

Jan. 9, 1940.

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2,186,531

ELASTIC FABRIC

Filed April 23, 1938

2 Sheets-Sheet 1

Fig. 1.

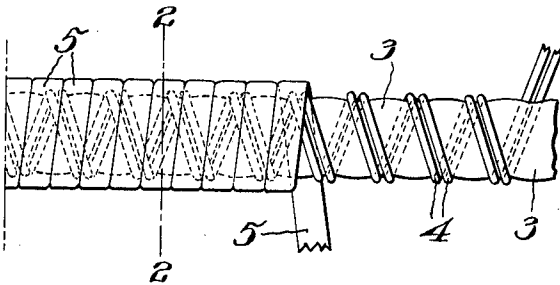


Fig. 2.

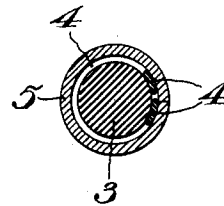


Fig. 3.

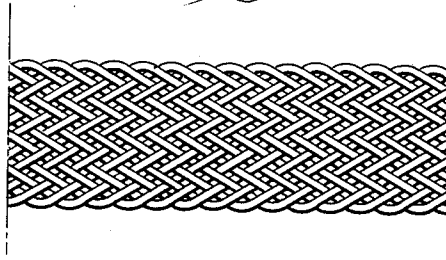
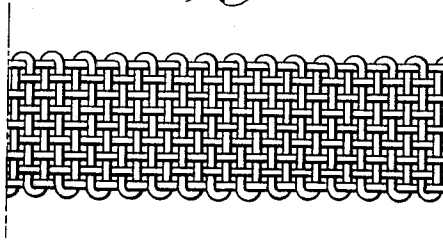


Fig. 4.



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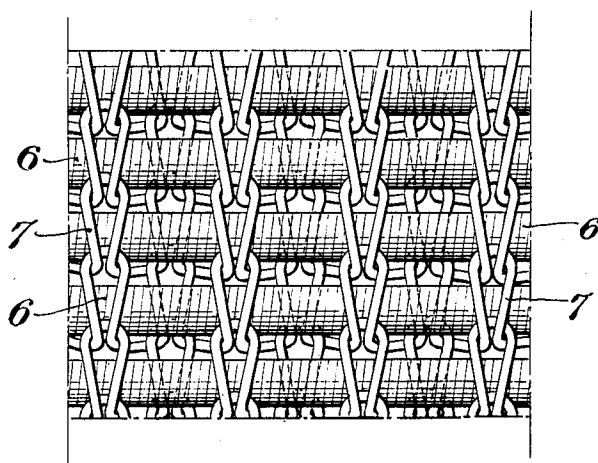
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2 Sheets-Sheet 2

Fig. 5.



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2,186,531

ELASTIC FABRIC

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Application April 23, 1938, Serial No. 203,754

2 Claims. (Cl. 28—1)

This invention relates to improvements in elastic fabrics of the kind employed in the manufacture of wearing apparel and surgical appliances. Such fabrics comprise a body or ground work of knit or woven fabric and laterally adjacent elastic strands enclosed by the threads of the body or ground work in a manner to permit the fabrics in their entireties to be stretched in directions longitudinally of the strands.

Each elastic strand of such fabrics comprises a freely stretchable, elastic, rubber thread forming the core of the strand and a suitable covering which surrounds the core. The rubber core of the strand is held in an elongated or stretched condition by the covering which surrounds the same; and, while the covering holds the core stretched from its normal condition and permits further stretching thereof, the stretched condition in which it is normally held by the covering is far from the limit to which it may be stretched.

When pieces of fabrics of the character above described are sewed together or sewed to pieces of fabrics of other kinds, it frequently happens that the needle used in the sewing operation pierces some of the rubber cores of the strands, sometimes leaving the sewing thread extending through the cores and sometimes merely leaving holes or broken edge portions in the cores; and the frequent stretching and release of the elastic fabric of the article of wearing apparel or the surgical appliance containing the rubber cores thus impaired causes them to break. After the cores have thus been broken the tendency thereof to resume their normal lengths has caused them to recede from the points of breakage not only through the body or ground work of the fabrics containing them but also through the coverings surrounding the cores, during the continued stretching and release of the fabric; and this continued stretching and release of the fabric has caused the end portions of the cores resulting from the breaking thereof to protrude from within the main body of the fabric in a manner to impair the efficiency of the article or appliance and to render it rough and unsightly.

The object of the invention is to overcome or lessen or entirely eliminate the aforesaid objection by providing the fabric with an elastic strand having a rubber core and a covering therefor of such novel construction that the recession or shifting of the entire strand within the body of the fabric from the region of the point of breakage of the rubber core thereof and also the recession or shifting of the core within its surrounding covering from the region of such point, will be

reduced to a great extent or entirely eliminated, with the result that the number and size of the protruding end portions of the broken rubber cores will be reduced or entirely eliminated from the fabric.

With the foregoing and related objects in view the invention resides in the elements and the combinations of them hereinafter described and claimed.

In the accompanying drawings, illustrating the invention,

Figure 1 is a side view, greatly enlarged, of a length of an elastic strand of the fabric embodying the invention, showing certain parts of the covering threads unwrapped from the core of the strand and broken away to expose portions of the core.

Figure 2 is a transverse section of the strand, on line 2—2 of Fig. 1.

Figure 3 is a view of a length of the tape of the covering of the rubber core, enlarged.

Figure 4 is a view similar to Fig. 3, showing a modification of the interweaving of the threads forming the tape.

Figure 5 is a view of the complete fabric.

Referring to Figs. 1 to 4 of the drawings, 3 designates the core of the strand, the same being constructed of freely stretchable, elastic, rubber.

The core 3 is enclosed within and surrounded by a covering consisting of fibrous threads 4 and a tape 5 formed of a plurality of interwoven fibrous threads. The threads of the tape 5 may be interwoven in the form of braid, as shown in Fig. 3, which I have found to give very good results, or they may be interwoven as longitudinally extending warp threads and transversely extending weft threads, as shown in Fig. 4.

Any suitable number of the threads 4 may be employed. As herein illustrated, two threads 4 are used and they are wrapped spirally around the core and advance longitudinally thereof.

The tape 5 is wrapped spirally around the core 3 reversely of the threads 4, in closely arranged helices which advance longitudinally of the core 3.

In producing my improved elastic strand, the core 3 thereof is stretched longitudinally to a length which is several times its normal length, and, while it is held in this stretched condition, the threads 4 and the tape 5 are applied thereto in the order named. When the core 3 is released from this stretched condition, after the application of the threads 4 and tape 5 thereto, the core contracts longitudinally and expands transversely and returns to a length which may be several times its normal length, and, in this condition,

the further return toward its normal length is prevented by the threads 4 and tape 5.

The extent to which the rubber core 3 is stretched when the threads 4 and tape 5 are applied thereto, and the extent to which the rubber core returns toward its normal length thereafter may vary greatly within the scope of the invention, such variation being governed by the character of the rubber of the core with reference to the resistance which it offers to being stretched.

The tape 5 lies flat upon the core 3 and the threads 4 surrounding it, and the tape advances in regularly formed, closely related helices, and it completely encloses the core 3 and threads 4 and presents a relatively smooth and even exterior surface for the strand as a whole, both when the strand is in a normal or unstretched condition and after it has been stretched.

When the core 3 is released after the application of the tape 5 thereto, the longitudinal contraction of the core crowds the helices of the tape together, and crowds the several interwoven threads of the tape together, and, when the complete strand is stretched from its normal condition, the crowded condition of the helices and the interwoven threads of the tape are relieved by movements thereof which tend to separate them. Such forward and back movements of the helices and threads, during the elongation and contraction of the strand, preserve the strand's relatively smooth and even exterior surface in all conditions thereof when it is in service.

Referring now to Fig. 5 of the drawings, the complete elastic fabric illustrated therein comprises elastic strands 6 arranged side by side and having the characteristics hereinbefore described, and co-operating binding threads 7. The elastic strands 6 are bound within the fabric and held in place therein, in side by side relationship, by the binding threads 7 which are knitted together and form a network which extends throughout the fabric and encloses the strands in pockets formed by and between the loops of adjacent binding threads.

I have discovered that the employment of the tape 5 in the covering for the rubber core 3 provides an elastic strand which, when used in my improved elastic fabric, will virtually eliminate the objectional results which have heretofore been present when the rubber core of the strand has been pierced or broken or otherwise damaged by a sewing needle, as hereinbefore pointed out, because the needle which damages the core pierces the body of the covering tape 5 on opposite sides of the core and leaves a stitch which extends

through the tape and secures the tape to the body of the fabric. This stitch extends through the loops of the binding threads of the fabric and between interwoven threads of the tape of the elastic strand, and the interweaving of the threads prevents the raveling thereof and causes the interwoven threads of the tape, at the crossings of such threads, to form effective barriers which engage the thread of the stitch and effectively prevent either the tape or the rubber core which it encloses or both from shifting their positions within the fabric longitudinally of the strand or from pulling away from the region of the damaged strand core.

I claim:

1. An elastic fabric comprising elastic strands arranged side by side, and co-operating binding threads retaining the elastic strands in pockets formed by and between adjacent binding threads, each elastic strand comprising a stretchable, elastic, rubber core and a covering surrounding the core, said covering comprising a tape wrapped spirally around the core and being formed of a plurality of interwoven fibrous threads, said core being stretched beyond the normal length thereof and being held in such stretched condition by said covering, whereby when a sewing thread stitch extends through the binding threads of the fabric and through the tape of a strand having a rubber core which is damaged in the region of the stitch, the stitch will prevent the core and its covering from being pulled from the region of the stitch longitudinally of the strand.

2. An elastic fabric comprising elastic strands arranged side by side, and co-operating binding threads retaining the elastic strands in pockets formed by and between adjacent binding threads, each elastic strand comprising a stretchable, elastic, rubber core and a covering surrounding the core, said covering comprising fibrous threads wrapped spirally around the core, and a tape wrapped spirally around the core reversely of said threads and being formed of a plurality of interwoven fibrous threads, said core being stretched beyond the normal length thereof and being held in such stretched condition by said covering, whereby when a sewing thread stitch extends through the binding threads of the fabric and through the tape of a strand having a rubber core which is damaged in the region of the stitch, the stitch will prevent the core and its covering from being pulled from the region of the stitch longitudinally of the strand.

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