July 22, 1952 S. S. C. FLEISCHER 2,603,852

METHOD TO ENSURE THE CORRECT SEQUENCE OF THE THREADS OR GROUPS OF THREADS IN THREAD LAYERS

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Fig. 1.

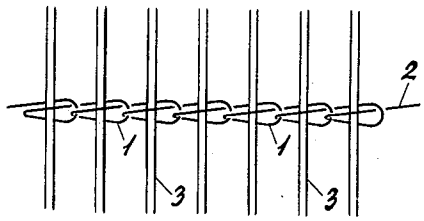


Fig. 2.

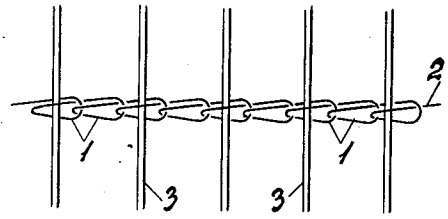


Fig. 3.

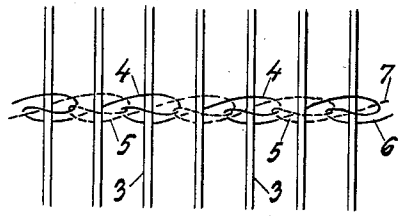
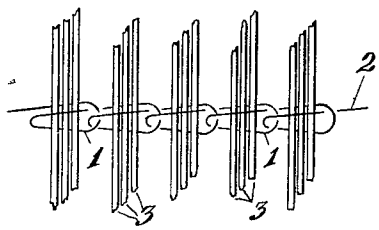


Fig. 4.



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METHOD TO ENSURE THE CORRECT SEQUENCE OF THE THREADS OR GROUPS OF THREADS IN THREAD LAYERS

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6 Claims. (Cl. 28—22)

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The present invention relates to an improved method to ensure the correct sequence of the threads or groups of threads in a thread layer.

It has often been found necessary in the textile industry to ensure the correct sequence of the threads, or of groups of threads in a thread layer during the various treatments these threads are subjected to. This refers particularly to warps, and especially when patterned or multicoloured work has to be done.

The correct sequence of the threads, or of groups of threads in a thread layer has hitherto been ensured by crossing the threads, i. e. by passing a pair of lease rods or cords across the threads, or groups of threads in such a manner that every other thread, or group of threads lies above the one and below the other lease rod or cord, whereas the remaining threads, or groups of threads pass below the one and above the other lease rod or cord. Two consecutive threads or thread groups will thus cross each other between the two lease rods or cords. Such a crossing of the threads or groups of threads will ensure their sequence, but these threads or thread groups will lie so closely together that there is some difficulty in separating the individual threads or thread groups. Such an individual separation is necessary when the threads or group of threads are to be subjected to certain treatments, for instance when they are to be tied to the threads of another thread layer, or when the threads are to be heddled in a loom.

When the threads are to be separated from the thread layer to be carried through the heddles of a loom they have to be held fairly taut and are therefore held between two clamps. The tension of the clamps holding the free ends of the threads must be so adjusted that the threads can easily be pulled out of engagement therewith when being drawn through the heddle eye. It is, however, not possible to avoid the free ends of the threads becoming entangled in the clamps, in which they will often cross each other. Any thread pulled out of the clamps will therefore often pull one or more other threads along with it, and this causes delay in the work.

The object of the invention is to remedy these drawbacks by means of a method according to which each thread or group of threads of a thread layer is entwined by the loops of stitches of thread in a connected row of loops or stitches.

The loops or stitches, which in the following will be called stitches, may according to the invention be made of a single thread or two interlaced threads. According to the invention only some of the stitches in a row of stitches entwine threads, whereas the intermediate stitches do not entwine any threads.

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The method according to the invention provides various advantages in comparison to any hitherto known method of ensuring the sequence of threads or groups of threads in a thread layer, because these threads or thread groups are spaced a greater distance from each other than the case is when the threads are crossed.

Owing to the fact that stitches are very elastic it is possible by stretching the row of stitches to increase the space between the threads or group of threads within a shorter or longer portion of the row of stitches. This is important when the threads or groups of threads are to be separated manually for their further treatment. Such a separation takes place for instance when the threads are to be heddled in a loom. Furthermore the stitches may be drawn so tightly around the threads that the free ends of these threads are held with sufficient firmness during the extraction, and accordingly the clamps can be dispensed with. As each thread is tightly held by the stitches it will not be possible for any thread to pull any other threads out with it when being extracted from the row of stitches.

The method according to the invention may likewise be employed with advantage for separating the threads of a thread layer that are subsequently to be tied to the threads of another thread layer. For this purpose there is preferably used a row of stitches that comprises two interlaced threads, stitches being formed alternately by the one and the other thread. By pulling one of these threads it is possible to undo a stitch and thus release the entwined thread, whereas the succeeding thread can only be released when it is pulled. In this manner the sequence of the separated threads is completely ensured because no mistake in separation is possible.

In the accompanying drawing several explanatory examples of performing the invention are shown.

Fig. 1 is a row of stitches in which each stitch entwines a thread in a thread layer,

Fig. 2 is a row of stitches in which only every other stitch entwines a thread in a thread layer,

Fig. 3 is a row of stitches formed by the interlacing of two threads,

Fig. 4 is a row of stitches in which each stitch entwines a group of threads in the thread layers.

In the row of stitches illustrated in Fig. 1 each stitch 1 is formed by means of the same single

thread 2, and each stitch entwines one of the threads 3 in a layer of threads. In the row of stitches illustrated in Fig. 2 all the stitches 1 are likewise formed by a single thread 2, but in this instance only every other stitch entwines a thread 3 in a layer of threads, and there is thus obtained an increased space between the threads 3. If a further increase of the space between the threads 3 is desired, the number of intermediate stitches that do not entwine threads 3 is increased.

The threads 3 may be separated singly from the stitches 1, e. g. by pulling each thread longitudinally out of the stitch engaging it. In the row of stitches shown in Fig. 3 the stitches 4 and 5 are made by means of two interlaced threads 6 and 7. In order to distinguish the two threads from each other in the drawing, the thread 6 is shown in full line, and the thread 7 in dotted line. In this manner of performance there may be intermediate stitches in the row of stitches that do not entwine threads 3, thus providing the desired space between the threads 3. In this instance the threads 3 may be extracted singly from the stitches by alternately pulling the free ends of the threads 6 and 7. Only one stitch at a time may be detached by pulling out the threads 6 or 7, i. e. the stitch which at any time lies outmost, because the succeeding stitch that is formed by the other thread obstructs the way for a continued pulling out of the stitches formed by the first thread. There is thus no possibility of an erroneous separation of the threads.

By means of an implement provided with a hook that is inserted through the heddle eye the threads are caught singly between the two rows of stitches, and are pulled through the heddle eye. The free ends of the threads will thus be pulled longitudinally out of the outmost stitch row. In order to be able to yield a suitable resistance against their extraction from the stitches, each stitch should be drawn tightly around its thread 3. This is desirable in such instances where the threads are to be subjected to further treatment groupwise. If desired several rows of stitches may be placed beside each other in the thread layer for producing a suitable hold on the threads 3. Such an increase of the rows of stitches will serve to maintain a correct sequence of the threads even if a thread forming the stitches for some reason or other should break. In the production of patterned or multi-colored fabric, for instance striped fabric, the threads 3 may be taken alternately singly and/or in groups from several thread layers. When the threads 3 in this manner and according to the desired pattern are entwined by the stitches in the row of stitches, the correct sequence of the threads is completely ensured, and no fault in this sequence can arise at a subsequent extraction of any single thread 3 from its stitch.

I claim:

1. In a method of ensuring the correct sequence of warp threads in a warp thread layer as in the operation of heddling a loom, the step of arranging the warp threads in correct sequence in a warp thread layer, and the step of running a row of looped stitches of thread transversely across the warp threads and enclosing the latter in the loops of the stitches.

2. In a method of ensuring the correct sequence of warp threads in a warp thread layer as in the operation of heddling a loop, the step of arranging the warp threads in correct sequence in a warp thread layer, and the step of running a row of looped stitches of thread transversely across the warp threads and enclosing at least one of the warp threads in each loop of the row of stitches.

3. In a method of ensuring the correct sequence of warp threads in a warp thread layer as in the operation of heddling a loop, the step of arranging the warp threads in correct sequence in a warp thread layer, and the step of running a row of looped stitches of thread transversely across the warp threads and enclosing each successive warp thread in each successive loop of the row of stitches.

4. In a method of ensuring the correct sequence of warp threads in a warp thread layer as in the operation of heddling a loop, the step of arranging the warp threads in correct sequence in a warp thread layer, and the step of running a row of looped stitches of thread transversely across the warp threads and enclosing the successive warp threads in every other loop of the row of stitches.

5. In a method of ensuring the correct sequence of warp threads in a warp thread layer as in the operation of heddling a loom, the step of arranging the warp threads in correct sequence in a warp thread layer, and the step of running a row of looped stitches of thread transversely across the warp threads and enclosing groups of the warp threads in the loops of the row of stitches.

6. In a method of ensuring the correct sequence of warp threads in a warp thread layer as in the operation of heddling a loom, the step of arranging the warp threads in correct sequence in a warp thread layer, and the step of running a row of looped stitches of two interlaced threads transversely across the warp threads and enclosing the latter in the loops of the row of stitches.

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