Peanut Peeling Machine

Patil Tryambak Keshavrao[1], Manoranjan Kumar[2], Patil Chaitanya Sanjiv[3], Priya Kumari[4] , Prof. Sabde Abhijit Manoharrao[5], Prof. Chaudhari Rupali Govind[6]

[1, 2, 3, 4] Dept of Mechanical Engineering

[5]Guide Lecturer, Dept of Mechanical Engineering

[1, 2, 3, 4, 5] Vishweshwarayya Abhiyantriki Padvika Mahavidhyalay, Almala, Maharashtra ,India.

Abstract- *In India, most of land use for agricultural purpose which produces semi-finished product or goods. Groundnut also one of the agricultural semi-finished goods. Groundnut is grown on small scale farmers in developing countries like India. The average kernel price is approximately twice the price of pod. . Lack of groundnut t processing machines, especially groundnut Sheller, is a major problem of groundnut production, especially in our country India. In the beginning the peanuts were separated from its shells by the workers. They simply decoct the groundnut by their hands and separate the peanuts from its shell. The output got from this method, was very low and it does not fulfill the market demand because it was very time consuming process. A research-work for design, fabricate, and performance evaluation of a groundnut Sheller consisting of feed hopper with a flow rate control device, shelling unit, separating unit and power system. The performance of the machine was evaluated in terms of throughput capacity, shelling efficiency, material efficiency and mechanical damage. Regression models that could be used to express the relationship existing between the Sheller performance indices, pod moisture content and feed rate were establish.*

Keywords- Frame, Belt and Pulley, Bearing, Motor , Hopper, Nut & Bolts.

I. INTRODUCTION

The purpose of this work is to understand the knowledge of design and fabrication mechanism of groundnut Sheller machine. The design is an environment friendly and uses simple mechanism properties such as shelling system, blowering mechanism and automation separating system etc. In this, some crushing force is needed to crush the groundnut. The design is so done that the knowledge of designing, mechanism and forces are increased. This project consists of designing and fabrication of an automatic groundnut Sheller machine considering various important parameters. In this project, designing & development of a machine to crush or shell groundnut so the farmers can gain high profit by selling groundnut direct in market. As well as the study of manufacturing was very important in order to carry out this project to ensure that what are needs to do. This project involves the process of designing and fabrication of different parts of this shelling machine considering forces and ergonomic factor for people to use. This project is mainly about generating a new concept of groundnut shell (crush)that would make easier to bring anywhere and easier to crush ground nut. After the design has completed, it was transformed to its real product where the design is used for guideline.

II. PROBLEM IDENTIFICATION

In the beginning the peanuts were separated from its shells by the workers. They simply decoct the groundnut by their hands and separate the peanuts from its shell. The output got from this method, was very low and it does not fulfill the market demand because it was very time consuming process. It was also a boring work for the worker. Traditional method of separating nuts from groundnuts by Putting the peanuts in a cloth bag and rolling over it with a rolling pin. This technique did a good job of cracking the shells (deleting the pain fulfingers problem), but we still had to pick the peanuts out since they didn't come all the way loose. This is not a reliable method for shell aground nut due to this crack the ground nut and nuts mixed with shell. Introduction gives knowledge that the traditional method is not asufficient method for separating the groundnut. Due to this manual process, identify some major problem & to over-come this problem some idea or concepts generates. According to generated ideas deciding objective of project.

Formers and small businessman are facing following main problems:-

1) Currently base process is manually operated (pedal operated)

(2) Nuts & husk (outer covering of groundnut) is mixed after crushing(shelling operation).

(3) Low productivity & time consuming

III. PROBLEM FORMULATION

The aim is to design & develop a low cost ground nut shelling machine which will help farmer to sell finished (shelled groundnut) instead of unshelled groundnut.

Considering the above problems we are going to design and fabricate such a machine that will eliminate most of the problems from previous available manually shelling machine, so human effort is reduced and getting more productivity, earn more profit to former. The machine shown in figure below is the modeling of groundnut Sheller machine. Concept A. Introducing low cost automation was to overcome problems with the current manual traditional method. The concept of the work is,(1) Observe the manual methods to identify the important processvariables.(2) Quantify the important method.(3) Develop a prototype automation system which could control over allof the process.(4) Investigate all areas of automated forming.(5) Produce a specification for a low cost automated system.(6) Refined design of the machine & fabricate the machine, as this playsa major role in rural area.

3.1OBJECTIVE

The main aim of this project is to overcome the traditional method.(1) To reduce wastage due to crack or crushed groundnut.(2) To increase the efficiency.(3) To reduce the hard work and To reduced time to shell the groundnut.(4) To develop a low cost machine which can be used by farmer to convert their semi-finished (shell groundnut) into finished product(groundnut).(5) It satisfies the need of village people to earn more money

IV. WORKING PRINCIPLE

Groundnut SHELLER is operated on the shearing action blowering action and separating action. Firstly the inputs i.e. the groundnut are fed to the machine through the hopper. Then groundnuts come in contact with the two members, one is semicircular net and another is roll shaft. Semicircular net is a stationary member while the roll shaft is rotating member. When the groundnut comes in contact with these two members then the shearing action takes place here. Due to shearing action (crushing) the groundnuts gets shelled and divided into two parts. i.e. in the peanut and outer shell of the groundnuts. There clearance is provided between the net and roll shaft. The clearance provided is depends upon the size of the groundnuts which is to be decocted. After shelleing the groundnut the peanut and shells of the groundnut gets dropped from the semicircular net, in downward direction then a centrifugal force is applied by a fan on the peanut and shell of the groundnut. Due to more weight, the peanuts gets moved downward and collected in the separator. But due to lighter weight the shell of the groundnuts are thrown outside the machine and which are collected from the backside of the machine. From the shelling chamber the unshelled groundnuts also gets dropped in the tray (7% to 10%).This groundnut gets dropped from the clearance made among the grill.

Fig. Peanut Peeling Machine

5.Following are the main components of machine:-

(1) Hopper :
(2) Semicircular Net
(3) Roll Shaft
(4) Pedestals Bearing

1.Hopper

2.Semicircular nut

3.Pulleys

4.Pedestal Bearing

The arrangement of various component of "Groundnut SHELLER" is being done are as follows:

(1) The foundation frame is being selected which carry the entire load of the machine.
(2) The roller shaft is mounted on the top face of the foundation frame with the help of pedestals bearing which is fasten using nut and bolt.
(3) The fan shaft is mounted at the back face of the foundation frame with the help of pedestals bearing which is fasten using nut and bolt.
(4) The semicircular net mounted on the support provided at inner side of the foundation frame.
(5) The hopper is mounted on foundation frame covering rolling shaft, and permanently fastened at one side using hinged, and other side is temporary fasten for time to time change of semicircular net.
(6) Fan cover fastened using nut and bolt to back side of foundation frame, which cover fan shaft.
(7) End of foundation frame (top face) carry the electric motor, which provide necessary power.
(8) 18 inch, 9 inch, and 3 inch pulley is mounted on roller, fan and motor shaft respectively, over which belt is mounted for transmission of power.
(9) The above arrangement ensure that all element of the project are balanced and also center of gravity of the assembly is on axis as that of the center of gravity human body that is on spiral cord.

VII. CONCLUSION

Proper evaluation of the design will be performed and created something even better instead of simply manually operated operations. Finally we conclude that atomize machine is better option to use farmer instead of manually operated. The demands atomize shelling machine of farmer & other customers will be also considered while designing machine. Purpose of fabrication of the Sheller was to determine the suitability of machine for farmer‟s use. Five experiments were performed with peanuts. Since this machine is made for small businessman or for farmers, therefore the work carried out by this machine is less.

VIII. FUTURE SCOPE

Future scope of work is what is required to be delivered. It is importuned that future scope statement is clear unambiguous and easily to understand. It should also include details leaving the reader in no doubt what is being delivered as part of project. The ground nut Sheller, with sufficient market penetration, would offer a substantial inshelling efficiency. Most shelling is done by hand in ground nut producing region of the developing world. This type of task is usually done by woman. The low cost groundnut Sheller is a case of intermediate technology

REFERENCES

[1] J. N. MADUAKO and M. HAMMAN "Determination of Some PhysicalProperties of Three Groundnut Varieties".
[2] A.Mishra, R.Soni and J. Mangla, "development of a low cost peanutdecorticator for use in Developing countries" Synergy and Technical Development (Synergy2009) Gödöll_, Hungary, 30. August– 02.September 2009.
[3] A.A. Atiku, N.A. Aviara and M.A. Haque, "performance evaluation of a bambara ground nut Sheller," Agricultural Engineering International: the CIGR Journal of Scientific Research and Development. ManuscriptPM 04 002.Vol. VI. July, 2004
[4] F.A. Oluwole*, A.T. Abdulrahim, and M.B. Oumarou,"" Development and performance evaluation of impact bambara groundnut Sheller""
[5] J. N. Maduako, M. Saidu, P. Matthias, I. Vanke, "Testing of an engine- powered groundnut shelling machine," Journal of Agricultural Engineering and Technology (JAET). Volume 14, 2006
[6] M.A.Helmy, A.Mitrroi, S.E. Abdallah, Mohamed, A. Basiouny "Modification and evaluation of a Reciprocating machine for shelling peanut," Misr J. Ag. Eng., 24(2): 283 -298

[7] Abubakar Mohammed &Abudulkadir B. Hassan, "Design & Evaluation of motorized & manually operated groundnut shelling