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(54) Garment for a woman in a state of pregnancy, for example a bathing costume or similar, and process for making it

(57) A garment (20) for a woman (21) in a state of pregnancy, unusually capable of avoiding the distortion of the appearance of the woman wearing it, comprises

an anterior part (22) having a portion (54) designed to cover an abdominal area. Said portion (54) is pre-deformed in such a way as to accommodate the abdominal area of the pregnant woman (21).

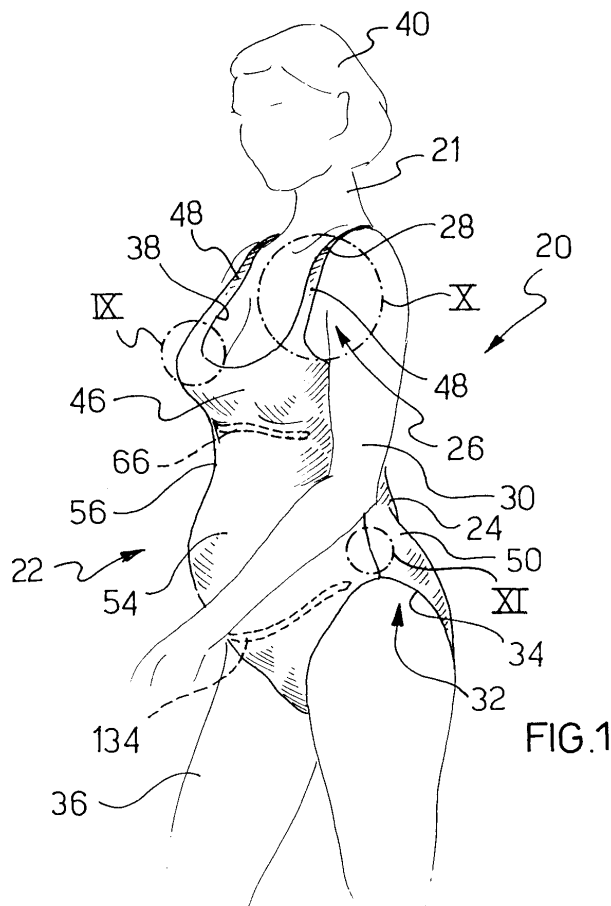


FIG.1

Description

[0001] The present invention relates to a garment for a woman in a state of pregnancy, particularly but not exclusively a bathing costume, and a process for making it.

[0002] A known type of garment for a woman in a state of pregnancy comprises an anterior part, having a portion designed to cover an abdominal area.

[0003] As it is known, the abdominal areas of women in a state of pregnancy, particularly in the last months of pregnancy, are enlarged to such an extent that the women are unable to wear their usual garments. Owing to the enlargement of the abdominal area, even if the pregnant woman retains a slim profile in all the other parts of her body, she is obliged to wear a garment suitably shaped to provide sufficient capacity to accommodate the abdomen.

[0004] The need to wear the aforesaid garments for pregnant women, commonly known as maternity wear, causes considerable discomfort to many women.

[0005] At the present time, garments for pregnant women, particularly bathing costumes and underwear, have the necessary capacity for the abdominal area as a result of the provision of cuts and/or pleating in the fabric in said area. When made up in this way, the known garment has an anterior part which is in the form of a bellows and is therefore abundant in the area of the abdomen. These known garments, owing to the abundance of fabric produced by cuts and pleating, are not comfortable to wear. In other words, these known garments deform the profile of the woman wearing them, causing discomfort to her.

[0006] The problem to which the present invention relates is that of devising a garment for a woman in a state of pregnancy, for example a bathing costume, of the type specified above, as well as a process for making the aforesaid garment, which has structural and functional characteristics such that the aforesaid disadvantages cited with reference to the prior art are overcome.

[0007] This problem is resolved by means of a garment for a woman in a state of pregnancy, for example a bathing costume, of the type specified above and characterized in that the said portion designed to cover an abdominal area is pre-deformed in such a way as to accommodate the abdominal area.

[0008] The aforesaid problem is also resolved by means of a process for making a garment for a woman in a state of pregnancy, in which a piece having a portion designed to cover an abdominal area is provided, characterized in that there is provided a stage of pre-deformation of the said portion in such a way as to accommodate the abdominal area.

[0009] To enable the invention to be understood more clearly, a non-restrictive embodiment thereof is described below by way of example, and illustrated in the attached drawings, in which:

Figure 1 is a perspective front view of a pregnant

woman wearing a bathing costume according to one embodiment of the present invention;

Figure 2 is a perspective rear view of the woman with the garment shown in Figure 1;

Figure 3 is a front view of an anterior part of the garment shown in Figure 1;

Figure 4 shows in a front view a detail of the garment shown in Figure 1;

Figure 5 shows in a front view a posterior part of the garment shown in Figure 1;

Figure 6 shows, in a perspective view, the details shown in Figures 3, 4 and 5, brought together to form a garment;

Figure 7 shows, in a perspective view, one stage of a process of making garments according to the invention;

Figure 8a shows, in a perspective view, a further stage in the process of treating the garment;

Figure 8b shows, in a perspective view, an alternative embodiment of the said further stage in the process of treating the garment;

Figure 9 shows, in a perspective view and in partial section, a detail of the garment, indicated by IX in Figure 1;

Figure 10 shows, in a perspective view and in partial section, a second detail of the garment, indicated by X in Figure 1;

Figure 11 shows, in a perspective view and in partial section, a third detail of the garment, indicated by XI in Figure 1; and

Figure 12 shows, in a perspective view, a garment according to a further embodiment of the invention.

[0010] With reference to the aforesaid figures, number 20 indicates the whole of a garment for a woman in a state of pregnancy, and particularly, but not exclusively, a bathing costume or suit.

[0011] The garment 20 comprises an anterior, or front, part, indicated as a whole by 22, and a posterior, or back, part 24. The front 22 and the back 24 consist of at least one piece, in a way that is described in greater detail below.

[0012] The term "piece" denotes a cut-out portion designed to form part of a garment. The said cut-out portion consists of fabric or of material which may be non-woven, but which is suitable for making, for example, a bathing costume or an item of underwear, as well as a dress.

[0013] Said front 22 and said back 24 are shaped to form, when they are joined, openings and, in particular, cut-outs 26 delimited by arm-holes 28 for the passage of the arm 30, leg openings 32 delimited by leg-holes 34 for the passage of the legs 36, and a neckline 38 for the passage of the head 40 and the neck 42 of the woman 21. Said neckline 38 is delimited frontally by a portion 46 capable of covering the bust, laterally by shoulder straps 48 and at the rear by a portion 50 capable of covering the hips, the back and the seat of the woman 21

(Figures 1 and 2).

[0014] Said arm-holes 28, leg-holes 34 and neckline 38 are associated with elastically deformable tapes. For example, said elastically deformable tapes 52 are inserted into seams provided to join and finish said front 22 and said back 24, as described in greater detail below (Figures 9 and 10).

[0015] The front 22 has, in particular, a portion 54 designed to cover the abdominal area of the pregnant woman 21.

[0016] In a particularly advantageous way, the said portion 54 designed to cover the abdominal area is pre-deformed in such a way as to accommodate the abdominal area. In other words, said portion 54 is made in a shape for the abdomen of a pregnant woman 21, in a bowl shape for example. According to one embodiment of the invention, said portion 54 is pre-deformed into a spherical bowl or, advantageously, an ellipsoidal bowl. For example, the pre-deformed portion 54 has a height "h", measured in the longitudinal direction with respect to the garment 20 or, in other words, along the axis y-y, which is variable from 150 mm to 230 mm, and preferably variable from 180 mm to 200 mm. Said pre-deformed portion 54 also has a width "b", measured in the transverse direction with respect to the garment 20 or, in other words, from the side 57 to the side 59 of the garment, which is variable from 150 mm to 270 mm, and preferably variable from 230 mm to 250 mm (Figure 3).

[0017] According to one embodiment of the invention, said portion 54 designed to cover the abdomen is made in one piece with a piece 56 forming the front 22. Advantageously, a front 22 comprises a first outer layer, consisting of a piece 56, provided with a pre-deformed portion 54 designed to accommodate the abdomen, and a second inner layer, consisting of a second piece 58 pre-deformed in such a way as to accommodate the abdomen. The said first and second layers are arranged to be superimposed on each other to form the front 22 of the garment 20. A back 24 comprises a third layer, consisting of a piece 60 (Figure 6).

[0018] According to a further embodiment of the invention, a front comprises, between a first outer layer and a second inner layer, a piece of knitted fabric 62, or bodice. Said piece of knitted fabric 62 comprises a portion 64 capable of covering the bust and has an elastically deformable band 66 placed transversely with respect to the garment, or, in other words, transversely with respect to the axis y-y, under the portion 64 designed to cover the bust (Figures 4 and 6).

[0019] A process for making a garment for a woman in a state of pregnancy is described below. First of all, a roll 70 of material 72 suitable for making garments 20, particularly a roll of material 72 suitable for pre-deformation treatment, such as pre-deformation by thermoforming, is provided. According to the present invention, said material 72 is for example a fabric 74 having a percentage of yarn comprising synthetic or elastomeric fibre variable from 3% to 100%. For example, the afore-

said material 72 contains at least one of the following materials: polyamide, polyester, viscose, cotton with elastomer. Advantageously, said fabric 74 comprises 13% Lycra and 87% polyamide. More advantageously, said fabric 74 comprises 16% Lycra and 84% polyamide. According to yet another embodiment of the invention, said material 72 consists of sheets of neoprene or a fabric comprising neoprene.

[0020] Layers 80 of said material 72 are then set down so that pieces 56, 58, 60 can be cut out, following a paper pattern, to form the front 22 or back 24 of the garment 20. For example, the roll 70 is unrolled and at the same time moved (as shown by the arrow "i") with reciprocating motions along a support 76 placed above a base plane 78. In this way the material 72 is set down in layers 80 folded and superimposed in accordion or bellows pleats on which rests a sheet 82, or pattern sheet, showing the outlines of a plurality of pieces 56, 58, 60 adjacent to each other in such a way that the plurality of superimposed layers 80 can be cut without excessive waste of the material 72 (Figure 7). The piece of knitted fabric 62 is cut in an entirely similar way.

[0021] When pieces 56, 58, 60, 62 have been cut, the portions of the front designed to accommodate the abdominal area of the pregnant woman 21 are pre-deformed. To carry out this stage of the treatment, one or more pieces 56, 58, for example, to form the front 22 are placed in a thermoforming station 90. According to a first embodiment, said station 90 comprises a die 92 supported by a base plane 94. Said die 92 has a protuberance 96 in the shape of a cup or bowl, for example an ellipsoidal bowl or a spherical bowl. Said protuberance 96 has overall dimensions equal to the capacity of the portion 54 of the piece 56, 58 which is intended to be pre-deformed to accommodate the abdomen of a pregnant woman 21. According to one embodiment of the invention, said protuberance 96 has a height variable from 20 mm to 100 mm, and preferably variable from 30 mm to 60 mm. The aforesaid height of the protuberance 96 makes it possible to obtain, at the end of the treatment, a pre-deformed portion of similar depth, in such a way that the abdomen of the pregnant woman can be accommodated. For example, it is possible to arrange to have garments made with three different cuts for the pre-deformed portion corresponding to three different capacities according to the stage of pregnancy of the pregnant woman. In particular, the three different cuts of the garment have a depth of the pre-deformed portion 54 of 40 mm, 55 mm and 70 mm. The die 92 is also provided with means for heating it to a temperature suitable for thermoforming. For example, electrical resistance means 98, suitable for heating the protuberance 96 in a controlled way, are provided in said die 92. A plurality of means 100 for setting and stretching the piece 56, 58 are provided and are subject to the control of the die. For example, elastic grippers 102 are fixed, in such a way that their position is adjustable, adjacent to the protuberance 96 and on the base plane 94. Said

grippers 102 are arranged in such a way as to position the portion 54 of the piece 56, 58 designed to accommodate the abdomen on the protuberance 96 and in such a way as to keep the piece 56, 58 suitably stretched for thermoforming. Said die 92 interacts with a counter-die 104 suitably supported so that it can be moved in a controlled way (as shown by the arrow "f") by a frame provided with sliding guides 106. Said counter-die 104 has a depression 108 whose shape mates with the protuberance 96 of the die 92. Seats for the elastic grippers 102 are also provided in said counter-die 104, so that the mating surface 108 can be brought next to the piece 56, 58. In a similar way to the die 92, said counter-die 104 may have means for heating it to a temperature suitable for thermoforming, for example electrical resistance means 110.

[0022] When piece 56, 58 has been placed in the station 90, the counter-die 104 having been previously raised (so that station 90 is in the open position), said piece 56, 58 is centred with respect to the protuberance 96 and locked in the stretched position by the elastic grippers 102. The die and the counter-die have been heated in advance. For example, the die and the counter-die are brought to a temperature variable from 190°C to 210°C, and preferably from 195°C to 205°C. According to the type of material 72 used and the colour of the piece 56, 58, the counter-die 104 and the die 92 are brought next to the portion 54 of the piece 56, 58 for the time required for its thermoforming. In other words, the piece 56, 58 is kept at the aforesaid temperature for a time interval variable from 20 seconds to 50 seconds, and preferably from 30 seconds to 40 seconds. The piece 56, 58 is then cooled to the ambient temperature (Figure 8a).

[0023] The possibility of replacing the means for heating the die and counter-die with an oven will be clear to a person skilled in thermoforming work. For example, according to a different treatment process, after the piece has been placed on a die 92 provided with a protuberance 96, a plate 112 provided with an aperture 114 having dimensions slightly greater than the perimeter 188 of the base of the protuberance 96 can be brought next to it. The plate 112 is made to bear on the die 92 in such a way as to receive in the aperture 114 the protuberance 96 and the portion 54 of the piece 56, 58 placed thereon and fixed by suitable means such as the aforesaid elastic springs. Only the portion 54 of the piece 56, 58 to be pre-deformed by thermoforming is then brought to the desired temperature by bringing a bottomless oven 116 (in the direction of the arrow "g") onto the plate 112. The fluid, for example air, contained in the oven 116 and surrounding the material 72 of the piece 56, 58 to be pre-deformed is heated to the aforesaid temperatures in such a way as to thermoform the material 72 placed on the protuberance 96. After the time interval required for thermoforming, the oven 116 is raised, and the plate 112 is then also raised. The piece 56, 58 is then cooled, and the stages of making up the

garment 20 follow (Figure 8b).

[0024] When the pieces 56, 58 for forming a front 22 have been pre-deformed, the garment 20 is made up by sewing said pieces 56, 58, together with the interposed piece of knitted fabric 62, to the piece 60 forming the back 24. In particular, the pieces 56, 58 and 62, forming the front 22, are sewn together and to the piece 60 forming the back 24 along the sides (Figure 11), the leg-holes 34, the arm-holes 28 (Figure 10) and the neckline 38 (Figure 9), and also in the shoulder straps 48. For example, the edges 120 and 122 of the outer piece 56 and the inner piece 58 are folded, forming flaps in which the piece of knitted fabric 62 and the elastically deformable tape 52 are placed, or which accommodate between them the edge 124 of the piece 60 forming the back 24. Said edges are then sewn in such a way that the sewing 126 only passes through the ends of the flaps, and is therefore concealed from view when the garment is completed.

[0025] It can be appreciated from the above description that, owing to the pre-deformed portion designed to accommodate the abdomen of the pregnant woman, the proposed garment is perfectly wearable, without distorting the profile of the woman wearing it. In other words, owing to the provision of the shaped portion, the proposed garment follows the profile of the woman, being close-fitting and not causing discomfort to the woman wearing it by distorting her appearance.

[0026] At the same time, the garment according to the invention can be worn by a woman in a state of pregnancy without dangerous binding and compression of her abdomen, but in such a way that the abdomen is accommodated gently in the pre-deformed portion.

[0027] One advantage lies in the provision of elastically deformable tapes in the arm-holes and leg-holes which make the proposed garment particularly close-fitting. In other words, even if the pregnant woman has a particularly enlarged abdomen, the proposed garment is perfectly close-fitting on all parts of the woman's body without the necessity of cuts or pleating.

[0028] Owing to the provision of an anterior part of the garment consisting of two layers, the proposed garment also provides sufficient covering in the portion stretched by the pre-deformation.

[0029] The presence of the piece of knitted fabric makes the garment more wearable and provides better covering by the portion of the anterior part designed to cover the bust. A further advantage is that the provision of an elastically deformable band under the aforesaid portion for covering the bust enables the profile of the bust to be defined more accurately and makes the anterior part of the garment as a whole more close-fitting.

[0030] Clearly, variations and/or additions may be made to what has been described and illustrated above.

[0031] According to a particular embodiment of the invention, the posterior part of the garment comprises a third outer layer, consisting of one piece, and a fourth inner layer, consisting of a further piece. Said pieces are

superimposed on each other, making the garment provide better covering in the posterior part.

[0032] Advantageously, the first and the third layers, forming the outer layer of the anterior part and of the posterior part of the garment respectively, can be made to have a different colour from the second and fourth layers, forming the inner layer of the anterior and of the posterior part of the garment. In this way the garment, besides being wearable in reversed form (double-face garment), can be worn with either the colour of the initially inner layers or that of the initially outer layers visible.

[0033] The proposed garment can also be made in two pieces, consisting of a brassiere 130 and briefs 132 which are also capable of covering the abdominal area. In this case, the pre-deformed portion designed to cover the abdominal area is separated from the portion designed to cover the bust, for example just below the elastically deformable band (Figure 12).

[0034] According to a further embodiment of the invention, an elastically deformable band 134 placed transversely with respect to the garment (transversely with respect to the axis y-y in Figure 1) is associated with at least one piece forming the anterior part, in such a way as to hold the abdomen of the pregnant woman from below. The said band 134 extends preferably from a first side 57 to a second side 59 in such a way as to make the garment even more close-fitting (Figure 3).

[0035] The proposed garment can be made from any material suitable for the pre-deformation, for example by thermoforming. It is also possible to provide a garment of the type specified above made of pure cotton. In this case, it will be necessary to provide a stage of treating the fabric, of dyeing the garment for example, since if the pre-deformation stage is one of thermoforming, there will be a yellowing of the yarn due to the heating of the material.

[0036] In a further embodiment, the elastically deformable band 66 placed under the bust is placed within the anterior part of the garment, being fixed to the outer piece 56 of the said anterior part for example, instead of being positioned in the piece of knitted fabric 62.

[0037] The above description clearly shows how underwear, or lingerie, such as a body, can be made with a portion of the anterior part pre-deformed in such a way as to accommodate the abdominal area of a woman in a state of pregnancy, or how to make a dress which clings to the body but at the same time is capable of accommodating the abdomen of a pregnant woman by means of a pre-deformed portion.

[0038] According to yet another embodiment of the invention, a garment has a portion pre-deformed in such a way as to accommodate the abdominal area of a woman in a state of pregnancy and a further portion pre-deformed in such a way as to accommodate the bust of said pregnant woman, making the garment even more clingy.

[0039] Clearly, a person skilled in the art may, in order

to meet contingent and specific requirements, make numerous modifications and variations to the garment described above, such as the style or colour of the garment, or the pattern or colours of the fabric or the addition of accessories such as buttons or buttonholes, all these modifications being contained within the scope of protection of the invention as defined by the following claims.

Claims

1. Garment (20) for a woman (21) in a state of pregnancy, comprising an anterior part (22) having a portion (54) designed to cover an abdominal area, characterized in that said portion (54) is pre-deformed in such a way as to accommodate the abdominal area.
2. Garment (20) according to Claim 1, wherein said portion (54) is pre-deformed into a cup shape.
3. Garment (20) according to Claim 2, wherein said portion (54) is pre-deformed into an ellipsoidal bowl shape.
4. Garment (20) according to Claim 2, wherein said portion (54) is pre-deformed into a spherical bowl shape.
5. Garment (20) according to Claim 1, wherein said pre-deformed portion (54) has a height (h) which is variable from 150 mm to 230 mm and, preferably, variable from 180 mm to 200 mm.
6. Garment (20) according to Claim 1, wherein said pre-deformed portion (54) has a width (b), which is variable from 150 mm to 270 mm, and preferably variable from 230 mm to 250 mm.
7. Garment (20) according to Claim 1, wherein said pre-deformed portion (54) has a depth which is variable from 20 mm to 100 mm, and preferably from 30 mm to 60 mm.
8. Garment (20) according to Claim 1, wherein said pre-deformed portion (54) is made in one piece with a piece (56, 58) forming the anterior part (22).
9. Garment (20) according to Claim 1, wherein said pre-deformed portion (54) is made by thermoforming.
10. Garment (20) according to Claim 9, wherein at least said pre-deformed portion (54) is made from a fabric having a percentage of yarn comprising synthetic fibre which is variable from 3% to 100%.

11. Garment (20) according to Claim 10, wherein a fabric for making the pre-deformed portion (54) comprises 13% Lycra and 87% polyamide.
12. Garment (20) according to Claim 10, wherein a fabric for making the pre-deformed portion (54) comprises 16% Lycra and 84% polyamide.
13. Garment (20) according to Claim 9, wherein said pre-deformed portion (54) is made of material (12) comprising neoprene.
14. Garment (20) according to Claim 1, wherein the anterior part (22) comprises a first outer layer, with a pre-deformed portion (54), and a second inner layer, with a pre-deformed portion (54), and said outer and inner layers are superimposed on each other.
15. Garment (20) according to Claim 14, wherein a piece of knitted fabric (62) is provided between the said first and second layers.
16. Garment (20) according to Claim 15, comprising an anterior part (22) with a portion (46) designed to cover a bust, said piece of knitted fabric (62) having an elastically deformable band (66), placed transversely under the portion (46) designed to cover the bust.
17. Garment (20) according to Claim 14, comprising a posterior part (24), said posterior part (24) of the garment (20) consisting of a third outer layer and a fourth inner layer superimposed on each other.
18. Garment (20) according to Claim 17, wherein the first and third layers, which form an outer part of the garment (20), have a different colour from the second and fourth layers which form an inner part of the garment (20).
19. Garment (20) according to Claim 1, wherein an elastically deformable band (134) placed transversely and in such a way as to hold the abdominal area from below is provided under said pre-deformed portion (54).
20. Garment (20) according to Claim 1, comprising cut-outs (26) and leg openings (32) to permit the passage of the arms and legs, and a neckline (38), the edges (28, 34) of said cut-outs (26), leg openings (32) and neckline (38) comprising an elastically deformable tape (52).
21. Garment (20) according to any one of the preceding claims, wherein it is a bathing costume.
22. Garment (20) according to Claim 21, wherein it is a two-piece bathing costume (130, 132).
23. Garment (20) according to any one of Claims 1 to 20, wherein it is an item of underwear.
24. Garment (20) according to Claim 23, wherein it is a body.
25. Garment (20) according to any one of Claims 1 to 20, wherein said garment is a dress.
26. Garment (20) according to Claim 1, comprising a portion designed to cover a bust, being said portion designed to cover the bust pre-deformed in such a way as to accommodate the bust.
27. Process for making a garment (20) for a woman (21) in a state of pregnancy, wherein a piece (56, 58) having a portion (54) designed to cover an abdominal area is provided, characterized in that a stage of pre-deformation of said portion (54) in such a way as to accommodate the abdominal area is provided.
28. Process according to Claim 27, wherein said pre-deformation stage is a stage of thermoforming.
29. Process according to Claim 28, comprising the following stages:
 - the piece (56, 58) is placed on top of a die (92); said die (92) comprising a protuberance (96) having a profile corresponding to the abdominal area;
 - the piece (56, 58) is centred in such a way as to place said portion (54) designed to cover the abdominal area onto said protuberance (96);
 - a counter-die (104) is brought next to the piece (56, 58) placed on the die (92); said counter-die (104) comprising a depression whose shape mates with said protuberance (96);
 - the depression of the counter-die (104) is brought into contact with the piece (56, 58);
 - the die (92) and the counter-die (104) are heated in such a way as to heat the portion (54) of the piece (56, 58).
30. Process according to Claim 28, comprising the following stages:
 - the piece (56, 58) is placed on top of a die (92); said die (92) comprising a protuberance (96) having a profile corresponding to the abdominal area;
 - the piece (56, 58) is centred in such a way as to place said portion (54) designed to cover the abdominal area onto said protuberance (96);
 - a plate (112) is brought next to said piece (56, 58) placed on the die (92); said plate (112) having an aperture (114) permitting the passage of the protuberance (96) of the die (92);

- the portion (54) of the piece (56, 58) placed on the protuberance (96) is placed in the aperture (114);
- the piece (56, 58) placed in the aperture (114) is surrounded with hot fluid in such a way as to heat the portion (54) of the piece (56, 58). 5

31. Process according to Claim 28, wherein said thermoforming stage brings the portion (54) of the piece (56, 58) to be pre-deformed to a temperature in the range from 190°C to 210°C, and preferably from 195°C to 205°C. 10

32. Process according to Claim 31, wherein said stage of thermoforming the portion (54) to be pre-deformed has a duration which is variable from 20 seconds to 50 seconds, and preferably variable from 30 seconds to 40 seconds. 15

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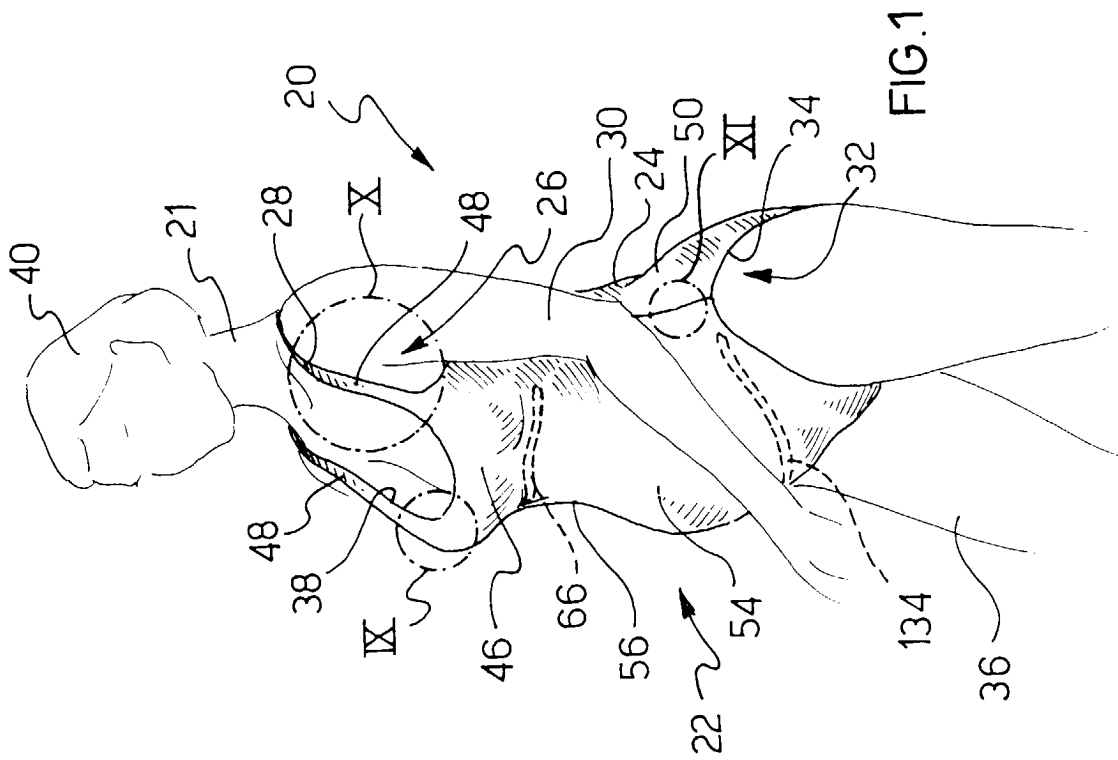
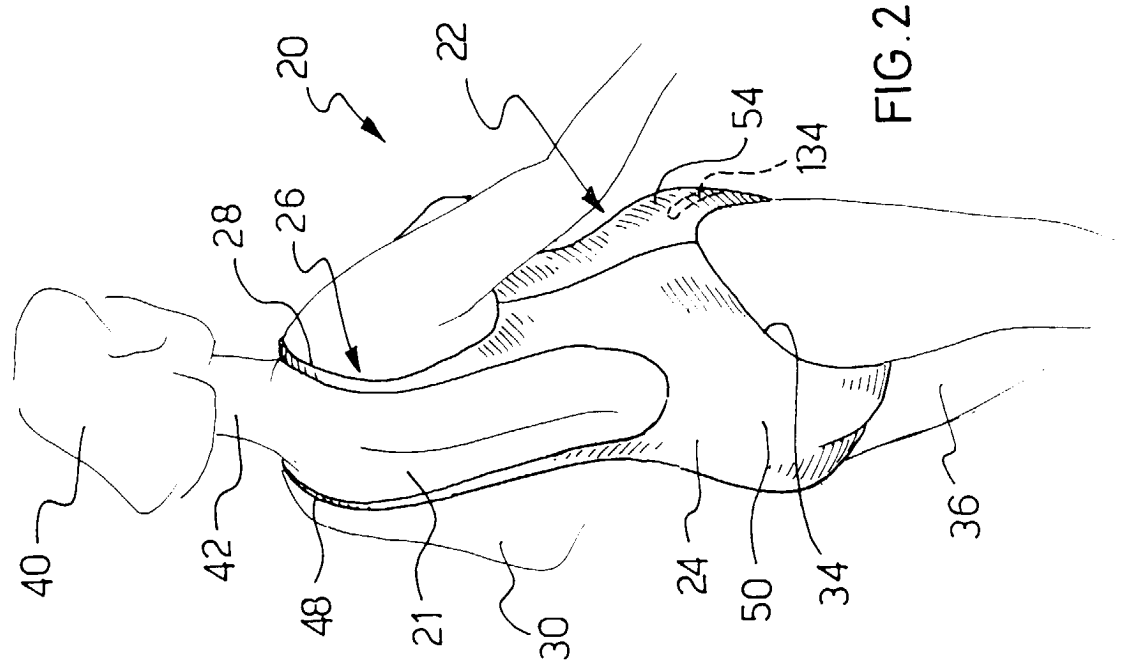
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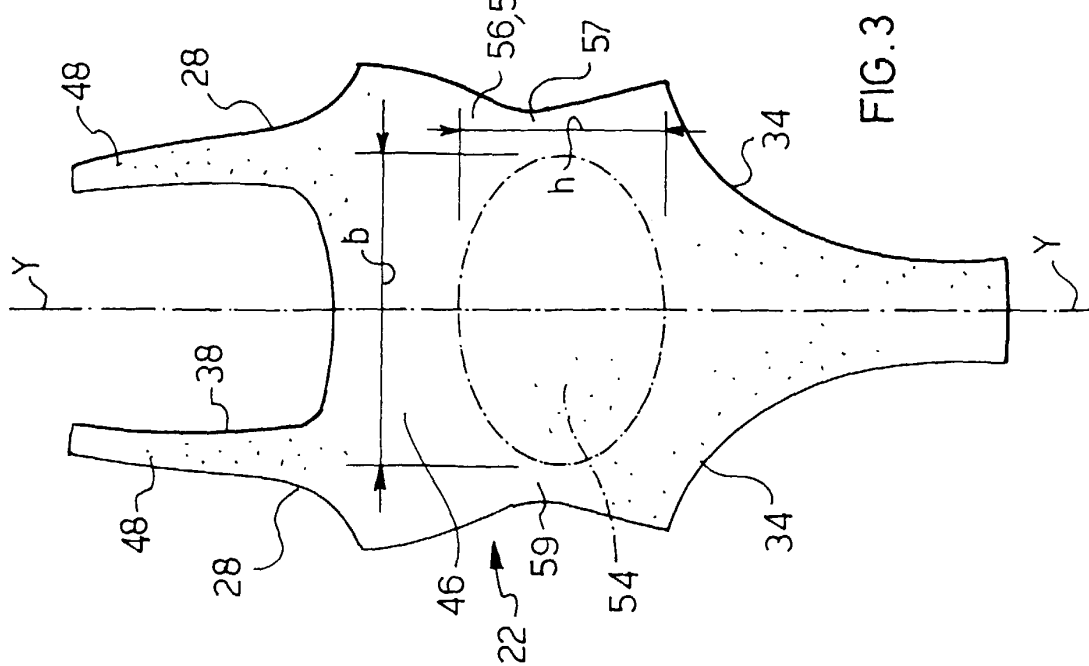
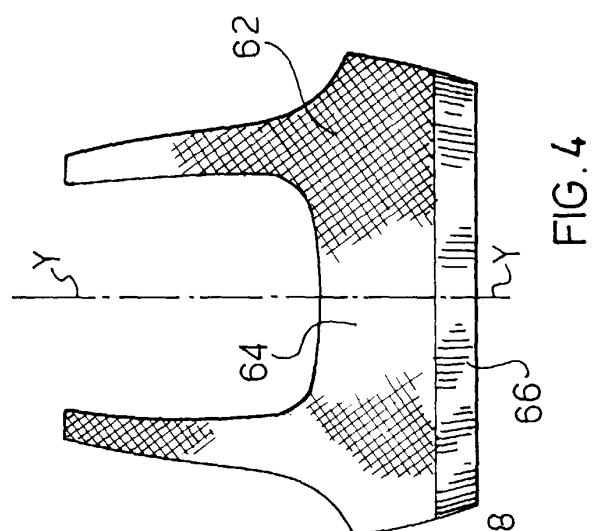
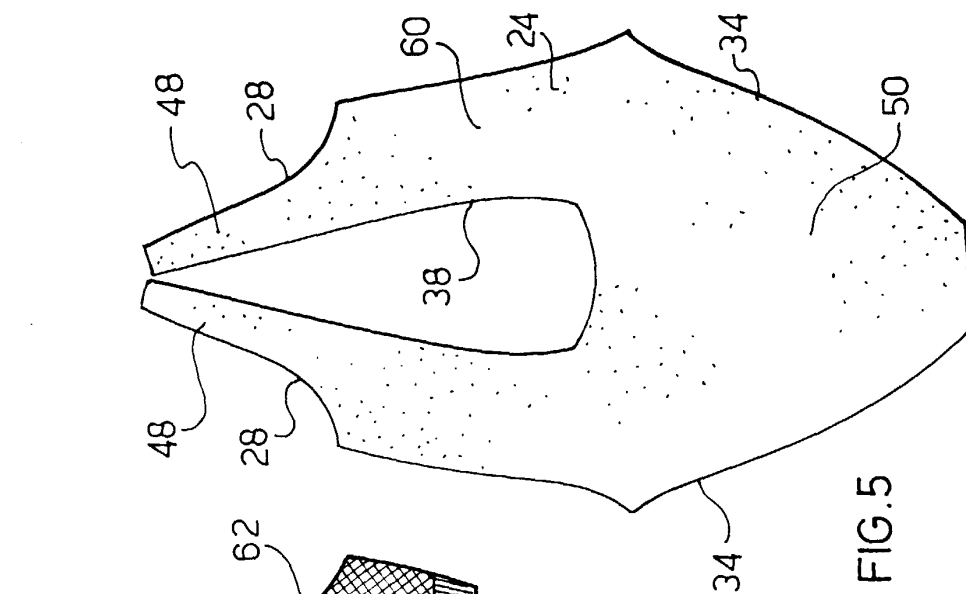
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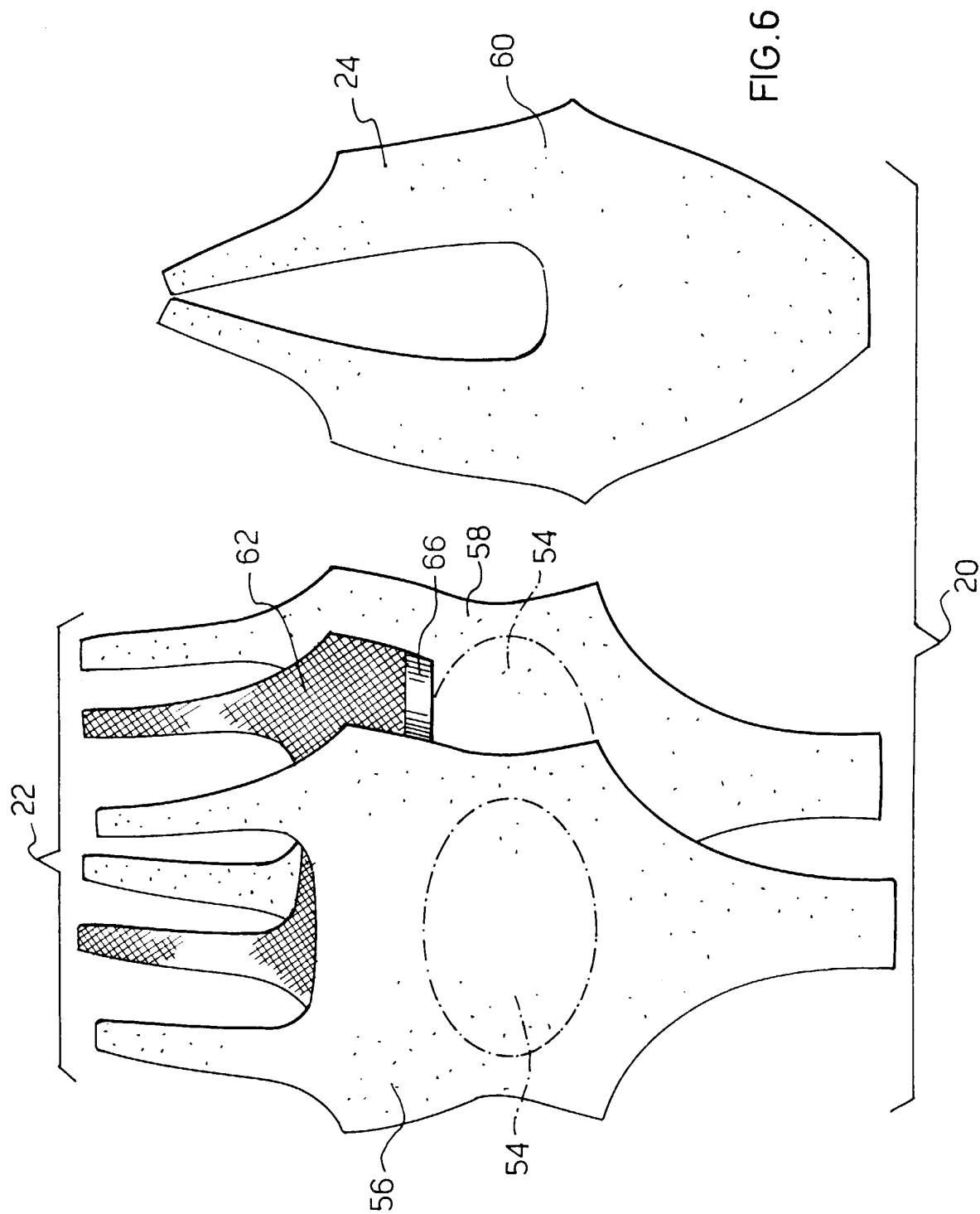
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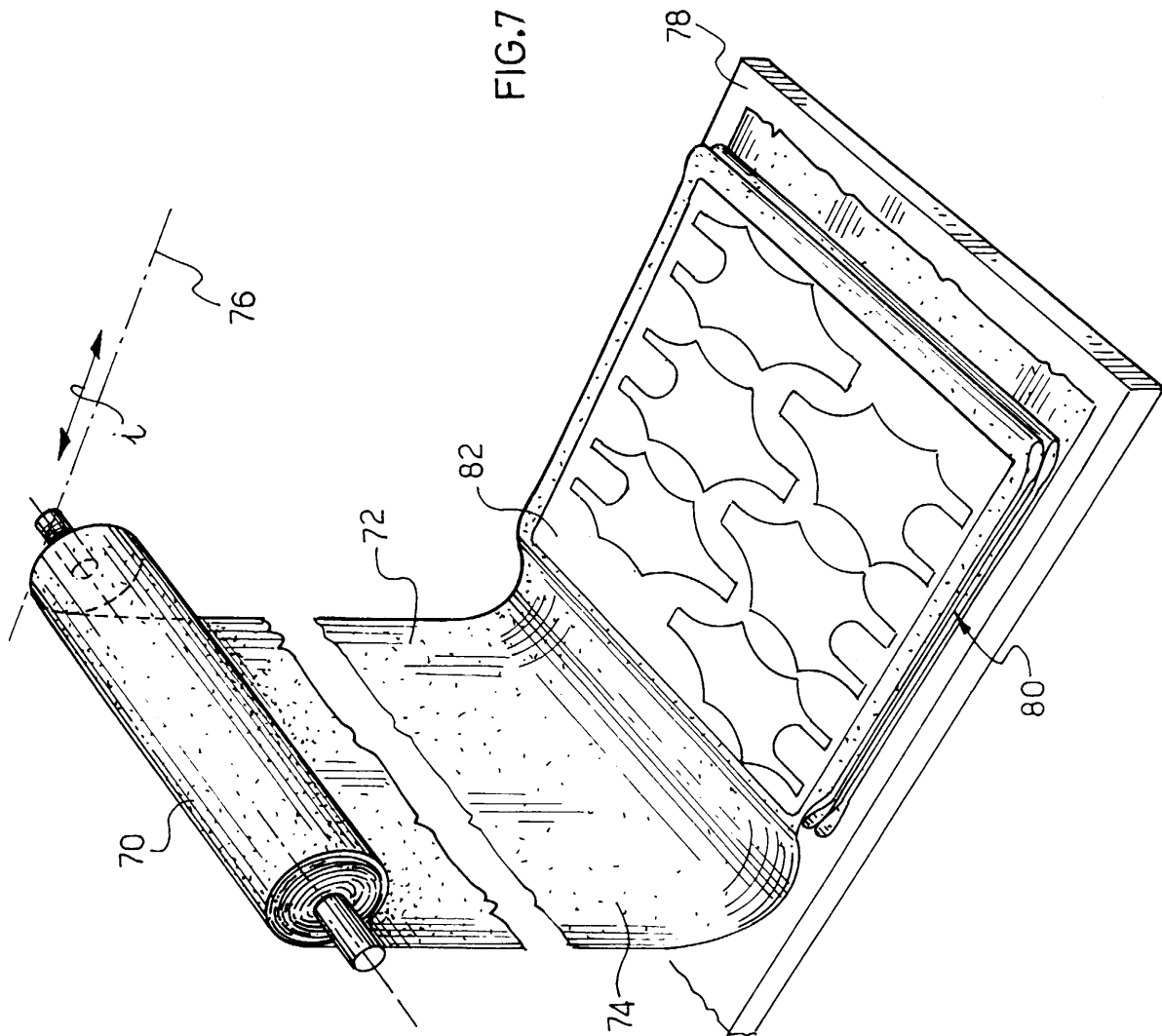
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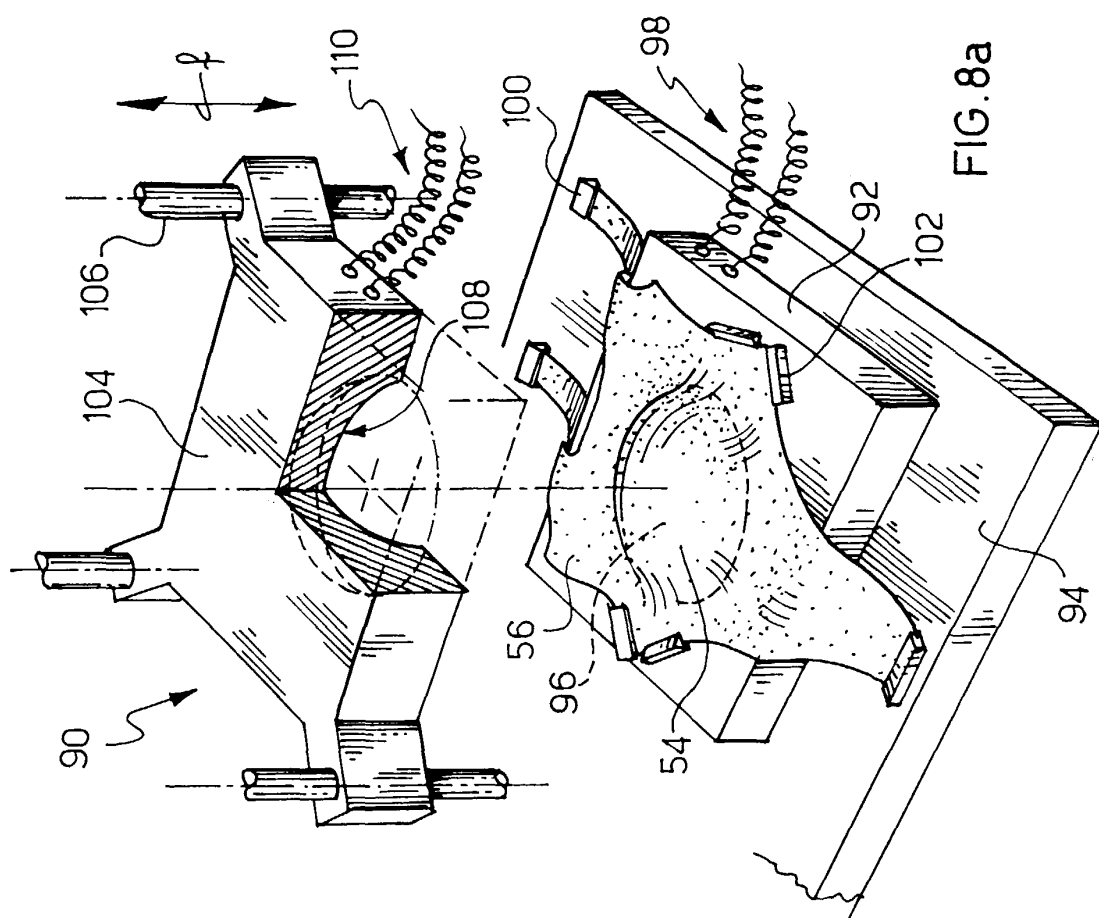


FIG. 8a

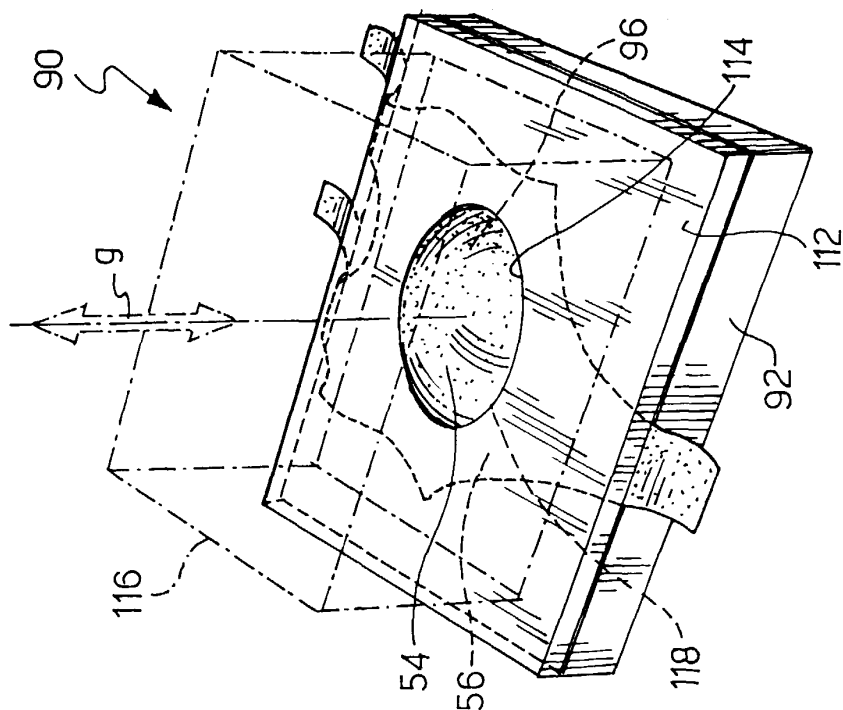
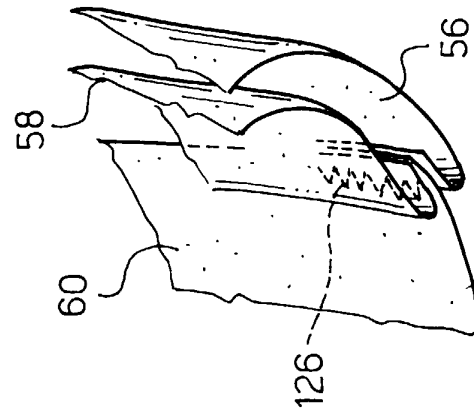
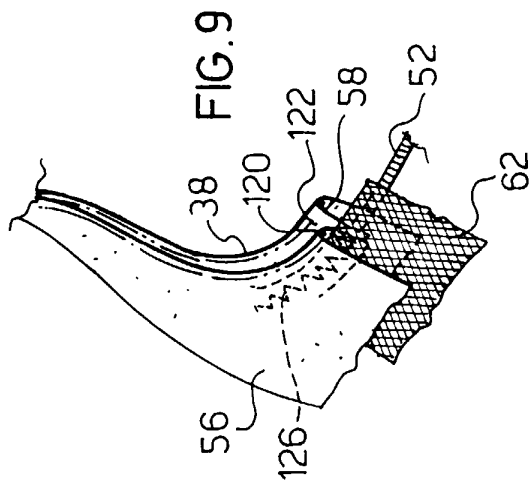
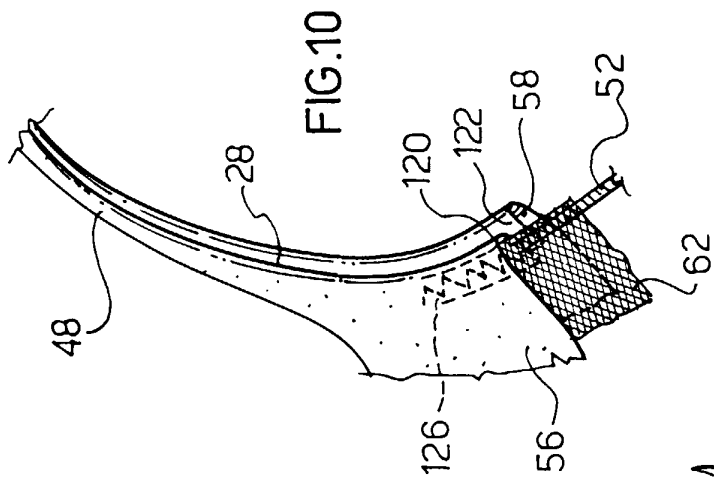
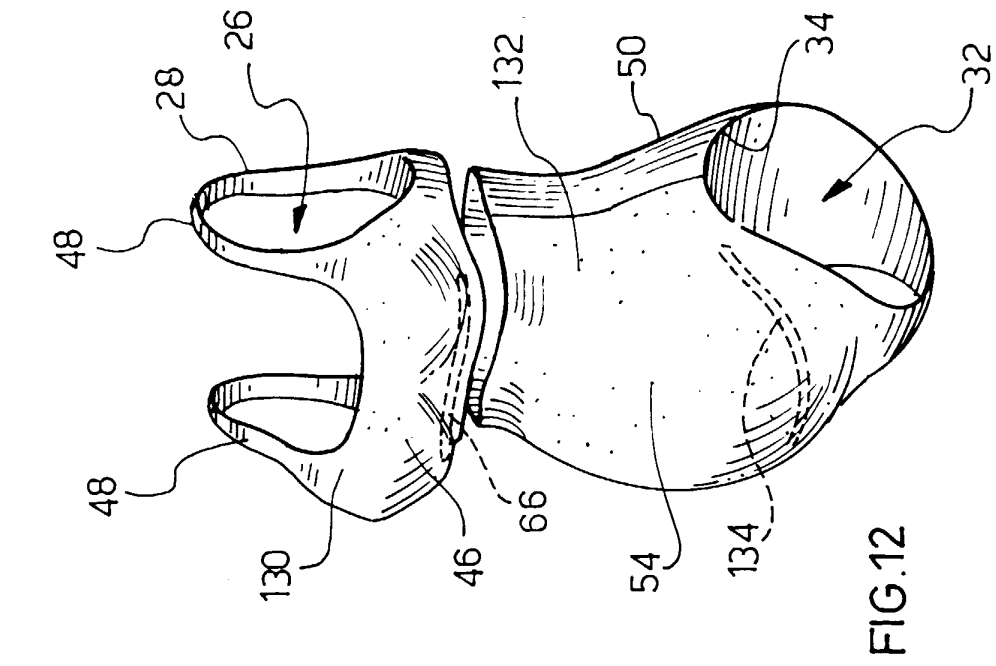


FIG. 8b





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 83 0587

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 5 406 646 A (BALIT ROBERT ET AL) 18 April 1995 (1995-04-18) * column 2, line 67 - line 68 * * column 3, line 32 - line 33 * * column 4, line 11 * * column 4, line 20 * * column 4, line 41; figures 4,5 *	1-4, 8-10, 20, 21, 23, 26-28	A41D1/20 A41D7/00 A41C5/00
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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