(No Model.)

E. E. KILBOURN.

ART OF MANUFACTURING STOCKINGS.

No. 422,886. Patented Mar. 4, 1890.

Fig. 1.

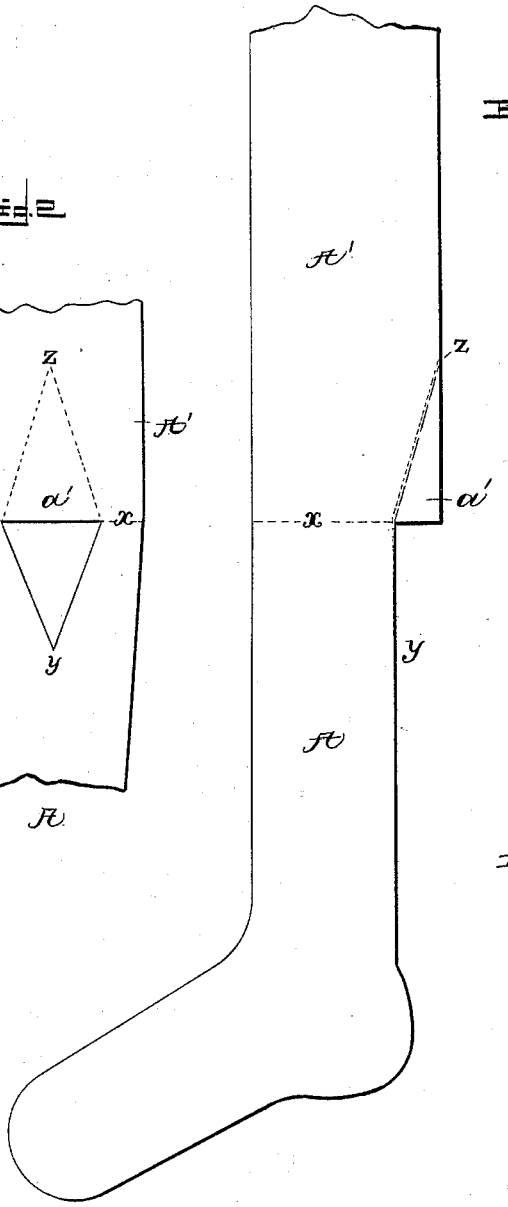
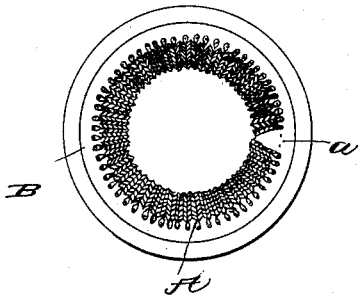


Fig. 2.

Fig. 3.



Witnesses

G. A. Taubenschmidt.

L. B. Whitaker

Inventor

Edward E. Kilbourn

By his Attorneys

Whitaker & Prevost

UNITED STATES PATENT OFFICE.

EDWARD E. KILBOURN, OF NEW BRUNSWICK, NEW JERSEY.

ART OF MANUFACTURING STOCKINGS.

SPECIFICATION forming part of Letters Patent No. 422,886, dated March 4, 1890.

Application filed July 27, 1889. Serial No. 318,897. (No model.)

To all whom it may concern:

Be it known that I, EDWARD E. KILBOURN, a citizen of the United States, residing at New Brunswick, in the county of Middlesex and State of New Jersey, have invented certain new and useful Improvements in the Art of Manufacturing Stockings; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the manufacture of full hose or stockings by circular-knitting machines; and it consists in an improved mode of procedure, whereby a stocking is produced having the upper portion of the leg larger than the lower portion, and the whole fabric of uniform texture and elasticity throughout.

Referring to the accompanying drawings, Figure 1 represents a portion of a stocking formed in accordance with my improved method before the final finishing. Fig. 2 is a rear view of the same. Fig. 3 is a top view of a knitting-cylinder, showing a portion of a stocking thereon.

In the manufacture of stockings it is desirable that in order to have them adapt themselves readily to the shape of the leg the upper portion should be somewhat larger than the part covering the foot and ankle, and that said upper and larger portion should merge gradually into the smaller part. In order to accomplish this when knitting seamless hose on machines adapted for circular knitting, a different mode of procedure must be adapted from that followed when straight-knitting machines are employed.

It has been proposed to knit the entire leg portion of the stocking upon a circular-knitting machine having a cylinder of a certain size by making the stitches of the upper portion of the leg considerably longer and looser than those of the lower portion, and then shaping the article on a suitable former. This method is objectionable, however, as it leaves the upper portion of the stocking-leg more open and loose than the lower portion and less elastic. It has also been proposed to knit the larger portion of the leg first down to a certain part, then to reciprocate the machine and knit a flat web, narrowing on each selvage edge for a certain distance, then to transfer the article to a smaller cylinder, and after knitting the remainder of the stocking to unite the two selvage edges by sewing in any suitable manner. The machines required to effect this work must both be capable of circular and reciprocating work, and also narrowing and widening, and where automatic machines are used for the foot they are more costly and need more attention during the periods of operation than machines for knitting plain circular work; hence the work produced by such machines is rendered costly by the expensive mechanism and the expense of skilled operators who are needed to operate them. It will also be seen that the time required to place the half-finished work upon the cylinder of the smaller or foot-forming machine renders said machine inoperative for considerable periods at short intervals, and this necessitates the use of a larger number of these costly machines in order to produce a given quantity of work. I avoid the objectionable features of both of these processes by my invention.

In the drawings, A represents the foot and ankle of a stocking and the narrower or smaller portion of the leg adjacent thereto as far as the dotted line *x*. This portion is first knit, and when this is done the work is removed and the leg portion is slit from the edge *x* down a short distance to a certain point, as *y*, Figs. 1 and 2. This part of the stocking is then set up on a machine having a cylinder B, as shown in Fig. 3, and a greater number of needles than there are stitches in the edge *x* of the fabric A. It will be seen that the stitches of the fabric will not engage all of the needles of the cylinder B, and the cut edges will thus be spread apart, as shown at *a*. The larger machine is preferably constructed for plain circular work only, and the remaining larger portion A′ of the stocking is formed in the usual manner. The work is then removed and folded in the usual way, as shown in Fig. 1. A seam is then sewed in any preferred manner from *y*, joining the severed edges of the fabric, and this seam is continued in an inclined direction to the outer edge of the portion A′ of the stocking at *z*. The surplus portion *a* of the part A′, which

will be a small triangular piece of the fabric, is then cut off and the stocking is completed. If desired, however, the part *a* (shown in dotted lines in Fig. 2) may be cut out first and the severed edges *y* to *z* joined, as before described. It will be apparent that in most methods of uniting the severed edge the stocking will be turned inside out before sewing. It will be seen that the larger machine, which need be capable only of plain circular work, is much less costly and requires no attention whatever except to place the work upon the needles, and it is this class of machines which by my process are rendered inoperative at intervals while the work is being adjusted. The machines for knitting the foot, on the other hand, are operated continuously, and a much smaller number of such machines are thus required, and I am thus enabled to produce a stocking of the desired shape and of uniform texture and elasticity very cheaply.

What I claim, and desire to secure by Letters Patent, is—

1. The herein-described process of joining a smaller knitted tube with a larger, which consists in slitting one end of the smaller tube and placing this end on a circular-knitting machine of larger size and knitting the larger tube.

2. The process of forming full hose or stockings by circular-knitting machines hereinbefore set forth, which consists in knitting the smaller portion of the leg, then making a slit adjacent to its upper edge, and placing this end on a machine having more needles than there are loops in the edge of the smaller part of the fabric and knitting the larger portion of the leg, then uniting the cut edges and continuing the seam to the edge of the larger portion, and then trimming off the surplus outside of said seam.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD E. KILBOURN.

Witnesses:
J. H. WHITAKER,
G. A. PREVOST.