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Portable Cam Operated Coconut Cutting Machine

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Abstract - The coconut is a big-hearted tree, a nature's blessing to humankind as it is a well spring of nourishment, refreshment, oilseed, filaments , timbers, wellbeing items and furthermore connected with puzzle and sign in the life of individuals. The coconut processing industries find it difficult to produce quality products on par with the world class manufacturing. An attempt is made in this project work to develop a machine for slicing coconut fruit to improve the efficiency of cutting with less effort and less man power. The survey results revealed that slicing of coconut fruit is done manually and cost of slicing also found to be high. A simple machine was developed and experimented to address the issues in the slicing of coconut fruit through this project. Experimental results show that the 180 coconuts slicing take 30 minutes against 60 minutes during manual slicing. It shows an improvement of 50% and cost saving of Rs.20 per 100 slicing.

***Keywords* - coconut, blade, motor, bearing, shaft, pulley.**

I. INTRODUCTION

This area predominantly agriculture in nature is emerging gradually but steadily as an Industrially Promising area. Coconut is one of the important nut crops. The process of coconut fruits slicing is mostly done by the labour using a traditional fruit cutter. It need lots of workers energy and takes quite long time to finish the process. The wastages created during the manual process also founded. It leads higher cost of production and challenges in meeting the customer demand. With this background, following objects are set in this project work to address the above issues.

To know the industrial practices through a survey. To develop a machine with improved efficiency of cutting of coconut fruit with less efforts and less man power and to increase the rate of cutting the coconuts fruits.

II. LITERATURE SURVEY

[1] Chandra Dinanath et al. A machine particularly intended to expel the husks from the coconut natural product including a majority of rollers pivoting in inverse ways successfully toward each other wherein every roller incorporates a majority of infiltrating spikes honed to enter and adequately draw in the husk bit of the coconut organic product.

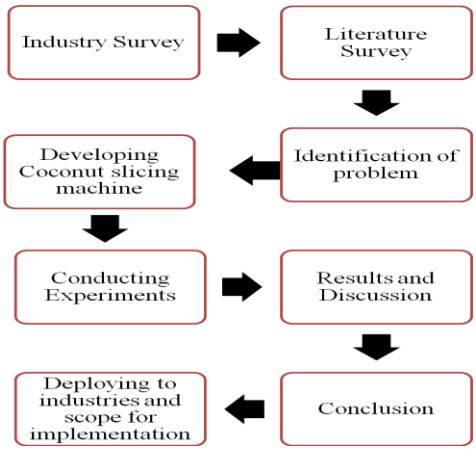
[2] M Joseph, et al. an agriculturist in Kerala is the individual to draw out the underlying idea of this sort of coconut tree climbing gadget. It has for the most part two gatherings of comparable development. The client needs to co-ordinate these two congregations at the same time by utilizing hands and legs to jump on coconut tree. In this development, the client needs to stand and work the gadget. At first the steel rope wires of both best and base get together must be circled with the tree and must be bolted. At that point the client can remain by setting foot on the two gatherings' and needs to hang on the handles gave. As the client lift the gathering by foot and raise the either get together by hand the steel rope will get extricate and when he push back with foot in the wake of coming to a specific tallness it will get fix. By this procedure the client can move to the tree effectively. The heaviness of the gadget is roughly 7 Kg. The client can climb 40m out of 2-3 minutes.

[3] Stephen Kwasi Adzimah et al. "Design of the Hand-operated Coconut dehusking Machine". This coconut dehusking machine peels off the coconut husk from coconut fruit to obtain dehusked coconut fruit via mechanically controlled dehusking devices. It consists of a hand-operated hydraulic pump, which pumps the oil to the cylinder for the downward movement of the ram. The ram is connected to the poker directly. The coconut is placed on the holder in vertical position. The coconut holders are made of mild steel material. The ram is moved down by the hand pedal operating the hydraulic pump by the hand lever. The actual force on the plunger will be around 30 kg but we feel only about 5 kg of force. This is due to the length of the hand lever provided to operate. But the force produced from the hydraulic cylinder will be around ten times

the force we apply to the hand lever i.e. around 300 N force can be obtained from the cylinder.

[4] Gilles Durand et al. A machine for removing the fibrous casing, said fill, the coconut, characterized in that it comprises: a system of continuous operation does not require stopping for loading the direction of chains pins guided nut which cause three rotary blades are designed to cut the floss after its ternary system and allowing the lifting of the three posts by letting out the retractable nuts.

III. METHODOLOGY



IV. INDUSTRY SURVEY

We have visited the coconut processing industry, they are harvesting the coconuts and using it for various purposes. Industry processing the coconut and making use of the coconuts. The industry uses coconut for commercial purposes. The dried coconut fruit is called copra.

By this we came to know that there is a lot of uses in coconut. The main use of coconut is for extracting oil and exporting it for various purposes. The problem faced by the industry is the cost of slicing the dried coconut fruit that is copra is high.

V. EXPERIMENTAL SET UP

This machine works with a help of an electric motor. We have connected the motor with a pulley and to reduce the cutting speed we have attached two shafts and pulleys. Pulley is driven by a belt drive connected from motor to the pulley. When the motor rotates, the knife blade attached with the pulley tends to rotate. Due to this slider crank mechanism it slices the dried coconut fruit. The cutting tools are made up of iron. It can able to slice the coconut fruit. So that it can be easily exported to various countries and industries.

- Motor
- Bearing
- Shafts
- Pulley
- Belt drive
- Cutting blade

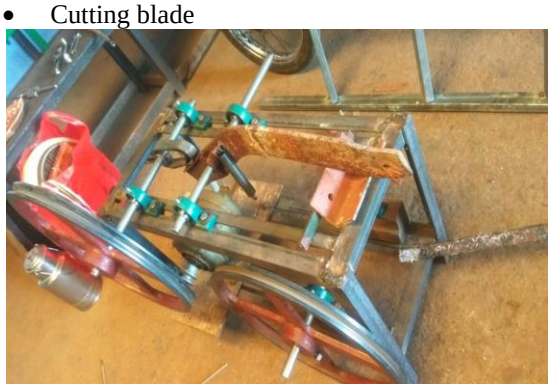


Fig. 1 Coconut Cutting Machine

Motor

An electric motor is an electrical device that converts electrical energy into mechanical energy. The reverse of this is the conversion of mechanical energy into electrical energy and is done by an generator. We have used 1 horsepower motor.

Bearing

A Bearing, otherwise called a Plummer piece or housed bearing unit, is a platform used to offer help for a pivoting shaft with the assistance of perfect course and different frill. Lodging material for a pad square is normally made of solid metal or cast steel. We have utilized four 19mm heading.

Shafts

A pole is a turning machine component, normally roundabout in cross segment, which is utilized to transmit control starting with one section then onto the next, or from a machine which produces energy to a machine which retains control. The different individuals, for example, pulleys and gears are mounted on it. We have utilized 457.2mm of two shafts.

Pulley

A pulley is a wheel on an axle or shaft that is designed to support movement and change of direction of a taut cable, supporting shell is referred to as a block. We have used two pulleys to achieve the required cutting speed.

Belt drive

A belt is a loop of flexible material used to link two or more rotating shafts mechanically, most often parallel. Belts may be used as a source of motion, to transmit power efficiently, or to track relative movement.

Cutting blade

A cutting blade is used to slice the coconut fruit.

VI. OPERATIONS PERFORMED

In our project various operations are performed. Some of the operation like cutting, welding, finishing, etc.

Cutting

Cutting is the procedure of cut the quickening agent hill with the assistance of saw edge. The nonstop cutting produce brambles amid the procedure. Ointment or coolant can be utilized for ease slicing and to cool the warmth which is delivered in work piece and the instrument life can likewise be expanded. Cutting should likewise be possible in woods, metals, hard materials, and so on.

Welding

Welding is a method for warming bits of metal utilizing power or a fire with the goal that they soften and stick together. There are numerous sorts of welding, including circular segment welding, protection welding, and gas welding. The most well-known compose is curve welding. Any individual who is close curve welding needs to wear a unique head protector or goggles in light of the fact that the circular segment is so splendid. In our undertaking we utilized curve welding to join the edge for all time.

Grinding

Grinding is an abrasive machining process that uses the grinding wheel as Cutting tool. In our project we use bench grinder. Bench grinder often found in residential garages and basements Working of coconut fruit shaping machine.

STEP 1:

Place the dried coconut fruit in the holder which is need to be sliced.

STEP 2:

When we switch on the machine the motor starts rotating and thus slices the dried coconut fruit by slider crank mechanism.

STEP 3:

The sliced coconut fruit slices is collected and used it for other commercial purposes.

STEP 4:

The copra is placed one by one after slicing it.

VII. DESIGNCONSIDERATIONS

- When outlining our connection,the accompanying contemplations were considered .
- The machine ought to be reasonable for neighborhood fabricating capacities.
- The machine should utilize minimal effort materials and Manufacturing techniques.
- It ought to be open and reasonable by low-salary gatherings, and should fulfill their fundamental requirement for mechanical power.
- It ought to be easy to produce, work, keep up and repair.
- It ought to have the capacity to cut the coconut effectively.
- Should devour less vitality, less space.
- Operation of the machine ought to be ok for individuals.
- Should be condition well disposed.

VIII. RESULTS AND DISCUSSION

In conclusion, it was found during observations after the development and testing of this particular manually operated welder that the overall benefits accruing and associated with the use of the equipment includes.

- It was faster than the traditional method of slicing coconut.
- It cannot work where there was no power supply.
- Less labor needed and it is more economical than hand slicing of coconut.
- Here use less power, hence maintenance cost is very less.

IX. CONCLUSION

Coconut is grown on a large scale in India, this horticultural crop have become source of income and employment in many parts of southern states. All the parts of coconut earn revenue and some are even exported like coir products. Post harvesting operation of coconut is tedious job to perform, and involves much human drudgery. Skilled workers for coconut dehusking are diminishing these days. Many attempts have been made to mechanize this operation by developing various tools and even power operated machinery.

The present work aims to develop a semi-automatic power operated coconut dehusking machine with eliminating the drawbacks of previously developed tools and machinery. The proposed machine makes use of rotating cylinders with cutting tynes attached over their surface, which rolls in opposite direction to remove the husk from the shell of coconut. A provision to adjust the distance between rotating cylinders is made to accommodate various sizes of coconuts due to change in variety and maturity. The cutting tynes are attached to the cylinders with fasteners so that easy replacement of

damaged tynes is possible. Accordingly the proposed machine will be designed thoroughly, manufactured and tested.

X. REFERENCE

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