

May 11, 1954

E. C. BLOCH ET AL
LOOP PILE CARPET FABRIC

2,677,871

Filed July 11, 1952

Fig. 1.

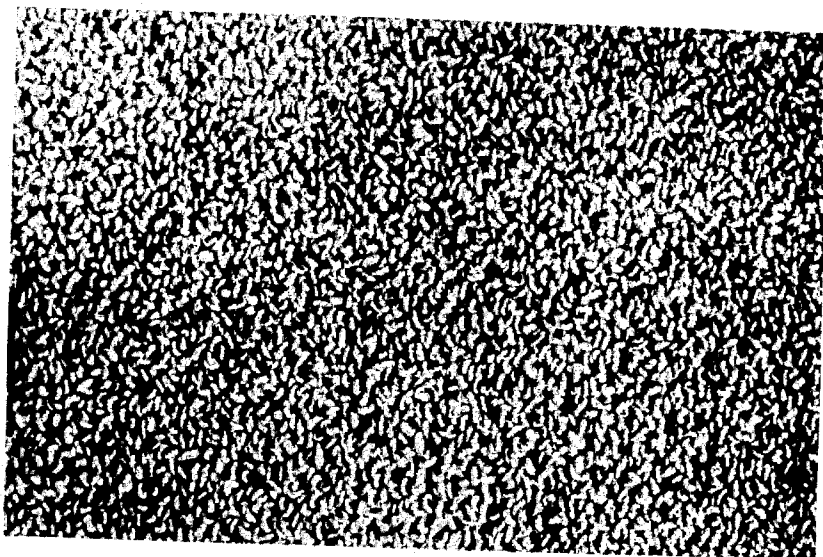


Fig. 2.

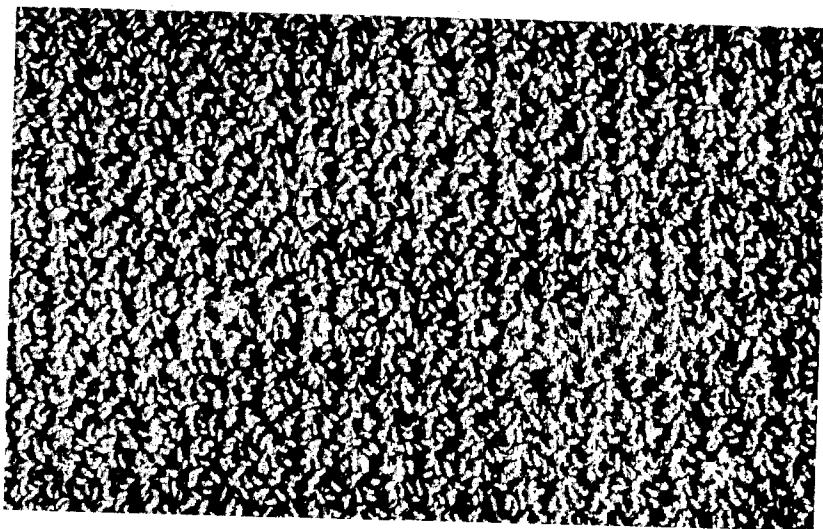


Fig. 3.



INVENTORS:
ELSIE C. BLOCH
and GODFREY BLOCH.
BY
J. Jordan Thum
ATTORNEY:

UNITED STATES PATENT OFFICE

2,677,871

LOOP PILE CARPET FABRIC

Elsie C. Bloch and Godfrey Bloch,
New York, N. Y.

Application July 11, 1952, Serial No. 298,401

8 Claims. (Cl. 28—74)

1

This invention relates to improvements in various types of fabrics, including loop pile fabrics, and to methods of producing the same, and more particularly to fabrics having a uniform and even patternless texture and appearance.

An object of the invention is to produce a fabric having a substantially non-directional texture and appearance which may be suitable for floor coverings, woven and knit apparel, and the like.

Another object of the invention is to produce a hard twisted, uncut looped fabric, or frieze, which may be joined side to end without noticeable visual effect.

A further object of the invention is the production of such fabric constructions as would normally otherwise have textured lines across the width but which, according to the special technique disclosed herein, provides fabrics that are free of all-over textured line and are uniform and free of visual direction or directional pattern.

Further objects and advantages of the invention will be apparent from the specification.

The features of novelty which we believe to be characteristic of our invention are set forth with particularity in the appended claims. Our invention, itself, however, both as to its fundamental principles and as to its particular embodiments, will best be understood by reference to the specification and accompanying drawing, in which:

Figure 1 is a photographic view of a portion of carpeting showing a substantially patternless non-directional pile;

Fig. 2 is a photographic view of a portion of carpeting showing across the width of the fabric certain striations which the methods of the present invention obviate; and

Fig. 3 is a schematic view of a pair of loops mounted in a base, one of said loops being twisted in one direction and the other of said loops being twisted in the opposite direction.

Although many constructions of pile fabrics including hard twisted, show a substantially uniform texture, many other constructions particularly of stock dyed yarn made with lenos over gauges in accordance with our Patent No. 2,497,716 will, without the special provision of this invention, show a line across the width of the fabric (Fig. 2), according to the repeat of the harness of the loom. This line is probably the result of a visual effect caused by a difference in tension at different points in the repeat of the pattern, whereby one row of pile threads may be

2

slightly fuller, and another row of pile threads slightly tighter than adjacent rows. A result of this phenomenon is that on certain points in the repeat all the loops tend to line up clearly in one direction giving the fabric a lined effect.

This is a texture line across the width which is due to a repeat of the harness pattern. This type of line is distinguished from the line that appears in other carpets which are in the nature of streaks or lines along the warp or very occasional imperfections across the width, sometimes called wire marks which do not occur at regular intervals in weaving, but at odd times when there is an imperfection in the functioning of the loom.

While not necessarily displeasing in itself, this line spoils the possibility of making non-directional fabrics which may be joined side to end, and it tends to show up any deviation from complete straightness in weaving.

This texture line which appears particularly in the manufacture of stock dyed hard twist loops woven over stationary gauges by means of leno heddles has not been eliminated by expedients such as making different settings of the looms or altering the degree of hard twist, yarn size or blend.

A hard twisted looped pile fabric made according to this invention, and having the non-directional aspect as exemplified in Fig. 1, may be produced by any of the well known methods. The product of this invention may be produced by any of the methods which will produce a looped pile fabric, namely by weaving, knitting, punching with sewing needles through a back, hooking, or by any other method.

Furthermore, the method of the present invention may be applied to pile heights of from $\frac{1}{16}$ " to $\frac{1}{4}$ ".

A back coating is painted or otherwise applied on the back of the carpet to hold effectively and permanently the loops and fibers of the loops firmly in place, and as this backing material is preferably of a natural or synthetic latex base, it prevents the carpet from shrinking greater than 3% when piece-dyed, whereas normally carpet will shrink up to 8%. Also by holding the bases of the loops anchored against creeping during the dyeing process, the loops curl up more tightly and thus give to the face of the carpet a pebbly or boucle appearance, in which some of the loops assume a position much lower or closer to the ground than others. Piece-dyeing enhances the non-directional character of the fabric produced by the methods of the present invention.

By the term "hard twist" we include also plied

3

yarns hard-twisted together, even though they may contain elements not hard-twisted in their original state.

We have found after trial over extended time that the only method practicable for the production of patternless substantially non-directional stock dyed hard twist loop fabrics of the pile height in question is to use some yarns of S twist and some yarns of Z twist. As is well known in the art, an S twist yarn is twisted in one direction, while a so-called Z twist is twisted in the opposite direction. In a single yarn, the Z twist is known as the regular twist, and the S twist is known as the reverse twist. Fig. 3 illustrates this arrangement wherein there are mounted in base A a loop B, the yarn of which is twisted in one direction, and adjacent thereto a loop C, the yarn of which is twisted in the opposite direction. It will be understood that in the mass, a multiplicity of these loops of opposite twist will produce a patternless and substantially non-directional pile in the finished fabric.

Since plied yarns will be most often used in the practice of this invention, it should be stated that when S twist is used in the single, Z twist is normally used in the plying, and vice versa, when Z twist is used in the single, S twist will be used in the plying. This plying in the reverse direction of the single is designated in the trade as "regular" twist in the ply, although the use of reverse in the ply is not precluded.

We have found that by this expedient, constructions of hard twist uncut loops which show lines, boxes or various configurations without special weave pattern become substantially non-directional and of even uniform patternless texture. Below are given two examples of construction in which the present invention has unique efficacy in the production of non-directional uniform results:

1. A woven fabric in which there are ground cotton ends and jute filling picks and in which the pile consists of $12\frac{1}{2}$ threads per inch of stock-dyed wool frieze of seven turns per inch twist, the same being fifty yards to the ounce in weight. The fabric is woven by leno heddles over $\frac{3}{8}$ " stationary gauges, for example, the loops being staggered and uncut, and every alternate pile thread being of reverse twist, the two ends weaving as one over the gauge.

2. A hooked fabric of uncut twist loops on a burlap back in which the yarns are hard twisted acetate rayon, seven turns per inch, fifty-five yards per ounce. The loops are punched to a pile height of about $\frac{3}{8}$ " altogether, the same is made about fourteen rows to the inch, and about five loops to the inch in the long direction. The threads are alternately regular twist and reverse twist, one of each being hooked through the back, two as one. Both regular and reverse twist threads are hooked together through the same space in the back as if they were one thread.

It will be understood, however, that we can produce our non-directional weave either with the single yarn or with the ply yarns in accordance with the techniques of the present invention.

We can use plied yarns which are twisted in the same direction as the singles, although that would not normally be the practice in most instances. By using in the same fabric yarns which have opposite twist to each other (sometimes designated herein as S and Z twists, respectively) we mean to include, when speaking of plied yarns, yarns which are opposite to each other

in the twist of the single, in the twist of the ply, or in the twists of both.

We have also found that certain constructions of soft or ordinary twist looped pile fabrics which would otherwise show a directional texture line across the width can also be made with a uniform substantially patternless non-directional appearance by means of the method of the present invention. For example, we have produced such a woven pile fabric in which there are ground cotton ends and jute filling picks and in which the pile consists of $6\frac{1}{4}$ threads per inch of 4 ply wool yarn weighing 30 yards to the ounce of ordinary twist woven on leno heddles over $\frac{3}{8}$ " gauges, the loops being staggered and uncut, and every alternate warp thread being of a twist opposite to an adjacent warp thread.

Although good non-directional uniformity of appearance is achieved by the weaving methods described hereinabove, and although, as previously stated, piece dyeing may enhance the non-directional aspect, this desirable appearance may be further enhanced in some cases after weaving and in other cases after dyeing, by a physical treatment such as passing the woven fabric between rollers, one of which has sharp protrusions which shear or cut the pile in some places to deform, cut or tear the loops. The deformation of the loops may also be accomplished by other suitable mechanical means, with or without the actual cutting of the loops.

By non-directional patternless, we mean such uniformity of color that, regardless of the way the pile is crushed, or of the direction that light strikes the same, with good workmanship and judgment, it may be used effectively joined side to end. The word "patternless" does not exclude texture but does exclude figured patterns.

In the specification, we have explained the principles of our invention, and the best mode in which we have contemplated applying those principles, so as to distinguish our invention from other inventions; and we have particularly pointed out and distinctly claimed the part, mode or combination which we claim as our invention or discovery.

While we have shown and described certain preferred embodiments of our invention, it will be understood that modifications and changes may be made without departing from the spirit and scope thereof, as will be clear to those skilled in the art.

We claim:

1. A looped pile fabric comprising an arrangement of hard twisted pile yarns, a substantial number of said yarns being twisted in one direction and distributed throughout the fabric, and the remaining yarns being substantial in number and being twisted in the opposite direction and distributed throughout the fabric, said yarns being combined to produce a patternless substantially non-directional pile.

2. A fabric according to claim 1 and further comprising a back coating material from which the pile loops above the ground are substantially free.

3. A looped pile fabric wherein each loop comprises a pair of hard twist yarns and wherein one of said yarns is twisted in one direction and the other of said yarns is twisted in the opposite direction, said loops being combined to produce a substantially non-directional patternless pile.

4. A looped pile fabric comprising an arrangement of pile yarns, a substantial number of said yarns being twisted in one direction and dis-

5

tributed throughout the fabric, and the remaining yarns being substantial in number and being twisted in the opposite direction and distributed throughout the fabric, said yarns being combined to produce a substantially non-directional patternless pile.

5. A looped pile fabric comprising pairs of loops wherein the yarn of one loop of each pair is twisted in one direction and the yarn of the other loop of each pair is twisted in the reverse direction, said loops being combined to produce a substantially non-directional patternless pile.

6. The method of minimizing pattern and direction of texture in the manufacture of looped pile fabrics which comprises twisting a substantial number of the yarns of the fabric in one direction and distributing them throughout the fabric and twisting a substantial number of the other yarns in the reverse direction and distributing them throughout the fabric.

7. The method of minimizing pattern and direction of texture in the manufacture of looped pile fabrics having a plurality of pairs of loops distributed throughout the fabric, which comprises twisting the yarn of one loop of each pair

6

in one direction and twisting the yarn of the other loop of each pair in the reverse direction.

8. A looped pile fabric comprising an arrangement of pile yarns, a substantial number of said yarns being twisted in one direction and distributed throughout the fabric, and the remaining yarns being substantial in number and being twisted in the opposite direction and distributed throughout the fabric, said yarns being combined to produce a substantially non-directional patternless pile, and a back coating material from which the pile loops above the ground are substantially free.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
2,497,716	Bloch et al. -----	Feb. 14, 1950
2,571,077	Underwood et al. -----	Oct. 9, 1951
2,571,087	Underwood et al. -----	Oct. 9, 1951

FOREIGN PATENTS

Number	Country	Date
4,020	Great Britain -----	of 1910