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METHOD OF MAKING ELASTIC FABRIC

Filed March 11, 1955

Fig. 1

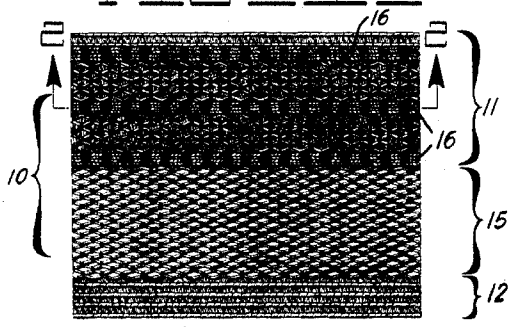


Fig. 2

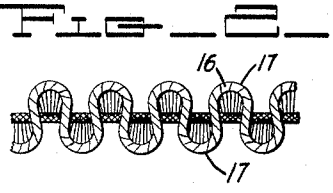
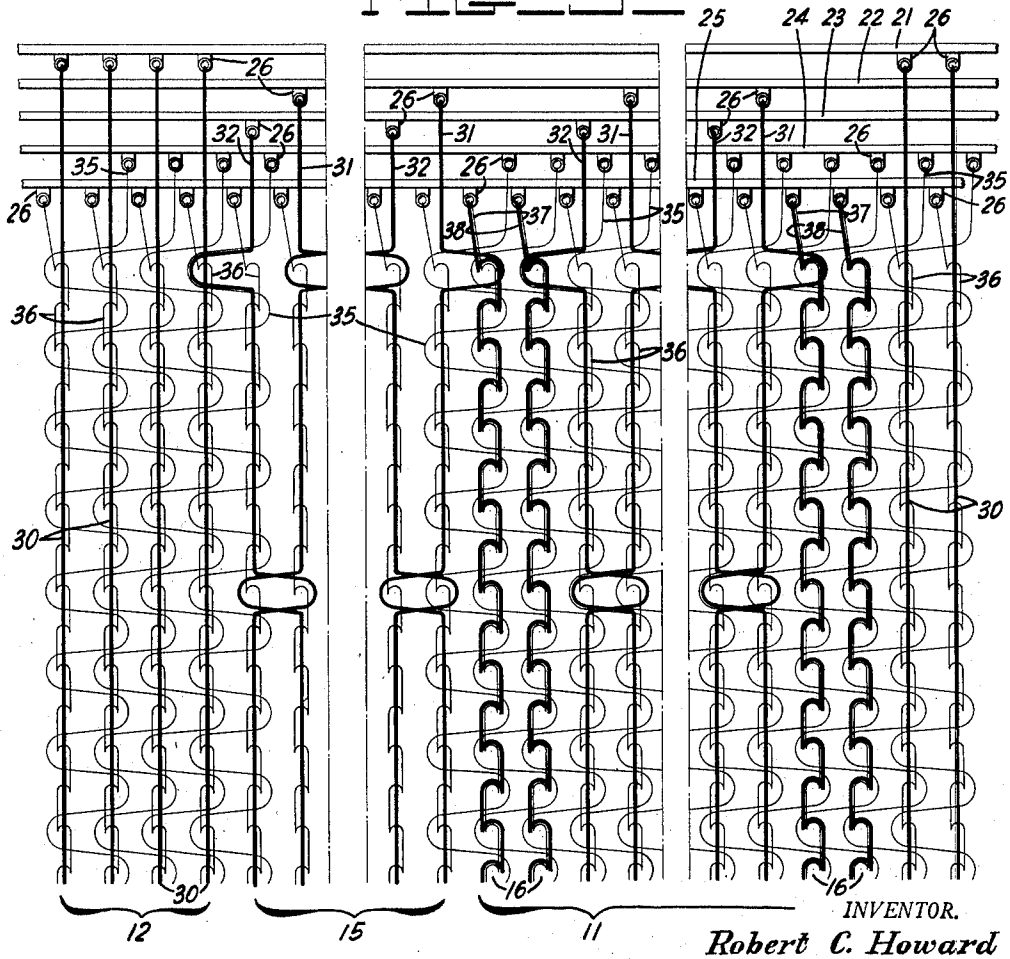


Fig. 3



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METHOD OF MAKING ELASTIC FABRIC

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1 Claim. (Cl. 66—193)

This invention relates to elastic fabric and more particularly to such fabric for use as a self-supporting welt or top edge for stockings and the like.

Heretofore, in order to eliminate the use of auxiliary devices for holding stockings in position on the legs of a wearer, the stockings were provided with self-supporting garter tops or welts of elastic fabric. This elastic fabric was in the form of a knitted or braided band which included a top or garter section having extensibility only circumferentially of the wearer's leg and an intermediate section having universal extensibility to permit the section to stretch both circumferentially and lengthwise of the legs of the wearer. The primary object of this elastic fabric was to provide a garter top having the ability to stretch to relieve the strain in the stockings during flexing movements of the wearer's legs and at the same time to maintain the stockings in correct position on the wearer's legs. However, the rubber strands, which provide the elasticity in such fabrics, were usually covered by non-elastic materials having little if any adhering qualities which would serve to hold the garter section in place on the leg of the wearer.

Consequently, unless the garter section was given such constrictive characteristics as to cause excessive discomfort to the wearer, strains on the garter section caused it to slip from its holding position thereby requiring frequent adjustments by the wearer.

It is therefore an object of the invention to provide an elastic fabric band for use as self-supporting means for garments that is economical to manufacture and will overcome the above noted and other defects.

Another object of the invention is to provide an elastic fabric band for use in supporting garments that will have sufficient frictional engagement with the body of the wearer to maintain the garment in place without causing undue constriction and discomfort to the wearer.

A further object of the invention is to provide an elastic fabric band for attachment to garments such as stockings which will have sufficient frictional engagement with the body of the wearer to maintain the band in its supporting position during flexing movements of the stockings resulting from movements of the body of the wearer.

A still further object of the invention is to provide an elastic fabric supporting band for garments having a garter portion which resiliently and frictionally engages the body of the wearer to maintain the garment in predetermined position thereon, and a stretchable portion for relieving strain on the garter portion and garment caused by bending movements of the body of the wearer.

With these and other objects in view which will become apparent from the following detailed description of the illustrative embodiment of the invention shown in the accompanying drawings, the invention resides in the novel features of construction, as hereinafter more particularly pointed out in the claims.

In the drawings:

Figure 1 is a face view of a length of an elastic fabric band made in accordance with the invention;

Fig. 2 is a diagrammatic sectional view of the fabric taken substantially along the line 2—2 of Fig. 1; and

Fig. 3 is a diagrammatic view showing the yarn components and their relation to each other in the elastic fabric of the invention, distance breaks being shown to indicate omission of duplicate parts of the fabric.

Referring to the drawing, Fig. 1 shows an elastic fabric band **10** according to the instant invention which is generally of the type shown in U.S. Patent No. 2,351,199 of S. R. Fry, issued June 13, 1944, for use as a top edge for garments such as stockings. The fabric band **10** includes a wide upper or garter section **11** having stretchability longitudinally or lengthwise of the fabric band, a narrow lower section **12** having stretchability only longitudinally of the fabric band and a section **15** intermediate the wide and narrow sections having stretch both longitudinally and transversely of the fabric band. The fabric band **10** illustrated is of a knitted structure formed on a "Raschel" type knitting machine and is attached to the stockings or other garments by sewing or otherwise connecting the section **12** of the band to the top edge of the stocking as shown and described, for example, in said Patent No. 2,351,199.

In the prior practice the sections **11**, **12** and **15** of the fabric band **10** are provided with elastic strands of the type having a center core of fine gauge rubber with a covering of inelastic yarn, the elastic strands lying along wales extending substantially parallel throughout the longitudinal length of the fabric. In the sections **11** and **12**, the elastic strands are covered by loop chains formed of additional inelastic strands as hereinafter set forth and the adjacent elastic strands are joined together by other inelastic strands which act to limit or prevent transverse stretch in these sections without restricting longitudinal stretch. In the section **15**, the adjacent elastic strands are covered by additional inelastic strands which are worked at intervals to join the adjacent elastic strands to each other in a manner to permit the section to stretch longitudinally and transversely of the fabric band. The resulting fabric band **10** when attached to the top of a stocking was intended to provide a substantially flat upper garter section **11** for snugly gripping the upper or thigh portion of the wearer's leg with sufficient constrictive pressure to maintain the garter section in place without causing discomfort to the wearer and to provide a section **15** having sufficient transverse elasticity to permit the section to stretch and relieve the strain in the stocking caused by flexing movements of the wearer's leg without displacing the garter section. However, due to the smooth surface characteristics of the inelastic yarns the repeated flexing movements of the section **15** caused the section **11** to slip down the leg of the wearer resulting in sag in the stocking and thereby requiring frequent adjustments by the wearer to return the stocking to correct position.

In accordance with the invention, in order to resist or prevent displacement of the section **11** of the fabric band **10** on the body of the wearer during flexing movements thereof, the section is provided with spaced areas **16** comprising chain stitch wales formed of bare rubber strands. The areas **16** extend longitudinally of the fabric band **10** and substantially parallel to the covered elastic strands and are joined to the covered elastic strands by inelastic strands which prevent transverse stretch in the chain stitch wales without restricting the longitudinal stretch of these areas. In forming the fabric band **10**, the covered rubber strands are initially stretched approximately to their normal elastic limit and the bare rubber strands are stretched approximately half of their normal elastic limit before being fed to the fabricating means such as the needles of a warp knitting machine of the Raschel type. When the tension in the completed fabric

band is relaxed, portions 17 of the bare rubber areas 16 are projected alternately above opposite faces of the covered rubber strand portions of the section 11 as shown in Figs. 1 and 2. In use the bare rubber projecting portions 17 will frictionally engage the leg of the wearer which together with the overall constrictive force exerted by the section 11 will maintain the section 11 of the band 10 in correct position regardless of the flexing or stretching of the section 15 of the band.

Fig. 3 diagrammatically illustrates the relation of the various elastic and inelastic strands in the band 10. The figure also diagrammatically shows guide bars 21, 22, 23, 24 and 25 having usual guide members 26 through which the strands are fed to the needles of a warp knitting machine of the Raschel type (not shown) to form the vertical wales indicated in the figure. The guide bar 21 feeds covered elastic strands 30, two of which are shown along the right edge of section 11 and four of which are shown at the left edge of the section 12. The guide bar 22 feeds alternate covered elastic strands 31 in the sections 11 and 15 and the guide bar 23 feeds the remaining covered elastic strands in these sections and indicated at 32. The covered elastic strands 30, 31 and 32 are indicated as being of the same size but these strands may be of different sizes to vary the constrictive force in the fabric sections as desired. The guide bar 24 carries inelastic shuttle strands 35 and the bar 25 carries inelastic strands 36. Certain of the guide members 26 on the bar 25 carry a bare rubber strand 38 and an inelastic strand 37 fed in parallel relation to the needles of the machine. The inelastic strand 37 acts to prevent excessive stretch and tearing of the bare rubber strand 38 and also assists in slipping the loops off the needles of the machine as the bare rubber strands are formed into loop chains as hereinafter set forth.

As indicated in Figs. 1 and 3, the covered elastic strands 30 lie in straight parallel paths at opposite edges of the fabric band 10 and are covered by loop chains formed by the inelastic strands 36, the guide bars 21 and 25 only moving to feed each of the strands 30 and 36, respectively, to the same needles throughout the formation of the band. The covered elastic strands 31 and 32 also extend generally in individual wales throughout the fabric band and are covered by loop chains formed of the inelastic strands 36. However, at intervals the bars 22 and 23 are moved to carry their elastic strands 31 and 32, respectively, alternately to the right or left to receive a loop from the adjacent loop chains and then are again returned to their normal wales which results in a distortion of the wales (not shown in Fig. 3) so that the elastic strands extend along zig-zag lines throughout portions of the section 11 and all of section 15, as shown in Fig. 1. The bare rubber strand 38 and inelastic strand 37 are formed jointly into loop chains in the areas 16 simultaneously with the inelastic strands 36 carried by the bar 25, as hereinbefore set forth. The guide bar 24 for the inelastic strands 35 move these strands back and forth between two adjacent wales to tie all of the wales in the sections 11 and 12 together and thereby prevent stretch transversely of the sections. As shown, the inelastic strands 35 also join the section 11 to the adjacent wale having the elastic strand 31 in the section 15 and join the section 12 to the adjacent wale having the elastic strand 32 in the section 15.

As hereinbefore set forth, the covered elastic strands 30, 31 and 32 are initially stretched substantially to their elastic limit and the bare rubber strands 38 are stretched approximately to half of their elastic limit as the strands are fed to the fabricating means of the machine. However, the proportion of initial stretch given to the covered elastic and bare rubber strands may be varied to project the portions 17 of the stitch wales above opposite faces of the band to a greater or lesser degree as desired when the fabric band is relaxed.

In the form of fabric band 10 illustrated in the drawing there are three areas 16 shown and each area is two wales in width. However, it will be obvious that the number of areas 16 and the number of wales in each area may be varied without departing from the scope of the invention. It will also be understood that reference to the various inelastic and elastic strands employed herein means any of the well known commercial types generally employed in producing similar types of fabric.

It will be understood that the improvements specifically shown and described by which the above results are obtained, can be changed and modified in various ways without departing from the invention herein disclosed and hereinafter claimed.

I claim:

The method of making a knitted elastic fabric band section having stretch only in one direction and including flat portions and portions projecting above said flat portions when said fabric band is in relaxed condition comprising the steps of tensioning covered rubber strands to substantially their elastic limit, introducing said covered rubber strands into said fabric band in substantially parallel relation to each other, tensioning bare rubber strands to substantially less than their elastic limit, forming looped chains of said bare rubber strands between spaced ones of said covered rubber strands and in substantially parallel relation to said covered rubber strands, connecting said covered and bare rubber strands with inelastic strands to prevent stretch in said fabric band except in said one direction and relaxing the tension in said covered and bare rubber strands to form said flat and said projecting portions in said fabric band.

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