



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
17.11.2010 Bulletin 2010/46

(51) Int Cl.:
D04B 21/08 (2006.01) D04B 21/18 (2006.01)

(21) Application number: **09006317.3**

(22) Date of filing: **11.05.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA RS

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(54) **Elastic fabric**

(57) An elastic fabric, of the type comprising a first elastomeric yarn (1) with a 2-0-1/1-3-2// weave for closed mesh or 0-2-2/3-1-1// for open mesh on the first bar of a warp knitting machine and a second synthetic fiber yarn (2) with a 2-4-3/2-0-1// weave for closed mesh or 4-2-2/0-2-2// for open mesh, the yarning for both yarns (1 and 2) being all full, where the weave between the elastomeric yarns (1) and the synthetic fiber yarns (2) of the fabric forms parallel and resistant four-yarn strands (3) by means of consecutive loops in a longitudinal direction of the fabric, these strands (3) being configured

by the two parallel yarns (1 and 2) and the turn thereof, the elastomeric yarns (1) and the synthetic fiber yarns (2) being arranged in the diagonal direction, changing in each loop the exit direction with respect to the entrance direction, thus forming a hybrid mesh of extensible and resistant yarns with improved tension from an inclined entrance direction to an oblique exit direction and vice versa, both in upward diagonals and in downward diagonals with respect to the formation direction of the loops, the fabric having elastomeric yarns (1) and synthetic fiber yarns (2) also aligned in both diagonal directions.

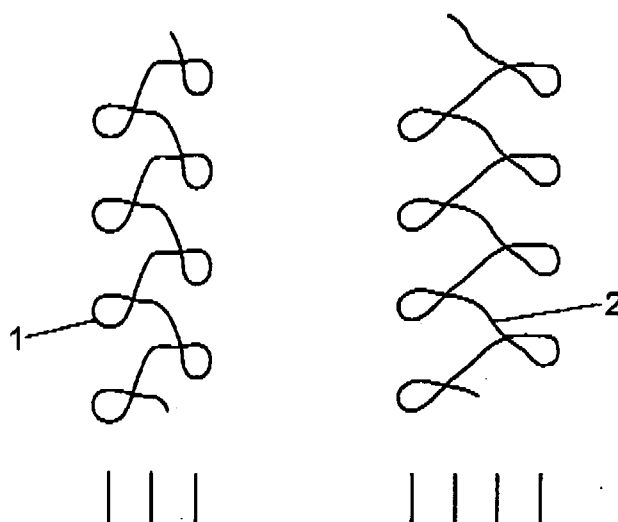


Fig. 2

Description

ELASTIC FABRIC

Object of the Invention

[0001] The present invention relates to a warp knit fabric with synthetic fiber and elastomeric yarns.

Background of the Invention

[0002] The use of fabrics incorporating mixtures of natural or synthetic fibers with elastomers currently allows manufacturing elastic garments with a great adaptability to the human body, such as underwear garments, sportswear or simply garments that are very comfortable to wear.

[0003] These elastic fabrics must provide different qualities such that they allow an ease in manufacturing the garments and subsequently a better maintenance. The fabrics are preferably made by means of warp knitting to achieve a greater elasticity.

[0004] Garments incorporating synthetic fibers thus allow laser cutting and ultrasound welding, thus preventing uncomfortable seams. However, these garments have a certain tendency to roll up at their selvages or edges, such that the movement of the user's body forms cords or small rolls causing certain discomfort.

[0005] The garments made with mixtures of natural fibers and elastomers do not have a correct lightness finish and have problems of adaptability to the body compared to previous fabrics of synthetic fibers as they are looser.

[0006] An example of elastic fabric which is more suitably adapted to the configuration of the body is that describing a fabric in which one yarn is formed by an elastomer and the other yarn is formed by a synthetic fiber. The fabric comprises the elastomeric yarn with a 2-0-1/1-3-2// weave for closed mesh or 0-2-2/3-1-1// for open mesh of the same weave on the reed closest to the needles of a warp knitting machine, whereas in the second reed the synthetic yarn is arranged with a 2-4-3/2-0-1// weave for closed mesh or 4-2-2/0-2-2// for open mesh, the yarning for both yarns being of the all full type. The synthetic fiber yarn is thus on one face of the fabric, making a certain plating, and the elastomeric yarn is on the other face of the fabric, such that said construction prevents said fabric from being able to roll up when it is tensed or stretched on the user's skin.

Description of the Invention

[0007] The elastic fabric object of this invention has technical particularities making it especially suitable for manufacturing underwear garments, sportswear, garments that are comfortable to wear, control wear, swimwear, technical garments for their use in medical treatments, garments for protecting muscles and generally all those garments fitting tightly on the human body.

[0008] According to the invention, the weave between the elastomeric yarns and the synthetic fiber yarns of the fabric forms parallel and resistant four-yarn strands by means of consecutive loops in a longitudinal direction of the fabric, these strands being configured by the two parallel yarns and the turn thereof, the elastomeric yarns and the synthetic fiber yarns being arranged in the diagonal direction, changing in each loop the exit direction with respect to the entrance direction, thus forming a hybrid mesh of extensible and resistant yarns with an improved tension from an inclined entrance direction to an oblique exit direction and vice versa, both in upward diagonals and in downward diagonals with respect to the formation direction of the loops, the fabric having elastomeric yarns and synthetic fiber yarns also aligned in both diagonal directions.

[0009] This arrangement provides that the stress distribution in the diagonal direction is also benefited since the fabric has elastomeric yarns and synthetic fiber yarns also aligned in both diagonal directions.

[0010] The fabric comprises from 30% to 70% by weight of synthetic fiber yarn. The fabric in turn comprises from 30% to 70% by weight of elastomeric yarn.

[0011] In a preferred embodiment, the fabric comprises 57% by weight of synthetic fiber yarn and 43% by weight of elastomeric yarn.

[0012] Said elastomer is mainly an elastane fiber, such as Lycra® or other trademarks such as Creora®, Roica®, etc., which allows a high longitudinal and transverse elasticity. The yarn used is an elastane fiber with a density between 11 and 210 deniers.

[0013] The synthetic fiber yarn used is preferably a polyamide fiber, such as polyamide PA6, PA66, PES or other synthetic fibers, the density of which comprises from 11 to 210 deniers, with monofilament to multifilament and microfiber yarns.

[0014] The synthetic fiber together with elastane allows the fabric to be handled with the most modern technologies, allowing the laser cutting of the fabric and its welding by means of ultrasound, thus allowing making multi-piece garments without conventional seams, which lead to a loss of elasticity and comfort of the piece or garment that do not occur in a garment the parts of which are joined by welding.

Description of the Drawings

[0015] To complement the description which is being made and with the aim of aiding to better understand the features of the invention, a set of drawings is attached to the present specification in which the following has been depicted with an illustrative and non-limiting character:

- Figure 1 shows an enlarged image of the fabric resulting from the use of these weaves.
- Figure 2 shows a depiction of the layout of the elastane yarn and of the synthetic fiber yarn of the mesh

fabric.

Preferred Embodiment of the Invention

[0016] As can be observed in the referenced figures, the fabric is formed by a warp knit with an elastomeric yarn (1), in this case a Lycra® type elastane, and a synthetic fiber yarn (2), polyamide in this case.

[0017] Figure 1 shows how the yarns (1 and 2) are woven in a series of consecutive loops in a longitudinal direction, forming resistant four-yarn strands (3), whereas diagonally the yarns (1 and 2) are arranged alternately between the synthetic fiber yarn (2) and the elastomeric yarn (1). In each loop, the yarns (1 and 2) entering in a diagonal direction exit in the other oblique direction, the fabric being formed such that the synthetic fiber yarn (2) is arranged on one face thereof, and the elastane yarn (1) is arranged on the other face.

[0018] The fabric has the elastomeric yarn (1) in a bar of the weaving machine with a warp knit with a 2-0-1/1-3-2// weave in the first reed of the machine, and with an all full yarning, whereas the yarn (2) is arranged in the second reed of the machine, with a 2-4-3/2-0-1// weave in this second reed, and an all full yarning, forming an open mesh.

[0019] Having sufficiently described the nature of the invention, as well as a preferred embodiment, it is stated for all intents and purposes that the materials, shape, size and arrangement of the described elements can be modified, provided that this does not involve an alteration of the essential features of the invention which are claimed below.

Claims

1. An elastic fabric, of the type comprising a first elastomeric yarn (1) with a 2-0-1/1-3-2// weave for closed mesh or 0-2-2/3-1-1// for open mesh on the first bar of a warp knitting machine and a second synthetic fiber yarn (2) with a 2-4-3/2-0-1// weave for closed mesh or 4-2-2/0-2-2// for open mesh, the yarning for both yarns (1 and 2) being all full, **characterized in that** the weave between the elastomeric yarns (1) and the synthetic fiber yarns (2) of the fabric forms parallel and resistant four-yarn strands (3) by means of consecutive loops in a longitudinal direction of the fabric, these strands (3) being configured by the two parallel yarns (1 and 2) and the turn thereof, the elastomeric yarns (1) and the synthetic fiber yarns (2) being arranged in the diagonal direction, changing in each loop the exit direction with respect to the entrance direction, thus forming a hybrid mesh of extensible and resistant yarns with improved tension from an inclined entrance direction to an oblique exit direction and vice versa, both in upward diagonals and in downward diagonals with respect to the formation direction of the loops, the fabric having elas-

tomeric yarns (1) and synthetic fiber yarns (2) also aligned in both diagonal directions.

2. The fabric according to claim 1, **characterized in that** it comprises from 30% to 70% by weight of synthetic fiber yarn (2).
3. The fabric according to any of the previous claims, **characterized in that** it comprises from 30% to 70% by weight of elastomeric yarn (1).
4. The fabric according to the previous claims, **characterized in that** it comprises 57% by weight of synthetic fiber yarn (2) and 43% by weight of elastomeric yarn (1).
5. The fabric according to any of the previous claims, **characterized in that** the elastomer is an elastane fiber.
6. The fabric according to claim 5, **characterized in that** the elastane fiber has a density between 11 and 210 deniers.
7. The fabric according to any of the previous claims, **characterized in that** the synthetic fiber yarn (2) is a polyamide fiber.
8. The fabric according to claim 7, **characterized in that** the polyamide fiber has a density between 11 and 210 deniers.
9. The fabric according to any of the previous claims, **characterized in that** the synthetic fiber yarn (2) is formed by monofilament yarns, multifilament yarns and/or microfiber.

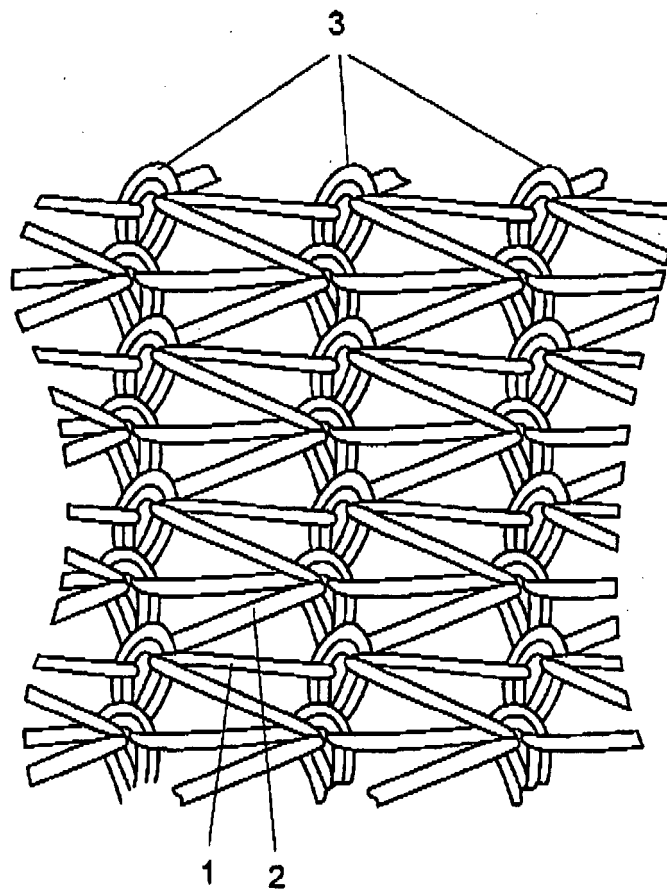


Fig. 1

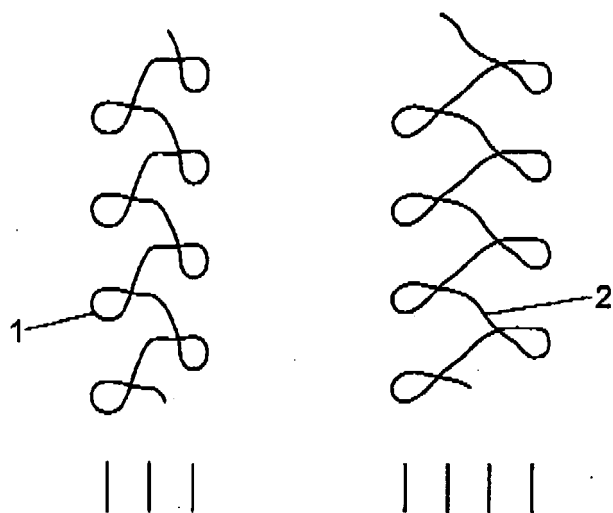


Fig. 2



EUROPEAN SEARCH REPORT

Application Number
EP 09 00 6317

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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			D04B
Place of search		Date of completion of the search	Examiner
Munich		25 May 2010	Sterle, Dieter
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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EPO FORM 1503 03/82 (P04/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 00 6317

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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