MULTI-DRILL HOLDER

INTRODUCTION:

- The multi drill holder (Eccentric Drive) is one which can be used to drill a number of holes at various large and even unsymmetrical layouts according to our requirements, where the conventional Multi spindle Drill Heads cannot be used.
- This is an improvement over geared drill heads and drill heads adopted with universal joints. This is an improvement over geared drill heads and drill heads adopted with universal joints.

- The drill head is mounted on the drilling machine table. The drill head spindle is inserted in to the machine spindle. It is used to drill a number of holes in different layouts according deals with a proper idea of usage of eccentrics in the field of drilling. The report furnishes a cost estimation of all the components of the equipment by careful considerations of all factors such as cost of material, labour, machining and purchased components.

    - The very essence of our economic life and growth is dependent in a great part upon the continued improvement of Electronic and Mechanical fields.
    - To aid these fields, we have designed multi spindle drill head [Eccentric Drive] which can be widely used to drill products like

printed Circuit Boards, Engine heads and other Automobile components. Extreme care should be there to drill multi holes at different layouts. The multi spindle drill head [Eccentric Drive] helps to achieve accurate and identical drilled layouts in mass production.

- We have designed this multi spindle drill head [Eccentric Drive] model to drill five holes of various diameters in an un-symmetrical layout. In case of drilling large layouts in mass production, we can apply this type of drill head.

WORKING PRINCIPLE:

A Multi spindle drilling machine will drill a number of parallel holes simultaneously in a work piece. Multi spindle drilling machines are employed for work of a light character, especially repetition work, such as drilling small components for the Automobile and Aircraft industries.

A Multi spindle drilling machine has a number of drill spindles driven by a single motor. All the spindles holding the drills are fed in to the work piece at the same time. For this purpose, either the drill heads can be lowered onto the work piece or the work table is raised.

The Main eccentric is driven by the drilling machine spindle which is driven by a single motor. The several drill holding eccentrics are driven by the main Eccentric through a Revolving plate.

Eccentric is a mechanism which is usually used to convert rotary motion into sliding motion. It shall be noted that an Eccentric cannot convert reciprocating motion into rotary motion.

Here we are converting the rotary motion into revolutionary motion and in to rotary motion. when the main spindle rotates, the rotary motion of the spindle is converted into revolutionary motion of the Revolving plate.

Through the Main Eccentric and the revolutionary motion of the Revolving plate is converted into rotary motion of the Drill holding Eccentrics. The conversion of the motion is achieved by the eccentricity provided in the eccentrics.

Drill bits can be fed by lowering the Drill head. The pillars provided with springs guide the Driller head in motion. Springs secure the Drill head with drill bits, from a rapid fall, while releasing the Drill head from the machine spindle.

It is designed to drill five holes of various diameters in unsymmetrical layouts. The art of eccentricity plays a major role in this principle.

APPLICATIONS:

In this type of machine number of holes is drilled in the work piece at a time. This machine is used in mass production. The work pieces drilled in this machine are as follows:

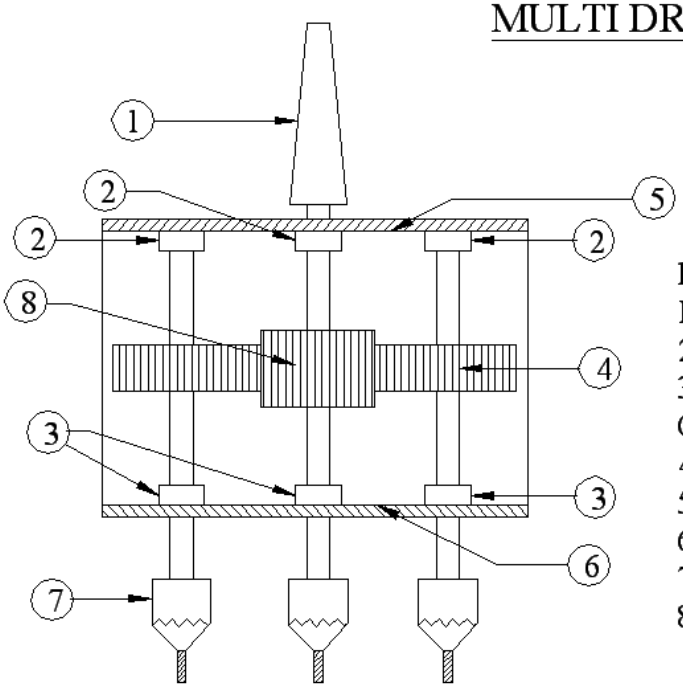
- Printed Circuit Boards.
- Pipe Flanges.
- Pump housings.

Production works such as Drilling, Boring, Reaming and Tapping.

ADVANTAGES:

- Can be used for very centre distances.
- Presetting for definite depth is possible prior to mounting on machine.
- Outputs shall be obtained at high precision.
- Higher productivity can be achived.
- Outputs shall be obtained at high precision.

MULTI DRILL HOLDER:



1.ATTACHEMENT HEAD IN DRILLING MACHINE
2.TOP BEARING WITH CAP
3.BOTTOM BEARINGS WITH CAP
4.SPINDLE GEAR WHEEL
5.TOP PLATE
6.BOTTOM PLATE
7.DRILL CHUCK
8.CENTER GEAR WHEEL

EXISTING MODELS IN MULTIPLE DRILL HOLDERS:

MODEL:1

ABSTRACT:

In Indian manufacturing sector the growth of manufacturing depends largely on its productivity Drilling machine is used primarily in drilling holes, there are a few other functions that the multiple spindle drilling machine is capable of performing the functions include tapping, spot facing, reaming, countersinking, and counter boring.

The multiple spindles drilling attachment performs basic drilling operations; there are some specific functions that are performed more accurately and conveniently. This attachment works mainly on planetary gear system arrangement. Multi Spindle Drilling Attachment Main function is more than one drilling operation at a time. It has many advantages like increase the production, decrease the operation time, reducing the labor cost, increase productivity. Also reduce the cycles of operations. This is not possible if carry out the production by using general purpose machines. Productivity and performance of the existing drilling machine will be increased by Design & Manufacturing Process of Multiple Spindle Drilling Attachment.

INRODUCTION

In the conventional manner only one job can be worked at a time for either of the above operations, but with increase in productivity demands a special purpose device or attachment is need which will increase productivity by,

- Performing operations on more than one job at a time.
- Performing multiple operations in one cycle.
- Indexing capability to sequence operations one after another.

The Multi-spindle drilling attachment is an ideal solution to the above problem where in the conventional drilling machine is used to perform three operations at a time, so also different operations like drilling, reaming, countersinking or spot facing can be done simultaneously.

The multi-spindle drilling attachment is easy to mount on the drilling machine, where in the taper arbor directly fits into the drilling machine sleeve, if necessary a support sleeve can be attached to the top casing plate for extra stability. In the multi-spindle drilling attachment three spindles are driven simultaneously which carry three drill chucks. The drill chucks can receive twist drills, reamers, countersink drills or spot facing cutters to perform the desired operation.

PRINCIPLE OF MULTIPLE SPINDLE DRILLING

Torque is transmitted from sun gear to three planet gears for drilling purpose. There are three planet gears and one sun gear arrangement for transmitting the power from main spindle to planet shaft. . When machine is started the drilling machine spindle sleeve drives the arbor and thereby the planet gear system and the drill chucks and respective cutting tools, when the drilling machine spindle is fed in the downward direction the cutting action takes place. For enhancement and fast production an index able drill jig can be mounted on the drill machine table.

ADVANTAGES:

- Productivity is increasing
- Time is less

DISADVANDAGES:

- Accuracy is low

MODEL: 2

ABSTRACT:

His growth of Indian manufacturing sector depends largely on its productivity & quality. Productivity depends upon many factors, one of the major factors being manufacturing efficiency with which the operations are carried out in the organization. Productivity can be improved by reducing the total machining time, combining the operations. in case of mass production where variety of jobs is less and quantity to be produced is huge, it is very essential to produce the job at a faster rate. This is not possible if we carry out the production by using general purpose machines. The best way to improve the production rate (productivity) along with quality is by use of special purpose machine. Usefulness and performance of the existing radial drilling machine will be increased by designing and development of multispindle drilling head attachment.

INTRODUCTION:

Multiple-spindle drilling machines are used for mass production, a great time saver where many pieces of jobs having many holes are to be drilled. Multi-spindle head machines are used in mechanical industry in order to increase the productivity of machining systems. The multiple spindle drilling machines is a production type of machine. It is used to drill two holes in a work piece simultaneously, in one setting. The holes are drilled on number of work pieces with the same accuracy, so as to make them interchangeable.

This machine has two spindles driven by a single motor and all the spindles are fed in to the work piece simultaneously. Feeding motions are obtained either by raising the work table or by lowering the drills head. The centre distance between the spindles can be adjusted in any position as required by the different jobs. For adjusting the centre distance between the drill spindles they are connected to the main spindle by universal joints. In mass production work drill jigs are used for guiding the drills in the work piece so as to achieve accurate results.

In today's market the customer demands the product of right quality, right quantity, right cost, & at right time. Therefore it is necessary to improve productivity as well as quality. One way to achieve this is by using multi spindle drilling head. On the other hand, in order to meet quality requirements of final product.

WORKING:

As the name indicates multiple spindle drilling machines have two spindles driven by a single power head, and these two spindles holding the drill bits are fed into the work piece simultaneously. The spindles are so constructed that their centre distance can be adjusted in any position within the drill head depending on the job requirement. For this purpose, the drill spindles are connected to the main drive by means of universal joints.

The rotation of the drills are derived from the main spindle and the central gear through a number of planetary gears in mesh with the central gear and the corresponding flexible shafts. The positions of those parallel shafts holding the drills are adjusted depending upon the locations of the holes to be made on the job.

REQUIREMENTS:

- Shaft
- Gear
- Upper plate
- Lower plate
- Bearings
- Drill chuck

REQUIREMENTS FOR NEW MULTI DRILL HOLDER

PARTS	QUANTITY
SHAFT	3
DRILL CHUCK	3
BEARING	6
GEAR WHEEL	3
DRILL BIT	3

REASON FOR GOING NEW MULTIPLE DRILL HOLDER:

- Compared to other drill holders it is a simple design.
- Compared to other drill holders its cost is less.
- Compared to other drill holders required parts is less. So we go for new multiple drill holders.

DESIGN	ADVANTAGES	DISADVANTAGES
MODEL 1	• Higher productivity • Operation time is less • Easy to operate	• Center distance cannot be adjustable. • Accuracy is less.
MODEL 2	• Higher productivity • Operation time is less • Accuracy is more	• Center distance cannot be adjustable. • Design is heavier. • It requires more parts. • Cost is more.
NEW MULTI DRILL HOLDER	• Model is small. • Weight of the model is less. • Design is simple. • Easy to operate. • Cost is less.	• Center distance cannot be adjustable.