A REVIEW ON DESIGN AND DEVELOPMENT OF CORN PEELING AND SHELLING MACHINE

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ABSTRACT:- *This paper is about an idea of designing a machine for the corn peeling and shelling purpose. Having higher production rate, compact size attachments for collection of cobs and seeds without damaging the seeds. Which will be easy for application and affordable to all farmers. Performing both peeling and shelling by feeding once collectively or single at a time.*

***Key Words*: Corn, Peeling, shelling, compact, production rate.**

1. INTRODUCTION:-

Corn is grown on small scale by farmers in developing countries like India. There are number of traditional and modern corn peeling and shelling techniques in India, which are used by farmers. The main problems with these techniques are that they are not more productive and also corn seeds get damaged on large scale due to this seeds are not good for sowing at large extent.

So now a day's farmers are required to use the new techniques to increase the production rate and also reduce the man power. But existing machines are not affordable to small scale farmers which are bigger in size. This synopsis is about the idea of creating machine for corn peeling and shelling. Which are compact in size, having more production rate and also provision for separate collection of cobs, shells and corn seeds.

In India, Corn is emerging as the third most important crop after rice and wheat, and it has significance as a source of a large number of industrial products besides its use as human and animal food. Corn is also a versatile crop, allowing it to grow across a range of agro-ecological zones. In our country, most of land use for agricultural purpose which produces semi-finished products. Corn also is one of the agricultural semi-finished goods. Every part of Corn has economic value as the grain, leaves, main crop stock, tassel and cob can all be used to produce a large variety of food and non-food products. In India Corn is grown in all seasons, After harvesting with sickle and plucking of cob manually, dehiscing of cob is done by hand to remove its outer sheath and further grain is obtained by shelling the cob traditionally, i.e. by beating the cobs with sticks or removing with fingers or sickle, etc.

2. RELEVANCE:-

- Most of the farmers shell corn by mainly three methods namely shelling cob grain by hand; hand operated corn Sheller and beating by stick method were carried for removing corn kernel from the cob. For removal of corn shells and to deseeding of the corns with minimum damage to the corns we are a developing a superior machine, which will not only shell but also peel the corn without damaging corn seeds.
- There are several electrical operated Corn shelling machines for mass shelling. The machine is power operated .It is also suitable for small farming applications and budget friendly for farmers.
- Mechanical damage of corn has adverse economic effects on the farmer, processor, and eventually the consumer. Which is reduced from by the machine.

3. LITERATURE REVIEW:-

1] **Pradip Kadam et al[1]:** The proposed work aims to develop a machine which helps to reduce the human effort and cost of the machine and also suitable for small scale farming. Simple machine construction and better features developing a machine in compact size which peels the shells of the corn and also deseeds the corn in less time.

2] **Pradip Kadam et al[2]:** This paper describes the design of corn peeling and shelling machine and covers following points: The shelling efficiency was more than other hand operated or pedal operated shelling machines. The efficiency of peeling and shelling machine varies between 90%-97% with average efficiency of 94%. During the shelling operation the kernels were detached from the cobs without any damage to the kernels.

3] **Desai Shridhar R.et al[3]**: This peeling machine has been designed, developed and fabricated for reduce the efforts of Indian farmers. The peeling machine was tested in the fabrication shop and later taken to the field. The leaf discharging mechanism is

effective and the corn leaf is discharged easily. For commercial purposes one can improve the efficiency of the machine by increasing the size of the machine. By applying multiple head increases the production rate.

4]Mandar Mukundrav Sumant[4] :This machine had tested the performance of the fabricated machine, it could be concluded that the shelling efficiency, cleaning efficiency, grain recovery efficiency, Sheller performance index, total grain losses and output capacity are 87.08%,95.89%, 95.48%, 91.55%, 2.96% and 623.99kg/hr. respectively at 13% moisture contents of corn and at 886rpm shelling speed The best moisture content of corn for shelling according to this evaluation is 13% dry basis and the best shelling speed is 886rpm.Using improved power operated Sheller. The electric motor seat provides adjustment so that the V-belt can be fixed easily. There is no doubt that the machine will ease the long term scourge of youth unemployment in our land.

5]Dr. C. C. Handa et al[5]: This machine having design is an environment friendly and uses simple mechanism properties such as shelling system, and automation separating system etc. In this, some threshing force is needed to thresh the Corn. 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 Corn Sheller machine considering various important parameters. In this project, designing & development of a machine to shell Corn so the farmers can gain high profit by selling Corn direct in market.

6] J.N. Nwakairea et al[6]:- In this machine, the number replaceable parts was low when compared to most threshers available in the market. This machine has an estimated useful life of ten years. The threshing capacity of the corn sheller was such that it handled the threshing needs of the farmers within required time and zero drudgery. Thus farmers had more time for other activities with good strength. Both the farmers and the agro processing centers not only reduced their cost of threshing corn per bag but created more wealth for themselves.

7] Sunil Kadam et al[7] : This machine will make the farmers becomes independent and not rely on the labours for removing covers of corn and for deseeding. A single person can efficiently operate this Corn shelling and threshing machine. It takes less weeding time compared to manual shelling and threshing of corn. Controlled feed rate and from working as per directions on can achieve greater productivity. It is portable Corn shelling and threshing machine with collecting system which can be driven by automatically.

4. CONCLUDING REMARK FROM LITERATURE REVIEW:-

This shows that many authors suggests various Corn peeling and shelling combo machines which are developed ,designed, and fabricated to reduce the human efforts. The machines available have mechanism for separate peeling either shelling arrangement. We find very few machines are combo machines i.e. Corn peeling and shelling mechanisms. The existing combo machine either have low production rate or bigger in size.

5. PROPOSED WORK:-

The Proposed work aims to design the corn peeling and shelling combo machine. Design of shafts for required speed taking proper length and diameter of various shafts and also choose the material to suit desired working conditions. Optimization of size and reducing the overall dimensions considering strength and base of machine.

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