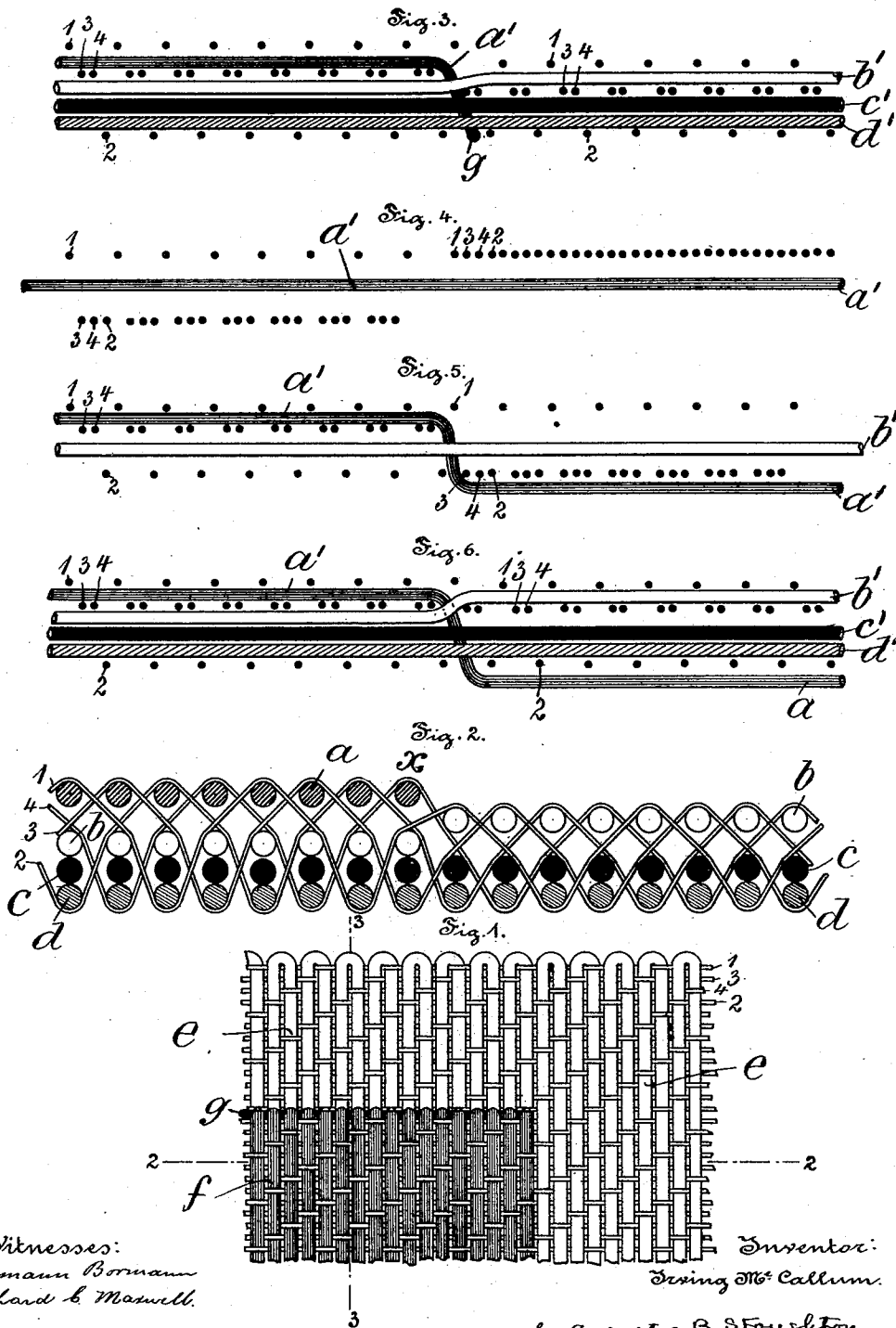


(Specimens.)

I. McCALLUM.  
WOVEN FABRIC.

No. 475,466.

Patented May 24, 1892.



Witnesses:  
Hermann Bornmann  
Richard L. Maxwell.

Inventor:  
Ivesing McCallum.  
by Augustus B. S. Foughton  
att'y.

# UNITED STATES PATENT OFFICE.

IRVING McCALLUM, OF PHILADELPHIA, PENNSYLVANIA.

## WOVEN FABRIC.

SPECIFICATION forming part of Letters Patent No. 475,466, dated May 24, 1892.

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*To all whom it may concern:*

Be it known that I, IRVING McCALLUM, 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, of which the following is a specification.

My present improvements are applicable in whole or in part to woven fabrics in general, but they are especially applicable to that class of carpet fabrics which are commonly designated as "rugs," and they relate more particularly to certain structural peculiarities of the fabric, whereby an additional color or an additional weft-thread is introduced into certain portions of the face of the fabric without marring the general figure effect or in any wise affecting the remaining portions thereof.

The principal object of my present invention is to provide a woven carpet fabric or rug having a warp disposed uniformly throughout the same and having an additional color—*i. e.*, an additional weft-thread—introduced at its central face portions without being incorporated with the edge or marginal portions and without in any wise effecting the continuity of the face of the fabric at the lines of union of the center and marginal face portions.

My invention consists of a woven fabric or rug having one or more underlying weft-planes, and having an additional weft-plane incorporated with certain portions of the face of said underlying weft-planes, and having warps disposed uniformly throughout the fabric, and the selvage portions of the wefts appertaining to the additional weft-plane disposed at the back of the fabric.

One practically efficient mode of producing and incorporating an additional weft-plane upon portions of the face of a fabric embodying features of my invention consists in shedding the portion of the warp corresponding in width to the width of the additional weft-plane and lifting the other portion of the warp without shedding it, then introducing a shot of weft appertaining to the additional weft-plane through the shedded portion of the warp to form the additional weft-plane and under the lifted portion of the warp to throw the selvage portion of said weft at the back of the fabric, then manipulating the

whole warp and introducing the wefts appertaining to the underlying weft plane or planes to form the latter, and finally repeating the above-described operations at each row of picks throughout the length of the additional weft-plane.

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

Figure 1 is a top or plane view of portions of a rug embodying features of my invention, and showing an additional weft-plane at the central portions of the face thereof, also showing the selvage portions of the weft pertaining to the additional weft-plane located at the back of the fabric. Fig. 2 is a transverse section drawn to an enlarged scale and taken on the line 2 2 of Fig. 1—*i. e.*, a section in the direction of the warps—showing three underlying weft-planes and an additional face weft-plane incorporated with the fabric, and also showing the warps disposed uniformly—*i. e.*, in regular order—throughout the fabric. Fig. 3 is a section drawn to an enlarged scale and taken on the line 3 3 of Fig. 1—*i. e.*, in a section in the direction of the wefts—showing the selvage portions of the wefts appertaining to the additional weft-plane located at the back of the fabric. Fig. 4 is a section taken transversely of the warps—*i. e.*, a section in the direction of the wefts—illustrating the step in the production of my improved fabric which consists in shedding—*i. e.*, opening—a portion of the warp corresponding in width to the width of the additional weft-plane, lifting the other portions of the warp and introducing a shot of weft appertaining to the additional weft-plane into the shedded portion and beneath the raised portion of the warp. Fig. 5 is a like view illustrating the step in the production of the improved fabric which consists in manipulating all the warp and introducing shots of weft appertaining to the underlying weft-planes and showing one shot of weft appertaining to the underlying weft-planes; and Fig. 6 is a like view showing one complete row of picks, whose repetition throughout the length of the additional weft-plane produces a fabric possessing the characteristics of my improved fabric.

In the accompanying drawings the warp is divided into four divisions 1 2 3 4, as in ordinary ingrain or Scotch carpet-weaving; but a warp in any other number of divisions may be employed. A warp in four divisions is illustrated because ordinarily a power carpet-loom is adapted for such a warp and because excellent results have been attained in practice by its employment. The wefts are disposed in one or more underlying weft-planes and in an additional weft-plane extending over portions of the underlying weft-planes and incorporated therewith. In the present instance three underlying weft-planes *b*, *c*, and *d* are employed, and the additional weft-plane *a* extends over and is incorporated with the central portions of the face of the underlying weft-planes *b*, *c*, and *d*, so that a rug, Fig. 1, is formed having a border or margin *e* surrounding the center or body *f* thereof. The wefts *b'*, *c'*, and *d'* pertaining, respectively, to the underlying weft-planes *b*, *c*, and *d*, are hereinafter designated the "ordinary" wefts, and may be of different colors and may be ingrained to produce a figure effect in the border or margin *e*. In the present instance three wefts *b'*, *c'*, and *d'* are employed in the production of the underlying weft-planes *b*, *c*, and *d*, so that the margin or border *e* may have three colors—that is to say, there are or may be as many colors in the border *e* as there are underlying weft-planes. However, the weft *a'*, appertaining to the additional weft-plane *a* and hereinafter designated the "extra weft," may be of a different color from the wefts *b'*, *c'*, and *d'*, so that there is an additional color at the center or body *f* of the rug. The selvage portions *g* of the additional wefts *a'*—i. e., the loops formed by the return of the wefts *a'*—are located at the back of the fabric, Figs. 3 and 1, and hence are not visible upon the face of the rug, so that the lines of union of the sides of the additional weft-plane *a* with the underlying weft-planes *b*, *c*, and *d* are not discernible upon the face of the fabric and the continuity of the face of the fabric is not broken or otherwise marred. By the introduction of the extra wefts *a'* only at certain portions of the fabric and not at the other portions thereof an economy of material is effected, because the extra weft is only introduced at the required points and does not lie buried at the other portions thereof. It may be remarked that the additional weft-plane *a* may be caused to present a figured effect instead of a plain or solid color effect, as has been hereinabove described, by "ingraining" the "additional" weft *a'*—i. e., by causing it to change places with one of the wefts *b'*, *c'*, or *d'* appertaining to the underlying weft-planes—in accordance with the requirements of the pattern.

In order that one method of weaving my improved fabric may be more fully understood, I will proceed to describe the same in connection with the fabric illustrated in Figs. 1, 2, and 3, and I will refer for this purpose more especially to Figs. 4, 5, and 6.

A loom having four harnesses, corresponding journal-lifts for actuating the same, and a Jacquard machine for operating the individual threads of the warp, may be advantageously employed in carrying the method into effect, and the latter will be described in connection with such a loom.

For the sake of a description it will be assumed that the wefts are introduced in the following order—to wit: *a'*, *b'*, *c'*, and *d'*—that is to say, first, the "extra" weft pertaining to the additional weft-plane *a*, and, second, the ordinary wefts, pertaining to the underlying weft-planes *b*, *c*, and *d*; but the order of introduction of the wefts is immaterial. It will also be assumed that the four divisions 1, 2, 3, and 4 pertain, respectively, to the four harnesses of the loom.

In practice certain threads of portions of the warp corresponding in width to the width of the additional weft-plane *a*—that is, the threads at the left-hand side of Fig. 4—are lifted by the ordinary operation of the journal-lift and all the threads of the other portions of the warp corresponding to the side margins of the rug—i. e., the threads 1, 2, 3, and 4 at the right-hand side of Fig. 4—are lifted, the threads 1 being lifted by the ordinary operation of the journal-lift, and the threads 2, 3, and 4 being lifted by the Jacquard machine, so that at the left-hand side of Fig. 4 the warp is "shedded" or opened and at the right-hand side of said figure the whole warp is lifted without being shedded or opened. A short or extra weft *a'* is then introduced, and this weft *a'* passes into and through the shed at the left-hand side of Fig. 1 and beneath the whole warp at the right-hand side of said figure. The warp-threads 3, 4, and 2 at the marginal portion of the fabric—i. e., at the right-hand side of Fig. 4—are then dropped, as shown at the right-hand side of Fig. 5, by the operation of the Jacquard machine, and the warp-threads 3 and 4 at the left-hand side of Fig. 4—i. e., at the center of the rug—are lifted by the Jacquard machine, as shown at the left-hand side of Fig. 5, whereupon the weft *b'* is introduced, Fig. 5. The warp-threads at the center portion of the rug—i. e., at the left-hand side of Fig. 5—are permitted to occupy the position shown in said figure during the introduction of the shots of wefts *c'* and *d'*, Fig. 6, and the warp-threads 3 and 4 at right-hand side of Fig. 5 are lifted by the Jacquard machine, as shown at the right-hand side of Fig. 6, before the introduction of the wefts *c'* and *d'*.

The three operations above described with reference to Figs. 4, 5, and 6 complete the formation of a row of picks *x* in Fig. 2, and the repetition of these three operations throughout the length of the additional weft-plane *a* produces a fabric embodying my invention, it being understood that the weft *a'* is carried at each repetition of these three operations from the face to and out of the back of the fabric and is then looped around the under-

lying wefts  $b'$ ,  $c'$ , and  $d'$  and passes from the back to the face of the fabric, so that the selvage  $g$  of the weft  $a'$ , Fig. 3, lies at the back of the fabric. The end margins of the fabric or rug may be produced by any well-known method of weaving.

As above described, the additional weft-plane  $a$  is of a solid color; but it may be figured by the employment of the process known as "ingraining"—*i. e.*, by causing the weft  $a'$  to change places with one of the wefts  $b'$ ,  $c'$ , and  $d'$  by means of the Jacquard machine.

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

1. A woven fabric or rug having one or more underlying weft-planes and having an additional weft-plane superposed on certain portions of the face of said underlying weft-planes, and with warps disposed uniformly throughout the fabric, and with the respect-

ive wefts appertaining to the additional weft-plane disposed singly in separate sheds, and having the selvage portions thereof at the back of the fabric, substantially as and for the purposes set forth.

2. A woven fabric or rug having one or more underlying weft-planes and having an additional figured or ingrained weft-plane incorporated with certain portions of the face of said underlying weft-plane, and having warps disposed uniformly throughout the fabric, and having the respective wefts of the additional weft-plane in separate sheds, with the selvage portions thereof disposed at the back of the fabric, substantially as described, and for the purposes set forth.

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

IRVING McCALLUM.

Witnesses:

A. B. STOUGHTON,  
HERMANN BORMANN.