

# FABRICATION OF 360 DEGREE FLEXIBLE DRILLING MACHINE

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## Abstract:

In basic drilling machines, there's a problem of limitation of movement of drilling machine in many directions. additionally there area unit issues of less house between bit and job and alignment issues. we are going to overcome these issues with the help of a 360 degree versatile drilling machine. It area unit typically mounted on a flat surface and may be revolved in any direction-vertical, horizontal, up and down. so as that job setting operation is not difficult. the brad purpose bit helps change the manoeuvre whereas drilling wood. It reduces the setting time for the operation. Materials, like wood, plastic and lightweight metals area unit typically trained with this machine. the quality drilling machine is often found in each business. Drill machines area unit the heart of every business. In business creating holes in elements, sheets and structures may even be a daily work. excellent and well aligned drilling desires mounted and powerful drills. we'd wish to use hand drills in such cases however hand drills have alignment issues whereas drilling. thus here we have a tendency to propose a 360° versatile drill which is able to be mounted on a table or wall and will be uses to drill holes horizontally vertically or even the incorrect high . this idea into the mounted drilling machine to makes it attainable to drilling in difficult elements and surfaces.

*Keywords* — Drill bit, Nut, Bolt, Chuck, Drilling machine, etc...

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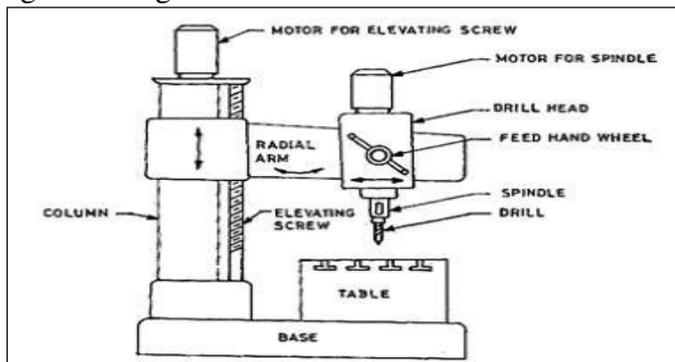
## I. INTRODUCTION

Drilling could be a cutting method that uses a drilling bit to chop a hole of circular cross-sectional in solid materials. The drilling bit is sometimes a rotary cutlery, usually multipoint. The bit is ironed against the piece of work and turned at rates from a whole bunch to thousands of revolutions per minute. This forces the vanguard against the piece of work, analytic chips (swarf) from the gap as a result of it's trained. In rock drilling, the gap is usually not created through a circular cutting motion, although the bit is usually turned. Instead, the

gap is usually created by hammer a bit into the gap with quickly perennial short movements. The hammer action are often performed from outside of the outlet (top-hammer drill) or among the outlet (down-the-hole drill, DTH). Drills used for horizontal drilling area unit known as wanderer drills. In rare cases, specially-shaped bits area unit accustomed cut holes of ellipsoidal cross-sectional; a sq. cross-section is feasible. Drilling could be a cutting method within which a hole is originated orenlarged by means that of a multipoint, fluted, finish cutlery.As the drill is turned and advanced into the work piece,material is removed within the variety of chips that move on fluted shank of

drill. method characteristics: one. Uses a multipoint, fluted, finish cutlery two. Cutting tools area unit turned and advanced relative to every different three. Creates or enlarges no preciseness holes four. could manufacture coarse, coiling feed marks, betting on machining parameters five. Creates tiny burrs on entry and coarse burrs on exit.

Fig.1 Drilling Machine



When the ability is given to the motor, the spindle rotates and thereby the stepped machine hooked up thereto additionally rotates. On the opposite finish, another stepped machine is hooked up which is inverted to extend or decrease the speed of the move motion. Now, a V-belt is placed in between the stepped pulleys thus on drive the ability transmission. Here a V-belt is employed rather than a flat belt, so as to extend the ability potency. currently the bit additionally rotates that was placed within the chuck and that was in reference to the spindle. because the Pulleys rotates, the spindle additionally rotates which may rotate the bit. Now, by the rotation of hand-wheel, the spindle moves up and down within the vertical direction so as to offer the required quantity of feed to the work and this bit is employed to create the holes on the part placed within the machine vice

## II. PROBLEM IDENTIFICATION

In previous drilling machine several of the issues arise throughout drilling. Some components cannot drill because of tiny work area between bit and work piece. therefore we tend to use hand drills during this cases however it cause alignment issues. therefore here we tend to propose a 360 degree versatile drill that may be mounted on a table or wall and might be wont to drill holes horizontally, vertically or maybe the wrong way up. therefore this build it potential for straightforward drilling in even difficult components and surfaces.

## III. OBJECTIVE

- 1) To style a 360- degree versatile drilling machine.
- 2) To drill holes in numerous locations like vertical, horizontal, or perhaps up and down
- 3) To perform operation with high accuracy
- 4) To build the movement easier
- 5) To scale back human effort

## IV. REVIEW OF LITERATURE

- 1) **Mr. Jay M. Patel , Mr. Akhil P. Nair , Prof. Hiral U.Chauhan , 3-Directional Flexible Drilling Machine, International Journal for Scientific Research & Development , Vol. 3, January 2015 , Pages 1262 – 1264**

In this paper gift , 3-Directional drilling machine which might be used supported drilling holes in numerous location and movement and simply operation through with high accuracy. Productivity may be improved by reducing total machining time and reduced human effort and reduced producing cycle time. The paper conclude that , the scale of

machine is smaller than the older machine therefore it's terribly straightforward to maneuver from one place to a different. therefore this machine may be simply transported. the house needed is additionally minimum. With the assistance of this machine we are able to drill holes in any direction at a selected time. This machine is reduces the producing producing time, the re-clamping may be eliminated: once the work is clamped, there's no would like for reclamping in an exceedingly totally different direction, reduces the amount of machines required, elimination of human error. The machine is incredibly straightforward to control.

**2) Lookesh Kumar Sahu<sup>1</sup> Pranesh Mohan Mishra<sup>2</sup> Deepak Kumar Singh<sup>3</sup> Vijay Kumar Yadu<sup>4</sup> Sandeep Kumar Kansari<sup>5</sup>** 1Student 2,3,4,5Assistant Professor 1,2,3,4,5Department of Mechanical Engineering 1,2,3,4,5Bharti College of Engineering and Technology, Durg, India

In this paper project even be rotate merely drill at any direction. so as that job setting operation is not tough any as reduces the setting time for the operation. It to boot takes into thought the foremost effective methodology of dominant the drilling machine by manually. Materials like wood, plastic and light-weight metals trained with this. The piece is mounted on the work table. as a result of the machine exert Vertical pressure to original a hole it loosely called a “drill press”. This Drilling is performed for numerous Position Drilling inside the operative job. Up/Down and mechanism is obtainable throughout this Drilling Machine.

**3) Prof. Ms. A.A. Shingavi, Dr. A.D. Dongare, Prof. S.N. Nimbalkar(2015)-**

In this reseach, the authors discuss the case study and comparability of productivity of parts using conventional radial drilling machine and special purpose machine. The growth of India's production sector is rely on its productivity & standard of the product. Productivity depends on several factor, one of the main element factors is production.

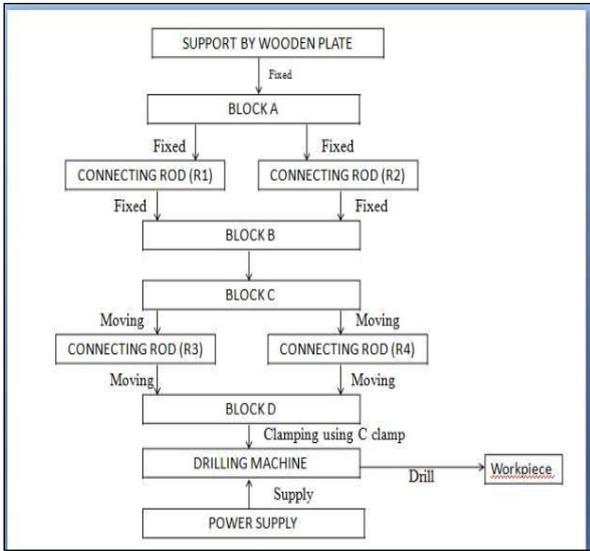
Productivity can be increased by minimizing the machining time.

**4) Thiren G. Pokar, Prof. V. D. Patel**

In this used gray based mostly taguchi technique to work out the optimum small drilling method parameters. hivapragash, K. Chandrasekaran, C. Parthasarathy, M. Samuel have tried to optimize the drilling method involving metal matrix composites (MMC) so as to attenuate the injury done to that during the method by mistreatment taguchi and gray rational analysis. The work piece used is Al-Ti Br<sub>2</sub> (MMCs), with dimension of 100mm × 170mm × 15mm. The tool material is HSS with diameter of zero.6 mm. The input parameter ar spindle speed, depth of cut and feed rate whereas the output parameter ar MRR and surface roughness. for locating out the optimum combination of cutting parameters the results ar born-again into S/N ratios and better the higher sort characteristics is employed for MMR, and smaller the higher characteristics is employed for surface roughness.

**5) Mr. Jaynt khade** Around 35,000 BCE, homo discovered the advantages of the appliance of rotary tools. this may have rudimentarily consisted of a pointed rock being spun between the hands to bore a hole through another material. This light-emitting diode to the handheld drill, a swish stick that was generally connected to flint purpose, and was rubbed between the palms. This was used by several ancient civilizations round the world together with the Mayans. The earliest perforated artifacts like bone, ivory, shells and antlers found, area unit from the time period era. Bow drill (strap-drills) area unit the primary machine drill.

## V. PROPERSED PLAN OF WORK



## VI. COMPONENTS

The components used in our 360 degree flexible drilling machine projects are:- 1) Drilling Machine

- 2) Connecting Rod
- 3) Block A, B, C, and D.
- 4) Nut, Bolt, Washer.
- 5) Power supply
- 6) Chuck
- 7) Drill bit

## VII. WORKING OF 360 DEGREE FLEXIBLE DRILLING MACHINE

The working rule of this versatile drilling machine is at the start started from the D.C. motor through full wave rectifier. during which there's one power sources, received from the rectifier. Then the arm rotates at 360 degree and moves anyplace once drilling is needed up to its most arm length. With

the assistance of my project we will hammer in difficult elements accurately.

FIG.2, 360 Degree flexible drilling machine



## Experimental setup and working

Box A is mounted on a plate, which may be additional mounted on the table or wall for stability. the full mechanism will rotate 360 degree at the vertical axis of box A. Box B is connected to Box A with the assistance of 2 slant links, thus keep a angle of forty five degrees between each boxes. currently the box B will rotate 360 degree at the vertical axis of box A. Box C is mounted on Box B in such the simplest way that it will rotate 360 degrees on its vertical axis. Box D is connected to box C with the assistance of 4 movable links, thus achieving a vertical motion of box D. therefore currently the box D will rotate 360 degrees at vertical axis of box C.

Fig.17 Experimental Diagram



When power supply is ON, and start the drilling machine by using the switch button, start the machine. As per the drilling location machine moving the machine up and down, left and right and front and back.

Connecting rod (L1) = 30CM  
Connecting rod (L2) = 40CM  
Block of (A, B, C, D) =L\*H= 6.5\*4CM

### Capacity

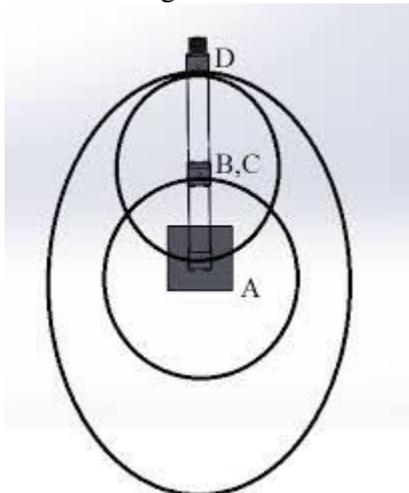
- M Maximum capacity for wooden drill:- 20 mm
- M Maximum capacity for stainless steel:-10mm
- M Maximum capacity for concrete drill:- 10mm

### IX. ADVANTAGES

- 1) Efficient Drilling
- 2) 360 Degree Rotation
- 3) Flexible
- 4) Easy To Use
- 5) Low Cost
- 6) Reduce Time
- 7) Reduce Overall Manufacturing Cost
- 8) Increase Productivity

### VIII.CALCULATION

Project making for distance of travelling machine highest  
According to that and weight of drilling machine and travelling distance



### X. APPLICATION

- 1) To put holes with high precision on engine heads, blocks and cylindrical shell.
- 2) Used in furniture making.
- 3) It is used with automation for automatic drilling.
- 4) In future it is used in every field where drilling is required.
- 5) Also use this method of rotation of arm in other machining operation.

## **XI. CONCLUSIONS**

The 360 degree versatile drilling machine operating satisfactory condition. The 360 degree drilling machine provides effective drilling operation and rotates in 360 degree direction. This project is Associate in Nursing economical operation and competitive value. Since variety of operation and hole is performed in an exceedingly straightforward unit. it's economical and economical.

## **XII. FUTURE SCOPE**

- 1) It is used in industries.
- 2) It is used with automation for automatic drilling.
- 3) In future it is used in every field where drilling is required.
- 4) Also use this method of rotation of arm in other machining operation
- 5) Also use this method of rotation of arm in other machining operation.
- 6) We can use servo motor in our machine to provide the automation by giving auto feed
- 7) We can use telescoping arm to increase the working envelope of the machine to reach in any direction easily.

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