Fabrication of Corn Sheller Machine

Sandeep W. Bhiwapurkar[1], Ganesh R. Chandekar[2], Harshal N. Tambe[3], Suraj B. Deshmukh[4], Pranali Wankhede [5]

[1, 2, 3, 4] *Diploma Student of Mechanical Engg, V.I.T Uti Nagpur road, Umred, Maharashtra, India*

[5].*Asst. Prof. of mechanical Engg, V.I.T Uti Nagpur road, Umred, Maharashtra, India*

Abstract- **Corn is grown on small scale farmers in developing countries like India. The average kernel price is approximately twice the price of maize. Lack of Corn processing machines, especially Corn Sheller, is a major problem of Corn production, especially in our country India. A research-work for fabricate, and performance evaluation of a Corn Sheller consisting of feed hopper, 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. This paper describes about the design of various components of Corn Sheller machine. Hence in this design of various parts are necessary, and design of various parts due to which the design quality of those parts will be improved.**

Index Terms- Corn, Sheller Machine, Efficiency, Oka.

I. INTRODUCTION

In today's industrial world man's innovative ideas has brought him towards all the directions concerning about the production as well as safety in industrial establishments. Some instruments are of shear excellence where as others are the result of long research and persistent work, but it is not the amount of time and money spends in the invention of device or the sophistication of it operation is important, but its convenience, utility and operational efficiency that are important in considering the device. India is presently in need of technology in the agricultural field. The farmers need to do all the segregating processes manually which is a cumbersome task for them We have participated indeed in mass shelling of corn using the most primitive, cumbersome, and difficult method of hand shelling which encourages time consuming and human stressfulness. Corn otherwise known as "Oka" in Igbo tribe is mostly sued seed across all the tribe in this country today. It is widely used in homes, hotels, and schools for eating and seedling process (when dried). It is therefore very rare to see any Nigerian who has not tested it in one way or the other.

Now, since it is very imperative for dieting inclusively, it can be refined to form varieties of food supplementary diet such as making of Akamu (pap), Semovita corn pounded, corn mill etc. Today, in our industrial sectors such as ceramics and biscuit industry, it is widely used for making of biscuit, flouring for bakery of the bread, and corn mill. Infect to summarize all this, junked food that are baked in supermarket today are mostly involves corn in making them.

In the light of this as technology advance forward, an introduction of this machine (Sheller) made manifest and come into existence which is more stress less, easy to operate, low costing, and time reduction with high degree of production volume and efficiency. Modifications have also made it possible to be manually and electro-mechanical operated type depending on the choice of design and the speed of shaft required

II. NEED OF PROJECT

In Process industries and robotics and other applications, technology have been utilize in several purpose to carry out operation of opening and closing. Out of this technology is important one, in fast life where time is a first important factor, we need to utilize automation technology for future growth. The proposed work aim to develop a machine which helps to reduce the human effort and cost of the machine and also suitable for small scale industries. 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.

III. SPECIFICATION OF COMPONENTS

A. AC MOTOR:

The universal motor is a type of electric motor that can operate on either AC or DC power and uses an electromagnet as its stator to create its magnetic field. It is a commutated series-wound motor where the stator's field coils are connected in series with the rotor windings through a commentator. It is often referred to as an AC series motor. The universal motor is very similar to a DC series motor in construction, but is modified slightly to allow the motor to operate properly on AC power. This type of electric motor can operate well on AC because the current in both the field coils and the armature (and the resultant magnetic fields) will alternate (reverse polarity) synchronously with the supply. Hence the resulting mechanical force will occur in a consistent direction of rotation, independent of the direction of applied voltage, but determined by the commentator and polarity of the field coils

Universal motors have high starting torque, can run at high speed, and are lightweight and compact. They are commonly used in portable power tools and equipment, as well as many household appliances. They're also relatively easy to control, electromechanically using tapped coils, or electronically. However, the commentator has brushes that wear, so they are much less often used for equipment that is in continuous use. In addition, partly because of the commentator, universal motors are typically very noisy, both acoustically and electromagnetically.

B. CAST IRON PIPE

Cast iron pipe is a pipe which has had historic use as a pressure pipe for transmission of water, gas and sewage, and as a water drainage pipe during the 19th and 20th centuries. It comprises predominantly a gray cast iron tube and was frequently used uncoated, although later coatings and linings reduced corrosion and improve hydraulics. Cast iron pipe was superseded by ductile iron pipe, which is a direct development, with most existing manufacturing plants transitioning to the new material during the 1970s and 1980s. Little cast iron pipe is currently manufactured.

The oldest cast iron water pipes date from the 17th century and were installed to distribute water throughout the gardens of the Chateau de Versailles. These amount to some 35 km of pipe, typically 1m lengths with flanged joints. The extreme age of these pipes make them of considerable historical value. Despite extensive refurbishment in 2008 by Saint-Gobain PAM, 80% remain original.

Cast iron proved to be a beneficial material for the manufacture of water pipes and was used as a replacement for the original elm pipelines utilized earlier. These water pipelines were composed of individually cast pipe sections, often termed sticks, jointed together by a bell and spigot joint.[1]Here one end of the pipe stick is flared, termed the bell or socket, to enable the opposite end of the next stick, the spigot end, to be inserted to create a joint. The gaps in these joints were sealed with oakum to prevent the water leaking out. A molten-lead joint was then run around the socket to ensure that the oakum seal remained in place.

C. JAW OR TEETH MADE FROM C.I. PIPE

This jaw is made from C.I pipe used in our corn Sheller machine which will rotate when the motor will switched on and will start to remove the cobs from the corn.

D. REGULATOR (SPEED CONTROLLER):

A voltage regulator is an electronic circuit that provides a stable DC voltage independent of the load current, temperature and AC line voltage variation. A voltage regulator may use a simple feed forward design or may include negative feedback. It may use an electromechanically mechanism, or electronic components. Depending on the design, it may be used to regulate one or more AC or DC voltage.

Electronic voltage regulators are found in devices such as computer power supplies where they stabilize the DC voltage used by the processor and other elements. In automobile alternators and central power station generator plants, voltage regulators control the output of the plant. In electric power distribution system, voltage regulators may be installed at a substation or along distribution lines so that all customers receive steady voltage independent of how much power is drawn from the line.

E. SPRING

This springs are provided to the movable jaw which will automatically open and closed as per the size of the corn two springs are connected to the jaw for more compressibility and spring deflection. This spring have 20 wounds of coil for much stretching the spring without much stress.

IV. ADVANTAGE

1. The machine is in compact size.
2. The power consumption is low.
3. Less time consuming.
4. Maintenance cost is less.
5. High Production in less time
6. Any size of corn can be De-seeded.
7. Simple in Design and Fabrication.
8. No need of any safety device.
9. Benefit for small and medium scale farmers.
10. There is no damage of the corn grains.

V. APPLICATION

1. Used in agricultural field.
2. Used in starch industry.
3. The device can be very helpful to small scale farmers and domestic purpose.
4. This machine can also be used as Mould breaking machine.

VI. OBJECTIVE

1. To increase the efficiency.
2. To reduce the hard work.
3. To reduced time to shell the corn.
4. To develop a low cost machine which can be used by farmer to convert their semi-finished corn into finished product corn.
5. It satisfies the need of village people to earn more money.

VII. CONCLUSION

The above design procedure is been adopted for the fabrication of Automatic Corn Sheller machine which will make the product durable for long time as well as make it efficient also helps to understand the concept of design. Thus, with help of this design we can fabricate an automatic Corn Sheller machine to simply achieve high volume of profit as well as to reduce the human fatigue. After all process has been done, shelling operation may help us to understand the fabrication and designing that involved in this project.

VIII. ACKNOWLEDGEMENT

Indeed it is a matter of grate felicity and privilege for us to work under the guidance of Mr.Pranali Wankhede, Department of Mechanical Engineering, and Vidarbha institute of technology, Uti Nagpur Who constantly supported and encourage us during every step of dissertation. We really feel highly indebted to him for constantly guiding us to continue our work and giving us short term goals, which we acknowledge our gratitude a regards to Prof. Swapnil Marathe Head of The Department of Mechanical Engineering, Vidarbha institute of technology who were kind enough to share their precious time as well as for their keen interest and continues support. We would also like to acknowledgment Prof.Vaibhav

Bankar, Principal, Vidarbha institute of technology, uti Nagpur for his great cooperation and support

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Biographies:

Mr. Sandeep W. Bhiwapurkar pursuing in Diploma (Mechanical Engineering), MSBTE, Mumbai.
Mr. Ganesh R. Chandekar pursuing in Diploma (Mechanical Engineering), MSBTE, Mumbai.
Mr. Harshal N. Tambe pursuing in Diploma (Mechanical Engineering), MSBTE, Mumbai.
Mr. Suraj B. Deshmukh pursuing in Diploma (Mechanical Engineering), MSBTE, Mumbai.