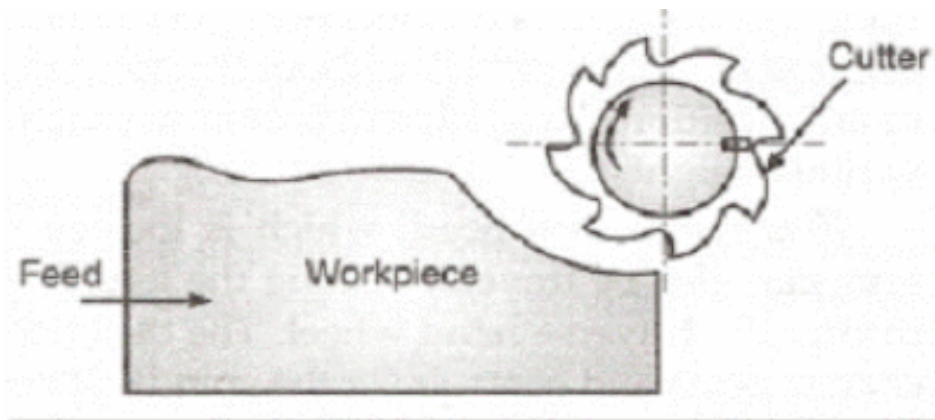


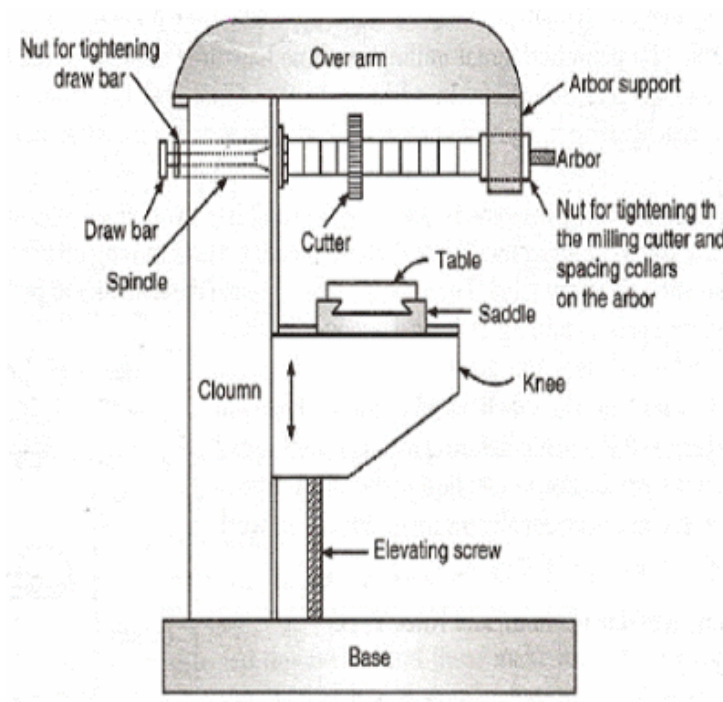
Milling Machine

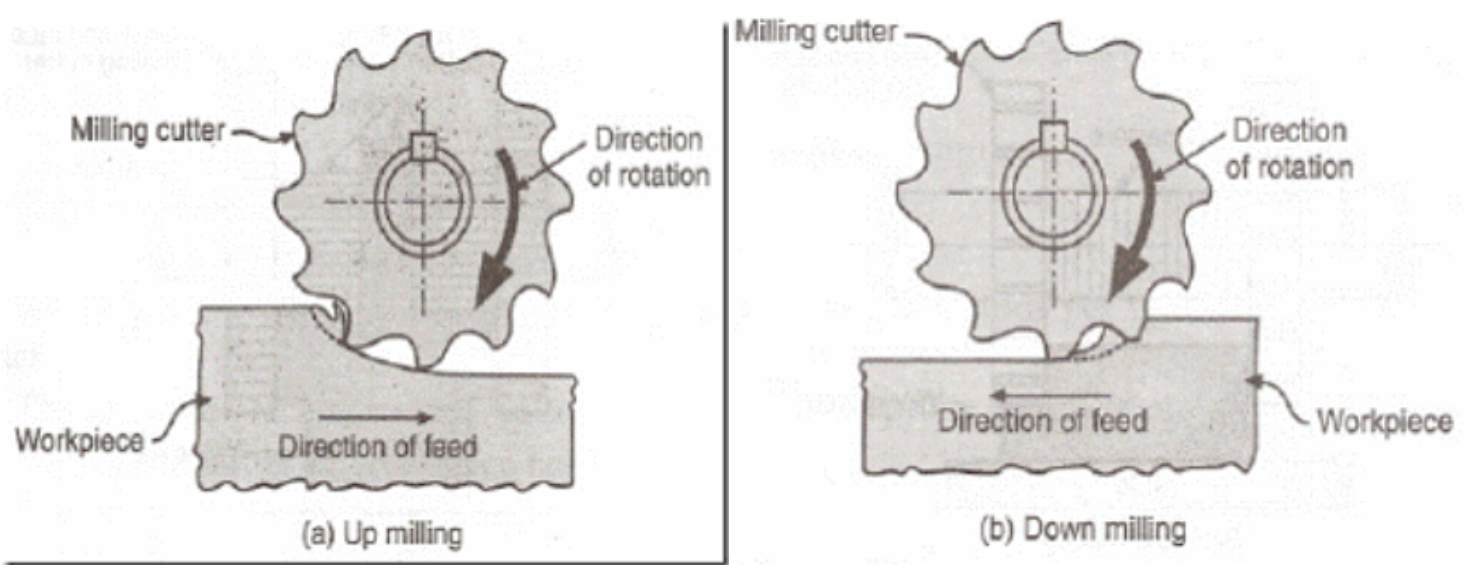
Introduction: Milling is the cutting operation that removes metal by feeding the work against a rotating, cutter having single or multiple cutting edges. Flat or curved surfaces of many shapes can be machined by milling with good finish and accuracy. A milling machine may also be used for drilling, slotting, making a circular profile and gear cutting by having suitable attachments.

Working Principle: The workpiece is holding on the worktable of the machine. The table movement controls the feed of workpiece against the rotating cutter. The cutter is mounted on a spindle or arbor and revolves at high speed. Except for rotation the cutter has no other motion. As the workpiece advances, the cutter teeth remove the metal from the surface of workpiece and the desired shape is produced.



Horizontal Milling Machine Construction: The main part of machine is base, Column, Knee, Saddle, Table, Overarm, Arbor Support and Elevating Screw.





1. Base: It gives support and rigidity to the machine and also acts as a reservoir for the cutting fluids.

2. Column: The column is the main supporting frame mounted vertically on the base. The column is box shaped, heavily ribbed inside and houses all the driving mechanisms for the spindle and table feed.

3. Knee: The knee is a rigid casting mounted on the front face of the column. The knee moves vertically along the guide ways and this movement enables to adjust the distance between the cutter and the job mounted on the table. The adjustment is obtained manually or automatically by operating the elevating screw provided below the knee.

4. Saddle: The saddle rests on the knee and constitutes the intermediate part between the knee and the table. The saddle moves transversely, i.e., crosswise (in or out) on guide ways provided on the knee.

5. Table: The table rests on guide ways in the saddle and provides support to the work. The table is made of cast iron, its top surface is accurately machined and carries T-slots which accommodate the clamping bolt for fixing the work. The worktable and hence the job fitted on it is given motions in three directions:

a). Vertical (up and down) movement provided by raising or lowering the knee.

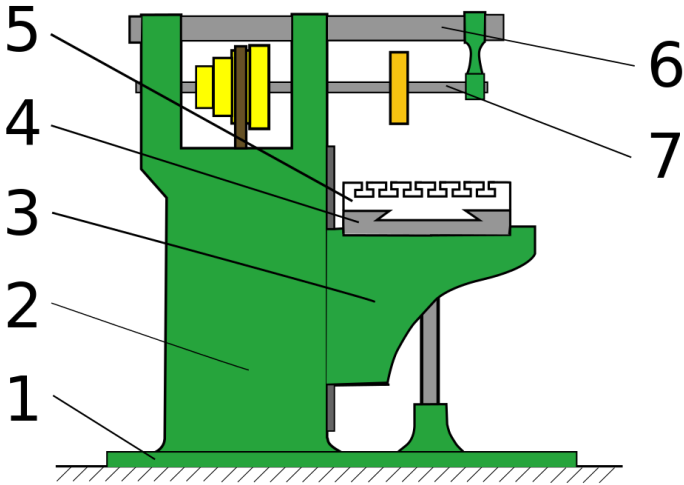
b). Cross (in or out) or transverse motion provided by moving the saddle in relation to knee.

c). Longitudinal (back and forth) motion provided by hand wheel fitted on the side of feed screw.

In addition to the above motions, the table of a universal milling machine can be swiveled 45° to either side of the centre line and thus fed at an angle to the spindle.

6. Overarm: The Overarm is mounted at the top of the column and is guided in perfect alignment by the machined surfaces. The Overarm is the support for the arbor.

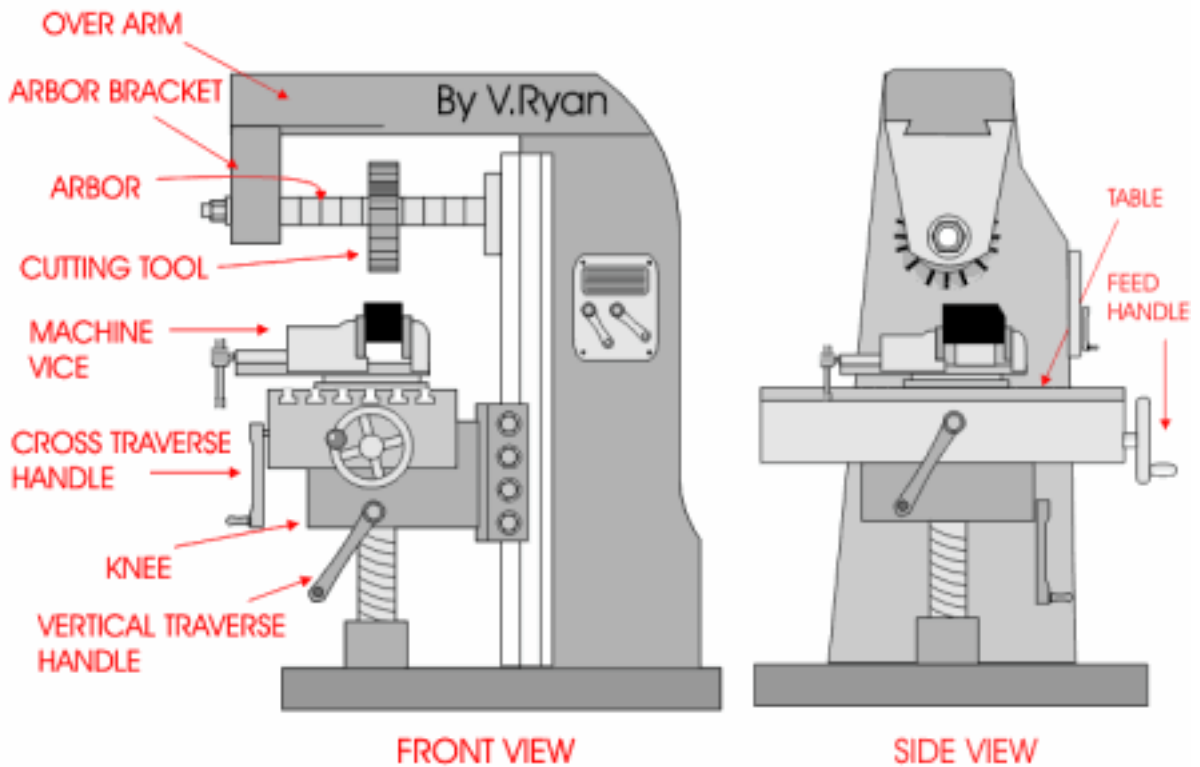
- 7. Arbor support: The arbor support is fitted to the Overarm and can be clamped at any location on the Overarm. Its function is to align and support various arbors. The arbor is a machined shaft that holds and drives the cutters.
- 8. Elevating screw: The upward and downward movement to the knee and the table is given by the elevating screw that is operated by hand or an automatic feed.



Labels same as fig. 1



Figure 2



Milling machine animation

