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SEMI – AUTOMATIC ARECA NUT COLLECTING MACHINE

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Abstract - *Areca nuts are first plucked from the tree and laid out to dry on the ground. Directly collecting dried areca nuts from the ground is a tedious process. Therefore, a machine is developed, which can collect areca nuts directly from the ground into a gunny bag. After that a trolley can also be used to transport the bags to storage areas, after they have been filled or else it can be done manually. The farmer himself can utilize the device because it can be operated by a single person. The machine can be used without any power sources. The rotational mechanism, which grabs the areca nuts from the ground, is the main component of the machine. A chain-driven Conveyor having U-shaped cups attached to it carries the collected areca nuts up into the bags by elevator mechanism*

1. INTRODUCTION

Areca nut is a major economical crop that is grown in India and many other Asian countries. In India, areca nut is largely grown in Karnataka and Kerala. It is harvested when it is fully ripened. After harvesting, it is sundried for about 45 to 60 days by trading them in a single layer on level ground. After the areca nuts are dried up, they should be bagged and moved to the storage area. The collecting and bagging of the areca nuts is a time-consuming process and the non-availability of laborers is a major challenge in the timely bagging of the areca nuts. Even though machines are available for different types of areca nut farming work, there is no machine currently available for the collection and bagging of areca nuts, which has resulted in a labour shortage in the agricultural sector. Farmers face additional challenges such as late reporting, insufficient labour, and higher wages. It is also a more time-consuming technique that is not suited in emergency situations such as rain, and it requires more labour to pick areca nut directly from the ground level. As a result, we're working on a machine that collects Areca Nuts directly from the ground and places them in gunny bags.

2. LITERATURE REVIEW

Jagnnath Pattar and Dr. Ashok Mehatha [1] have used components like pulley, crankshaft, drive shaft and bearing, chain drive and belt conveyor to collect Areca nuts into a bag mounted on a movable machine. The scrapper mechanism of the machine uses larger scrapper arms to collect Areca nuts, which boosts collection rate. It has turning provision which makes transportation easy. Depending upon the features of the proposed concepts following are the key points, it requires less effort, user friendly, ease of operation. Proposed concept is simple and cost effective then compared to existing concepts, which helps to achieve objectives of the project.

Mr. Santosh Kunnur and Bhaskar Kulkarni [12] have done fabrication work of the machine. The areca nut collecting and bagging machine is constructed as follows, initially, rectangular GI pipes are used to form the chassis. Following that, the wheels are mounted to the chassis. The front scrapper mechanism is made up of rollers, and the scrapper blades are attached to the scrapper blades by a belt. After that, the scrapper is mounted on the chassis. Underneath this scrapper lies a sheet of aluminium metal with holes drilled in it. This sheet metal serves as a filter for small stones and dirt as well as a guide for Areca nut travel. Following that, buckets are made and attached to the chain.

Kiran K, Arun Kumar Govin [14] Have developed a machine which occupies major role in post drying process of areca nut. After the Areca nut is dried for sufficient time it is subjected to dehusking process. Dehusking manually is inefficient and is restricted to small quantity. So a machine is developed with sharp knife edge which can dehusk amount of Areca nut compared to human work and trials have been conducted for different size of Areca nut for comparing the results.

3. METHODOLOGY

Fig. 1 Final assembly

The entire system for collecting and bagging areca nuts is housed in a mobile machine. The machine mainly involves two mechanisms, Rotary gear mechanism and chain conveyer mechanism. The rotary gear mechanism consists

rotary drums that are propelled by wheels. The chain conveyer is made up of buckets that move the areca nut in a defined space and are driven by a chain. In the back of the bucket elevator, the collected areca nuts in buckets are transported to the collecting bag.

4. COMPONENTS USED

4.1 Bearing with Housing

Fig. 2 Bearing with housing

A ball bearing could be a sort of rolling- component bearing that uses balls to take care of the separation between the moving passage way of bearing the aim of a needle bearing is to scale back motion separation and support radial and axial loads.

4.2 Chain drive

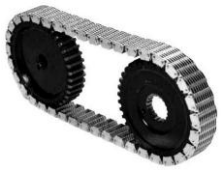

Fig. 3 Chain drive

A chain drive consists of a chain and two crank wheels. The crank wheels are toothed wheels with an infinite chain attached to them.

4.3 Reverse gear mechanism

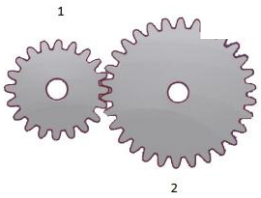

Fig. 4 Reverse Gear mechanism

The reverse gear includes a drive gear attached to driving shaft, the driven gear rotates in the direction opposite to drive gear, due to meshing between the two gears.

4.4 Rotary drum

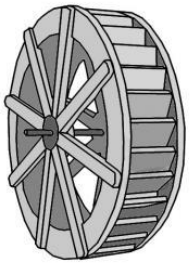

Fig. 5 Rotary drum

A rotary drum is used to collect Areca nuts directly from the ground, which are spread on ground for drying. The storage facility is been provided inside the drum, which is connected to the chain drive.

4.5 Bucket elevator

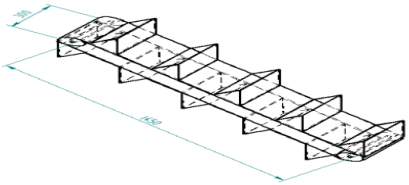

Fig. 6 Bucket elevator

The areca nuts is fed into the buckets, which are attached to conveyor. At the other side of the conveyor, there is a collecting bag in which areca nuts are finally collected.

5. RESULTS AND DISCUSSION

It is found that different mechanisms and methodology for fabricating Areca nut collecting machine using different components like scrapper arm, bucket elevator, drives. These methodologies and mechanisms are used to choose right component and methodology to our project. Machine is developed to collect areca nuts from ground level to gunny bags using the components like bucket elevator, cups attached to runner, belt drive, bearing with housing etc, which can be operated without any use fuel and electricity and can be easily operated by one person. The merits include no requirement of skilled labour, user friendly, less effort required, does the work in faster rate and single time investment.

6. CONCLUSION

Different machines have been designed for collecting dried areca nut. But there were some drawbacks in the existing machine. So, there was need for designing an efficient and simple machine to be put in use. The manufactured collection device has a larger chance of raising the rate of

collection. The objective is to provide farmers with this new type of equipment at a fair price. Anybody may understand this machine's straightforward mechanisms. This machine's primary function is to conserve precious time and money. This will make a less significant contribution to the advancement of agricultural technologies.

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