

⑤ Tool Head :- Tool heads are mounted on the cross-rail by saddle. The saddle may be made to move transversely on the cross rail to give cross feed. The clamped block is hinged at hinge pins to the clapper block and it holds the tool post in which the tool is clamped by straps.

### Work Holding devices used in Planner

- a) Heavy duty vices
- b) T-bolts and Clamps
- c) Stop blocks, T-bolts and Clamps
- d) Proppets on stop pins and dogs
- e) Angle plates.
- f) Planer centers.
- g) Planer Jacks.
- h) V-blocks.
- i) Stops.

### Planer Tools

- a) Right hand, left hand - Straight roughing tools.
- b) Right hand, left hand - Bent roughing tools.
- c) Straight, Round nose, square nose and goose neck - Finishing tools.
- d) Grooving or slotting tool
- e) T-slot cutting tool
- f) Dovetail slide cutting tool

## Specification of a Planer

1. Number of speeds and feeds available.
2. Power Input
3. Floor space required
4. Net weight of the machine
5. Type of drive.

## Cutting Parameters of Planer machine

→ Cutting speed :- It is the rate at which the metal is removed during forward cutting stroke and is expressed in m/min.

→ Feed :- It is the distance the tool head travels per double stroke at the beginning of each cutting stroke and is expressed in mm.

→ Depth of cut :- It is the thickness of metal removed in one cut. It is measured by the perpendicular distance between machined and unmachined surfaces of the work. It is given in mm.

## Planer Operations

1. Planing Horizontal Surfaces.
2. Planing Vertical Surfaces.
3. Planing curved surfaces.
4. Planing slots and grooves.
5. Planing at an angle and machining dove-tails.
6. Planing a helix.
7. Gang or multiple planing.

## Difference b/w planer and shaper

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### Shaper machine

1. In shaper ram moves in reciprocating and back and forth.
2. In shaper cutting tool moves back and forth.
3. Used for the machining of small jobs.
4. Each stroke of cutting tool gives the feed in cross wise.
5. For the adjustment of Ram stroke crank mechanism are used.
6. Only one tool are used.
7. In shaper cutting speed, feed range are in wide range.

### Planer machine

1. Platen/table reciprocates moves and also moves back and forth.
2. In planer work piece moves in back and forth.
3. Used for the machining of large jobs.
4. In each stroke of Platen or work piece feed are given by feed screw.
5. For the adjustment of platen gears and rack mechanism are used.
6. Two or more tools are used.
7. In planer machine cutting speed, cutting feed are limited.

Slotter Machine :- Slotting machine (slotter) is a reciprocating type of machine tool similar to a shaper or a planer machine. It may be considered as a vertical shaper. The main difference between a slotter and a shaper is the direction of the cutting action. The slotting machine operates in a manner similar to the