Attachment for Flutless Tap on Tool and Cutter Machine

[1]Bhagwat Khedkar, [2]Mayur Nere, [3]Vivek Dhanorkar , [4]Omkar Deshmukh

[1,2,3,4]UG Student Mechanical Engineering Department
G.H. Raisoni College of Engineering and Management, Chas, Ahmednagar, India

***Abstract*: In today's world manual errors are the major cause of concern for mass production as well as batch production of components in manufacturing industries. Now a day, there is tremendous development in the production industry and their relevant machinery to improve the productivity. But still in small, medium and some large scale industries uses the conventional method in some of the operations accuracy and productivity are the key to survivals. It relate to the same kind of machine which certainly does not use the complete automation but will satisfactorily reduce the manual error to fulfill the requirements accuracy during the production.**

***Keywords*: Error, Automation, Accuracy, Productivity**

1. INTRODUCTION

There is a tremendous technological development in the manufacturing industry and manufacturing industries are making large amount of effort for their mass production with best quality products having higher reliability and economical in cost. Now-a-days the hand operated machines are replaced with the application of automation in automatic or semi-automatic machines which utilize to improve the productivity. Spiral point on a tap is provided for easy removal of chips during the process of material removal. Spiral point also known as gun nose or bull nose or chip driver. The prime objective of this project is to improve the consistency in the geometry of the final product i.e. the spiral point tap. Also the secondary objective is to improve the production rate by reducing the time required for conditioning of the grinding wheel during the operation for the proper functioning of it. This time to time conditioning in the form of dressing is quite necessary in order to obtain the better material removal rate, but it consumes the most precious time which is not desirable by the industry in order to keep pace with their market requirement in the era of competition.

2. LITERATURE REVIEW

Povilas Krasauskas et.al presented new method for forming threaded holes in thin-walled work pieces using a combined hole making and tapping tool. The main advantages of the developed combined tool in compare to currently widely used separate drilling and tapping tools are that it eliminates the inter-operational time related to tool changing and reduces the machining time [1]. Gaurav Upadhyay et.al explained Cylindrical grinding which is one of the most important metal cutting processes used extensively in the Metal finishing operations. Metal removal rate and surface finish are the important output in the production with respect quantity and quality respectively. The object of this paper is to arrive at the optimal grinding conditions that will maximize metal removal rate when grinding IS 319 brass. Empirical models were developed using design of experiments by Taguchi L9 Orthogonal Array and the adequacy of the developed model is tested [2].

Daneshi A et.al investigated Performance of grinding operation is influenced by variety of factors amongst which dressing process is the most important. Through the dressing process, the grinding wheel topography is produced. This affects, in turn, directly the grinding forces, work piece surface quality and grinding wheel wear. This research aims to develop appropriate dressing strategies for small abrasive wheels in internal cylindrical grinding [3].

F. Kuster et.al determined preparation of grinding tools is the most important enabling factor in the grinding process. It influences the material removal rate, the grinding forces, the surface quality as well as the material properties of the subsurface zone, and is the key issue for subsequent wear of grinding tools. The evolving and conventional conditioning technologies are reviewed based on technical and commercial aspects [4].

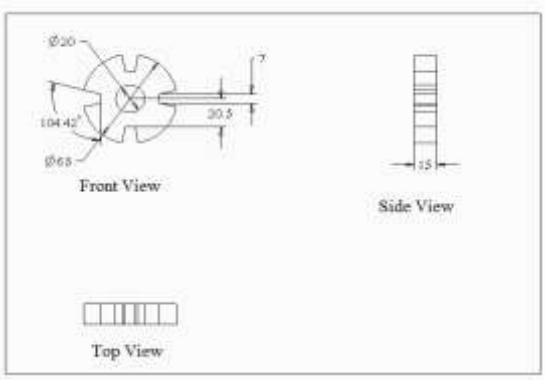
Yali Hou et.al studied about high-efficiency abrasive process with CBN grinding wheel is one of the important techniques of advanced manufacture. Combined with raw and finishing machining, it can attain high material removal rate like turning, milling and planning. The difficult-to-grinding materials can also be ground by means of this method with high performance [5].

3. INTEGRATED PARTS

3.1 Indexing Plate

Indexing in reference to motion is moving into a new position or location quickly and easily but also precisely. When indexing a machine part, its new location is known to within a few hundredths of a millimetre, or often even to within a few thousandths of a millimetre, despite the fact that no elaborate measuring or layout was needed to establish that location. In reference to multi-edge cutting inserts, indexing is the process of exposing a new cutting edge for use. Indexing is a necessary kind of motion in many areas of mechanical engineering and machining. Indexing is most often the quick and easy but precise rotation of a machine part through a certain known number of degrees. Positioning a work piece at a precise angle or interval of rotation for a machining operation is called indexing.

Indexing is an operation of dividing a periphery of a cylindrical work piece into equal number of divisions by the help of index crank and index plate. A manual indexing head includes a hand crank. Rotating the hand crank in turn rotates the spindle and therefore the work piece. The hand crank uses a worm gear drive to provide precise control of the rotation of the work. The work may be rotated and then locked into place before the cutter is applied, or it may be rotated during cutting depending on the type of machining being done.



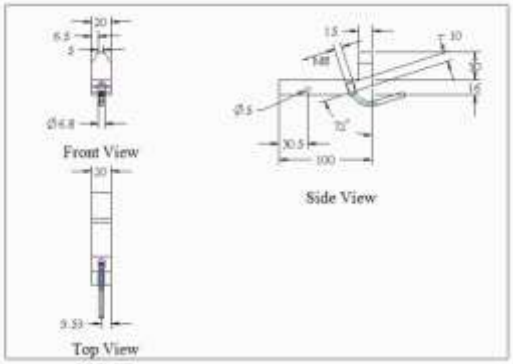
(A) 2D model

(B) 3D model

3.1 Indexing Plate

3.2 Lever

A lever is a simple machine consisting of a beam or rigid rod pivoted at a fixed hinge, or fulcrum. A lever is a rigid body capable of rotating on a point on itself. On the basis of the location of fulcrum, load and effort, the lever is divided into three types. A lever amplifies an input force to provide a greater output force, which is said to provide leverage. The ratio of the output force to the input force is the mechanical advantage of the lever. The lever is a movable bar that pivots on a fulcrum attached to or positioned on or across a fixed point. The lever operates by applying forces at different distances from the fulcrum, or pivot. The location of the fulcrum determines a lever's class. Where a lever rotates, continuously, it functions as a rotary 2nd-class lever. The motion of the lever's end-point describes a fixed orbit, where mechanical energy can be exchanged. The motion of the lever's end-point describes a fixed orbit, where mechanical energy can be exchanged.



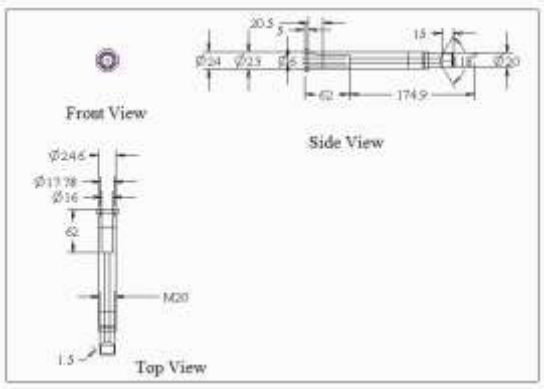
(A) 2D model

(B) 3D model

3.2 Lever

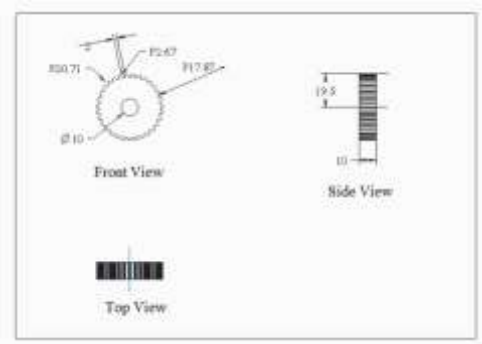
3.3 Rack and Pinion

A rack and pinion is a type of linear actuator that comprises a pair of gears which convert rotational motion into linear motion. A circular gear called "the pinion" engages teeth on a linear "gear" bar called "the rack"; rotational motion applied to the pinion causes the rack to move relative to the pinion, thereby translating the rotational motion of the pinion into linear motion. It is a mechanical device consisting of a bar of rectangular cross section (the rack), having teeth on one side that meshes with teeth on a small gear (the pinion). The pinion may have straight teeth, as in the figure, or helical teeth that mesh with teeth on the rack that are inclined to the pinion-shaft axis. If the pinion rotates about a fixed axis, the rack will translate; *i.e.*, move on a straight path. Some automobiles have rack-and-pinion drives on their steering mechanisms that operate in this way. If the rack is fixed and the pinion is carried in bearings on a table guided on tracks parallel to the rack, rotation of the pinion shaft will move the table parallel to the rack. On machine tools, rack-and-pinion mechanisms are used in this way to obtain rapid movements of worktables, the pinion shaft is usually rotated with a hand crank.

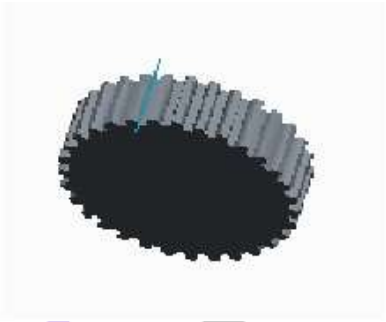


(A) 2D model

(B) 3D model



(C) 2D model



(D) 3D model

3.3 Rack and Pinion

3.4 Tool and Cutter Machine

It is an extremely versatile machine used to perform a variety of grinding operations: surface, cylindrical, or complex shapes. The machine is manually operated, however highly automated Computer Numerical Control (CNC) machines are becoming increasingly common due to the complexities involved in the process. The operation of this machine requires a high level of skill. The two main skills needed to understand the relationship between the grinding wheel and the metal being cut and knowledge of tool geometry. The huge variety in shapes and types of machining cutters requires flexibility in usage. A variety of dedicated fixtures are included that allow cylindrical grinding operations or complex angles to be ground.

3.4 Assembly of tool and cutter machine

4. SUMMARY

Firstly we used finger point attachment method for cutting operation but it seems few drawbacks. We analysed the problems in cutter and suggest some remedies to overcome the problem in cutter then we start and perform some analysis like geometric, force, deformation by using CAD/CAM software and we get some useful output. Therefore we prefer to replace this method by indexing mechanism and this proposed mechanism endorses the reduced human interface which will certainly result in improved accuracy, increased production rate (less cycle time), consistency in geometry of the tool. Recent we select the parameters and materials to perform future operation or process.

5. ACKNOWLEDGMENT
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