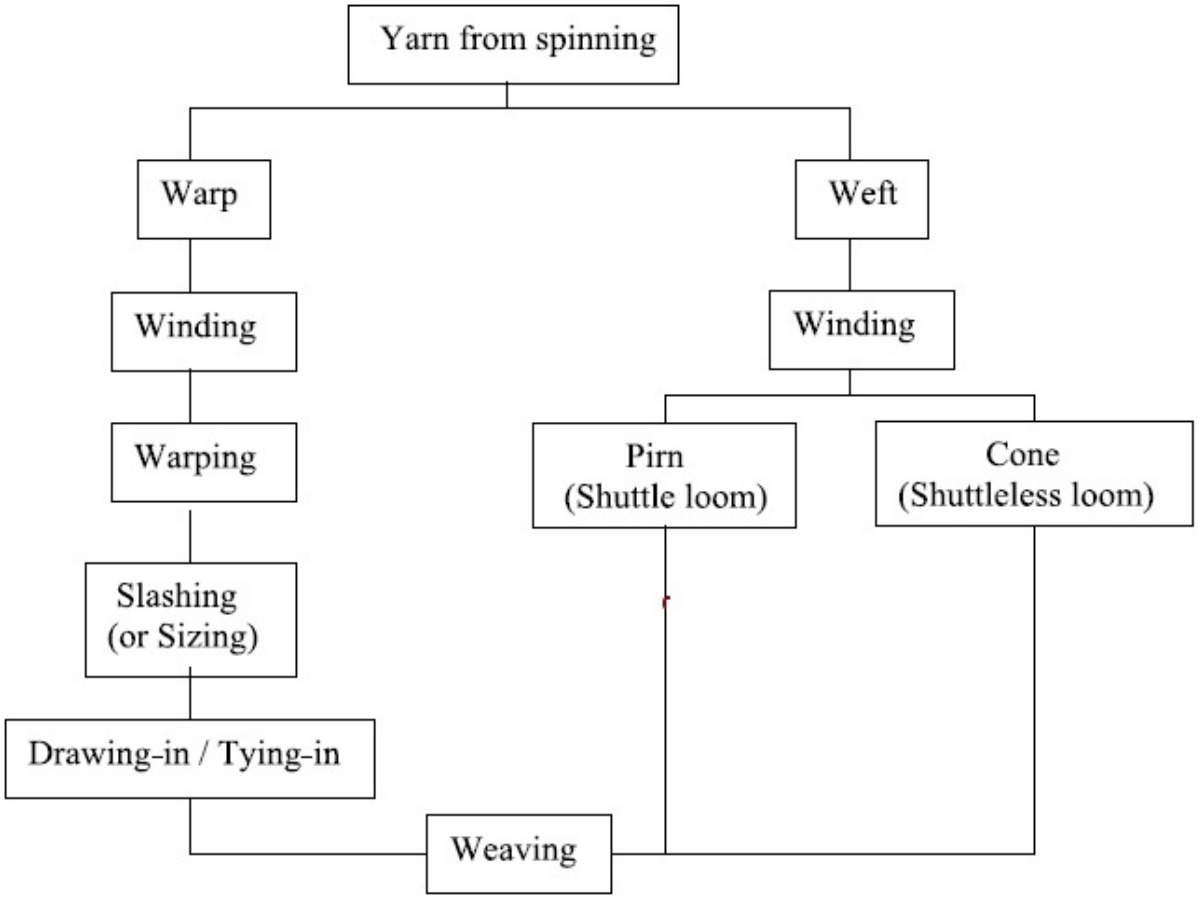
Weaving Process Flow Chart



Elements of Weave Design

Woven Design

Woven fabrics are made by using two or more sets of yarn interlaced at right angles to each other. These threads are interlaced with one another according to the type of weave or design. Much variety is produced by weaving. The warp threads are those that run longitudinally along the length of the fabric and the weft threads are those that run transversely across the fabric. For the sake of convenience the warp threads are termed as ends and the weft as picks or fillings.

Methods of Weave Representation

A weave is the interlacing pattern of the warp and weft. Two kinds of interlacing are possible:

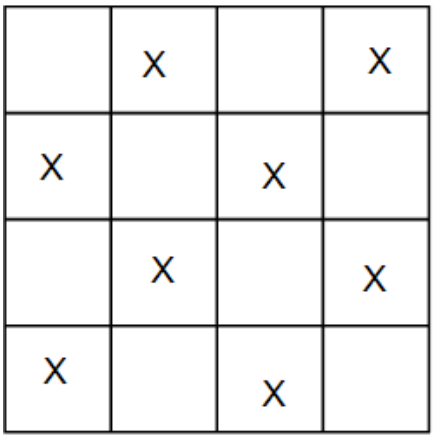
- Warp overlap in which warp is above weft
- Weft overlap in which weft is above warp

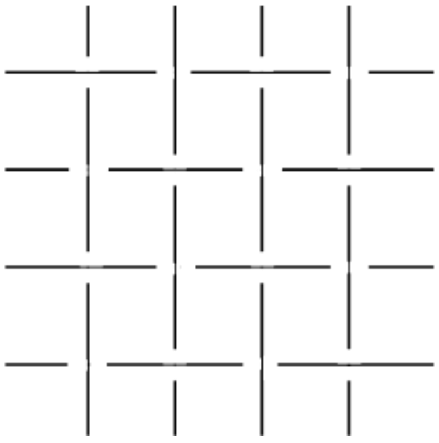
When the warp is lifted above the inserted weft, a warp overlap is obtained. When the warp thread is lowered, the weft thread is inserted above the warp thread and the weft overlap is obtained.

There are two practical methods of weave representation:

- Linear
- Canvas

In the linear method each warp thread is represented by a vertical line and each weft thread by a horizontal line. The point of intersection of lines corresponding to a warp overlap is marked by the dot, and the point of intersection corresponding to weft overlap remains unmarked.. Though this is a simple method, it is seldom used because the designer has to draw plenty of horizontal and vertical lines, which is time consuming.





In the canvas method, a squared paper is employed, on which each vertical space represents a warp thread and each horizontal space represents a weft thread. Each square therefore indicates an intersection of warp and weft

thread. To show the warp overlap, a square is filled in or shaded. The blank square indicates that the weft thread is placed over the warp i.e. weft overlap. Several types of marks may be used to indicate the warp overlap. The ‘x’ mark is most commonly used.

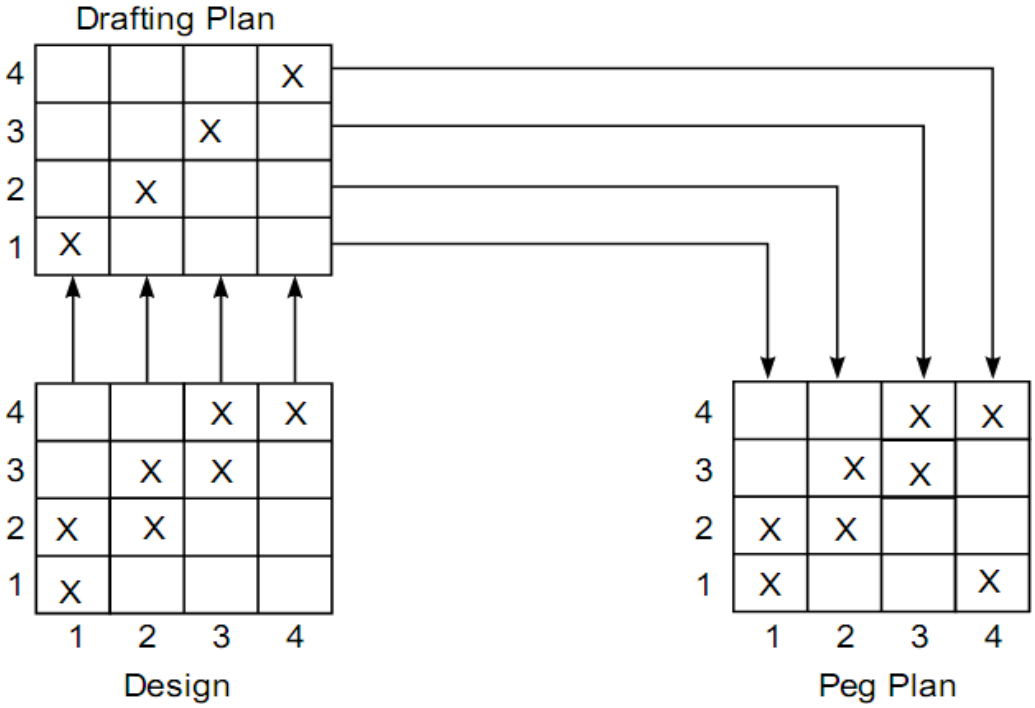
Weave Repeat

The repeat of a weave is a quantitative expression of any given weave. It indicates the minimum number of warp and weft threads for a given weave. It comprises of warp and weft repeat. The size of the repeat may be even or uneven depending upon the nature of the weave. In elementary weaves such as plain, twill, satin etc. the repeat size is normally even. However in weaves such as honey comb, huck-a-back the repeat size may be even or uneven. For any weave the repeat size is the sum of the warp and weft floats. Thus in case of a 2/1 twill the repeat size is 3 x 3. It is common practice to denote one repeat of a weave on design paper.

Basic Elements of a Woven Design

The three basic elements in a woven design are:

1. Design
2. Draft or drawing plan
3. Peg or lifting plan



The design indicates the interlacement of warp and weft threads in the repeat of the design. It is made up of a number of squares, which constitute the repeat size of a design. The vertical direction of the squares indicates the picks and the horizontal direction indicates the ends. A blank in a square indicates that a warp goes below the corresponding weft and 'X' mark in the square indicates that the warp floats above the weft.

The draft or drawing plan indicates the number of heald shafts used to produce a given design and the order is which warp ends are threaded through the heald eyes of the heald shaft. The principle of drafting (i.e. putting of ends on different healed shafts) is that ends which work in different order requires separate heald shafts. To keep matters simple, we can say that the ends that work alike are put on the same heald shaft.

The peg or lifting plan provides useful information to the weaver. It denotes the order of lifting of heald shafts. In a peg plan the vertical spaces indicate the heald shafts and the horizontal spaces indicate the picks. The peg plan depends upon the drafting plan. In the case of a straight draft, the peg plan will be the same as the design. Hence no peg plan is necessary in the case of a straight draft.

Relation between Design, Drafts and Lifting Plan

The construction of any woven fabric depends upon the design, draft and the lifting plan and these are very closely dependent upon one another. A thorough knowledge of this interdependence is very valuable to the designer upon whose skill several mechanical limitations of the loom may be imposed. In many cases it is only his innate acquaintance with the drafting systems and the possibilities of manipulating the lifting orders which enables him to introduce variety into apparently rigid mechanical systems of operation. In normal practice the designer has to produce a range of designs for looms with a known pattern scope. This usually involves the draft and the lifting plan construction. A similar procedure is adopted when the designer is asked to reproduce a specific design from a sample. The weave in the sample is analyzed and a suitable draft and lifting plan is derived.

Classification of Woven Structures

Woven structures are classified into the following categories:

- Simple structures
- Compound structures

In case of simple structures, there is only one series of warp and weft threads. These threads interlace with one another perpendicularly. All the neighboring warp and weft threads are parallel to one another and play an equally important role in determining the properties of the fabric.

In case of compound structures, there may be more than one series threads, of which one set forms the body or ground and the other forms the figuring or ornamentation. Unlike the simple structures, the neighboring threads need not be parallel to one another.