SAMIR KUMAR
1BM18CS091

1 (a) → Classification of welding process

Based on the principle of formation of the weld joint welding process is classified as follows

(i) pressure welding or plastic welding
(ii) fusion welding or Non-pressure welding

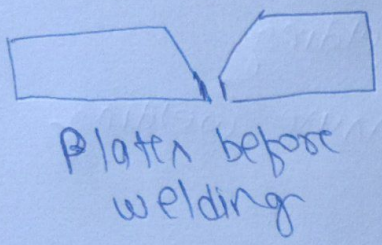
(i) Pressure welding:
In pressure welding the metal pieces are heated only up to the plastic state. They are then joined together by the application of external pressure. In this type of welding no filler material is added. Eg. forge welding and resistance welding

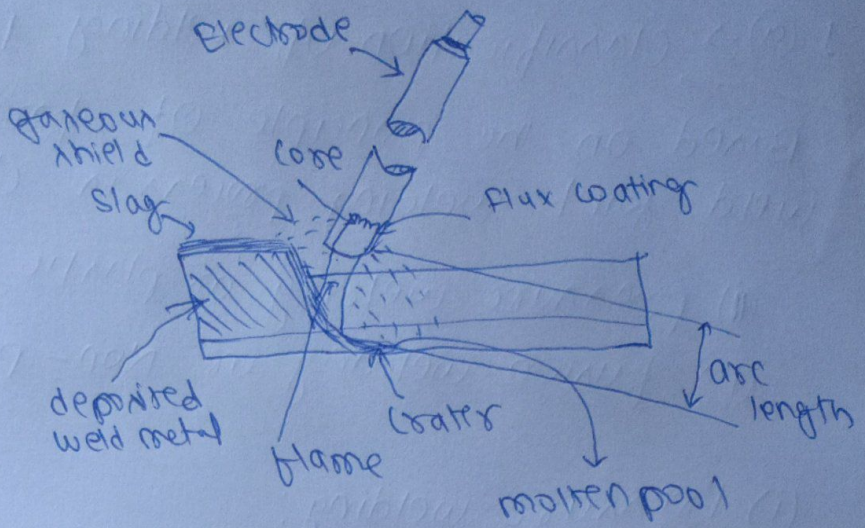
(ii) fusion welding:
In fusion welding, the work piece are heated to molten state at the welding location and it is allowed to solidify without applying any pressure. In this type of welding filler material may be used. Eg. Gas welding or Arc welding.

⇒ Electric Arc welding or Arc welding
Arc welding is the most extensively used welding type. It uses electric power for heating the base metal and filler metal. An electric arc is produced electrodes which are connected to the power supply:

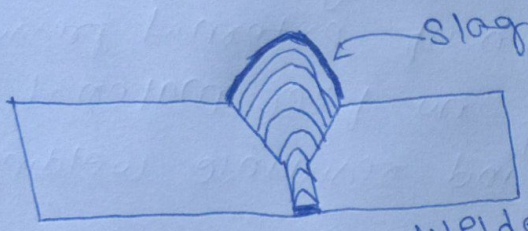
samir kumar

SAMIR KUMAR
1BM18CS091





welding process



Working principle

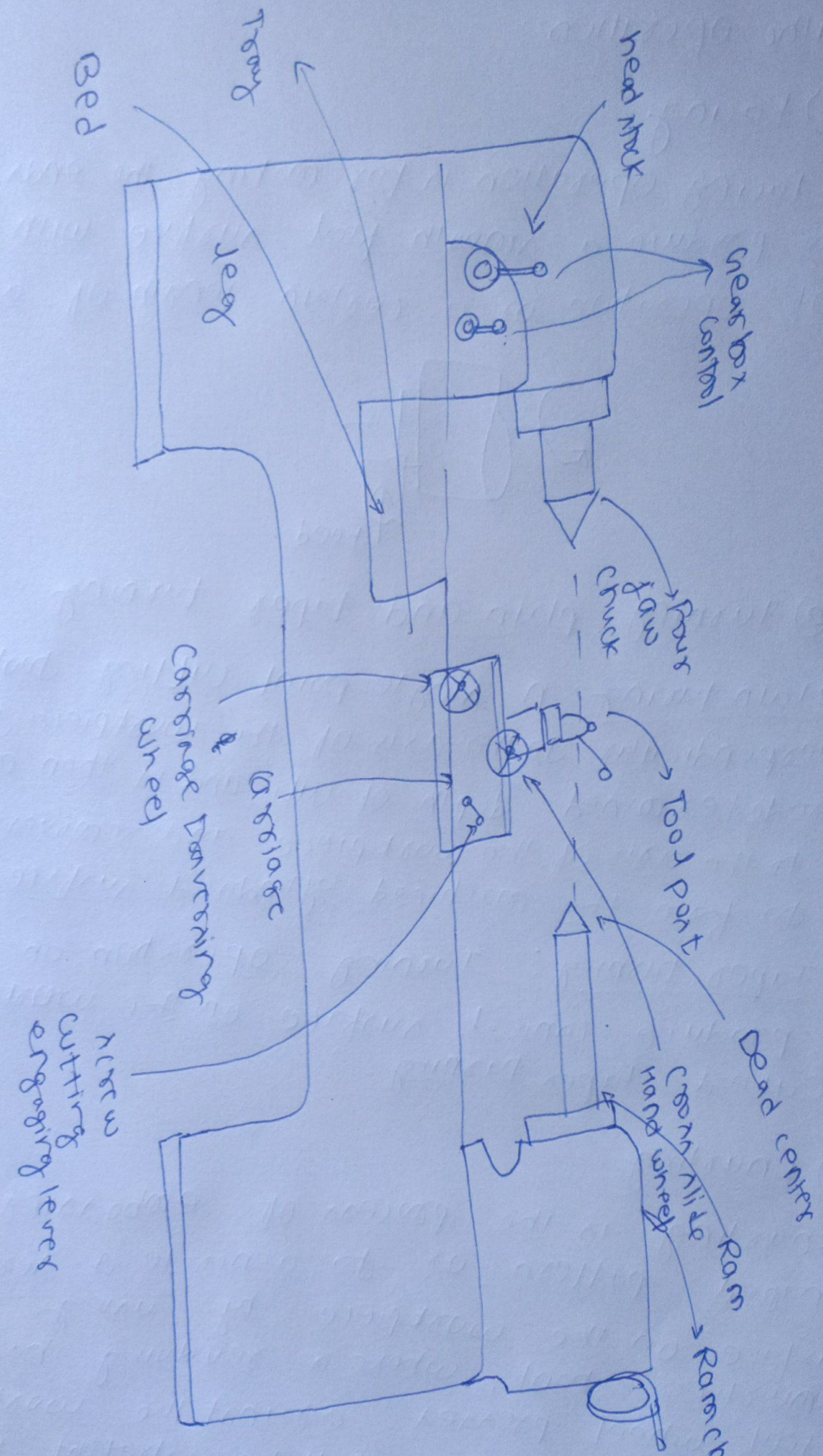
An arc is produced when the current-carrying conductors are brought together momentarily and then separated by a small gap. If there is sufficient voltage between two conductors to flow electric current through the air gap, an arc is produced. This arc is associated with a bright glow and intense heat and has the temperature of 5000°C, which is enough to melt the base metals.

Samir Kumar

SAMIR KUMAR
1BM18CS091

(b)

Parts of lathe



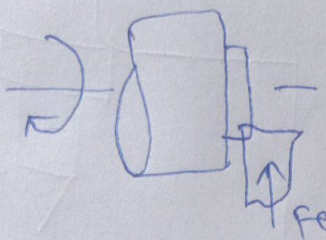
samir kumar

SAMIR KUMAR
1BM18CS091

lathe Operation:

① Facing:

facing operation is for making the ends of the job to produce a smooth flat surface with the axis of operation or a certain length of a job.



② Turning: plain and taper turning

Plain turning: A single point cutting tool is fed perpendicular to the axis of the workpiece to a known predetermined depth of cut, and is then moved parallel to the axis of the workpiece and removes the material to form the machined cylindrical surface.

Taper turning: Turning operation on lathe to produce conical surface on the workpiece is called taper turning.

③ Knurling

Knurling is the process of embossing a diamond-shaped pattern or to generate a serrated surface on the workpiece by using the knurling tool, where a revolving hardened steel wheel pressed against the workpiece. Impression patton may be straight line or diamond patton.

samirkumar

(3) →

Sl No	Description	Welding	Brazing	Soldering
1.	Joint strength	Strongest	Medium	Lowest
2.	Melting of base metal	Melting and fusing	Hardly any metallurgical effect	No metallurgical change
3.	Composition of filler metal	Similar to base metal	Dissimilar	Dissimilar
4.	Use of filler material	Optional	Needed always	Always necessary
5.	Joining surfaces	similar surfaces	May be dissimilar	May be dissimilar
6.	Flow of filler metal	Mostly deposited into the joint	Mostly capillary action	Mostly capillary action
7.	Heat affected zone	High	Less	Negligible
8.	Surface finish	Requires finishing operation	Good	Good
9.	Joining temperature	very high of the order of 5000°C	450 to 1000°C	Less than 450°C
10	Flux used	Oxides, Carbonates and Flourides	Borax, Boric acid	Zinc chloride
11	Application	Cast iron, Alloy steels, Non-ferrous metal parts	Cast iron ceramics	Sheet metal work, plumbing, electric circuit

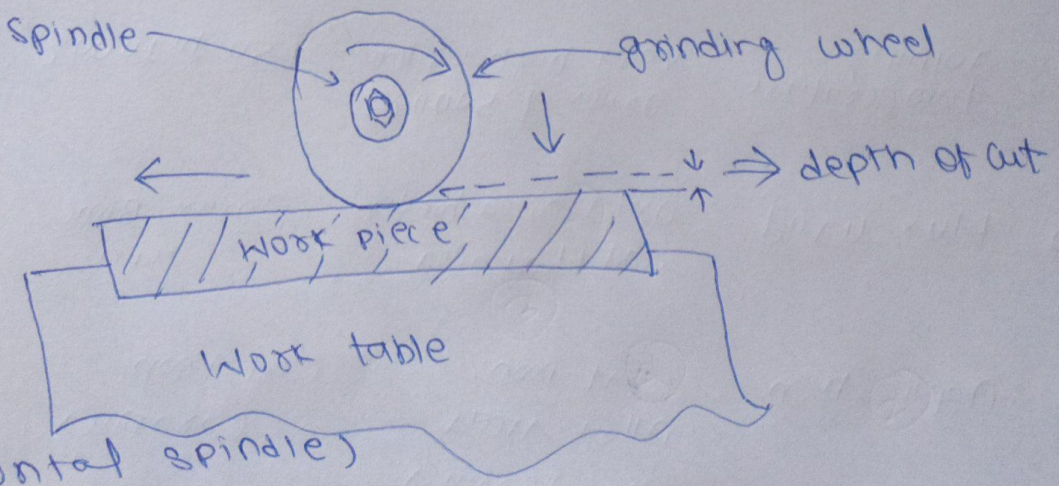
SAMIR KUMAR
1BM18ME091

3(a) → The process of removing excess material from the workpiece by the abrasive action of a rotating wheel on the surface of the workpiece is called "Grinding". It is a finishing operation employed to produce workpieces of high accuracy and surface finish.

principle of grinding: Grinding wheel mounted on a spindle rotates at high speed. Workpiece when fed down, the rotating wheel material is removed as particles.

Methods of grinding and types of grinding machines:

1. surface grinding
   (a) horizontal spindle machine
   (b) vertical spindle machine
2. cylindrical Grinding machine
3. centerless Grinding machine
4. Internal grinding machine
5. special grinding machine.



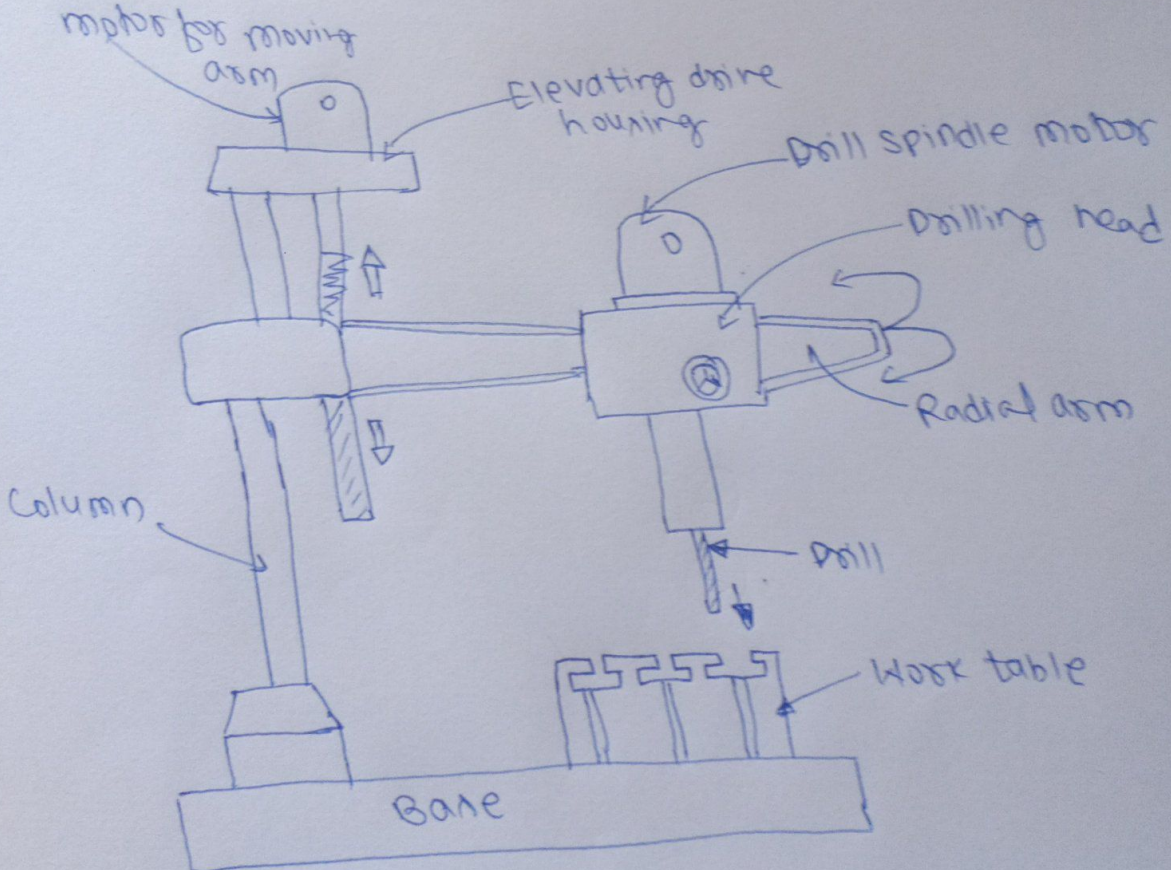
(horizontal spindle) surface grinding machine

Samir Kumar

SAMSR Kumar
1BM18CJ091

Radial drilling machine:

Radial drilling machine is used for workpieces, which are too heavy and also may be too large to mount them on the worktable of the vertical spindle drilling machine. It consists of a heavy base and a vertical column with a long horizontal arm extending from it. It can be rapidly raised, lowered and swiveled in the horizontal plane about the main column to any desired location. The drilling head can move to and fro along the arm (the head can also be swiveled only in the universal radial drilling machines) to drill holes at an angle.



samsr kumar