

A Review on Fabrication of Universal Drilling Machine

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Abstract

A lot of work is being done to get the final product out of immature products. These activities are carried out with the help of various machines. Mining is one of the most important industries. These operations are usually performed on two types of drilling machines, namely the Bench Drilling Machine and the other is a Hand Drill Machine. A bench piercing machine can be used for heavy tasks but to perform many tasks fails. It requires a lot of spinning machines to do the same. In the case of a hand drill, a great deal of effort from man is needed, and the machine survives. This world-class drilling rig is a combination of both a hand drill and a bench drill, which is designed to get the best results with reduced effort and time as well. This machine provides additional flexibility to travel in any direction due to its contact and construction. This machine can work on all sides provided by the operator. There are various connections and joints made in their construction that bring more flexibility to operation. A straight column is designed in such a way that it can rotate in a circular motion. The arm provides angular movement up and down and the latter provides precise stability and holds the engine and other joints to perform the function.

Introduction

The drilling machine is one of the most common and is one of the most common and useful machines employed in industry for producing, forming and finishing holes in a work piece. The unit essentially consists of:

1. The spindle which turns the tool (called drill) which can be advanced in the work piece either automatically or by hand
2. A work table which holds the workpiece rigidly in position.

Working principle: The Rotating edge of the drill exerts a large force on the work piece and the holes generated. The removal is by shearing and extrusion.

History : About 35,000 BCE, Homo sapiens discovered the benefits of the use of rotating tools. This would involve a sharp sickle twisted between the hands of a person to pierce a hole in something. This led to the piercing of the hand, a smooth stick that was sometimes attached to a sandbar, rubbed between the hands. This was used by many ancient civilizations around the world including Mayors. The earliest known artifacts, such as bone, ivory, shells, and anecdotes have been found, dating to the Upper Paleolithic period. Bow drill (strap-drill) is a first-of-its-kind machine drill, as it converts back and forth motion into a rotating motion, and can be traced back about 10,000 years ago. It was found that tying a rope to a stick, and then connecting the ends of the rope to the end of the rod (bow), allows the wearer to pierce quickly and effectively. Mainly used to create fires, bow-drills were also used in ancient wooden, stone, and dental works. Archaeologists have unearthed Neolithic tombs in Mehrah, Pakistan since the time of the Harappa, about 7,500-9,000 years ago, consisting of 9 adult teeth with 11 teeth already bound. There are hieroglyphs depicting Egyptian carpenters and bead makers in Thebes tomb using archery tools. The earliest evidence of such tools used in Egypt dates back to about 2500 BCE The use of bow-drills was widespread in Europe, Africa, Asia, and North America, in ancient times, and it is still used today. Over the years a small variety of bow and string piercings have been developed for the use of boring materials by means of building materials or fires.

PROBLEM DEFINITION

As we know, a drilling operation is a heart of many industries as well as it is also an important machine in domestic use. But if you want to have more number of holes on a same work piece, you have to use multi spindle drilling machine having a combination with radial drilling machine which become more costly and expensive. So it cannot be affordable for all. It also requires varying the positions of the work piece then it also affects the accuracy of the operation. If we are going to use a hand

drill machine: i.e. portable drilling machine, then we can obtain the flexibility in the operations but the stability during the operation and the working conditions there is a possibility of reducing the accuracy of the operation and the weight of the machine also affects the performance.

For such kinds of machines, the weight and vibrations also have to be considered. In portable drilling machines it is not easily possible to achieve same accuracy and efficiency of operation every time

Construction

The fig symbolizes the various parts of a universal digging machine.

This worldwide drilling machine consists of the following components:

1. Base Frame
2. Straight Arm
3. Robot Arm
4. Bearing
5. Links
6. Motor
7. Drill Chuck
8. Drill Tool
9. Battery
10. Connecting Cables
11. Switch.

Basic Framework A basic framework is nothing but a member used for the foundation and provides appropriate support for the meeting.

Vertical Arm: attached to a frame by means of a bearing. It rotates its axis to give direction to the other assembly to cover the working part of the circuit.

Robot Arm: connected with the help of a flexible join on a straight arm. This connects the car handle to the straight arm. Provides angular movement up and down the operation.

Bearing: provides support for a straight arm and allows it to rotate freely with its straight axis. Attached to the base frame

Linkage : this is used to connect or attach various parts of the system. These are flexible and can provide slide movement between links. These are used to make rotating parts.

Motor: is a feature that provides rotational movement on the chuck or tool handle to detect the output of the machine. Here we have used a 12V dc engine in this machine. Fig-8: Motor & Chuck

Drill Chuck: nothing but a tool handle. Hold the tool in the jaws. Attached to the motor to get the rotation movement and move it to the cutting tool.

Piercing tool: also known as drill bit. We will use bits that are limited in size but that are mostly used on this machine in this paper. We will use a bit of diameter 6mm, 7mm, 8mm & 10mm.

Battery: it is used to drive the motor to obtain desired output. Here we are going to use a rechargeable battery of 12V capacity.

Electric wires: wires are used to connect the battery to the motor.

Switch: it is used to control the ON-OFF action of the motor. When switch is at on position, the motor gets started & when switch is at OFF position motor get stopped

PRINCIPLE / VISION

This universal drilling rig simply works on the principle of converting electricity from a battery to a useful machine by rotating the chuck or spindle to gain cutting using the tool. It also refers to a sliding search engine that allows free rotation of links. This results in a higher degree of freedom for the machine or the arms of the robot. This will result in a higher operating capacity of the machine.

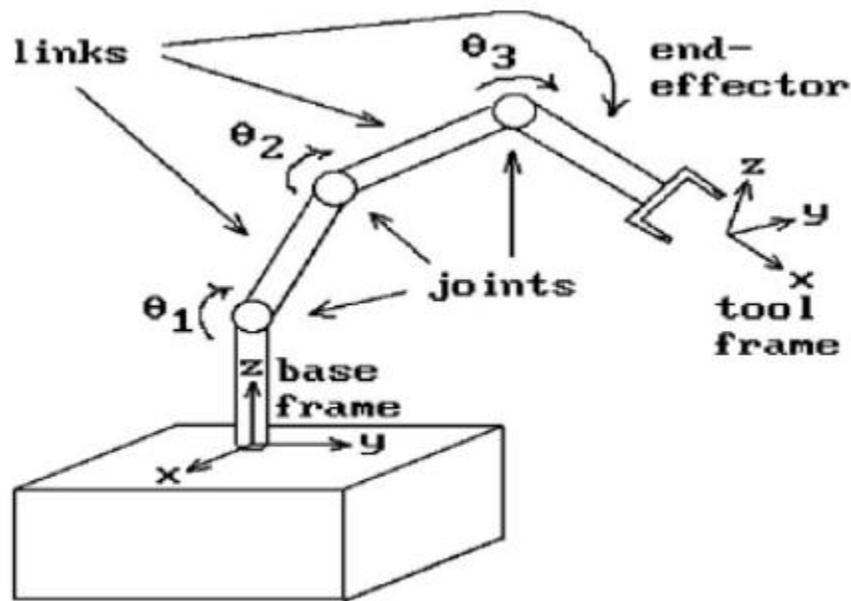


Fig - Universal Piercing Concept

Working

.As seen in fig. provide smooth pears for each member. This sliding palette offers more accessibility and a higher level of freedom. These members are brought together with the help of imprisoned members. As relaxation and strengthening of communication can easily happen. As the switch is operated by the operator and is NOT ON, it then connects the engine to the battery via power cords. As soon as the engine starts, it rotates the chuck or spindle mounted on the motor outlet. The chuck is used to hold the tool through the jaws. As the chuck or spindle starts, it leads to rotation of the tool. This tool rotation is also used to find the cut of a piece of work. Before starting the machine, it is necessary to make a decision and mark the size of the cut and the depth of the holes that should be drilled. Then position the machine so that you can cover the top points with their width. After determining the location where the foundation will be connected for the drill, the operator must start the engine. The operator must then provide directions to the marks. After completing tasks the operator should shut down the engine and slow down the engine. In this way the universal machine works with the least possible effort from the operator.

Advantage

Lightweight ,Portable, Easy to carry., Few efforts required.

CONCLUSION

This universal drilling machine provides better operational stability with respect to the portable drilling rig. It seems to be more profitable than conventional drilling rigs. This is a lightweight and portable too. So it provides better control during operation. The joints are made so that they can rotate everywhere and work better, so they work as we expected. It reduces the human effort required for mining operations and reduces the total energy consumption required to perform the same tasks. It also requires less space and is easier to manage.

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