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Regeneration of Tapping Machine with Effective Utilization

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Abstract: *The main idea of our project is to designed tapping machine with less power consumption and unskilled operator can do work effectively. As far as main concerned we have to developed a design that can be easily used by unskilled labour as well as consume less power so the efficiency of the machine can increase so we formulating the design and used scrap machine that was not exist in used so we developing a mechanism so power consumption reduces and increase efficiency and part of production.*

Keywords: *Regeneration, Tapping, Power Consumption, 1 HP Motor, Gear Box*

I. INTRODUCTION

It is a tapping machine which performs operation with the help of tap tool by forming tool method. This machine works on the mechanism gear and pulley arrangement with the help of v-belt drive. In this machine step cone pulley are used to perform tapping operation. This is an special purpose machine which perform only tapping operation.

II. LITERATURE REVIEW

A. Hardik J. Patel, Bhaveshkumar P. Patel, and Prof. S. M. Patel

For the development of the new technique, operation, process or methodology it is very important to make detail study on the existing techniques, operation, process or methodology and to understand the same for elimination of problems concerned with them. This section covers the literature review for tapping operation and its parametric study carried out by other researchers in the same field. This study can be helpful for improving the quality of tapping, dimensional accuracy, and productivity, also reduced in operational timing, tool breakages, and human errors.

B. In 1973, E. D. Doyle and S. K. Dean

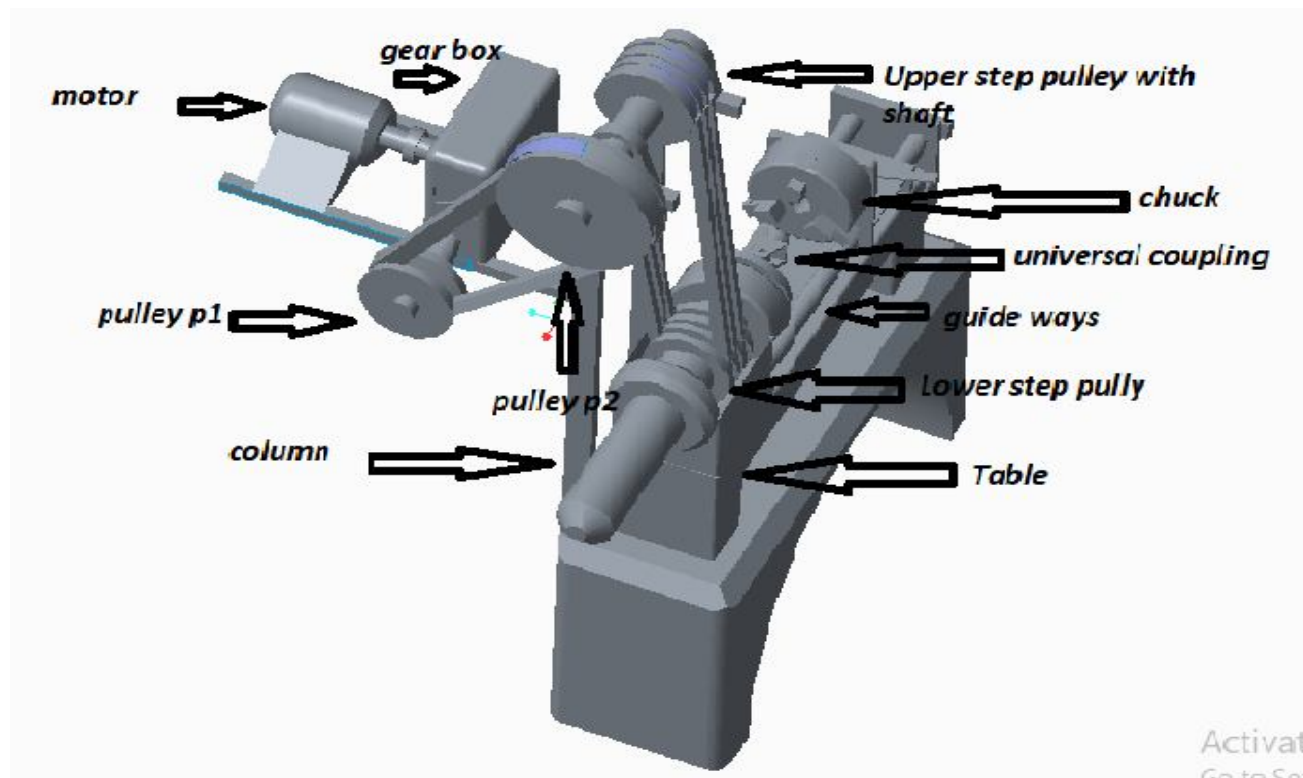
They have designed tapping attachment to reduce the axial forces generated during the tapping operation. When tapping threads on a machine tool, such as a drilling machine, axial forces on the tap can be generated by the cutting action of the tap, by the operator and by the machine, and they can cause dimensional inaccuracies in the thread. Oversize threads and poor thread forms produced on a radial drill were found to be caused by axial forces generated by the machine. These defects were eliminated by using a tapping attachment specifically designed to reduce axial forces. A device for reducing the axial force was developed and its use enables the cutting of accurate thread forms [1]. G. Lorenz, in 1980, has studied on tapping torque and tap geometry. Vibrations in tap geometry are reflected in the measurements of the tapping torque. The effects of cutting speed, thread relief, chamfer and rake angle on torque have been investigated in a statistically designed experiment when using 7/16 – 20 UNF bottoming taps and zip-oil on a pitch gear controlled tapping machine. The analysis of the experimental data showed that the higher order interactions of the variables, in particular those of speed and chamfer relief, significantly affect the torque. Furthermore, the results suggest that tapping torque measurements should be carried out at three speed levels when the ratings of cutting fluids have to be established.

C. In 1987, S. S. Patil, S. S. Pande and S. Somasundaram

They have reported the results of an experimental program to study the influence of torsional vibrations on tapping process. An attachment has been designed and developed to produce controlled torsional vibration on the tap while tapping. Investigations have been carried out to study the influence of different process conditions, such as tap size, work material, vibration amplitude and frequency, etc. on the tapping torque and thrust during machining. Optimal process conditions which enhance the tap life are reported. The optimal frequency of vibration corresponding to the maximum reduction in tapping torque and thrust is different under different operating conditions. The optimal process conditions observed for vibratory tapping process on cast iron and aluminium. The optimal cutting conditions give about 8% reduction in tapping torque and about 16 % reduction in thrust while tapping cast iron. For tapping in aluminium reduction in tapping torque and thrust was about 14% and 56% respectively. A critical uncut chip

thickness value is seen to exit below which only the reduction in tapping torques and thrust is possible. The critical uncut chip thickness is found to increase with the decrease in the hardness of the work material. The optimal value of the frequency increases with the decrease in uncut chip thickness. The optimal value of amplitude, for a given size of tap or uncut chip thickness, depends upon the hardness of the work material. Thus, it is seen that the vibratory tapping process is suitable under particular operating conditions

III.IMPLEMENTATION



IV.PROBLEM FINDING

- A. In normal lathe machine job is fixed in chuck and its rotating so operated skilled operated is required to operate the tool for performing to operation.
- B. There is 3hp power is used so what happened there its take more electric power consumption.
- C. In normal lathe machine there is more tool breakage just because of tool is fixed and more stresses is induced.

V. INNOVATION ON MACHINE

- A. In normal lathe machine work piece is rotates and tool is constant but in this process workpiece is constant and tool is rotating
- B. We used automatic lever arrangement which makes automatic feed to the workpiece.
- C. We installed 1 H.P. motor for tapping process.
- D. We used pulley arrangement for transmission of power.
- E. We used universal coupling which gives more degree of freedom to workpiece.
- F. We used linear bush guide ways instead of carriage and leadscrew.
- G. We used 1 H.P. motor instead of 3H.P. motor for tapping machine.

VI.WORKING PROCEDURE

The motor rpm 1440 RPM transmitted to gear box .the gear shaft is connected to the gear box pulley (P1) so we obtained 200rpm at (N1) than the power transmitted from P1 to P2 pulley through v belt and rpm is reduced to 100rpm at P2 pulley. Three pullies P3, P4, P5 which has same diameter mounted on the shaft of P2 pulley which is called as upper step pulley and rpm is same as P2 pulley. the upper step pulley is connected with lower step pulley with the help of three v belts and rpm is reduces from 100rpm to 80rpm.at the end universal coupling and tool both rotates at 80rpm.thus operation has been performed

VII. CONCLUSION

From the above mentioned process and literature review, we come to the conclusion that the tapping machine is works on the principal of removing material from the workpiece and making threads inside the material .We achieved desired output as required 60 to 80 rpm for tapping process so we have developed design as well as calculation for machine. Specially, this machine reduces the human effort as the unskilled labour can be easily operate through it . As 1hp motor is used that's why less electricity is used through it. Hence the power consumption is less with the help of universal coupling the chances of breaking of tool is less because of universal coupling vibration is reduced and good internal threading is done through it. We have also concluded that , the chances of reducing expensive things like electricity, highly skilled labours, etc.

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