R. W. SCOTT.

KNIT ARTICLE AND METHOD OF MAKING THE SAME.

APPLICATION FILED JULY 14, 1915.

1,234,703.

Patented July 24, 1917.

2 SHEETS—SHEET 1.

Fig. 1

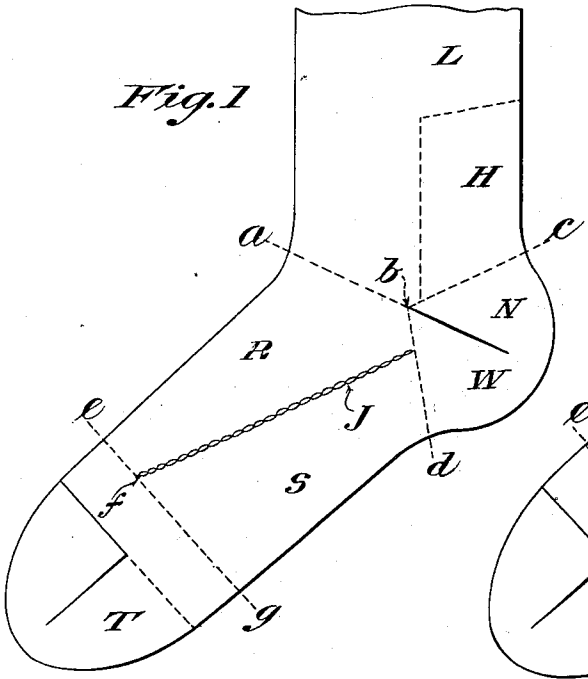
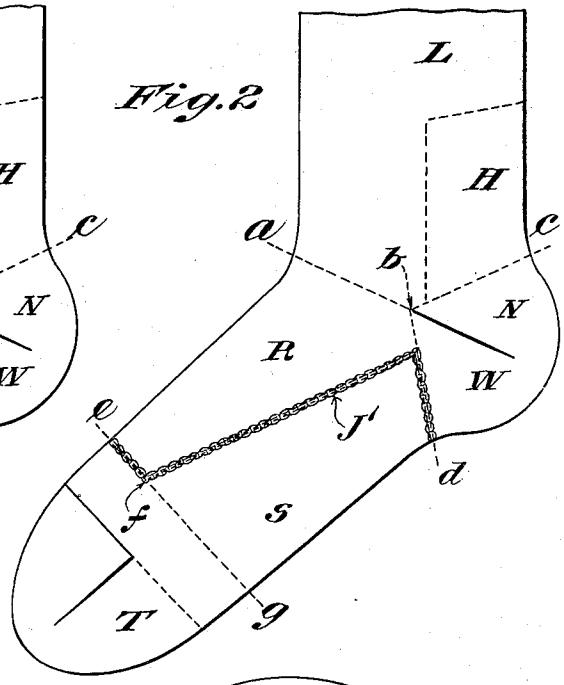


Fig. 2



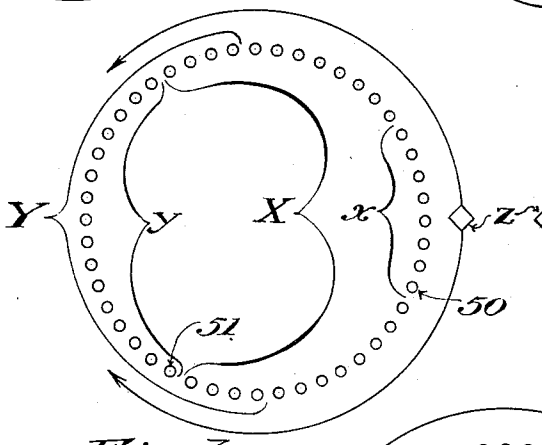


Fig. 3

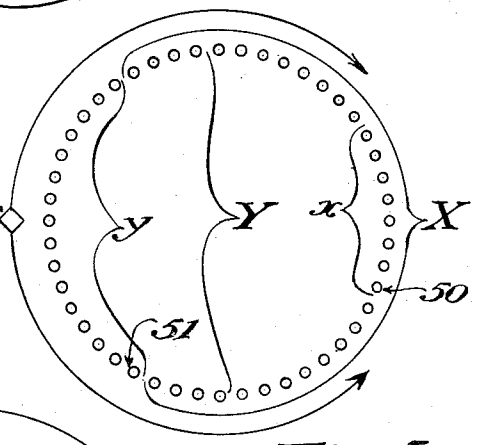


Fig. 5

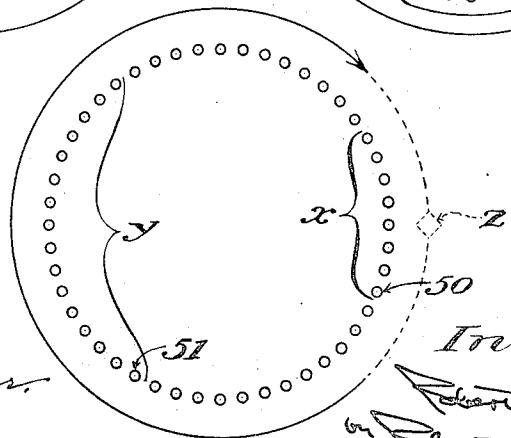


Fig. 4

Witness
M. G. Crozier.

Inventor
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by Robert C. Cline
his Attorney

R. W. SCOTT.

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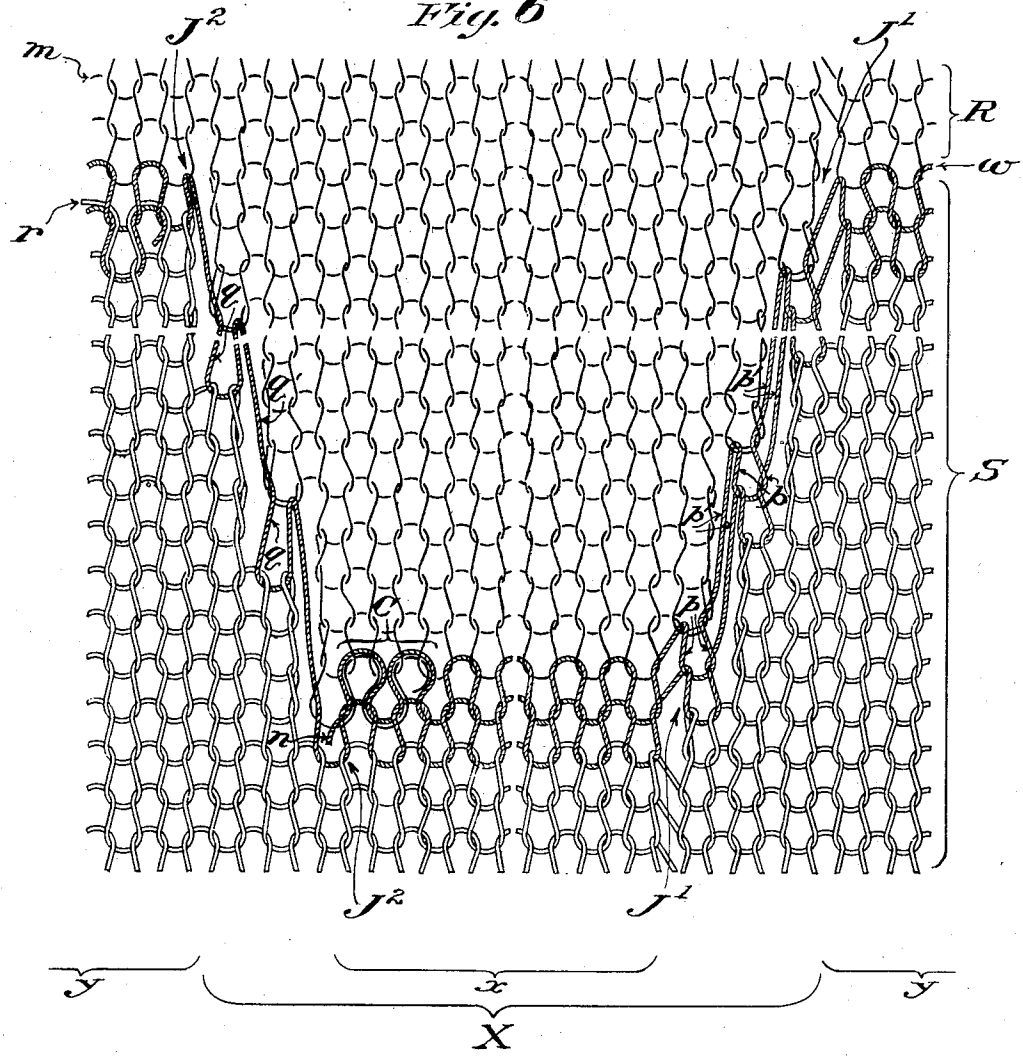
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2 SHEETS—SHEET 2.

Fig. 6



Witness
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UNITED STATES PATENT OFFICE.

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KNIT ARTICLE AND METHOD OF MAKING THE SAME.

1,234,703. Specification of Letters Patent. Patented July 24, 1917.

Application filed July 14, 1915. Serial No. 39,888.

To all whom it may concern:

Be it known that I, ROBERT W. SCOTT, citizen of the United States, and resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Knit Articles and Methods of Making the Same, of which the following is a specification.

My invention relates to knit fabrics and the art of making such fabrics and especially to knit fabrics having a tapered area or areas joined together or to the remainder of the fabric by a suture or interloopment, of the general class disclosed in my application Serial No. 814,480 filed January 26, 1914. (Letters Patent 1,150,548, dated August 17, 1915.)

In the accompanying drawings:

Figure 1 is a side elevation of the foot portion of a stocking embodying my invention;

Fig. 2 is a similar view showing a modified form;

Figs. 3, 4 and 5 are diagrams illustrating the method of making a typical fabric;

Fig. 6 is a diagram elevation of a foot-top section showing the juncture of said section with the adjoining portions of the fabric.

Fabrics of the class referred to are tubular fabrics such as seamless stockings having at the top of the foot a tapered area such as R, having selvages at its edges occurring in integral sutures J joining a sole portion S and said area R, said stocking having if desired the usual leg L, a high spliced area H, and a heel having the usual narrowed gore N and widened gore W. The foot-top and sole portions may be reversely tapered in opposite directions, my said prior disclosure explaining a method of making the fabric on a circle or other endless series of needles by knitting whichever section is first knit by a reciprocal operation on a diminishing number of needles, the end needles being put out of action one after the other at the respective sides of the tapered section, the complementary widened half of the foot tube being thereafter knit on a complementary part of the series of needles. This operation involves knitting reciprocally on an increasing series of needles, opposite or complementary to those on which the narrowed section was formed, those needles which have been put out of action while retaining the end loops of the previously knit fabric section being restored to action successively during knitting of the widened area, to interknit the last loops of wales extinguished by narrowing with the initial loops of the added wales of the widened area.

I will now describe an improved procedure at a point in the operation between the end of narrowing and the beginning of widening, and a new fabric structure formed thereby at the junction between the fabrics R and S.

Referring now to Figs 1 and 3, after having in any usual manner knit the leg L and heel, as upon a circle of needles, or upon two or more straight rows, or upon any other endless arrangement of knitting instruments, and when line *a*, *b*, *d* has been reached, a tapered foot-top R may be begun, upon a segment X of the needles opposite the needles of the back-half Y usually employed for knitting heels and toes. This segment may be more than half the needles if desired, as indicated in Fig. 3, including at each end several of the needles Y, but I may employ the remaining procedures to be described in connection with a section R having its widest portion knit upon half of the needles or less only, said needles of series X then all being of the usual instep half. Having placed out of action and retained the last knit loops at line *b*, *d* reciprocally knit narrowed web R is formed, the knitting wave and yarn guide *z* therewith moving through an arc central of needles X, one or more of the needles at the ends of said segment X being placed out of action while retaining their loops at intervals of one or more reciprocal courses, as explained in my said application, the operation continuing until only those needles of the segment *x* are in action, at which time the section R will have been completed to the line *e*, *f*. The needles of segment *x* are now put out of action, holding loops at said line *e*, *f*, while the terminal loops of the narrowing courses along the edges of section R remain suspended upon said end needles. The terminal loops of the gore W of the

heel at line *b*, *d* except any that have been formed on needles X, still remain upon the needles of the segment *y*.

According to my said prior disclosure, reciprocal knitting now immediately begins upon the complementary part of the series of needles, as illustrated upon the segment *y* (that is, upon needles at line *b*, *d*, upon which there has been no knitting during formation of section R) as indicated by the position of yarn guide *z* in Fig. 5, the needles holding the loops of the narrowing courses successively being added to the segment in operation. Upon passing from the loops last knit at *e*, *f*, to the first course of the complementary widened portion at the line *b*, *d*, if a continuous knitting yarn was in use the said yarn was removed from or floated behind the needles between the last needle 50 of the segment *x* holding the loops at line *e*, *f*, and the first needle 51 of segment *y* about to be operated to knit at line *b*, *d*.

The yarn for the initial course of the area S, when a continuation of the yarn of the last course of the section R, thus floated unknit from the last course of the section R to the first course of the section S or the yarn left the fabric in the course at *e*, *f*, and the same or another yarn replaced it for the next knit course at line *b*, *d*. Instead of so floating or removing the yarn when the operation is completed to the line *e*, *f*, the last course now ending at the needle 50 at one end of the series of needles or segment *x*, the center of the arc or line of reciprocation is now shifted to the other side of the series of needles or needle circle, as shown in Fig. 5, the yarn *m* (Fig. 6) being supplied as indicated in Fig. 4 to the needles intervening between needle 50 and the first needle 51 of the segment *y* and loops being knit at said needles from said yarn, prior to beginning knitting for the widened segment S at the first needle 51 of segment *y*, thereby forming a course of loops through each of the detained loops along one of the sutures J. During or prior to the last course of the narrowed fabric R, I may exchange the yarn *m* of which section R was knit for a yarn *n* suitable for the section S, as shown at C in Fig. 6, and this yarn will be knit along the suture J on the approach to the segment *y* of the needles, upon which the first course of the section S is now to be knit.

Referring now to Fig. 6, while the selvage loops of section R at the needles intervening between the needle 50 and the needle 51 are cast off of said needles, new loops *p* of the yarn *n* are retained upon said needles.

The needles of the segment X including those holding the loops *p* may now be placed out of action prior to knitting the widened section S, but in some cases I prefer as illustrated in Figs. 2 and 6 to continue the operation indicated in Fig. 4 by knitting a circular course or courses *w* upon all the needles including each of the needles of the segment *y*, and the complementary segment X, said course containing loops *q* of the yarn *n* in the opposite suture J^2, and containing a loop knit at each needle until the segment *y* at the needle 51 is again reached. If desired several courses of the yarn *n* may be knit on all the needles.

Having again reached the segment *y* the needles of the segment X are now placed out of action while holding their loops, and reciprocal knitting beginning at the segment *y* and widening by restoring needles of the segment X in turn to operation at the ends of the segment *y* proceeds, to form the widened section S. Reciprocal knitting ceases at the line *f*, *g* as described in my said application, and the usual toe T may thereafter be knit.

It is desirable in some cases when knitting the circular course or courses *w* of the yarn *n* to cause a greater draft of stitch at the needles, or locally at the needles upon which the courses are reversed for widening and narrowing, loops *p* and *q* respectively being robbed when the fabric is completed and stretched to provide yarn for the sinker wale floats *p'* and *q'* extending across the eyelet holes formed in the sutures between the interknit loops of sections R, S, the described method of forming the sutures resulting in sinker wale floats of abnormal length when the fabric is stretched lengthwise.

The yarn *n* may, as indicated in the drawings, be exchanged for anothr yarn *r* prior to knitting the section S, if desired, and in this case the ornamental effect illustrated in Fig. 2 will result when the yarn *n* is of a different color or kind from the yarns *m* or *r*.

Important results of my present method are to prevent long floated yarns and to permit the manufacture to be carried out upon certain types of machine in which it is desirable or necessary to maintain the continuity of knitting during all relative movements of the needles and the yarn guide and cams such as will occur when the reciprocal arc is shifted from one side to the other side of the needles, thus avoiding the provision of means for preventing knitting movements of segments of the needles other than the usual and front and back halves, or of devices for operating some of the needles in the absence of yarn in such a manner as to prevent them from casting off their loops.

From the point of view of the article produced, my new fabric is of advantage by reason of the ornamental effect of the courses of the yarn *n*, and because of the partial concealment of the eyelet holes formed in the diagonal sutures by the sinker-wale

floats p', q' formed in the circular courses at the diagonal sutures.

What I claim is:

1. A stocking comprising at the top of the foot a tapered area having selvages at the edges of said area occurring in integral sutures joining the sole portion of said foot and said area, one or more of said sutures comprising a course of knit loops intervening between said selvages.

2. A seamless stocking having at the foot a narrowed top, and an oppositely widened sole, said sections being joined by a course or courses of intervening fabric interknit with both sections.

3. A seamless stocking having at the top of the foot a tapered area having selvages, and an oppositely tapered area at the sole having selvages, said areas being joined by fabric having needle loops interknit with adjacent selvages of said areas.

4. A circular knit seamless stocking having a foot comprising a reciprocally knit tapered foot top, and a reciprocally knit sole tapered in the opposite direction, said sections being joined by sutures containing a complete circular course or courses.

5. A knit article having a plurality of selvaged sections side by side, said sections being joined by a course or courses of knitting having needle loops engaging each of said sections at intervals of a plurality of courses, sinker-wale loops of said course or courses extending between said needle loops in the direction of said suture or juncture, whereby the eyelet holes in said suture are concealed.

6. A tubular knit fabric having side by side regularly narrowed and regularly widened areas, said sections respectively diminishing and increasing in the same direction, and a course or courses of knit loops at the end of one section, at the juncture between said sections and at the beginning of the other section.

7. A stocking comprising a tubular foot having a tapered area at the top the widest portion of which comprises more than half the width of the tube, and a complementary sole portion integrally joined to said tapered area.

8. A circular knit seamless stocking having a foot comprising a reciprocally knit tapered foot top, and a reciprocally knit sole tapered in the opposite direction, said sections being joined by integral sutures, the widest part of said foot top being wider than the complementary part of said sole.

9. The art of knitting tubular fabrics having oppositely tapered areas side by side comprising the following steps; first knitting a series of reciprocal courses at a successively diminishing number of instruments; thereafter knitting an intervening course or courses at the end and along an edge of the fabric so formed, and thereafter knitting the complementary part of said fabric by forming successively widened reciprocal courses beginning at a place in the fabric corresponding to the widest part of the narrowed area and engaging loops of said intervening course or courses at the ends of said widened courses.

10. The art of knitting tubular fabrics having complementary sections joined by diagonal sutures comprising first knitting a narrowed section by reciprocal knitting at a portion only of an endless series of instruments; thereafter knitting in continuation of the end and side of said narrowed section a course or courses intervening between said sections, and thereafter knitting a widened section at another portion of said instruments having widening wales initiated at loops of said intervening course or courses.

11. The art of knitting tapered split-foot stockings on a circle of needles comprising first knitting a tubular part, thereafter knitting in continuation of a segment of said tubular part a foot-top narrowed by reciprocal knitting on a diminishing number of said needles; thereafter knitting a course across one end of said narrowed area and along the side thereof, and at a part of said circle complementary to said segment, and thereafter knitting a widened sole having widening courses successively engaging said course.

12. The art of knitting on a closed series of instruments, such as knitting machine needles, tubular seamless fabrics having adjacent oppositely tapered areas which comprises forming a tapered area upon a diminishing series of said instruments by successively retaining at said instruments the end loops of reciprocal courses, thereafter knitting an intervening course or courses engaging said retained loops and extending to another part of the series of instruments, and thereafter knitting a widened area at the instruments of said other part by increasing reciprocal courses having end loops engaging said intervening course or courses.

13. The art of knitting tubular fabrics having tapered areas side by side on a closed series of instruments comprising the following steps; first knitting a series of reciprocal courses at a diminishing number of instruments, thereafter knitting an intervening course or courses in succession at each of said instruments, and thereafter knitting the complementary part of said fabric by forming widened reciprocal courses beginning at the instruments not employed for the first mentioned operation, said widened courses engaging loops of said intervening course or courses at their ends.

14. The art of knitting fabrics having complementary tapered sections joined by diagonal sutures comprising first knitting a narrowed section, thereafter knitting an intervening course or courses with comparatively long knit loops, and thereafter knitting a widened section engaging said intervening courses at each end of the widening courses; and thereafter stretching the fabric lengthwise whereby the sinker wale loops of said intervening courses are elongated and the knit loops thereof are shortened.

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

ROBERT W. SCOTT.

Witness:

RUTH A. ROPER.