

WARP AND WEFT KNITTING MACHINES

A knitting machine is a device used to create knitted fabrics in a semi- or fully automated fashion. There are numerous types of knitting machines, ranging from the simple, non-mechanical, to the highly complex and electronic. All, however, produce various types of knitted fabrics, usually either flat or tubular, and of varying degrees of complexity. Pattern stitches can be selected by hand manipulation of the needles, or dials, mechanical punch cards, or electronic pattern reading devices and computers. To knit wear's knitting. And the knitting is done by using two machine named Warp Knitting Machine and Weft Knitting Machine. To knit a fabric the weft knitting machine is used exclusively

Weft Knitting Machine:

The knitting machine in which the loops are produced in a horizontal direction and each loop in horizontal direction is made from a single yarn is called Weft Knitting Machine. Here usually latch needle is used along with feeder.

Types of Weft Knitting Machine:

1. **Fabric Machine:** - In fabric machine fabric is knitted in a continuous, uninterrupted length of constant width. It is also known as yard goods or piece goods machine.

2. **Garments Length Machine:** - Garments length Machine which has an additional garments control mechanism to co-ordinate the knitting action in the production of garments structured repeat sequence in a wale direction.

Weft Knitting Machine according to Machine Design and Needle Bed:

Flat Machines: a) V-bed flat m/c
b) Flat bed purl m/c
c) Domestic Single Bed Flat m/c
d) unidirectional multi-carriage m/c



Circular Machines: a) Single Needle Bed M/c
b) Two Needle Bed M/c

Fundamental Element of Knitting Machine

1. Machine needles

The fundamental element in construction of knitted fabrics is the knitting needles. During yarn feeding, the hook is opened to release the retained old loop and to receive the new loop which is then enclosed in the hook. The new loop is then drawn by the hook through the old loop which slides on the outside of the bridge of the enclosed hook. Types of Knitting Needles: There are three types of Needle. These are:-

1. Latch Needle
2. Bearded Needle
3. Compound Needle.

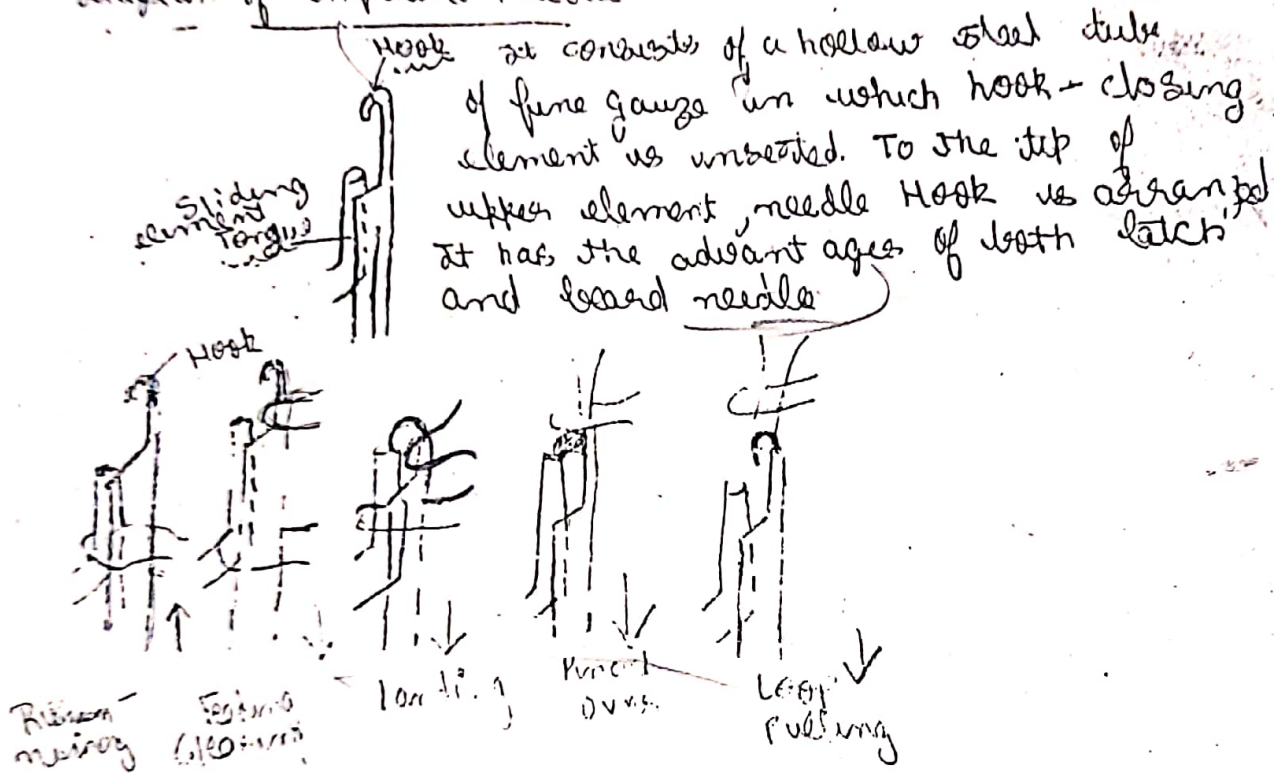
→ ex. give, high speed and more productivity

Compound Needle consists of two separately controlled parts: these are- the open hook and the sliding closing element (tongue, latch, piston, and plunger). The two parts rise and fall as a single unit

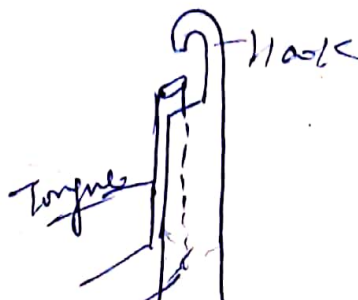
Advantage of compound Needle → Higher Speed, less start rate
less strain on yarn, &

Disadvantage of compound needle → It is complicated & costly needle, two separate cam systems are required. one for tongue movement & other for needle movement

(2)
Diagram of compound Needle



The held loop is shown on the needle-stem in the summer position. The Hook and tongue elements move upwards so that a new yarn may be presented to the hook and hence feeding occurs. Both elements descend although at different velocities, which causes the tongue to close off the hook. Thus the held loop is free to leave the needle, knock over pulling occurs. The needle now returns to the return to complete the cycle.



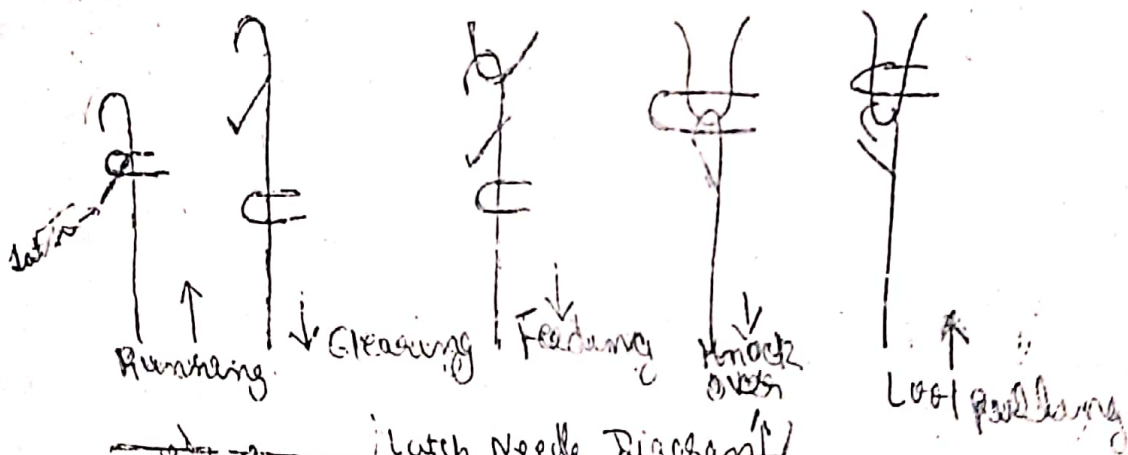
④ Beard Needle ^{III} This needle consists of a top hook curved downwards, with a finished tip and the downward continuation is called beard.

Beard Needles are cheaper and simplest to manufacture & put less strain on yarn. But it has one disadvantage that at high speed loop part breaks easily. Even an external agency is required for loop formation.

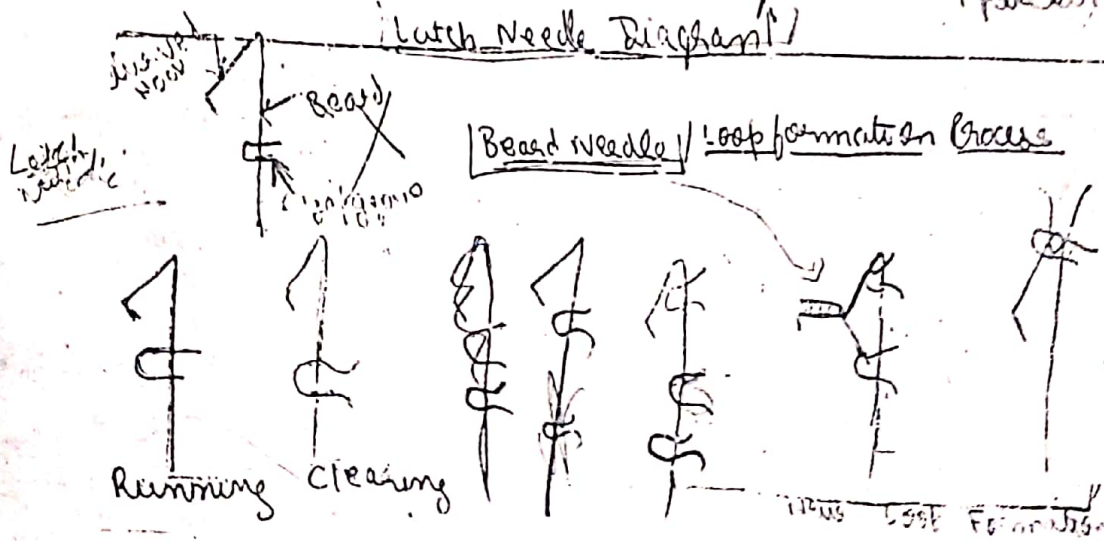
Loop formation process of Beard Needles

I - III steps same as Latch Needle

IV Formation of New Loop → Here the straight yarn is converted into loop with help of sinker and pressure bar is required to close the beard.



Latch Needle Diagram



Beard needle / Loop formation process