IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 1, March 2025

Design and Development of Corn Thresher Machine for Agriculture Purpose

Sumit Jalgekar[1], Pranav Doiphode[2], Suraj Bhaud[3], Ishan Dafal[4], Prof. B. P. Shinde[5]
Students, Department of Mechanical Engineering[1,2,3,4]
Lecturer, Department of Mechanical Engineering[5]
Zeal Polytechnic, Pune, Maharashtra, India

Abstract: *Designed to improve the efficiency and speed of corn thresher machines Addressing the labor-intensive and time-consuming nature of separating corn kernels from cobs Manual threshing. This machine uses a mechanical system driven by an electric motor to automate the threshing process. Main components include threshing drum, sieve, motor, and a frame to support the structure. A motor drives the drum, which removes the kernel The corn passes through the cobs, while the sieve helps separate the kernels from the chaff and Husks.*

The primary objectives of the project are to increase productivity, reduce physical Increasing the required effort and production capacity from the operator. The machine is designed with Keep in mind the simplicity, making it small and convenient to ensure ease of operation and maintenance a middle class farmer. A motorized corn thresher aims to provide a cost-effective solution Improving post-harvest processing and contributing to agricultural efficiency in rural areas.

Keywords: Strong materials ensure adjustable drum speed, easy mobility and durability in a harsh working environment. A motorized corn thresher machine has the capacity Increasing farmers' income by reducing processing time and labor costs loss of grain during threshing

I. INTRODUCTION

Threshing is the oldest agricultural process, which is necessary to separate grains or seeds of harvested crops. traditionally, threshing was done by hand cobs or rubbing them on a hard surface. This is not only a labor- intensive method It also causes time-consuming but significant grain loss and damage, making it inefficient option for mass production. With increasing demand for agricultural produce and the post-harvest processes need to be improved, mechanization has become an important solution modern farming challenges.

The development of threshing machines began in the 19th century with this aim in mind Reducing manual labor and increasing productivity. Early threshing machines were, however large and expensive, making them inaccessible to small and medium farmers, especially in developing regions. Over time, advances in technology shaped the design Includes smaller, more affordable threshing machines tailored to local farming needs Corn Thresher.

Corn is one of the most important cereal crops globally, providing food, feed, and industrial products. In many regions, especially in developing countries, smallholder farmers rely on corn as a staple crop. However, they often lack access to efficient post-harvest machinery, resulting in higher labor costs, reduced crop quality, and substantial post-harvest losses. The introduction of motorized corn thresher machines has greatly improved the efficiency of processing corn, reducing the time and physical effort required.

corn threshers, powered by electric or fuel-driven motors, are designed to be affordable, portable, and easy to operate, making them accessible to a wide range of farmers. These machines not only increase the speed of threshing but also help reduce grain losses, improve kernel quality, and lower the overall cost of production. The growing interest in sustainable farming and the need for rural development has driven the continued innovation and adoption of such machines.

In conclusion, the corn thresher machine represents a significant advancement in agricultural mechanization, particularly for small-scale farmers in rural areas

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 1, March 2025

II. TECHNICAL SPECIFICATIONS

The following table illustrates the technical specifications of corn thresher machine.

Table 2.1: Technical Specifications corn thresher machine

Sr. No.	Category	Specifications
1.	Power Source	electric motor
2.	Motor Power	Single Phase 1 HP
3.	Output System	Gravity
4.	Threshing Drum Speed	800-1200 RPM
5.	Threshing Efficiency	85% - 90%
6.	Frame Material	Mild steel
7.	Power Transmission	Belt and pulley

III. LITERATURE REVIEW

Anant J. Ghadi and Arunkumar (August 2014, Belgaum)[1]- Current Practices In the agricultural industry, corn de-husking is the breaking of the grain by hand or using a tool Large machinery for deciding, both of which are not effective for developing economies Like in India where farmers have less money to invest.

(Pradeep Kadam et al)[2]: The proposed work aims to develop a machine which will assist Reduces human effort and cost of machines and also suitable for small scale farming. Simple machine construction and good features developing machine in compact size which peels the corn husks and peels the corn in less time.

(Ilori T. A., Raji A. O and O. Kilanko et al)[3]: In this paper the author has studied this topic. Farmers and processors are employed due to economic conditions in most developing countries on a small scale, therefore, the use of automatic and electric powered equipment is limited Some large enterprises. The effect of ergonomic parameters is; weight, age, height and arm length in relation to resulting performance; Shelling efficiency, Cleaning efficiency, mechanical damage and damage of hand-operated corn shellers A study was conducted and the author observed that age was more related to weight than handedness Length From the results obtained in this study, the following conclusions were drawn; The Shelling efficiency increases with significant increases in operator weight Age and arm length. The operator's weight has a major influence on driving Mechanical losses observed from machine performance evaluation are very low Correlation with ergonomic parameters.

(Kumar et al. (2018)[4]- examined the cost-effectiveness and accessibility of mechanization Thresher for smallholder farmers in India. The study found that while spending the initial investment of concern to many farmers, the long-term benefits and growth came from reduced labor costs The productivity made the machines a worthwhile investment. In addition, Govt Subsidies and cooperative procurement schemes helped reduce financial barriers Adoption studies have also highlighted the need for training programs to ensure appropriateness Machine operation and maintenance

IV. LITERATURE GAP

The Automatic Corn Sheller Machine is a cost-effective, efficient, and durable solution designed to reduce human effort and increase profitability. Made from locally available materials, it is lightweight, self-cleaning, and easy to maintain. Its performance depends on moisture content, feeding rate, and blade speed, making it highly effective for farmers, especially in developing regions. By integrating multiple functions, it enhances agricultural productivity while reducing costs.

V. METHODOLOGY

To fabricate a Corn Thresher Machine, the process begins with research and design, where the working principle, required components, and material selection are determined. The main components include a sturdy frame, a thresher drum with beater rods, a concave metal mesh for kernel separation, bearings and shafts for smooth rotation, and a motor for power transmission. The motor drives the drum using a V-belt and pulleys, while a timing belt ensures synchronized movement. After designing the layout, the fabrication starts by cutting and welding MS tubes for the frame, mounting the drum and

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 1, March 2025

shaft onto high-speed bearings, and securing the concave mesh for efficient threshing. The motor is then installed and connected to the shaft via the belt-drive system, with proper alignment for optimal power transfer.

Fig. 1.1 – Thresher drum with timing belt

Once assembled, the machine undergoes rigorous testing and optimization to ensure smooth operation and maximum kernel separation. Adjustments are made for belt tension, drum speed, and alignment to minimize vibrations and enhance efficiency. Safety features, such as protective covers for moving parts, are added to ensure operator safety. The final step involves painting and finishing the machine for durability and corrosion resistance. After successful testing, the Corn Thresher Machine is ready for use, providing an efficient and reliable method for threshing corn while reducing manual labor

Fig. 1.2 Corn thresher machine

VI. CONCLUSION

A corn thresher machine is designed to separate corn kernels efficiently from the cob using mechanical power to enhance the threshing process. In it the hopper is where the ears of corn are fed into the machine, a threshing drum or cylinder that rotates a system of sieves or screens to remove the kernels, and to separate the kernels husks and other debris. The machine is driven by a motor, which replaces the conventional one manual or animal power, increasing productivity and reducing labor time. In short, a motor drives the threshing drum through belts or gears, while air blowers or suction systems assist to further clean the kernel. This motorized design is widely used in small to medium Scale farming makes the process faster, cleaner and more efficient as compared to manual threshing method.

VII. ACKNOWLEDGMENT

It gives me immense pleasure to express my deepest sense of gratitude and sincere thanks to my highly respected and esteemed guide Prof. B. P. Shinde, Lecturer in Mechanical Engineering Department, for their valuable guidance, encouragement and help for completing this work. Their useful suggestions for this whole work and co-operative behavior are sincerely acknowledged.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 1, March 2025

I would like to express my sincere thanks to Prof. N. N. Kokare, Head of Mechanical Engineering Department for giving me this opportunity to undertake this project and for his kind hearted support. I would also like to thank Prof. A. A. Tamboli, Principal for wholehearted support. I am also grateful to my teachers for their constant support and guidance.

I also wish to express my indebtedness to my parents as well as my family member whose blessings and support always helped me to face the challenges ahead. At the end I would like to express my sincere thanks to all my friends and others who helped me directly or indirectly during this project work.

REFERENCES

[1]. Tiwari_2018_Power threshers for effective threshing of crops since green revolution- A Review
[2]. Adekomaya & Samuel (2014): Development of motorized maize thresher for small- scale farming.
[3]. Kumar et al. (2020). Performance evaluation of a rotor-type corn thresher. Agricultural Mechanics, 51(1), 34- 42.
[4]. Alabi et al. (2016): Effects of motorized threshers on small-scale farmers' productivity in West Africa.
[5]. Patel et al. (2019). Design and development of a pneumatic corn thresher. International Conference on Agricultural Engineering, 123-130.
[6]. https://www.researchgate.net/publication/341727994_Design_of_Corn_Thresher.