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Section-2

Q2

Ans. Deep Drawing :-

- This process consists of plastic deformation of flat sheet into a recessed, three dimensional parts with a depth several times the thickness of the metal.

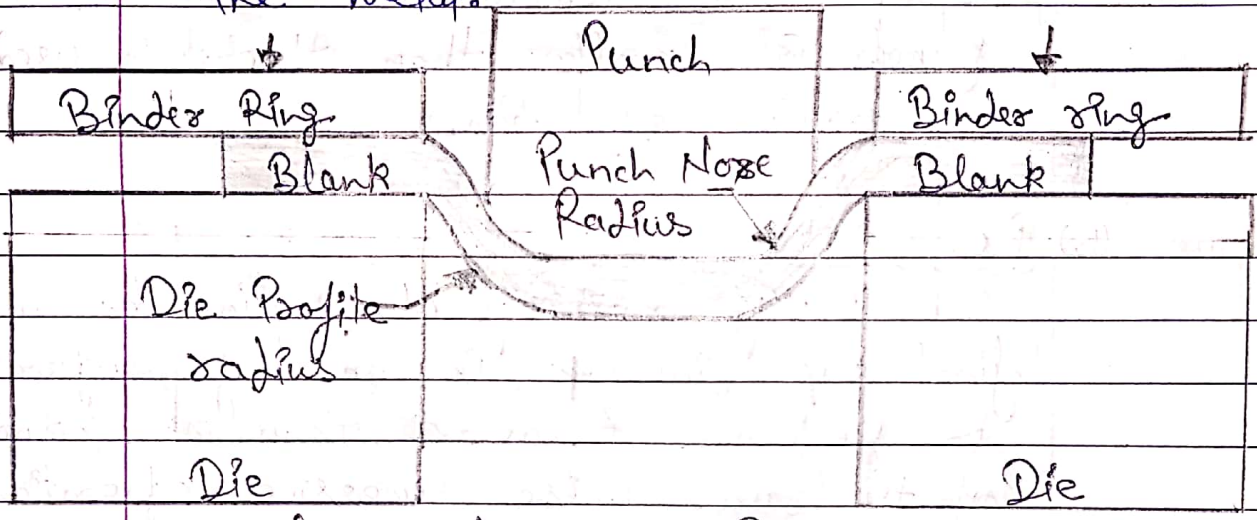

fig :- Method of Deep Drawing.

- Process starts with a flat sheet metal blank held on the upper surface of the die and center portion of the sheet is pressed by the stroke of the punch into the die cavity to take the desired shape and design by plastic deformation of sheet metal without collapsing the corners.
- This operation requires double action force.
- One force held the blank in its position while other forces punch the sheet into shape.

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*> Various Deep Drawing Operation :-

(a) Ironing :- This operation is used to reduce the thickness of the shell wall and smoothened the surface.

- This operation is similar to the drawing except that clearance blw the die and punch is smaller than that is used in drawing operation.

(b) Redrawing :-

- If ratio of blank diameter and final cup diameter is too large, operation is performed in more than one stroke of the ram. These sucessive operations are known as redrawing.

- The amount of reduction that may be affected at each operation depends upon various factors like quality of material, die edge radius, bottom radius, material, thickness, thickening allowed etc

(c) Reverse Drawing :-

- In this operation, a drawn cup is subjected to bending in the opposite direction to its originally drawn direction.

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* Defects in Deep Drawing Operation :-

(a) Earing :-

- It is the formation of ears or edges around the top of a drawn shell.

(b) Buckling :-

- It is uncontrolled deformation in perpendicular direction of the surface of a sheet due to compressive stress.
- Due to buckling, a bend, kink or other wavy condition may appear.

(c) Surface Scratch :-

- This occurs on the surface of a drawn cup.

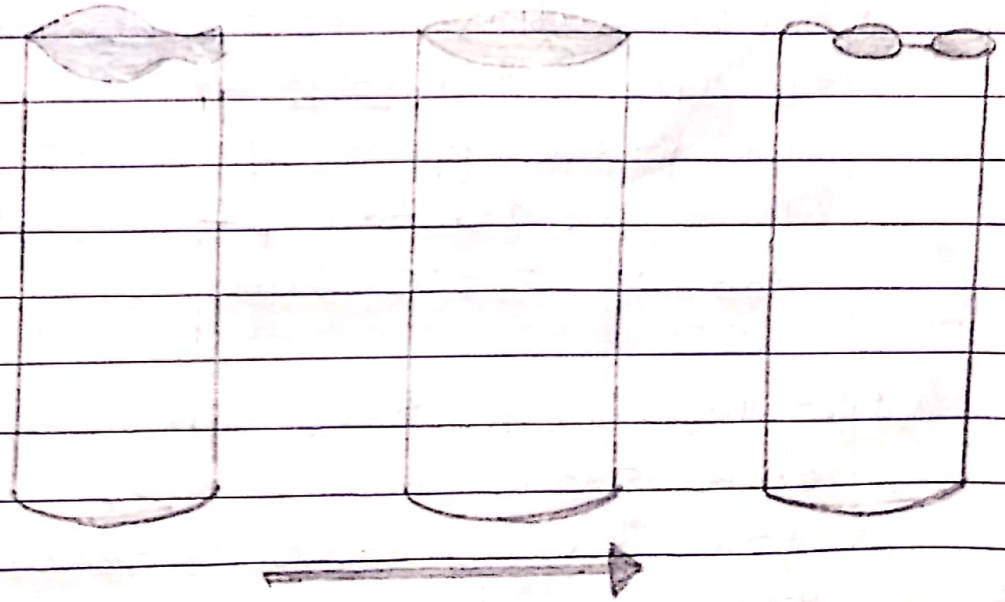

Fig :- Earing in cup drawing (the arrow indicate rolling direction)