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SURFACE PILE FABRIC AND ITS METHOD OF MANUFACTURE

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Fig. 1.

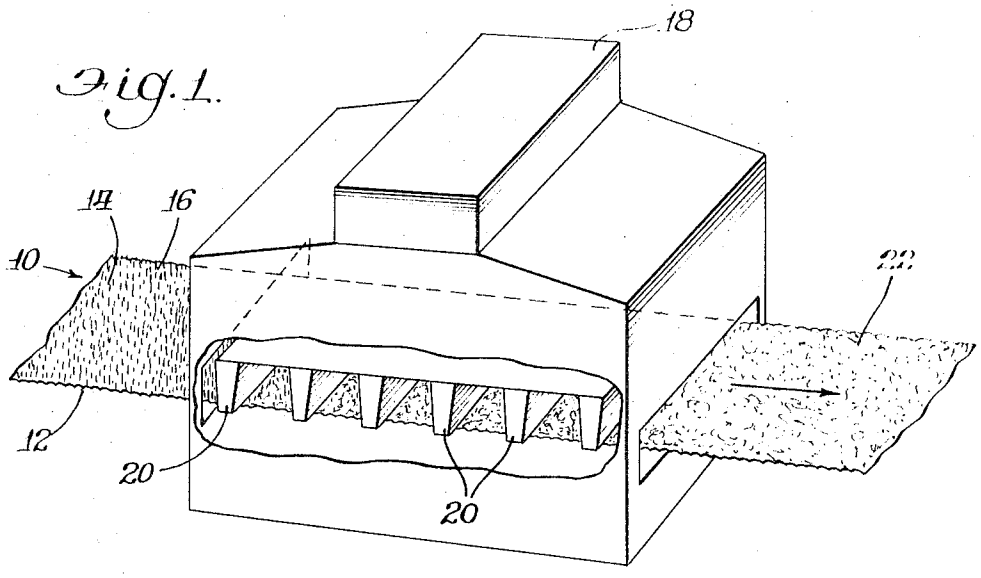


Fig. 2.

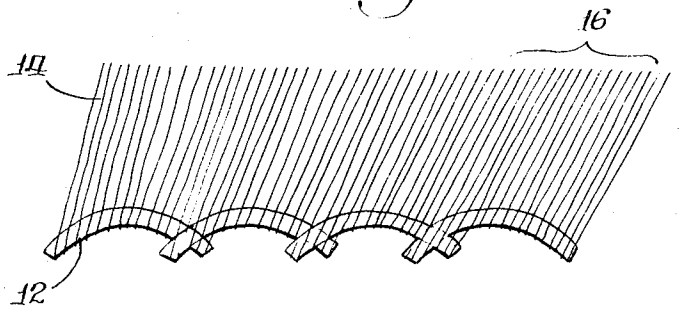


Fig. 3.



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SURFACE PILE FABRIC AND ITS METHOD OF MANUFACTURE

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U.S. Cl. 161—63 6 Claims

ABSTRACT OF THE DISCLOSURE

An improved surface pile fabric which is comprised of a base fabric and pile fibers intertwined with the base fabric and extending therefrom to provide a pile which has been irregularly disoriented into an improved surface pattern as a result of the relaxation of stresses in the fibers under the impingement of heat and fluid pressure for a given period of time. The method of manufacture of this improved surface fabric is such that the pile fibers may all have substantially the same disorientation characteristics.

SUMMARY OF THE INVENTION

This invention relates to pile fabrics and, more particularly, it relates to a pile fabric having an improved surface pattern resulting from the disorientation of the fibers caused by the relaxing of stresses in the fibers under the impingement of heat and fluid pressure for a given period of time.

Several different methods have been used to obtain a patterned surface in pile fabrics. One such method incorporates a pressing roll with the desired pattern formed as a raised portion on the surface of the roll. The pile fabric is pressed by the roll in the presence of heat so that the uniform pattern is pressed into the pile fabric. In this operation, the particular design on the pressing roll is repeated over and over again on the surface of the pile fabric.

Other patterned effects have been accomplished by the selection and dispersion of synthetic fibers of different denier, length, and shrinkage. In these methods the varying characteristics of the varying fibers result in groups of fibers with varying lengths thereby producing, a random pattern effect in the surface of the pile fabric. These methods, involving the use of varying characteristic fibers, result in an involved process of intertwining the pile fibers with the base fabric in a given pattern, thus complicating the knitting operation.

The improved surface pattern pile fabric of the subject invention is attained without the use of a uniform pattern pressing roll and without the specific selection and dispersion of special synthetic fibers and depending on these fibers to obtain a predetermined pattern. The resulting pattern of the subject invention is in contrast to the patterns of the methods commonly used in that the resulting pattern is not uniform and is not one that can be predetermined. Hence, each pattern produced by the process of this invention is unique and unlike any other pattern produced thereby. The resulting pattern in this application can best be described as being similar to a "bark effect" as appears on the surface of a tree. Even though the "bark effect" is achieved over and over again, there is no degree of mechanical repetition in the non-uniform, irregular surface resulting from the present method. The previously known methods rely primarily on the shrinkage of the fibers to produce the pattern effect. In contrast, the subject method is not one in which shrinkage plays a role in the production of the surface pattern, rather, it is the result of the relaxation of the inherent fiber stresses and the disorientation and curling of the fibers which produces the effect.

Hence, the subject pile fabric can be manufactured from fibers of one type or a mixture of fibers or different types without affecting the resultant pile surface as the subject method does not rely upon varying characteristics of different types of fibers, but rather relies upon the relaxation of the inherent stresses in the fibers, regardless of the type of fiber.

DESCRIPTION OF THE DRAWINGS

To understand more fully the details of this invention reference may be had to the drawings, wherein:

FIG. 1 is a schematic perspective view of a length of pile fabric and a heat and fluid dispensing oven through which the pile fabric passes;

FIG. 2 is an enlarged view of the pile fabric prior to passage through the oven; and

FIG. 3 is an enlarged view of the pile fabric including the improved surface pattern after it has been treated in the oven.

DETAILED DESCRIPTION

More specifically, the drawings show a length of pile fabric **10** which is comprised of a base fabric **12** and a plurality of individual pile fibers **14**. As in most pile fabrics the pile fibers **14** are intertwined with the base fabric **12** and extend upwardly therefrom so as to produce a uniform pile fabric surface **16**. The pile fabric in this particular instance can be manufactured from acrylic, modacrylics, polyesters, and blends of these fibers or other synthetic textiles which, under the influence of heat, are able to be softened. As in the production of most pile fabrics, the upper surface **16** has been sheared so as to result in a uniform, smooth surface.

Oven **18** in FIG. 1 may be of a standard type used to heat set the base fabric of a pile fabric. In such a standard, heat set operation the pile fabric is passed through the oven **18** with the base fabric **12** facing upward so that the pile fibers and the base fabric become heat set together. The oven **18** contains apparatus capable of heating the fabric to predetermined temperatures as it passes through the oven. The oven also includes apparatus to impinge a fluid stream, such as hot air or dry steam, onto the surface of the pile fabric. This stream of fluid is passed from the oven **18** through one of a series of baffles **20** and onto the pile surface of the pile fabric. It should be noted that the fluid impings onto the pile surface over its full width and not just selected areas.

In order to accomplish the purpose of the present invention, the pile fabric **10** is fed through the oven **18** with its pile fiber surface **16** facing upwardly as viewed in FIG. 1. As the pile surface is fed into the oven **18** it is softened by the heat of the impinging fluid and it is at this point that the pattern or "bark effect" begins to form on the surface of the pile fabric. When the individual fibers **14** are softened, there is a relaxation of the normal fiber stresses which were introduced during the fiber production, and once the fibers become relaxed, they are easily disoriented and curled by the force of the impinging fluid. The resulting positioning of the fibers can be seen in FIG. 3 where the fibers **14** have become curled and intertwined with each other in an irregular surface pattern **22**. Once the fiber has been allowed to cool it remains in its disoriented and curled position with stability to both laundering and dry cleaning.

As previously mentioned, it is necessary to direct a fluid such as hot air or dry steam onto the pile surface. The relationship of time, temperature, and force of the impinging fluid are important with respect to the degree of permanency of the "bark effect" on the surface of the pile. The best results have been achieved when heat is applied so as to raise the temperatures to between 325°

F. and 350° F., depending upon the fiber type; with a fluid pressure in the impinging fluid of 4/10" water gauge for three minutes exposure time. These conditions of time, temperature, and force of the impinging fluid have been found to be very successful with a pile fabric having a fiber pile height of approximately 3/8". However, it is possible to go slightly higher or lower in pile height. The pile density plays an important role in the creation of the "bark effect" with optimum conditions being from 7 to 12 oz. pile per 60" linear yard of pile fabric. Any increase in pile density over the 12 oz. per 60" linear yard will not allow the fibers to curl as readily due to the greater fiber population in the given area. Any less than 7 oz. per 60" linear yard will produce a fabric which has openings through which the base fabric or backing can be seen, which is undesirable from an appearance standpoint. The finish on the fabric prior to producing the "bark effect" is also important. The pile surface should have good directional lay with good fiber freeness and the depth of finish should be high; thereby adding to the fiber freeness.

Therefore, it should be clear that the subject invention provides a new method of treating pile fabrics so as to result in an improved surface pattern on a pile fabric which produces a "bark effect" on the surface of the pile fabric. Such resulting pile fabrics containing the "bark effect" surface finish have many commercial uses including men's and women's outer garments, linings for outer garments, and unique floor and furniture coverings.

Although but one specific impingement of this invention has been described in detail, it should be clear to those skilled in the arts to which it pertains that many changes and modifications may be made thereto without departing from the scope of the invention as set forth in the appended claims.

We claim:

1. The method of producing an improved random non-repetitive pattern fabric which consists of knitting a backing and simultaneously intertwining therein multiple heat-softenable synthetic face fibers projecting from one surface thereof in a generally straight pattern, shearing the fibers to render the length thereof generally uniform and thereafter subjecting all of the sheared fabric to a series of impingements of fluid streams in the presence of an amount of heat sufficient to soften the fiber, whereby the fibers are caused to relax their internal stresses and under the influence of the fluid assume random non-repetitive patterns giving an overall irregular non-repetitive pattern.

2. The method of claim 1 wherein the heat is in the range of from 325° F. to 350° F.

3. The method of claim 1 wherein the face fibers consist of fibers having the same chemical composition.

4. The product produced by the method of claim 1.

5. The method of claim 1 wherein the pile density of fibers is from 7 to 12 ounces pile per 60 inches linear yard of fabric.

6. The product produced by the method of claim 5.

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U.S. Cl. X.R.

26—2, 15; 28—76; 161—67