

(Specimens.)

W. ESTY.

ART OF KNITTING STOCKINGS.

No. 386,118.

Patented July 17, 1888.

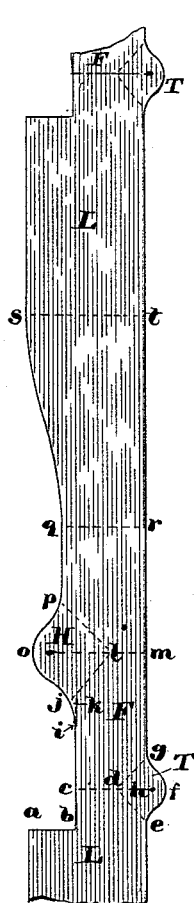


Fig. 1.

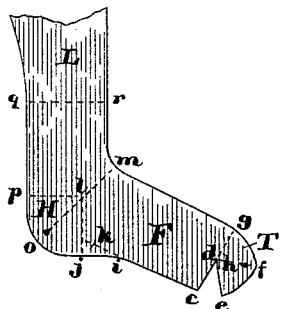


Fig. 3.

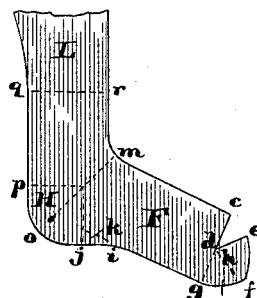


Fig. 4.

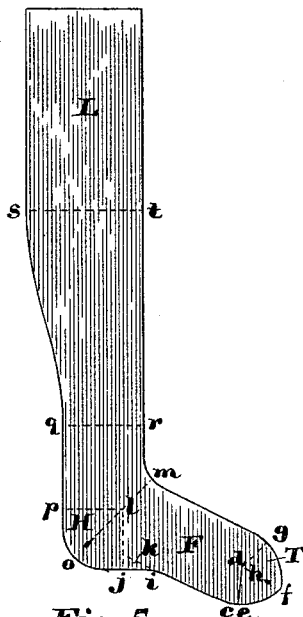


Fig. 5.

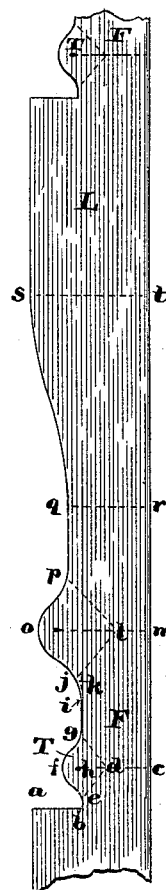


Fig. 2.

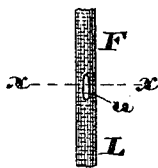


Fig. 6.

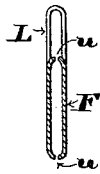


Fig. 7.

Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM ESTY, OF LACONIA, NEW HAMPSHIRE.

ART OF KNITTING STOCKINGS.

SPECIFICATION forming part of Letters Patent No. 386,118, dated July 17, 1888.

Application filed September 20, 1887. Serial No. 250,217. (Specimens.)

To all whom it may concern:

Be it known that I, WILLIAM ESTY, of Laconia, in the county of Belknap and State of New Hampshire, have invented certain new and useful Improvements in the Art of Knitting Stockings, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to the art of knitting stockings by machinery, and is an improvement upon the invention described in Letters Patent No. 302,388, granted to me July 22, 1884.

It consists in an improved art or method of knitting and completing full-fashioned stockings, and in the art or method of knitting full-fashioned stockings in the web or continuous and connected series, which will be readily understood by reference to the description of the drawings, and to the claims to be hereinafter given, and in which my invention is clearly pointed out.

In the accompanying drawings, Figure 1 is an elevation of a portion of a web of tubular stocking-blanks, illustrating this invention. Fig. 2 is a modification of said web with the toe-bulge upon the same side of the tube as the heel-bulge. Fig. 3 is a partial elevation of the stocking-blank knit in accordance with this method after it has been separated from the continuous tube shown in Fig. 1. Fig. 4 is a similar partial elevation of a stocking-blank after it has been separated from the continuous tube illustrated in Fig. 2. Fig. 5 is an elevation of the finished stocking. Fig. 6 is an edge view of a section of the fabric between T and t on Figs. 1 and 2, and showing the slit separating the two short sections of flat webs; and Fig. 7 is a section on line *x x* on Fig. 6.

L represents the leg, F the foot, T the toe, and H the heel, of a stocking made by this improved process. This method of knitting stockings may be carried out upon a machine adapted for making tubular work of varying diameters. A portion of the tube having been knit of a width equal to the widest or upper portion of the leg L, the needles containing the stitches from *a* to *b*, Figs. 1 and 2, are first thrown out of action and the stitches are cast off therefrom. A few courses may then be knit with the remaining needles by delivering each yarn to the same row of needles during

both the forward and return strokes of the yarn-carrier, thereby forming two short sections of flat webs, each having selvage edges, as shown at *u*, Figs. 6 and 7, to afford a convenient space for inserting the shears for cutting the stockings apart. Then one-half of the remaining needles, or those carrying the stitches from *c* to *d*, are thrown out of action, and with the needles containing the stitches on the line *d e* the toe-bulge T is knit narrowing from *e* to *f*, and then widening again from *f* to *g*, and at the same time uniting the narrowed and widened edges along the line *d h*. The needles carrying the stitches on the line *c d* are then brought into action and a tube is knit to form the foot F, said tube being knit of an even width until the point *i* is reached, when the tube is gradually widened by bringing into action some of the needles which were first thrown out, the widening being continued from *i* to *j*, thus forming in the center widthwise of the bottom of the foot the gusset *k* for the purpose of increasing the width of the stocking at the heel and making it conform more nearly in shape to the foot of the wearer. The knitting has now progressed as far as the line *j l m*. The needles which carry the stitches on the line *l m* are now thrown out of action and the needles which carry the stitches on the line *j l* continue their operation and knit the heel-bulge H, which is formed in the same manner as the toe-bulge T, the narrowing taking place from *j* to *o* and the widening from *o* to *p*. The needles carrying the stitches on the line *l m* are then brought into action again and a straight tube of even width is knit to form the ankle portion until the line *q r* is reached, when the widening of the leg is begun and continued gradually by bringing into action the needles which carry the stitches on the line *a b* and were first thrown out until the full width of the tube forming the leg L is attained at the line *s t*. The remaining or upper portion of the leg is then completed, being made of an even width and carried to the desired length. The needles carrying the stitches along the line *a b* are then again thrown out of action, and the operation is repeated.

In knitting the stocking-blank as above described, it is preferable to use two threads or yarns, which are fed to the needles in opposite

directions around the circumference of the tube of stockings being knit, in the manner set forth in Letters Patent No. 302,119, granted to me July 15, 1884. These two yarns may be of different colors, in which cases the courses which form the leg L and foot F will be of alternate colors, thus producing a series of fine transverse stripes, the yarns crossing each other at the front and back of the foot.

In knitting the toe-bulge T the yarns are fed from the narrowed edge *d h* upon one side around the edge *ef* to the corresponding narrowed edge upon the opposite side of the toe and then back again, the courses of the narrowed portion running parallel to the line *de* and the two yarns starting simultaneously from the opposite narrowed edges *d h* and crossing each other upon the line *ef*. The other half or widened portion is knit in a similar manner, the two yarns being fed in opposite directions back and forth between the widened edges *dh* upon opposite sides of the toe T, crossing each other upon the line *fg*. It will thus be seen that each yarn will be knit into two consecutive courses upon either side of the toe T, and if the two yarns are of different colors the stripes thus produced will consist of two courses each, instead of a single course, as is the case with the leg L and foot F.

To complete the stockings, it is only necessary to separate the several stockings by cutting through the two short sections of flat webs between the top of the leg of one stocking and the toe-bulge of the next stocking, using the slit or opening formed by the two contiguous selvage edges of said two short sections of flat webs (shown at *u*, Figs. 6 and 7) as a guide for inserting the shears and determining the line of cut, then to unite by seaming the disconnected side of the toe-bulge to the foot portion in any well-known manner, and to hem the top of the leg.

By this improved method full-fashioned stockings, or stockings which are shaped to conform to the foot and leg of the wearer during the process of knitting, may be produced, which require but one short seam to be closed after the knitting is completed, and that extending around one-half of the foot portion at the toe, said stockings being knitted in a continuous tube or series by a continuous operation of the machine without once severing the yarn, and thus a more rapid production is effected. By the use of the two yarns, as above described, the knitting can be performed twice as fast as when a single yarn is used, and if the two yarns are of different colors an ornamental appearance is given to the stocking.

In the method described in my prior Letters Patent before cited the few courses knit after the top of the leg was completed and before the commencement of the knitting of the toe-bulge were knit by feeding the two yarns continuously in opposite directions to all the needles then in action, thereby forming a section of a tubular web, consisting of a few circular courses, for the purpose of affording a conven-

ient space for severing the stocking-blanks from each other when the knitting of the toe-bulge was commenced.

In the method herein described two short flat webs are knit between the top of one stocking and the toe-bulge of the next stocking, the whole of one web being knit upon one row of needles and the other web upon the other row of needles, the two contiguous edges of said two webs being separated by a slit, as at *u*, Figs. 6 and 7, which serves as a guide in cutting the stockings apart. Without this slit as a guide the person cutting the stockings apart is liable to make an oblique cut, which may occasion an extra amount of raveling from both parts, with great danger of injury to one or the other of the two stockings by causing a shortening of the leg in the one case or the spoiling of the stocking in the other case by having to ravel so far as to spoil the toe-bulge.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The method of forming full-fashioned stockings, which consists in taking up the full number of stitches required to form the top of the leg, knitting a few circular courses, dropping a portion of the stitches, knitting a few courses upon the remaining needles by feeding each yarn to the same row of needles in both directions throughout said courses, thereby forming two short sections of flat webs, then throwing out of action one-half of the remaining needles, knitting a toe-bulge by knitting a given number of courses back and forth and narrowing, and then a corresponding number of like courses and widening, at the same time uniting the widened portion to the narrowed portion, then throwing into action the needles last thrown out of action, then knitting a sufficient number of circular courses to form the greater portion of the foot, then widening for several courses to form a gusset or gore in the bottom of the foot, then knitting the heel-bulge in the same manner as the toe-bulge and upon the same side of the tube as the gusset or gore, then knitting a series of circular courses to form the ankle, then widening upon the same side of the tube as the heel-bulge till all the needles first thrown out of action are again in operation, then knitting a series of circular courses, using the whole number of needles to complete the desired length of the leg, then throwing out of action and dropping the stitches from the same needles that were first thrown out, (repeating the foregoing operations as many times as there are stockings required,) and then severing the sections and uniting by seaming the disconnected side of the toe-bulge to the foot portion.

2. The herein-described improvement in the art of knitting stockings in continuous web or connected series, whereby the top of the leg forming part of one stocking may be accurately severed from the toe-forming portion of the next stocking of the web with the minimum of waste, which consists in knitting several

courses between the leg and toe portions of
different stockings to form two short flat webs
each having two selvage edges, to thereby
designate the courses within which the web
5 may be divided.

In testimony whereof I have signed my name
to this specification, in the presence of two sub-

scribing witnesses, on this 1st day of September, A. D. 1887.

WILLIAM ESTY.

Witnesses:

N. C. LOMBARD,

WALTER E. LOMBARD.