SHUTTLE-LESS LOOMS

S.D.M.M. Premathilake

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Shuttle less loom is the modern loom. It is used to produce high fashionable fabrics with high production rate. In the modern times, the uses of shuttle less ae increased rapidly. Shuttle less loom has specific characteristics and applications method. The shuttle less loom has different picking method.

Types of shuttle less loom:

- Projectile loom
- Rapier loom
- Jet loom- Water jet loom and Air jet loom

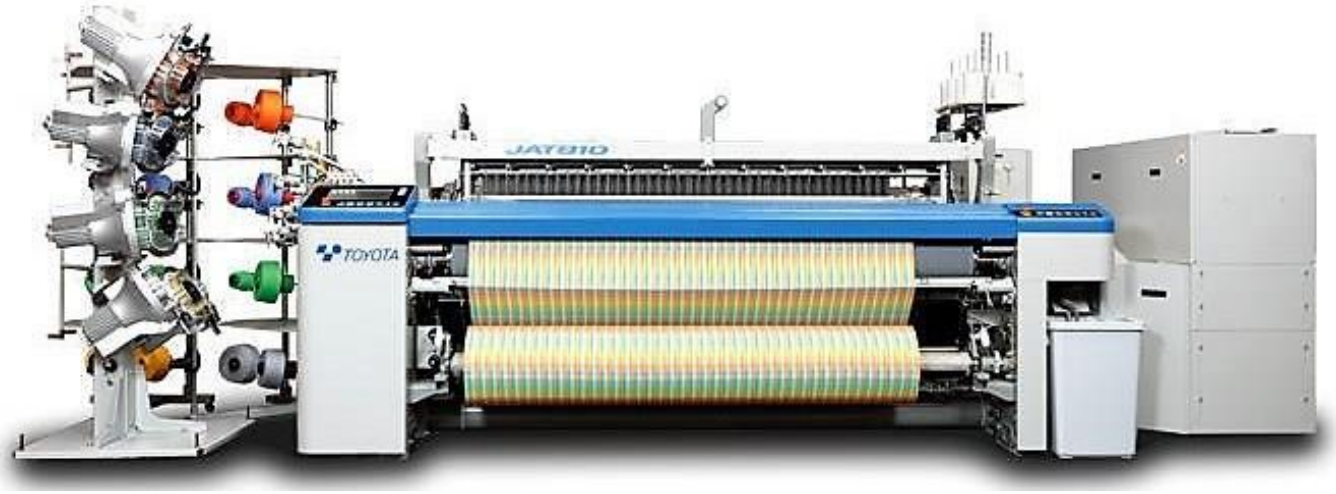
Advantages of shuttle less loom:

- Weaving production is high due to high speed of the machine.
- It reduces the labor cost due to higher allocation of loom and productivity.
- It facilities defect free cloth during weaving.
- Shuttle less loom creates less noise.
- Pirn winding process is eliminate in shuttle less loom.
- It keeps better fabric value.
- Easy maintenance and less work load for workers.
- Used to high scale production.
- Efficiency of shuttle less is higher than shuttle loom.
- Accident percentage is low.
- It is easy to market trades.

Disadvantages of shuttle less loom:

- The price of shuttle less loom is higher than shuttle loom.

AIR JET LOOMS



In the air jet weaving looms, a jet of air is used to propel the **weft yarn** through the shed at speeds of up to 600 ppm. Uniform weft yarns are needed to make fabrics on this loom. Also, heavier yarns are suitable for air jet looms as the lighter fabrics are very difficult to control through shed. However, **too heavy yarns also can't be carried across the loom by air jet**. In spite of these limitations, air jet loom can produce a wide variety of fabrics.

Air-jet looms are capable of producing standard household and apparel fabrics for items such as **shirts, denim, sheets, towels, and sports apparel, as well as industrial products such as printed circuit board cloths**. Heavier yarns are more suitable for air-jet looms than lighter yarns. Air-jet looms are capable of weaving plaids, as well as dobby and jacquard fabrics.

NOTE:

- ***Heavier yarns are more suitable for air-jet looms***

Advantages of air jet looms:

1. In case of air jet loom, noise level is lower than rapier loom and missile.
2. Normally, standard width of air jet loom is 190cm.
3. Weft insertion performance is too much here (normally 600pm).
4. It consumes very low power.

Disadvantages of air jet looms:

1. Broken pick or miss pick has occurred due to excess air pressure of main nozzle.
2. In case of air jet loom, pile up and buckle tip of yarn formed due to air resistance.
3. Double pick may occur in air jet loom.
4. Loom of weft yarn along weft direction formed due to variation of air pressure.

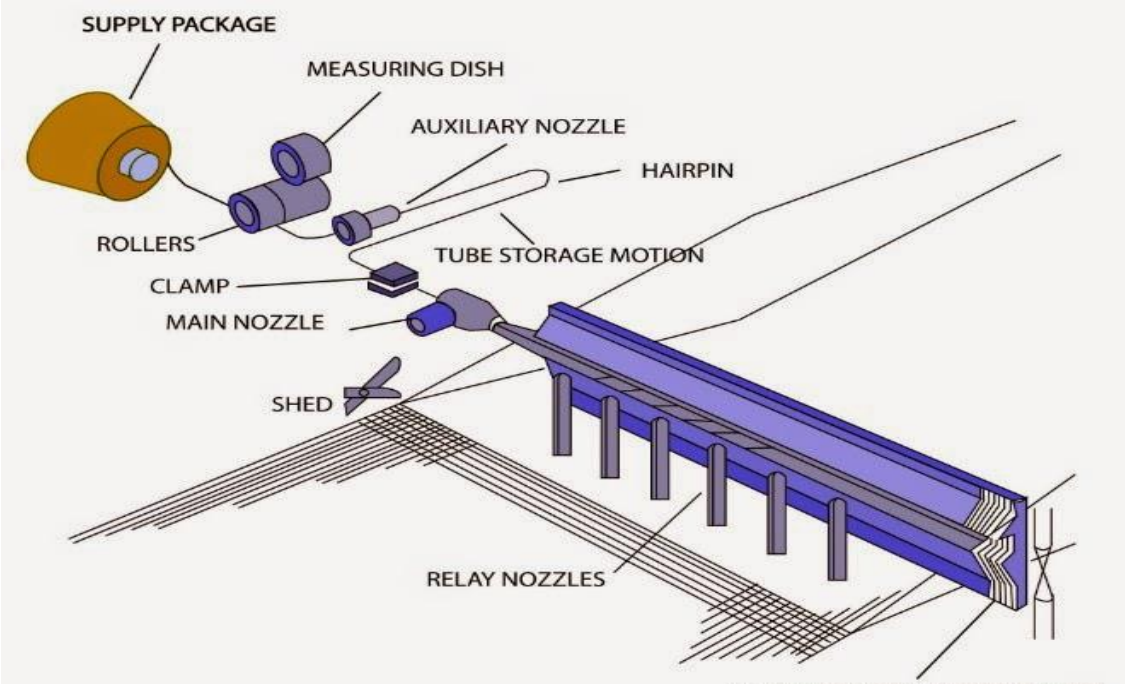


FIG: OPERATION PRINCIPLE OF THE AIR JET LOOM

WATER JET LOOMS

In it, a pre-measured length of **weft yarn is carried across the loom by a jet of water**. These looms are very fast with speeds up to 600 ppm and very low noise. Also, they don't place much tension on the filling yarn. As the pick is tension less, very high quality of warp yarns is needed for efficient operation. Also, only yarns that are not readily absorbent can be used to make fabrics on water jet looms such as filament yarn of acetate, nylon, polyester, and glass. However, it can produce very high-quality fabrics having great appearance and feel.

NOTE:

- These looms are only suitable for the weaving of hydrophobic yarns (synthetic fibers).

Features of Water Jet Loom:

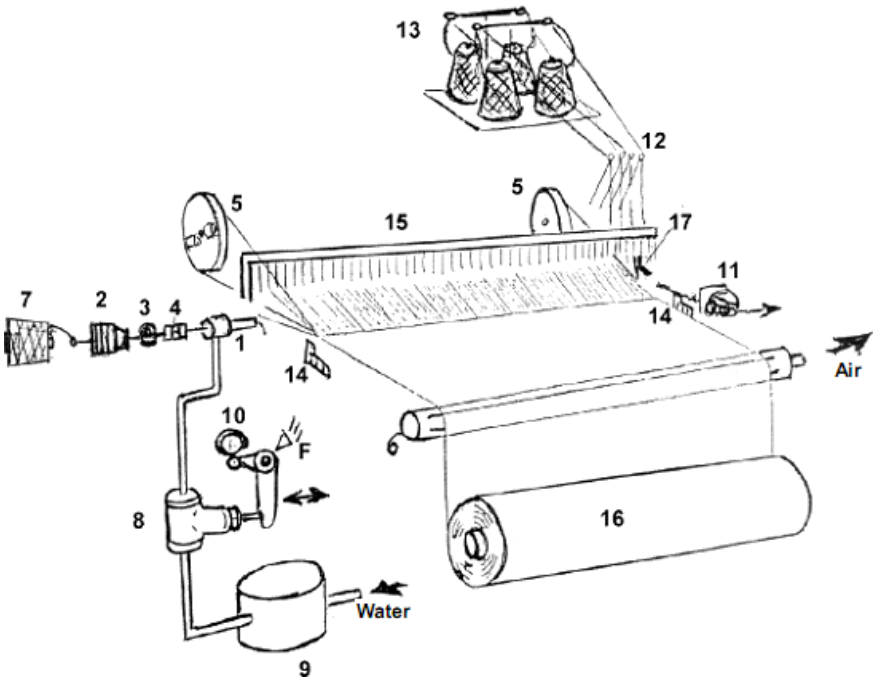
1. In case of water jet loom, weft yarn package weight varies 3.6 to 4.1 kg.
2. Here, treated water is used by pump nozzle.
3. It consumes less power than others.
4. Higher number of weft insertion in water jet loom than air jet loom (normally 600ppm).

Advantages of Water Jet Loom:

1. Water jet loom machine consumes less power than others.
2. This type of loom is suitable for producing synthetic fabric.
3. Here, production rate is higher.
4. It creates less noise than rapier loom and missile.

Disadvantages of Water Jet Loom:

1. By using hard water, here may form rust on the yarn.
2. It is not perfect for absorbent fibre such as cotton.



RAPIER LOOM

Rapier loom is a shuttle less loom machine. Here, filling yarn is carried through the shed of the warp yarns into another side of the loom by finger like carriers. This type of looms is competitors to the missille looms.

Rapier loom is classified into two types, where one is long rapier and another one is single rapier or double rapier. In case of single rapier, it carries the weft yarn across the fabric width from one of loom to another. One rapier feed the filling yarn half way through the shed of warp yarn to the arm the other side, which reach in and takes it across the rest of the way.

Features of Rapier Loom:

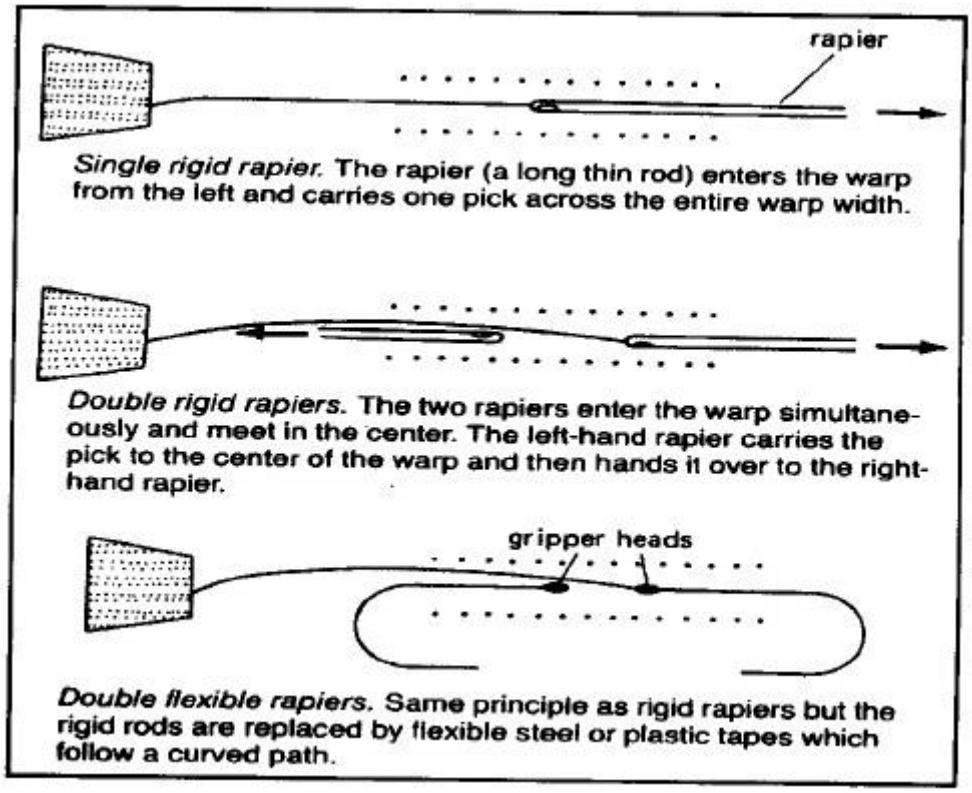
1. Higher production cost in rapier loom.
2. Rapier loom machine consumes moderate power.
3. This **type of loom** machine is suitable for weft patterning.
4. Fancy fabric is produced by using rapier loom in **weaving** sector.
5. Normally, rapier loom has a simple mechanism.
6. In case of rapier loom, standard rapier with stands at 190 cm.

Advantages of Rapier Loom:

1. Rapier loom is too much perfect for weft patterning.
2. Rapier loom has a simple mechanism.
3. Fancy fabric is produced here.
4. Higher production cost than others loom machine.
5. Production speed of rapier loom machine varies from 200-260 ppm.
6. This type of loom machine consumes moderate power than others.

Disadvantages of Rapier Loom:

1. In case of rapier loom, noise level is higher than jet loom machine.
2. Here, production speed is less than jet loom.



The operation principle of three rapier systems

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