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SAW AND DRILLING MACHINE

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ABSTRACT

The motorized multi-operation machine contains three operations in a single machine. The three operations are drilling, grinding and cutting. The purpose of the machine is to reduce the manufacturing time and cost reduction. The same machine is used for doing all these three operation, instead of using separate machines such as drilling machine, grinding machine and hacksaw cutting machine. The machine operates through motor drive with bevel gear mechanism, which paves the ways to carry out all these three operations exactly at the same time.

INTRODUCTION

DRILLING

Drilling is a cutting process that uses a drill bit to cut a hole of circular cross-section in solid materials. The drill bit is usually a rotary cutting tool, often multi-point. The bit is pressed against the work- piece and rotated at rates from hundreds to thousands of revolutions per minute. This forces the cutting edge against the work-piece, cutting off chips from the hole as it is drilled. A drill is a tool fitted with a cutting tool attachment or driving tool attachment, usually a drill bit or driver bit, used for boring holes in various materials together.

GRINDING

A grinding machine, often shortened to grinder, is any of various power of tools used for grinding, which is a type of machining using an abrasive wheel as the cutting tool Each grains of abrasive on the wheel`s surface cuts a small chip from the work- piece via shear deformation.

CUTTING

In the context of machining, a cutting tool or cutter is any tool that is used to remove material from the work-piece by means of shear deformation. Cutting may be accomplished by single-point or multi-point tools. Single-point tools are used in turning, shaping, planning, similar operations, and remove material by means of one cutting edge. Milling and drilling tools are often multipoint tools. Grinding tools are also multipoint tools. Each grain of abrasive function as a microscopic single point cutting edge (although of high negative rake angle), and shears a tiny chip. A drill is a tool fitted with a cutting tool attachment or driving tool attachment, usually a drill bit or driver bit, used for drilling holes in various materials or fastening various materials together with the use of fasteners. The attachment is gripped by a chuck at one end of the drill and rotated while pressed against the target material. The tip, and sometimes edges, of the cutting tool does the work of cutting into the target material. This may be slicing off thin shavings (twist drills or auger bits), grinding off small particles (oil drilling), crushing and removing pieces of the work-piece (SDS masonry drill), countersinking, counter boring, or other operations. Drills are commonly used in woodworking, metalworking, construction and do-it-yourself projects. Specially designed drills are also used in medicine, space missions and other applications. Drills are available with a wide variety of performance characteristics, such as power and capacity.

LITERATURE REVIEW

As a general-purpose machine tool that includes the functions of a milling machine, drill press, and lathe, the multi machine can be used for many projects important for humanitarian and economic development in developing countries: The multi machine is an all-purpose open source machine tool that can be built inexpensively by a semi-skilled mechanic with common hand tools, from discarded car and truck parts, using only commonly available hand tools and no electricity. Its size can range from being small enough to fit in a closet to one hundred times that size. The multi machine can accurately perform all the functions of an entire machine shop by itself. The multi machine was first developed as a personal project by Pat Delaney, than grew into an open source project organized via a Yahoo! group. The 2,600 member support group that has grown up around its creation is made up of engineers, machinists, and

experimenters who have proven that the machine works. As an open-source machine tool that can be built cheaply on-site, the Multi machine could have many uses in developing countries.
The multi machine group is currently focused on the humanitarian aspects of the multi machine, and on promulgating the concept of the multi machine as a means to create jobs and economic growth in developing countries.

METHODOLOGY

The following steps are used for designing the machine.

Study the drilling and saw machine operation.
Combine both operations to operate these both in together.
Convert the rotary motion into the reciprocating motion.
List out the all component needed in these.
Start to design all components.
Fixed the position of Saw Cutter as per requirement.
Direct the rotary motion via bevel gear then disc and connecting rod and then after finally to Saw cutter.

PROPOSED MODEL

Drills are held in the drill chuck mounted on the drill spindle. Generally drills under ½"° diameter are having straight shanks. These drills are mounted in the chuck. The chuck is tightened using chuck. If can operated without key also. This type of chuck is used for holding tools having straight shanks. Three slots are cut 120 Ø apart in the chuck body which houses three jaw & having threads cut at the back that meshes with a ring nut. The ring nut is attached to the sleeve bevel test cut on its face which meshed with the bevel teeth on the sleeve. The rotation of the sleeve causes the ring not to rotate in a fixed position and all the three jaws closed & opened by the same amount from the centre closing or releasing the shank of a tool. The component to be drilled is marked using scriber. Then the drill point is punched using centre punch. The component is clamped on the work table using clamping device. While doing this the punched mark is matched with the drill held in the chuck. The drill is hold in the chuck using chuck key. The drill should be hold tightly in the chuck. The required step is selected. A drill is a tool with rotating drill bit used for drilling holes in various materials. Drills are commonly used in wood working and metalworking. The drill bit is gripped by a chuck at one end of the drill, and is pressed against the target material and rotated. The tip of the drill bit does the work of cutting into the target material, slicing off thin shavings (twist drills or auger bits) or grinding of small particles

DESCRIPTION OF EQUIPMENTS BEARING

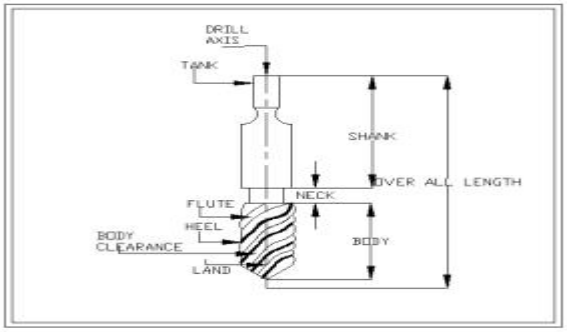
A bearing is a device to permit constrained relative motion between two parts, typically rotation or linear movement. Bearings may be classified broadly according to the motions they allow and according to their principle of operation. Low friction bearings are often important for efficiency, to reduce wear and to facilitate high speeds. Essentially, a bearing can reduce friction by virtue of its shape, by its material, or by introducing and containing a fluid between surfaces. By shape, gains advantage usually by using spheres or rollers.

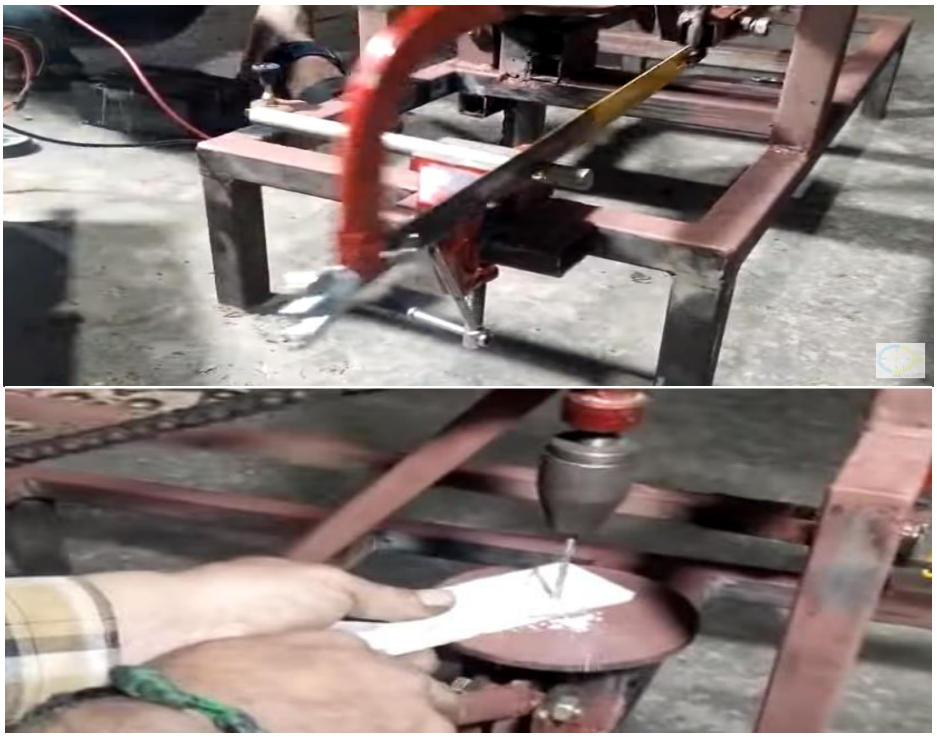
LINEAR BEARING

A linear-motion bearing or linear slide is a designed to provide free motion in one dimension. There are many different types of linear motion bearings and this family of products is generally broken down into two sub-categories: rolling-element and plane.

DRILLING TOOL

Drilling tool is a cylindrical end-cutting tool used to originate or enlarge circular holes in solid material.
Usually, drills are rotated by a drilling machine and fed into stationary work, but on other types of machines a stationary drill may be fed into rotating work or drill and work may rotate in opposite directions.





ADVANTAGES

Less employee cost- By adding multi purpose machine to an operation, means less employees are needed to get the job done. It also indicates less safety issues, which leads to financial saving. Reduction in production time -Having a machine that is automated definitely speeds up the production time since no thinking needed by the machine, there is better repeatability, and less human error.

CONCLUSION:

We can see that all the production based industries wanted low production cost and high work rate which is possible through the utilization of multi-function operating machine which will less power as well as less time, since this machine provides working at different center it really reduced the time consumption up to appreciable limit.

In an industry a considerable portion of investment is being made for machinery installation. So in this paper we have proposed a machine which can perform operations like drilling, sawing, grinding at different working centers simultaneously which implies that industrialist have not to pay for machine performing above tasks individually for operating operation simultaneously.

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