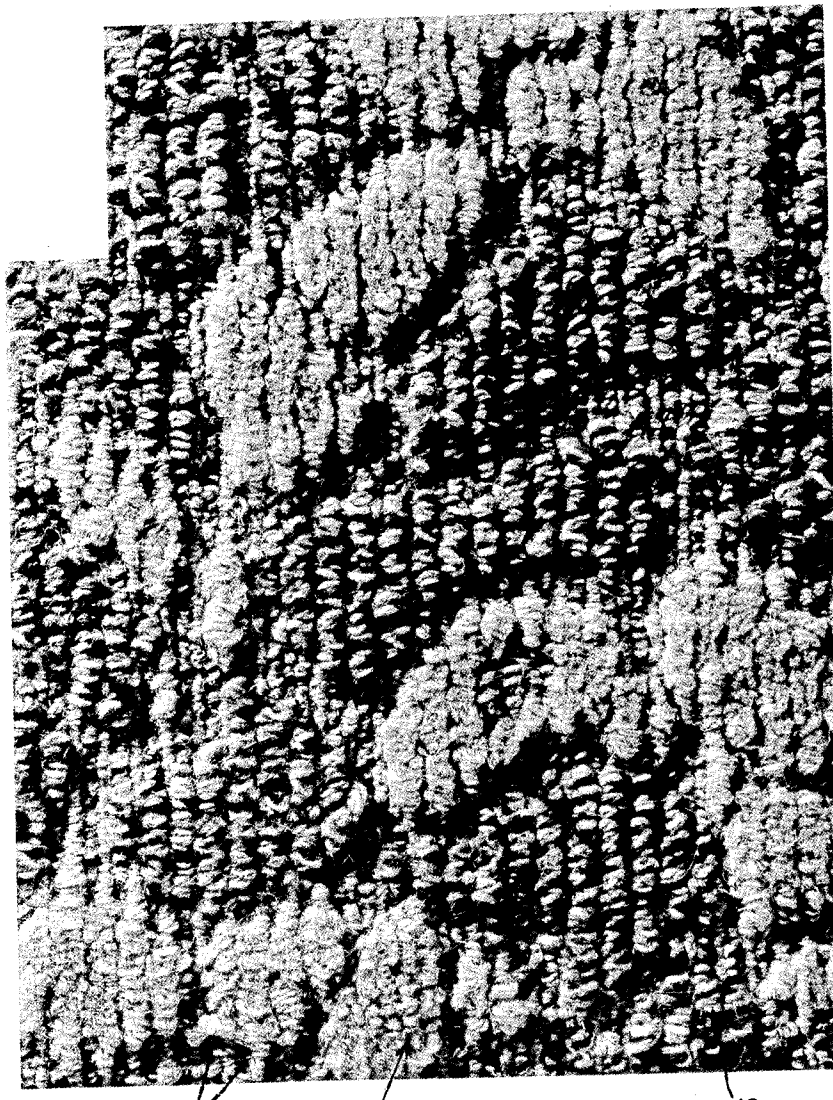
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TUFTED FABRIC

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Fig. 1.



Inventor

ROGER L. WILCOX

By P. E. Hennings

Attorney

Dec. 11, 1962 R. L. WILCOX 3,067,430

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Fig. 2.

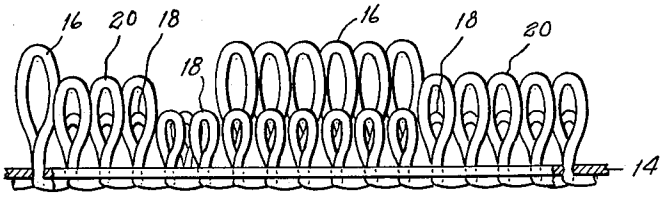


Fig. 3.

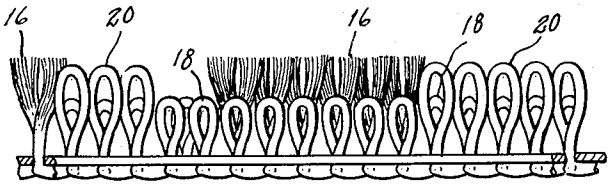
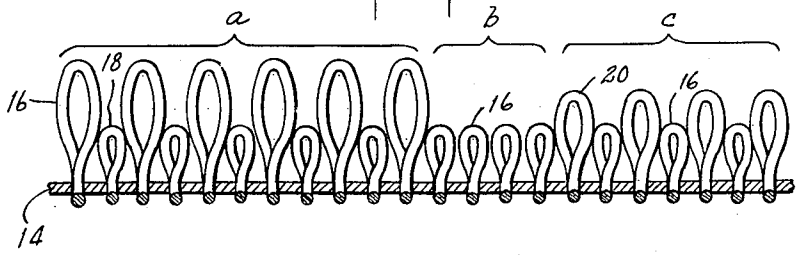


Fig. 4.



INVENTOR.
ROGER L. WILCOX
BY
ATTORNEY

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3,067,430

TUFTED FABRIC

Roger L. Wilcox, Amagansett, N.Y., assignor to A. & M. Karagheusian, Inc., New York, N.Y., a corporation of Delaware

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The present invention relates to a tufted pile fabric having cut pile pattern areas and uncut pile background pattern areas.

Tufted pile fabric composed of figure and ground areas of different height have been proposed heretofore. It has also been proposed to produce tufted fabrics having cut and uncut areas constituting patterns in the fabric. Finally, it has also been proposed to use pile yarn of different color in pile fabric structures.

Heretofore, tufted pile fabrics have not combined all the physical characteristics which would render them equal in customer appeal to woven fabrics adapted for the same purpose.

Many fabrics of the Wilton variety have heretofore been produced in complex design and color variation of exquisite beauty. These fabrics have been made possible by the fact that multi-frame looms under Jacquard control have provided very flexible tools for their production. To date tufting machines do not provide the same possibilities of yarn manipulation with the result that only tufted fabrics of rather elementary design and color variations have been produced.

It is, therefore, the primary object of the invention to provide a fabric structure which can be produced in a tufting machine but which is capable of great variations in pattern and color design such that Wilton quality fabrics can be produced.

It is also an object of the invention to provide a tufted fabric structure which has an improved hand and which embodies superior wearing qualities.

It is another object of the invention to provide a simple tufted fabric structure which is capable of a wide range of variations such that fabrics can be produced which are fully competitive with woven fabrics which are more costly to produce.

Accordingly, it is the purpose of the invention to provide a tufted pile fabric having cut pile pattern areas and uncut pile background pattern areas of simple structure, yet capable of design variation over a wide range of patterns.

It is a further object of the invention to provide a tufted fabric having a three dimensional effect in conventional tufting machines. To this end the fabric has formed therein cut pile pattern areas, looped pile background areas composed of looped pile of intermediate height, and pattern definition areas separating said pattern areas which are composed of adjacent low pile loops formed in the same courses containing the pile of which said higher pattern areas are formed.

It is the further purpose of the invention to provide for simple color control in a multi-colored tufted fabric.

It is still a further object of the invention to provide a fabric which presents a color effect, when colored yarns are employed, which is over and above the effects heretofore produced on tufting machines.

The invention also contemplates a tufted fabric structure in which both the cut pile pattern area and the uncut pile background pattern area are given body, and the high pile thereof is supported throughout the structure by low pile loops at opposite sides of the high pile.

The invention is predicated on the symmetrical treatment of alternate pile yarns such that a low pile loop appears in conjunction with higher pile, whether looped or cut. The structural technique is also relied on to provide

a simple method for controlling color distribution throughout the fabric by reason of the ability of the higher pile loops or cut pile to mask adjacent low pile loops of different color.

The tufted pile fabric herein is characterized by cut pile pattern areas and uncut pile background pattern areas formed in a separately fabricated ground fabric by a plurality of parallel courses of alternate high cut pile and low pile loops only tufted into and extending from a face of the ground fabric to form cut pile pattern areas, and alternate courses of low pile loops and parallel pile loops of intermediate height only tufted into and extending from the face of the ground fabric to form the uncut pile background pattern areas.

In its specific aspect, the low pile loops in the cut pile pattern areas are a continuation of the courses of the pile loops of intermediate height in the uncut pile background areas and the low pile loops in the uncut pile pattern areas are a continuation of the courses of high cut pile loops in the cut pile pattern areas. This structure results in a fabric of great durability in which the low pile loops in each of the pattern areas lends substantial stability to the face pile of the fabric.

For a full understanding of the invention, reference may be made to the accompanying drawings in which like reference numerals indicate like parts and in which:

FIG. 1 is a photographic plan view of a pile fabric according to the invention;

FIG. 2 is a warp-wise view showing two adjacent lines of tufts, including a plurality thereof adapted for shearing to form a cut pile area;

FIG. 3 is a view similar to that of FIG. 2 showing the sheared ends of high pile loops; and

FIG. 4 is a view taken along a row of pile loops, including a plurality thereof adapted for shearing to form a cut pile area.

As shown in FIG. 1, the tufted pile fabric herein is produced to embody cut pile pattern areas **10** and uncut pile background pattern areas **12**, which are separated from each other by definitive areas **13** of adjacent low pile loops. As in the usual practice, the fabric is formed by tufting loops of yarn into a separately formed ground fabric **14**, as shown in FIG. 2.

The cut pile pattern area **10** is formed of long cut pile and alternate short looped pile while the uncut pile background pattern area is formed mainly by looped pile of intermediate height and alternate looped low pile. A typical arrangement of alternate looped pile is shown in FIG. 4, which is taken along a single row of pile loops. In this figure, high pile loops **16** are alternated with low pile loops **18** enclosed within the bracket *a* constituting the pile of which the cut pile pattern area of the fabric is formed. Ordinarily, the predominant uncut pile background pattern is formed by looped pile **20** which is of an intermediate height and which alternates with low pile **16** as shown by the section of FIG. 4 embraced in the bracket *c*. A minor portion of the uncut pile background pattern will ordinarily be formed by adjacent low looped pile, as shown by the section of FIG. 4 enclosed in the bracket *b*. The adjacent low pile areas by which the pattern areas are separated constitute definition areas which lend prominence to the pattern areas. It is through the agency of the low pile definition areas that the fabric obtains its three dimensional effect.

According to the invention, a single pile yarn may form the high loops **16**, the low loops **18** and the loops **20** of intermediate height. Whenever a course of high loops or loops of intermediate height is formed, the immediately adjacent course of loops on both sides will be low, except for those areas of the uncut pile background pattern where adjacent lines of loops may all be low. This assures that warp-wise, taking any substantial area of the

fabric where high pile and pile of intermediate height appear, every other course of pile will ordinarily be composed of low loops.

Reference to FIG. 2 will illustrate the basic relationship of low loops to higher loops. This figure shows two adjacent courses of loops. Specifically, in FIG. 2, the high loops **16** of the pile course in the background are designed to form the cut pile pattern area and it will be noted from this figure, that where the high loops **16** are formed, low loops **18** are formed adjacent thereto in the pile course in the foreground. By the same token, loops **20** of intermediate height in the course of loops in the foreground are supported at adjacent sides thereof by low loops **18** in the course of loops in the background, and by corresponding low loops along the front face thereof, as viewed in FIG. 2.

The height of the loops can be controlled in any suitable automatically controlled tufting machines. Such control is usually under domination of a pattern device which decreases or increases the velocity of yarn feed rollers located between the source of yarn and the needles. Basically, these devices control the amount of yarn fed to the several needles of the tufting machine and vary the amount as required to control the height of the pile loops.

It can be seen, therefore, that the yarn fed to a single needle may be formed into loops of any desired height depending upon the control pattern by which the feed mechanism is regulated.

After the fabric has been tufted to form high, intermediate and low loops as above described, the same is subjected to a shearing operation whereby the tops of the long loops are sheared off as shown in FIG. 3. The fibers of the sheared loops will relax and fray to produce the cut pile pattern areas **10** while the looped pile of intermediate height will produce the uncut pile background pattern areas **12**. After the fabric is sheared, it is subjected to a steaming operation to cause the cut pile ends to bloom. In this connection it may be stated that any suitable yarn may be employed. Particularly, since the fabric has been conceived as a carpet, any suitable carpet yarns are adaptable. In this connection, it is contemplated that the best results can be obtained in a carpet by using conventional yarns.

It is contemplated that the high loop areas may be interspersed with randomly distributed lower loops which are exposed when the higher loops are sheared, thus producing a random sheared loop effect. In the alternative, the same effect can be attained by forming randomly distributed long loops which extend above the surface to be sheared, and by then shearing only the randomly distributed long loops.

The fabric structure of the invention adapts itself

ideally to the production of fabrics having a variety of shades and colors. By reason of the masking function of the cut pile and the higher pile of intermediate height, the low pile loops are concealed from view. This makes it immediately possible to form varicolored and varishaded designs and patterns by the simple expedient of feeding pile yarns of selected shades or colors to alternate needles of the needle bank of the tufting machine. These results can be attained because the yarn chosen as the predominant feature of the uncut pile background pattern is always and completely concealed in the cut pile and by the pile of intermediate height which forms the uncut pile background pattern area. Wherever pile yarn which predominates in the cut pile pattern area and the yarn of different color or shade which predominates in the uncut background pattern area form adjacent rows of low pile loops, the effect of a third color design, pattern and/or texture is obtained due to optical mixing of the two colors employed in proximity to each other without resort to any additional manipulation of the tufting operation.

While the fundamentally novel features of the invention have been illustrated and described in connection with a specific embodiment of the invention, it is believed that this embodiment will enable others skilled in the art to apply the principles of the invention in forms departing from the exemplary embodiment herein, and such departures are contemplated by the claims.

What is claimed is:

1. A tufted pile fabric having in each alternate course low and high pile and having in each remaining course low pile of the same height as said first named low pile of said alternate courses and pile of a height intermediate said high and low pile, said high pile of said alternate courses being distributed along said courses to form high pile pattern areas and said pile of intermediate height being distributed along said remaining courses to form pattern areas of intermediate height, said low pile throughout all of said courses being distributed therealong to provide a support on both sides of said high and intermediate pile where such high and intermediate pile forms pattern areas, and pattern definition background areas composed of adjacent courses of low pile separating said pattern areas.

2. The fabric of claim 1, wherein the pile of said high pile pattern areas is cut.

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