

PRODUCTIVITY IMPROVEMENT BY “ECCENTRIC TURNING ATTACHMENT” IN A SMALLSCALE INDUSTRY

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ABSTRACT

Man always put his efforts to save his energy and the time required to do his work. At the same he is also worried about the quality of the products he produced and cost of the product. It is felt that during eccentric turning quite a good amount of time is spent in setting up the job in a four jaw chuck. Moreover even for a skilled turner it is a laborious and tedious to set the job for eccentric in a four jaw chuck. The present work is aimed at reducing the setup time for eccentric turning in a four jaw chuck by designing and fabricating an eccentric turning attachment. This designed attachment consists of simple parts such as V-block, studs, center plate, center rod, base plate, nuts, scale etc,. The fabricated eccentric turning attachment is tested experimentally and the desired results have been obtained. The set-up time can be reduced drastically by using this attachment.

I INTRODUCTION

The lathe is one of the oldest machine tools and came into existence from the early tree lathe which was then a device for rotating and machining a piece of work held between two adjacent trees. A rope wound round the work with its one end being pulled by a man caused the job to rotate intermittently with its further development a strip of wood called “lath” was used to support the rope and that is how the machine came to be known as “lathe”.

This device continued to develop through centuries and in the year 1797, HENRY MAUDSLAY an Englishman, designed the first screw cutting lathe which is the forerunner of the present day high speed heavy duty production lathe, a machine tool which has practically given shape to the present day civilization by building machines and industries. Eccentric work is work that is turned off center, or not on the normal center axis. An engine crankshaft is a good example of an eccentric workpiece. Crankshafts normally have a main center axis, called a main journal, and offset axes, which produce the throw and the eccentric diameters of the mechanism. An eccentric shaft may have two or more diameters and several different center axes. The amount of eccentricity, or half of the throw, is the linear distance that a set of center holes has been offset from the normal center axis of the workpiece.

Eccentric turning on the lathe is used for the following eccentric turning situations. When the throw is large enough to allow all centers to be located on the workpiece at the same time. When the throw is too small allow all centers to fit into the end of a workpiece at the same time. When the throw is large then all centers cannot be located on the work, or in other words, a throw larger than the largest diameter of the workpiece.

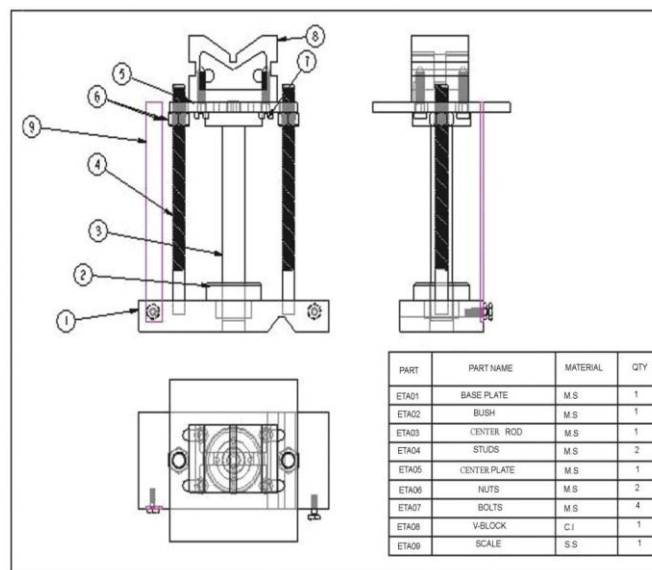
II CONCEPT OF THE ECCENTRIC TURNING ATTCHMENT

- This is mainly used for reducing the time require for setting the job on lathe machine for eccentric turning.
- The attachment require less time & efforts by the operator which perform the eccentric turning operation.

III PRINCIPLE

Eccentric turning is one, which is a difficult and time-consuming operation. In fact there are various methods of eccentric turning out of which eccentric turning by fixing a job in four-jaw chuck is tedious and time consuming operation. when the job work is to be done according to consumer's requirement inevitable one has to go to produce the required eccentric with the help of four jaw chuck only. It becomes still more difficult when job is of irregular in nature. Hence it is decided to design a simple, and easy to operate, "Eccentric Turning Attachment" which will reduce tediousness and burden on the operator to fix a job for eccentric turning in a four jaw chuck.

PART DISCRIPTION



- **Base plate:**- It provides strength to stand the assembly on the bed of lathe machine. Other main components are placed on it.

- **Studs:-** Two studs are vertically placed on the corners of base plate. It use to set the vertical up-down moment of the v block. Due to the vertical arrangement, the workpiece takes position as per required and needed.
- **Guide rod :-** When the v block plate moves upward or downward it guide to the block plate exactly vertical direction
- **Measuring scale:-** Two measuring scales are placed vertically on the base plate.
- **‘V’ block:-** The round bar which we want to machined, it placed on the v block. Because of the v shape of the block, the round bar is perfectly placed & there are no errors occurs.
- **‘V’ block plate:-**The v block is placed on it & also adjust the height of workpiece during the setting.

IV ADVANTAGES

- Setting time is reduced of eccentric turning on workpiece.
- Simple to construct.
- Less moving parts.
- Easy maintenance.
- Semi-Skilled operator is required.
- Easy to operate.

V WORKING OF THE ECCENTRIC TURNING ATTACHMENT

STEP 1: Marking is to be done on the work piece as per the requirements with help of scribe, angle plate, v-block, surface plate and a dot punch.

STEP 2: After marking is done, the work is placed on the v-block of ETA. The eccentric center of the work piece is adjusted to the height of the dead center by adjusting the nuts of ETA.

STEP 3: Once the eccentric is aligned with the tailstock center, the attachment will be moved towards the 4-jaw chuck and work piece will be firmly fixed.

VI CONCLUSION

- Less skilled operators can also turn eccentrics efficiently by setting the job quickly and easily with the help of eccentric
- Turning attachment.
- Simplified design and construction, of eccentric turning attachment do not arise any external power source to operate it
- When compared with other lathe attachments.

- Eccentric turning attachment is inexpensive, as no special manufacturing methods are needed to manufacture it.
- The general materials such as low carbon steels (mild steel) are used to make the attachments, thus the material use also
- Inexpensive. This eccentric turning attachment costs very low when compared to other attachments. If this attachment is
- Manufactured in bulk the cost can be four times reduced. The attachment is highly useful for job working shops.
- Accuracy of the turned eccentrics can be highly increased.
- More flexibility makes the attachment for simple and easy maintenance.

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