

[54] **CURVILINEAR WAISTBAND FABRIC**

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[58] Field of Search **139/421-423,**
139/419, 416-418, 386 A, 386 R; 2/231,
237; 161/77

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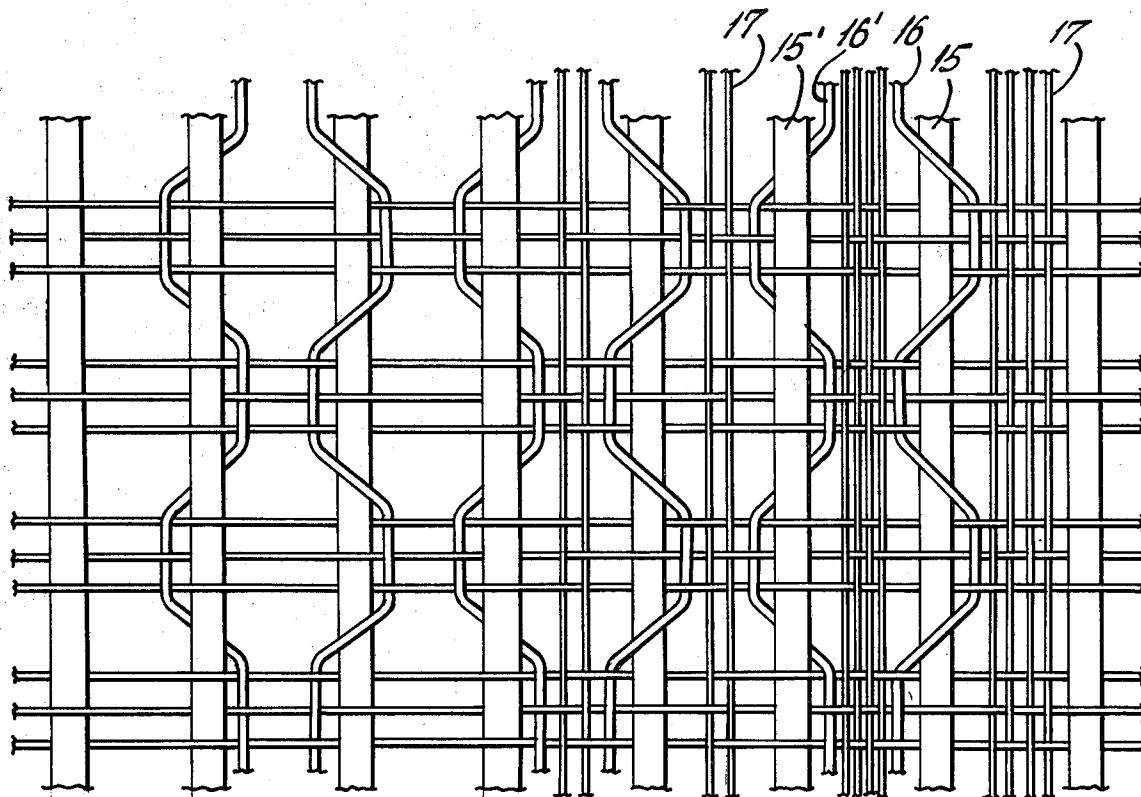
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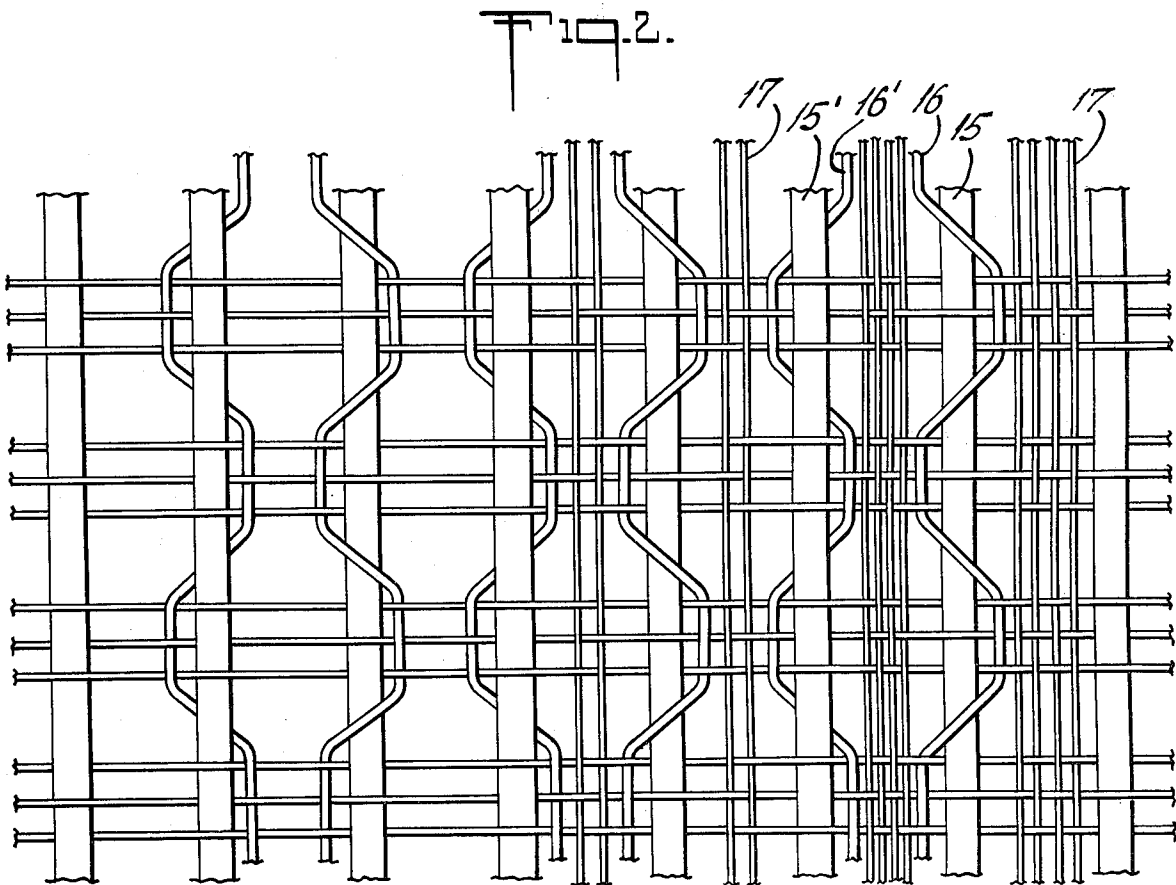
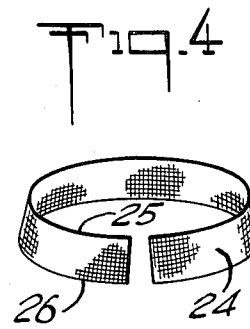
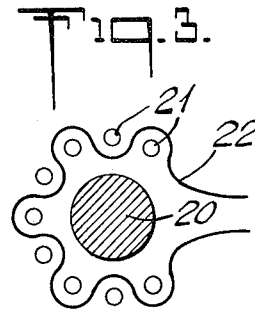
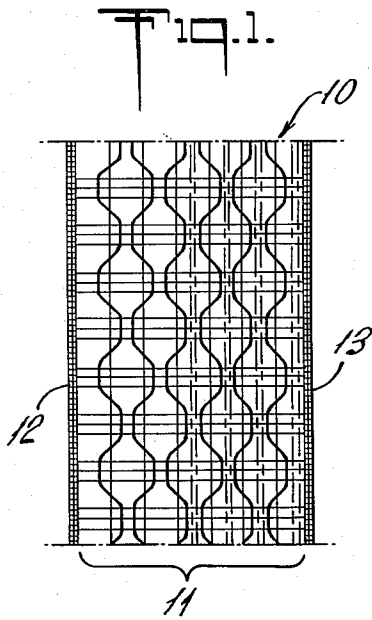
Primary Examiner—James Kee Chi

[57] **ABSTRACT**

A lightweight, curvilinear, narrow elastic, waistband fabric comprising three sets of warp yarns. The yarns of the first set are elastic, the yarns of the second set are nonelastic, and the yarns of the third set are preferably texturized yarns. The yarns of the first and second warp sets are woven in a reverse leno weave with each elastic yarn leno woven with a nonelastic yarn. Adjacent elastic yarns are on opposite faces of the fabric. From the center of the fabric to one edge thereof the synthetic texturized warp yarns of the third set are woven between adjacent pairs of leno woven warp yarns to produce a curvilinear shape.

10 Claims, 4 Drawing Figures





CURVILINEAR WAISTBAND FABRIC

This invention relates to a new, lightweight, leno woven, curvilinear, narrow elastic fabric suitable for use in the waist encircling portion of articles of apparel.

BACKGROUND OF THE INVENTION

In recent years narrow elastic fabrics have gained considerable acceptance as waistbands in articles of apparel. This is especially true if the apparel is made from knit or stretch-type fabrics as are so prevalent today. Waistbands should have the characteristics of preventing rollover of the edge of the apparel, they should be resilient, have desirable washing and dry cleaning properties, and the necessary stretch characteristics. Also, when used in summer-weight wear or many women's garments the waistband should be light-weight and have aesthetic qualities.

The design of a woman's garment may be quite different than the design of a man's garment at the waistband portion. Generally women's hips have a greater slope. Furthermore the waistband itself of women's garments especially in what are known as "hip-hugger" type garments is lower than in men's or children's garments. This design requires the waistband to take a tilt or slope in the garment in order to conform to the slope at the hips. It is extremely difficult to produce a stretch waistband which will conform completely across its width to the slope of the hips of the wearer.

SUMMARY OF THE PRESENT INVENTION

We have discovered an improved narrow elastic fabric which is suitable for use in the band encircling portions of articles of apparel especially in women's clothing. Our new fabric has all the desirable characteristics of washability and dry cleanability, resilience and prevents rollover of the edge of the garment. Furthermore, our new fabric has a curvilinear shape; that is, it will conform to the slope of the hips and when sewn into a circular configuration will have a smaller diameter along one edge thereof than along the opposite edge thereof. Our new waistband has different stretch properties along one edge thereof than it does along the opposite edge thereof to produce its curvilinear shape.

In the body or center portion of our new elastic waistband fabric there are three sets of warp yarns. The first warp set comprises elastic yarns which are either covered rubber core yarns or covered spandex core yarns. The second warp set comprises yarns other than the elastic yarns mentioned above; that is, they may be texturized yarns, monofilament yarns, multifilament yarns, spun yarns and the like. The yarns of the first and second warp set are woven in a reverse leno weave with each elastic yarn being leno woven with a yarn other than elastic yarn. Adjacent elastic yarns are disposed on opposite faces of the fabric. The third warp set comprises synthetic texturized yarns, spun yarns, multifilament yarns or the like. The yarns of the third set are disposed between adjacent pairs of leno woven warp yarns from approximately the center of the fabric to one edge of the fabric. In a preferred embodiment of the narrow elastic fabric of the present invention the number of texturized yarns of the third warp set disposed between adjacent leno woven yarns is graduated. There are fewer yarns between adjacent leno woven yarns in the center of the fabric and more texturized yarns between adjacent leno woven yarns on the one outer edge of the fabric to produce a uniform curvilinear

ear shape in the fabric. The side with the added synthetic texturized warp yarns is longer than the side without the texturized yarns.

Preferably monofilament filling yarns are used in the fabric of the present invention and an odd number of filling yarns are woven between each leno crossing of the warp yarns. When monofilament filling yarns are used it is preferred that the outer edges of the fabric be woven with texturized yarns to produce smooth soft outer edges. This may be accomplished by using one or more elastic warp yarns and a plurality of texturized yarns along the outer edges of the fabric. These warp yarns are woven with the filling yarns in a three-and-one weave to produce a rounded edge with the edge completely covered by the texturized yarns.

DESCRIPTION OF THE DRAWINGS

The invention will be more fully described in conjunction with the accompanying drawings wherein:

FIG. 1 is a plan view of a portion of a narrow elastic waistband of the present invention,

FIG. 2 is an enlarged plan view showing the weave of the narrow elastic fabric of the present invention.

FIG. 3 is a cross-sectional view of the outer edge of an embodiment of the narrow elastic waistband of the present invention and

FIG. 4 is a perspective view of how our new waistband appears when placed in a circular shape.

DETAILED DESCRIPTION OF THE DRAWINGS

Referring to the drawings in FIG. 1 there is shown a narrow elastic waistband 10 of the present invention. The waistband comprises a center portion 11 running in the longitudinal direction of the fabric and it is this center portion which contains the new and improved structure of the present invention. The fabric also has two edge portions 12 and 13 and these outer edge portions may be constructed differently depending upon the desired characteristics of the edge portions.

Referring more specifically to FIG. 2 the center portion comprises three sets of warp yarns. One of the sets of warp yarns contains the elastic yarns 15, that is, either a rubber yarn or a spandex yarn. These elastic yarns are covered with other yarns such as nylon, polyester, etc. to give the elastic yarn desired fabric properties. The second set of warp yarns comprises any of the standard yarns 16 other than elastic yarns described above. This set of warp yarns may be texturized or stretch yarns, multifilament yarns, monofilament yarns, spun yarns and the like. The yarns may be made from nylon, polyester, rayon, cotton, etc..

These two sets of warp yarns are woven in a reverse leno weave with each elastic yarn leno woven with a nonelastic yarn. The twisting thread in the leno weave or the doup yarn is the nonelastic yarn 16. As seen in the drawings starting on the right hand side of the drawing the first leno woven elastic yarn 15 has the nonelastic yarn 16 crossing over from the left to the right hand side of the elastic yarn and then back from the right to the left hand side of the elastic yarn. The next elastic yarn 15' has the nonelastic yarn 16' passing beneath the elastic yarn and going from the right to the left hand side and from the left back to the right hand side so that the twisting yarns or doup yarns are in a reverse position or a reverse leno weave. The first elastic yarn is on the back surface of the fabric as seen in the drawing and the next elastic yarn is on the top surface of the

fabric as seen in the drawing. The reverse leno woven structure continues across the width of the fabric with adjacent elastic yarns being woven so as to be on opposite faces of the fabric.

The third set of warp yarns preferably comprises synthetic texturized yarns 17. The following description will be of the preferred embodiment wherein the third warp set comprises synthetic texturized yarns; however, other yarns such as spun yarns, multifilament yarns or the like may be substituted for the synthetic texturized yarns of the third warp set. The warp yarns of the third set are disposed only over approximately half the width of the fabric. The texturized yarns start approximately in the center of the fabric and are disposed from the center of the fabric to the longitudinal edge shown on the right hand side of the drawing. From one to four or more synthetic texturized yarns are disposed between adjacent pairs of leno woven yarns. It is preferred that one or two texturized yarns be disposed between adjacent leno woven yarns in the center of the fabric and from four to six texturized yarns be disposed between adjacent leno woven yarns along the longitudinal outer edge so that the texturized yarns are graduated from the center to the outer edge. The edge of the fabric in which the texturized yarns are incorporated is longer than the edge of the fabric in which there are no texturized yarns and by graduating these texturized yarns a very uniform curvilinear shape is formed. As may be seen in FIG. 4 our new waistband 24, when placed in a circular configuration as shown, will have a smaller diameter along the edge 25 which does not contain the texturized yarns as described and a larger diameter along edge 26 which does contain the texturized yarns.

The warp yarns are woven with filling yarns and it is preferred the filling yarns be monofilament yarns to provide the necessary stiffness in the widthwise direction of the fabric so that the fabric will be suitable as a waistband and will prevent rollover about the outer edge of the garment to which it is attached. The monofilament filling yarns may be nylon, polypropylene or any of the other well-known monofilament yarns. The monofilament filling yarns are woven with the warp yarns in a plain one-by-one weave and an odd number of filling yarns are woven between each reverse or twist of the leno yarns.

It is preferred that the outer edges of the narrow elastic fabric of the present invention comprise one or more elastic yarns of the same type as used in the center portion of the fabric and a plurality of texturized yarns. The texturized yarns and the elastic yarns run in the longitudinal or warp direction of the fabric and the texturized yarns are disposed about the greater portion of the periphery of the outermost elastic yarns. The elastic yarns and texturized yarns are woven with the filling yarns in any suitable weave that will hold the filling yarns in place such as a three-and-one weave or the like. The texturized yarns produce a soft, smooth outer edge and cover the bent portion of the monofilament filling yarns which may be quite harsh. In FIG. 3 there is shown a cross-sectional view of such a desired outer edge with the center yarn 20 being the elastic yarn and the outer yarns 21 being texturized yarns woven alternately with the monofilament filling yarn 22.

The texturized yarns used in the center portion of the fabric and in the outer edges as described may be any of the synthetic texturized yarns such as nylon yarns or

polyester yarns generally the same type of yarns are used in the center portion as in the outer edge portions.

Generally the number of yarns per inch in the first and second warp sets will be from about 10 to 30 warp yarns per inch with half of these being elastic yarns and the other half being nonelastic yarns. From about six to 30 texturized warp yarns will also be incorporated in about half the width of the fabric as previously described.

The preferred filling yarns are monofilament yarns from about 400 to 1200 denier. Usually around 850 denier filling yarns are used in fabrics 1 inch or narrower in width and about 1100 denier monofilament filling yarns used in fabrics having a width of 1 inch or more. A lower denier yarn does not offer the desired stability and too high a denier yarn is very difficult to bend to make the edge of the fabric and will cause many loom breakdowns. Low denier filling yarns may be used if the fabric is made on a needle loom as opposed to a standard weaving loom. The difference being that in the needle loom two filling yarns weave as one filling yarn.

The following is an illustrative example of a narrow elastic waistband fabric according to the present invention.

EXAMPLE

Three warp sets are made to weave a narrow elastic fabric in accordance with the present invention. The fabric is to have a width of approximately 1½ inches. One of the warp sets comprises 15 elastic yarns with each yarn having a spandex core of approximately 1680 denier which has been initially wrapped with 100 denier multifilament nylon yarn and top covered with 20's polyester yarn. The second warp set comprises fifteen 200 denier multifilament yarns. The third warp set comprises 20 texturized nylon yarns. The filling yarns used are 850 denier monofilament nylon yarns. The three warp sets and the filling yarns are woven as shown and described in conjunction with FIG. 2 to form the center portion of the fabric. The texturized warp yarn set is disposed from approximately the center of the fabric to the right hand outer edge of the fabric. Starting from the outer right hand edge four synthetic texturized yarns are woven between each adjacent pair of leno woven warp yarns between the first four pairs of adjacent leno woven yarns. Between the next adjacent leno woven yarns only two synthetic texturized yarns are woven between adjacent pairs of leno woven yarns. Along each outer edge of the center portion of the fabric there are woven two elastic warp yarns similar to the yarns used in the center portion and eight texturized nylon warp yarns. The two elastic yarns and eight texturized nylon yarns are woven with the filling yarns in a three-and-one weave with the texturized nylon yarns disposed about the periphery of the elastic yarns. The resultant fabric is open and lightweight. The edge of the fabric which includes the texturized yarns from the edge to the center is longer than the other edge of the fabric to produce a curvilinear shape when the fabric is placed in a circular configuration and used as the waistband in an article of wearing apparel. The fabric is stable and the yarns do not shift or move with respect to one another. The fabric is stiff and resilient in the widthwise direction and makes an excellent waistband especially for the low waistband design of women's slacks.

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The above detailed description has been given for clearness of understanding only. No unnecessary limitations should be understood therefrom as modifications will be obvious to those skilled in the art.

What is claimed is:

1. A lightweight, curvilinear, narrow elastic waistband fabric consisting of three sets of warp yarns, woven with a set of filling yarns, the yarns of the first warp set are elastic yarns selected from the group consisting of rubber core yarns and spandex core yarns, the yarns of the second warp set are doup warp yarns other than elastic yarns, the yarns of the first and second warp sets are woven in a reverse leno weave with each elastic yarn leno woven with a yarn other than elastic yarn with adjacent elastic yarns being disposed on opposite faces of the fabric, and the yarns of the third warp set are disposed in a graduated manner between the yarns of the first and second warp sets from the center of the fabric to one longitudinal edge thereof.

2. A lightweight, curvilinear, narrow elastic, waistband fabric having a center portion and two longitudinal edge portions, the center portion consists of three sets of warp yarns woven with a set of filling yarns, the yarns of the first warp set are elastic yarns selected from the group consisting of rubber core yarns and spandex core yarns, the yarns, the yarns of the third warp set are doup warp yarns other than elastic yarns, the yarns of the third warp set are disposed in a graduated manner over approximately half of the width of the fabric from the middle of the center portion to one longitudinal edge thereof, the yarns of the first and second warp sets are woven in a reverse leno weave with each elastic yarn leno woven with a yarn other than an elastic yarn, adjacent elastic yarns are disposed on opposite faces of the fabric, the yarns of the third warp set

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are woven with the filling yarns in a plain weave, each edge portion of the fabric comprising at least one elastic warp yarn and a plurality of texturized warp yarns woven with said set of filling yarns.

3. A narrow elastic fabric according to claim 2 wherein the yarns of the third warp set are synthetic texturized yarns.

4. A narrow elastic fabric according to claim 2 wherein the elastic yarns of the first warp set have a spandex core wrapped with a nylon multifilament yarn.

5. A narrow elastic fabric according to claim 2 wherein the filling yarns are monofilament nylon yarns.

6. A narrow elastic fabric according to claim 2 wherein three filling yarns are woven between each twist of the leno weave.

7. A narrow elastic fabric according to claim 2 wherein the yarns in the third warp set are synthetic texturized nylon yarns.

8. A narrow elastic fabric according to claim 2 wherein there are a plurality of yarns from the third warp set between adjacent pairs of leno warp yarns.

9. A narrow elastic fabric according to claim 8 wherein there are a fewer number of yarns of the third warp set between adjacent pairs of leno woven yarns in the center of the fabric than at the outer edge of the fabric.

10. A narrow elastic fabric according to claim 2 wherein the elastic yarns of the first warp set have a spandex core wrapped with nylon multifilament yarn, the nonelastic yarns of the second warp set are multifilament nylon yarns, the yarns of the third warp set are synthetic texturized nylon yarns and the filling yarns are monofilament nylon yarns.

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,920,054

DATED : November 18, 1975

INVENTOR(S) : Goff, Jr., Richard Everett
Guay, Normand Daniel

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In Column 1, Line 42, insert period at the end of sentence.

In Column 5, Line 26, the words "the yarns, the yarns of the third" should read --- "the yarns of the second" ---.

In Column 5, Line 32, the word "wary" should read --- "warp" ---.

Signed and Sealed this

twenty-ninth Day of June 1976

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks