*International Journal of Research in Engineering and Science (IJRES)*
*ISSN (Online): 2320-9364, ISSN (Print): 2320-9356*
*www.ijres.org Volume 10 Issue 5 ǁ 2022 ǁ PP. 60-63*

# A Review Paper on Experimental Investigation of Corn Shelling Machine

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***ABSTRACRT:-***
*Assessing the performance characteristics of the developed corn shelling machine is the focus of this paper. Corn shelling machine was fabricated based on an engineering design approach with the aid of software (CAD) and values and was later fabricated at K.D.K College of Engineering, Nagpur Workshop using suitable materials after considering the factors such as Hardness, ease of machining, tensile strength, availability, durability, and the cost. The machine is electrically operated by an electric motor with a power rating of 2.235 kW, speed of 1430 rpm, and torque of 14.92 Nm. Kernel losses and damages were found to be very negligible.*
***Keywords: -*** *Corn, Shelling, Machine, Design, Development*

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Date of Submission: 24-04-2022 Date of acceptance: 06-05-2022

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## I. INTRODUCTION:-

Processed corn is used in the manufacturing of many products, starting from breakfast foods, corn meal-flour and grits, starch, corn syrup, corn oil, spirits, acetone, chemical, absorbent, seed, and silage. Therefore, a large quantity of maize is needed to meet the need of the agro-allied industries in providing the afore-stated items for the use and survival of humanity. The increased quality of maize can be enhanced by devising an effective method of processing. The sequence of maize processing includes harvesting, de-husking, shelling, winnowing, drying, bagging, and storage. Maize shelling is defined as the removal of grains from the cobs by the initial impact, and rubbing action as the material passes through a restricted clearance between the cylinder, and concave bars. The performance of these hand-operated shelling machines is limited and can cater to only domestic maize requirements. Power-operated machines including Mo hinder, radar, Armar, sherdur, amude, spike tooth tropical motorized maize shelling machine, and Francis smith shelling machine have been used till date, and can handle a large amount of cobs butte cost of purchase is prohibitive for the local farmers. Tractor operated shelling machine is the most costly among maize shelling machines, because it demands the additional cost of a tractor for the operation of the machine; but has an added advantage of providing the facility for cobs transportation. The existing shelling machines have another problem in the area of increased damage to the grains while shelling them from the cobs. This made the manual method better than the machining method because of the low grain damage witnessed in it. Therefore, an effort towards minimizing grain damage while engaging in mass production, during the shelling process, will be commendable. Therefore, information on the most influential factories is needed by designers, to incorporate the right shelling cylinder into the shelling machine that will promote high efficiency with few corn grains damages.

## II. LITERATURE REVIEW:-

### 1) "**PEDAL OPERATED CORN SHELL":-**

S. B. Patil, a. D. Chendake, m. A. Patil, s. G. Pawar, r. V. Salunkhe, S. S. Burkul pad. Dr. D. Y. Patil college of agricultural engineering and technology, talsande, Kolhapur.

Before the start of the shelling process, the machine was set up in a place where sufficient space was available. Two big size buckets filled with cobs were
placed on either side of machine to facilitate easy access to both the workers to

pick up. The driver of the machine started pedaling by sitting on the seat provided and the driver started pedaling the four shelling units started rotating. The driver and other workers were picking up the cobs from the buckets placed on either side and putting them into the rotating shelling units with both hands. The rotating motion of the shelling unit shell out the kernels and detached kernels fall on the kernel collection trays from where they got collected through the collection chute in the bag or container placed below the collection chute. Plate 2 shows the setup in working condition.

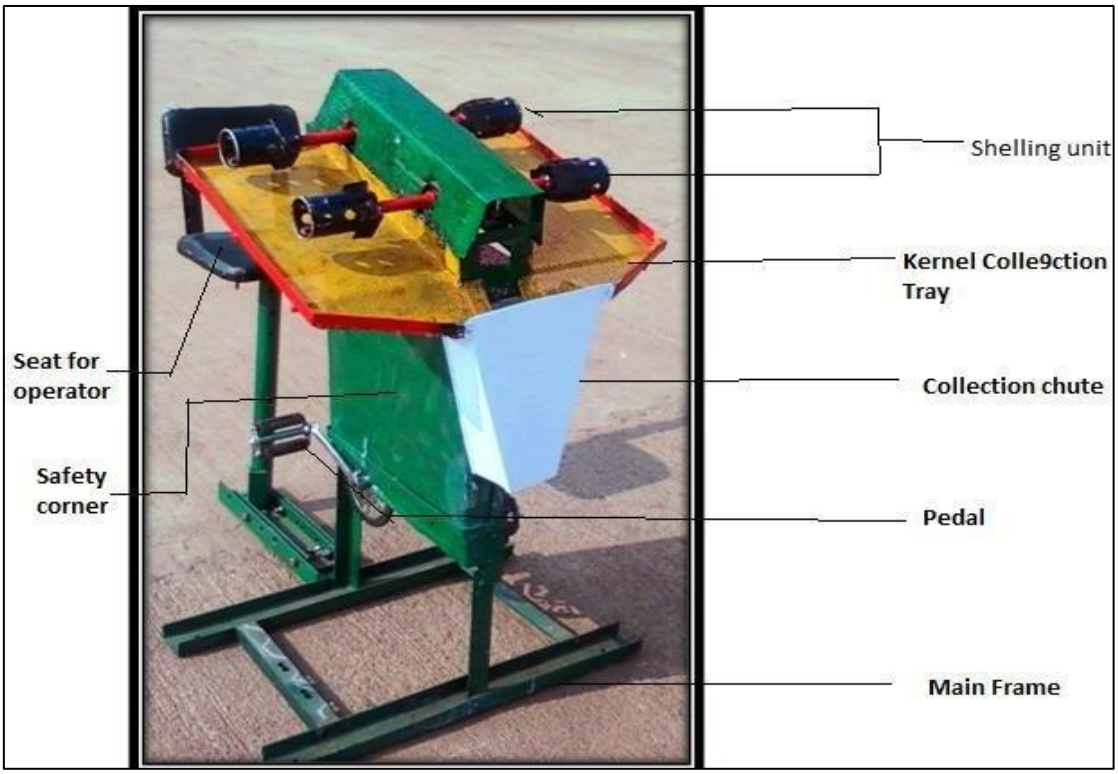


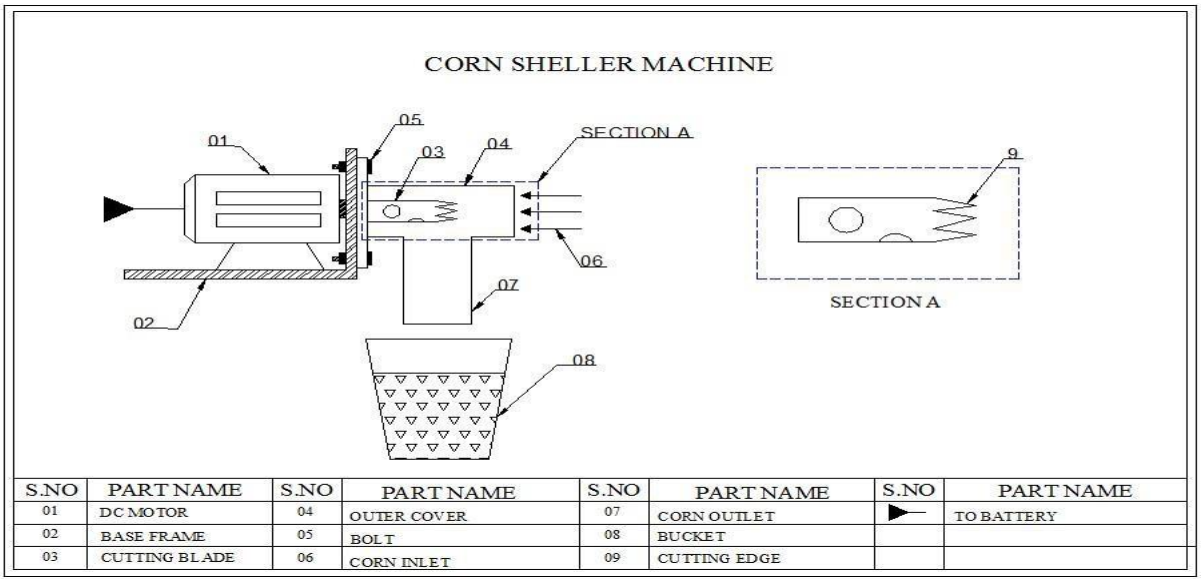

Fig. PEDAL OPERATED CORN SHELL

2) **"MOTOR OPERATED CORN SHELLER":-**

Nitin, Praveen Kumar, Praveen raj, madheswaran ug student, bannari Amman institute of technology, sathyamangalam, erode 638401 India.

The main components in this model are a dc motor, cutting blade, cylinder, collecting tank, and supporting frames. The cutting blade is placed in between the cylinder and DC motor. The cutting blade is rotated using a DC motor

Maze move in the cutting blade. The blade has been specially designed to remove the kernels from the corn. Thus rotating at high speed kernels are removed and are collected in the collecting tank.




| S.NO | PART NAME | S.NO | PART NAME | S.NO | PART NAME | S.NO | PART NAME |
|---|---|---|---|---|---|---|---|
| 01 | DC MOTOR | 04 | OUTER COVER | 07 | CORN OUTLET | ▶ | TO BATTERY |
| 02 | BASE FRAME | 05 | BOLT | 08 | BUCKET | | |
| 03 | CUTTING BLADE | 06 | CORN INLET | 09 | CUTTING EDGE | | |

Fig. MOTOR OPERATED CORN SHELLER

3) **"CONCEPTUAL DESIGN AND DEVELOPMENT OF SHREDDING MACHINE FOR AGRICULTURAL WASTE"**

Professor and Head, Department of Mechanical Engineering, Vvit, Bangalore, karnataka, India.

The scope of this work is to conceptually design and develop a Shredder machine focusing on chopping of dry leaves, areca leaves, this chopped powder to prepare the vermin compost. The work began with collection of information and data on user lifestyle and current process by which they perform their job. A concept was developed with reference of four different shredder machine and operating processes. Concept was developed considering the safety factor users operating and maintenance. The machine consists of Three-phase motor, spur gear, bearings, structural frame, cutter and dual shaft. The machine frame is can be built using mild steel and High Carbon steel used for cutter tip preparation. Sixteen cutters are mounted on two shafts, which rotate parallel driven by a spur gear. The power from the electrical motor is transmitted to cutter shaft through a belt drive. Cut is made inside the chopping house due to the effect of tensile, friction, and impact effect in chopping process. The dry leaves get chopped and powder is collected at the bottom.

**RESEARCH GAP:-**

In the beginning the corns were separated from its cobs by the workers. They simply de-cob the corn by their hands and separate the corn from its cob. The output get from this method, was very low and it does not fulfill the market demand because it was very time consuming process. In traditional method of separating corn seed from cob by putting the cobs in a cloth bag and beating it with a stick. This technique did a good job of de-cob the shells (deleting the painful fingers problem), but we still had to pick the corn out since they didn't come all the way loose. This is not a reliable method for shell a corn due to this crack and the corn and cobs mixed after shelling. Introduction gives knowledge that the traditional method is not a sufficient method for separating the corn. Due to this manual process, identify some major problem & to over-come this problem some idea or concepts generates. In keeping with generated ideas deciding objective of project. Following are the problem:-

1) High cost of machine.

2) Mixing of cob and corn.

3) High power consumption.

4) Breaking of seeds.

5) Wastage of cob.

**OBJECTIVE AND SCOPE:-**

1) To Investigate & Analysis of Corn Shelling Machine.
2) To study briefly on experimental results by varying various parameter.
3 Focuses on the development & optimizing of corn shelling mechanism.

**ACKNOWLEDGEMENT:-**

The author would like to express his sincere thanks to his guide Asst. Prof. Vedanand.N. Mujbaile and Asst. Prof. Mayur .S. Shelke for his valuable references and support throughout the seminar work.

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