No. 729,161. PATENTED MAY 26, 1903.

C. H. L. HANSON.

WOVEN FABRIC.

APPLICATION FILED JAN. 21, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

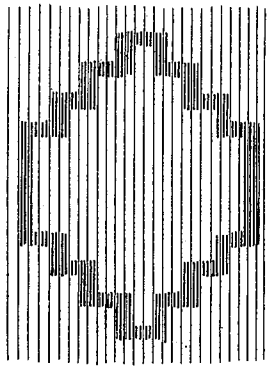
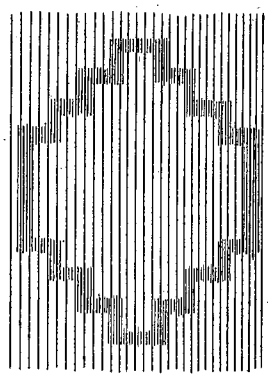


Fig. 2.



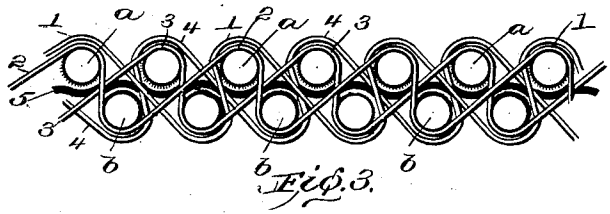


Fig. 3.

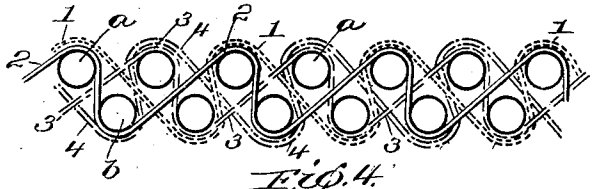


Fig. 4.

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No. 729,161

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NO MODEL.

2 SHEETS—SHEET 2.

Fig. 5.

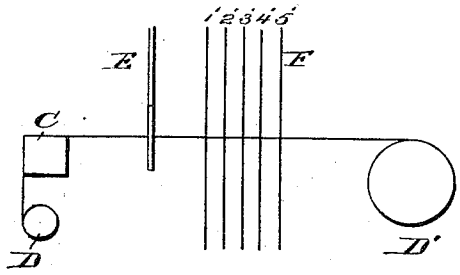


Fig. 8.

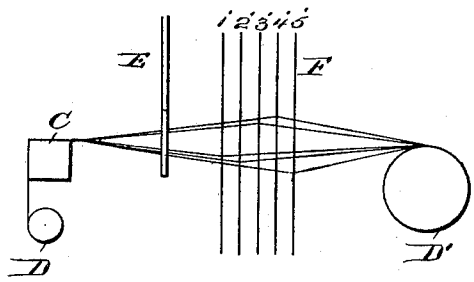


Fig. 6.

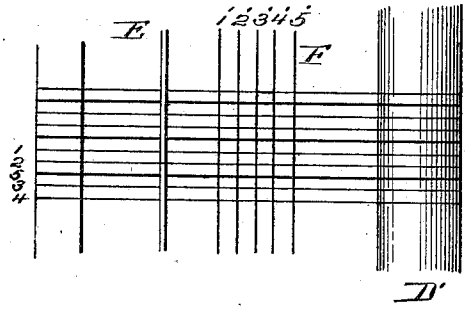


Fig. 9.

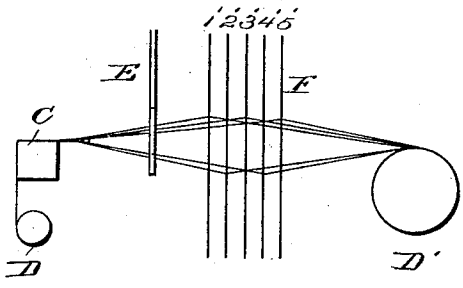


Fig. 7.

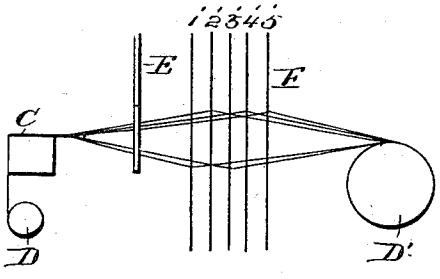
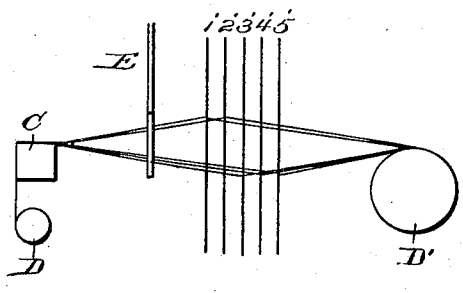


Fig. 10.



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No. 729,161. Patented May 26, 1903.

UNITED STATES PATENT OFFICE.

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WOVEN FABRIC.

SPECIFICATION forming part of Letters Patent No. 729,161, dated May 26, 1903.

Application filed January 21, 1903. Serial No. 139,891. (No specimens.)

To all whom it may concern:

Be it known that I, CHARLES H. L. HANSON, a citizen of the United States, residing in the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Woven Fabrics, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

The invention to be hereinafter described relates to woven fabrics more especially designed for floor-coverings—such as carpets, rugs, and the like—although it is to be understood that the same is not limited in this respect; and the object of my invention is to produce such type of fabric in more or less close resemblance to the well-known oriental or Persian rugs.

With these general objects in view the invention comprises a fabric having a plurality of weft planes, two being shown in the present embodiment of the invention, the weft-threads in one plane constituting the face of the fabric and the weft-threads in the other plane constituting the back thereof, suitable binder-warps serving to tie in the weft-threads in separate sheds in the two planes, with the weft-threads constituting the face of the fabrics disposed over the space separating the weft-threads of the back of the fabric, so that the face figuring effect shall show with more or less distinctness upon the back of the fabric, as in the oriental rugs referred to. In order to maintain the two planes of weft-threads constituting the face and back of the fabric properly separated from each other, as also to prevent drawing the face-wefts too much to the back of the fabric between the backing-wefts, I may employ a stuffer, which at all times lies between the face and back weft-threads, and this stuffer, as well as the binder-warps and back wefts to be hereinafter described, may be of any desired material; but as a preferred character thereof I have found that the stuffer and binder warps formed of cotton or other inexpensive thread and the backing weft-thread formed of jute or a mixture of jute and fiber answer very well, and while I prefer these characters of thread for the stuffer, binder warps, and backing-weft, respectively, it is to be distinctly understood that my invention is not limited in respect to the composition or material of the threads employed.

For the face-weft, which forms the figuring effect, I employ any desired or usual character of chenille or other similar thread which will permit the binder-warps to sink into the material thereof and be thus hidden, while at the same time depressing or drawing down the fibers of such thread toward the back of the fabric between the backing weft-threads to produce in more or less distinctness on the back of the fabric a reproduction of the face figuring effect.

With the general characteristics of the invention thus set forth the same consists of the fabric to be hereinafter more particularly described and then definitely pointed out in the claims.

In the drawings, Figure 1 is a plan or face view of a piece of fabric, showing a form of figuring effect upon the face thereof. Fig. 2 is a view of the back of such fabric, showing in more or less distinctness the figure effect on the face. Fig. 3 is a longitudinal sectional view of a portion of a fabric embodying my invention, showing the arrangement of the warp and weft threads. Fig. 4 is a longitudinal sectional view of the same fabric with the stuffer-thread omitted. Figs. 5 and 6 are respectively diagrammatic side and plan views of such parts of a loom as are necessary to show the tying in of the warp-threads, and Figs. 7, 8, 9, and 10 are like diagrammatic views showing the manner of shedding the warp-threads through one cycle of operations in producing the fabric.

Referring to the drawings, *a* represents the weft-threads constituting the face of the fabric and by which the figure effect is produced. These threads are preferably formed of chenille or other desired character of material, which, being laid side by side upon the face of the fabric, serve to produce the figure or pattern desired, and *b* represents the weft-threads, which constitute the back of the fabric and may be formed of any desired material, such as jute, cotton, or the like. The

weft-threads *a*, constituting the face of the fabric, and the weft-threads *b*, constituting the back, are preferably arranged in two planes, the weft-threads of the face being disposed above the space between the weft-threads of the back, such disposition of the weft-threads being maintained by the binding warp-threads, to be described.

Referring to Figs. 5 to 10, C indicates the breast-beam; D D′, the take-up and let-off rolls; E, the lay, carrying the ordinary reed, and F the heddles, which when a stuffer-warp is employed are five in number—one for each of the four sets of binder-warps 1, 2, 3, and 4 and one for the stuffer-warps 5. The heddles are designated as 1′, 2′, 3′, 4′, and 5′, and the warps are drawn into them in any particular order; but for the purpose of more clearly disclosing the manner of binding in the individual weft in the two weft planes I have in the present instance drawn warp designated 1 through No. 1′ heddle, warp 2 through No. 2′ heddle, warp 3 through No. 3′ heddle, warp 4 through No. 4′ heddle, and stuffer-warp 5 through No. 5′ heddle. With the arrangement thus outlined, which of course is merely arbitrary as to the particular order of drawing in of the warps, the fabric of Fig. 3, commencing at the left of said figures, may be produced by the following cycle of shedding operation: First, raise heddle 1′ and 2′, depress 3′, 4′, and 5′, and introduce shot of chenille or face-weft *a*, as in Fig. 10; second, raise heddle 1′, 3′, and 5′, depress 2′ and 4′, and introduce shot of backing-weft *b*, as in Fig. 9; third, raise heddles 3′ and 4′, depress 1′, 2′, and 5′, and introduce shot of chenille or face-weft *a*, as in Fig. 8; fourth, raise heddles 2′, 4′, and 5′, depress 1′ and 3′, and introduce shot of backing-weft *b*, as in Fig. 7. It will be understood, of course, that the usual beating up takes place after each introduction of a weft-thread, either face or back. Thus it will be noted that I employ four binder warp-threads, which are worked in pairs, the threads constituting the pairs being varied in each successive shed throughout each cycle of operations, as above indicated, and that in the finished fabric the binder warp-threads in pairs pass around or overlie the weft-threads of both face and back, and that one of the threads of each pair of warp-threads passes from its tied-in weft directly to the opposite surface of the fabric to tie in the next weft-thread on that surface, and that the other of the pair passes diagonally to the opposite surface to tie in the second shot of weft on that surface, and then each binder-warp passes to the surface from which they originally came in the described cycle of operations, where they together tie in a shot of weft on that surface. The result is that each weft-thread of both the face and back of the fabric is bound in place by binder-warps passing directly and in reverse diagonal directions to the opposite surface of the fabric. By such binding in of the weft (best illustrated in Figs. 3 and 4) the weft-threads on one surface are firmly and securely held in position opposite the spaces between the weft-threads of the other surface, by which means the chenille or other face-weft may have the fibers thereof depressed by the binder-warps, so as to appear in more or less distinctness on the back in the same pattern or figure as on the face.

It is desirable to use the stuffer-warp 5 between the two weft planes in order to more properly and accurately position the face-wefts between the spaces of the back weft, as also to prevent too much drawing through of the face-weft by the binder-warp; but in some cases it may, if desired, be omitted, as illustrated in Fig. 4.

It is obvious, of course, that more or less body may be given the fabric by the use of more or less heavy threads and that the binder-warp may be varied in color as desired, and my invention is not limited in this respect, the invention broadly contemplating the formation of a fabric resembling with more or less accuracy an oriental or Persian rug, the figure or pattern being formed by chenille or similar threads upon one surface overlying the spaces between the suitable backing-threads and bound in by warp-threads, so that a portion of the chenille or face-weft may be drawn to the back of the fabric to produce the face-pattern thereon. It is also obvious that various modifications of the disposition of the binder-warps may also be made without departing from the spirit of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A woven fabric comprising weft-threads arranged in two planes, the weft-threads in one plane being disposed opposite the spaces between the weft-threads of the other plane, and binder warp-threads arranged in pairs for binding the weft-threads in one plane and in different pairs for binding the weft-threads of the other plane to produce in more or less distinctness on the back of the fabric the figure or pattern formed by the weft-threads on the face thereof.

2. A woven fabric comprising weft-threads arranged in two planes, the weft-threads in one plane being disposed opposite the spaces between the weft-threads of the other plane, stuffer warp-threads interposed between the two planes of weft-threads, and binder warp-threads arranged in pairs for binding the weft-threads in one plane and in different pairs for binding the weft-threads of the other plane to produce in more or less distinctness on the back of the fabric the figure or pattern formed by the weft-threads on the face thereof.

3. A woven fabric comprising face weft-threads and backing weft-threads, the face weft-threads being disposed opposite the spaces between the backing weft-threads, and

binder warp-threads passing around the face and back weft-threads in pairs, one of the pair of binder warp-threads passing from its tied-in weft-thread to the opposite surface of the fabric to tie in the next weft-thread on that surface, and the other one of the pair passing diagonally to the opposite surface to tie in the second weft-thread on that surface, whereby each weft-thread of both face and back is tied in place by binder-warps passing directly and in reverse diagonal directions to the opposite surface of the fabric.

4. A woven fabric comprising face weft-threads and backing weft-threads, the face weft-threads being disposed opposite the spaces between the backing weft-threads, stuffer warp-threads interposed between the face and backing weft-threads, and binder warp-threads passing around the face and back weft-threads in pairs, one of the pair of binder warp-threads passing from its tied-in weft-thread to the opposite surface of the fabric to tie in the next weft-thread on that surface, and the other one of the pair passing diagonally to the opposite surface to tie in the second weft-thread on that surface, whereby each weft-thread of both face and back is tied in place by binder-warps passing directly and in reverse diagonal directions to the opposite surface of the fabric.

5. A woven fabric resembling an oriental rug and formed of chenille face weft-threads and inferior quality of backing weft-threads, the chenille weft-threads being disposed opposite the spaces between the backing weft-threads, stuffer warp-threads interposed between the face and backing weft-threads, and four sets of binder warp-threads passing around the face and backing weft-threads in pairs, one of the pairs of binder warp-threads passing from its tied-in weft-thread directly to the opposite face of the fabric to tie in the next weft-thread on that surface, and the other one of the pair of binder warp-threads passing diagonally to the opposite surface to tie in the second weft-thread on that surface, whereby each weft-thread of both face and back is tied in place by binder-warps passing directly and by others in reverse diagonal direction to the opposite surface of the fabric, to hold the face weft-threads securely opposite the spaces between the backing weft-threads and produce the figure of the face upon the back of the fabric.

In testimony whereof I have hereunto affixed my signature this 14th day of January, A. D. 1903.

CHARLES H. L. HANSON.

Witnesses:
GEO. W. REED,
H. T. FENTON.