Corn Shelling and Threshing Machine

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Abstract- *India depends on agriculture for its economic development. Corn is the third largest grown crop in India and farmers largely depend on it.Corn is grown on small scale farmers in developing countries like India. The average kernel price is approximately twice the price of maize. Since there are no corn peeling and deseeding machine available in our country India, due to which farmers are facing problems in corn production. A research has been done to design, fabricate, and evaluate performance of a Corn peeler and sheller consisting of feed hopper, shelling unit, separating unit, m.s rod, pedestal bearing, belt and pulley and power system. The performance of the machine depends upon how efficiently corns are peeled and shelled. This project describes about the design of various components of Corn peeler and sheller machine. Overall, this project involves processes like design, fabrication and assembling of different components etc.*

Keywords- Shelling, peeling, design, shaft, pulley, motor.

I. INTRODUCTION

In today's world of industries man have developed many innovative ideas in the development sector. Shelling of high quantity of maize by hand typically is a time consuming and very painful task. The existing alternatives which are used for shelling of maize instead of hand are unaffordable and expensive. In industrialized countries, maize is largely used as livestock feeds and as raw material for industrial products, while in low income countries; it is mainly used for human consumption. Maize is a vital raw material in industry. Corn starch, corn oil, corn syrup and sugar are the chief industrial products obtained from maize. Corn starch is used for starching clothes. The starch is also employed in the manufacture of asbestos, ceramics, Plastics , etc. Corn syrup is used in shoe polish, glassine paper and rayon in tobacco industries. Corn sugar is used mainly in manufacturing of chemicals etc. The maize when cooked under acids produces furfural. The stalks and leaves are sometimes used for making paper, paper board and wall board. Pulverized maize cobs are used extensively for removing carbon from airplane motors.

II. LITERATURE REVIEW

A. Present Theories and Practices:

Anant J. Ghadi and Arunkumar [1]Suggested that, the Aztecs and Mayans cultivated it in numerous varieties throughout central and southern Mexico, to cook or grind in a process called nixtamalization. The crop spread throughout America and later around the 1250 BC it spread to all corners of the region. The traditional method used for corn shelling and deseeding in agriculture industry consist of breaking the grains by hand or by using large machinery for deseeding, both of which are not effective for a developing economy like India where farmers have little money for investment. Hence there is a need for an innovative idea or product which is affordable and efficient enough.

Oriaku E.C, Agulanna C.N, Nwannewuihe H.U, Onwukwe M.C And Adiele, [2] Explained that, corn the American Indian word for corn, means literally that which sustains life. It is, the third largest grain in the world used as fodder for animals and food for humans. It is used in various forms to alleviate hunger, and such forms include pap or ogi, maize flour etc.The major steps involved in the processing of maize are harvesting, drying, de husking, shelling, storing, and milling. For the rural farmers to increase their profit newly adopted techniques must be used. The processing of agricultural products like maize into quality forms not only prolongs the useful life of these products, but increases the net profit farmers make from mechanization technologies of such products. The most important processing operations is shelling or threshing of maize.

ChunhuaZhao , Tao Zhao, BaoLong Hu[3] Explained that, peeling roller is important working part of multifunction corn peeling machine. The main material of peeling rollers are analyzed in this paper's-shaped grooves are used 550r/min and 10 degree peeling angle is better for peeling roller which is calculated from different reading.

S.O. Nkakini , M.J. Ayotamuno , G.P.D. Maeba ,S.O.T. Ogaji , S.D. Probert [4] Suggested that, manually-operated handle is used to rotate two shafts, one of which translates rotational motion to become linear motion of a slider crank.

The slider pushes the maize cobs into the sheller continually one after another. The manual linear-motion continuous maize-Sheller consists of the following components hopper, pulleys and belts (i.e. the power-transmission unit); handle (i.e. torque arm); crank; slider crank; shelling disc housed in the compartment; spikes; chutes; spring.

S. B. Patil, A. D. Chendake, M. A. Patil, S. G. Pawar, R. V. Salunkhe, S. S. Burkul [5] Suggested that, the pedal operated maize Sheller is gives more efficiency and without damage corn collection. It gives difference between man and machine work. It higher shelling rate in machine condition it is near that 5.5 times more than hand operated maize Sheller.

HussenAbagissaDubaleBefikadu [6]Explained that, women in rural Ethiopia to shell maize for household consumption which they mostly do it using conventional finger– palm method for the removal of kernels by pressing it between thumb and hand palm which is laborious and painful. Maize shelling is the important process after harvesting as the shells are firmly attached to hard corb. Developing a corn shelling machine can solve the problem of rural cities for household consumption.

Anirudha G. Darudkar, Dr. C. C. Handa [7] explained that, Corn is grown on small scale by farmers in developing countries like India. But this requires a cheap, manually operated and efficient corn Sheller. Lack of corn processing machines is a major problem of corn production, in our country India. A study designed, the need to develop a machine for corn shelling and deseeding which depends upon the physical conditions of the corn.

Praveen Kiran Mali, Dr. C. N. Sakhale, S. D. Shelare[8] Suggested that, he had found there are many maize threshing techniques in India which are used in our life. The main problems with these machines are that they are not affordable to farmers who are having acreage farms and which they do not require these big threshing machines. Most of the farmers who are having low acreage Maize production meet several difficulties because of high labor expenditure and cost of foreign Maize Threshers. This proposed machine has been designed to be fabricated with the use of locally available materials. The machine is simple, less bulky and the ergonomic considerations in the design would allow for its comfortable use in a sitting posture for it can easily be operated by either male or female.

III. PROPOSED WORK

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 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.

IV. ACKNOWLEDGMENT

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V. CONCLUSION

The peeling and deseeding machine has been designed, developed and fabricated to reduce the efforts of Indian farmers. The machine was tested in the fabrication shop and later taken to the field. It worked smoothly in the field conditions. The leaf removing and deseeding of corn from corb mechanism is effective and the mechanism works very 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.

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