

R. W. SCOTT.

SHAPED SEAMLESS HOSIERY AND MODE OF KNITTING SAME.

APPLICATION FILED JUNE 7, 1906.

1,042,152.

Patented Oct. 22, 1912.

2 SHEETS-SHEET 1.

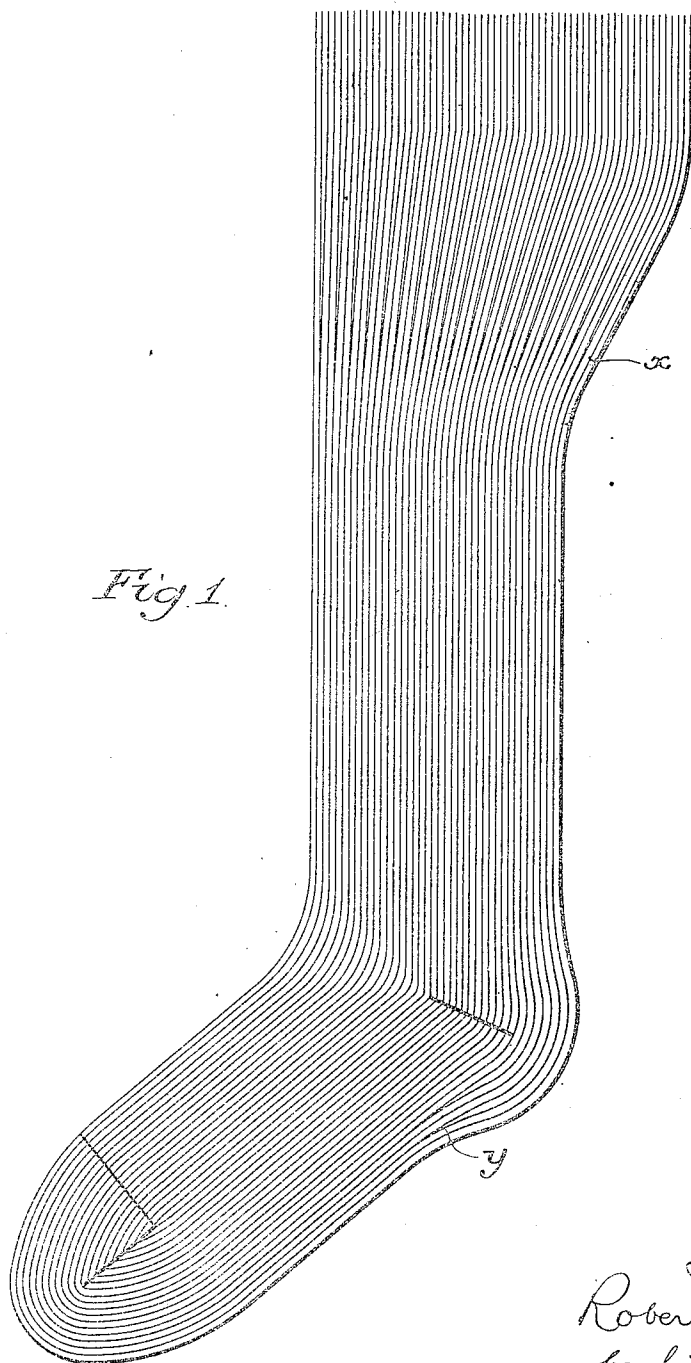


Fig. 1.

Witnesses *Hammett S. Turner*
Kate A. Beasly.

Inventor
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2 SHEETS—SHEET 2.

Fig. 2.

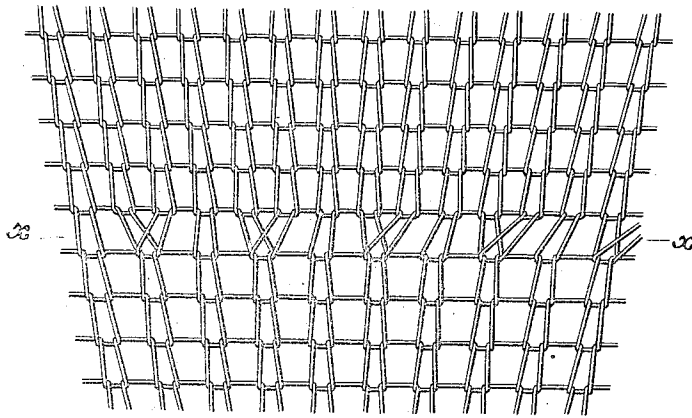
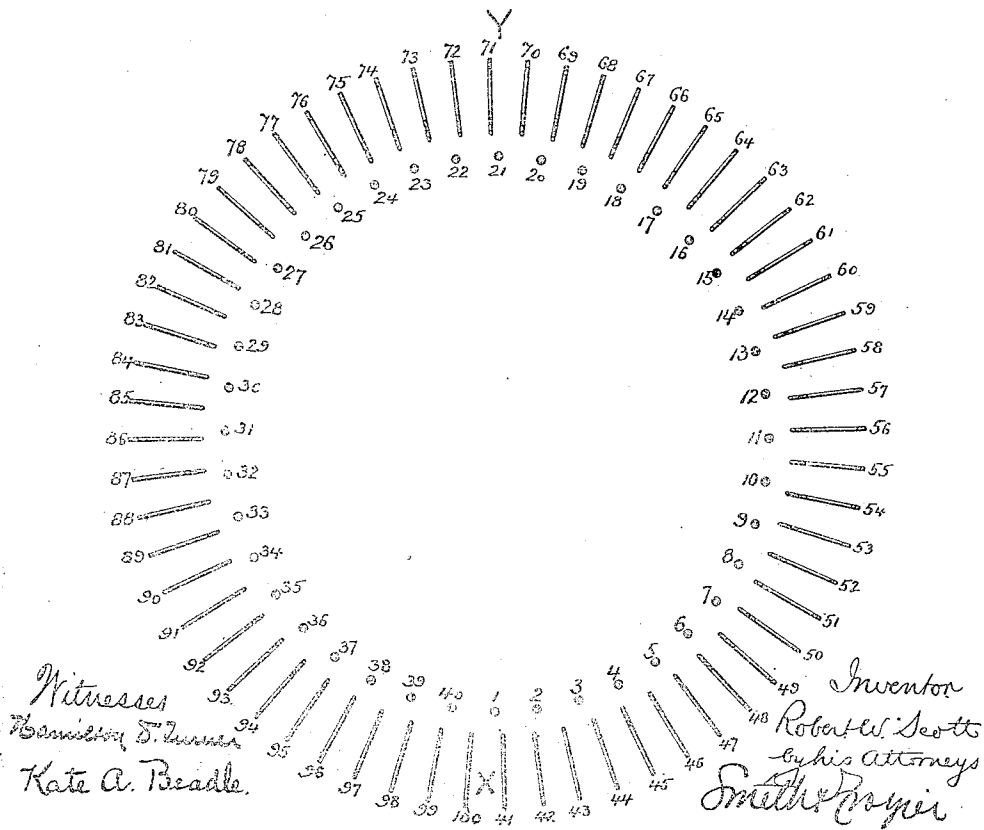


Fig. 3.



UNITED STATES PATENT OFFICE.

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

SHAPED SEAMLESS HOSIERY AND MODE OF KNITTING SAME.

1,042,152.

Specification of Letters Patent.

Patented Oct. 22, 1912.

Application filed June 7, 1906. Serial No. 320,574.

To all whom it may concern:

Be it known that I, ROBERT W. SCOTT, a citizen of the United States, formerly of Leeds Point, New Jersey, but now of Boston, Massachusetts, have invented certain Improvements in Shaped Seamless Hosiery and Mode of Knitting Same, of which the following is a specification.

The object of my invention is to produce a stocking having a seamless heel and toe, a seamless leg with shaped calf portion, and a seamless foot; said stocking being also provided, if desired, with gussets, whereby the instep portion of the stocking may be wider than the foot portion.

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 the method of fashioning the same, and Fig. 3 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. 3 of the drawing, the small circles numbered from 1 to 40, inclusive, represent the cylinder needles of a circular knitting machine equipped with means for forming seamless heel and toe pockets, and the numbers from 41 to 100 inclusive, represent 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.

Supposing that a stocking is being knitted upon a machine of this character, the knitting operation begins at the top of the stocking upon the dial needles, thereby producing a seamless, tubular web having sixty wales of stitches. When the desired length of tubular web for the upper portion of the stocking leg has been completed and it is necessary to decrease the diameter of the tube for the ankle portion, as at *x* in Fig. 1, stitches are transferred from the dial needles to the cylinder needles, but, as there are only two-thirds as many needles in the cylinder as there are in the dial, this transfer is, in part, a straight transfer, that is to say, a transfer of stitches directly from certain of the dial needles to corresponding cylinder needles, and, in part, a doubling transfer,

or transfer of stitches from certain of the dial needles to cylinder needles which have already received stitches from other dial needles, the dial needles being then put out of action.

In making the straight transfer I omit every third dial needle, the remaining dial needles equaling in number the cylinder needles. After this transfer has been effected the doubling transfer is made from the remaining one-third of the dial needles to corresponding cylinder needles, and the knitting of seamless tubular web of small diameter for the ankle and foot tube of the stocking is proceeded with, the formation of seamless heel and toe pockets upon one side of this tube being effected in the usual manner.

If gussets are to be formed in the foot tube so as to reduce the diameter of the same, as compared with the instep portion of the stocking, a somewhat different method is adopted. After transferring stitches from the first two-thirds of the dial needles to corresponding cylinder needles the succeeding doubling transfer of stitches from the remaining dial needles to cylinder needles omits a certain number of said remaining dial needles, for instance those represented at 43, 46, 98, and 95, and these needles are permitted to remain in action with the cylinder needles in knitting the ankle tube and heel, these needles being within the limit of the continuous wales at the rear of the heel, and hence interfering in no way with the desired fashioning operation upon the remaining cylinder needles in producing a seamless heel pocket. After the completion of the heel pocket the stitches are transferred from these remaining dial needles 43, 46, 98 and 95 onto adjoining cylinder needles, thereby narrowing the foot tube as at *y*, in Fig. 1, and the knitting of the foot tube with its seamless toe pocket is then effected upon the cylinder needles only. As an alternative to this method, all of the dial needles from 41 to 46 and from 100 to 95, inclusive, may be permitted to retain their stitches when the original or calf narrowing transfer *x* is being effected, and may be permitted to remain in action during the knitting of the ankle tube and heel, the cylinder needles from 1 to 4 and 40 to 37, inclusive, being out of action at such time, and, when the knitting of the

heel has been completed, transfer of all of the stitches from these remaining dial needles to the cylinder needles may be effected by a straight transfer of stitches from
 5 needles 41, 42, 44, and 45 to cylinder needles 1, 2, 3, and 4, and from needles 95, 96, 98, and 99 to cylinder needles 37, 38, 39, and 40, respectively, this transfer being followed by
 10 a doubling transfer of the stitches from needles 43, 46, 97 and 100 onto the cylinder needles 2, 4, 38, and 40, respectively.

The above method of transfer provides for an abrupt reduction in the diameter of the tube which is being knitted, but if a
 15 tapering reduction is desired, this may be readily effected by making the doubling transfer in a number of successive courses instead of in a single course, for instance, each doubling transfer, instead of involving
 20 the entire number of needles remaining in action when the straight transfer is effected, may involve only a certain fractional number of such needles, or, in extreme cases, may only involve a single needle at a time,
 25 and the angle of reduction can therefore be graduated as desired, both by varying the number of dial needles from which doubling transfer is effected at one operation, or by
 30 knitting any desired number of courses of stitches between successive doubling transfers. In either case the transfer can be effected without stopping the knitting operation, for the machine may be provided with
 35 stitch transfer devices of the character set forth in my Letters Patent No. 834,763, dated October 30th, 1906, and the knitting point may be located at X, Fig. 3, and the transfer point at Y in said figure, each operation being conducted without affecting
 40 the other, whereby, when an abrupt transfer is effected as shown at *x* in Fig. 1, such transfer may be completed in one and the same course of the knitted web and both the wide and narrow webs can be knitted with a
 45 continuous yarn.

It will be evident that the number of

needles which I have represented in the drawing is purely arbitrary, and is in fact, much less than would be employed in practice. I may say, however, that it is preferable to have the number of dial needles 50 per cent. in excess of the number of cylinder needles, because it is the customary practice in knitting women's stockings to narrow the web for the foot and ankle to the extent of 55 one-third of the number of wales contained in the leg portion.

I claim:

1. A machine knit stocking having a seamless leg, a seamless heel, and a seamless foot 60 narrowed by doubling stitches of certain wales onto adjoining wales, said doubling wales being within the limit of the continuous wales at the rear of the heel.

2. The mode herein described of producing a machine knit stocking with a seamless 65 leg having a shaped calf, a seamless heel, and a seamless foot having instep gussets, said mode consisting in first knitting upon a circularly arranged series of needles a tube 70 of a diameter sufficient for the leg of the stocking, transferring the stitches from said needles onto a smaller number of circularly arranged needles partly by straight transfer and partly by doubling transfer, the transfer 75 from some of the first set of needles being effected at one point in the formation of the seamless tube to produce a calf narrowing, and the transfer from the remaining portion of said first set of needles being 80 effected at a subsequent period to produce instep gussets, and knitting a seamless heel upon certain of the needles of both sets between the successive transfers.

In testimony whereof, I have signed my 85 name to this specification, in the presence of two subscribing witnesses.

ROBERT W. SCOTT.

Witnesses:

HAMILTON D. TURNER,
 KATE A. BEADLE.