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HOSIERY AND METHOD OF MAKING THE SAME

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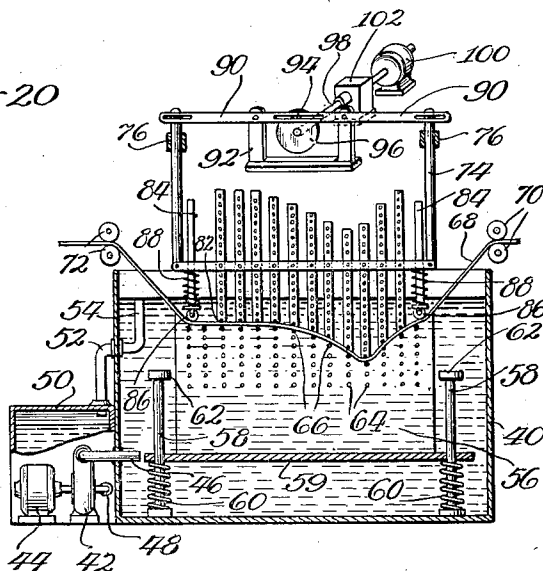
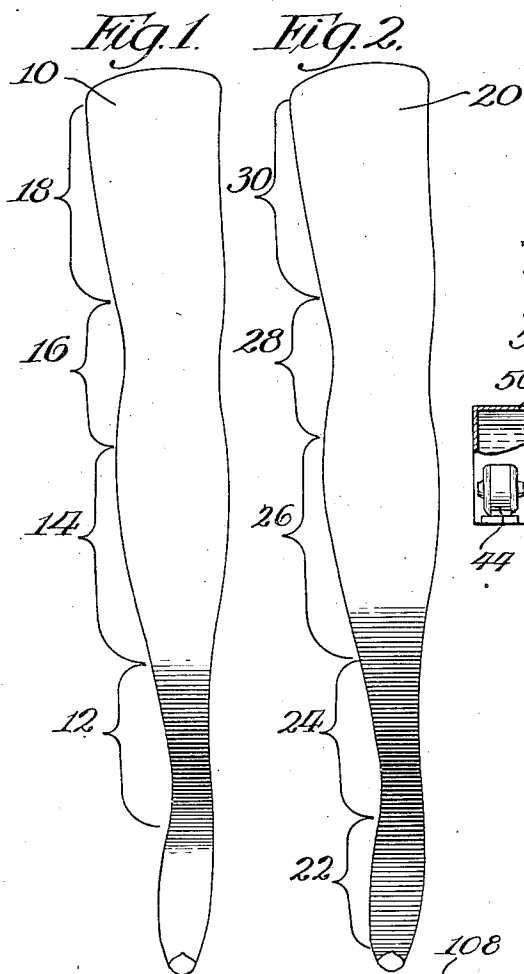
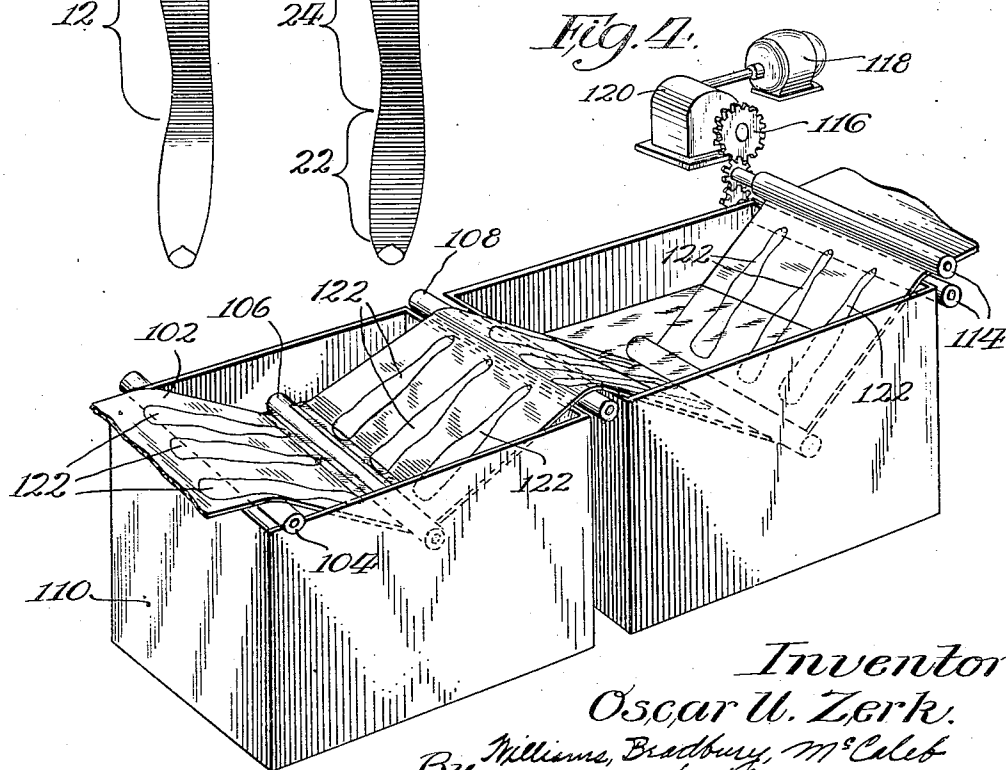


Fig. 3.



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UNITED STATES PATENT OFFICE

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HOSIERY AND METHOD OF MAKING THE
SAME

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Application May 28, 1930. Serial No. 456,334

1 Claim. (Cl. 8—5)

My invention relates generally to hosiery and methods of making same, and more particularly to a novel type or kind of ladies' hosiery, which due to its construction and the method in which it is dyed, produces an optical illusion of shapeliness of the wearer's limb.

It is an object of my invention to provide improved hosiery, especially for ladies' wear, which is dyed in such a manner that portions thereof will be of a comparatively dark shade, while other portions will be of a relatively light tint, and the intermediate portion, or portions, will be of gradually differing color depth so that the hosiery when worn will give the effect of a uniformly dyed hose, portions of which lie in a shadow. In this way, because of the resultant optical illusion, portions of the wearer's leg which are disproportionately large may be made to appear smaller, and vice-versa. The wearer's legs may thus be made to appear properly proportioned and to acquire an attractive shapeliness.

A further object is to provide a hosiery which will impart to the legs of the wearer an appearance of slenderness at the ankle, or at the foot and ankle.

A further object is to provide an improved method of dyeing hosiery of the above-described type.

A further object is to provide an improved apparatus for dyeing hosiery to obtain the above-mentioned effects.

Other objects will appear from the following description, reference being had to the accompanying drawing, in which:

Figure 1 shows a stocking or hose for use by a person having disproportionately large ankles;

Figure 2 shows a stocking for use by a person having disproportionately large ankles and feet;

Figure 3 is a vertical sectional view of an improved apparatus for dyeing hosiery of the kind shown in Figs. 1 and 2; and

Figure 4 is a perspective view of a modified form of dyeing apparatus.

Although it is known that dark colored hose produce the effect of a slender limb, dark colored hose of a single shade and without a pattern are not generally worn because of their lack of aesthetic appeal, especially if worn with light colored clothes. Furthermore, the optical illusion thus produced by a dark colored hose is frequently undesirable, since it not only makes the ankle of the wearer appear smaller, but also decreases the apparent size of the calf, which, for limbs having under-developed calves, is a disadvantage.

It has been attempted to obtain some of the advantages of my invention by knitting portions of the hose adjacent the ankle in double thickness. This, however, has the disadvantage in that it shows a sharp break at the line of joining the double-knit portion with the single knit portion and thus removes the effect of the optical illusion which might otherwise be produced.

The hose of my invention are adapted to be dyed in practically any desired color which has a wide range of pleasing tints and shades. Furthermore, under certain circumstances, the hose may have portions thereof dyed in different colors, provided the colors are such which will readily blend into one another.

As shown in Figure 1, the hose 10 has a comparatively darkly shaded ankle portion 12, and is adapted to be worn by a person having a disproportionately large ankle. The calf portion 14 is of a comparatively light tint at its upper end and shades gradually by imperceptible degrees into the deeper colored ankle portion. This gradual increase in color depth is more or less diagrammatically illustrated in the drawing, but it will be understood that the variation in color depth is so gradual that it is impossible to discern a line of color demarcation, and the hose, especially when being worn, will have the appearance of a uniformly colored hose, the ankle portion of which lies in a diffused shadow. The knee portion 16 and the thigh portion 18 of the hose are also of a light tint substantially of the same color depth as the upper end of the calf portion. The foot portion 19 shades gradually by imperceptible degrees of color depth from the dark ankle portion to the toe. If desired, the ankle portion may be dyed in one color and the remaining portions of the hose in another lighter color, it being essential, however, that the colors be such as blend well so that there will be no apparent line of demarcation between the two colors. Various pastel tints may thus be combined in a pair of hose to produce very beautiful effects.

In Figure 2 is illustrated a hose 20 which will, when worn by a person having disproportionately large feet and ankles, make the legs appear shapely and well-proportioned. In this hose both the foot and ankle portions 22, 24 are dyed in a comparatively dark shade of the color used, while the calf portion 26, knee portion 28 and thigh portion 30 are dyed in a relatively lighter shade. As above described with reference to Figure 1, the darker shaded portions blend by imperceptible degrees of variation in color depth with the lighter colored portions. Likewise two

different colors may be used in a manner similar to that above described.

In Fig. 3 is illustrated a machine or apparatus which may be utilized to effect the dyeing operation. The apparatus comprises a tank 40 containing the dyeing solution. The level of the solution is maintained constant and circulated through the tank by a pump 42 driven by a motor 44. A discharge pipe 46 connects the pump with the tank 40 while an inlet pipe 48 is adapted to withdraw the solution from an auxiliary storage tank 50. A drain pipe 52 projects into the tank 40 and has an extension 54 which is swivelled so that it may be moved to adjusted position, thereby changing the level of its open upper end and controlling the level of the liquid in the tank 40. A frame comprising a pair of similar side plates 56 (only one of which is shown), and a bottom plate 59 is mounted for vertical reciprocation upon a plurality of rigid posts 58. Compression coil springs 60 supported around these posts tend normally to raise the frame until the plate 59 abuts against heads 62 formed at the end of the posts 58.

The plates 56 each have a plurality of regularly spaced rows of holes 64. Wires 66 are adapted to have their ends passing through these holes 64 and the wires are thus adapted to form a supporting surface of any desired contour for a web 68 which is intermittently fed through the apparatus by feed rolls 70. Tension rolls 72 guide the web as it is fed into the apparatus. A frame, comprising a plurality of rods 74 suitably joined together and mounted for vertical reciprocation in guide blocks 76, forms a support for a pair of cross bars 78 (only one of which is shown).

A plurality of bars 80 are adjustably mounted on each of the cross bars 78 and at their lower ends have openings through which wires 82 may be threaded. At each end of the cross bars 78 are slidably mounted presser bars 84 which carry rollers 86 at their lower ends and are pressed downwardly by compression springs 88.

A pair of levers 90 are each pivotally mounted upon a suitable support 92 and at their outer ends have a pin and slot connection with the rods 74. The inner ends of these levers 90 overlap and have registering slots through which a pin 94 projects. The pin 94 is mounted eccentrically upon a disc 96 carried by a shaft 98. The shaft 98 is driven at the desired variable speed by a motor 100 connected to the shaft 98 through a gear box 102.

The size of the wires 66 and 82 is greatly exaggerated in the drawing, these wires being preferably of a very fine piano wire which is stretched taut between the plates 59 and the bars 80 respectively. The web 68 is preferably of as diaphanous a character as is compatible with the necessary strength and may, for example, be of a very coarse mesh screen made of fine wire or other suitable foraminated material.

In the operation of this apparatus, a plurality of the hose to be dyed are placed upon the web 68, being secured thereto by any suitable fastening means if desired. All of the hose, of course, will have their toe portions pointing in the same direction and upon a transverse line. The web is then fed into the tank by feed rolls 70 (the drive for which may be any suitably timed intermittent gearing) so that the hose will lie above the cross wires 66. It will be understood that the frame, which includes the plates 56, will be in its uppermost position. After the hose is thus in position above the tank the motor 100 will oper-

ate through the intermittent gearing contained within the box 102 slowly to depress the upper frame which carries the wires 82. The wires 82, being of course arranged so as to form a contour parallel to that formed by the wires 66, will move downwardly until the web is conformed to this contour, being held between two sets of wires. Thereafter the continued downward movement of the upper frame will move the lower frame downwardly against the compression of the springs 60. The lowermost portion of the web will, of course, enter the dyeing liquid first and thereafter the adjacent portions of the web will be immersed. It will be understood that the movement of the upper frame is comparatively slow (depending upon the speed of action of the dyeing solution) so that the portion of the hose which is thus immersed first will remain within the solution for a much longer time than the remaining portions of the hose. It will be noted, however, that the contour of the plane formed by the wires is such that the difference in the time of immersion between adjacent portions of the hose will be very slight and thus the hose will be dyed in such a manner that the more darkly dyed portions will blend by imperceptible degrees of variation in color depth from the portions dyed in the light tint. It will be understood that by securing the wires 66 and 82 in the appropriate manner the contour of the plane formed by these wires may be changed to any desired extent and any portion of the hose thus immersed in the dyeing solution for any desired length of time, so that hose, having their darker portions either at the knee, the ankle, the calf portion, or the thigh portion, or having any two of these portions of the hose of a darker shade, may be made.

The upward movement of the upper frame which carries the wires 82 is preferably comparatively rapid and as soon as the plate 59 abuts against the heads 52 of the posts 58 and the web 68 is thus no longer held between the wires 66 and 82, the feed rolls 68, 70 will be rapidly rotated to carry the hose to a suitable washing tank and simultaneously bring a set of undyed hose into dyeing position.

As an alternate or modified method of dyeing the hose in the manners illustrated in Figs. 1 and 2, the apparatus shown in Fig. 4 may be employed. In this apparatus a web 102 is fed over rolls 104, 106 and 108 so as to have the lower portion thereof dip into the dyeing solution in a tank 110. After passing through the tank 110 over the roller 108 the web is fed into a washing or rinsing tank 112, being drawn therethrough by feed rolls 114. The latter rolls are geared together and driven by a gear 116. The latter gear is rotated by a motor 118 through a suitable gearing mechanism contained within a housing 120. A plurality of hose 123 are suitably placed upon the web 102 and thus fed first through the dyeing solution and then through the washing solution or fixing solution. It will be noted that only a small portion of the hose will be in the dyeing solution at one time. Thus, by varying the speed at which the hose is drawn through the dyeing solution, the various portions of the hose will be immersed in the cylinder for different time intervals and the portions therefore dyed to different degrees of saturation. The speed at which the web is drawn through the solution is made to vary very gradually so that the effects illustrated in Figs. 1 and 2 may readily be obtained. The variation in speed of the drive of the web may be accom-

plished wholly by gearing contained within the housing 20 and driven by a constant speed motor or the speed of the motor itself may be controlled by an automatically and gradually varying rheostat in the field or armature winding of the motor. The latter method is preferable because the speed of the web may be varied more gradually by means of a rheostat than can readily be obtained by mechanical gearing intermediate the motor and the drive rolls.

As a further alternative method, the thread or yarn of which the hose is made may be dyed previous to the knitting operation. In carrying out this process the yarn or thread necessary for one hose will be dyed in a manner similar to that described with reference to the apparatus shown in Fig. 4 or any other suitable apparatus so that lengths thereof will be of different shades or tints and the hose knitted from such yarn or thread will have the appearance of the hose as described with reference to Figs. 1 and 2.

If the hose is to be dyed in two colors (as distinguished from different shades or tints of the same color), the hose is first dyed by any one of the processes above described with the dye of one color and then dyed with the dye of the other color by a similar process.

The process in general as carried out by any one of the specific processes illustrated or described is that of immersing the finished hose (or the yarn or thread of which it is made) in a

dyeing solution for different periods of time, thus to have portions thereof completely saturated with the dye and other portions thereof incompletely saturated and the intermediate portions varying by imperceptible degrees so that the former two portions blend into each other.

While I have shown and described the preferred embodiments of my invention, it will be understood that I do not wish to limit myself to the specific disclosure but that other decorative patterns may be added to the hose shown, for example, clocks, lined or blocked decorative patterns may be added to the portion of the hose covering the heel and ankle. If desired, a block or line pattern may also be added to the upper portion of the hose to produce any desired artistic or æsthetic effect.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

The method of dyeing hosiery which comprises passing the hose to be dyed longitudinally through a dyeing solution at a varying speed with only a comparatively small transverse section being in the dyeing at one time whereby different portions thereof will be dyed to different degrees of color depth, the changes in speed being sufficiently gradual that the difference in degree of saturation of the dye between successive incremental transverse zones of the hose will be very small.

OSCAR U. ZERK.

35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150