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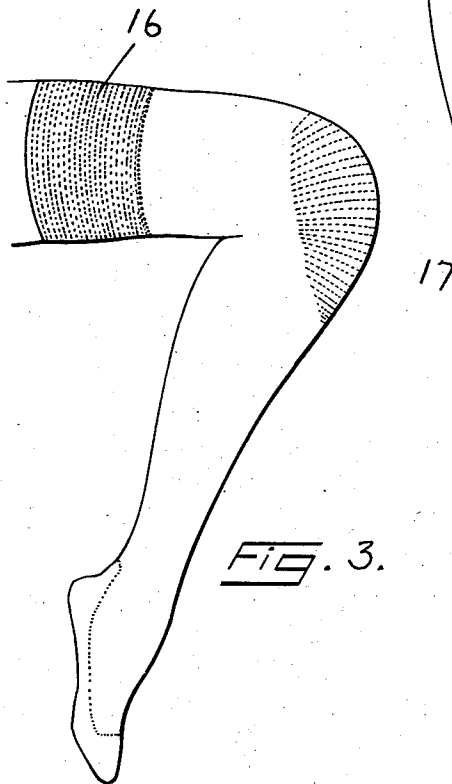
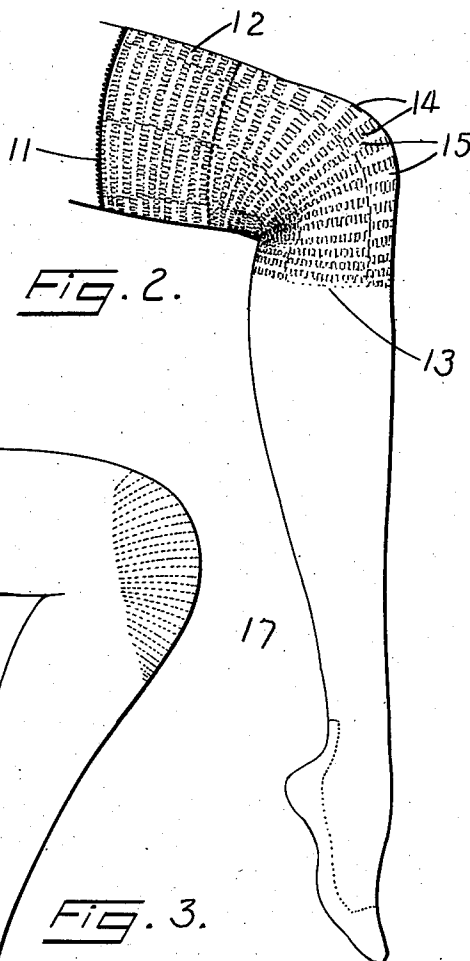
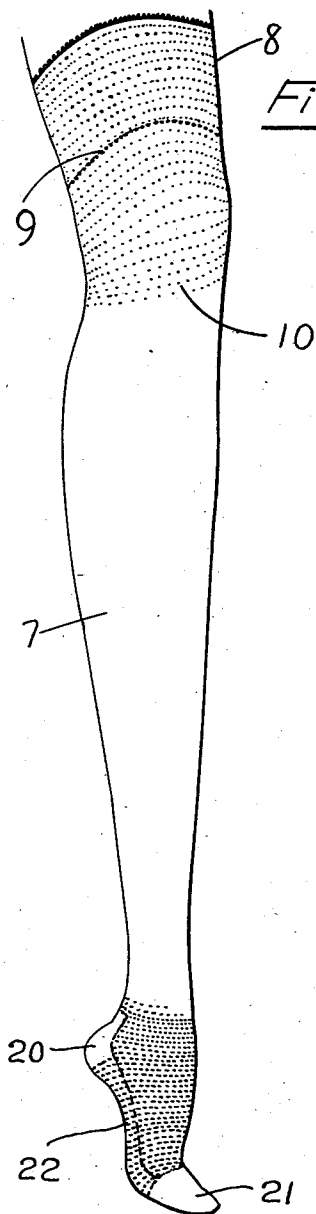
A. W. MUTCHLER ET AL

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STOCKING AND METHOD OF KNITTING SAME

Filed Nov. 9, 1931

2 Sheets-Sheet 1



INVENTOR
Arthur W. Mutchler and Allen L. Leopold.
BY
Wm. W. Hallen White.
ATTORNEY

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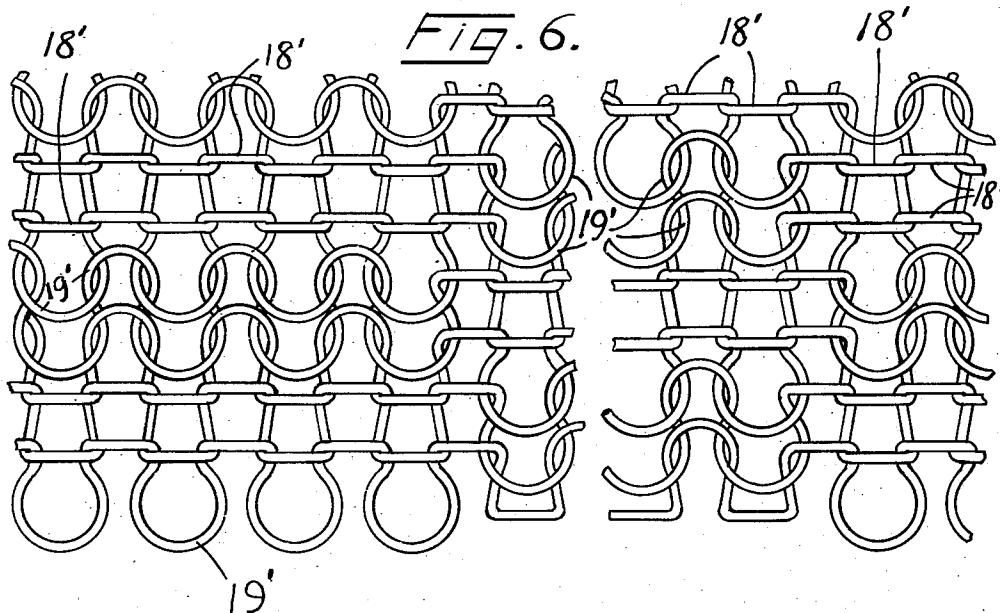
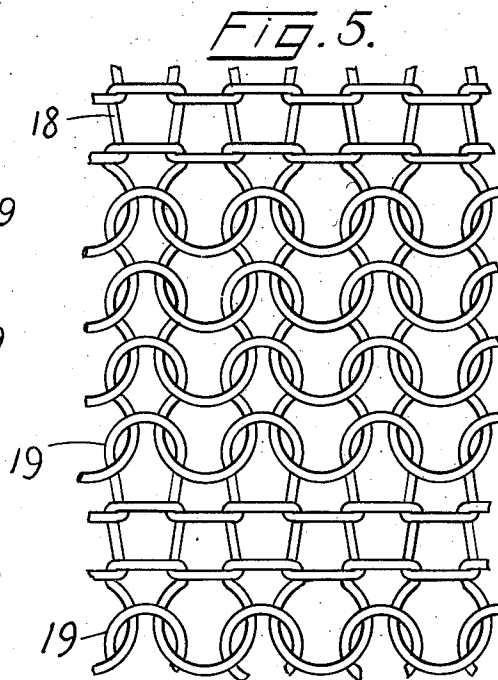
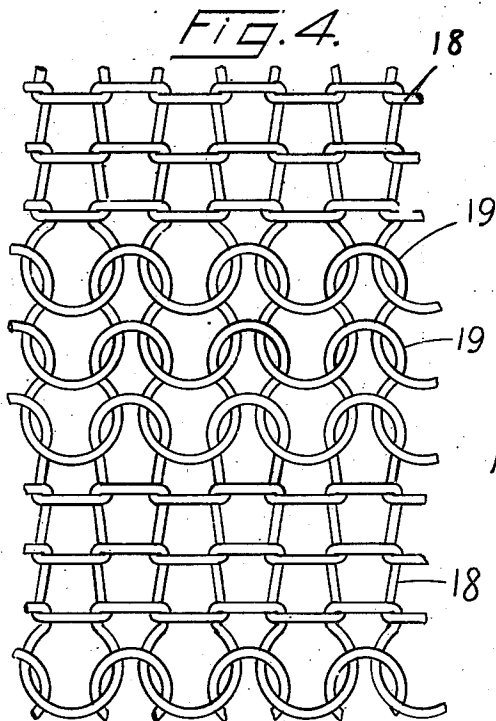
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INVENTOR

Arthur W. Mutchler and Allen L. Leopold.

BY

Wm Wallace White.

ATTORNEY

UNITED STATES PATENT OFFICE

ARTHUR W. MUTCHLER AND ALLEN L. LEOPOLD, OF BROOKLYN, NEW YORK, ASSIGNORS
TO JULIUS KAYSER & CO., OF NEW YORK, N. Y.

STOCKING AND METHOD OF KNITTING SAME

Application filed November 9, 1931. Serial No. 573,940.

Our invention relates to improvements in stockings of the character produced on a straight bar machine and having knitted courses formed with the conventional form of loops or "chain-stitches" and relates more particularly to ladies silk stockings of the full-fashioned type and to the method of knitting the fabric or portions of the fabric from which such stockings are made.

The main object of our invention is to provide an improved stocking having greater stretch or give throughout the sheer or leg portion of the garment and/or in the welt and/or the foot portions thereof, or to provide such greater stretch or give only at the knee and/or upper part of the garment, where maximum stretch is desirable so that the stocking may readily adapt itself to limbs of varying thicknesses.

A further object of our invention is to provide an improved method of knitting full-fashioned hosiery to give additional stretch or give while still providing a fabric having the necessary body and resistance when in use.

It is obvious that a fabric in which all the courses are loosely knitted would give much greater stretch than a similar fabric with the ordinary closely knitted courses. A loosely knitted fabric of this kind, however, would not have the necessary body and shape retaining quality and would be limp and become distorted unduly when in use, and would not cling closely to the limb.

We have discovered however that although a fabric knit with ordinary tight loops has a definite limit of stretch or give in each course, a fabric knitted with loose courses interposed between the courses knitted in the usual way has the characteristic that much greater give in a horizontal or coursewise direction as well as in a walewise or vertical direction is obtained while still providing a fabric having the necessary body, and by interposing between loosely knitted courses an equal number of tightly knitted courses of the usual type, or by using a combination of loose and tight courses within the ratios hereinafter set forth, we provide a fabric having the neces-

sary body and cling, and providing the desired stretch or give.

In one form of the fabric according to our invention single tight courses and groups of loose courses are alternatively arranged and we have also obtained satisfactory results by interposing two or more adjacent tight courses between two or more adjacent loose courses and the ratio of tight to loose courses may be modified to suit the type of fabric or the type of garment required, but we have discovered that the number of loose courses should be approximately equal to or greater than the number of tight courses.

The method of constructing our improved fabric consists in knitting one or more tight courses then automatically modifying the movement of the needles so as to knit one or more courses of loose stitches, then automatically varying the needle control means to again knit the desired number of tight courses and so on through the garment or throughout the particular part of the garment being knitted in this special manner.

In order that our invention and the method of carrying same into practice may be more clearly understood, we have shown by way of illustration or example a number of forms of the stocking and of the fabric on the annexed drawings, on which Fig. 1 is a perspective view of a stocking made in accordance with the invention and Figs. 2 and 3 show two modified forms of the stocking. Fig. 4 is an enlarged detail view showing a fragment of a fabric made in accordance with this invention. Fig. 5 is a similar view showing another form of the fabric and Fig. 6 is a similar view, but with the central part broken away.

The stocking shown at Fig. 1 has a leg portion 7 knitted in the usual way while the double welt portion 8 and a portion extending from the base 9 of the welt 8 to a line 10 below the knee is formed with alternately arranged tight and loose courses or groups of courses to provide the desired give or stretch at the knee and at the thigh so that the stocking may readily adapt itself to legs of varying thickness.

In this stocking the heel and toe parts 20, 21 are reinforced and closely knitted in the

usual manner but the central or instep portion of the foot including the sole reinforcement 22 are knitted with the improved combination of loose and tight loops with the result that the stocking may adapt itself to feet of different lengths due to the much greater walewise stretch. If desired, of course, the special knitting may extend from the line 10 to the foot so as to provide the increased give or stretch throughout the entire garment except at the parts 20 and 21.

Fig. 2 shows a modified form of stocking in which the upper part extending from the top edge 11 of the welt 12 to a line 13 below the knee is formed with a combination of tight and loose loops or stitches, but in this form the loose stitches are not continued throughout the entire course, but only through sections thereof and the sections 14 of loose loops are arranged in staggered relation to corresponding sections of loose loops in the adjacent courses so that each section 15 of tight loops is interposed between sections of loose loops 14.

In the form of stocking shown at Fig. 3 the welt 16 is formed with a combination of loose and tight courses and in order to provide the desired elasticity at the knee of the stocking, the front portion 17 is formed with loose stitches interposed between tight stitches in the manner previously described, but in this form the loose stitches do not continue throughout the entire courses, but only through the front portion of the garment so that the rear part of the knee of the stocking is knitted in the usual manner whilst the front portion 17 has the desired give.

Referring to Fig. 4 the fabric here shown is knitted with three adjacent tight courses 18 formed in the usual manner, then three loose courses 19, then three tight courses 18 so that each group of three tight courses is interposed between groups of loose courses throughout the garment or throughout the particular part of the garment where greater give is desired. As shown in this figure the tight courses consist of tight stitches or loops formed in the usual manner while the loose courses consist of loose loops or stitches formed by variation in the operation of the needles or in other convenient manner.

Fig. 5 shows a modified form of the fabric in which tight courses 18 are combined with loose courses 19 in the ratio of 2 to 4 so that a double course of tight stitches is interposed between quadruple courses of loose stitches in the manner above described.

Fig. 6 shows a fragment of a fabric of the type embodied in the stocking shown at Fig. 2. This fabric comprising a combination of tight loops 18' and loose loops 19', but in this fabric each course includes both tight and loose loops arranged in sections disposed alternately to each other and each section

of loose loops is interposed between corresponding sections of tight loops in the adjacent courses. The upper course in this figure is loose at the left hand side, is tight at the center of the figure and loose at the right hand side while in the next two courses the tight loops 18' at the left hand side of the figure change to loose loops 19' at the center and to tight loops 18' at the right.

Although the drawings and above specification disclose the best mode in which we have contemplated embodying our invention, we desire to be in no way limited to the details of such disclosure for in the further practical application of our invention, many changes in form and arrangement may be made as circumstances require or experience suggests without departing from the spirit of the invention within the scope of the appended claims.

What we claim is:

1. A stocking of the character described comprising alternate series of courses of loose and tight loops, each series comprising groups of a plural number of rows, all of the loops of each group being substantially of the same size.

2. A stocking of the character described comprising rows of tight loops extending horizontally of the stocking and rows of similar but relatively loose loops interposed between the first mentioned rows, each row being formed with a single thread, all of the loops in each row being of substantially the same size, and the rows of loose loops being grouped together with at least two loose rows directly looped together.

3. A stocking of the character described having at least one giving portion positioned at a place where it will receive considerable stretching when worn, said portion comprising rows of tight loops extending horizontally of the stocking and at least an equal number of rows of similar but relatively loose loops interposed between the first mentioned rows, and the rows of loose loops being grouped together with a plurality of such rows in direct contact with each other.

4. In a stocking of the character described, upper and knee portions comprised of alternate series of horizontal courses of loose and tight loops, in combination with a leg portion consisting of loops similar to said tight loops, and the rows of loose loops being grouped together with a plurality of such rows in direct contact with each other.

5. In a stocking of the character described, an upper thigh portion comprised of alternate series of courses of loose and tight loops, each series comprising groups of a plurality of courses looped into each other, and each course being formed with one thread, and all of the loops of each course being of substantially the same size, in combination with a leg portion consisting of courses in which the

loops are of uniform size and substantially similar to said tight loops.

6. In a full fashioned stocking of the character described a main leg portion consisting of loops of uniform size and an upper thigh portion comprising alternate series of courses of large loops and small tight loops, each series comprising groups of a plural number of rows each, and all of the loops of each group being substantially of the same size.

7. In a stocking of the character described a main leg portion with loops of substantially uniform size, and an upper portion comprised of alternate series of horizontal courses of loose and tight loops, all of the loops in each course being substantially of the same size, each series comprising a plurality of courses looped into each other, and each course being formed with one thread.

8. A stocking fabric of the character described comprising groups of loose and tight loops in certain courses, and adjacent courses with similar groups of loops arranged in staggered relation to the first mentioned groups to interpose tight loops between loose loops in both a crosswise and a wale-wise direction, all of the loose loops being of substantially the same size and all of the tight loops being of substantially the same size.

In testimony whereof we have signed our names to this specification.

ARTHUR W. MUTCHLER.
ALLEN L. LEOPOLD.