May 26, 1936. G. GASTRICH 2,042,149

KNITTED FABRIC AND HOSIERY PRODUCED THEREFROM

Filed June 27, 1932 2 Sheets-Sheet 1

FIG. 1

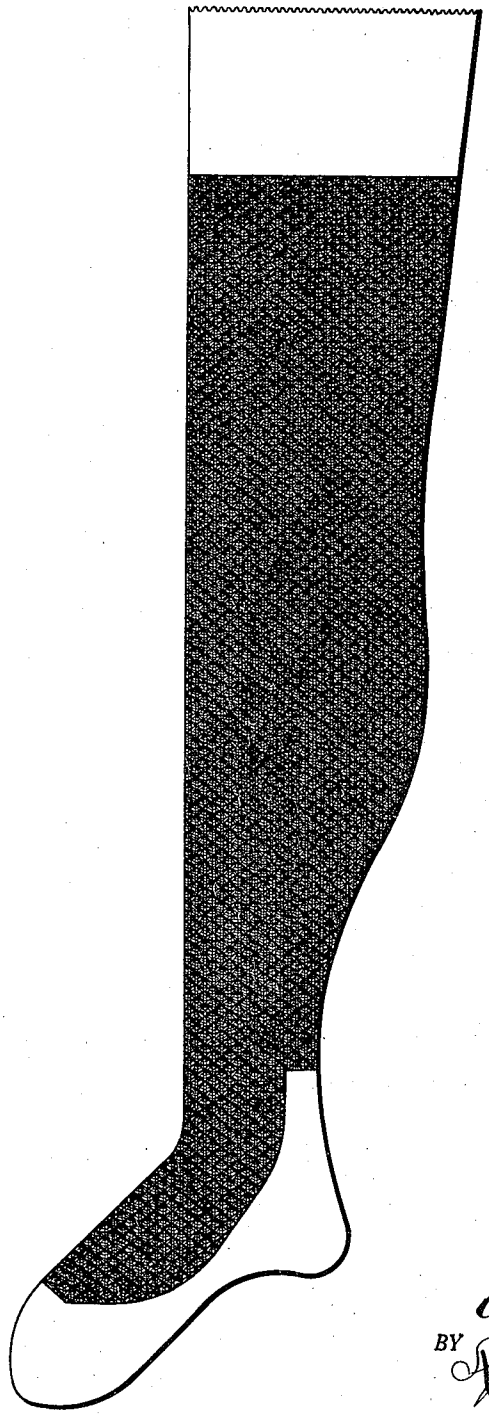

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FIG. 2

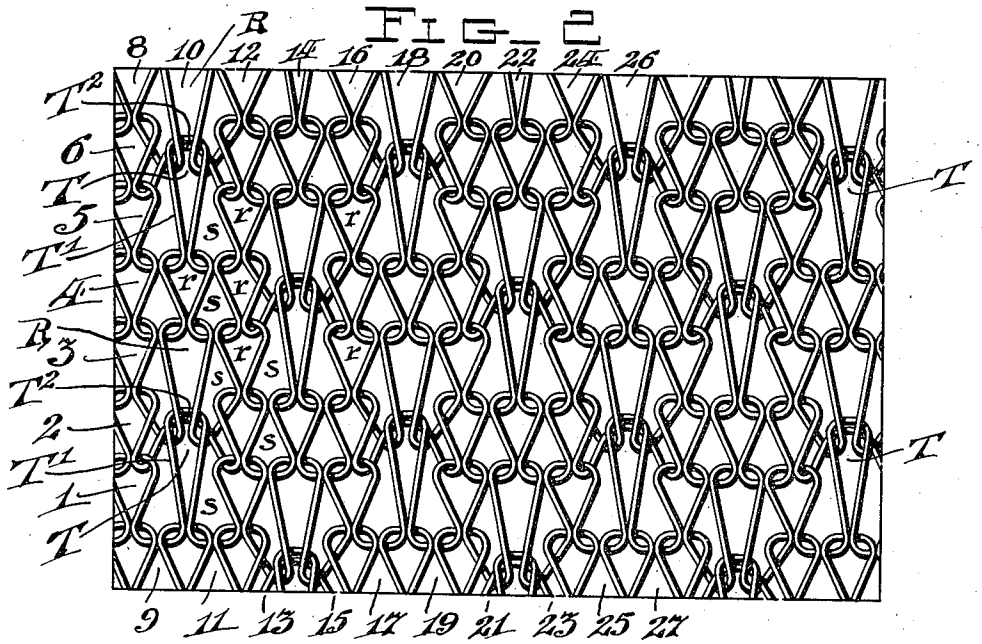


FIG. 3

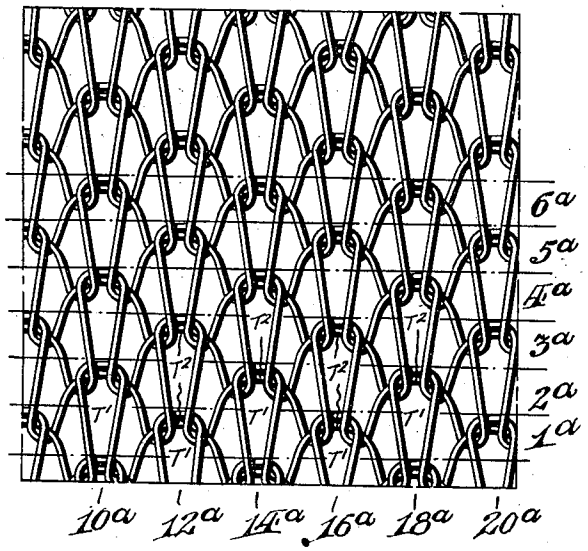
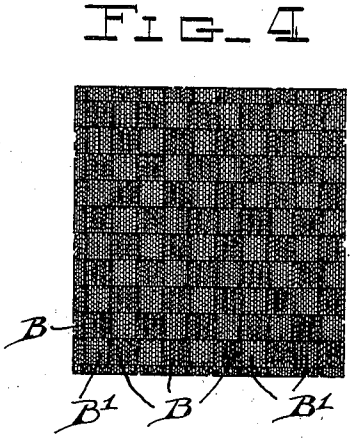


FIG. 4



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UNITED STATES PATENT OFFICE

2,042,149

KNITTED FABRIC AND HOSIERY PRODUCED THEREFROM

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Application June 27, 1932, Serial No. 619,417

1 Claim. (Cl. 66—180)

This invention relates to knitted fabric, and to the articles of wearing apparel made therefrom, particularly full fashioned hosiery.

Full fashioned flat knit stockings usually are made of plain fabric composed of successively knit transversely extending courses of regular stitches or needle loops, disposed in longitudinally extending parallel rows, termed "needle wales", which alternate, transversely of the fabric, with parallel rows of loops formed by the sinkers of the machine, which are commonly termed "sinker wales".

The breaking of a stitch of any course in a needle wale will cause the interknit stitches of the preceding course to be dropped, whereupon the dropping of stitches will progress along the needle wale in which the broken stitch occurs in a direction toward the initial course, that is, in a direction reverse to that of the knitting of the succeeding courses, producing a "runner" or "ladder" in the fabric.

A broken sinker loop occurring at any course in a sinker wale will drop the interknit sinker loop of the succeeding course, whereupon the dropping of sinker loops will progress in a direction away from the initial course, i. e. in the direction of knitting of the succeeding courses.

The initial course in flat full fashioned hosiery is usually located at the top or welt of the finished stocking, hence, the breaking of a stitch in a needle wale in some part of the leg of the stocking will cause the resultant dropping of stitches to progress toward the welt, while the breaking of a loop in a sinker wale will cause the resultant dropping of sinker loops to progress downwardly toward and into the foot of the stocking.

The objects of the present invention are to produce stockings in a variety of different ornamented forms having substantially the same run-resist characteristics; and to arrange special stitches, such as tuck stitches, with plain or other than tuck stitches in such manner as to reduce to a minimum the time required to knit stockings having desirable run-resist characteristics, and to enable the same to be readily produced in a wide variety of specifically different appearing stockings as exemplified in the illustrative embodiments illustrated in the accompanying drawings, in which:

Fig. 1 illustrates diagrammatically, a flat knit full fashioned stocking composed of fabric made in accordance with the principles of the present invention, with a plain knit welt or top portion, a plain knit foot portion, and a body portion including ornamental run-stop or barrier areas having tuck stitches arranged in a manner to ornament the stocking and to cooperate with regular stitches in resisting runs substantially throughout the extent of the stocking while presenting a predetermined ornamental effect;

Fig. 2 is a fragmentary view of a piece of the fabric shown in Fig. 1, illustrating diagrammatically the stitch formation;

Fig. 3 is a view similar to Fig. 2, but showing a different arrangement of the tuck stitches by which a corresponding anti-run effect is obtained while presenting a different design effect; and

Fig. 4 discloses still another variation in the arrangement of the tuck stitches while maintaining the anti-run feature of the invention.

The fabric shown in Fig. 2, which is an enlargement in stitch diagram form of a piece of the fabric of the stocking shown in Fig. 1 having the present fan-shaped ornamental run-stop or barrier areas incorporated therein, comprises a plurality of successively formed courses 1, 2, 3, 4, 5, 6, etc. produced in the order of their numbering.

The loops of which the said courses are formed are disposed in longitudinally extending parallel rows comprising needle wales 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, etc., which alternate with sinker wales 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, etc.

At predetermined intervals in predetermined needle wales, for example in needle wale 10, are formed tuck stitches T, T, each of which includes a relatively elongated needle loop T^1 originating in one course, for example course 1, and held on its needle during the formation of the next course 2, in which a loop T^2 is formed on the same needle, the held loop T^1 and loop T^2 being subsequently interknit with and locked by a regular stitch R formed in a succeeding course, in the present instance course 3 as shown in Fig. 2, and which due to the tension of the held loop T^1 becomes slightly elongated. Interknit with the elongated regular stitch R of the course 3 is a normal sized regular stitch *r* in course 4. Course 5 corresponds to course 1 and starts a repeat of the cycle described above in regard to courses 1 to 4.

In needle wale 14 a cycle begins in course 3 and is repeated along the wale in substantially the same manner as described, while in the needle wale 18 a cycle begins in course 1, the same as in wale 10. Between each pair of needle wales containing tuck stitches is a needle wale composed entirely of plain regular normal sized slip loop stitches *r*, such as illustrated in needle wales 8, 12, 16, etc. With this arrangement the tuck stitches are staggered both longitudinally and

transversely of the fabric and each tuck stitch is completely surrounded by regular stitches, which gives the fan-like design effect shown in Fig. 1.

In each instance the stitches of adjacent needle wales are connected by the sinker loops *s* of the intervening sinker wales **9**, **11**, **13**, etc. with the exception of those points at which loops T^2 are formed, wherein a loop T^2 at its opposite ends connects with the needle loops of the needle wales disposed immediately adjacent the opposite sides respectively of the needle wale in which the loop T^2 is formed.

A break occurring in any sinker loop *s* at any point in a sinker wale and running in the direction of knitting will, at the most, progress through but three courses, being arrested when the runner advances to a course in which an elongated loop occurs, thus any runner starting at any point in any sinker wale will be prevented from running down the stocking beyond the tuck stitch of which the said tuck loop forms a part.

Should a loop T^2 break no runner would ensue, due to the interknitting of the associated held loop T^1 of the preceding course with the locking stitch R of the succeeding course, and as these loops T^2 are not connected or interknit with the sinker loops *s* of the said preceding and succeeding courses it will be clear, upon referring to Fig. 2, that no runner will develop in the sinker wale at either side of the needle wale in which the broken loop occurs.

A broken stitch in a needle wale, however, would permit a runner to advance upward through the stocking along the needle wale in which the broken stitch occurs.

The fabric as described above and as shown in Figs. 1 and 2 of the drawings is capable of being produced on a regular flat full fashioned hosiery knitting machine with but slight adjustment of certain of the elements thereof.

For example, by providing the regular stitch transfer bar with points arranged to bear against predetermined needles, for instance the needles producing the stitches of needle wales **10**, **18**, **26**, etc. in course **1**, to flex the needles away from the presser bar as the needles descend to cast their loops, the beards of the needles engaged by the said points will be prevented from closing, thus the loops on the shanks of these needles will slide up under the open beards as the needles descend and be held on the needles to produce the held loops T^1 while the intermediate unflexed needles will cast their stitches in the usual manner to produce the adjacent regular stitches R or *r* of the intermediate needle wales **12**, **14**, **16**, **20**, **22**, **24**, etc.

As an alternative arrangement the stitch transfer bar may be equipped with any desired form of needle covering points that will prevent the stitches from being cast off the needles.

In the formation of course **2**, the needle flexing or covering points are not effective, thus all the needles cast their stitches in the regular manner, thus the needles producing the stitches of needle wales **10**, **18**, **26**, etc. will cast the held loops T^1 and the loops T^2 to provide the tuck stiches T.

Prior to the casting of the loops comprising course **3**, the needle flexing or covering points are shogged laterally into alignment with the needles producing the stitches of needle wales **14**, **22**, etc., consequently the loops on such needles are held until the casting of all the loops constituting course **4**, whereupon the held loops T^1 and loops T^2 will be cast off their needles.

For the formation of the loops comprising course **5**, the points are again shogged back into alignment with the needles producing the stitches of needle wales **10**, **18**, **26**, etc. for a repeat of the cycle.

In the fabric shown in Fig. 3 the same general operation as above described is effected, the only difference being that the needle-engaging points are aligned with alternate needles to hold the stitches on half the number of needles during the casting of stitches from the other half of the needles in one course and in the next course the points are shogged laterally into alignment with the needles that had cast their stitches in the preceding course, so that during the formation of one course half the needles hold their loops while the other half cast their loops and during the formation of the next course the needles that had cast their loops in the preceding course are caused to hold their loops while the other half of the needles cast not only the loops held from the preceding course but also the loops formed in the course being produced.

In this manner when the needles operate to cast the stitches comprising course *1a*, Fig. 3, the needles producing wales *10a*, *14a*, *18a*, etc. hold their loops T^1, T^1, while the needles producing needle wales *12a*, *16a*, *20a*, cast the loops T^1 which they held from the preceding course and the loops T^2, T^2, formed in the course *1a*.

During the formation of the stitches of course *2a*, the needles forming the stitches of wales *12a*, *16a*, *20a* are caused to hold their stitches while the needles forming the stitches of the wales *10a*, *14a*, *18a* cast the stitches T^1, T^1 held from the course *1a* and the loops T^2, T^2 produced by the second feeding of yarn to the needles that are holding the stitches from the course *1a*.

In this manner a fabric is produced which consists solely of tuck stitches in staggered relation to each other throughout the fabric longitudinally and transversely thereof, by which a different design effect is obtained, and in which a broken thread will not produce a runner downwardly in the fabric, as no interknitting of sinker wales exists.

In Fig. 4 the fabrics of either Fig. 2 or Fig. 3 or some other predetermined arrangement of tuck stitches, with or without regular stitches, are formed in blocks B which alternate longitudinally and transversely of the fabric with blocks B^1 composed entirely of regular normal sized stitches, thus a runner starting in the regular stitches of any of the blocks B^1 will be arrested upon entering one of the blocks B containing the tuck stitches.

This fabric, like those shown in Figs. 2 and 3, is made on a flat machine with needle-engaging points for holding the stitches on predetermined needles within the tuck stitch blocks B. After a predetermined number of courses are formed, depending upon the longitudinal measurement of the blocks B, the bar on which the needle-engaging points are mounted is shifted laterally a distance equal to the width of the blocks to bring the needle-engaging points into alignments with the needles that have been producing the regular stitches of the blocks B^1.

Of course, the novel fabric and stocking specifically shown and described can be changed and modified in various ways without departing from

the invention herein disclosed and hereinafter claimed.

I claim:

A full-fashioned knitted stocking including a leg and a foot, substantially the entire leg thereof being rendered impervious to the development of sinker wale runs of appreciable length by tuck stitches distributed substantially throughout said leg in alternate wales only and arranged in both coursewise and walewise alternation with other than tuck stitches.

GUSTAV GASTRICH.