

R. W. SCOTT.
KNITTED WEB, HOSIERY, AND MODE OF MAKING SAME.
APPLICATION FILED JUNE 6, 1906.

974,302.

Patented Nov. 1, 1910.

2 SHEETS-SHEET 1.

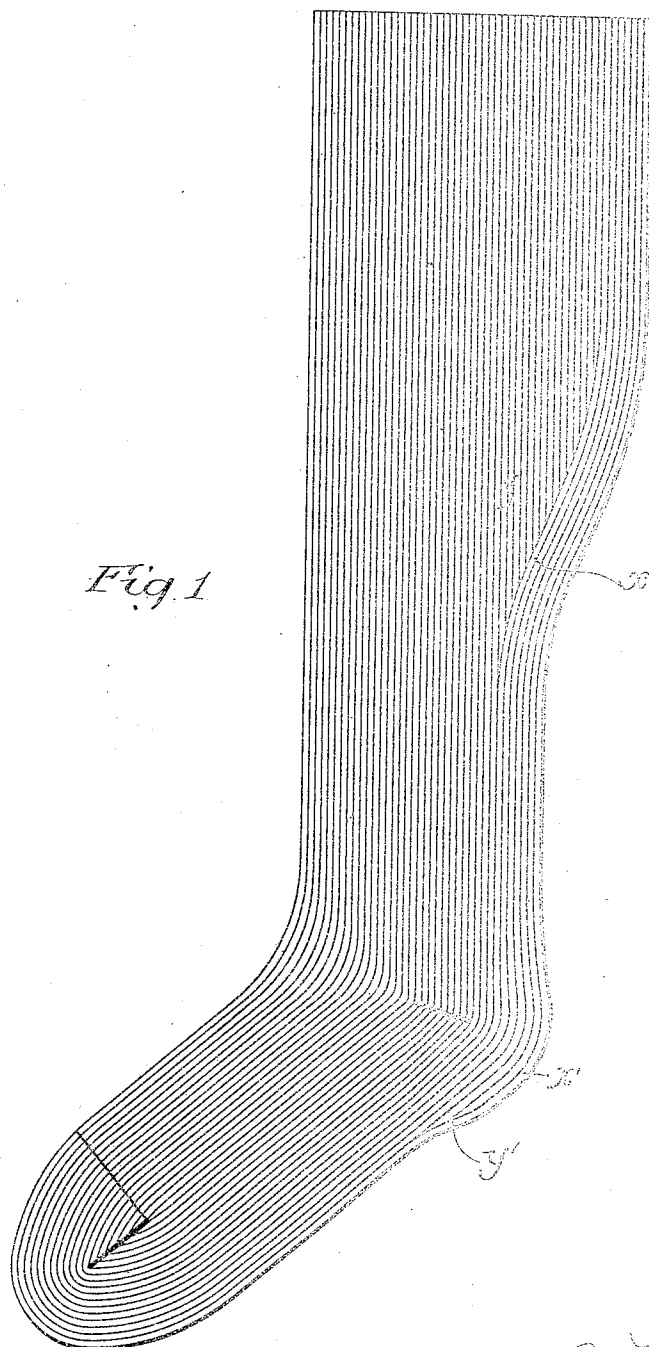


Fig. 1

Witnesses
Hamilton D. Zinner
Kate A. Beadle.

Inventor
Robert W. Scott
by his Attorneys
Smith & Tracy

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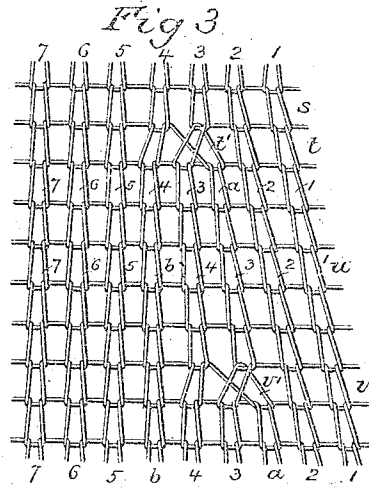
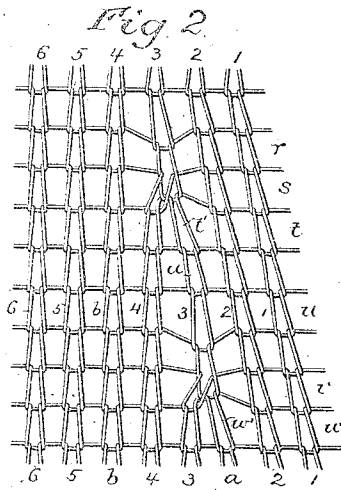
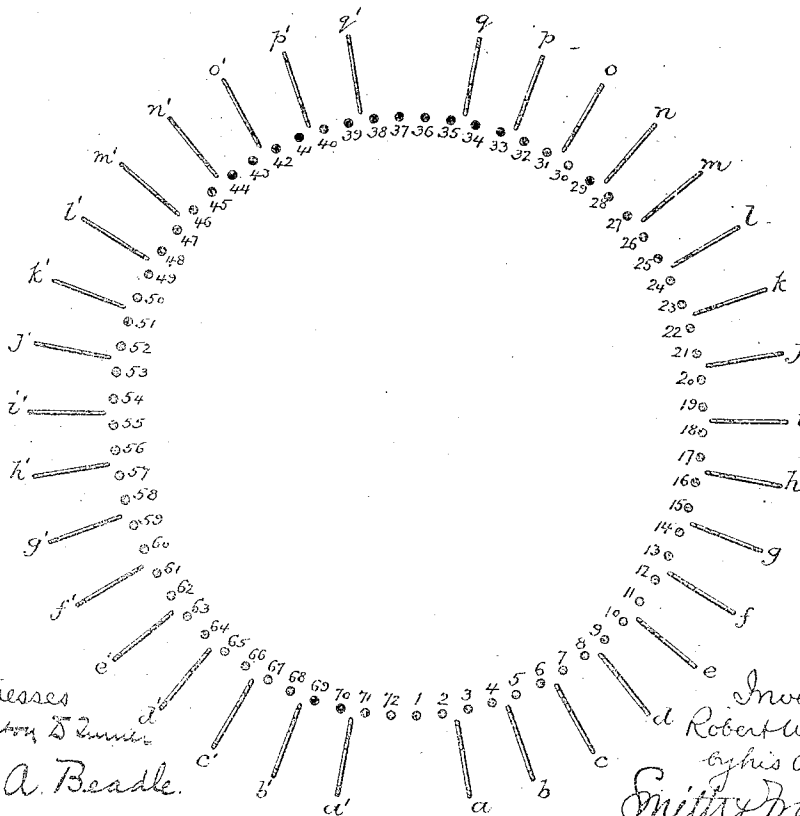


Fig. 4



Witnesses
Hammett D. Smith
Kate A. Beadle.

Inventor
Robert W. Scott
by his Attorney
Smith & Poyer

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 WEB, HOSIERY, AND MODE OF MAKING SAME.

974,302.

Specification of Letters Patent.

Patented Nov. 1, 1910.

Application filed June 8, 1906. Serial No. 320,407.

To all whom it may concern:

Be it known that I, ROBERT W. SCOTT, a citizen of the United States, residing in Leeds Point, Atlantic county, New Jersey, have invented certain Improvements in Knitted Webs, Hosiery, and Modes of Making Same, of which the following is a specification.

The object of my invention is to produce a stocking having a seamless heel and toe and a seamless leg with shaped calf portion having a band resembling the bordering wales, which are presented in the calf portion of a stocking made from a flat fashioned web, my improved stocking being also provided, if desired, with gussets, whereby the instep portion of the stocking may be wider than the foot portion. Certain features of my invention are also applicable to the production of seamless tubular webs having shaped portions with an equivalent for the usual bordering wales, and intended for other purposes than the manufacture of stockings.

In the accompanying drawings:—Figure 1 is a view of sufficient of a stocking to illustrate my present invention, the wales of stitches being represented by single lines; Fig. 2 is an exaggerated view of part of the web, illustrating one method of fashioning the same. Fig. 3 is a similar view, illustrating another method of effecting such fashioning operation, and Fig. 4 is a diagrammatic view representing the arrangement of needles in a knitting machine devised for the carrying out of my invention.

Referring in the first instance to Fig. 4 of the drawing, the small circles numbered from 1 to 72 inclusive, represent the cylinder needles of a circular knitting machine, provided with means for knitting seamless heel and toe pockets, and the letters from *a* to *g* and from *a'* to *g'* inclusive, represent fashioning needles which operate in an annular dial surrounding the cylinder above the top of the same, whereby these needles draw stitches in the same direction as the cylinder needles, and hence produce a plain web, the machine in this respect being distinct from one of the rib type, in which the dial needles are located on the inside of the cylinder and draw stitches in a direction op-

posite to that in which the stitches are drawn by the cylinder needles. Supposing that a stocking is being knitted upon a machine of this character, the knitting begins at the toe portion of the stocking with the cylinder needles only in operation, the first step being to form a few courses of stitches upon all of the cylinder needles, then to throw one-half of said needles, say for instance those from 19 to 54, inclusive, out of operation while permitting them to retain the loops of stitches formed upon them, to-and-fro knitting being then resorted to upon the remaining needles and the web being fashioned by first narrowing and then widening upon the end needles of the set in the well known manner to produce a seamless pocket; which being completed, the needles from 19 to 54 are brought into action and tubular web for the foot of the stocking is produced, this operation continuing until it is desired to introduce gussets for widening the instep portion of the stocking. The stocking has widening wales *y* for shaping the calf portion of the stocking and other widening wales *y'* forming gussets in the foot portion, and outside of the widening wales *y* in the calf is a band *x*, and outside of the widening wales *y'* a narrower band *x'*, each of these bands consisting of a series or group of continuous parallel wales which resemble the bordering wales formed on the edges of the flat web from which the ordinary full fashioned stocking is made, consequently, although in my improved stocking the wales comprising the bands *x* and *x'* are part of a continuous tubular web and not wales on the borders or edges of a flat web, I have, for convenience, referred to these groups of continuous parallel wales constituting said bands *x* and *x'* as bordering wales, which they are in the sense that they border the widenings whereby the shaping of the calf is effected and the instep gussets are produced. The needles upon which the gusset wales are formed are those indicated at *a*, *b*, *a'* and *b'*, the needles from *c* to *g* and *c'* to *g'* inclusive, being those which form the widening wales in the calf portion of the leg of the stocking. The cylinder needles 1, 2, 71, and 72 are those upon which the bordering wales *x'* are produced, and the cylin-

der needles 1 to 6 *a*, *b*, 67 to 72 and *a'*, *b'* are those upon which the bordering wales *w* are produced, the needles from 7 to 66, inclusive, being standing wale needles. The needles *a*, *b* produce the gusset wales on one side of the foot of the stocking, and the needles *a'* and *b'* produce said gusset wales on the other side of the foot, hence a description of the operation as conducted upon the needles *a* and *b* will be sufficient.

Supposing that the foot tube has been knitted as far as the course *s* in Fig. 2, the needle *a* adjoining the bordering wale needle 2 is first caused to engage a stitch of wale 3 in course *r* which precedes course *s*, and in forming course *t* said needle *a* receives the knitting yarn and draws a stitch *v'* in said course *t*, thus widening said course to the extent of one wale. After any desired number of courses have been knitted including needle *a*, the stitch is transferred from the latter onto needle 3, from said needle 3 to needle 4, and from the latter to needle *b*, the latter thus carrying the extra wale of the course, and the needle *a* being left empty. This operation may take place say at course *u*. When another wale is to be introduced, say after the formation of course *v*, the needle *a* is again caused to engage a stitch in wale 3, but in the course preceding course *v*, and, in the formation of course *w*, said needle *a* receives the knitting yarn and draws the stitch *w'* in said course, the fabric being thereby widened to the extent of two wales. The formation of the seamless heel of the stocking is then proceeded with by throwing out of action the needles from 19 to 54 but permitting them to retain their stitches and knitting to and fro upon the needles from 1 to 18, from 55 to 72, and upon the needles *a*, *b*, and *a'*, *b'*, first narrowing and then widening upon any desired number of end needles of the set, until the desired heel pocket has been produced, whereupon the needles from 19 to 54 are again put into action, and the production of tubular web for the ankle portion of the stocking is proceeded with. When it is desired to widen the tube for the calf portion of the stocking the same operations as those before resorted to for the production of the gusset wales are repeated in connection with needles *c* to *g* and *c'* to *g'*, the needle *c* being first introduced in the same manner as before described in connection with the needle *a* to form the first widening wale, which, after the desired number of courses has been knit, is transferred from the needle *c* to the needle 7, the stitch on the latter being transferred to the needle 8, and from the latter to the needle *d*, the latter thus receiving the extra wale and the needle *c* being left empty. For the second widening, the needle *c* is introduced to form the extra wale and

the stitches are then transferred, as follows: From *c* to 7, 7 to 8, 8 to *d*, *d* to 9, 9 to 10, and 10 to *e*, the latter thus receiving the extra wale, and the needle *c* again being left empty, and these operations are repeated in introducing the successive wales, the transfer of stitches on the next operation extending to the needle *f*, and on the final operation to the needle *g*, the needle *c* on introducing the fifteenth widening wale retaining the same and knitting being conducted upon all of the needles for the formation of the leg portion of the stocking.

In producing a web of the character shown in Fig. 3, a somewhat different method of operation is resorted to. Supposing that the last course *s* of the narrow web for the foot tube has been produced, primary widening needle *a* receives yarn in knitting the next course *t*, although it is, by preference, introduced between the first two standing wale needles 3 and 4 instead of between the outermost standing wale needle 3 and the adjoining bordering wale needle 2, in order that it may cross its stitch with that of the wale 3, as shown at *t'*, in Fig. 3, and thus prevent the formation of an eyelet hole. After the desired number of courses have been knitted stitches are transferred from *a* to 3, 3 to 4, and 4 to *b*, (in course *u* for example) leaving needle *a* empty for the production of a new wale *v'* at the next widening course *v*.

By the above described operations I am enabled to produce a stocking having a seamless leg and foot, seamless heel and toe pockets, and shaped calf and gussets having bordering wales, and therefore presenting the same appearance as the corresponding portions of what is termed a "full fashioned" stocking, the number of gusset-bordering wales being less than the number of bordering wales in the shaped calf.

The use of one leg-fashioning needle for every two cylinder needles is preferred, because it is the customary practice in knitting women's stockings to narrow the web to the extent of one-third of the number of wales contained therein. It will be evident, however, that more or less of these leg-fashioning dial needles may be employed without departing from the essential features of my invention, and the number of gusseting needles may also be varied in like manner, but these gusseting needles should never extend beyond the bounds of the central group of cylinder needles which are always in action in knitting the heel, otherwise they would interfere with the fashioning of said heel.

While I have shown my invention as embodied in the production of a stocking, and while I especially claim this product, my invention may also be adopted in the manu-

facture of shaped, tubular, seamless webs, with bordering wales on the shaped portions, and intended for other purposes than stockings, for instance, for making the legs of drawers, the sleeves of shirts, and the like.

The number and disposition of the needles shown in the drawing are purely arbitrary, and the operative machine will have a greater number of needles in each set than are here shown.

I claim:—

1. A shaped, seamless, tubular web having bordering wales and widening wales, each of the latter being introduced alongside of the innermost of the bordering wales, and having a closely drawn primary loop or stitch.

2. A machine-knit stocking having a seamless foot, seamless heel and toe pockets, and gussets adjoining the front of the heel pockets, and consisting of widening wales, each introduced alongside of the innermost of a series of bordering wales.

3. A machine-knit stocking having a seamless leg, with shaped calf having bordering wales, and widening wales introduced alongside of the innermost of the bordering wales, and each having a closely drawn primary loop or stitch.

4. A machine-knit stocking having a seamless leg, with shaped calf having bordering wales, a seamless heel, and widening wales introduced alongside of the innermost of the bordering wales and each having a closely drawn primary loop or stitch.

5. A machine-knit stocking having seamless leg and foot, seamless heel and toe pockets, a shaped calf with bordering wales, and widening wales introduced alongside of the innermost of the bordering wales and each having a closely drawn primary loop or stitch.

6. A machine-knit stocking having a seamless leg and foot, seamless heel and toe pockets, a widened shaped calf with bordering wales, and a gusseted portion with bordering wales, the widening wales for said calf and gusset being introduced alongside of the innermost of the bordering wales.

7. The mode herein described of producing a shaped, seamless, tubular web, said mode consisting in knitting a narrow web upon a series of needles, some of which are employed to knit bordering wales and others of which are operated to knit continuous standing wales, knitting the widening wales upon a second series of needles, starting each widening wale upon a secondary needle adjoining the innermost bordering wale needle

of the first set, and afterward transferring said widening wale to a standing wale needle of the first set and thence to another needle of the widening set.

8. The mode herein described of producing a shaped, seamless, tubular web, said mode consisting in knitting a narrow web upon a series of needles, some of which are employed to knit bordering wales and others of which are operated to knit continuous standing wales, knitting the widening wales upon a second series of needles, starting each widening wale upon the secondary needle adjoining the innermost bordering wale needle of the first set, and afterward transferring said widening wale, by a progressive operation involving needles of each set, to another needle of the widening set.

9. The mode herein described of producing a shaped, seamless, tubular web, said mode consisting in knitting a narrow web upon a series of needles, some of which are employed to knit bordering wales and others of which are operated to knit continuous standing wales, knitting the widening wales upon a second series of needles, starting each widening wale upon the secondary needle adjoining the innermost bordering wale needle of the first set by causing it to engage with a stitch of a course preceding that upon an adjoining standing wale needle, and afterward transferring said widening wale to a standing wale needle of the first set and thence to another needle of the widening set.

10. The mode herein described of producing a shaped, seamless, tubular web, said mode consisting in knitting a narrow web upon a series of needles, some of which are employed to knit bordering wales and others of which are operated to knit continuous standing wales, knitting the widening wales upon a second series of needles, starting each widening wale upon the secondary needle adjoining the innermost bordering wale needle of the first set by causing it to engage with a stitch of a course preceding that upon an adjoining standing wale needle, and afterward transferring said widening wale, by a progressive operation involving needles of each set, to another needle of the widening set.

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

ROBERT W. SCOTT.

Witnesses:

HAMILTON D. TURNER,
KATE A. BEADLE.