Aug. 18, 1942. W. COLEMAN 2,293,639

KNITTED FABRIC

Original Filed Oct. 20, 1936

Fig. 2.

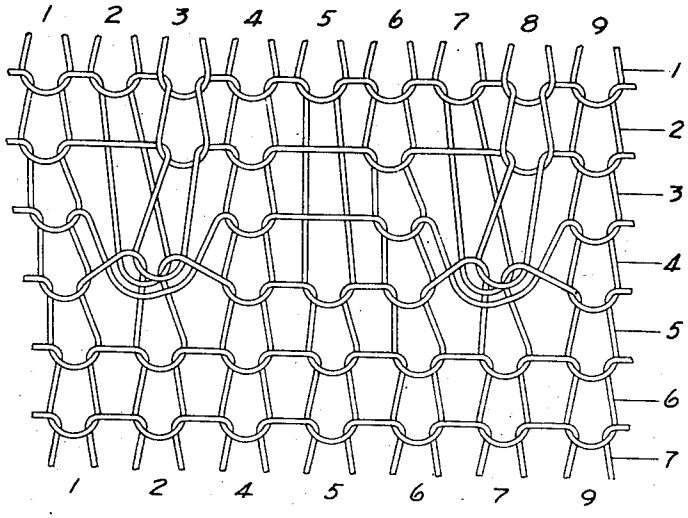


Fig. 3.

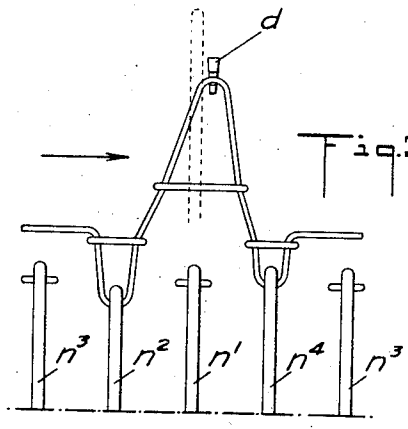


Fig. 4.

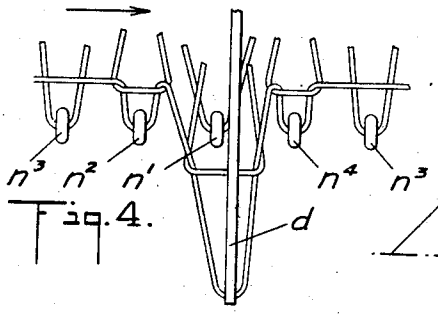
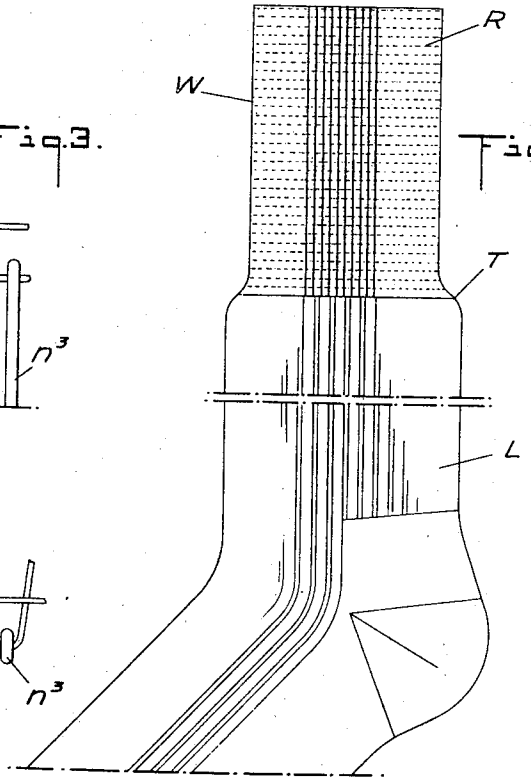


Fig. 1.



INVENTOR
WILLIAM COLEMAN
BY HIS ATTORNEYS

Howson and Howson

Patented Aug. 18, 1942 2,293,639

UNITED STATES PATENT OFFICE

2,293,639

KNITTED FABRIC

William Coleman, Johnson City, Tenn., assignor to Scott & Williams, Incorporated, New York, N. Y., a corporation of Massachusetts

Original application October 20, 1936, Serial No. 106,673. Divided and this application August 20, 1937, Serial No. 160,182

8 Claims. (Cl. 66—188)

This invention relates to fabric knit by circular knitting machines and it is an object of this invention to provide an improved stocking having a ribbed fabric instep and leg and a plain fabric top with elastic threads laid or knit therein.

In the drawing—

Fig. 1 is a diagrammatic view of a stocking in accordance with this invention;

Fig. 2 is a fragmentary enlarged view showing portions of several courses of loops before, during and after transfer; and

Figs. 3 and 4 are fragmentary enlarged views showing in elevation and plan, respectively, the relation of the loops and the cylinder and dial needles during transfer.

In the drawing the invention is shown applied to a fabric knit by a ribbed fabric hosiery knitting machine, such as is shown in the patent to Scott No. 1,641,554, issued September 6, 1927, and as in that machine, the stocking is knit beginning at the toe and comprises a ribbed fabric instep and leg L and a plain fabric top W which, however, is, in accordance with this invention, modified by the insertion of an elastic thread R which is engaged at spaced wales in spaced courses. The transfer from the ribbed to the plain fabric takes place at T and, if desired, a different yarn may be introduced for the knitting of the top a few courses prior to the change from ribbed fabric to plain fabric.

The dial needles *d*, preferably constructed as shown in the Scott Patent No. 1,641,101, issued August 30, 1927, are arranged with the cylinder needles so as to knit a 4 x 1 ribbed fabric. The cylinder needles have jacks under alternate needles, the needles n^1 immediately following the dial needles and the needles n^3 being without jacks, while the needles n^2 and n^4 are provided with jacks. The jacks are provided with long and short butts in alternation. The cylinder needles are also provided with the usual long and short butts which cooperate with the usual knitting cams; the needles n^2 having their butts cut away at the bottom so that when raised they are not raised as soon as or to the same extent as the needles n^1 in advance thereof. The time of raising of the needles with respect to the operation of the cast-off portion of the dial needles *d* during transfer is preferably adjustable. In addition to a dividing cam, a draw down cam and a jack operating cam, an additional jack operating cam is provided which is arranged to be placed in operative position during every fourth course when in use and to be inserted partially so as to operate only the long butt jacks. The long butt jacks can be positioned to operate either of the jack operated needles. There is also provided a draw down cam arranged to draw down the cylinder needles to a greater extent than usual during the transfer operation.

During the knitting of the foot and leg the operation is as shown in the patent to Scott No. 1,641,554. At a point a couple of courses prior to the transfer from ribbed to plain fabric the dividing cam is inserted drawing down all the cylinder needles, but the alternate cylinder needles n^2 and n^4 being provided with jacks are raised upon the operation of the jacks to pass over the leading stitch cam to take and knit the body yarn in the usual manner. The remaining cylinder needles n^1 and n^3 pass below the leading stitch cam and the center knitting cam which is, at this time, in a raised position so that these needles do not take the yarn and knit.

Drawing down the cylinder needles n^1 immediately following the dial needles so as to keep these needles from taking and knitting the yarn in a couple of courses prior to the transfer course causes the loops knit by the dial needles to extend between the needles n^4 and n^2, as shown in Figures 3 and 4, and as each dial needle loop tends to center itself between the cylinder needles with which it is connected the dial needle loop will be distorted and the loop previously knit by the dial needle will be stretched sidewise and held open.

At the beginning of the transfer course a cam is inserted to draw down all the cylinder needles substantially as far as possible without rupturing the loops, the needles then being raised. The butts on needles n^2 having been cut away at the bottom these needles are not raised as soon or as high as the other needles and serve to retain some tension on the dial needle loops, drawing these loops to the left so that as the needles n^1 are raised they engage in the dial needle loops of the previous course before the needles n^2 are raised far enough to release the tension on the dial needle loops. The dial transfer cam having been inserted the dial needles *d* are withdrawn leaving the dial needle loops on the cylinder needles n^1 immediately following the dial needles. As in the transfer operation in the Scott Patent No. 1,641,554, the cams operative at this time are maintained in operative positions during a plurality of courses so as to insure the transfer of the dial needle loops to the cylinder needles.

Upon completion of the transfer and the withdrawal of the transfer cams the elastic yarn

guide is operated to present the elastic thread R to the needles and a cam is inserted to operate the jacks having the long butts so their needles are operated to take the elastic thread. As only alternate jacks have long butts the elastic thread is taken by every fourth needle. The yarn guide feeds the rubber thread below the latches of the raised needles so the rubber thread is held down as the remaining needles are raised. The remaining needles when raised pass in front of the rubber thread so that when the needles are operated by the stitch cams to take and knit the body yarn the elastic thread is not knitted in but is engaged with the loops of the plain fabric at every fourth wale. The long butt jacks are operated so that the elastic thread is engaged with the plain fabric loops in every fourth course. Where it is desired to knit in the elastic thread at the spaced needles in the courses in which it is introduced the needles taking the elastic thread retain it in their hooks when the needles are operated by the stitch cams to knit the elastic thread as well as the body yarn. With the introduction of the elastic thread the dial is raised to increase the spacing between the dial and cylinder to provide for the passage of the fabric containing the elastic thread.

The top containing the elastic thread is knit of the desired length and the yarns then withdrawn and the fabric pressed off in the usual manner.

The fabric in the region of the transfer course is as shown in Fig. 2 in which courses 1 and 2 are of rib fabric the wales 1 to 9, inclusive, beginning at the left, being knit by cylinder needles n^2, n^1, dial needle d, cylinder needles n^4, n^3, n^2, n^1, dial needle d, and cylinder needle n^4 respectively. Courses 3 and 4 are the courses prior to the transfer course in which the needles n^1 and n^3 in wales 2, 5 and 7 are drawn down and do not take the body yarn. While both needles n^1 and n^3 are arranged to miss the body yarn this is because the same arrangement is used in the starting up course. It is only necessary that the needle n^1 immediately following each dial needle be caused to miss the body yarn. In 2 x 1 rib, every other cylinder needle would need to miss the body yarn. Course 5 is the transfer course in which the dial needle loops in wales 3 and 8 are transferred to the cylinder needles knitting wales 2 and 7, it being assumed the transfer is completed in the one course. In this transfer the cylinder needles n^1 engage in the dial needle loops of course 3 and the dial needle loops of course 4 when cast off the dial needles tend to straighten out but are held by the needle n^1 along with the dial needle loops of course 3. Courses 6 and 7 are plain fabric courses prior to the introduction of the elastic thread. In the courses in which the elastic yarn is included the elastic yarn is fed under such tension that the fabric of the completed top is contracted by the elastic yarn to form continuous ribs extending lengthwise of the stocking and giving the plain fabric top substantially the appearance of a ribbed fabric with the ribs thereof forming continuations of the ribs of the fabric of the stocking leg.

This application is a division of my co-pending application Serial No. 106,673, filed October 20, 1936, now Patent No. 2,100,941.

I claim:

1. A stocking having a ribbed fabric leg, a plain fabric top with a weft elastic thread contracting said top in folds to a substantially ribbed fabric and a transfer course between said leg and top in which the rib wales are merged with plain wales at one side of the rib wales.

2. A stocking having a ribbed fabric leg, a plain fabric top with an elastic thread engaged at spaced wales in spaced courses of said top and a transfer course between said leg and top in which the rib wales are merged with plain wales extending from the rib fabric.

3. A stocking having a ribbed fabric leg, a plain fabric top with an elastic thread laid in spaced courses of said top and a transfer course between said leg and top in which the rib wales are merged with adjacent plain wales.

4. A stocking having a ribbed fabric leg, a plain fabric top with an elastic thread knit in at spaced wales in spaced courses of said top and a transfer course between said leg and top in which loops of the rib wales are interlooped with loops of adjacent plain wales.

5. A stocking having a ribbed fabric leg, a plain fabric top with a weft elastic thread contracting said top into rib-like fabric substantially continuing the ribbed fabric of the leg and a transfer course between said leg and top in which loops of the rib wales are interlooped with loops of plain wales continued from the rib fabric.

6. A stocking having a ribbed fabric leg, a plain fabric top and a transfer course between said leg and top in which loops of the rib wales are interlooped with loops of adjacent plain wales.

7. A stocking having a ribbed fabric leg, a plain fabric top and a transfer course between said leg and top in which the rib wales are merged with plain wales at one side of the rib wales, said rib fabric leg having a course in which plain fabric loops adjacent the rib wales extend walewise of the fabric for a plurality of courses to the transfer course.

8. A stocking having a ribbed fabric leg, a plain fabric top and a transfer course between said leg and top in which the rib wales are merged with plain wales at one side of the rib wales, said rib fabric leg having one or more courses immediately preceding the transfer course in which the plain wales adjacent the rib wales have fewer loops than other plain wales.

WILLIAM COLEMAN.