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2,713,877

WOVEN PILE FLOOR COVERING

Filed Dec. 9, 1949

2 Sheets-Sheet 1

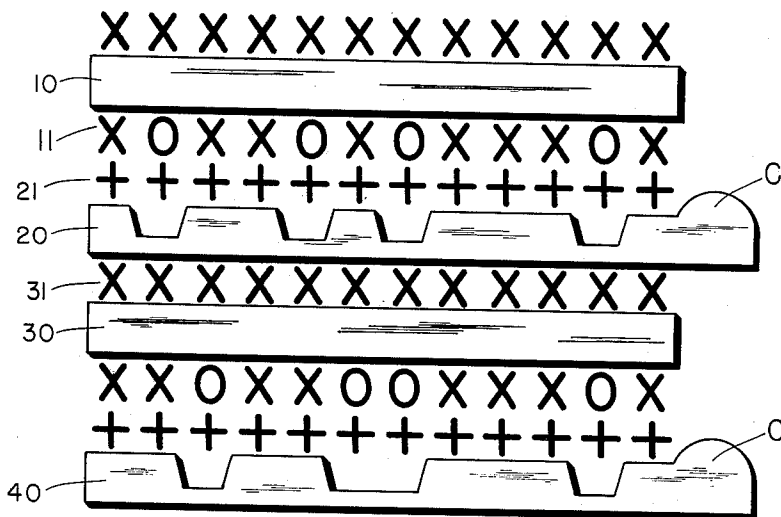
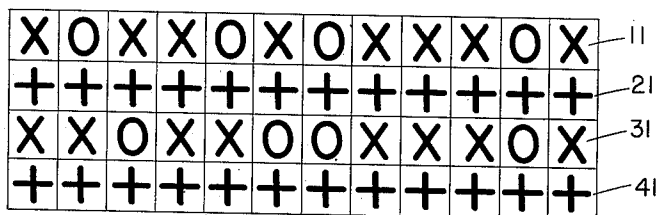


Fig. 2



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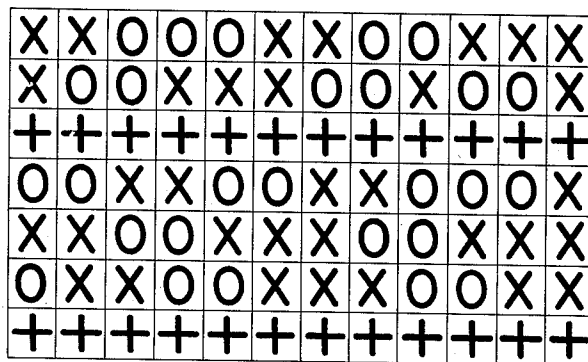


Fig. 3

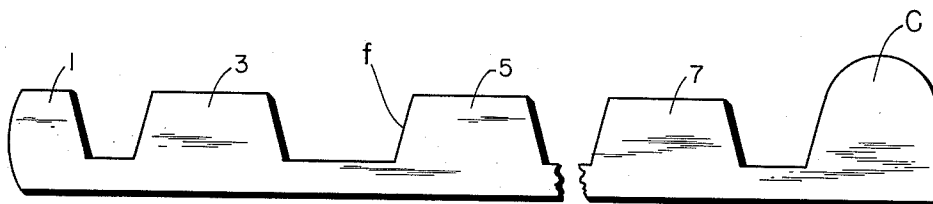


Fig. 4

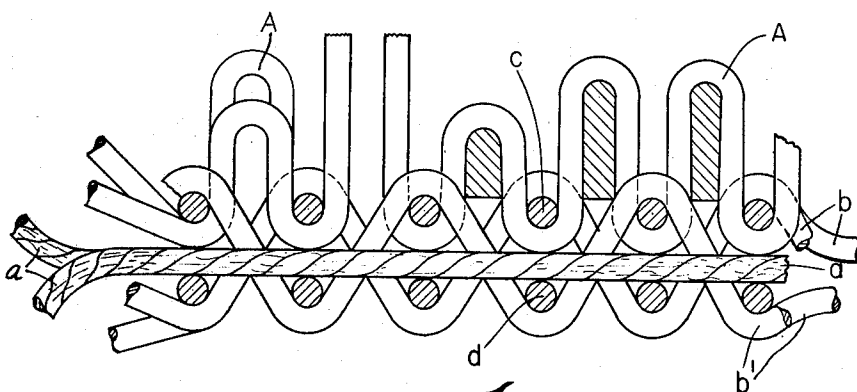


Fig. 5

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WOVEN PILE FLOOR COVERING

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Application December 9, 1949, Serial No. 132,113

3 Claims. (Cl. 139—403)

This invention relates to woven fabrics having fibrous, such as wool, pile yarn, particularly carpets and rugs woven on wire looms, and to methods of weaving the same.

A principal object of this invention is to produce on the surface of the fabric weftwise rows of uncut loops, in which rows there are high and low pile loops, and weftwise rows of cut tufts, all of which rows may be arranged in warpwise relation to each other in any pattern desired, such as a pattern in which the rows of cut tufts are interspersed with rows of loops.

An important feature of this invention is the employment in a wire loom of sets of wires consisting of wires of even height and of wires having high and low portions, i. e. cut-out portions, some or all of said wires having blades at the outer ends thereof and said wires being so placed and arranged as to produce the pattern of loops and cut tufts desired.

Other objects and features will be more particularly pointed out in the appended claims and will appear from the following description taken in conjunction with the accompanying drawings in which:

Fig. 1 is a diagram of a weave produced with a repeat set of four wires;

Fig. 2 is a diagrammatic plan view of the fabric resulting from the weaving operation of Fig. 1;

Fig. 3 is a plan view of a weave with a repeat of seven wires;

Fig. 4 is a partial elevation of an example of a cut-out wire; and

Fig. 5 is a warpwise section of the weave.

Any known form of pile wire loom such as that described in Patent No. 1,840,856, may be employed in the application of my invention.

A preferred weave, Fig. 5, of a common type consists of stuffer warps *a*, binder warps *b*, *b'*, holding weft shots *c* above the stuffer warps and weft shots *d* held in position against the stuffer warps by the binder warps. The pile warps *A* are strong enough to render, that is, be drawn, under a holding weft shot without breaking when pulled by the high portion of a wire, as will be described.

The cut-out wires, Fig. 4, are formed with high and low portions according to the pattern of high and low warp loops desired. This wire has high portions, 1, 3, 5, 7, etc. and low portions between them. These high and low portions may be varied and located in the pile wire in accordance with the desired pattern and may be of any number, height and length. A cut-out wire may have a cutting blade *C* on its end. Each low portion is connected to the adjacent high portion lying outwardly thereof, that is, nearer the end of the wire which is withdrawn last, by a loop-raising portion or incline *f*. These loop-raising portions are of the proper slope, not over 75°, to raise the loops formed over the low portions of the wire to the height of the high portions as the wire is withdrawn.

The plain wires are of even height throughout and may or may not be provided with blades at their outer ends.

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According to the method of weaving illustrated in Fig. 1, the first wire of a set is a plain wire 10 of even height which does not have a blade and which on withdrawal forms a full complement of high loops *X* in the first row 11. The second wire is a cut-out wire 20 with a blade *C* at the end and when this wire is withdrawn, it lifts all the warps and then cuts them to form a full complement of high cut tufts + in the second row 21. At the same time it draws down the high pile loops *X* of the first row 11 wherever low loops were formed on the low portions of the second wire 20, and therefore first row 11 finally contains high and low loops *X* and *O* corresponding to the high and low portions of the second wire 20, as is shown in Fig. 2. The third wire 30 is a plain wire of uniform height and when this is withdrawn it forms a full complement of uniform high loops *X* in the third row 31 and does not effect any change in the cut tufts of row 21 as these tufts are not drawn down. The fourth wire 40 is a cut-out wire in which the high and low portions differ from those in wire 20 so that the low loops created in row 31 by the withdrawal of this fourth wire are positioned differently from those in row 11.

This completes the use of the set of four wires so that in the woven fabric there is a pattern, as shown in Fig. 2, in which every other weftwise row has a full complement of cut tufts + of a uniform height, corresponding to the high portions of the cut-out wires, and each of the other rows has a full complement of high and low loops indicated as *X* and *O*. The cut tufts, being formed of cut high loops, form a row which is higher than the loops in the other rows as shown in Fig. 5.

As above stated, the pile warps *A* are so strong that they are pulled successfully without breaking under the holding wefts which are drawn down against or close to the stuffers. An effect of pulling the pile yarns is that, as these yarns are pulled through the contracted opening between the holding weft shots and the stuffers, the surface of the yarns is chafed as it is pushed back and the twist altered, that is, the yarn is squeezed between the holding weft shot and the stuffer, and the twist is thereby forced back in the loop so that the amount of twist is concentrated in the shorter length of yarn forming the low loop. As a result the low loops appear on the surface of the fabric in a rough, uneven and bumpy condition. The low loops, thus produced, have an appearance which is distinctly different from that of warp yarns woven in the usual manner over wires, without having their surfaces chafed or pushed back, which yarns have a comparatively smooth, even appearance.

Fig. 3 shows the pattern of a weave produced by a set of seven wires of which the first is a plain wire, the second is a cut-out wire without a cutting blade, the third is a cut-out wire with a cutting blade, the fourth is a plain wire, the fifth and sixth are cut-out wires without cutting blades and the seventh is a cut-out wire with a cutting blade. This produces two rows of high and low loops followed by a single row of cut tufts, then three rows of high and low loops, which may be different from the first and second rows, and finally a row of cut tufts.

To weave several rows of cut tufts in succession the successive wires have cutting blades.

In order to produce a row of cut tufts of uniform height the next wire is a plain wire so that on its withdrawal none of the cut tufts is drawn down. But, if a cut-out wire is used in the row following the row of cut tufts, the high portions of the cut-out wire draw down and reduce the height of one leg of those cut tufts, but that reduced leg would still be held in the bight of the weft and binder elements of the weave.

The first wire of a set preferably should be a plain high wire.

In cases in which the fabric is woven on a loom pro-

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vided with the usual warp beam, the shapes of the wires in a repeat set to impart a given pattern are such that every pile warp is of the same length as it passes over the high portions and the low portions of a set of wires. To secure this effect the sums of the heights of the portions of a set of wires warpwise are the same. Thus, every pile warp is drawn evenly from the warp beam without variation in length.

Where the wires are used on a loom, such as a jacquard, provided with spools on which the pile warps are wound, the shapes of the wires are not so limited, because the drawoff of the pile warps need not be the same.

The wires in a set, which may consist of plain wires without a blade, or plain wires with a blade, cut-out wires without a blade and cut-out wires with a blade, may be arranged so as to produce a pattern of weftwise rows of cut pile, weftwise rows of high and low loops, the loops being in any sequence, and the weftwise rows may be arranged in any desired relation with the novel result that the pile surface of this carpet has a striking diversity of weftwise rows arranged in novel patterns. Where, as in many cases, the high loops are cut to form cut tufts, such tufts are higher than the uncut loops.

The invention is applicable to weaving on a tapestry carpet loom and to weaving on a jacquard carpet loom in which the pile warps are selectively raised by the jacquard in accordance with a pattern.

Method of weaving disclosed herein are claimed in divisional application, Serial No. 505,320, filed May 2, 1955.

I claim:

1. A pile fabric floor covering having a warp pile face comprising pairs of immediately adjacent weftwise rows of pile, one row of each pair containing cut pile tufts of which the legs of each tuft are of the same height, and the other row containing high and low pile loops, at least one pile warp being common to the two rows, said loops and tufts being woven into a backing structure including stuffer warps, a series of holding wefts lying on one side of the stuffer warps, a series of non-holding wefts lying on the other side of the stuffer warps and binder warps holding the wefts of both series of wefts against the stuffer warps.

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2. A pile fabric floor covering having a warp pile face comprising pairs of immediately adjacent weftwise rows of pile, one row of each pair containing cut pile tufts of which the legs of each tuft are of the same height, and the other row containing high and low pile loops, all of the pile warps which form loops in one row also forming tufts in the companion row, said loops and tufts being woven into a backing structure including stuffer warps, a series of holding wefts lying on one side of the stuffer warps, a series of non-holding wefts lying on the other side of the stuffer warps and binder warps holding the wefts of both series against the stuffer warps.

3. A pile fabric floor covering having a warp pile face comprising pairs of immediately adjacent weftwise rows of pile, one row of each pair containing cut pile tufts of which the legs of each tuft are of the same height, and the other row containing high and low pile loops, at least one of the high loops being in a warp which forms a tuft in the companion row, said loops and tufts being woven into a backing structure including stuffer warps, a series of holding wefts lying on one side of the stuffer warps, a series of non-holding wefts lying on the other side of the stuffer warps and binder warps holding the wefts of both series against the stuffer warps.

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