R. W. SCOTT.

WELTED KNITTED WEB AND MAKING SAME.

APPLICATION FILED MAR. 28, 1910.

1,045,620.

Patented Nov. 26, 1912.

2 SHEETS—SHEET 1.

Fig. 1

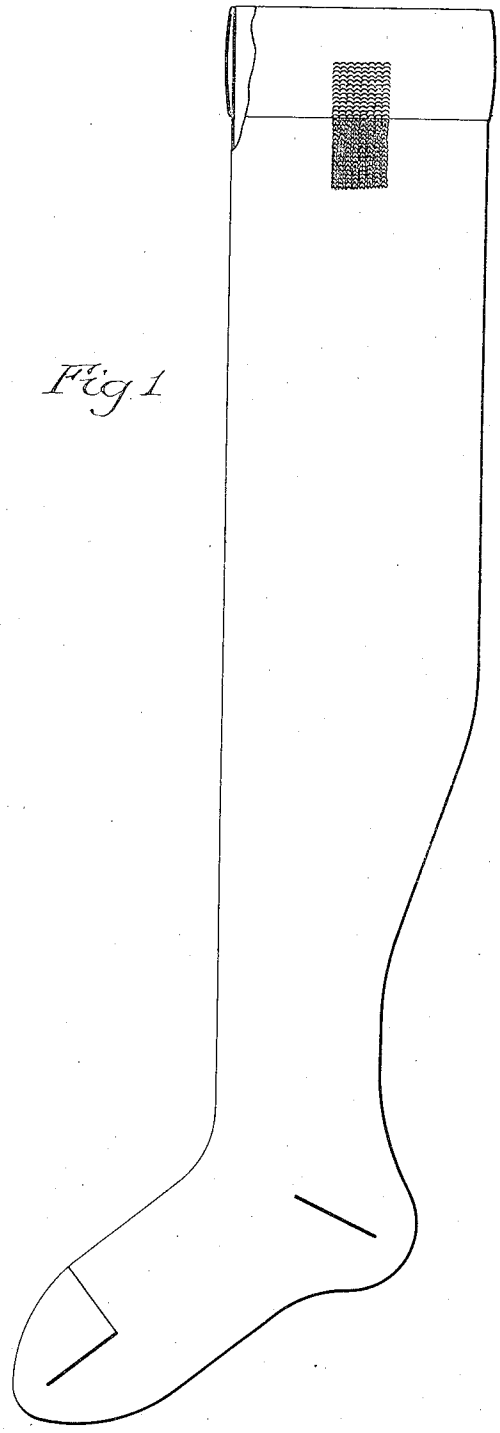


Fig. 9

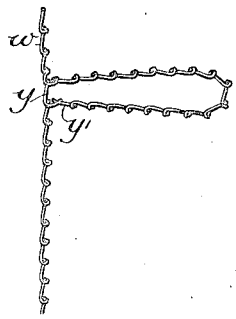


Fig. 10

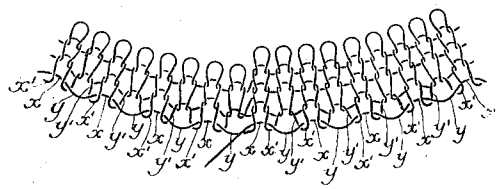
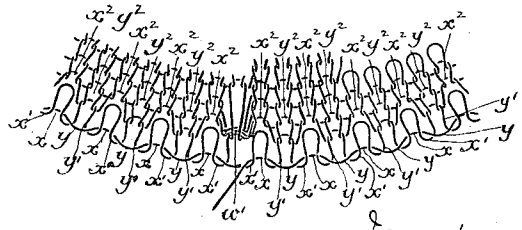


Fig. 11



Witnesses
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2 SHEETS—SHEET 2.

Fig. 2

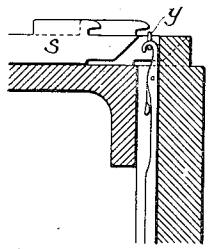


Fig. 5

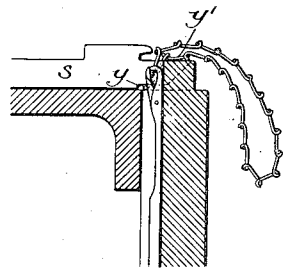


Fig. 3

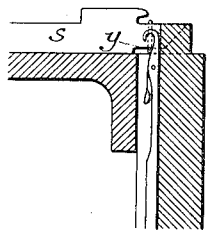


Fig. 6

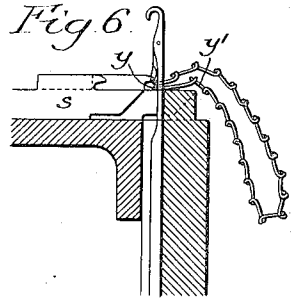


Fig. 4

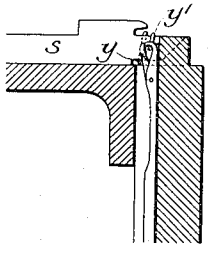


Fig. 7

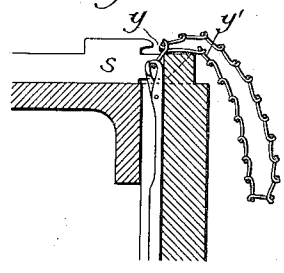
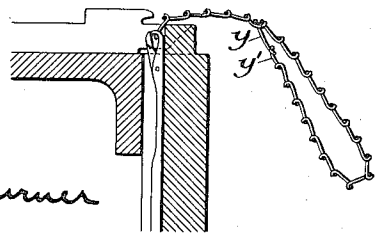


Fig. 8



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UNITED STATES PATENT OFFICE.

ROBERT W. SCOTT, OF LEEDS POINT, NEW JERSEY, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO SCOTT & WILLIAMS, INCORPORATED, OF CAMDEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

WELTED KNITTED WEB AND MAKING SAME.

1,045,620. Specification of Letters Patent. Patented Nov. 26, 1912.

Application filed March 28, 1910. Serial No. 552,002.

To all whom it may concern:

Be it known that I, ROBERT W. SCOTT, a citizen of the United States, residing in Leeds Point, Atlantic county, New Jersey, have invented certain Improvements in Welted Knitted Webs and Making Same, of which the following is a specification.

The object of my invention is to produce, automatically and in a simpler manner than before, a turned welt upon the end of the leg, sleeve or body of a knitted undergarment, and particularly upon the top of a stocking leg, an object which I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a side view, partly in section, of a stocking, having, at the top of the leg, a turned welt made in accordance with my invention; Figs. 2 to 8, inclusive, are sectional views of sufficient of the elements of an ordinary circular knitting machine to illustrate the method of carrying out my invention; Fig. 9 is a view illustrating the method of constructing a special form of turned welt constituting part of my invention; Fig. 10 is an enlarged diagram, illustrating the first few courses produced in knitting a welt in the manner illustrated in Figs. 1 to 8, and Fig. 11 is a similar view illustrating another method of beginning the formation of the hem or welt.

In making stockings upon ordinary circular knitting machines it is customary to finish the stocking at the top by turning in a hem or welt and sewing the inturned edge thereof to the leg portion of the stocking, an operation which must be performed with great care and which is consequently expensive, while, at the best, the turned welt or hem produced thereby is unsatisfactory.

Another plan has been to knit a certain length of web upon the needles and then to turn back the edge of this web and run the edge course of stitches onto the needles of the machine, which retained the last course produced, and then to draw the stitches for the next course through the two courses of stitches then upon the needles. While this produces a satisfactory welt, the operation of running-on the end course of stitches is a slow, arduous, and consequently expensive one, and for this reason this method of forming turned welts has not met with favor.

In Letters Patent No. 864,433, dated August 27, 1907, I described a method whereby a turned welt or hem could be formed by the operation of the machine upon which the fabric was knitted, this operation being performed without the necessity of transferring stitches by hand and consisting in first forming a setting-up course upon two sets of needles, then knitting a length of web for the hem or welt upon one set of needles and permitting it to hang down from the other or inoperative set of needles, which retained the setting-up loops originally formed upon them, and then, by a certain operation of the two sets of needles, transferring stitches of this web to the operative set of needles and freeing the web from the other set of needles, and then proceeding with the knitting of the leg tube upon the operative set of needles.

In carrying out my present invention I turn the welt or hem to the outside of the leg tube instead of to the inside of the same. By this means I am enabled to impart a distinctive appearance to the welt at the top of the stocking, since I expose on the outside of the welt that face of the web which is usually on the inside of the knitted tube, this face presenting a different appearance from that of the outer face of the web, as is well recognized by those skilled in the art.

A more important result, however, of this reversal in the usual method of forming the welt, is that I am enabled to produce it upon an ordinary knitting machine having but a single set of needles and thereby materially simplify and cheapen the operation.

The machine may be of any of the usual types of circular knitting machine but is preferably one of that class intended for the production of tubes with seamless heel and toe pockets thereon, so that the leg, heel, foot and toe of the stocking can be knitted by one continuous operation. The machine is also equipped with web holders and in carrying out my invention in its simplest form, these web holders may be constructed

and may operate, as usual. In starting to knit a stocking at the top of the leg, the yarn is first fed to all of the needles but as soon as one course of yarn has been laid in the hooks of the needles, every other needle (say, for instance, the even numbered needles) is retired from action but caused to retain the loop of the initial course of yarn originally laid in this hook, the desired number of courses for the welt being then knitted upon the remaining (or odd numbered) needles, and the edge of this strip of fabric being confined to the even numbered needles by reason of the retention of the initial loops upon the latter. When the desired number of courses of stitches for the welt has thus been knitted upon the odd numbered needles, the even numbered needles are again brought into action, and, in drawing their first stitches, cast off the initial loops which were formed upon them, these loops being caught and held by said freshly drawn stitches. The knitting of the tubular web for the leg of the stocking upon all of the needles is then proceeded with, the edge of the welt strip being integrally united to said leg tube by reason of the loops initially formed upon the even numbered needles.

If a relatively long welt is desired, the loop-retaining needles are retired from action while retracted so that the sinker wales lying between the needle wales subsequently formed upon the odd numbered needles can pass over the retracted hooks of the even numbered needles and thus permit of the formation of a web of any desired length. If, however, only a short, bunchy welt is required, the loop-retaining needles may be retired from action while in a projected position, so that the sinker wales of the subsequently produced welting courses will all be caught and retained by said needles, and will be cast off as a unit when the formation of the welt has been completed and the stitches for the first course of the leg tube are being drawn. A welt of this character, however, has the objection that it contains only half as many needle wales as are contained in the leg tube, and I therefore prefer, in carrying out my invention, to proceed in the following manner in order to produce a welt having as many wales as there are in the leg tube. After laying the initial course of yarn in the hooks of all of the needles, I so act upon the loops of yarn carried by every other needle (say the even numbered needles) as to prevent said loops from being cast from said needles by the subsequent knitting movements of the latter, for instance, I lower the loops on the needles to such an extent that the retraction of the needles sufficient to cast off the subsequently applied loops of yarn will not cast off the initial loops, which thus remain upon the stems of the needles until it is desired to cast them off, whereupon the restraining influence upon them is removed.

In the diagram Fig. 10, x may represent the loops of yarn originally applied to the odd numbered needles, and y the loops of yarn originally applied to the even numbered needles, and then placed under restraint thereon, so that on knitting the next course, stitches x' will be drawn through the loops x, but fresh loops y' will be formed on the needles which originally received the loops y, the latter being retained on the needles for the purpose of subsequently uniting the edge of the welt to the leg of the stocking.

A simple method of lowering the initial loops y upon their needles is to provide a set of web holders, every other one of which is operable at a certain time independently of the intervening ones, each of these specially operable web holders s, after the first course of the knitting yarn has been laid in the hook of its corresponding needle, being first withdrawn, as shown in Fig. 2, and then advanced, as shown in Fig. 3, so that a beveled forward face of the web holder may engage the yarn, depress the same and cause it to pass under the web holder, as shown in Fig. 3, the subsequent normal movements of the web holder not being sufficient to free the yarn from this restraint. After having been thus abnormally withdrawn, and then projected again, the web holders s act normally, and, in receiving the yarn for the second course the odd numbered needles will be operated so as to draw stitches x' of said yarn through the loops x already upon these needles, while the even numbered needles will be operated so as to draw the new loops y', as in Fig. 4, and in knitting the third course all of the needles will draw stitches, as will be understood on reference to Fig. 10. By this means, a welt having a full number of wales may be knitted and when the desired length of web for the welt has been produced, as shown in Fig. 5, the web holders s will be again withdrawn to an abnormal extent and the initial loops y upon the even numbered needles will be permitted to rise, as shown in Fig. 6, so that, in drawing the next course of stitches, these initial loops, as well as the loops last drawn by these needles, will be cast off, as shown in Fig. 7, the knitting of the leg tube being then proceeded with and the edge of the hem or welt being integrally united to said leg tube by means of said initial loops, as shown in Fig. 8. If the pull of the web is not sufficient to insure the rise of the initial loops y upon the loop-retaining needles, when the web holders s have been withdrawn so as to release said loops, suitable lifting means may be employed for effecting such rise.

The operation above described is as carried out in connection with a stocking in which the knitting begins at the top of the leg and progresses toward the toe, but there is another type of stocking in which a reverse method of knitting is adopted, that is to say, the knitting begins at the toe and progresses from the toe toward the top. In knitting a stocking of this type I withhold the stitches upon every other needle when that point in the knitting has arrived where the welt is to be formed, and then proceed with the knitting upon all of the needles to form a band or strip of the desired length for the hem or welt, after which the restrained stitches are released and are cast off with the stitches already upon the needles in drawing the stitches for the next course. After this has been done, however, a few courses of web must be knitted before the web can be cast off from the needles in order to prevent release of the united edge of the welt by the raveling back of the stitches, since the web cast off from the stitches at the end of the knitting operation is not a non-raveling web, hence the provision of this protective strip w as shown in Fig. 9, in order to insure that any raveling back of the stitches which may be likely to take place will not reach the point of union between the main web and the turned edge of the welt.

The knititng operations described in connection with Figs. 2 to 8 produce an out turned welt which is united to the leg web only at every other wale, but a welt which is united to each wale of the web may be produced by restraining stitches upon the needles in successive courses, for instance, referring to Fig. 11, the initial loops y upon the even numbered needles may be restrained in the manner before set forth, and, after the formation of the stitches x' upon the odd numbered needles, the same may be restrained in like manner, so that in the third course loops x^2 will be formed upon the odd numbered needles while stitches y^2 are being drawn upon the even numbered needles, the loops y and stitches x being cast off simultaneously onto the stitches which constitute the first course of the leg web in order to unite every wale of the welt to said leg web. In this case it may be necessary to tuck for several courses on the last of the even numbered needles, as shown for instance at w' in Fig. 11, in order to insure a proper start for the stitches upon the adjoining odd numbered needles.

My invention, although intended especially for use in knitting seamless tubular webs, is not necessarily limited thereto, but is applicable also to tubes composed of flat webs folded and having their meeting edges secured together.

The term "loops" as used in certain of my claims is intended as a generic term to include either initial loops applied to the needles, or stitches formed by drawing loops of yarn through previously formed loops or stitches.

By turning the welt outwardly a much smoother welt can be produced than when said welt is turned inwardly as usual, since the natural tendency of the knitted web is to curl outwardly. A stocking having an outturned welt can, moreover, be "boarded" more effectively and with less labor than a stocking having an inturned welt, since the straightening and smoothing of the latter upon the board are rendered difficult because, owing to the fact that the welt has been turned in a direction contrary to its natural direction of curl, it is very difficult to cause the hem to assume a straight line at the top or fold, and, in consequence, present stockings which are provided with a hem at the top are almost invariably marred by the presence of folds or tucks in the web of which the welt is composed, these folds or tucks being permanently set in the web by the heat and pressure to which the wet or damp stockings are subjected after being boarded.

I claim:

1. A knitted tube having an out-turned welt thereon, whose out-turned portion is integrally united to the body of the tube.

2. A knitted tube having an out-turned welt thereon, whose out-turned portion is integrally united to the body of the tube, said welt having as many needle wales as there are in the body of the tube.

3. A knitted tube having an out-turned welt thereon, with as many needle wales therein as there are in the body of the tube, each of said wales of the welt being integrally united to a corresponding wale in the body of the tube.

4. A seamless tubular knitted web having an out-turned welt thereon, whose out-turned portion is integrally united to the body of the web.

5. A seamless tubular knitted web having an out-turned welt thereon, whose out-turned portion is integrally united to the body of the web, said welt having as many needle wales as there are in the body of the web.

6. A seamless tubular knitted web having an out-turned welt thereon, with as many needle wales therein as there are in the body of the web, each of said wales of the welt being integrally united to a corresponding wale in the body of the web.

7. A stocking having, at the top of the leg, an out-turned welt whose out-turned portion is integrally united to the leg web.

8. A stocking having, at the top of the leg, an out-turned welt whose out-turned portion is integrally united to the leg web, said welt

having as many needle wales as there are in the leg web.

9. A stocking having a seamless leg, heel, foot and toe pocket and having, at the top of the leg, an out-turned welt whose out-turned portion is integrally united to the leg web.

10. A stocking having a seamless leg, heel, foot and toe pocket and having, at the top of the leg, an out-turned welt whose out-turned portion is integrally united to the leg web, said welt having as many needle wales as there are in the leg web.

11. A stocking having, at the top of the leg, an out-turned welt, containing as many wales as there are in the leg web, each of said wales in the out-turned portion of the welt being integrally united to a corresponding wale of the leg web.

12. A stocking having a seamless leg, heel, foot and toe pocket, and having, at the top of the leg, an out-turned welt containing as many wales as there are in the leg web, each of said wales being integrally united to a corresponding wale of the leg web.

13. The mode herein described of producing a turned welt upon a knitted web, said mode consisting in knitting such web upon a single set of needles, retaining loops upon needles of the set while knitting the band or strip for the welt or hem, and then casting off said retained loops and drawing stitches through them in order to cause them to unite the welt or hem to the body web.

14. The mode herein described of producing a turned welt upon a knitted web, said mode consisting in knitting such web upon a single set of needles, retaining loops upon all of the needles of the set while knitting the band or strip for the welt or hem, and then casting off said retained loops and drawing stitches through them in order to cause them to unite the welt or hem to the body web.

15. The mode herein described of producing a turned hem or welt upon a knitted web, said mode consisting in knitting such web upon a single set of needles retaining loops upon certain of the needles, knitting the web for the hem or welt upon needles including those carrying the retained loops, and, after the desired length of web has been knitted, casting off the retained loops from the needles and drawing fresh stitches through them.

16. The mode herein described of producing a turned hem or welt upon a knitted web, said mode consisting in applying the initial course of yarn to a single set of needles, retaining loops upon needles of the set while knitting the strip for the hem or welt upon needles including those carrying said retained loops, and then casting said loops from the needles and drawing fresh stitches through the same.

17. The mode herein described of producing a turned hem or welt upon a knitted web, said mode consisting in applying the initial course of yarn to a single set of needles, retaining loops upon all of the needles while knitting the strip of web for the hem or welt thereon, and then casting said retained loops from the needles and drawing fresh stitches through the same.

18. The mode herein described of producing a turned hem or welt upon a knitted web, said mode consisting in applying the initial course of yarn to a single set of needles, retaining said initial loops upon certain of the needles while knitting the strip of web for the hem or welt upon needles including those carrying the said retained loops, and then casting said loops from the needles and drawing fresh stitches through the same.

19. The mode herein described of producing a turned hem or welt upon a knitted web, said mode consisting in knitting such web upon a single set of needles retaining loops upon certain of the needles while knitting upon all of the needles a strip of web for the welt or hem, and then casting off said retained loops and drawing fresh stitches through them.

20. The mode herein described of producing a turned hem or welt upon a knitted web, said mode consisting in knitting such web upon a single set of needles applying the initial course of yarn to all of the needles of the set, retaining loops of the initial course of yarn upon certain of said needles while knitting upon all of the needles a strip of web for the desired welt or hem, and then casting off the retained loops and drawing fresh stitches through them.

21. The mode herein described of producing a turned hem or welt upon a knitted web, said mode consisting in knitting such web upon a single set of needles first retaining loops of one course upon certain of the needles, and then retaining loops of another course upon other needles of the set, then knitting upon all of the needles a strip of web for the hem or welt, and then casting off the retained loops and drawing fresh stitches through the same.

22. The mode herein described of producing a turned hem or welt upon a knitted web, said mode consisting in applying the initial course of yarn to a set of needles, retaining loops of said initial course upon certain of the needles, retaining loops of a subsequent course upon other needles of the set, knitting a strip of web for the hem or welt upon all of the needles, and then casting off the retained loops and drawing fresh stitches through the same.

23. The mode herein described of producing a turned hem or welt upon a knitted web, said mode consisting in knitting such

web upon a set of needles, moving loops upon needles of the set to such position that they will not be cast therefrom by the ordinary knitting movements, knitting a strip or band for the hem or welt upon needles including those having the displaced stitches thereon, and then permitting said displaced stitches to be cast from the needles and onto the stitches of the course which is being drawn.

24. The mode herein described of producing a turned hem or welt upon a knitted web, said mode consisting in knitting such web upon a single set of needles moving the loops upon all of the needles to such position that they will not be cast from the needles by the ordinary knitting movements, then knitting upon all of the needles a strip of web for the welt or hem, and then permitting said displaced stitches to be cast from the needles onto the stitches of the course which is being drawn.

25. The mode herein described of producing a turned hem or welt upon a knitted web, said mode consisting in knitting such web upon a single set of needles applying the initial course of yarn to all of the needles of the set, moving the loops upon needles of the set to such position that they will not be cast off by the ordinary knitting movements, knitting upon all of the needles of the set a strip of web for the welt or hem, and then permitting said displaced stitches to be cast from the needles and onto the stitches of the course which is being drawn.

26. The mode herein described of producing a turned hem or welt upon a knitted web, said mode consisting in knitting such web upon a single set of needles applying the initial course of yarn to all of the needles of the set, moving loops upon all of said needles to such a position that they will not be cast from the latter by the ordinary knitting movements, knitting upon all of the needles a strip of web for the welt or hem, and then permitting said displaced stitches to be cast from the needles and onto the stitches of the course which is being drawn.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ROBERT W. SCOTT.

Witnesses:
HAMILTON D. TURNER,
KATE A. BEADLE.