March 27, 1956 L. STERN 2,739,467

KNITTED SOCK

Filed May 26, 1955

Fig. 1.

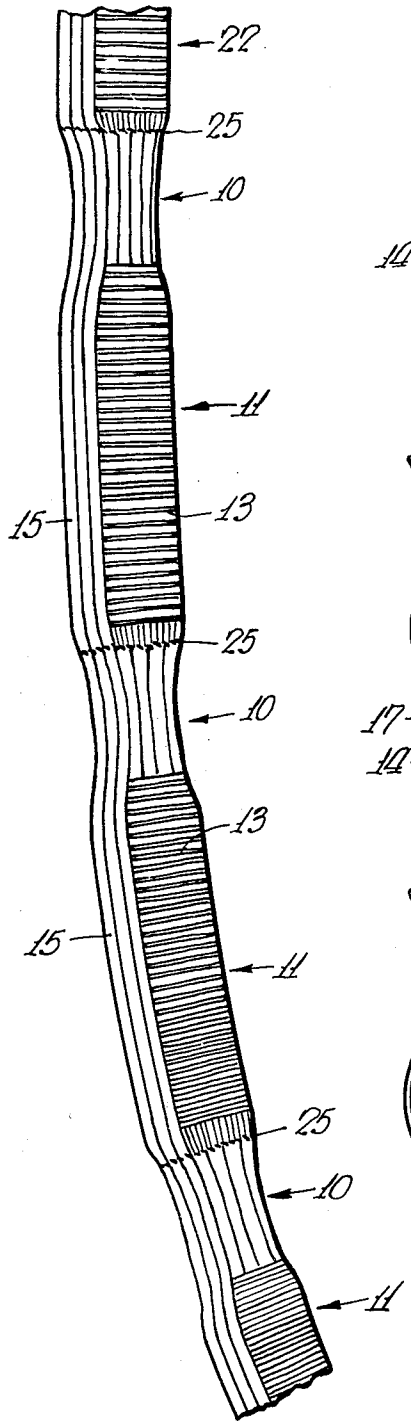


Fig. 2.

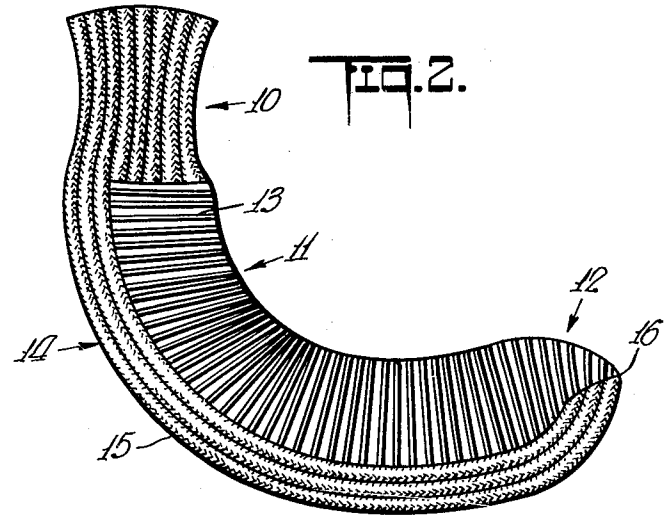


Fig. 3.

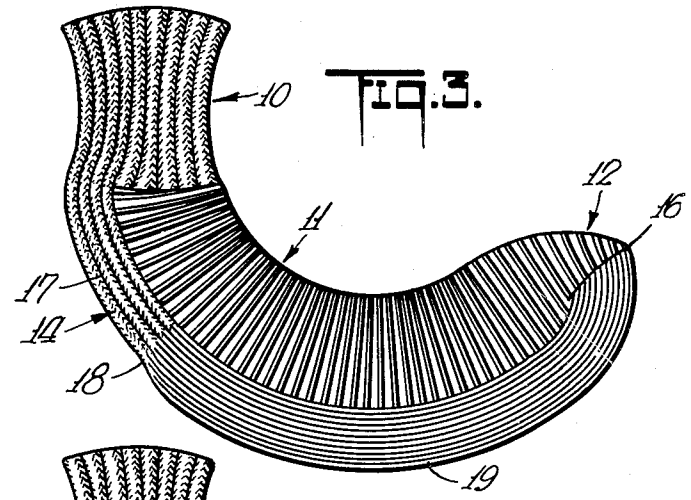
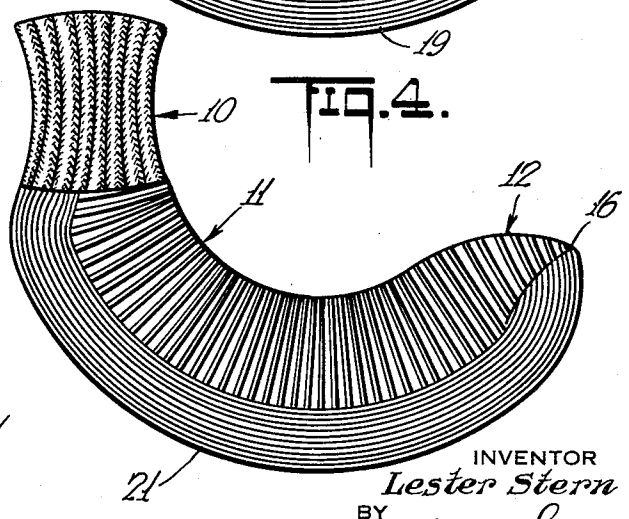


Fig. 4.



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KNITTED SOCK

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11 Claims. (Cl. 66—185)

This invention relates to knitted hose, preferably socks.

It is among the objects of the present invention to provide knitted hose which can be made of one size for adults, another size say for teen age children, still another size for other age groups of children and one and the same sock made for each age group will fit all sizes of feet within the said age group.

It is another object of this invention to provide a knitted hose which can be made on existing superposed or double cylinder knitting machines in the form of a long tube, requiring only the removal of the draw thread knitted into the tube at intervals defining each hose and sewing of the toe portion to form the hose.

Other objects and advantages of this invention will be apparent from the following detailed description thereof.

In the preferred embodiments illustrated on the drawing the invention is shown incorporated in a so-called adult short sock. The present description will be confined to the present illustrated embodiments of the invention. It will be understood, however, that the novel features and improvements are susceptible to other applications, such, for example, as children's socks, or socks or hose which have a longer leg portion than the socks disclosed in the drawing.

From an appearance standpoint, with particular reference to the boomerang shape of the sock, the preferred embodiment of this invention is in a sock, such as the so-called short sock, in which the leg and feet portions are dimensioned substantially as shown in the drawing, rather than in the so-called full length sock in which the leg portions are appreciably longer than shown in the drawing. It will be appreciated, that the scope of this invention is not confined to the embodiments herein described.

In the accompanying drawing, forming a part of this specification and showing, for purposes of exemplification, preferred forms of this invention without limiting the claimed invention to such illustrative instances,

Figure 1 is an elevational view of a length of knit tube as produced on a double cylinder machine which can be separated along the transversely extending separating threads (preferably draw threads) to produce individual knit sock blanks requiring only the shaping and sewing of the toe portion to form the completed sock;

Figure 2 is a side view of a completed sock embodying this invention;

Figure 3 is a side view of a modified form of sock embodying this invention; and

Figure 4 is a side view of still another modified form of sock embodying this invention.

In the drawing **10** indicates the cuff portion of the sock, **11** in the case of a short sock, as shown in the drawing, the instep portion of the sock and **12** the toe.

The cuff is knit with a vertical rib stitch which is 1 knit, 1 purl, or 2 knit, 1 purl or 2 knit, 2 purl, referred to in the knitting art as 1x1, or a 2x1, or a 2x2 rib, respectively. In all modifications the cuff is ribbed, giving the desired relatively tight hold on the leg.

In the embodiment of the invention shown in the drawings a short sock is shown having little or no leg portion contiguous to the cuff **10** and an instep portion **11**. This instep portion **11** has from 60° to 300°, preferably 90° to 270°, of the periphery (in a direction about the generally circular exterior as contrasted with the length of the sock) constituted of a transverse rib **13**. These ribs may be 1x1, 2x1 or 2x2 ribs. They are termed transverse ribs because they extend for the most part transversely to the length of the sock. The transverse ribs **13** cooperate with residual peripheral portion **14** of the sock to impart an arced or what can be aptly characterized as a "boomerang" shape to the sock.

An important feature of this invention is that from 60° to 300° of the periphery of the sock, in a direction transverse to the length of the sock, is of transverse rib knit as shown and the remainder of the periphery is of longitudinally extending rib knit, or jersey or flat knit, or a combination of longitudinal rib and jersey or flat knit. This novel construction results not only in imparting the shape to the finished sock but surprisingly produces a sock which automatically adjusts itself to the foot of the wearer including heel, sole and toe thereof, so that one and the same adult size sock can be used for all practical purposes for all sizes of feet. The advantages of this feature are obvious; among other advantages, it eliminates the necessity of the manufacturer making and storing different sizes of socks, and the jobber and retailer stocking different sizes of socks. Surprisingly, when the sock of this invention is placed on the foot it snugly hugs the foot forming a heel, sole and toe conforming to the shape of the foot. It will be noted that the sock of this invention is devoid of a heel defining pouch, the knit construction above described automatically results in a snug heel formation when the sock is placed on the foot.

In the embodiment of the invention shown in Figure 2, the residual peripheral portion **14**, which may be of 60° to 300°, preferable 90° to 270°, in transverse extent (throughout the specification the reference to transverse is relative to the length of the sock) is knitted to form the longitudinally extending ribs **15**. These ribs may be 1x1, 2x1 or 2x2 ribs. In Figure 1 they extend the full length of the sock from the top of the cuff **10** to the seam **16** defining the extremity of the toe **12**.

The modification of Figure 3 has the residual or back periphery **14** which, as in Figure 1, is of 60° to 300°, preferably 90° to 270°, in transverse extent knitted to form longitudinal ribs **17** which terminate at **18** intermediate the base of cuff **10** and toe **12**. From point **18** to seam **16** the base of the sock is knit with a jersey or flat stitch **19**. The length of the sock thus constituted of jersey or flat stitch is preferably at least equal to the maximum size of foot, so that the transition from rib stitch to smooth or flat stitch will not occur on the foot portion of the sock where the possible unevenness caused by this transition might be felt by the wearer. Of course, where such slight unevenness is not objectionable, as in a heavy sock for winter wear where it would not be felt, the transition from one stitch to the other may occur at any point along the length of the sock below the base of the cuff.

In Figure 4, the entire back or residual periphery **14** is knit with a flat stitch **21** thus forming a smooth jersey knit extending from the base of cuff **10** to seam **16**.

The sock of this invention is knit in the form of a long tube **22**, shown in Figure 1, on a superposed or double cylinder machine disclosed, for example, in United States Patents 2,070,762, granted February 16, 1937; 2,112,501, granted March 29, 1938; 2,085,619, granted June 29, 1937, and 2,101,494, granted December 7, 1937. It will be understood that these patents disclosed types of well known double cylinder circular knitting machines and that the

socks of this invention may be produced not only on the machines disclosed in these patents but on other types of double cylinder circular knitting machines. In producing the socks of this invention the control cams are set to knit a tube which, in the case of the sock of Figure 2, knits in the order mentioned, first the rib cuff **10**, the instep portion **11** and the draw thread **25**, thereafter another cuff, instep portion and draw thread, etc. The transverse ribs **13** are formed by alternately knitting two courses on one cylinder and two courses on the other cylinder, etc., which together form the ribs with separating depressions. When thus knitting the tube **22**, the tension on the thread on one cylinder, usually the top, is maintained materially greater or tauter than on the other cylinder. Desirably, the tension is from 10% to 30%, preferably from 15% to 25% greater on the thread knitted by one cylinder than that on the thread knitted on the other cylinder. This results in a transverse rib which exerts a transverse pulling or puckering action on the length of the sock with consequent formation of a boomerang shape sock, which, although free of heel pouches, automatically adjusts itself to the shape of the wearer's foot to produce a form fitting sock.

As the construction and operation of double cylinder circular knitting machines are well known, and to one skilled in the operation of such machines given the structure of the sock shown in the drawing, it is a comparatively simple matter to set the control cams of the machine, it is believed further description of the knitting machine and knitting procedure would serve no useful purpose.

After formation of tube **22**, the draw threads **25** are removed to form individual sock blanks open at the toe. The open toe is then closed, desirably by cutting same to shape and sewing to form the seam **16**. This cutting and seaming operation may be performed simultaneously by a sewing machine designed so to do.

While wool yarn or thread is preferred because of its resiliency and other desirable properties of wool, any desired yarn or threads may be used including nylon, Orlon, Dacron, and other synthetic and natural fibers or mixtures thereof.

Since different embodiments of this hose could be made without departing from the scope of this invention, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A knitted hose constituted of a ribbed cuff, a knitted heel and a knitted sole both knit without transverse ribs, knitted toe and a longitudinally extending instep portion of transverse rib knit to impart an arcuate shape to the hose and cause the heel, sole and toe portion to automatically snugly engage the foot of the wearer.

2. A knitted hose as defined in claim 1, in which the transverse rib knit extends from 60° to 300° of the periphery of said hose in a direction transverse to its length.

3. A knitted hose constituted of a ribbed cuff, an instep portion, a pouchless heel and sole portion and toe portion, said instep portion being of transverse rib knit and extending to said toe, and said heel and sole portion being of longitudinally extending rib knit and extending to said toe.

4. A knitted hose as defined in claim 3, in which the transverse rib knit extends from 60° to 300° of the periphery of said hose in a direction transverse to its length and the longitudinally extending rib knit extends about the remainder of the periphery of said hose below said cuff.

5. A knitted sock constituted of a ribbed cuff, an instep portion, a pouchless heel and sole portion and toe, said instep portion being of transverse rib knit extending about the periphery of said sock from 60° to 300° and said heel and sole portion being of jersey knit.

6. A knitted sock constituted of a ribbed cuff, an instep portion, a pouchless heel and sole portion and toe, said instep portion being of transverse rib knit extending about the periphery of said sock from 60° to 300° and said heel and sole portion being partly of longitudinally extending rib knit and partly of jersey knit.

7. A knitted sock as defined in claim 6, in which the jersey knit portion extends from the toe and completely covers the entire sole portion of said sock.

8. A knitted sock constituted of a ribbed cuff, an instep portion, a knitted pouchless heel and sole portion both knit without transverse ribs and a toe portion, said sock being of generally boomerang shape, the instep portion thereof being of transverse rib knit, which transverse rib knit extends to said toe and covers from 90° to 270° of the periphery of said sock in a direction transverse to its length.

9. A knitted sock as defined in claim 8, in which the said heel and sole knit construction is entirely of a longitudinally extending rib knit which extends from the base of the cuff to the toe.

10. A knitted sock as defined in claim 8, in which the said heel and sole knit construction is entirely of a jersey knit and extends from the base of the cuff to the toe.

11. A knitted sock as defined in claim 8, in which the said heel and sole knit construction is partly of longitudinally extending rib knit and partly of a jersey knit.

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