

# Design of Honey Collecting Machine from Beehive Powered by Solar

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## Article Info

Volume 82

Page Number: 2839 - 2843

Publication Issue:

January-February 2020

## Abstract:

Apiculture is the commercial production of Honey. It is an important element in the sweetener for man. Honey is produced by honey bees. Apiculture is breeding of bees for the production of honey and bees wax using for commercial production. Honey is adulterated by sugar syrups and molasses derived by acids or enzymes from corn, sugarcane, sugar beet and syrups of natural origin. This is a main reason as many people keep bees for honey production to boost the energy of our body and can help to overcome seasonal allergies. We designed a model to collect the honey from their beehives without adulteration and prevent many people from bee bites. Our machine directly collect the honey and wax by putting smoke from smoke distributor to drive away the bees, by using directly cut hive without human interface. An effective harvesting method is necessary to make the honey harvesting more easier and overcome the problems and Without any manual interference, we can able to collect honey from the hives. This process removes the role of extractor to climb the tree and collect the honey. This may reduce the cost of labors and takes less time than the manual method. It also eliminates the wastage of honey, when the beehive is located in high places like tall buildings, mountains, under the rock etc. This process prevents humans from bee bites. The main feature of this model is 70% saving in cost and 90% saving in time. The major goal of this model is to collect honey without human interference and without wastage of honey.

**Keywords:** Machine, Honey collecting, natural, and sugar syrups

## Article History

Article Received: 14 March 2019

Revised: 27 May 2019

Accepted: 16 October 2019

Publication: 18 January 2020

## I. INTRODUCTION

The first step in the extraction process is to break the capping. This may be done by an with a manually-operated uncapping knife. The knife should be heated for cutting the wax capping. The cutted piece of wax is called as capping. of wax, which is rich in honey content. This 'capping wax' is used to make candles or other products. Automated uncapping machines work by scraping the surface of the wax. After uncapping, by fixing the frames in a honeycomb, which will extract the honey. The frame should be position correctly to prevent from the flowing out during extraction. The resulting some wax should be passed for screening to obtain pure honey.

## II. REVIEW OF RELATED LITERATURE

J. Biesmeijer[1], describe about the occurrence and context of the shaking signal in honey Bees. Honey from the beehive can be extracted when its curved. If the frame is curved, take the frame to the ground. Shake the frame gently. If the honey is leak from the frame it should not be extracted, because it is highly with water content in the honey.

O.F. Michae[2], describe about the Costs and returns in modern bee keeping for honey production in Nigeria. Here, the queen bees are hidden in the lowest part of the hive and the upper part are filled by the workers where the section spacing was

equally separated. It is easy for managing producer to collect the honey.

Bitzer[3], describe about the Honeycomb technology. The author describe about the different types, different shapes of comb, designing of sandwich panels of the honey comb, testing and materials properties of the comb panel. The fig 1.1 shows the different types and different shapes of the honey comb.

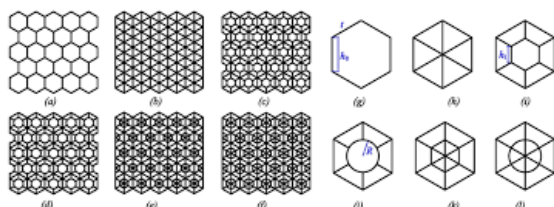


Fig 1.1 honey comb technology

#### Significance:

- Without any manual interference, we can able to collect honey from the hives
- This process removes the role of extractor to climb the tree, and collect the honey
- This may reduce the cost of labours and takes less time than the manual method
- By this process, we can able get the pure honey without any adulteration.
- This process prevents the human from bites and also from death.

### III. CONVENTIONAL METHOD

#### Extracting Bee Hive Honey:

Step 1: In order to drive out the bees from hive. The extractor creating the smoke fire and the make fire near the entrance of the holes of the hive. This procedure drive out the bees from the hive.

Step 2: By using Knife, the hives can be cut down. Be aware of the large opening is enough so that only we can able to fit the hand inside the hive.

Step 3: Once we reach out the hive for the extraction of the hive. without the machine, it is very difficult task for collecting the honey. By using the knife we can able to cut the comb.

Step 5: Place the tray on the top of the hive. The tray is used to collect the honey. press the honey comb to extract the honey.

Step 6: The tray contains the extracted honey and then passed through the strainer. Finally, The strained honey is ready for the usage.



Fig 1.2 Traditional method of honey collecting method



Fig 1.3 Artificial honey extracting method

### Types of Bees:

1. Honey bees
2. Bumble bees
3. Leafcutter bees
4. Mason bees
5. Mining bees
6. Plasterer bees
7. Flower bees
8. Stingless bees
9. Wool carder bees



Fig 1.4 Types of bees

### IV. METHODOLOGY

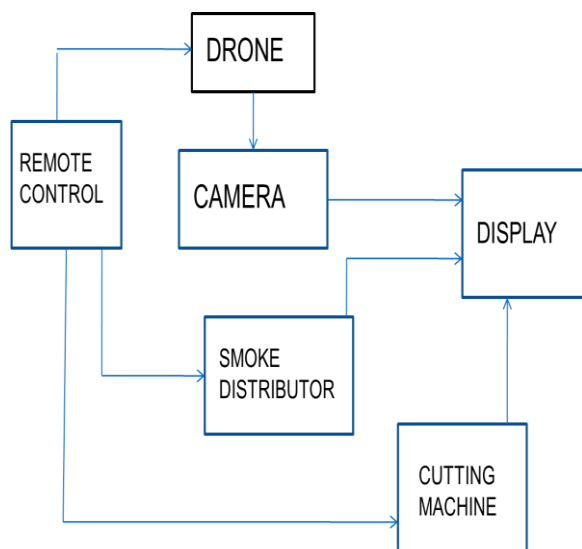


Fig 1.5 block diagram of the honey collecting machine.

The Fig 1.5 explains the overall working of the honey collecting machine. The drone reaches the beehive (located at high place) by using the remote control. Then, by the smoke distributor

distributes the smoke to drive away the bees. The camera fixed in the drone shows the position of the beehive in the display. Now, by using the cutting machine cut the honey comb and finally honey is collected.

### Specifications:

#### Drone:

1. 1000Kv BLDC Motor
2. 40A ESC
3. 28cm arm length of single side
4. 12 inch propeller
5. k2.1 FSB
6. 11.1v/2200 MAH battery
7. b3 charger

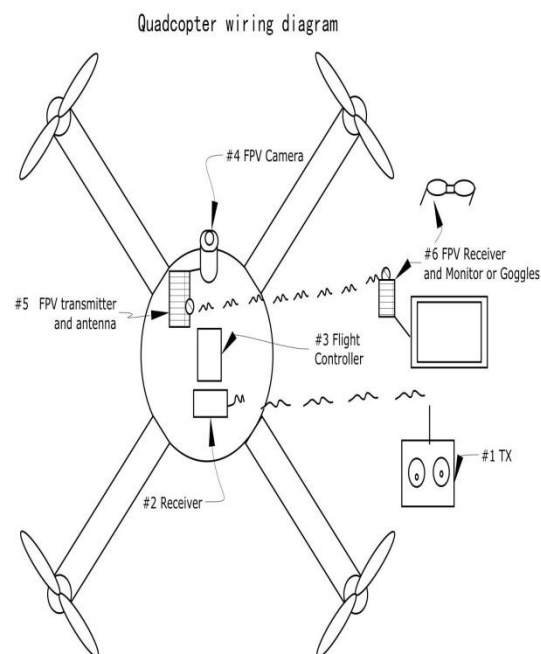


Fig 1.6 Layout of quadcopter

### Smoke Distributor:

It is a smoke storage tank consists of Nozzle and Remote controller shown in Fig 1.7. The toxic smoke is produced from a reaction between two chemical compounds, hydroquinone and hydrogen peroxide. The supply to the battery is also provided by solar panel (12V). The lipo battery is charged also by using solar panel. Because it is renewable.

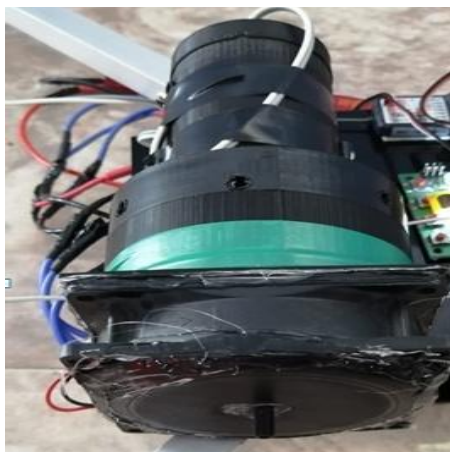


Fig 1.7 Smoke Distributor

### Operation of Smoke Distributor:

Step 1: The lipo battery and circuit protection are in the last part of the setup

Step 2: The coil is connected to the lipo battery for energize.

Step 3: The coil is wound with cotton (dipped in the neem oil) shown in Fig 1.8.

Step 4: Due to energize, the coil gets heated.

Step 5: Finally, the smoke will arise.



Fig 1.8 Inner coil of smoke distributor

### Operation:

The drone consists of four propellers. The opposite propellers are rotated in same direction. Two propellers (A,C) rotated in clockwise direction. The other two propellers (B,D) rotate in Anti-clockwise direction. The smoke setup is placed above the drone. Inside the setup coil is placed. By giving supply to the setup the coil gets heated. So the smoke is produced. By connecting BLDC motor the smoke produced is distributed outside through the nozzle. Then the mechanical setup is placed in the drone. The servomotor is used in the mechanical setup to cut the beehive. An axe blade is connected to the setup extending outside to cut the beehive. By operating the servomotor, the blade moves forward and backward. It cuts the beehive.



Fig 1.9 Drone with smoke setup

## V. CONCLUSION

In order to reduce the Drawbacks of the Traditional Honey collecting method, this project is Designed and Fabricated with Solar System acting as source of Input Power shown in Fig 1.9. This system automatically collects the honey and wax from the beehive and reducing the bee bites. This can be further used in future extending to larger agricultural application like cutting the fruits and vegetables and watering the crops.

### Acknowledgement:

Our sincere gratitude and thanks to Dr.N.Senthilnathan, Professor and Head of the Department, Department of EEE for guiding and mentoring us through the different stages of the project. We also thank the management of Kongu Engineering College for supporting the project and appreciating our efforts.

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