

Aug. 17, 1937.

H. L. SHUTTLEWORTH

2,090,462

PILE FABRIC

Filed Sept. 3, 1936

Fig. 1.

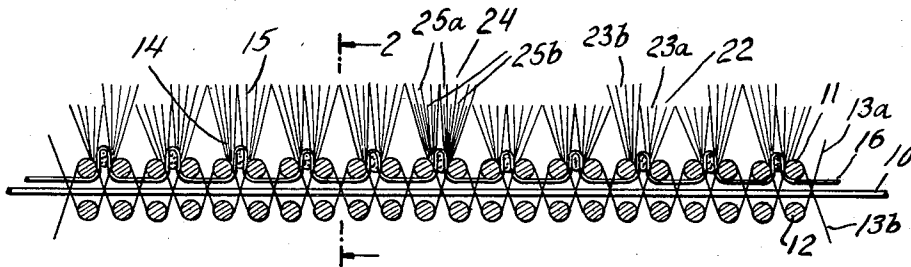


Fig. 2.

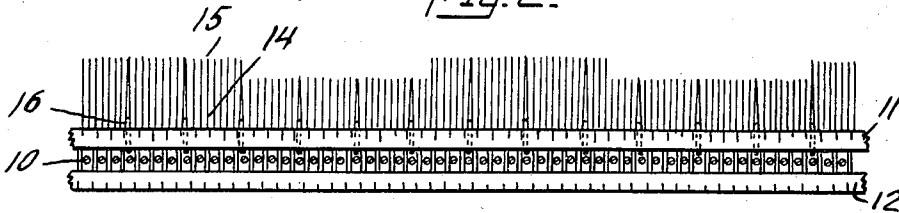


Fig. 3.

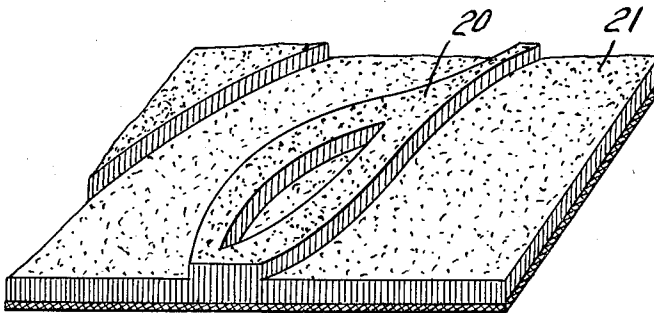


Fig. 4.

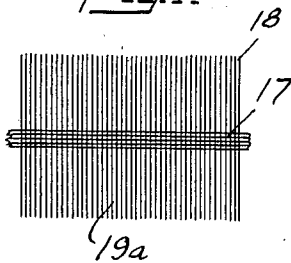


Fig. 5.

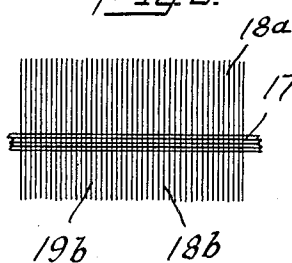
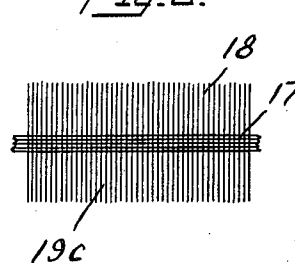


Fig. 6.



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2,090,462

PILE FABRIC

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Application September 3, 1936, Serial No. 99,183

2 Claims. (Cl. 139—394)

This invention relates to pile fabrics of the so-called "embossed" type, such as are commonly used for rugs and carpets, and is concerned more particularly with a novel embossed fabric which is superior to such fabrics as heretofore produced in that the pile surface of the new fabric with the embossed pattern effect thereon is of better appearance, and satisfactory coverage of the backing web is obtained with less tufts.

In the manufacture of embossed fabrics as now carried on, it is the usual practice to employ pile wire looms, provided with pile wires both with and without knives so that the surface of the fabric includes both cut pile loops or tufts and uncut loops. In the weaving operation, the pile warp yarns are raised by the wires and the pile loops or tufts in a single transverse row across the fabric have a height determined by the height of the wire by which the pile yarn is raised, the loops which are to be cut to form tufts being formed ordinarily over higher wires than the uncut loops. This practice causes the ends of the tufts to lie above the tops of the loops, so that the tufts can be sheared to provide a smooth, level surface. The embossed pattern effect is then provided by the arrangement of the tufts and loops in successive rows.

In such fabrics, the figures in the design or pattern are usually formed by cut loops or tufts with the relatively large areas of background made up of uncut loops. Since the pile yarns which are to form the loops in the background cannot be raised by wires with cutting edges, it is the practice, in weaving those portions of the fabric in which a transverse line passes through both background areas and figures of the pattern, to raise the pile yarns alternately by wires with and without cutting edges so that successive rows of tufts and loops are provided for the figures and background, respectively. With this procedure, alternate pile rows include no loops in the background, but only such tufts as are required in the design, and as a result, in those parts of the background lying offset laterally from figures in the design, the pile surface shows well-defined lines of separation between adjacent rows of loops, and this detracts considerably from the appearance of the pile surface.

Attempts have been made heretofore to improve the pile surface of such fabrics by increasing the number of pile rows per unit of longitudinal length of the fabric and thereby making a more compact weave. This procedure is based on the assumption that if the rows of pile loops in the background are closer together, the lines of separation

above referred to will be eliminated, and while a fabric so woven is of better appearance than one with a smaller number of rows of pile per inch, the construction is of high cost because of the excessive amount of wool used to produce the pile surface.

Further attempts to eliminate the lines of separation between the rows of loops have involved producing a fabric with its entire pile surface made up of loops, and then later in a finishing operation, cutting the tops of the pile loops in different portions of the fabric to produce a design effect. This method has, however, proved unsatisfactory because the areas of the pile surface made up of cut loops can not be sheared to produce a level surface without causing damage to the areas made up of uncut loops.

Another limitation on the production of embossed fabrics by the methods heretofore proposed is that the designs can be made only by the use of cut and uncut pile loops, so that the different parts of the surface differ in appearance.

The present invention is, accordingly, directed to the provision of a novel embossed fabric avoiding the disadvantages of fabrics of that type as heretofore produced and of a method by which the new fabric may be made expeditiously and without special equipment. According to the invention, the fabric is provided with a pile surface made of chenille fur of V-shape, held in place against a woven backing web by suitable binder warps with adjacent lengths of fur spaced apart by weft threads in the face of the web. The chenille fur used for the purpose carries tuft yarns of different lengths and in some instances a single length of the chenille extending across the fabric is provided with tufts of several different heights. The use of the fur carrying tufts of varying heights permits the production of a fabric with an embossed pattern effect on the pile surface with the entire surface made up of tufts and each row of tufts including a full complement thereof.

For a better understanding of the invention, reference may be had to the accompanying drawing in which:

Fig. 1 is a diagrammatic sectional view of a piece of fabric embodying the invention;

Fig. 2 is a sectional view of the fabric on line 2—2 of Fig. 1;

Fig. 3 is a view in perspective of the pile surface of the fabric; and

Figs. 4, 5 and 6 are plan views of different types of chenille strips used in producing fabric.

As illustrated in Fig. 1, the new fabric includes

stuffer warps 10 and two series 11 and 12 of weft threads lying, respectively, above and below the stuffer warps and bound in place against the stuffer warps by one or more sets of binder warps 13a, 13b. The weft threads employed in the fabric may be of any suitable material, but heavy woolen yarns are preferred in order that the backing web or body of the fabric may have a soft, smooth back. The pile surface of the fabric is formed of V-shaped strips 14 of chenille and these strips carry pile tufts 15 which are of different heights throughout the fabric. Each of the strips 14 is bound against the face of the backing web by warps 16 which pass over each strip and under all the face weft threads 11.

The chenille strips employed in the new fabric are produced in the usual way by weaving a fabric which consists of a plurality of sets of small warp threads 17 with the sets spaced apart across the fabric and interwoven with heavy weft yarns 18. After the weaving of the fabric, it is separated into strips by severing the weft yarns along lines lying between the sets of warp threads 17. Each strip thus produced comprises a group of warp threads 17 forming the backbone of the strip and weft yarns extending beyond the sides of the backbone and used to form the pile tufts in the fabric of the invention.

For producing the chenille strips for use in the new fabric, the chenille web is cut into strips in such manner that certain of the strips carry tufts of substantial height, while the tufts of other strips are of less height. Also, in some instances, the tufts carried by a single strip may vary in height along the strip. In Fig. 4, there is illustrated a strip 19a in which the tufts 18 of both sides of the fur are of the same height and relatively high, while in Fig. 5, there is shown a strip 19b in which the tufts 18a of one side are of greater height than the tufts 18b of the other side. The strip 19c, shown in Fig. 6, carries a row of tufts 18 which are of uniform height, but somewhat lower than the tufts of the strip 19a, Fig. 4. It is to be understood that these variations in the height of the tufts are produced in accordance with the pattern to be formed in the finished fabric, and the strips are then used in such manner that the tufts produce the raised figures and lower background in the pile surface.

Upon completion of the chenille strips, they are formed into V-shape in the usual way and the V-shaped strips are then inserted in the fabric in accordance with the usual practice in the weaving of chenille fabrics. By the use of such strips, it is possible to produce a fabric such as that shown in Fig. 3 in which the pattern figure 20 is formed of tufts of greater height than those forming the background area 21. In the production of such a fabric the pattern may require that a single strip should have tufts of different heights, and this is illustrated by the strip 22 which carries tufts 23a on one side which are shorter than the tufts 23b on the other side. Similarly, the pattern may require that a strip should have tufts of the same height on both sides for a portion of its length and tufts of a different height throughout another portion of its length. This is illustrated by the strip 24 carrying long tufts 25a for a portion of its length

and short tufts 25b for another portion of its length. These different requirements of the pattern are taken care of by the initial formation of the strips and by the insertion of the strips in such manner that the tufts have the height required by the pattern in different portions of the pile surface.

The use of the chenille strips carrying cut pile tufts of different heights in the production of the new fabric permits embossed pattern effects to be obtained without the elimination of tufts in any row. As a consequence, both the background and the figured portions of the pattern have a more attractive appearance than in the embossed fabrics heretofore produced and there is a better coverage of the backing web by the pile yarns. Also in the prior fabrics, made on pile wire looms, the number of colors that can be employed in the background and in the figures of the pattern is somewhat limited. In the new fabric, a much greater number of colors may be used and more elaborate pattern effects may, therefore, be obtained. A further advantage of the new fabric is that by the use of chenille strips, the height of the pile tufts may be closely regulated without the necessity of a subsequent shearing operation which is expensive, both for labor, power, etc., and also because of the waste of yarn resulting.

The new fabric may be woven on looms of the ordinary chenille type without mechanical changes therein and without any increase in the cost of production.

I claim:

1. A pile fabric which comprises a backing web made up of stuffer warps, face and back weft threads lying, respectively, above and below the stuffer warps, two sets of binder warps crossing the weft threads and binding them against the stuffer warps, strips of V-shaped chenille lying above the stuffer warps in contact with a pair of adjacent face weft threads, adjacent strips being spaced by at least two face weft threads, and a single set of binder warps crossing and binding said strips in place and passing beneath the face weft threads, said strips carrying pile loops varying in height, and being so arranged that the pile surface formed by the loops bears a design, portions of which are formed by tufts of different heights.

2. A pile fabric which comprises a backing web made up of stuffer warps, face and back weft threads lying, respectively, above and below the stuffer warps, two sets of binder warps, the warps of the two sets crossing and binding alternate weft threads against the stuffer warps, strips of V-shaped chenille lying above the stuffer warps in contact with a pair of adjacent weft threads bound by binder warps of different sets, adjacent strips being separated by at least a pair of adjacent face weft threads, and a single set of binder warps crossing and binding said strips in place and passing beneath the face weft threads, said strips carrying pile loops varying in height and being so arranged that the pile surface bears a background formed by tufts of one height and a design formed by tufts of another height.

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