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ELASTIC FABRIC

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Fig. 1.

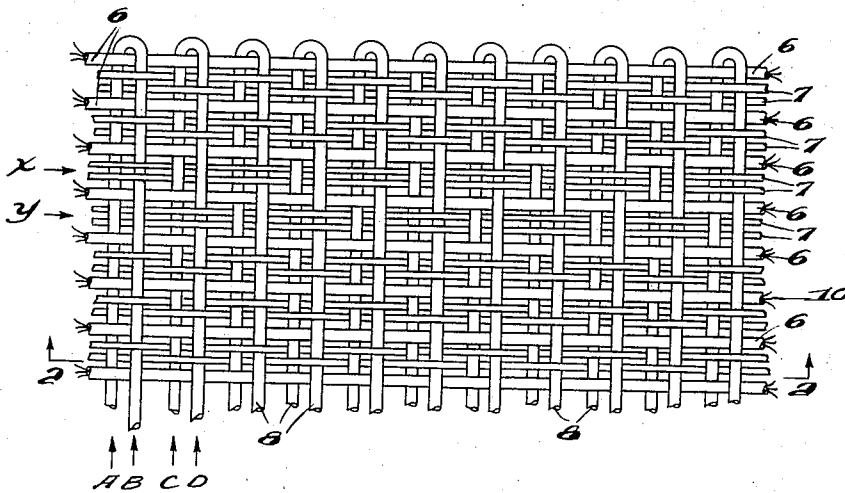


Fig. 2.

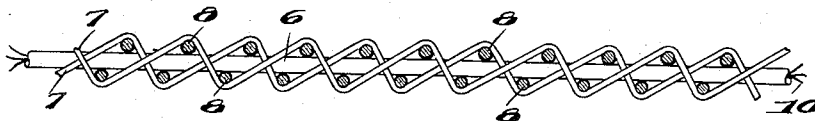
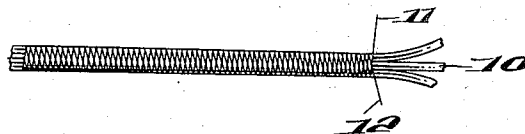


Fig. 3.



Fig. 4.



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ELASTIC FABRIC

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1 Claim. (Cl. 139—423)

This invention relates to improvements in elastic fabrics.

A particular object of this invention is to provide an elastic fabric with a series of elastic yarns each including a plurality of elastic strands which cooperate to prevent slippage of the composite elastic yarns within the fabric even though certain of the elastic strands within the yarn have been severed.

It has long been the problem of manufacturers to produce an elastic fabric which will not disintegrate at certain sections particularly where sewing operations must be effected. In certain conventional elastic fabrics the elastic yarns have always been composed of a single strand of elastic. This single strand has always been subject to rupture by the piercing of a needle during a sewing operation. Whenever the elastic fabric was subjected to elongation the severed ends of the strand would progressively slip through the fabric towards their respective secured ends and thus provide a collapsed section in the fabric according to the amount of slippage of the strand ends.

The manufacturers have been attempting to overcome this defect, for example, in certain instances by providing a non-slip cover for the strand and in other instances by attempting to provide an interlocking weave which would limit the amount of slippage. However, up to the present time all of the methods have been defective, the chief defect of which has been a reduction in the elasticity of the fabric.

The present invention has overcome the problems of slippage of the elastic yarns within the fabric without affecting the elasticity of same. In fact with the employment of my multi-stranded elastic yarn the weave will allow a greater elongation due to the confining of the interlocked inelastic warp yarns at either side of the elastic warp yarns.

Proceeding now to a more detailed description, reference will be had to the accompanying drawings, in which—

Fig. 1 is an enlarged view in plan of a fragment of a fabric embodying this invention.

Fig. 2 is a sectional view taken along the lines 2—2 of Fig. 1.

Fig. 3 is a detail view of one of the elastic yarns showing it at a certain stage in the manufacture.

Fig. 4 is a detail view similar to Fig. 3 but showing the yarn at a further stage.

Referring more particularly to the drawings, Fig. 1 illustrates a fragment of an elastic fabric composed of elastic and inelastic warp yarns 6 and 7 interwoven with inelastic filler 8 to provide elasticity only in the warpwise direction of the fabric.

As will be seen, particularly in Figs. 3 and 4, the elastic warp yarns 6 are composed of a plurality of elastic strands 10, preferably three, which are laid in side-by-side relation and covered first by spirally winding a thread 11 thereabout in one direction and then by spirally winding a second thread 12 thereabout in the opposite direc-

tion so as to provide a compact elastic warp yarn in which the double spiral covering elongates and shrinks with the encased elastic strands.

A preferred embodiment of the fabric is illustrated in Figs. 1 and 2 and consists of a series of spaced elastic warp yarns 6 and a plurality of inelastic warp yarns 7 laid between adjacent warp yarns 6. Before being interwoven, the elastic warp yarns 6 are elongated a predetermined amount and retained under tension. The filler 8 is then passed, as indicated, at the first row A, beneath each elastic warp yarn 6 and alternately over and under the inelastic warp yarns 7 lying between the elastic warp yarns 6. The filler 8 then returns, as indicated at the second row B, over the elastic warp yarns 6 and alternately under and over the inelastic warp yarns 7. The third row C is formed by passing the filler 8 under the elastic warp yarns 6 and alternately under and over the inelastic warp yarns 7. The fourth row D is formed by passing the filler 8 over the elastic warp yarns 6 and alternately over and under the inelastic warp yarns 7. Each successive four rows are repeated as in A, B, C and D. This provides a pattern of interweaving in which the elastic warp yarns 6 are uniformly laid over and under each alternate filler 8 in a 1 and 1 weave and the intermediate inelastic warp yarns 7 are alternately laid under and over two adjacent rows of filler 8 in a 2 and 2 weave throughout the warpwise direction of the fabric 5.

Where it is desired to provide an ornamental strip of contrasting appearance in the warpwise direction of the fabric, the interweaving of the inelastic warp yarns 7 with the filler 8 may be modified by laying all of the inelastic warp yarns 7 between two elastic warp yarns 6 beneath the first two rows of filler 8 and then over the next two rows of filler, as generally indicated at X. If the strip is to be widened, the intermediate inelastic warp yarns 7 between the next two elastic warp yarns 6 will be uniformly laid over two and then under two rows of filler 8, as indicated at Y. This may be repeated according to the desired width of the ornamental strip.

As shown in Fig. 2, the uniform passing of alternate rows of filler 8 under and over the elastic warp yarns 6 forms a tubular pocket about said elastic warp yarns while the particular weaving of the intermediate inelastic warp yarns 7 with the filler 8 tends to lock the elastic warp yarns 6 within the formed tubular pocket. When the weaving is completed tension is released from the elastic warp yarns to permit them to return to their normal contracted state.

Each elastic warp yarn 6 formed of three independent elastic strands 10 which cooperate with each other to reduced internal slipping of one yarn relative to the remaining yarns. This is best illustrated by a comparison of an elastic fabric employing an elastic yarn composed of a single covered elastic strand. If at any point along the length of a conventional fabric the single elastic strand of a yarn is severed, as by a needle in a sewing operation, the result will be an internal slippage for at least a considerable length of the fabric. This not only presents an unsightly appearance to the fabric but also materially reduces the overall resistance to stretch and thus places an additional strain on the remainder of the fabric.

The defects above described have been reduced to a minimum in a fabric according to the present invention. Each elastic yarn contains a plurality of individual elastic strands which are so advantageously arranged within the covering that when one is severed, the remainder serve to maintain at least a very substantial elasticity. The result is that the severed strand even if it does shrink will not materially affect the stretchable qualities of the yarn. The surface of the fabric will not be marred because the remaining strands will still support the spiral

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covering against collapse. Thus it will be apparent that a stitching operation through a fabric according to this invention will not materially affect either the strength or appearance of the fabric.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

A fabric comprising a series of spaced elastic warp yarns, each of said elastic yarns including three elastic strands disposed in side-by-side relation with respect to the fabric and a longitudinally expansible covering for said strands, yarns interposed between each adjacent pair of elastic warp yarns consisting of a pair of inelastic warp yarns, a filler interwoven with said elastic and inelastic warp yarns, first alternate rows of said filler passing over all of said elastic warp yarns and second alternate rows of said filler passing under all of said elastic warp yarns

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respectively, said first alternate rows passing over and under the inelastic warp yarns immediately adjacent each side of each of said elastic warp yarns and said second alternate rows of said filler passing under and over the inelastic warp yarns immediately adjacent each side of each of said elastic warp yarns.

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