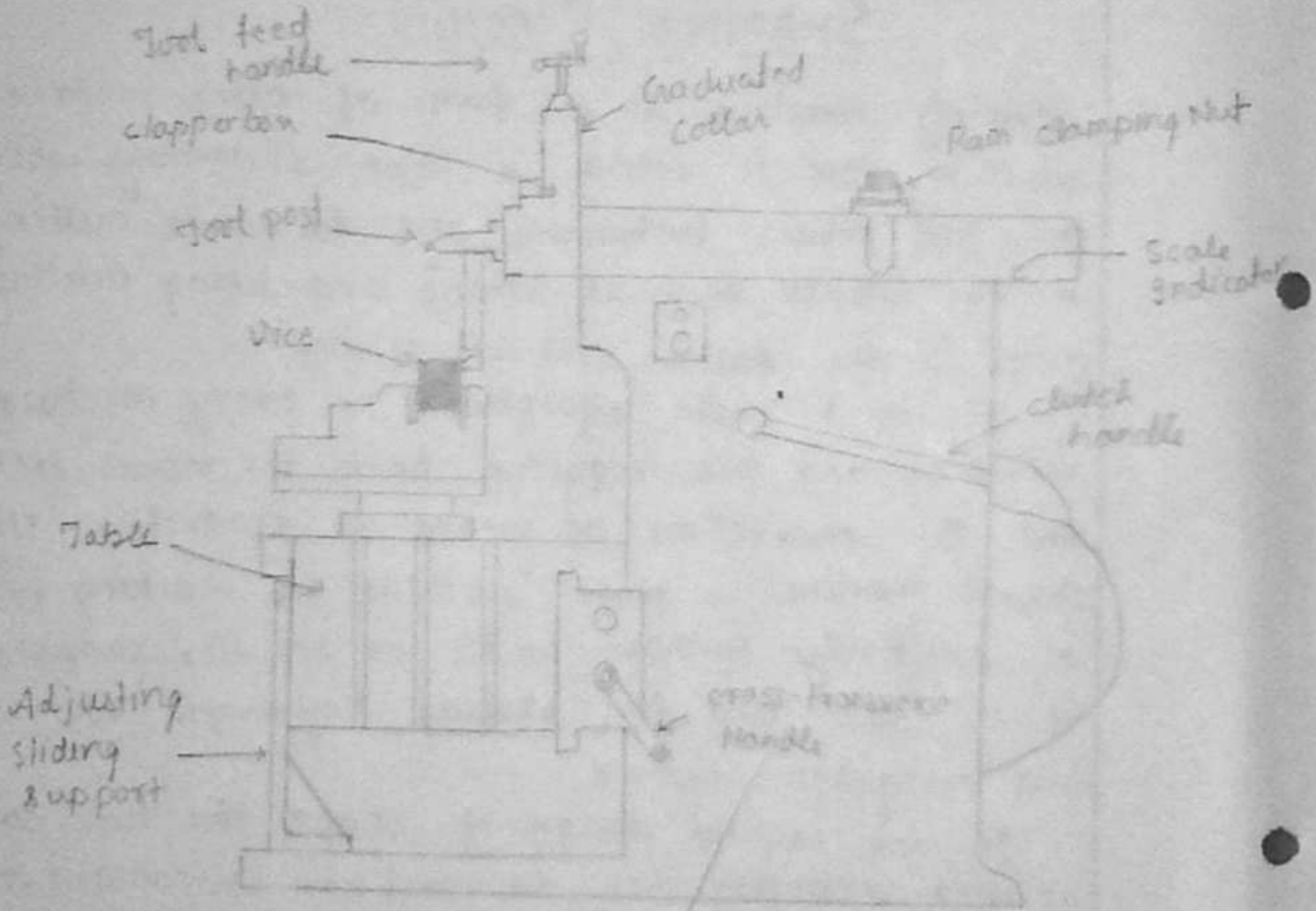
SHAPING MACHINE

Shaping machine is a form of plane surface machine tool in which is kept stationary whilest the tool moves backwards and forwards. cutting on the slower forward stroke and lifing practicall clear on the faster return stroke.

It is a basic equipment of every mechanica workshop and are required both the repair sector and the construction of means of production. The shaping machine is more suitable for maching surfa of relatively narrow width or smaller surfaces. It is also used for shaping keyways. vee slid and irregular sections.

In the actual design of shape the tool can adjusted vertically for the tool box is carried on Slide that can be moved up and down a vee-typ Slide by means of screw and nut arrangement. The table may also be adjusted vertically and sidew in the horizontal sence; There is also an arrangem for giving the horizontal hand or automatic feed

Its cut is analogus to that of a lathe exce that it is linear insted of helical.



SHAPER MACHINE

Aim → To prepare a semicircular ruf key of the mild steel material.

Materials Required:

One cylinderical mild steel work piece of dimension 45 L x 45 ϕ.

Tools & Equipments:-

- Spanner
- chuck key
- Packing
- Cutting tools
- Vernier calliper
- Shaper handle
- Sly range
- Spirit level
- Tool holder with single point cutting
- Marking tool block
- Block.

Theory:-

Types of Shapers:-

Shaper are classified in a number of ways based on general features of design or purpose for which they are intended. Shapes are classified as under

1) According to type of mechanism used for giving reciprocating motion to the ram:-
   a) Crank type b) Geared type c) Hydraulic type
2) According to the position and travel of ram:-
   a) Horizontal type. b) Vertical type c) Traveling head type.
3) According to type of design of table
   a) Standard shaper b) Universal shaper
4) According to type of cutting stroke:- a) Push type
   b) Draw type

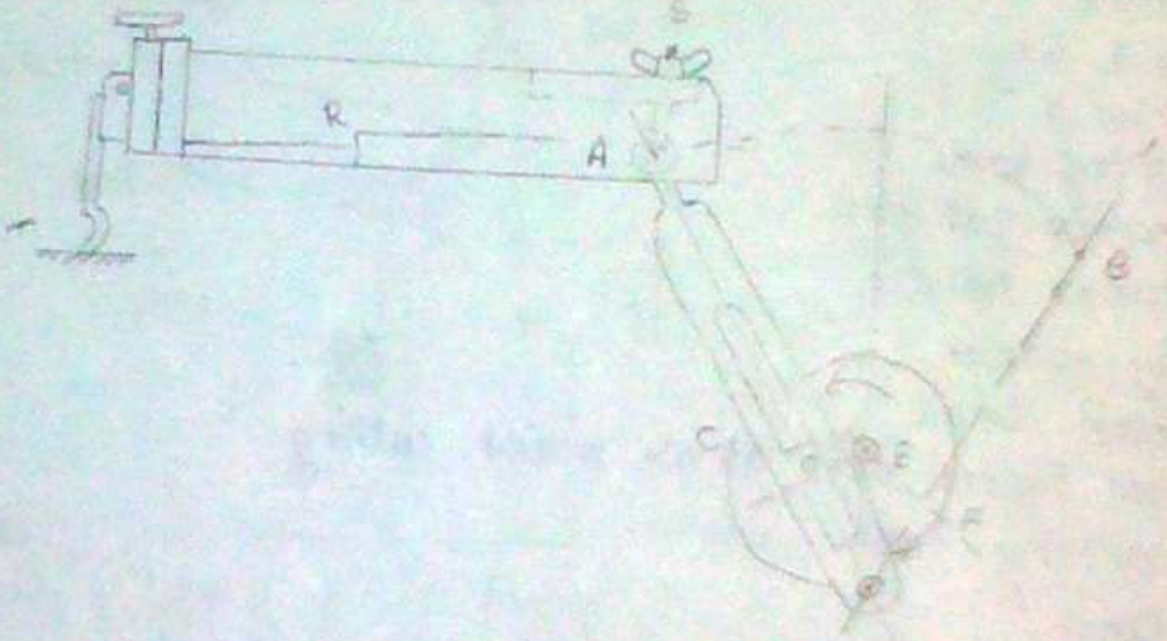


Diagram of Mechanism of shaping machine

Working Principle

The stroke of the cutting tool is made variable in order to deal with different widths of work. The usual arrangement of shaper mechanism is as shown (on left). In this case the ram, which consists of a dovetailed sliding unit R carrying at one end and cutting Tools T, derives its reciprocating motion from a swinging arm AB through the medium of a pin C which is rotated about the centre E of a revolving disc. The slotted arm AB has a fixed bearing at B and a pin bearing at A. The pin C of the disc works in a rectangular block which can slide in the slot of the arm AB. The arm AB is shown at the extreme left-hand side of its travel. The extreme right hand position is indicated by dotted position B.

As shown the ram has just completed its slow forward stroke. On the return idle stroke the uniformly rotating driving disc will move the arm at the its maximum speed. For the angle through which the disc rotates, viz CEF is smaller than the angle (360°-CEF) corresponding to forward stroke. The ram therefor moves back more quickly that it moves forward.

Provision is made by means of the adjusting screw S to move the ram bodily in relation to the pin bearing A in order to shift the starting position of the tool to suit different jobs.

Parts of Shaping Machine

Base :- The base is the necessary bed or support required for all machine tools. The base may be rigidly bolted to the bench according to the size of machine.

Column :- The column is a box like casting mounted upon the base. It encloses the ram driving mechanism. Two accurately machined guide ways are provided on the column on which the ram reciprocates.

Cross-rails :- The cross-rails is mounted on the front vertical guide ways of its column. It has two parallel guide ways on its top in the vertical plane that are perpendicular to ram axis.

SADDLE - It is mounted on cross rail which holds table firmly on its top.

Table :- The table which is bolted to the saddle receives cross wise and vertical movements from the saddle and cross-rail.

Ram :- It is the reciprocating member of the shaper. This is semicylindrical in form and heavily ribbed inside to make it more rigid.

Tool head :- It holds the tool rigidly, provides vertical and angular feed movement of tool and allows the tool to have an automatic relife during return slide stroke.

PROCEDURE :-

i) Firstly different lathe operations were performed on the specimen (facing)
ii) Facing is done on lathe machine to get correct dimension of specimen
iii) Then specimen was placed on machine vice it holds specimen tightly.
iv) Spirit level was used to check if the position of object was correct or not

v) Shaper has a holder where single point cutting t
was placed in clapper box.
vi) The apron clamping bolts were tightend to hold
holder firmly
vii) Then ram was made to move back and forth
giving supply
viii) Initially the parallel mechanism was carefully
observed and handled
ix) In this way, the specimen was made into a wood
chuck key
x) The metal of specimen was removed in forward
stroke but while returning no metal was remo
and it was quicker so it is called Quick return mech

PRECAUTIONS

i) As the cut metal pieces are hot, it should be
that they don't come in contact with body.
ii) Apron should be worn
iii) shoes should be worn.
iv) Anyone shouldn't stand infront of the machine.

CONCLUSION :-

Thus a semi circular wooden ruff Key w
Prepared by the use of shaping machine and
finally submitted to concerned teacher.