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Design and fabrication of automatic Coconut cutting machine

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Abstract: *The purpose of the project is to design a machine that will split upper side of coconuts. The machine will consist of a feed mechanism which will feed the coconut to the cutting chamber. The cutting chamber will consist of a cutting wheel that will cut the coconut. The peeling blade will be driven by prime mover (mostly an electric motor). The coconuts will be first fed in from a bucket/hopper to the chamber where the complete process thereafter will be automated. The main aim after the design and development of such a machine is to automate the process of coconut splitting wherein the process will be time saving, include less efforts and will help prevent any probable accidents.*

Key Word: *Feed Mechanism, Automated, Development, Prime Mover, Less effort.*

I.INTRODUCTION

1.Coconut production plays a very important role within the financial set-up of Bharat. Coconuts are known for its skillfulness as seen in several uses of its totally different components. It additionally has cultural and religious significance in several societies.

2.In India, there are large numbers of coconut trees and there is a wide range of its consumption, one of the major consumptions is drinking the fluid inside the coconut fruits.

3.Generally, a labor is trained to cut the hard coconut fruit. As now a days the workers are disappearing gradually, this machine will help to overcome this problem of cutting the coconut fruit.

4.In India coconut is produced in the most of the states and it is utilized in two stages such as immature and mature, the fruit contains water and jelly like meat. For the productive usage of the coconut fruit peeling operation is essential in market. Coconut peeling machine is also called coconut trimming machine, the traditional methods for coconut peeling using sharp knife, which is monotonous and laborious. Our introduced coconut peeling machine consists rotating lower part of fixture where coconut is fixed and rotate by the motor. The husk is removed by the sharp blades fixed on tools. Tools are fixed on the frame to reduce the vibration and guide the movement of the tools. Due to the simple mechanism used in machine it will be efficient and economical with low maintenance.

II.REVIEW OF LITERATURE

In India, coconut is cultivated mainly in the coastal tracts of Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Odisha, West Bengal, Pondicherry, and Maharashtra and in the islands of Lakshadweep, Andaman and Nicobar.
By the late 1970s it accounted for some 68% of total production in India and at one stage some 899,198 hectares were reportedly under cultivation.

Today Kerala produces roughly 45% of India's coconuts with some 92% of total production lying in the southern Indian states and Kerala's neighbors.

In this Research paper author says that India is one of the most coconut growing country in the world. For the effective utilization de-husking is essential. De-husking is the process of expelling husk from the coconut. The conventional methods are foot operated de-husking machine, mechanical coconut de-husking machine and hydraulic operated coconut de-husking machine.

In this paper author says that coconut water used as a healthiest drink which is naturally available. In many countries like it is obtained by splitting and punching but this is risky. That's why the proposed model consists of hydraulic system and frame with fixture which hold the coconut. Piercing operation is done with the tool which is operated by hydraulic system

In this paper author given that this paper consists the development conceptual design for dual purpose coconut processing machine. Prototype of the machine is created and tested which used to obtained dehusked as well as grated coconut. Which operated at different speed for both the operations. Three conceptual designed machines are analyzed where two persons are performing two different operations simultaneously to because tools are situated adjacently.

In this paper author found that the coconut is used by one third peoples of our world. But for the utilization it needs to de-husked before it, manual methods for de-husking are time consuming and it has risk of injury. It requires mechanized system but the existing technology consists hydraulic systems which is not affordable for the producer. To overcome these problems proposed system has simple mechanism having motorized shaft with spikes which penetrate into the husk and remove it.

III.PROBLEM STATEMENT

Coconuts are very hard which does not cut easily, so for make it easy skilled labors are required for this. It takes a lot of time, once to peel the coconut and once to grate it. It help us to decrease the time because it can do both work the works simultaneously.

IV.DESIGN METHODOLOGY

Coconut with avoid shape with length 500-650 mm, Diameter of 160-206 mm, Weight of 0.62-40 kg, Shell diameter 80-120 mm, thickness is 62 at pedicel end, thickness is 34mm at apex end, thickness is 32 mm from ¼ distance from pedicel end, thickness of 24 mm from half distance from pedicel end and thickness is 28 mm from 3/4th distance from pedicel end.

The methodology to design of coconut shearing machine based on the quality function deployment (QFD) method, which the basis for determining the parameters needed to design accordance with the coconut farmer's community needs.

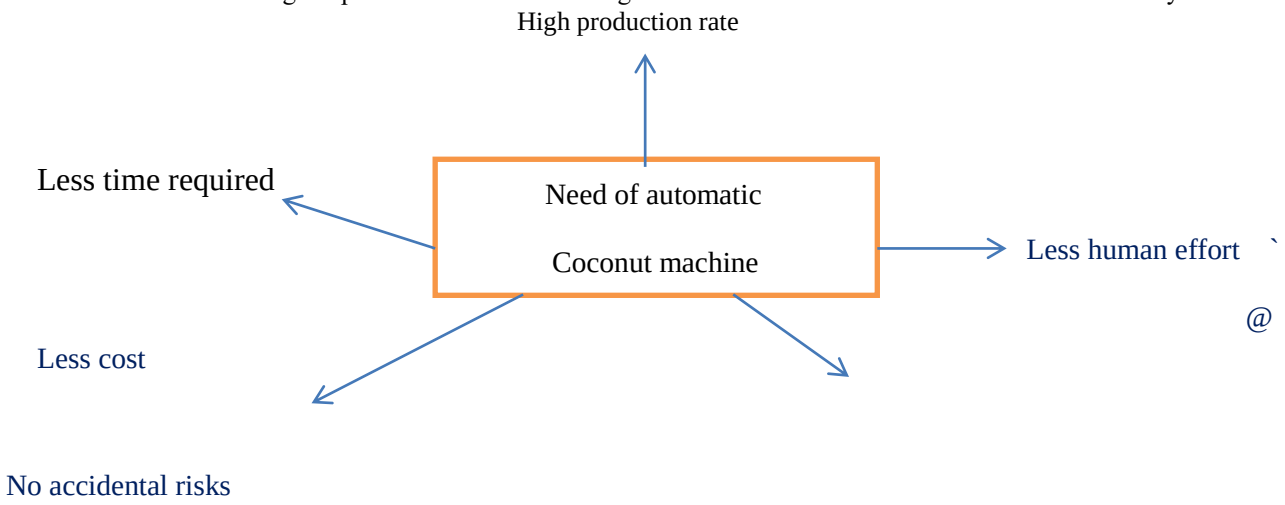

Figure 4.1

V.ADVANTAGES

1. It is simple and fast process.
2. No need of skilled labor.
3. Accidents are eliminated.
4. Increase in production rate.
5. Time required is less

VI.LIMITATIONS

1. Machine is bulky
2. Maintenance cost is high.

VII.APPLICATIONS

1. Coconut Oil Industries:

The coconut oil industries occupied a large space in industrial area. The requirement of coconut oil has increased vastly z in recent years.

To get the oil from the coconut it is required to make some operations on coconut such as, removing the husk and De-shelling the coconut. These operations were carried out manually and also some other machines were present for Conducting those operations. These processes have more limitations. But the automated coconut de-husking machine has a strong impact in the coconut oil industries. The automated coconut de-husking machine can make revolutionary and Productive changes in coconut oil industries.

2. Coconut Farming:

Agriculture forms the backbone of our country economy. About 50-60% of citizens are depending on agriculture.

For developing our country means providing our farmers with more advanced technology or tools, which would reduce overall time and cost required for work. This would make work more easy and comfortable.

VIII.CONCLUSION

With this machine we can,

- Reduce human effort.
- Increase continuous work capacity.
- Increase efficiency than conventional system.
- Less harmful to user.
- Fool proofing.

A power operated coconut de-husking and de-shelling machine was designed and developed. Coconut de-husking and de-shelling machine which de-shell coconuts without nut breakage and machine is easy to operate and perform with an average de-husking capacity of approximately 200-250 nuts per hour. An automated machine for coconut dehusking and deshelling has been developed for the small scale farm holder in the agriculture and rural areas. The operation of machine is simple, fool proofing and the maintenance of the machine is not expensive.

References

1. *Venkataramanan S, Abhinav Ram B, Rahul R, "Design and Development of Automated Coconut De-husking and Crown Removal Machine".*
2. *Y. Prashant, C. Gopinath, Vignesh Ravichandran, "DESIGN AND DEVELOPMENT OF COCONUT FIBER EXTRACTION MACHINE"*
3. *Mr.VinodP.Sakhare, Mr..KetanK.Tonpe, Dr.C.N.Sakhale, "Performance Analysis of Hydraulically Operated Coconut De-husking Machine"*
4. *S. D. S. Piyathissa, P. D. Kahandage, "Introducing an appropriate mechanical way for coconut de-husking"*
5. *Mr. Varad V. Bhalekar, Mr. Shubham M. Langarkar, Mr. S. B.Kamble , "AUTOMATIC COCONUT DE-HUSKING AND DE-SHELLING MACHINE"*
6. *Stephen Kwasi Adzimah, Samuel Oppong Turkson, "Conceptual design of coconut de husking machine"*
7. *Mr. Pankaj K. Panda, "Design and fabrication of coconut de-shelling machine" 2016 IJEDR, Volume 4, Issue 2, ISSN: 2321-9939*
8. *Albert L. Mix, Battle Creek, Mich., "Coconut de-shelling machine" US patent 2,783,801, March 5, 1957.*
9. *B. N. Nawankwojike, "development of coconut de-husking machine for rural s mall scale farm holdew", international*