

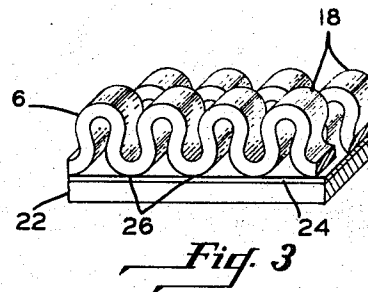
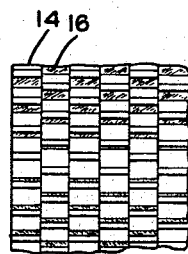
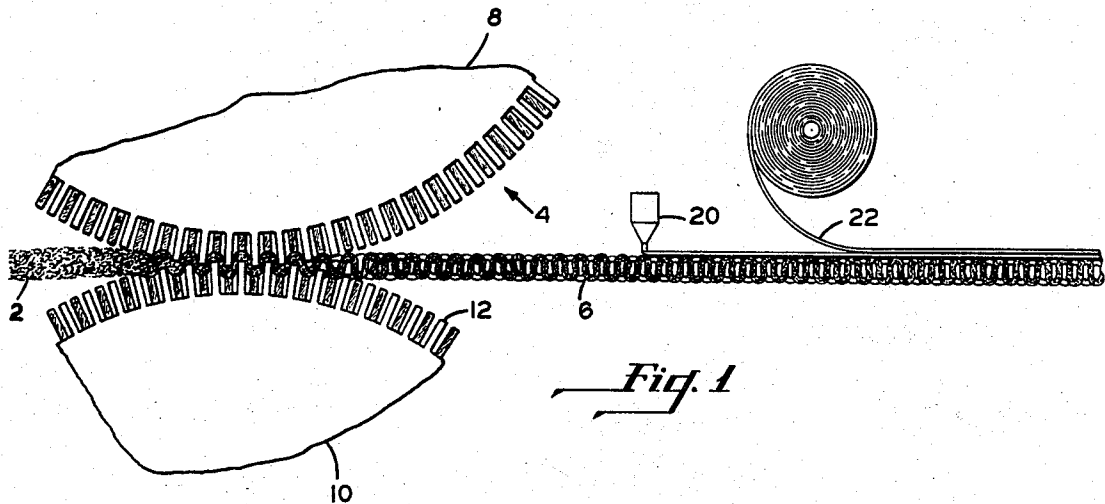
Oct. 13, 1970

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3,533,871

NONWOVEN TUFTED FABRIC BY CRIMPING

Filed April 10, 1968



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1

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NONWOVEN TUFTED FABRIC BY CRIMPING
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Filed Apr. 10, 1968, Ser. No. 720,285

Int. Cl. D04h 11/08

U.S. Cl. 156—205

2 Claims

ABSTRACT OF THE DISCLOSURE

A process for converting a nonwoven web into a web which has the appearance of a tufted fabric. The nonwoven web is fed between two meshing crimping rolls to provide the web with a corrugated structure that gives the appearance of a tufted fabric. A staggered tooth arrangement on the crimping rolls provides a staggered row arrangement in the tufted appearance of the end product. A suitable backing is applied to the nonwoven crimped end product to maintain the crimped structure in position.

BACKGROUND OF THE INVENTION

Field of the invention

The invention relates to improved pile fabrics, more particularly to novel pile fabrics having a discontinuous tufted appearance on the upper face of the pile fabric. The invention also relates to the process for forming the above-mentioned fabric.

Description of the prior art

Nonwoven materials have been formed into a pile fabric by several different techniques, as for example shown in Pat. Nos. 3,034,942, 3,142,604, and 3,330,708. In each case some type of crimping operation is performed on the flat sheet of nonwoven material to provide it with a pile yarn fabric effect. In almost every case, the piles appear as rows extending across the full width of the web of material.

In Pat. No. 3,034,942, there is a disclosure of a means of offsetting adjacent rows to interrupt "the rowiness of conventional pile fabrics and give a tufted appearance." This was accomplished by forming the crimped pile yarn fabric with its continuous row structure, fastening the crimped fabric to a backing, and then slitting longitudinally the pile fabric and backing so that it would be possible to offset adjacent rows to yield a tufted pile fabric appearance.

Needless to say the apparatus necessary to slit the pile fabric and shift the individual slit sections $\frac{1}{2}$ pile width or about $\frac{1}{4}$ " is extremely complicated and expensive. The individual slit sections must be individually glued together, and this is often best accomplished by the use of an additional backing layer which will further increase the expense of the end product. The problem solved by the process herein is that of providing an inexpensive method for readily providing a pile fabric formed from a nonwoven material with the appearance of a tufted floor covering.

SUMMARY OF THE INVENTION

The invention involves the apparatus and process for forming a tufted fabric from a nonwoven web wherein the tufted appearance is produced by passing the web through a pair of rollers, each of which includes staggered teeth or projections. The projections on each roll are arranged in circumferential sections which are offset approximately $\frac{1}{2}$ tooth or projection unit from the teeth or projections in the adjoining section on the same roll. The rolls are arranged with sufficient clearance to allow the

2

passage of the web material between the rolls while allowing the tufts to be formed in the material due to the intermating projections of the two rolls. Upon passage of the web through the rolls, the tufting is retained by adhering the web on one side to an adhesive such as a plastisol which may then be fused to form the backing or by merely adhering the web to a backing with an adhesive.

The primary advantage of the above process is that the normal flat, nonwoven fabric is converted into a pile-type fabric which gives the appearance of having been made by a conventional carpet tufting process. This in effect converts the end product from an inexpensively appearing carpet to a carpet that has the appearance of a high-priced carpeting. The above advantage is accomplished by the use of a rather simple crimping device which utilizes a staggered tooth structure to provide the tufted appearance.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a side view of the crimping rolls;

FIG. 2 is a front view of the crimping rolls showing the tooth arrangement; and

FIG. 3 is a perspective view showing the end product.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. 1 there is shown the flat, nonwoven fabric 2 being fed into the crimping apparatus 4 for conversion to the end product 6 which has the appearance of a tufted pile fabric carpeting. The crimping assembly 4 is composed of an upper roller 8 and lower roller 10. Both roller structures have intermating teeth or projections 12 which engage opposite surfaces of the nonwoven web to provide the crimped surface which gives the appearance of the tufted fabric.

Referring to FIG. 2 there will be seen the arrangement of the projections or teeth 12 which provide the desired appearance to the end fabric. The projections on each roll are arranged in circumferential sections and each projection in each section is offset approximately $\frac{1}{2}$ tooth or projection unit from the teeth or projections in an adjoining section on the same roll. For example, section 14 has its teeth or projections offset from the teeth or projections in section 16. As will be seen in FIG. 2, there is sufficient clearance between the intermating teeth to allow passage of the web material between the rolls as the tufts are formed in the material.

The end product, as shown in FIG. 3, therefore has the appearance of a tufted pile fabric in which each tuft 18 gives the appearance of being an individual loop of material which has been sewed to the backing such as is conventional in the normal tufted carpeting.

In order to permit the nonwoven web 6 to maintain its tufted appearance, an adhesive dispenser 20 will apply adhesive to one surface of the web 6 after which a backing 22 is applied to the web 6 to form the carpet backing and to hold the crimped fabric in position. As seen in FIG. 3, the backing 22 has a layer of adhesive 24 which engages the crimped fabric at points 26 to secure the crimped fabric to the backing 22. The holding of the points 26 in position will insure the maintenance of the tufted appearance in the upper face of the tufted web 6.

Many other types of ways may be utilized for providing a backing to the tufted web material to insure that the web material maintains its tufted appearance. For example, a plastisol could be applied to one surface of the web material and later fused thereto and possibly expanded to form a foamed backing with the web material securely bound to its upper surface.

What is claimed is:

1. An improved process for the manufacture of carpet structures having a pile yarn fabric bonded to a backing, said fabric having a plurality of rows of pile loops, said

3

process comprising the steps of forming a flat nonwoven material into a plurality of rows of pile loops with a forming tool having a plurality of staggered projections so that the pile loops in adjacent sections are offset approximately $\frac{1}{2}$ loop length from the loop in an adjacent section, and bonding a backing to the formed pile loops to maintain the loops in their staggered relationship.

2. The process of claim 1 wherein the forming structure is a plurality of staggered tooth crimping rolls.

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4

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10

U.S. Cl. X.R.

156—72, 210; 161—66, 67, 132, 133