May 15, 1928.

1,669,591

J. C. WILLIAMS

SEAMLESS HOSIERY

Filed April 8, 1927

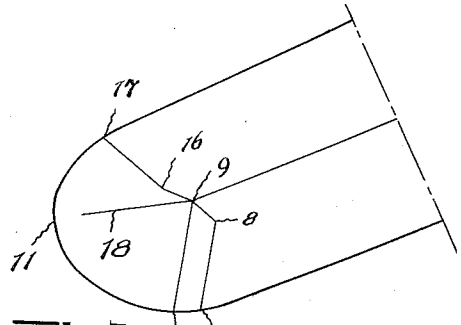


Fig. 3.

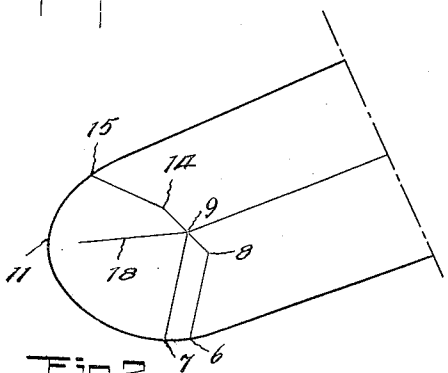


Fig. 2.

Fig. 1.

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Patented May 15, 1928. 1,669,591

UNITED STATES PATENT OFFICE.

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SEAMLESS HOSIERY.

Application filed April 8, 1927. Serial No. 182,041.

This invention relates to knitted stockings having so-called seamless toe pockets and more particularly to the structure of the toe. The invention involves forming the tapered web which constitutes the top half of the toe pocket of smaller size than the lower half of the toe pocket.

One object of the invention is to provide a stocking whose toe pocket is so shaped that it will not be visible when worn with the slipper type of shoe. Another object of the invention is to obtain a stocking with this improved appearance without the presence of the pucker or surplus fabric, commonly called the dog ear, found on the inner end of the gore or diagonal suture of a toe pocket such as is formed on seamless hosiery machines. Another object of the invention is to increase the length of the sole of the stocking relatively to the length of the instep in order that the stocking may conform more nearly to the natural shape of the foot, thus eliminating wrinkles on the instep and avoiding strain upon the sole of the stocking. Another object of the invention is to provide a stocking which can be manufactured more quickly and with less yarn and be a better fitting and better looking stocking than heretofore.

In the example given in the drawings—

Fig. 1 represents a stocking having a toe made according to the new invention; and

Fig. 2 represents a modified form of toe; while

Fig. 3 represents another modified form of toe.

In the specification the word "stocking" is meant to include hose, half hose, or any other foot wear, the invention being applicable to any form of knitted foot wear having toe pockets with diagonal sutures.

The toe of an ordinary modern seamless stocking consists of a pocket having a narrowed web and a widened web. When the stocking is knit from top to toe, this toe pocket is manufactured by a narrowing and widening operation in which one needle is picked out of action at each reciprocation when narrowing, i. e., during the formation of the first or lower half of the toe, and two needles are picked into action and one picked out of action for each reciprocation in the second half of the toe. This makes the narrowed and widened webs of the same size and gives them the same number of courses from the point of the toe to the outer edge of each web. According to the present invention a lesser number of courses is knit in the top or widened web than in the narrowed web. In the example shown in Fig. 1 of the drawings this is done by picking the needles into action at a uniformly faster rate than they were picked out in forming the lower half of the toe. For example during the widening operation which forms the second half of the toe, two needles may be picked into action at every reciprocation, as usual, but no needles picked out of action. This produces a low web 9—10—11 for the second half of the toe which is half the size of the web 7—9—11 forming the first half of the toe. In other words, the distance from the point of the stocking to the loopers rounds is approximately half what it would be on the normal toe. This reduces the amount of fabric in the stocking and consequently the cost, and at the same time improves the appearance of the stocking when worn with the slipper type of shoe. This improvement in appearance is due to the fact that the heavy yarn of which the toe is knit does not extend too far from the point of the toe toward the instep and therefore is hidden under the instep portion of the shoe, whereas in the case of the ordinary toe the loopers rounds and the heavy yarns are apt to be visible.

It should be understood that the invention is not limited to a structure in which the low web is formed by picking two needles down and picking up none—other manipulations can be used.

In the ordinary stocking having a seamless toe pocket there is surplus fabric forming a dog ear, or pucker at the inner end 9 of the diagonal suture 18 at each side of the toe owing to the reduced amount of fabric radiating from the inner end of the suture. The resulting low toe just described tends to further reduce the amount of fabric radiating from this point in the stocking, making the dog ear very prominent. For the purpose of eliminating this dog ear the improvement which forms the subject matter of my Patent 1,621,343, dated March 15, 1927, can advantageously be employed with the low toe. In the drawings this is shown as a tapered segment of fabric 6—8—9—7 on the sole of the stocking between the foot and the toe pocket the points 9 of the ta-

pered segment coinciding with the inner ends of the diagonal sutures. This segment not only results in having more fabric radiating from the inner end 9 of the diagonal suture 18 but puts more fabric between the point 11 of the toe of the stocking and the point of the heel opposite the end of the suture 14, thus decreasing the length of the stocking from the instep 12 to the point of the toe relatively to the distance from the point of the toe to the heel. This increase in the length of the sole and the decrease in the length of the instep due to the low toe improve the fit of the stocking tremendously, the human foot being much longer on the sole than on the top.

The stocking can be even further improved if the widened web of the toe pocket has portions containing different angles between the diagonal suture and the upper edge of the web. Thus in Fig. 2 the portion adjacent the inner ends of the sutures has a more obtuse angle than the portion near the point of the toe. This is accomplished by increasing the number of active needles less rapidly during the last few courses, i. e., in the wales from point 14 to point 9. A toe pocket made according to this figure will have a lower toe than normal—though not as low as the toe shown in Fig. 1—and yet the amount of fabric in the toe will tend to reduce the dog ears found in the plain low toe of Fig. 1 when not accompanied by the segment 6—8—9—7.

In the ordinary slipper type of shoe the instep is cut lowest at the top of the shoe and therefore the toe of the stocking can sometimes be kept of normal size for purposes of wear provided it is low at the middle of the top. I have discovered a construction of toe which gives this maximum wearing surface without exposure of the toe pocket by the shoe and which in addition tends to eliminate the dog ears found in Fig. 1 even when it does not include the segment 6—8—9—7. This toe is shown in Fig. 3 and includes a toe 7—9—16—17—11 whose widened web has a more acute angle nearer the inner ends 9 of the diagonal suture than near the point 11 of the toe. This may be constructed by increasing the number of active needles less rapidly in the first reciprocations forming the widened web than in the last reciprocations. Thus for example when beginning the widened web two needles may be picked down and one up, but when the wale at point 16 is reached the machine can be made to pick two down and none up at each reciprocation till it reaches the inner ends 9 of the sutures.

It will be observed that a toe pocket manufactured according to my invention requires fewer reciprocations and therefore less time for its manufacture. Furthermore the reduction in the number of courses in the upper web of the toe pocket reduces the amount of yarn required.

Still another feature of interest is that the diagonal sutures can be carried closer to the point of the toe without increasing the number of courses in the widened web as compared with the normal toe.

This invention is not concerned with the shape of the picks or the mechanism which operate them, but relates solely to the stocking.

What I claim is:

1. A stocking having a toe pocket comprising tapered narrowed and widened webs, the web constituting the upper part of the toe pocket containing different angles between its upper and lower edges, the portion of said web adjacent the inner edge of the toe having the more obtuse angle.

2. A stocking having a toe pocket comprising tapered narrowed and widened webs, the web constituting the upper part of the toe pocket containing different angles between its upper and lower edges, the portion of said web adjacent the inner edge of the toe having the more obtuse angle, in combination with a tapered segment between the foot and the toe pocket, only the points of said segment touching the diagonal sutures.

In testimony whereof I have signed my name to this specification.

JAMES C. WILLIAMS.