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J. JABOULEY
METHOD OF WEAVING
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Fig. 1.

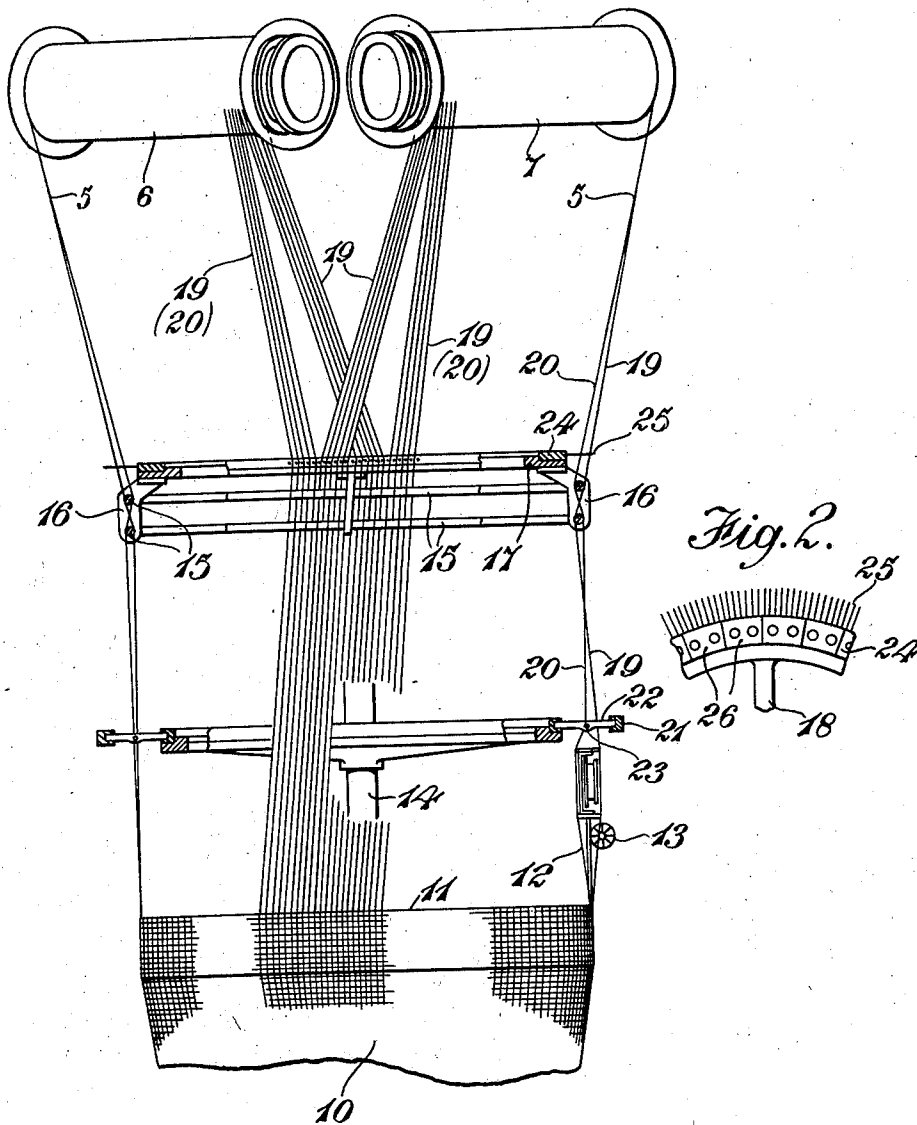
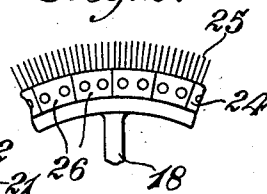


Fig. 2.



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METHOD OF WEAVING

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6 Claims. (Cl. 139—13)

This invention relates to looms and is of particular importance in connection with circular looms in which the warps are drawn from beams or beam sections as is necessary in the weaving of fabrics of high warp density in order that a large number of warp threads may be accommodated in the loom.

In a circular loom the beams or beam sections (hereafter referred to as "beams") are arranged to form the sides of a square or other polygon in order that the warp threads extend substantially continuously around the loom, the end threads of one warp beam being guided to a point adjacent to the end threads of the next warp beam, so that the whole of the threads constitute a cylinder of threads extending round the loom. It has been found, however, that while over the major portion of the length of each beam the warps can be substantially evenly tensioned, at the ends of the beams some variation in tension occurs and some difficulty is experienced in equalizing the tensions between the warp threads at the end of one beam and those at the end of an adjacent beam.

Similarly, in rectilinear looms such as wide sheeting looms in which warp threads may be supplied from two or more separate beams to form a single wide sheet of threads difficulty arises in subjecting the threads at the ends of adjacent beams to uniform tension, with the result that though the resultant fabric is woven from a single sheet of warp threads some warp-wise streakiness is often apparent along the line of union of the warp threads from the ends of the different beams.

According to the invention this difficulty is overcome by distributing threads from adjacent beams over a common space which would otherwise be occupied only by separate sets of threads proceeding from separate beams. In this manner some of the warp threads from one beam occupy positions in the resultant fabric which would otherwise be occupied by warp threads from an adjacent beam, the intermingling of the threads and the gradual union of the separate sets of warp threads thereby achieved neutralizing the line of demarcation between the threads of one beam and the threads of an adjacent beam.

Where the warp beams are placed end to end in a loom a number of threads from one beam end may be crossed with a similar number of threads from the adjacent beam end, the whole of the threads forming the union being spread over a space between the beams which would

otherwise be occupied only by separate sets of threads proceeding from the separate beams. The warp threads from one beam end may be crossed in a reed or like thread-spacing device with those from another beam end in simple alternation, or two threads from one beam end may alternate with two threads from the adjacent beam end, and so on.

As indicated above, the invention is of particular importance in connection with circular looms, since in such looms it is necessary to deflect the warp threads from the ends of the warp beams through a relatively large angle from the normal to the axis of the beam in order to cause the threads to pass through points in the periphery of a circle to form a continuous cylinder of threads around the loom. Some variation in tension occurs in the threads having to undergo the greatest amount of deflection and thus in addition to the normal difficulty of tensioning equally the end threads from adjacent beams, the added difficulty arises of maintaining the tension equal in the threads deflected from their natural plane. This difficulty can be overcome satisfactorily by crossing 10-15 or more threads from one beam end with a similar number of threads from an adjacent beam end. The 10-15 or more threads may be taken alternately from the threads of each beam end and may be crossed from one beam to the other in simple alternation. In this case a union is effected between the end threads of adjacent beams, the union being spread over 40-60 threads.

When more than two warp beams are used to supply warp threads to be woven into the same fabric the union of the several sets of threads may be effected by distributing some threads from one warp beam amongst part of the threads of an adjacent beam, and distributing further threads from the first-mentioned beam amongst part of the threads of a further adjacent beam, and so on around the loom, the intermingling of the threads from the several beams forming a substantially complete cylinder of threads which can be woven into a cylindrical fabric having substantially no streakiness at the points of union of the several sets of warp threads.

In order to effect the distribution or crossing of the warp threads spacing means in the form of a reed, comb, perforated plate or the like are preferably provided to guide the warps before they reach the shuttles, some or all of the warps in one beam end being carried into the spacing means opposite the end of the adjacent beam. Preferably the crossing or distribution of the

warps is effected before the warps reach the shedding means.

The invention will now be described in greater detail in connection with a circular loom with reference to the accompanying drawing in which:

Fig. 1 shows somewhat diagrammatically in part cross-sectional elevation sufficient of a circular loom to illustrate the warp thread spacing arrangement according to the invention; while

Fig. 2 is a plan view of a detail of Fig. 1.

As shown in Fig. 1, warp threads 5 unwinding from a number of beams, of which two, 6 and 7, are shown, pass downwardly in sheet form to the fabric 10 along the fell 11 of which weft is laid by a plurality of shuttles 12 (one shown) between which and the warp threads there is relative circular motion with respect to the central shaft 14 of the loom. The shuttles 12 are supported within the warp threads by vane wheels 13 in the manner described in detail in U. S. Patent No. 2,050,328.

The warp threads 5 proceeding from the beams, are deflected and caused to pass through points in the periphery of a circle by circular lease rods 15 which are supported directly over the shuttles 12 by brackets 16 suspended from a ring 17 which is supported by a spider 18 extending from the central shaft 14 of the loom.

Alternate threads are passed to opposite sides of the lease rods 15 and in this manner the sheet of threads unwinding from each beam is divided into two sheets 19, 20. These separate sheets proceed downwardly to the shuttles 12 through a reed 21 comprising dents 22 with eyes 23. The threads of the sheet 19 are threaded between the dents 22 while the threads of the sheet 20 are threaded through the eyes 23 so that when the whole of the warp threads are pressed (e. g. by a warp shedding wheel) at a point above the reed 21 radially inwards or downwards with respect to the central shaft 14, to form a shed, the threads of the sheet 20 have substantially no radial movement while the threads of the sheet 19 are free to pass from side to side of the shuttles 12.

Supported on the ring 17 above the level of the lease rods 15 is a circular thread-spacing comb 24 the prongs 25 of which extend radially from the loom (see Fig. 2) and while being open at their ends for convenience of threading, are long enough to prevent accidental disengagement of the warp threads. The warp threads are thus spaced evenly round the loom, the end threads of each sheet being drawn towards the end threads of the adjacent sheet in order to form a continuous and evenly spaced cylinder of threads extending round the loom. The number of threads passing between adjacent prongs 25 depends on the warp thread density and on the pitch of the prongs.

In order substantially to overcome the effects of any uneven tension in the warp threads proceeding from adjacent beam ends, a number of threads (say 10 to 15 or more) of the outer sheet 19 from each beam are carried over and crossed with a corresponding number of threads from the next beam, leaving the other threads of the sheet 19, and all of the threads of the sheet 20, shown collectively as 19 (20), to proceed normally to the fabric 10, as illustrated clearly in Fig. 1. In this manner some of the warp threads from one beam end occupy positions in the resultant fabric 10 which would otherwise be occupied by warp threads from the adjacent beam. Unevenness in warp ten-

sion at the ends of the beams is distributed over a greater width of fabric than heretofore, and in addition it is probable that the slightly longer path followed by the crossed warp threads overcomes a tendency for the warps at the ends of the beams to be slightly under-tensioned.

It will be understood that the normally proceeding threads comprising the ends of the sheet 20 are omitted from the drawing for clarity of illustration of the crossing of the end threads 19.

It will also be understood that the thread spacing and the spacing of the comb prongs 25 is exaggerated in the drawing for simplicity of illustration. Distribution of the warp threads is effected above the level of the lease rods 15 so that all the warp threads proceed normally (i. e. in parallel formation) to the shedding means.

By means of the invention warps consisting of fine smooth threads such as natural or artificial silk threads can be woven with little danger of the fabric showing any unevenness in spite of the tendency of uneven warp tension to show itself in fabric woven from this type of thread.

The thread-spacing comb 24 may be formed in sections 26 for ease of transport, and in order to enable quick replacement of the comb to be effected when a comb of finer or coarser pitch is desired. When the shuttles 12 are supported within their respective warp sheds by vane wheels 13 of the type diagrammatically illustrated in Fig. 1, it is advantageous to cause the warp threads to follow an inclined path between the lease rods 15 and the fell 11 of the fabric, in the manner shown clearly in Fig. 1 in order that the threads are in substantial alignment with the inclined spaces between the vanes of the vane wheels. The passage of the threads past the vane wheels is thus facilitated.

While the invention has been described more particularly with reference to the crossing over of warp threads from adjacent beam ends in simple alternation, any other form of alternation can be effected. For example, two adjacent warp threads from one beam end may alternate with two adjacent warp threads from the adjacent beam end, and so on, the associated threads from the different beams being distributed over a common space which would otherwise be occupied only by separate sets of threads proceeding from separate beams. The spacing of warp threads according to the invention can of course be effected even when no lease rods are used.

What I claim and desire to secure by Letters Patent is:—

1. Method of spacing warp threads in a circular loom in which warp threads from a plurality of beams are woven into the same fabric, comprising distributing some threads from one warp beam amongst part of the threads of an adjacent warp beam over a common space in the vicinity of one end of said first-mentioned warp beam and the end adjacent thereto of said adjacent warp beam, and distributing further threads from said first-mentioned warp beam amongst part of the threads of a further adjacent beam over a common space in the vicinity of the other end of said first-mentioned warp beam and the end adjacent thereto of said further adjacent beam so that warp threads from a plurality of beams are intermingled and woven in the fabric in positions which would otherwise be occupied only by separate sets of threads taken from separate beams.

2. Method of spacing warp threads in a circular loom in which warp threads from a plurality

of beams are woven into the same fabric, comprising crossing a number of threads from one beam with a number of threads from an adjacent beam over a common space in the vicinity of the adjacent ends of said beams so that warp threads from one beam occupy positions in the resultant fabric which would otherwise be occupied by warp threads from the adjacent beam.

3. Method of spacing warp threads in a circular loom in which warp threads from a plurality of beams are woven into the same fabric, comprising distributing a number of threads from adjacent beam ends over a common space in the vicinity of said adjacent beam ends, which space would otherwise be occupied only by separate sets of threads proceeding from separate beams.

4. Method of spacing warp threads in a circular loom in which warp threads from a plurality of beams are deflected and caused to assume a cylindrical arrangement, comprising distributing a number of threads from adjacent beam ends alternately amongst the threads of the adjacent beam over a common space in the vicinity of said adjacent beam ends, so that warp threads from one beam end occupy positions in the resultant

fabric which would otherwise be occupied by warp threads from the adjacent beam end.

5. Method of spacing warp threads in a circular loom in which warp threads from a plurality of beams are woven in the same fabric, comprising crossing 10 to 15 threads from one beam end with a similar number of threads from an adjacent beam end over a common space in the vicinity of said adjacent beam ends, so that warp threads from one beam end occupy positions in the resultant fabric which would otherwise be occupied by warp threads from the adjacent beam end.

6. Method of spacing warp threads in a circular loom in which warp threads from a plurality of beams are woven in the same fabric, comprising crossing in simple alternation 10 to 15 threads taken alternately from one beam end with 10 to 15 threads taken alternately from an adjacent beam end over a common space in the vicinity of said adjacent beam ends, so that a union is effected between the end threads of adjacent beams, the union being spread over 40 to 60 threads.

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