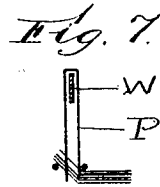
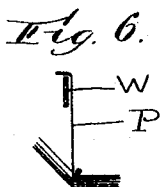
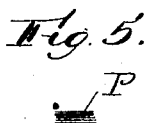
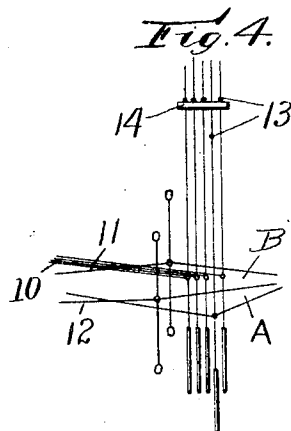
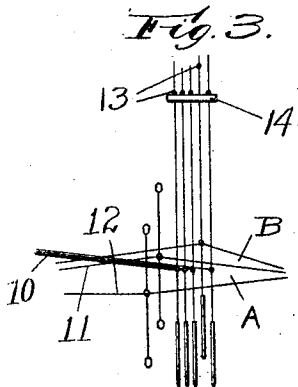
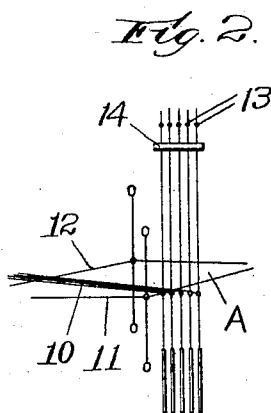
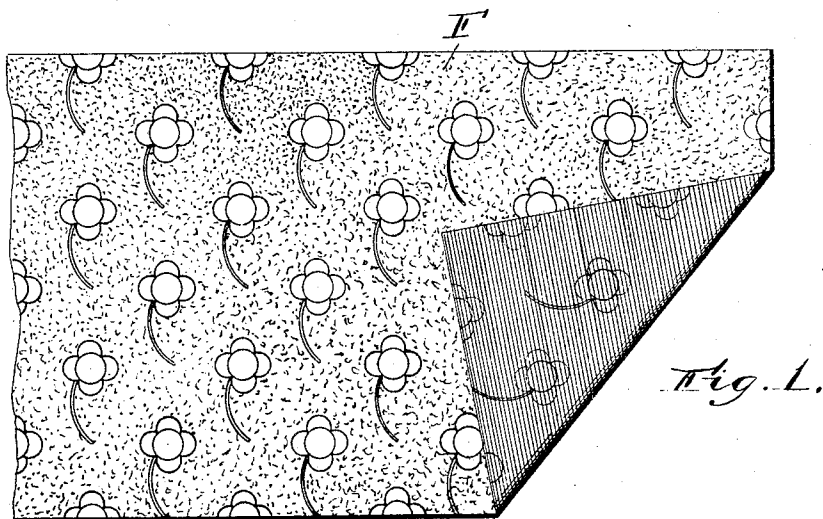


No. 810,012.

PATENTED JAN. 16, 1906.

M. J. WHITTALL.
WOVEN PILE FABRIC.
APPLICATION FILED JUNE 26, 1902.



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UNITED STATES PATENT OFFICE.

MATTHEW J. WHITTALL, OF WORCESTER, MASSACHUSETTS.

WOVEN PILE FABRIC.

No. 810,012.

Specification of Letters Patent.

Patented Jan. 16, 1906.

Application filed June 26, 1902. Serial No. 113,289.

To all whom it may concern:

Be it known that I, MATTHEW J. WHITTALL, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Woven Pile Fabric, of which the following is a specification.

This invention relates to that class of pile fabrics in which the surface of the fabric is formed by a number of figuring-warps which are woven over pile-wires, the design being shown by the selection or calling up of the proper colored figuring-warps. In this class of fabrics are Brussels and Wilton carpets.

The especial object of this invention is to improve this class of pile fabrics by providing a construction in which the piles are more securely fastened or tied than in previous forms of pile fabrics and in which the successively-called figuring-warps will be shown at the back of the fabric, so as to substantially reproduce the design of the fabric at the back thereof.

To these ends this invention consists of a new pile fabric as an article of manufacture as hereinafter described, and more particularly pointed out in the claims at the end of this specification.

In the accompanying drawings, Figure 1 is a fragmentary perspective view showing both the front and back of a piece of carpet or other pile fabric embodying this invention. Figs. 2, 3, and 4 are diagrammatic views illustrating successive steps in weaving pile fabrics according to this invention. Figs. 5, 6, and 7 are diagrammatic views corresponding to Figs. 2, 3, and 4, respectively, and illustrate the results produced by the successive steps of weaving, the chain-warps of the fabric being omitted from Figs. 5, 6, and 7 for the sake of clearness; and Fig. 8 is a diagrammatic view of a section of "two-shot" fabric constructed according to this invention.

In the manufacture of Brussels and Wilton carpets or other similar fabrics the face of the fabric is formed by calling up or selecting the desired ones from among a number of differently-colored figuring-warps. In this class of fabrics attractive and widely-varied designs may be shown on the face side of the fabric; but the backs of fabrics of this kind have usually been left entirely plain or have had simply such accidental variations as have resulted from the indiscriminate showing of the bunches of variously-colored figuring-warps—that is to say, at the back of or-

dinary Brussels and Wilton carpets as they have heretofore been manufactured, in addition to the cotton chain-warps and cotton filling-threads, the figuring-warps will be shown, but will not appear in any particular sequence. For example, when a two-color design is being produced in a six-frame carpet (and instances of this kind frequently happen in manufacturing carpets) the required colors of figuring-warps would be employed in two of the frames, while the warps for the remaining frames can be supplied by any warps which happen to be at hand without regard to their color, as such warps will not be shown on the face of the fabric. These warps which are put in to run with the figuring-warps which are displayed on the surface of the fabric are, however, ordinarily exposed at the back of the carpet, and it results from this that the backs of Brussels and Wilton carpets are frequently extremely unattractive, and in weaving carpets which are identical in design and coloring there is no certainty that different pieces will have the same appearance on the back. Furthermore, in manufacturing carpets or other fabrics of this class it is extremely desirable that the piles should be tied or locked in place as firmly as possible, the life of fabrics of this class depending to a considerable extent on the secureness with which the surface threads are tied into the chain or body of the fabric. The especial object of the present invention is to provide a pile fabric of the class referred to in which the pattern will be reproduced or made to appear to the back of the fabric and in which the surface threads will be even more securely fastened or tied than in the forms of fabrics of this class which have heretofore been employed. To accomplish these objects, I have invented a novel form of fabric which can be produced equally as rapidly and with substantially the same amounts of materials as the prior forms of fabric.

In a pile fabric constructed according to this invention each of the figuring-warps after having been called up to form part of the surface or pile of the fabric is then carried through to the back of the fabric and there shown separate from the other figuring-warps before it is again associated therewith. To manufacture a fabric of this class, my method of weaving consists in dropping each figuring-warp down into the lower shed after it has been called, while the remainder of the figuring-warps are held in the upper shed,

and I accomplish this purpose by using a special lifter-board and devices cooperating therewith arranged so that the lifter-board under certain conditions will permit thread-raising knots to pass down through the holes thereof, although normally said knots are designed to rest upon and be lifted by the lifter-board.

A pile fabric woven according to my invention is essentially a single-ply fabric as distinguished from that class of multi-ply fabrics in which two or more plies are associated or woven together by warp-threads which pass through from one weft plane to a second weft plane—that is to say, in weaving a fabric according to this invention the shuttle in its travel from one side of the loom to the other and back always traverses the same path, while in making double-ply fabrics the filling-threads are laid in distinct weft planes or else two or more separate shuttles are required to be used.

Referring to the accompanying drawings for a detail description of a fabric constructed according to my invention and of my method of weaving the same, in Fig. 1 the fabric F is shown with a pattern appearing on its face, while said pattern is also reproduced at its back, although not appearing as clearly as on the face of the fabric on account of the chain and cotton filling-threads also showing.

Referring to the diagrams for an understanding of my method of weaving my pile fabric, as shown in Figs. 2 to 4, 10 designates the figuring-warps, in the present instance five figuring-warps being illustrated, which would produce a five-frame fabric, although in weaving a large number of Brussels or other carpets a six-frame is frequently desired. Running with the figuring-warps, as is usual in fabrics of this class, are the chain-warps 11 and 12. The chain-warps 11 and 12 are controlled by the ordinary harness-frames, and the figuring-warps 10 are controlled by lingoes, the strings from which extend to the jacquard or other selecting mechanism and are provided with knots 13, which are normally above and are adapted to be picked up by the lifter-board 14. Referring now to Fig. 2, when the parts are in this position the shuttle is thrown through the shed A to lay a weft-thread over the figuring-warps, as shown in Fig. 5. The jacquard mechanism then selects the desired figuring-warp, raising it high enough to open a second shed B, and at the same time the lifter-board 14 raises the remainder of the figuring-warps above the shed A. As shown in Fig. 6, a wire W is then inserted below the warp P, and, as shown in Fig. 4, the figuring-warp P is then dropped down below the shed A and the shuttle is again thrown back through the shed A to place a weft-thread below the bunch of figuring-warps, but above the figuring-warp P, which has just been carried up

over the wire W. To permit the knot 13 to pass down below the lifter-board 14, I have provided a special construction of lifter-board and have arranged special devices in connection therewith for causing the lifter-board to again pick up the thread P when the parts have returned to the position illustrated in Fig. 2. In this application for patent I do not desire to claim, however, any particular construction of loom for practicing my invention, and I have not, therefore, herein shown any particular form of apparatus for this purpose. A special loom which I may employ in practicing my invention is covered by my United States Letters Patent No. 727,521, granted to me May 5, 1903.

In Fig. 8 I have illustrated diagrammatically the fabric produced by a repetition of the series of steps illustrated in Figs. 5, 6, and 7. In the drawings, furthermore, I have only illustrated a two-shot fabric—that is to say, a fabric formed with two picks to each pile-wire. It is to be understood, also, that my invention is equally applicable to a three-shot fabric, although in this application for patent a specific claim is based on a two-shot fabric woven according to my invention. The three-shot fabric is claimed specifically in my companion application for patent, Serial No. 113,290, filed June 26, 1902.

In the complete fabric woven according to my invention it will be seen that each figuring-warp after it is selected or called up to be shown in the pile or surface is then carried through a fabric to appear in the back thereof separated from the remainder of the figuring-warps, and in practice I have found that by weaving carpets in this manner I am enabled to secure a substantial reproduction of the carpet design at the back of the carpet, while inasmuch as each figuring-warp after having been selected is carried through to the back of the fabric I have found in practice that the piles of a fabric as thus woven are more firmly tied and fastened into the fabric than with other constructions with which I am familiar.

I am aware that in the production of double-ply or multi-ply fabrics it has already been proposed to reproduce the designs of the top ply of the fabric in the back ply or back thereof by carrying the selected warp-threads through from one ply of the fabric to a second ply of the fabric. A carpet or other fabric constructed according to my invention is to be distinguished from the multi-ply or duplicated fabrics of this class, inasmuch as my fabric is essentially a single-ply construction—that is to say, in making the same little, if any, more material will be required than now required for weaving ordinary carpets, and as the filling-threads are all laid in a single weft plane the fabrics constructed according to my invention may be woven in the ordinary looms without the use of special appliances or

multiple shuttles which are required for weaving multiple-ply fabrics.

I am aware that numerous changes may be made in practicing my invention by those who are skilled in the art. For example, while I have shown my invention as applied to a five-frame fabric it is equally applicable to fabrics having a greater or less number of frames. I do not wish, therefore, to be limited to the particular construction I have herein shown and described; but

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. As an article of manufacture, a single-ply pile fabric having its filling-threads all in a single weft plane and having a number of figuring-warps, each of which, after having been called, is carried through to the back of the fabric and there shown separate from the

other figuring-warps before it is again associated therewith.

2. As an article of manufacture, a single-ply two-shot pile fabric having all its filling-threads in a single weft plane and having a number of figuring-warps, the unselected ones of which pass alternately under and over successive filling-threads, while each figuring-warp, after having been called, is carried through to the back of the fabric and there shown separate from the rest of the figuring-warps before being associated therewith.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

MATTHEW J. WHITTALL.

Witnesses:

PHILIP W. SOUTHGATE,
JOHN F. CROWELL.