

Rechargeable Mosquito Killer LED Bulb

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Abstract--- Every year nearly two million peoples died because of the diseases like malaria, yellow fever, dengue and chikungunya through mosquitoes. Reducing the mosquito population is more important especially in populated country. Above mentioned diseases easily transfer through living being around the world. In this paper we propose a Novel approach to design user friendly mosquito killing machine, which will attract the mosquito and kill it by using ELECTRIC MESH and it is best suitable for India. In Asia continent, country like India has more than 120 crore people's population. Due to this more population the poor waste treatment varieties of pests, bacteria and viruses are populated in and around the cities of India. In this project. We try to reduce the population of the mosquitoes by using electric powered mosquito's attractant cum mesh killer machine. The rechargeable mosquito killer with LED light is a approach to help in reducing the mosquito with the help of UV rays. This bulb works like a normal bulb and uses the normal light switch and The bulb has an control circuit with rechargeable battery with charging circuit. The AC-DC driver is used to make driver circuit which convert AC into DC to store them into the battery.

I. INTRODUCTION

LED bulb with zapper to just plug in and get rid of all flies, mosquitoes and other unwanted pests from your surroundings. The electric mosquito rechargeable LED bulb exactly does that for you. It comes with a electric mesh and UV rays LED that attracts the mosquitoes near to the LED and the electric mesh (zapper) give them shock that kill them instantly. The LED bulb works best in dark, closed-off room, and is toxic free, odourless, and safe for human and pets.

The electric mosquitoes killer bulb works on both AC and DC supply. For DC source, there is a battery is placed inside which connected with PCBA driver circuit. that help to charge the battery when the AC supply is coming . when the supply is cut it switched its operation and work with provided DC supply by battery.[11]

The LED bulb functions with the help of an internal battery, charging itself when switched on during the availability of power supply. As soon as the electricity is disconnected, this bulb backed with wide voltage springs into action and brightens up the spaces. While it operates with a lumen output of 100 lumen per watt during power supply, it works at a reduced lumen level of 40-50% at times of no electricity supply. It is bright enough to provide sufficient illumination for reading or whatever you might want to do.

II. LITERATURE SURVEY

In order to test the mosquito attraction capability, the LED light types were changed to attract mosquitoes using different light distribution patterns, the 3 W UV LED light bar shown in and which is mounted by a lens array shown

in Fig. 1c were used in the bug zapper respectively. The luminous intensity distribution measurements of the LED lights were conducted by using the ProMetric near field measurement system (PM-NFMS) developed by Radiant Vision Systems Co.. An optical power meter (1830-R) and an integrating sphere produced by Newport Co. were used to measure the LED lights output power. The LED lights without lens output power was 72.13 mw and the with lens LED light bars was 55.5 mw. Distribution curves of LED before and after lens deployment are shown in and d, respectively. The results indicate that the beam divergence angle increased from 135 to 160 degrees by the lens installation, whereas the output light power decreased. In addition, the tests of bug zappers with different LED used outdoors in the same area and at the same time showed that the mosquito attraction effect of the wide-angle LED lights increased by 2.33 times , which raw data are shown in Table 1. Thus, it can be certain that an increase in LED beam divergence angle can help attract mosquitoes, even the output power of the LED light is reduced due to the lens.[2]

III. BLOCK DIAGRAM

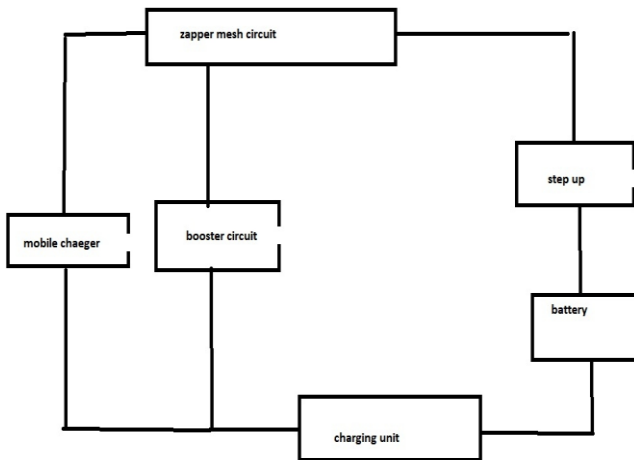


Fig 1: Block diagram of Rechargeable mosquito killer led Bulb

3.1 BOOSTER CIRCUIT

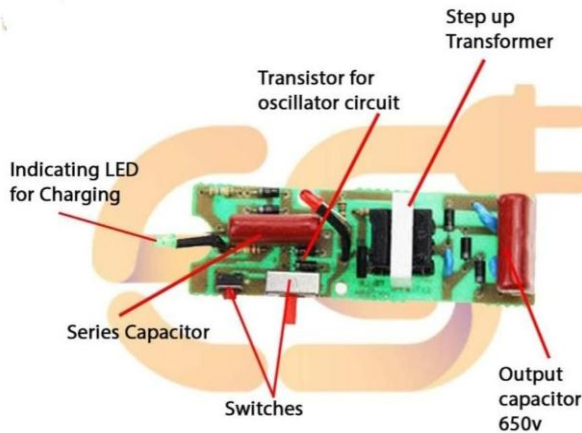


FIG 1 : BOOSTER CIRCUIT

The working of the Mosquito Killer is very simple. A high voltage power supply is given to the metal mesh. So when a mosquito flies between the Meshes it creates a low resistance path between the meshes so the high voltage creates an ARC through the body of the mosquito which is instantly electrocuted.[4]

The main printed circuit board (PCB) only has one layer. The board appears to be manually assembled, with through hole (TH) mounting type components placed on one side and then hand soldered on the other side, where the copper traces are visible. A separate board is used to mount the flashlight LED in the flashlight cup. Hand assembly and soldering takes longer than automated pick-and-place machines, is more expensive in high volumes, and is prone to errors; however, labour is relatively inexpensive in China, and the chosen components that

require manual assembly may have been cheaper, which must have made manual assembly more economical. Note that no electronic components are used, which is something that is becoming increasingly rare in modern devices.

3.2 STEP UP CIRCUIT:

XL6009 module is a non-isolated step-up boost voltage converter featuring adjustable output voltage, high efficiency. It converts input voltage of 5-32V DC to an output voltage of 4-38V DC.

Features:-

- Wide input voltage 3V ~ 32V, optimum operating voltage range is 5 ~ 32V;
- Wide Output voltage 5V ~ 35V;
- Built-4A efficient MOSFET switches enable efficiency up to 94%; (LM2577 current is 3A)

High switching frequency 400KHz, can use a small-capacity filter capacitors that can achieve very good results, the ripple smaller and smaller. (LM2577 frequency only 50KHz)



Fig 3: Step Up Circuit

3.3 ZAPPER CIRCUIT

To turn any light Socket into bug zapper light there are no. of specially designed light bulb. The bug zapper light bulb feature are designed led light wave that draw flying insect in and then eliminate them by the means of electrified grid. A bug zapper, more formally called an electrical discharge insect control trap system, electric insect killer or (insect) electrocute trap, is a device that attracts and kills flying insects that are attracted by light. A light source attracts insects to an electrical grid, where they are electrocuted by touching two wires with a high voltage between them. The name comes from the characteristic onomatopoeic zap sound produced when an insect is electrocuted.[8]

Bug zappers are usually housed in a protective cage of plastic or grounded metal bars to prevent people or larger animals from touching the high voltage grid. A light source is fitted inside, often a fluorescent lamp designed to emit both visible and ultraviolet light, which is visible to insects and attracts a variety of them. The light is

surrounded by a pair of interleaved bare wire grids or spirals. The distance between adjacent wires is typically about 2 mm (0.079 in). A high-voltage power supply powered by wall power is used, which may be a simple transformer less voltage multiplier circuit made with diodes and capacitors which can generate a voltage of 2 kilo volts or more. This is high enough to conduct through the body of an insect which bridges the two grids, but not high enough to spark across the air gap. Enough electric current flows through the small body of the insect to heat it to a high temperature. The impedance of the power supply and the arrangement of the grid is such that it cannot drive a dangerous current through the body of a human. [7]

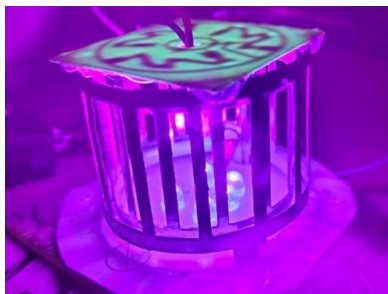


Fig 4: Zapper Circuit

3.4 :MOBILE CHARGER CIRCUIT

It is a center tapped step down transformer. In a center tap transformer, a wire is connected exactly at the midpoint of the secondary winding of the transformer and kept at zero volts by connecting it to neutral current. This 9-0-9 transformer converts 220 volts of AC supply to 9 volts of AC.

The rectification process will be similar as it will just convert negative half into positive half. The calculation for the capacitor required in the process of filtration must be calculated properly especially for mobile phone charger. The difference between the input and output voltage of the voltage regulator 7805 must be kept into consideration and heat sink should be designed accordingly.

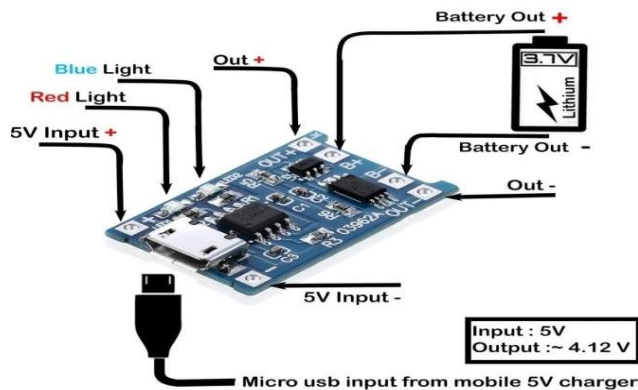


Fig 6: MOBILE CHARGER CIRCUIT

IV. RESULTS

The main of this work is to built an electronics device that's is used to kill mosquito insects it attract mosquitoes with uv light and kill them using high voltage grid and the led bulb will act as a emergency light in the absence of the electricity.

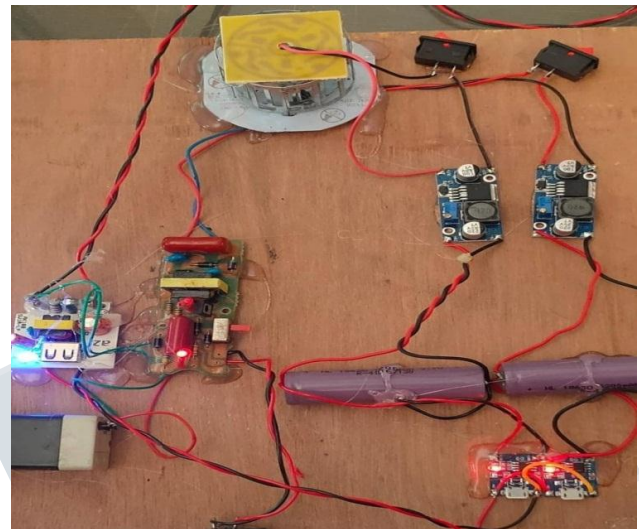


Fig 7: rechargeable mosquito killer led circuit

V. CONCLUSION

In the last, we demonstrated that the present invention placed near of the affected area, the mosquito can be attracted and killed until death, The Mosquito attracted by UV rays near to the bulb, So it will easily help to attract the mosquitoes. UV rays is to attract the mosquitoes using UV-Lamp - (9w/225mm length and 16mm diameter) emit radiation between 300nm-400nm rang of frequency. The application of this range of frequency is to trap the insects like mosquito. The fly's eyes are made up of 100s of tiny hexagonal lenses, which form a curved lattice across of the eye. Unlike humans, flies can see ultraviolet light, due to the complex makeup of their eyes. The present invention use this UV light for attracting the mosquitoes far away from the device. when flies comes near the device the UV rays attract mosquitoes immediately into the trap area and then attracted mosquito directed through the electric shock mesh unit. In Electric shock unit all the mosquitoes and house flies killed by electric shock, which is driven from electric mesh module through supply.

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