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Designing and Fabrication of Slotting Attachment for Lathe Machine

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ABSTRACT

In today's fast life everyone wants to save time and money, even small scale industrialist wants to earn more profits with given limited resources .due to the globalization the competition is increasing day by day, especially micro industries is facing lot of trouble to sustain in throat cutting competition. So we came up with an idea of saving money and also we can increase the flexibility by designing and fabricating of slotting attachment for lathe machine. By this attachment we can make a slot on shaft on lathe machine. Which can save money of small industrialist by avoiding the subcontracting of works which may require special machines. This paper aims to help the small scale production floors where a lathe machine exists. Using this project slots can be cut on work pieces using a lathe machine. This project is an attempt to design and fabricate an attachment for lathe machine which would produce square slot much easier than the currently available methods.

KEYWORD - *Slotting attachment, Lathe machine, Motor, Pulley, and Lead Screw.*

I. INTRODUCTION

In today's world everyone wants to earn good money and raise their standard of living, people who have good degrees generally succeed in doing this. But there is also one class of people who want to work independently as an 'Entrepreneur'. These people mostly comes from lower or middle strata of society which face major problem of financing their project as they have limited budget and cannot afford more than one or two machine at initial level. Also, any product be it finished or semi-finished consists of one or more machining operations. And all processes cannot be done on same machine .So we came up with idea of designing and fabricating a multipurpose tool post for a lathe machine. We selected lathe machine cause it is most basic and versatile of all the machine and this is the only reason they call it 'Mother of all Machine', so we have tried an slotting attachment do operations of slot on lathe which earlier performed on Milling machine. The convention lathe machine only carry out the limited operation that's include, Turning(reducing diameter), Facing(reducing length), Tapering(making a conical shape), Knurling (making a diamond shaped pattern for easy grip), Grooving (making a symmetrical indentation), Parting (removing a section), Eccentric turning (turning about a point other than axis), Chamfering (creating a radially symmetrical chamfer) other than that Drilling ,reaming, can also be done only parallel to spindle axis (Operations which are perpendicular to spindle axis cannot be carried out.).Conventional lathe machine involves carrying of work piece to different machines to machine them which increases setting up time and cost.

Small-scale production units are often equipped with either one or the other general-purpose machine tools, but they find it difficult to have different machining machines for various machining operations. This is because it may require more space, with high expenses. This project is an attempt to design and fabricate an attachment for lathe machine which would produce square slot much more easily than the current methods. This project is actually designed to fit in an existing lathe machine, an attachment which can be used for making slots or square holes in components of small scale production units. Design of portable attachments reduces machining time, loading and unloading time, cost of production and also where space is limited. A slotting attachment is one that can take up small slotting jobs by attaching itself to a lathe machine. It can be readily fixed onto an already existing lathe machine. It can be easily fixed on to and removed from the lathe machine It is very economical when compared to the other means of slotting.

II. MAIN WORK

Slotting attachment is fitted on the cross-slide of carriage by replacing the tool post. It is fitted on the stud fitted in the cross slide with the help of nut. The power is given to the motor and the motor rotates. And with the help of pulley and belt drive mechanism the power is transmitted to the main shaft.

The main shaft is then rotates in the pipe with the help of bearings. The Drill chuck is fabricated on the shaft with help of welding. So the Drill chucks rotates and the drill rotates fitted in the drill chuck.

The depth of slot is given with the help of cross feed. And the length of slot is given with the help of longitudinal feed.

III. OUR MODEL'SSPECIFICATION:

Component	Specification	Unit
Length of Lathe machine	5	Ft.
Motor type	3-Phase	-
Motor's rotating speed	1440	rpm
Power developed by motor	0.5	Hp
Thread on motors shaft	¼	BSP
Chuck type	1/8	-
Belt	V shape	-
Cutting Tool	Multipoint	-

Table 1 specification of model

Fig. 1 Slotting Attachment

IV. BENEFITS AFTER MOUNTING OF NEW ATTCHMENT

A. With this attachment we can perform slotting operation on machine.
B. A small scale industrialist can design such attachment in his own workshop with minimum resources available to him.
C. The need of subcontracting or carrying the work piece here and there always is eliminated.
D. Time and cost for machining is reduced by large margins, hence increasing the flexibility of lathe machine.
E. Fixture cost is low.

F. Production cost is low.
G. Reduced manufacturing costs.

V. CONCLUSION

This attachment gives a good solution to the small scale industries that cannot afford a separate slotting machine, and have in possession a lathe machine, and may require doing certain slotting operations. This unit eliminates the presence of slotting machine in machine shop. The variation of the speed of the slotting tool makes this product a feasible one for carrying out machining operations on materials which require utmost care while fabricating. And also semi-skilled machine operators can easily use them thereby saving the cost of manpower. The design of the slotting attachment described in this work is simple, portable type, low cost than the other machines available in the market. By selecting and incorporating such small but useful ideas a small scale industrialist can save huge amount of time, energy, and money hence forth increasing the overall productivity.

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