July 11, 1939. F. E. STRUVE 2,165,520

NONRUN HOSIERY

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Fig. 1.

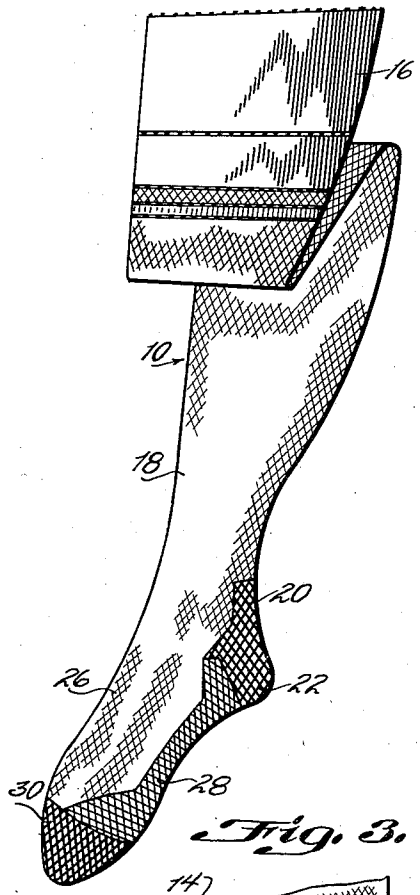


Fig. 2.

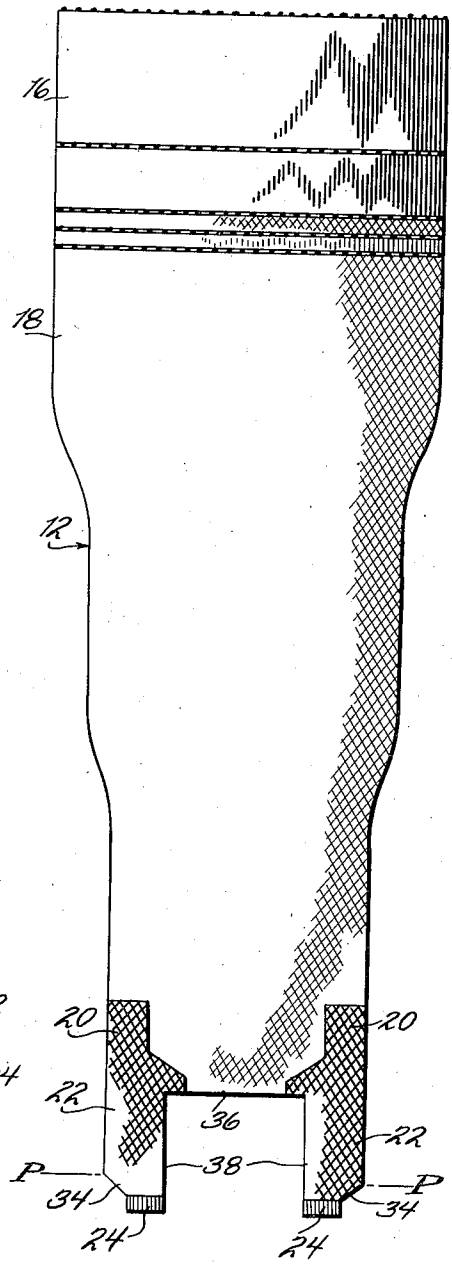
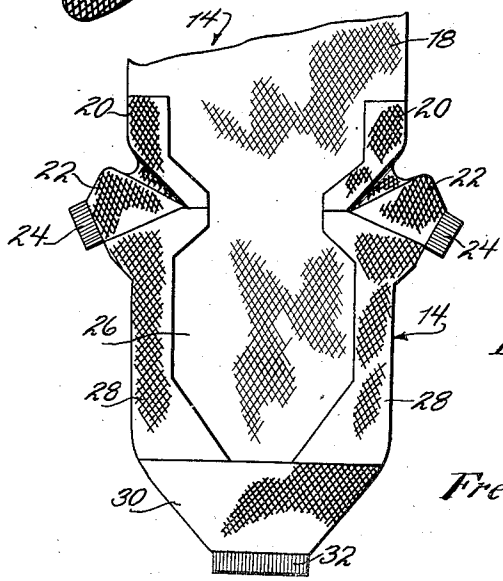


Fig. 3.



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Fig. 4.

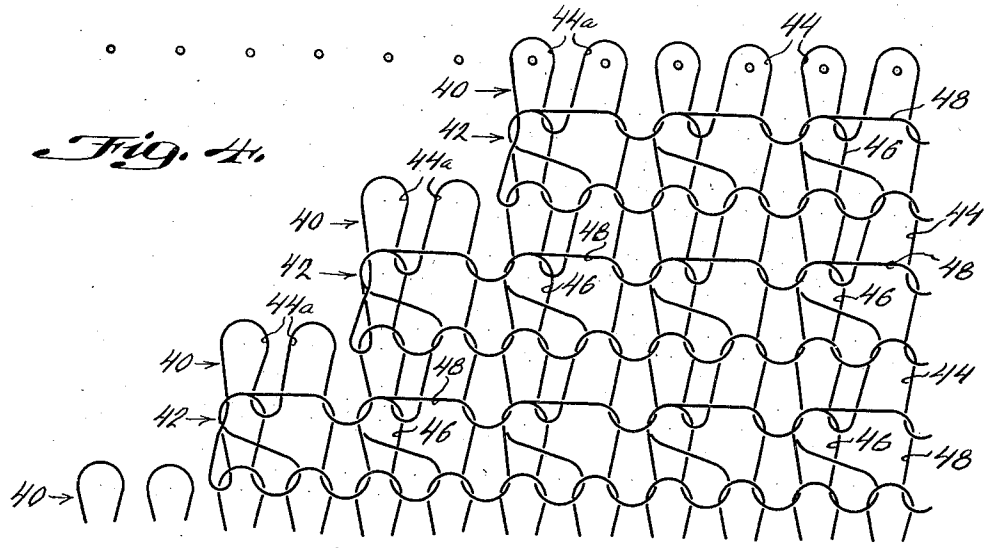
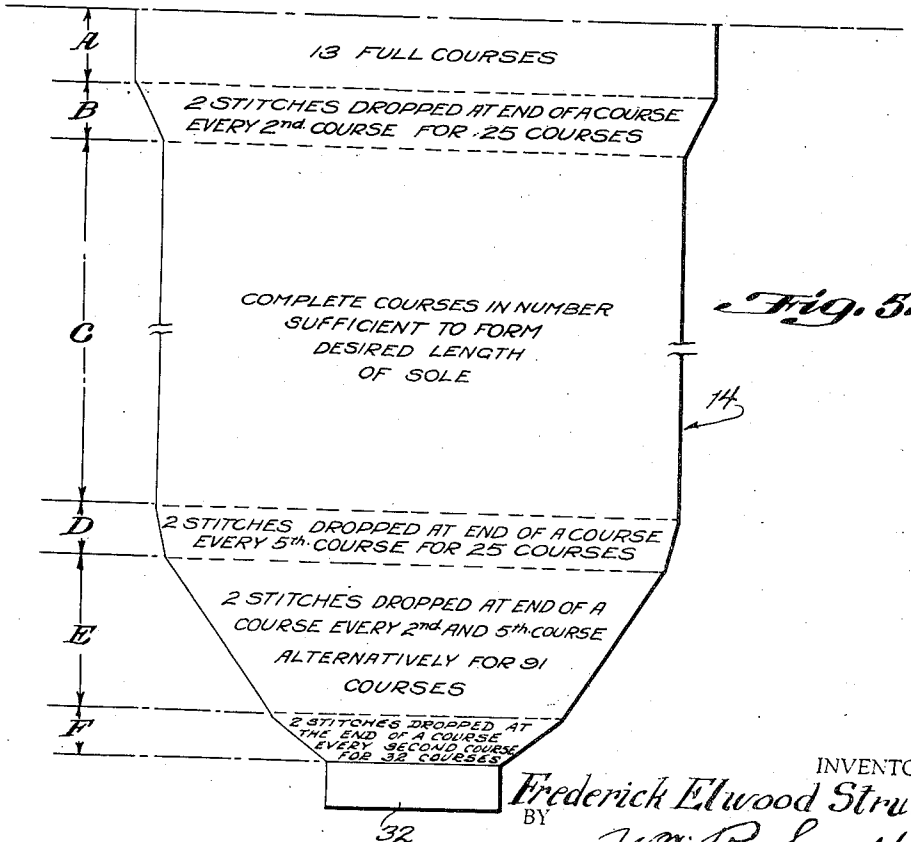


Fig. 5.



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NONRUN HOSIERY

Frederick Elwood Struve, Philadelphia, Pa.

Application April 15, 1938, Serial No. 202,169

5 Claims. (Cl. 66—178)

The present invention relates to flat knitted fashioned hosiery, more particularly to the manufacture of so-called non-run stockings, and has for one of its main objects the provision of a stocking wherein the entire leg and foot, including the heel, sole, and toe sections, consist of fashioned non-run knitted fabric, thereby producing a stocking of characteristic structure having a lacy appearance and anti-ravelling construction throughout.

It is an important object of the invention to provide a non-run stocking wherein the heel, sole, and toe sections are all made of non-run stitches to correspond to the non-run stitches in the leg and instep portions of the stocking.

The invention also aims to provide a non-run stocking consisting of a stocking fabric blank having its leg, instep, heel, sole, and toe portions constructed entirely of non-run stitches, the selvedges of said blank being fashioned on the knitting machine, whereby the stocking, when looped and seamed, will conform to the human leg and foot.

The invention is moreover characterized by the particular manner of working the heel, sole, and toe sections of non-run stitch construction, whereby to impart to said sections a shape for the adequate fitting of the stocking foot.

Other important objects and advantages of the invention will be in part obvious and in part pointed out hereinafter.

In order that the invention and its mode of operation may be readily understood by those skilled in the art, I have, in the accompanying drawings and in the detailed description based thereupon, set out a possible embodiment of the invention.

In these drawings:

Figure 1 is a side elevation of a stocking made in accordance with the invention and diagrammatically illustrating a possible construction thereof.

Figure 2 is a face elevation diagrammatically showing the construction of the leg blank used in making the stocking shown in Figure 1.

Figure 3 is a face elevation diagrammatically representing the construction of the foot blank and its connection to the corresponding portion of the leg blank in the manufacturing of the stocking.

Figure 4 is a greatly enlarged diagrammatic representation showing the knitted structure of a fashioned portion of the foot fabric.

Figure 5 is a diagrammatic view of the outline of the foot portion of the blank explaining the mode of making the same.

Having more particular reference to the drawings, wherein like characters of reference will designate corresponding parts throughout, I have shown in Figure 1 a complete stocking 10 constructed in accordance with the invention. The stocking, as represented in Figure 1, is of the so-called non-run construction and is made of a leg blank 12 (Figure 2) with which is knitted a foot blank 14 (Figure 3).

From Figure 2 it will appear that the leg fabric blank 12 consists of a welt 16, leg proper 18, high splice heel sections 20, and heel tabs 22, each heel tab terminating with the usual ravelling topping extension 24.

The foot fabric blank 14 interknitted with the leg blank 12, as illustrated in Figure 3, comprises the instep 26, sole sections 28, and toe 30, the latter having the ordinary topping extension 32.

The leg and foot blanks are knitted on ordinary full-fashioned knitting machines provided with well known loop spreading attachments, for instance, such as shown and described in the patent to Gastrich, No. 1,998,364, dated April 16, 1935, and operating to form courses of plain loops, and thereafter spread and interlock selected loops with associated plain loops to prevent the formation of "runs."

In knitting the stocking, the leg blank 12 is started at the welt on a flat full-fashioned knitting machine, as is customarily done in the art, by feeding the yarn to the needles over the entire length of the needle bar. Preferably, although not necessarily, the welt 16 is knitted plain, that is, without the spreading of loops, so that said welt will have the usual elasticity.

Following the completion of the welt, the leg proper is knitted, the knitting machine being set so that the loop spreading attachment thereof will function to spread and interlock certain loops with adjoining plain loops, thereby forming an anti-run fabric throughout the entire leg portion. The machine is moreover set so that at the proper time in the process of the leg knitting, the feeding of the yarn is controlled in such a manner that a number of loops will be dropped at each end of a course, thereby reducing the width of the blank for fashioning the same.

This type of knitting is continued through to the end of the heel tabs 22, a reinforced yarn being introduced, as is customary, for the formation of the high splice heel sections 20 and heel tabs 22. Therefore, it will be understood that according to the present invention and contrary

to the usual practice in the art, the high splice heel sections 20 and heel tabs 22 are constructed of associated plain and spread interlocked loops, the same as in the leg 18, thereby imparting to the entire fabric of the leg blank 12 from the point immediately below the welt 16 to the end of the heel tabs 22 a characteristic structure having a lacy appearance and anti-ravelling construction.

Of course, it will be appreciated that the lower-part of each heel tab 20 must be so fashioned as to impart thereto the required rounding of the heel in order that the same may adequately conform to the human foot. For that purpose, and in accordance with the invention, the feeding of the yarns to the knitting needles is such that starting at approximately the point indicated at P in Figure 2, two loops at the outer selvedge of each heel tab 20 are dropped every first course of consecutive series of courses. In practice, it is found that by dropping two loops at the end of a course every fifth course, a sufficient abrupt reduction in the width of the fabric is had to produce a selvedge 34 of the required slant to assure proper formation of the heel pocket.

After the completion of the heel tabs 22, several plain ravelling courses are knitted to constitute the topping extensions 24 serving to facilitate the handling for the final looping operation in the manner well understood in the art.

The finished leg blank 12 may then be transferred to the foot knitting machine by engaging the lower marginal edge 36 of the leg blank and the inner selvedges 38 of the heel tabs with the bank of needles of said foot knitting machine. In this manner, the foot 14 is knitted by feeding the proper yarns back and forth over the needles to form the instep 26 as a continuation of the leg, the sole sections 28 as continuations of the heel tabs 22, and finally the toe 30, terminating the foot blank.

During the operation of the machine for the formation of the foot 14, the loop spreading attachment functions to spread and interlock the selected loops so that the entire blank, including the sole sections and toe, is constructed completely of non-run stitches. It is to be noted that the high heel sections 20, heel tabs 22, and toe 30 are reinforced to a greater extent than the sole sections 28.

Attention is particularly called to the fashioning of the foot blank which constitutes one of the major characteristics of this invention. Upon reference to diagrammatic Figure 5, it will appear that at the beginning of the foot blank 14, a series of courses, approximately thirteen in number, are knitted on the entire set of needles to form a straight selvedge portion A. Thereafter, two loops at the end of a course are dropped every other course for a series of approximately twenty-five courses, thereby gradually reducing the width of the fabric for shaping the beginning of the sole as indicated by portion B. Subsequently, there are formed the necessary number of courses to provide the desired foot length, as represented by portion C, after which two loops are again dropped at the end of a course every fifth course in a series of approximately twenty-five courses, thereby fashioning the end of the sole, as indicated by slanting selvedge portion D.

Following the completion of said portion D, the toe fabric is knitted. The particular fashioning of the toe fabric to impart thereto the proper fitting is had as follows: With the beginning of the toe fabric, two loops are dropped at the end of a course every second and fifth courses alternatively for approximately ninety-one courses, thereby producing an inclined selvedge portion E extending at an angle with respect to the slanting selvedge portion D. Thereafter, two loops are dropped at the end of a course every second course for approximately thirty-two courses, thus decreasing the width of the fabric and forming the tapering selvedge portion F extending at an angle relatively to the inclined selvedge portion E. Accordingly, it will be understood that the opposite selvedges of the toe fabric constitute broken lines converging towards the end of said toe fabric and therefore the necessary rounding of the toe is obtained to properly shape the same. The toe fabric is preferably terminated with several plain ravelling courses constituting the usual topping extension 32.

Upon completion of the interknitted leg and foot blanks, the same may be looped, seamed, dyed, and finished in the manner customary in the art.

The dropping of the loops in the manner stated to fashion the stocking fabric may be obtained through actuation of a narrowing head of the knitting machine, which functions to govern the distance travelled by the carrier rods in their yarn laying movements. The function of said narrowing head, for the purpose specified, may be controlled by the usual pattern chain mechanism through a particular arrangement of control buttons predisposed, according to a definite pattern, for attaining the gradual reduction in the width of the stocking fabric at those points along the length thereof as hereinbefore indicated.

In Figure 4, there is diagrammatically shown the knitted structure of a fashioned portion of the foot fabric. From said Figure 4, it will be noted that the fabric, as produced, comprises plain courses 40 and interlocking courses 42 which preferably alternate with each other. It is, however, to be understood that any number of plain courses may succeed each other and any number of interlocking courses may be successively formed, or that every course may be an interlocking course, if found desirable.

As represented in the drawings, the plain courses 40 are formed from plain loops 44, while the interlocking courses 42 consist of alternate plain loops 46 and spread interlocking loops 48. In producing the interlocking loops, a course of plain loops is first formed, and then selected loops, that is, every alternate loop, is spread from the wale in which it originates into an adjacent wale, thus interlocking the loops together to prevent ravelling thereof. As also represented, the dropping of loops for the purpose of shaping the stocking fabric blank is preferably done in an interlocking course 42 so that the end loops 44a of a preceding plain course 40 will lock the associated plain and spread loops 46 and 48 respectively interknitted therewith, in order to retain them in overlapping, interlocking relation until gathered in the rear seam.

From the foregoing, it will be appreciated that I have provided a flat knitted fashioned stocking having a non-run construction throughout. I am aware that flat knitted stockings having a leg fabric and instep fabric constructed of anti-ravelling stitches have been made heretofore. However, I believe I am the first to provide a stocking, the leg and foot portions of which, including heel, sole, and toe sections, entirely con-

sist of non-run fabric, and fashioned as herein disclosed to impart the proper shape thereto. Therefore, what I claim is:

1. A flat knitted fashioned non-run stocking comprising a leg and a foot, both entirely composed of non-run knitted fabric, said foot comprising six consecutively knitted portions, the first portion consisting of a predetermined number of courses, each extending the full width of the blank; the second portion consisting of a predetermined number of courses with stitches dropped at the end of every second course; the third portion consisting of a sufficient number of courses to give the desired length to the blank, each course extending the full width of the last course of said second portion; the fourth portion consisting of a predetermined number of courses with stitches dropped at the end of every fifth course; the fifth portion consisting of a predetermined number of courses with stitches dropped at the end of every second and fifth courses alternatively; and the sixth portion consisting of a predetermined number of courses with stitches dropped at the end of every other course.

2. A flat knitted fashioned non-run stocking comprising a leg and foot, both entirely composed of non-run knitted fabric, said foot comprising six consecutively knitted portions, the first portion consisting of approximately thirteen courses, each course extending the full width of the blank; the second portion consisting of approximately twenty-five courses with two stitches dropped at the end of every second course; the third portion consisting of a predetermined number of courses, each extending the full width of the last course of said second portion; the fourth portion consisting of approximately twenty-five courses with two stitches dropped at the end of every fifth course; the fifth portion consisting of approximately ninety-one courses with two stitches dropped at the end of every second and fifth courses alternatively; and the sixth portion consisting of approximately thirty-two courses with two stitches dropped at the end of every other course.

3. In a stocking, a knitted foot fabric constituted entirely of non-run courses and comprising six consecutively knitted portions, the first portion consisting of a predetermined number of courses, each extending the full width of the blank; the second portion consisting of a predetermined number of courses with stitches dropped at the end of every second course; the third portion consisting of a sufficient number of courses to give the desired length to the blank, each course extending the full width of the last course of said second portion; the fourth portion consisting of a predetermined number of courses with stitches dropped at the end of every fifth course; the fifth portion consisting of a predetermined number of courses with stitches dropped at the end of every second and fifth courses alternatively; and the sixth portion consisting of a predetermined number of courses with stitches dropped at the end of every other course.

4. In a stocking, a knitted foot fabric constituted entirely of interlocked non-run courses and comprising six consecutively knitted portions, the first portion consisting of approximately thirteen courses, each course extending the full width of the blank; the second portion consisting of approximately twenty-five courses with stitches dropped at the end of every second course; the third portion consisting of a predetermined number of courses, each extending the full width of the last course of said second portion; the fourth portion consisting of approximately twenty-five courses with stitches dropped at the end of every fifth course; the fifth portion consisting of approximately ninety-one courses with stitches dropped at the end of every second and fifth courses alternatively; and the sixth portion consisting of approximately thirty-two courses with stitches dropped at the end of every other course.

5. In a stocking, a knitted foot fabric constituted entirely of interlocked non-run courses and comprising six consecutively knitted portions, the first portion consisting of approximately thirteen courses, each course extending the full width of the blank; the second portion consisting of approximately twenty-five courses with two stitches dropped at the end of every second course; the third portion consisting of a predetermined number of courses, each extending the full width of the last course of said second portion; the fourth portion consisting of approximately twenty-five courses with two stitches dropped at the end of every fifth course; the fifth portion consisting of approximately ninety-two courses with two stitches dropped at the end of every second and fifth courses alternatively; and the sixth portion consisting of approximately thirty-two courses with two stitches dropped at the end of every other course.

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