

# Designing and Fabrication of Multipurpose Tool Post for Lathe Machine

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**Abstract---** In Today's Fast Life Every One Wants To Save Time And Money, Even Small Scale Industrialist Wants To Earn More Profits With Given Limited Resources .Due To The Globalisation 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 By Desginning And Fabritacting A Multi-Purpose Tool Post Which Can Save Money Of Small Industrialist By Avoiding The Subcontraction Of Works Which May Required Speacil Machines .

**Keywords:** Dc Motor,Drilling,Grinding,Lathe Machine, Milling,Multipurpose Tool Post,Etc.

## 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 to do operations which were perpendicular to Spindle axis like Grinding, Drilling, Milling in our project. 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.

It would be very dreadful for the people who are running micro industry, because they cannot afford to have all machines at their door step.

## II. PRINCIPLES OF WORKING:

The basic principle of working of our model is : "Rotation of a mounted tool via small chuck on shaft with help of a small motor mounted

### A. Design Methodolgy

- First take the size and working load capacity of given Lathe machine into consideration for which the attachment is to be designed.
- Now take the motor at suitable RPM and power (because drilling operations requires high torque and low RPM but grinding operations require high RPM and less torque).
- FOR DRILLING AND REAMING OPERATIONS Extend the shat of motor and make threads of suitable dimension on it to facilitate the mounting of chuck on it.
- FOR GRINDING OPERATION: Take a suitable Abrasive grinder wheel having optimum inner diameter (more than or equal to motors shaft diameter and Outer diameter more the outer diameter of whole motor assembly). Design the bush and bolt assembly if required to house wheel firmly on motor's shaft.
- Now take the cross slide and remove compound rest from it so as to facilitate the mounting of new attachment.
- After removal of this compound rest, take a metal plate of adequate dimension to counter the weight and load imposed by the motor.
- Now, attach motor with the plate with suitable means which can be done either by bolting or any other means
- NOTE: Here at most care should be taken while attaching motor to metal plate about what operations we want to perform i.e. for drilling the hole on plate should be parallel to motors shat axis and perpendicular to lathes spindle axis, while for grinding operation holes on metal should be perpendicular to motors shaft axis and perpendicular to lathes spindle axis.



Fig. 1: Attachment for drilling and milling



Fig. 2: Drilling and milling operation



Fig. 3: Grinding operation.



Fig. 4: Drilling and milling operation performed on lathe.

### III. BENEFITS AFTER MOUNTING OF NEW ATTCHMENT

- A. *With this attachment we can perform drilling, grinding, milling on same 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 efficiency of lathe machine.*

### IV. PROTOTYPE/ MODEL

Our model's Specification:

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	1/4	BSP
Chuck type	1/8	-
ID of grinder wheel	37.5	mm
OD of grinder wheel	200	mm
Metal plate dimensions (l x b x h)	200 x 300 x 40	mm

Note: A person can develop this type of arrangement himself only which can be suitable for his own comfortable working condition.

### V. SCOPE FOR FUTURE DEVELOPMENT AND MODIFICATION

- A. *For larger lathes we cannot mount motor directly so we can use belt drive system.*
- B. *For facilitating the adjustment in height we can use hydraulic system.*
- C. *We can also swivel the whole system to get more use of this attachment.*

### VI. CONCLUSION

We know that Country's GDP is largely affected by many small scale industries. Also, we saw that in this fast moving world a micro industries are facing very tough competition from large scale industries and it's almost very difficult for them to survive and earn their share of bread and butter as they have an only choice of selecting one or two machine at a time due which there is a rise of a serious problem called as either sub contraction or renting of machines which further decreases the overall efficiency of whole machine and industry. 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 of a firm and hence contributing more efficiently in countries GDP.

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