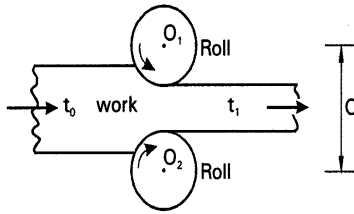


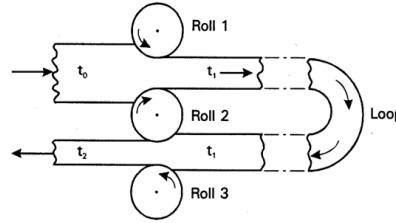
CLASSIFICATION OF ROLLING BASED ON THE ARRANGEMENTS

Two high mill

It consists of two rolls located one above the other with their centers in vertical plane. A controlled opening or gap is provided between the rolls. This gap represents the required thickness of the product. The rolls are cylindrical and mounted on bearings. They are driven by motor and rotate in opposite directions as shown.



Two high mill



Three High roll Mill

The rolling direction can be changed by changing the direction of rotation of the rolls.

The center distance between the rolls (C) can be changed to change the roll gap to vary the thickness of the product. This is mainly used for producing blooms and billets.

Three high mill

The arrangement Consists of three rolls located one above the other, with their centers in a vertical plane. Outer rolls will be rotating in one direction and the center one will be rotating in the opposite direction. Here two passes of the work is possible unlike one pass in two roll mill. Work piece is fed between the gap of top set of rolls and its thickness is reduced. The out put of this is fed into the gap between the bottom set of rolls.

One reduction in thickness of the work piece is obtained. Thus rolling will take place in both directions. Since the out put of one is taken and fed into the second set of rolls, the work forms a loop as shown. Hence, it is also named as looping mill.

The mill has higher out put. Gap between roll1 and roll2= t_1 and between roll2 and roll3= t_2 . Where $t_1 > t_2$

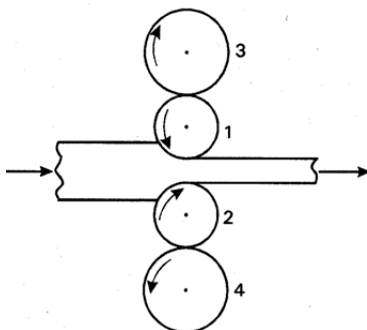
Four high mill

Here four rolls are used.

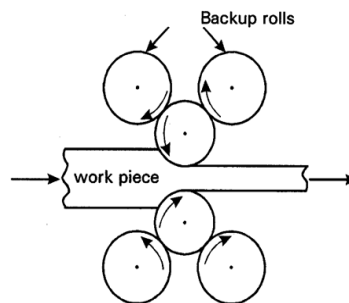
Two smaller form the main rolls and come in contact with the work piece and cause deformation. These rolls are backed up by larger diameter rolls.

Thus the mill is more rigid and can be used for higher reductions in the work.

Back up rolls prevent roll deflection.



Four high mill



Cluster Mill

Cluster Mill

Here the main rolls are small and are backed up by two sets of rolls on each side. Higher rigidity and stability is imparted to the mill. Higher reductions are possible. Better deformation will take place.

Planetary Mill

Here the large roll has very small rolls located along the circumference. A number of them will be arranged on each roll of a virtually two high roll mill. The arrangement looks like planets on the rolls.

Hence, the name planetary mill. In fact the small rolls come in contact with the work piece and the big roll act as back up roll.

Higher reduction of the order 25:1 is possible in one pass.

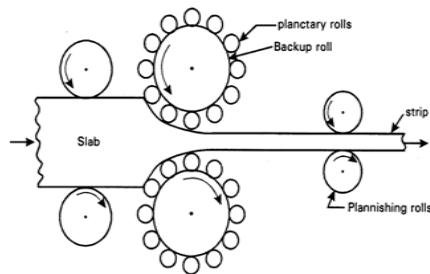
The mill provides forging action as well as rolling action at the same time.

There will be two high mill at the beginning feeding the work piece to the planetary mill.

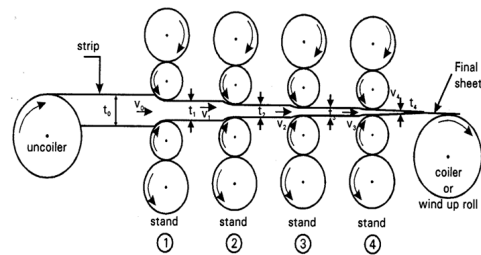
At the out let end there will be another set of two high mill to take the out coming work.

This arrangement provides roll tension at the beginning and at the out let.

The mill is mainly used for converting slab to sheet or strip.



Planetary Mill



Tandem Mill

Tandem Mill

A series of four high mills are used one after the other.

The work piece passes through each one of them.

Reduction in the thickness will take place at each point. Each one of the mill is referred to as stand.

There may be as many stands as necessary.

This arrangement is referred to as "Tandem Mill".

Continuous reduction will take place at each stand.

There will be coiler and uncoiler which provides winding up of the work at the out let end and act as feed roll by releasing the work piece. Normally this arrangement is used for converting thick sheet to very thin sheet and is a cold roll mill. Coiler and **uncoiler**

provide the necessary tension in the work piece. Very smooth and good surface is obtained in the work piece.

Sendizmer Mill

It is basically a cluster mill.

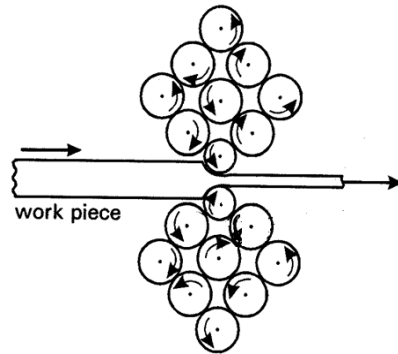
It is used to produce thin sheets and foils.

Very strong metals can be rolled very easily.

Basically a cold rolling mill.

Stainless steels, Alloy steels etc., can be rolled easily.

Very high reduction ratio is obtained.



Sendizmer Mill

Source : <http://elearningatria.files.wordpress.com/2013/10/vtu-e-notes-mpiii-18.pdf>