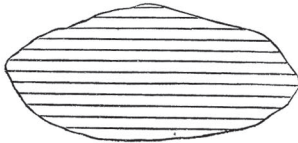


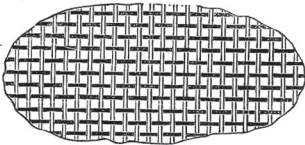
### Weaving.

WEAVING is the process by which the spun threads of cotton, flax, silk, or wool are formed into fabrics of different kinds, such as calico and muslin from cotton, linen from flax, ribbons and broad silks from silk, and cloths and carpets from wool. The whole process consists of laying two sets of parallel threads across each other, and so passing them under and over one another as to form a superficial fabric. One of these sets of threads is stronger, thicker, and more tightly twisted than the other. These stronger threads run the length of the cloth, and are called the *warp*; the finer threads, called the *weft*, cross and recross the warp, so that each set of threads keeps the other set in its place.

One of the best illustrations of weaving is the common method of darning stockings. The darning first stretches a number of stitches across the hole in one direction, corresponding to the warp on a loom; thus:

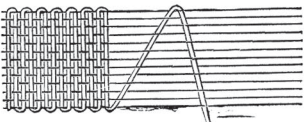


The darning then crosses these with another row at right angles to them, and passes each of this second set of stitches, corresponding to the weft, alternately under and over the warp threads; thus:



Weaving is of many different kinds, varying mostly in the manner in which the warp and weft cross each other. The simplest is *plain* weaving, in which the weft goes alternately over and under the warp threads, never going either over or under more than one at a time. This kind of weaving produces such simple fabrics as calico, linen, and plain silk, in which no variety of appearance, such as stripes or twills, nor any kind of pattern, is required.

In weaving, the warp threads are stretched out, side by side, across the loom or weaving machine, while one weft thread is passed from side to side, forming, by its doubling over the two outer warp threads, the "selvedges," or edges of the cloth; thus:

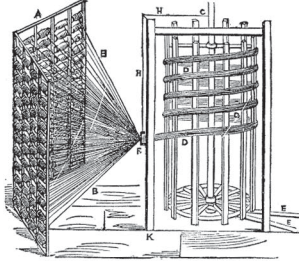


The weft thread is replaced by a new one as soon as used, the two ends being fastened together; but the warp threads are put on the loom of the full length the piece of cloth is meant to be, varying from a few yards to a hundred or more.

To prepare the warp threads for the loom, to get them regularly parallel, and ready for the weft to make them into cloth, several preparatory processes are required. The chief of these are: (1) warping, (2) beaming, and (3) dressing.

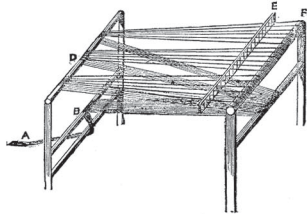
*Warping* is the method by which the threads, when spun, are laid together to form the warp. Whatever number of threads are required to form the width of the cloth, about a sixth as many reels of spun thread are put into a frame, and the ends of all the threads are joined together. All the threads are then drawn

together as they are unwound off the reels, and the loose rope formed by these is wound up round a large frame called the *warping-mill*, thus—



The bobbins containing the spun threads are put in a frame, A. All the threads, B, are passed together through a loop, F, and thus formed into a rope, D, which is wound round the drum, C. The strap, E, connected with either a steam-engine or a hand-wheel, turns the drum, C, round and round, drawing the threads through the loop, F, from the bobbins. A cord, H, passing from F to the pivot of the drum, raises and lowers the loop, F, up and down the height of the post, K, as required. When the warp reaches the bottom of the drum, it is wound round a pin, and turned back. The drum is then turned the reverse way, and the warp winds round it in an upward direction, until it reaches the top, and then again descends, and so on until there are threads enough to form the width of the piece of cloth. The length of warp thus formed is the length of the piece when woven, after allowing for shrinking, shortening in weaving, etc.

*Beaming* is the fixing the warp thus formed on the loom, and laying the threads of it side by side sufficiently apart to allow of the weft thread passing between them, and yet near enough to form, with the weft, a close, compact fabric. Beaming is done thus:



The warp, or rope of threads, A, is passed round a roller, B, at one end of the machine, from which it passes to another, C, at the other end, and then back to D, and finally through the comb, E, to the roller, F. In thus passing to and fro, it becomes gradually more and more opened out, until the comb, E, finally places the threads at exactly the same distance apart, when they are finally wound on the roller, F. Sometimes the processes of warping, beaming, and dressing are all done by one machine. The threads from the reels are wound on one roller, and then wound off from that on to another at some little distance from it, on their way passing through the dressing-paste, and being dried by passing over hot copper rollers.