

DEVELOPMENT OF AUTOMATIC TAILSTOCK DRILL BIT IN LATHE MACHINE

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ABSTRACT

Any industry's has its own desire to maintain their ability to provide safe and secure drilling of their customer's hazardous materials. Addressing these challenges is an important task and the efficient delivery of their cargo, play a vital role in the economy of the country. This system provides the safety and accurately, when component have to drill operation on lathe. This time the Automatic feeding system work more efficiently and speedy. In this system problem arrive in manual feeding is not constant feed is totally eliminated by using constant speed by motor speed which assemble to rotate spindle and to the direction towards head stock. The drilling spindle drills the particular position and moving up direction then, the wood plate will rotate for next position. The drilling machine drills the next position also like this the machine will drills the no of wood plates and different positions also

Keyword: - Lathe machine, pully, belt, drill bit, motor,

1. Introduction

Auto drilling process is used to produce small highly accurate holes which are a common requirement across large number of industries and applications by using auto feeding system attach to the tail stock. Industries and applications that require huge volumetric production, the drilling time and the finishing of the hole, rivals the cost of the process. So an intensive study of the machining process is required to make the production economical. Drilling refers to a metal removal process which removes a circular cross section from the work piece. The drill bit which is a multipoint cutting tool in most cases is pressed against the material and rotated which cuts of chip from the material and this result in the formation of hole. Drilled holes are characterized by their sharp edge on the entrance side and the presence of burrs on the exit side. Helical feed marks are also present inside the hole. Drilling also affects the mechanical properties of the material. So in order to find out the local circularity error, the use of optical microscope (SEM) is required. The forces acting during the operation is measured using dynamometer. The burr formed during the drilling operation must also be examined and analysed in order to reduce it in future operator transverse motion or cross feed

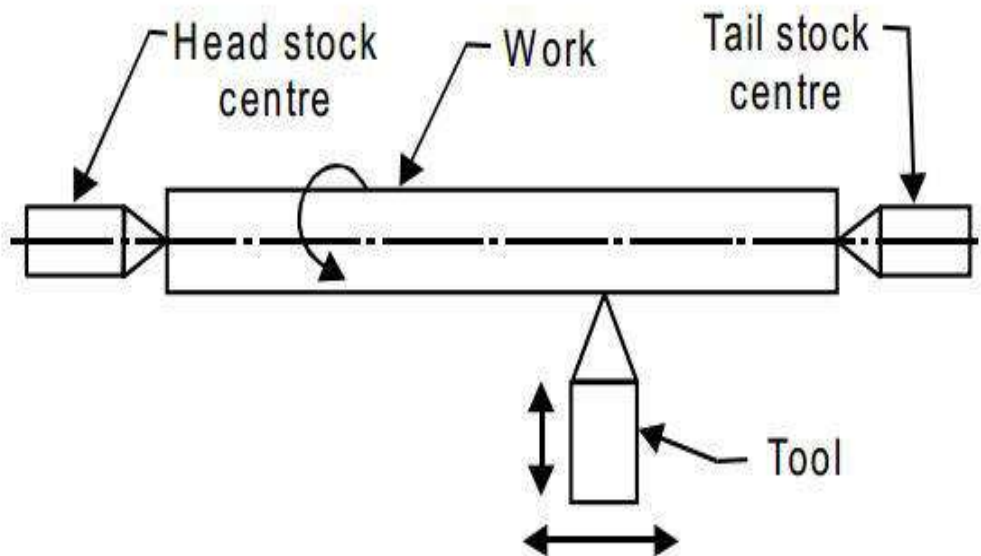
1.1 Theory and mainconcept

. This machine was invented by the Ancient Egyptians. The Romans borrowed the worked on to free the craftsman's hands. Wood pieces were crafted on this machine. They were drilled, cut and also sanded into the desired shape. Lathes were also utilized in pottery, metalworking and glass-working as well. Numerous objects can be produced with lathes. These include: gun barrels, candlestick holders, table legs and even intricate instruments such as wind instruments that require precision design and then improved on it. Its main function is to rotate the piece that is

1.2 Principle of automatic tailstock drill bit in lathe machine

A Lathe is a machine tool in which the work piece is rotates on its axis to perform various operations such as cutting, sanding, knurling, drilling, or deformation with tools that are applied to the work piece to create an object which is moving reciprocating in parallel and perpendicular directions

Lathe removes undesired material from a rotating work piece in the form of chips with the help of a tool which is traversed across the work and can be fed deep in work. Lathe machine holds the work piece between two rigid and strong supports called centre, or in a chuck or Face plate while the latter revolves. The chuck or the face plate is mounted on the projected end of the machine spindle. The cutting tool is rigidly held and supported in a tool post and is fed against the revolving work. While the work revolves about its own axis the tool is made to move either parallel to or at an inclination with this axis to cut the desired material. In doing so it produces a cylindrical surface, if it is fed parallel to the axis or will produced a Tapered surface if it is fed at an inclination



1.3 Principle of lathe machine

The lathe is a machine tool which holds the workpiece between two rigid and strong supports called centers or in a chuck or face plate which revolves. The cutting tool is rigidly held and supported in a tool post which is fed against the revolving work.

1.4 Tailstock

A tailstock, also known as a foot stock, is a device often used as part of an engineering lathe, wood-turning lathe, or used in conjunction with a rotary table on a milling machine.

It is usually used to apply support to the longitudinal rotary axis of a workpiece being machined. A lathe centre is mounted in the tailstock, and inserted against the sides of a hole in the center of the workpiece. A tailstock has a Dead Center, while headstock has Live Center. A Tailstock is particularly useful when the workpiece is relatively

long and slender. Failing to use a tailstock can cause "chatter," where the workpiece bends excessively while being cut.

It is also used on a lathe to hold drilling or reaming tools for machining a hole in the work piece. Unlike drilling with a drill press or a milling machine, the tool is stationary while the workpiece rotates. Holes can only be cut along the axis that the workpiece is set to spin.

Usually, the entire tailstock is moved to the approximate position that it will be needed by manually sliding it along its ways. There, it is locked in place and the tool mounted to it is moved with a leadscrew to the exact position where it is needed. When a cutting tool such as a drill bit or reamer is used, the feed is done with this leadscrew. The tailstock quill or extendible portion usually has a Morse taper mount in the end of it to secure the drill or reamer. If the work is heavy the drill may be further secured from turning.

1.4.1 type of tail stock

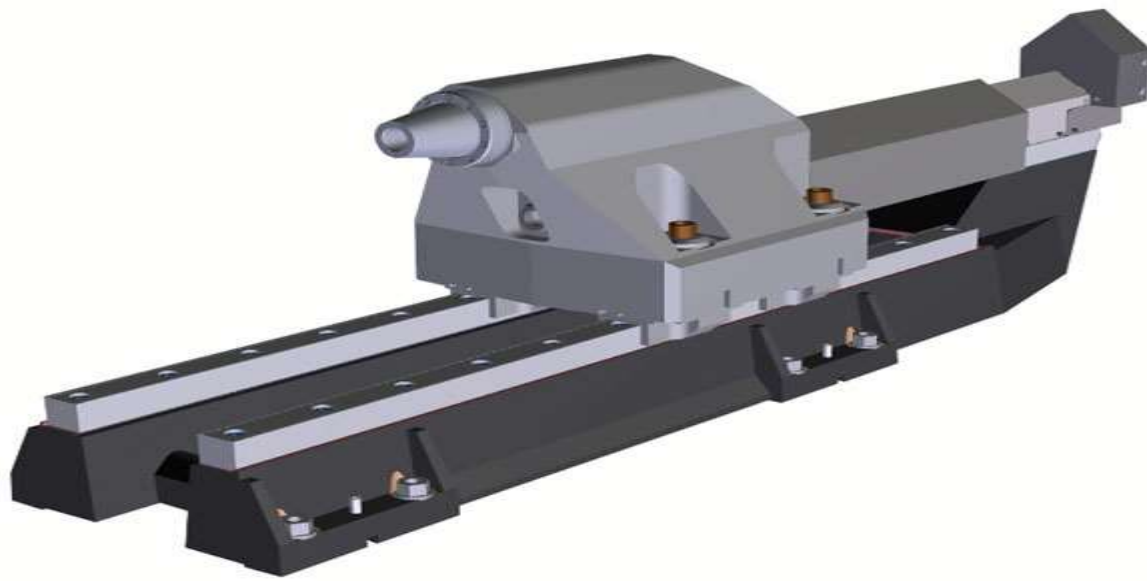
manual tail stock:-

It is handled and operated with and it all depends on the operator to adjust the tailstock. It is used to support the work piece from the end and it gives stability to the work piece while rotating the spindle.



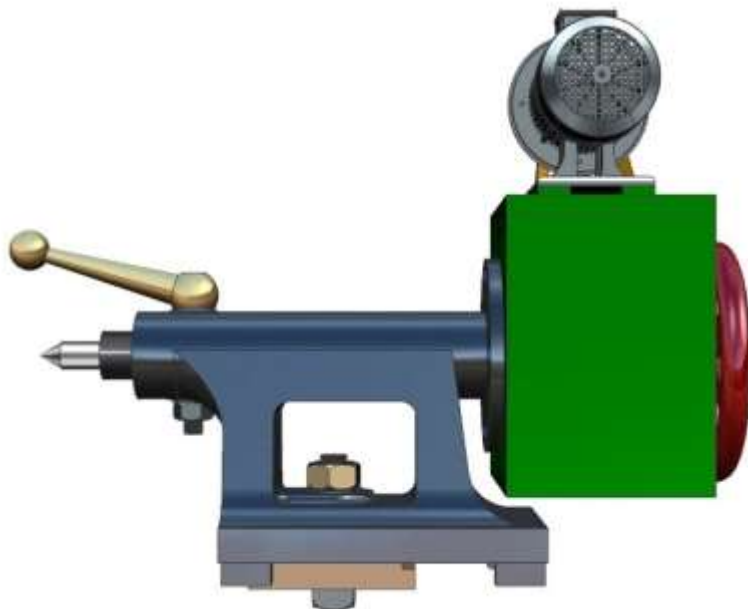
1.4.2 Hydraulic tailstock:-

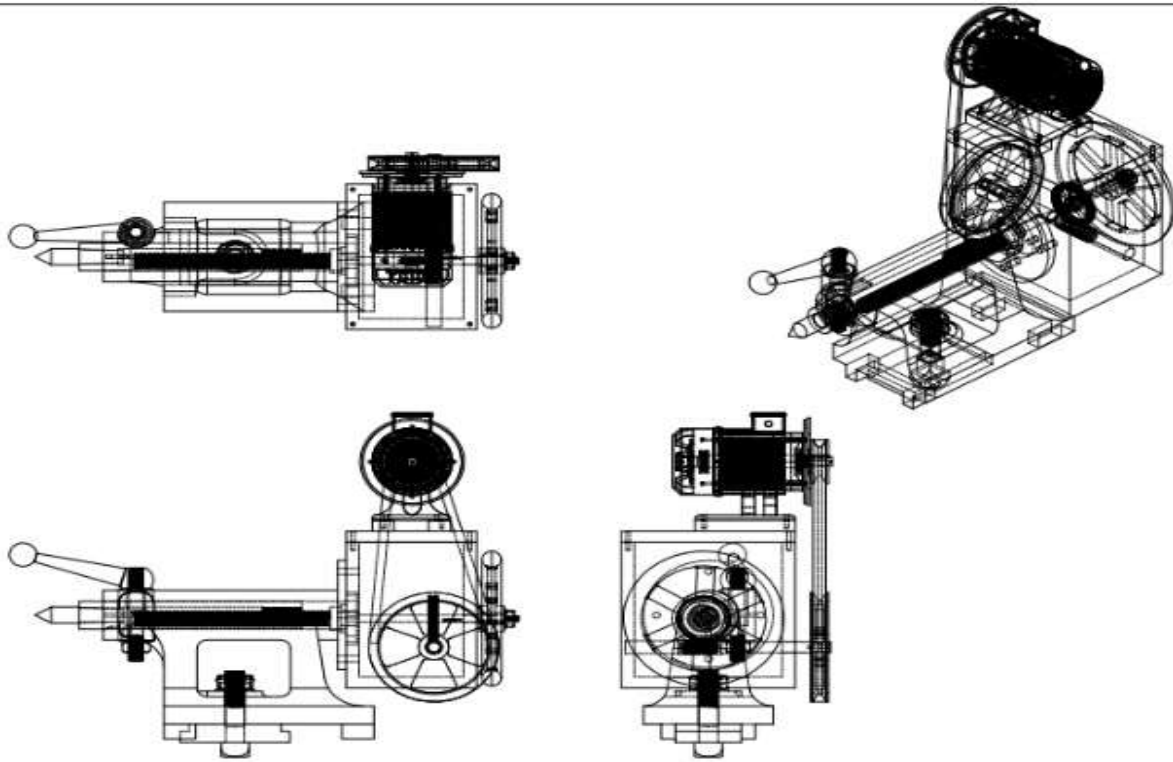
This is also type of tail stock which is more stable and highly used for more accurate work. This generally used for higher rate of production and accuracy. This is modern and it costs higher than the manual tail stock



2.Design

A lathe machine is used for rotating a workpiece in order to perform sanding, cutting, drilling, knurling and turning operations on the workpiece. ... So here we study the design and fabrication of a mini lathe machine. Our machine consists of a motor with belt arrangement used to drive the lathe chuck.





2.1 IMPLEMENTATION

1.Should covering actualimplementation?

Yes, it can be easily implemented on ordinary lathe. And can be used for faster manufacturing and production.

2.Testing andverifications:-

We tested this system in lathe tail stock, it works efficient and fast.Thisisthetestingfaceanditwillworkwaybetterthanthe experiment result, as it is a boon for the industry to produce huge stock in limitedtime.

3.Results:-

After Implementing, testing and verification we get that this system is able to work easily and by using this more accurate work done. This gives better and faster work in day to day busy life.

2.2Aotomatic drill machine

There are many types of lathes but they are broadly classified in to seven types:

- 1) Speed lathes
- 2) Engine lathes
- 3) Bench lathes
- 4) Tool room lathes
- 5) Capstan and turret lathes
- 6) Special purpose lathes
- 7) Automatic lathes

2.2.1Speed

This lathe is simplest of all the lathes and is easily understandable to everyone. As the name indicates very high speeds are generated. These lathes contain a bed, head stock, tail stock mounted on an adjustable slide. These lathes do not have tool post, feed rod, and lead screw. Very few ranges of speeds are possible by speed lathes. These lathes are in general employed for wood working, centering polishing and spinning.

2.2.2 Engine Lathe

It is the most commonly used lathe and is of high importance in lathe family. The name engine is kept as in the past

steam engines are used for running these lathes. This is similar to the speed lathes but the head stock is little robust in construction. Engine lathes have additional mechanisms to produce a wide range of speeds. Many parts like lead screw, feed rod, tool post etc. are also provided in these lathes. Speeds both in anti-clockwise and clockwise directions can be generated very effectively.

2.2.3 Bench Lathe

This is a very small lathe and is generally mounted over a bench. This contains all the parts of engine lathe but the major difference arises in size. These lathes are small in size and are generally used for doing small and precision works.

3. CONCLUSIONS

The lathe evolved from a very simple structure to a sophisticated structure. They were mainly used in wood working but now there are metal lathes, the pottery wheel and also lathes that work with plastics. They were initially operated by two people where one person turned the piece being worked on and the other worked on it. Currently, they have been fully automated and their utility has been improved. Metal spinning lathes have also been developed to ease the process. Ornamental turning lathes have also been developed to manufacture ornamental pieces. Intricate watchmaker's lathe machines have also been developed to ease the watch making process.

4. ACKNOWLEDGEMENT

In the three years of Engineering our faculty has guided us to achieve a goal and made us capable of completing our engineering successfully. So we would never like to miss the chance of thanking our faculty and college that has made us such as that we would be an asset of wherever we go always be confident and achieving our goals.

Firstly, we would like to give our sincere regard to our respecter guide **Mr. SUNIL PATEL** for giving his excellent guidance and gave us confidence that we would complete this project. We are thankful that we got chance to work under his guidelines.

We would also like thanks to **Mr. SANKET GANDHI** (Head of Department) that gave us the chance to take over this project and show his confidence that we would complete this project.

Finally, we would like to thank our friends, parents and all the persons those help us in our project and respect them to do so that we would complete our project successfully.

5. SUMMARY

In industry main aim is to produce more number of parts in short time. This is achieved in lathe works by implementing our system on tail stock. It is simpler and easy to use, one can easily habituate with this system easily. So production reaches at another higher level with the help of automation in drilling operation feeding system. And another feature is constant feed rate by giving constant r.p.m in driving motor, so drill operation is become smooth and effective, and life of drill is also increase because of reducing the jerk which produced in manual feeding system.

6. REFERENCES

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BIOGRAPHIES

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