented or was given permission to use it, the password lock system is invisible. For highly confidential locations like government organisations, financial institutions, research institutes, data centres, and military outposts, this method is incredibly helpful.

III. METHODOLOGY:

Our project primarily consists of two sections. The first section discusses the use of infrared or ultrasonic sensors, a microprocessor, a speech chip, and the LM567 IC, a tone-generating cum decoder IC. Real-time applications are favoured for ultrasonic sensors. This system is put into place on all four sides of a location. A robber who attempts to access the premises will be apprehended right away.

The project's second section focuses on an invisible password lock mechanism that is superior to current systems like RFID cards and scratch cards. The password system is hidden inside the walls next to the door, making it impossible for an unauthorised individual to access it. This system makes use of components like magnetic switches, microcontrollers, and servo motors. When a burglar tries to open the door, Bluetooth or GSM are utilized to alert the property owner. GSM is chosen for greater range, whereas Bluetooth is preferable for shorter range. When strong security is required and there is a need for great confidentiality, this application is used.

IV. REQUIREMENTS:

The hardware requirements are as follows:

1. Infrared sensor:

An electrical device known as an infrared sensor uses infrared radiation to detect and/or emit specific features of its environment. Additionally, it has the ability to detect motion and gauge an object's temperature. The human eye is unable to see infrared waves. Infrared radiation is a portion of the electromagnetic spectrum with wavelengths longer than those of visible light but shorter than those of microwaves. The infrared spectrum roughly stretches from 0.75 to 1000m. Infrared light is picked up by IR (infrared) sensors. A voltage or amperage detector detects the electric current created when the IR light is converted into it.

2. Microcontroller unit:

The microcontroller, which is regarded as the project's brain, plays a significant role. The controller should send the instructions for any task that needs to be done. The controller controls the outputs in response to the inputs. A microcontroller runs the program that is stored within.

When designing a system with a microprocessor, the designer must choose external memory like RAM, ROM, or EPROM as well as peripherals; as a result, the PCB will need to be large enough to accommodate all the necessary peripherals. However, the microcontroller has all of these peripheral features on a single chip, so designing a similar system with a microcontroller results in a smaller PCB and lower design costs.

3. DC motor:

DC motors are common, affordable, compact, and powerful for their size. They are the easiest to manage. Two signals are all that are needed for one DC motor to operate. Since they are non-polarized, the motor won't be harmed if the voltage is reversed. DC motors have leads marked +ve and -ve. When connected to a DC voltage source, they move in a clockwise direction, and when the polarity is reversed, they move in an anticlockwise way. RPM (rotations per minute) is used to specify the maximum speed of a DC motor. There are two speeds: idle and loaded. When moving a load, the rpm is lowered or falls as the load increases.

4. Speaker:

Any electronic entertainment device's loud speaker serves as its voice, so it must be able to faithfully reproduce the original sound coming from the broadcasting studios. Regardless of their loudness, frequency, or waveform, all sounds should be able to be reproduced by a decent loud speaker with identical accuracy. An object in motion causes air to vibrate, creating sound waves. In a loud speaker, the vibrating body is either a cone or a diaphragm that is connected to a driving unit that transforms electrical currents into mechanical motion, causing the diaphragm to vibrate and emit sound waves that contain acoustic energy.

5. Voice Recording Chip and Playback chip:

The APR33A3 IC, a single chip voice recorder and playback device from a plus Integrated Circuits, is used to build the circuit. It uses a flash non-volatile memory technology to proprietary analogue storage technique.

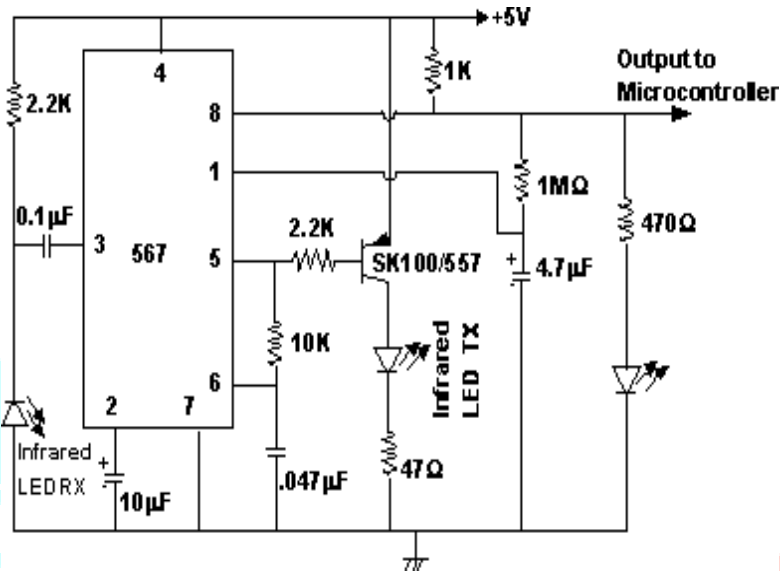
6. Magnetic switches:

Magnetic switches that are positioned inside a wall or a closed barricade are also an option. The location of the decoding circuit will only be known to authorized or concerned individuals. There are five magnetic switches over all in the decoding circuit, and they must be triggered or energized in the order specified by the micro controller. The controller will activate the green indication and open the door when the sequence is correct.

7. LM567 Tone detector:

When an input signal is present inside the pass band, the LM567 IC's general-purpose tone decoder will supply a saturated transistor switch to ground. The circuit is made up of two-phase detectors, referred to as Q and I detectors, which are driven by a voltage-controlled oscillator that establishes the decoder's centre frequency. Centre frequency, band width, and output delay are individually controlled by external components.

V. BLOCKDIAGRAM:



VI. WORKING:

Obstacle sensing circuit designed using ir sensors:

The Obstacle Sensing circuit Designed with IR Sensors is the project's fundamental building element. The tone decoder ICLM56, which also generates tone frequency, issued to design the obstacle-sensing block. A 567 IC and a collection of sensors are utilized to detect the impediments. Infrared sensors are used in the obstacle sensing block's construction; a set of these sensors serves as both an IR signal broadcasting LED and an IR signal receiving LED. The IC 567, a tone frequency generator and decoder, is used to connect both sensors. This IC can generate tones with frequencies up to 20KHz and also decode frequencies. The IR signal sending LED is linked at the output of the IC's tone signal generating part, while the IR signal receiving LED is connected at the output of the tone signal decoding section, since this IC can perform two distinct functions. Any obstruction that causes the transmitted laser beam to be interrupted will cause some of the signal to be reflected. The infrared LED receiver will pick up this reflected signal. A strong signal is produced at Pin No.8 of the LM567 IC as a result of the radiation that is reflected back towards the system and collected by the receiving LED. The micro controller receives the receiver's output.

The microcontroller activates the speech chip to proclaim the information whenever the controller receives a high signal from the reference point. When the frequencies coincide, the output is enabled, the transistor conducts (ON), and the Vcc supply is grounded internally within the IC through the transistor. A logic low signal will therefore be detected. If the frequencies are not compatible, the output will not be able, resulting in the transistor turning off (OFF) and the supply coming from the output pin, which is the logic high signal.

VII. CODE DECODING CIRCUIT THROUGH MAGNETIC SWITCHES:

Unlike password entry, card swiping, or RFID cards, this design is for high security purposes. The circuit that was created here is an unnoticeable invisible decoding circuit. Magnetic switches installed inside a wall or similar closed barricade serve as the decoding circuit. The decoding circuit's location will only be known to the authorized individual. There are five magnetic switches overall in the decoding circuit, and they must be triggered or energized in the order specified by the microcontroller.

A small magnet that must be brought close to the magnetic switches will be used by the authorized individual to activate them. The controller controls the DC motor that opens the door by shifting the magnet in a way that causes the switches to activate in the controller's predetermined order. When the magnetic switches are constantly activated in a different order for three cycles, the microcontroller automatically sends an SMS message to the designated concern cell phone number. This message is sent using the GSM modem.

VIII. ADVANTAGES:

1. Compared to a lock system with a password, it is more secure.
2. It can be accessed by authorised people but is invisible to unauthorised people.
3. The hidden keys in this place are inexpensive magnetic switches.
4. PCB size and design expenses are decreased by the micro controller.
5. Circuit design is inexpensive.

IX. APPLICATIONS:

1. High security

X. CONCLUSION:

The "Invisible fencing with hidden watch dog" idea was successfully planned and developed. A prototype module is built for the demonstration, and the outcomes are judged to be adequate. Since it is a prototype module, a straight forward module is built, which can be used for a variety of applications, such as highly confidential areas or places requiring high level security. We have outlined the significance of security in an ambient intelligent environment in this project.

In addition to cryptographic algorithms, secure techniques for secret key creation and storage are required in order to ensure trust and security. The keys can be made impermeable to tampering and protected from being destroyed by criminals or other unauthorized individuals by the restriction of such invisible security measures. The main and most important duty is setting up the software to carry out the activities based on their inputs. The software (code) that we define in the controller is the only factor that affects the machine's performance.

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