

# Topic: TEXTILE AND CLOTHING

BA PART III, 5<sup>TH</sup> PAPER, By: Dr. AMARJEET KUMAR, Home Science Department, Rohtas Mahila College, Sasaram. E-mail ID: [amarjeetkumar11@gmail.com](mailto:amarjeetkumar11@gmail.com)

## FABRIC CONSTRUCTION

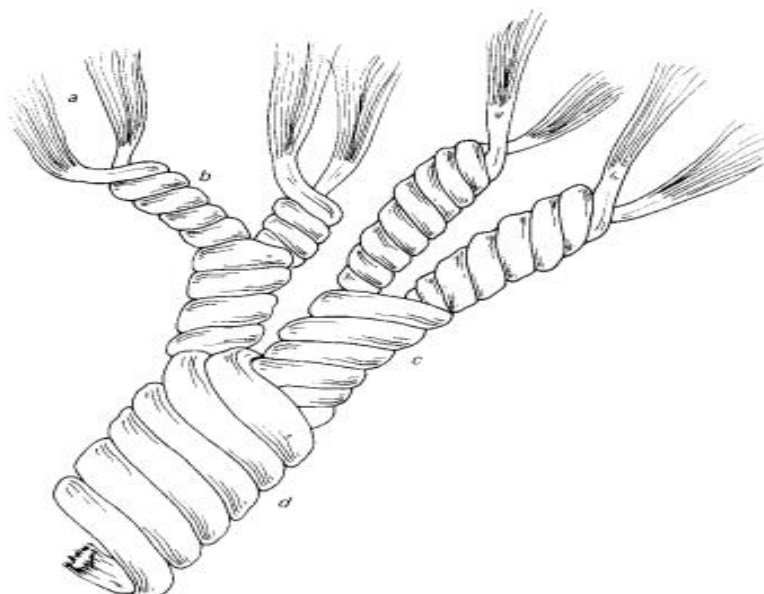
The quality of cloth, its suitability for different purposes, and its performance in wear and cleaning cannot be assumed entirely from a knowledge of its fibers. The method by which the fibers have been combined to form yarns, and the ways in which the yarns have been interlaced to form the material are very important. Yarns are composed of textile fibers. Yarns play an important role in determining the characteristics of the great variety of fabrics. Much of the beauty, variety and texture of fabrics is due to yarn differences. Yarn as defined by ASTM (American Society of Testing Materials) is “**A generic term for continuous strand of textile fibers or filaments in a form suitable for knitting, weaving or otherwise intertwining to form a textile fabric**”. **Yarns are of two types**

- 1) Short staple fibers are derived from natural fibers that are short in length or they may be composed of man-made fibers or silk fibers that have been cut short.
- 2) Long filament fibers obtained by extruding the chemical liquid through fine jets in the spinnerets.

### Classification of yarns

**Yarns are classified as simple, complex and textured yarns.**

A simple yarn is composed of two or more simple single yarns plied or twisted together. A ply yarn consists of two or more singles twisted together and a cord yarn consists of two or more ply yarns twisted together.



**Fig 1 - Yarn Structure (a) fibres b) singles c) ply yarn(s) d) cord yarn)**

Complex or Novelty yarns are different from simple yarns in structure, size, twist and effect. Complex yarn may be composed of single or ply. Complex ply yarns are composed of a base or core, an effect and tie or binder yarn. The base yarn controls the length and stability of the end product. The effect yarn forms the design and the tie or binder yarn holds the effect yarn so that it will remain in position. Textured yarns have greater apparent volume than other yarns of similar fiber count and linear density. The yarns have a relatively low elastic stretch and the greater volume is achieved by physical, chemical or heat treatment.

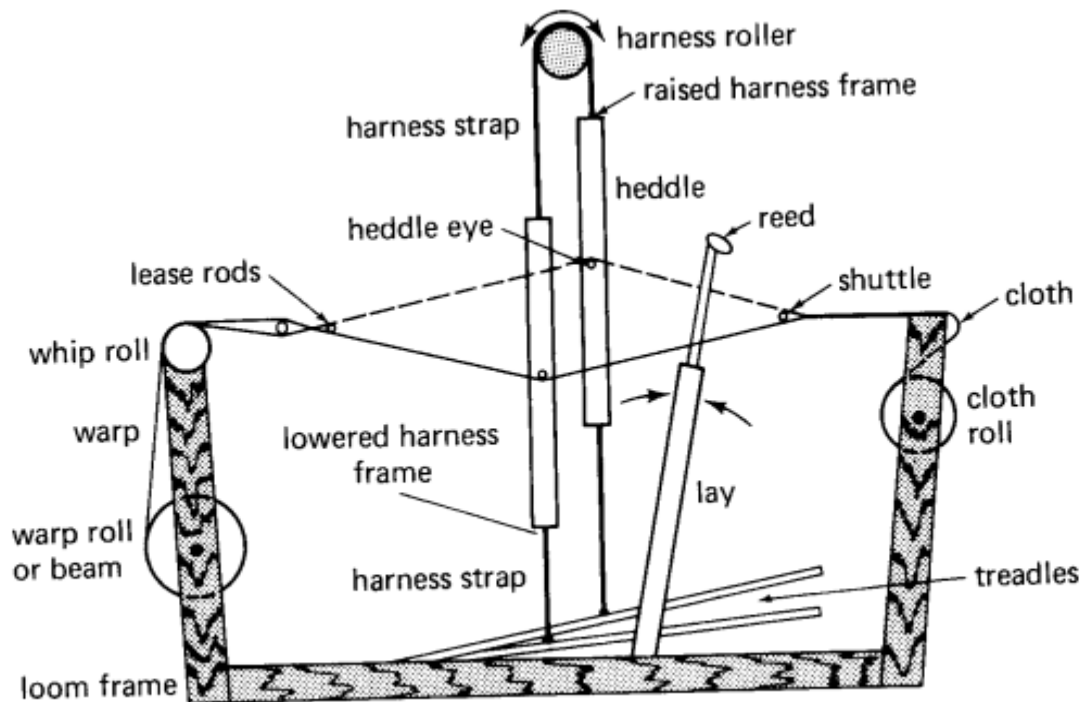
**Processing of yarns:** Yarns are made from fibers by two processes - General which is common to many yarns and texturizing to obtain special textured effects such as extra bulk, stretch or a combination of these properties in the fabrics made from them.

The **General** processes include opening, picking, cleaning, blending, degumming, scouring, carbonizing, carding, combing, drawing, spinning, throwing, slashing, rewinding as discussed in the earlier chapters in the manufacture of natural fibers. No fiber goes through all these processes. Texturing process are primarily applicable to manmade fibers and particularly to thermoplastic fibers.

**Texturizing** imparts a permanent **curl, loop or crimp** to the individual filaments, so that when they are recombined, the yarns are more or less fuzzy - appearing and have stretch, bulk or both. Textured yarns do not have free fiber ends to pull out, roll up, or pill. They are opaquer, have a different appearance, feel, warmth and more absorbent. Yarns thus formed are now used in the manufacture of fabrics. Woven fabrics consists of sets of yarns interlaced at right angles in established sequences. One of the process of fabric manufacture is **weaving**.

### **Weaving of Fabrics**

Weaving is the process most used for the manufacture of textile fabrics (John Hoyer, 1942) In weaving two or more set of yarns are interlaced at right angles to each other. The warp yarns run in the lengthwise direction in a woven fabric also called as **ends**. The filling yarns run in the crosswise direction also called as **picks**. Extra warps yarns at each side form a selvedge which is parallel to the warp yarns. The machine for weaving is a **loom**. Loom are of different types varying in their complexity from the most primitive to the most modern, operate on the same principles. A diagram of a simple loom is shown in figure-2.



**Fig.2-Simple loom**

The essential parts of the loom are - the warp beam which holds the lengthwise yarns are located at the back of the loom and release yarns as needed. The harness is the frame which holds the heddles in position. The heddles are the wire or metal strips with an eye at the centre through which individual yarns are threaded. The harness can be raised or lowered to produce the shed. The reed is a comb-like device which determines the cloth width and acts as a beater bar. The filling yarns are carried by shuttles or bobbins across from side to side. The cloth beam is present at the front of the loom which rolls the fabric as it is woven.

**The basic weaving operation includes:**

**Shedding:** The harness can be raised or lowered which has the warp yarns by means of heddles to form the shed. The filling yarns pass from one side of the loom to the other through the openings of the warp yarns.

**Picking:** The filling yarns are carried by the shuttle across the shed, laying the filling in position.

**Battening or Beating** consists of evenly packing the filling yarns into position in the fabric with the reed.

**Taking up** involves the taking up of the newly made fabric on the cloth beam and **Letting off** involves releasing thread from the warp beam for the weaving operation.