

[54] **CORDUROY AND PROCESS FOR PRODUCING CORDUROY**

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[51] Int. Cl. **D04b 23/08**

[58] Field of Search 66/191-195, 85 A, 84 R, 85 R; 112/410; 139/392

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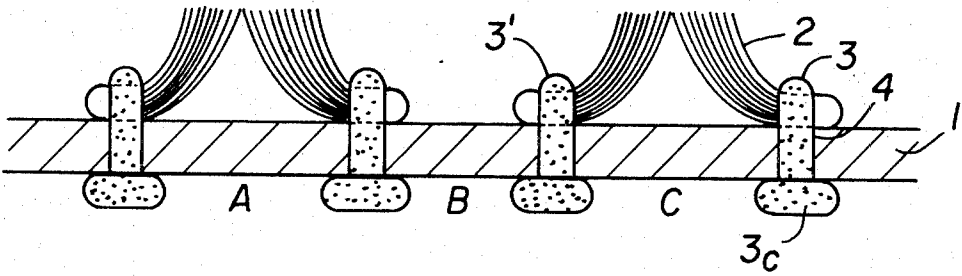
Primary Examiner—James Kee Chi

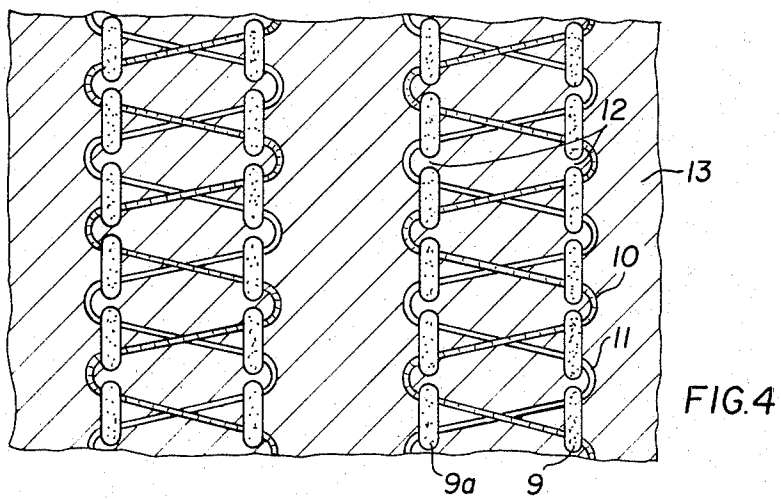
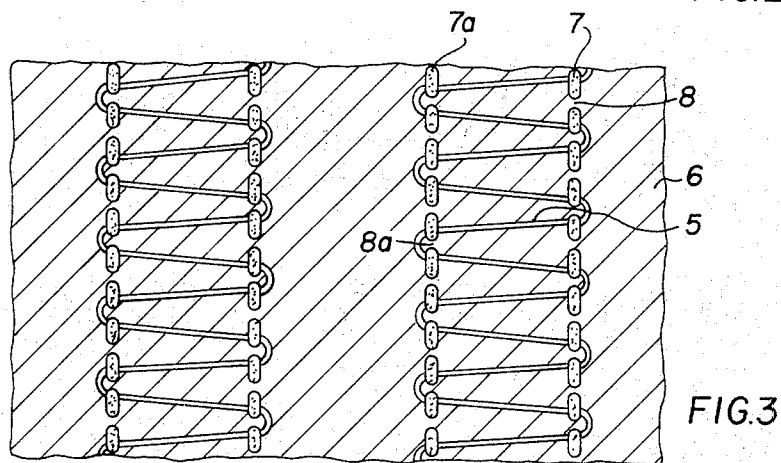
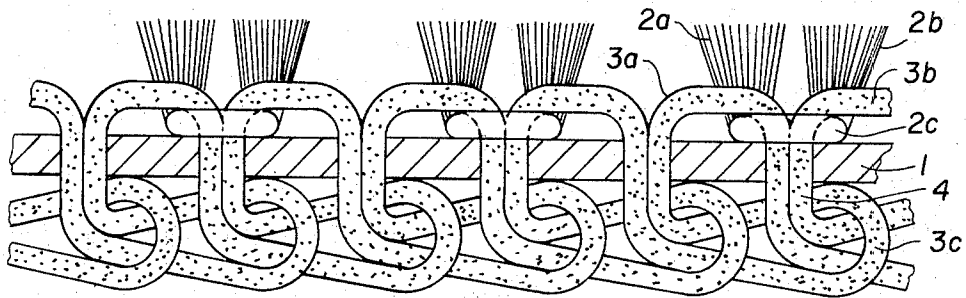
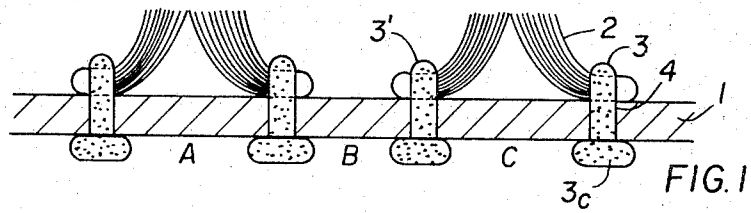
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[57] **ABSTRACT**

Corduroy or the like, wherein the pile tufts are arranged on a base web and are doubly bound into chain-stitch seams, each one of the two free legs of the pile tufts are bound to the base web by a respective wale of the chain-stitch seam, and the foot portion of each pile tuft, interconnecting the two free legs thereof, is arranged in the direction of the chain-stitch seam.

9 Claims, 10 Drawing Figures





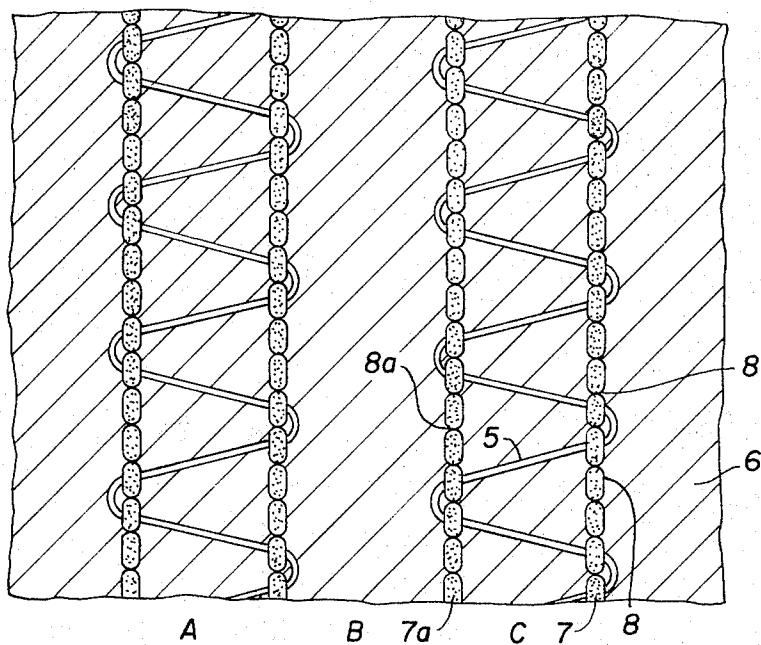


FIG. 5

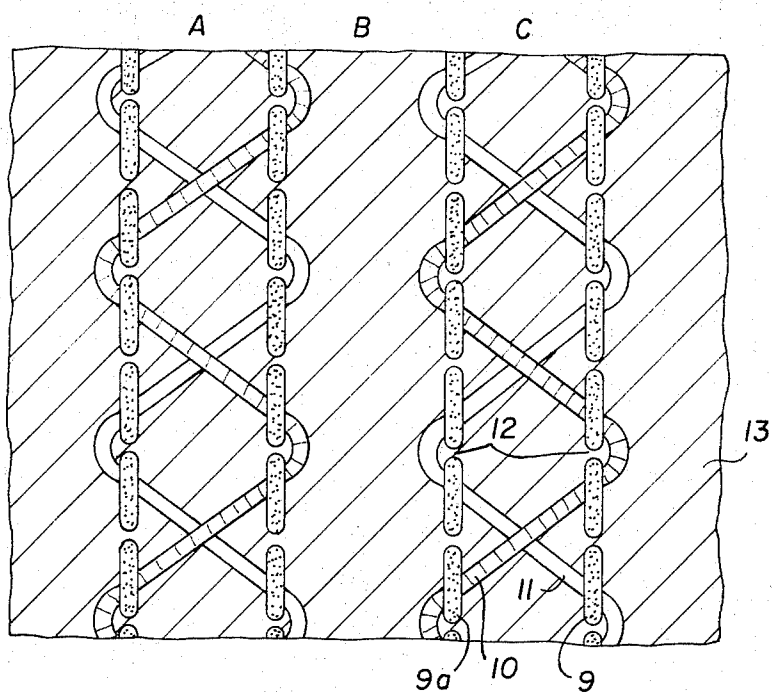


FIG. 6

FIG.7

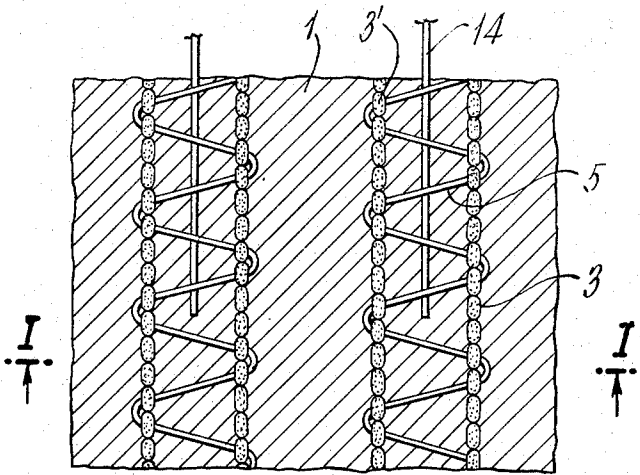


FIG.8

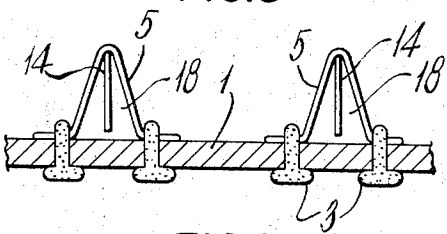


FIG.9

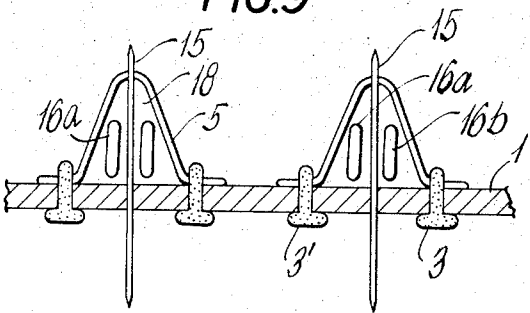
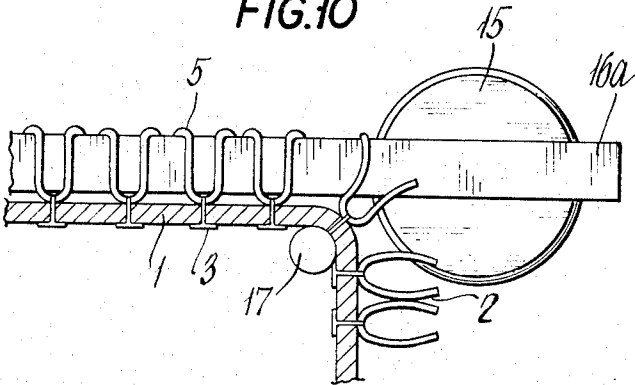


FIG.10



CORDUROY AND PROCESS FOR PRODUCING CORDUROY

The present invention relates to a corduroy where the pile tufts are arranged on a base web and are bound into chain-stitch seams or wales. The chain-stitch seams are drawn into the base web on which the pile tufts are secured, by means of the chain-stitch seams, without being pulled through the base web.

Such a corduroy, preferably produced by stitch-knitting can be produced much more economically as compared with woven or knitted corduroy, as the machines to be used for its manufacture, preferably stitch-knitting machines, have a high output.

A corduroy made by stitch-knitting is known from East German Pat. No. 28,973 or U.S. Pat. No. 3,168,883. It was found, however, that the corduroy thus produced still has some disadvantages. According to the patent, a plurality of cross threads, from which the later pile is formed, is placed flat on a base web and connected with it by chain-stitch seams. The cross threads are arranged as a group of threads in zigzag form on the base web. The resulting oblique and crossing position of the cross threads, which are cut open between the chain-stitch seams and formed into cord ribs, is still apparent even in the fully finished corduroy and therefore impairs the use of these fabrics for high-grade purposes. In particular, however, this corduroy has, as does also the woven corduroy, only a single, V-shaped binding of the pile tufts and therefore its pile strength is not very high.

It is known how to produce stitch-knitted pile fabrics by the so-called "weft pile process." In this process a cross-thread layer serving as base web is consolidated by means of chain-stitch seams, and at the same time pile threads which have been formed over pile sinkers into pile tufts are bound into the chain-stitch seams. In this way the pile threads are arranged on the face of the fabric and are not pulled into the base web. This method is very advantageous for the production of textile materials having a closed plush surface, e.g., velours type floor covering materials.

It has, however, not been possible until now to produce by the "weft pile process" an attractive corduroy, because satisfactory cord ribs could not be obtained.

It is the purpose of the present invention to remedy this defect of the "weft pile process" for producing corduroy or the like.

The problem underlying the invention is to provide a corduroy, the construction of which makes possible the formation of cord ribs, using elements of the "weft pile process."

The corduroy or the like according to the invention, where the pile tufts are arranged on a base web and are bound into the chain-stitch seams, is especially characterized in that in each pile tuft one of its two free legs is bound into the wale of the chain-stitch seam formed before the stitch insertion point and the other leg in the wale formed thereafter. This results in a double, extremely strong or firm binding of the pile tufts by means of the chain-stitch seams at the base web.

The base web is preferably a woven fabric. But also knitted fabrics, nonwoven fabrics, and other structures may be considered. Also the base web may consist simply of a group of weft or cross threads. As chain-stitch seams it is also to be understood to include wales which bind off for example in fringe laying.

Another essential characteristic for the corduroy according to the present invention is that the pile tufts are bound in longitudinal direction, i.e., in the direction of the chain-stitch seams. In contrast to this, both in the woven corduroy and in the corduroy according to East German Pat. No. 28,973 the pile tufts are formed from pile threads which lie in weft or transverse direction from the chain-stitch seams.

It is also to be regarded as an essential feature of the invention that the free legs of the doubly bound pile tufts present between two chain-stitch seams are inclined toward each other and from these legs a cord rib is formed between the two chain-stitch seams.

The pile tufts may be formed at every, every other, or every fourth stitch insertion point. If pile tufts are formed at every other or every fourth stitch insertion point, the pile tufts are arranged staggered from chain-stitch seam to chain-stitch seam.

To insure a clear rib formation, pile tufts are preferably arranged only at every second of the longitudinal rows formed between the chain-stitch seams and therefore cord ribs are developed.

The instant invention will be better understood when considered with the accompanying drawings, illustrating the corduroy according to the present invention and details of the process to be employed for its production, in which:

FIG. 1 shows the corduroy of the invention in transverse section;

FIG. 2 shows the corduroy of the invention in longitudinal section;

FIG. 3 shows the binding of the pile threads into the chain-stitch seams at every other stitch insertion point when using one pile thread per cord rib;

FIG. 4 shows the binding of the pile threads into the chain-stitch seams at every stitch insertion point when using two pile threads per cord rib;

FIG. 5 shows the binding of the pile threads into the chain-stitch seams at every fourth stitch insertion point when using one pile thread per cord rib;

FIG. 6 shows the binding of the pile threads into the chain-stitch seams at every other stitch insertion point when using two pile threads per cord rib;

FIG. 7 corresponds generally to FIG. 3, however also illustrating pile sinkers;

FIG. 8 is a sectional view taken on section line I—I of FIG. 7;

FIG. 9 corresponds to FIG. 8 but now showing the cutting of the pile tufts to form cord ribs;

FIG. 10 is a longitudinal section of the operation illustrated in transverse section in FIG. 9.

As can be seen in FIGS. 1 and 2 the pile tufts 2 are arranged on the base web 1 and are bound into the chain-stitch seams 3. The chain-stitch seams 3 are drawn into the base web 1 at the stitch insertion points 4. The wales 3a, 3b of the chain-stitch seams 3 lie on the face and the stitches 3c on the underside of the fabric. By its leg 2a, the pile tuft 2 is bound into the wale 3a lying before the stitch insertion point 4 and by its leg 2b into the wale 3b of the chain-stitch seam lying behind the stitch insertion point 4. Thus, there is formed a double, w-shaped binding of the pile tufts, resulting in a higher pile stability as compared with a v-type fastening.

As can be seen in FIG. 1, the free legs 2a of the pile tufts 2 formed between two adjacent chain-stitch seams 3, 3' are inclined toward the center and form upright pile tufts.

It is evident from FIG. 2 that foot portion 2c of pile tuft 2 present between the wales 3a, 3b and the base web 1 extends parallel to the chain-stitch seam 3 and therefore the pile tufts 2 are bound in the direction of the chain-stitch seam 3, while in all corduroys known until now the pile tufts lie in weft or transverse direction.

In the longitudinal rows A, B, C formed between the chain-stitch seams 3, 3', pile tufts 2 are arranged, according to a preferred form of execution of the invention, only in every second longitudinal row, that is, only in the longitudinal rows A and C. Thereby striking cord ribs are formed. However, other sequences are possible, to obtain patterns as desired.

FIG. 3 illustrates the arrangement of the pile threads 5 from which the later pile tufts 2 (FIGS. 1 and 2) are formed, on the base web 6, and their fastening by means of the chain-stitch seams 7. FIG. 3 illustrates further what process steps must be employed for the production of the corduroy according to FIGS. 1 and 2. The pile threads 5 are bound into the adjacent chain-stitch seams 7, 7a staggered from stitch insertion point 8 to stitch insertion point 8a. Later the pile threads 5 are cut open between the chain-stitch seams 7, 7a. The resulting free legs of the pile tufts 2 are formed into cord ribs according to FIG. 1 by means of finishing processes. This is done essentially according to known techniques of corduroy finishing.

It is evident from FIG. 4 that for the pile tufts formed within two adjacent chain-stitch seams 9, 9a two separate pile threads 10, 11 may be used. These two pile threads 10, 11 bind into the chain-stitch seams 9, 9a staggered in relation to each other. After the cutting open of the pile threads 10, 11, there is formed a pile tuft on the base web 13 at every stitch insertion point 12! In this way the production of cord ribs of a particularly close pile tuft arrangement is possible.

The embodiments shown in FIGS. 5 and 6 are slight modifications of the embodiments shown in FIGS. 3 and 4, respectively. In FIGS. 5 and 6 similar numerals are used as are used in FIGS. 3 and 4 to designate corresponding elements. In FIG. 5 a single pile thread 5 is bound between adjacent chain-stitch seams 7, 7a staggered from stitch insertion point 8 to stitch insertion point 8a such that the resulting pile tufts 2 appear at every fourth stitch insertion point. FIG. 6 depicts the arrangement of two pile threads 10 and 11 bound between adjacent chain-stitch seams 9, 9a whereby a pile tuft 2 appears at every other stitch insertion point.

If the two pile threads 10, 11, of FIGS. 4 and 6, are of different color, interesting novel pattern effects for corduroys will result. With the laying of the pile threads 10, 11, which is done in known manner by means of laying bars, such as the stitch-knitting machines arranged for the "weft pile process" have, pile thread 10 may bind regularly or according to a certain pattern arrangement over or under the pile thread 11, whereby specific color effects can be attained.

For the production of the corduroy according to FIGS. 3, 4, 5 and 6, preferably the pile threads 5 or respectively 10, 11 are laid between the chain-stitch seams 7, 7a or respectively 9, 9a over pile sinkers arranged centrally and hence formed into pile loops, before they are cut open and developed as pile tufts 2 (FIGS. 1). This, however, is to exclude the possibility of binding the pile threads 5 or respectively 10, 11 between the chain-stitch seams 7, 7a or respectively 9, 9a.

Production of corduroy according to the invention is illustrated in greater detail in FIGS. 7-10.

As can be seen from FIGS. 7 and 8, the pile threads 5 interlaced with the chain stitch seams 3 and 3' are placed over the pile sinkers 14 so that longitudinal rows of pile threads 5 are formed on the base web 1. The pile tufts 5 form hollow lanes 18 and are cut open to cord ribs 2 by means of a known corduroy cutting machine, as shown in FIGS. 9 and 10.

The cutting is effected by revolving blades 15 which are arranged between pairs of guide needles 16a, 16b. The guide needles 16a, 16b pierce into the hollow lanes 18 so that the pile tufts 5 are guided on the guide needles 16a, 16b to the revolving blades 15. The guide roller 17 forms a cutting table. At this point the revolving blades 15 effect the cutting of the pile tufts 5a to form cord ribs 2 (see also FIG. 1).

What is claimed is:

1. Corduroy wherein the pile tufts are arranged on a base web and are bound into chain-stitch seams, which comprises:

- a. pile tufts each having a first free leg and a second free leg,
- b. a first wale of the chain-stitch seam formed before the stitch insertion point binding the first free leg of a pile tuft to the base web,
- c. a second wale of the chain-stitch seam formed after the stitch insertion point binding the second free leg of a pile tuft to the base web,
- d. a foot portion of each of said pile tufts interconnecting the first and second free legs thereof and arranged in the direction of the chain-stitch seam, and
- e. a cord rib formed between and parallel to adjacent chain-stitch seams by the free legs of the pile tufts bound into adjacent chain-stitch seams, the free legs in each adjacent chain-stitch seam being inclined toward the legs in the other chain-stitch seam.

2. Corduroy as defined in claim 1 wherein the pile tufts are formed at every stitch insertion point of the chain-stitch seams.

3. Corduroy as defined in claim 1 wherein the pile tufts are formed at every other stitch insertion point of the chain-stitch seams.

4. Corduroy as defined in claim 1 wherein the pile tufts are formed at every fourth stitch insertion point of the chain-stitch seam.

5. Corduroy as defined in claim 1 wherein cord ribs are formed in every second of the longitudinal rows formed between the chain-stitch seams.

6. A process for producing corduroy which comprises binding into adjacent chain-stitch seams stitched into a base web a pile thread staggered from stitch insertion point to stitch insertion point, and cutting the pile thread in the center between these chain-stitch seams to form the pile tufts whereby each of the pile tufts has a first free leg and a second free leg interconnected by a foot portion, the foot portion is arranged in the direction of the chain-stitch seams and the free legs in each adjacent chain-stitch seam are inclined toward the free legs in the other chain stitch seam to form a cord rib between and parallel to adjacent chain-stitch seams.

7. A process for producing corduroy which comprises binding into adjacent chain-stitch seams stitched into a base web a first pile thread staggered from stitch

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insertion point to stitch insertion point, binding into the adjacent chain-stitch seams a second pile thread staggered from stitch insertion point to stitch insertion point and staggered in relation to the first pile thread, and cutting the first and second pile threads in the center between these chain-stitch seams to form pile tufts whereby each of the pile tufts has a first free leg and a second free leg interconnected by a foot portion, the foot portion is arranged in the direction of the chain-stitch seams and the free legs in each adjacent chain-stitch seam are inclined toward the free legs in the

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other chain stitch seam to form a cord rib between and parallel to adjacent chain-stitch seams.

8. The process for producing corduroy as defined in claim 6 which further comprises arranging pile sinkers between the adjacent chain-stitch seams and beneath the pile thread.

9. The process for producing corduroy as defined in claim 7 which further comprises arranging pile sinkers between the adjacent chain-stitch seams and beneath the pile threads.

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