IOT BASED SMART INSECT KILLER

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ABSTRACT

Mosquitoes cause at least 2.7 million deaths every year. In 2020, With over 100 million cases examined every year, most of the reported cases are confirmed. We are having traditional mosquito killing machine which is not effected that much in this cause of killing mosquito, In this automated world we need the such type of machine which will reduce human interaction with machine and which will automatically detect environment and run on it. This information is all about designing and manufacturing of automated insect killer machine which is having numbers of features which will help to get maximum required output. Such as, killing mosquitos and giving safe environment for living for human beings. So, based on this Internet of things we want to Present our paper "Internet of things based smart insect killer" an addition to home automation. With help of IOT (Internet of things) we build such type of machine which will be automatically controlled through mobile phones, timer and it will adapt itself according to environment.

Keywords—Mosquito, internet of things, Design, Manufacture, Automatic.

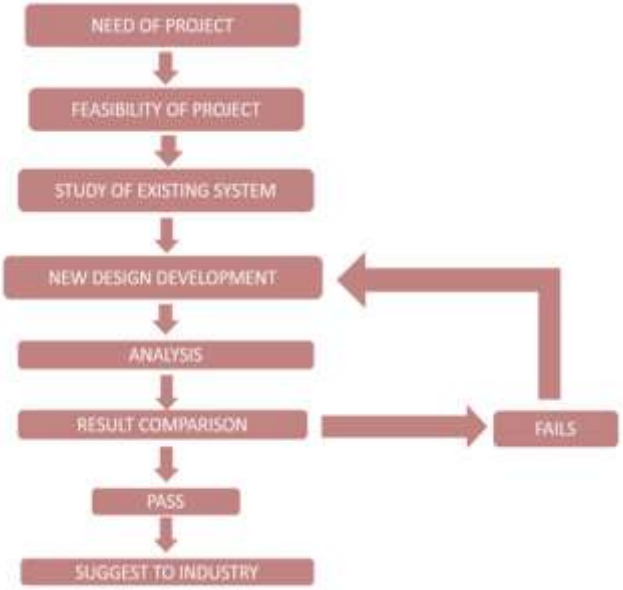
INTRODUCTION

Nowadays we are having automation in home through light bulb, fan, entertainment systems. In addition to that, we want automation in health areas. Mosquito killing machine having big importance in health area because it indirectly prevents mosquito born diseases. So, Inspired by that we build IOT based mosquito killing machine which will be an addition to home automation.

In the earlier mosquito killer machine, By study we found that it cause Skin problems like Irritation, rashes and Shortness of breath. Chest tightness or pain are also found. Because of manual mode the liquid gets consumed at a faster rate on the Active+ mode because people forget to turn it off. Interaction of humans with machine is more and also User get confuse when to switch on active mode and switch off active mode.

By introducing more power to the insect killer machine we want to prevent the mosquito born diseases like Zika virus, West Nile virus, Chikungunya virus, dengue, and malaria because more power will help to reduce mosquitos. Total avoid manual control by introducing IOT Making intelligent machine which will automatically adapt with respect to room environment. By the help of IOT automatically switch on active mode and switch off active mode according to time and environment. Make machine human friendly.

WORK METHODOLOGY



COMPONENTS

The IOT based smart insect killer consist of following components

1) CASE : It is made up plastic. Having small size which is easily fit into electric board.

2) HEATING ELEMENT : It is a ceramic Positive Temperature Coefficient (PTC) thermistor having a hollow metallic cylinder at its center. When heated, the resistance of a PTC thermistor increases. This is having two coils inside it.

3) SWITCH MODE POWER SUPPLY : Hi-link 12V 3W - AC to DC Power Supply Module from Hi-Link is a PCB mounted plastic enclosed isolated switching step down power supply module. It can supply 12V DC from 120V AC- 230V AC and has a power rating of 3 watt.

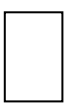
4) NODE MICROCONTROLER UNIT : Wi-Fi Module: ESP-12E module similar to ESP-12 module but with 6 extra GPIOs. Node MCU is an open-source Lua based firmware and development board specially targeted for IoT based Applications. It includes firmware that runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module.

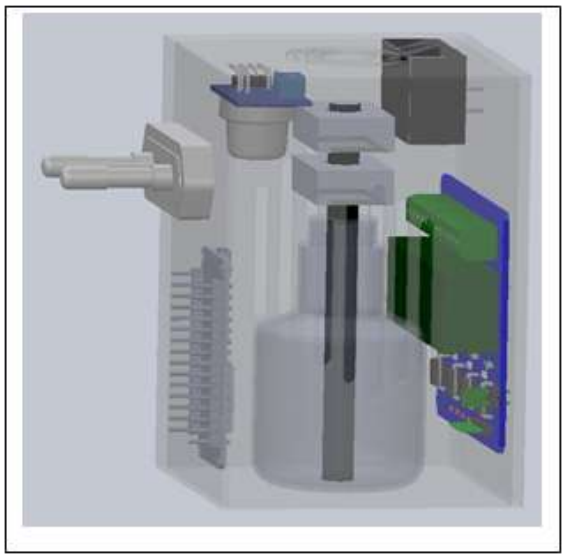
5) RELAY MODULE : The four-channel relay module contains four 5V relays and the associated switching and isolating components, which makes interfacing with a microcontroller or sensor easy with minimum components and connections. The contacts on each relay are specified for 250VAC and 30VDC and 10A in each case, as marked on the body of the relays.

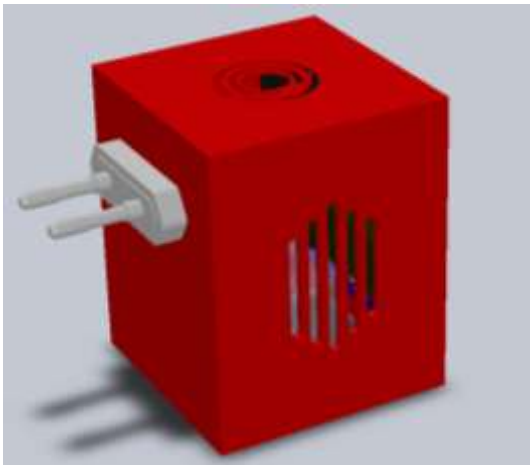
6) MQ 6 SENSOR : The MQ-6 Gas sensor can detect or measure gases like LPG and butane. The MQ-6 sensor module comes with a Digital Pin which makes this sensor to operate even without a microcontroller and that comes in handy when you are only trying to detect one particular gas.

DESIGN OF CASE AND PARTS

Model created in Designing software Solid Works.







WORKING OF IOT BASED SMART INSECT KILLER

This system is controlled through an app. A personalized blynk server is been setup for this system. Blynk Server is an Open-Source based Java server, responsible for forwarding messages between Blynk mobile application and various micro controller boards

This app allows us to control our system. This mobile application has different modes for different purposes.

Through server the information is shared to Node MCU which controls the whole system.

The four-channel relay module is placed inside the system which contains four 5V relays and the associated switching and isolating components, which makes interfacing with a micro controller or sensor easy with minimum components and connections.

It requires an AC supply hence it has 5V direct current to 230V alternating current (i.e. Amplifier). Thus HLK-PM12 Hi-link 12V 3W - AC to DC amplifier helps the coil to heat. Its ultra compact size makes it perfect to use in places where size is a constraint and that needs a 12 volt supply from mains.

This Power Supply Module voltage source is a switching source, so you do not have to worry about fluctuations in voltage grid.

After coil starts to heat up the fluid inside the coil start to heat up evaporates. This process of heating coil or increasing or decreasing the intensity of coil can be controlled through app .These coils are placed inside the heating element in the mosquito repellent machine. It is a ceramic Positive Temperature Coefficient (PTC) thermistor having a hollow metallic cylinder at its center. When heated, the resistance of a PTC thermistor PTC ceramic heating element and aluminum tube, low thermal resistance, high heat transfer efficiency. This PTC ceramic air heater has the characteristic of surface insulation and high security.

A MQ 6 gas sensor is placed just above the liquid coil to detect the density of the evaporating gas.The MQ-6 Gas sensor can detect or measure gases. The MQ-6 sensor module comes with a Digital Pin which makes this sensor to operate even without a micro controller and that comes in handy when you are only trying to detect one particular gas. The detected values are sent to the micro controller unit and controls the amount of heating so that no excess amount of liquid is wasted.

1) This application has on/off switch

2) SLIDER- A slider is there through which the user can regulate the quantity of liquid to be vaporized. The vapors are released through a small circular opening on the top of the repellent.

3) MODE SLIDER- The heating intensity of the coil and the quantity of liquid to be vaporized will depend upon the mode selected

4) This app has 4 modes which includes

a) Normal Mode

b) Active Mode

c) Child Mode

d) Old Age Mode

A) NORMAL MODE -

In normal mode the only two heating coils will be activated. This will use minimum energy

B) ACTIVE MODE -

In Active mode all four heating coil will be activated. The liquid gets consumed at faster rate.

C AND D) CHILD MODE AND OLD AGE MODE -

Each mode has its own different settings. In both of these modes the vaporization of the liquid stops after it crosses a certain limit. Excess amount of such gases can harmful for these age groups so this mode was introduced.

INTENSITY SLIDER : This can also be called as custom mode. You can set your system as per your requirements. Intensity is directly proportional to no of active heating coils

TIMER : A timer is an electrical circuit with a built-in clock. Acting as a communicator between the power source and the light, the timer turns system on and off based on the times you set. this devices come equipped with controls ranging from circular dials to digital settings.

RESULT

1) By applying four heating coils to the insect killer machine we achived the maximum power machine can able to worked on. Successfully prevented the mosquito born disease .because more power will help to reduce mosquitos.

2) By the help of IOT we are able to get zero manual control and Make machine human friendly.

3) With the help of MQ6 sensor and timer we are able to make intelligent machine which will automatically adapt with respect to room environment.

4) we able to control machine with mobile based application blink.

5) We able to include four types of machine power Normal mode, Active mode, Child mode and Old age mode.

6) The machine is at very low price giving lots of features .Total budget of project is 2500 Rs.

7) We are able to make machine which will stand in market with the help of its features and low cost.

ADVANTAGES

• Small in size easy to handle.

• It can operate by mobile application.

• No need of manual efforts.

• With help of smart machine we can regulate the flow of insect killing liquid.

• It can operate on four different modes.

• By fixed tolerance limit of gas health danger impact is also reduce.

• It is equipped with timer.

DISADVANTAGES

• Internet connection is required.

• Price of this product is comparatively high than normal mosquito killer machine.

CONCLUTION

Nowadays home automation is very common thing. To survive New product in market. It must have remotely controlled system in it. This remotely controlled system attracts costumer to the product. The projects based on such aspects. It delivers remotely controlled and automated system in one hand.

As there are many mosquito born diseases like Zika virus, West Nile virus, Chikungunya virus, dengue, and malaria are taking lives of human being at mass rate. It is important to build device which will reduce numbers of mosquitos in house hold or at work place. As initiative of that the project IOT based Smart insect killer is provide good resistance to the mosquitos.

The project complete package which is help to reduce numbers of mosquitos in Morden days with fully automated abilities.

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