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(54) **GARMENT HAVING ENGINEERED LACE ZONES**

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(57)

ABSTRACT

Related U.S. Application Data

(60) Provisional application No. 62/983,194, filed on Feb. 28, 2020.

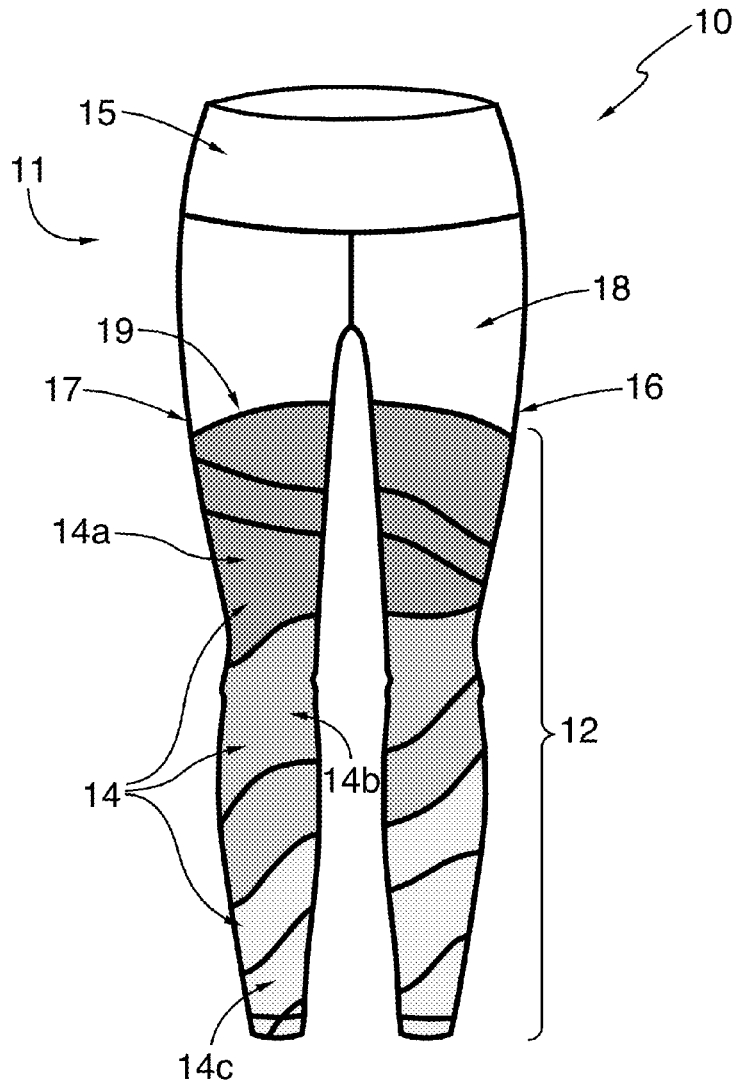
Examples of a garment having engineered lace zones are disclosed. The garment comprises a lace panel that forms at least a portion of the garment and that has a first engineered lace zone and a second engineered lace zone. The first engineered lace zone has a first structural property and the second engineered lace zone has a second structural property.

Publication Classification

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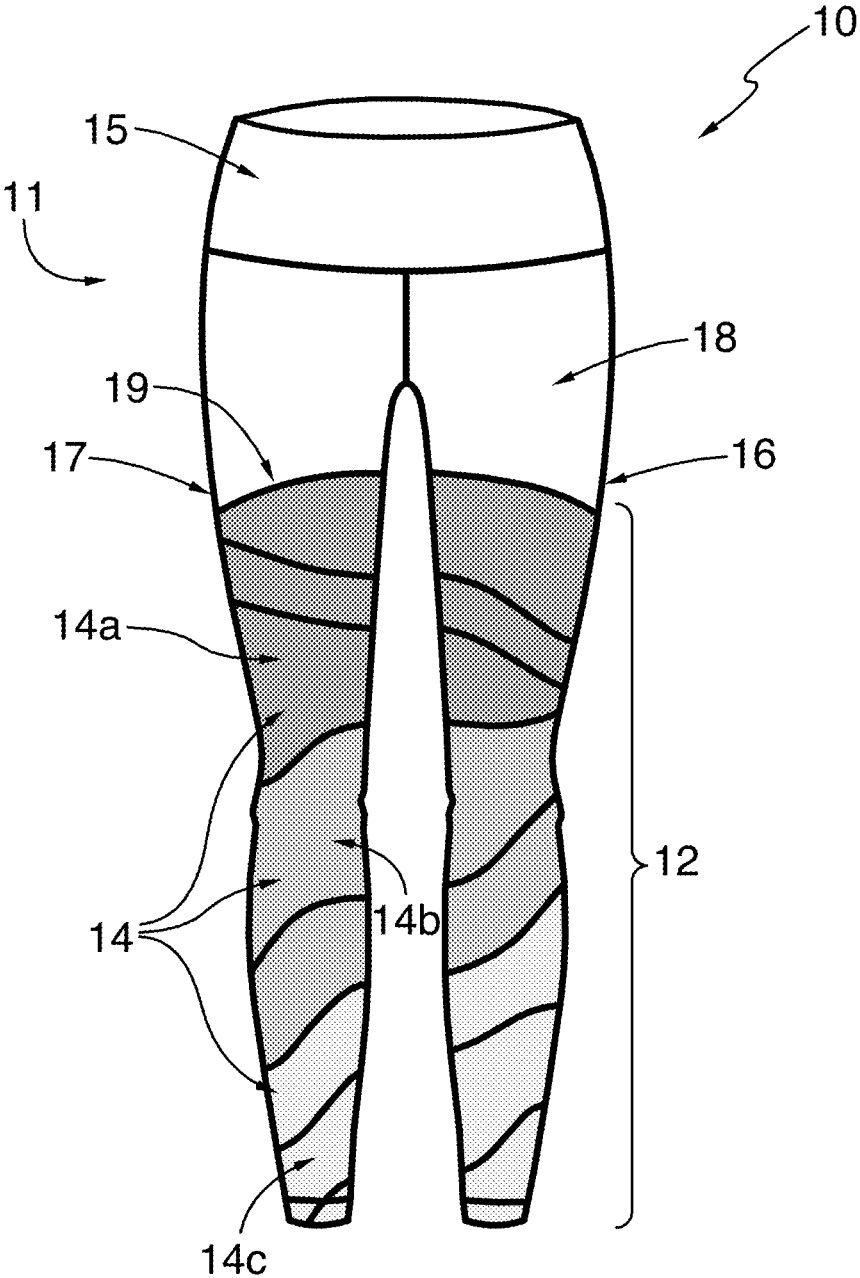


FIG.1

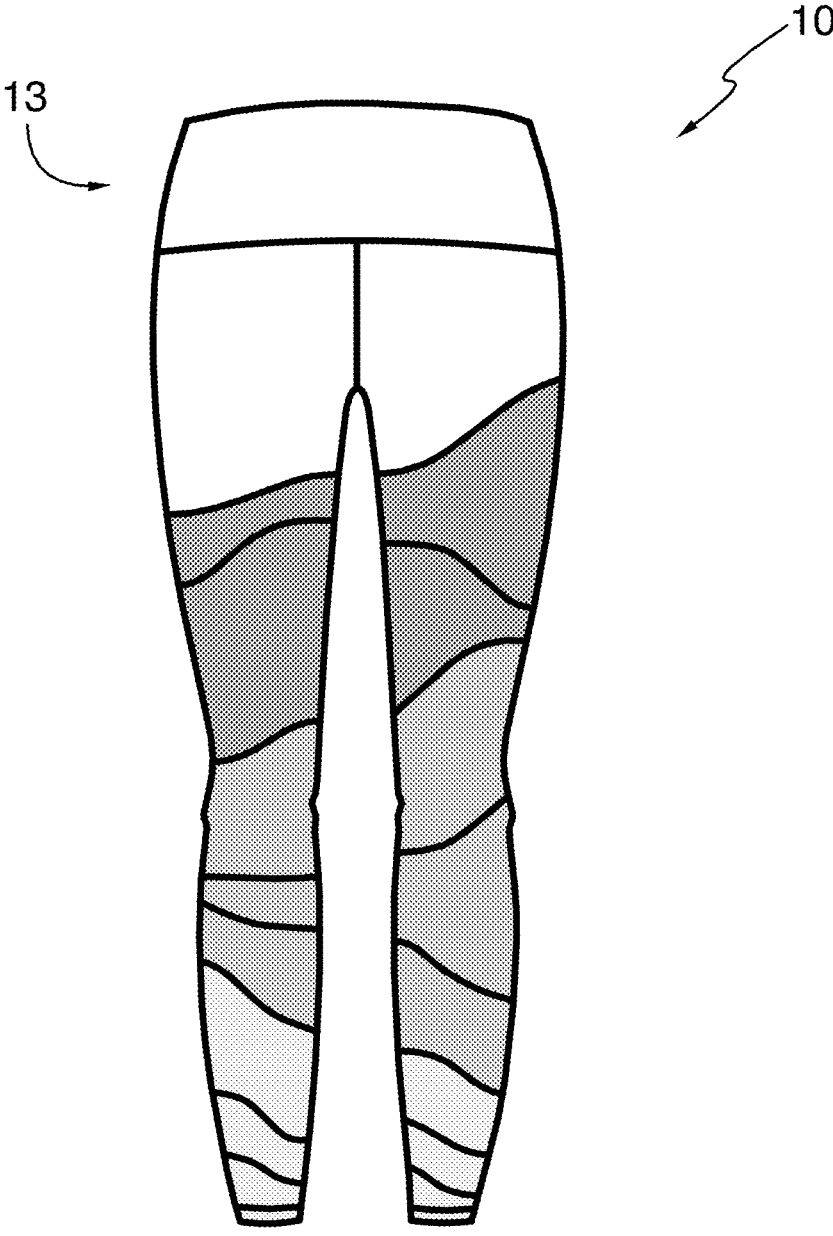


FIG.2

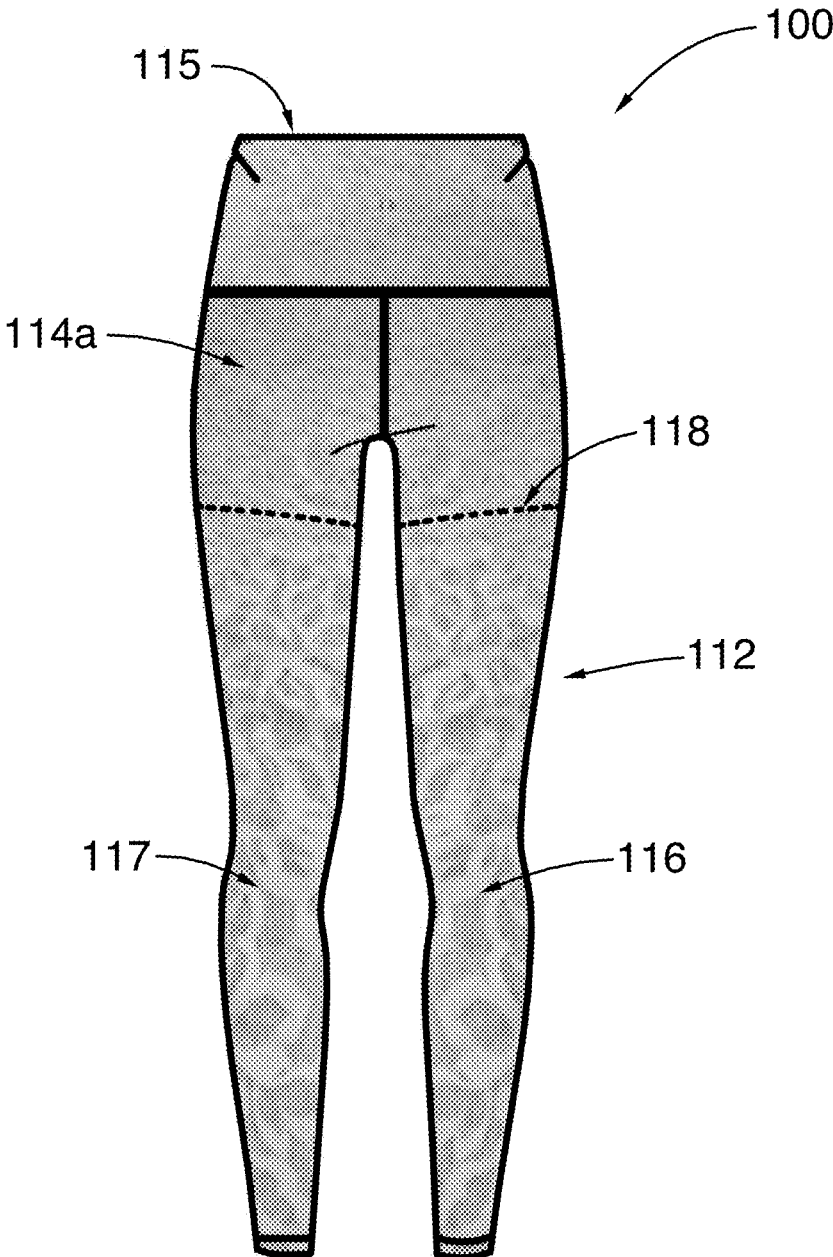


FIG.3

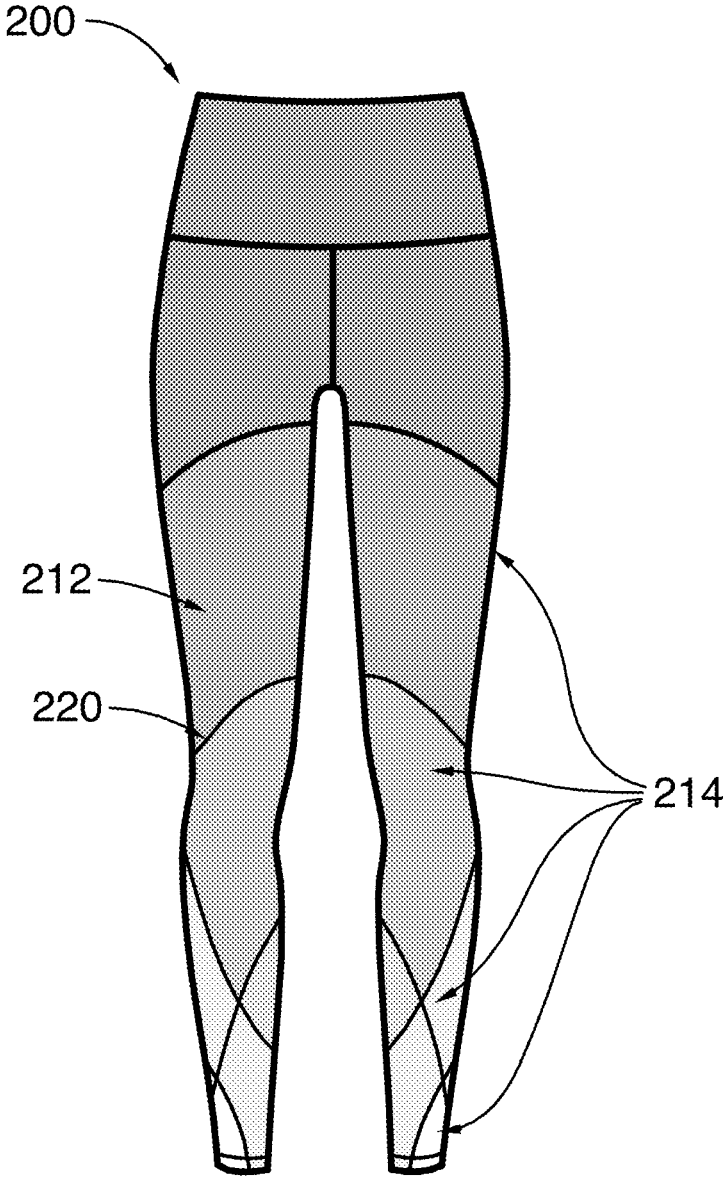


FIG.4

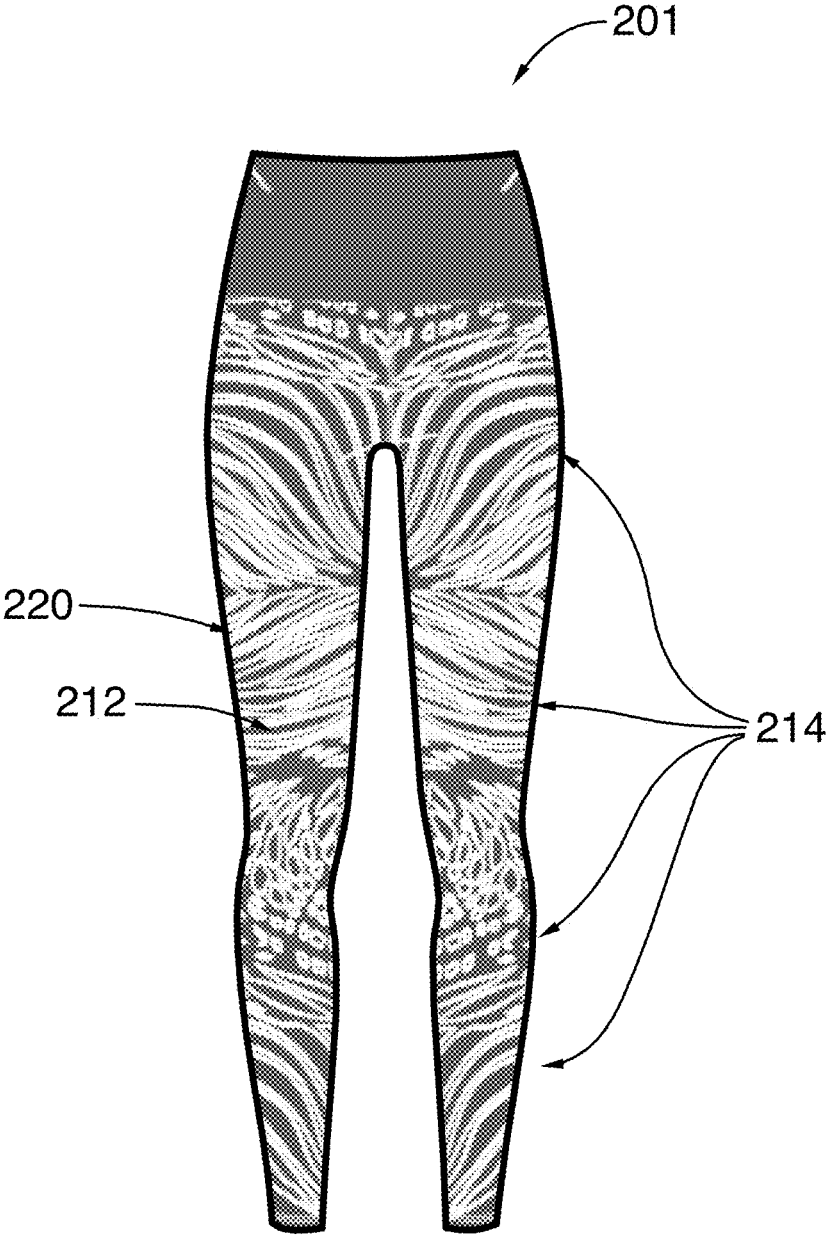


FIG.5

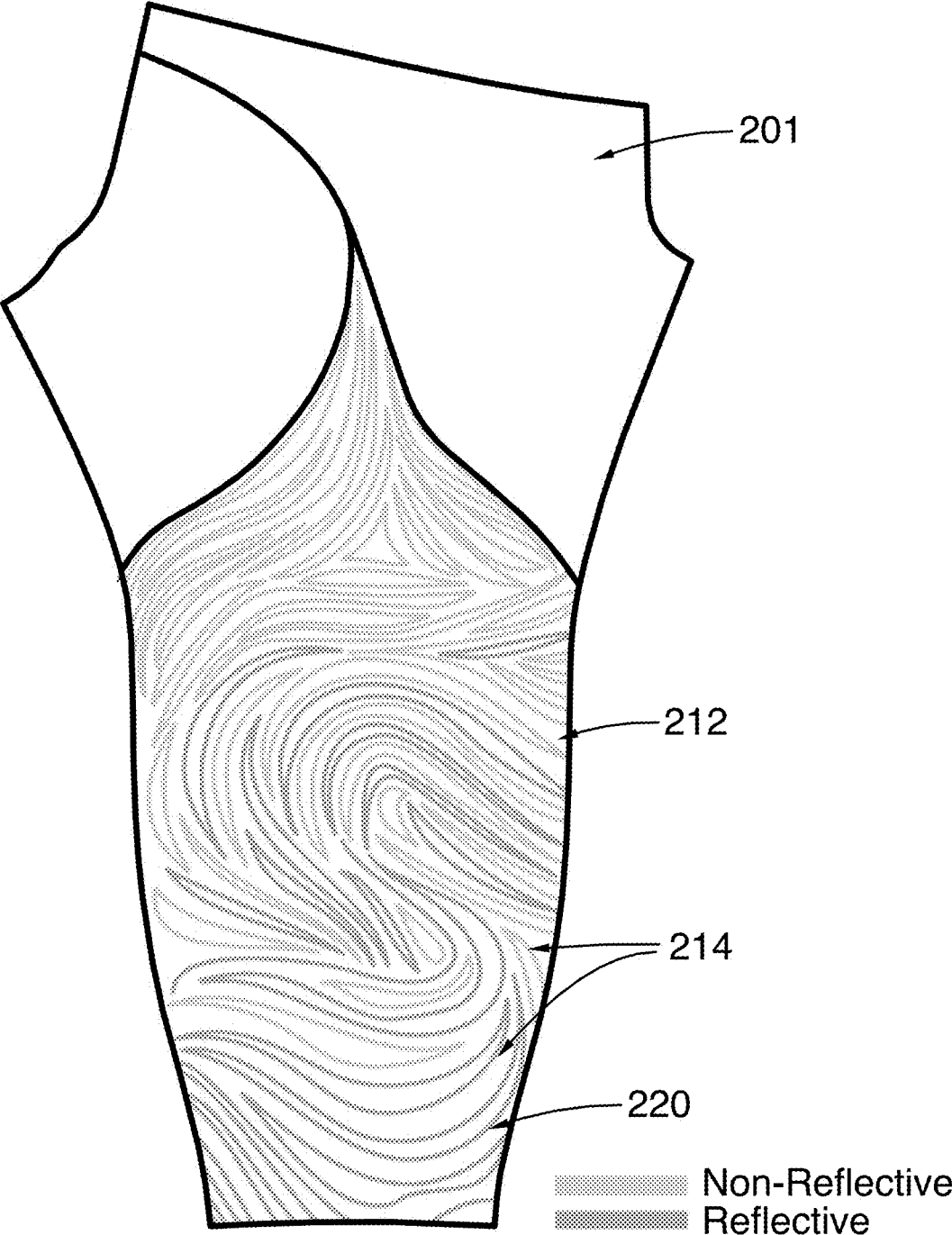


FIG.6



FIG.7

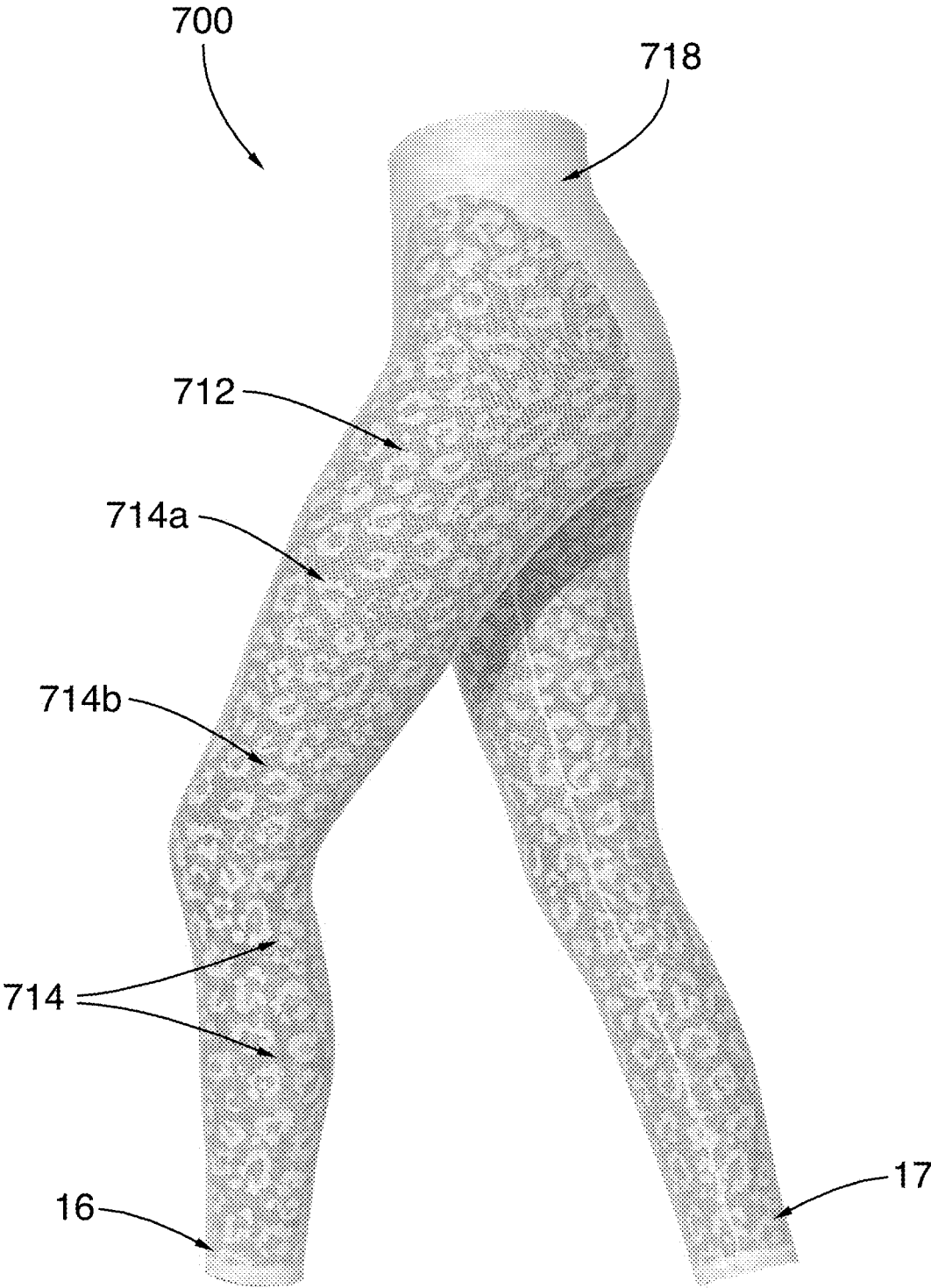


FIG.8

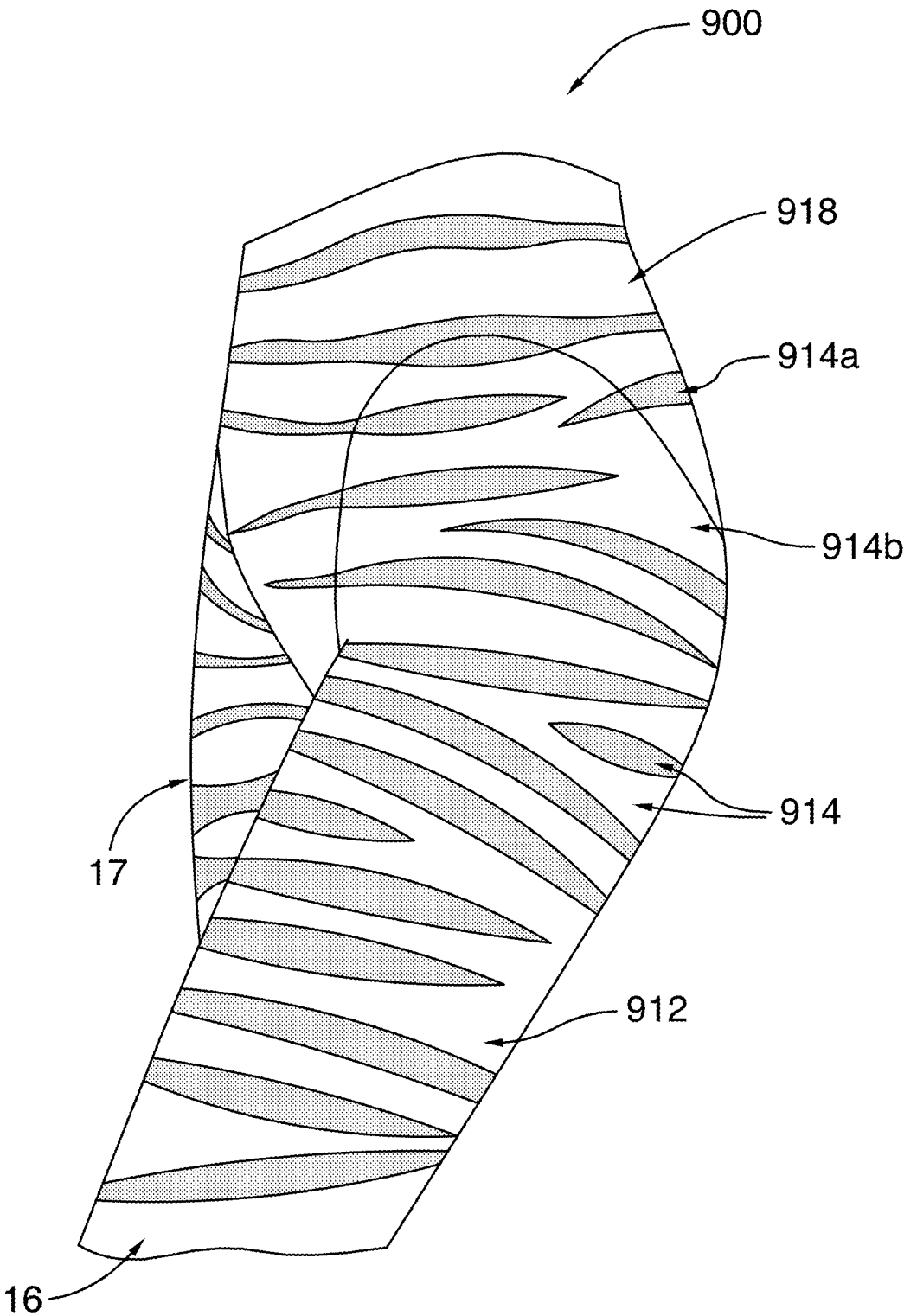


FIG.9

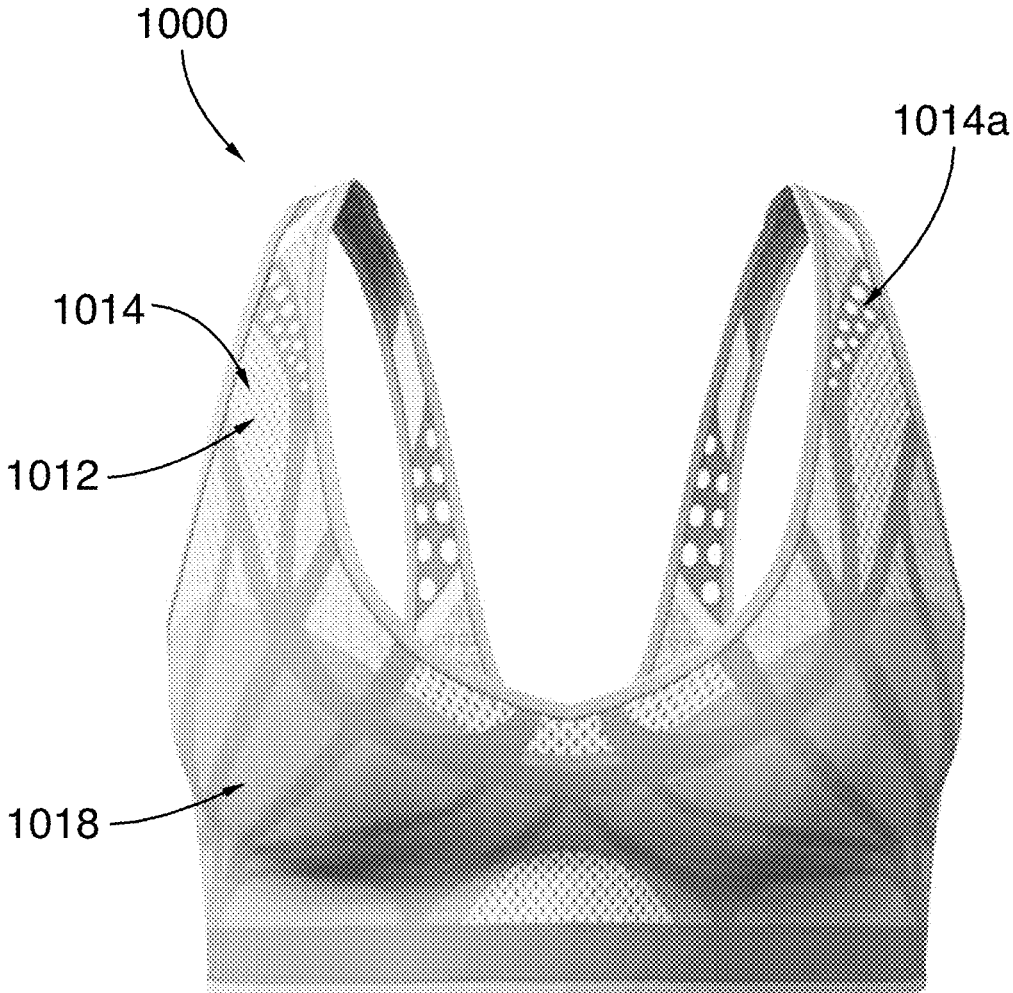


FIG.10

1000



1014b



FIG.11

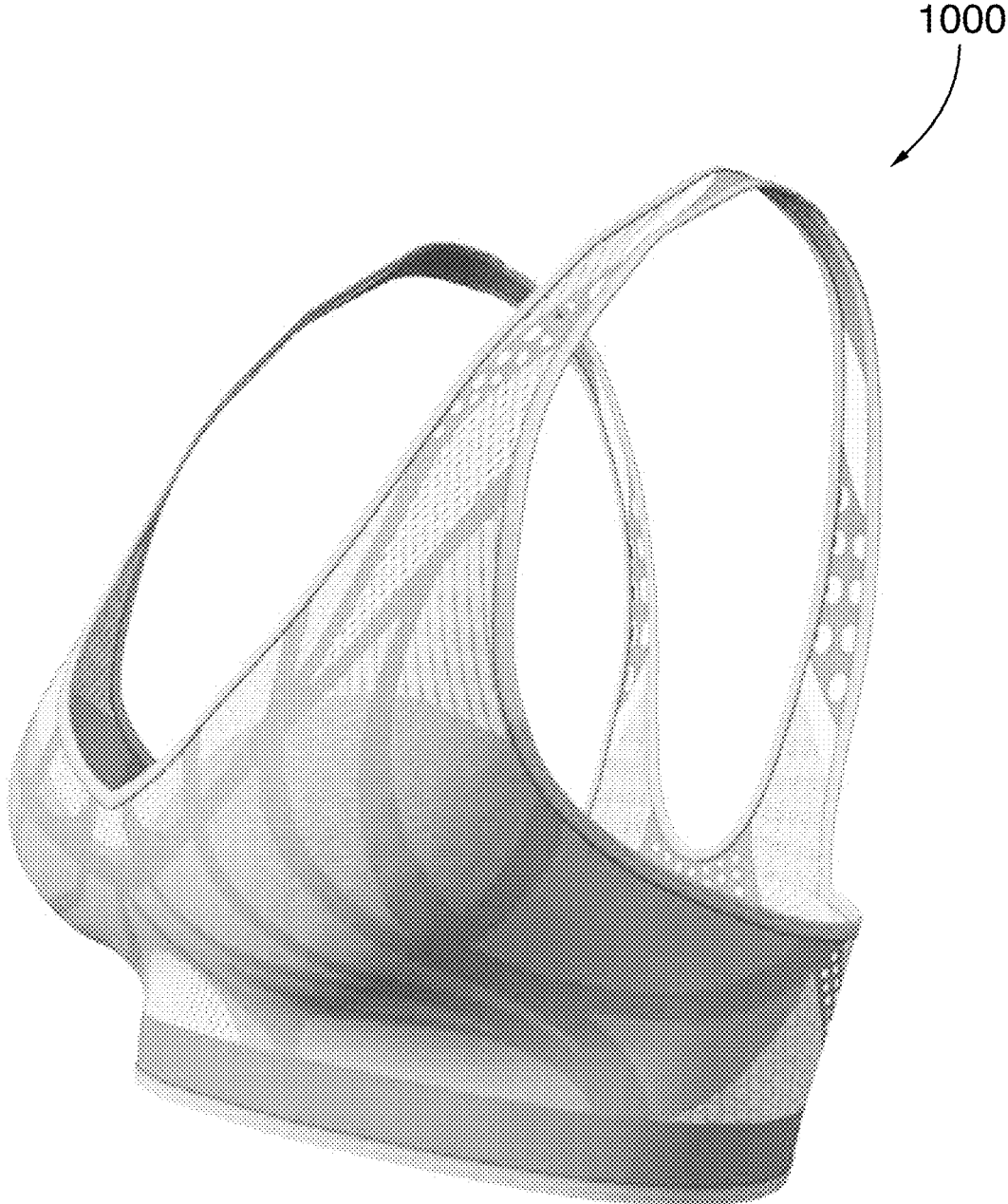


FIG.12



FIG.13

GARMENT HAVING ENGINEERED LACE ZONES

[0001] This application claims priority from and the benefit of the filing date of U.S. Provisional Patent Application No. 62/983,194, filed Feb. 28, 2020, and the entire content of such application is incorporated herein by reference.

TECHNICAL FIELD

[0002] This application relates to the field of garments, and more specifically, to a garment for sporting activities, exercise, and the like that has engineered lace zones.

BACKGROUND

[0003] Athletes and consumers are demanding high performance activewear and sportswear, such as for example, sports tights. Currently, most sports garments are made by cutting and sewing together fabrics having different structural properties to provide different levels of pressure sensation in different areas of the garment. However, such garments typically have limited ornamental designs (or looks) and typically have a number of seams located throughout the garment that may cause chaffing. In addition, making such garments typically involves greater fabric waste and increased labor and manufacturing costs.

SUMMARY OF THE APPLICATION

[0004] In one aspect, a garment having engineered lace zones is provided. The garment comprises a lace panel that forms at least portion of the garment and that has a first engineered lace zone and a second engineered lace zone. The first engineered lace zone has a first structural property and the second engineered lace zone has a second structural property.

[0005] In addition to the aspects and embodiments described above, further aspects and embodiments will become apparent by reference to the drawings and study of the following detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Throughout the drawings, reference numbers may be re-used to indicate correspondence between referenced elements. The drawings are provided to illustrate example embodiments described herein and are not intended to limit the scope of the application. Sizes and relative positions of elements in the drawings are not necessarily drawn to scale. For example, the shapes of various elements and angles may be not drawn to scale, and some of these elements may be arbitrarily enlarged and positioned to improve drawing legibility.

[0007] FIG. 1 is a front view illustrating an example of a garment having engineered lace zones.

[0008] FIG. 2 is a rear view thereof.

[0009] FIG. 3 is a rear view illustrating an example of a garment having gradually changing engineered lace zones.

[0010] FIGS. 4 and 5 are front views illustrating example garments having engineered lace zones and having reflective yarn incorporated therein.

[0011] FIG. 6 is a left side view illustrating a leg panel of the example garment of FIG. 5.

[0012] FIGS. 7, 8, and 9 are front, side, and perspective views illustrating two example lower body garments having engineering lace zones extending further up the legs.

[0013] FIGS. 10, 11, 12, and 13 are front, rear, and perspective views illustrating an example upper body garment having engineering lace zones.

DETAILED DESCRIPTION

[0014] In the following description, details are set forth to provide an understanding of the application. In some instances, certain structures, techniques, and methods have not been described or shown in detail in order not to obscure the application.

[0015] FIGS. 1 and 2 illustrate a garment 10 having a lace panel 12 that includes two or more engineered lace zones 14. The garment 10 may be a pair of sports tights (or a sports tight). Of course, the garment 10 may be any other athletic or sports garment such as a bra, top, shirt, jacket, pants, shorts, etc., without departing from the scope of the application. The garment 10 has a front side 11, as illustrated in FIG. 1, and a rear side 13, as illustrated in FIG. 2. The garment 10 further comprises a waistband 15 and first and second (or right and left) legs 16, 17.

[0016] The lace panel 12 is shaped and sized to cover at least a portion of a wearer's body (e.g., the wearer's legs, a portion of the wearer's torso, etc.). The lace panel 12 comprises multiple (e.g., three) engineered lace zones 14, such as a first engineered lace zone 14a, a second engineered lace zone 14b, and a third engineered lace zone 14c. Persons skilled in the art will understand that the lace panel 12 can have two zones or more than three lace zones without departing from the scope of the application. Each of the engineered lace zones (e.g., 14a) has a respective structural property that differs from the structural property of the other engineered lace zones (e.g., 14b, 14c). The structural property of the engineered lace zones 14 can be changed by changing the yarn fed into the machine used to knit the lace, changing the gauge (looser or tighter gauge), or by changing the knit structure. For example, the first engineered lace zone 14a can be knitted with a thicker yarn or combination of yarns, or with a tighter gauge or thicker knit construction, or any combination thereof, so that it provides a first amount (or level) of pressure (e.g., sensation, compression, etc.) on the skin of the wearer. The third engineered lace zone 14c can be knitted with thinner yarn/yarns having a looser gauge or knit structure, so that it provides a second amount (or level) of pressure which is less than the first amount of pressure of the first engineered lace zone 14a. In addition, the third engineered lace zone 14c can include a mesh that improves breathability or ventilation within the zone 14c while providing a lower amount of pressure on the skin of the wearer. The second engineered lace zone 14b can be knitted so that it provides a third amount (or level) of pressure that is greater than the second amount of pressure provided by the third engineered lace zone 14c but less than the first amount of pressure provided by the first engineered lace zone 14a. According to one embodiment, transitions between engineered lace zones 14a, 14b, 14c are seamless. For example, in the illustrated example of the garment 10, the first engineered lace zone 14a can be positioned in the thigh area, the second engineered lace zone 14b can be positioned in the knee and upper calf area, and the third engineered lace zone 14c can be positioned in the lower calf and ankle area.

[0017] Persons skilled in the art will understand that the engineered lace zones 14 can have different sizes and shapes and can be positioned in different parts of the garment 10

without departing from the scope of application. For example, where the garment is a shirt, an engineered lace zone providing a greater amount of pressure can be positioned in the abdomen area or across the back (for posture control) of the garment **10**. In addition, the garment **10** can have more than one fabric panel **18** (as described below).

[0018] The engineered lace zones **14** can be knitted from a yarn or thread made from a material such as Lycra™, spandex, nylon, elastane, polyamide, polyether-polyurea copolymer, polyester, cotton, wool, silk, forest based fibres, etc., that can provide stretch and shape retention and is quick-drying, sweat-wicking, smooth, and soft. In one embodiment, Cordura™ yarn can be added to increase the durability of the garment **10**. In some embodiments, thermal yarn can be added to provide the wearer with a warming or cooling sensation, or reflective yarn can be incorporated to increase visibility of the wearer at night. In some embodiments, waterproof or water-resistant yarn can be used to knit the lace panel **12**.

[0019] The garment **10** further comprises a fabric panel **18**. For example, the fabric panel **18** can cover the pelvic area of the wearer's torso. In one embodiment, it can also extend to the upper portions of the legs **16**, **17**. The fabric panel **18** can be knitted with a structural property that is different than that of the lace panel **12**. For example, the fabric panel **18** can be heavier and/or thicker than the lace panel **12** and can provide an amount a pressure that can be greater than the amount of pressure provided by the engineered lace zones **14**. The fabric panel **18** can be connected or attached to the lace panel **12** by sewing or bonding. In the example garment **10**, the fabric panel **18** is sewn to the lace panel **12** thereby defining a seam **19**.

[0020] FIG. 3 shows another example of a garment **100** having a lace panel **112**. The garment **100** is a tight or pair of tights. The lace panel **112** extends from a waistband opening **115** all the way through the legs **116**, **117** forming the entire garment **100**. The density of the lace panel **112** gradually changes along the length of the garment **100**. For example, the upper part of the lace panel **112** near the waistband opening **115** can be knitted with a thicker yarn or combination of yarns, or with a tighter gauge or thicker knit construction, or any combination thereof, forming an engineered lace zone **114a**. The engineered lace zone **114a** can cover the pelvic area (encircling the waist and splitting to cover the upper thigh area of each leg **116**, **117**), such that the increased thickness of the lace panel **112** in the engineered lace zone **114a** makes the garment **100** less transparent in that area. The lace panel **112** structure is engineered so that its thickness gradually decreases down the legs **116**, **117**. In one embodiment, the garment **100** can further comprise a fabric panel **118**. The fabric panel **118** can be an inner liner (e.g., inner shorts) positioned under the engineered lace zone **114a**. In one embodiment, the fabric panel **118** can be connected or attached to the lace panel **112**. For example, the fabric panel **118** and the lace panel **112** can be connected along an edge of the waistband opening **115**.

[0021] FIGS. 4, 5, and 6 illustrate further examples of garments **200**, **201** having an engineered lace panel **212** with multiple engineered lace zones **214** as described above. A reflective yarn or yarns is added to knit at least a portion of the lace panel **212** forming reflective portions **220** of the garment **200**, **201**. A structural property of the reflective portions **220** can differ from one another. For example, the structural property of a reflective portion **220** can be the

same as the structural property of the engineered lace zones **214** where the reflective portion **220** is located. In some embodiments, the structural property of all of the reflective portions **220** can be the same and the structural property of the reflective portions **220** can be different from the structural property of the engineered lace zones **214**.

[0022] FIGS. 7, 8, and 9 illustrate further examples of lower body garments **700**, **900** (e.g., tights) having an engineered lace panel **712**, **912** with multiple engineered lace zones **714**, **914** as described above. As shown in FIGS. 7 and 8, the engineering lace panel **712** may extend further up the legs **16**, **17** of the garment **700** to join the fabric panel **718** at or above the hips. The lace panel **712** may include engineered lace zones **714** forming a leopard-like pattern having spots **714a** positioned on a background **714b**. The structural properties of the spot and background portions **714a**, **714b** may be different. For example, the background portion **714b** may be sheer, transparent, or translucent. As shown in FIG. 9, the engineering lace panel **912** may extend further up the legs **16**, **17** of the garment **900** (e.g., to the hips or above) and may extend over or incorporate the fabric panel **918**. The lace panel **912** may include engineered lace zones **914** forming a striped or wave-like pattern having lines or waves **914a** positioned on a background **914b**. The structural properties of the line and background portions **914a**, **914b** may be different. For example, the background portion **914b** may be sheer, transparent, or translucent.

[0023] FIGS. 10, 11, 12, and 13 illustrate an example of an upper body garment **1000** (e.g., a bra) having an engineered lace panel **1012** with multiple engineered lace zones **1014** as described above. The engineering lace panel **1012** may include portions of the straps and back panel of the garment **1000** and may extend to, extend over, or incorporate the fabric panel **1018** of the front panel, side panels (or wings), and underbust band of the garment **1000**. The lace panel **1012** may include engineered lace zones **1014** forming various patterns of mesh or sheer **1014a**, **1014b**. The structural properties of the mesh portions **1014a**, **1014b** may be different. For example, the mesh portions **1014a** of the straps may have smaller openings formed therein than the mesh portions **1014b** of the back panel.

[0024] While particular elements, embodiments and applications of the present application have been shown and described, it will be understood, that the scope of the application is not limited thereto, since modifications can be made by those skilled in the art without departing from the scope of the present application, particularly in light of the foregoing teachings. Thus, for example, in any method or process disclosed herein, the acts or operations making up the method/process may be performed in any suitable sequence and are not necessarily limited to any particular disclosed sequence. Elements and components can be configured or arranged differently, combined, and/or eliminated in various embodiments. The various features and processes described above may be used independently of one another, or may be combined in various ways. All possible combinations and subcombinations are intended to fall within the scope of this application. Reference throughout this disclosure to "some embodiments," "an embodiment," or the like, means that a particular feature, structure, step, process, or characteristic described in connection with the embodiment is included in at least one embodiment. Thus, appearances of the phrases "in some embodiments," "in an embodiment," or the like, throughout this application are not necessarily all

referring to the same embodiment and may refer to one or more of the same or different embodiments. Indeed, the novel methods and systems described herein may be embodied in a variety of other forms; furthermore, various omissions, additions, substitutions, equivalents, rearrangements, and changes in the form of the embodiments described herein may be made without departing from the spirit of the application.

[0025] Various aspects and advantages of the embodiments have been described where appropriate. It is to be understood that not necessarily all such aspects or advantages may be achieved in accordance with any particular embodiment. Thus, for example, it should be recognized that the various embodiments may be carried out in a manner that achieves or optimizes one advantage or group of advantages as taught herein without necessarily achieving other aspects or advantages as may be taught or suggested herein.

[0026] Conditional language used herein, such as, among others, “can,” “could,” “might,” “may,” “e.g.,” and the like, unless specifically stated otherwise, or otherwise understood within the context as used, is generally intended to convey that certain embodiments include, while other embodiments do not include, certain features, elements and/or steps. Thus, such conditional language is not generally intended to imply that features, elements and/or steps are in any way required for one or more embodiments or that one or more embodiments necessarily include logic for deciding, with or without operator input or prompting, whether these features, elements and/or steps are included or are to be performed in any particular embodiment. No single feature or group of features is required for or indispensable to any particular embodiment. The terms “comprising,” “including,” “having,” and the like are synonymous and are used inclusively, in an open-ended fashion, and do not exclude additional elements, features, acts, operations, and so forth. Also, the term “or” is used in its inclusive sense (and not in its exclusive sense) so that when used, for example, to connect a list of elements, the term “or” means one, some, or all of the elements in the list.

[0027] Any example calculations, simulations, results, graphs, values, and parameters of the embodiments described herein are intended to illustrate and not to limit the disclosed embodiments. Other embodiments can be configured and/or operated differently than the illustrative examples described herein.

What is claimed is:

1. A sports garment having integrated engineered lace zones, comprising:

a lace panel forming at least a portion of the garment and having a first engineered lace zone and a second engineered lace zone, the first engineered lace zone having a first structural property and the second engineered lace zone having a second structural property.

2. The sports garment of claim 1, wherein a transition between the first and second engineered lace zones is seamless.

3. The sports garment of claim 2, wherein the first structural property is formed by a first combination of one or more types of yarns, knit stitch construction types, and/or lace gauges and the second structural property is formed by a second combination of one or more types of yarns, knit stitch construction types, and/or lace gauges, and wherein the first structural property is different than the second structural property.

4. The sports garment of claim 3, wherein the first engineered lace zone provides a first amount of pressure and the second engineered lace zone provides a second amount of pressure.

5. The sports garment of claim 4, wherein the first amount of pressure is greater than the second amount of pressure.

6. The sports garment of claim 1, further comprising a fabric panel connected to the lace panel.

7. The sports garment of claim 6, wherein the fabric panel is connected to the lace panel by sewing.

8. The sports garment of claim 6, wherein the fabric panel is connected to the lace panel by bonding.

9. The sports garment of claim 6, wherein the fabric panel has a third structural property that is different than both the first structural property and the second structural property of the lace panel.

10. The sports garment of claim 9, wherein the fabric panel provides a third amount of pressure that is different than both the first amount of pressure and the second amount of pressure.

11. The sports garment of claim 1, wherein the lace panel further comprising at least one additional engineered lace zone joined to at least one of the first engineered lace zone and the second engineered lace zone by a respective seamless transition and having a structural property defined by a combination of one or more types of yarns, knit stitch construction types, and/or lace gauges, the structural property of the additional engineered lace zone being different than both the first structural property and the second structural property.

12. The sports garment of claim 11, wherein the at least one additional engineered lace zone provides an amount of pressure that is greater than the second amount of pressure of the second engineered lace zone but less than the first amount of pressure of the first engineered lace zone.

13. The sports garment of claim 1, wherein the engineered lace zones change gradually along a length or width of the garment.

14. The sports garment of claim 1, wherein the engineered lace zones form a repeatable pattern.

15. The sports garment of claim 1, wherein the lace panel comprises a reflective yarn incorporated therein.

16. The sports garment of claim 1, wherein the garment is a sports tight or pair of sports tights.

17. The sports garment of claim 1, wherein the garment is a sports shirt.

18. The sports garment of claim 1, wherein the garment is a sports bra.

* * * * *