

→ Automation in Manufacturing :-

→ Need of Automation

→ Kind of Auto. electrical/electronic

→ Control Sys. feedback

→ ~~Auto. is the process by which~~ by

→ Auto. is a process achieved without human assistance.



→ Tool setting

→ Tool movement

→ Tool manag.

→ feedback

But Auto.

mechanical, electronics, computer ^{based} sys. to operate and control ~~with the help of~~ production. This ^{auto.} technology includes (1) automatic me. tool to process parts

(2) Auto. assembly line balancing

(3) Industrial Robots

(4) Auto. mat. handling and storage of finished prod.

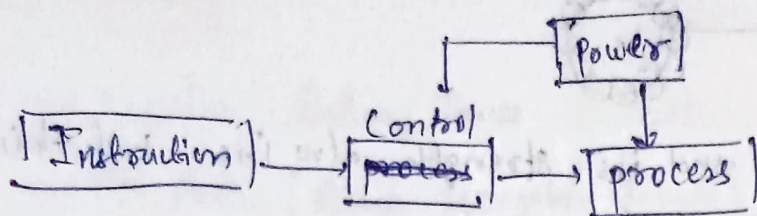
(5) feedback control & computer process control

→ Essentials of the Automated Sys.

(1) power

(2) prog. of instructions

(3) Control Sys



→ Types of Automation :- (1) Fixed Auto.

(2) Programmable Auto. / CNC

(3) flexible Auto. / DNC

Customer Need/demand

→ Reason for Auto. :- (1) To improve productivity

(2) High cost level

(3) Shortage of labour (skilled)

(4) Safety of workers

(5) High cost of Equip.

(6) Improve prod. quality

(7) Reduction of manuf. lead time

(8) Reduction of inprocess ~~inventory~~ inventory

→ What we need to automated?

(1) Tool Management

(2) Tool speed

(3) Tool Movement

(4) Spindle Movement

(5) Feedback Control

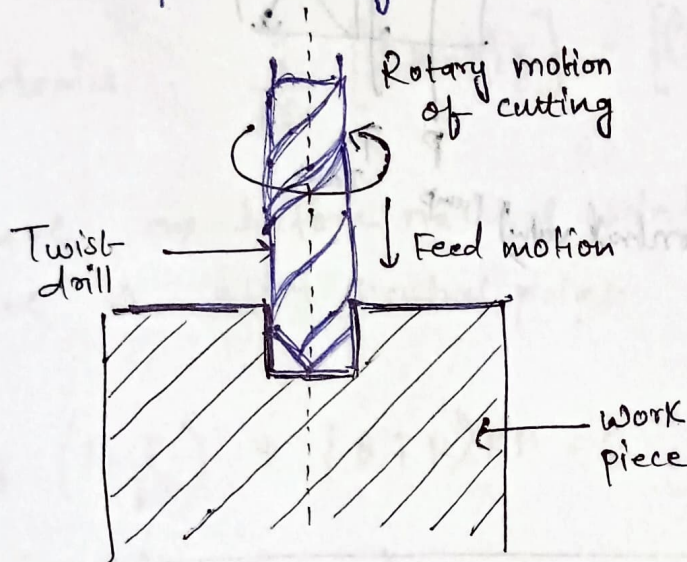
(6) Material Loading / Handling

(7) Mat. storage

Drilling Machine :-

Drilling is a process of making hole or enlarging a hole in an object by forcing a rotating tool called drill.

The drill is generally called as twist drill. Since it has a sharp twisted HS formed around a cylindrical tool. provided with a helical group along its ~~along~~ its length to allow the cut material to escape through it.



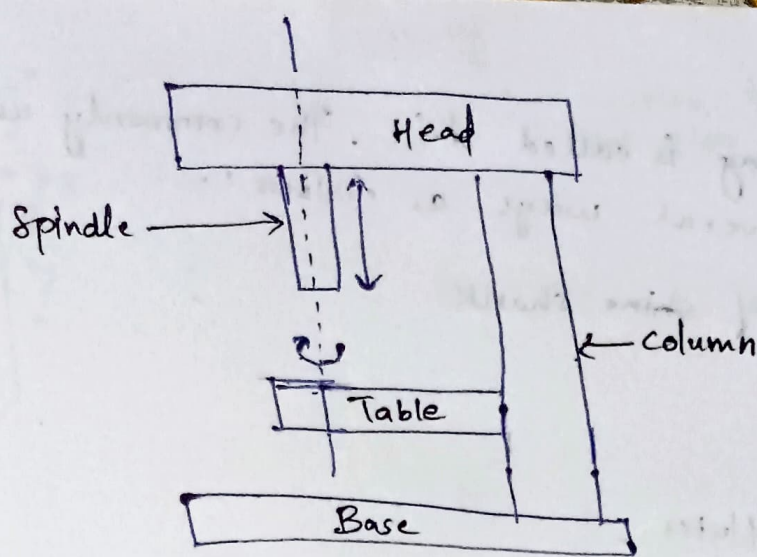
Types

Types of drilling m/c

- (1) portable drilling m/c
- (2) sensitive or bench drilling m/c
- (3) upright drilling m/c
- (4) radial drilling m/c
- (5) Gang drill.
- (6) Turret drill m/c
- (7) deep hole drill
- (8) Multiple spindle drilling m/c
- (9) Automatic drilling m/c

Specifications of a drilling machine :-

- (1) Size of the drilling m/c table
- (2) Largest bit the m/c can hold
- (3) Maximum size of the hole that can be drill
- (4) ——— the wip that can be held
- (5) Power of the motor, spindle speed or feed



Block diag. of a drill press

Types of drilling machine :- (some specified m/c)

- (1) Portable drilling machine - max^m. dia. of drill which can be held
- (2) Sensitive and upright drilling machine - The dia. of the largest w.p that can be drilled.
- (3) Radial drilling machine - The length of the arm and column dia.
- (4) Multiple spindle drilling machine - The drilling area, the size and no. of holes a m/c can drill

(generally)

- (1) Portable drilling machine
- (2) Sensitive or bench drilling m/c.
- (3) Upright drill

Classi. of drill :-

The tool used for drilling is called drill. The commonly used drills may be classified in several ways as follows :-

(1) Acc. to the type of shank

(a) Parallel shank

(b) Taper shank

(2) Acc. to the type of flutes ;

(a) Flat drills

(b) Twist drills

(3) Acc. to length

(a) Short series drills

(b) Stub series drills

(c) Long series drills

(4) Acc. to Applications

(a) Core drills (b) drills for long drilling

~~(c) drills for long drilling~~ (c) Centered drills

(5) Acc. to Tool material

(a) High speed steel drill

(b) Turbine tipped drills

Drilling m/c operations :-

(1) Reaming

(2) Boring

(3) Counter boring

(4) Counter sinking

(5) Spot facing

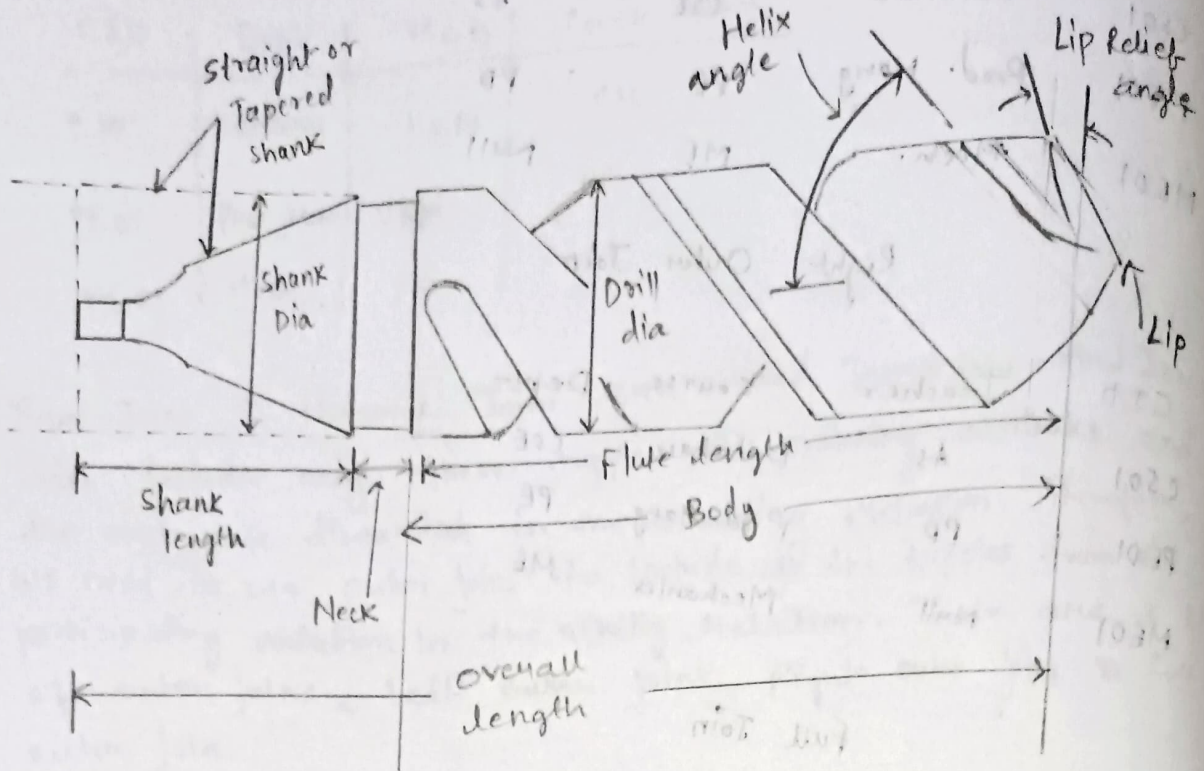
(6) Tapping

(7) Trepanning

19 April

MTS

(DP sir)



Elements of Twist Drill

The twist drill consists of mainly two parts: body and shank, both are separated by a neck. Two long neck diametrically opposite helical grooves called flutes run through out the length of the drill.

1) Body - The body is the portion of the drill which extends from its extreme point up to the neck or shank of the drill. It consists of body - ~~chisel~~ ~~margin~~ edge, ~~face~~ ~~flank~~ face, flank, flutes, heel, land or margin, point, lip and ~~width~~ ~~web~~ web.

(i) Body Clearance - It is the portion of the body surface with reduced diameter which provides diametrical clearance.

(ii) Face - It is the portion of the body surface flute adjacent to the lip on which chip flows as it is cut from the work piece.

(iii) Flank - It is the conical surface of a drill point which extends behind the lip to the following flute.

(iv) Flutes - These are helical grooves cut on the cylindrical surface of the drill and provide the lip. They serve the following purposes:

- (a) ensure easy escape and flow of chips
- (b) Cause the chips to curl and provide passes for their flow
- (c) form the lips and cutting edges on the point
- (d) Allow the cutting fluid to reach the cutting edges thus reducing their friction.

(v) Heel - It is the edge formed by the intersection of flute surface and the body clearance.

(vi) Land or margin - It is the cylindrically ground narrow strip on the living edges of the drill flutes. It keeps the drill align. It is also known as margin.

(vii) Point - It is the cone edge sharpened and ~~at~~ of the drill that produces lips, faces, flanks and chisel edge of the drill.

(viii) Lips - The lips also known as cutting edges, are the edges formed by the intersection of flanks and faces. They are two in no. with identical length and angle.

(ix) Web - It is the thickness of the drill bet. the flutes which extends from point towards the shank. The point end of the web forms the ~~the~~ chisel edge.

2) Shank - The shank is the cylindrical portion of the drill which is used to hold and drive the drill. It extends from the neck and it may be either straight or tapered. Tapered shanks are used in drills of bigger sizes.

