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(54) **Improvements to brassieres**

(57) A bra that includes two breast cups that each include an outer fabric layer and an inner fabric layer and wherein a neckline perimeter of each breast cup is defined at least by one of the outer fabric layer and inner fabric layer, wherein at each breast cup, a core pad is captured between the inner fabric layer and the outer fabric layer that includes a tapered perimeter region to define a thin perimeter region, said thin perimeter region located inward of the neckline perimeter.

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to improvements to brassieres.

BACKGROUND

[0002] Pads are effective in creating support of the breasts of a wearer of a brassiere (hereinafter "bra").

[0003] Pads that are incorporated in bras can help support the breasts and also create uplift. A pad is normally made from a foam material and is incorporated between interior and exterior most layers of the bra. The pad is located normally covering the entire breast cup regions of a bra. However the incorporation of pads in a bra can be undesirable for certain reasons. A pad increases the thickness of the breast cup regions of a bra. At regions where a perimeter of the pad is defined, a sudden change in the thickness of the bra can be created. Such a sudden change in thickness, may be undesirable for visual reasons. A bra worn under an over garment, such as a dress or top, may to some wearers wish to be inconspicuous. Where a sudden change in thickness or a thick perimeter of the bra is defined, the bra may be more readily visible from the outside of the over garment. The bra or regions of the bra where such features are defined, may show through the dress or top and this may be visually undesirable.

[0004] It is therefore an object of the present invention to provide a partial core pad incorporating brassiere that has improved external visual impact and/or that will at least provide the public with a useful choice.

[0005] Another feature of prior art bras that it is undesirable is in relation to the chest band construction. An elastic band has traditionally been added to the chest bands (also known as the wings or wing portions) of a bra in order to enhance the elasticity of the chest bands. This may assist in providing improved sizing characteristics of the bra and provide some degree of flexibility in the chest band size. For example, a wearer need not adjust the size of the chest band if the wearer increases or decreases in chest or bust size as the size change can, to a certain extent, be compensated for by the elastic band.

[0006] An elastic band may be sewn onto and along the length of the external side of the fabric layer facing/touching the wearer's skin when the brassiere is worn. The elastic band may be wrapped or covered by a fabric layer to form an assembly before being sewn onto the chest band.

[0007] The main disadvantage of this type of chest band construction is that the elastic band or the assembly may cause discomfort to the wearer and create a visually unappealing appearance. This may increase localised friction on the skin of the wearer. The chest band may also dig into the wearer. Other parts of the chest band that do not include the elastic band may hence bulge out.

[0008] In some bras, designated elastic bands are not added to the chest bands. The elasticity of the chest bands in such case is provided only by the natural elasticity of the fabric layers of the chest bands or in combination with the natural elasticity of any foam layers added to the chest bands. The main disadvantage of this type of construction is that the elasticity of the chest bands may deteriorate after repeated washing of the bra or repeated or prolonged stretching of the chest bands. This maybe as a result of the properties of the materials used for making the fabric layers and any foam layers of the chest bands.

[0009] It is therefore an object of the present invention to provide a brassiere that has improved chest band construction and/or a chest band for association with components to define a brassiere with improved chest band construction or that will at least provide the public with a useful choice.

BRIEF DESCRIPTION OF THE INVENTION

[0010] Accordingly in a first aspect the present invention consists in a bra that includes two breast cups that each include an outer fabric layer and an inner fabric layer and wherein a neckline perimeter of each breast cup is defined at least by one of the outer fabric layer and inner fabric layer, wherein at each breast cup, a core pad is captured between the inner fabric layer and the outer fabric layer that includes a tapered perimeter region to define a thin perimeter region , said thin perimeter region located inward of the neckline perimeter.

[0011] Preferably the thin perimeter region is located proximate most the neckline perimeter of the breast cup yet is not contiguous the neckline perimeter.

[0012] Preferably the thin perimeter region of the core pad is the perimeter region of the core pad that is proximate most the neckline.

[0013] Preferably the inner fabric layer is laminated to the core pad.

[0014] Preferably the outer fabric layer is laminated to the core pad.

[0015] Preferably the inner fabric layer and the outer fabric layer are laminated with each other and are laminated to each other at at least some regions at where the core pad is not placed intermediate thereof.

[0016] Preferably the inner fabric layer and the outer fabric layer are laminated to each other at regions intermediate of the neckline perimeter of each breast cup and the thin perimeter region of the core pad.

[0017] Preferably the outer fabric layer includes at least one panel of a lace.

[0018] Preferably intermediate of at least the panel of lace and the core pad is a lining panel.

[0019] Preferably the lining panel covers the entire outwardly presented surface of the core pad.

[0020] Preferably the outer fabric layer at each breast cup includes a panel of lace and a panel of opaque fabric.

[0021] Preferably where the outer fabric layer includes lace, the inner fabric layer is a sheer fabric panel.

[0022] Preferably the outer fabric layer includes lace only at regions where the outer fabric layer does not overlay the core pad.

[0023] Preferably the core pad is of at least one ply of foam.

[0024] Preferably the ply of foam is a shaven ply of foam to define at least at the thin perimeter region, a reduced thickness of said core pad.

[0025] Preferably the extent of the core pad at where it is located at a breast cup is smaller than the breast cup.

[0026] Preferably the core pad consists of two plies of foam material laminated with each other and for each breast cup, capturing an underwire.

[0027] Preferably both plies of foam material are tapered to define the thin perimeter region.

[0028] Preferably one of the foam plies defines the thin perimeter region of the core pad, the other foam ply including a perimeter region that sits inward of the thin perimeter region.

[0029] Preferably the perimeter region that sits inward of the thin perimeter region is also a tapered perimeter region.

[0030] Preferably the core pad has perimeter regions other than at least part of the thin perimeter region that are contiguous the perimeter of the breast cups.

[0031] Preferably there are two core pads, one for each breast cup.

[0032] Preferably there is one core pad that extends across a bridge between the cups to extend at part of each breast cup.

[0033] Preferably the bra is a molded bra.

[0034] Preferably the bra is a seamless bra.

[0035] In a second aspect the present invention consists in a core panel for a bra that includes two breast cups that each include an outer fabric layer and an inner fabric layer and wherein a neckline perimeter of each breast cup is defined at least by one of the outer fabric layer and inner fabric layer, wherein said core pad includes a tapered perimeter region to define a thin perimeter region, said thin perimeter region to be located inward of the neckline perimeter.

[0036] In a further aspect the present invention consists in a core panel for a bra comprising:

> a first ply of foam material that includes an upper perimeter region to be located proximate more the neckline of at least one breast cup of a bra with which the core panel is to be incorporated,
> a second ply of foam material laminated to the first ply of foam material

wherein the upper perimeter region of the first ply of foam material is tapered so that the upper perimeter region of the first ply is thinner than the body region of the first ply.

[0037] Preferably the second ply includes an upper perimeter region contiguous the upper perimeter region of the first ply.

[0038] Preferably the second ply includes an upper perimeter region that is at least partly located inwardly of the perimeter region of the first ply.

[0039] Preferably the upper perimeter region of the second ply is tapered so that the upper perimeter region of the second ply is thinner than the body region of the first ply.

[0040] Preferably the first and second plies capture at least one underwire structure.

[0041] Preferably the first and second plies define a shape to the core pad that in use will extend at each breast cup of a bra with which it is to be incorporated.

[0042] Preferably the core pad is molded to include a cup form.

[0043] Preferably the core pad is molded to include two cup forms.

[0044] In a further aspect the present invention consists in a molded brassiere including,

a core pad of at least an inner layer of molded foam material preferably laminated with an outer layer of molded foam material, said core pad defining two breast cup regions and an intermediate bridge region extending there between and wherein at least one layer of flexible material having non-stretch properties is provided adjacent one of or intermediate of and laminated with said inner and outer layer of molded foam material at said bridge region, said flexible material having non-stretch properties oriented so that across the bridge region parallel to the cup to cup direction said core pad is non-stretchable, and

an inner and outer layer, each of at least a fabric material, is disposed on opposed sides of and each laminated with said core pad on a respective interior and exterior side of said core pad to preferably encase said core pad, at least one of the inner and outer layer at least partially defining a neckline perimeter,

wherein the core pad includes a tapered perimeter region defining a thin perimeter region located inward of the neckline perimeter.

[0045] Preferably said flexible material having non stretch properties is a woven fabric material with bi directional non-stretch properties and is oriented such that the non stretch orientation extends across said bridge region parallel to the cup to cup direction of said core pad.

[0046] Preferably said layer of flexible material having non stretch properties is captured intermediate of said inner and outer layer of molded foam material.

[0047] Preferably said inner and outer layers of foam are coextensive with each other and both define the perimeter of the said core pad.

[0048] Preferably said inner and outer layers of foam are staggered such that the outer layer may extend to define the neckline perimeter and the inner layer may sit inward of the neckline perimeter at at least part of the neckline perimeter.

[0049] Preferably said core pad perimeter terminates short of said neckline perimeter.

[0050] Preferably said core pad is of a shape defining only the breast cups and said bridge, but not shoulder straps and chest strap(s).

[0051] Preferably said chest straps extend outwardly from each side of said core pad provided region of said molded brassiere.

[0052] Preferably two underwire structures are provided intermediate of said inner layer and said outer layer of foam, one each adjacent the breast cup regions.

[0053] Preferably said inner layer and said outer layer of foam are laminated directly to each other save for said flexible material having non-stretch properties and said two underwire structures.

[0054] Preferably said underwire structure comprises a rigid elongate member and a flexible material casing about at least part of said rigid elongate member.

[0055] Preferably said casing is a fabric material.

[0056] Preferably said casing is adhered to one or each of the facing surfaces of said inner and outer layers of foam by an adhesive material.

[0057] Preferably said casing is a tubular sock within which said rigid elongate member is located, the sock having closed distal ends.

[0058] Preferably said outer fabric layer may be lace.

[0059] Preferably said inner fabric layer may be a sheer fabric.

[0060] Preferably at least side of core pad proximate the lace layer has an intermediate backing material.

[0061] Preferably there is an intermediate backing material between interior and exterior sides of said core pad and respective said inner and outer fabric layers.

[0062] Preferably the outer fabric layer may consist of at least two plies of material.

[0063] Preferably the two plies of material may be butt joined or lap joined.

[0064] In a further aspect the present invention consists in a bra that includes two breast cups from each of which there extends a chest band portion each chest band portion including at least an interior most panel and an exterior most panel, each chest band portion including an upper perimeter and a lower perimeter, wherein captured between and adhered with said interior most panel and said exterior most panel is at least one elastic band that is located to extend at least along at least part of and adjacent the upper perimeter and lower perimeter.

[0065] Preferably the interior most panel and exterior most panel are fabric.

[0066] Preferably intermediate of at least one of the (i) exterior most panel and (ii) interior most panel, and the at least one elastic band, is at least one additional panel.

[0067] Preferably the additional panel is a foam paneL

[0068] Preferably the foam panel is coextensive with at least one of the exterior most panel and interior most panel.

[0069] Preferably the interior most panel and the exterior most panel are coextensive each other.

[0070] Preferably for each chest band portion, the elastic band is contiguous at least one of the exterior most panel and interior most paneL

[0071] Preferably for each chest band portion, the elastic band extends between the adjacent breast cup and the free distal end of the chest band portion.

[0072] Preferably for each chest band portion, the elastic band extends from the adjacent breast cup to the free distal end of the chest band portion.

[0073] Preferably the at least one elastic band is adhered with the exterior most panel and interior most panel by adhesive tape disposed to each side of said at least one elastic band.

[0074] Preferably the at least one elastic band is adhered to the exterior most panel and interior most panel by adhesive tape disposed to each side of said at least one elastic band.

[0075] Preferably for each chest band portion there are two elastic bands, a first elastic band that is located to extend at least along at least part of and adjacent the upper perimeter and a second elastic band that is located to extend at least along at least part of and adjacent the lower perimeter.

[0076] Preferably the exterior most panel and interior most panel are laminated with each other.

[0077] Preferably the exterior most panel and interior most panel are laminated to each other.

[0078] In a further aspect the present invention consists in a bra that includes two breast cups that each include an outer fabric layer and an inner fabric layer and wherein a neckline perimeter of each breast cup is defined at least by one of the outer fabric layer and inner fabric layer, wherein at each breast cup, a core pad is captured between the inner fabric layer and the outer fabric layer that includes a tapered perimeter region to define a thin perimeter region, said thin perimeter region located inward of the neckline perimeter and wherein extending from each of said two breast cups is a chest band portion each chest band portion including at least an interior most panel and an exterior most panel, each chest band portion including an upper perimeter and a lower perimeter, wherein captured between and adhered with said interior most panel and exterior most panel is at least one elastic band that is located to extend at least along at least part of and adjacent the upper perimeter and lower perimeter.

[0079] In a further aspect the present invention consists in a bra that includes

an exterior most fabric layer and an interior most fabric layer each defining two breast cups and two chest band portions extending from a respective breast cup, and

wherein a neckline perimeter of each breast cup is defined at least by one of the exterior most layer and interior most layer, wherein at each breast cup, a core pad is captured between the exterior most layer and interior most layer that includes a tapered perimeter region to define a thin perimeter region, said thin perimeter region located inward of the neckline perimeter, and

wherein said interior most layer and an exterior most layer at each chest band portion define an upper perimeter

and a lower perimeter, wherein captured between and adhered with said interior most layer and exterior most layer at each said chest band portion is at least one elastic band that is located to extend at least along at least part of and adjacent the upper perimeter and lower perimeter.

[0080] In a further aspect the present invention consists in a molded brassiere including:

> a core pad of at least an inner layer of molded foam material preferably laminated with an outer layer of molded foam material, said core pad defining two breast cup regions and an intermediate bridge region extending there between and

wherein at least one layer of flexible material having non-stretch properties is provided adjacent one of or intermediate of and laminated with said inner and outer layer of molded foam material at said bridge region, said flexible material having non-stretch properties oriented so that across the bridge region parallel to the cup to cup direction said core pad is non-stretchable, and

an inner and outer layer, each of at least a fabric material, is disposed on opposed sides of and each laminated with said core pad on a respective interior and exterior side of said core pad to preferably encase said core pad, at least one of the inner and outer layer at least partially defining a neckline perimeter,

wherein the core pad includes a tapered perimeter region defining a thin perimeter region located inward of the neckline perimeter, and

wherein extending from each breast cup region is a chest band portion defined at least in part by the inner and outer layer, each said chest band portion includes an upper perimeter and a lower perimeter, wherein captured between and adhered with said inner and outer layer is at least one elastic band that is located to extend at least along at least part of and adjacent the upper perimeter and lower perimeter.

[0081] This invention may also be said broadly to consist in the parts, elements and features referred to or indicated in the specification of the application, individually or collectively, and any or all combinations of any two or more of said parts, elements or features, and where specific integers are mentioned herein which have known equivalents in the art to which this invention relates, such known equivalents are deemed to be incorporated herein as if individually set forth.

[0082] Where reference herein is made to interior and exterior or similar terminology in relation to component parts or items of the bra or part of the bra, it is meant to be understood to be in relation to the body of the wearer of the bra. For example the "interior" or "inner side" or "inner region" is a relative term to denote that an item is more proximate the face side of the bra that is more proximate to the body of the wearer than items of the bra that are more distal the body of the wearer . "Inner" does not mean "inner most" unless specified. This similarly applies to terms such as "outer" or "exterior".

[0083] Where there is reference to the word "layer" it is to be understood that it may have its common definition and, but not limited to that the layer could consist of one panel or may have regions that are defined by two or more panels that are joined and that may each be of a different characteristic (e.g. color, thickness, material, orientation, size).

[0084] Where there is reference to the word "layer" it is to be understood that it may have its common definition and, but not limited to that the layer may be of one ply or of more plies of the same or dissimilar characteristics (e.g. color, thickness, material, orientation, size) that are engaged to each other such as by lamination or other in an at least partial overlapping configuration.

[0085] By seamless is meant the bra is visibly substantially seamless, in that the edges of the bra are finished in a seamless way, for example by ultrasonic welding, or by folding the edge of an outer layer over and affixing it to an inner layer by a non-stitching means, or by some other means that is substantially without seams. Seams may however be found inside the bra structure where it is not externally visible, or in visibly less conspicuous externally at places such as the region where the shoulder strap is attached to a bra cup region, or the region where hook or eye tape is connected to the chest bands.

[0086] As used herein the term "and/or" means "and" or "for", or both.

[0087] As used herein "(s)" following a noun means the plural and/or singular forms of the noun.

[0088] The term "comprising" as used in this specification means "consisting at least in part of". When interpreting statements in this specification which include that term, the features, prefaced by that term in each statement, all need to be present but other features can also be present. Related terms such as "comprise" and "comprised" are to be interpreted in the same manner.

BRIEF DESCRIPTION OF THE DRAWINGS

[0089] A preferred form of the present invention will now be described with reference to the accompanying drawings in which:

> Figure 1 is a plan view of a bra of the present invention,
>
> Figure 2a illustrates a variation to the formation of the present invention wherein each breast cup may be separately defined and incorporate the features and optional features herein described wherein each component can then be fastened together at the bridge region,
>
> Figure 2b illustrates the incorporation of the components defining the breast cup or breast cup region and other components capable of being engaged or fastened therewith to define a bra,
>
> Figure 3 is a front view of part of a bra showing some components in a partial see through manner to illustrate the core pads in location at each of the breast

cups,

Figure 4 is a sectional view through section AA of Figure 3,

Figure 5 is a sectional view through section AA but only through and of a variation of the core pad,

Figure 6 is a sectional view through section AA but only through part of and of a variation of the core pad of Figure 3,

Figure 7 is a plan view of the core pad shown in part in Figure 6,

Figure 8 is a sectional view through part of section AA of a variation of Figure 3 illustrating the core pad and exterior and interior layers,

Figure 9 is a partial front view of a bra showing some components in a see-through condition,

Figure 10 is a front view of part of a bra of a variation of the invention,

Figure 11a is a sectional view through section BB of Figure 10,

Figure 11b is an exploded view of Figure 11a with a slight variation of the exterior most panel,

Figure 12 is an exploded view of a variation of Figure 11a,

Figure 13 is a sectional view a two part exterior most panel configuration,

Figure 14 is a perspective view of part of a bra illustrating the incorporation of elastic bands at the chest strap region of a bra, and

Figure 15 is a perspective view of part of a bra illustrating the incorporation of an elastic band at the chest strap region of a bra.

DETAILED DESCRIPTION OF THE INVENTION

[0090] With reference to Figure 1 there is shown a bra 100 that may generally be defined by a breast cup region 102, chest bands 103 and 104 and shoulder straps 105 and 106. The shoulder straps 106 and 105 may extend between the breast cup region 102 and each of the chest bands 103 and 104 respectively.

[0091] Such over the shoulder straps may however be optional as it is envisaged that the bra may also be of a strapless version. Indeed whilst reference is herein made to a bra, it is envisaged that the assembly of panels component parts and items to define such, may alternatively be incorporated into other garments such as, for example, evening dresses or bathing suits or similar.

[0092] At the ends of each of the chest bands may be fasteners 107 and 108 that are mutually cooperative to allow for the bra to be fastened about the chest of a wearer.

[0093] The bra may be seamless and made from materials at least some of which are molded or moldable and that are engaged to each other preferably at least in part by lamination.

[0094] As can be seen with reference to Figure 2b the components defining the breast cup region 102 may be fastened to the components defining the chest band 103 and the shoulder strap 106. Such fastening may occur by adhesive and/or ultrasonic welding or other forms of welding and/or by stitching. Stitching is not the preferred form of assembly. In the most preferred form the bra of the present invention is a seamless bra that incorporates little or no stitching at all. With reference to Figures 2a and 2b it can be seen that a bra of the present invention can be made from discrete components such as the breast cups and the chest bands that are during the manufacture of the bra fastened together. However in the most preferred form the or at least some of the plies of material of the bra are continuous over both breast cups and both chest bands.

[0095] The breast cup region 102 preferably defines two breast cups 109 and 110 that are adjacent to each other and between which may extend an intermediate bridge region 111. At least some of the material components defining the breast cups 109 and 110 are continuous over the entire breast cup region 102, including across the bridge region 111. Alternatively some or all of the material components may only be present at at least part of the breast cups 109 and 110.

[0096] In the preferred form, at least one of the material components of the breast cup region 102 is continuous over the breast cup region 102 and preferably also over the bridge region. However in alternative forms each of the breast cups 109 and 110 may be separately predefined as for example shown in Figure 2a and may be affixed together at the bridging region 111 to define, once assembled, a breast cup region 102.

[0097] The bra includes a neckline perimeter 121 and 122 at each of the breast cups 109 and 110. The neckline perimeter may be continuous or may be discretely defined for each breast cup. The neckline perimeter generally extends from an upper region of each breast cup preferably at where the shoulder straps are engaged to the breast cup, to or towards the bridge region 111. The neckline perimeter as shown in the bra in Figure 1, is preferably continuous across the neckline perimeter and extends from shoulder strap to shoulder strap. The neckline perimeter generally sits above a substantial part of the breast of the wearer. The neckline is often that part of the bra that is exposed through the likes of the necked tops or shirts. It is also that part of the bra against which clothing may cling or sit tightly against.

[0098] Additional components, layers or plies of material may be provided with the materials defining the breast cup region and/or the bra, to those herein defined.

[0099] Variations to the bra shown in Figure 1 may include where the chest bands 104 and 103 are unitary and may extend along the lower perimeter of the breast cup region 102. The bra may be a front opening bra where mutually cooperative fasteners are positioned at the bridge region 111 to allow the bra to be opened and fastened at that region.

[0100] With reference to Figure 3 there is shown part of a bra wherein at each breast cup 109 and 110, there is provided a core pad 1, 2. In the upper regions of each

of the breast cups at and towards the neckline perimeter 121, a gradual reduction in the thickness of the breast cups is defined. Figure 3 shows an exterior most panel 4 on which is positioned the core pads 1, 2. Each core pad is shaped so as to taper at least at parts of each of the core pads towards at least part of the upper perimeter 5, 6 thereof. The upper perimeter of each cup is disposed more, towards the neckline perimeter 121/122 of the bra. The upper perimeter regions correspond to being located at the upper locations of each of the core pads. Preferably tapering of the pads occurs towards the entire upper perimeter region of each of the core pads. In the most preferred form tapering occurs towards the entire perimeter of the breast pads. Such tapering reduces the thickness of each of the core pads. This reduction in thickness, when the pads are incorporated in a bra and are captured between the exterior most layer 4 and interior most layer 7 as for example shown in Figure 4, will result in the tapered perimeter region of the core pads from becoming indistinguishable to the touch.

[0101] In the most preferred form at least that perimeter of each of the core pads that sits inward of the breast cup is tapered whereas any remaining perimeter of the core pad need not be tapered. Such non tapered perimeter regions need not be tapered because they are located at parts of the bra where other parts such as the underwire are located.

[0102] During manufacture of the core pad, a constant thickness sheet of a foam material may be taken and shaved to the appropriate form for defining the tapered perimeter region(s).

[0103] Most preferably the core pad 1 and 2 are of a size so that its side and lower perimeters are substantially contiguous the corresponding breast cup perimeter regions whereas the upper perimeter region of the core pads sit inward of the neckline perimeter of each of the breast cups.

[0104] In one form of the present invention the bra is defined by an exterior most panel 4 and an interior most panel 7 of a flexible material such as a fabric material capturing therebetween a core pad at each of the breast cups. As shown in Figure 4, each core pad may consist of a single ply of foam material. The exterior most panel 4 and interior most panel 7 extend beyond the upper perimeter 6 of the core pad to terminate at the neckline perimeter 121.

[0105] In the example shown in Figure 4 both the exterior and interior most panels are contiguous at the neckline perimeter. Preferably the interior and exterior most panels 4 and 7 are contiguous across the entire breast cup regions and chest band regions of the bra.

[0106] Preferably the exterior most panel 4 and interior most panel 7 and the core pads are laid up and by the use of adhesive bonded or tacked together in a layflat condition after which a subsequent mold forming of the three dimensional shape or shapes occurs. Additional materials may be incorporated with the interior and exterior most panels and core pads prior to or subsequent such molding steps. Such may include underwires, a non-stretch fabric bridge panel and/or others.

[0107] With reference to Figure 5, there is shown for example a variation to the core pad 1 wherein an underwire assembly 9 is positioned intermediate of two plies of foam 10, 11. An exterior ply 10 and interior ply 11 of foam material are bonded and preferably laminated together. An underwire assembly 9 that may include an underwire captured within a fabric sock is positioned intermediate of the plies 10 and 11. The foam plies capture the underwire assembly at least in part and preferably entirely therebetween. In-one form where two or more plies of foam material are laminated together to define a core pad, the foam plies are preferably of the same perimeter shape and are preferably fully laminated to each other save at where for example the underwire is laminated intermediate of the two plies.

[0108] A variation to the preferred form as shown by way of example with reference to Figure 5, is shown in Figure 6. In Figure 6, the exterior ply 10 is of a size to extend at least at one region of the perimeter of this ply beyond at least part of the perimeter region of the interior ply 11. The extension of the perimeter of the exterior ply 10 beyond the perimeter of the interior ply 11 preferably occurs at the perimeter region 6 of the core pad. Both the interior and exterior plies of foam material, having been shaved to define an upper tapered perimeter, allows for a thin perimeter to be defined at the region 6 of the core pad 1. Figure 7 shows the core pad 1. It can be seen that the perimeter 12 of the interior ply 11 sits inwardly of the perimeter 6 of the exterior ply 10. A staggered positioning of the perimeter of the ply at where tapering of the core pad is defined, allows for a thin perimeter of the core panel to be defined. Preferably the tapering is to a zero thickness.

[0109] With reference to Figure 8, such a staggering of panels may also occur in respect of the exterior and interior most panels 4 and 7. For example the exterior most panel 4 may extend to define the neckline perimeter 121 whereas the interior panel 7 may sit inward of the neckline perimeter 121 at at least part of the neckline perimeter. As well as defining a gradual tapering of the thickness of breast cups of the bra, the construction of the bra also reduces the thickness of the bra towards upper regions extending towards and/or at the neckline perimeter of the bra.

[0110] In the most preferred form, no foam core pad extends to be positioned at the neckline perimeter or perimeter regions of the bra. The foam core perimeter terminates short of the neckline perimeter.

[0111] This reduces thickness thereby helping reduce or eliminate deterability of the neckline perimeter and core pads, at least to the touch and/or visually when the bra is worn.

[0112] Having preferably only two overlying plies of material, defined by the exterior most panel 4 and interior most panel 7, at the upper region such as region 16 (that region positioned between the core pad and the neckline

perimeter of each of the breast cup), can also help with breathability and ventilation of the skin of the wearer at these regions.

[0113] With reference to Figure 9, a variation is shown wherein the core panel is continuous across the bridge region 111. Only one foam core pad 19 is provided rather than two discrete core pads 1/2 as previously described. The core pad 19 may also extend at least in part to and at at least part of the chest bands 103/104. Again the core pad 19 in this variation includes an upper perimeter that terminates inward of at least part of the neckline perimeter 121. Preferably the upper perimeter 6 terminates short of the entire neckline perimeter 121 of each of the breast cups.

[0114] With reference to Figure 10, a variation is shown where the exterior most panel consists of at least two plies of material. The exterior most panel 4 preferably consists of a first ply 21 and a second ply 22. The first ply 21 may be of a material of different characteristics (color or texture or thickness or other) to the second ply of material 22. The first ply of material 21 may for example be a lace material and may extend to and at at least part of the chest bands and part of each of the breast cups. The first ply of material 21 is preferably bonded to the second ply of material 22 along the join 23. The join 23 may be a butt join as shown in Figure 11a or may be a lap join as shown in Figure 13. Such joining may occur by adhesive and/or ultrasonic welding. A bra that includes a variation in outwardly appearance by this construction of the outermost panel may be defined. Where the first ply 21 is of a lace material, it may include apertures providing a see-through effect. A contrasting colour material may be provided by a backing material to the lace. Indeed multiple contrasting materials may be provided to provide a backing to the lace.

[0115] Most preferably the join 23 is contiguous at least part of the upper perimeter 6 of the core pad 1. Alternatively and with reference to Figure 11b, the perimeter 23 may at least in part sit inwardly of the core panel 1. Where for example a lace material defines the ply 21 and the join 23 extends across part of the core pad 1, the core pad 1 is preferably laminated with at least one and preferably both fabric plies 26 and 27.

[0116] A variation where the core panel consists of a single ply of foam material, the core panel 1 is lined by opposed plies 26 and 27. Preferably the foam panel is captured between the plies. The plies hide the foam from being visible through the lace material.

[0117] Preferably both sides of the foam panels 10 and 11 are laminated with plies 26 and/or 27 although in one form the interior side of the foam panel need not be lined by the ply 26.

[0118] The interior most panel 7 may be of a fabric material or of a sheer fabric material. It may also be of two or more plies bonded together but is preferably of one piece and preferably coextensive with the exterior most panel. At least at some of the regions other than where the core pad is provided, the sheer material will be visible through the lace material from external of the bra. For example, through the apertures of the lace material 21, the sheer material 7 will be visible. At regions where the sheer material may extend over the foam panels, apertures through the lace material allow for the ply 27 of the core panel to be seen therethrough.

[0119] With reference to Figure 14 there is shown part of a bra 500 wherein a particular construction of a chest band is shown. The construction of the chest band 503 (and which is duplicated on the chest band on the other side of the bra) includes the exterior most fabric panel 507 and interior most fabric panel 504. Intermediate of the exterior and interior most fabric panels 507, 504 may be further panels of material in addition to the components hereinafter described relating to the incorporation of elasticity in the chest band. For example the interior more panel may be an assembly of a foam panel with an interior most fabric panel laminated to it. Likewise the exterior more panel may be an assembly of a foam panel with an exterior most fabric panel laminated to it.

[0120] Elasticity can be incorporated in the chest band 503 by the provision of two elastic bands 560 and 561. In the most preferred form the elastic bands 560 and 561 are contiguous the interior most and exterior most fabric panels 504 and 507 although additional panels of material on one or both sides of the elastic bands 560 and 561 may be provided.

[0121] The elastic band 560 preferably extends adjacent along and parallel to the upper perimeter 573 of the chest band 503. It preferably extends between and preferably from or proximate the breast cup 509 to or towards the chest strap claps (not shown) at the other end of the chest band 503.

[0122] The elastic band 561 preferably extends adjacent along and parallel to the lower perimeter 574 of the chest band 503. It preferably extends between and preferably from or proximate the breast cup 509 to or towards the chest strap claps (not shown) at the other end of the chest band 503.

[0123] During assembly of the bra (or of a chest band 503 to be incorporated with other components to define the bra) adhesive tape is utilised. Preferably the adhesive tape is known as Bemis adhesive tape which is a two sided heat sensitive adhesive tape.

[0124] By way of example to illustrate the adhesive tape, a strip of adhesive tape 531 is shown located between the elastic band 560 and the interior most panel 504.

[0125] In the most preferred form the chest band is constructed by having both sides of each elastic bands 560,561 attached to the two-sided heat sensitive adhesive tape. The adhesive will provide the greatest adhesion when it is heated up during lamination of the two panels 504,507 and the elastic bands 560,561 together by the application of heat and pressure. At room temperature, the adhesive only provides low adhesion but which is sufficient for moderately fixing the elastic bands 560,561 at the desired positions on one of the two panels

504,507 immediately before performing the lamination. If the external side of the exterior most fabric panel 507 is to face upwards during the lamination, the elastic bands 560,561 are preferably placed on the internal side of the interior most panel 504

[0126] Alternatively and less preferred, the adhesive tape may for example be provided on the interior most fabric panel 504 at where the elastic bands 560 and 561 are to be located. Likewise the exterior most fabric panel 507 may have adhered to it such tape at where the elastic bands 560 and 561 are to be located. The tape is preferably provided adjacent the longitudinally extending perimeter edges of the respective interior most and exterior most fabric panels. The elastic bands 560 and 561 may be applied to the exposed side of the tape on the interior most fabric panel and thereafter the exterior most fabric panel 507 may be adhered to the exposed side of the elastic band 560 and 561 by adhering the adhesive tape engaged to the exterior most fabric panel 507 thereto. However this may alternatively be achieved by firstly appaneling the elastic band 560 and 561 to their respective adhesive tape on the exterior most fabric panel 507 thereafter adhering the exposed side of the elastic bands to the exposed surfaces of the adhesive tape on the interior most fabric panel 504.

[0127] In yet an alternative manner, the adhesive tape may firstly be applied to each side of each of the elastic bands 560 and 561 thereafter the exterior and interior most fabric panels 507 and 504 being applied to the exposed surfaces of the tape. It will be appreciated that other combinations of assembling the chest band construction may be achieved.

[0128] Once the layers are assembled, wherein the elastic bands 560 and 561 are captured between the interior and exterior most fabric panels 504, 507, a lamination of the chest band can occur by the application of heat and pressure.

[0129] Two elastic bands 560,561 are so fixed in order to provide the chest band 503 with substantially even distribution of elasticity along the length of the chest band 503 when the brassiere 500 is being worn (i.e. when the chest band 503 is being stretched along its length). Such even distribution of elasticity cannot be achieved if only one of the elastic bands 560,561 is so fixed.

[0130] Even distribution of elasticity can also be achieved if a singe elastic band that is substantially coextensive to the boundary of the chest band 503 is used instead. This is for example shown in figure 15. In such an embodiment the single elastic band 590 may be substantially of the same shape as the chest strap and have an upper perimeter provided as where the upper perimeter of the upper elastic band 560 is provided and a lower perimeter as where the lower perimeter of the lower elastic band 561 is provided. Adhesive 591 and 592 may be provided on each side of the band 590.

[0131] Nevertheless, using two elastic bands 560, 561 is preferred in order to save some material costs.

[0132] The chest band construction as herein described that incorporates the elastic band or bands may be utilized in combination with the breast cup construction as herein described to offer a product with a number of advantages over prior art.

[0133] The or some of the fabric material used may be of a material known by model number CMF-7440MU of Friendly Foundate Ltd. This fabric is made of 80% Tactel and 20% lycra. The fabric layer 9 may have a make-up of approximately 80% Tactel 40d/34f and 20% lycra 40d and of a weight of, for example, 190 g/m2.

[0134] The foam used is preferably a polyurethane foam of a precursor density of, for example, 30-40d.

[0135] Adhesive used may be of a kind such as RM-30 of Ultra Energy Adhesive Trading Co., Ltd.

[0136] The bridge fabric may be 7118 of Goldspring Co. Ltd. It is preferably a piece of gauze which is 100% nylon.

[0137] One or all the molding processes occur preferably at an upper mold temperature of 180° C. to 200° C. and the lower mold is preferably of 180° C. to 200° C. The dwell time holding the mold portions together is for example 120 seconds.

Claims

1. A core panel for a bra comprising:

   a first ply of foam material that includes an upper perimeter region to be located proximate more the neckline of at least one breast cup of a bra with which the core panel is to be incorporated, a second ply of foam material laminated to the first ply of foam material,

   wherein the upper perimeter region of the first ply of foam material is tapered so that the upper perimeter region of the first ply is thinner than the body region of the first ply.

2. A core panel for a bra of claim 1 wherein the second ply includes an upper perimeter region contiguous the upper perimeter region of the first ply.

3. A core panel for a bra of claim 1 wherein the second ply includes an upper perimeter region that is at least partly located inwardly of the perimeter region of the first ply.

4. A core panel for a bra of claim 1 wherein the upper perimeter region of the second ply is tapered so that the upper perimeter region of the second ply is thinner than the body region of the first ply.

5. A core panel for a bra of claim 1 wherein the first and second plies capture at least one underwire structure.

6. A core panel for a bra of claim 1 wherein the first and second plies define a shape to the core pad that in use will extend at each breast cup of a bra with which it is to be incorporated.

7. A core panel for a bra of claim 1 wherein the core pad is molded to include a cup form.

8. A core panel for a bra of claim 1 wherein the core pad is molded to include two cup forms.

9. A molded brassiere including:

a core pad of at least an inner layer of molded foam material preferably laminated with an outer layer of molded foam material, said core pad defining two breast cup regions and an intermediate bridge region extending there between and wherein at least one layer of flexible material having non-stretch properties is provided adjacent one of or intermediate of and laminated with said inner and outer layer of molded foam material at said bridge region, said flexible material having non-stretch properties oriented so that across the bridge region parallel to the cup to cup direction said core pad is non-stretchable, and

an inner and outer layer, each of at least a fabric material, is disposed on opposed sides of and each laminated with said core pad on a respective interior and exterior side of said core pad to preferably encase said core pad, at least one of the inner and outer layer at least partially defining a neckline perimeter,

wherein the core pad includes a tapered perimeter region defining a thin perimeter region located inward of the neckline perimeter.

10. A molded brassiere of claim 9 wherein said flexible material having non stretch properties is a woven fabric material with bi-directional non-stretch properties and is oriented such that the non stretch orientation extends across said bridge region parallel to the cup to cup direction of said core pad.

11. A molded brassiere of claim 9 wherein said layer of flexible material having non stretch properties is captured intermediate of said inner and outer layer of molded foam material.

12. A molded brassiere of claim 9 wherein said inner and outer layers of foam are coextensive with each other and both define a perimeter of the said core pad.

13. A molded brassiere of claim 9 wherein said inner and outer layers of foam are staggered such that the outer layer may extend to define the neckline perimeter and the inner layer may sit inward of the neckline perimeter at at least part of the neckline perimeter.

14. A molded brassiere of claim 12 wherein said core pad perimeter terminates short of said neckline perimeter.

15. A molded brassiere of claim 9 wherein said core pad is of a shape defining only the breast cups and said bridge, but not shoulder straps and chest strap(s).

16. A molded brassiere of claim 15 wherein said chest straps extend outwardly from each side of said core pad provided region of said molded brassiere.

17. A molded brassiere of claim 9 wherein two underwire structures are provided intermediate of said inner layer and said outer layer of foam, one each adjacent the breast cup regions.

18. A molded brassiere of claim 17 wherein said inner layer and said outer layer of foam are laminated directly to each other save for said flexible material having non-stretch properties and said two underwire structures.

19. A molded brassiere of claim 18 wherein said underwire structure comprises a rigid elongate member and a flexible material casing about at least part of said rigid elongate member.

20. A molded brassiere of claim 19 wherein said casing is a fabric material.

21. A molded brassiere of claim 19 wherein said casing is adhered to one or each of the facing surfaces of said inner and outer layers of foam by an adhesive material.

22. A molded brassiere of claim 19 wherein said casing is a tubular sock within which said rigid elongate member is located, the sock having closed distal ends.

23. A molded brassiere of claim 9 wherein said outer fabric layer may be lace.

24. A molded brassiere of claim 23 wherein said inner fabric layer may be a sheer fabric.

25. A molded brassiere of claim 23 wherein at least side of core pad proximate the lace layer has an intermediate backing material.

26. A molded brassiere of claim 23 wherein there is an intermediate backing material between interior and exterior sides of said core pad and respective said inner and outer fabric layers.

27. A molded brassiere of claim 9 wherein the outer fabric layer may consist of at least two plies of material.

28. A molded brassiere of claim 27 wherein the two plies of material may be butt joined or lap joined.

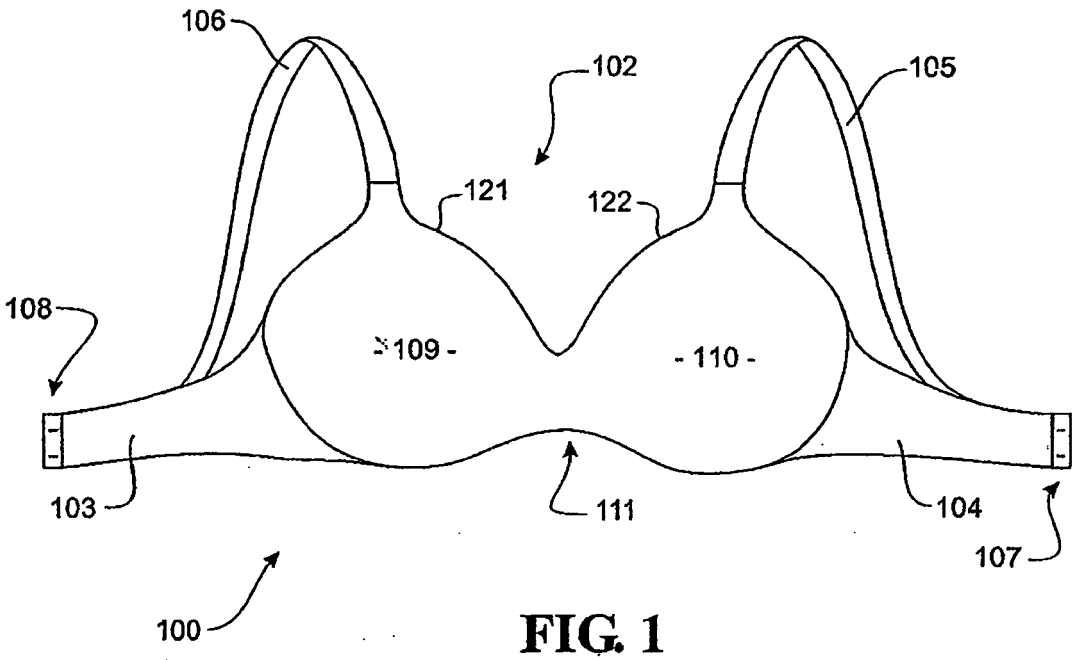


FIG. 1

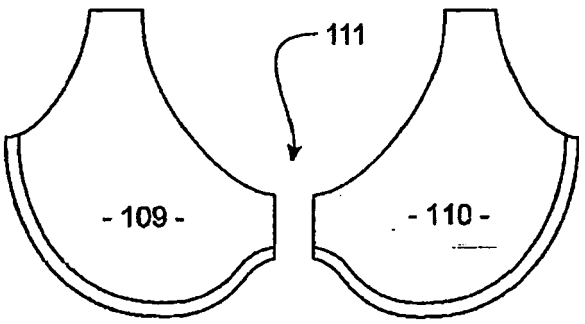


FIG. 2a

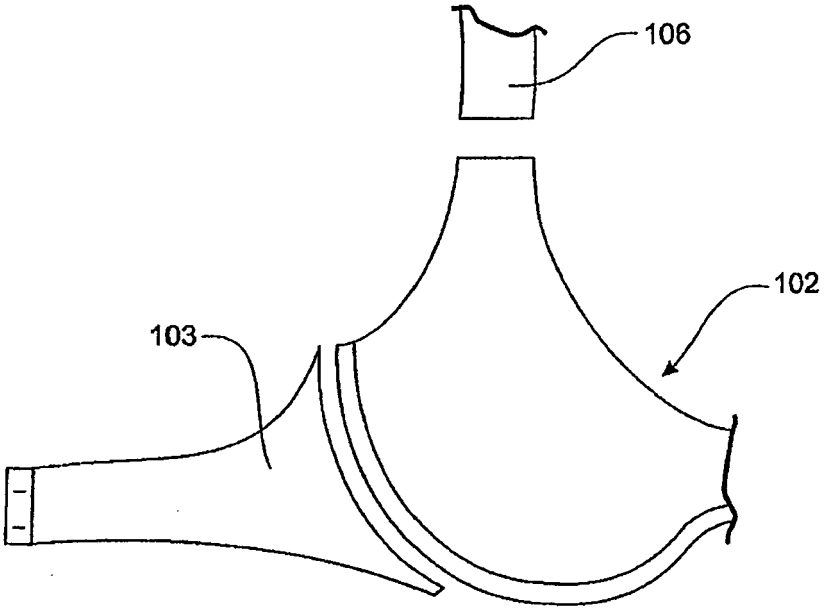


FIG. 2b

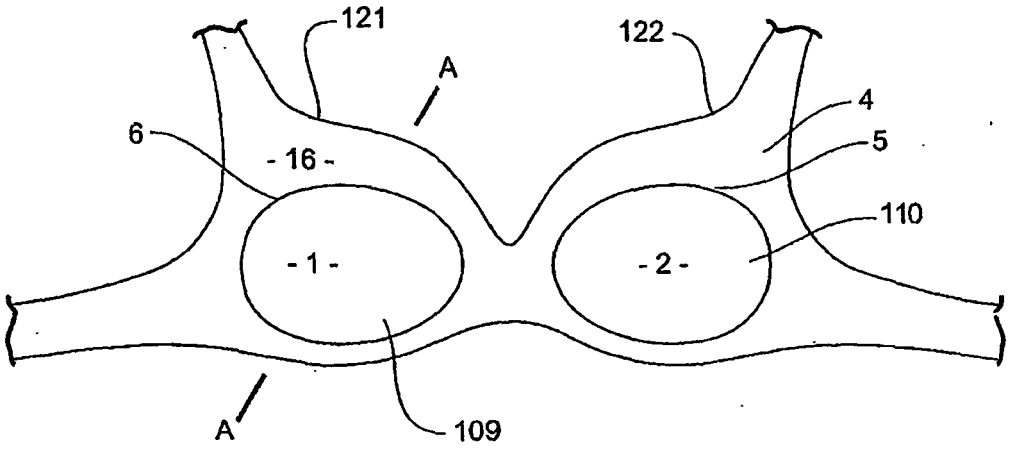


FIG. 3

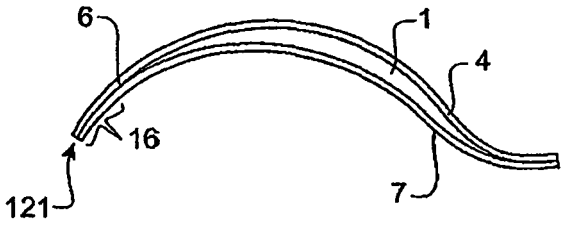


FIG. 4

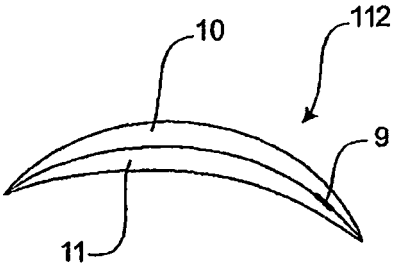


FIG. 5

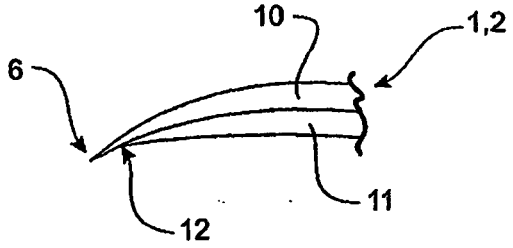


FIG. 6

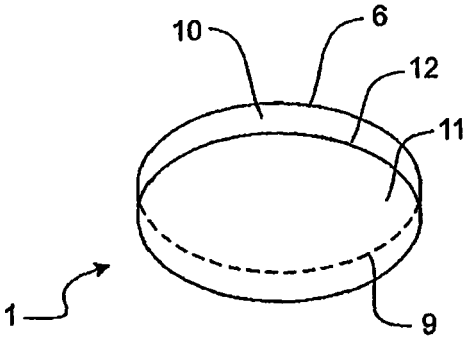


FIG. 7

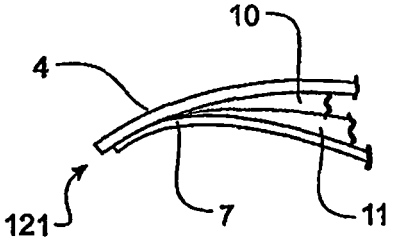


FIG. 8

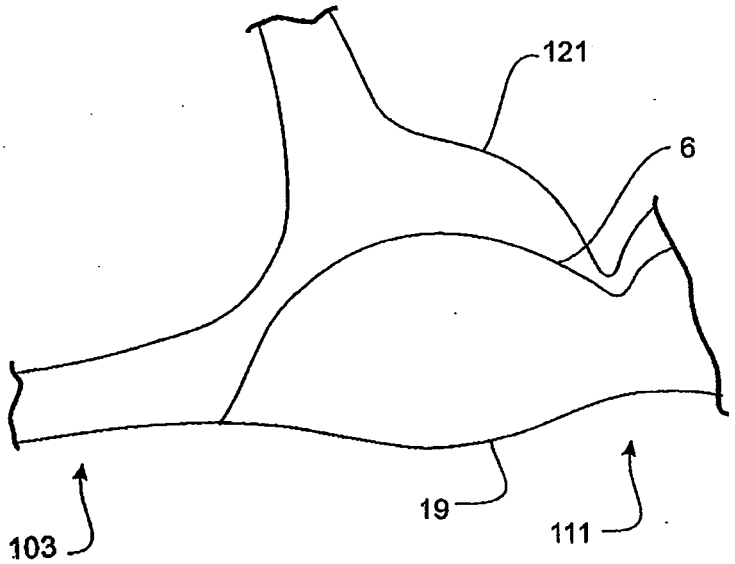


FIG. 9

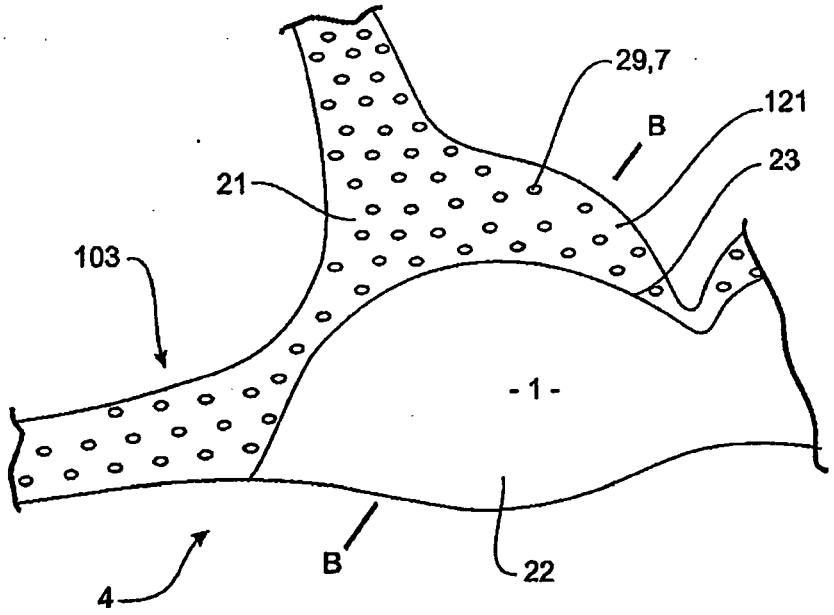


FIG. 10

FIG. 11a

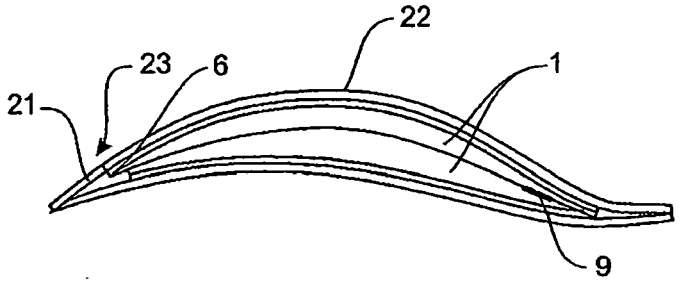


FIG. 11b

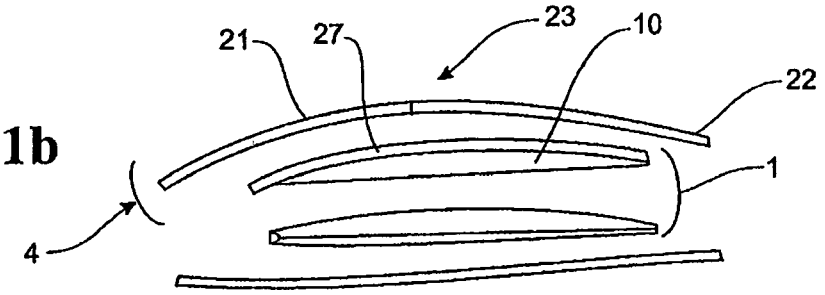


FIG. 12

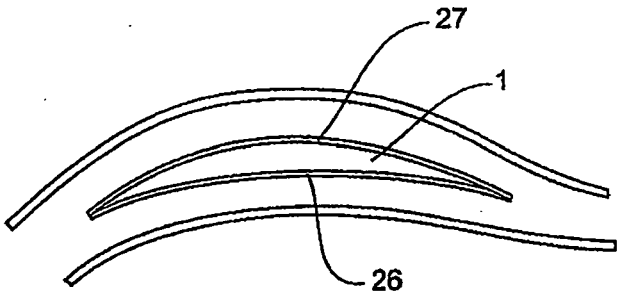
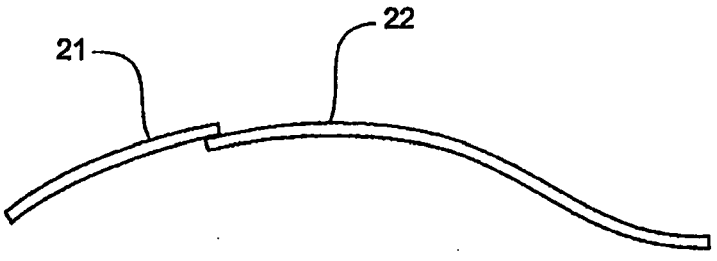


FIG. 13



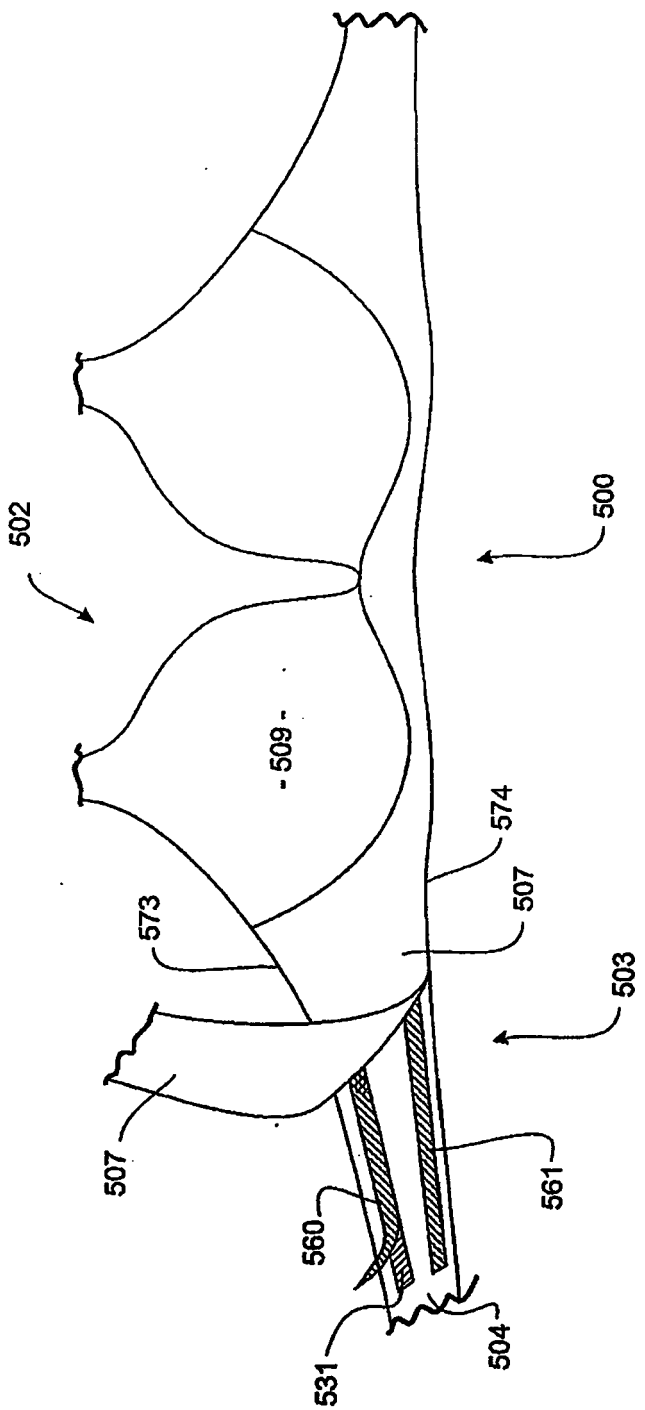


FIG. 14

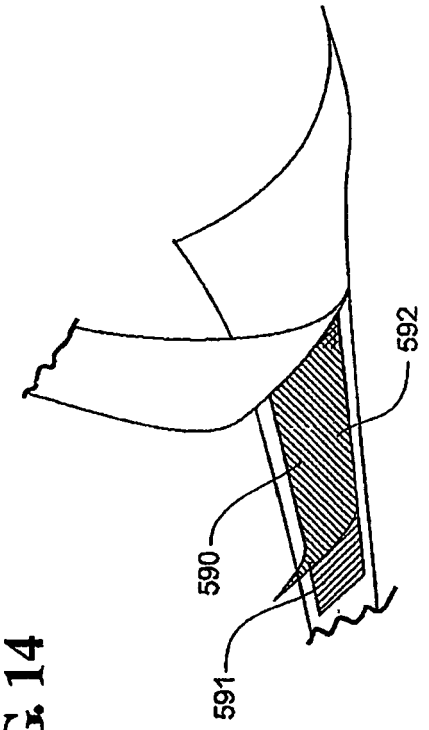


FIG. 15

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EUROPEAN SEARCH REPORT

Application Number
EP 09 07 5169

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	26 June 2009	Herry-Martin, D

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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