MOSQUITOES AND INSECTS KILLING MACHINE

A REPORT

Submitted in partial fulfillment of the
Requirement of I year I Semester of the course

"Product Design Studio"
OF
BACHELOR OF TECHNOLOGY

BY

SOMA.AMULYA	**(19K41A04B6)**
S.NIKITHA	**(19K41A04B5)**
SNEHA REDDY	**(19K41A04B4)**
SHIVA KEERTHI	**(19K41A05B1)**
I.SAIDEV	**(19K41A05B2)**

Under the guidance of

Mr……GURU PRASAD…….
Assistant Professor
DEPARTMENT OF <ECE> ENGINEERING

SR Engineering College
Innovation . Creativity . Entrepreneurship
Approved by AICTE, New Delhi | Affiliated to JNTUH | Accredited by NAAC 'A' Grade
Ananthasagar (V), Hasanparthy (M), Warangal - 506371
(An Autonomous Institution)

MAY - 2020

SR Engineering College
Innovation . Creativity . Entrepreneurship
Approved by AICTE, New Delhi | Affiliated to JNTUH | Accredited by NAAC 'A' Grade
Ananthasagar (V), Hasanparthy (M), Warangal - 506371
(An Autonomous Institution)

CERTIFICATE

This is to certify that the report entitled **"Mosquitoes and insects killing machine"** being submitted by **SOMA AMULYA (19K41A04B6), S.NIKITHA (19K41A04B5), SNEHA REDDY (19K41A04B4), SHIVA KEERTHI (19K41A05B1), I.SAIDEV (19K41A05B2)** in partial fulfillment of I year -II semester of the course 'Product Design studio' of Bachelor of Technology**,** S.R. Engineering College, Warangal.

Internal Examiner **External Examiner**

ACKNOWLEDGEMENT

We would like to express our special thanks of gratitude to our teacher, **Mr.Guruprasad,** who gave us the wonderful opportunity to do this project together as a team, who also helped us in completing this project. We had great joy in learning and doing this project together as a team under the excellent guidance of our teachers and staff. Secondly, we would like to thank our friends and family who encouraged and supported us throughout the journey of this project.

Group 10

ABSTRACT

The domain of our project is health care and comfort. In this project we devised a machine which can kill insects and mosquitoes. The main motive of our product is to kill mosquitoes and insects without any human effort by an electrically driven machine which can be used both indoors and outdoors. Using this product the user can get rid of mosquitoes and insects just by providing power supply to the machine. The idea of our product is to place an electric mesh or net in a cardboard box (plugged in to a switch board) which has an LED bulb in it so that, it can attract insects and mosquitoes towards the machine, when they touch the net, they can be killed. Our product does not pose any health hazard whatsoever, unlike other mosquito killing products such as coils, flash cards and electrical vapor releasing machines which can emit dangerous carcinogens.

CONTENTS

CHAPTER INDEX

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS

CHAPTER - 1

UNDERSTANDING THE USER

1.1 Understanding from the user identification and survey:

1.1.1 **Job Platform/Domain:** Health care and comfort

We have selected health care and comfort of the people as our domain. Health is the most important aspect in every person's life and living a comfortable life is what we all aspire. People often tend to feel more comfortable when there is reduced human effort, this can be achieved efficiently by the use of machines. Thus we are aiming to prepare a machine which considers the person's health care and comfort both at a time.

Under this domain, we have many aspects to work on such as, advanced electrical massager, automatic heating pad, automatic medical box, power supplied mosquitoes and insects killing machine, etc.

Finally, we decided to work on the mosquitoes and insects killing machine as this problem is more persistent and seen often in our everyday life.

Mosquitoes are often found indoors and outdoors. Mosquito bites not only cause irritation but they can also transmit diseases like malaria and dengue.

Image 1: mosquitoes biting.

1.2 The Identified opportunities:

1.2.1 Tools used to identify the opportunities:

We took the help of prior art search to identify the opportunities. Prior art is any evidence that your invention is already known. Prior art does not need to exist physically or be commercially available. It is enough that someone, somewhere, sometime previously has described or shown or made something that contains a use of technology that is very similar to your invention.

We chose the following options to identify different opportunities under the selected domain:

1.2.1.1 observations:

We have observed many situations in our day to day life activities which can relate to the domain we have selected, that is, health care and comfort. There are many unhygienic and uncomfortable things we can change in our daily life such as sink cleaner, medical box organizer, etc. out of all these observations we have found that mosquitoes problem is more persistent and uncomfortable aspect in everyone's life and we aim to work in that direction.

1.2.1.2 Interactions with people:

We interacted with people and asked about their problems regarding our domain. They expressed that killing mosquitoes with hand or with an electric bat is a hectic task while sleeping at night or while traveling outdoors. They expressed their inconvenience with the usage of coils as many people are not comfortable with the fumes of the mosquito coils and vapors emitted by electronic machines to kill the mosquitoes. They wanted a product which was easy to use without any human interference and which does not cause any threat to health of the human beings.

1.2.1.3 Experiences:

Based on our experience with the problem as said by different people while we were interacting with them and also our own personal experience, we have decided to devise an idea such that it fulfills all the requirements to provide comfort to the people.

CHAPTER 2: *UNDERSTANDING THE PROBLEM*

2.1 IDENTIFYING THE NEEDS OF THE USER:

The users need a product which can automatically kill the mosquitoes without any human effort. They need a product which does not cause any health or environment harm. They need a machine which can be effectively used with low maintenance and affordable cost.

2.2 NEED STATEMENT:

We need a machine which can kill mosquitoes and insects automatically, without any effort or inconvenience to humans.

2.3 PRIOR ART SEARCH:

Prior art is any evidence that your invention is already known. Prior art does not need to exist physically or be commercially available. It is enough that someone, somewhere, sometime previously has described or shown or made something that contains a use of technology that is very similar to your invention.
Our product is a new and affordable idea which was never done by anyone before.

CHAPTER 3: *GENERATING A SOLUTION*

3.1 CONCEPT GENERATION

3.1.1 TOOLS USED – SCAMPER

The SCAMPER idea generation technique is founded on the belief that everything new is an alteration of something already in existence. The term 'SCAMPER' is actually an acronym…

S – Substitute.
C – Combine.
A – Adapt.
M – Modify.
P – Put to another use.
E – Eliminate.
R – Reverse.

3.1.2 CONCEPTS GENERATED USING SCAMPER

CONCEPT 1

Substitute: we can substitute the harmful chemicals in coils with organic and natural materials.
Modify: we can modify the Composition with natural oils in vapor emitting machines such that they are harmless to humans.

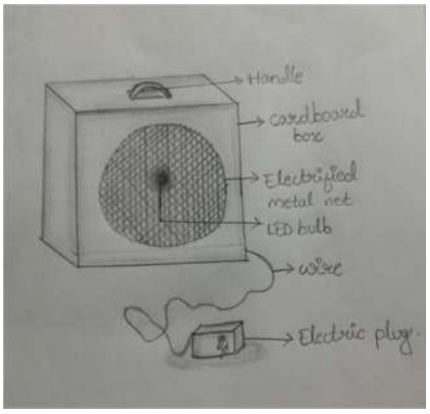
CONCEPT 2

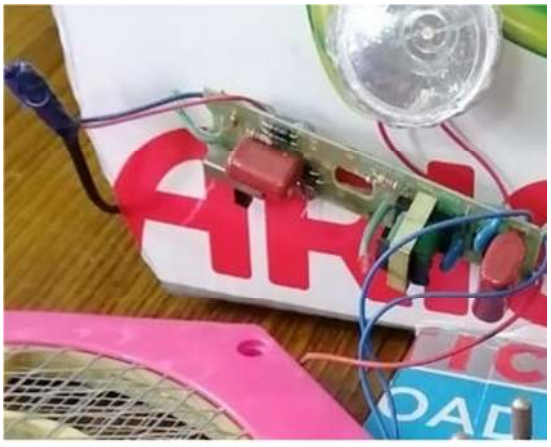
Combine: we can combine the ideas of electric bat and mosquito repelling vapor emitting machine.
Adapt: we can use light to lure the mosquitoes into the electric net of the machine.
Put to use: we can put to use an old dysfunctional electric bat
Eliminate: we can eliminate the lower portion of the electric bat and use the upper net.
Rearrange: we should rearrange the circuit of the electric net inside the cardboard box.

3.1.3 CONCEPT SKETCHES

IMAGES OF CONCEPT 1:

IMAGES OF CONCEPT 2:





3.2 CONCEPT SELECTION

3.2.1 MATERIAL USED

The materials used in the preparation of this product are:

- Cardboard box
- 4.5 volts DC adapter
- Old or dysfunctional bat
- LED bulb
- Power supply
- Soldering machine
- Screw driver
- Double sided duct tape
- Pin punch or stapler

3.2.2 CONCEPT SELECETED USING THE TOOL

We selected concept 2 due to the following reasons:

- Feasible
- Materials are easily available
- Affordable
- Practical and workable

CHAPTER 4: *REALISING THE SOLUTION*

4.1 PRODUCT ARCHITECTURE

4.1.1 PHYSICAL DECOMPOSITION

We have used cardboard box as the outer covering, inside the cardboard box we have arranged electric net connected to the circuit. This circuit also connects an LED bulb and a wire is sent out of the box

4.1.2 FUNCTIONAL DECOMPOSITION

The wire which comes out of the box is connected to a plug and it is put in a switch board, when the current is passed, the circuit inside the box becomes active and electricity passed through the metallic net arranged at to the cardboard.

4.1.2.1 PART-WISE FUNCTIONALITY

Table 1: Part wise functionality of the product

s.no	Part name	Functionality of the part
1	Metallic net	It zaps the mosquitoes and insects when they touch the net.
2	LED bulb	It attracts the mosquitoes and insects towards the machine
3	Wire and adapter	It provides the current from switch board to the machine
4	circuit	It is present inside the cardboard box and provides current to the metallic net and LED bulb.
5	Handle	It is on top of the cardboard box. It helps to lift up the machine easily.

4.1.2.2 PHYSICAL ASSEMBLY- EXPLODED VIEW

4.2 EXECUTION

4.2.1.1 WORKPLAN

- All the existing products to kill insects are either human effort dependent or harmful to our health.
- The product we have designed is capable of killing mosquitoes and insects without any health harm or effort to humans.
- This is achieved through electricity. We can zap the mosquitoes to kill them.
- We already have existing mosquito bats which involves human effort to kill.
- But we should not involve any human effort. So, we created a machine which can automatically kill mosquitoes and insects.
- We incorporated a metallic net in a cardboard box and gave electric supply.
- But this is not enough to get the mosquitoes closer to the machine.
- So, we need to attract the insects.
- As we all know that insects can be easily attracted towards light, we can attach an LED light inside the cardboard box to lure them in and then they can easily get killed.

4.2.1.2 MOCK-UP MODEL

The image of mock up model of our product:

4.2.1.3 FINAL PROTOTYPE

The final prototype of our product:

CHAPTER-5: *COST ESTIMATE*

Table 2: cost estimate

s.no	Expense type	Rupees
1	Material cost(4.5 volt DC adapter)	450/-
2	Miscellaneous	20/-
Total		**470/-**

CHAPTER-6: *CONCLUSION AND FUTURE SCOPE*

6.1 CONCLUSION

We came up with a product which can kill mosquitoes without any human effort. Our product does not harm our health and it is comfortable to use.

6.2 FUTURE SCOPE FOR IMPROVEMENT

There is a scope for further improvement in our project by the following changes:

- In our product we can include a battery which can be charged and used when there is no direct current supply or in case of power cuts.
- Instead of using cardboard we can use wood or plastic for strength and durability of the machine.
- We can increase the voltage of the adapter to zap lizards if they touch the electric net.