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Bulger Alarm System with Motion Detector

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ABSTRACT: The objective of this project is to develop a motion sensor alarm based on a Passive Infra-Red (PIR) sensor module. There are many vendors that manufacture the PIR sensor modules and almost all of them are pretty much the same in function. PIR sensor detects the changes in the IR levels emitted by humans. PIR sensors can detect levels of infrared radiation. In this project, microcontroller continuously monitors the output from the sensor module and turns a buzzer on when it goes active. The application areas of this project are: All outdoor lights, Lift lobby, Multi apartment complexes, common staircases, for basement or covered parking area, shopping malls, for garden lights. Certain crystalline materials have the property to generate a surface electric charge when exposed to thermal infrared radiation. This phenomenon is known as pyro electricity. The presence of human body creates a sudden change in the IR profile of the surrounding that is sensed by the pyro electric sensor. When the microcontroller detects the sensor is triggered, it drives the buzzer. The sensor is in retriggering mode, the buzzer remains on as long as the motion is continuously sense. Our project also consists of 'Security Power (Solar) Fence' for perimeter protection can be not only a deterrent but also detects all sort of unauthorized entry.

The highlights of our product are Can delay & control all sort of unauthorized intrusions We are complying with international standards set by Geneva Energy Convention with regard safety and security. We at Alliance Security Systems, established by experienced professionals with maximum installations and service backup centres manned by experienced professionals. The Farm Sector Power Fences offered by us is a new concept, introduced to keep out the animals ranging from snakes to elephants includes, wild boar, monkey, cattle and leopard. With the help of these systems, our clients can also safeguard the propertied from theft. This resulted in increasing the yield by way of protecting the damages by wild animals which proved in enhancement in the returns. Moreover, our range is widely used in various sectors like agree-horticulture farms, aqua farms and research stations.

KEYWORDS: Passive Infra-Red (PIR), Security Power (Solar) Fence'

I. INTRODUCTION

The project designed for produce the electric power with the help of solar energy and uses this power to protect farm from wild animal and lighting system for farm house. The motive of developing this project is to avoid the conventional energy source for protecting and lighting the farm. And also this project gives the facility of electricity where electric supply is not provided form Electricity distribution department. For that we use solar battery charging system and inverter which convertor dc supply in to ac supply and buzzer system. If the animal tries to cross the fencing of farm them firstly buzzer start but animal don't go away and again tries to enter in farm then animal has to face tolerable amount of electric shock. This shock is not enough for death of any wild animal as well as human being

II. INTRODUCTION OF PIR SENSOR

There are several steps to be applied in designing an PYRO infrared motion detector for farm security system. The relevant information is gathered through Literature review from previous chapter. Data on motion detection and security system projects has been collected where the theoretical design is studied based on the motion detector for security concept. The understanding on the electrical structure for the hardware developments needed for the design circuit process of the motion detector and the basic security circuit. The next is the hardware development according to

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the circuit designed. This process is just only being proceed if each part of the circuit being improved is valid, else, it will be repeated until it is valid as the theoretical. Once the hardware development circuits have the output as the expected, then, the comparison for both hardware and theoretical analysis will be done. Next is the step where software structure is developed for the security system to be interface with the hardware development. While the final step of this research is on applying the whole project to the real farm entrance like doors and windows

III.FARM SECURITY SYSTEM

Farm security system is one of security that truly related to burglar or safety alarm system. Burglar and safety alarms are found in electronic form nowadays. Sensors are connected to a control unit via either a low-voltage hardwire which in turn connects to a means for announcing the alarm to elicit response. In a new construction systems are predominately hardwired for economy while in retrofits wireless systems may be more economical and certainly quicker to install. Some systems are dedicated to one mission; handle fire, intrusion, and safety alarms simultaneously.

In common security system, the lights are triggered by motion gives the impression to user that someone is at farm and able to see the burglar. Infrared motion detectors placed in farm security system in crucial areas of the farm can detect any burglars and alert the farm owner or police. The first security system invented, farm alarms were triggered by the release of a pressure button fitted into a door or window frame. This basic alarm was fundamentally flawed as the entire intruder needed to do to silence the alarm was to close the door or window.

While various systems on the market ranging from inexpensive farm security alarms to highly sophisticated systems requiring professional installation. All modern alarms are based on the same foundation, the electric circuit which is completed either when the door is opened or closed depending on the security system designed.

The alarm is triggered when the circuit is altered and will not be silenced until a code is punched into the control panel. The most expensive and complicated alarm systems might also involve a combination of motion sensors and pressure pads to ensure even the most cunning intruder doesn't get his hands on treasures.

IV. THEORY

A Pyro electric Infrared (PIR) Sensor is a pyro electric device that can sense infrared (IR) radiation changes within its viewing range. In other words, these sensors are sensitive to moving objects radiating IR light. A PIR sensor creates temporary electric potential whenever a change of IR radiation occurs on the viewing range of the sensor, but the electric potential generated is very small in amplitude and must be amplified significantly. That is because PIR sensors cannot be used alone, instead they become one of the key components of a passive infrared device (PID) with some other circuitry. The basic structure of a PID contains four main structures: A Fresnel lens, a PIR sensor, an amplifier circuitry and a comparator plus time delayer circuitry. Structural details are given in Chapter 2. Fresnel lens focuses IR radiation on PIR sensor and PIR sensor measures the change in the IR rate and creates an electric potential difference corresponding to the variation in the IR radiation. However, this potential difference is very small and must be amplified without introducing noise. The amplifier circuitry aims to have a large gain for the sensor signal and suppress the ambient noise at the same time. So, generally a two stage band pass amplifier is used. The amplified sensor signal is then compared with a threshold. If the signal stays in the range determined by the threshold then it is assumed that no motion is observed, otherwise it is assumed that there is a moving target. This threshold based approach may generate false alarms. Therefore ordinary PIR sensors are simple and give an output of logical one when they detect a motion and a logical zero when there is no moving object within their viewing ranges. The PIDs are low-cost, easy to use and widely available commercially.

A PIR based motion detector (usually called PID, for Passive Infrared Detector) uses this PIR sensor with some additional electronics circuitry for detecting motion. A typical PIR sensor gives a logical zero when there is no motion or to the background IR level, and gives a logical one when it detects a hot body motion. A PIR sensor becomes useful when it 5 chapter 2. Piezoelectric infrared (PIR) sensors 6 are used in PIR. In this thesis, both the PIR sensor and the PIR will be studied, because of this reason. The PIR sensors are widely used especially in indoor and short range outdoor applications directly or as an assistance of a video camera, since they are very cheap, easy to use and widely available commercially. Besides, in some applications, a PIR sensor network is built in order to cover a large area or an

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entire building for monitoring purposes [40]. Although they are used widely in indoor and outdoor applications, their application areas are limited. Security systems, robotics, burglar alarms, visitor acknowledgement, light switch control and intelligent toys, etc. are some of example applications. As mentioned above, a classical PIR sensor is sensitive to the IR radiation, so their response is affected by some factors like the ambient temperature, humidity, moving object's speed, direction of motion, distance to the sensor and the moving object's body itself. Since PIR gives a logical one or a logical zero as its output, the amplitude of the response isn't affected, but the duration and the frequency of the response change by these factors. The response of the sensor is weakened by the increasing temperature and humidity. As the humidity in the air increases, the IR radiation is absorbed and attenuated more. A good example is the increasing heat absorption of the atmosphere when the weather is cloudy. Also high humidity causes vapor on the surface of the sensor which recedes IR radiation captured by the sensor. When the ambient temperature becomes high, e.g. above 40 degrees, or very low, e.g. below zero, the sensitivity of the PIR decreases [3]. Also sudden temperature changes can create a moving object response, in other words a false alarm, and if this sudden temperature change situation continues, the sensor response can be unstable, e.g. output continuously switches between one and zero. This unstable condition can be observed especially in windy weathers. On the other hand, when the body of the moving object is big, or when the object gets close to the sensor, PIR responds faster and the duration of the response becomes longer. When the moving target chapter 2.pyroelectric infrared (PIR) sensors 7 is too small or too far from the sensor, the sensor can ignore it or gives no response or gives a very short response. In addition when the moving object emits more heat, a longer response will be given by the sensor. Moreover the direction of motion and speed of the moving object creates a different non-linear characteristic at the sensor's response. As the speed of the moving object increases, the duration of the response decreases but when the object moves very slowly, there is a possibility for the sensor not to distinguish it from the background. Since the viewing range of the sensor is limited by approximately 140 degrees in azimuth and 125 degrees in elevation [3], the faster object spends less time in the viewing range and this causes shorter response duration. Moreover, the direction of the moving object gives different results.



Figure 1 HOUSE FANCING

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Figure 2 Farm Fencing

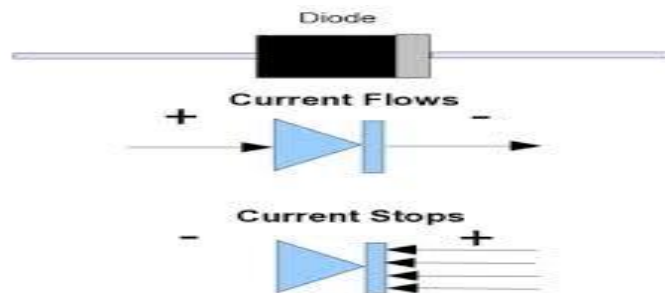


Figure 3 Diode

In electronics, a diode is a two-terminal electronic component that conducts primarily in one direction (asymmetric conductance); it has low (ideally zero) resistance to the flow of current in one direction, and high (ideally infinite) resistance in the other. A semiconductor diode, the most common type today, is a crystalline piece of semiconductor material with a p-n junction connected to two electrical terminals.^[5] A vacuum tube diode has two electrodes, a plate (anode) and a heated cathode. Semiconductor diodes were the first semiconductor. The discovery of crystals' rectifying abilities was made by German physicist Ferdinand Braun in 1874. The first semiconductor diodes, called cat's whisker diodes, developed around 1906, were made of mineral crystals such as galena.

V. RECTIFIER

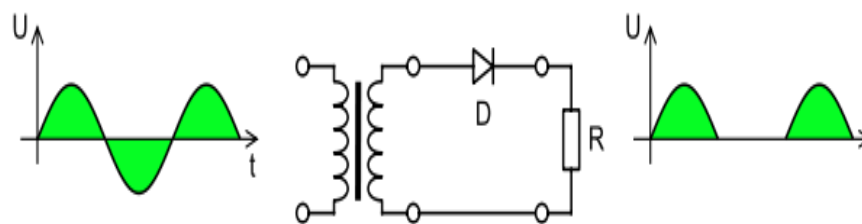


FIGURE 4 RECTIFIERS

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A rectifier is an electrical device that converts alternating current (AC), which periodically reverses direction, to direct current (DC), which flows in only one direction. The process is known as rectification. Physically, rectifiers take a number of forms, including vacuum diodes, mercury-arc valves, copper and selenium oxide rectifiers, semiconductor diodes, silicon-controlled rectifiers and other silicon-based semiconductor switches. Historically, even synchronous electromechanical switches and motors have been used. Early radio receivers, called crystal radios, used a "cat's whisker" of fine wire pressing on a crystal of galena (lead sulfide) to serve as a point-contact rectifier or "crystal detector". Rectifiers have many uses, but are often found serving as components of DC power supplies and high-voltage direct current power transmission systems. Rectification may serve in roles other than to generate direct current for use as a source of power. As noted, detectors of radio signals serve as rectifiers. In gas heating systems flame rectification is used to detect presence of a flame. Because of the alternating nature of the input AC sine wave, the process of rectification alone produces a DC current that, though unidirectional, consists of pulses of current. Many applications of rectifiers, such as power supplies for radio, television and computer equipment, require a *steady* constant DC current (as would be produced by a battery). In these applications the output of the rectifier is smoothed by an electronics filter (usually a capacitor) to produce a steady current. Before the development of silicon semiconductor rectifiers, vacuum tube thermionic diodes and copper oxide- or selenium-based metal rectifier stacks were used.^[1] With the introduction of semiconductor electronics, vacuum tube rectifiers became obsolete, except for some enthusiasts of vacuum tube audio equipment. For power rectification from very low to very high current, semiconductor diodes of various types (junction diodes, Scotty diodes, etc.) are widely used.

VI. CONCLUSION

Hence by this project we can design an effective solar battery charging system, and this energy is used to protect the farm from wild animals. The uniqueness of this project is not only alerting the animal but also it saves the energy. This project also useful for lighting in farm house. The project can install anywhere with less space occupy

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