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J. L. GETAZ

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CIRCULAR KNIT HOSIERY AND METHOD OF CLOSING THE FOOT OF SAME

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Fig. 1.

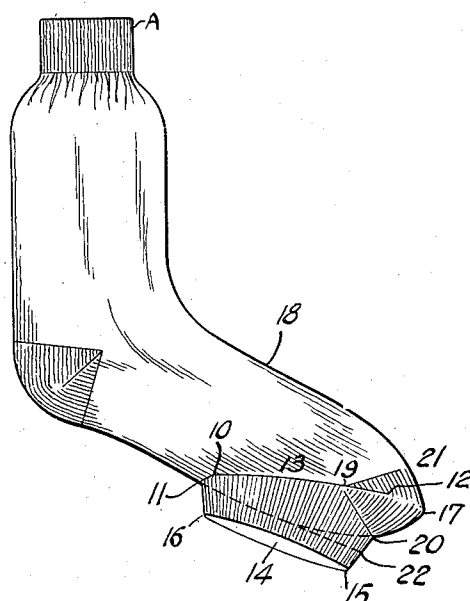
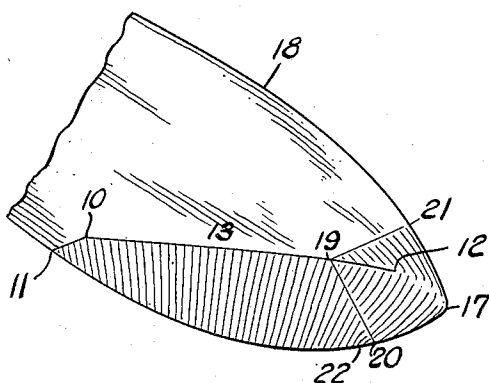


Fig. 2.



INVENTOR:
JAMES LOUIS GETAZ

BY
Curtis, Morris & Safford
ATTORNEYS:

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CIRCULAR KNIT HOSIERY AND METHOD OF CLOSING THE FOOT OF SAME

James L. Getaz, New York, N. Y.

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10 Claims. (Cl. 66—185)

This invention is related to knitted hosiery and particularly to a novel hosiery construction and to a method of closing the toe of hose which is knitted on circular knitting machines.

In the manufacture of circular knit hose, the toe is closed by a seam which runs across the foot near the toes at a right angle to the length of the foot. To make this seam in a satisfactory manner, it is necessary for the operator to place by hand each loop at the end of the toe portion of the hose on one of the points of the dial of a looping machine. The loops of the instep portion are likewise individually placed on the same points as the loops of the foot portion, and these pairs of loops are sewn together to close the toe. This operation of putting the loops on the points of the looper dial is tedious and requires a long period of training on the part of the operator before sufficient skill can be obtained.

In my co-pending patent application Serial No. 472,440, which was filed on December 1, 1954 (now Patent No. 2,740,279, issued April 3, 1956), I have shown a new and practicable way in which the toe of circular knit hosiery may be closed by a seam which runs lengthwise of the hose on the bottom of the foot. It is the purpose of this application to show an improvement in this method of closing the toe.

Figure 1 shows a side view of the hose as it comes from the knitting machine.

Figure 2 shows a side view of the toe portion of the hose after the toe has been closed.

In making a stocking, the knitting begins at the top A, as shown in Figure 1, and continues in the usual manner through the leg portion, heel and foot until the point 11 is reached. At this point a few needles are raised out of action, being those which knit the portion of the foot between the points 10 and 11. The reciprocating movement of the cylinder then begins, and the arc of reciprocation is made sufficient to knit a long course from the point 10 past the point 18 to the point 10 on the other side of the foot. Beginning at 10 a narrowing gore 10—13—19—12 is formed which is much longer than the gore which is usually knitted in forming the toe.

This gore may be formed by raising one or more needles with each reciprocating stroke of the cylinder, or the length of this gore may be increased. If it is desired to so construct the foot portion that a longer gore is achieved, the preferred method of regulating the length of this gore is as follows.

If it is desired to make a narrowing gore twice as long as it would be if one needle were raised out of action on each reciprocation, a needle is raised out of action at each reciprocation, and at every fourth reciprocation two needles are pulled down into knitting position. The proportions of the extension of the length of the gore may be varied by varying the frequency with which needles are pulled down into knitting position, and the length of a widening side of a gore may be varied in the same way.

In my co-pending application which is mentioned

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above, two methods are described for completing the fabric at the end of the foot portion after the gore 10—13—19—12 is knitted on the narrowing side. In the first of these which is also shown in the drawings, all of the needles which have been raised are lowered into action simultaneously, and the remainder of the foot portion is knitted by continuous rotation of the cylinder. This method has the advantage of taking a minimum of time, which helps production, and there is only a small portion of waste material to be discarded when the seam which closes the foot is sewn. It has the disadvantage of extending the seam to the point of the toe where it may be visible when worn with shoes which have open toes, or it may cause discomfort to the wearer in its contact against or between the toes. Also, in certain types of sewing machines, the arm of the machine extends beyond the sewing needles, and it is not convenient to begin the seam at the point of the toe.

The other method which is described specifies that after the narrowing of the gore has proceeded to the point 12, the needles which have been raised may be brought into action one at a time or two at a time. This method has the advantage of permitting the seam to begin back from the point of the toe so that it does not come in contact with the toes of the wearer and is not visible when worn with shoes which have open toes. It has the disadvantage of slowing production, and it produces a larger portion of waste material to be discarded when the seam which closes the foot is sewn.

It is the purpose of this invention to combine the advantages of these two methods and avoid their disadvantages. This has been accomplished as follows: After the narrowing side of the gore has been knitted to the point 12, the end of the toe is rounded by continuing to reciprocate the cylinder and pulling down one needle which has been raised with each reciprocation until the courses reach the line 19—20. This pulling down one needle at a time is accomplished in the usual manner by raising one needle and pulling down two with each reciprocation. After this line 19—20 is reached, the remaining needles which have been raised out of action are lowered into knitting position simultaneously, and the fabric 10—13—19—20—15—16—11 is knitted by continuous rotation. The two sides of the fabric are then brought together, the seam 11—20 is sewn, the opening 14 is thereby closed, the portions 11—20—15—16 is discarded, and the hose is finished as shown in Figure 2. The line 19—21 is not essential, but it is at this point that a heavier or reinforcing yarn is often introduced in making the end of the toe. The portion of the fabric 19—21—17—20 forms a toe pocket without any seam in it or alongside of it. This insures greater comfort to the wearer, the time which is required to knit the fabric is not materially increased, and there is no additional waste of material.

The method which is described above is illustrative and various modifications may be made within the scope of this invention.

I claim:

1. In circular knit hose, a foot portion, a gore extending from near the bottom edge of said foot portion obliquely upward and forward along either side of said foot portion to a point near the toe of said hose, a seamless toe pocket at the end of said foot portion, said foot portion being closed by a seam of stitches extending longitudinally of said foot portion and along the bottom thereof.

2. In circular knit hose, a foot portion, a gore extending obliquely upward and forward along either side of said foot portion, a seamless toe pocket at the end of said foot portion, said foot portion being closed by

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a seam of stitches extending longitudinally of said foot portion and along the bottom thereof.

3. In circular knit hose, a foot portion, a gore extending from near the bottom center of said foot portion to a point near the end of said foot portion, a seamless toe pocket at the end of said foot portion, said foot portion being closed by a seam of stitches extending longitudinally of said foot portion and along the bottom thereof.

4. In circular knit hose, a foot portion constructed of courses of loops of yarn, a gore in said courses, said courses on the instep side of said foot portion extending obliquely to said gore, and said courses on the bottom side of said gore extending obliquely to said gore at one end of said gore, and said courses on the bottom side of said gore extending parallel to said gore at the opposite end of said gore, said foot portion being closed by a seam of stitches extending longitudinally of said foot portion and along the bottom thereof.

5. In circular knit hose, a foot portion constructed of courses of loops of yarn, a gore in said courses, said courses on the instep side of said foot portion extending obliquely to said gore, a seamless toe pocket at the end of said foot portion, courses on the bottom side of said foot portion and within said toe pocket extending obliquely to said gore, courses on the bottom side of said foot portion and outside of said toe pocket extending parallel to said gore, said foot portion being closed by a seam of stitches extending from a point near the edge of said toe pocket longitudinally of said foot portion and along the bottom thereof.

6. The method of knitting the foot of hosiery in a machine having needles in a circular cylinder which comprises knitting a portion of said foot by continuous rotation of said cylinder, raising out of action a first group of needles on the side of said cylinder on which the bottom of said foot is knitted, knitting the remainder of the instep portion and the upper toe portion of the foot on the remaining needles in said cylinder by reciprocation of said cylinder while forming at either side of said foot narrowing gore portions by raising needles out of action a few needles at a time, knitting fabric at the bottom of the toe portion on said remaining needles while placing some but not all of said remaining needles back into action a few at a time to form at either side of said fabric widening gore portions adjoining said narrowing gore portions, placing all of said needles into knitting position, and knitting additional fabric by continuous rotation of said cylinder, said foot portion being closed by a seam of stitches extending longitudinally of said foot portion and along the bottom thereof.

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7. The method of forming and closing the foot of hosiery knitted in a machine having needles in a circular cylinder which comprises knitting a portion of said foot by continuous rotation of said cylinder, raising out of action a first group of needles on the side of said cylinder on which the bottom of said foot is knitted, knitting the remainder of the instep portion and the upper toe portion of the foot on the remaining needles in said cylinder by reciprocation of said cylinder while forming at either side of said foot narrowing gore portions by raising said needles out of action a few at a time, knitting fabric at the bottom of the toe portion on said remaining needles while placing some but not all of said remaining needles back into action a few at a time to form at either side of said fabric widening gore portions adjoining said narrowing gore portions, placing all of said needles into knitting position, knitting additional fabric by continuous rotation of said cylinder, casting said hosiery from said needles, closing the resulting opening in said foot by sewing a seam of stitches extending longitudinally of said foot and along the bottom thereof from a point near the line at which said first group of needles was raised out of action to a point near the line at which all of said needles were placed back into knitting position, and removing the fabric beyond said seam.

8. In circular knit hose, a foot portion containing an instep portion and a sole portion, a seamless toe pocket joined to said instep portion and to said sole portion by courses of knitted loops, said foot portion being closed by a seam of stitches extending longitudinally of said foot portion and along the bottom thereof.

9. In circular knit hose, a foot portion, a seamless toe pocket at the end of said foot portion joined to said foot portion by courses of knitted loops, said foot portion being closed by a seam of stitches extending longitudinally of said sole portion and along the bottom thereof.

10. In circular knit hose, a foot portion constructed of courses of loops of yarn, a seamless toe pocket at the end of said foot portion, said foot portion being closed by a seam of stitches extending longitudinally of said foot portion and along the bottom thereof, said courses extending obliquely to said seam at one portion of said seam and extending parallel to said seam at another portion of said seam.

References Cited in the file of this patent

UNITED STATES PATENTS

1,789,494	Page	Jan. 20, 1931
1,810,098	Allen	June 16, 1931
1,945,227	La Montagne et al.	Jan. 30, 1934