R. W. SCOTT.

HOSIERY.

APPLICATION FILED MAY 26, 1914.

1,211,247.

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Fig. 3.

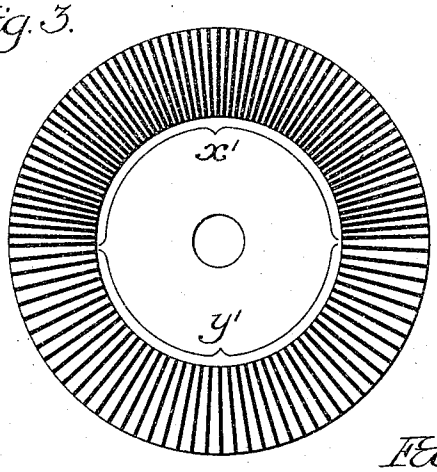


Fig. 2.

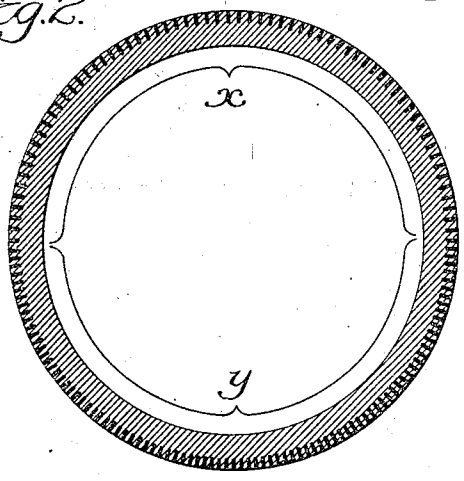


Fig. 1.

WITNESSES

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HOSIERY.

1,211,247. Specification of Letters Patent. Patented Jan. 2, 1917.

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To all whom it may concern:

Be it known that I, ROBERT W. SCOTT, a citizen of the United States, residing in Boston, Massachusetts, have invented certain Improvements in Hosiery, of which the following is a specification.

My invention relates to that class of stockings which have a ribbed leg portion extending down over the instep, (this term usually including the top of the foot down to the toe) and plain heel, sole and toe portions, the object of my invention being to provide a more acceptable stocking of this type than has heretofore been produced. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawing, in which—

Figure 1 is a representation of a stocking made in accordance with my invention; Fig. 2 is a horizontal section illustrating the needle cylinder member of a rib knitting machine for producing my improved stocking, and Fig. 3 is a sectional plan view illustrating the dial member of such machine.

In the ordinary rib stocking having a seamless foot, as such stocking is made today, it is customary to knit the leg portion upon a rib knitting machine and the foot portion upon another machine which produces plain web and is capable of knitting the heels and toes automatically, the ribbed leg portion being either run upon the needles of the footing machine or transferred thereto by means of a transfer ring. In any such case, however, the ribbed leg portion contains more wales than the foot portion because sufficient elasticity is not secured where the number of wales in the ribbed and plain portions coincide.

The so-called "doubling" of stitches which takes place in transferring the stitches of the ribbed web to the needles of the plain footing machine adds greatly to the labor and expense in the production of such stockings and in the knitting machine shown in my Letters Patent 834,763, dated October 30, 1906, provision was made whereby the doubling of stitches could be automatically effected, but even when so made the foot of the stocking was not as elastic as desired and, in any case, where a low cut shoe is worn the stocking is unsightly because of the change in the character of the fabric which occurs over the instep. Moreover, even where the transfer was effected automatically upon the machine above referred to the operation was a delicate one and called for a nicety of adjustment which it was difficult to maintain.

It has been proposed to knit a stocking with ribbed leg and instep and plain sole, heel and toe, the ribbed leg of the stocking being started at the top with a two-and-one rib and the character of the rib in the back of the leg being gradually changed from two-and-one rib to one-and-one rib by first knitting a number of courses of two-and-one rib, then transferring stitches from certain of the double wale ribs into adjoining single wale ribs, then knitting a number of courses with this new arrangement, then transferring stitches from certain other of the double wale ribs to adjoining single wale ribs and continuing such operation during the formation of the leg until by the time the ankle portion of the stocking is reached all of the double wale ribs have been transformed to single wale ribs and one-and-one rib fabric is being produced, the stitches being then transferred from the ribbing needles onto corresponding and formally inactive cylinder needles, prior to the formation of the heel, sole and toe of the stocking in plain web upon the cylinder needles. Even in the production of such a stocking, however, the objectionable doubling of stitches is necessary.

In order to overcome these objections I proceed as follows: Instead of the needle carriers being cut uniformly as usual I cut one-half of the cylinder and dial so that, in knitting ribbed web, a closer disposition of the stitches is permitted around one half of the web than around the other half, the needle carriers being so set up in the machine that the front of the ribbed leg and the instep will be of finer gage than the rear of the leg.

I have determined the fact that where a tubular ribbed fabric is produced with needle carriers cut as above described and yarn of a given number or weight is employed, the resulting fabric, particularly after being passed through the dyeing process tends to justify itself, that is to say, it presents no material difference in appearance as between the two halves thereof.

Referring to Fig. 2, which is a diagram illustrating the cutting of the cylinder of a

circular knitting machine such as that of my previous patent, the segment x may be cut with, say, sixty-five slots and the segment y with, say, ninety slots, the segment x' of the dial being cut with sixty-five slots and the segment y' with forty-five slots.

In knitting ribbed fabric each of the slots of the dial will be equipped with a needle and each of the sixty-five slots throughout the segment x of the cylinder will be equipped with a needle for coöperation with the sixty-five needles contained in the segment x' of the dial, and while, throughout the segment y of the cylinder, every one of the ninety slots contained therein will be equipped with a needle, only every other one of these needles will be active in rib knitting, and will coöperate with the forty-five needles around the segment y' of the dial, so that in knitting the leg of the stocking there will be one-hundred and thirty wales in the fine gage front of said leg and ninety wales in the coarser gage rear half of the same, such ribbed fabric being of one-and-one rib type throughout.

The welt a being first formed at the top of the leg, the machine proceeds to knit the leg portion down to the line b whereupon automatic transfer of stitches from the forty-five needles around the segment y' of the dial to the theretofore inactive forty-five needles contained in every other slot throughout the segment y of the cylinder is effected, this transfer requiring no doubling of the stitches and being preferably made in accordance with the process set forth in my Letters Patent No. 830,373, dated September 4, 1906. At the same time a lighter yarn is preferably substituted for the relatively heavy yarn used in knitting the ribbed leg portion and the knitting operation is then proceeded with, ribbed web being produced upon the one-hundred and thirty needles contained in the segment x of the cylinder and segment x' of the dial and plain web upon the ninety needles contained in the segment y of the cylinder.

At or about the point c a reinforcing yarn is preferably added to thicken the heel and the knitting of the heel is then proceeded with upon the needles contained in the segment y of the cylinder, the needles in the segment x of the cylinder and in the segment x' of the dial being temporarily put out of action but retaining their stitches and being brought into action again when the knitting of the heel has been completed, so as to proceed with the knitting of the foot of the stocking with ribbed top and plain sole, after which the knitting of the toe upon the needles contained in the segment y of the cylinder is effected, the toe being also thickened if desired by the addition of reinforcing yarn during the knitting of the same, or such reinforcing yarn after being introduced at the point c, being permitted to remain during the knitting of the heel, sole and toe so as to thicken all of these members of the stocking, or such reinforcing yarn being introduced at the point b if it is desired to produce what is termed a "high spliced" heel.

The same yarns which are employed in knitting the high spliced and thickened heel, sole and toe of the stocking may be employed in knitting the ribbed web of the ankle and instep, or the reinforcing yarn may be fed only to the needles of the segment y of the cylinder in knitting the high splice, and the heel, sole and toe.

As there are, in knitting the heel, sole and toe, never more than ninety needles in action as against one-hundred and thirty employed in knitting the ribbed fabric comprising the front of the leg and the instep, I secure a comparatively coarse fabric in the heel, sole and toe and can consequently reinforce these portions and provide comparatively heavy fabric therein, or in any one or more of said parts, while still preserving the desired narrow foot and ankle portion of the stocking, the ribbed web in the front of the ankle and instep being materially contractile, by virtue of its elasticity, so that I am enabled to produce a stocking which has ample room and elasticity in the leg and ankle portion, a heel, sole and toe sufficiently coarse and heavy to withstand the greater wear to which they are subjected, and an instep portion which tends to contract the foot and presents an unbroken area of the same character of fabric as that of which the leg is composed.

It will be apparent that if an even division of the needles in the needle carriers was used and an attempt was made to introduce heavy yarns in the heel, sole and toe portions of the stocking the foot of the stocking would be entirely too wide for the other portions and if yarn of proper weight to suit the gage was employed the foot portion would, under like circumstances, be too light and too thin to properly resist the wear to which these portions of the stocking are subjected.

I claim:

1. A seamless stocking having a ribbed leg portion with uniform type of rib throughout but with a coarser gage in the rear half than in the front half due to a lesser number of wales in the rear half than in the front half.

2. A seamless stocking having leg and instep portions of ribbed fabric, and heel, sole and toe of plain fabric, the type of ribbed web being uniform throughout but being of coarser gage in the rear portion of the leg than in the front of the leg and instep due to a lesser number of wales in the rear half than in the front half.

3. A seamless stocking having leg and instep portions composed of ribbed web, and heel, sole and toe of plain web, the ribbed web being of uniform type throughout but the rear portion of the leg being of coarser gage than the front portion and instep due to a lesser number of wales in the rear half than in the front half, and the plain web having reinforced portions.

4. A seamless stocking having leg and instep portions of ribbed fabric, and heel, sole and toe of plain fabric, the type of ribbed web being uniform throughout but being of coarser gage in the rear portion of the leg than in the front of the leg and instep due to a lesser number of wales in the rear half than in the front half, and the plain fabric of the heel, sole and toe having a lesser number of wales than the ribbed fabric of the front of the leg and instep.

5. A seamless stocking having leg and instep portions of ribbed fabric, and heel, sole and toe of plain fabric, the type of ribbed fabric being uniform throughout but being of coarser gage in the rear portion of the leg than in front of the leg and instep due to a lesser number of wales in the rear half than in the front half, and the plain fabric of the heel, sole and toe having a lesser number of wales than the ribbed fabric of the front of the leg and instep, and being composed of heavier yarn.

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

ROBERT W. SCOTT.

Witnesses:
ROBERT C. CHILD,
MARY F. GRIFFIN.