

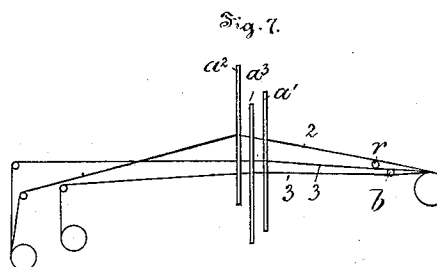
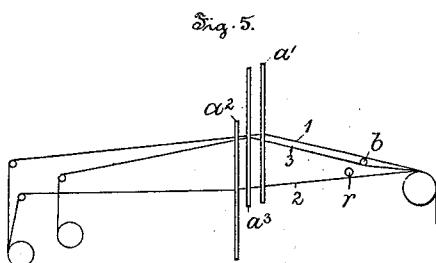
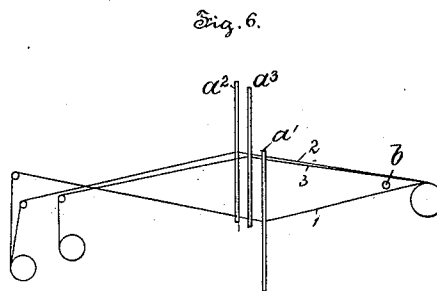
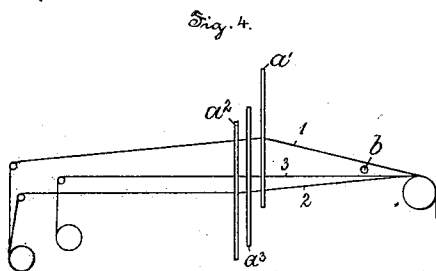
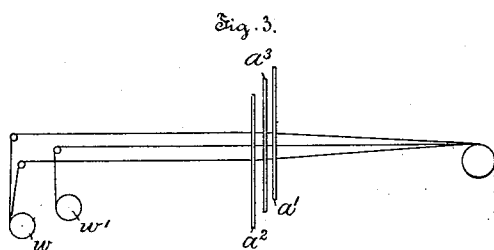
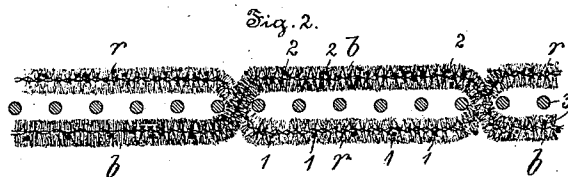
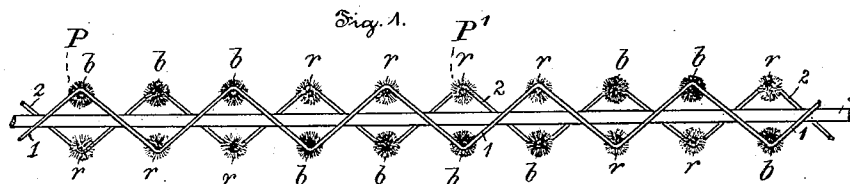
(Specimens.)

G. H. HARVEY.

WOVEN FABRIC AND METHOD OF WEAVING THE SAME.

No. 472,216.

Patented Apr. 5, 1892.



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UNITED STATES PATENT OFFICE.

GEORGE H. HARVEY, OF PHILADELPHIA, PENNSYLVANIA.

WOVEN FABRIC AND METHOD OF WEAVING THE SAME.

SPECIFICATION forming part of Letters Patent No. 472,216, dated April 5, 1892.

Application filed November 28, 1890. Serial No. 372,830. (Specimens.)

To all whom it may concern:

Be it known that I, GEORGE H. HARVEY, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Woven Fabrics and the Method of Weaving the Same, of which the following is a specification.

The principal objects of my present invention are, first, to provide a carpet fabric which is cheaper to manufacture than ordinary two and three ply carpet fabrics and such as shall constitute an acceptable substitute therefor and for such costly upholstery fabrics as are now employed; second, to provide an inexpensive carpet fabric which shall present a multiple-ply color effect and which shall be heavier in weight and possess better weaving qualities than ordinary motley single-ply carpet, and, third, to provide an inexpensive, efficient, and expeditious method of weaving such a carpet fabric by means of a loom provided with a simple form of jacquard.

My invention consists of an improved woven fabric having figuring chenille weft-threads passing from face to face thereof to constitute the required pattern and form a cut-pile or full chenille surface throughout both the face and back of the fabric with spun warp-threads in three sets or divisions, and two of said sets or divisions passing from face to face of the fabric and tying said weft-threads and the other of said sets or divisions lying along the middle of the fabric and directing the weft-threads.

My invention further consists in the method of producing such a woven fabric by employing a series of wefts in predetermined order and warps in three sets or divisions, two for binding the wefts and one for controlling the disposition thereof, so as to produce the required figure effect, and lifting one division of said binding-warps successively and certain of said figure-controlling warps before the introduction of each of the series of wefts, and then lifting the other division of binding-warps successively and certain of said figure-controlling warps before repeating the introduction of each of the series of wefts in the same order, as will be hereinafter more fully described.

In weaving a carpet fabric according to my invention preference is given to the employment of two divisions or sets of fine binding-warps and one division of coarse and stiff warps, and there is in a loom for weaving such a fabric a plain harness for each set of fine binding-warps and a "Jacquard machine" for controlling the heddles for the coarse warps. In weaving figured fabrics there is one operation of the Jacquard needles for every pick of the loom and there is an operation of one of the pair of plain harnesses for each operation of the Jacquard machine—that is to say, the same plain harness is operated successively once for each shot of different-colored weft-threads, and then the other plain harness is operated successively in a similar manner. In weaving plain fabrics—that is, fabrics having a solid color upon the respective faces thereof—there is one operation of the Jacquard needles for every other pick of the loom and there are two successive operations of each of the plain harnesses for every operation of the Jacquard needles.

In carrying out my improved method of weaving the warp is divided into three sets or divisions, two of binding-warps and one of figure-controlling warps, and these divisions of the warps are manipulated in the following manner: One set or division of the binding-warps is lifted by means of a plain harness and journal and certain of the coarse warps are jacked up or lifted by means of a Jacquard machine, whereupon a shot of weft is introduced. This weft goes to the back of the fabric wherever the figure-controlling warps are lifted and to the face of the fabric wherever the figure-controlling warps are permitted to occupy their normal or depressed position. All the warps are then returned to their normal positions and the weft is beaten up by means of a lay and reed. The same set of binding-warps is again lifted and certain others of the figure-controlling warps are jacked up and a second shot of weft is introduced. This second weft goes to the back of the fabric wherever the figure-controlling warps are lifted—that is to say, at the points where the first weft went to the face—and to the face of the fabric wherever the figure-controlling warps are permitted to occupy

their normal or depressed position—that is to say, at the points where the first weft went to the back. During the next operation of the loom the other set of binding-warps is operated in the manner above described and the wefts are introduced in the same order, so that the two divisions of binding-warps are operated by a journal and weave only plain sheds and the figure-controlling warps are drawn tight and are operated by the Jacquard machine. These figure-controlling warps lie between the two wefts and serve to direct the same to either the one or the other of the two faces of the fabric, according to the requirements of the pattern.

The nature and objects of my present invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is a diagrammatical view of a section of the fabric, taken in the direction of the warp-threads—*i. e.*, a section through the weft-threads—showing the character of the weave of a fabric embodying the features of my invention. Fig. 2 is a similar view representing a section of the fabric, taken in the direction of the weft-threads—*i. e.*, a section through the warp-threads—showing weft-threads of two different colors separated by the coarse warps and appearing on the face of the fabric in accordance with the requirements of the pattern. Fig. 3 represents the arrangement of certain parts of a loom and such as may be conveniently employed for the production of my improved fabric, and Figs. 4, 5, 6, and 7 illustrate diagrammatically the operation of weaving the improved fabric by means of a loom arranged in the manner illustrated in Fig. 3.

In the drawings, 1, 2, and 3 represent a warp in three divisions. The two divisions 1 and 2 are binding-warps and may comprise threads of different or of the same color; but preference is given to the employment of threads of the same and of a dark color. The other division 3 is a figure-controlling warp and comprises coarse and stiff threads of cotton or other inexpensive material of any color.

For the sake of perspicuity only one thread of each set will be considered throughout the following description, and it will be assumed that two colors—*viz.*, red and black—are necessary to produce the required pattern. *b* represents weft-threads of black chenille or black spun yarn, and *r* represents weft-threads of red chenille or red spun yarn. Preference, however, is given to the employment of chenille weft-threads, because by their employment a fabric having full chenille or cut pile faces is produced.

Referring now to Fig. 1, the fine binding-warps 1 and 2 pass from face to face of the fabric and constitute plain sheds containing the red and black wefts *r* and *b*, and the figure-controlling warps 3 lie along the middle of the fabric and direct the wefts *r* and *b* to

the face or back thereof, as will be readily understood by reference to Fig. 2. The warp-threads 3 not only serve to direct the wefts to the back and face of the fabric, but also serve to give body and weight to the fabric as a whole and to cushion the face and back wefts, thereby preserving the same longer against wear and tear and preventing what is technically known as “gazing”—that is to say, the formation of gaps on one side of the fabric through which the other face thereof can be seen.

In order that my invention may be more fully understood, a brief description will now be given of the manufacture of my improved fabric in two colors—to wit, red and black—and according to my improved method of weaving.

Referring now to Fig. 3, the two divisions of fine warps 1 and 2 are carried, preferably, upon the same warp-beam *w* and are led in through the two harnesses *a'* and *a''*, adapted to be operated by means of journals, and the figure-controlling warp 3 is carried upon a second warp-beam *w'* and is under slightly greater tension than the divisions 1 and 2. The threads of the division 3 are led in through the heddles of a third harness *a'''*, and these heddles are adapted to be operated by means of a Jacquard machine in the usual or in any preferred manner. If the fabric is to be woven on an ordinary ingrain-carpet loom, these threads 3 would of course be led in through the third and fourth harnesses and would be operated by the Jacquard needles in sets of four and the journal-lift for these two harnesses would be dispensed with.

In weaving the plain portion of the fabric indicated by the letter P in Fig. 1 the wefts are introduced in a certain order—for example, black and red—the harness *a'* and warp 1 are lifted by means of a journal, and a shot of black weft *b* is introduced into the shed, Fig. 4, and appears at the face of the fabric. The harness *a'* is then lowered and the weft beaten up. The harness *a'* and thread 1 are again lifted by the journal and certain of the threads 3 are jacked up, Fig. 5, and a shot of red weft *r* is introduced and appears at the back of the fabric. The harness *a'* and threads 3 are then lowered and the weft beaten up. At the next operation of the loom the harness *a''* is raised, so that the warps 1 and 2 form plain sheds throughout the fabric and the warp 3 lies along the middle thereof.

In weaving the figured portion of the fabric indicated by the letter P' in Fig. 1 the two shots of wefts are introduced in the same order—that is to say, first black and then red—and the harness *a''* and thread 2 are lifted by the journal and certain of the threads 3 are jacked up and a shot of black weft *b* is introduced into the shed and appears at the back of the fabric, Fig. 6. The harness *a''* and threads 3 are then lowered and the weft is beaten up, Fig. 6. The harness *a''* is again lifted by the journal and a shot of red weft is

introduced into the shed, Fig. 7, and appears at the back of the fabric. The harness a^2 is then lowered and the weft is beaten up. At the next operation of the loom the harness a' is lifted, so that the warps 1 and 2 form plain sheds throughout the fabric and the warp 3 lies along the middle thereof.

The journal-lifts may be dispensed with and all the threads may be operated by means of a Jacquard machine; but good results have been obtained in practice by the employment of journals, and hence preference is given to their use.

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

1. The herein-described woven fabric, comprising figuring chenille weft-threads passing from face to face of the fabric to constitute the required pattern and form a cut pile or full chenille surface throughout both the face and back of the fabric and spun warp-threads

in three sets, two of said sets passing from face to face of the fabric and tying said weft-threads and the other one of said sets lying along the middle of the fabric and directing the weft-threads.

2. The method of producing the herein-described woven fabric, which consists in employing two sets of wefts and warps in three sets, two for binding the wefts and one for controlling the figure effect, introducing said wefts singly, and operating the binding-warps once for every two shots of weft and certain of the figure-controlling warps once for every shot of weft, for the purposes set forth.

In witness whereof I have hereunto set my signature in the presence of two subscribing witnesses.

GEORGE H. HARVEY.

Witnesses:

A. B. STOUGHTON,
RICHARD C. MAXWELL.