Dec. 15, 1953 E. D. LACEY 2,662,227

PILE FABRIC

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Fig. 1

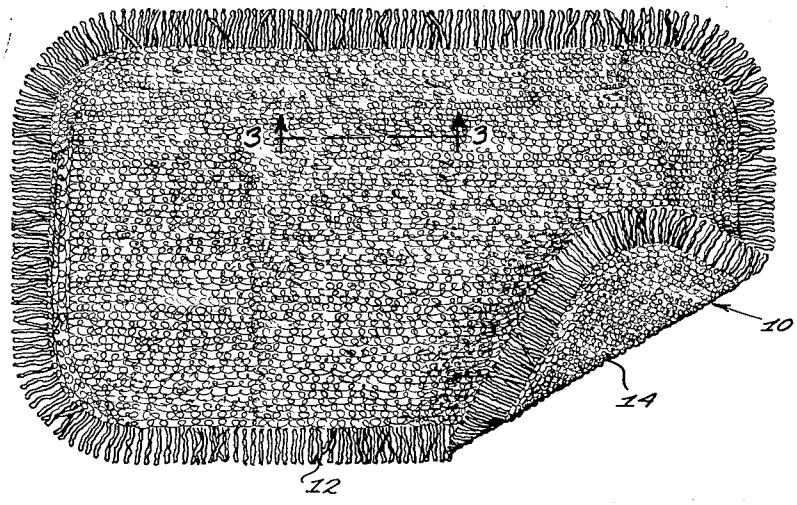
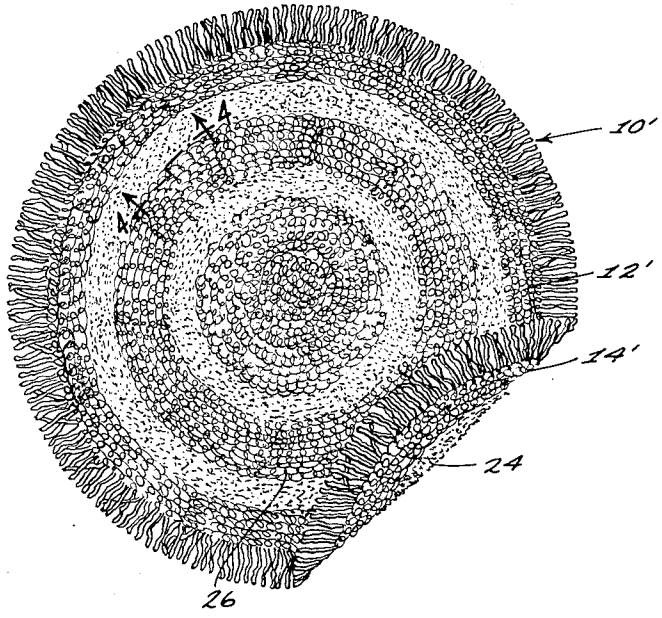


Fig. 2



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Fig. 3

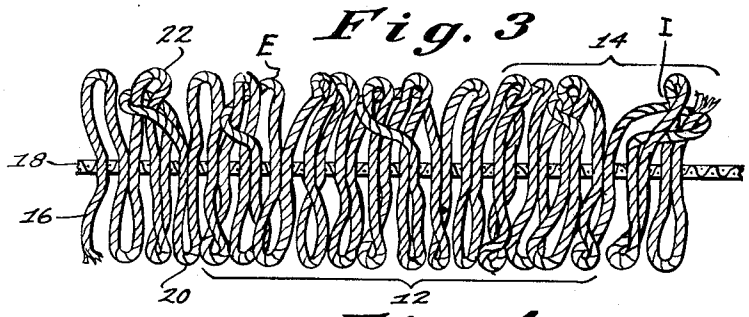
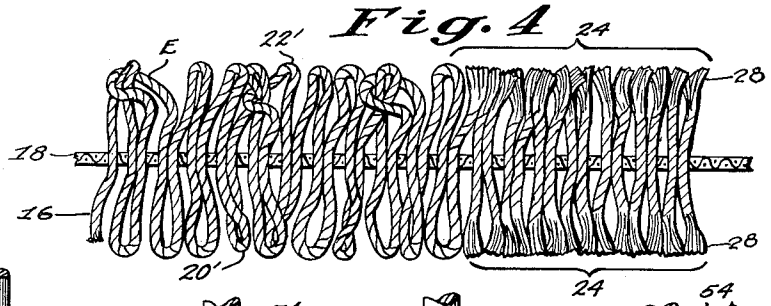


Fig. 4



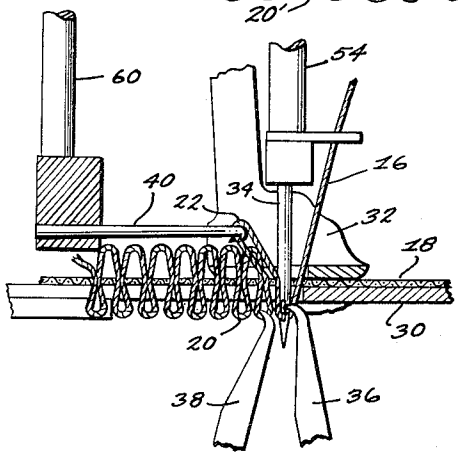


Fig. 5

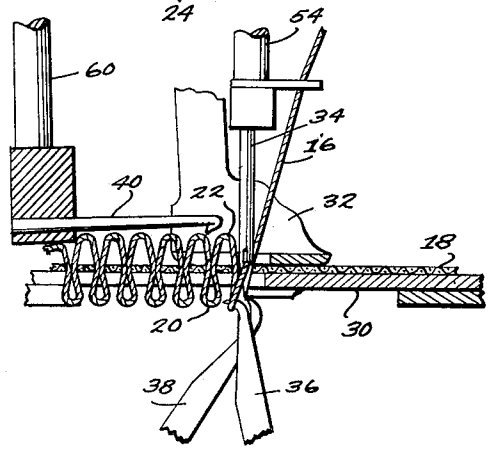


Fig. 6

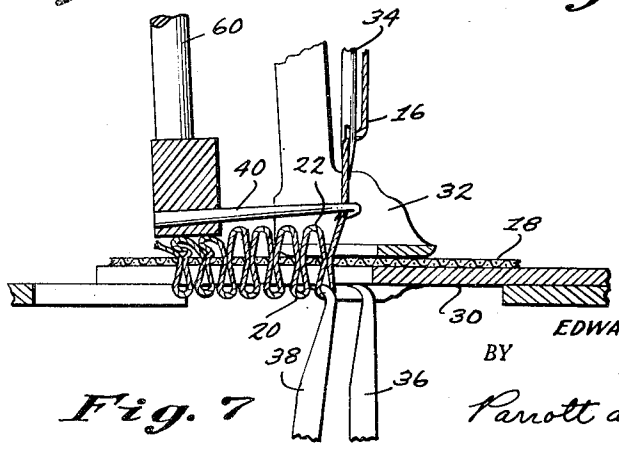


Fig. 7

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PILE FABRIC

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Application April 4, 1950, Serial No. 153,928

6 Claims. (Cl. 2—278)

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This invention relates to pile fabrics of the type having pile tufts inserted in a fabric base, and more particularly to a pile fabric of this sort in which pile tufts are provided in the form of loops and a pile surface is formed on both faces of the fabric base.

It has long been common practice to form pile fabrics, usually referred to as "chenille," by inserting doubled portions of a pile yarn through a fabric base and cutting the extending ends of the inserted yarn portions to form a surface of chenille ends on one face of the fabric base. In some cases, too, the inserted yarn portions have been left uncut so that a pile surface of loops was formed instead, although this practice has always had the serious objection of leaving the continuous pile yarn used in forming the loops unsevered so that the loops were interconnected and were accordingly easily subject to objectionable unraveling if any portion of the continuous pile yarn was caught and pulled away from the fabric base.

More recently pile fabrics have been developed as disclosed in U. S. Patents 2,482,682 and 2,482,683 to Moore, in which pile tufts are inserted in a fabric base in a unique manner so that a pile surface is provided on both faces of the fabric base, by inserting the doubled yarn portions to form loops on one face and cutting the pile yarn in spaced relation to the other face to form chenille ends.

In accordance with the present invention a pile fabric of this same general type is provided in which a pile surface of loops is formed on both faces of the fabric base in a manner which obviates the difficulties heretofore encountered with unraveling, and which accordingly provides a pile fabric that is equally as serviceable as those disclosed in the above noted Moore patents and that has the further advantage of allowing exactly duplicate pile patterns to be produced on each face of the fabric base. Briefly described, this result is accomplished according to the present invention by inserting the doubled pile yarn portions at closely spaced intervals in the fabric base so that a random entanglement and interlocking of adjacent loops is obtained as the pile fabric is formed which effectively prevents later withdrawal of the continuous pile yarn to unravel the loops.

The pile fabric of the present invention and the method by which it is formed are described in further detail below in connection with the accompanying drawings, in which:

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Fig. 1 is a plan view of a pile fabric rug formed in accordance with the present invention having both faces covered with loops;

Fig. 2 is a plan view representing a variation of the rug shown in Fig. 1, having sections of double loops alternating with sections of double chenille;

Figs. 3 and 4 are enlarged sectional details taken substantially along the lines 3—3 and 4—4 in Figs. 1 and 2, respectively; and

Figs. 5, 6, and 7 are fragmentary details illustrating the manner in which the loops are formed in producing a pile fabric in accordance with the present invention.

Referring now in detail to the drawings, and more particularly at first to Fig. 1, a reversible pile fabric rug formed in accordance with the present invention is shown, as indicated generally by the reference numeral 10, with pile surfaces of loops arranged on both of its faces as at 12 and 14. The nature of the loops forming the pile surfaces 12 and 14 is further illustrated in Fig. 3 in which successive doubled portions of a continuous pile yarn strand 16 are inserted through a fabric base 18 to form loops 20 extending from one face of the fabric base 18. Between the successive inserted loops 20, the continuous pile yarn 16 is trained in relation to the opposite face of the fabric base 18 to form bights or loops extending from this other face as at 22. The loops 20 are inserted in the fabric base 18 contiguously in rows so that a random entanglement and interlocking of at least the trained loops 22, and of the inserted loops 20 to some extent too, occurs as the pile fabric 10 is formed which results in effectively preventing withdrawal of the continuous pile yarn 16 from the fabric base 18 after the loops 20 and 22 are formed, as will appear more in detail presently.

It will be noted that formation of the loops 20 and 22 in the manner just described above arranges them to form exactly duplicate pile patterns on both faces 12 and 14 of the pile fabric rug 10, and this feature of the present invention may be employed advantageously as illustrated in Fig. 2 to obtain modified pile patterns in which pile surface portions of chenille ends as at 24 may be arranged alternatively with pile surface portions of loops as at 26, and with the pile surface patterns on each face of the pile fabric rug 10 shown in Fig. 2 still maintained as exact duplicates. Such alternate pile surface portions of chenille ends 24 may be formed by means such as is shown in U. S. Patent 2,482,647 to Bradwell

and Brock. Fig. 4 shows an enlarged illustration of this modified arrangement of the pile fabric rug 10', in which the chenille ends forming the pile surface portions 24 are indicated at 28, and the inserted and trained loops forming the pile surface portions 26 are indicated at 20' and 22', respectively.

The method of forming a reversible pile fabric rug in accordance with the present invention is illustrated in Figs. 5, 6, and 7 of the drawing, in which a suitable work support as at 30, and an associated presser foot 32, are shown arranged to dispose the fabric base 18 for insertion of doubled portions of the continuous pile yarn 16 by a reciprocating needle 34 to form the inserted loops 20 on each downstroke. Lower loopers as at 36 and 38 are arranged below the work support 30 to take each doubled pile yarn portion after insertion by the needle 34 and hold the resulting inserted loop 20 at a predetermined length against withdrawal as the reciprocating needle 34 is withdrawn on its upstroke. With the inserted loops 20 held in this manner, the upstroke of the reciprocating needle 34 results in extending the continuous pile yarn 16 upwardly from the other face of the fabric base 18, and a lateral looper 40 is arranged above the work support 30 to train the loops 22 from this face.

The lateral looper 40 is shown in Fig. 5 at its farthest retracted position holding a trained loop 22, taken from the needle 34 during its previous cycle of operation, against withdrawal and at a predetermined length during the downstroke of the needle 34 to insert the next succeeding loop 20. It will be noted that this lateral looper 40 operates to pull each trained loop 22 to a position extending laterally from the fabric base 18 toward the trained loops 22 already formed. This lateral pulling of the trained loops 22 results in stretching them taut which has a tendency to remove the twist temporarily from the yarn portion forming the trained loop 22, so that upon release the trained loop 22 tends to snap back from its taut position as it regains its twist, which has the further effect of inducing a pronounced curl in the trained loops 22, and because these loops 22 are extending laterally toward the previously formed trained loops 22 as they are formed, the random entanglement of each trained loop 22 as it is released with the previously trained loops 22 is made possible.

In the event that a given trained loop 22 does not become entangled with the previously trained loops 22 as it is released, the manner in which it snaps back to regain its twist after release may further result in disposing it in the path of the needle 34 so that it becomes interlocked with a succeeding trained loop 22 as the needle 34 passes through the fabric base 18 to insert a succeeding doubled portion of the pile yarn 16. The resulting entanglement of trained loops 22 as just described above is illustrated in Fig. 3 at E, and interlocking of the trained loops 22 at I, and it will be seen that this entanglement and interlocking of the trained loops 22 as they are formed effectively prevents withdrawal of the continuous pile yarn 16 from the pile fabric rug 10.

The release of each trained loop 22 takes place as the lateral looper 40 moves forward, as illustrated in Fig. 6, toward the needle 34 from its retracted position to take and form the next succeeding trained loop 22. This forward movement of the lateral looper 40 takes place during the upstroke of the needle 34, so that it passes the needle 34 and is in position to pass beneath

the needle 34 and take the pile yarn strand 16 at about the time the needle 34 reaches the top of its stroke as illustrated is Fig. 7. The arrangement and operation of a lateral looper 40 of this sort is described in detail and claimed in the copending application of W. V. Williams, Serial No. 153,959 filed April 4, 1950, now Patent No. 2,625,125, dated January 13, 1953, to which reference is made for further details. The method of forming the pile fabric of the present invention is claimed in divisional application Serial No. 311,439, filed September 11, 1952, and means for forming this pile fabric is claimed in divisional application Serial No. 311,440, filed September 11, 1952.

I claim:

1. A pile fabric comprising a fabric base having doubled portions of a continuous pile yarn inserted therein at closely spaced intervals and extending from both faces of the fabric base in the form of loops, the adjacent loops on at least one face of said fabric base being randomly entangled and interlocked whereby withdrawal of said continuous pile yarn from said fabric base is prevented.

2. A pile fabric comprising a fabric base having doubled portions of a continuous pile yarn inserted therein at spaced intervals and extending from both faces of the fabric base in the form of loops, the spacing of the intervals at which said doubled pile yarn portions are inserted in said fabric base being substantially less than the length of the loops formed on the faces of said fabric base whereby a random entanglement and interlocking of adjacent loops is obtained for preventing withdrawal of said continuous pile yarn from said fabric base.

3. A pile fabric comprising a fabric base having doubled portions of a continuous pile yarn inserted therein contiguously in rows and extending from both faces of the fabric base in the form of loops with the adjacent loops on at least one face of said fabric base randomly entangled and interlocked whereby withdrawal of said continuous pile yarn from said fabric base is prevented.

4. A pile fabric comprising a fabric base having succeeding doubled portions of a continuous pile yarn inserted therein contiguously in rows to form loops extending from one face of said fabric base and trained in relation to the other face of said fabric base to extend in the form of loops from said other face as well with the loops extending from said other face randomly entangled and interlocked whereby withdrawal of said continuous pile yarn from said fabric base is prevented.

5. A reversible pile fabric comprising a fabric base having doubled portions of a continuous pile yarn inserted therein at spaced intervals to extend from one face of said fabric base in the form of loops of uniform predetermined length, and bights formed in said continuous pile yarn alterlately with said inserted doubled portions to extend from the opposite face of said fabric base in the form of loops of uniform predetermined length, the spacing of the intervals at which said doubled pile yarn portions are inserted in said fabric base being substantially less than the length of the loops formed by said bights whereby a random entanglement and interlocking of said last mentioned loops is obtained for preventing withdrawal of said continuous pile yarn from said fabric base.

6. A pile fabric comprising a fabric base having doubled portions of a continuous pile yarn

inserted therein contiguously in rows and extending from both faces of the fabric base, certain rows of said doubled pile yarn portions being cut to form chenille ends in an exactly duplicate pattern on both faces of said fabric base, and the remaining doubled pile yarn portions extending from both faces of said fabric base in patterns which are likewise exactly duplicate and with the adjacent loops on at least one face of said fabric base randomly entangled and interlocked whereby withdrawal from said fabric base of the continuous pile yarn forming said loops is prevented.

EDWARD D. LACEY.

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