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Review of Multipurpose Groundnut Pods Separating Machine

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ABSTRACT

Groundnut is grown on large scale by farmers in developing countries like India in monsoon, summer season. Lack of groundnut processing machines at affordable cost, especially groundnut Sheller, is a major problem of groundnut production. There is need a harvesting machine for ground nut.This is requirement of local farmer the groundnut sheller machine available in the market are large in size & costly & not suitable for domestic purpose. The machine is fabricated by locally sourced material. The major part of machine are happer, crushing chamber, separating chamber & blower. The processes involve in the project are like design, fabricating &assembly of different component

1. INTRODUCTION

India is an agricultural based country. Since last 50 year's lot of changes has been occurred in agriculture sector. Many new agricultural based industries have been started new varieties and species of plant have been discovered. In our country most of the people can be depend on the agriculture sector/field. The Groundnut is one of the product in the marathwada-nashik region. The product in the farm, in abundant quantity. There is lot of time waste in old method of groundnut pod separating. The time required for 1 Kg of groundnut pod separating from this groundnut is about 1 2 hours. so we have we have produces new machine for fast groundnut pod separating.

In the Marathwada region people collect the groundnut from the groundnut plant directly for pod separating purpose. The ground spreads on the ground and the pod of groundnut can be separated manually. Because of this method lot of time waste takes place as well as due to striking process some ground nut can be brakes of damage. But by using the groundnut pod separating machine we separate the pod from groundnut efficiently and large quantity in very less time. So we increase the work capacity and saving the time efficiently & effectively. So our machine in very useful to separating the pod from groundnut.

2. Literature Review

Shelling is the removal of grains from their pod either by stripping, impact action and rubbing or any combination of these methods [4].the most popular method of groundnut shelling, which is still widely used in the method of crushing or pressing of pods in between the thumb and the first method has low efficiency, it is time consuming, and has high demand of energy [4]. Groundnut shelling machine is a machine used to remove the shell of obtain the groundnut seed [3]. They are different machine have been fabrication and used to shell wide variety of groundnut pods [4].The machine are too costly and complex in operation and maintenance .The lowest price is 13000/- some of these machine have very high shelling capacity, shelling capacity varies from machine to machine groundnut so as to ranging from 6kg speed/h to 60 kg speed/h same hand sheller machine are suitable are domestic application but they only do shelling operation. , separation of seeds we have to do manually by using traditional methods such as by using natural wind or by using sieve. A simple hand operated groundnut Sheller has a semi-cylindrical screen closed on both sides. A shaft carrying a lever at one end is fixed across the centre of the semi-cylinder as shown in the Fig.1 (a). On the lever is a pair of plate with shoes or beater bars, having blunts on their undersides. For successful operation of the machine, the operator stands by the side, then holding the operating lever (handle) and swinging it by pushing to and fro to provide shelling action on the shoes assembly [4]. The semi-rotary, action of the shoes shells the pods against the screen but this type of machines cannot do separation of shell and seed.

3. Working Principle

By using electrical motor, the rotating moment transferred with the help of belt to the rotor shaft and fan shaft. The step pulley is maintained on the electrical motor shaft. When rotor rotating the groundnut falls in the hopper and then groundnut pressed between the rotor and grill. At that time groundnut seed and pod separated. The groundnut pod and groundnut seeds fall in the tray. Due to high fan speed the high velocity of air is created by

using this high velocity air the light weight pod is thrown out from the machine and the groundnut seed falls in the tray due to this weight. We collect the seeds in the pot of bag.

Fig. 1 Groundnut Separating Machine

4. COMPONENTS & SPECIFICATIONS

- Frame
- Electric motor
- Roller
- V-Belt
- Pulley
- Fan

4.1 FRAME:

The frame is used to support all the components. Material of frame is cast iron and height up to 1m.

Fig .2 Frame

4.2 ELECTRIC MOTOR:

This motor is used to rotate the roller by using belt and pulley. Output = 230 volt Current =3.5 amps Power =0.37kw/0.5 HP

Fig.3 Electric motor

4.3ROLLER :

Roller is made up of hollow cylinder of 1ft dia. and 1ft length with the rods welded on its periphery.

Fig.4 Roller

4.4 V-BELT :

V-Belt is used to transmit rotary motion of shaft of motor to the shaft of roller. Material of the belt is rubber or polymer for strength and reinforcement.

Fig 5 V-Belt

4.5 PULLEY:

Pulley is used to transmit the torque of motor to the roller. One pulley is directly mounted over the motor shaft and another pulley mounted on the shaft of roller. And both the pulleys are connected with the help of V-belt. Pulley Dia. =75mm.

Fig.6 Pulley

FAN:

Fan is mounted on the shaft of the motor just in front of pulley at some distance. This fan separates the shell and the peanuts.

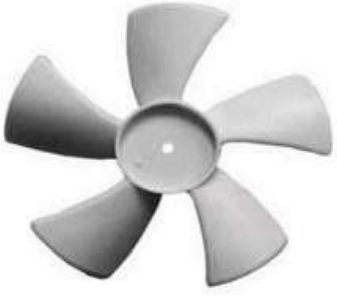

Fig.7 Fan

5. PROJECT CONCERNS:

Since the 20th century the production of groundnut is increased. It is the main underground crash crop giving more profit to summers in the marathwada-Nashik region, it is the main product in Maharashtra, Karnataka, Madhya Pradesh etc. the large production is taken in district of the Maharashtra is usmanabad, Latur, Kolhapur etc. When we use traditional method of separating the pod from the groundnut there is very large time wastage during the process and the work done is very large time wastage during the process and the work done is very less as compare to time use for working. So the farmer goes under a big loss. So we develop a new "groundnut pods separating machine" which separates the groundnut pod from the groundnut effectively and easily and in more quantity. By using this machine time required for separating the pods from groundnut is comparatively very less. Therefore it is profitable for farmer. Considering these aspect we have prospered a "groundnut pod separating machine" which gives us maximum output in less labor, less efforts, cost with maximum efficiently and effectively.

6. DESIGN OF GROUND NUT POD SEPARATING MACHINE:

In our attempt to design a GROUND NUT POD SEPARATING MACHINE we have adopted a very a very careful aAGBoach, the total design work has been divided into two parts mainly;
System design and Mechanical design. System design mainly concerns with the various physical constraints and ergonomics, space requirements, arrangement of various components on the main frame of machine no of controls position of these controls ease of maintenance scope of further improvement; height of m/c from ground etc.
In Mechanical design the components are categories in two parts.

1. Design parts
2. Parts to be purchased.

For design parts detail design is done and dimensions thus obtained are compared to next highest dimension which are readily available in market this simplifies the assembly as well as post production servicing work. The various tolerances on work pieces are specified in the manufacturing drawings. The process charts are prepared & passed on to the manufacturing stage .The parts are to be purchased directly are specified &selected from standard catalogues.

7. SYSTEM DESIGN

In system design we mainly concentrate on the following parameter
System selection based on physical constraints:-
While selecting any m/c it must be checked whether it is going to be seed in large scale or small scale industry in our case it is to be used in small scale industry so space is a major constrain .The System is to be very compact. The mechanical design has direct norms with the system design hence the foremost job is to control the physical parameters.
Arrangement of various components:- Keeping into view the space restriction the components should be laid such that their easy removal or servicing is possible moreover every component should be easily seen & none should be hidden every possible space is utilized in component arrangement.
Components of system:-
As already stated system should be compact enough so that it can be accommodated at a corner of a room. All the moving parts should be well closed & compact A compact system gives a better look & structure.
Following are some example of this section

- Design of machine height
- Energy expenditure in hand operation
- Lighting condition of m/c

Chances of failure:-
The losses incurred by owner in case of failure of a component are important criteria of design. Factor of safety while doing the mechanical design is kept high so that there are less chances of failure. Periodic maintenance is required to keep the m/c trouble free.
Servicing facility:-
The layout of components should be such that easy servicing is possible especially those components which required frequent servicing can be easily dismantled.
Height of m/c from ground:-
Fore ease and comfort of operator the height of m/c should be properly decided so that he may not get tired during operation .The m/c should be slightly higher than that the level also enough clearance be provided from ground for cleaning purpose.

Weight of Machine:
The total wt of m/c depends upon the selection of material components as well as dimension of components. A higher weighted m/c is difficult for transportation & in case of major break down it becomes difficult to repair. Input to the automatic gear box is to be given similar to engine drive hence the aAGBoach is to utilize an variable speed AC motor with the facility to vary input power and there by the input speed by use of an electronic aviator.

8. CONCLUSION

In this way we have concluded that, on the basis above review, analysis of farmer problem on groundnut harvesting machine, after completing above project farmer will get benefit.

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