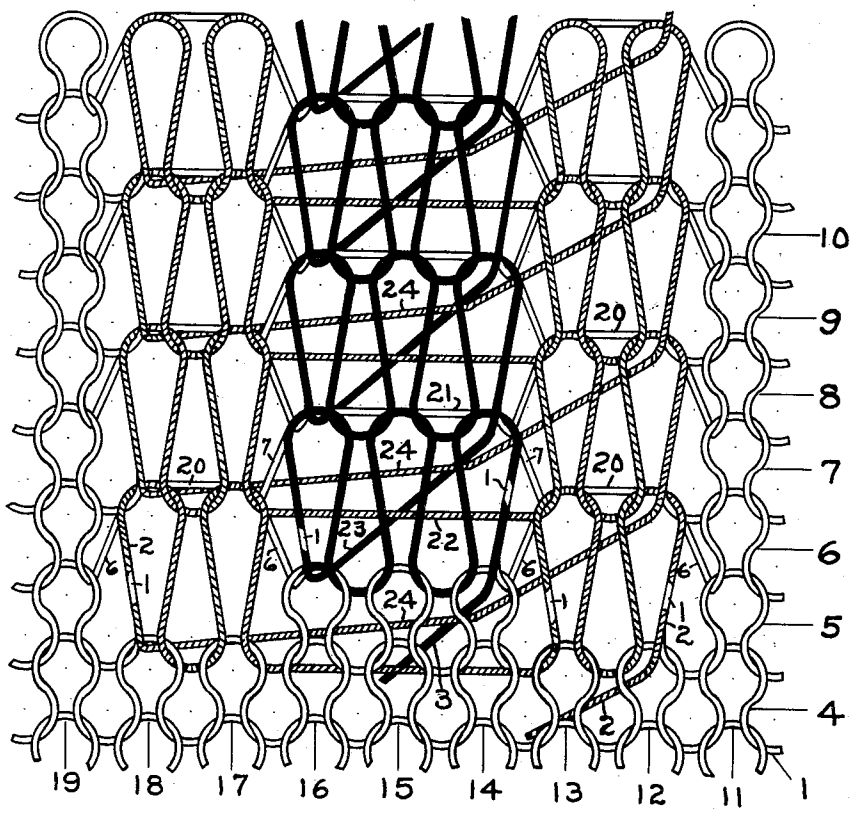
March 9, 1937. R. H. LAWSON 2,073,242

WRAP STRIPE FABRIC AND METHOD OF KNITTING THE SAME

Filed Aug. 19, 1931 2 Sheets-Sheet 1

FIG. 1.



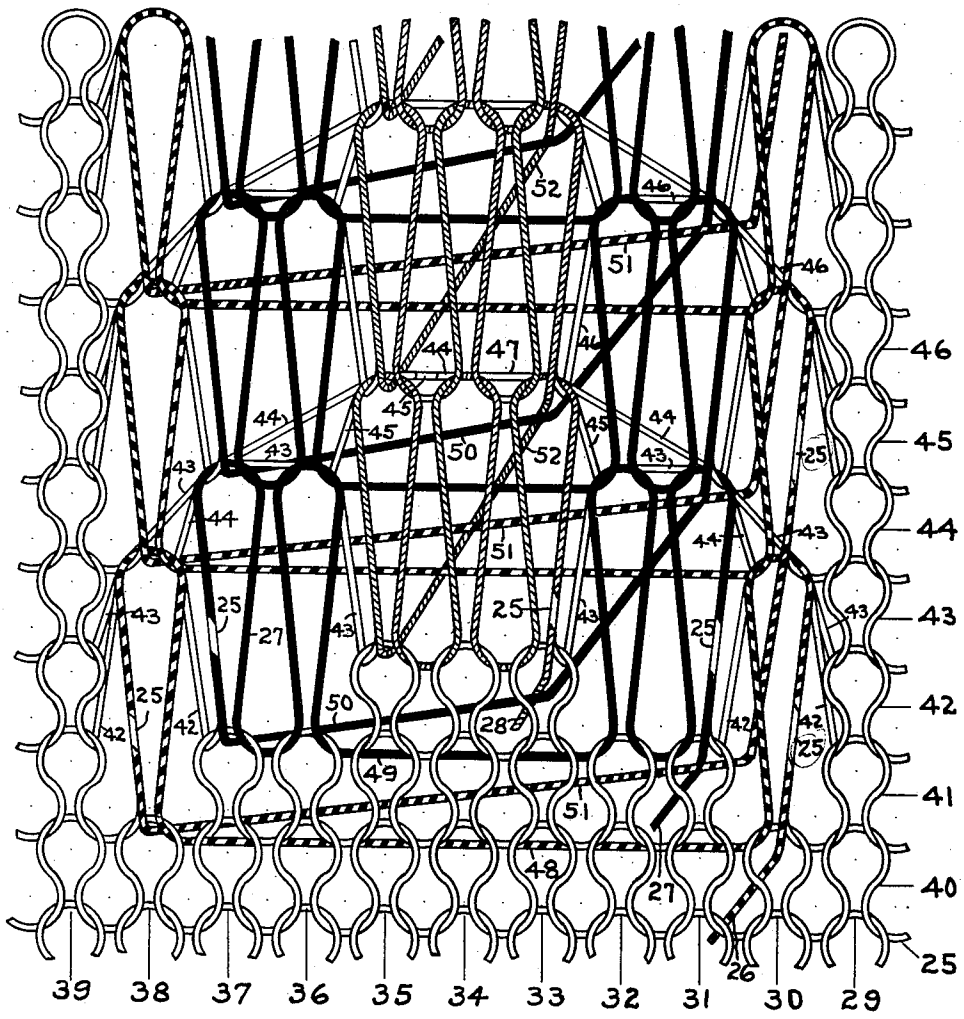
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WRAP STRIPE FABRIC AND METHOD OF KNITTING THE SAME

Filed Aug. 19, 1931 2 Sheets-Sheet 2

FIG. 2.



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Patented Mar. 9, 1937

2,073,242

UNITED STATES PATENT OFFICE

2,073,242

WRAP STRIPE FABRIC AND METHOD OF KNITTING THE SAME

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Application August 19, 1931, Serial No. 558,062

15 Claims. (Cl. 66—201)

This invention relates to new and improved weft knitted fabrics and methods of making the same, and more particularly to fabrics such as stockings or half-hose having clocking or other effects knitted therein by means of or including so-called wrap threads and wherein adjacent wales show threads having different colors or other characteristics.

In the drawings:

Fig. 1 is a view of one form of knitted fabric, the wrap or face threads being shown broken away in order to show the body yarn; and

Fig. 2 is a view of a modified form of knitted fabric, the wrap or face threads likewise being shown broken away.

Referring to Fig. 1, the fabric is shown therein as being composed of a main or body yarn 1, a wrap thread 2 of one color or characteristic, and a second wrap thread 3 of another color or characteristic, both threads 2 and 3 preferably being of a color or other characteristic different from the body yarn 1.

The clock or other area includes courses 4–10 inclusive, course 4 being shown as the last plain knitted course, i. e., the last course wherein all of the needles knit the body yarn 1. Immediately following the knitting of the course 4 all of the needles engage the yarn 1 and draw the same through the loops constituting the course 4, certain of the wales of which are indicated by the numerals 11, 12, 13, 14, 15, 16, 17, 18, and 19, wales 11 and 19 being plain wales, i. e., knitted throughout with yarn 1 only. Preferably, just prior to the needles, that knit the wales 12, 13, 17, and 18, engaging the yarn 1, such needles are wrapped by means of the wrap thread 2 which wrapping may be accomplished in any suitable manner such as for example by a machine similar to that shown in the Lawson Patent No. 1,702,608, February 19, 1929 and more specifically disclosed in the patent Great Britain, No. 367,796, February 19, 1932. If the fabric be knit on a circular machine of the type disclosed in the mentioned Lawson patent, continued rotation of the needles causes the needles knitting the wales 11–19 inclusive successively to move past the knitting cams, whereby the stitches constituting the course 5 are drawn through the stitches constituting the last plain course 4. Continued rotation of the needle cylinder carries the needles that knit wales 12–18 around again to the wrapping mechanism where the needles that knit wales 14, 15 and 16 are wrapped with thread 3. The needles that knit wales 12, 13, 17 and 18, preferably, do not cast their stitches off the latches (if latch needles be used) nor are they engaged by a cam to draw stitches through the previous course stitches, but such needles may engage the yarn 1 and accumulate stitches or tuck. During the same course of knitting, i. e., course 6, the needles knitting the wales 14, 15 and 16, when they are engaged by the stitch drawing cam, engage the body yarn 1 and draw the said yarn 1 and thread 3 through the loops constituting the course 5.

During the knitting of course 7 the needles knitting wales 12, 13, 17, and 18 are again wrapped by thread 2, continued rotation of the needle cylinder causing such needles to engage yarn 1, the stitch drawing cam then engaging such needles and causing them to draw loops or stitches of yarn 1 and thread 2 through the stitches of yarn 1 and thread 2 which stitches were drawn through the stitches of course 4 during the knitting of course 5; at the same time drawing the yarn 1 and thread 2 through two-wale loops formed respectively at wales 12, 13 and 17, 18 by the yarn 1 which floats as shown at 20. During the knitting of said course 7 the needles knitting wales 14, 15, and 16 may engage the yarn 1 but are not actuated to cast the stitches of yarn 1 and thread 3 off their latches, the needles knitting the wales 14, 15, and 16 accumulating loops or tucking.

Course 8 is then knitted and during the knitting of such course, the needles are all controlled and actuated as they were during the knitting of course 6, the only difference being that, whereas during the knitting of course 6 the stitches knitted by the needles knitting wales 14, 15, and 16 were drawn through plain loops of course 5; in course 8 the stitches of yarn 1 and thread 3 are drawn through the stitches of yarn 1 and thread 3 which stitches were drawn during the knitting of course 6, the stitches of course 8 in wales 14, 15, 16 being also drawn through a three-wale loop or stitch of yarn 1 which floats across such wales as at 21.

While knitting the next course, i. e., course 9, the needles are actuated and controlled in the same manner as they were during the knitting of course 7, course 9 in the fabric being the same as course 7; and following course 10 is likewise a duplicate of course 8, being knitted in the same manner.

As shown in Fig. 1, the loops knitted at the wrap wales are elongated, due to tucking, and are substantially two courses in length; also wales 12, 13, 17, and 18 being wrapped during the knitting of one course, and the adjacent wales 14,

15 and 16 being wrapped during the knitting of another, results in a staggered or offset positioning of the wrap wales in the fabric.

The floats 22 of the wrap thread 2 between courses 12, 13 and courses 17, 18 are closely adjacent to the inner face of the fabric and between the yales thereof and diagonally disposed floats 23 of thread 3, other and more or less diagonally disposed floats 24 of thread 2, which floats connect adjacent courses, are also disposed adjacent to the inner face of the fabric and between the wales thereof and the floats 23.

In Fig. 2 there is shown a modified form of fabric wherein three wrap threads are knitted into the fabric, and wherein the wrap stitches are elongated to span three courses.

The body of the fabric is shown as being composed of a body yarn 25 which is knitted throughout the plain portion of the fabric, i. e., other than the wrap area or areas, and is knitted together with one or more of the wrap threads in the wrap area or areas. Wrap threads 26, 27, and 28 are shown as being knitted into adjacent wales of the fabric; thread 25 being shown as being knitted into the fabric throughout wale 29 and at wale 30 together with wrap thread 26; at wales 31, 32 with wrap thread 27; at wales 33, 34, 35 with wrap thread 28; at wales 36, 37 again with wrap thread 27; at wale 38 again with wrap thread 26; and throughout wale 39, at which wale none of the wrap threads are knitted into the fabric.

In Fig. 2 a course 40 is shown as being the last plain knitted course, i. e., prior to the incorporation of the wrap thread, during the knitting of which course 40 all of the needles knit all of the wales in the usual manner.

During the knitting of the first wrap course, i. e., course 41, the wales 29 and 39 are knitted in the usual manner, whereas wales 30 and 38 are knitted by their needles drawing stitches of yarn 25 and thread 26 through the stitches in wales 30 and 38 which were drawn during the knitting of course 40; the thread 26 being wrapped around the needles knitting wales 30 and 38 prior to the needles reaching the stitch drawing cam at or adjacent to which cam the said needles engage yarn 25, the stitch drawing cam then causing such needles to draw yarn 25 and thread 26 through the previous course loops. During the knitting of course 41 the stitches constituting wales 31–37 inclusive are drawn in the usual manner, i. e., as in plain knitting.

During the knitting of the following course, i. e., course 42, the needles knitting wales 30 and 38 remain in an inactive, tucking position and consequently do not cast the previously drawn stitches off their latches, but may engage the body yarn 25 in their hooks. During the knitting of said course 42 the needles knitting wales 31, 32, 36, and 37, are wrapped with thread 27 prior to being engaged by the stitch drawing cam, said needles also engaging the body yarn 25 in their hooks; and as said needles are engaged by the stitch drawing cam, loops of yarn 25 and thread 27 are drawn through the plain stitches of course 41. During the knitting of said course 42, the needles knitting wales 33, 34, 35 continue to knit in the usual manner, i. e., as in plain plating.

During the knitting of the next course, i. e., course 43, the needles knitting wales 30 and 38 and which needles drew loops of the yarn 25 and thread 26 through loops or sitches of the course 40 and remained inactive during the knitting of course 42, likewise remain inactive during the knitting of course 43 excepting that they again engage the yarn 25 in their hooks. The needles knitting wales 31, 32, 36, and 37 also remain inactive during the knitting of course 43 in that their loops are not cast off their latches although such needles engage the yarn 25 in their hooks. However, during the knitting of said course 43, the needles knitting wales 33, 34, and 35 are wrapped for the first time by thread 28 and, at or adjacent to the stitch drawing cam, the said needles engage yarn 25 and when engaged by the stitch drawing cam, form loops or stitches of the yarn 25 and thread 28 and draw the same through the plain loops of course 42.

During the knitting of the next course, i. e., course 44, the needles knitting the wales 30 and 38 are again wrapped by the thread 26 and, when engaged by the stitch drawing cam, draw such wrap thread and yarn 25—which such needles engage in their hooks at or adjacent to the stitch drawing cam—through the elongated loops drawn through the loops of course 40 during the knitting of course 41. During the same course of knitting, the needles knitting wales 31, 32, 36, and 37 remain inactive in that they do not cast their loops off their latches, but they may engage yarn 25 then having three strands of three courses of such yarn in their hooks, the strand which was engaged in the hooks of the needles during the knitting of course 43 being elongated as compared with such strand at the wales 30 and 38. Needles knitting wales 33, 34, and 35 remain inactive during the knitting of course 44, but engage the yarn 25 in their hooks.

During the knitting of the next course, i. e., course 45, the needles knitting the wales 30 and 38 remain inactive without casting the loops off the latches, but may engage a strand of yarn 25. The needles knitting wales 31, 32, 36, and 37, however, are again wrapped by the thread 27 and again engage yarn 25, the stitch drawing cam then causing the needles to draw stitches through the elongated loops originally drawn through the stitches of course 41. During the knitting of said course 45 the needles knitting wales 33, 34, and 35 are inactive to the extent that they do not draw stitches, but they may, however, engage a strand of yarn 25 in their hooks, such strand subsequently appearing as a float in the completed fabric.

During the next following course of knitting, i. e., course 46, although a strand of yarn 25 is engaged by needles knitting wales 30 and 38, such needles do not cast the old loops off their latches, having three strands of yarn 25 in their hooks. During the knitting of said course 46 the needles knitting wales 31, 32, 36, and 37 remain inactive, not casting the loops off their latches although they engage yarn 25 in their hooks. However, during the knitting of said course 46 the needles knitting wales 33, 34, and 35 are again wrapped by thread 28 and again engage a strand of yarn 25, subsequent engagement of the needles by the stitch drawing cam causing such needles to draw loops of yarn 25 and thread 28 through the loops originally drawn through the plain loops of course 42 and through the three-wale loops of the strands of yarn 25 engaged by the hooks of the said needles during the knitting of courses 44, 45, such three-wale loops floating across the wales as at 47.

The immediately following course of the fabric is identical in formation and structure to the

course 44, each succeeding three courses duplicating courses 44, 45, and 46.

In the fabric shown in Fig. 2, the wales 30 and 38 are wrapped by the thread 26 and the intervening wales, namely, 31–37 inclusive, not being wrapped by said thread, said thread floats across said wales, as at 48; likewise the thread 27 is knitted at wales 31, 32 and 36, 37, floating across wales 33, 34, and 35 as at 49.

The fabric shown in Fig. 2 includes wrap and other loops which are elongated to span three courses, the loops of the respective threads 26, 27, and 28 being drawn during the knitting of successive courses, the wrap stripes thus appearing more or less staggered or offset in the knitted fabric.

Floats 48 of thread 26, which floats connect wales 30, 38 and are formed during the knitting of single courses, are adjacent to the inner face of the fabric, being between the inner face thereof and more or less diagonally disposed floats 50 of thread 27 which diagonal floats 50 connect adjacent courses. Between the floats 50 and the inner face of the fabric are also the diagonal floats 51 of thread 26 which diagonal floats connect adjacent courses. The diagonal floats 52 of thread 28, which floats connect adjacent courses, are on the inner face of the fabric, the other floats, namely, 48, 49, 50, and 51 being between the said floats 52 and the knitted wales of the fabric.

Although as hereinbefore disclosed, the portions of the fabrics other than the wrap areas, are knitted with one yarn 1 or 25, two or more yarns may be knitted into such portions of the fabrics in plating relation or otherwise; and other designs may be knitted into the fabrics in any well known manner if desired.

By knitting a fabric with a plurality of wrap threads in a manner hereinbefore described, it is possible to wrap adjacent or other needles having threads of different colors or other characteristics, whereby the completed fabric shows a color or colors within another color or colors; and, futhermore, the number of wrap theads which may be knitted into the fabric is not limited to three.

By knitting a wrap thread into the tuck stitches of the fabric, such thread reinforces the tuck stitches thus avoiding the usual weakness inherent in tuck stitch fabric.

Although as shown in Figs. 1 and 2, the wrap stripe area is knitted with wrap threads which wrap the same number of needles or wales from course to course, nevertheless clocking or other effects may be knitted into the fabric wherein the number of needles or wales wrapped with a thread vary from course to course, the needles being selectively raised in any convenient manner to engage such wrap threads in their hooks.

Wherever in the appended claims reference is made to "alternate courses", there is no intention of thus limiting the claims to the first, third, fifth, etc. courses of the fabric; but by such language it is the intention to cover as well the first, fourth, seventh, etc. courses, or any other methods of fabrics wherein one or more intermediate courses are provided.

Although in the foregoing description specific terms have been used in describing the parts, nevertheless it is not the intention to limit the invention otherwise than as required by the claims.

I claim:

1. A knitted fabric some of the wales of which have wrap threads incorporated therein, adjacent wales having different wrap threads, the wrap loops being at least two courses in length and knitted in successive courses, the wrap loop wales being characterized by floats which extend across the said wrap loops.

2. A knitted fabric having knitted therein a plurality of wrap threads, at least one wale having one wrap thread knitted therein in one course and an adjacent wale having another wrap thread knitted therein in the next course but not in the first course, each wrap loop being two courses in length and the wrap loop wales being characterized by floats which extend across the said wrap loops.

3. A knitted fabric having knitted therein a plurality of wrap threads, some at least of said wrap threads being knitted as tuck stitches in adjacent wales and in successive courses, the wrap loop wales being characterized by floats which extend across the said wrap loops.

4. A knitted fabric consisting of a body yarn and a plurality of wrap threads, one of such wrap threads being formed into one or more loops in one course and another such wrap thread being formed into one or more loops in another course, the loop or loops of the first named wrap thread overlapping the loop or loops formed by the second named wrap thread.

5. A knitted fabric consisting of at least one body yarn and at least two wrap threads, one of such wrap threads being knitted into the fabric at a certain wale and another such wrap thread being knitted into the fabric at an adjacent wale, the wrap loops knitted at adjacent wales being relatively offset and overlapping.

6. A knitted fabric consisting of at least one body yarn and and a plurality of wrap threads, one such wrap thread being knitted into the fabric at a certain wale and another such wrap thread being knitted into the fabric at an adjacent wale, the loops of the two wrap threads spanning at least two courses and overlapping.

7. A knitted fabric consisting of at least one body yarn and a plurality of wrap threads, one such wrap thread being knitted into the fabric at a certain wale and another such wrap thread being knitted into the fabric at an adjacent wale, the loops of the two wrap threads spanning at least three courses and overlapping.

8. A knitted fabric consisting of a body yarn and at least three wrap threads, one such wrap thread being knitted at a certain wale and in a certain course, a second wrap thread being knitted at an adjacent wale and in another course, a third wrap thread being knitted at an adjacent wale and in another course, each wrap loop being three courses in length.

9. A knitted fabric consisting of at least one body yarn and a plurality of wrap threads, one of such wrap threads being knitted into the fabric at one or more wales thereof in every other course only, lengths of said body yarn being also knitted into the fabric at the said wales in the said courses only, and other lengths of said body yarn being incorporated but not knitted in the fabric in the intermediate courses at said wales.

10. A method of knitting consisting in knitting a body yarn on needles of a knitting machine during a plurality of courses and wrapping a plurality of threads around needles in such a manner that immediately adjacent needles are wrapped with different threads, one of said needles being wrapped during the knitting of alternate courses only and another of said needles being wrapped during the knitting of intermediate courses only,

the wrap loops being retained in the needle hooks during the knitting of the courses following the courses when the respective needles are wrapped.

11. A knitted fabric consisting of at least one body yarn and a plurality of wrap threads, one of such wrap threads being knitted into the fabric at one or more wales thereof in every other course only, lengths of said body yarn being also knitted into the fabric at the said wales in the said courses only, and other lengths of said body yarn being incorporated but not knitted in the fabric in intermediate courses at said wales, adjacent wales being knitted in the same manner as the said one or more wales are knitted but so that at said adjacent wales the wrap threads are knitted in the said intermediate courses only.

12. A method of knitting consisting in knitting a body yarn on needles of a knitting machine during a plurality of courses and wrapping a plurality of threads around needles in such a manner that two immediately adjacent needles are wrapped with different threads, one of said needles being wrapped during the knitting of alternate courses only and another of said needles being wrapped during the knitting of intermediate courses only.

13. A knitted fabric including a body yarn and a wrap thread, the said wrap thread being knitted at two wales and in the same course, both of the resultant wrap loops extending across at least two courses.

14. A method of knitting fabric consisting in knitting a body yarn and at least one wrap thread by causing loops of the thread to be drawn through previous course loops at two wales during the knitting of the same course, and thereafter knitting at least one course with the body yarn without casting off either of the last drawn thread loops.

15. A method of weft knitting consisting in so controlling needles and threads that during the knitting of one course at least one of a group of needles, any of which group may be wrapped with one of two or more threads, is wrapped with one only of said threads, and at least one adjacent needle of the said group, which is not wrapped during the knitting of the first course, is wrapped with another only of said threads during the knitting of the next course, the needle first mentioned not casting off the first wrap loop during the knitting of the said next course.

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