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MANUFACTURING OF 360 FLEXIBLE DRILLING MACHINE

Viraj G. Mane[1], Ajay G. Kale[2], Swapnil N. Ghule[3] ,Bhalchandra U. Jodh[4], Aishwarya Khanore[5], Vaishnavi Isoliker[6], Prof Pramod S. Wankhede[7]

[1]*Viraj G.Mane student of STC, SERT Shegaon*
[2] *Ajay G. Kale student of STC, SERT Shegaon*
[3]*Swapnil N. Ghule student of STC, SERT Shegaon*
[4]*Bhalchandra U. Jodh student of STC, SERT Shegaon*
[5]*Aishwarya Khanore student of STC, SERT Shegaon*
[6]*Vaishnavi Isoliker student of STC, SERT Shegaon*
[7]*Guide Prof Pramod S.Wankhede Of STC,SERT Shegaon*

Abstract – *Directional drilling machine which can be used based on drilling holes in various location and movement and easily operation done with high accuracy. Productivity can be improved by reducing total machining time and reduced human effort and reduced manufacturing cycle time. In this present age the application of micromachining operations continues to grow. These operations are required to fabricate the products required for sectors like medical science, automobile industries and electronics manufacturing etc. which deals with miniature trends. Drilling process is one of the machining processes which is used to drill micro holes not only in micro products but also in relatively larger work pieces which require ultra-small features which can be accomplished only by drilling process.*

1.Introduction

In previous drilling machine many of the problems arise during drilling. Some parts cannot drill due to small work space between drill bit and work piece. So we use hand drills in this cases but it cause alignment problems. So here i propose a 360 degree flexible drill that can be mounted on a table or wall and can be used to drill holes horizontally, vertically or even upside down. So this make it possible for easy drilling in even complicated parts and surfaces.

Drill machines have been the heart of every industry. Drilling holes in parts, sheets and structures is a regular industrial work. Perfect and well aligned drilling needs fixed and strong drills. Some parts cannot be drilled using fixed drills due to low space between drill bit and drill bed. We need to use hand drills in such cases but hand drills have alignment problems while drilling. So here we propose a 360º flexible drill that can be mounted on a table or wall and can be used to drill holes horizontally , vertically or even upside down. So this makes it possible for easy drilling in even complicated parts and surfaces. Thus we use rotating hinges and connectors with motor mount and supporting structure to design and manufacturing of a 360 degree drilling machine for easy drilling operations.

Drilling machine is one of the most important machine tools in a workshop. It was designed to produce a cylindrical hole of required diameter and depth on metal work pieces. Though holes can be made by different machine tools in a shop, drilling machine is designed specifically to perform the operation of drilling and similar operations. Drilling can be done easily at a low cost in a shorter period of time in a drilling machine. Drilling can be called as the operation of producing a cylindrical hole of required diameter and depth by removing metal by the rotating edges of a drill. The cutting tool known as drill is fitted into the spindle of the drilling machine. A mark of indentation is made at the required location with a center punch. The rotating drill is pressed at the location and is fed into the work. The hole can be made up to a required depth. Drilled holes are characterized by their sharp edge on the entrance side and the presence of burrs on the exit side (unless they have been removed). Also, the inside of the hole usually has helical feed marks. Drilling may affect the mechanical properties of the work piece by creating low residual stresses around the whole opening and a very thin layer of highly stressed and disturbed material on the newly formed surface.

2. Parts of the Manufacturing Of 360 Flexible Drill

1)Hand Drill Machine And Drill Bit

A hand drill is a fastening tool used to secure screws or bolts. It can also be used with a drill bit to tighten fasteners, and can be used with stirring attachments to mix paint and joint and other liquid materials, such as glazing materials for ceramics. There are two types of hand drills: manual and power drills (corded or with rechargeable batteries). Battery-operated drills are most commonly used today. Hand drills are used to drill holes or secure two objects together. They can also be used for drilling concrete, steel and other construction materials, depending on the bit used. Hand drills are low-cost tools and reduce the need for

more intensive manual labor. They are efficient and lightweight, and will save users on labor time. Hand drills are low-cost tools and reduce the need for more intensive manual labor. They are efficient and lightweight, and will save users on labor time.

2)Base plate

The base acts a support for the whole machine. It's made of a mild steel. The base of the drilling machine supports the entire machine and when bolted to the floor, provides for vibration-free operation and best machining accuracy. The top of the base is similar to the worktable and maybe equipped with t- slot for mounting work too larger for the table.

3)Arms

There are two arms:

1 Upper arm

2 Lower arm

The primary arm holds the secondary arm and it is with the help of this arm the 360° of rotation is transferred from the t plate to the secondary arm in order to move the drill head at angles. They are made up of stainless steel.

4) Tool Post

We have used a hand drilling machine to be fixed on the cross slide. Our drilling machine can drill holes on concrete, wood and metal. The drill bit can be rotated both clockwise and anticlockwise direction

5)Square pipe

Square pipe is the stationary member which is used to construct the chassis of vehicle and give the support and stability to the all moving element. It is made up of mild steel these pipes are connected to each other by welding.

6) Ball Bearing

A bearing is a machine element that constrains relative motion to only the desired motion, and reduces friction between moving parts. The design of the bearing may, for example, provide for free linear movement of the moving part or for free rotation around a fixed axis; or, it may prevent a motion by controlling the vectors of normal forces that bear on the moving parts. Most bearings facilitate the desired motion by minimizing friction. Bearings are classified broadly according to the type of operation, the motions allowed, or to the directions of the loads (forces) applied to the parts. Deep groove ball bearings are particularly versatile. They are simple in design, non-separable, suitable for high and very high speeds and are robust in operation, requiring little maintenance. Because deep groove ball bearings are the most widely used bearing type, they are available from SKF in many designs, variants and sizes. In addition to the bearings presented in this section, deep groove ball bearings for special applications are shown under engineering product. Deep groove ball bearings for special applications include that's why we are using Deep groove type Bearing.

3. Working

In which all the component is mounted on table. This support the arm to rotate freely. Arm rotates manually when where it is required and Arm which moves where workpiece is to drill. Put drill bit point on work piece area where drill is required. Switch on the main supply which of A.C. Then this A.C. flow through Rectifier and convert to Pure D.C. This rotates motor and also bit rotates. drill hole on the work piece in required position. Then switch off the main supply.

Rotation of Vertical and Horizontal Arms

Our project even be rotate easily drill at any direction. So that job setting operation is not complicated as well as reduces the setting time for the operation. It also takes into consideration the most effective method of controlling the drilling machine by manually. Materials like wood, plastic and light metals drilled with this. The work piece is fixed on the work table. As the machine tool exert Vertical pressure to original a hole it loosely called a "drill press". This Drilling is performed for Different Position Drilling in the working job. Up/Down and rotating mechanism is available in this Drilling Machine.

Fig Working of Manufacturing Of 360 Flexible Drilling Machine

4. Advantages

1) Efficient Drilling

2) 360 Degree Rotation

3) Flexible

4) Easy To Use

5) Low Cost

6) Reduce Handling Cost

7) Reduce Time

8) Reduce Overall Manufacturing Cost

9) Increase Productivity

5. Application

1) To put holes with high precision on engine heads, blocks and cylindrical shell.

2) Used in furniture making.

3)Use To put angular and straight holes with high precession on engine heads and blocks and cylidrical shell

4)Used in general furniture making angle

3. CONCLUSIONS

This project is an efficient operation and competitive Cost.Since a number of operation and hole can be performed in a simple unit. It is efficient and economical. Considering its uses and cost of project, it becomes relatively cheap when compared to other units. The size of machine is smaller than the older machine so it is very simple to move from one place to another. So this machine can be easily transported. The overall space required is also minimum. With the help of this machine we can drill holes in any direction at a partcular time. This machine is reduces the manufacturing cycle time, the re-clamping can be eliminated: once the workpiece is clamped, there is no need for re-clamping in a different direction, reduces the number of machines needed,elimination of human error. The machine is very simple to operate.

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