

Nov. 18, 1930.

W. F. ROLSTON

1,781,933

SUTURE

Filed Nov. 11, 1926

Fig. 1.

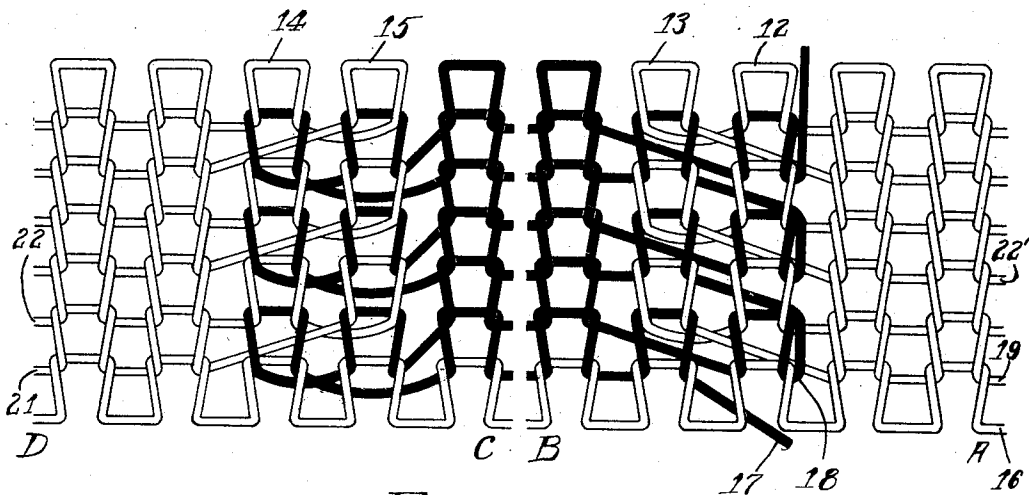


Fig. 2.

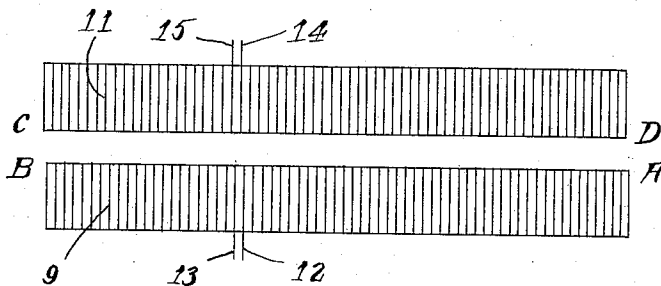
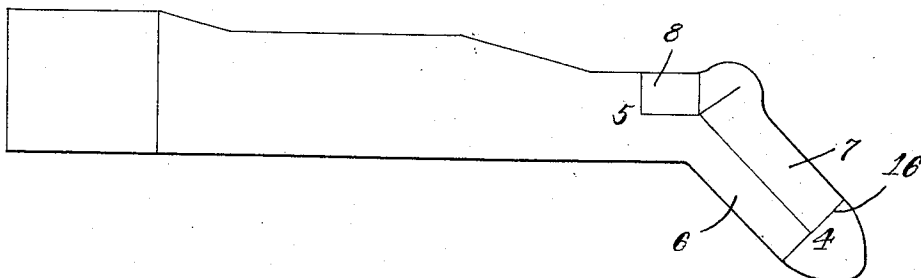


Fig. 3.



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UNITED STATES PATENT OFFICE

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SUTURE

Application filed November 11, 1926. Serial No. 147,674.

This invention relates to knit sutures for connecting knit fabrics or webs such, for example, as in the knitting of a split foot stocking in which a suture occurs between the lighter yarn of the instep and front and the heavier yarn of the sole and high splice. My invention is not, however, confined to this example but is applicable to the knitting of a suture connecting any knit fabrics.

The primary object of my invention is to provide a new knit suture and method of knitting the same, characterized by alternate action of the suture needles to produce a closer knit, stronger, and better appearing suture structure. This method of knitting a suture, as explained more fully hereinafter, is advantageous and desirable in that it makes for easier and more uniform knitting and the suture needles act as web holders to hold the fabric from pulling up. The suture per se is also improved and there are no openings or eyelets or other weakening tendencies such as found in certain prior suture knitting.

Other objects and attendant advantages will be appreciated by those skilled in this art as the invention becomes better understood by reference to the following description when considered in connection with the accompanying drawing, in which—

Figure 1 is a diagrammatic view illustrating the fabric of a split foot having a suture at each side, embodying my invention;

Fig. 2 is a diagrammatic view illustrating the needles of a straight parallel row knitting machine employed for knitting the fabric shown in Fig. 1; and

Fig. 3 is a view of a stocking, showing the location of the suture.

My improved suture may be knit either on a straight or a circular machine, although I have, in this case, taken as an example for purpose of illustration, its application to a split sole stocking such as knit on a straight, parallel row knitting machine. It

should be understood, therefore, that my invention is not confined to this example or to the operations which comprise the knitting of two sutures, except as specified in certain of the claims appended hereto.

In the knitting of a split sole stocking, the suture occurs along the line 4—5, Fig. 3, at each side of the foot, connecting the fabric or web of the instep 6 which is usually of lighter yarn such as silk and the fabric of the sole 7 and high splice 8 of a heavier and stronger or more durable yarn. For purpose of clarity I will refer hereafter to the heavier yarn as the "first" yarn and the lighter as the "second" yarn.

In illustrating the method of knitting my new suture on a straight, parallel row machine, as above referred to, I have shown in Fig. 2 the opposed front and rear beds of needles 9 and 11, respectively, the right hand end being the transfer or "home" end at which the yarn changes occur. These beds are further identified in practice, for convenience in following the courses of knitting, by the letters A—B applied to the front bed 9 and C—D to the rear bed 11, as shown. In this particular case two suture needles 12 and 13 are employed in the front bed and two similar needles 14 and 15 in the rear bed, each pair for knitting a separate suture connecting the webs knit on the respective beds. In the knitting of a split sole stocking, which is a tubular fabric, two sutures are of course required in order to connect the lighter and heavier webs, and it will be understood, as above mentioned, that this illustrates merely a single application of my invention which contemplates essentially a single suture.

Any suitable mechanism may be employed for operating the needles to produce the knitting, which will be presently described, a preferred example being illustrated in my co-pending application for suture forming mechanism, Serial No. 147,673, filed Nov. 11, 1926.

Referring to Fig. 1, it will be noted that the letters A—B and C—D are applied to show the fabrics or webs knit on the front and rear beds, respectively, it being well known that these webs are joined at B—C and at A—D (although this drawing, Fig. 1, omits many wales between these points). In round-and-round knitting, a complete course is knit in the order A—B—C—D, as shown by the lowermost course 16, this being the last course of the toe, as noted in Fig. 3. In knitting the split sole in this particular example the order of knitting is approximately, starting with the first yarn, from A forward on the front bed to the suture needles, back on the same bed to A, forward on the rear bed from D to the suture needles, back on the same bed to D, and then a change of yarn. The second yarn will be introduced at the suture needles on the front bed and knit forward to B, back on the rear bed from C to the suture needles, forward on the same bed to C, and then back on the front bed to the suture needles where the yarn will be changed. The first yarn will then be brought into action and the operations repeated. Whether the operations start with the first or second yarn is immaterial; and it is likewise immaterial as to the point of starting the operations. The sequence of knitting, however, by which the suture needles are operated in alternation to produce a suture of the character disclosed herein, illustrates the principles of my invention and should be considered in preference to the particular example herein disclosed which is but a single practical application of my invention. In this case I am, therefore, starting to knit the suture with the second yarn which is brought into action at 17 at the suture needles on the inner side of the front bed. In Fig. 1, the wales knit by the suture needles are identified by the reference numerals applied to said needles, namely, 12, 13, 14, and 15, respectively. The second yarn, shown black on Fig. 1 and introduced at 17, knits forwardly on the front bed starting with the second suture needle, that is 13, and continues knitting on the forward stroke on such number of needles as are advanced for knitting. On the back stroke the knitting is done on the rear bed and the second yarn knits back from C with the second suture needles 15 out of action and finishes on the first suture needle 14. On the next forward stroke the second yarn knits forward on the rear bed starting with the second suture needle 15 and continuing to C. On the return stroke the needles on the front bed from B to the suture are brought into action and the second yarn knits back with the second suture needle 13 out of action and finishes on the first suture needle 12, at which point 18 the second yarn is held out and a yarn change occurs bringing the first yarn into play. The first yarn knits forward on the front bed from A (starting,

as shown in Fig. 1, at 19) with the first suture needle 12 out of action and finishes on the second suture needle 13, then back on the front bed starting with the first suture needle 12, then forward on the rear bed (starting at 21, Fig. 1) with the first suture needle 14 out of action and finishing on the second suture needle 15, then back on the rear bed starting with the first suture needle 14 and going out of play at 22 after the last needle on this bed has knit, at which time a yarn change occurs bringing the second yarn into play. The operations will then be repeated, it being noted that the foregoing description of the several operations is not strictly correct in its reference to the particular number of needles in action from the suture needles to each end of the bed, since reference is made, for example, to knitting on the front bed from the suture needles forward to B, whereas in actual practice all of these needles might not be in action and the knitting would terminate at some point short of B, depending on the foot size of the stocking or the number of needles employed in knitting the tubular fabric. It will also be noted that the first yarn at 22, held out of play, is identical with or joins the opposite end of the fabric at 22', this latter point being the start of the knitting when the first yarn is next brought into play. The next operation starts at 18 with the second yarn, the knitting being in the same sequence as described above with reference to the yarn 17, it being noted that the knitting starts with the second suture needle 13 which knits the new loop onto a loop of the first yarn. As the knitting continues, a suture is knit by the needles 12—13 and another by the needles 14—15. Each suture comprises, as shown in Fig. 1, two wales connecting the adjoining fabrics or webs and in each wale the first and second yarns alternate regularly. It will be further noted by reference to the suture wales 14 and 15, Fig. 1, that each yarn of a given suture course crosses upon itself by being knit on one suture needle in one direction and on another suture needle in the opposite direction. By reason of this alternate action of the suture needles, an exceptionally strong and durable suture is provided and, furthermore, the knitting is uniform and regular and devoid of openings or eyelets such as are found in certain prior sutures. The present suture is, therefore, better appearing and more artistic than the customary suture. Another advantage is that this method lends itself to easier knitting by reason of the fact that each web at the end of any stroke ending with the suture is held down by the last suture needle and the knitting starts on the next succeeding stroke on the second suture needle in point of order, the first suture needle in such point of order being held down, thus holding the web down and preventing any tendency of the web from

pulling up as might occur if this needle were advanced for taking a new loop. Thus, the suture needles perform a web-holding function which is very desirable since when starting to knit from the suture needle end the first suture needle in point of order prevents the web from being pulled up by the advancing of the second suture needle in such point of order.

of the other adjoining web, and the yarn in each suture course being crossed upon itself by being knit part in one direction and part in the opposite direction, the first suture wale in order of knitting in one direction being omitted but being formed to complete the course upon the next succeeding stroke in the opposite direction.

In witness of the foregoing I affix my signature.

WALTER F. ROLSTON.

It is believed that the foregoing conveys a clear understanding of my new suture and method of knitting the same and, as an example of a mechanism for performing this method, reference may be had to my application Serial No. 147,673, above mentioned.

In the present application I have claimed only the article, that is, the suture or fabric structure, while in my application Serial No. 147,673 I have claimed the method and apparatus for knitting sutured fabrics of this character.

I claim:

1. A suture between two knit fabrics comprising two adjoining wales in which the yarn of one fabric alternates with the yarn of the other fabric, each yarn being crossed upon itself by being knit successively in said two wales but in opposite strokes.

2. A knit suture connecting two knit webs each of different yarns, having plural suture wales, one yarn in each suture course being crossed upon itself by being knit on one suture needle in one direction and on another suture needle in the opposite direction.

3. A knit suture composed of plural wales connecting two knit webs, in which the successive suture courses are composed of alternate yarns and the yarn in each suture course crossed upon itself by being knit in opposite directions.

4. A tubular knit fabric composed of plural webs connected by knit sutures, each suture comprising plural wales, the alternate courses of the sutures having the yarn of one adjoining web and the intermediate courses having the yarn of the other adjoining web, and the yarn forming the wales in each suture course being crossed upon itself by being knit in opposite directions.

5. A tubular knit fabric composed of plural webs connected by knit sutures, each suture comprising plural wales, the alternate courses of the sutures being composed of the yarn of one adjoining web and the intermediate courses being composed of the yarn of the other adjoining web, and the yarn in each suture course being crossed upon itself by being knit part in one direction and part in the opposite direction.

6. A tubular knit fabric composed of plural webs connected by knit sutures, each suture comprising plural wales, the alternate courses of the sutures being composed of the yarn of one adjoining web and the intermediate courses being composed of the yarn

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