Unit - 2

Weaving Technology

Chapter- 4: Loom Preparatory

4.1. INTRODUCTION

As taught in the earlier Units, a woven fabric is made of two yarn systems, the **filling** or width-wise yarns and **warp** or lengthwise yarns, which are interlaced almost perpendicular to one another in weaving process.

The filling yarns or picks are not subjected to the same type of stresses as are the warp yarns and thus are easily prepared for the weaving process. Most often the filling yarns are taken straight off the spinning process and used for picking, after dyeing, if required.

But the yarns that are used as warp have to run from the back to front of the loom and hence should pass through a series of operations, to prepare them to withstand the strains of the weaving process.

All the processes through which the warp yarn passes are collectively called as **Weaving Preparatory processes**. An entire segment of textile industry has developed around this one aspect of woven fabric production. Successful warp preparation depends on fundamental understanding of the prior influences of yarn forming and a sound comprehension of the stresses of weaving.

Fig 4.1: Flow chart for Yarn Preparatory Process

4.2. PREPARATORY PROCESS FOR WEAVING

4.2.1. Preparatory for Warp

4.2.1.1. Winding -

Fig 4.2: Winding Machine

Yarns are repackaged as large cones, so that they can be further used for weaving process. This re-packaging process is termed as **winding**.

During this process, some spun yarns may be imparted more twist or combined with other single yarns into double and ply yarns. The defects in the yarn, like thick places and thin place are also removed. This leads to increase in overall strength of the yarn and causes less yarn breakage during weaving

4.2.1.2. Creeling

Fig 4.3a: Yarn being unwound from Creel

Fig 4.3b: Creel

Yarn packages are placed on a large metallic frame known as creel (Fig 4.3a and 4.3b). These creels are equipped with yarn tensioning devices so that constant

yarn tension is maintained in all the yarns as they are being wound onto the warp beam. The modern day creels are equipped with automatic control, centralized tension variation and yarn breakage monitoring system in order to increase the warping performance.

4.2.1.3. Warping

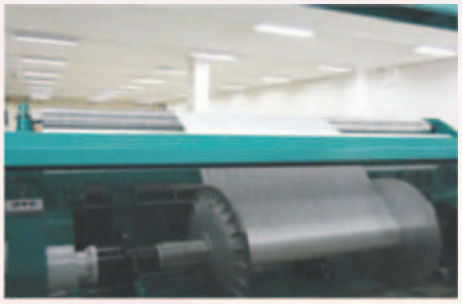

Fig 4.4: Direct Warping Machine

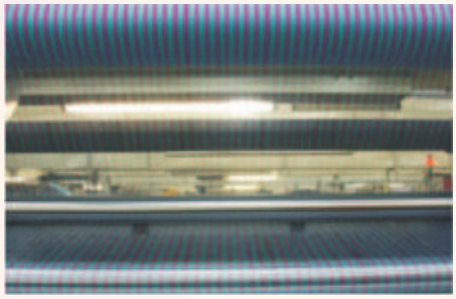

Fig 4.5: Sectional Warping Machine

The process of converting yarn from single end package to an even sheet of yarn representing hundreds of ends (multiple end package) is called Warping. The ends are then wound onto the warp beam. Warping can be done in two ways:

a) **Direct warping -** The ends of the yarn are wrapped in single operation from the yarn packages onto the warp beam. This method is predominantly used when single colour or less complicated patterns are to be woven (Fig.: 4.4)

b) **Indirect warping -** The yarns from the yarn package are wound in bands onto an intermediate drum called Pattern Drum and are then transferred onto a warp beam in a separate operation. This method of warping is employed when fancy coloured patterns of warp are need or the capacity of creel is limited (Fig.:4.5)

4.2.1.4. Sizing

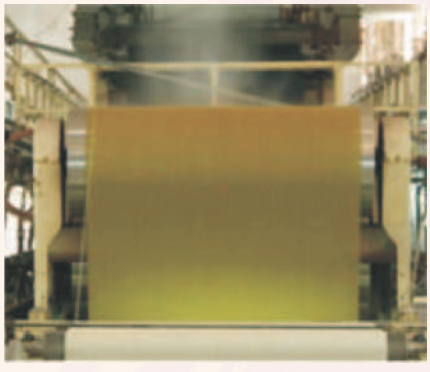

Fig 4.6: Sectional Warping Machine

Sizing of the warp yarn is essential to reduce breakage of the yarn and thus the production stops on the weaving machine.

On the weaving machine, the warp yarns are subjected to several types of actions, like abrasion at various loom parts, inter yarn friction, etc. With sizing, the strength - abrasion resistance - of the yarn improves and hairiness of the yarn also decreases.

The sizing paste is applied on the warp yarn with the warp sizing machine. After weaving process, the fabric is washed to remove the size paste (Desizing)

4.2.1.5. Drawing-in and Denting

Fig 4.7: Drawing-In

Fig 4.8: Denting

This is the process of drawing each end of the warp separately through the eyes of the heald, (Fig.:4.7) as indicated in the draft and then through the dents of the reed (Fig.:4.8).

- The order in which the warp threads are threaded in the heald shaft is known as "**Drafting Order**".
- The order in which the warp threads are threaded in the dents of the reed is known as "**Denting Order**".

The manual process of Drawing-in and Denting is time consuming and hence when mass production of same fabric is to be done then simply each end of new beam is tied to corresponding end of old beam. This is called **Tying-In**.

4.2.2. Preparatory for weft

a) Pirning

This process is need only for the looms that use Shuttle to carry the weft. In more modern, shuttle-less looms, the cones are directly put on to the stand for picking.

Summary:

A fabric is made up of two sets of yarn - Warp and Weft. These yarns have to withstand various strains during the Weaving Process. Hence, it passes through a series of processes before it is taken on loom. These are called Weaving Preparatory Processes. These processes are done in a typical order and vary for different types of yarns or the end fabric to be produced. This chapter introduces the student to the Weaving Preparatory Process i.e. all the processes through which the yarn passes before it is taken on loom for weaving.