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[54] **FOOTLET CONSTRUCTION**
2 Claims, 3 Drawing Figs.

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66/173
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ABSTRACT: The disclosure describes a footlet construction which involves an integrally knitted upper band fitting around the top of the footlet or socklet which need not be assembled from gores and stitching. The socklet is made on a circular knitting machine by using a turned-over top knitted of Lycra yarn on top of a body of nylon yarn. The loops on the elastic top are provided by knitting 30 to 60 courses and preferably about 50 courses on 200 needles with the intervening or alternating needles holding the initial stitch so that a tubular element will be formed serving as the upper elastic band or selvage of the footlet.

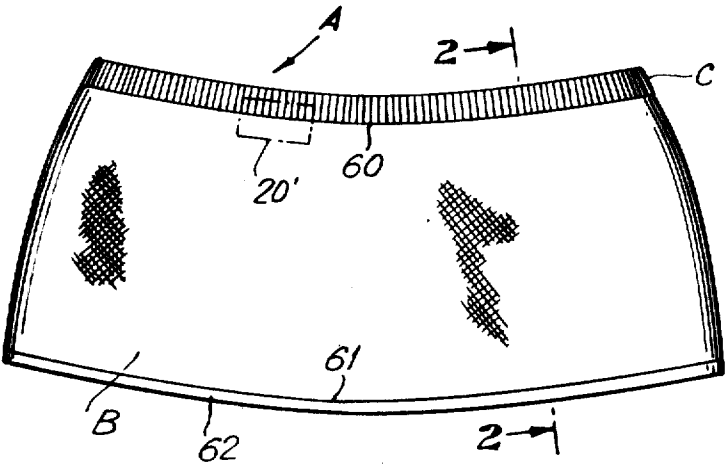


FIG. 1

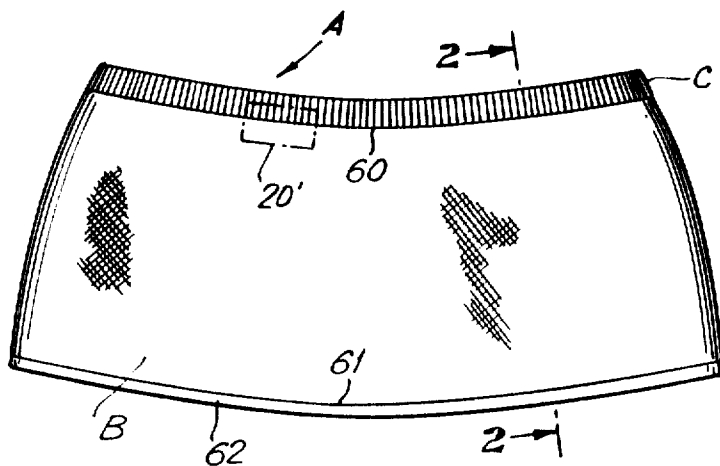


FIG. 2

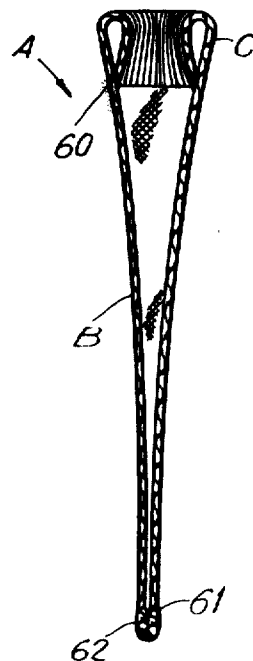
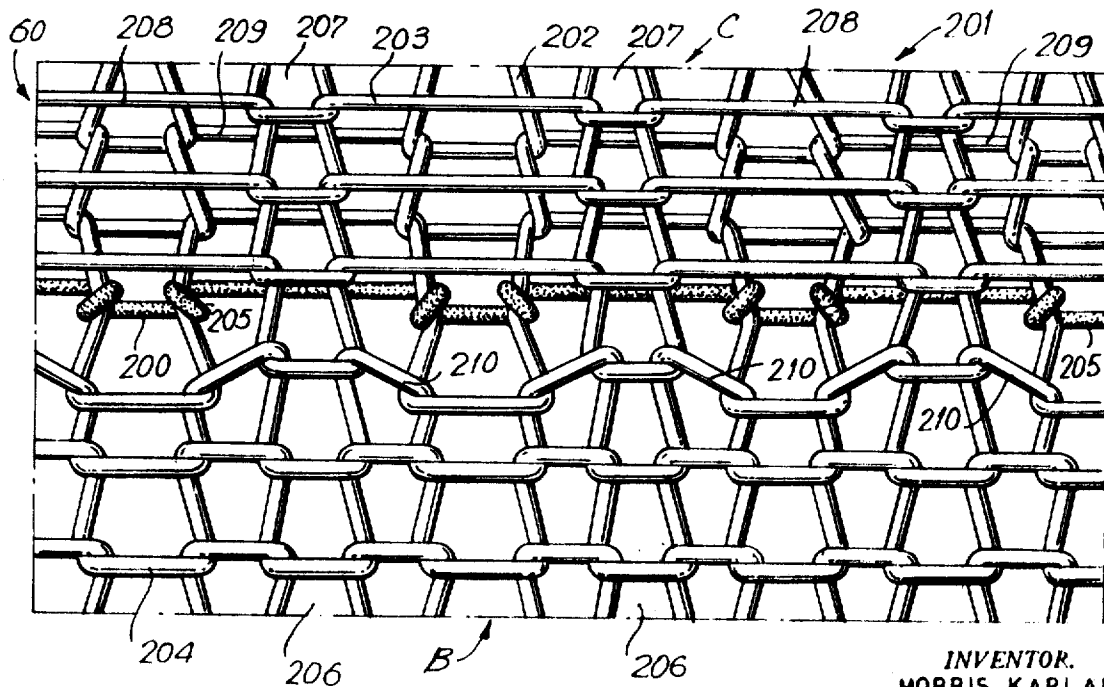


FIG. 3



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FOOTLET CONSTRUCTION

The present invention relates to footlets and it particularly relates to footlets for women's and girls' wear. Such footlets, which fit the lower part of the foot and the toe and heel are worn with or without stockings and it is important that they be of light construction yet durable and devoid of any lumpiness or tendency to gather, which would cause discomfort.

It is desirable that they fit a variety of different foot sizes so that it is not necessary to manufacture separate models for each foot size and that, in accommodating different foot sizes, there should be no discomfort to the wearer either in the lower size range from lumpiness or gathering, or in the upper range because of tension or binding.

It is among the objects of the present invention to provide a novel footlet of the character described which will accommodate a series of foot sizes, for example, from four to 12 without causing discomfort and which may be readily manufactured at low cost by automatic machinery with little manual labor.

Another object is to provide a novel machine for manufacturing footlets which will be substantially in condition to be worn without undue stitching, seaming or other fitting operations and which at the same time will assure a substantially perfect fit over a wide variety of foot sizes.

In making footlets it has been customary to form the footlet by cutting a series of gores and then stitching them together and then providing a selvage which consists of stitching a rubber elastic band around the interior top thereof and this not only has the disadvantage of necessitating additional manual operations but the elastic bands are frequently not sewn in uniformly at a predetermined position around the selvage and they cause undue tension in fitting the selvage of the footlet, particularly with the larger sizes.

It is therefore among the objects of the present invention to provide a footlet which will snugly fit the lower portion of the foot without the necessity for providing elastic bands or braids sewn upon the interior of the upper edge thereof and which may be readily manufactured without additional manual operation required by such stitching or attachment of said elastic band.

It has also been suggested that it is possible to knit into the upper edge of the footlet elastic strands which may be floated in position or actually knitted in the structure, but this has not been satisfactory because of the undue complication of the knitting operation and the need to provide special attachments to the knitting machine and the unsatisfactory result from utilizing a few strands or fillings of elastic strands to support and permit the secure attachment of the top of the footlet. Therefore it is among the further objects of the present invention to make a novel footlet which will securely fit the foot without the need of rubber elastic of any type and which may be readily knitted upon circular knitting machines without special attachments or controls and it may be produced at low cost without unnecessary manual manufacturing operations.

Still further objects and advantages will appear in the more detailed description set forth below, it being understood, however, that this more detailed description is given by way of illustration and explanation only and not by way of limitation, since various changes therein may be made by those skilled in the art without departing from the scope and spirit of the present invention.

In accomplishing the above objects it has been found most satisfactory to knit the footlet as a tube with a turned-over top and a selvage bottom which is seamed together to form a seam extending longitudinally below the bottom of the foot terminating substantially inside the toes and heel. Desirably the top portion or tubular portion of the footlet is knitted of Lycra yarn while the body of the footlet is knitted of nylon yarn and the lower edge, which is stitched together to form the longitudinal seam, is knitted of rayon yarn. It has been found most

satisfactory that the needle count be well over 150 and desirably the basic needle count should be of the order of 300 to 500 needles of a circular knitting machine with a preference for 400. The top tubular elastic portion of Lycra should desirably be knitted on between 150 to 250 needles with a preferred count of 200 needles.

In the preferred form of the invention the Lycra yarn is 40 denier and covered with 20 denier nylon. The preferred Lycra yarn has two ends of the nylon yarn twisted around it and it is desirably knitted for between 30 to 70 courses and desirably about 50 courses on 200 needles without use of the intervening needles and with the intervening needles holding the initial stitch so that a tubular element will be formed serving as the upper elastic selvage of the footlet.

Then the body of the footlet will be knitted from two ends of 70 denier count stretch nylon, using about 150 to 250 courses and this is carried on for about 175 to 250 courses with 400 needles. The bottom selvage or lower edge which is stitched together to form a longitudinal seam is then knitted with a spun-rayon yarn. In the preferred system a 400-needle machine is operated so that, in making the tubular upper portion, only every second needle is operated to give a 200knit fabric in the tubular elastic portion and this may be done for 48 courses.

Then 206 courses may be knit from two ends of stretch nylon having opposite twist so that there will be no torque. In the preferred method of knitting a 200-needle course is first knitted with the Lycra then the 400 needles are used for the next course with the Lycra and these 400-needle stitches are held on alternate needles which are then drawn downwardly out of operation following which there are 48 courses knit on the alternate 200 needles from Lycra.

The course 200 is knit in the same manner as the course 203 in that it is knit upon alternate needles. This course 200 is a position 60 in FIG. 2. The floats 208 are part of the outer portion of the tube shown at the upper part of FIG. 2, while the floats 209 are part of the inner layer of the tube, and they are shown separated from one another for better clarity of the drawing.

On the 49 course the 200 needles are elevated into knitting position and the feed is changed from Lycra to two ends of stretch nylon of opposite twist to knit 206 courses, following which the yarn is changed to spun rayon to knit the last five to 10 courses serving as the bottom selvage.

These footlets are made automatically upon the circular knitting machine alternating from 200 to 400 needles with the cam on the back of the drum being built up about one-half inch to cause the appropriate operation. When the course which is held upon the needles is combined with the next full 400 -needle course on the 49th course the selvage will turn over into a tube and an elastic top selvage will be formed. This operation is much more satisfactory than would result when dial bits are utilized and loop stitches are held over the dial bits while knitting the top selvage. This avoids knitting a fabric with undue stress and permits a better knitted footlet and it does not form an uneven knitted fabric. The fabric which is thus formed is highly useful for footlets but may be used for other types of fabric where elasticity is desired without undue tension or gathering.

DESCRIPTION OF DRAWINGS

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts as hereinafter more specifically described, and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which fall within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:

FIG. 1 is a front elevational view of a socklet according to the present invention.

FIG. 2 is a transverse sectional view on the line 2—2 of FIG. 1.

FIG. 3 is an enlarged fragmentary view showing the stitch structure of FIG. 1.

DESCRIPTION OF PREFERRED EMBODIMENT

The footlets A, as indicated upon FIGS. 1, 2 and 3, are produced by vertical needle action on a 400-needle Seamless Fidelity Knitting Machine, Model LBMD dual feed. The transfer jacks or dial bits on the machine are not utilized.

In the knitting procedure, the fabric B consists of a knitted fabric knitted on 400 needles of about 200 courses, which may extend from 60 to 61. The portion from 60 to 61 will have between 190 to 220 courses and desirably about 210 courses, and the bottom edge 62 is seamed to close the bottom of the footlet or socklet. The portion B is desirably formed of a 70-denier stretch nylon, two ends per strand, with two feeds, one feed having an S twist and the other end having a Z twist to prevent torque.

The important feature of the present invention resides in the upper tubular portion C, which forms the integrally knitted band. This weltlike portion consists of 50 courses which are knitted on the alternating needles, that is 200 needles held down and holding the first course. The tubular portion C is knitted of 40-denier Lycra. The preferred Lycra yarn has two ends of 20-denier nylon yarn wound around it.

The first course knitted at 60 is a locking course and it is knitted with 400 needles, whereupon the 200 needles hold the loops down and the next 40 to 60 courses, or preferably 48 courses, are knitted on the alternate 200 needles to form the tubular structure C. Then all of the 400 needles are restored to knitting position and the knitting will continue with the 400 needles to give the body B of the footlet or socklet. This will result in a tubular double layer structure at C which will be elastic and which will serve in lieu of any added elastic strands which would normally be stitched on to the interior face of the top edge of the socklet.

The locking course 200 is shown in FIG. 3 and it forms the junction and connection between the 50 course two-ply weltlike structure C and the single-ply 210 course body structure B of the footlet or socklet. It may be noted that the 210 courses which are knitted on 400 needles are produced with 70-denier two-end stitched nylon yarn having opposite twists to prevent any torque.

The end portion or lower portion 62 of the socket may consist of eight to 10 courses which are knitted on the 400 needles and are produced with a spun-rayon yarn, blue in color, so that the seaming operator will have a visible guide area for seaming shut the bottom end of the footlet with a Merrow Sewing Machine.

Referring particularly to FIG. 3, this shows the loop area indicated at 20, in the upper portion of the footlet as shown in FIG. 1 with the loops stretched to maximum extend both walewise and coursewise. The locking courses 200 forms the connection between the single-ply B and the double C. Adjacent the locking course 200 it will be noted that there are no

substantial loops, but the coils or turns 205 engage every second line of Wales at the junction 60. Throughout the structure as shown in FIG. 3, there will be lines of Wales 206 which extend through the single-ply portion A and into the face of the double-ply portion at 207 in FIG. 3. Intervening Wales however, as indicated at 208 on the front side and 209 on the rear side will be double or triple width.

Directly below the banding course 205 the loops will have oblique top portions 210. This not only produces a top knitted tubular structure eliminating the need of additional foreign elastic material but also permits the formation of an integrated structure which will more closely fit the foot of the user.

The present socklet or footlet is preferably knitted on a 400-needle Fidelity 3 to 3 1/4-inch cylinder LBMD. The body of the footlet or socket B is desirably made of a low stretch yarn, while the tubular double-ply elastic section C is made of a high-stretch yarn, both being knitted as a continuous operation.

Normally the knitting will knit the socket or footlet of FIGS. 1, 2 and 3 upside down, with the tubular section C being knitted first. The first course, which will form the structure at junction 60, is knitted of two ends of a Lycra yarn with nylon twisted around the yarn. This may be 40-denier covered Lycra, with two ends of nylon twisted therearound.

This is first knitted on 400 needles and then the next 48 courses are knitted on 200 needles with alternating needles being held in down position and the next 48 loops being knitted on 200 needles. Then there is a final course in which the loop C is completed and the machine will revert to 400 needles and to a 70-denier nylon stretch yarn forming a body.

The final knit is in the lower seam at 62, which may be eight 10 courses, and consists of rayon. This will produce the socklet as shown with an integrally elastic upper portion C.

As many changes could be made in the above footlet construction and method of making same, and many widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter combined in the above description shall be interpreted as illustrative and not in a limiting sense.

Having now particularly described and ascertained the nature of the invention, and in what manner the same is to be performed,

1. An integral knitted footlet with Wales and courses having an upper tubular elastic portion encircling the top of the footlet, a main foot-covering portion and a bottom longitudinal seam, the Wales being reduced in number in said elastic portion and wider than the Wales in the main portion, the elastic portion consisting of about 50 courses and the foot-covering portion consisting of about 210 courses, said tubular portion consisting of 40-denier Lycra yarn covered with 20-denier nylon and said covering portion formed of 70-denier two-end stretch having opposite twists to prevent torque.

2. The footlet of claim 1, said elastic portion having between 30 to 70 courses and said body portion having about 150 to 250 courses.

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