DESIGN AND FABRICATION OF TENDER COCONUT CUTTING MACHINE

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Abstract: *Automation plays a vital role in major things in day to day life. It is not only applicable in automotive industries. The necessary of automation is to reduce the human effort and to save time. Here the tender coconut opening in easiest way is proposed. But most of the people cut the coconuts manually. But it is more difficult and skilled persons required. A common problem that many people are facing is punching and splitting the coconut. The existing (traditional) tools used are unsafe, messy and also needs skill and training. The risk of injury is also too high. There are some machines for pairing coconut, but until now no tool exists to punch a hole and split it open. This necessitates the development of a cutting and punching coconut. The selected concept mainly consists of punch operated by a lever and torsion spring mechanism. When the coconut has to be punched the operator places the coconut on the top of the machine in natural rest position and the lever is raised and pressed against the tender coconut to punch a hole. For cutting, the coconut is placed in the rest position and the lever is raised & operated to cut the coconut to extract the cut. The selected concept is further analyzed in terms of its functionality and cost.*

Key words: *Tender coconut opener, Blade cutting, spring mechanism, Eco friendly*

1. INTRODUCTION:

This project is to improve the quality of cutting the coconut with least efforts and less man power. It reduces the chance of any danger while cutting the coconut along with this . This machine is the portable device, due to its less weight it can be easily portable. The life span of the machine is good. Only the changing of cutting blades and drill tool has to be required after a certain cutting coconut frequently. It required less effort as compare to other cutting process of coconuts. The only need is checking the sharpness of blades. The presented paper will provide a brief idea in designing new machine with some of these instruments

2. LITERATURE REVIEW:

Nagarajan.N[1] , Sundararajan.P.N [2] "Fabrication of husk remover with shell cutter"[1] May 2015: The new proposed design is needed for removal of husk from the coconut. In this there are two pneumatic actuators. One is placed at the bottom of structure, it's for Holding the coconut and another one is placed on the top of the structure connected with hinge joint for peeling the husk. In hinge joint there are five linkages used for dehusking the coconut. These are operated with the help of pneumatic actuators. The actuations are controlled by the 5/2 DC solenoid valve. After the de-husking process the coconut shell is taken to the next stage. This part is used for cutting the coconut shell. Here one pneumatic actuator is being used. For cutting operation the knife is attached to the pneumatic actuator. When the pneumatic actuator is actuated, the knife comes down with high force, breaking the coconut into two.

Prof. S. M. Fulmali1 , Prof. A. A. Bhoyar2 "development of multipurpose coconut cutting machine"[2] Nov-2015: This machine is mainly design to cut the coconut and to make the hole in coconut with the help of various tools like cutting blade, hole making tool. The important thing about this machine is that it reduces the time of cutting the coconut, along with the coconut the various fruits can be cut out on these machines. The two operations can be done simultaneously there is no any extra attachment is required for performing the operations. The cost of the developed machine is very less so that it can be used in small restaurants and shops. This will definitely improve the productivity

H. Rajanikanth[1], Prof. Reddy Naik. J[2] : "Product Design and Development of Tender Coconut Punching and Splitting Machine"[3] November 2015: this project is mainly design to cut and punch the coconut by using the compressor. This necessitates the development of a punch-cum-splitter for punching and splitting the tender coconut. The present work focuses on the development of a manually operated coconut punch-cum-splitter for extracting coconut water and coconut meat. In this direction, customer needs statement was translated to the concept; by concept generation. The best concept was selected using pugh matrix and concept scoring matrix. The selected concept mainly consists of punch operated by a lever and torsion spring mechanism. When the tender coconut has to be punched, the operator places the tender coconut on the top of the holding mechanism in natural rest position and the lever is raised

and pressed against the tender coconut to punch a hole. For splitting, the tender coconut is placed in the rest position and the lever is raised & operated to split the tender coconut to extract the meat. The selected concept is further analyzed in terms of its functionality and cost.

3. MATERIALS:

Sl.no	Materials required	quantity
1	Bar rods	As required
2	lever	1
3 4	Knife Spring	1 1

TABLE 1.1

Knife: it is used to cut the coconuts by applying the pressure on the lever to cut the coconut.

FIGURE 1.1

Spring: it is used to apply the tension on the lever to come back to the original position.

4. METHOD:

This project is used to cutting and punching the coconuts. The basic principle of the project is to apply the pressure to cut and punch the coconuts. Initially coconut is placed in the circular box. After that lever is attached to closed coil .The pressure is applied on the lever to punch the coconut. After removing pressure lever comes to original position by tension of spring. After removing the water coconut is placed in that rectangular tray. Apply the pressure on the lever to cut the coconut by the use of knife. It is very simple operation. It does not have more skill to cut the coconut.

FIGURE 1.2

5. DISCUSSION:

- It is low cost compared to other manual cutting machines.
- It is non- polluting.
- It is eco friendly.

6. ANALYSIS:

Total operation time: maximum 20 seconds including cutting & punching.
Life time of structure: by assuming daily usage it will withstand up to 5 years.
Manufacturing capital cost: Rs.1500/- (welding, knife, lever).

7. CONCLUSION:

- The manual coconut cutter is an advanced method ,which is to cuts the coconut in an easy way of operation. This will reduce the human effort and avoid chances for accidents of the manual method of operation. It reduces the operational cost of the work. comparing to the automatic method, this project is a very effective and advantageous method. This project is to saves more valuable time. In order to solve these problems to cut the coconut & punch the coconut**.**
- It is faster than the existing traditional method.
- Human effort is almost eliminated and also productivity is increased.
- The device can be easily assembled and dismantled.
- Spare parts (Bolts & Nuts) can be replaced with the use of simple tools.
- High efficiency compared to traditional method of punching and splitting.
- Easy to operate with minimum skill level.
- Product cost is reasonably economical for tender coconut vendors.
- Handle is such that it can suit the operator to operate both sitting and standing positions.

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