



Modelling and Fabrication of Groundnut Separating Machine

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ABSTRACT

This project is mainly focused on design and fabrication of groundnut separating machine electrically powered by a 0.5HP motor. Farmers having large harvesting area can afford and use this machine. This separating machine is light-weight, time consume and low in cost. During the process of testing it was observed that majority of groundnuts were been separated without damaging the groundnut. Farmers and business-man start their business with less investment.

Keywords: Groundnut, Harvesting, oil

1. INTRODUCTION

Groundnut is important oil seed crop in the world. The groundnut contains 48-50% of oil and 26-28% protein, minerals and vitamins species legume or beans family. Groundnut has a botanical name of "Arachis Hypogaea". Groundnuts are important protein crops in India grown mostly under rain-fed conditions. Indian manufacturer provide edible peanuts and high standards. The traditional method is requiring more manpower, so the advance groundnut separating machine helps the farmers to benefit. This project is mainly discuss about how to remove the groundnut from the plant with less time, manpower by using electrical energy sources. The cultivated groundnut is a ancient crop of the New World, which originated in South America.

2.LITERATURE REVIEW

Pratima G. Mungase et al. [1] designed and fabricated a machine where 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. By considering all these designs we designed our own equipment which is of low cost and less maintenance but higher efficiency. The fabricated machine is manually operated. Sheller machine is used to shell only dry pods and it can be used as a groundnut Sheller machine for

domestic application. Kulbhushan M. Shejole et al. [3] designed and fabricated the pedal operated groundnut crusher. It is a manual process where the groundnuts are removed from shell. The pedal is used for the movement of the crusher. There will be no energy consumption and the cost of production is less. It has less maintenance cost. Tushar Walke et al. [4] designed and fabricated the groundnut machine which is electrically operated. It is also offered to be less-weight. The fresher and small farmer or business man can start business by investing less capital. In this project, we designed and developed a small machine to peel out the shell of groundnut so that machine will reduce their labor cost and processing time and high profit by selling the groundnut. The main motto of the design is to remove the pods from the roots of the plants. This equipment is eco-friendly and also has less maintenance cost. So that processing time and labor cost was decreases and farmers have getting the high profit by selling the groundnut.

ROBOTIC ARMS

Ashok .S. Andhali et al. [7] designed and develop groundnut separated machine which run with robotic arms. The robotic arms form into a sharp rotating drum. With this the human effect is reduced and also efficiency is increased as it as fully automatic. There are more harvesting groundnut in market but farmers scale is small by this machine groundnut production improved. The cost of the machine is very high so the farmers can't invest more money on that machine.

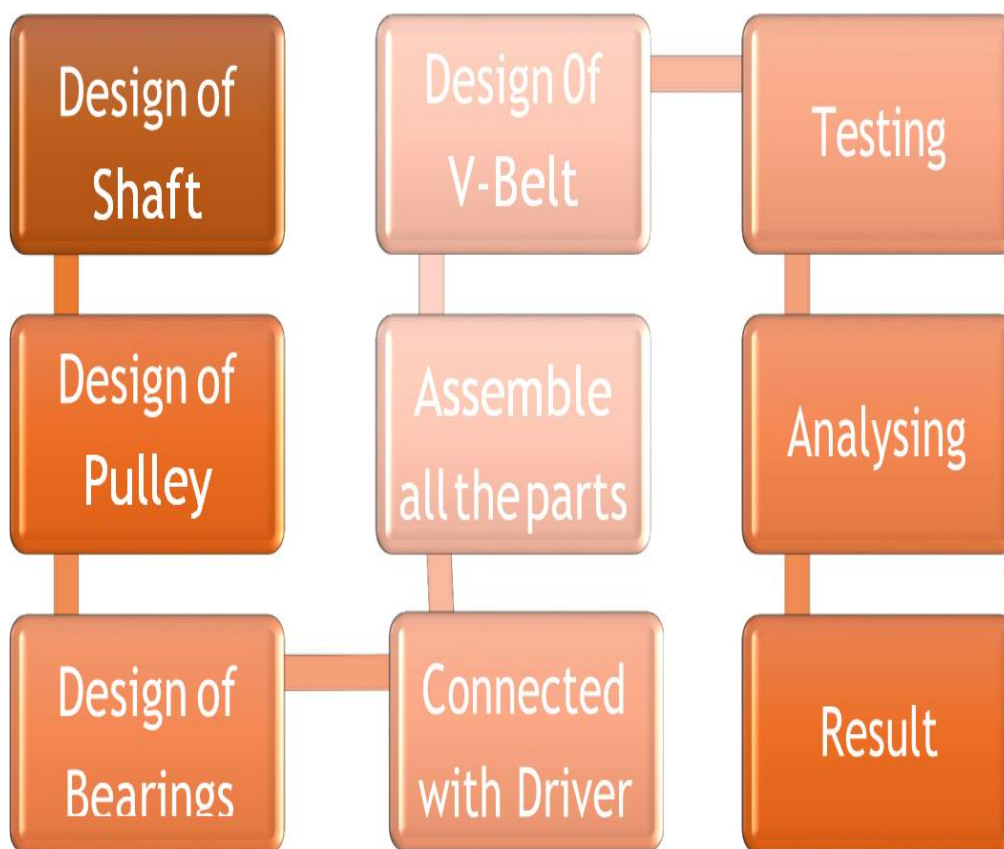


Fig 1. Methodology

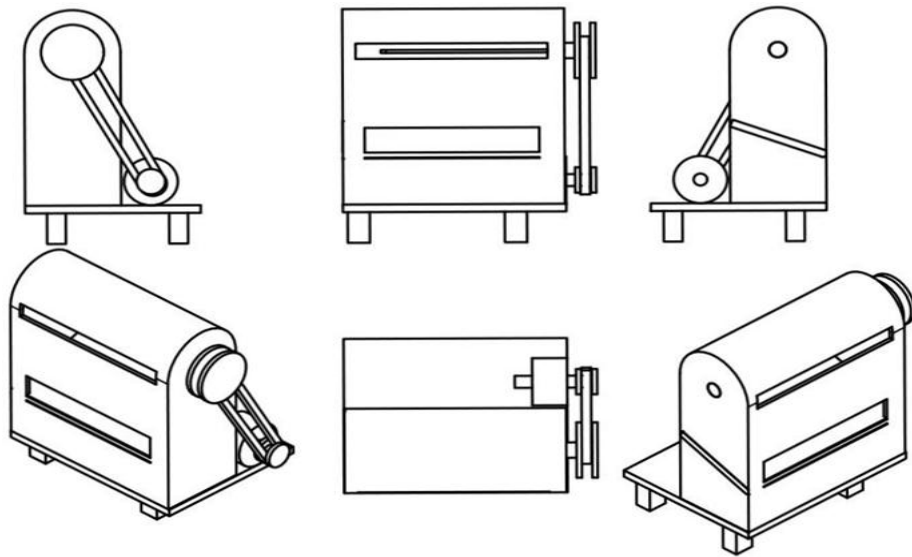


Fig 2. Layout of Proposed Working Model (2D Drawing)

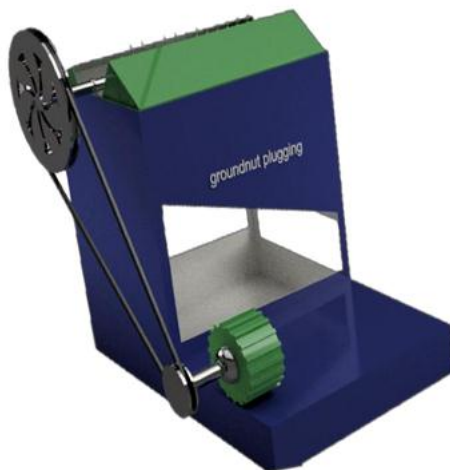


Fig.3. Layout of Proposed Working Model (3 D Drawing)



Fig.4. Layout of Proposed Working Model

EXPERIMENTAL SETUP

The all the parts was been assembled and parts were been painted not to get corrosion in the material. The assembled parts are:

1. Frame
2. Sheet Metal
3. Motor
4. Pulley
5. Shaft
6. Bearing
7. Blade
8. Shield
9. V-belt
10. Sleeve



Fig.5.Front View Groundnut Separating Machine



Fig.6.Top view of the groundnut separation machine



Fig.7.Side view of the groundnut separating machine

WORKING

The electrical motor rotates in counter-clockwise direction and the power supply given was direct supply. The motor have a driving pulley which is connected to the driven pulley (larger pulley) through v-belt. When the motor rotates the driven pulley also rotates which is connected with the shaft. When the shaft rotates the groundnut was placed in the machine which the groundnut and blade was been separated by the blade.

OBJECTIVE

- The machine is reasonable price for the farmers.
- The machine space is less.
- Improve the groundnut production.
- Time consumption is less by this machine.
- Reduce the farmers work and gain profit.

CONCLUSION

This machine provide production of groundnut more and reduce time. Now-a-days, climate conditions also be a reason for workers not occupied, but this groundnut separating machine requires only two labors which reduce the cost of the labor and increases the production rate of the groundnut and give profit to the farmers. This machine helps in protect of damages of groundnut due to late harvesting and unavailability of workers. Comparing with manual harvesting, it is very efficient method. The cost of the machine is very less and get profit by this method.

REFERENCES

1. Mungase, Pratima G., et al. "Peanut Sheller using Screw Conveyor." (2016).
2. Mangave, Santosh, and Bhagyesh Deshmukh. "Design of Portable Groundnut Sheller Machine." Department of mechanical engineering, WIT, Solapur. International Journal of Mechanical Engineering and Information Technology 3: 1125-1129.
3. Kulbhushan M. Shejole, Nitin B. Borkar, Abhijit M. Bobade. "Design and Fabrication of Pedal Operated Groundnut Decorticator Machine"
4. Walke, Tushar, et al. "Design & Fabrication of Groundnut Sheller Machine."

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5. Faculty of Mechanical Engineer 2014, “PSG Design Data Book”, Compiled by PSG College of Technology.