

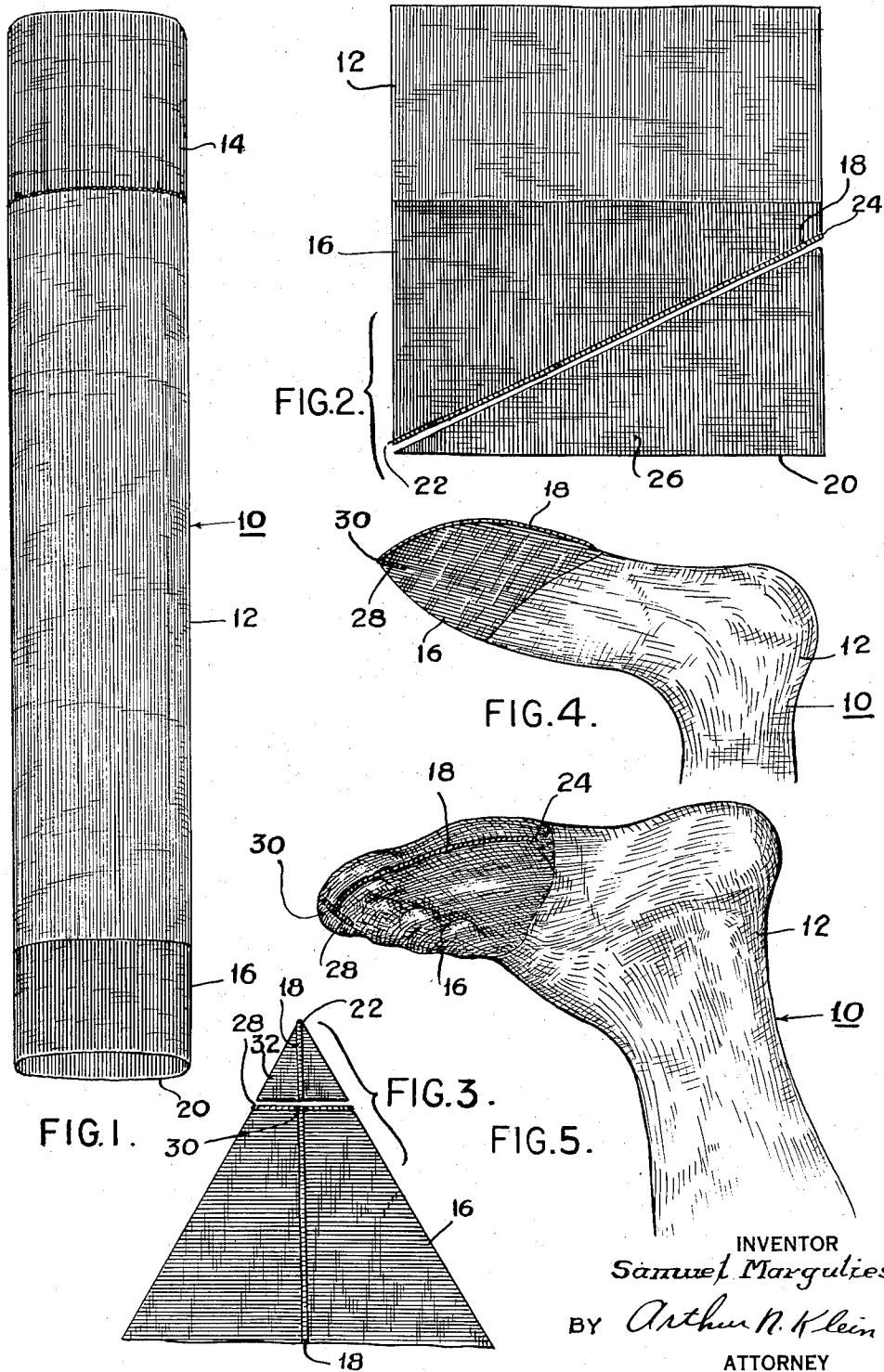
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WOMAN'S STOCKING AND METHOD OF FORMING SAME

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WOMAN'S STOCKING AND METHOD OF FORMING SAME

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5 Claims. (Cl. 66—182)

The present invention relates generally to seamless tubular-knit hosiery and it relates more particularly to the toe structure of such seamless tubular-knit hosiery.

An object of the present invention is to provide a novel toe structure for seamless tubular-knit hosiery, as well as a novel method of forming the same.

Other objects and advantages of the present invention are apparent in the following detailed description, appended claims and accompanying drawings.

In forming so-called "seamless" hosiery, that is hosiery which is tubular-knit on a circular knitting machine (as distinguished from so-called "full-fashioned" hosiery, which is knit in the form of a flat strip, the edges of which are subsequently sewn together by a seam which extends from the toe, along the bottom of the foot portion, and up the back of the leg portion), it has heretofore been customary to construct the toe portion by setting the knitting machine to knit additional courses along part of the toe opening of the tubular blank, thereby providing a pocket or extension and also placing the axis of the toe opening at an angle to the axis of the remainder of the tubular blank. The toe opening is then sewn closed by an arcuate seam which extends across the tops of the toes of the wearer in the final stocking. However, this conventional method of forming the toe in seamless hosiery has serious disadvantages. Thus, the need for knitting additional courses along part of the toe opening, complicates the operation, and reduces the rate of production, of the knitting machine. Additionally, and even more serious, it requires considerable skill properly to form the arcuate seam which closes the off-center opening; only a small proportion of operators being able to perform this work and even they turning out a relatively high percentage of defective stockings.

According to the present invention, there has, for the first time, been perfected a novel toe structure, as well as a novel method of forming the same, which eliminates the objectionable features of the prior art and enables the toe to be formed by any average operator in a fraction of the time heretofore needed and with a far smaller proportion of defective hose; in addition to providing appreciably greater strength in the toe.

Generally speaking, the present invention contemplates the formation of the toe portion of a seamless tubular-knit stocking by forming a seam closing the toe opening along a line extending generally diagonally along the flattened tubular blank (and extending from the point of the toe downwardly along the sole to just beyond the ball of the foot in the final stocking) and then forming a relatively short seam extending in both directions at right angles to the main seam at the front end thereof and serving to reinforce the main seam at the point of greatest stress during use. The seams can be formed, in a few seconds, by any operator of average skill, employing a conventional sewing machine which trims as it sews.

For the purpose of illustrating the invention, there is shown in the accompanying drawings one form thereof which has been found in practice to give satisfactory results and which is presently preferred; it being understood, however, that this invention is not limited to the precise arrangements and instrumentalities illustrated.

Referring to the accompanying drawings, in which like reference characters indicate like parts throughout:

Figure 1 is a perspective view of a seamless, circular-knit tubular blank as it comes off the knitting machine and before closing of the toe portion.

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Figure 2 is an enlarged fragmentary elevational view of the flattened tubular blank on which the first step of the toe closing operation, namely the forming of the main diagonal seam, has been completed.

Figure 3 is an elevational view illustrating the second step of the toe closing operation, namely the formation of the short right-angular reinforcing seam line at the forward end of the main seam.

Figure 4 is a side elevational view showing the foot portion of the blank placed on a shaper imparting proper configuration thereto.

Figure 5 is a perspective view showing the underside of a woman's foot wearing the novel stocking of the present invention.

In Fig. 1, there is shown a seamless, circular-knit tube or blank 10, which includes a sheer main portion 12 formed of relatively light thread, an upper or welt portion 14 formed of relatively heavier and stronger thread, and a lower or toe portion 16 also formed of heavier and stronger thread. The blank is of true tubular configuration throughout, there being no offset toe opening of the type needed in prior art stockings as described above.

The first step in the formation of the toe structure is shown in Fig. 2. Thus, a diagonal seam 18 is formed in the flattened toe portion 16 running from a point 22 adjacent one end of the flattened circular free edge 20 of the toe portion to a point 24 spaced appreciably inwardly of the other end of the flattened edge 20. While the seam 18 is shown, in Fig. 2, as being generally straight, it can be rounded slightly, especially nearer the end 24, to improve the fit of the final stocking.

After the seam 18 has been formed, the generally triangular flattened portion 26 disposed outwardly of the seam is cut off as illustrated in Fig. 2. The cutting operation can be performed simultaneously with the seaming by means of conventional edging sewing machines which cut as they seam.

The toe portion 16, which is now closed by the diagonal seam 18, is then flattened, in the vicinity of the point 22, in a plane generally at right angles to that of Fig. 2, and a second relatively short reinforcing seam 28 is formed so as to cross the seam 18 at a point 30 (somewhat inward of the point 22) and to extend generally at right angles to the seam 18 for a short distance on both sides thereof, as shown in Fig. 3.

The uppermost small generally triangular flattened portion 32 above the seam 28 is then cut off as indicated in Fig. 3; the cutting being performable simultaneously with the seaming in the manner referred to above.

It can be seen that only a few seconds are required to run the flattened tube portion 16 through the sewing machine (so as to form the diagonal seam 18 and simultaneously sever the portion 26); thereafter to flatten the end of the tube adjacent the point 22; and finally to run the flattened end through the sewing machine once again (so as to form the short reinforcing seam 28 and simultaneously sever the portion 32), so as to complete the formation of the toe structure.

I prefer to make the seam 18 run almost the full width of the flattened blank, so that the transverse reinforcing seam 28 is located adjacent the level of the toe nails in the final stocking, thereby strengthening the toe portion in the zone of greatest stress and wear, as illustrated in Fig. 5.

After the toe portion has been formed, the blank is placed on a shaper and stretched and set into proper configuration, as indicated in Fig. 4; using conventional shaping techniques known to those skilled in the art.

By using the novel method of the present invention, I have found that it is possible substantially to reduce the manufacturing cost of women's circular-knit seamless hosiery and, at the same time, to produce a stronger and better wearing stocking.

The present invention may be embodied in other specific forms and, therefore, the foregoing embodiment is to be considered in all respects merely as illustrative and not restrictive; reference being made to the appended claims as indicating the scope of the invention.

Having thus described my invention, I claim as new and desire to protect by Letters Patent the following:

1. In a woman's circular-knit stocking, a toe closure

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comprising a seam running forward along the bottom of the stocking from about the arch of the foot to about toenail level, and a relatively short reinforcing seam running transversely and generally at right angles to the first-mentioned seam and extending to both sides from the front end of said first-mentioned seam.

2. A construction according to claim 1 wherein the main portion is relatively sheer and is knitted of thin thread and wherein the toe portion is knitted of relatively heavier thread; the aforesaid seams being located wholly within the relatively heavier toe portion.

3. A method of forming a woman's stocking which comprises the steps of forming a circular-knit seamless open-ended tube of generally uniform diameter, flattening the tube adjacent one end thereof so as to form a pair of parallel longitudinal fold lines therein, running a generally diagonal seam from a point located generally at the outer end of one of said fold lines to a point located at the other fold line an appreciable distance inward from the outer end thereof, trimming off that portion of the blank located beyond the diagonal seam, folding the seamed end of the tube in a plane generally at right angles to the plane of the original fold so as to form a generally triangular portion with the above-mentioned seam generally bisecting said triangular portion, forming a second relative-

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ly short reinforcing seam intersecting the first-mentioned seam generally at right angles slightly below the uppermost end thereof, and trimming off the small triangular portion located above the last-mentioned intersecting seam.

4. A method according to claim 3 wherein each trimming operation is performed substantially simultaneously with the corresponding seaming operation.

5 10 15 5. A method according to claim 3 wherein the circular-knit seamless tube has its major portion formed of relatively light thread, and wherein the annular portion adjacent one end of the tube is formed of heavier thread, and wherein the aforesaid seams are formed wholly within the above-mentioned heavier-thread annular portion to provide a reinforced toe portion in the final stocking.

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