RESEARCH ARTICLE

DESIGN AND FABRICATION OF GROUNDNUT POD STRIPPER AND DESHELLER

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Abstract: Our project focused on the design and fabrication of a groundnut pod stripper and desheller machine on electrically powered by 1 hp motor. The machine has the capacity of stripping and shelling of 100 kg of groundnut per hour respectively. The machine was fabricated from locally soured materials of steel rod, bearing, shaft, ect..., which makes it cheap and easily affordable and also easy and cheaper to maintain. It is also of light weight and it consist hopper, desheller, separator and blower unit.

Keywords: *Groundnut, farmer, time consumption, traditional method of pod separator and desheller, Automatic pod separator and desheller.*

I. INTRODUCTION

India is an agriculture based country. Groundnut is sixth impotent oilseed crop . Many new agricultural based industries have been started new varieties in groundnut. The groundnut is one of the product in the India specifically Gujarat, AP, Tamilnadu. The product in farm in abundant quantity. There is lot of time waste in old method of groundnut pod stripping and deshelling. The time required for 1 kg of groundnut pod stripping and deshelling from this groundnut is about 1 to 2 hours. So we have produces new machine for fast groundnut pod stripping and deshelling. Framers collect the groundnut from the groundnut plant directly for pod stripping and deshelling purpose. The groundnut spreads on the groundnut and the pod stripping and deshelling manually. Because of this method lot of time waste takes place as well as due to striking process some groundnut can be brakes of damages. But by using the groundnut pod stripping and deshelling machine we stripping and deshelling the pod from groundnut

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efficiently and large quantity in very less time. So we increase the work capacity and saving the time efficiently and effectively. So our machine in very useful to stripping and deshelling the pod from groundnut. Seed is the basic input in agriculture. However, for maximum gain in productivity the use of both improved integrated crop management practices are required. In most of conventional practices quality of groundnut while plucking is harmed, so in order to avoid this groundnut plucking and sorting machine can efficiently pluck as well as sort groundnut and hence better results can be obtained.

Main objectives:

- To minimize the time for stripping and deshelling the groundnut pod from plant body.
- ➢ To minimize man power.
- To make low cost groundnut stripping and deshelling machine.
- The cost of a machine should be affordable to the farmer.

II.MATERIALS

- ➢ Frame
- > 1hp Motor
- ➢ Belt & Pulley

- > Hopper
- > Shaft
- ➤ Bearing

Frame

The frame is used to support all components and separator. Materials of frame are steel and height up to 3m.

1 Hp Motor

The motor is used to rotate the roller by using belt and pulley.

Input=240volt

Output=430rpm

Power=745.7/1hp

Belt and Pulley

The belt is used to transmit rotary motion of the shaft of the motor to the shaft of desheller and separator. Pulley is used to transmit the torque of motor to the separator and desheller. Both the pulley connected with help of belt. Pulley dia=45mm.

Hopper

A hopper is funnel shaped container from which solid materials from the emptied into container below. The hopper is used to collect the groundnut pod from the separator

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and send to the desheller. Hopper contains P = Vgroundnut before and during separator and deshelling process. P = 2

Shaft

The shaft is held in metal ball upheld in focal bearing piece, usually circular in cross section, which is used to transmit from one part to another, or from machine which produce power to a machine which absorbs power .The various members such as pulley and gears are mounted on it .In our project The shaft is used to transmit the power from the motor to separator and desheller.

Bearing

Bearing is used to rotating the shaft in groundnut pod separating and deshelling purpose. Bearing is made up of iron steel.

III. DESIGN CALCULATION

According to the motor specification: voltage 210-230v

RPM: 430

Capacity: 1Hp

Power

P = VI $P = 220 \times 3$ P = 660 watt $P = 2\Pi \text{NT}/60$ $T = P \times 60/2\Pi \text{n}$ $T = 660 \times 60/2\pi (430)$ T = 1.46 Nm

Shaft Calculation:

Diameter of the shaft =30mm

Length of the shaft = 450mm

IV. WORKING PRINCIPLE:

The vines along with the groundnut are held over the spiked cylinder and the pods get removed. The vines are not fed into the machine. After pod removal bunch is dried and used as fodder for animals it saves 60 percent of labour and pod separation time. Which ultimately reduce the cost of cultivation. The working principle of desheller is the shell will be separated. Material enters in the desheller from hopper automatically, then the rubbing device desheller the groundnut .Due to the different speed of roller it cause large frictional force

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to desheller, and keep the whole kernel without damage.

V.TESTING

The various part the machine where assembled ,after which the electric motor was mounted, the machine was then test run without groundnut poured into the hopper .these was done to study the behavior of the machine the electrically powered groundnut shelling and separating machine test was then carried out to evaluated . the performance of the machine based on its shelling efficiency, the time taken to shell a known weight of groundnut pods and capacity of the machine the shelling efficiency was assessed separate ex by taking four separate experimental samples of hundred ground seed poured into hopper while the machine was running after each group was passed through the machine the output was analyzed by physically counting the shelled, unshelled, partially shelled broken shattered groundnut.



VI.FARMERS NEEDED

- > To reduce time consumption
- > To reduce the cost of machine
- \succ To speed up the process
- Maintenance cost very low
- \succ Easy to handle the farmer.
- The machine should not have high weight. It should be easily move anywhere.

VII.RESULT AND DISCUSSIONS

From this project efficiency of the groundnut pod stripper and desheller high and at the same time it reduced the manual labour cost and time consumption is less. And overall it has good output. The

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groundnut pod stripper and desheller machine is brought from market. It is sun dried for one day to remove moisture content. Samples contain stripper and deshelling groundnut some soil adhered to deshelling.

VIII.CONCLUSION

This project has completely mechanization process and no manual power required and also portable and easily handling one. From these projects we learned and experienced lot. Required to the mechanical process and also certain mechanism.

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