

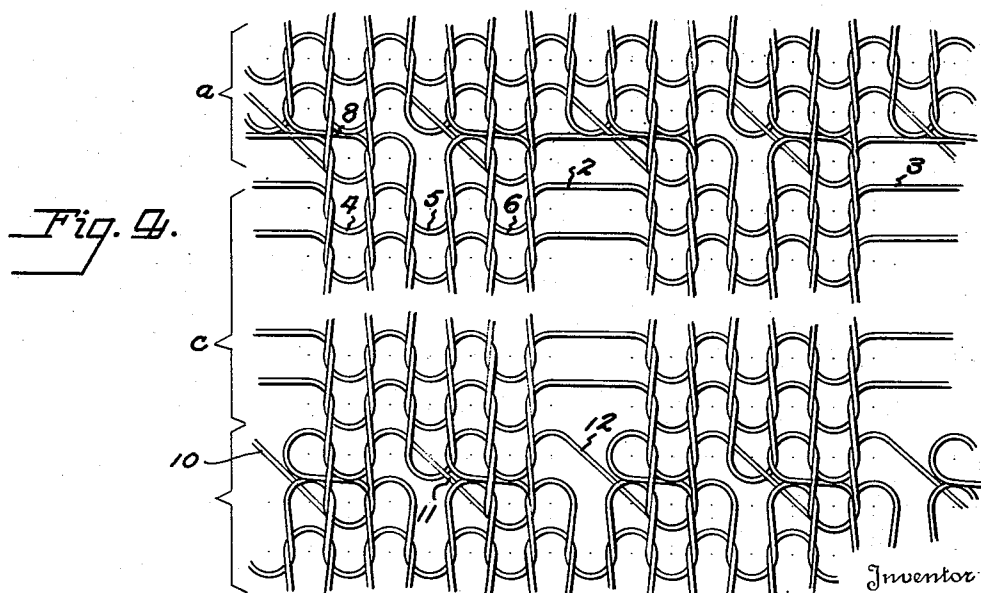
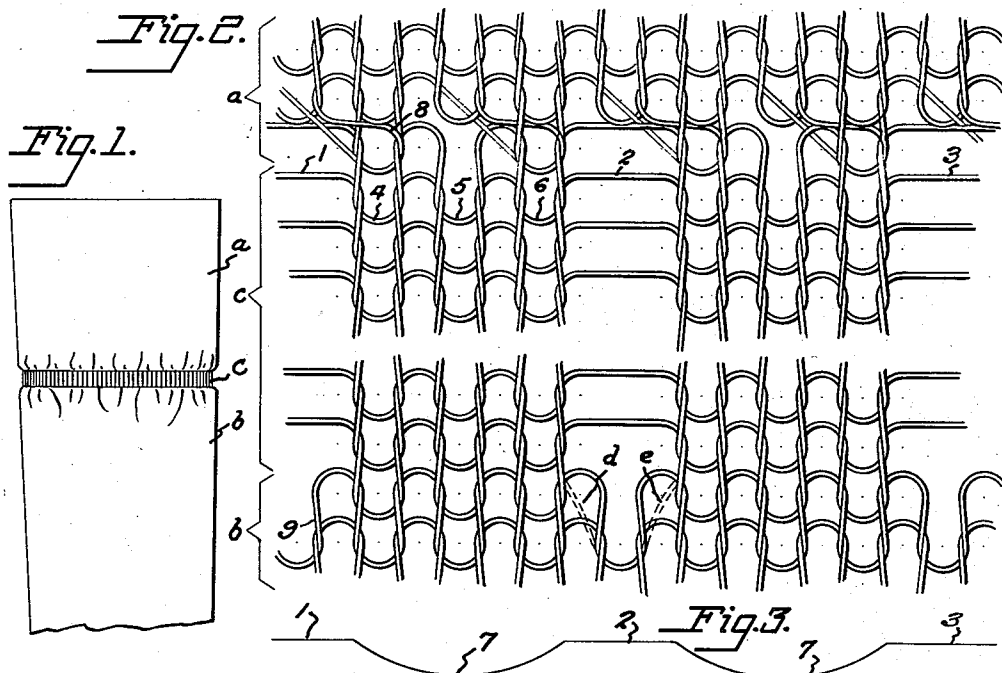
May 5, 1942.

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2,281,606

STOCKING OF THE STRAIN ABSORBER TYPE

Filed June 16, 1939



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UNITED STATES PATENT OFFICE

2,281,606

STOCKING OF THE STRAIN ABSORBER
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Application June 16, 1939, Serial No. 279,543

6 Claims. (Cl. 66—172)

This invention relates to knit hosiery of the type having an integrally knit band of two-way stretch rubber fabric of fine gauge covered rubber yarn between the welt and knee, for the purpose of absorbing longitudinal stresses occasioned by flexing the knee.

It is known that such a strain absorbing band as is above described sets in the form of a circumferential channel when the stocking is in relaxed state, impairing the sales appeal of the stocking. This tendency to curl is due to the fact that fine gauge covered rubber yarn, on account of the ease with which it stretches, cannot be knit on a machine without tensioning it, so that when the loops are shed from the needles this tension is relaxed, the fabric contracts, and the curl results.

Among various means which have been devised to inhibit curling of the strain absorbing band, perhaps the most efficient is the provision of a series of rib formations running across the band in the direction of its width. These ribs are formed between walewise rows of drop stitches in the elastic band, said rows of drop stitches providing fullness which permits the rubber in those parts of the courses between the drop stitches to contract, bending the fabric between the rows of drop stitches into a convex shape, thus forming the ribs.

These convex reinforcements have a girder function in maintaining the strain absorbing band flat, notwithstanding its inherent urge to curl.

The efficiency of such rib formations in preventing curling is impaired through the fact that the welt or upper part of the stocking to which the elastic band is customarily integrally united, loop for loop, is made of inelastic yarn which does not contract when the loops are shed from the needles; therefore, the inelastic fabric at the line of juncture with the elastic band remains spread, while the elastic band contracts, the result being that the inelastic fabric holds the upper edge of the elastic band spread circumferentially and thus keeps the upper ends of the transverse ribs from assuming a convex form, thereby impairing the girder function of said ribs at least insofar as preventing curling along the upper edge of the elastic band, is concerned.

The object of the present invention is to provide for the narrowing of the lower circumferential edge of the upper part of the stocking made of inelastic yarn to which the elastic band is integrally knit so that there is no tendency on the

part of the upper part of the stocking to spread the elastic band circumferentially.

Another object of the invention is to provide a stocking of the type having the strain absorbing band as described, in which the parts of the stocking between which the elastic band is intercalated, made of the basic inelastic yarn, are narrowed along the edges to which the elastic band is integrally united.

Other objects of the invention will appear as the following description of a preferred and practical embodiment thereof proceeds.

In the drawing which accompanies and forms a part of this specification, and throughout the several figures of which the same characters of reference have been employed to designate identical parts:

Figure 1 is a view in elevation of the upper portion of a stocking showing a strain absorbing band, and embodying the features of the present invention;

Figure 2 is a diagram showing in a conventionalized way the knitting in the lines of juncture between the elastic band and the adjacent upper and lower part of the stocking in one form of the invention;

Figure 3 is a cross-section illustrating the convex nature of the rib formation; and

Figure 4 is a view similar to Figure 2, illustrating another modification of the invention.

Referring now in detail to the figures, and first adverting to that form of the invention shown in Figure 2, the part of the knitting embraced within the brackets *a* and *b* are made of inelastic yarn, while that part of the knitting embraced within the bracket *c* is fabricated from fine gauge covered elastic rubber yarn, and constitutes the strain absorbing band or zone. A series of rows of drop stitches 1, 2 and 3 are formed, preferably at regular intervals, widthwise of the strain absorbing zone, leaving several rows of loops 4, 5 and 6 therebetween. The fullness which is produced by dropping the stitches permits the elastic fabric constituted by the rows of loops 4, 5 and 6 to contract together into the convex form shown in cross-section at 7 in Figure 3.

It is, of course, a matter of elemental knowledge that any sheet material bent into a convex form is thereby stiffened in the direction of the length of the corrugation. Consequently, the corrugations or ribs formed by the convex bending of the rows of loops 4, 5 and 6 have a girder function in stiffening the strain absorbing band in a widthwise direction, overcoming its inherent urge to curl.

It will be obvious to those skilled in the art that if the top edge of the strain absorbing band were united loop for loop with the welt or upper part of the stocking made from inelastic yarn, the latter being in uncontracted state will maintain the edge of the elastic band to which it is united, in circumferentially spread condition so that the circumferential stress imparted to said band will prevent the upper portions of the rows of loops 4, 5 and 6 from bending together in convex form, but will keep them substantially planiform. Thus, to the extent that they are prevented from bending, their girder effect does not materialize and they fail to adequately reinforce the strain absorbing band, permitting it to curl.

The present invention aims to narrow the edge of the relatively inelastic upper part of the stocking to which the strain absorbing zone is attached, and thus to obviate the spreading of the upper edge of the strain absorbing zone. The means provided for narrowing the lower edge of the welt or upper part of the stocking is a simple transfer stitch 8 done in the last course of inelastic yarn and repeated circumferentially at desired intervals. Figure 2 shows that certain of these transferred loops come at the head of the rows of drop stitches and form run stops therefor. Said transfer stitches reduce the number of points at which the strain absorbing zone is joined to the upper part of the stocking. In this manner the spreading of the upper portion of the strain absorbing zone is prevented. Figure 2 shows, furthermore, that certain of the transferred loops come at the head of the middle row 5, which is involved in the rib formation and thus produces suitable break between the rib and the superadjacent part of the stocking, increasing the freedom of the rib to assume a convex form.

It is, of course, old wherever drop stitching is employed in knitting, to transfer a loop at the head of the row of drop stitches to limit the run of the drop stitches, but in such patterns as have heretofore been devised, the drop stitching as well as the transferred loop constituting the run stop has been altogether in the elastic strain absorbing zone where it has not the slightest effect in preventing the spread of the upper edge of the strain absorbing zone at its line of juncture with the inelastic yarn of the stocking.

In that form of the invention illustrated in Figure 2, the expedient employed at the line of juncture of the strain absorbing band and the upper portion of the stocking, of narrowing the last course in the inelastic fabric is not necessary at the line of juncture of the strain absorbing band and the inelastic fabric included within the bracket b, inasmuch as the transition from the knitting of the elastic yarn to that of the inelastic yarn forming the leg portion of the stocking involves only the addition of a row of loops in line with the rows of drop stitching. It is essential that the first course 9 in which the added loops appear shall be of inelastic yarn and the added loops occur only in line with the rows of drop stitching. The dotted lines d and e in Figure 2 indicate the actual position of the limbs of the added loop, from which it will readily be seen that there is no tendency to spread the lower edge of the strain absorbing zone through increasing the number of stitches in the inelastic courses which are succeedingly knitted.

Figure 4 shows a slight modified form of the invention, in which the construction of the knitting at the line of juncture between the upper

part of the stocking and the strain absorbing zone is the same as that shown in Figure 2, but the knitting adjacent the line of juncture between the strain absorbing zone and the leg portion of the stocking involves a similar series of transfer stitches. It will be understood that the yarn 10 in which the transferred loops occur is inelastic. The transferred stitches 11 which are in the line of the rib formations have the same function as the corresponding transferred stitches adjacent the top edge of the strain absorbing zone, that is, they constitute a break in the knitting, permitting the unrestrained convexing of the ribs. The transferred loops 12 which occur in the line of the drop stitches form a loose course between the elastic strain absorbing zone and the inelastic yarn of the leg portion of the stocking which still further remove the tendency of the leg portion of the stocking to spread the adjacent course or courses of the strain absorbing band. This course of transferred loops between the strain absorbing band and the leg portion of the stocking is especially effective in preventing the leg portion of the stocking from spreading the adjacent portion of the strain absorbing zone after the leg portion has been abnormally distended by being worn upon a large leg.

It will be apparent to those skilled in the art that the invention is not necessarily confined to courses of transferred stitches in the inelastic fabric to which the strain absorbing band is integrally knit, but that any type of knitting which effects narrowing in the inelastic fabric adjacent the line or lines of juncture of the same with the strain absorbing zone is equally within the purview of the invention.

It is also obvious that other rib formations than that produced by spaced rows of drop stitching may be employed to inhibit curling and with which the device of the present invention may be advantageously used.

What I claim is:

1. Stocking comprising an upper portion knit from basic inelastic yarn, and a two-way stretch knit strain absorbing band of fine gauge covered rubber yarn having the inherent tendency to curl, and being formed at intervals with transverse rows of drop stitches spaced apart by a plurality of walewise rows of loops forming transverse convex ribs, said strain absorbing band being integrally knit to said upper portion, a course of inelastic yarn of said upper portion adjacent the line of juncture of said upper portion with said strain absorbing band being knit with transferred stitches in the longitudinal lines of said ribs, performing the dual functions of narrowing the margin of the upper portion at the line of juncture with the strain absorbing band, preventing spreading with consequent flattening of the ribs, and affording a break between said upper portion and the ribs, facilitating the convexing of the ribs transversely of their length under the contraction of the material of said ribs away from said rows of drop stitches, the transferred stitch formation being duplicated in an inelastic yarn of the leg portion adjacent the line of juncture of said leg portion with said strain absorbing band.

2. Stocking comprising an upper portion knit from basic inelastic yarn and a two-way stretch knit strain absorbing band of fine gauge covered rubber yarn having the inherent tendency to curl, and being formed at intervals with transverse rows of drop stitches spaced apart the distance of a plurality of rows of elastic loops forming convex ribs, said strain absorbing band being integrally

knit to said upper portion, a course of the inelastic yarn of said upper portion adjacent the line of juncture of said upper portion with said strain absorbing band being formed with transferred stitches some stitches being transferred from rows in longitudinal alignment with rows of rib-forming loops affording a break between the upper portion and the ribs, facilitating curling of the ribs transversely of their length under the contraction of the material of said ribs away from said drop stitches, and some of said transferred stitches being at the heads of the rows of drop stitches acting as run stops for said drop stitches, said course of inelastic yarn knit with said transferred stitches functioning to narrow the margin of said upper portion to which said strain absorbing band is integrally knit, preventing spreading of said strain absorbing band circumferentially with consequent flattening of said ribs.

3. Stocking as claimed in claim 2, the transferred stitch formation being duplicated in an inelastic yarn of the leg portion adjacent the line of juncture of said leg portion with said strain absorbing band.

4. Stocking comprising an upper portion knit from basic inelastic yarn, and a two-way stretch knit strain absorbing band of fine gauge covered rubber yarn having the inherent tendency to curl, and being formed at intervals with transverse rows of drop stitches spaced apart by a plurality of walewise rows of loops forming transversely convex ribs, said strain absorbing band being integrally knit to said upper portion, a course of inelastic yarn of said upper portion adjacent the line of juncture of said upper portion with said strain absorbing band being knit with stitches transferred from rows in longitudinal alignment with said rows of rib-forming loops, performing the dual function of narrowing the margin of the upper portion at the line of juncture

with the strain absorbing band, preventing spreading with consequent flattening of the ribs, and affording a break between said upper portion and the ribs, facilitating the convexing of the ribs transversely of their length under the contraction of material of said ribs away from said rows of drop stitches.

5. Stocking comprising an upper portion knit from basic inelastic yarn, and a two-way stretch knit strain absorbing band of fine gauge covered rubber yarn having the inherent tendency to curl, and being formed at intervals with transverse rows of drop stitches extending there-through spaced apart by a plurality of walewise rows of loops forming transversely convex ribs, said strain absorbing band being integrally knit to said upper portion, with transferred locking loops for the rows of drop stitches, in the line of juncture between said upper portion and said strain absorbing band, and alternate transferred loops in said line of juncture, at the heads of said ribs, breaking the continuity of the median wale chains of said ribs, relieving the knitting at the heads of said ribs of coursewise tension.

6. Stocking comprising a two-way stretch knit strain absorbing band of fine gauge covered rubber yarn integrally intercalated between portions knit from basic inelastic yarn, said two-way stretch band being formed at intervals with transverse rows of drop stitches extending there-through spaced apart by a plurality of walewise rows of loops forming transversely convex ribs, with transferred locking loops for the rows of drop stitches, in the line of juncture between said upper portion and said strain absorbing band, and alternate transferred loops in said line of juncture, at the heads of said ribs, breaking the continuity of the median wale chains of said ribs, relieving the knitting at the heads of said ribs of coursewise tension.

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