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S. E. MILLER

3,597,300

ELASTIC FABRIC

Filed Nov. 21, 1968

FIG. 1

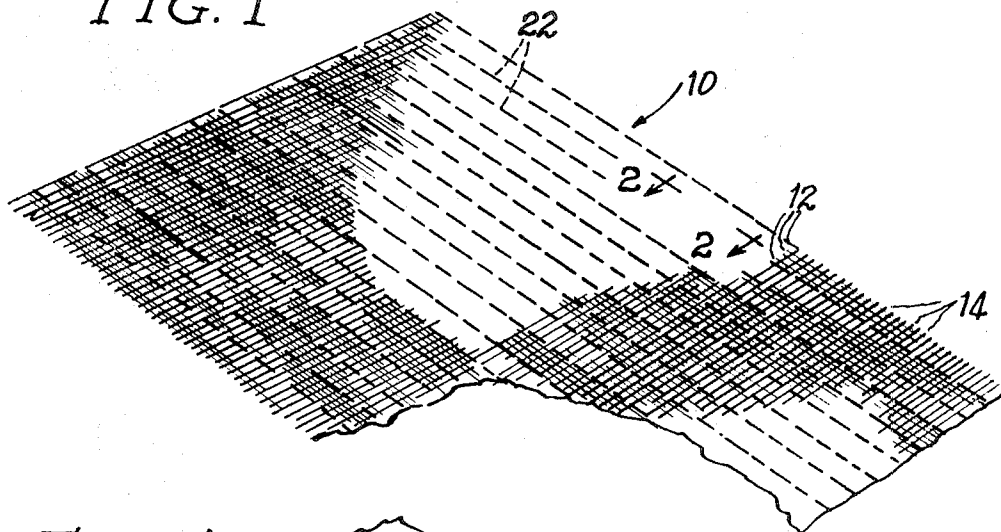


FIG. 4

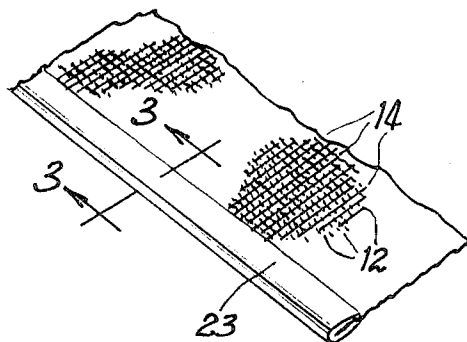


FIG. 2

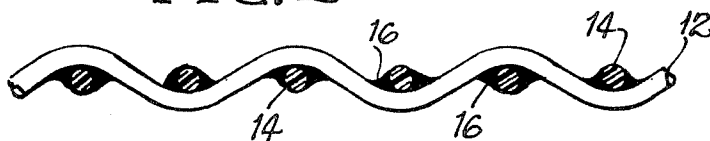
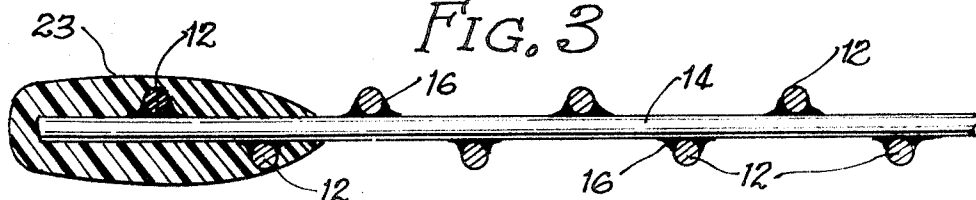


FIG. 3



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ELASTIC FABRIC

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1 Claim

ABSTRACT OF THE DISCLOSURE

Longitudinally stretchable textile fabric comprising comparatively rigid weft threads having a tendency to present sharp ends at the selvage or to become dislodged laterally. The warp threads are elastic. The ends of the weft are sealed with a narrow band of an elastomer having at least the same degree of stretch as the warp. In accordance with the method strips are formed from wider fabric without ravelling by first coating the whole width with a resin or the like to bind the warp and weft, then slitting into strips of the required width and treating the edges as aforesaid. Optionally the resinous or other binder may be removed following the edge treatment.

This invention relates to elastic fabric wherein the warp threads are elastic and the weft threads are comparatively rigid so that these latter are incapable of assuming a sinuous form alternating about the warp threads.

It has been known to weave elastic narrow textile fabric in which a synthetic yarn, usually a mono-filament is employed as the weft. In general, such mono-filaments, e.g. nylon, tend to break at the selvage where the weft is doubled on itself thereby to present sharp, and therefore undesirable terminations. Should both ends of a weft thread break, the thus-isolated thread can easily be dislodged, if not during production, then when the material is incorporated in a garment. In the case where wide goods are fabricated and then slit into narrow strips, such as for use in a waistband, each mono-filament weft thread, not being adequately locked by the warp, is even more subject to lateral shifting.

One of the objects of the invention is to provide a longitudinally stretchable fabric in strip form, which is cut from wider goods, and characterized in that the strip is rendered non-ravelling at the cut edges.

Another object is to provide fabric in strip form having a sealed selvage of an elastic character which will not detract from maximum stretchability in the longitudinal direction.

Still a further object is to produce a longitudinally stretchable fabric in comparatively narrow strip form without the use of a narrow fabric loom.

An additional object is to enable a manufacturer to begin with readily obtainable longitudinally-extensible wide goods, and to produce therefrom comparatively narrow strips of any width by simple location or re-location of the knives of the slitting machine.

Another object is to provide fabric having a relatively stiff thread in the weft e.g. as employed for a waistband, but in which the weft is proof against dislodgment.

Other objects and advantages will become apparent from the ensuing description which, taken with the accompanying drawing, discloses a preferred mode of carrying the invention into practice.

In this drawing:

FIG. 1 is a perspective view of a section of the full-width goods;

FIG. 2 is a cross section taken on the line 2—2 of FIG. 1;

FIG. 3 is a view in the direction of the arrows in FIG. 1;

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FIG. 4 is a detail of an edge portion to show the sealing of the selvage.

In accordance with the invention full width goods are woven or knitted, including so-called warp-knit, e.g. as produced on the Raschel knitting machine. The full width goods are coated with any suitable binding medium, e.g. a heat-curable resin, the degree of coating being only sufficient to lock the warp and weft pending slitting and sealing of the selvages in a narrow zone. It may be found that such sealing may be acceptable if applied only to one selvage. It will be understood that, if desired, the material used in coating the whole width of the goods may be of a kind which may be eliminated following application of the elastomeric marginal zones, so as to free the fabric for optimum stretch. Further, such material may itself be an elastomer.

Turning to the drawing there is shown (FIG. 1) a section of fabric 10 as woven on a wide loom. The warp threads 12 are of an elastomer, e.g. rubber or wrapped rubber, as used in fabrics designed to possess longitudinal stretch, while the weft threads 14 are of any suitable material. However, since the principles of the invention are of special utility when the weft threads comprise a mono-filament, e.g. nylon, the same are typically indicated in FIG. 3 as straight. That is to say, the comparative stiffness of a plastic mono-filament will preclude the same, under the force of the warp threads, from assuming a sinuous form as would occur with a flaccid thread. Under the foregoing circumstances it will be readily seen why a weft thread 14 may become dislodged laterally. In the fabric as woven the selvage will, in general, prevent weft threads from being so dislodged, but even in this case it is possible for the return bight at both sides to be broken whereby to free a particular weft thread or threads for lateral shifting.

In accordance with the invention the whole area of the wide goods is subjected to any well-known treatment to bind the warp and weft threads. Keeping in mind that the warp threads are elastic it is required that the treatment be such as will not adversely affect the desired degree of elasticity. On the other hand, since the treatment is to provide only a temporary holding action it may utilize a binder capable of being eliminated after the selvages are sealed. Moreover if the treatment is so controlled as to lock the warp and weft essentially only at their points of intersection it will be evident that the treating substance need not be removed, for the reason that the elasticity of the warp threads between the points of intersection will remain relatively unaffected.

The location of the resin or other binder is typically indicated at 16 in FIGS. 2 and 3. Resins are frequently employed in the treatment of textile fabrics to impart special qualities thereto. Accordingly, the use of an appropriate resin will not only fulfill those desired objectives, but the objective particularly specified in carrying out the instant invention.

Having treated the wide goods in the manner explained the same may be slit (as indicated by broken lines 22 in FIG. 1) to the required width. Since equipment for slitting wide goods into strips is well known, elucidation thereof will be omitted.

Since the threads comprising the fabric have been adequately secured, the weft threads, even though quite short, are proof against shifting.

To provide the finished product the edges of the strip are given a bead 23 of an elastomeric material to cover the ends of the weft threads and to bind the same securely to the warp. As shown, the bead 23 surrounds at least one of the warp threads. The material employed for the bead will possess at least such degree of stretch as will not retard stretching of the strip regardless as an entirety. The bead 23 may be applied in any suitable manner, e.g. by extrusion from a pair of nozzles while the strip is moved

past the same, or the bead material may be applied to rollers which will transfer the same to the edges of the strip. Any suitable elastomer may be used, e.g. neoprene, Hycar and the like.

From the foregoing it will have become apparent that there has been provided a longitudinally-extensible fabric strip having a relatively unbendable weft in which the individual threads are locked against transverse displacement. Further, the same is produced from wide goods woven on a conventional loom rather than from a narrow loom having a considerably lower production rate. It will also have become apparent that the principles of the invention are equally applicable to knitted fabrics and to those which have the characteristics of both woven and knitted fabrics.

I claim:

1. Longitudinally elastic textile fabric comprising elastomeric warp threads and a substantially non-extensible monofilament weft, said weft, if cut or broken, presenting a needle-like aspect at the place of cutting or breaking, and an elastomeric marginal bead located at at least one edge of the fabric covering the edge and bound to at

least one warp thread, to present a non-abrasive aspect if the weft is cut or broken and to prevent weft threads from shifting laterally, said bead being at least as elastic as the warp threads.

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