"Assignment-2"

Date 05/01/22
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Shivalal

"Sheet Metal Work"

Introduction :-

Many Engineering and household articles such as hoppers, covers, boxes, cans, funnels etc are made from flat sheet of metal ; the process being known as tin smithy or Sheet Metal work.

Metals used in Sheet Metal work :-

(i) **Black iron sheet** :- It is cheapest, has bluish-black appearance. It corrode rapidly. It is used in articles that are to be painted like pans or stove pipes etc.

(ii) **Galvanized Iron** :- It is soft steel coated with molten zinc. It is used in pans, buckets funnels etc. It improves appearance of metal and resists rust.

(iii) **Copper** :- It is reddish coloured, good conductor and resist to corrosion. It is used in automobiles and domestic heating appliances etc.

(iv) **Tin** :- It is an iron sheet coated with tin to resist rusting. It is bright silvery in colour. It is used in food containers, cans and pans etc

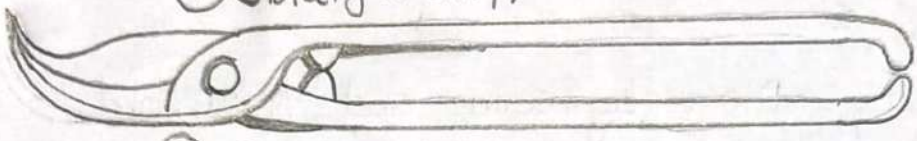
(v) **Aluminium** :- It is used in alloy form and becomes corrosion resistance. It is used in trays, household appliances etc.

(vi) **Stainless steel** :- It is alloy of steel with nickel, chromium and traces of other metals. It is used in kitchenwares.

Tools :-

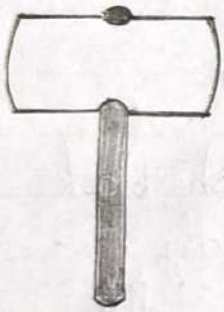
1

(i) Straight Snips



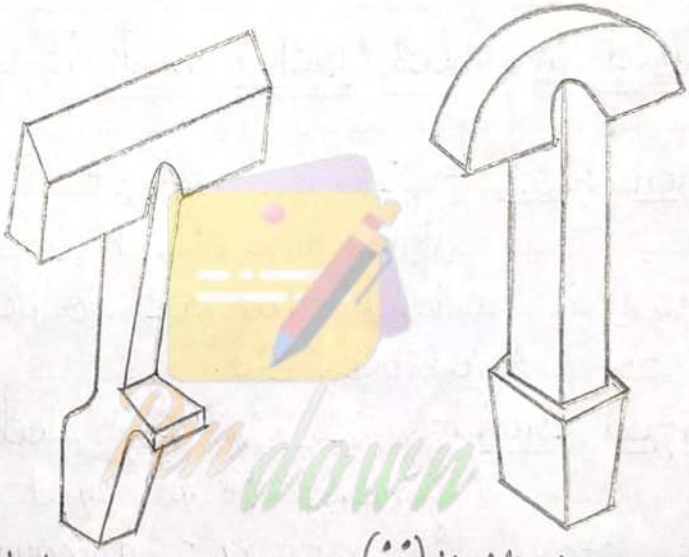
(ii) Bent Snips

2

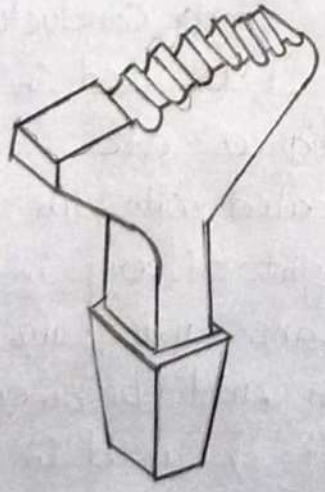


MALLET

3 Stakes

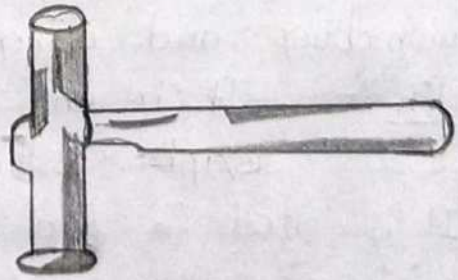


(i) Hatched Stake (ii) Half Moon Stake.



(iii) Creasing Stake

4



Raising Hammer

Tools required for sheet Metal work :-

① SNIPS :- Snips are hand shears. 200 mm and 250mm being the length are Commonly used.

(i) Straight Snip :- Used for cutting along straight lines and outside curves.

(ii) Curved Snip :- It is used for trimming along inside curves.

② MALLET :- It is used for bending and folding work. It is soft hammer, made of wood.

③ STAKES :- They are anvils, which are used as supporting tools. They are made from wrought Iron, faced with steel.

(i) Hatchet Stake :- Used to make straight and sharp bends.

(ii) Half Moon stake :- Used to fold edges of disc to create a base.

(iii) Creasing stake :- The slots in the square horn are used for bending and the round horn is used for forming Conical shaped pieces.

④ Raising Hammer :- It is used for denting the metal down to shape.

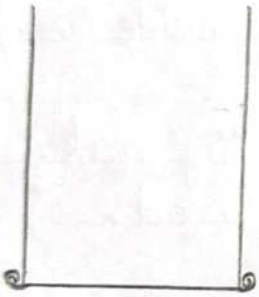
⑤ Miscellaneous Tools :- Bench vice, scribber, bent strip, gloves.

Sheet Metal Joints

① 

Lap Joint

② Grooved (Lock) seam

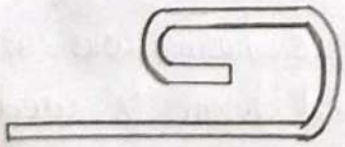
③ 

Single seam

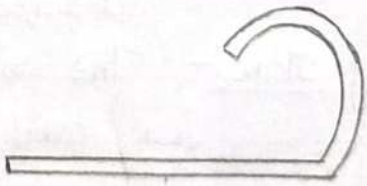
④ 

Double seam

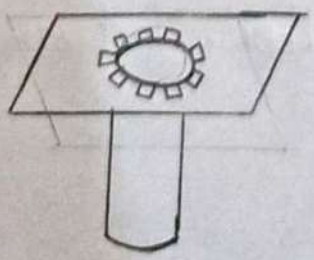
⑤ Hem



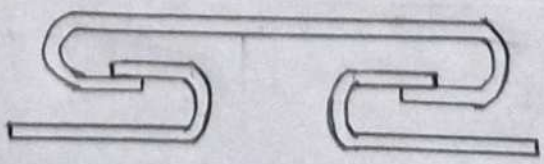
⑥ Wired Edge



⑦ Dove Tail seam



⑧ Cap Seam



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Sheet Metal Joints :-

Some Commonly used sheet metal joints are by folded edges, formed by joining together the two pieces of sheet metal and using the metal itself to form the joint. These joints are to be used on sheets of less than 1.6 mm thickness.

① **Lap Joint** :- This Consist one edge lapping over the other and joint is made by soldering or riveting.

② **Grooved Seam** :- It is made by hooking two folded edges together and then off-setting the seam.

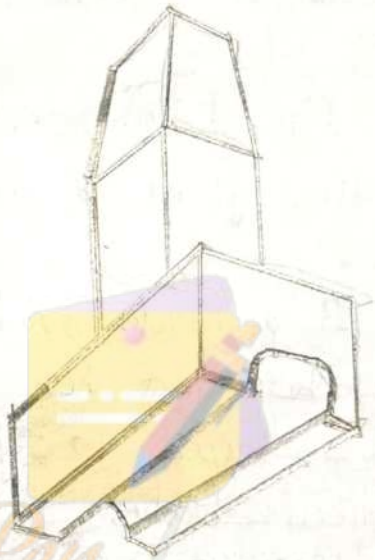
③ **Single seam** :- It is used to join a bottom to a vertical body.

④ **Double seam** :- It is similar to single seam with the difference that the formed edge is bent upward against the body.

⑤ **Hem** :- It is made by folding the edge to make it smooth and stiff.

⑥ **wired edge** :- It consist of an edge which has been wrapped around a piece of wire. This edge is used when more strength is needed.

⑦ **Other joints** :- Cup or Circular, locked seam, Flanged, Angular, Cap etc.



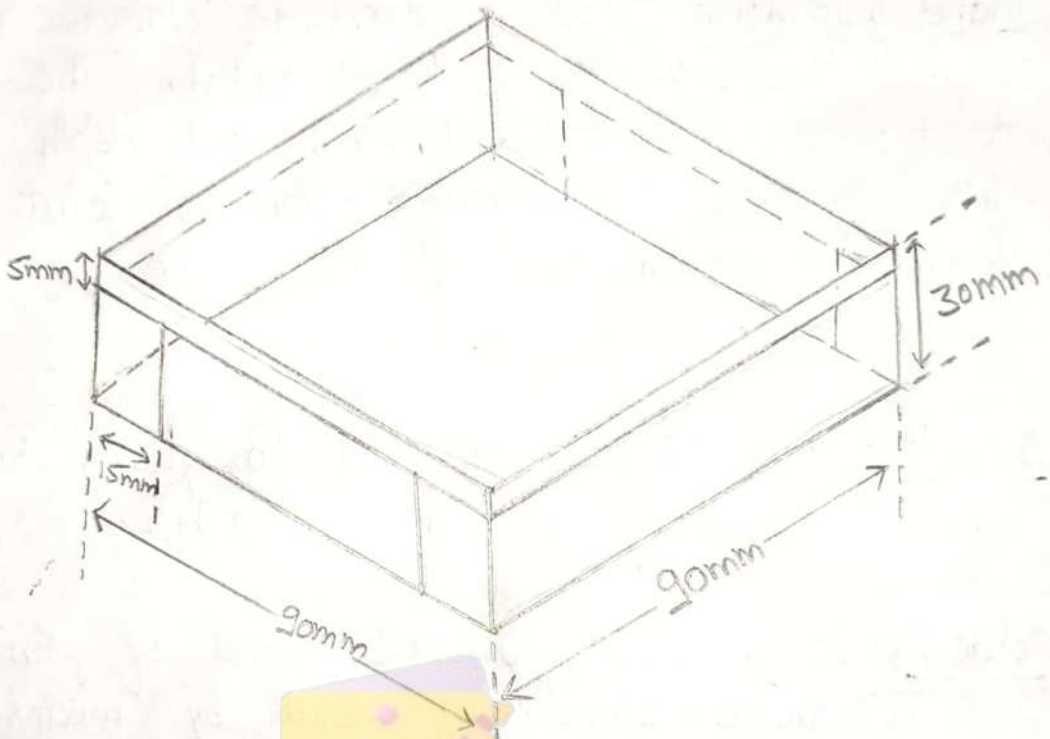
Hand Groover

Hand Groover :- It is used to flattern and shape joints made in sheet metal. The tool has a groove of required width and depth like a die. This groover is placed over the joint and hammered from the top to shape.

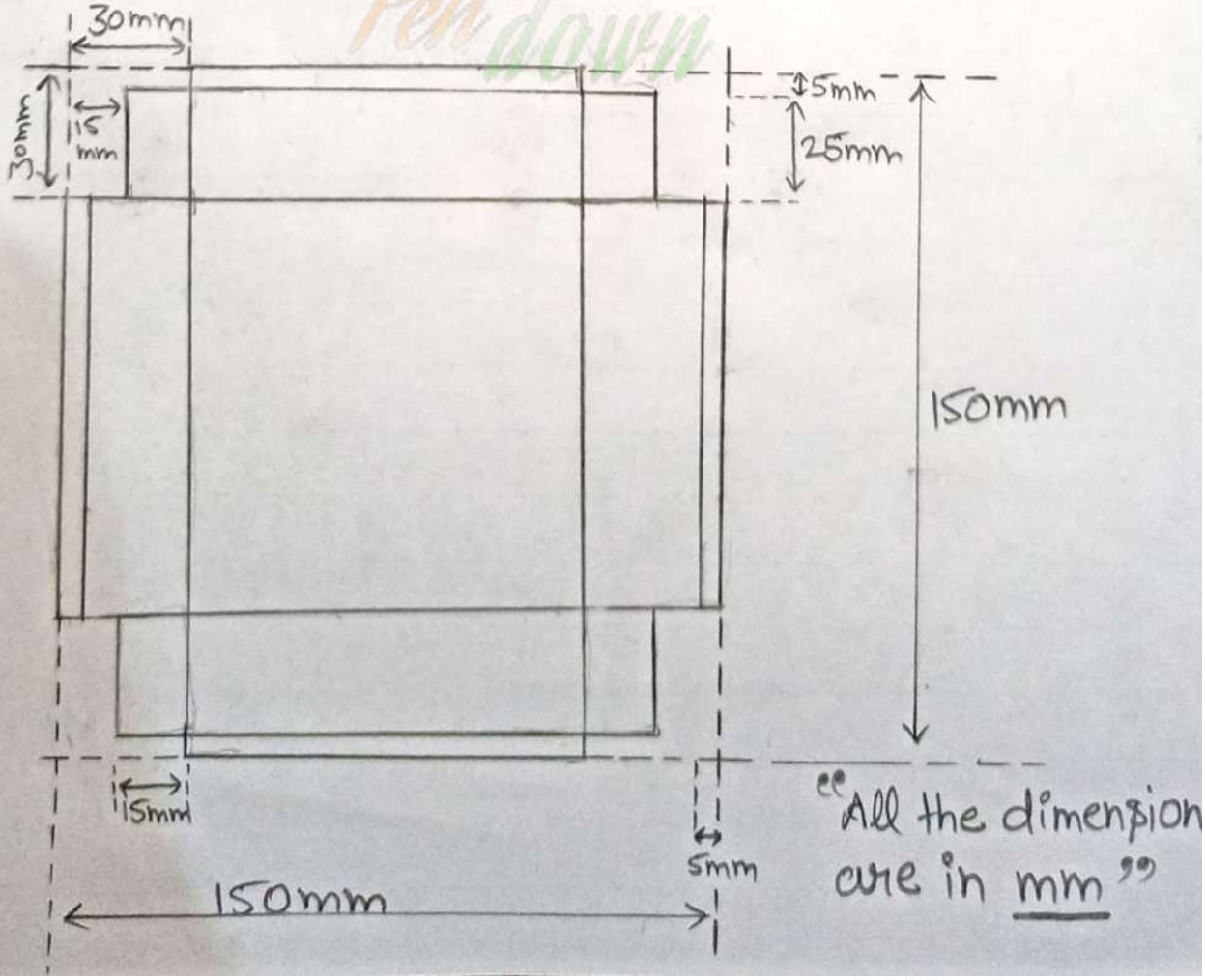
Riveting :- Rivets are used to fasten two or more sheets of metal together.

Soldering :- Soldering is a method of joining two or more pieces of metal by means of fusible alloy, called solder. applied in molten form.

"SQUARE TRAY"



"Development of square Tray"



"All the dimension are in mm"

MODEL NO: 1
"SQUARE TRAY"

Aim :- To make a square tray as per given dimensions.

Material Required :- G.I sheet of size 150 X 150 mm of 26 swg.

Tools Required :- Steel rule, Mallet, Scriber, Straight Snips, Bench Shear, Try square, Anvil.

Procedure :-

S.No	operation	Description	Tools used
1)	Laying out and marking	The marking on the sheet is done for cutting by drawing layout of the work material.	Steel rule, Marker or pencil.
2)	Cutting, Notch cutting	Cut the sheet along marked lines. Check the straightness of edges with the help of try square	Straight Snips. Try Square
3)	Bending, Hemming.	Do all bending operations to get the square as vertical side.	Mallet and stake.

		Bent all edges to avoid sharp corners and edges for safety.	
4)	Finishing	Straighten the four sides and then finish the model Check all the dimensions and finish.	Steel Rule and Try square to check dimensions.

Result :- The square tray of desired dimension is obtained.

Precautions :- ① Cut the sheet accurately.
② Joint should be made accurately so it doesnot open
③ Use gloves to avoid cuts.