

Fabrication Of Arecanut Dehusking Machine

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ABSTRACT: Fabrication of areca nut de husking machine is presented in this paper. De husking of Areca nut is very difficult by hand. This work present the fabrication work involved in developing an automated areca nut husk removing machine. The main purpose of this machine is eliminates the skilled operators involved in de husking the areca nuts. The loading of areca nut is manually processed through the hopper. The husk removal action is achieved by the rotating shafts which consists blades on its periphery. The shafts are rotated with the help of gear box mechanism. The gear box is connected to the motor. Currently there is more number of devices available for peeling the green and dry areca nut. But some other machines are not suitable for peeling the only dry areca nut. Compare to other devices our machine is most economical, compact and portable. And also less cost.

Key words: De husking machine, Areca nut, blades.

1: INTRODUCTION

Production of areca nut in India is more compared to other countries. It is a most economical crop in India. Kerala, Karnataka, Tamil Nadu, Assam, West Bengal, Meghalaya, Maharashtra are the highest production of areca nut in India. In India it is extensively used by large sections of people and is very much linked with religious practices. India is the largest producer of areca nut and at the same time largest consumer also. Major states cultivating this crop are Karnataka (40%), Kerala (25%), and Assam (20%).

After drying areca nut are de husked by manually by using sharp edge knife. By this method the production rate is low and the consumption of time is more. So it is necessary to develop a automated de husking machine to increase the production rate, decrease the labor cost and save production time.

1.1. CHARACTERISTICS

The areca nut is mainly grown in coastal areas of Kerala and Karnataka in India. There are two varieties of Areca nut, called White Supari and Red Supari. White variety supari is prepared by harvesting fully ripe Areca nut and by sun drying for a several days. After drying the nut, the shell of the nut has to be removed by hand or machine.

The nut removed from this dried fruit is called Areca nut. The white variety of Areca is mainly grown in Dakshina Kannada and North Canara of Karnataka state and northern parts of Kerala.

2: LITERATURE SURVEY

The current world productivity of Areca nut is 1.287 tones/ha. India is the largest producer of Areca nut in the world. India ranks first in both area (58%) and production (53%) of Areca nut. Besides India, China, Bangladesh, Indonesia, Myanmar, Thailand are the other important Areca nut producers. It is estimated that more than 10 million people depending on this crop for their livelihood.

The main pockets of production of Areca nut in India are distributed in the states of Karnataka (42% of area and 45% of production), Kerala (28% of area and 24% of production), and Assam (20% of area and 16% of production). Tamil Nadu, Maharashtra Andhra Pradesh, West Bengal and Orissa are the other important producing states. Mumbai, Ahmadabad, Indore, Jaipur, Delhi, Nagpur, Patna, Calcutta, Cuttack, Mangalore, Bangalore, Rajkot, and Chennai are the important marketing centers of Areca nut in India. In India the total consumption of areca nut is estimated to be 330,000 tons/year. Pan masala, scented supari and gutkha are the main areca nut products exported from India to other countries.



Fig.1 photo of areca nut

In India the areca nut is majorly producing in Karnataka. The areca nut is one of the type of garden crop cultivated across South India. In Karnataka Shimoga, North Canara, Dakshina Kannada, Udupi, and Chikmagalore districts are stands in major production of areca nut. The present production increased 400 times under area wise compare to 40 years ago production.

3. RELATED WORKS

There are so many areca nut peeling machines are available in the market. The mainly used machines are given below:

➤ **pedal operated machines:** These machines are either hand operated or pedal operated.



Fig. 2 hand operated peeling machine

➤ **Fully automated machines:**

These machines are operated by electric motor and other source of energies. The below machine in **Fig.3** consists of a mainframe on which a rotary shelling drum is a hollow cylinder of diameter 280mm and width 60mm. it is welded at the centre by bush to hold the shaft. The outer portion of drum is wound by a rubber soul of 20 mm thickness by means of nut and bolt arrangement. Below the drum mechanism 2 rotating shafts are provided to remove the husk, the shafts having the helical grooves where the husk is holds and removed. The shafts are rotated with the help of belt drive connected to the pulley of 1 hp electric motor. Its production capacity is 25 kg per hour. The cost of this unit is Rs. 28 000.



Fig.3 existing project

4. PROBLEM DEFINITION

The removing of husk from areca nut is the concentrated process for the labors. In most of the villages the ladies and children are working for peeling the areca nut. By hand it is very difficult to peel the areca nut. They use sharp knives to remove the husk. By this method the production rate is low and time consumption is more. The production rate is 3kg/hr being done through manually. And normally one will do about 24 kg in a day. This work is done by skilled labors only. Shortage of labor is a major problem which almost every village and farmer faces, especially during the harvest season. It is necessary to develop a machine which is upgrade the rate of production and decrease the production time and also eliminate the risk of labor injury during the manual peeling method. Now a day's there are more variety types of machines are available in the market. These existing machines are more costly and are complex in design. The main problem is that they are heavy in weight and not portable. Some machines may cause damage to the Areca nut and not easy to operate.

5. OBJECTIVE

The main purpose of this project is to fabricate the machine for peeling the areca nuts. To overcome the problems arrived from the existing machines such as incomplete peeling of husk, more cost and not suitable for different sizes. These problems can be overcome by developing a machine which can efficiently and economically de-husk the areca nuts. The machine should be able to accommodate different sizes of areca nut and it must also be easy to operate, eliminating the need of skilled labor.

6. WORKING PRINCIPLE

The machine consists of 2 active shafts or live shafts, one of the shafts is rough surfaced and the other 1 shaft consists of 6 blades. The feed is provided at a horizontal position of shaft. The shafts get power from an electric motor through a chain and sprocket through pulleys. The shafts rotate in opposite directions to each other. The areca nut is fed through a hopper; the smaller grade (size) areca nut is fed at the position as shown in fig.4. As the shafts rotate in opposite directions, the patterned shaft grips the areca nut and the bladed shaft peels the husk from the nut. The husking will be on the basis of the moment action of force. When both the shafts rotate further, the twist action of the blades inside the husk half width will peel the husk.



Fig 4: Areca nut dehusking machine

7. TECHNICAL SPECIFICATIONS

Feature	Description
Total weight	26 kg
Maximum height	550mm
Maximum width	500mm
Maximum length	800mm
Motor	220v,2800rpm
shaft	Length=450mm Dia=50mm

8. SCOPE OF PROJECT

In our country the people are looking for a job that has to be done in easier way. This machine reduces the human effort and also saves time to great extent. It is possible for us to obtain the more output. In many industries labors are used for processing of areca nuts, it is both costly and time consuming. Our proposal reduces the cost and time, as the machine is fixed once. By implementing this human effort will get reduced. Chances of accidents in manual method is more, we can overcome in this design. Efficiency of machine will be maximum, if proper care and service is carried out once in a week. The production rate will get increases, as the time required by this machine is less. It is not huge, so less space is required.

9. RESULTS AND DISCUSSION

The dry areca nuts are designated as three types according to their sizes. Small sized, medium sized and large sized. Each type of these areca nuts is used to remove the husk in different trials. In each trial the consideration were made with respect to the removal of outer skin of areca nut.



Fig. 5 trial of areca nut dehusking

After completing each trial, the results were compared and found that the third trail was the best method. This suggests that on an average around 7 Areca nuts of each type is Dehusked completely by this machine. The production rate of this machine is 60 nuts per hour.



Fig.6 final output of dehusked areca nut

CONCLUSION

The areca nut De husking machine is in evolution stage. The machine is compact in design to make it portable. And also the cost of the machine is more effective compare to other machines. The machine can be operated by semiskilled labors also. This machine has two live shafts to remove the husk from the areca nut. It could help a large number of farmers to overcome their various De husking problem.

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