W. E. SMITH.

TUBULAR RIBBED FABRIC.

APPLICATION FILED SEPT. 23, 1909.

1,009,450. Patented Nov. 21, 1911.

Fig. 1.

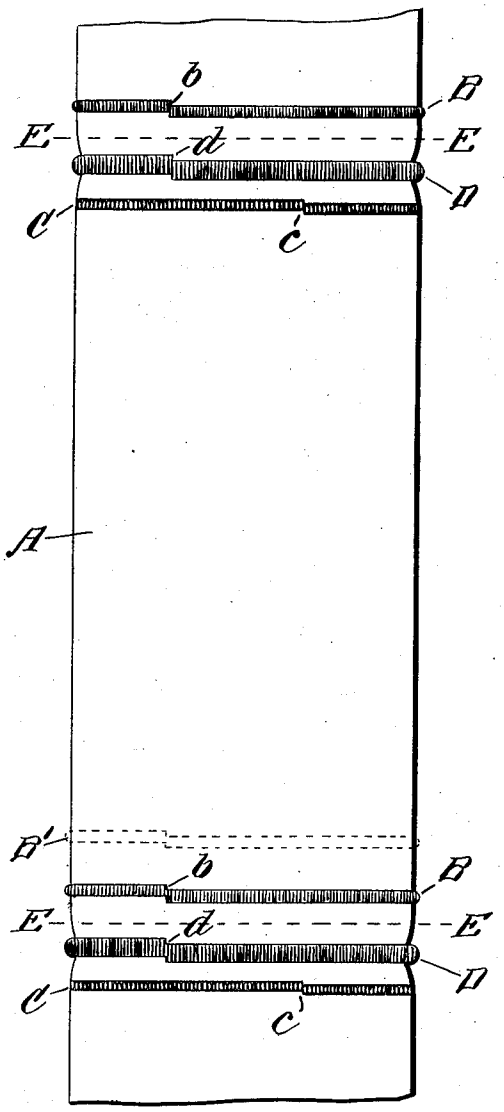


Fig. 2.

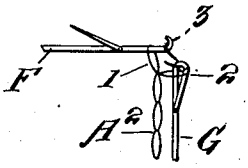


Fig. 3.

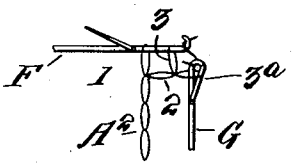
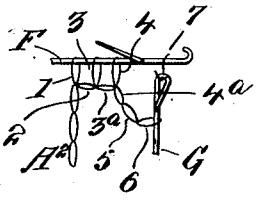


Fig. 4.



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TUBULAR RIBBED FABRIC.

1,009,450. Specification of Letters Patent. Patented Nov. 21, 1911.

Application filed September 23, 1909. Serial No. 519,203.

To all whom it may concern:

Be it known that I, WILLIAM E. SMITH, citizen of the United States, residing at New Brunswick, in the county of Middlesex and State of New Jersey, have invented certain new and useful Improvements in Tubular Ribbed Fabric; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention consists in an improved article of manufacture, to wit, a ribbed top or cuff to form part of men's half hose. It is customary to knit these rib tops upon a circular rib knitting machine provided with horizontal or dial needles and vertical or cylinder needles, and to provide each of said tops or cuffs with a welt (or welts) at one end which serves as a selvage and at the other end a course of stitches the thread of which is more loosely drawn than that of adjacent courses, forming what is termed the "slack course", or "running-on" course. These tops or cuffs are usually knit as a continuous fabric or tube, a few courses being knit between the slack course of one top and the welt of the next adjacent course to permit of severing the individual tops or cuffs and to provide courses to be raveled when the top is applied to a knitting machine. The several tops are separated at a point between the slack course of one top and the selvage or welt of the next adjacent course, and the slack course of stitches is run on to the needles of a circular knitting machine, or upon the points of a transfer cup or ring and subsequently transferred to the needles of the knitting machine, and the stitches beyond the slack course are raveled back to the slack course. The leg of the stocking is then knit directly on to the slack course of the ribbed top.

The operation of running on has been usually performed by hand but recently machines have been devised for mechanically placing the cuffs or tops in such position that the stitches of the slack course can be engaged by transfer levers which are made to engage all or a portion of the stitches of the slack course and transfer them upon the points of a transfer ring or cup. These machines are provided with certain guiding and positioning devices which usually engage the depressions between the exterior ribs or wales of the fabric. The continuous rib fabric has been fed to the transferring machine, expanded over a mandrel, and moved by the positioning devices to bring the slack course of a cuff or top into proper position, by the engagement of such positioning devices with the selvage or welt of the preceding adjacent top. This necessitates the retraction of the positioning devices to permit the fabric to be severed between the slack course to be run on, and the selvage welt of the preceding top, and where the transfer levers are arranged to engage every stitch of the slack course, the positioning devices must be withdrawn sufficiently to clear the slack course entirely, as the positioning devices cover the alternate stitches of the slack course which are in line with the depressions between the exterior wales. The withdrawal of the positioning devices to permit the web or fabric to be severed and to permit the transfer levers to engage the stitches of the slack course has a tendency to disarrange the slack course and release it from the positioning means so that some of the transfer levers are liable to miss their stitches, and produce defective work in transferring the slack course to the transfer ring.

According to this invention, a tubular rib fabric is knit with the usual selvage welt, and the slack course of stitches and between the selvage welt or welts of one ribbed top, and the slack course of the next adjacent top, an additional or special welt having features differentiating it from the ordinary or selvage welt, is knit for the sole purpose of serving, in conjunction with the positioning devices of the transferring machine, to position the slack course of stitches with respect to the series of transfer levers. The web or fabric is severed between the selvage welt or welts, and the special welt, hence the positioning devices do not have to be withdrawn from engagement with the special welt to permit such severing of the web, and it is preferred to employ a series of transfer levers corresponding to every alternate stitch of the slack course, so that they may pass between the positioning devices, and engage the alternate stitches of the slack course while the fabric is still held by such positioning devices. After the cuff or top is transferred to the transfer ring or to the needles of a knitting machine the special

positioning welt is raveled out together with any courses intervening between it and the slack course and hence does not appear in the completed hose.

This invention consists in providing such a cuff or ribbed top with a positioning welt of particular or special construction, to adapt it to more perfectly coöperate with the positioning devices, of the transferring machine in securing the results previously described.

In the drawing, Figure 1 represents diagrammatically a section of continuous tubular rib fabric comprising a series of rib tops embodying my invention. Figs. 2, 3 and 4 are diagrammatic views illustrating the manner of forming the special form of positioning welt, indicated in Fig. 1.

In the drawing A represents the tubular ribbed web or fabric, provided at proper intervals with a selvage welt B, and a slack course of stitches C, arranged at suitable distances apart to form a ribbed top or cuff of the desired length.

D represents the special welt, which as shown is knit between the selvage welt B and the slack course of the next top or cuff and at a sufficient distance from the selvage welt to permit the cuffs to be severed between the two welts B and D, as indicated by the dotted line E, E. In some cases it is customary to knit more than one welt at the selvage end of the cuff or top, for the purpose of making a more ornamental effect, or to indicate the size of hose which is to be knitted thereon, and such an additional selvage welt is indicated in dotted lines at B', but such welts will always be located between the selvage welt and the slack course of the same cuff or top and have nothing to do with the present invention.

In circular knitting any single course of stitches will have its beginning and end the width of a stitch apart. This does not show in the main body of a circular knit fabric as the courses of stitches are knit practically in a spiral manner, but in the case of a single course of stitches such as the slack course, and in the case of a welt, the separation of the ends of the course is apparent, and is termed a "jog." In the drawing, Fig. 1, the jog in the slack course of stitches is indicated at *c*, the jog in the selvage welt is indicated at *b*, and the jog in the special welt is indicated at *d*. It is important and desirable that the jog *c* in the slack course should be located at a distance laterally of the tubular fabric, from the point at which the jog *d* in the special welt D occurs, in order to facilitate the positioning of the slack course, and prevent distortion of the same which might occur if the jogs *c* and *d* occurred in the same longitudinal row of stitches. It is not material where the jog in the selvage welt or welts occur but they will ordinarily occur as shown in line longitudinally with the jog in the special welt.

The special welt D may be knit in the same manner as the ordinary selvage welt or welts, except that the stitches are drawn tighter than those of adjacent courses, and tighter than those forming the ordinary welt in order to make the special welt fit more tightly upon the mandrel of the transferring mechanism, and thus stretching open the stitches of the slack course more uniformly and holding the slack course more firmly against the thrust of the transfer levers. As this special welt is to be raveled, it can be knit considerably tighter than the ordinary welt, which has to be elastic enough to pass over the heel when the stocking is drawn on. This special welt D is preferably so made that it projects farther above the surface of the fabric than the ordinary selvage welt, thus giving a better hold for the positioning devices, and this welt D is shown as being made tighter than the selvage welt, to stretch the slack course more uniformly and to afford a better resistance to the transfer levers as they stretch out the web and apply the stitches to the points of the transfer ring. When the number of transfer levers is less than the number of stitches in the slack course the tighter special welt also serves to support more firmly the stitches not so engaged by the transfer levers, as the alternate stitches for example, so as to hold them very accurately in position to engage the proper points of the transfer ring.

The manner of knitting the special welt D shown in Fig. 1 is illustrated in Figs. 2, 3 and 4, in which A^2 represents the fabric, F a dial needle and G a cylinder needle. In Fig. 2 the needles are represented in position to commence the knitting of the special welt, and 1 represents the loop held by the dial needle and 2 represents the loop held by the cylinder needle. A thread 3 is fed to both cylinder and dial needles, but the dial needles F in taking this thread are not advanced far enough to carry their latches through the loops 1, and they therefore hold the loop 1 and the new loop 3 while the cylinder needles G knit as usual, a stitch 3^a. A second thread is then fed in the same manner to the needles F and G thus accumulating another loop 4 on the dial needles, the cylinder needles knitting a stitch 4^a, (see Fig. 3). The dial needles F then remain stationary while the cylinder needles knit one or more courses (as 5 and 6) when both needles resume rib knitting with the thread 7. In taking the thread 7, the dial needles are projected far enough to carry their latches through the accumulated loops 1, 3 and 4, and said loops are cast off in making the stitch with thread 7.

In this manner an extra bulky welt is formed which projects farther from the surface of the fabric than the ordinary welt and is peculiarly well adapted to receive the positioning devices of the transferring machine, and by increasing the tension on the thread, while knitting this welt or otherwise, it is made tighter than the ordinary selvage welt.

The ribbed tops herein described are preferably manufactured in a strip of any desired length folded flat and rolled upon itself into a roll of any desired diameter. It is obvious, however, that the ribbed tops or cuffs can be knit separately, or knit continuously and separated from each other before being used, if found desirable.

A machine well adapted for transferring the herein described ribbed tops or cuffs is illustrated and described in the application of E. E. Kilbourn, William E. Smith and Isaac W. Kilbourn, filed Jan. 29, 1909, Serial No. 474,953.

What I claim and desire to secure by Letters Patent is:—

1. As a new article of manufacture, a ribbed top or cuff for use in connection with a transferring machine, provided adjacent to one end with a selvage portion, and adjacent to the other end with a course of stitches to be transferred, and having a positioning welt, adjacent to the said course of stitches to be transferred on the side thereof from which the fabric is to be raveled back, the said positioning welt being knit with tighter stitches than those of the adjacent course to cause it to fit tightly upon the mandrel of the transferring machine and afford a firm support for the course of stitches to be transferred, during the transferring operation.

2. As a new article of manufacture, a ribbed top or cuff for use in connection with a transferring machine provided adjacent to one end with a selvage portion, and adjacent to the other end with a course of stitches to be transferred, and having a positioning welt, adjacent to the said course of stitches to be transferred on the side thereof from which the fabric is to be raveled back, said positioning welt projecting farther from the surface of the fabric than the ordinary or selvage welt, and having its stitches drawn tighter than those of adjacent courses of the fabric to cause it to fit tightly upon the mandrel of the transferring machine to facilitate the engagement therewith of the positioning devices of said machine, and to afford firm support for the stitches to be transferred during the transferring operation.

In testimony whereof I affix my signature, in the presence of two witnesses.

WILLIAM E. SMITH.

Witnesses:
I. W. KILBOURN,
JOHN ERICKSON.