



Fabrication of Tender Coconut Cutting And Water Extraction Machine

Mukesh Nathbuva^a, Bhairavi Pawar^b, Rahul Patil^c, Virsing Valvi^d, Prof.H.R.Nehete^e

^aUG student, Department of Mechanical engineering, KCECOEM, Jalgaon, Maharashtra, India

^bUG student, Department of Mechanical engineering, KCECOEM, Jalgaon, Maharashtra, India

^cUG student, Department of Mechanical engineering, KCECOEM, Jalgaon, Maharashtra, India

^dUG student, Department of Mechanical engineering, KCECOEM, Jalgaon, Maharashtra, India

^eAssistant Professor, Department of Mechanical engineering, KCECOEM, Jalgaon, Maharashtra, India

ABSTRACT

Delicate Coconut Water is viewed as one of the best beverages normally accessible. Yet, the majority of the current approaches include a ton of actual work and a ton of intricacies as the end result is an eatable item which limits its accessibility. The point of the task is to plan a approach and to create a Coconut water extraction machine that is safe, sterile, and simple to work. The model created is a switch worked water powered framework that requires lesser effort and improved efficiency than manual activity. All the parts which interact with the item is a foodgrade material. The refined results are expanded efficiency, diminished time per activity conversely, with the ordinary strategy. This machine can be utilized in little and medium-scale businesses to extricate Coconut Water on a huge scale.

Keywords: Coconut Cutting , Water Extraction Machine

1.Introduction

The coconut palm (*cocosnucifera*) is tracked down all around the globe, where it has blended into the existences of neighborhood people. It provides practically every one of the prerequisites of people like food, drink, kindling, medications, homegrown utensils and so forth. In light of these reasons, it has been known as the "Tree of paradise" and "Tree of Life". Water from delicate coconut is a common refreshing drink and has been utilized as a great isotonic in a few tropical nations. It isn't just a revitalizing fluid, yet additionally a mineral beverage, which is valuable to human wellbeing. A typical issue that many individuals are looking in an agricultural nation like India is punching and parting the delicate coconut. Present apparatuses and patterns utilized are dangerous as well as the gamble of injury is high. From previous years the delicate coconut is being opened and cut by totally manual exertion by utilizing a hard blade. The apparatuses utilized are dangerous, muddled and need ability and preparing. Some machines for paring coconut are accessible, yet as of recently no family device exists to punch opening in delicate coconut and split it open securely. A market study was done to comprehend the unique components utilized in different associations for this activity. The market study was exceptionally useful in understanding about the components and machines being utilized in India as well as abroad.

2.Literature Survey

The coconut is notable for its extraordinary flexibility as found in the many purposes of its various parts, all through the jungle and subtropics region. Coconuts are important for the day to day consumes less calories of many individuals. Coconuts are not quite the same as some other organic products since they contain an enormous amount of "water" and when juvenile they are known as delicate nuts or jam nuts and maybe collected for drinking. When mature, they actually contain some water and can be utilized as seed nuts or handled to give oil from the portion, charcoal from the hard shell and coir from the sinewy husk. The endosperm is at first in its atomic stage suspended inside the coconut water. As improvement proceeds, cell layers of endosperm store along the dividers of the coconut, turning into the consumable coconut "tissue". At the point when dried, the coconut tissue is called copra. The oil

and milk got from it are regularly utilized in cooking and broiling; coconut oil is likewise generally utilized in cleansers and beauty care products (Anon.,2010). The reasonable fluid coconut water inside is an invigorating beverage. The husks and leaves can be utilized as material to make an assortment of items for outfitting and designing. Delicate coconut water is a healthy, nutritious beverage. It is one of the most liked beverages of the city people. The entire coconut is green shaded. To extricate the water and meat, it is to be cut from the top and stressed. The water of delicate coconut, actually the fluid endosperm, is the most nutritious healthy drink that the nature has accommodated the individuals of the jungles to battle the hot intensity. This type is 90 to 95 percent water. The fluid from this coconut is at its most perfect and generally recuperating. The water of delicate coconut, actually the fluid endosperm, is the most nutritious healthy drink that the nature has given for individuals of the jungles to battle the steamy intensity. It has caloric worth of 17.4 per 100gm (Kuberski et al., 1979a). "It is unctuous, sweet, expanding semen, advancing assimilation and making the urinary way," expresses Ayurveda on delicate coconut water.

Carter (1926) has developed a coconut splitter. The invention was mainly to split open, so that kernel can be easily removed from the shell after sun drying. Rey (1956) developed an apparatus to split open the coconuts. But the apparatus is too bulky.

Shamsudeen K.P and Anitha (1997) developed a tender coconut punch and splitter at the Kellappaji College of Agricultural Engineering and Technology, Tavanur. It consisted of a punch assembly and seat assembly. The punch was pivotally attached to a hand-lever, which was hinged along a horizontal pin mounted on a stand. The up and down swinging of the hand-lever made the punch reciprocate up and down in a sleeve. Though it could punch a hole in the tender coconut, movement of the punch through the sleeve was not easy. Further there was also a necessity to enhance the mechanical advantage of the tool

Shamsudeen et al. (1999) fostered a delicate coconut shaper in KAU. It involved essentially a base, a stand, a turning head, a sharp edge and a hand-switch. The base was a wooden board. The stand was mounted on the base. The turning head was freely mounted concentric to the stand and held at a level of 20cm. The cutting edge was 30 cm long furthermore, 5cm wide. Its bleeding edge was serrated and tips of serration were a ways off of 4 cm. One finish of the sharp edge was appended to turning head through an even pivot to empower the cutting edge to be worked in an upward plane, and the opposite end was critically connected to handlever 70cm long. In activity the coconut was put on the base with the end goal that its longitudinal hub was outspread to the stand. Knife was lifted and put on the coconut. It was then pushed down with a descending push parting the coconut into equal parts. This strategy was a lot more secure than the conventional strategy, in light of the fact that the sharp edge development was through a controlled way and at a controlled speed. No extraordinary ability was expected for working it and consequently an ideal apparatus for delicate coconut parlors claimed by men. It was seen that the mechanical benefit was not adequately sufficient to handily part open the over-mature nut. This made the activity challenging for ladies while dividing open such nuts. However, it was capable that the mechanical work was not sufficient to handily divided open the overripe nuts.

3.Problem statement

The point of this undertaking is to plan and create a motorization for coconut water extraction, with the fundamental measures being further developed efficiency alongside diminished exertion of work, time and along these lines expanding the benefits. This Report involves an essential review of various systems utilized for the reason characterized above and tracking down an answer for the issue, proposing new plan, doing a possibility investigation of plan and manufacture of the machine

4. Development of tender coconut machine

1) Cylinder assembly

The cylinder was made from GI sheet. It is found that it is having strength and hardness enough to prevent deformation during working. The handles fixed to the cylinder provide good leverage on rotation due to its length. The cylinder with 20 cm diameter is found to be suitable because it can enclose because it can enclose nuts with a wide range of diameters. It is observed that the length of the cylinder is sufficient to hold the husk which got rid off the nut and prevent it from falling during operation. The risk of injury was reduced to a great extent due to the enclosing of knife during operation. It is also noted that the movability along the shaft makes the engagement easier. The slots made on the surface of the cylinder were complying with the width and thickness of the knives.

2) Knives

The cutting tool in the machine was the knife. the knife was developed. Two types of knives were developed. High carbon steel knife I was found that the knife during insertion reaches only half of the diameter of the nut. i.e., a complete rotation of the cylinder is required to cut the coconut. . Cast iron knife had length more than the previous one, it could penetrate through the entire nut. i.e., only a half rotation is required to accomplish cutting. It is found that the knife made out of high carbon steel performed well during the experiments.

3) Metallic arc with projections

The arc with radius of curvature 10 cm and length 30 cm is used. It provides satisfactory area of contact that helps in proper holding. The projections on the arc gives more grip between the holder and coconut. This holder is applicable only for tender coconut having a minor diameter in between 17 to 21cm. Due to the lack of flexibility of the holder, it is difficult to hold coconuts with diameter less than 17 cm.

4) Metallic arc

The two inch width arc gives more area of contact within less arc length. It is suitable for small, medium and large sized coconuts because of its specific curvature. The round pipe handle attached to the arc shows more comfortability during operation.

5) Flat belt

Due to the flexibility of the belt, the holding will not depend on the size of the nuts. The belt is wrapped on the coconut and then it is tightened by means of hook and chain. The coconut gets tightened due to the friction between the nut and belt. This makes the hands free during operation. It eliminates the effort to hold the nut. The whole effort can be given to the rotation of the cylinder only. This method requires precise tightening.



5. Conclusion

In this strategy, the coconut is set over the seating. The holder is utilized for holding the coconut firmly on the stand. The chamber is then moved along the shaft to cover the end segment the coconut. Then blade is embedded through the advantageous opening on the chamber into the coconut by applying pressure. Then, at that point, the chamber is turned at 360 degree by utilizing handles, so that a plane of cut is made, which is opposite to the longitudinal hub of the coconut and the two bits will isolate. After the turn the blade is delivered. The holder is then releasing to take out the coconut from the machine. The time expected for the activity was noted and it was assessed to work limit. A gifted work can done it inside a brief period of time (under ten seconds). The cutting limit of the machine was found as one nut for each minute. The created shaper requires a couple of moments more than the customary strategy. However, it decreases the work, so it tends to be essentially worked even by a lady. It is basic in development and activity and financially suitable. The expense of the machine is about Rs.4500/- . Alterations of the machine can additionally work on the presentation. A few ideas that might help for the future exploration works are given beneath.

1. The cutting unit could be mechanized to build the limit.
2. One more holding system/material will help for the appropriate holding.
3. By integrating various sorts of blades and chamber gathering, the machine could be utilized for cutting the various kinds of products of the soil.
4. The machine can be altered as a multi apparatus for leafy foods.

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