



SMART IRRIGATION BASED ON INTERNET OF THINGS

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Abstract:

This work is primarily about the improvement of current agricultural practices by using modern technologies for betterment of agriculture and modernization the traditional agriculture system. Internet of Things (IoT) plays a crowning role in smart agriculture. The project will help root level farmers to get into smart irrigation in term of agriculture. Which provide greater service in less cost in irrigation and lowest man power. Smart irrigation is an empirical concept because IoT sensors capable of providing information about their agriculture fields and making irrigation automated by Internet of Things. The feature of this paper includes monitoring temperature, humidity, pH and water level in agricultural field through sensors. The data from sensors are sent to Web server database using wireless transmission. Controlling of all these operations will be through any remote smart device or computer connected to internet and rain condition is also applied to the operations. It will be performed by interfacing sensors, IFTT app, Smart agriculture app, Wi-Fi and raspberry pi.

- I. INTRODUCTION The purpose of this paper 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, blower 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 groundnut. After the design has completed, it was transformed to its real product where the design is used for guideline.



- II. **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 painful fingers 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 a ground nut due to this crack the ground nut and nuts mixed with shell. Introduction gives knowledge that the traditional method is not a sufficient 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:-
- III. **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. A. Concept 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 process variables. (2) Quantify the important method. (3) Develop a prototype automation system which could control over all of 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 plays a major role in rural area. The above considering point we design the semi-automated machine which replace manual process. B. Objective 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. The three kinds of the nets can be used with different size of capsule slots, size vise small, medium and large for various size of groundnuts. In this way the “GROUNDNUT SHELLER” works.

IV. RESEARCH METHODOLOGY Research methodology deals with design & fabricated all of component which are to be used in the machine with required modification. Firstly synthesis the all the problem which are consult with project. After that design complete atomize machine, then regarding development done on shelling machine. Parameters will be selected according to objectives. 2D & 3D diagrams of components and assembled machine and line diagrams with labeling. The various instruments used for fabrication of machine. As seen on last project, it is based on manually operated (paddle operated). Existing project will be modified by making motorized (semi-automize). Another problem is that nuts and husk is mixed coming after shelling operation, this problem will be remove by using blower or other mechanism to separate nuts and husk (outer covering of a ground nut). By making motorization (semiatomizing) productivity improve with minimizing time consuming and damages of nuts, capacity also improve. The approach will be synthesis, design, development & testing of the machine. By keeping the point in our mind, we think that we should make such a machine, whose production capacity is more & machine gets operated on 1 H.P. electric motor instead of manual work.

B. Modeling & Fabrication After that design complete semi-automize machine, then regarding development done on shelling machine. Parameters will be selected according to objectives. 3D diagrams & photos of each components and assembled machine and line diagrams with labeling. Main objectives of this project were to develop the first prototype of an easy to use, low priced and efficient ground nut decorticator and test its



performance. Taking leads from previous researchers following design constraints were established. Design should be easy to maintain and should not require highly skilled labor, which is difficult to be found in rural areas. Design should be based on easily available material in rural areas. Manufacturing process should be simple and based on locally available machines in rural areas.

The various instruments used for fabrication of machine. Following are the main components of machine:- (1) Hopper (2) Semicircular Net (3) Roll Shaft (4) Fan Shaft (5) Pedestals Bearing (6) Pulleys (7) Foundation Frame (8) Fan Cover C.

Assembly 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.

VIII.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. The capital required for purchasing the bigger size groundnut decorticator is very high or the cost required for decorticating the groundnut on the job work is also more. In comparison these “Groundnut Sheller” is very



cheap. We have selected the “GROUNDNUT SHELLER MACHINE” as our project work. The “GROUNDNUT SHELLER MACHINE” is the ideal equipment for decorticating process. In the process of completion of the project work our ideas and thought are development towards the mechanisms and technologies of the equipment. We also visualized that this “GROUNDNUT SHELLER MACHINE” is the most critical equipment for the future growth and development of cottage sector projects. Similarly we can say that for the purpose of decorticating the groundnut this is economical and ideal in case of cottage sector projects. The “GROUNDNUT SHELLER MACHINE” can be used in cottage industry or even a farmer can also take benefit from this machine. The decorticating process of groundnut by this machine is more economical and faster than manual process or any other processes. Therefore on the completion of this project, we conclude that the “GROUNDNUT SHELLER MACHINE” will save the tremendous time, energy manpower and save financial input of the project, reducing the cost and time considerably which is the backbone of the present world economy.

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