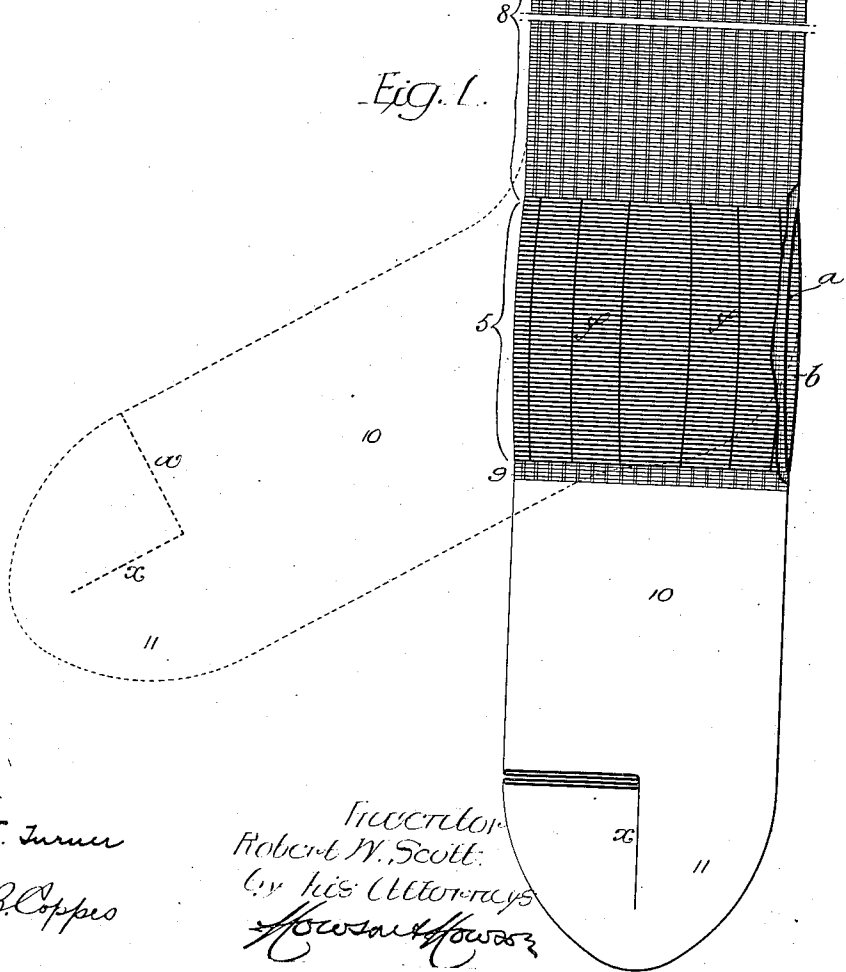
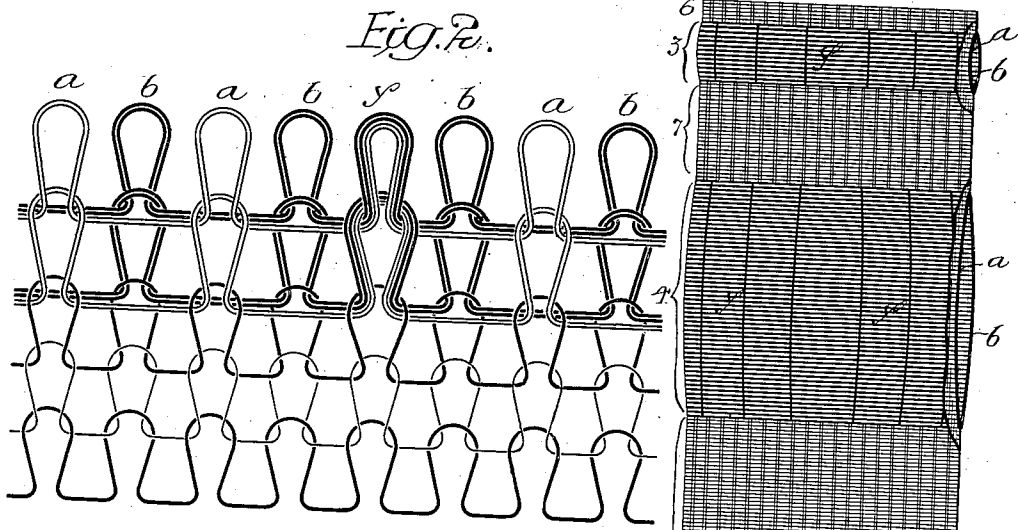


R. W. SCOTT.
 KNITTED FABRIC AND HOSIERY MADE THEREFROM.
 APPLICATION FILED SEPT. 22, 1905.

1,018,134.

Patented Feb. 20, 1912.



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UNITED STATES PATENT OFFICE.

ROBERT W. SCOTT, OF LEEDS POINT, NEW JERSEY, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO SCOTT & WILLIAMS, INCORPORATED, OF CAMDEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

KNITTED FABRIC AND HOSIERY MADE THEREFROM.

1,018,134.

Specification of Letters Patent. Patented Feb. 20, 1912.

Application filed September 22, 1905. Serial No. 279,635.

To all whom it may concern:

Be it known that I, ROBERT W. SCOTT, a citizen of the United States, residing in Leeds Point, New Jersey, have invented certain Improvements in Knitted Fabrics and in Hosiery Made Therefrom, of which the following is a specification.

The object of my invention is to produce hosiery having, as to certain portions, better wearing properties than previous forms of hosiery with which I am familiar, my invention also comprising a novel form of knitted web intended for the production of such hosiery.

In the accompanying drawings; Figure 1, represents a stocking web made in accordance with my invention; and Fig. 2, shows an exaggerated view of the stitches in that portion of the knitted web to which my invention particularly relates.

The novel features of my invention are restricted to the heel and knee portions of the stocking, and to what I term a "garter band" at the top of the stocking, this garter band being intended for the attachment of the garters or hose supporters commonly used.

In carrying out my invention I first produce, upon a machine having two independent sets of needles and corresponding cams and yarn guides so disposed that they are capable of either joint or independent operation, a tubular web comprising in alternation, ordinary rib fabric and what I term "bi-knit" fabric.

By the term "bi-knit fabric" I mean two independent single webs, preferably united at intervals. The compound ribbed and bi-knit web is produced in definite lengths and afterward cut into sections, each of a proper length for the leg of the stocking, and each comprising, by preference three lengths 3, 4 and 5, of bi-knit fabric, and four lengths 6, 7, 8 and 9, of ribbed fabric, the stitches of the ribbed fabric 9 being then applied to the needles of a separate machine calculated for the production of single fabric and by preference having a less number of needles than the stitches of the ribbed fabric thus applied, so that certain of said needles receive a plurality of said stitches. Upon this second machine is then knit the foot 10 and toe 11 of the stocking, the toe being, by preference, of the character known to the

trade as a seamless toe, that is to say, a toe produced by means of a bag or pocket resulting from knitting back and forth upon a certain number of needles of the footing machine, first narrowing and then widening, so as to effect a union of the stitches along the line *x*, the stitches cast from these fashioning needles being then united by the ordinary looping machine to the stitches cast from the remaining needles of the machine, so as to form what is practically a seamless union along the line *w*, thereby effecting the closing of the toe.

Fig. 1, shows the web in the condition in which it leaves the footing machine, the dotted lines showing the web after the toe has been closed and the stocking has been "boarded" and pressed so as to turn the foot web to the proper angle in respect to the leg. Such formation of a foot with seamless toe is common in ordinary practice, and hence need not be further referred to, my invention relating specifically to the formation of the leg and heel web, which is accomplished in the following manner:

Assuming that in the first place rib knitted fabric 6 is being produced upon both sets of needles with a multiple yarn feed, a garter band 3 is first produced by causing independent instead of coöperative operation of the two sets of needles, that is to say, the yarn from one or more of the yarn guides is caused to form stitches upon one set of needles and the yarn from the other guide or guides is caused to produce stitches upon the other set of needles, this result being effected by a change in the operation of the cams whereby the needles are reciprocated in the manner set forth in the patent of D. C. Bellis, No. 714,998, dated Dec. 2, 1902, certain of the needles of one set being caused to receive yarn from the guides which normally feed the needles of the other set, as explained in said patent, the result being the production of two independent single fabrics *a* and *b*, which are united or tied together at intervals *y* by yarn of one fabric engaging with the other fabric. If, however, stitches of the same character are used in knitting both the ribbed and bi-knit portions of the web, the latter will not possess the same degree of elasticity as the ribbed portions, hence I prefer to draw longer or coarser stitches in the bi-knit fabrics than

in the ribbed fabrics, thereby permitting said bi-knit fabrics to stretch to an extent equaling or approaching the capacity of the ribbed fabric and thus preventing excessive strain upon the stitches composing said bi-knit fabric. This formation of longer or coarser stitches in the "bi-knit" fabrics also permits me to use coarser or heavier yarns in either or both of said "bi-knit" fabrics than in the ribbed fabric, thereby producing a bi-knit fabric having better wearing qualities than the ribbed fabric, such increase in size or weight of the yarns being preferably effected by adding an additional strand or strands to the yarns in changing from rib fabric to bi-knit fabric.

Having completed the production of a length of "bi-knit" fabric 3 sufficient for the garter band I now remove the reinforcing or thickening strands of yarn and resume the production of rib knitted fabric, which is continued for a length sufficient to form the top 7 of the stocking, and when this has been completed I resume the production of bi-knit fabric with heavier yarn and coarser stitches until a length sufficient for the knee portion 4 of the stocking has been produced, whereupon the thickening yarns are again removed, the stitches again shortened, and ribbed fabric for the production of the leg portion 8 of the stocking is knitted. When this has been completed bi-knit fabric of the character before described is produced of a length sufficient for the heel portion 5 of the stocking, and a short length of rib fabric 9 is then knitted prior to the resumption of bi-knit web for another garter band. The web of fabric thus produced is then severed through the short ribbed sections close to the garter band and heel and the stitches of the ribbed fabric 9 are transferred to the needles of the footing machine, doubling up of stitches being resorted to because of the lesser number of needles in said footing machine, and the surplus stitches being raveled back in order to form a clean line of union between the two fabrics.

The knitting of the foot portion 10 and toe pocket 11 upon the footing machine and the closing of said toe on the line *w* completes the formation of the stocking web shown in Fig. 1.

The garter band 3 of the stocking provides a strong and substantial web for the attachment of the usual hose supporter which web is not so susceptible to injury as the ordinary ribbed web.

The bi-knit knee section 4 of the stocking, being a double web containing a greater number of strands of yarn than the ribbed portion of the stocking is, consequently, better enabled to resist wear than such ordinary ribbed fabric, and the same is true of the heel band 5 of the stocking, and in ad-

dition to the wear-resisting quality due to these features of construction, the stocking is, because of the fact that the bi-knit knee and heel portions of the same extend completely around it, not subject to the same limitations in use as an ordinary stocking, for it will be apparent that it is immaterial which part of the web constitutes the front of the knee or the back of the heel, which are the parts most subject to wear, hence my improved stocking can be turned or shifted in position so as to bring different portions of the web successively into position at the front of the knee or back of the heel, the toe of the stocking being practically the same in all portions and hence lending itself perfectly to such change of position. This, however, is not essential to the broader embodiment of my invention.

The importance of using what I term bi-knit fabric in the knee and heel bands of the stocking will be understood when it is borne in mind that it would be impossible to increase to the extent which is advisable, the thickness or number of strands in the knitting yarn if rib knitting was continued throughout the entire stocking, as the needles thus employed in rib knitting would be overloaded, whereas when the needles are independently operated such objection is not encountered.

In Fig. 2 of the drawing, I have shown in the ribbed portion of the fabric successive light and dark courses, and have shown one portion of the bi-knit web as composed of dark stitches and the other of light stitches, in order to indicate from the drawing itself that a plurality of yarn guides have been employed, but it will be evident that this is simply for purposes of illustration and that in practice the stocking may be composed of courses of the same color or shade throughout, or the ribbed portion of the stocking may, if desired, be knit with a single yarn guide and an additional yarn guide may be brought into operation in producing the bi-knit fabric but even in such case a heavier yarn or greater number of strands of yarn is preferably employed in one or both of the guides used in producing said bi-knit fabric, and longer stitches will be drawn in said fabric than in the ribbed fabric in order to impart to it the needed increase in diameter to enable it to stretch to the same extent as the ribbed fabric.

Having thus described my invention, I claim and desire to secure by Letters Patent:—

1. A stocking having a leg portion knitted in rib stitch, a heel band knitted in separate plain webs, and a foot portion consisting of a plain web joining a rib course at the front of the bi-knit heel band, substantially as specified.

2. A stocking having a leg portion

knitted in rib stitch, a heel band knitted in separate plain webs, and a foot portion consisting of a plain web joining a rib course at the front of the bi-knit heel band and
5 having a seamless toe, substantially as specified.

3. A stocking having a leg portion knitted in rib stitch, a knee band knitted in separate plain webs, a heel band also
10 knitted in separate plain webs, and a foot consisting of a plain web united to the ribbed fabric at the front of the heel band, substantially as specified.

4. A stocking having a leg portion
15 knitted in rib stitch, a knee band knitted in separate plain webs, a heel band also knitted in separate plain webs, and a foot consisting of a plain web united to the ribbed fabric at the front of the heel band, and
20 having a seamless toe, substantially as specified.

5. A stocking having a leg portion knitted in rib stitch and a heel band knitted in separate plain webs, extending completely
25 around the stocking, substantially as specified.

6. A stocking having a leg portion knitted in rib stitch, a heel band knitted in separate plain webs, extending completely
30 around the stocking, and a foot portion consisting of a plain web, substantially as specified.

7. A stocking having a leg portion knitted in rib stitch, a heel band knitted in separate plain webs, extending completely
35 around the stocking, and a foot portion consisting of a plain web joining a rib course at the front of the bi-knit heel band, substantially as specified.

8. A stocking having a leg portion
40 knitted in rib stitch, a heel band knitted in separate plain webs, extending completely around the stocking, and a foot portion consisting of a plain web having a seamless toe thereon, substantially as specified.

9. A stocking having a leg portion
45 knitted in rib stitch, a heel band knitted in separate plain webs, extending completely around the stocking, and a foot portion consisting of a plain web joining a rib course
50 at the front of the bi-knit heel band and having a seamless toe, substantially as specified.

10. A stocking having a leg portion knitted in rib stitch, a knee band knitted in separate plain webs extending completely
55 around the stocking, a heel band also knitted in separate plain webs extending completely around the stocking, and a foot consisting of a plain web united to the
60 ribbed fabric at the front of the heel band, substantially as specified.

11. A stocking having a leg portion knitted in rib stitch, a knee band knitted in separate plain webs extending completely
65 around the stocking, a heel band also knitted in separate plain webs extending completely around the stocking, and a foot consisting of a plain web united to the ribbed fabric at the front of the heel band, and hav-
70 ing a seamless toe, substantially as specified.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ROBERT W. SCOTT.

Witnesses:

WALTER CHISM,
JOS. H. KLEIN.