

H. HARDWICK.
CARPET FABRIC.

Patented May 1, 1888.

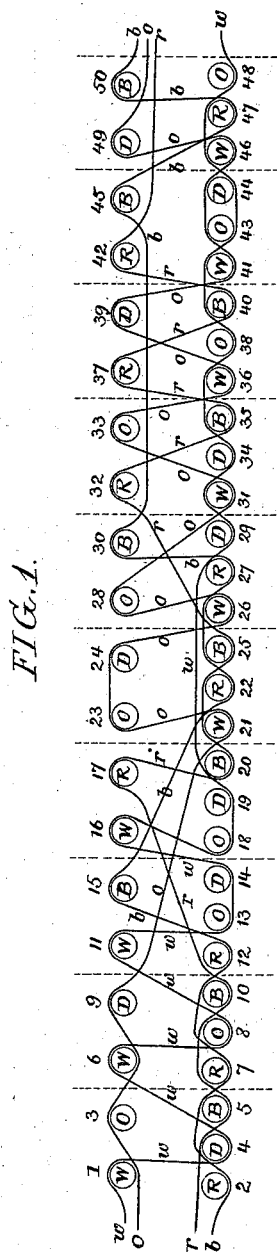


FIG. 1.

Witnesses.
Wm. Barkoff.
John E. Parker.

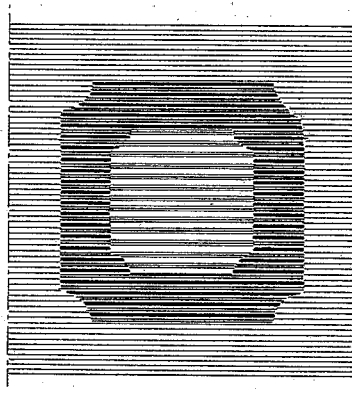


FIG. 2.

Inventor:
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Horvorn and Sons

UNITED STATES PATENT OFFICE.

HARRY HARDWICK, OF PHILADELPHIA, PENNSYLVANIA.

CARPET FABRIC.

SPECIFICATION forming part of Letters Patent No. 382,157, dated May 1, 1888.

Application filed September 5, 1887. Serial No. 248,850. (Specimens.)

To all whom it may concern:

Be it known that I, HARRY HARDWICK, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Carpet Fabrics, of which the following is a specification.

One object of my invention is to provide for greater variety than usual in the coloring of a two-ply ingrain carpet fabric, and another object is to attain this result without unduly increasing the expense of the fabric. I attain the first of these objects by increasing the number of weft or filling threads in the set from four to five, two threads of the set appearing in one ply and three in the other ply; and the second object I attain by causing two of the regular warp-threads of the set to do extra duty in binding the additional thread on the face and back of the fabric.

In the accompanying drawings, Figure 1 is a diagram illustrating various arrangements of threads possible in a two-ply carpet fabric made in accordance with my invention; and Fig. 2 is a view of part of a pattern, showing one of the effects which may be produced in carrying out my invention.

In the diagram, Fig. 1, W, R, O, D, and B represent five weft or filling threads, colored, say, white, red, olive, drab, and black, re-

spectively, and *w*, *r*, *o*, and *b* represent four warp-threads, colored, respectively, white, red, olive, and black. This differs from the ordinary arrangement of threads in a two-ply ingrain carpet fabric in the use of the thread D, and the introduction of this extra thread in the manner hereinafter specified constitutes my present invention, for by its aid I am enabled to very materially amplify the color effects possible in the pattern without a corresponding increase in the expense of the fabric, either as regards material used or the cost of weaving, for, although an extra shot of filling is required for each set, it will be observed that the presence of three weft-threads in one ply and two in the other causes the set of five threads to produce a greater length of fabric than would be produced by two pairs of threads arranged two above and the other two below, and the extra thread is bound on the face by one of the regular warp-threads of the set and on the back by another of said regular warp-threads, so that no extra warp-threads need be added to those now in use.

To produce a fabric such as shown in the drawings, the weft-threads would be introduced in the order indicated, and the ground and figure lift boards and harness shaft of the loom would be operated as follows:

Shot.	Color.	Figure-lift board.	Ground-lift board.	Harness-shaft lifts.	Threads down.
1	W	Rises. No lift.	At rest.	<i>w</i> to bind face.	<i>r</i> , <i>b</i> , and <i>o</i> .
2	R	At rest.	Lifts <i>w</i> and <i>o</i> .	<i>r</i> .	<i>b</i> to bind back.
3	O	Rises. No lift.	At rest.	<i>o</i> to bind face.	<i>r</i> , <i>b</i> , and <i>w</i> .
4	D	Lifts <i>r</i> and <i>b</i> .	At rest.	<i>o</i> .	<i>w</i> to bind back.
5	B	At rest.	Lifts <i>w</i> and <i>o</i> .	<i>b</i> .	<i>r</i> to bind back.
6	W	Rises. No lift.	At rest.	<i>w</i> to bind face.	<i>r</i> , <i>b</i> , and <i>o</i> .
7	R	At rest.	Lifts <i>w</i> and <i>o</i> .	<i>r</i> .	<i>b</i> to bind back.
8	O	Lifts <i>r</i> and <i>b</i> .	At rest.	<i>o</i> .	<i>w</i> to bind back.
9	D	Rises. No lift.	At rest.	<i>o</i> to bind face.	<i>r</i> , <i>b</i> , and <i>w</i> .
10	B	At rest.	Lifts <i>w</i> and <i>o</i> .	<i>b</i> .	<i>r</i> to bind back.
11	W	Rises. No lift.	At rest.	<i>w</i> to bind face.	<i>r</i> , <i>b</i> , and <i>o</i> .
12	R	At rest.	Lifts <i>w</i> and <i>o</i> .	<i>r</i> .	<i>b</i> to bind back.
13	O	Lifts <i>r</i> and <i>b</i> .	At rest.	<i>o</i> .	<i>w</i> to bind back.
14	D	Do.	At rest.	<i>o</i> .	<i>w</i> to bind back.
15	B	At rest.	Rises. No lift.	<i>b</i> to bind face.	<i>r</i> , <i>w</i> , and <i>o</i> .
16	W	Rises. No lift.	At rest.	<i>w</i> to bind face.	<i>r</i> , <i>b</i> , and <i>o</i> .
17	R	At rest.	Rises. No lift.	<i>r</i> to bind face.	<i>b</i> , <i>w</i> , and <i>o</i> .
18	O	Lifts <i>r</i> and <i>b</i> .	At rest.	<i>o</i> .	<i>w</i> to bind back.
19	D	Do.	At rest.	<i>o</i> .	do.
20	B	At rest.	Lifts <i>w</i> and <i>o</i> .	<i>b</i> .	<i>r</i> to bind back.
21	W	Lifts <i>r</i> and <i>b</i> .	At rest.	<i>w</i> .	<i>o</i> to bind back.

Shot.	Color.	Figure-lift board.	Ground-lift board.	Harness-shaft lifts.	Threads down.	
						70
5	22 R	At rest.	Lifts <i>w</i> and <i>o</i> .	<i>r</i> .	<i>b</i> to bind back.	
	23 O	Rises. No lift.	At rest.	<i>o</i> to bind face.	<i>r</i> , <i>b</i> , and <i>w</i> .	
	24 D	Do.	At rest.	<i>o</i> to bind face.	<i>r</i> , <i>b</i> , and <i>w</i> .	
	25 B	At rest.	Lifts <i>w</i> and <i>o</i> .	<i>b</i> .	<i>r</i> to bind back.	
	26 W	Lifts <i>r</i> and <i>b</i> .	At rest.	<i>w</i> .	<i>o</i> to bind back.	
	27 R	At rest.	Lifts <i>w</i> and <i>o</i> .	<i>r</i> .	<i>b</i> to bind back.	75
	28 O	Rises. No lift.	At rest.	<i>o</i> to bind face.	<i>r</i> , <i>b</i> , and <i>w</i> .	
10	29 D	Lifts <i>r</i> and <i>b</i> .	At rest.	<i>o</i> .	<i>w</i> to bind back.	
	30 B	At rest.	Rises. No lift.	<i>b</i> to bind face.	<i>r</i> , <i>w</i> , and <i>o</i> .	
	31 W	Lifts <i>r</i> and <i>b</i> .	At rest.	<i>w</i> .	<i>o</i> to bind back.	
	32 R	At rest.	Rises. No lift.	<i>r</i> to bind face.	<i>b</i> , <i>w</i> , and <i>o</i> .	
	33 O	Rises. No lift.	At rest.	<i>o</i> to bind face.	<i>r</i> , <i>b</i> , and <i>w</i> .	80
	34 D	Lifts <i>r</i> and <i>b</i> .	At rest.	<i>o</i> .	<i>w</i> to bind back.	
15	35 B	At rest.	Lifts <i>w</i> and <i>o</i> .	<i>b</i> .	<i>r</i> to bind back.	
	36 W	Lifts <i>r</i> and <i>b</i> .	At rest.	<i>w</i> .	<i>o</i> to bind back.	
	37 R	At rest.	Rises. No lift.	<i>r</i> to bind face.	<i>b</i> , <i>w</i> , and <i>o</i> .	
	38 O	Lifts <i>r</i> and <i>b</i> .	At rest.	<i>o</i> .	<i>w</i> to bind back.	
	39 D	Rises. No lift.	At rest.	<i>o</i> to bind face.	<i>r</i> , <i>b</i> , and <i>w</i> .	85
	40 B	At rest.	Lifts <i>w</i> and <i>o</i> .	<i>b</i> .	<i>r</i> to bind back.	
20	41 W	Lifts <i>r</i> and <i>b</i> .	At rest.	<i>w</i> .	<i>o</i> to bind back.	
	42 R	At rest.	Rises. No lift.	<i>r</i> to bind face.	<i>b</i> , <i>w</i> , and <i>o</i> .	
	43 O	Lifts <i>r</i> and <i>b</i> .	At rest.	<i>o</i> .	<i>w</i> to bind back.	
	44 D	Do.	At rest.	<i>o</i> .	<i>w</i> to bind back.	
	45 B	At rest.	Rises. No lift.	<i>b</i> to bind face.	<i>r</i> , <i>w</i> , and <i>o</i> .	90
	46 W	Lifts <i>r</i> and <i>b</i> .	At rest.	<i>w</i> .	<i>o</i> to bind back.	
	47 R	At rest.	Lifts <i>w</i> and <i>o</i> .	<i>r</i> .	<i>b</i> to bind back.	
25	48 O	Lifts <i>r</i> and <i>b</i> .	At rest.	<i>o</i> .	<i>w</i> to bind back.	
	49 D	Rises. No lift.	At rest.	<i>o</i> to bind face.	<i>r</i> , <i>b</i> , and <i>w</i> .	
	50 B	At rest.	Rises. No lift.	<i>b</i> to bind face.	<i>r</i> , <i>w</i> , and <i>o</i> .	95

30 In the fabric shown, the extra thread, being of a light color, is bound on the face by one of the light warps and on the back by the other of said light warps, it being preferable that the binding-warp for the extra weft, or at least the face binding-warp for the same, should accord closely therewith in color; hence if the extra weft were a dark thread it would for the same reason be bound on face and back by the dark threads of the warp. In the completed fabric, therefore, the result is that as to two of the warps each binds one face weft and one back weft, the third warp binding two face wefts and one back weft and the fourth warp binding one face weft and two back wefts.

45 In order to produce my improved fabric, the ordinary ingrain-loom should be modified as to the shuttle-box mechanism, so as to adapt it for five shots instead of four, there should be such modification of the card-cylinder mechanism as will permit the operation of said cylinder for each pick when necessary, and the mechanism for operating the ground and figure lift boards should be modified, so as to permit of the lifting of either one or the other of these boards twice in succession at proper intervals, instead of operating the boards alternately, as usual. The necessity for this will be understood on reference to the preceding table, which shows that for three successive picks the lifter-boards are operated alternately and the harness-shafts one after another, while for the next two picks the same lifter-board and harness-shaft are operated twice in succession, one of these latter picks being the extra thread.

65 In the diagram, Fig. 1, my invention is shown as applied to a fabric in which mate weft-threads of ground and figure appear side

by side upon the face of the fabric, as set forth in my Patent No. 353,135, dated November 23, 1886; but it will be evident that my present invention is not limited to fabrics of this class, but can be applied to ordinary two-ly ingrain carpet fabrics as well.

One of the advantages of my invention is shown in Fig. 2, the pattern there illustrated having a groundwork of solid color with figure containing a spot of ordinary ground of two colors, the effect of solid color being obtained by using an extra weft of the same color as one of the regular ground-wefts of the fabric.

Solid colors in the figure may, as will be evident, be obtained by using an extra weft-thread of the same color as one of the regular figuring-wefts.

In Fig. 1 the sets of threads are separated by dotted lines; and it should be understood that the arrangement of threads in any set may be repeated any desired number of times in a pattern, the diagram simply showing different ways in which the threads can be combined without any attempt being made to show the actual succession of threads in a definite pattern.

The three threads of the set need not necessarily always appear on the same face of the fabric, but may sometimes appear on the face and sometimes on the back, as the exigencies of the pattern may demand, and the extra thread may be omitted, if desired, in some portions of the fabric, the loom, if worked by power, operating as if the extra thread were being used, or the treading being changed in a hand-loom, so as to avoid the blank shots.

I claim as my invention—

1. A two-ply ingrain carpet fabric having the weft-threads divided into sets of five, of which three are in one ply and two in the other, all substantially as set forth.

5 2. A two-ply ingrain carpet fabric having the wefts divided into sets of five and the warps into sets of four, the wefts being two in one ply and three in the other, and two of the warps each binding one face weft and one back
10 weft, the third binding two face wefts and one

back weft, and the fourth binding one face weft and two back wefts, all substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two sub- 15 scribing witnesses.

HARRY HARDWICK.

Witnesses:

WILLIAM D. CONNER,
HARRY SMITH.