

Coconut Peeling Machine

Prof. Pankaj P. Awate¹ Prof. N. D. Patil² Prof. S. A. Kore³

^{1,2}Assistant Professor ³P.G. Cordinator
^{1,2,3}Department of Mechanical Engineering
^{1,2,3}PVPIT Budhgaon, Sangli, India

Abstract— Peeling or de-husking the coconuts in India require human power, de-husking tool, and more time and is lengthy process sometime cause hazard to operator. Doing the process without a hazard and with minimum time was the need of time and easy operation. Coir industries need husk of dry coconut as their raw material. So the parties need complementary parts of the coconut. Hence there is a need to bridge the gap between coconut farms and industries. So earlier days, when peeling of coconut is need, it required more man power by using old coconut pilling machine. There is chance of danger and accident doing peeling of coconut using old machine. Sometimes hard and very though coconut cannot peel easily by using old machine and it increases the chances of accident during the operation. When coconut is soft and green it contains some sort of water in their coir, then it is difficult to peeling the coconut. Hence, the old machine is very useful for this type of coconut. Due to these problems, it is required to make a machine which nullify the all these above problem.

Key words: Coconut Peeling, De-husking

I. INTRODUCTION

Conventionally, it is easy to break the coconut which we get in the market which is of daily use. But for a huge scale production, the process starts from de-husking or peeling the fiber off from coconut. So this necessity i.e. to avail the process at one place made us motivated to optimum processing time and compactness taken into consideration. To peel the fiber off from a dry coconut manually is a tedious task and also it can cause harm to the operator.

The thickest and most resistant of all commercial natural fibers, Coir is a coarse, short fiber extracted from the outer shell of coconuts. India is the largest coir producer in the world accounting for more than 80 per cent of the total world production of coir fiber.

The coir sector in India is very diverse and involves households, co-operatives, NGOs, manufacturers and exporters. Coconuts are grown in more than 93 countries in the world. Due to this, a machine fulfilling both the requirements is desirable and hence our project finds its scope.

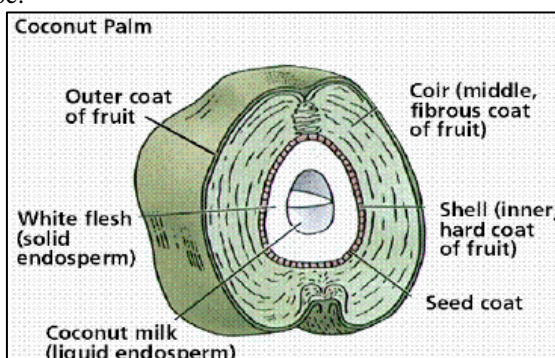


Fig. 1: Cut Section of Coconut



Fig. 2: Conventional Method of Coconut De-Husking

II. DESIGN & METHODOLOGY

As we use coconut peeling machine for peeling the coconut and separate the coir from coconut shell. It mainly consist of 1) Main base frame 2) Tilting frame 3) Peeling jaws 4) square bar 5) spring

A. Working Principle

The working principle of coconut peeling machine is a basic principle used in mechanical linkages and their constraint motion. It consists of main five important parts. The parts are main base frame, tilting frame, spring, peeling jaws, vertical square bar etc. We have to place coconut over main base frame, and then with the help of spring we inject or insert peeling jaws with the help of our legs which applied force. When the peeling jaws insert in the coconut then the peeling jaws are expand with the help of our hands. Hence, with the help of mechanical linkages and man power we can peel the coconut very easily and comfortably.

B. Components of Machine

1) Main Base Frame



Fig. 3:

The main base frame is of M.S.(mild steel) material. As on this frame all the forces are act, hence it should be tough and have better strength to absorb the various forces during the operation. Therefore we select M.S. and Dimension: length = 60cm, width = 30cm

2) Tilting frame



Fig. 4:

The M.S. frame is pivot to the square bar and it contain the peeling jaws for peeling the coconut. The frame should be tough enough to absorb the forces and Dimension: Length=68cm, Width=11cm

3) Peeling jaws



Fig. 5:

The peeling jaws are used to peel the coconut which is of gray cast iron. It should have high rigidity and toughness for peeling the hard coconut. And Dimension: Handle length = 64cm

4) Square bar



Fig. 6:

The square bar is act as cantilever beam in the construction. So, bar should have high strength and capable to absorb bending stress induced during the operation. Material: M.S. & Dimension: Length= 45cm

5) Spring



Fig. 7:

The spring that we used should have high stiffness and rigidity which is required when a force is applied during the peeling of the coconut. Material: High carbon steel Dimension: Free length = 30cm, Solid length = 4cm, Deflection = 1.5cm, Inside dia. = 2.8cm, Outside dia. = 3cm

6) Actual Working Model



Fig. 8:



Fig. 9:

7) Peeling Capacity

Capacity should be based on the maximum amount of coir to be removed within the shortest available time. As a rule-of-thumb, specify approximately twice the maximum capacity you anticipate needing for normal conditions. An average it removes coir with twice operating or stroke of the jaws and leg force approximately.

C. Cost Expenditure

Sr. No.	Particular	Quantity	Cost in Rupees
1.	Angle bar	1/12feet	350
2.	Square bar	1/2.5feet	150
3.	Peeling jaws	1	200
4.	Hollow pipe	1	150
5.	Rivets	10	20
6.	Nut	6	10
7.	Bolt	2	20
8.	Washer	8	10
9.	Spring	1	40
10.	Fabrication	-	700
11.	Painting	-	50
Total			1700

III. RESULT & DISCUSSION

As per the operations performed, readings are obtained are shows time taken by each process with respect to the different coconuts size.

- Most inexpensive method to remove the coir from coconut with very effectively.
- Less effort are required as compare to old coconut peeling machine.
- Less time required for peeling the coconut and the working is very easy.
- Hard as well as green fresh coconut also peel very easily.
- It is useful for home as well as commercial purpose.

A. Advantages

- Low capital cost
- Less maintenance required and very simple construction.
- Less man power and highly efficient as compare to other peeling machines.

- It takes less time to peel the whole coconut.

B. Disadvantages

- Weight of the machine is more as compared to other old peeling machines.
- More space required.

IV. CONCLUSION

In this modern world the time and cost has more weightage for each and every operation. So a new machine has been designed, fabricated and named as “Coconut peeling machine”. By comparing with many types of existing methods, including traditional, and automatic, it can be concluded that this machine requires less human effort and the test results substantiate the above.

- The developed model is simple, efficient, requires less time and cost effective when compared to the existing available model.
- Importance is given towards user friendly in operation and mainly safety.
- Overall performance of coconut peeling machine is satisfactory for peeling the coconut effectively and economically.

V. FUTURE SCOPE

The coconut peeling machine operated by using effective utilization of man power and with the help of mechanical linkage.

For large scale operation of peeling of coconut the machine should not be compactable with mechanical linkages. It also uses man effort to peel the coconut, hence the time required is more. It is possible to use man power for high production rate.

For high production rate we can use hydraulic or pneumatic system and equipment for peeling and removing coir from coconut. Which is useful for high production rate or job production purpose.

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