May 5, 1936. C. A. RIGGS 2,039,932

METHOD OF MAKING HOSIERY

Filed Jan. 3, 1936

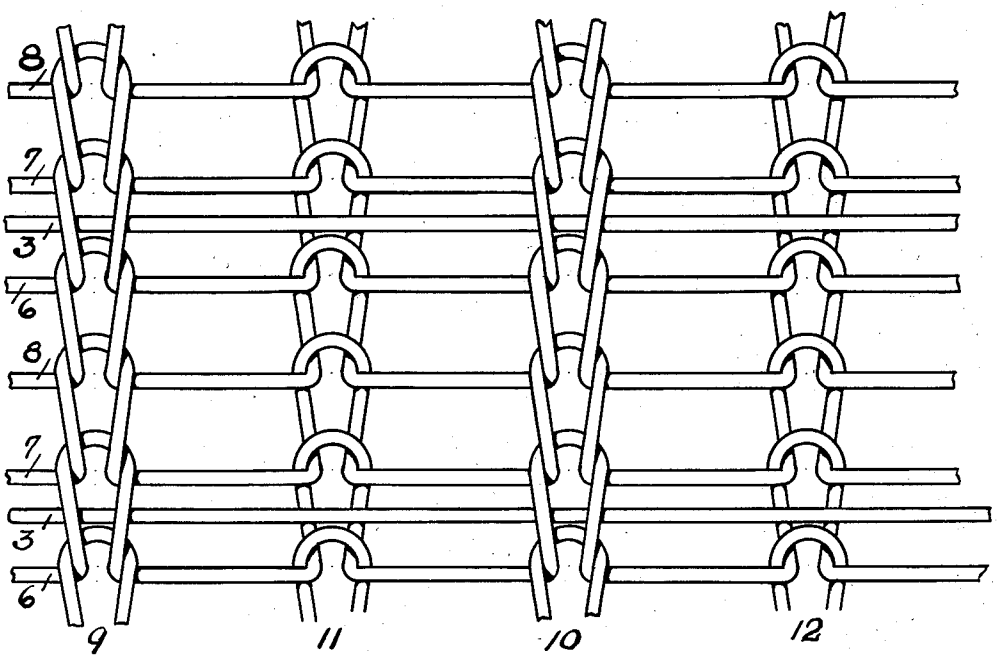


Fig. 2

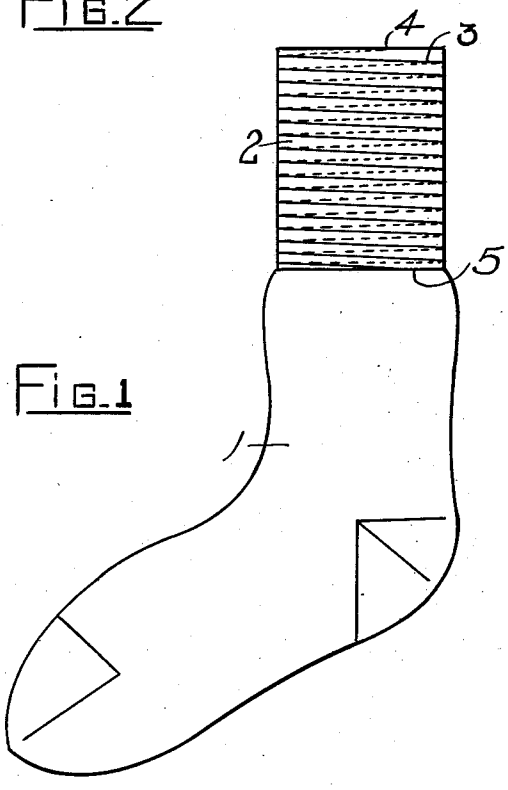


Fig. 1

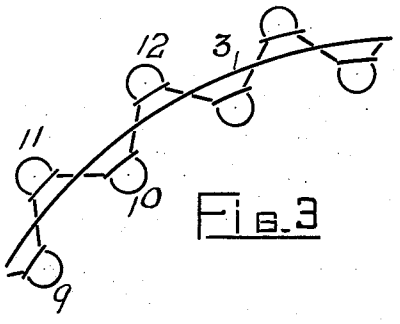


Fig. 3

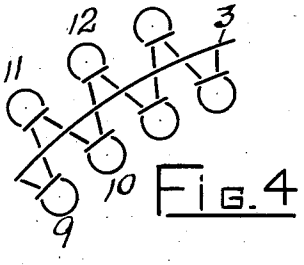


Fig. 4

CLYDE ALVIN RIGGS
INVENTOR
BY Nathan Levin
ATTORNEY

Patented May 5, 1936 2,039,932

UNITED STATES PATENT OFFICE

2,039,932

METHOD OF MAKING HOSIERY

Clyde Alvin Riggs, Chattanooga, Tenn., assignor of one-fourth to Nathan Levin, Trenton, N. J., and three-tenths to Margate Hosiery Mills Incorporated, Chattanooga, Tenn., a corporation of Tennessee

Application January 3, 1936, Serial No. 57,348

1 Claim. (Cl. 66—9)

This application is a continuation in part of my application Serial Number 47,663 filed October 31, 1935, in which is disclosed a plural course spiral knit rib top in which an elastic yarn is incorporated unknit in one of said plural courses.

It is an object of this application to disclose a certain novel way of fabricating a plural course spiral knit rib top of the type shown in my earlier application.

In the drawing:

Fig. 1 is a view showing a man's half hose containing my novel top,

Fig. 2 is a detail view of a portion of the top showing the knitted stitches,

Fig. 3 is a detail view in cross section of a portion of a course distended and

Fig. 4 is a detail view in cross section of the same portion of a course contracted.

It has been customary in providing garter top socks or stockings to inlay a rubber yarn or an elastic yarn or thread, known in the trade as rubber or "Lastex" which may be covered with a textile yarn wrapping or may be uncovered, in successive rib courses on a single feed ribber for a number of courses, the number being relatively few in comparison to the number of courses in the entire normal rib top. This rubber is usually placed near the upper edge of the top and extends for about a half to three quarters of an inch. It has been customary to make the socks of less than their usual normal length in the leg, as with a normal length sock, the rubber insert provided would be positioned near the calf of the leg of the wearer and the insert was not effective at this point. Accordingly the socks were made shorter in the leg so that the garter insert would be effective, on a narrower portion of the leg, in retaining the sock in position. Such short length socks are objectionable in that when the wearer crosses his legs the uncovered portion of his leg above the short sock is usually brought into view, beneath the trouser legs. Furthermore the garter effect, produced by placing the inlay in successive rib courses for a short distance, is too tight and binds the leg. Again it stretches less than the remainder of the rib top in which no rubber is incorporated. Apparently this cannot be overcome by placing less initial tension upon the rubber yarn, as then it extends in an unsightly manner from and between the wales of the rib top.

I have overcome the above objections and have provided a normal length sock or stocking in which there is an all over elastic garter effect in the rib top without the garter being too tight. This is done by using a larger diameter machine than normally and by using in the larger diameter machine the same number of needles as in the previously used smaller diameter machine, the needles in the larger machine being spaced apart further than in the smaller machine. In addition the treatment of the tension on the rubber yarn is reversed, that is instead of trying to lay the rubber in with as little tension as possible, a great deal of tension is placed upon the rubber yarn so that when the same contracts after the knitting it tends to and does contract the fabric make on the larger diameter machine to a diameter the same or substantially the same as that normally made upon the smaller diameter machine. The resultant rib top then has a diameter the same as though it had been made upon the smaller diameter machine and has the same number of wales as there were in the top produced on the latter machine. This larger diameter machine has a plurality of feeds and the rubber is inlaid at one feed. In this way there is a soft stretch to the rubber yarn. I can if I desire make the sock of less or more than normal length when it is necessary for any purpose. It is understood that my invention relates to the rib top and that the same may be used upon any type of stocking, hose or sock or that the same may be used in any manner in which a rib top or like fabric may be used.

In Fig. 1 at 1 is shown a man's half hose having my novel top 2 thereon. It will be seen that the rubber yarn 3 extends spirally throughout the top 2 being anchored at points 4 and 5 in a manner to be described.

In Fig. 2 the detail of the stitches shows that the top is made of textile yarns 6, 7, and 8 each fed at a separate feed on a three feed ribber. The knitting is done on a three course spiral. Following the feed at which one of the three textile yarns is knitted say the yarn 6, the rubber yarn 3 is laid in in the usual manner over the verge of the needle cylinder and below the dial between the cylinder or plain stitches in wales 9 and 10 and the dial or rib stitches in wales 11 and 12. The knitting continues as shown in Fig. 2 with the rubber yarn being inlaid for the entire rib top including the welt and loose course. The knitting is preferably done with a loose stitch to allow for the tension on the rubber.

The rib tops are made in the usual manner, that is continuous with a pull thread selvage welt and this welt is made on one of the three feeds, preferably the one at which the rubber yarn is inlaid so that during the making of the welt the

tuck stitches will secure or anchor the rubber. When the successive tops are separated from each other in the usual way, the rubber yarn is cut above the point 4. The rubber yarn is constantly fed and continues being inlaid in the loose course as well as in the welt.

The diameter of the machine used in making the top is larger than that used normally for making a top of similar size. By way of illustration let us take a half hose having 220 wales in the leg thereof which is knit on a 220 needle footer. The rib top which is transferred to such a machine for such a half hose has 220 wales therein, 110 being plain wales alternating with 110 rib wales. The usual rib machine for making this rib top is of three and a half inch diameter and contains 110 needles each in the cylinder and dial. The three and a half inch ribber is practically a standard size for men's hose tops. However I use a five and a half inch diameter ribber with 110 needles in the cylinder and dial each, making a total of 220 needles. The spacing between the needles is obviously greater than the spacing between the needles on the three and a half inch machine. The needles used on the larger machine are of practically the same gauge as those on the smaller machine. Obviously with the same gauge needles and the same number of them the fabric made on the larger machine will have a greater diameter without the action of the rubber. The rubber is fed under high tension so that it contracts the fabric from the five and a half inch machine to a diameter equal to that of fabric made upon the three and a half inch machine. The approximate circumference of the three and a half inch machine is eleven inches whereas the approximate circumference of the larger machine is seventeen inches. Thus it will be seen that I have provided an elastic rib top with a maximum of stretch and with an allover easy elastic garter effect. While I have chosen to illustrate a top of 220 needles it is obvious that a top of any number of needles may be used without departing from the spirit of the invention. Likewise the size of the larger diameter ribber may be varied and still be used with the tensioned rubber to contract the fabric to the smaller diameter.

In Fig. 3 I have shown in diagrammatic detail the cylinder stitches 9 and 10 and the dial stitches 11 and 12 as they are when on the machine with the tensioned rubber 3 laid between the stitches. It will be seen that the extent of yarn extending from the cylinder stitch 9 to the adjacent dial stitch 11 is of greater than usual length due to the greater spacing between the needles. In Fig. 4 is shown the same fabric after it comes off the machine and it will be seen that the fabric has contracted considerably. It will be noted that the thickness of the fabric in Fig. 4 due to the contraction from a large to a small diameter is greater than the thickness of the fabric in Fig. 3.

I have disclosed the use of a three feed machine with the rubber every third course, but obviously a machine with the rubber spaced apart by a different plurality of courses may be used. The machine may have two, four or even five feeds with the rubber inlaid at one or more spaced apart feeds.

As usual the rib top is transferred to the needles of a plain machine or footer to make the leg and foot of the stocking. This is done by transferring the loose course of the rib top to the needles of the footer and then ravelling back the excess fabric to the loose course. Since the rubber yarn extends through and beyond the loose course, this also is removed during the ravelling and then the loose end thereof is placed across a needle or needles of the footer. When knitting commences uopn the footer the loose end of the rubber yarn is anchored or locked into the fabric at the point 5.

Instead of locking in the ends of the rubber in the welt and in the first course of the footer, the ends of the rubber may terminate just below the welt and just before the loose course, say a course or two before the welt and the loose course. In this event the ends of the rubber will be anchored by interknitting with the fabric for a few stitches by means well known to the trade.

It will be apparent that I have provided novel means and method of making the novel top for hosiery and that the invention may be modified or changed without departing from the scope of the same as expressed in the claim.

I claim:

The method of knitting a tubular stocking having a rib top and a plain leg, the rib top approximating in diameter the diameter of a rib top as normally made upon a certain diameter machine having a certain number of needles, including the step of knitting upon a plurality of feeds upon a larger diameter machine having the same certain number of needles to knit the courses of said top of separate yarns in regular and repeating sequence, the step of feeding rubber yarn under tension to said larger diameter machine at only one of the feeds thereof for incorporation unknit between the plain and rib wales in the courses knit of one of said yarns substantially throughout the top, the tensioned rubber yarn contracting the rib fabric as it comes off the larger diameter machine to the desired diameter, the step of transferring said rib top to a plain machine of smaller diameter than said larger diameter machine and having the same certain number of needles and the step of knitting the plain leg.

CLYDE ALVIN RIGGS.