Re-design and fabrication of groundnut shelling machine

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ABSTRACT

The main aim of this project is to re-design the existing machine for better efficiency and merging the nut separator machine to shelling machine. This machine can separate the groundnut from the plant and separate the nut from the shell. This machine is fully fabricated with mild steel hence it makes it cost efficient and it is more compatible than the previews designs. It consists of two drums, motor, frame, bearings, fan, chain, and sprocket. The major priority of this project is to shell nuts more efficiently and effectively. In this project two drums are vertically placed one above other, where the top drum is used to separate the nut from the plant and the lower drum is used to separate the but from the shell. This is achieved by the shearing action inside the drum between the crusher and the drum. This paper describes the design of various components or parts of groundnut shelling machine. This project involves process like the design, modeling, and analysis components etc. The performance of the machine is evaluated in terms of capacity, the rate of feed and efficiency.

Keywords: Design, Structure, Assembly

1. INTRODUCTION

Our India is an agriculture country where 70-72% of the population are farmers. In India mostly, farming is done with help of tradition equipment’s and methods. Due to that traditional equipment and methods earning of farmers is reduced. In India, most of the rural population is engaged in agricultural land.

Where in our country due to the heavy cultivation of groundnut there is a need of shelling the groundnuts and obtaining the peanuts in safe, fast and economic form. The agriculture industries in our country have heavy machines to do the same but the farmers in rural areas and in small industries it is necessary to have an economical machine which can easy to remove the shell from the groundnuts. Hence this project can be of skillful use.

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2. LITERATURE SURVEY

This project has been done in different types for different purposes, but the main aim is to get the nut out of the shell. From the paper published in International Journal on the topic of Peanut Sheller using screw Conveyor. This project purpose to try to use manpower in crushing the shell of a peanut. The Sheller available in our vicinity uses electric energy; therefore, using manpower ensures the preservation of our resources to some extent. Lack of groundnut processing machines, especially groundnut Sheller, is a major problem of groundnut production, especially in our country India. The sprockets of a bicycle are rotated by pedaling action and this rotary motion is used to rotate the shaft of a screw conveyor. The peanut gets crushed in between the flights around the shaft and the casing of the conveyor. Peanuts are delivered into the conveyor with the help of a hopper.
3. CONSTRUCTION AND METHODOLOGY

In this project, we have re-design the previous model for better efficiency and by clubbing two different machines into one single machine and reduce labor power. Here groundnut along with the plant is fed to the top drum were the groundnut is separated from the roots of the plant. In the top drum, it consists of a casing and a roller with a blade, where the roller blade strikes the groundnut and separates the groundnut from the plant and since the other drum is placed vertically down the groundnut falls in that drum for shredding and the nut falls through the gap the shell of the groundnut is shredded and the nut falls through the casing is provided with two bars at each end as shown in the figure below:

**Fig. 1: Construction**

After shelling both the nut and shell pass through a gap provided at the bottom of the drum and motorized fan is installed on to side and blows of the shell from the tray leaving the nut.

4. COMPONENTS USED

**Casings:** There is two casing made up of mild steel. One casing is provided with two bars at each end as shown in the figure:

**Fig. 2: Casings**

**Spinner Blade:** The blades are welded on the cylinder is shown in the figure below:

**Fig. 3: Spinner Blade**

**Fan:** It is motorized fan used to blow out shells from the tray and leave behind the nut.

5. ADVANTAGES
- It is Compact in Size
- More efficient
- Minimum labor requirement.
- Easy maintenance.

6. DISADVANTAGES
- Continues power supply is required
- Regular Inspection is needed.

7. APPLICATION
- Used for the shelling of groundnut

8. CONCLUSION
- This project helps bring down the cost of the machine
- The objective of this project is to be more efficient in shelling the groundnut.

9. REFERENCE