

Fabrication and Design of Coconut Dehusking Machine: A Concept

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Abstract— Coconut is a main crop of Kokan, Kerala region and dehusking of coconut is very necessary step in making the coconut ready for further utilization. Coconut dehusking machine is used to removing of the husk from the coconut. Traditional dehusking is time consuming and difficult process. Generally, coconuts area unit dehusked manually employing a hand cutter. These strategies need skilled labor that is tough and painstaking method. To overcome these limitations and to provide safety for the operator, a new design of dehusking machine is introduced and fabricated. Optimum variety of blades is arranged on the rollers to dehusk the coconut with minimum force.

Keywords— Spikes, Roller, Dehusking, Coconut.

I. INTRODUCTION

India is the third largest producer of coconut in the world after the Philippines and Indonesia. India alone accounts for about 69% of the world production of coir and coir products. The total output of coir and coir products in India is estimated to be around Rs.1500.00 core including exports of Rs.350.00 core. Coconut husk, shell, copra, coconut water are useful parts of coconut orchard. In various forms such as shell as a fuel, copra as food, coconut water as nutritious liquid in this way coconut husk used in coir industry. Coconuts are grown in approximately more than 93 countries of the world, with a total production of 5.4 billion tons per year. An individual coconut fruit is made up of an excerpt, India is the second largest country to grow the coconut palms. In the economic, social and cultural activities of millions of people in our country coconut plays an important role. Food, edible oil, industrial oil and health drink to humanity are produced from the coconut. All parts of coconut tree is useful in one way or other and the crop profoundly affects the socio-economic security for millions of farm families. The main source of vegetable oil used for both edible and industrial applications is coconut. The present study is focused on the various machines which are available for the husking operation of coconut and points out the advantages and disadvantages of each.

II. PROBLEM DEFINITION

Dehusking with traditional hand tools like machete or a spike depends on the skill of worker and involves training. Nowadays there is shortage of such skilled. Workers. The mechanized or the power operated machines are developed to eliminate the drawbacks of manual tools. Following causes were identified for dehusking of coconut:-

- The dehusking of coconut regarded as most time consuming.
- Tiring and difficult operation to perform.
- Involves more drudgery
- Skill worker is required because dehusking is done with the help of traditional hand tool.

All methodology of Coconut dehusking machine can be used as a continuous improvement the above mentioned problems are affecting the dehusking rate of coconut hence it will affect the market demand of coconut. Hence in order to eliminate the above mentioned causes.

III. DESIGN CALCULATION

In the designing of machine, it is very important to consider the shape and size of the coconut. After the careful study, average dimensions of the coconut wherever found. Those values are described below.

Height : 800mm

Length : 480mm

Width : 400mm

Material : Mild steel

Design of motor

Phase : single phase

Voltage : 230V

Current : 2.5 A

Speed : 1400rpm

Design of gear

Simple gear train will be used.

Module : 4

Gear 1

Teeth : 18

pitch diameter : 72mm

speed : 20rpm

Gear 2

Teeth : 7

pitch diameter : 28mm

speed : 60rpm

Gear 3

Teeth : 7

pitch diameter : 28mm

speed : 60rpm

Gear 4

Teeth : 28

pitch diameter : 112mm

speed : 15 rpm

Design of pulley and belt

Driver pulley diameter : 75mm

Driven pulley diameter : 280mm

Center distance : 300mm

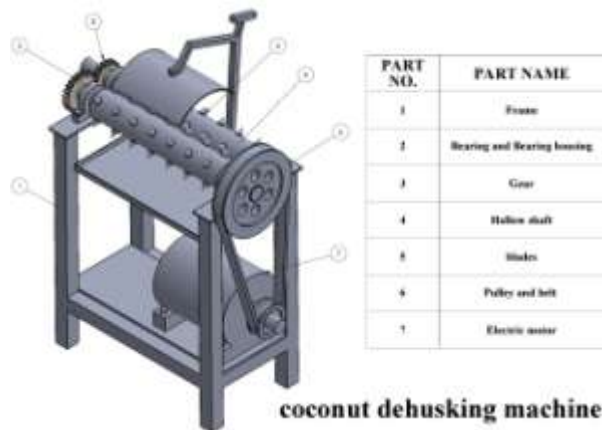
Size of roller

Diameter of roller : 150mm

- Length of roller : 400mm
- Shaft size : 40mm
- Size of tynes or blade
- Conical type blade are used.
- Diameter : 15mm
- Total height : 35mm
- Blade height : 12.5mm

IV. CONSTRUCTION AND WORKING

This power operated coconut dehusking machine operates on single phase, one HP motor. Transmit the ability from motor to the cylinders, with needed speed, gear and block gear are incorporated. The dehusking unit consists of 2 cylinders, this cylinder rotates different speed so as to cause tearing impact over the coconut husk. The two diameters provide different speeds at opposite directions. This eliminates the employment of range speed reduction unit within the machine. The tynes are mounted on the cylinders in a particular manner, to get more grip and effective dehusking. The dehusking method is terribly easy, place the coconut in between the two rolling cylinders, rotating in opposite directions and press it by a manually operated mechanical linkage. As the cylinders rotate, tynes provided on the periphery will penetrate into the husk and tear it away. Tynes are designed in such how that it'll not cause any injury to the coconut shell. Removed husk is in the form of separated fibers, so these fibers are more useful in coir industry. Thus the dehusking can be done, effectively.



Solid Model Of Coconut Dehusking Machine

V. OBJECTIVES

- Reduction of human effort.
- Low cost coconut dehusking.
- Reduction of manpower requirement.
- Improvement on number of nuts processed per hour.

VI. CONCLUSION

In this contemporary world the time and cost has lots of weightage for each and every operation. So a new machine has been designed, developed, fabricated and named as "Coconut Dehusking Machine". By comparing with various types of existing methods and machines includes traditional, and automatic, it can be concluded that this machine need less human effort and therefore the check results test substantiate the above. As compared to the existing available model the developed model is simple, efficient, need less time and cost effective. Importance is given towards user friendly operating and primarily safety. Safety cover is provided on the rotating members like belt pulley and gear.

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