

Aug. 16, 1966

A. BÜNGER
DOUBLE FABRIC

3,266,529

Filed March 23, 1964

4 Sheets-Sheet 1

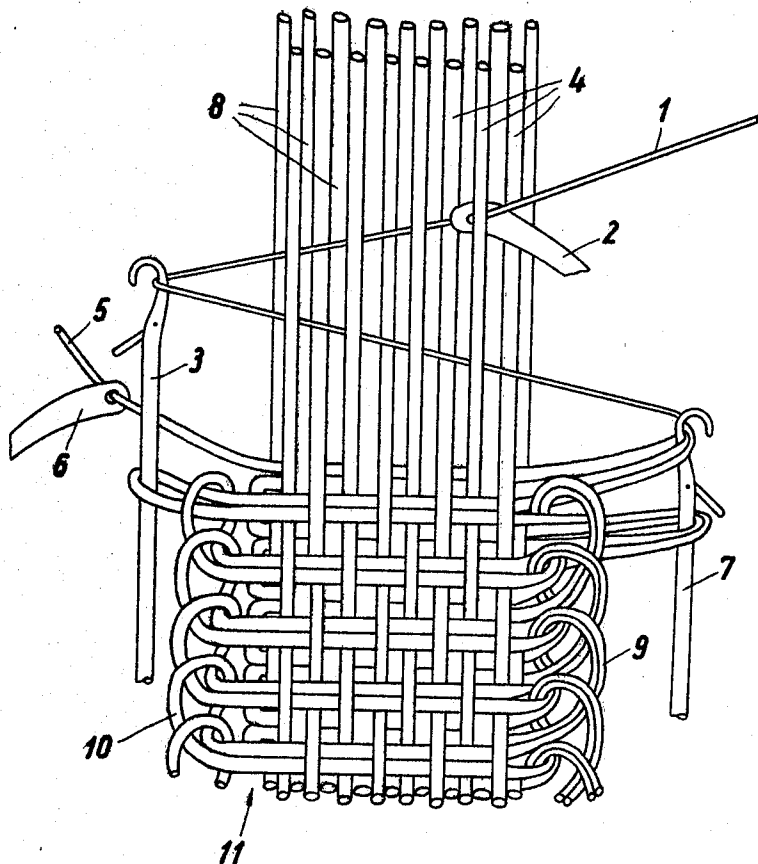


Fig. 1

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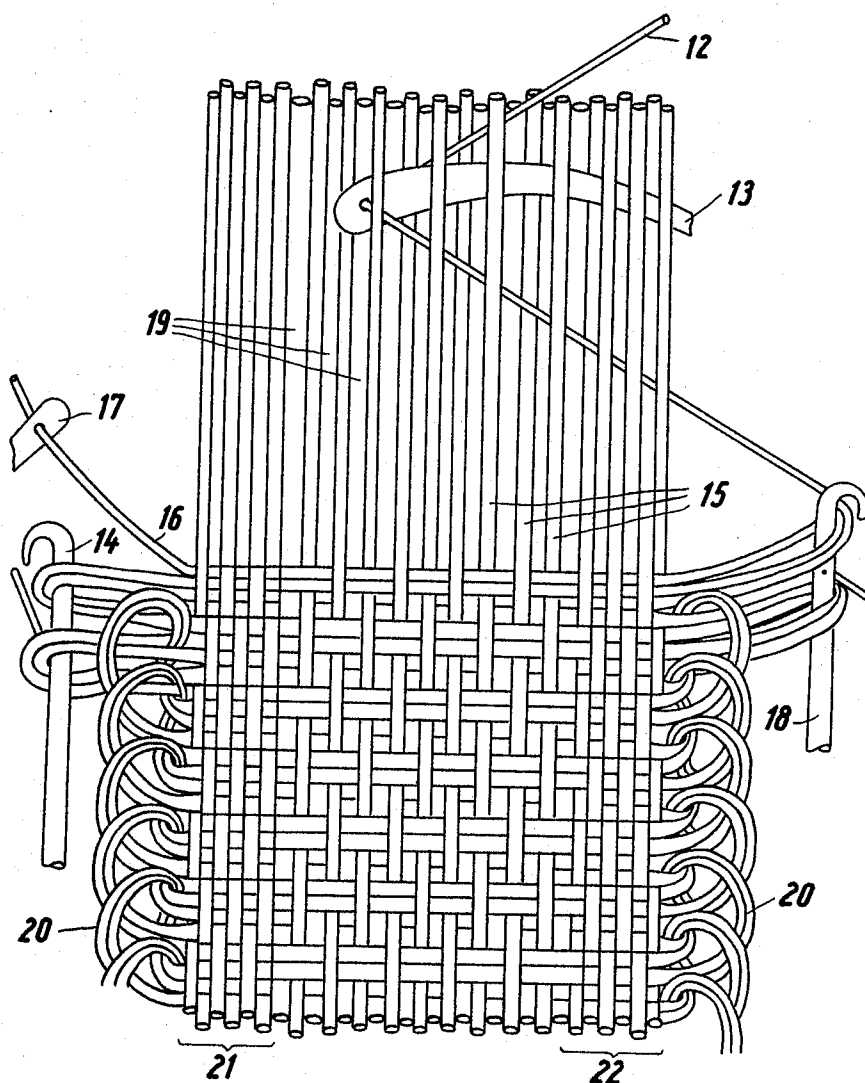


Fig. 2

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4 Sheets-Sheet 3

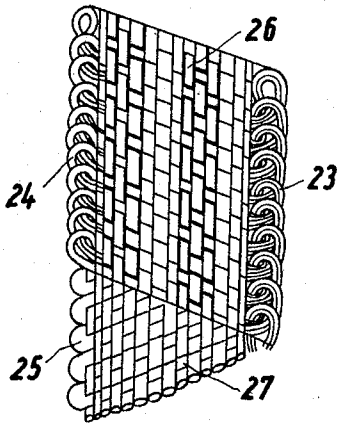


Fig. 3

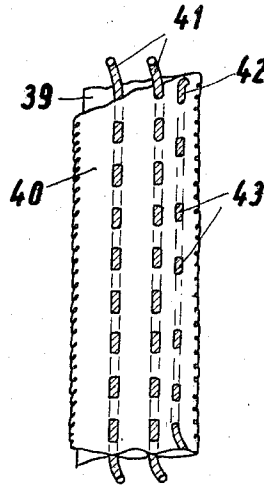


Fig. 6

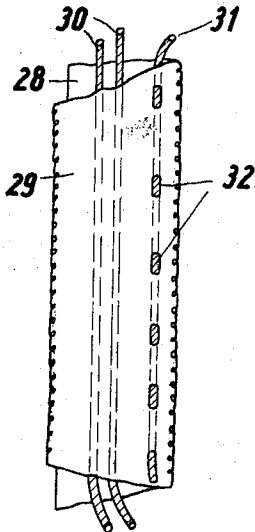


Fig. 4

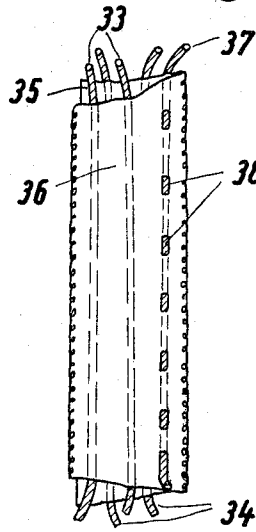


Fig. 5

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4 Sheets-Sheet 4

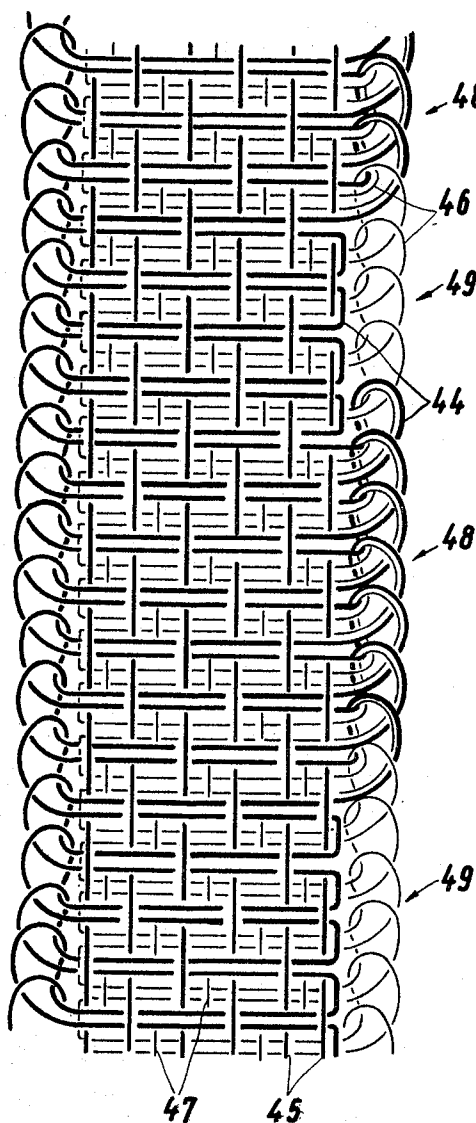


Fig. 7

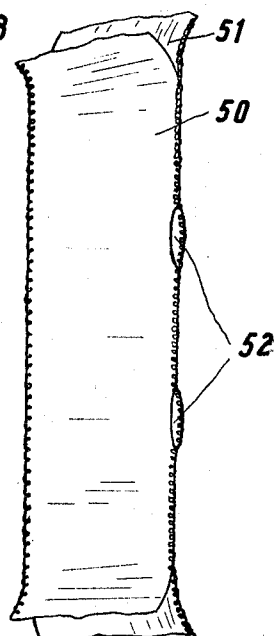


Fig. 8

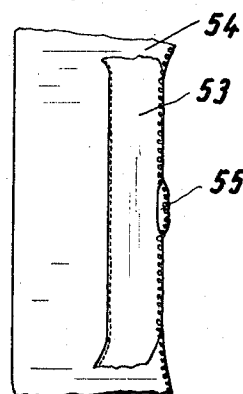


Fig. 9

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DOUBLE FABRIC

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B 71,234

5 Claims. (Cl. 139—384)

The present invention relates to the art of textile weaving and is particularly concerned with a double fabric where the two layers of fabric which are disposed one above the other are connected with each other at one or both edges, where, for example, where small fabrics are involved, a V-shaped band or web or a tubular band is formed.

Double fabrics of this type which are normally produced with a shuttle loom are made, as is well known, in a manner that the connections between the upper and the lower fabric are made with the warp threads or the weft threads. The connecting by means of the warp threads was effected either by what is referred to as the tying up method, where threads of the upper warp are tied in with the bottom fabric, or by tying in, where the threads of the bottom warp are woven in with the upper fabric. To the extent that the connecting was effected by means of the weft threads, this was done, for example, in that the same weft thread was worked in alternately with the upper and with the bottom fabric, whereby a connection of the two fabric layers was effected at least at one edge.

The invention is based on the known type of binding where the weft thread is inserted in the form of double loops so that only at the side from which the weft thread is placed into the opening a firm edge is readily formed. In order that also the other edge is strengthened the ends of the double loops of the weft are connected with one another in the form of knitted loops to constitute a little knitted selvage. For producing these simple fabrics mostly in the form of bands looms without shuttles are utilized, where the weft thread is inserted into the opening or shed as a double thread by means of a gripper or an insert finger. In order to connect the end loops of the double thread weft the work needle in the form of a tongue needle or a lace or hook needle is arranged which then seizes the end of the weft loop and pulls through in each case the preceding loop. In looms of this type it is known to work with two oppositely arranged thread feeders which alternately place a weft thread into the shed whereby a work needle produces a loop chain at each edge of the fabric which either draws the loops of one weft thread or the loops of both weft threads into the loops, possibly with an additional edge thread. All of these fabrics are simple goods even there where one operates with two weft thread feeders or placers.

As compared to this the invention concerns a double fabric where the edges of the individual fabrics per se are of the same configuration as in the above mentioned simple fabrics, namely a firm edge at one side which is formed by the reversing of the weft thread from one shed to the other and at the other edge a loop chain which has been formed by a type of crocheting of the ends of the weft loops. More in particular, the invention provides that the connection of the two layers of fabric at the edge is obtained in that both weft threads are worked into the loop stem at the particular edge. In this connection the return loop of the weft thread which otherwise forms the firm edge is each time drawn between two weft inserts as a second loop into the double loop which has thus been formed. If this connection is only provided at one edge, then a V-shaped braiding band is formed. By means of a connection at

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both edges a tubular fabric or tubular band is formed.

In both cases it is possible to reinforce this edge connection of double loops of both weft threads by tying in the warp threads of the one layer with the other layer of the fabric. These zones of reinforcement through the tied in warp threads can be of any desired width. Moreover, it is not necessary that these zones in which the warp threads of the upper and the bottom fabric are brought together are limited to the edge portions along the connecting edges, as they can also be repeated within the fabric or the band so that in the case of a tubular fabric not a single larger hollow space is formed but several tubular spaces disposed alongside one another. If the edge connection is interrupted in places by the weft threads that have been worked together into stitches, then a slot is formed at that location. Bands or bindings having such slots can be used for many purposes.

Thus the invention allows a variety of forms of double weave fabrics and double bands where the two layers of web are connected in accordance with the basic inventive concept by working the two weft threads into edge loop selvages. In addition, however, the invention provides also the much more economical manner of operation of a loom without shuttles with two weft thread feeders for the production of such webs and bands. The advantage of the use of these looms resides in their well known great operating speed, which is about ten times as great as that of a loom having shuttles.

Further features and advantages of the invention will become apparent from the following description with reference to the accompanying drawings which show fabrics formed in accordance with the invention, particularly bands and a few examples of use, and in which:

FIG. 1 shows a double fabric with the connection of the fabric layers at one edge as well as the manner of production;

FIG. 2 shows in a manner similar to FIG. 1 a double fabric with connection of the fabric layers at both edges;

FIG. 3 illustrates a binding provided with the features of the invention;

FIGS. 4-6 illustrate double bands or ribbons in the form of curtain carrying strapping;

FIG. 7 shows in a schematic illustration the forming of a double band where the edge connecting the two layers of double meshes is interrupted in places, and

FIGS. 8 and 9 show straps or bands with slots which are made in the manner illustrated in FIG. 7.

In the double fabric illustrated in FIG. 1 a special weft thread is provided which is placed in the warp in the form of a loop. As shown furthermore by FIG. 1, the loom is provided with two weft thread fitters of which one fitter 2 places the weft thread 1 for the upper fabric into the shed between warp threads 4. A corresponding fitter 6 carries the weft thread 5 for the lower fabric into the shed formed by the warp threads 8. The catch needle 3 cooperates with the fitting finger 2 for the top fabric and seizes the inserted weft thread loop at its end and pulls it through the preceding weft thread loop. Thus a selvage 10 of interlocked loops is formed at the left side. The needle 7 which is provided at the other side of the fabric, however, does not only cooperate with the weft thread fitter 6 of the lower weft, to seize the ends of the loops of the weft thread 5 there, but it cooperates also with the thread fitter 2 in a manner that also the thread 1 is placed each time around the needle 7. In this manner the selvage 9 is formed, whereby a loop of thread 1 as well as also a loop from thread 5 are united to form a double loop for each stitch. The two loops are thereby interknitted and form a knitted looped selvage consisting of double loops.

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As indicated at 11, the left edge of the bottom fabric is formed by the return arcs or loops of the weft thread which are developed between two weft insertions.

FIG. 2 illustrates a double fabric in which both layers are connected with each other at both edges. Also here the essential tools of the loom used for producing the fabric are shown. The weft thread 12 is entered by the fitting finger 13 into the shed formed by the warp threads 15 of the upper fabric. Suitably a fitting finger 17 is provided for inserting the weft thread 16 for the lower fabric into the shed formed by the warp threads 19. In the production of this double fabric the two needles 14 and 18 operate in a manner that they both seize the loop of the weft thread inserted from the other side as well as also the return loop of the other weft thread inserted from their own end. In this manner the double loop chains 20 are formed at both edges which connect the upper and the lower fabric to form a tube.

If the connections produced merely by the weft threads are to be reinforced, the warp threads in the adjacent border zones of the individual layers can be guided in a manner that they are tied in with the other layer. Such reinforced zones are indicated in FIG. 2 at 21 and 22. However, the reinforcing zones 21 and 22 need not be limited to the border portions along the connected edges as in FIG. 2, but they can extend more toward the center of the strip or band. If such a zone where the warp threads connect the two layers of fabric is provided only in the center or also in the center of the band or strip, a band is formed which has two tubular spaces adjacent to one another. If more than two tubular spaces are desired in the band, then two or more such zones must be provided.

In FIGS. 3 to 6 different forms of embodiments of the V-shaped bands are illustrated such as they are realized by the manner of operation illustrated in FIG. 1 by providing one edge connection between upper and lower fabric. The band in accordance with FIG. 3 has the double selvage 23 out of top and bottom layer which connect the upper fabric 26 with the bottom fabric 27. The left selvage 24 illustrates the loop lock of the upper fabric while the selvage 25 of the bottom fabric is formed by the reversing loops of the bottom layer. Six heavier or effect threads are woven into the upper fabric. Such a band is particularly suitable for bindings for carpets. The color scheme for the basic fabric and for the effect threads can be chosen to match the carpet.

The bands in accordance with FIGS. 4, 5 and 6 are intended for use as curtain support edging. In the band illustrated in FIG. 4 two drawing or crimping threads 30 are woven into the upper fabric 29 which is connected with the lower fabric 28 by means of the double selvage at the right, by means of which threads the curtain which is sewn in between the two layers 28 and 29 can be pleated in any desired manner. A further cord 31 is combined with the upper fabric in such a manner that it is only exposed along short stretches 32. In these locations hooks or sliders are inserted which are to be slid into the curtain traverse rod. FIG. 5 illustrates a similar construction in accordance with which two crimping threads 33 are provided in the upper fabric 36 or two such threads 34 also in the bottom fabric 35. Again the strap 37 for the hooks is only exposed at the locations 38 for receiving the hooks.

FIG. 6 shows a different manner of working in the crimp or draw threads. It is shown here how the two threads 41 are alternately tied into the upper fabric 40 and the lower fabric 39. In this manner hollow or tubular spaces are formed particularly between the double selvages at the right connecting the two layers and the right crimp thread as well as also between the two crimp threads 41. For sewing in the curtain there remains the V-shaped portion of the double layer band which is open at the left.

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FIGS. 7 to 9 illustrate a further advantageous development of the double fabric in accordance with the main concept of the invention. FIG. 7 shows a double fabric having the upper fabric represented by heavier lines while the lighter lines show the bottom fabric. The weft thread of the upper fabric is indicated at 44, and 45 are the warp threads, while the weft thread of the bottom fabric is indicated at 46 and the warp threads at 47. As reflected by the drawing the two layers are connected by double stitches at the right. For distinguishing the form of construction in accordance with FIGS. 1 and 2, however, this connection does not pass through the entire length but is interrupted in places. Thus it can be seen that at the locations 48 the double stitches out of the two weft threads 44 and 46 connect the upper and lower fabric, while at the locations 49 only stitches are present defined by the weft thread of the bottom fabric. The weft thread 44 of the upper fabric forms a stiff selvage in the usual manner at locations 49 by means of the reversing loops which are formed when the weft thread passes from one shed to the next. At the left side of FIG. 7 it is seen how the left edge of the upper fabric is formed by the stitches defined by the weft thread 44 and how the reversing loops of the weft thread 46 result in the left stiff fabric selvage of the bottom fabric. FIGS. 8 and 9 show how the interruption of the knitted loop connection at locations 49 of FIG. 7 may be used in the finished band or strap which again is intended to serve as a curtain carrier band. Since at the locations 49 the upper and lower fabrics are freely disposed one upon the other, there is formed in accordance with FIG. 8 a V-shaped band from the upper fabric 50 and the lower fabric 51, the right connecting edge of which is provided with the slots 52. The two layers of such a band need not be of equal width, but they can differ considerably as far as width is concerned as shown by parts 53 and 54 in FIG. 9, which again leave such a slot between them at 55.

Through these slots the sliders can be inserted which are in the form of an inverted T and which with their wide flange which is on edge are sewn in between the two layers 50, 51 or 53 and 54. The stay passed therethrough carries at its end, for example, a sliding head, by means of which the band with the curtain sewn thereto can travel along the rail or rod.

Having now described my invention with reference to the embodiments illustrated in the drawings, I do not wish to be limited thereto, but what I desire to protect by Letters Patent of the United States is set forth in the appended claims.

I claim:

1. Double fabric comprising an upper and a lower fabric layer each formed of warp threads and weft threads, one said layer having the weft threads disposed therein in one direction and the other said layer having the weft threads disposed therein in the opposite direction, the weft threads in each layer being inserted in the form of loops having ends defining on one side of the layer a firm selvage of interlocked loops, while on the other side of the layer the weft threads define reversing loops between two weft inserts, said upper and said lower layer being connected at least at one selvage edge in a manner that the reversing loops of the weft threads of one fabric layer are interknitted with the loops of the weft threads in the other fabric layer to form a knitted locked selvage of double loops.

2. Double fabric in accordance with claim 1, where for reinforcing the selvage of double loops the warp threads of one fabric layer are tied in with the other fabric layer parallel to the selvage.

3. Double fabric in accordance with claim 1, where the warp threads of one fabric layer are interwoven with the other fabric layer thereby connecting both layers to form adjacent tubular spaces distributed over the width of the fabric.

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4. Double fabric in accordance with claim 1, where the threads forming the fabric include ornamental warp threads in at least one layer of the fabric.

5. Double fabric in accordance with claim 1, where the connection of the two fabric layers established by means of the interlocked selvage loops of said two weft threads is interrupted in predetermined locations where single loops are formed in the layers to define slots.

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