PLANER MACHINE

PRESENTATION ON PLANER MACHINE

PLANER

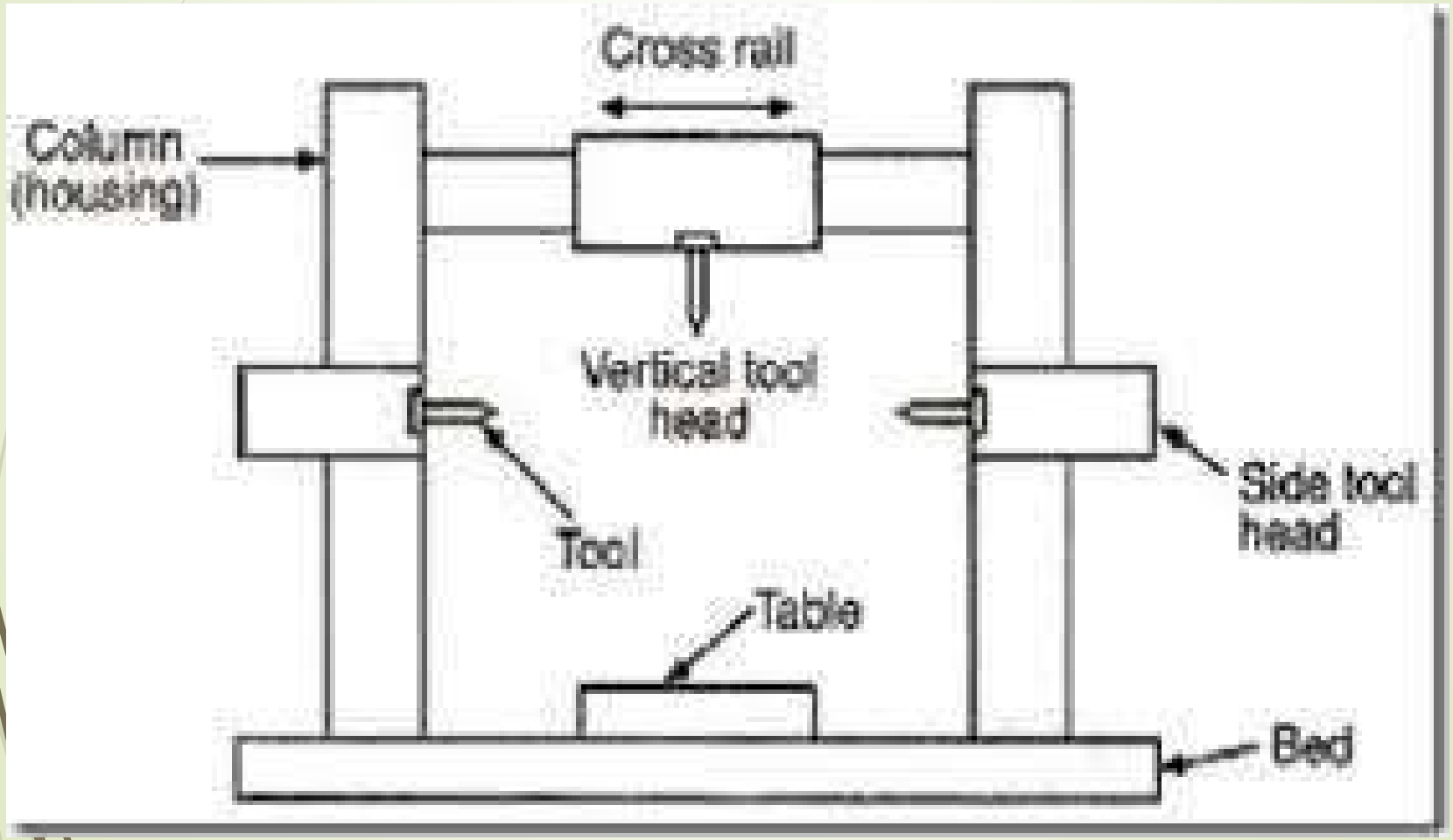
Planer is machine that use to generate accurate flatsurfaces and cutting slots.

- It is similar to a shaper, but it is larger than shaper machine.
- and with the entire workpiecemoving beneath the cutter,
- The work table is moved back and forth on the bed beneath the cutting head either by mechanical means, such as a rack and pinion gear, or by a hydraulicsystem.

PLANING MACHINE PARTS

- BED
- TABLE
- COLUMN
- CROSS RAIL
- TOOL HEAD

PARTS OF PLANER



BED

- Bed of a planer is large in size and heavy in weight
- It supports the column and all other moving parts of machine
- It is made slightly longer than twice the length of the table so that the full length of the table may be moved on it.
- There is a v shaped ways on the bed which help to reciprocate or back and forth motion to the table.
- Smooth movement need to proper oil on table and bed v shape surface so oil is provided by oil reservior.

TABLE or PLATEN

- Table supports the work and reciprocates along the bed
- Table is made from good quality cast iron
- The top face of the table is accurately finished in order to locate the work correctly
- T-slots are provided on the entire length of the table so that the work and work holding devices may be bolted upon it.

COLUMN

- These are rigid box like vertical structure placed on each side of the bed and table.
- They are heavily ribbed to trace up severe force due to cutting.
- It also facilitate tool head mechanism.
- The cross rail may be made to slide up and down for accommodating different heights of work

CROSS RAIL

- It is rigid box- like casting connecting the two columns
- It may be raised or lowered on the face of housing and can be clamped at a desired position by manual or electrical clamping devices
- It should remain absolutely parallel to the top surface of the table

TOOLHEAD

- According to construction it is similar to the shaper machine tool head.
- Tool heads are mounted on the cross rail by saddle
- The saddle may be made to move transversely on the crossrail to give cross feed.
- The clapper block is hinged at hinge pins to the clapper block and it holds the tool post in which the tool is clamped by straps

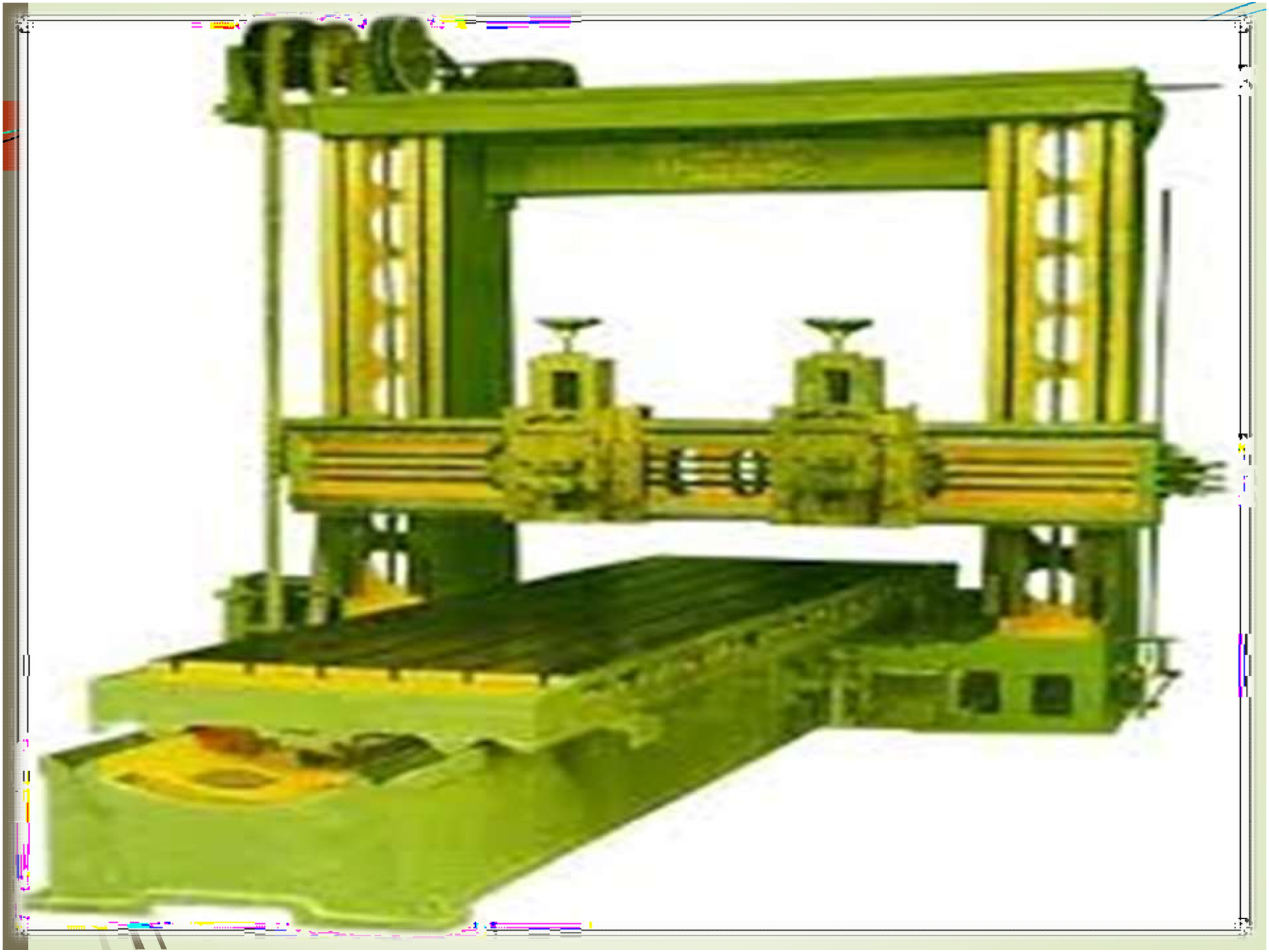
CLASSIFICATION OF PLANER

Planer are generally divided into 3 types

- Double housing planer.
- Opens side planer.
- Divide type planer.

DOUBLE HOUSING PLANER

- It is very old systemmachine.
- Massive bed on which worktablereciprocates
- A planer having two housings to support the cross rail, with two heads on the cross rail.
- Twovertical columnson which two tool head slides
- Cross rail fitted between two columns and carries one or two heads slides horizontally.



OPEN SIDE PLANER

- It consist of onevertical column may be mounted on the cross rail
- column and cross rail consist of single and double tool head
- Used for the machining of wide workpieces

DIVIDE TYPE PLANER

- it also called tandemplaner.
- Consist of twoworktable.
- Used for continuous mass production.
- On one table the workpiece is being machined and on the other tablework piece is on standby.
- Two table are also join together when needed.

DIVIDE TYPE PLANER

PLANNING OPERATION

- Operation that is performed in planer are similar to that of a shaper. The only difference is that a planer is specially designed for planning large work, whereas a shaper can machine only small work . The common types of work machined in a planner are bases and table of all kinds of machine tools ,large structure, frames of different engines and identical pieces of work which may be small in size but large in number.

OPERATION ON PLANER

- PLANING FLAT HORIZONTAL SURFACES.
- PLANNING VERTICAL SURFACES

PLANNING HORIZANTAL SURFACES

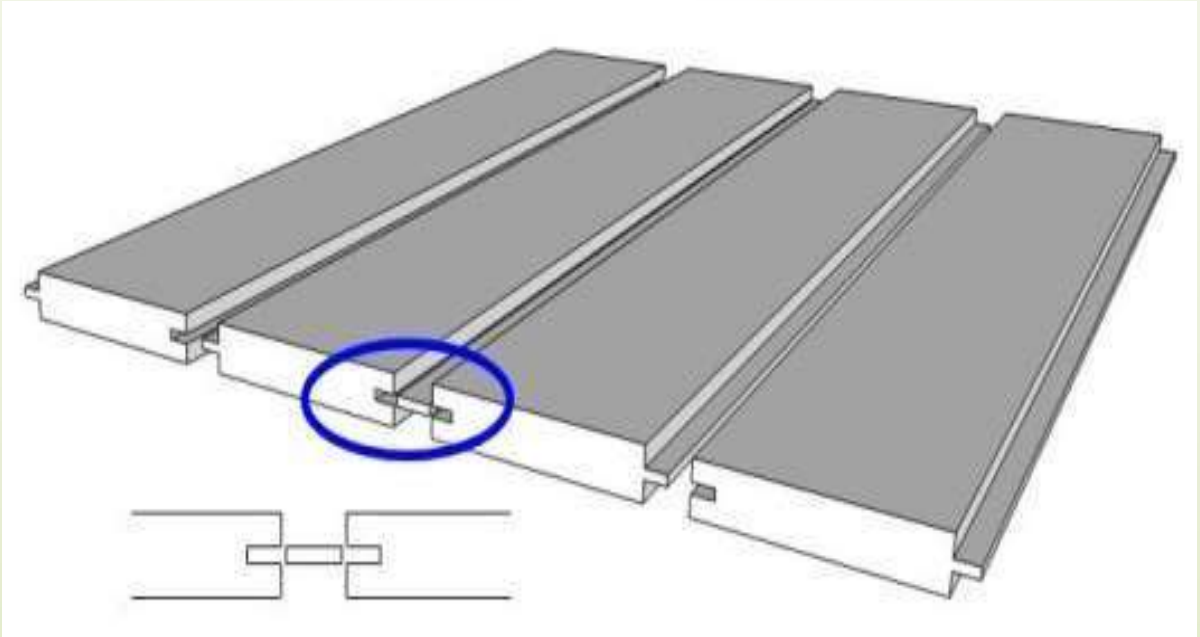
- While machining horizontal surface, the work isgiven a reciprocating movement along with the table and tool is fed crosswise to complete the cut. Both the railheads may be used for simultaneous removal of the metal from two cutting edges.

PLANNING VERTIAL SURFACE

- The vertical surfaces of a work is planed by adjusting the saddle horizontally along the cross rail until the tool is in a position to give the required depth of cut. The vertical slide is adjusted perpendicular to the planer table and the apron is swivied in a direction so that the tool will swing clear out of the machined surface during the returnstroke.

Planning slots or grooves

- Slots or grooves are cut by using slotting tools .the operation is similar to that of a shaper



TOOLS

They are general similar in shapes and tool angles to those used on a lathe and shaping machine

- As a planer tool has to take up heavy cut and coarse feed during a long cutting stroke , the tools are made heavier and larger in crosssection.

- Planers tools may be forged type or bittype.
- Bits are made of high speed steel, satellite or cemented carbide and they may be brazed.
- Cemented carbide tipped tools are used for production work.
- A planer tool may also be classified as right hand or left hand and roughing or finishing.

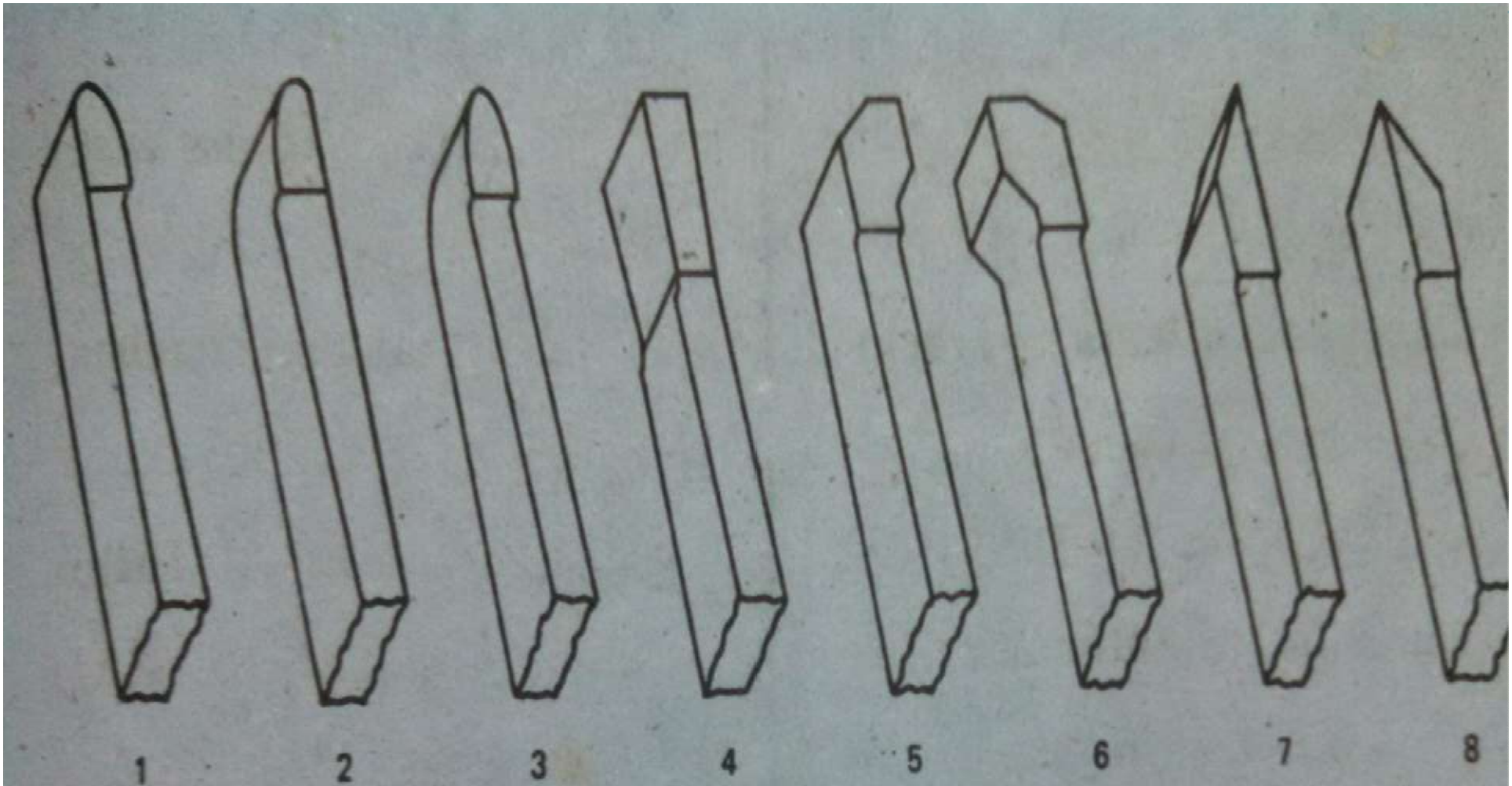


Fig. 8.15 Solid planer tools.

1. Right hand roughing tool
2. Left hand roughing tool
3. Round nose roughing tool
4. Square-nose roughing tool
5. Right hand side cutting tool
6. Left hand side cutting tool
7. Right hand dovetail tool
8. left hand dovetail tool

IMPORTANT POINTS

- CUTTING SPEED
- FEED
- DEPTH OF CUT

CUTTING SPEED

- The cutting speed of a planner is the rate at the metal is removed during the forward cutting stroke.
- It may be 6,9,,12 and 15 m/minute
- And returning stroke speed is 20,30,40,and 50ft/minute

- C.S = N.L/600 (m/min) in metric system
- C.S = N.L/7.2 (ft/min) in British system

- N = no. of stroke , L = length of stroke

Cutting feed

- The feed in planning machine is the distance the tool head travels at the beginning of each cutting stroke expressed in mm per double stroke.

Depth of cut

- It is the thickness of metal removed in one cut and is measured by the perpendicular distance between the machined and no machined surface expressed in mm.
- The depth of cutting and the feed rate are always dependent on materials of tool and work piece.

MACHINNING TIME

- The cutting speed ,feed , length of cutting stroke , breadth of the job and number of double strokes per minute for a planer operation are known , the machining time required for one complete cut may be calculated.

- Time = W/F.N
- F = feed per stroke.
- N = no. of stroke per minute

Difference b/w planer and shaper

Shaper machine	Planer machine
In shaper ram moves in reciprocating and back and fourth	Platen/table reciprocates moves and also moves back and fourth
In shaper cutting tool moves back and forth	In planer work piece moves in back and forth
Used for the machining of small jobs	Used for the machining of large jobs
Each stroke of cutting tool ,gives the feed in crosswise.	In Each stroke of Platen or work piece feed are given by feed screw.
For the adjustment of Ram stroke crank mechanism are used	For the adjustment of platen gears and rack mechanism are used
Only one tool are used	Two or more tools are used
In shaper cutting speed ,feed range are in wide range	In planer machine cutting speed , cutting feed are limited

SAFTEY

- Protect the machine from burrs and irregularities of work pieces
- Leveling of machine table should of the maintained properly
- Use of crane in fixing the work piece should be done properly.
- For the surfacing work the tool head is set vertically . Appropriate tests shoulds be carried out for the same


THANK YOU