

No. 702,843.

Patented June 17, 1902.

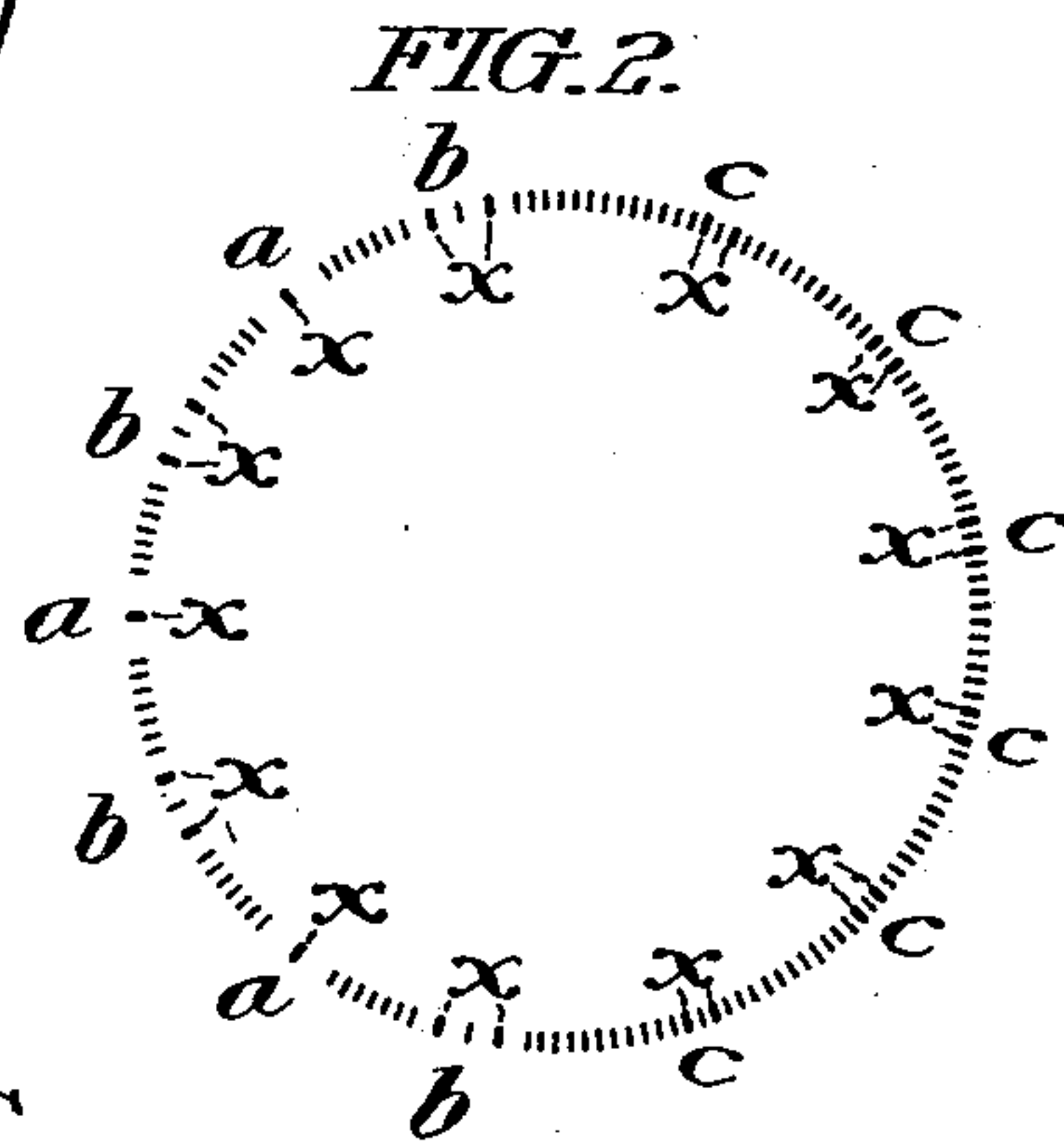
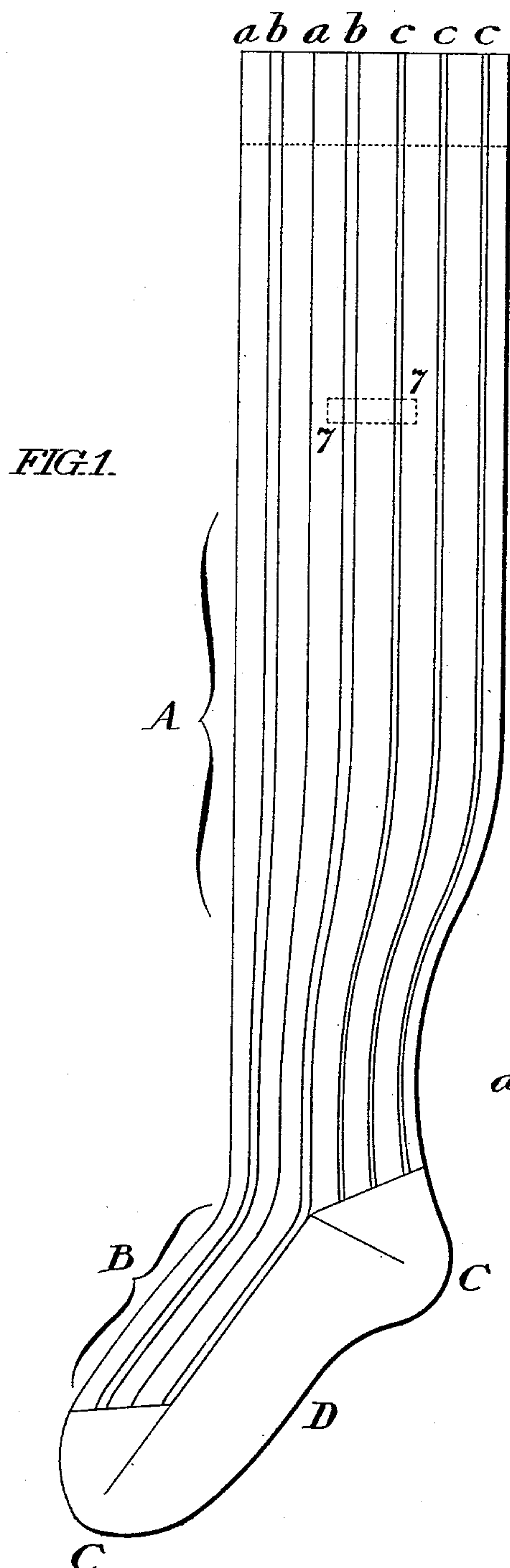
W. WILSON.

MANUFACTURE OF SEAMLESS HOSIERY WITH LACE WORK STRIPES.

(Application filed June 15, 1901.)

(No Model.)

4 Sheets—Sheet 1.



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FIG. 3.

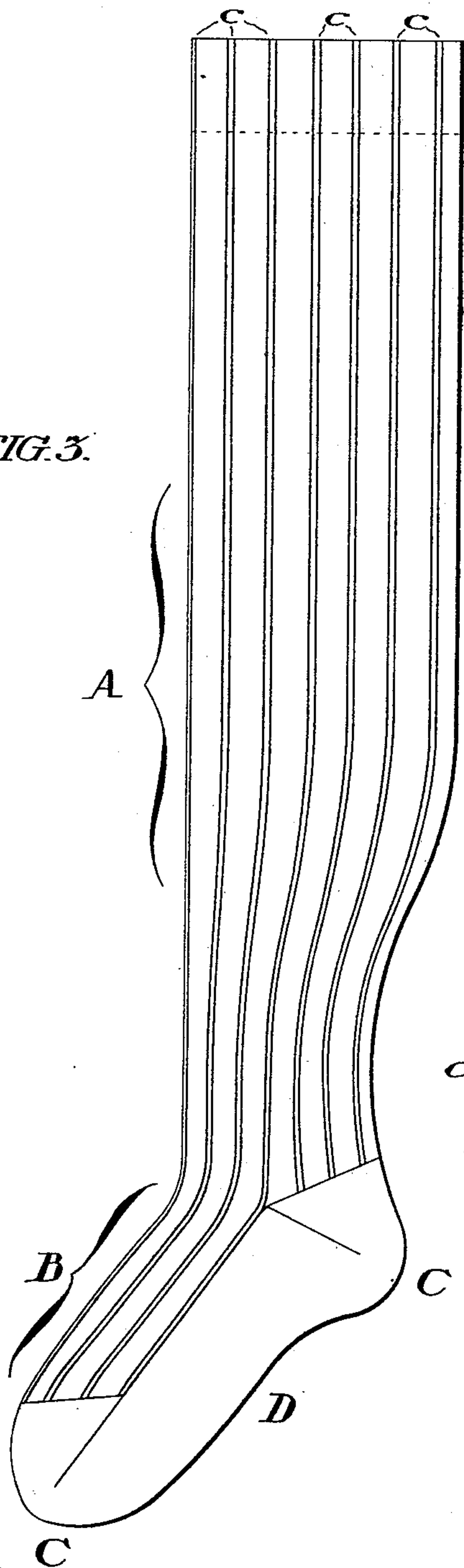
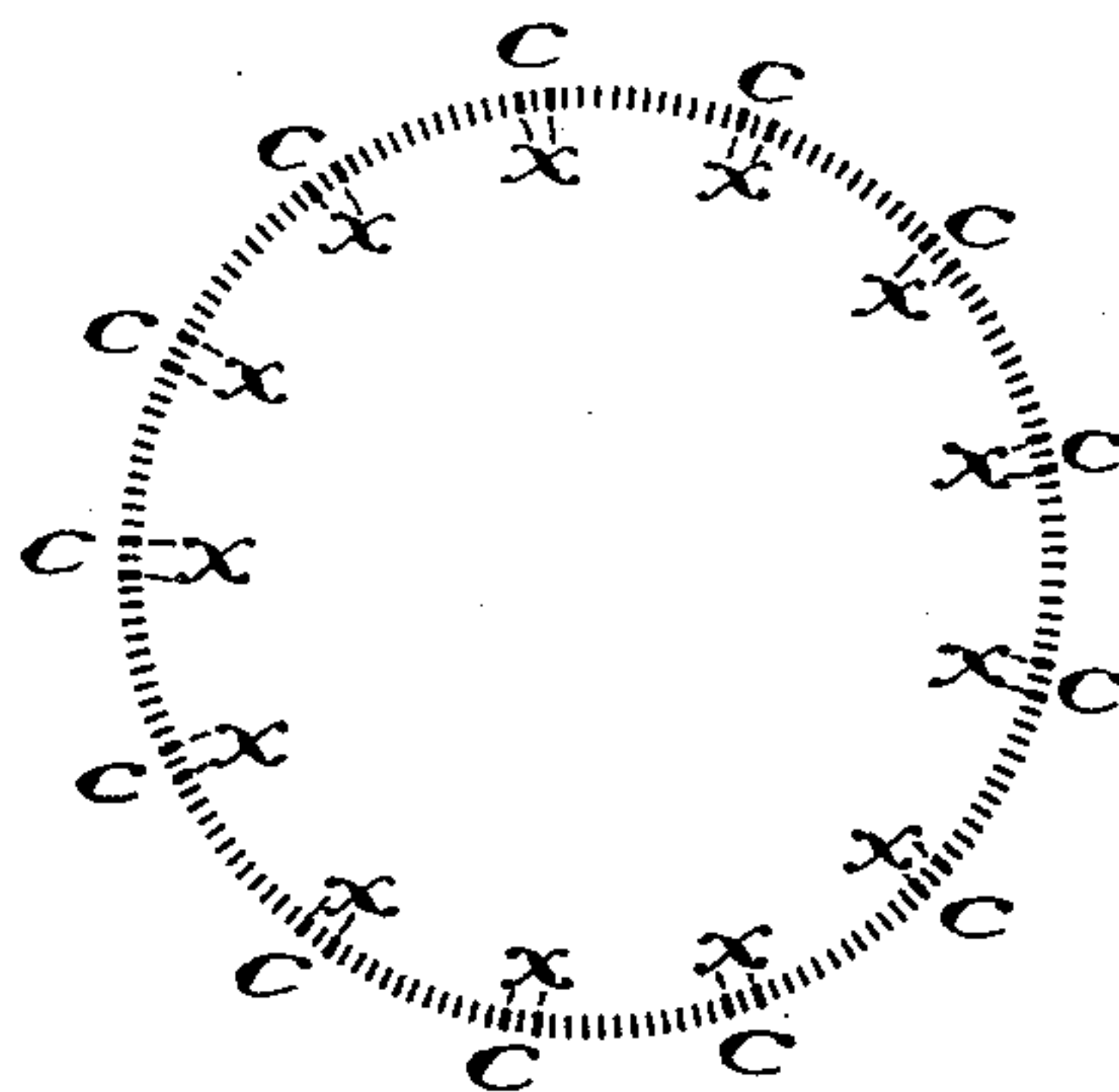


FIG. 4.



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FIG. 5.

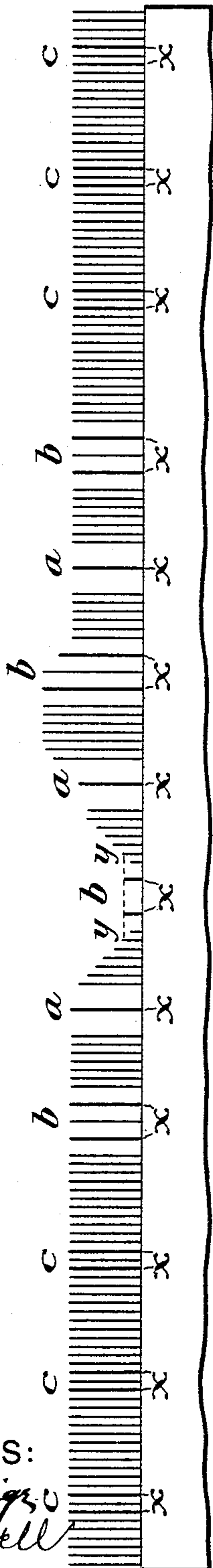
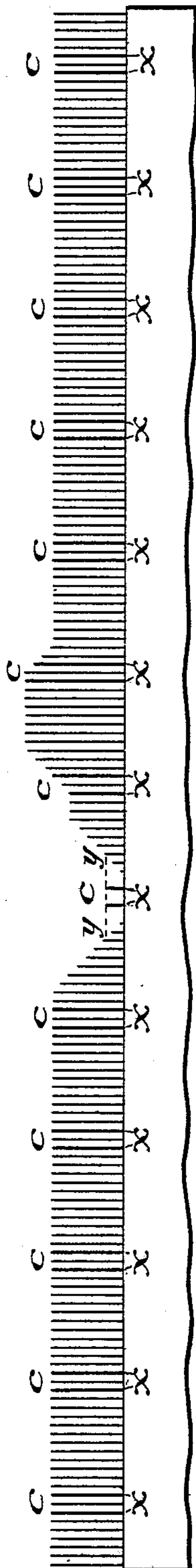


FIG. 6.



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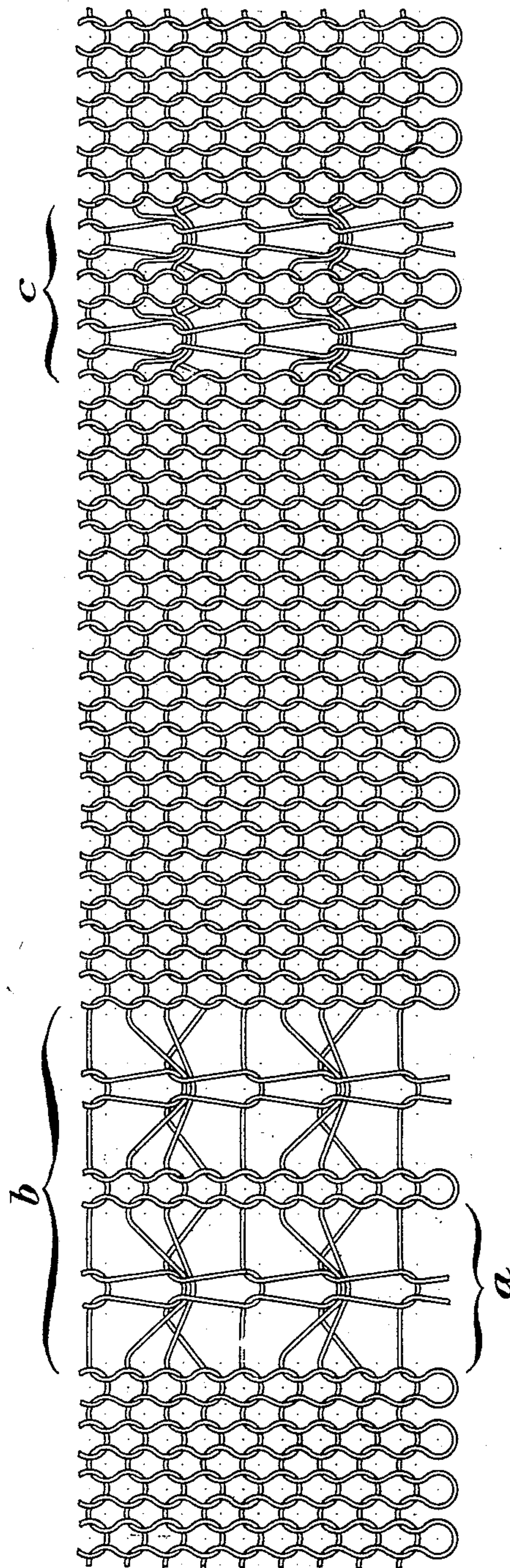
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4 Sheets—Sheet 4.

FIG. 7.



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UNITED STATES PATENT OFFICE.

WALLACE WILSON, OF PHILADELPHIA, PENNSYLVANIA.

MANUFACTURE OF SEAMLESS HOSIERY WITH LACEWORK STRIPES.

SPECIFICATION forming part of Letters Patent No. 702,843, dated June 17, 1902.

Application filed June 15, 1901. Serial No. 64,642. (No model.)

To all whom it may concern:

Be it known that I, WALLACE WILSON, a citizen of the United States, residing at No. 4827 Penn street, Frankford, in the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in the Manufacture of Seamless Hosiery with Lacework Stripes, of which the following is a specification, reference being had to the accompanying drawings.

Longitudinal open-work or lacework stripes have heretofore been produced in the knitting of hosiery by the omission at regular intervals from the knitting-cylinder of certain of the needles. Where simple open-work stripes are to be produced, it is only necessary to omit certain needles at proper intervals. Where lacework stripes are to be produced, in addition to omitting certain needles a specially-operating needle, which I will hereinafter call a "tuck-needle," must be employed in proper relation to the region of each series of omitted needles and capable of producing a tuck-stitch. Ordinarily this special or tuck needle is used with one or more needles omitted on either side of it. This combination produces the ordinary lacework. If a broad lace effect is desired, the same combination is duplicated. Hitherto when lacework stripes have been produced in a seamless stocking they have occupied only the front of the leg and instep by reason of the fact that the omission of any needles in the back of the leg prevented the proper formation of the heel and toe pockets and the sole of the foot, which must be made by the same needles and which of course must be formed of continuous plain knitting. Thus Letters Patent of the United States No. 668,674, dated February 26, 1901, were recently granted showing seamless stockings having lacework down the front of the leg and instep and the rest of the stocking plain.

I have discovered that it is possible to produce a lacework effect by the use of properly-grouped tuck-needles without the omission of any needles from the cylinder, and I have also found that it is thus possible to knit continuously a seamless stocking with lacework effect not only down the front of the leg and instep, but also down the back of the leg, while at the same time knitting the heel and toe

pockets and the sole of the foot of plain knitting.

Figure 1 represents a seamless stocking embodying my invention in a preferred form. Fig. 2 is a diagrammatic illustration of the arrangement of the circle of needles upon which the stocking is knit. Fig. 3 represents a stocking embodying my invention in a different form. Fig. 4 represents the circle of needles upon which this second stocking is knit. Fig. 5 is an interior elevation of the circle of needles shown in Fig. 2 developed upon a plan. Fig. 6 is a similar development of the circle of needles shown in Fig. 4. Fig. 7 is a detailed view of the portion of the fabric, Fig. 1, inclosed within the dotted rectangle 7 7 shown thereon.

Referring to Fig. 1, it will be observed that in the stocking there shown the leg A and also the instep B of the foot are knit with stripes at short intervals, these stripes occupying the back, as well as the front, of the leg. In every instance the stripes are formed by sections of knitting containing one or more lines of tuck-stitches, while the intervals between the stripes are formed by sections of plain knitting. The heel and toe pockets C C and the sole D of the foot are knit of ordinary knitting. The entire stocking is seamless—that is to say, it is knit continuously from a single yarn—and as such constitutes a new manufacture—namely, a seamless stocking formed with the effect of lacework stripes all around the leg.

Of the longitudinal stripes I have illustrated three varieties, which I have indicated at the top of the stocking by the letters *a b c*, respectively. The stripes *a* constitute simple lacework stripes. They are knit upon the group of needles which in Figs. 2 and 5 are designated by the same letter. This group consists of a single tuck-needle *x*, with two needles omitted on either side of it. In my process of knitting each of these tuck-needles is caused to operate differently from the regular needles in that after knitting with the other needles for two courses of plain knitting it operates for the two succeeding courses in such a way as not to shed the loop last taken by its hook, thereby gathering beneath its hook in all three threads and interlooping them with the thread of the next course, when

it again proceeds to operate with the other needles. In Fig. 5 the contour line at the top indicates the line of advancement of the ordinary needles, while the dotted line *y y* indicates the different course pursued by the special or tuck needles during that part of their operation in which they are differently operated from the plain needles. The stripes *b* are compound lacework stripes. They are knit upon the group of needles indicated by the letters *b* in Figs. 2 and 5. This group *b* consists of the following combination: an omitted needle, a tuck-needle, an omitted needle, a plain needle, an omitted needle, a tuck-needle, and an omitted needle. The tuck-needles, it will be understood, operate just as did those which occurred in groups *a*. The resulting fabric is illustrated in detail in Fig. 7 in the part designated by the bracket *b*, where, as will be observed, the result of causing the tuck needles to "knit two and tuck two," as it is called in knitting parlance, is to produce the lacework effect there shown. A simple lacework stripe *a* has not been shown separately; but it is the same as half of the double stripe, with a greater space alongside the tuck-stitches. These stripes *a* and *b* alternate around the front of the leg and are continued down the instep. Down the back of the leg a third variety of stripe *c* is formed. It is not quite so open as stripes *a* and *b*, but it closely resembles these stripes in appearance. The stripes *c* are formed by the groups of needles so lettered in Figs. 2 and 5. These groups consist of two tuck-needles operated in the same way as the tuck-needles described, separated by a single plain needle and without any omitted needles. The stripe thus produced is shown in detail in Fig. 7 at the part indicated by the bracket.

In order to knit the stocking which I have described, it is requisite that the machine be furnished with means for causing the special needles *x x* to operate, as has been described, during the knitting of the leg of the stocking—that is to say, all of these tuck-needles throughout the knitting of the tubular portion or leg, whether forming stripe *a*, stripe *b*, or stripe *c*, knit for two courses and then tuck for two courses, and so on in regular alternation, so that the mechanism for specially operating the tuck-needles is in continuous operation during the entire knitting of this portion of the stocking. Upon reaching that point in the operation of the knitting of the stocking when the formation of the heel *C* upon the rear fashioning set begins the mechanism for specially operating the tuck-needles is thrown entirely out of operation, so that throughout the process of narrowing and widening the tuck-needles operate as do all the others, thus producing a heel of ordinary plain knitting. Upon reaching the point of the operation at which the formation of the foot begins I proceed thus: I cause the mechanism for specially operating the tuck-needles to be in operation dur-

ing that half of each course of round-and-round knitting which corresponds to the upper half of the instep, but cause it to be out of operation during the remainder of each course. Thus the sole of the foot is knit of plain knitting, all of the tuck-needles which occupy the portion of the needle-cylinder with which this part of the stocking is made being operated as ordinary needles, while, on the other hand, the top of the instep is knit with longitudinal stripes corresponding to the front of the leg. Upon reaching the point of the operation when the knitting of the toe-pocket begins the tuck mechanism is again thrown altogether out of operation and the toe-pocket knit, as usual, upon the rear fashioning set, all the needles knitting in the ordinary way.

My invention lends itself to a great variety of detail in the formation of the stripes, as different kinds of lacework stripes may be employed, according to the fancy of the knitter, it only being necessary that those occupying the back of the leg should not require any omitted needles. For example, I have shown in Fig. 3 a stocking embodying my invention, in which the stripes of the front of the leg are all similar in construction to those of the back of the leg of Fig. 1—that is to say, all of the stripes are similar to those lettered *c* in Fig. 1. The arrangement of the needles for the production of this stocking is illustrated in Figs. 4 and 6, and in other respects the operation is similar to that which has been already described. It is obvious that the stripes *c* may be formed with one or three or more lines of tuck-stitches instead of with two, as illustrated.

It is to be understood that not only may many varieties of lacework stripes be produced, depending upon the various possible combinations of omitted and tuck needles, but also that the operation of the tuck-needles may vary. I have chosen to illustrate a stocking in which these needles knit two and tuck two; but instead they may knit three and tuck one, and so on, through a great number of possible varieties.

Having thus described my invention, I claim—

1. A continuously-knit seamless stocking, the leg of which is provided on all sides with alternate sections of plain knitting and sections containing lines of tuck-stitches; of the stripes thus formed those down the back of the leg being formed by the alternation of tuck-stitches and plain stitches; those down the front of the leg being prolonged down the instep of the foot; and the heel and toe pockets and the sole of the foot being formed of plain knitting, substantially as described.

2. A continuously-knit seamless stocking, the leg of which is provided on all sides with alternate sections of plain knitting and sections containing lines of tuck-stitches; of the stripes thus formed those down the back of the leg being formed by the alternation of

tuck-stitches and plain stitches; those down the front of the leg being formed with alternate tuck-stitches and omitted stitches, and being prolonged down the instep of the foot; 5 and the heel and toe pockets and the sole of the foot being formed of plain knitting, substantially as described.

3. The process of knitting a seamless stocking, with lacework stripes down both the 10 front and back of the leg and the instep of the foot, upon a circle of needles comprising plain needles and tuck-needles at intervals, both front and rear, corresponding to the position of the stripes to be produced, which 15 comprises the following cycle of operations: first, knitting the leg upon the whole circle with the tuck-needles operating to tuck at regularly-recurring intervals; second, knitting the heel upon the rear fashioning set 20 with the tuck-needles operating as plain needles; third, knitting the foot upon the whole circle with the front tuck-needles operating to tuck and the rear tuck-needles operating as plain needles; fourth, knitting 25 the toe upon the rear fashioning set with the tuck-needles operating as plain needles, substantially as described.

4. A machine-knit stocking having a tubular portion formed of a single thread at one 30 continuous operation; said stocking having in one half of its tubular surface a section or sections of tuck-stitches alternating with a section or sections of plain knitting; and upon the other half of its tubular surface a 35 section or sections of open or lace work tuck-stitches alternating with a section or sections of plain knitting, substantially as described.

5. A machine-knit stocking, having a tubular portion formed of a single thread at one 40 continuous operation; said thread being knit

into alternate sections of plain knitting and sections of tuck-stitches consisting of a plurality of threads formed into a single elongated loop, to form one half of the tubular surface of the fabric; the said thread being 45 knit into alternate sections of plain knitting and sections of lacework, consisting of a series of elongated superimposed loops separated from adjacent loops by a space with a series of loose crossing threads spanning said 50 space and interlocked with the elongated loops, to form the remaining half of the tubular surface of the fabric, substantially as described.

6. A machine-knit stocking having a toe, 55 foot, heel, and leg portion knit continuously from a single thread at one operation; the rear portion of the leg of the stocking being formed of tuck-stitches alternating with plain knitting; the heel, sole, and toe portions of 60 the stocking being formed of plain knitting; and the front of the leg and instep portion of the foot of the stocking being formed of alternate sections of regular and open or lace work tuck-stitches, substantially as de- 65 scribed.

7. A machine-knit seamless tubular stocking having a toe, foot, heel and leg knit continuously from a single thread at one operation; the rear of the leg portion being 70 formed of alternate sections of tuck-stitches and plain knitting extending down to the heel portion of the stocking; and the heel, sole, and toe portions being formed of plain knitting, substantially as described.

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Witnesses:

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