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(54) **Cup with magnetic opening system**

(57) The present invention relates to a cup which can be opened by means of components positioned at the supporting part of the cup and able to magnetically interact. The cup can be partially opened allowing discrete

and simple exposure of the breast. The cup can be part of a nursing garment to allow nursing of the infant.

The present invention further relates to a method for producing such cup or garments having such cups.

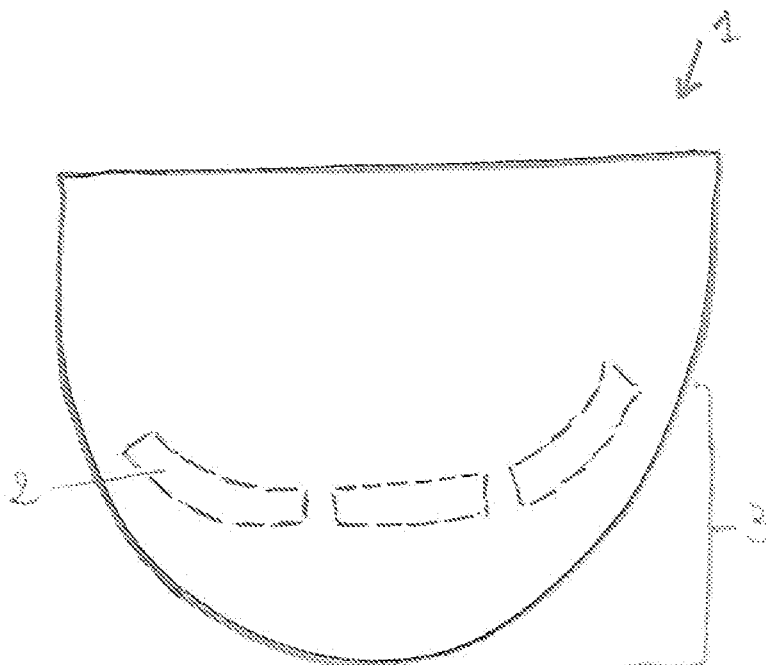


FIG 1

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to the field of garments having cups, in particular garments having cups which can be opened.

BACKGROUND OF THE INVENTION

[0002] Garments having cups which can be opened have long been known in the art, especially in the field of nursing garments. They have taken a number of forms including the form of a brassiere or other garment having a portion thereof which functions essentially as a brassiere.

[0003] Many such garment designs have utilized fasteners of some sort to temporarily release the cups and thereby provide the baby access to its mother's breast. A common design is the fastener on the strap. The use of such fasteners has obvious disadvantage. Main disadvantage is the difficulty in maneuvering and adjusting the cups when the nursing has ended. It is very difficult to maneuver with an infant in the arms while closing the cup. Often, the fastening means are hooks which are attached to the strap. The straps are elastic or at least connected with an elastic part to the back side of the body-encircling foundation. Due to elasticity, the hook on the strap may retract over the shoulder when the cup is opened. Hence, it is not easy to catch the hook on the strap and close the cup while holding an infant.

[0004] Garments with other fasteners for releasing the cups, such as snaps, buttons or loop and pile fasteners have been proposed. Such fastening means include the commonly known fastener VELCRO. The drawback of such fasteners is the difficult handling while at the same time being abrasive to the infant's skin.

[0005] Most examples of the garments designed for nursing have cups that open totally, exposing the whole breast when nursing. A substantial percentage of nursing bras open from the top of each cup, the cup being disconnected from the body of the bra at a location near the top of the bra and then being pulled downwards to expose the breast which is to be used for nursing.

[0006] Examples of nursing bras and garments are shown by White in U.S. Pat. No. 4,911,677; Knapp in U.S. Pat. No. 6,361,398; Turner et al in U.S. Pat. No. 6,074,273; Eggen, in U.S. Pat. No. 5,611,086 and Witczak, in U.S. Pat. No. 5,461,725. Portions of the bra essentially acting as cups and covering the breast of a user are detached by pulling major portions of the cup material downwardly for nursing. Most nursing bras open in this manner, despite the fact that this is not a comfortable and discrete manner for a mother to nurse the infant.

[0007] An example of a nursing bra is a bra with a magnetic opening and closure system where the magnet is attached to the strap of the bra. The website of Made in Femmes (<http://www.madeinfemmes.com>) shows a

nursing bra having a magnetic component attached on the top of the cup and the corresponding magnetic component on the strap and where a major portion of the cup material is pulled downwardly for nursing. The drawback of this nursing bra is that upon pulling downwards a major portion of the cup, it is not possible for the mother to nurse her infant in a discrete way.

[0008] Another drawback of conventional bras is that the use of breast compresses is hampered by the above referenced inflexibility of such bras. Use of breast compresses is particularly beneficial to avoid leaking and subsequent spots on the bra.

[0009] Given the above drawbacks, it is now an objective of the present invention to provide a cup which demonstrates flexibility in handling at the start and the end of the breast feeding.

[0010] It is a further objective to provide a cup providing the mother a maximum level of discretion to guarantee a comfort level for the mother to breastfeed in ideal circumstances.

[0011] It is yet another objective to minimize the level of irritation induced by the fastening means.

[0012] It is a fourth objective of the invention is to provide a cup which allows easy use of a breast compress.

SUMMARY OF THE INVENTION

[0013] The present invention is directed to a cup comprising a component positioned at the supporting part of the cup characterized in that said component is being able to magnetically interact.

[0014] The present invention is further directed to a method comprising the step of positioning a magnetically interacting component at the supporting part of the cup.

[0015] Further, the present invention is directed to a method for producing garments having cups, comprising the step of positioning a magnetically interacting component at the supporting part of the cup.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

FIG 1 illustrates a cup comprising a component that is able to magnetically interact and is located at the supporting part of the cup.

FIG 2 illustrates a cup comprising a component being able to magnetically interact and located at the peripheral side of the supporting part of the cup.

FIG 3 illustrates a cup comprising a component positioned at the peripheral side of the supporting part of the cup so that the cup opens partially. The component is able to magnetically interact.

FIG 4 illustrates a cup fully opened. A first set of components is fixed on the peripheral side of the supporting part of the cup and magnetically interacts with a second set of components fixed on the compress holder.

FIG 5 illustrates a cup which opens partially by means of components able to magnetically interact. FIG 6 illustrates a bra where the cup is partially opened from the supporting part of the cup towards the strap.

FIG 7 illustrates a bra where the cup is opened from the center of the body towards the nipple of the breast. The components at the inside of the peripheral side of the supporting part of the cup magnetically interact with a corresponding set of components on the body-encircling foundation of the bra. The body is not shown.

FIG 8 illustrates a preferred embodiment of the present invention. A nursing bra is illustrated. One of the cups is partially opened. The first set of components on the inside of the peripheral side of the supporting part of the cup magnetically interacts with a second corresponding set of components on the compress holder.

FIG 9 illustrates another embodiment of the present invention having a specific magnetic opening and closing system.

FIG 10 illustrates an embodiment where the first components are positioned on the outside of the peripheral side of the supporting part of the cup and the second corresponding components are positioned in an extra portion of tissue on the outer surfaces of the foundation about portions of the periphery of the openings. The corresponding components are able to magnetically interact.

DESCRIPTION OF THE INVENTION

[0017] The present invention is directed to a cup 1 comprising a component 2 positioned at the supporting part 3 of the cup 1 characterized in that said component 2 is able to magnetically interact.

[0018] In the context of the present invention the cup 1 is to be understood as the piece of tissue holding a breast, and the supporting part 3 of the cup 1 is to be understood as only that part where the breast is resting on.

[0019] As shown in FIG. 1 and 2, by providing a cup 1 comprising a component 2, positioned at the supporting part of the cup, said component 2 being able to magnetically interact, flexibility in handling the cup is guaranteed. At the moment the person wearing the cup 1 wishes to open and/or close the cup 1 for exposing the breast for clinical consultation or to nurse an infant, moving the cup 1 away from or towards the breast (not shown in the figure) is sufficient to flexibly open and close the cup 1. Moreover, by providing this flexible opening and closing system at the supporting part 3 of the cup 1, awkward situations are minimized. By reducing the handling and increasing the flexibility of the opening and closing system of the cup 1, discretion for the person wearing the cup 1 is maximized.

[0020] A further embodiment in accordance with the

present invention is a cup 1 wherein the component 2 magnetically interacts with a further corresponding component 12.

By magnetic interaction of the component 2 positioned at the supporting part of the cup 3 with the further corresponding component 12, no maneuvering is needed when the cup 1 needs to be closed. The woman only needs to bring the portion of the cup 1 opened towards a further corresponding component 12 and proper and comfortable closing is guaranteed.

The further component 12, magnetically interacting with the component 2 on the cup 1, may be positioned anywhere, as long as interaction with the component 2 on the cup 12 is possible. Possible locations to position this further corresponding component 12 are on a part of garment such as adjacent to or on the bail 13 of a bra, corset, sleeping suit or bikini.

[0021] In another embodiment in accordance with the present invention, and as illustrated in FIG. 4, a cup 1 is provided where the further corresponding component 12 is positioned at a compress holder 5. The compress holder 5, illustrated in FIG. 5, is a portion of tissue positioned at the inside of the cup 1. This provides extra support for the breasts and allows a breast compress to be enclosed in the holder and to stay in its place. Women may thus be tended to use breast compresses more often, which reduces the risk of spots of leaking on their garments.

[0022] In a further embodiment in accordance with the present invention a cup 1 is provided wherein the component 2 being able to magnetically interact is positioned at the periphery 4 of the supporting part 3 of the cup 1. By positioning the component 2 at the periphery 4 of the supporting part 3 of the cup 1, as illustrated in FIG. 2 and 3, it is possible for the person wearing the cup 1 to comfortably open the cup from the center of the body towards the underarm and/or vice versa, or open the cup from the supporting part towards the nipple of the breast.

[0023] In contradiction to prior cups with magnetic opening and closing means on top of the cup, normally opened by detachment of major portions of the cup material pulled downwards for uncovering the breast, the cup 1 can be opened in such way that not the whole breast need to be uncovered. A cup 1 where the component 2 is positioned at the periphery 4 of the supporting part 3 of the cup 1 provides the person wearing such cup 1 a comfortable and discrete manner to open the cup 1.

[0024] In accordance with the present invention, all forms of magnetically interacting components 2 and 12 may be used, such as bars, pastilles, squares, etc. Preferably, bars are processed in the cup 1.

The component 2 and the further corresponding component 12 may be positioned in any configuration, such as perpendicular to or in parallel with the periphery 4 of the supporting part 3 of the cup 1. Preferably, and to maximize a women's comfort, the components 2 and 12 are positioned in parallel with the periphery 4 of the supporting part 3 of the cup.

[0025] A further embodiment in accordance with the

present invention comprises a cup 1 which can be opened at least partially, as illustrated in FIG. 3 and 5. When a mother intends to nurse the infant, it may be convenient and more discrete to open only a part of the cup 1, exposing only the nipple of the breast to the infant.

[0026] Opening of the cup 1 can occur from the center of the body towards the underarm area, as shown in FIG. 5, and further in FIG. 7 to 9, where the cup 1 is part of a bra 6. By partial opening of the cup 1 from the center of the body towards the nipple, the cup 1 opens in the same manner as most of the clothing the mother wears, making it more comfortable for a nursing mother to release the breast for nursing while exposing a minimum of flesh. Alternatively, the cup 1 can be opened from the underarm area towards the center of the body.

[0027] In another embodiment in accordance with the invention and as illustrated in FIG. 6, showing a bra comprising a cup 1, the cup 1 can be partially opened from the supporting part 3 of the cup 1 towards the strap 7. By opening the cup 1 partially from the supporting part 3 of the cup 1 upwards, only the nipple is exposed, allowing discrete nursing of the baby.

[0028] In another embodiment in accordance with the invention, the component 2 which may magnetically interact is processed on the inner side 10 of the cup 1 and preferably covered by tissue in order to maximize the comfort and minimize irritation of the infant's skin.

[0029] In a further embodiment according to the present invention, by producing a cup 1 comprising a series of components 2, flexibility and magnetic attraction may be increased. Preferably, the cup 1 comprises a series of components 2 with alternating polarity. By positioning the components 2 such that there is alternating polarity, the magnetic power of the interacting components 2 and 12 may be increased while the mass of the magnetic components may be reduced. Preferably, the components 2 and 12 are processed in series of 3 components held together with a piece of adhesive strip.

[0030] In another embodiment, a cup 1 is produced with material suitable for adaptation to differing sizes of the breast allowing adaptations of breast sizes, especially experienced by nursing women.

[0031] In a preferred embodiment, a cup 1 is preferably processed with soft, easy to launder, elastic, moisture absorbing and anti-bacterial tissue to increase the nursing woman's comfort. Preferably tissues such as polyamide combined with elasthan, bio-cotton, bamboo tissues or elastic tissues treated with anti-bacterial are used.

[0032] In another embodiment, as shown in FIG. 10, the component 2 which may magnetically interact is processed on the outside of the cup 1. Opening and closing is possible by detaching an extra portion of tissue 11 attached to the body-encircling foundation 8 of the garment, e.g. a bra, and comprising the further corresponding component 12.

[0033] A further embodiment is a nursing bra where the further corresponding component 12, magnetically

interacting with the component 2 on the cup 1, is positioned on or adjacent to the bail 13 or on the compress holder 5. This guarantees perfect closure and improves the attractive power between the two components 2 and 12.

[0034] It is to be understood that all garments having cups such as bras, corsets, bikinis, sleeping suits, etc. and having cups 1 described above, fall within the scope of the invention as defined in the appended claims.

[0035] The present invention is further directed to a method of producing a cup 1, comprising the step of positioning a magnetically interacting component 2 at the supporting part 3 of the cup 1. After the cup 1 has been cut out according to the pattern specification, a component 2 is positioned at the supporting part 3 of the cup 1.

[0036] In a preferred method according to the present invention, the component 2 may be positioned parallel to the periphery 4 of the supporting part 3 of the cup 1. Preferably, the component 2 may be covered with tissue to maximize a woman's comfort. The component 2 may be processed in series of 3 components held together with a piece of adhesive strip. By processing the cup 1 comprising a series of components 2, flexibility and magnetic attraction may be increased. Preferably, the series of components 2 may be stitched to the cup 1 such that there is alternating polarity. By positioning the component 2 such that there is alternating polarity, the magnetic power of the component 2 may be increased.

[0037] The present invention is also directed to a method as described above, further providing a corresponding component 12 magnetically interacting with component 2. The further corresponding component 12 is preferably processed on a compress holder 5.

[0038] The present invention is further directed to a method for producing garments having cups 1, comprising the step of positioning a magnetically interacting component 2 at the supporting part 3 of the cup 1. The number of pieces of fabric is determined by the style of the garment. For a bra 6 comprising cup 1, four to six pieces are cut. Cups 1 for the bra are also cut. Preferably, the bra cup is placed between the lining and the front bra panels and the three pieces are stitched together. A side panel is then stitched to each of the front panels. For the straps 7, lengths of elastic are placed between two strap pieces and the three pieces are sewn together. The straps 7 are then sewn onto the front and side panels of the bra 6. Preferably, hooks are used as fastening means 9 to close the back of the bra 6. A metal or plastic hook 9 is sewn or ironed into a facing on the end of one side panel. A loop is made on the other side panel by folding the end piece over and stitching it to the panel. Preferably, at the end of the process, the component 2 is processed on the supporting part 3 of the cup 1, while the further corresponding component 12 is processed on the compress holder 5. Preferably, both components 2 and 12 may be processed in series of 3 bars, parallel to the periphery 4 of the cup 1, respectively the compress holder 5, and covered with tissue.

[0039] In an embodiment in accordance with the present invention, the component 2 may be positioned at the cup 1 before assembling the garment. Also corresponding component 12 may be positioned before assembling the garment. In this case, the components of the stitching machine may consist of magnetically not-interacting materials since components 2 and 12 are able to magnetically interact.

[0040] In another embodiment in accordance with the present invention, the component 2 may be positioned at the cup 1 after assembling the garment. Also corresponding component 12 may be positioned after assembling the garment. In that case, a stitching machine consisting of magnetically not-interacting materials is not required.

EXAMPLE

[0041] A person skilled in the art will understand that the examples described below are merely illustrative in accordance with the present invention and not limiting the intended scope of the invention. Other applications of the present invention may also be considered.

[0042] With reference to the drawings and particularly to FIG. 8 and 9, a nursing bra 6 in accordance with the present invention is shown configured according to the invention as described above. It is to be understood that the bra 6 could be a garment of other description, such garment typically including a bra function of varying degree or at least a garment having a portion of which covers the breast of a user and as it is handled to provide access to the breast of the person wearing the garment to facilitate nursing. A bra 6 is shown as the nursing garment merely as a matter of convenience and for ease of illustration.

[0043] Referred to drawings 8 and 9, and in accordance with the present invention, a nursing bra 6 is presented. The bra 6 comprises a body-encircling foundation 8 which may be closed by fastening means 9. The bra 6 further comprises two cups 1 attached to the body-encircling foundation 8. The bra also comprises two compress holders 5. The bra further comprises elastic straps 7 and two bails 13 attached to the body-encircling foundation 8. By incorporating the components 2 on the periphery 4 of the supporting part 3 of the cups 1 which may magnetically interact with the further corresponding components 12 on the compress holders 5, a nursing mother is able to open the cups 1 by a very simple handling. To maximize a mother's comfort, all components 2 and 12 are covered by tissue.

The cups 1 are opened partially by pulling away the portion of the cups 1 from the center of the body towards the nipple (the body is not shown in the figures). In this way only the portion of the breast needed to nurse the infant is exposed and the mother can nurse her baby comfortably and discretely. When nursing has ended, closing of the cup 1 used for nursing is achieved by bringing the cup 1 towards the compress holder 5. The mag-

netically interacting components 2 and 12 attract each other in such way that proper closing is guaranteed. The components 2 and 12 are processed adjacent to the bail, respectively on the inside of the cup 1 and on the compress holder 5. The components 2 and 12 which may magnetically interact are composed of different smaller bars so that there is increased flexibility. The smaller bars are produced at the inside of the cup 10 and all components 2 and 12 are covered by tissue so that the woman's comfort is increased and the chance of irritation of the infant's skin is minimized. By positioning the smaller bars of the components 2 and the further corresponding components 12, also a series of bars, in such way to create alternating polarity, the magnetic attraction between both components 2 and 12 is increased with a smaller volume of magnetic mass. The compress holders 5 are provided to offer extra breast support and allow a breast compress to be enclosed in the holders and to stay in its place. This allows the nursing mother to use breast compresses to avoid leaking spots on the bra 6 without any hinder. The nursing bra 6 is processed with soft, easy to launder, elastic, moisture absorbing and anti-bacterial tissues to increase the nursing woman's comfort. The cups 1 are produced with material suitable for adaptation to differing sizes of the breast allowing adaptations of breast sizes, especially experienced by nursing women.

Claims

1. A cup (1) comprising a component (2) positioned at the supporting part (3) of the cup (1) **characterized in that** said component (2) is being able to interact magnetically.
2. A cup (1) according to claim 1, wherein the component (2) magnetically interacts with a further corresponding component (12).
3. A cup (1) according to claim 1 and 3, wherein the further corresponding component (12) is positioned at a compress holder (5).
4. A cup (1) according to claim 1 and 2, wherein the component (2) is positioned at the periphery (4) of the supporting part (3) of the cup (1).
5. A cup (1) according to claims 1 to 4, which can be opened at least partially.
6. A cup (1) according to claim 5, which can be opened from the center of the body towards the nipple of the breast.
7. A cup (1) according to claims 1 to 6, wherein the component (2) is processed on the inner side (10) of the cup (1).

8. A cup (1) according to claims 1 to 7, comprising a series of components (2) with alternating polarity.
9. A cup (1) according to claims 1 to 8, wherein the components (2) are covered by tissue. 5
10. A cup (1) according to claims 1 to 9, wherein the cup (1) is produced with material suitable for adaptation to differing sizes of the breast. 10
11. A garment comprising a cup (1) according to any of the above claims, including a bra (6), a corset, a bikini or a sleeping suit.
12. A garment according to claim 11 wherein the further corresponding component (12) is positioned adjacent to or on a bail (13) or on the compress holder (5). 15
13. A method for producing a cup (1) comprising the step of positioning a magnetically interacting component (2) at the supporting part (3) of the cup (1). 20
14. A method according to claim 13, further providing a further corresponding component (12) magnetically interacting with component (2). 25
15. A method for producing garments having cups (1), comprising the step of positioning a magnetically interacting component (2) at the supporting part (3) of the cup (1). 30
16. A method for producing garments having cups (1) according to claim 15,
characterized in that the component (2) is positioned at the cup (1) before assembling the garment. 35
17. A method for producing garments having cups (1) according to claim 15,
characterized in that the component (2) is positioned at the cup (1) after assembling the garment. 40

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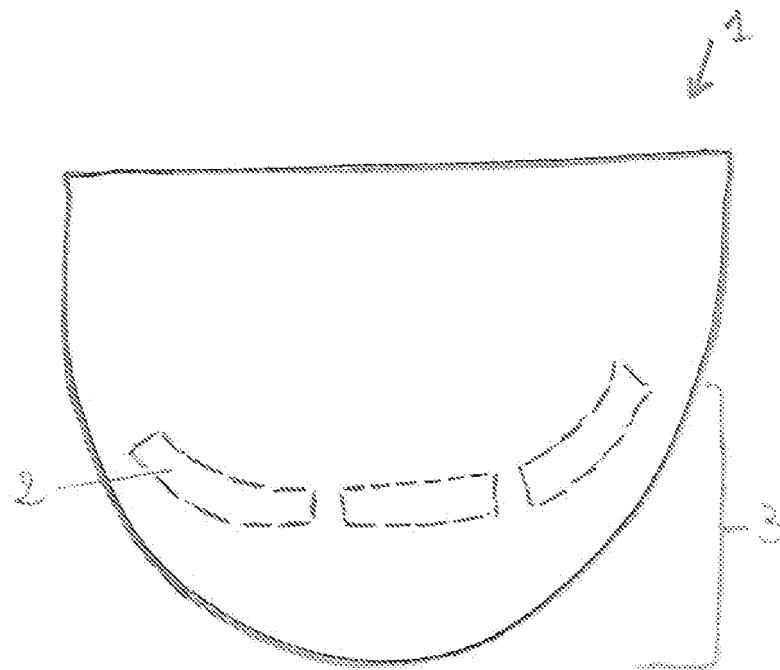


FIG 1

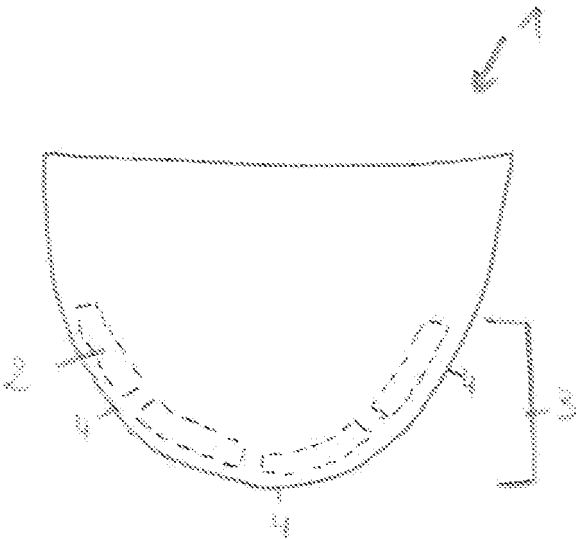


FIG 2

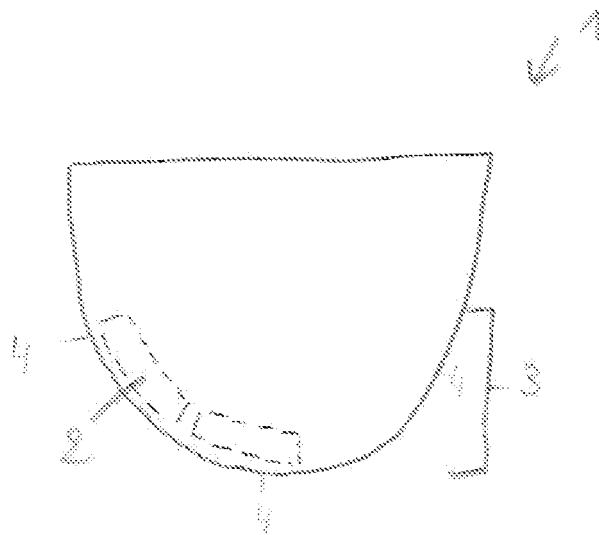


FIG 3

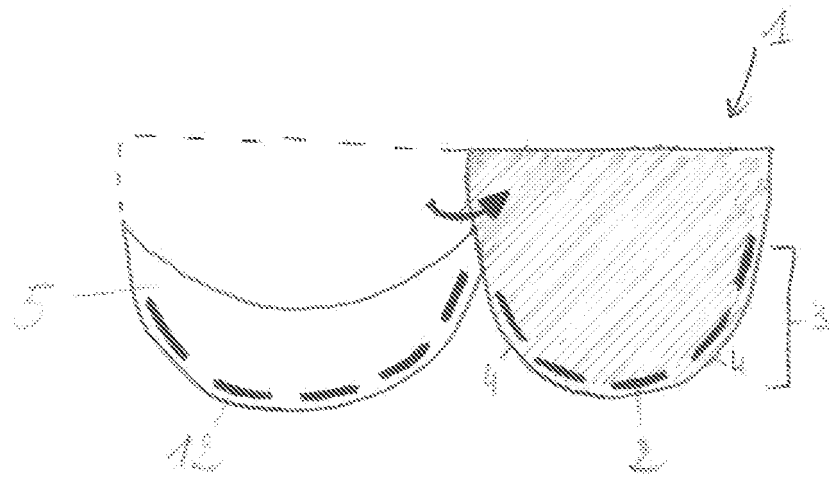


FIG. 4

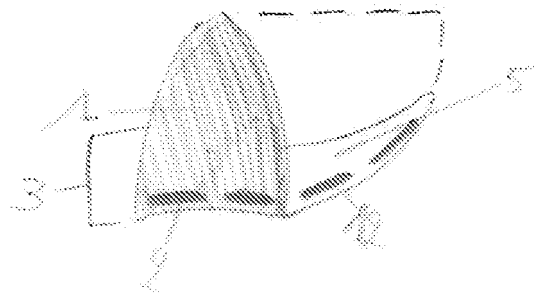
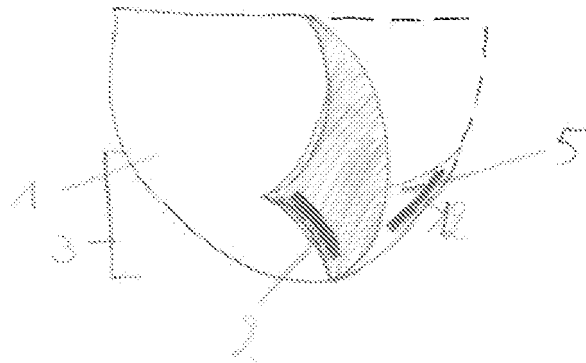
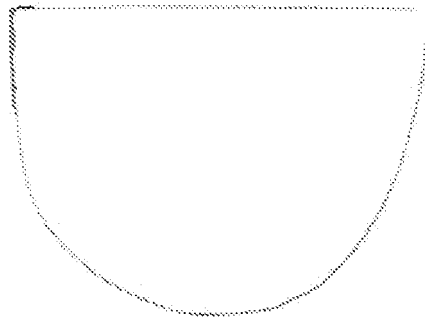
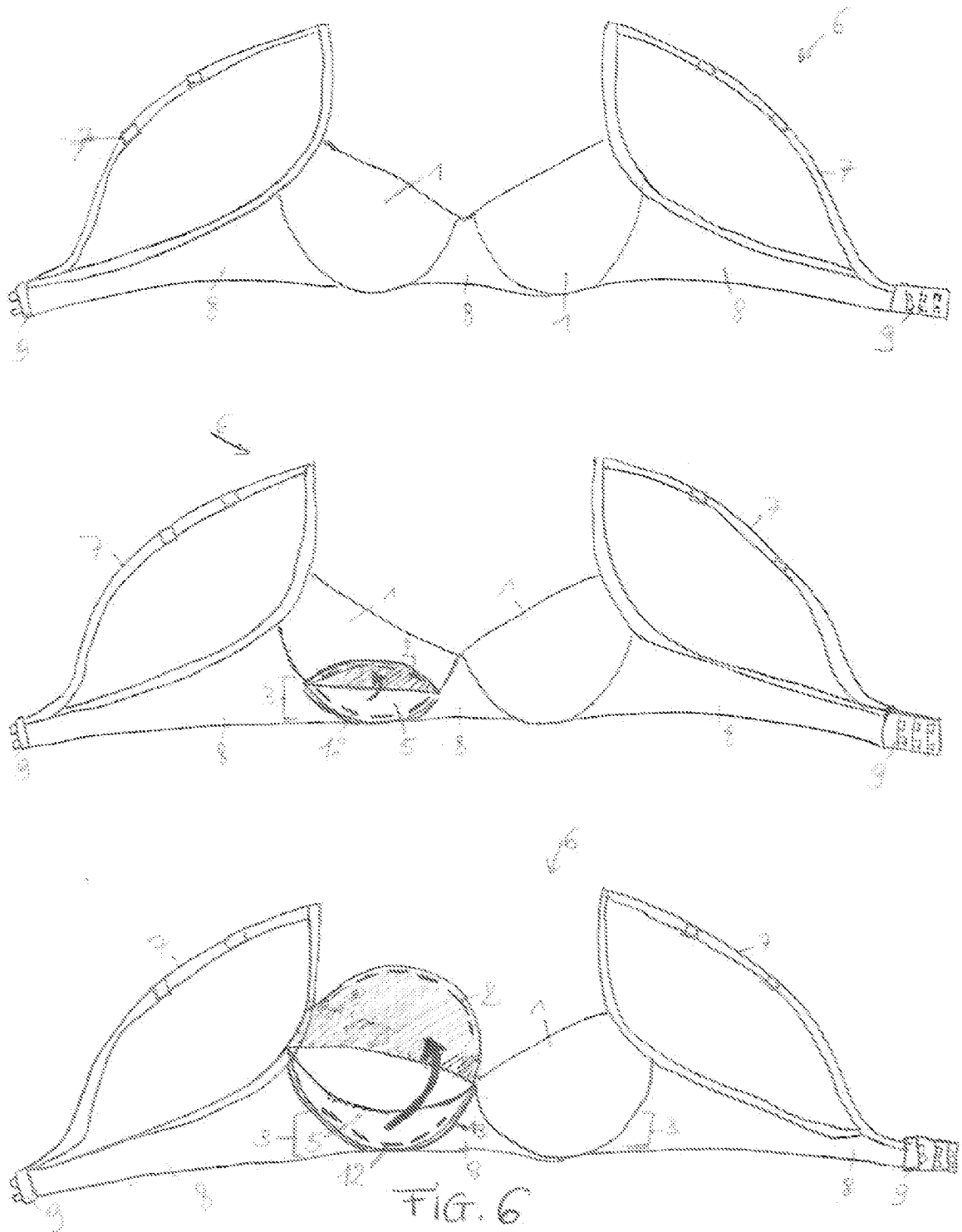


FIG. 5



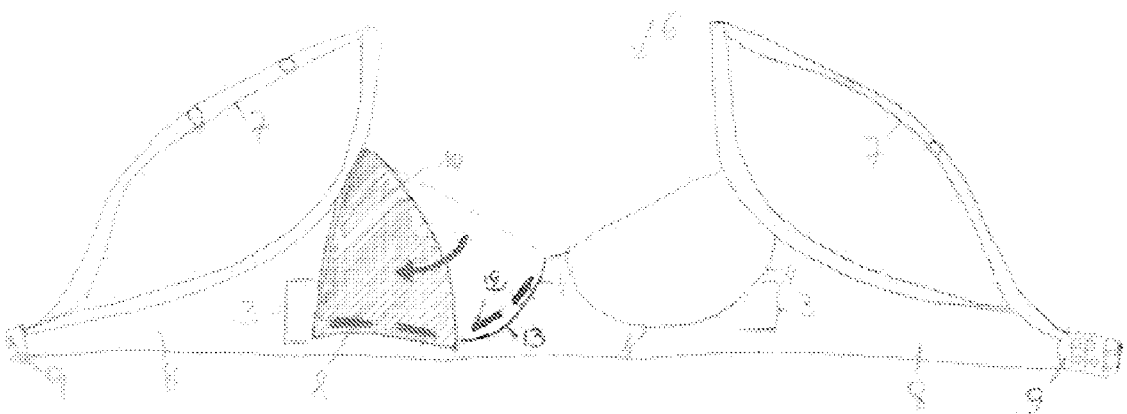
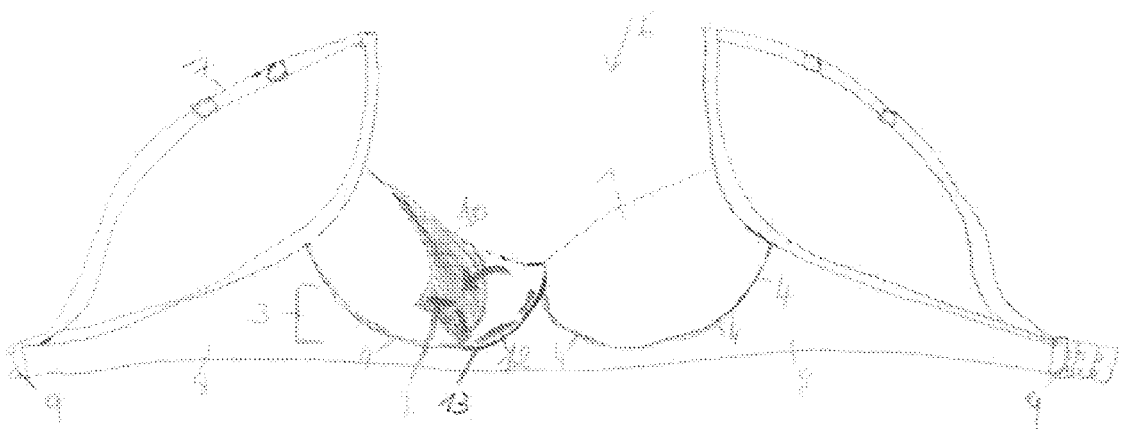
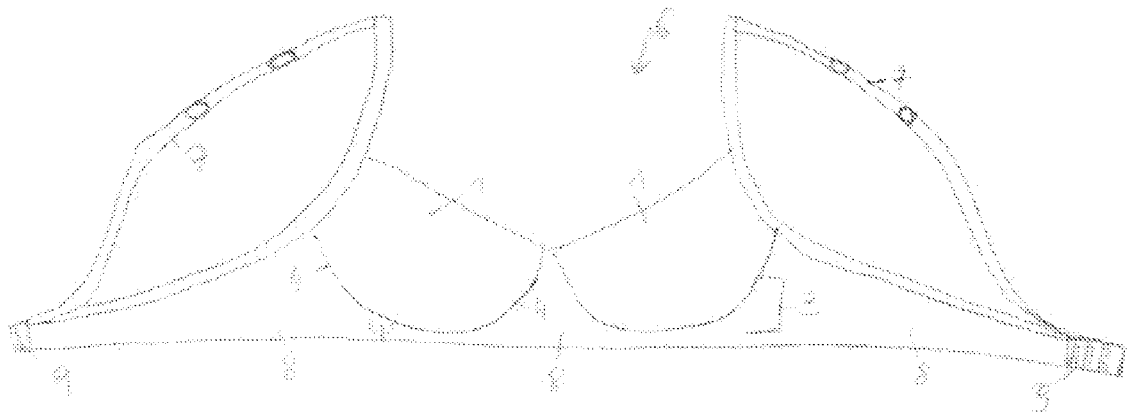
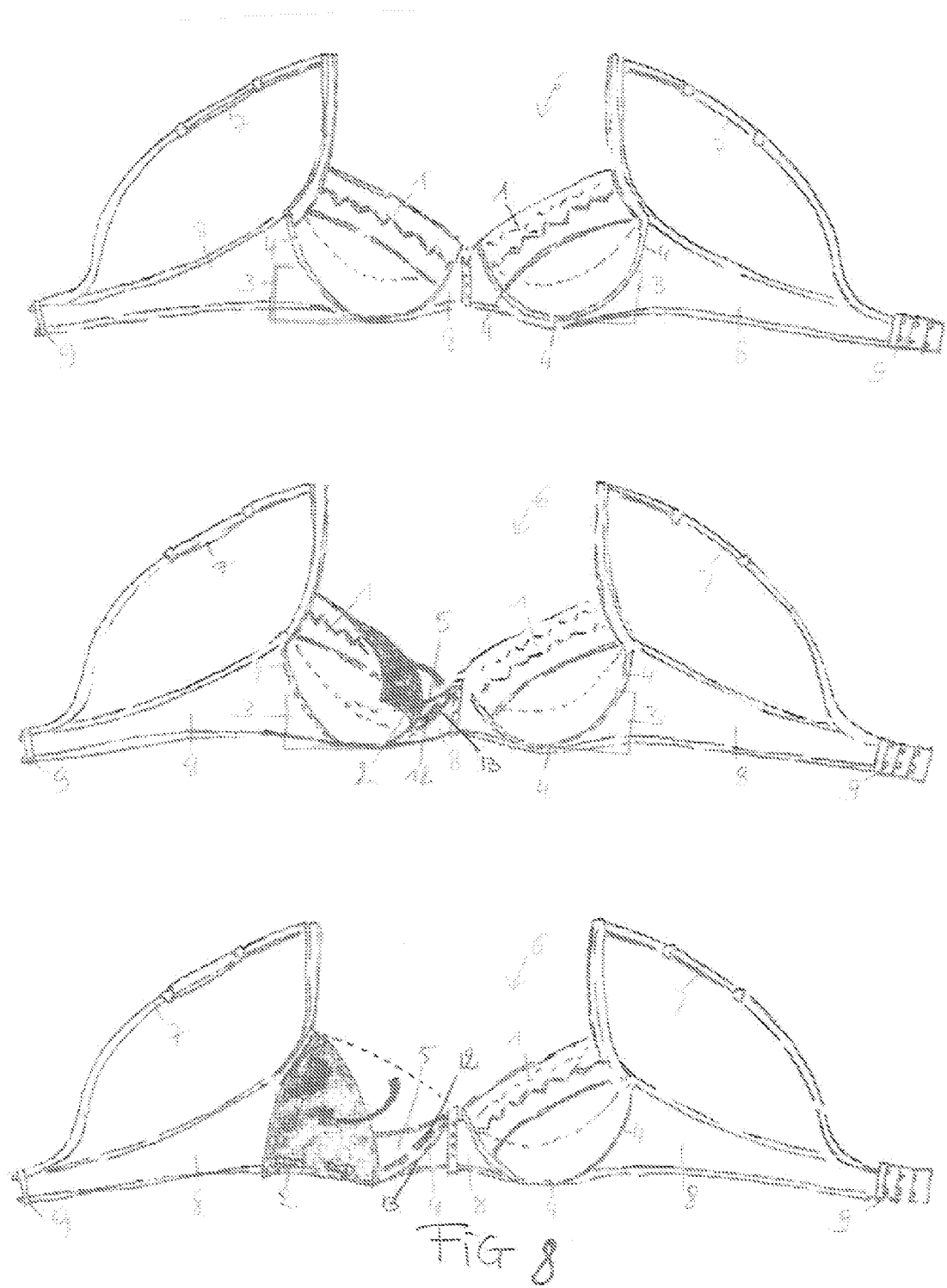
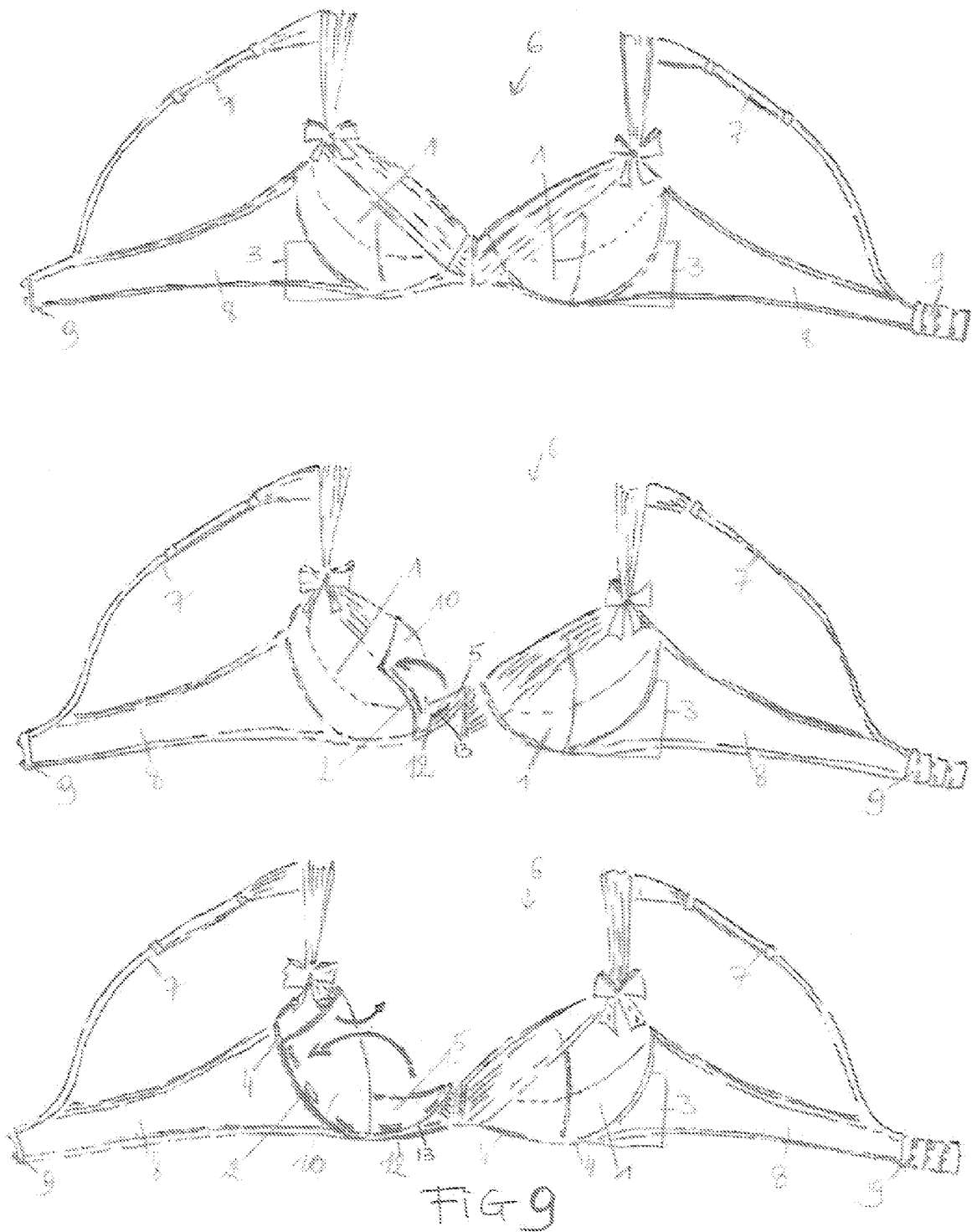


FIG 7





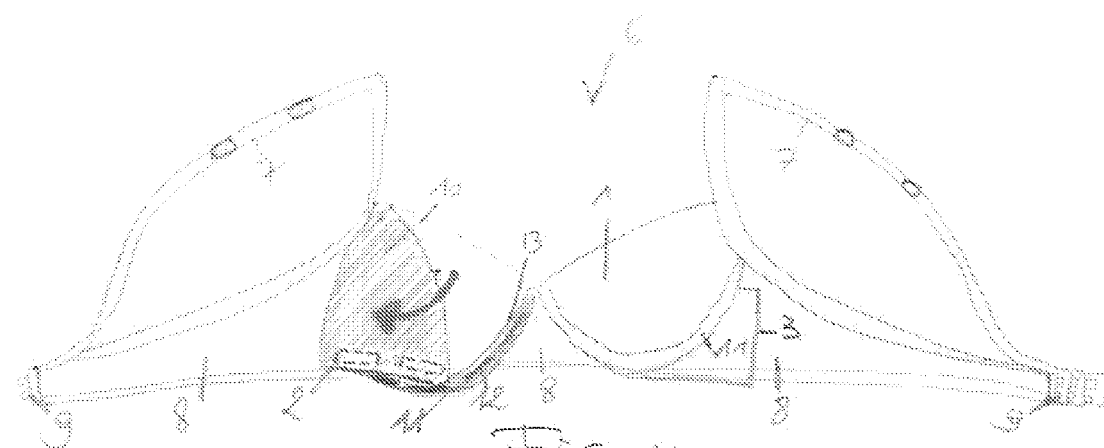
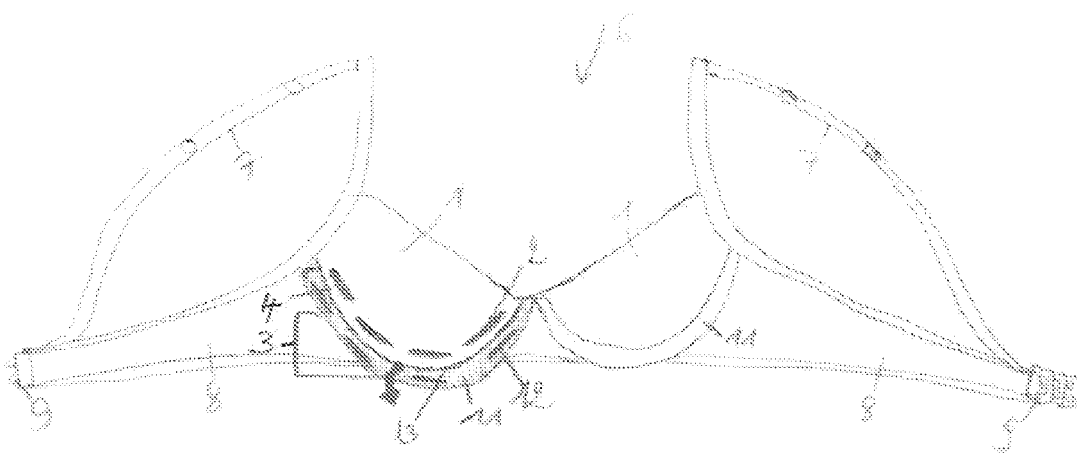
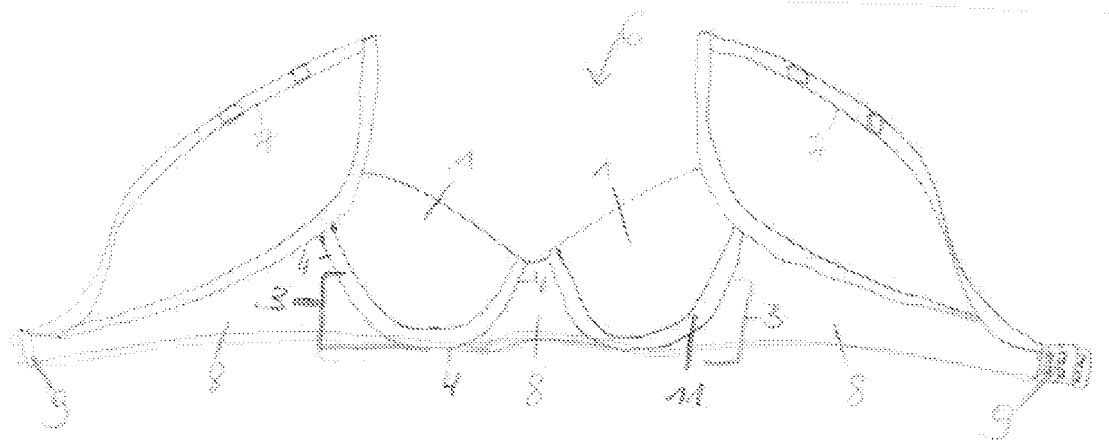


FIG 10



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 12 2556

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 7 May 2008	Examiner Herry-Martin, D
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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