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WOOD LATHE MACHINE (MAINTENANCE)

Shewale Pavan Keshav[*1], Thoke Nishant Vajesing[*2], Davere Ganesh Vishwas[*3], Thakare Harshal Dilip[*4], Khairnar Yogesh Supadu[*5], Zalte Akshay Ananda[*6]

[*1,2,3,4]Diploma Mechanical Engineering Student, Matoshri Institute Of Technology, Dhanore, Yeola, Maharashtra, India.

[*5,6]Lecturers, Matoshri Institute Of Technology, Dhanore, Yeola, Maharashtra, India.

ABSTRACT

The maintenance of wood lathe machines plays a crucial role in ensuring their efficient operation, safety, and longevity in woodworking industries. Wood lathes are vital tools in creating precise, intricate, and high-quality woodturning products. However, frequent use can lead to wear and tear, misalignments, and mechanical failures, which can affect both the quality of work and machine performance. This project aims to develop a comprehensive maintenance strategy that addresses these challenges through preventive care, troubleshooting, and performance optimization.

I. INTRODUCTION

To ensure your wood lathe machine operates smoothly and lasts a long time, regular maintenance is crucial, focusing on cleaning, lubrication, and inspecting key components like belts, rails, and the tool rest. Clean the machine, check for loose fasteners, and inspect tooling. Weekly: Lubricate moving parts, inspect belts, and verify electrical connections. Monthly: Check and adjust alignment, inspect coolant system (if applicable), and sharpen or replace cutting tools.

II. METHODOLOGY

Wood lathe machines, also known as wood turning lathes, shape wooden workpieces by rotating them while a stationary cutting tool removes material to form desired shape. the machine comprises the frame made of metal, with the headstock fixed in position; the tailstock moves along the bed of the machine, and the tool rest mounted on a cross slide which can be moved both longitudinally and transversely on the bed. It is located between the headstock and the tailstock.

1. DATA GATHERING

In this phase, relevant information is collected to support the project concept. This data is obtained through direct industrial visits, where we assess real-world system dimensions, operational mechanisms, time efficiency, and identify existing shortcomings or inefficiencies in the current system.

2. SYSTEM DESIGN

The system design phase focuses on developing a mechanism capable of executing the intended function. It involves determining system components, their configurations, dimensions, and functional attributes. The parts required for this phase are listed accordingly.

3. MECHANICAL DESIGN

Each component is analyzed for stress and strain under the given load conditions, and precise dimensions are determined. Standard parts are selected based on reference data from the CBS design handbook to ensure compatibility and reliability.

4. CREATION OF PRODUCTION DRAWINGS

Detailed production drawings are generated , incorporating dimensional accuracy and geometric tolerances. Additionally, raw material specifications for each part are established.

5. MATERIAL ACQUISITION & PROCESS PLANNING

Raw materials are sourced based on predefined specifications and required quantities. A structured process plan is then developed to outline the manufacturing sequence and identify suitable machinery for production.

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6. MANUFACTURING

The fabrication of components takes place as per the production drawings. Various machining processes, including turning on a lathe, drilling, and metal cutting, are carried out in the company workshop to produce the necessary parts.

III. MODELING AND ANALYSIS

Figure 1: Wood lathe machine.

IV. RESULTS AND DISCUSSION

A lathe machine is a versatile tool that rotates a workpiece against a cutting tool to shape it, and its versatility stems from its ability to perform various operations like turning, facing, threading, and drilling.

Key findings include:

1. **Lathe machine :** Operate on hand mechanism.
2. **Workshop industry:** workshop in any tool making.

V. CONCLUSION

In conclusion, lathe machines are versatile and fundamental machine tools used for shaping cylindrical workpieces through rotating them against stationary cutting tools, enabling various operations like turning, drilling, and threading, and are essential in diverse industries.

ACKNOWLEDGEMENTS

A lathe machine is a versatile tool that rotates a workpiece while a cutting tool removes material, enabling the creation of cylindrical shapes, threads, and other forms.

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