

No. 868,815.

PATENTED OCT. 22, 1907.

R. W. SCOTT.

HOSIERY AND THE MANUFACTURE OF THE SAME.

APPLICATION FILED SEPT. 20, 1905.

2 SHEETS—SHEET 1

Fig. 1.

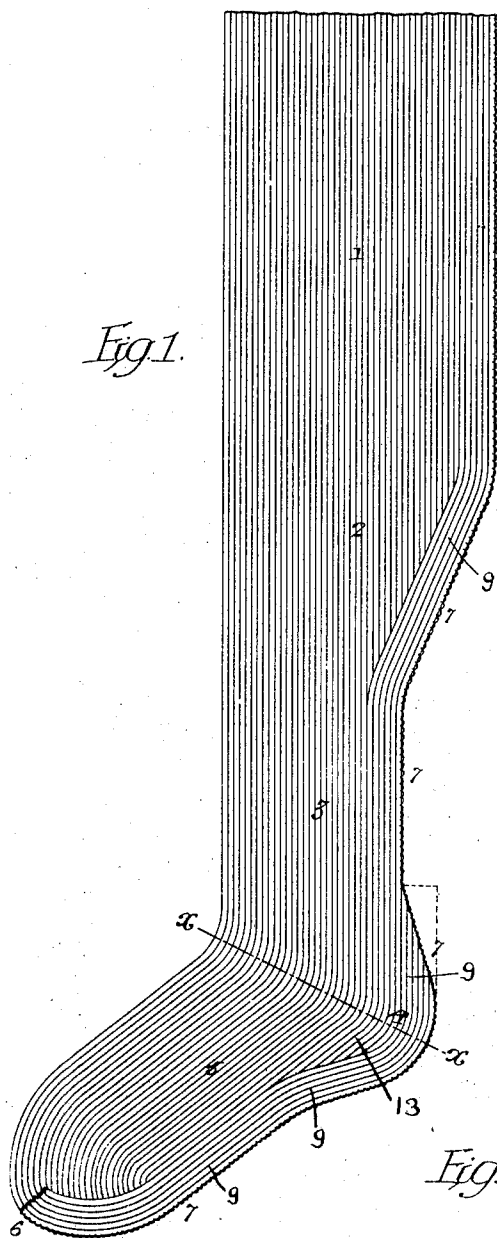
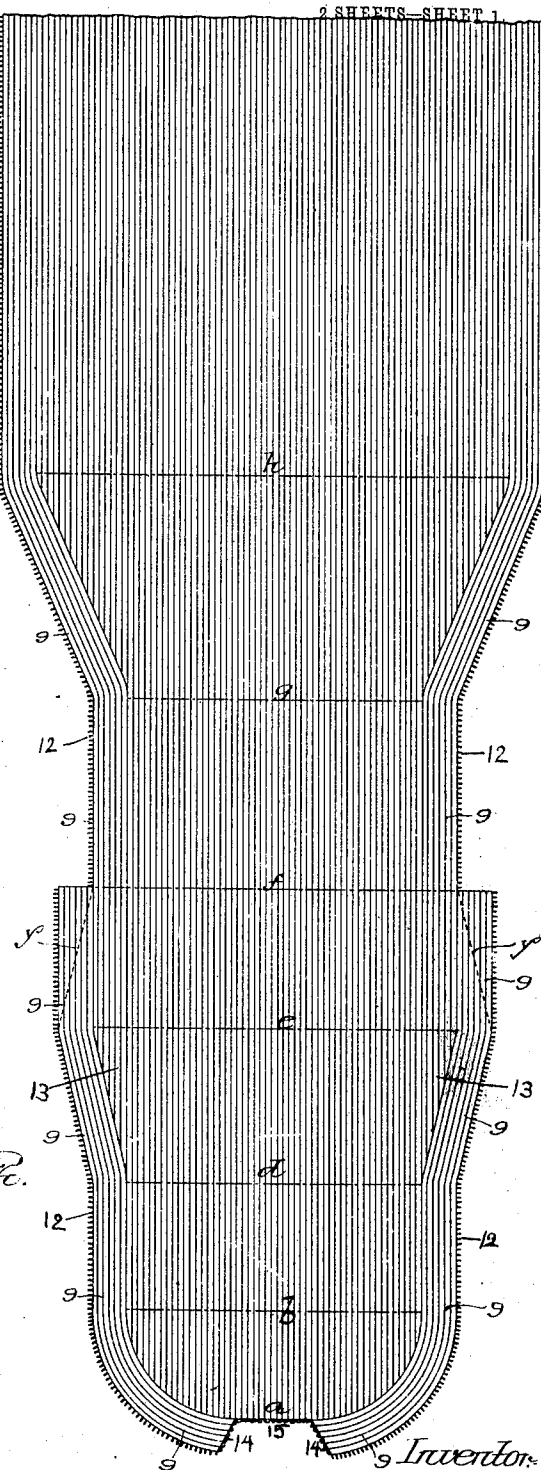


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

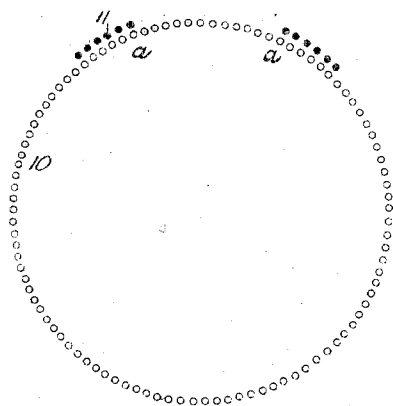


Fig. 4.

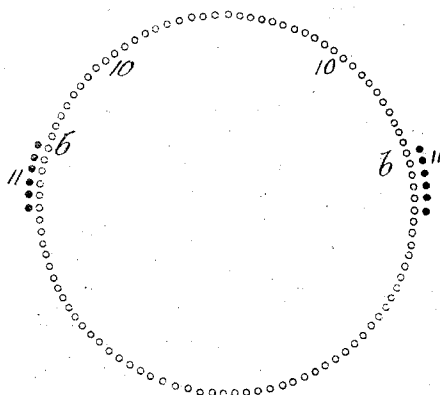


Fig. 5.

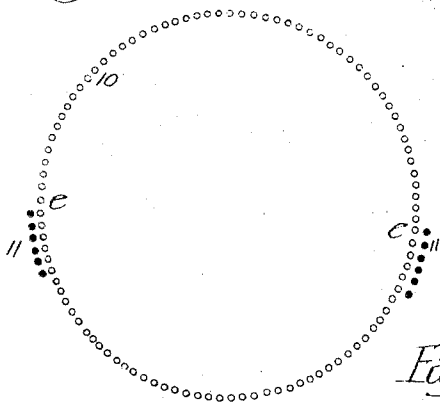


Fig. 6.

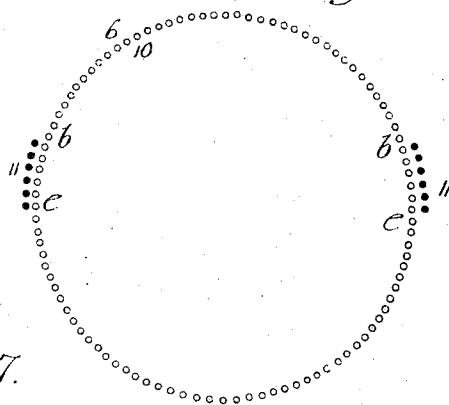


Fig. 7.

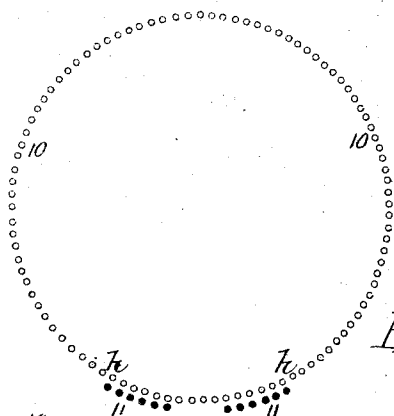


Fig. 8.

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HOSIERY AND THE MANUFACTURE OF THE SAME.

No. 868,815.

Specification of Letters Patent.

Patented Oct. 22, 1907.

Application filed September 20, 1905. Serial No. 279,306.

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 Hosiery and in the Manufacture of the Same, of which the following is a specification.

The object of my invention is to provide a shaped or fashioned sock or stocking which can be made in a simpler and cheaper manner than usual, the preferred form of the stocking being susceptible of manufacture by a continuous operation which produces a tubular web, upon either a flat or a circular machine, the web in the latter case being formed by rotating knitting instead of by reciprocating knitting, such as is usually resorted to in the manufacture of fashioned stockings. By making the stocking, or rather the blank of which the stocking is to be formed, upon one machine, I avoid all expensive transfer operations such as are necessary when more than one machine is employed in the fabrication of the stocking blank.

In the accompanying drawings, Figure 1, is a view of the foot and part of the leg of a stocking made in accordance with my invention; Fig. 2, is a view of the blank from which the stocking is made; and Figs. 3 to 8 inclusive, are needle diagrams illustrating the method of knitting said blank.

It may be well to state at the outset, that in knitting what are termed "full-fashioned" stockings it is customary to commence the knitting at the widest portion of the leg, the knitting being performed upon flat machines having spring-beard needles and the strip being knitted of a uniform width until the calf portion is reached, whereupon the strip is narrowed by transferring groups of stitches from the end needles on both sides of the machine toward the center of the fabric, these groups of stitches being moved inwards, a needle at a time, between successive operations, until the fabric has been sufficiently narrowed for the ankle portion of the stocking, the latter being then knitted of uniform width until the formation of the heel is necessary. At this juncture, two yarn guides are thrown into action, one employed for knitting a projecting heel piece at one side of the ankle web, and the other for knitting a corresponding heel piece at the opposite side of said ankle web, the intervening needles of the machine having stitches cast from them. The heel strips are knitted of uniform width down to the point where the rounding of the heel is to be effected, whereupon each of the strips is narrowed to the desired extent by transferring groups of stitches in the same manner as when narrowing for the calf portion of the stocking. When the knitting of the heel strips has been completed, they are cast from the needles and the selvaged inner edges of the heel strips are run

upon the outermost needles of a separate machine, 55 known as a footing machine, the intermediate needles of this machine receiving the loops around the instep portion of the leg web which are thrown from the needles of the leg machine when the formation of the heel strip was begun. The foot web is then knitted 60 upon the needles of the second machine, the web being narrowed at each side to form the desired instep gussets, and being also narrowed at the toe so as to properly round the same. This method of manufacture is a slow and tedious operation, necessitating the 65 use of expensive machinery and the highest class of skilled labor to operate it.

The main aim of my invention has been to so form the stocking as to permit of the use, in its production, of a web produced by tubular knitting preferably upon a 70 high speed circular or rotating machine in place of the usual low speed reciprocating machine, and to effect the desired shaping or fashioning of the web without the necessity of using transfer points for transferring stitches from needle to needle or filling-up points for 75 transferring a previously formed stitch of the knitted web to a naked needle, for the use of such transfer or filling-up points further reduces the production of the machine, since the knitting operation must be arrested while such points are in operation. 80

Referring to the drawings, it will be observed that the stocking illustrated in Fig. 1, is very similar to an ordinary full-fashioned stocking having the wide leg 1, a shaped calf 2, a narrow ankle 3, a wide heel 4, a narrow foot 5, a substantially seamless union of the webs 85 across the front of the toe as at 6, and a seam 7 extending from the point of the toe underneath the foot and heel, around the corner of the heel and up along the back of the heel, ankle, calf and leg. In my improved stocking, however, there are no side seams at the front of the heel, as in the ordinary full-fashioned stocking, and the leg portion and foot portion are not made separately, the stocking being produced from a web or blank of the character shown in Fig. 2, and this web being made in a manner which will be understood on reference to Figs. 95 3 to 7 inclusive.

It will be noted on reference to Fig. 2, that the web has, at each edge of the same, bordering wales 9, which, when the web has been folded and seamed or sewed together to form the stocking, extend throughout the 100 underside of the toe, the sole of the foot, the bottom of the heel, and the rear of the ankle, calf and leg of the stocking. In its preferable form, the fashioning or shaping of the different parts of the stocking is effected by a widening operation, the various widening wales being 105 introduced between the standing wales of the fabric and the bordering wales. The knitting of the web is commenced at the toe, and the machine employed for the

production of the fabric is by preference a rotary machine with a pair of needle-carrying segments movable from and towards each other around a full or interrupted circle of needles in a cylinder, the latter needles 10 (represented by the circular series of dots in Figs. 3 to 7,) forming the standing wales and the widening wales of the fabric, and the segment needles 11 forming the bordering wales of the fabric. A machine of this character is shown in my Patent No. 607,002, dated July 5, 1898. The machine knits round-and-round, a limited portion only of the needles 10 being in action at the beginning of the operation, and these needles being flanked by the bordering needles 11, the knitting yarn being carried across from one set of needles 11 to the other, and the floating yarns or elongated sinker wales being subsequently severed or trimmed off, with the result that, in either case, sinker wales or ends of yarn project from the bordering wales, as shown at 12, in Fig. 2, hence a characteristic feature of the stocking or blank, is that the outer edges, along the bordering wales, are unselvaged.

In starting the knitting operation, only the needles 10 from *a* to *a* Fig. 3, may be in operation so as to produce a narrow web such as shown at *a* in Fig. 2, with bordering wales 9 at each side of the same produced upon the needles 11. As the knitting proceeds, however, these needles 11 are racked apart and needles 10 are successively brought into action at each end of the set of needles *a*—*a* until the full amount of widening for the toe has been effected, as indicated at *b* in Fig. 2, by which time the relation of the needles 11 to the needles 10 will be that represented in Fig. 4, the widening wales are preferably introduced in such a manner as to prevent the formation of eyelet holes, as shown for instance, in my Patent No. 614,349, dated November 15, 1898. The knitting of a web of uniform width for the foot of the stocking now proceeds until the point *d* is reached, whereupon there is a further introduction of needles 10 and racking out of needles 11 for the purpose of producing the gussets 13, this widening operation proceeding until the web reaches the line *e*, Fig. 2, by which time the needles 11 bear the relation to the needles 10 shown in Fig. 5, the needles 10 from *e* to *e* being in action. This completes the stocking up to the instep line, represented by the dotted line *x*—*x* in Fig. 1; the insertion of the widening wales 13 serving to impart to the heel the additional width necessary for the instep portion of the stocking as compared with the foot and ankle portions of the same. The knitting of the web of fabric of this width now proceeds until the line *f*, Fig. 2, is reached, the fabric thus produced constituting the back of the heel. When this has been done the bordering needles 11 are racked in again to the point *b* as shown in Fig. 6, and the stitches are cast from the needles 10 from *b* to *e* and said needles are withdrawn from action. The production of fabric upon the needles 10 from *b* to *b* and upon the bordering needles, then continues until a proper length of fabric for the ankle portion of the stocking has been completed, as represented by the line *g* in Fig. 2, whereupon the bordering needles 11 are again racked outwardly and additional widening needles 10 are successively introduced until the web has been widened to the extent indicated by the line *h* in Fig. 2; the

bordering needles now bearing the relation to the needles 10 represented in Fig. 7. Fabric is now produced upon the needles 10 from *h* to *h* Fig. 7, and upon the bordering needles, until the desired length of web for the leg of the stocking has been completed, whereupon the production of a new stocking web is begun.

The blank thus produced is completed into a stocking by folding it along the central line, looping the front ends 14, of the bordering wales, to the ends 15, of the body wales of the foot, so as to form the seam 6 across the toe, then seaming or otherwise uniting together the unselvaged edges 12 of the web up the line *e*, then sewing diagonally across the bordering wales 9, as indicated by the dotted lines *y*—*y*, Fig. 2, until the unselvaged edges 12 are again reached at the point *f*, and then uniting these unselvaged edges from said point *f* to the top of the stocking. The result will be a stocking having but a single seam extending substantially parallel with the bordering wales along the bottom of the foot and heel and along the rear of the ankle, calf and leg, and extending diagonally across said bordering wales at the rear of the heel. The heel thus produced is an acceptable substitute for the usual full-fashioned heel and is produced without in any way complicating or increasing the expense of knitting the blank from which the stocking is made; the whole knitting operation being straightforward round-and-round knitting, which method of knitting is, as is well recognized, the simplest and cheapest method which can be adopted.

If it is desired to produce a stocking having a seamless tubular leg it is only necessary to so construct the machine that when the proper width of fabric for the leg is reached the bordering needles 11 will completely close the gap between the needles 10.

The term "tubular knitting" or "knitting round-and-round" applies as well to the operation of a circular machine, and to the operation of that class of machines having opposite straight needle beds and a yarn guide traveling to the right along one side of the machine and to the left along the other side and crossing at the ends of the needle beds, and in Fig. 8, I have shown bordering needles 11 in connection with the standing wale needles 10 of such a machine. While in the operation of this machine the yarn guides are reciprocated, the crossing of the said yarn guides at the ends of the needle beds renders such operation the equivalent of round-and-round knitting and the comparative slowness of operation of reciprocating yarn guides, as compared with a rotating yarn guide, may be counteracted to a great extent by the use of a plurality of yarn guides; the shortness of the sinker wales or float yarns between the two sets of bordering wales in a machine of this type reducing the waste to a minimum.

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

1. A stocking having bordering wales extending under the bottom and up the back of the heel, and widening wales introduced between said bordering wales and the standing wales on each side of the heel, the bordering wales at the back of the heel being seamed diagonally across so as to contract said heel from the corner to the top, substantially as specified.

2. A stocking having a heel shaped by means of widening wales at each side of the same introduced between the standing wales and bordering wales at the bottom of the heel, substantially as specified.

3. A stocking having a heel with widening wales on each side of the same introduced between the standing wales and bordering wales at the bottom and rear of the heel, the bordering wales at the rear of the heel being connected by a seam extending diagonally across said wales, substantially as specified.

4. A stocking having a heel provided on each side with widening wales introduced between the standing wales and bordering wales at the bottom and rear of the heel, said bordering wales, at the bottom of the heel, being connected by a seam substantially parallel with the bordering wales, and at the rear of the heel being connected by a seam extending diagonally across the same, substantially as specified.

5. A stocking having widening wales introduced inside of sets of bordering wales to shape the toe, the rear of the heel being shaped by a seam extending diagonally across said bordering wales, substantially as specified.

6. A stocking having widening wales introduced inside of sets of bordering wales to shape the calf, the rear of the heel being shaped by a seam extending diagonally across the bordering wales located at that point, substantially as specified.

7. A stocking having widening wales introduced inside of sets of bordering wales to shape the toe and the bottom of the heel, the rear of the heel being shaped by a seam extending diagonally across said bordering wales, substantially as specified.

8. A stocking having bordering wales extending along the bottom of the toe, foot, and heel, and up the back of the heel, ankle and calf, and a single seam connecting said bordering wales, said seam being substantially parallel with the bordering wales in all portions except the back of the heel, at which point it extends diagonally across said wales, substantially as specified.

9. A stocking having bordering wales extending along

the bottom of the toe, foot, and heel, and up the back of the heel, ankle, calf and leg, and a single seam connecting said bordering wales, said seam being parallel with the bordering wales in all portions of the stocking except in the rear of the heel, at which point it passes diagonally across said wales, substantially as specified.

10. The mode herein described of knitting foot, heel and ankle portions of a stocking web, said mode consisting in knitting round-and-round upon the needles of a machine to form a web of the proper width for the foot, then, while continuing the round-and-round knitting, gradually widening said web and knitting a length of said widened fabric to form the heel web, then casting the stitches from a number of end needles so as to reduce the width of the web, and then knitting round-and-round upon said reduced number of needles to form the ankle web, substantially as specified.

11. The mode herein described of knitting a web for the foot, heel and ankle portions of a stocking, said mode consisting in knitting round-and-round upon standing wale needles and bordering wale needles to form a foot web, continuing said round-and-round knitting and introducing standing wale needles inside of said bordering wale needles to widen said web and continue the production of said widened web throughout a number of courses, then casting the stitches from the outermost standing wale needles and racking in the bordering wale needles and continuing round-and-round knitting upon the reduced number of needles to form the ankle web, 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.