

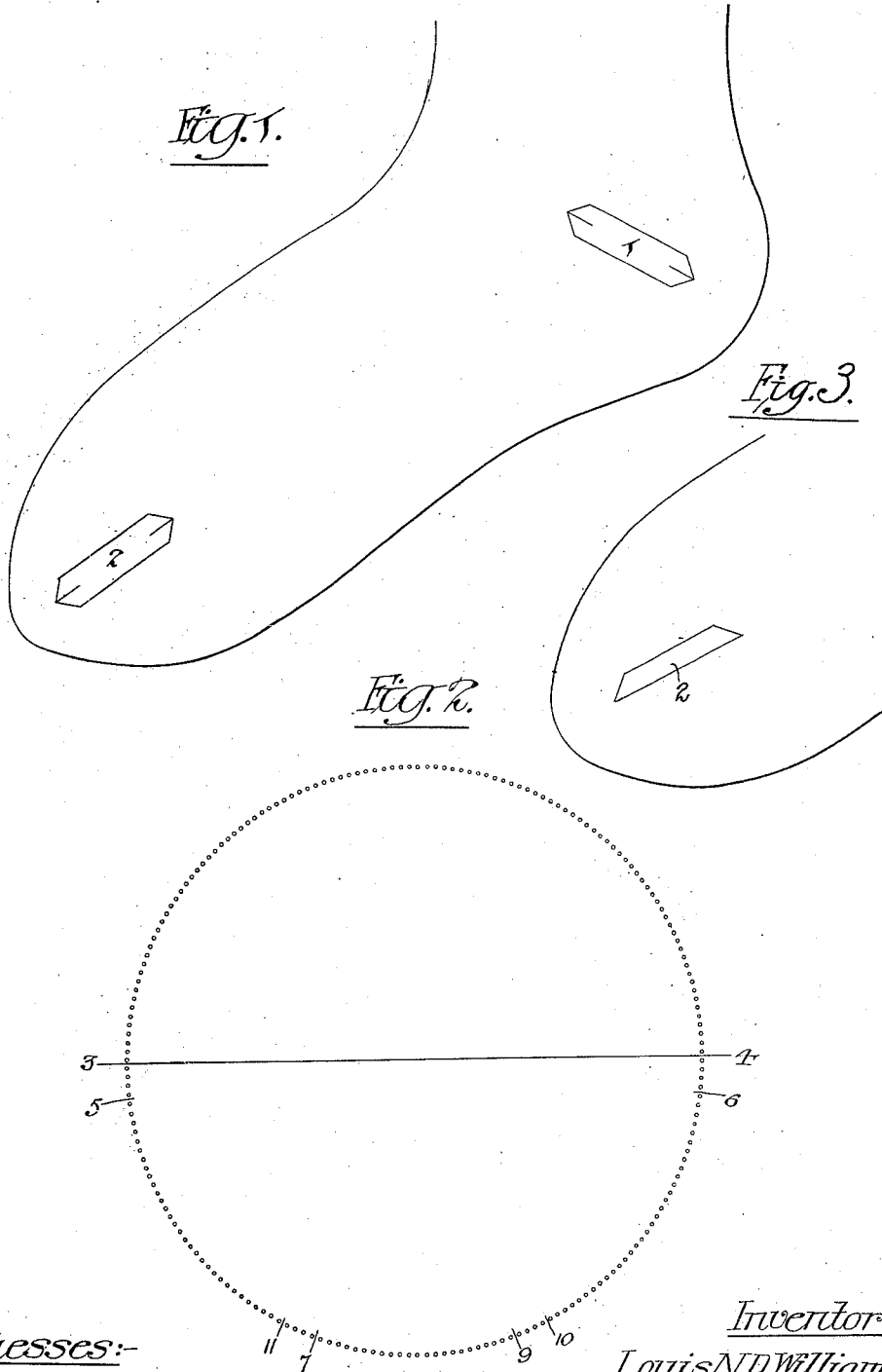
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PATENTED JULY 14, 1903.

L. N. D. WILLIAMS.
STOCKING.

APPLICATION FILED SEPT. 23, 1901.

NO MODEL



Witnesses:-

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UNITED STATES PATENT OFFICE.

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STOCKING.

SPECIFICATION forming part of Letters Patent No. 733,926, dated July 14, 1903.

Application filed September 23, 1901. Serial No. 76,227. (No model.)

To all whom it may concern:

Be it known that I, LOUIS N. D. WILLIAMS, a citizen of the United States, residing in Ashbourne, Pennsylvania, have invented certain Improvements in Stockings, of which the following is a specification.

The object of my invention is to produce a sock or stocking of the character known as "seamless," but having a better shape in the heel and toe than such stockings as usually made. This object I attain by providing the heel and toe pockets formed upon the knitted tube with a taper-ended gusset at each side.

In the accompanying drawings, Figure 1 is an outline view of part of a sock or stocking, showing the character and location of the heel and toe gussets formed therein in accordance with my invention. Fig. 2 is a diagram representing the needles of a circular-knitting machine for the purpose of conveying an understanding of the various knitting operations resorted to in carrying out my invention, and Fig. 3 is a view illustrating a modification of my invention.

In making an ordinary seamless stocking heel and toe pockets or bags are formed upon one side of a knitted tube, the usual method of forming such bag or pocket being to first put out of action the needles around one half of the circular knitting-head, these needles retaining their stitches, then to knit to and fro upon the needles of the other half of the head, putting out of action first a needle at one end of the set and then a needle at the other end of the set until the flat web produced by the to-and-fro knitting has been narrowed to the desired extent, the needles successively put out of action retaining their stitches, and then to continue the to-and-fro knitting, bringing into action first a needle at one end of the set and then at the other end of the same in the reverse order from that in which they were put out of action, so as to gradually widen the web and unite it stitch by stitch to the previously-narrowed web, the widening operation being continued until the full half of the needles is in operation, whereupon the other half of the needles is brought into action and the knitting of tubular fabric is resumed.

In carrying out my invention I introduce the taper-ended gusset between the narrowed and widened webs of the heel or toe pocket, so as to impart to the heel or toe of the stocking a better shape than can be given to these parts by the usual method of formation.

In Fig. 1 of the drawings, 1 represents a taper-ended gusset at one side of the heel of the sock or stocking, and 2 a similar gusset at one side of the toe of the same.

In carrying out my invention upon an ordinary circular-knitting machine I knit the ordinary tubular web up to the point at which the heel or toe pocket is to be formed, and I then throw out of action the needles around one half of the head—say those above the central line 3 4, Fig. 2—these needles retaining their stitches in the usual way. I then throw out of action a certain number of needles at each end of the remaining set—say those between the lines 3 and 5 and those between the lines 4 and 6, Fig. 2—these needles also retaining their stitches and the number of needles comprised in each set being dependent upon the desired width of the gusset to be produced. I then knit to and fro upon the needles contained in the segment between the lines 5 and 6, narrowing in the usual way by dropping out first a needle at one end of the set and then a needle at the other end of the set until the web has been narrowed to the desired extent—say until only the needles between the lines 10 and 11 remain in action. I then proceed with the formation of the gussets first on one side and then on the other side of the heel or toe pocket in the following manner: The needles from 10 to 11 are first put out of action and to-and-fro knitting is carried on, commencing with the needles from 6 to 10 and gradually widening by introducing a needle first at one and then at the other end of the set until the needles from 4 to 9 are in action, whereupon the web is gradually narrowed by successively putting out of action needles from 9 to 10 and from 4 to 6 until only the needles from 6 to 10 remain in action, the result being the formation of a gusset with paralld sides and wedge-shaped ends, as shown in Fig. 1. I then proceed in the same way to form the

gusset on the opposite side, putting out of action all of the needles except those from 5 to 11 and knitting to and fro upon these needles, first widening until the needles from 3 to 7 are in action and then narrowing upon the needles from 3 to 5 and 7 to 11 until only the needles from 5 to 11 remain in action. The needles from 10 to 11 are then put into action and the needles from 3 to 11 and 4 to 10 are put out of action, it being understood that in all of the operations described the needles thrown out of action retain their stitches. To-and-fro knitting is then carried on upon the needles from 10 to 11, the web being gradually widened by bringing into action first a needle at one end of the set and then a needle at the opposite end of the set until all of the needles from 11 to 3 and from 10 to 4 have thus been brought into action. The needles around the upper half of the head 3 to 4 are then brought into action and the production of tubular web upon the entire series of needles is resumed.

Instead of forming the gusset in the manner described a reverse method of procedure may be adopted—that is to say, in starting the gusset all of the needles from 3 to 7 or from 4 to 9 may be put into action and during the first portion of the to-and-fro knitting upon these needles the web may be narrowed upon the needles from 3 to 5 and 7 to 11 or 4 to 6 and 9 to 10 and then widened upon these same needles, the result being the production of a gusset having straight sides and wedge-shaped ends, but in which the stitches are somewhat differently disposed than in a gusset produced in the manner first described.

The gusset may also be produced by a widening or narrowing operation only instead of by both operations, one instance of such modification being shown in Fig. 3, and instead of putting out of action the needles from 3 to 5 and 4 to 6 before beginning the preliminary narrowing operation in the formation of the heel and toe pocket such narrowing operation may be performed upon all of the needles from 4 to 10 and 3 to 11 and gussets may be formed on each side of the heel or toe after the narrowing operation and before the widen-

ing operation without material change in the resulting effect.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. A sock or stocking having a heel or toe pocket with taper-ended gussets between the narrowed and widened portions of said pocket, substantially as specified.

2. The mode herein described of forming a heel or toe pocket upon a knitted tube, said mode consisting in first knitting to and fro upon the fashioning-needles to form the narrowed web for the pocket, then knitting to and fro upon certain of the fashioning-needles first upon one side of the machine and then upon the opposite side of the same, and shaping the web during each of these latter knitting operations, and then knitting to and fro upon the fashioning-needles to form the widened web for the pocket, whereby there will be formed between the narrowed and widened webs knitted upon the entire set of fashioning-needles, opposite taper-ended gussets knitted upon a portion of said fashioning-needles, substantially as specified.

3. The mode herein described of forming a heel or toe pocket upon a knitted tube, said mode consisting in first knitting to and fro upon a set of fashioning-needles to form the narrowed web for the pocket, then knitting to and fro upon certain of the fashioning-needles and upon additional needles at the end of the fashioning set, first upon one side of the machine and then upon the opposite side of the same, and shaping the web during each of these latter knitting operations, and then forming the widened web for the pocket by knitting to and fro upon the same fashioning-needles on which the narrowing was effected, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS N. D. WILLIAMS.

Witnesses:

F. E. BECHTOLD,
JOS. H. KLEIN.