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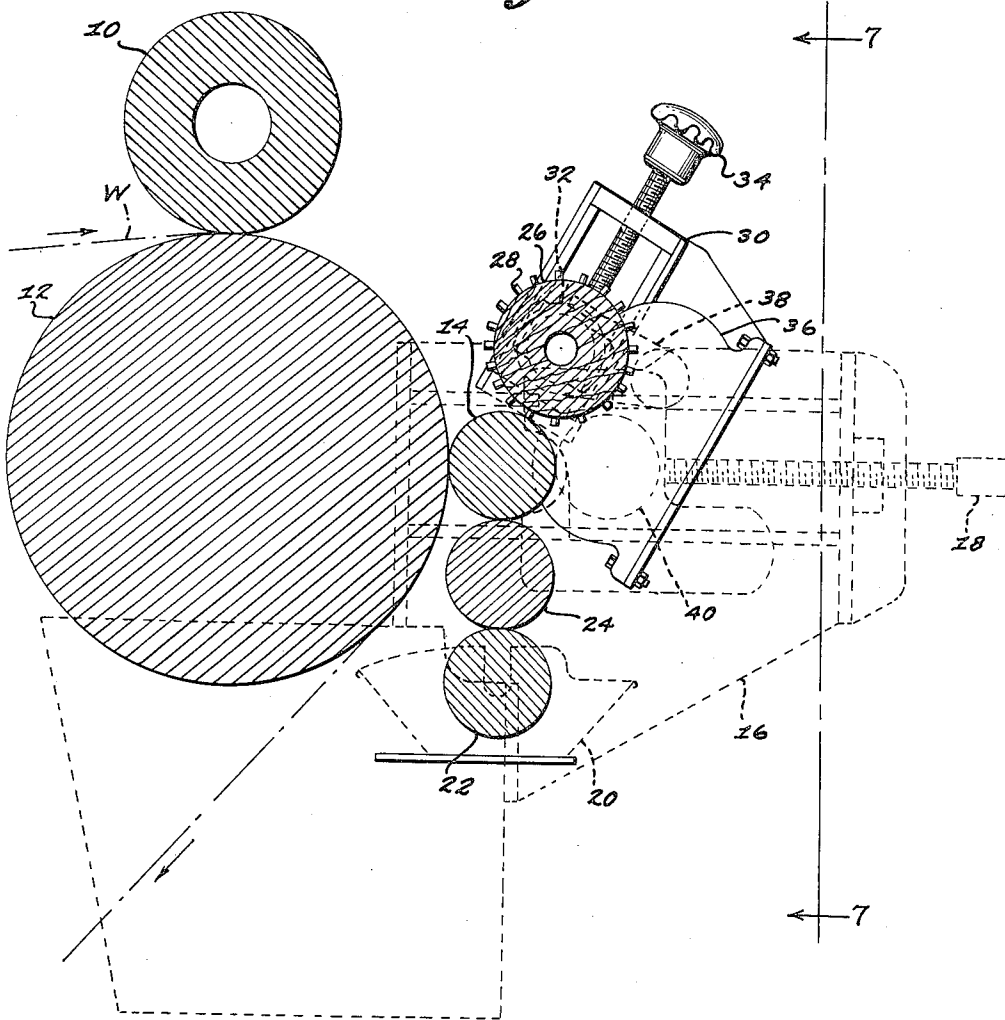
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DESIGN COLORING APPARATUS FOR TEXTILE FABRICS AND THE LIKE

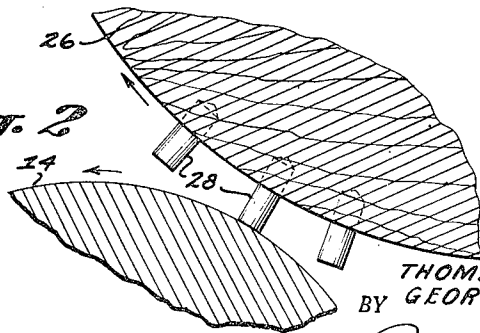
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3 Sheets-Sheet 1

*Fig. 1*



*Fig. 2*



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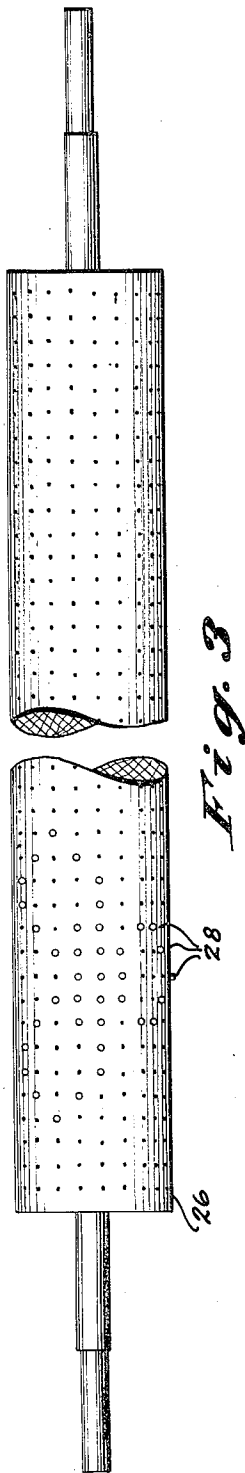
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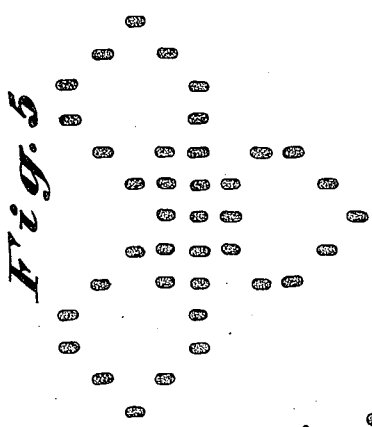
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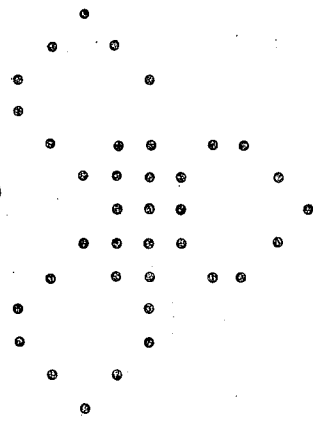


*Fig. 3*

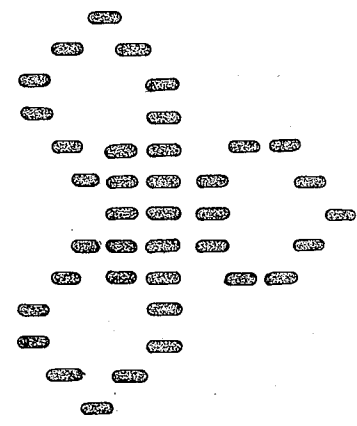
*Fig. 5*



*Fig. 4*



*Fig. 6*



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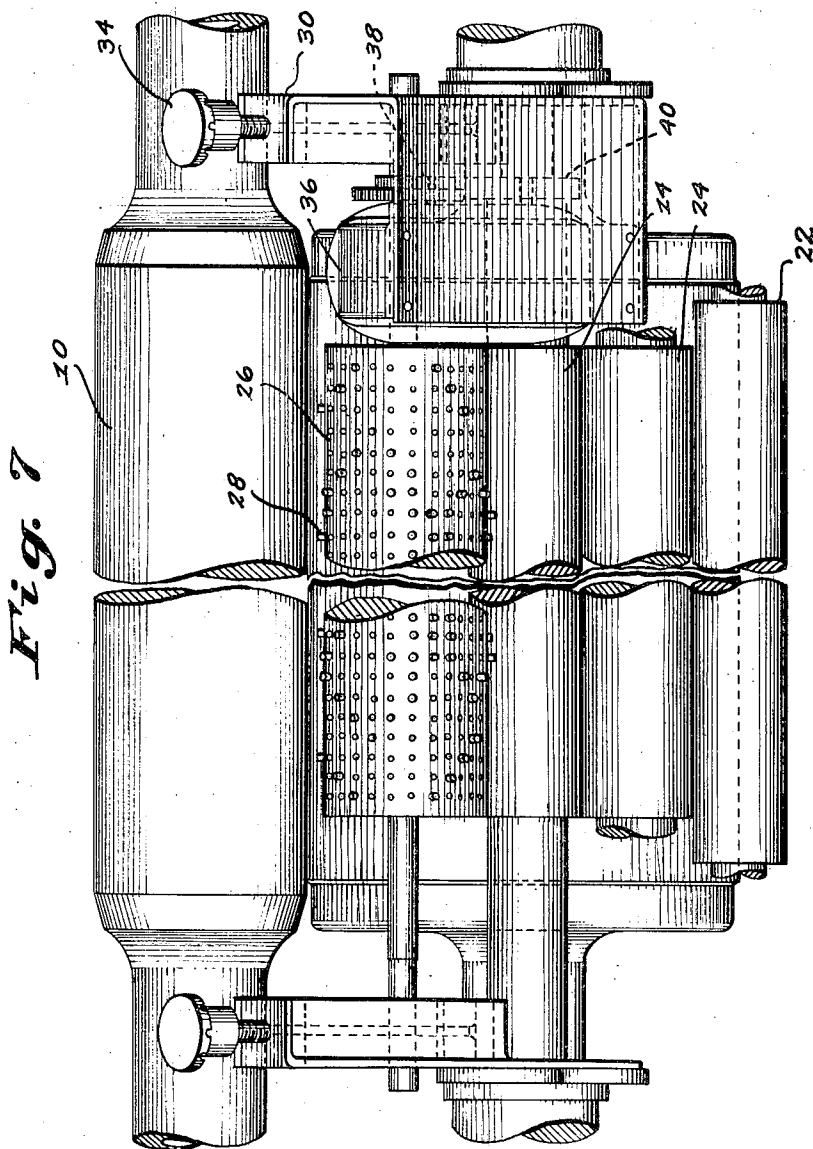


Fig. 7

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**DESIGN COLORING APPARATUS FOR TEXTILE FABRICS AND THE LIKE**

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Application August 26, 1953, Serial No. 376,617

3 Claims. (Cl. 118—204)

This invention relates to the design coloring of textile fabrics and the like, and more particularly to a uniquely arranged design coloring apparatus.

The apparatus of the present invention is characterized in general by the arrangement in relation to a smooth surfaced color applicator roll, adapted to receive and carry a continuous color coat, of a design roll formed to interrupt the continuity of the color coat on the applicator roll according to the design pattern desired before it is applied to the fabric to be colored. The design roll is formed for this purpose with a plurality of projections at its peripheral surface spaced in the pattern of the design desired, and is disposed so that the end faces of these projections run in contact with the surface of the applicator roll. The result is to remove or displace color from the surface of the applicator roll at each place of contact with this surface by a design roll projection, so that a pattern of discontinuity is formed in the color coat on the applicator roll which appears as uncolored or differently colored areas when the color coat is applied to the fabric to provide very unusual and attractive design coloring effects.

The present invention is described in further detail below in connection with the accompanying drawings, in which:

Fig. 1 is a side elevation, mainly diagrammatic, illustrating a representative embodiment of design coloring apparatus arranged in accordance with the present invention;

Fig. 2 is an enlarged fragmentary detail illustrating further the arrangement of the design roll in relation to the applicator roll;

Fig. 3 is a side elevation of the design roll showing a pattern of projection arranged at the peripheral surface thereof;

Fig. 4 is a schematic illustration of the design effect obtained when the design roll shown in Fig. 3 is operated at an equal surface speed with the applicator roll;

Fig. 5 is a further schematic illustration of the design effect obtained when the design roll shown in Fig. 3 is operated at twice the surface speed of the applicator roll;

Fig. 6 is a further schematic illustration of the design effect obtained when the design roll shown in Fig. 3 is operated at one half the surface speed of the applicator roll; and

Fig. 7 is a longitudinal section taken along the line 7—7 of Fig. 1, and illustrating the variable speed change means.

Referring now in detail to the drawings, and more particularly at first to Fig. 1, the illustrated embodiment of the present invention is shown arranged in relation to an embossing couple formed by a top engraved embossing roll 10 and a bottom composition or filled impression roll 12, such as is disclosed in copending application Serial No. 293,820, filed June 16, 1952, now U. S. Patent No. 2,667,426, granted January 26, 1954.

However, this embossing couple has been selected for illustration merely as a representative means for causing continuous travel of a fabric web as indicated at W in

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Fig. 1. The embossing couple might be reversed in arrangement as disclosed in copending application Serial No. 376,712, filed August 26, 1953; or it might be replaced by a pair of smooth surfaced pressure rolls employed either for coloring as disclosed in copending application Serial No. 376,704, filed August 26, 1953, or simply as draw rolls.

In any case, the apparatus of the present invention comprises a smooth surfaced color applicator roll 14 formed of rubber or the like and disposed to run in contact with the traveling fabric web W for applying color thereto. The disposition of the applicator roll 14 as shown in Fig. 1 is the same as that disclosed in the above noted copending application Serial No. 293,820, filed June 16, 1952, but it might alternatively be disposed as the applicator rolls are in any of the other copending applications referred to above, or otherwise in any suitable manner desired for applying color to the web W.

The applicator roll 14 is carried on a mounting bracket as indicated at 16 fitted with adjusting or pressure screws as at 18 for setting the applicator roll 14 in proper relation to the web W as it travels over a suitable backing surface such as is provided by the impression roll 12. The mounting bracket 16 also carries a color pan 20, and a two-high stack of transfer rolls 22 and 24 arranged to feed a continuous color coat from the color pan 20 to the surface of the applicator roll 14.

Beyond the point at which the applicator roll 14 receives this continuous color coat, and the point at which the applicator roll 14 applies color to the web W, a design roll 26 is arranged to run in contact with the surface of applicator roll 14 for interrupting the continuity of the color coat transferred thereto, as previously mentioned. This result is obtained by forming the design roll 26 with spaced projections as at 28 arranged so that the end faces of these projections 28 form the portion of the design roll 26 running in contact with the applicator roll 14.

The design roll 26 is carried by an auxiliary bracket structure 30 supported on the previously noted mounting bracket 16, and slidably fitted with journal bearings 32 positioned by adjusting screws 34 for setting the design roll 26 in relation to the applicator roll 14. The auxiliary bracket structure 30 also supports a speed change means, such as a variable speed unit as indicated at 36, having the output shaft thereof connected as at 38 for driving the design roll 26, and the input shaft thereof fitted with a drive gear as indicated at 40 arranged to be driven with the applicator roll 14, which may be driven in any suitable manner as is disclosed in the above noted copending application Serial No. 293,820, filed June 16, 1952.

Fig. 1 shows the design roll projections 28 spaced more or less regularly about the periphery of the design roll 26 for purposes of general illustration. More usually the spacing will be in pattern groups, as is described further below, but in any case the action of the projections 28 in interrupting the color coat on the applicator roll 14 is the same, and this action of the projections 28 can be described best in relation to Fig. 2 in which a suitable arrangement for the projections 28 appears more fully.

In Fig. 2 the projections 28 are seen as comprising peg elements fitted in the peripheral surface of the design roll 26 to project radially therefrom with the end faces of the projecting peg elements 28 set to run in contact with the surface of applicator roll 14, as noted above. The effect of this contact by the peg elements 28 is to remove or displace the color on the applicator roll 14 at the point of contact. What seems to happen is that a good portion of the color displaced by the end face contact of the peg elements 28 is attracted down the sides of the pegs 28 where it dries, so as to be completely removed from the surface of applicator roll 14. In any event, the continuity of the color coat on the applicator roll 14 is definitely

interrupted by the action of the pegs 28, and this interruption appears on the fabric web W as an uncolored or differently colored portion.

If the radially projecting length of all of the peg elements 28 is made uniform, the interruptions of the color coat on the applicator roll 14 will be uniform, and can be made to result in entirely uncolored areas on the fabric web W, or areas of lighter tone, depending upon the setting of the design roll 26 in relation to the applicator roll 14. Similarly, certain of the peg elements 28 may be formed with a slightly shorter radially projecting length than the others so that the shorter ones will interrupt the color coat on the applicator roll 14 differently from the others to result in coloring the web W in the nature of half tones.

Because the peg elements 28 run in contact with the surface of the applicator roll 14, it is important to prevent them from marring the surface of the applicator roll 14 and thereby impairing its color applying action. For this purpose, the peg elements 28 are preferably formed of a plastic material having autogenous lubricating properties, such as Teflon, i. e. tetrafluoroethylene, or Nylon. Also, a plastic material of this sort has the further advantage of lending itself to extrusion with a great variety of cross sections, so as to allow the cross section of the peg elements 28 to be a pattern forming factor, too.

Fig. 3 of the drawings shows a representative design roll 26 in side elevation with a pattern group of peg elements 28 in place. Fitting of the peg element 28 in the pattern desired may be accomplished either by forming the design roll 26 with a reference grid of markings, as shown, to provide a guide for drilling the body of roll 26 at selected locations to receive the peg elements 28, or a template may be placed over the surface of roll 26 to indicate the points at which the roll body should be drilled for the peg elements 28.

Fig. 4 illustrates schematically the design effect that would be obtained on the fabric web W through use of a design roll 26 having peg elements 28 arranged as shown in Fig. 3, if the design roll 26 were operated at an equal surface speed with the applicator roll 14, while Fig. 5 indicates the design effect that results when the design roll 26 is operated at twice the speed of applicator roll 14, and Fig. 6 the result when design roll 26 has half the speed of applicator roll 14. In Figs. 4, 5 and 6, the dark areas represent the proportionate effect on the fabric web W from the interruptions in the color coat on applicator roll 14 by the peg elements 28, and not the order of color contrast obtained, for these dark areas would in fact be lighter than the surrounding portions of the web W because of the color coat interruption. The point illustrated is the function of the variable speed unit 36 in making further design variations available through variation of the operating speed for the design roll 26.

Fig. 7 of the drawings shows the variable speed unit 36 connected for driving the design roll 26 and being driven by the applicator roll 14.

The present invention has been described in detail above for purposes of illustration only, and is not intended to be limited by this description or otherwise except as defined in the appended claims.

We claim:

1. Design coloring apparatus comprising a smooth surfaced driven color applicator roll, means for transferring a continuous color coat to the surface of said applicator roll, and a design roll running in contact with said applicator roll for interrupting the continuity of the color coat transferred thereto and connected for driving from the applicator roll drive through an interposed speed change means, said design roll being fitted at the peripheral surface thereof with a plurality of radially projecting peg elements arranged in spaced relation according to the design pattern desired and the end faces of said peg elements forming the portion of said design roll running in contact with said applicator roll.

2. Design coloring apparatus comprising a smooth surfaced color applicator roll, means for transferring a continuous color coat to the surface of said applicator roll, and a design roll running in contact with said applicator roll for interrupting the continuity of the color coat transferred thereto, said design roll being fitted at the peripheral surface thereof with a plurality of radially projecting peg elements arranged in spaced relation according to the design pattern desired and the end faces of said peg elements forming the portion of said design roll running in contact with said applicator roll, said peg elements being formed of a plastic material having autogenous lubricating properties and selected from the group consisting of tetrafluoroethylene and nylon.

3. Design coloring apparatus as defined in claim 2 and further characterized in that certain of said peg elements have a slightly shorter radially projecting length than the remaining peg elements, whereby the color coat on said applicator roll is interrupted differently by said shorter peg elements in relation to said remaining peg elements.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

1,656,170	Cooper	Jan. 17, 1928
1,678,497	Cooper	July 24, 1928
1,923,250	Barone	Aug. 22, 1933
2,077,470	Federwitz	Apr. 20, 1937
2,086,117	Case	July 6, 1937
2,097,428	Bergstein	Nov. 2, 1937
2,133,920	Goessling	Oct. 18, 1938
2,133,933	Daley	Oct. 18, 1938
2,398,844	Muggleton et al.	Apr. 23, 1946
2,456,495	Faeber	Dec. 14, 1948
2,667,426	Davis	Jan. 26, 1954

##### FOREIGN PATENTS

573,940	Great Britain	Dec. 13, 1945
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