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A New Development of Manual Operated Groundnut Shelling Machine

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Abstract- The world is mostly focusing on new inventions and everyone running with the updated technology. Farmers are important part for every country without them livehood becomes very different. Farmers cultivates different types of crops in their farm. Groundnut is one of them. Mostly the groundnut is grown on small scale by the farmer major problem in groundnut production in the country like India is lack of peanut processing machines available to farmers. In the beginning peanuts were separated from its shell by the workers manually. Output of this method was very low and also it could of meet the market demand as it was very time consuming process. This project mainly removing obstacles during removing of peanut shell with the help of this device the time interval for removing of shell reduces and also the labour requirement is also reduced. This project helps the farmers to work easily and can reduce time and investment. It is more efficient and can be available at low cost.

1. INTRODUCTION

Agriculture is the most important sector in Indian economy. Farmer works day and night for growing the crops. They cultivates variety of crop according to seasonal conditions. Groundnut is one of them. Arachis hypogeal is the scientific name of groundnut and it belongs to legume or beans family. It was first cultivated in Peru. Its seeds constrains about 63% cards, 19% protein and 6.5% oil. The groundnuts are produced under the ground and covered by the pods. The shell removed manually or by using machine.

The groundnut are stripped from the plant, dried stored and processed shelling is the important process in groundnut production. In this project we designed and developed a small machine to remove shell of groundnut so that farmers can reduce their labour cost and production time and also gain high profit by shelling the nuts directly.

It involves the process of designing the different parts of shelling machine considering forces and economic factors for farmers to use. After the design has completed. It was transform to its real product where the design is used for guideline. The equipment is ecofriendly and also have less maintenance cost.

2. LITERATURE REVIEW

Santosh Mangave and Bhagyesh Deshmukh fabricated a groundnut shelling machine which can run easily. The parts of the machine are hopper, axle, main disc, front disc, handle etc. The hopper is made up of thin metal sheet and the main disc and front disc are made up of wood. The axle manufactured from the steel. Axle of the machine may be horizontal, vertical or inclined. The peanuts falls from the hopper into the crushing chamber between the front disc and main disc. As we rotate the machine handle by hand, the front disc is rotated and the peanuts gets shelled and falls down from the disc. The machine shells the dry groundnut and machine can be used for domestic application

During our study it is found that some of the authors has done their work on the peanut sheller machine. It has 95.25% of shelling productivity and 91.67% of isolating proficiency. Engine, fundamental pulley, input shaft, yield shaft, fork, base plate, flywheel, almond couplings are the part of the machines. The materials utilized for the machine is cheap and easily accessible. The heaviness of the machine is also low and it comprise of the container, crushing chamber, partition chamber and the blower unit. This is our try to make a new development for the peanut sheller machine so that it will be convenient to the end user.

Khulbhushan M. Shejole design and fabricated the pedal operated groundnut shell removal machine. In the machine the groundnuts are separated manually. The groundnut decorticator machine works on quick return mechanism. Through the pedalling action the groundnuts get crushed. The pendulum is attached to the shaft. In order to decrease the mechanical damage of the groundnuts, the rubber pad is placed on the pendulum. With the help of the rubber pad the groundnuts get crushed. A greater output rate is obtained if we continuously operates the machine. Output rates obtained by pedal operated groundnut decorticator 49 kg/hour. The maintenance cost, production cost and energy consumption was less in these machine.

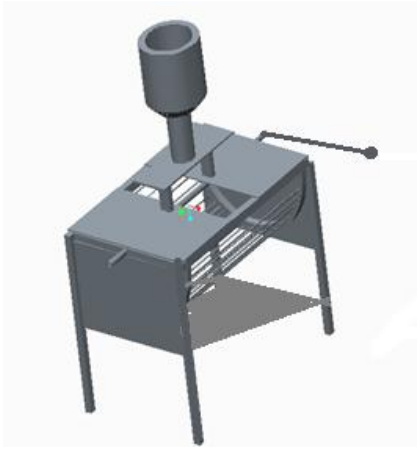
The pedal operated peanut crusher was designed and fabricated by Pratima G. Mungase. The pedalling action is used to rotate the screw conveyor which is placed on bicycle. In the bicycle shaft, the rear sprocket is placed on it. The rear sprocket which is rotated with the help of chain drive. The peanuts are inserted through the hopper in the screw conveyor. The distance between the flights and casing of the conveyor is enough to crush the peanuts. At the final output, the mixture of peanut and crushed shells are obtained.

3. OBJECTIVE

The main objective to develop a mechanism for groundnut sheller machine:

1) Separation of shell of nuts.
2) The cost of a machine should be affordable to the farmers.
3) The machine should not have excessive weight. It should be such that it can be easily portable.
4) To develop a machine

4. CONCEPT DESIGN



5. WORKING

The different parts utilized in the machine are: container, shaft, beater (roller), strainer, hand worked component, pivots, Plummer square, L edge, nut and screw. The dry groundnuts are poured in the container. From the container the groundnuts slide down into the devastating load. Smashing chamber comprise of turning mixer and the stationary sifter. The basic separation between the mixer and sifter is of 10mm. Groundnuts gets shelled when they are in contact of the blender and the sifter. The shelled groundnut blend falls in the isolating load, where the nuts and shells get isolated. Denser nuts, falls in that plate while the lighter shells are covered through an outlet. The plate is put underneath the confining chamber which falters by the smart bring framework back. The escaped from shells from the secluding chamber are removed when nuts are briefly taken care of in the faltering plate. The groundnuts are accumulated once the plate is full. Diverse pitch distance across hand worked system drive is utilized to run the blender, the devastating instrument by hand controlled.

6. ADVANTAGES

1) Time required for shelling of nuts will be less.
2) Cost of the machine is less as compared with automatic machine.
3) The work done by the machine is very efficient.
4) Only one labour is sufficient for its operation.

7. CONCLUSION

The machine available at low cost and it is very helpful for the farmer to earn more profit by shelling shelled nuts. By using this machine production cost and shelling time reduces only one labour is necessary for machine operation. The machine is helpful for both small and big farmers.

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