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(54) **WOMEN'S GARMENT**

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(57) **ABSTRACT**

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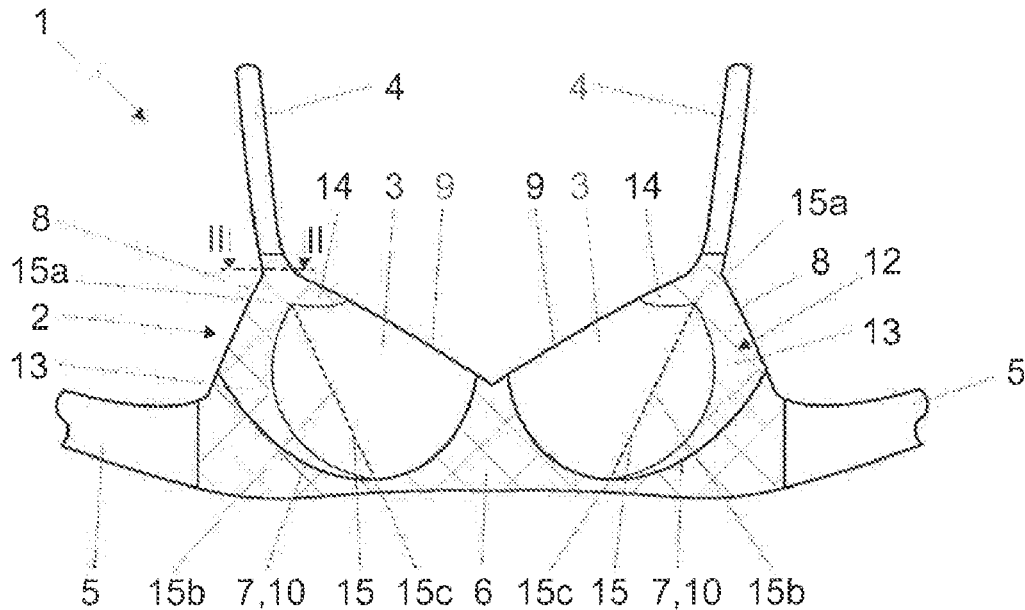
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The invention relates to a women's garment comprising a constructed bust part having two cups, and two shoulder straps attached to the cups. The cups are formed from at least two foam layers joined together via thermoforming. The two cups have a thickening at the lower edge thereof, which is formed during the thermoforming of the foam layers and runs along the breast. A stabilization element is arranged between the foam layers, having a section starting from the shoulder straps at an outer edge of the cups and extending down to the lower edge of the cups, and a section starting from the shoulder straps and extending along a part of an upper edge of the cups. A part of the upper edge of the cups and a central region of the cups are free from the stabilization element.



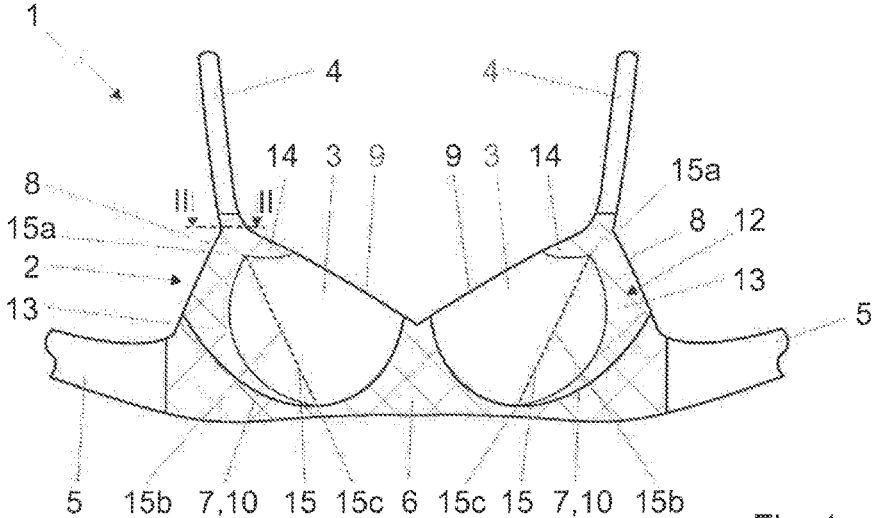


Fig. 1

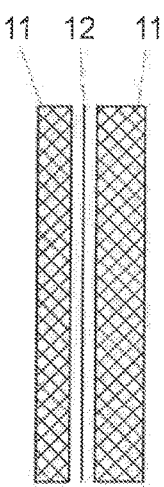


Fig. 2

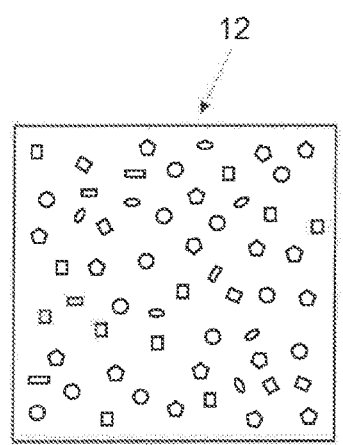


Fig. 3

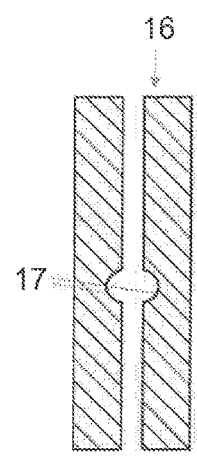


Fig. 4

WOMEN'S GARMENT

[0001] The invention relates to a women's garment comprising a constructed bust part having two cups, of the kind defined in more detail in the preamble of claim 1. The invention further relates to a method for producing a women's garment of this kind.

[0002] A women's garment of the type in question in the form of a bra is known from DE 10 2007 040 627 A1.

[0003] To achieve a good fit of the bra and better support for the breasts, the cups are often provided at their lower edge with shaping inserts, which are additionally intended to confer a defined shape on the breasts. However, these shaping inserts are sometimes felt uncomfortable by the wearer, and they also exert a certain pressure on the lymph system, which may not only lead to pressure sores but also, according to various medical studies, increases the risk of disease of the breasts. DE 10 2009 015 043 A1 describes a bra of this kind with shaping inserts.

[0004] For this reason, attempts have been made in recent times to produce such cups without shaping inserts. In this connection, reference is made to DE 20 2010 012 320 U1, for example.

[0005] However, the disadvantage of these known bras is that they provide less effective support of the breasts, which leads to reduced acceptance on the part of the wearer.

[0006] It is therefore an object of the present invention to make available a women's garment comprising a constructed bust part which does not require a shaping insert at the lower edge of the cups but which nonetheless provides sufficient support for the breasts accommodated in the cups.

[0007] According to the invention, this object is achieved by the features set out in claim 1.

[0008] By virtue of the thickening or reinforcement at the lower edge of the cups, which thickening or reinforcement is produced during the thermoforming of the foam layers without use of a shaped insert and extends along the breasts, a certain shaping of the cup and therefore of the breast accommodated therein is achieved. However, by virtue of this thickening, it is advantageously possible to do without a shaping insert since a shaping effect is already achieved by the thickening or reinforcement extending along the lower edge of the cups and thus extending in the lower breast region. With a shaping insert being omitted, no health-related limitations are expected with respect to the wearer.

[0009] The sufficient support of the breast inside the cup and the desired shaping of the breast are ensured according to the present invention by the stabilization element arranged between the foam layers, by the section thereof starting from the shoulder straps at an outer edge of the cups and extending down to the lower edge of the cups, and by the section starting from the shoulder straps and extending along a part of an upper edge of the cups, ensuring that force is introduced and transmitted via the shoulder straps over the center of the breast to the lower edge of the breast and thus to the above-described thickening. This results in an interaction of the stabilization element and of the thickening, which ensures improved shaping of the breast accommodated in the cup. Thus, by virtue of the solution according to the invention, the physical effect of a shaping insert is achieved without such a shaping insert having to be used, as a result of which the person wearing the women's garment according to the invention has the same assurance as when wearing garments with conventional cups.

[0010] By omission of the stabilization element in the central region of the cup, excessive stiffness of the cup is avoided, and this feels very comfortable for the wearer.

[0011] In a very advantageous development of the invention, provision can be made that the stabilization element has a shape like an inverted ypsilon. An inverted ypsilon-like shape of this kind is a very good illustration of the above-mentioned configuration of the stabilization element with the two sections extending away from the shoulder straps.

[0012] Furthermore, provision can be made that the section of the stabilization element starting from the shoulder straps and extending along a part of the upper edge of the cups runs for between a quarter and a half of the length of the upper edge. This ensures, on the one hand, that the force introduced via the shoulder straps is introduced over the center of the breast in the direction of the lower edge of the cup or of the thickening, and, on the other hand, that excessive stiffness of the cup, which is something not wanted by the wearer, is avoided in the region of the upper edge, thereby considerably enhancing the wearing comfort of the women's garment according to the invention. It is particularly preferable if the section extending along the upper edge of the cups runs along a length of approximately one third of the upper edge. This can vary, however, depending on the size of the cup.

[0013] In a further advantageous embodiment of the invention, provision can be made that the section of the stabilization element starting from the shoulder straps at an outer edge of the cups and extending down to the lower edge of the cups runs along approximately half the length of the lower edge. Similarly to the other section of the stabilization element, this ensures that the force is introduced as desired over the center of the breast in the direction of the lower edge of the cup and also ensures that excessive stiffness of the cup is avoided in the region of the lower edge of the cup facing towards the middle of the garment, and overall this results not only in the desired shaping effect but also in very good comfort for the wearer.

[0014] If, in an advantageous embodiment of the invention, the stabilization element has a thickness of 0.01 to 2 mm, the stiffening of the cup by the stabilization element is obtained in the desired regions, but excessive stiffness is avoided. In this way, the cup can adapt very well to the breast accommodated in it, even in the regions in which the stabilization element is located.

[0015] In order to further improve the described effect of the stabilization element, provision can furthermore be made that the stabilization element has a multiplicity of openings. An excessive stiffening of the cup by the stabilization element is prevented by the openings, and the textile feel of the stabilization element is maintained.

[0016] As regards the improvement in the introduction of the tensile force from the shoulder straps, it has proven advantageous if the stabilization element is arranged in the thickening. Simplified manufacture is achieved in this way too.

[0017] The thickening at the lower edge of the cups can be produced very easily if the thickening formed during the thermoforming of the foam layers at the lower edge of the cups is formed by recesses of a thermoforming tool used in the thermoforming.

[0018] A method for producing a women's garment according to the invention is set out in claim 9.

[0019] By means of this method, the women's garment according to the invention can be produced in a very simple and efficient way.

[0020] If the thickening at the lower edge of the cups is formed from recesses of the thermoforming tool used in the thermoforming, into which recesses the foam layers flow, then the thickening at the lower edge of the cups can be produced in a very simple way.

[0021] An illustrative embodiment of the invention is explained below with reference to the schematic drawing, in which:

[0022] FIG. 1 shows a women's garment according to the invention in the form of a bra;

[0023] FIG. 2 shows a cross section along the line II-II of FIG. 1, in an enlarged view;

[0024] FIG. 3 shows the stabilization element from FIG. 2 in an enlarged view; and

[0025] FIG. 4 shows a greatly simplified detail from a thermoforming tool used to produce the women's garment according to the invention.

[0026] FIG. 1 shows a women's garment 1 comprising a constructed bust part 2. In the present case, the women's garment 1 is a bra. However, the same garment could also be formed as a bodysuit, as a negligee, or as another women's garment 1 having a constructed bust part 2. The women's garment 1 can also be used in the area of swimwear, for example as a bikini top or bathing suit.

[0027] In a manner known per se, the bust part 2 has two cups 3. Furthermore, the women's garment 1 has two shoulder straps 4 attached to the cups 3, and also two back parts 5 which extend away from the cups 3 and which, in a manner known per se and not illustrated in FIG. 1, are provided in the back region with suitable closure means so as to be able to close the women's garment 1. In the present case, the back parts 5 do not directly adjoin the cups 3 and instead they adjoin a section of the women's garment 1 which in the present case is designated as lower part 6 and which is located underneath and between the two cups 3. In the present case, the lower part 6 also forms a region between the two cups 3, which region can also be designated as central part. In principle, however, the lower part 6 can also be omitted. Bras of this kind which have no such lower part 6, and in which the two cups 3 are connected only by a web, are likewise known per se.

[0028] Each of the cups 3 has a lower edge 7, a lateral or outer edge 8, and an upper edge 9. Of course, the illustrated shape of the cups 3 with the edges 7, 8 and 9 is to be understood only as an example, and other shapes thereof are also conceivable. Preferably, the two cups 3 are formed with mirror symmetry to each other, for which reason the description of one of the two cups 3 also applies to the other cup 3.

[0029] At their lower edge 7, the two cups 3 each have a thickening 10 which runs along the breast and which, in FIG. 1, is indicated only by a line corresponding to the lower edge 7. The thickening 10 is obtained during the thermoforming of at least two foam layers 11, by which the cups 3 are formed in a manner known per se.

[0030] FIG. 2 is a very schematic illustration of a cross section through one of the cups 3, from which can also be seen the two foam layers 11 in their initial state, i.e. in the non-thermoformed state. The different thickness of the foam layers 11, as shown in the present case, is to be understood purely by way of example.

[0031] It will also be seen from FIG. 2 that a stabilization element 12 is arranged between the foam layers 11, which stabilization element 12 is located between the foam layers 11 during the thermoforming thereof and melts during the thermoforming and therefore can no longer be seen as such in the women's garment 1 when the latter is finished. The two foam layers 11 connect to each other through the stabilization element 12, wherein the stabilization element 12 provides a certain barrier effect for the foam layers 11 and therefore a stiffening thereof.

[0032] In FIG. 1, the stabilization element 12 is indicated by a cross-hatched area. The stabilization element 12 has a section 13 starting from the shoulder straps 4 at the outer edge 8 of the cups 3 and extending down to the lower edge 7 of the cups 3, and a section 14 starting from the shoulder straps 4 and extending along a part of the upper edge 9 of the cups 3. To simplify matters, the first section mentioned is referred to below as outer section 13, and the second section mentioned is referred to below as upper section 14. A part of the upper edge 9 of the cups 3 and a central region of the cups 3 are free of the stabilization element 12, i.e. there is no stabilization element 12 in these regions, as can be seen very clearly in FIG. 1 from the area without cross-hatching. The stabilization element 12 thus has a shape like an inverted ypsilon or a shape like an inverted Y, of which the straight section is generated by the region of the stabilization element 12 attached to the shoulder support 4, and of which the two sections 13 and 14 in principle form a V shape and, together with the straight section, lead to the inverted ypsilon-like shape.

[0033] The upper section 14 of the stabilization element 12, starting from the respective shoulder strap 4, extends over a length of between a quarter and half of the length of the upper edge 9 of the cup 3. It is particularly preferable if the upper section 14 extends along ca. one third of the length of the upper edge 9. In this way, two thirds of the length of the upper edge of the cup 3 are thus free of the stabilization element 12. In principle, the upper section 14 can also be configured in two or more parts, in which case the illustrated upper section 14 is adjoined by one or more similar, further upper sections of the stabilization element 12. One such upper section 14 could then have an undulating shape, for example.

[0034] The outer section 13 of the stabilization element 12, starting from the respective shoulder strap 4, extends along the outer edge 8 of the cup 3 down to the lower edge 7 and there runs along approximately half the length of the lower edge 7. The outer section 13 of the stabilization element 12 is therefore substantially longer than the upper section 14, which is why the shape of the stabilization element 12 is referred to as being "epsilon-like".

[0035] By means of the stabilization element 12, force is introduced along a line 15 shown by dashes in FIG. 1, which line 15 starts from a point 15a at the edge of the stabilization element 12 and extends over the center 15b of the breast accommodated in the cup 3 to a point 15c at the lower edge 7 of the cup 3. The point 15c at the lower edge 7 of the cup 3 is approximately the point to which the stabilization element 12 extends. This introduction of force ensures that the tensile force introduced via the shoulder straps 4 is uniformly distributed over the respective cup 3, thereby achieving a very good balance of the cup 3. The line 15 here is of course to be understood as an example and can also have a curved profile.

[0036] In order to ensure the balance of the above-described force introduction in the very different sizes of the women's garment 1, it is preferable that the sections 13 and 14 of the stabilization element 12 are accordingly adapted in the grading such that the line 15 extends from the point 15a at the edge of the stabilization element 12, through the center 15b of the breast to the point 15c at the lower edge 7 of the cup 3. For this purpose, for example, the outer section 13 and/or the upper section 14 can be wider and/or longer for larger cup sizes. This increase in size of the outer section 13 and/or of the upper section 14 may also, if appropriate, be disproportionate to the increase in size of the whole cup.

[0037] FIG. 3 shows the stabilization element 12 in an enlarged view. In the illustrative embodiment shown, this stabilization element 12 is configured as a perforated foil and has a multiplicity of openings. The openings can have very different shapes and sizes. Furthermore, a symmetrical arrangement of the openings is possible, although this is not absolutely necessary. The thickness and the density of the perforated foil are dependent on the material used for the stabilization element 12. For example, the thickness of the perforated foil can be 0.01 to 0.05 mm.

[0038] As an alternative to the use of a perforated foil, it is also possible to use perforated textiles or plastics, e.g. in mesh form, or adhesive webs as stabilization element 12. Furthermore, the stabilization element 12 can be formed by applying silicone to the desired region. The use of viscous media as the stabilization element 12 is also conceivable.

[0039] The stabilization element 12 can be made of polyester for example, although other materials are also conceivable for it, for example materials with which a greater stiffening effect is achieved. When using such a stiffer material, the thickness of the stabilization element 12 could possibly be reduced. The stabilization element 12 should then be made of a material that melts upon thermoforming of the foam layers 11, such that the presence of a foreign body between the foam layers 11 is prevented.

[0040] FIG. 4 shows a very schematic representation of a thermoforming tool 16 used in the thermoforming of the foam layers 11. It can be seen that the two tool halves of the thermoforming tool 16 have two recesses 17 lying opposite each other. During the thermoforming, quite a large proportion of the two foam layers 11 flows into these recesses 17, such that the thickening 10 is formed in this region.

[0041] In the present case, the stabilization element 12 is also located in the region of the cup 3 forming the lower edge 7 and therefore the thickening 10. Furthermore, in the illustrative embodiment shown, the stabilization element 12 is also provided in the lower part 6, which simplifies the manufacture of the women's garment 1. If appropriate, however, the stabilization element 12 could also be omitted in the lower part 6.

[0042] In a method for producing the women's garment 1, the two cups 3 are thus produced by thermoforming from the at least two foam layers 11. During the thermoforming, the thickening 10 is formed at the lower edge 7 of the two cups 3. In particular, the thickening 10 is formed by the recesses 17 of the thermoforming tool 16, into which recesses 17 the foam layers 11 flow. Furthermore, the stabilization element 12 is arranged between the foam layers 11 in the thermoforming, as has been described in detail above.

[0043] In a manner not illustrated, it would also be possible to provide more than two foam layers 11 and, if appropriate, also more than the one stabilization element 12.

In principle, it would also be possible for the two sections 13 and 14 to be arranged in different layers of the stabilization element 12.

1. A women's garment comprising a constructed bust part, which has two cups, and comprising two shoulder straps attached to the cups, the cups being formed from at least two foam layers connected to each other by thermoforming, characterized in that the two cups have a thickening at their lower edge, which thickening is formed during the thermoforming of the foam layers and runs along the breast, and in that a stabilization element is arranged between the foam layers, which stabilization element has a section starting from the shoulder straps at an outer edge of the cups and extending down to the lower edge of the cups, and a section starting from the shoulder straps and extending along a part of an upper edge of the cups, wherein a part of the upper edge of the cups and a central region of the cups is free of the stabilization element.

2. The women's garment as claimed in claim 1, characterized in that the stabilization element has a shape like an inverted ypsilon.

3. The women's garment as claimed in claim 1, characterized in that the section of the stabilization element starting from the shoulder straps and extending along a part of the upper edge of the cups runs between a quarter and a half of the length of the upper edge.

4. The women's garment as claimed in claim 1, characterized in that the section of the stabilization element starting from the shoulder straps at an outer edge of the cups and extending down to the lower edge of the cups runs along approximately half the length of the lower edge.

5. The women's garment as claimed in claim 1, characterized in that the stabilization element has a thickness of 0.01 to 2 mm.

6. The women's garment as claimed in claim 1, characterized in that the stabilization element has a multiplicity of openings.

7. The women's garment as claimed in claim 1, characterized in that the stabilization element is arranged in the thickening.

8. The women's garment as claimed in claim 1, characterized in that the thickening formed at the lower edge of the cups during the thermoforming of the foam layers is formed by recesses of a thermoforming tool used in the thermoforming.

9. A method for producing a women's garment as claimed in claim 1, wherein two cups are formed by thermoforming from at least two foam layers, wherein a thickening running along the breast is formed at a lower edge of the two cups during the thermoforming, and wherein a stabilization element is arranged between the foam layers during the thermoforming, which stabilization element has a section starting from the shoulder straps at an outer edge of the cups and extending down to the lower edge of the cups, and a section starting from the shoulder straps and extending along a part of an upper edge of the cups, wherein a part of the upper edge of the cups and a central region of the cups are free of the stabilization element.

10. The method as claimed in claim 9, characterized in that the thickening at the lower edge of the cups is formed by recesses of the thermoforming tool used in the thermoforming, into which recesses the foam layers flow.