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METHOD OF TREATING FABRIC

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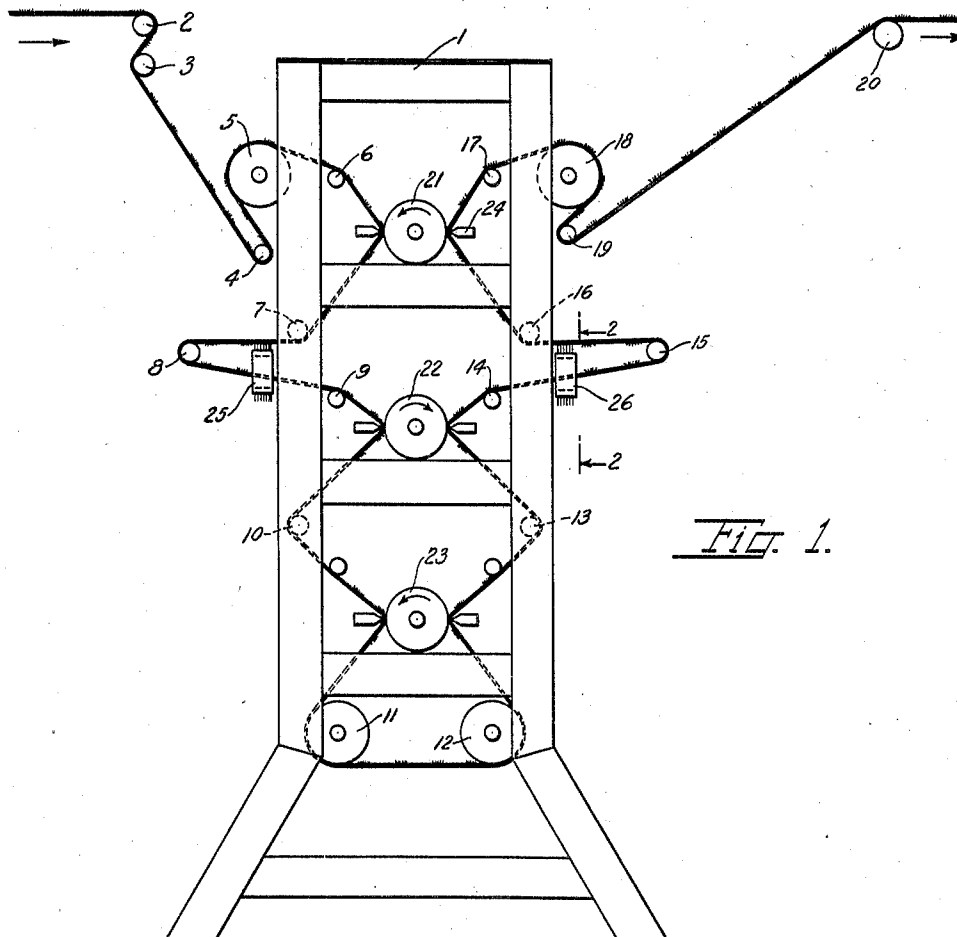


FIG. 1.

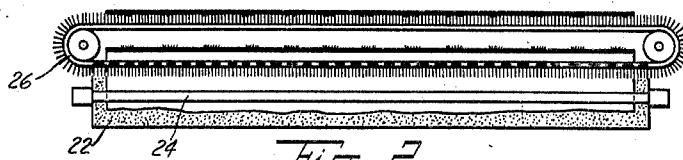


FIG. 2.

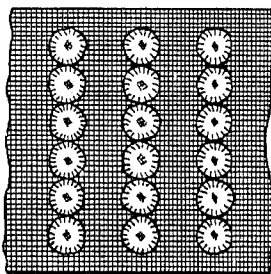


FIG. 4.

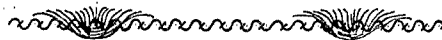


FIG. 3.

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METHOD OF TREATING FABRIC

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3 Claims. (Cl. 26—1)

This invention relates to a method of and apparatus for treating fabric.

In the present commercial art there exists a fabric such, for instance, as disclosed in the patent to Graham, No. 2,155,127, issued April 18, 1939, and in the patent to Robertson et al., No. 2,110,118, issued March 1, 1938.

This fabric, when it comes from the weaving mill, consists of a ground and spaced dots which are formed of yarns or rovings and extend from the obverse side of the ground.

In finishing this fabric it has been the practice to apply the finishing material to the reverse side of the ground and dry the fabric so that the penetration of the finishing material into the raised dots or pile areas will be arrested before it materially affects the character of those dots or pile areas.

Sometimes the fabric is treated as disclosed in the Robertson patent referred to, either frictionally or by compressed air or gas, to cause the dots or pile areas to become fluffy.

The present invention is directed particularly to the method of and means for fluffing separated pile areas and is particularly applicable to the fabric that I have described above and to the methods set forth in the patents to which I have referred, but it is not in any sense limited thereto.

In the drawing I have illustrated conventionally a machine for carrying out the method that forms part of the subject matter of this invention, in which drawing

Figure 1 is a side elevation thereof;

Figure 2 is a fragmentary view, looking at right angles to Figure 1;

Figure 3 is a view of the fabric before its treatment; and

Figure 4 is a plan view showing the fabric after it has been shrunk.

The structure shown in the drawing includes a pair of frames 1, which rest upon a foundation. Operatively mounted upon and conveniently driven by conventional mechanism are rollers 2 through 20, inclusive, all being mounted on parallel axes. Rotary brushes 21, 22 and 23 are mounted on the frames 1 on axes parallel with the guide rollers to which reference has just been made, the brushes 21 and 23 being preferably rotated in the same direction and the brush 22 in the opposite direction.

Guides 24 are arranged adjacent the rollers 21, 22 and 23 on diametrically opposite sides thereof. These brushes 21 may be of the ordinary conventional bristle type having the bristles

arranged substantially throughout their length and over substantially their entire area, or they may be formed of other materials capable of producing a brushing action, such, for instance, as a pile fabric.

Arranged on opposite sides of the frames 1 are brushes 25 and 26 that are mounted upon driving rollers 27 capable of imparting movement to the brushes. These brushes may also be of the bristle type, or any other type capable of producing a brushing action. These brushes 25 and 26 may be arranged to travel longitudinally of themselves in the same direction, but I prefer to have them travel in opposite directions for a purpose that I will later disclose.

The method that constitutes a part of the herein invention may be carried out on the machine that I have hereinbefore described as follows:

The fabric which includes a relatively open mesh ground such as marquisette or the like, and which includes spaced pile areas such as dots, and wherein the pile areas are separated from each other to form both longitudinal and transverse rows on the ground fabric, and wherein the ground fabric is unshrunk and the pile areas lie fairly flat upon the obverse side of the ground, such as shown in Figure 3 of the drawing, is first subjected to a conventional shrinking operation. This causes the filling threads to shrink or contract and in so doing the pile areas that are arranged transversely of the fabric move together so that they form fairly contiguous transverse rows of pile areas, which rows are separated longitudinally of the fabric such as shown in Fig. 4 of the drawing. The fabric in this shrunk condition is then dried and is fed to the machine that I have described above with the pile areas uppermost, around the rollers 2, 3, 4, 5 and 6, and thence over the adjacent guide 24, so that the relatively flat pile areas are presented to the rotating brush 21, the guide being arranged so that the ground does not contact said brush.

This brush 21, rotating as I have shown it in a counter-clockwise direction, brushes up the successive longitudinal rows of the pile areas from their trailing to their leading edges. Thence the fabric travels on around rollers 7, 8 and 9 to the next guide 24. In its travel from the brush 21 to the succeeding guide 24, the partially brushed pile areas are presented to the brush 25, which travels transversely of the fabric, and because of the movement of the fabric longitudinally of itself engages the rows of pile areas in a resultant diagonal line, thus further brushing

up the pile areas diagonally from one side to the other.

Thus doubly brushed the pile areas are presented to the brush 22 which I have shown to be rotated in a clockwise direction. Here again the guide 24 is so arranged that the ground of the fabric is not presented to the brush. This brush 22, during its rotation, further brushes up the pile areas from the leading to the trailing edge. The fabric then travels on around a roller 10 and over a similarly arranged guide 24 which presents the triply fluffed up pile areas alone to the brush 23 that I have shown rotating in a counter-clockwise direction. Here again the brushing action is the same as that of the brush 21, but because of the different condition of the pile areas when they reach the brush 23 there is a further fluffing action.

Passing around the rollers 11 and 12 the fabric is presented to the brush 23 on the opposite side to that to which it was first presented, and successively to the brushes 22 and 21 on the opposite sides to which the fabric was first presented, passing in its travel to presentation to these brushes over rollers 13, 14, 15, 16, 17, 18 and 19 and over the three guides 24 adjacent the rollers 21, 22 and 23.

In its travel after passing the roller 23, or indeed even before passing this roller, the pile areas are again presented to a transversely movable brush 26 which imparts a brushing action diagonally of the line of travel of the fabric and transversely of the fabric itself in a direction opposite to that of the brush 25. After being subjected to these brushing actions the fabric is carried off over the roller 20 to a stretching operation. This stretching is for the purpose of a transverse stretching of the fabric, and it may be accomplished by the usual tenter frame. In this stretching operation the pile areas are again separated transversely with the result that there is created a ground fabric which has fluffy pile areas spaced both longitudinally and transversely of the fabric ground.

After this stretching operation the back of the fabric may have applied thereto a finishing material. The penetration of this finishing material into the fabric may be arrested before it substantially penetrates the pile areas, with the result that the ground of the fabric will be finished and the pile areas will maintain their fluffy form. This may be accomplished by the mechanisms and the methods set forth in the patents to which I have above referred.

Of course this method may be applied in a more restricted sense to the brushing up of the pile areas after the stretching of the fabric and the application and drying of the finishing material.

It will be realized that as the transverse rows of the pile areas pass over the guides 24, the pile areas will be in a manner pushed out from the ground and because of the arcuate contact between the pile areas and the brushes 21, 22 and 23, there will be an engagement of the brushes only with the pile areas and not with the ground. Thus the pile areas are subjected successively and several times to brushing up actions from the trailing to the leading edge, and from the leading to the trailing edge, and are also subjected to diagonal brushing up action in both directions.

In a broader aspect the invention is not restricted to the treatment of fabric wherein the pile areas are actually in rows, for the method is applicable when the pile areas are arranged in a different or more irregular form but separated when the shrinking step is accomplished. The pile areas will be moved together whether they are arranged in rows or differently or irregularly, and the brushing and finishing operations may then be carried out.

Of course it may be realized that this method may be carried out by means other than that disclosed, and I, therefore, do not wish to be limited to the use of that means in so far as the method is concerned, and only to that use in so far as the breadth of the apparatus claims is concerned.

What I claim is:

1. The method of treating a strip of fabric having a relatively thin, light, open mesh ground and longitudinally and transversely spaced but flattened and unfluffed pile areas on the face thereof arranged in transverse and longitudinal rows to produce a fabric in which the ground is finished and the pile areas are fluffed up and unfinished and generally upstanding from the ground which includes: shrinking the ground to move the pile areas substantially together transversely for subsequent brushing, drying the fabric, moving the fabric in the direction of its length, subjecting the longitudinally separated pile areas successively to the actions of brushes operating both in the direction of the length and the direction of the width of the fabric, applying a sizing material to the back of the fabric ground, stretching the fabric transversely to separate the pile areas, and arresting the penetration of the size into the fabric before it travels substantially into the pile toward the pile ends.

2. The method of treating a strip of fabric having a relatively thin, light, open mesh ground and longitudinally and transversely spaced but flattened and unfluffed pile areas on the face thereof arranged in transverse and longitudinal rows to produce a fabric in which the ground is finished and the pile areas are fluffed up and unfinished and generally upstanding from the ground which includes: shrinking the ground to move the pile areas substantially together transversely for subsequent brushing, drying the fabric, subjecting the longitudinally separated pile areas successively to the actions of brushes travelling both in the directions of the length and the width of the fabric, and stretching the fabric transversely to separate the pile areas.

3. The method of treating a strip of fabric having a relatively thin, light, open mesh ground and longitudinally and transversely spaced but flattened and unfluffed pile areas on the face thereof arranged in transverse and longitudinal rows to produce a fabric in which the ground is finished and the pile areas are fluffed up and unfinished and generally upstanding from the ground which includes: shrinking the fabric to move the dots substantially together transversely for subsequent brushing, subsequently brushing the dots to render them fluffy while they are still adjacent each other, and thereafter stretching the fabric to separate the dots into their ultimate positions.

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