



## Design & Fabrication of Mini Lathe Machine

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**ABSTRACT** A lathe machine is used for rotating a work piece in order to perform sanding, parting off, and drilling, knurling and turning operations on the work piece. Lathes have been used on woodworking, essence corridor and also on plastic nylon corridor for a long time in the assiduity. So then we study the design and fabrication of a mini lathe machine. Our machine consists of a motor with belt arrangement wont to drive the lathe chuck. The machine consists of a bed with a portable arrangement. It consists of a holder in order to hold the asked tool in asked position. We use a chuck attached to the spindle shaft so as to run the motor. Our motor formerly powered transmits this power to the spindle through a belt medium, which is also used to rotate the chuck. This rotates the work piece by chuck. The machine is erected to hold and rotate the work piece and move the tool in a sliding medium, so as to achieve the asked operations. The machine external frame is designed to hold the work piece forcefully with tool in place so as to achieve asked operations with ease.

**Keywords-**Portable mini lathe machine, Design, Fabrication & Working of portable mini lathe machine.

### 1.INTRODUCTION

#### 1.1 BACKGROUND

The wood lathe machine is introduced to reduce the mortal suffering and to ameliorate profitable and technological standard, and for times now Ethiopia honored that was economically and technological poor and has been economically hooked in to the western world for survival in terms of technology. To discourage this importation of technological outfit placed enlarge on the importation of certain goods and this inspired our people to honored indigenous technology through our fore father used dismissal, scimitar and a few other sharp tools for designing forestland. But, as time goes on, technologist introduced mini wood lathe machine, which comes in colorful designs and models as technology improves. Therefore, the importance of wood lathe can't be over emphasized. it is the acknowledgement of this incontrovertible fact that led to the planning of mini wood lathe machine, indeed though this design of design and fabrication of wood lathe machine may be a copied design, we tried to ameliorate more on this machine in order that it can design wood with little or no stress, exercising the available material so as to reduced cost for product purposes and continuity being of utmost important. For the mini wood lathe machine to serve and perform its operations, colorful important parts are integrated together.

#### 1.2 MINI LATHE MACHINE

Mini lathe is a portable machine of dimension 60mm\*45mm\*30mm and made up of using mild steel Frame, it is commonly used for machining wooden or plastic work pieces. So here we study the fabrication of a mini lathe machine. Our machine consists of a motor used to drive the lathe chuck. The lathe consist a bed with movable arrangement. It also consist a holder to hold the desired tool and this holder can hold

different size drill bits. The machine is build to hold the work piece and move the tool in sliding mechanism, so as to achieve desired operations. The machine outer face is design to hold the work piece firmly with tool in place so as to achieve desired operations with ease.

### 2. OBJECTIVES

The main objective of the project is to design and manufacturing of motor driven mini wood lathe machine to produce good quality products.

#### 2.1 SPECIFIC OBJECTIVES

- To Select the high value conceptual design
- To Develop embodiment design
- To Design each components
- To Modeling and drafting each components
- To Testing prototype
- To estimate the resource requirement for designing mini lathe machine.

### 3.METHODOLOGY

Methodology that we follow to complete the study or project is highlighted as follows

Data collection done by literature survey, user study and market study through questionnaires, videos and observation etc. about the existing lathe machine.

Identify the drawbacks or limitations of the existing lathe machine.

Generate new ideas to solve these problems.

Select the best idea to model the new mini lathe machine.

Prepare preliminary design or model of the modified sprayer depends on our idea usingsolid work software. And material specification is done.

Geometric and force analysis of each component is done based on the preliminary design model.

Design the components.

Preparation of manufacturing drawing or part

and assembly drawing.

Manufacture all components

Assemble and testing

Check prototype

Finally conclude the study

#### **4.PARTS USED IN MINI LATHE MACHINE**

**Shaft:** A shaft is a rotating machine element, usually circular in cross section, which is used to transmit power from one part to another, or from a machine which produces power to a machine which absorbs power.

**Chuck:** A chuck is a specialized type of clamp used to hold an object with radial symmetry, especially a cylinder. In a drill or a mill, a chuck holds the rotating tool; in a lathe, it holds the rotating work piece.



**Fig 1: Chuck**

#### **5.TREND IN LATHE MACHINE FABRICATION**

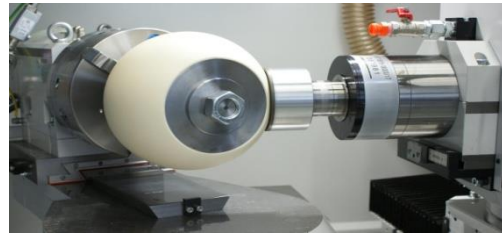
**1. CENTRE LATHE MACHINE** The Centre lathe is used to machine metals, by rotating the work piece mounted between centers against a cutting tool. The tool can be fed both transversely and longitudinally with respect to the turning axis of the job. The tool can be operated manually or automatically and many shapes as well as different works can be carried out on the Centre lathe such work as cylindrical, eccentric or conical shapes can be machined. Also done on the Centre lathe are threading and boring operations.



**Fig 2: Centre Lathe Machine**

#### **2. CERAMIC LATHE MACHINE**

The ceramic lathe is used for ceramic machining alone, though the operation is similar to that of the Centre lathe.



**Fig 3: Ceramic Lathe Machine**

#### **3. WOOD LATHE**

The wood lathe, just like other types of lathe, can be used to carry out a wide range of machining operations. It saves time and does not need much skill as in the use of hand tools. A wood lathe is a type of lathe that's designed specifically for woodworking applications. In other words, they are used to cut, sand, drill, face, turn and deform wooden work pieces.



**Fig 4: Wood Lathe Machine**

#### **6. ADVANTAGES AND DISADVANTAGES**

##### **ADVANTAGES**

- It's a portable lathe machine.
- Wood and plastic can be machined.
- Easy to design and fabricate.
- Very less maintenance.
- Its initial cost as well as running cost are less.

##### **DISADVANTAGE**

- We cannot work for long time because of heating problem
- Machining on a mini lathe take more time as compare to other lathe machine.
- Finishing of wooden job or work piece is not so good.
- Hard wood cannot be machined on it.

#### **7. APPLICATIONS**

- It can be used for wood designing operations
- It is low cost as well as portable machine to use
- Design of wood and drill , bore ,etc parts can be prepared easily.

#### **8. CONCLUSION**

Portable mini wood lathe machine has a good advantage when compare to other manual machining process. We had done various operations on mini lathe and found that it can machined more number of job in same time in which a carpenter do manually, its fabrication is easy and material required in fabrication is available easily so

everyone can made it by himself for their use. Machining on mini lathe was studied and found that it energy efficient and also reduce human effort.

#### 9. FUTURE SCOPE

Our project is simply a portable mini wood lathe machine, which is electrically operated. Further modifications can be done to improve the performance of the machine.

#### 10. REFERENCES

- [1] [https://www.ijite.com/citations/IJITE\\_400150018.pdf](https://www.ijite.com/citations/IJITE_400150018.pdf)
- [2] [https://en.wikipedia.org/wiki/Metal\\_cutting\\_books\\_and\\_made\\_easy\\_pdf\\_files](https://en.wikipedia.org/wiki/Metal_cutting_books_and_made_easy_pdf_files)
- [3] Designing and Fabrication of Multipurpose Tool Post for Lathe Machine (IJSRD/Vol. 2)
- [4] Manufacturing Processes Prof Dr.A.k.singh Vayu Publication New Delhi

