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SOCK OR STOCKING AND METHOD OF MANUFACTURING THE SAME.

APPLICATION FILED MAR. 17, 1917.

1,404,702.

Patented Jan. 24, 1922.

2 SHEETS—SHEET 1.

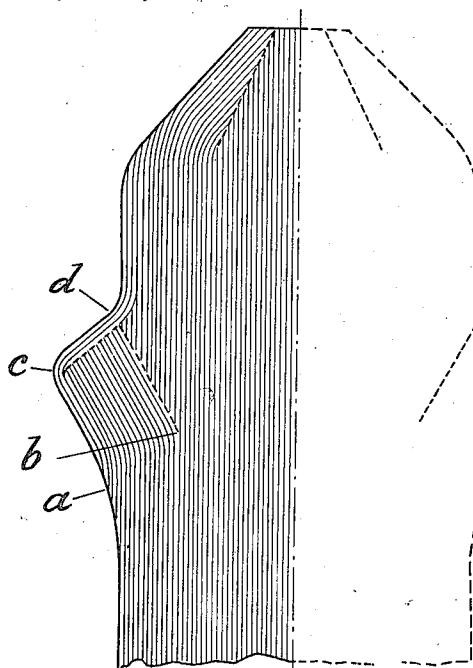


Fig. 1.

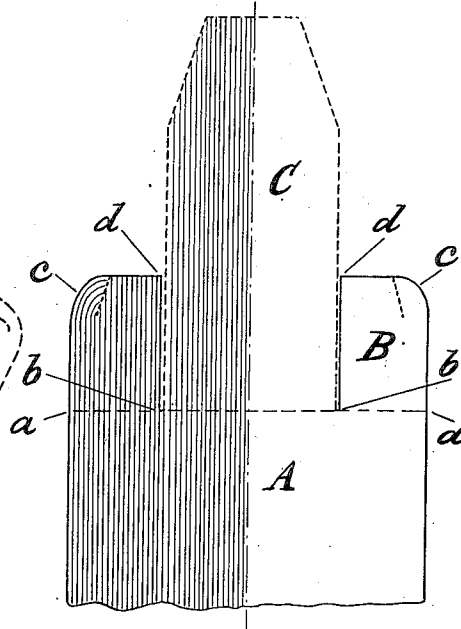


Fig. 2.

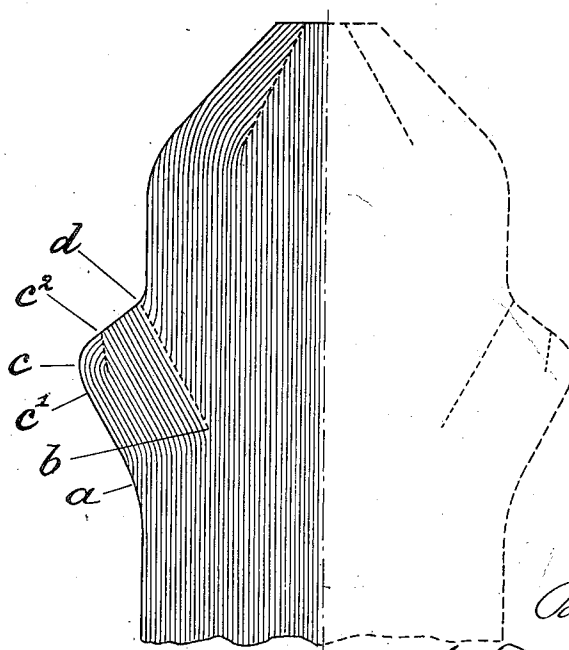


Fig. 3.

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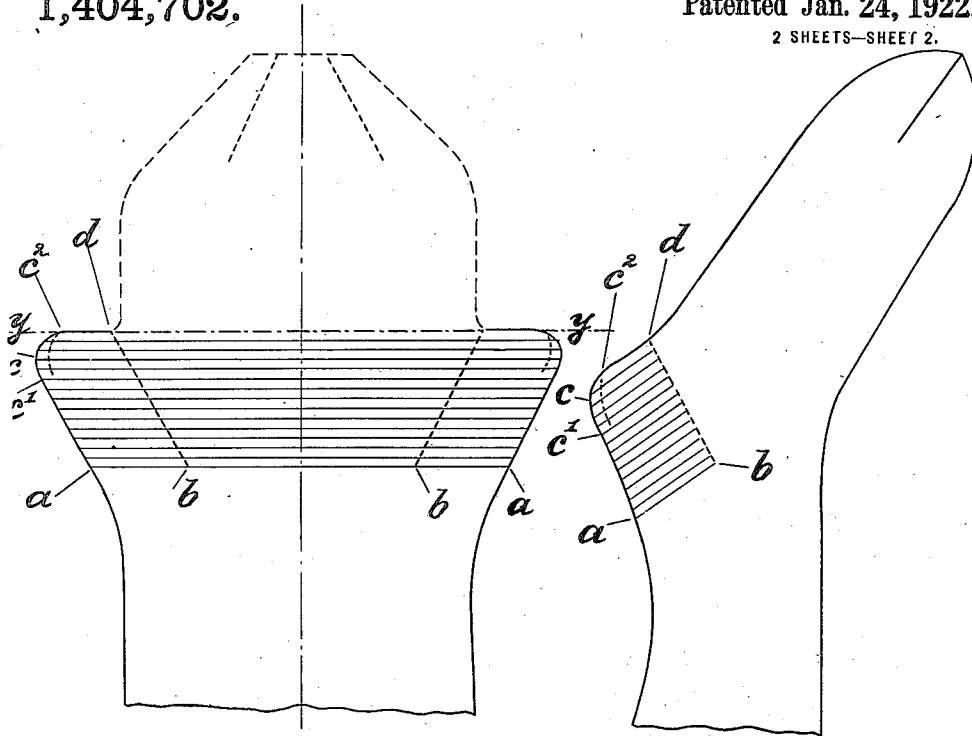


Fig. 4.

Fig. 6.

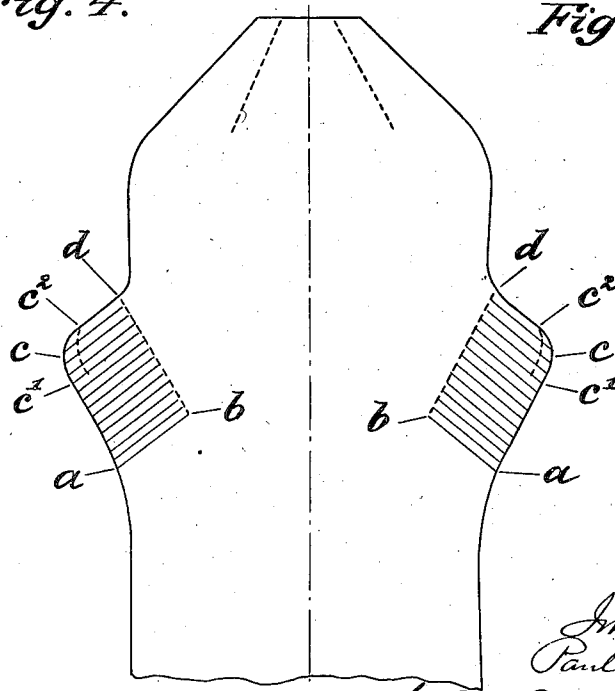


Fig. 5.

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UNITED STATES PATENT OFFICE.

PAUL THIERFELDER, OF AUERBACH, ERZGEBIRGE, GERMANY; META ROSA THIERFELDER ADMINISTRATRIX OF SAID PAUL THIERFELDER, DECEASED.

SOCK OR STOCKING AND METHOD OF MANUFACTURING THE SAME

1,404,702.

Specification of Letters Patent. Patented Jan. 24, 1922.

Application filed March 17, 1917. Serial No. 155,610.

To all whom it may concern:

Be it known that I, PAUL THIERFELDER, a citizen of Germany, and residing at Auerbach, Erzgebirge, in the Kingdom of Saxony, in Germany, have invented certain new and useful Improvements in Socks or Stockings and Methods of Manufacturing the Same, (for which I have filed an application in Germany, January 13, 1916,) of which the following is a specification.

My present invention generally relates to improvements in socks and stockings and a method of manufacturing the same, and my invention relates particularly to a novel method of knitting socks or stockings, which I have described and claimed in my co-pending application Serial No. 5336, filed January 27, 1915, and according to which the heel portions and the intermediate portion of the foot are knitted in one operation, the courses of loops extending over the whole width of the fabric.

Socks or stockings knitted in accordance with my said application Serial No. 5336, contain a heel of which that portion which is disposed upon the sole is narrowed whereby a kind of pocket-heel is produced. However, in many cases there is a demand for socks or stockings having what is known by the term French heels. Hitherto, the production of a stocking having a French heel, necessitated the employment of two knitting frames, viz., one knitting frame for the production of the leg and the heel portions, and a second machine for producing, and adding to the leg, the foot.

It is the object of my present invention to provide improvements in the manufacture of socks or stockings, whereby it becomes feasible to manufacture socks or stockings having French heels in one operation and on one and the same knitting frame. I attain this object by first proceeding in accordance with the method set forth in my said co-pending application Serial No. 5336, knitting the leg and the heel portion, and widening the heel portions by laterally transferring the loops allotted to the formation of the said heel portions. However, during the formation of the heel portions by the said widening operation I effect a narrowing of marginal loops only within the range of the apex of the heel, that is, within that part of the heel which requires to be

rounded off. Thereafter I proceed to knit the foot, and for that purpose, cause the remainder of the marginal loops to be forced off the frame needles, on which the heel portions have been formed; thereby reducing the width of the fabric to the width required for the knitting of the foot. As a result of this modified manipulation, there is prevented the formation of the pocket-heel, the place of which will be occupied by the chain stitch usually employed in French heels for closing the heel.

In order to more fully explain the improvements provided by my present invention I will now describe the same with reference to the accompanying drawings in which, inter alia, I have illustrated some embodiments of my invention by way of example. Figure 1 illustrates in a diagrammatical manner, a part of a stocking manufactured in accordance with my above mentioned application Serial No. 5336, and having what is termed a pocket-heel. Figure 2 shows a stocking having a French heel produced in the usual manner by separate operations on two knitting frames; while Figure 3 shows a part of a stocking having a French heel manufactured in accordance with my present invention. Figure 4 shows a part of the novel stocking shown in Figure 3 in the position which the stocking will occupy while hanging on the frame needles during the course of manufacture. Figure 5 shows the knitted stocking according to my present invention when taken off the frame needles; while Figure 6 shows the same stocking in the finished condition with the edges of the fabric combined by sewing.

In carrying my present invention into effect I proceed as fully described in my above mentioned application Serial No. 5336. Having knitted the leg of the fabric, I allot a plurality of loops on either side of the fabric to the formation of the heel parts; see Figure 4. In continuing the knitting operation, the courses of loops are knitted to extend over the whole width of the fabric and the heel parts are formed by continuously transferring the loops disposed within the heel parts *a*, *b*, and *b*, *a*, and previously allotted to the formation of the latter, laterally to other needles until the required width of the fabric is obtained. During this widening operation some of the marginal

loops of the heel parts are narrowed so as to produce the heel rounding c which extends from c' to c^2 ; see Figures 3, 4, 5, and 6.

If the line $y-y$ in Figure 4 represents the row of needles on the knitting frame the thus knitted stocking inclusive of the heel parts and still hanging on the needles of the frame, would be of the shape shown in Figure 4 and would be finished except for the missing foot portion which is indicated in dotted lines and which portion may then be added by proceeding in accordance with the method described in the said application Serial No. 5336. However, since the foot is to have but the width d , d , this necessitates a shortening of the path of the thread guide to a corresponding width; in consequence thereof the upper loops of both heel parts between the points c^2 and d , are forced off the frame needles at the commencement of the knitting of the foot because the needles within the range of the said loops do not receive any more yarn. On completion of the foot which has the shape shown in Figure 5, the edges c^2 , d , and d , c^2 , as well as the tip of the foot are combined by means of a chain stitch on a chain stitching machine to which the thus knitted stocking is transferred from the knitting frame, the procedure being the same as followed in the manufacture of an ordinary French heel; while the remaining edges of the stocking are sewn together. When the fabric is taken off the knitting frame the heel parts assume the position illustrated in Figure 5 in consequence of the tension in the fabric within the line a, a (Figure 4) resulting from the widening operation.

By the thus described method I am able to produce a sock or stocking having a French heel in one operation, viz. without any interruption of the knitting action, and on one and the same knitting machine, whereas formerly two machines were required to perform this work.

The longitudinal lines in Figures 1 to 3 designate the direction of the wales of the loops, while the transverse lines in Figures 4, 5 and 6 indicate the direction of the produced courses of loops.

What I claim as my invention and desire to secure by Letters Patent of the United States is:—

1. The hereinbefore described sock or stocking, in which the heel portions and the intermediate portion of the foot consist of continuous rows of loops, the foot portion being composed of regular loops while the heel portions consist of widened loops, the marginal loops of either heel portion within the range of the apex of the heel only being narrowed, substantially as described.

2. The hereinbefore described method of manufacturing socks or stockings on a knitting frame, consisting in, knitting the leg in the form of a flat fabric, forming the heel portions by widening a plurality of loops on either side of the said fabric, narrowing only the marginal loops of the thus formed heel portions necessary to produce the heel rounding, and thereafter knitting the foot and the toe.

3. The hereinbefore described method of manufacturing socks or stockings on a knitting frame, consisting in, knitting the leg in the form of a flat fabric, allotting a plurality of loops on either side of the said fabric to the formation of the heel portions, forming said heel portions by continuously widening said plurality of loops until the required width of the fabric is obtained, simultaneously narrowing such of the marginal loops of the heel portions as are disposed within the apex of the heel, reducing the width of the fabric to the required width of the foot portion by forcing off the frame needles the remainder of the marginal loops of the thus produced heel portions, and thereafter knitting the foot and the toe.

PAUL THIERFELDER.