

Mechanical Type Copy Turning Attachment in Lathe

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Abstract - As we know that each machine tool is specified for range of activities called as stipulated work. Similarly lathe machine is also used for carrying out certain amount of operations such as turning, facing, tapping and many more operations. If we consider turning operation, only one job can be turned on lathe machine at a time. But if many similar jobs are to be turned on lathe with same dimensions it is needed that the fabricator must have sheer accuracy and has to be done in limited amount time, which is very difficult for any machine operator. Yes, these types of jobs can be done on CNC Computer Numerical Control machine but buying CNC machine is a costly affair for small scale industries. So to overcome these problems an attachment is made in such a way that the template is made of which the design is copied on the job by fixing the template temporarily on the lathe machine. So by making such type of attachment many similar kind of jobs can be manufactured in less amount of time and with great accuracy and better surface finish. Here a detailed study of Copy Turning Lathe Attachment is carried out in such way that it illustrates how the attachment is attached to lathe machine and how the work is done.

Keywords - CNC Machine, Lathe Machine, Metal And Wood Turning, Copy Turning ,Template, Stylus, Attachment, Tool Box, Manufacturing.

I. INTRODUCTION

Lathe machine is known as father of machines. The main function of a lathe is to remove material from a piece of work to give it the required cylindrical shape and size. Lathes are used in wood turning, metal turning, metal spinning, thermal spraying parts reclamation, and glass working. Metal or Wood turning is a form of working that is used to create different objects on a lathe. Turning differs from most other forms of working in that the workpiece is moving while a (relatively) stationary tool is used to cut and shape it. Many intricate shapes and designs can be made by turning metal or wood. Wood turning is method referring to a piece of wood on a molding lathe that is being turned on its center axis between the headstock and tailstock of the lathe. The wood is generally removed by running a turning tool down the slope of the wood from a larger diameter in the wood to a smaller diameter. Woodturning is the method used for items such as chair and table legs, lamps, cues, bats, and candlesticks etc. i.e. long and thin objects. Some additional special devices, which augment the processing capability of any ordinary machine tool are known as Attachments.

II. EXPERIMENTAL WORK AND DISCUSSIONS

The fabricated attachment is attached to macpower lathes in college workshop. After getting the proper dimensions of lathe machines, perfect position for the attachment is found. After finding the position ,design of attachment is done according to the dimensions of the lathe. After getting the proper dimensions of lathe machines perfect position for the attachment is found. The Tool post region is selected over the saddle of lathe. We removed the tool post by removing two nuts and attaching our attachment easily which only has 2 nuts to fix on the cross slide. Hence, this position was more effective and easy to attach and detach the Copy turning attachment.



TABLE -1: DIMENSIONS OF LATHE MACHINE

<i>SR. NO.</i>	<i>DESCRIPTION</i>	<i>DIMENSIONS</i>
1	Length of Bed	4. ½ feet
2	Width of Bed	240 mm
3	Height of Centre	165 mm
4	Swing over bed	320 mm

5	Swing over gap	510 mm	
6	Swing over Cross Slide	180 mm	
7	Admit between Centre	700 mm	
8	Length of gap	120 mm	
9	Width of gap	240 mm	
10	Spindle bore diameter	40 mm	
11	Lead screw of	4 TPI	
12	Cross Slide travel	200 mm	
13	Top Slide Travel	115 mm	
14	Tailstock quill travel	150 mm	
15	Tailstock quill taper	MT-3	
16	Tailstock quill Diameter	38.1 mm	
17	Speed Range in RPM min / max	40 / 800	
18	Overall Dimensions (Approximately)	Length Breadth Height	1600 mm 700 mm 1370 mm
19	Weight (Approximately)	460 kg.	

TABLE – 2 :PARTS OF ATTACHMENT, MATERIAL AND QUANTITY

Sr No	Part Name	Mat	Qty
1	Base	MS	5 kg
2	Frame	MS	3 KG
3	Tool shaft dia. 20 mm	MS	1 no
4	Linkage	MS	2 no
5	Tool guide	MS	1 SET
6	Hand lever	MS	2 NOS
7	Bolt	MS	9 NOS
8	Single point cutting tool	HSS	1 NOS
9	Bearing	STD	1NOS
10	Template	MS	2 nos
11	Colour	-	1 lit

III. WORKING

The job mounted in the chuck supported by the chuck at one end & the other end is supported by Dead Center which is locked by lock handle. The faceplate & the cutting tool are connected to each other through the connecting rod. Two handle is provided in the machine one handle is used to move the faceplate & the cutting tool in horizontal direction & the other is used to move in forward & backward direction. As the faceplate is moved on the profile template the cutting tool also get moved along with the faceplate & the profile get copied on the job.



IV. CONCLUSION

This Lathe attachment is especially design to manufacture Curve shaped Work piece with the turning operation. This will improve the rate of production and Flexibility of the Product. The machine will provide precision and accuracy without help of necessity of skilled worker. This will reduce the Cost of the production and improve standardization in Production. Also reduce use of complicated tools and methods during curve turning. By the use of simple Mechanism it will replace the experience required for such works. Also the attachment is portable so that it can be easily move to desired location. As we are using lathe machines available in workshop hence high motor speed is available hence we can work on metal jobs.

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