



US 20130186150A1

(19) **United States**

(12) **Patent Application Publication**

Pilawa et al.

(10) **Pub. No.: US 2013/0186150 A1**

(43) **Pub. Date: Jul. 25, 2013**

(54) **ARTICLE OF ELASTIC KNITTED LINGERIE HAVING REMOLDING BRIEFS**

Publication Classification

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(51) **Int. Cl.**
A41B 11/14 (2006.01)
(52) **U.S. Cl.**
CPC *A41B 11/14* (2013.01)
USPC **66/177**

(21) Appl. No.: **13/876,038**

(57) **ABSTRACT**

(22) PCT Filed: **Oct. 27, 2011**

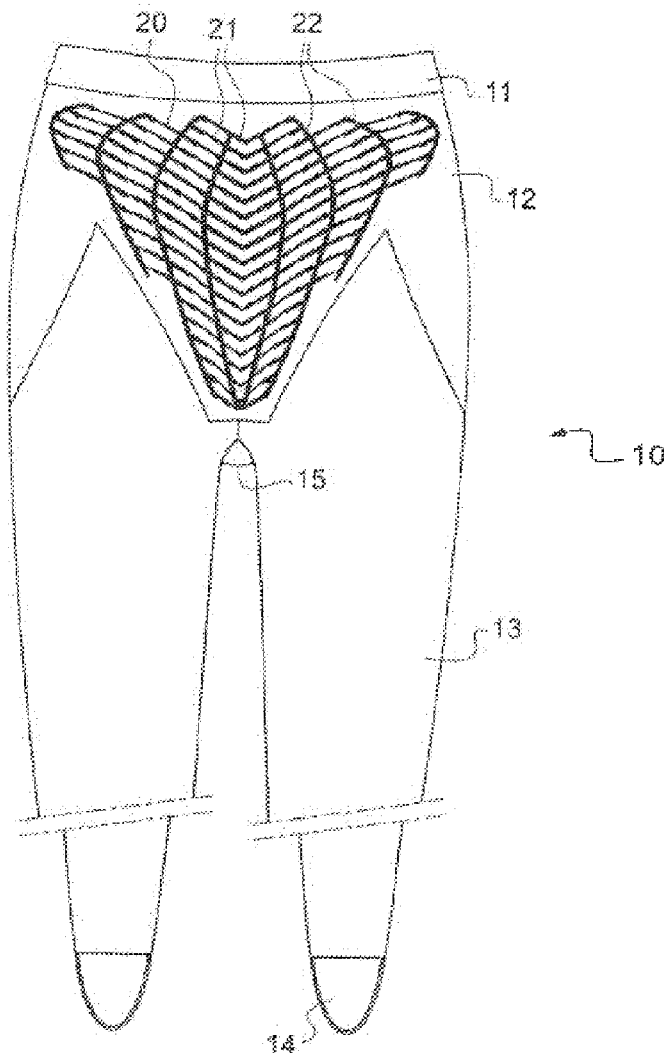
(86) PCT No.: **PCT/FR2011/052515**

§ 371 (c)(1),
(2), (4) Date: **Mar. 26, 2013**

This article of elastic knitted lingerie has a briefs part (12) intended to cover the abdomen and buttocks of a subject, said briefs part (12) being made of a base knit and having a silicone-based resin deposited on the base knit in the form of a network of lines (21, 22) and extending in one and/or the other of the two regions formed respectively by a first, approximately triangular zone at the front of the briefs (12), having its tip at the bottom and its base at the top, and a second zone at the rear of the briefs, formed by a substantially vertical region to the sides of the buttocks and a substantially horizontal region beneath the buttocks.

(30) **Foreign Application Priority Data**

Oct. 27, 2010 (FR) 1058830



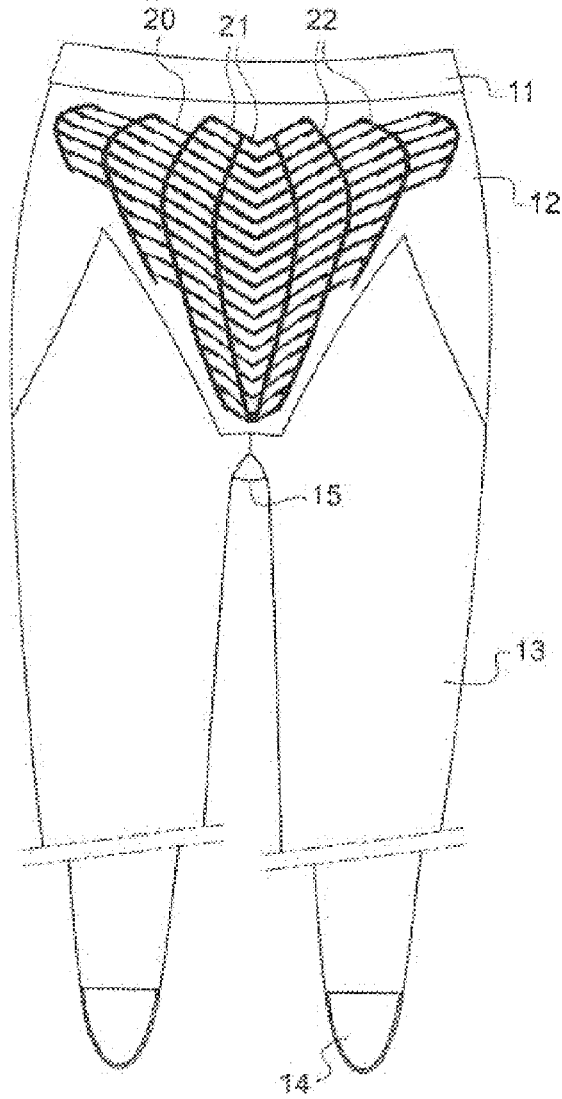


Fig.1

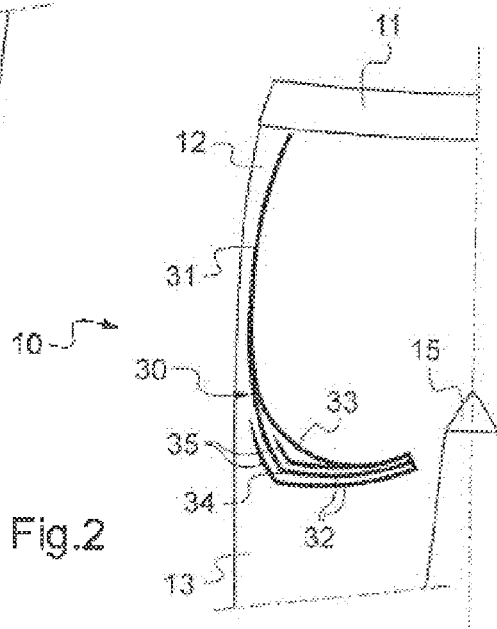


Fig.2

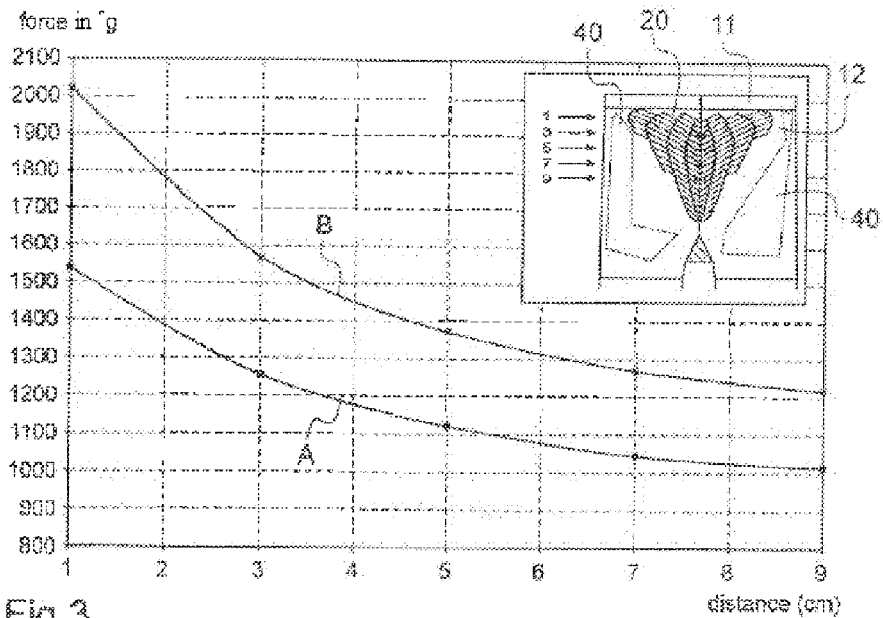
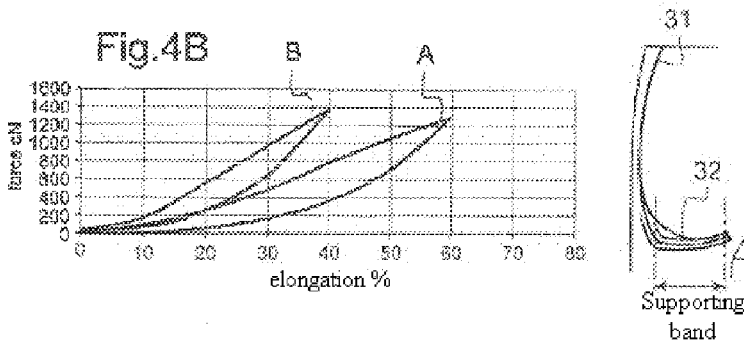
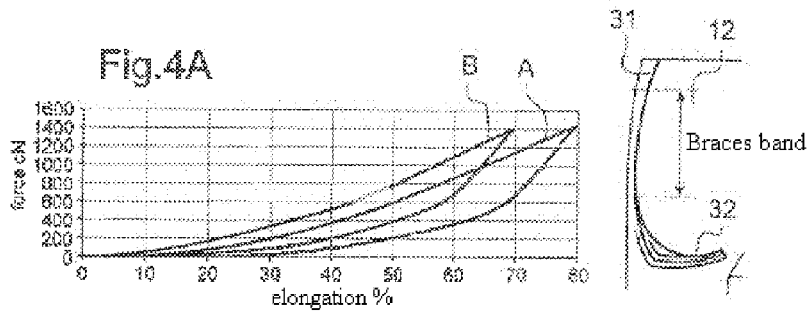


Fig. 3



ARTICLE OF ELASTIC KNITTED LINGERIE HAVING REMOLDING BRIEFS

[0001] The present invention relates to an article of fine elastic knitted lingerie of the type comprising a briefs or panty portion, notably a pantyhose.

[0002] Pantyhose is produced by knitting on a circular loom and comprises sections formed of different stitches and/or different threads according to the sections to create the waistband, the panty portion, the leg portion and the toe portion. The invention is concerned with the panty portion of the garment.

[0003] With a view to providing better tummy support at the front of the pantyhose and better buttock support at the rear, it is known practice, for example from document U.S. Pat. No. 5,465,594, to knit the panty portion using different stitches and/or different threads, but this introduces a certain level of complexity into the knitting.

[0004] Also known, from document EP 2181613, is a lower-body garment comprising a panty portion to which a closely spaced array of resin has been applied to form a band of elastic around the entire pelvis region for orthopedic purposes.

[0005] It is an object of the invention to propose an elastic knitted lingerie article the panty portion of which has a remodeling effect on the silhouette of the wearer.

[0006] The invention achieves its goal by virtue of an article of elastic knitted lingerie comprising a briefs or panty portion intended to envelop the tummy and buttocks of a subject, and made from a base knit and comprising, on the base knit, an application of silicone-based resin in the form of an array of lines, characterized in that the array of lines extends into one and/or the other of the two regions which are formed respectively by a substantially triangular first zone at the front of the panty portion having its apex at the bottom and its base at the top, and a second zone at the rear of the panty portion and formed of a substantially vertical region to the side of the buttocks (laterally external to each buttock) and of a substantially horizontal sub-buttock (situated beneath each buttock) region.

[0007] Advantageously, the base knit of the article, in the panty portion, is knitted in a jersey stitch based on polyamide and elastane (preferably between 10% and 30% by weight of elastane with respect to the total weight of the knit). It advantageously has an elongation at 15 Newtons (in accordance with standard BS 4952) equal to or greater than 150%. The mass per unit area in the panty portion is advantageously of the order of 150 to 200 g/m² (standard ISO 3801).

[0008] Very advantageously, the base knit of the panty portion is knitted uniformly, which means to say with no change in stitch or of thread, thus making it considerably easier to manufacture.

[0009] The silicone-based resin is applied to the inside or to the outside of the panty portion. It is preferably applied in such a way that it does not pass fully through the entire thickness of the base knit so that it does not protrude on the opposite side of the knit.

[0010] Various varieties of silicone can be used according to the way in which the resin is applied. These might include cold-crosslinkable silicones (RTV), hot-crosslinkable silicones (HTV), silicones of the monocomponent type or of the bi-component type.

[0011] However, for preference, the silicone-based resin deposit is formed of silicone incorporating expansion beads which, without causing the silicone to lose its properties,

make it possible to obtain a matt surface finish of the silicone following crosslinking and reduce the risks of irritation, notably when the silicone is printed on the inside of the panty portion and is therefore in contact with the skin.

[0012] The silicone may be deposited using a nozzle, by injection, or by screen printing.

[0013] Advantageously, the lines of silicone have a thickness (or height of silicone measured from the surface of the knit) of between 0.5 mm and 2 mm. Their width is advantageously of between 2 mm and 8 mm.

[0014] Over the front part of the panty portion it is advantageous for the level of resin coverage to be between 30% and 70%. The lines there are advantageously organized in parallel chevrons pointing downward, intersected by symmetric arcs.

[0015] Over the rear part of the panty portion, the vertical line of resin to the side of the buttocks is advantageously connected to at least one substantially horizontal sub-buttock line.

[0016] Other features and advantages will become apparent from the following description of one particular embodiment which is given with reference to the attached drawings in which:

[0017] FIG. 1 is a front view of a pantyhose according to the invention

[0018] FIG. 2 is a partial half-view of the same pantyhose, from the rear

[0019] FIG. 3 is a graph showing the improvement in constraint afforded by the invention in the circumferential direction in the tummy region,

[0020] FIGS. 4A and 4B are two graphs showing the improvement in constraint afforded by the invention in the region of the buttocks in two directions, these respectively in the vertical and the horizontal directions.

[0021] FIG. 1 shows a pantyhose 10 comprising, from the top downward, a waistband portion 11, a panty or briefs portion 12, a leg portion 13 and a toe portion 14. The assembly 12, 13, 14 is knitted on a circular loom, for example one having 400 needles. The waistband 11 may or may not be added on.

[0022] The panty portion 12 is knitted in jersey stitch with one row of elastane-coated polyamide thread alternating with one row of uncoated polyamide. The proportion of elastane in the coated thread is around 48% and the proportion of elastane in the knit is around 18%. The mass per unit area of the knit is 180 g/m².

[0023] A resin pattern 20 of triangular overall shape has been applied to the front of the panty portion 12, with the base of the triangle next to the waistband 20 and the apex pointing downward, toward the crotch 15 of the pantyhose. The triangle covers more or less the lower abdomen or tummy of the subject wearing the pantyhose.

[0024] The resin pattern 20 is formed of two types of line which intersect. On the one hand, there are parallel chevrons 21 of various length, arranged one above the other to partially fill the triangle formed by the pattern. Over the height of the triangle there are, for example, between 15 and 25 chevrons, and in this instance 19 chevrons, spaced 2 to 4 mm apart. The chevrons 21 are relatively open, making an internal angle of around 120°. In the vertical direction, the array is formed of symmetric arcs 22, with their concave side facing toward the vertical axis of symmetry of the pattern 20. There are, for example, between 3 and 6 and, in this instance four, arcs on either side of this axis.

[0025] These lines 21, 22 together form a two-dimensional array leaving approximately 50% of the underlying knit uncovered.

[0026] Each line of resin 21, 22 is around 1.1 mm thick on top of the knit and its width is around 5 mm. The width may vary notably with a view to achieving decorative effects.

[0027] The rear part of the panty portion of the pantyhose, half of which has been depicted in FIG. 2, comprises a pattern 30 consisting essentially of a substantially vertical line 31 to the side of the buttocks, and of several substantially horizontally sub-buttock lines 32 which extend from a certain distance from the side of the panty portion 12 to a certain distance from the axis of symmetry of the panty portion. The line 31 is slightly concave on the buttock side, and runs more or less from the waistband 11. Toward the lower part of the panty portion 12 it is connected to one or more of the sub-buttock lines 32, for example by an arc 33 or a corner 34. In the lower region of the pattern, the sub-buttock lines 32 are connected to short portions of lines 25 extending up toward the main line 31. The lines 31 to 35 have dimensions (thickness and width) comparable to those of the front region of the pantyhose.

[0028] In one practical instance, use was made of a silicone combining:

[0029] a viscosity that was not excessively high in the uncrosslinked state, so as to encourage the expansion during the hot crosslinking and swelling of the microbeads mixed in with the silicone.

[0030] a hardness of the crosslinked product that was not too high, in order to give the applied pattern a pleasant soft feel.

[0031] In order to obtain a silicone mousse that meets expectations in terms of softness while at the same time maintaining its elastomeric properties, there are four key factors that can be varied, these being the choice of silicone, the size of the microspheres, the viscosity of the mixture and the crosslinking temperature.

[0032] As mentioned earlier, the silicone is advantageously a bi-component HTV silicone. Its Shore A hardness is advantageously between 10 and 40, preferably between 10 and 30 and more preferably still of Shore A=10, so that the feel of the mousse remains soft after crosslinking.

[0033] The viscosity dictates the correct expansion of the microspheres. It is between 100 000 and 500 000 mPa·s, advantageously around 250 000 mPa·s (measured on a Brookfield viscometer—spindle No. 7—2.5 rpm). If necessary, a viscosity-regulating additive or an organic solvent can be added to the silicone mixture in order to obtain the desired viscosity that allows correct expansion of the beads.

[0034] The size of the microspheres and the crosslinking temperature have a combined influence on the lack of gloss (matt appearance, no skin irritation) and loft (which provides comfort). The beads may range from 20 to 140 μm, but the use of beads measuring around 80 μm yields excellent results.

[0035] The crosslinking temperature needs to be adapted to suit the silicone and microspheres used.

[0036] By way of concrete example, use was made of a silicone of the Elastosil® make grade LR 3003/10 from Wacker, crosslinkable in the hot state, and the bi-component (A+B), mixed with Expancel® beads 909DU080 (size of microspheres after expansion 80 μm) from Akzo Nobel. Viscoregler® 64 from Wacker was also added in order to regulate the viscosity, along with a colorant in the form of black pigment paste 9011 Elastosil® FL from Wacker. The mixture was screen-printed onto the panty portions of pantyhose and

crosslinked at 175° C. for 30 seconds under infrared radiation (this could have been done by heating in hot air for two minutes).

[0037] A test specimen of pantyhose manufactured in this way according to the invention was subjected to the various measurements illustrated in the graphs of FIGS. 3, 4A and 4B.

[0038] FIG. 3 indicates the result of constraint force measurements, expressed in grams, as a function of elongation of various measurement points measured from the waistband 11. The measurement is taken by placing the panty portion 12 on the laterally mobile fingers 40 of a measurement machine. Curve A corresponds to the measurements taken on a panty portion made of the basic knit without the silicone coating, and curve B corresponds to the same measurements taken on a panty portion according to the invention again using made of the same base knit but coated with the pattern 20 according to the invention. It is clearly apparent that the application of the pattern 20 according to the invention has improved the constraint in the circumferential direction and will therefore make an effective contribution to achieving the “flat tummy” effect.

[0039] FIGS. 4 indicate the results of force measurements as a function of elongation in the vertical direction on part of the vertical line 31 to the side of the buttocks or “braces” line in the case of FIG. 4A and in the horizontal direction on part of the horizontal lines 32 in the case of FIG. 4B. Curves A correspond to the same measurements taken on a panty portion with no silicone pattern whereas curves B correspond to the panty portion according to the invention. Once again, the two graphs 4A, 4B clearly indicate the effect of the lines of resin according to the invention, both in the vertical direction and in the horizontal direction, demonstrating how the invention will therefore make an effective contribution to the effect of supporting and lifting the buttocks.

[0040] The invention therefore allows the silhouette to be remodeled in the tummy and buttock regions.

1. An article of elastic knitted lingerie comprising a briefs or panty portion intended to envelop the tummy and buttocks of a subject, and made from a base knit comprising, on the base knit, an application of silicone-based resin in the form of an array of lines, comprising an array of lines extending into one and/or the other of the two regions which are formed respectively by a substantially triangular first zone at the front of the panty portion having its apex at the bottom and its base at the top, and a second zone at the rear of the panty portion and formed of a substantially vertical region to the side of the buttock and of a substantially horizontal sub-buttock region.

2. The article as claimed in claim 1, wherein the base knit of the article, in the panty portion, is knitted in a jersey stitch based on polyamide and elastane.

3. The article as claimed in claim 1, wherein the base knit of the panty portion is knitted uniformly.

4. The article as claimed in claim 1, wherein the silicone-based resin is formed of silicone incorporating expansion beads.

5. The article as claimed in claim 4, wherein the silicone is matt after crosslinking.

6. The article as claimed in claim 1, wherein the lines of silicone have a thickness of between 0.5 mm and 2 mm and a width of between 2 mm and 8 mm.

7. The article as claimed in claim 1, wherein over the front part of the panty portion, the level of resin coverage is between 30% and 70%.

8. The article as claimed in claim 1, wherein over the front part of the panty portion (12), the lines are organized in parallel chevrons pointing downward, intersected by symmetric arcs.

9. The article as claimed in claim 1, wherein over the rear part of the panty portion, the vertical line of resin to the side of the buttocks is advantageously connected to at least one substantially horizontal sub-buttock line.

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