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(54) **Item of protective clothing**

(57) An item of protective clothing whose structure comprises, at a body part to be protected, a support (10, 110, 210) made of plastic material that is monolithically associated with the outside of the item (11, 111), with at

least one protective rigid shield (12, 112, 212) arranged in a preset region of the support, and means (13, 113, 213) for mutually fixing the support (10, 110, 210) and the at least one protective shield (12, 112, 212).

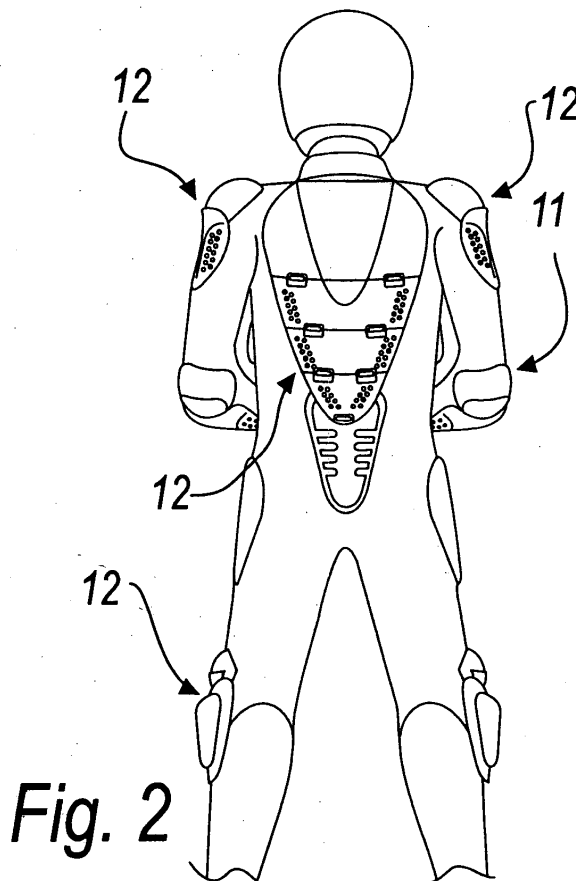


Fig. 2

Description

[0001] The present invention relates to an item of protective clothing.

[0002] The invention is particularly suitable to be configured as a motorcycling suit, jacket, pants, or other protective clothing in general.

[0003] As is known, body protection elements in suits, jackets and pants for motorcyclists are constituted by rigid shields or elements that are embedded within the item of clothing at the parts of the body that are most exposed to injuries or fractures (shoulders, knees, elbows) in order to absorb impacts and provide protection against them.

[0004] Each protective element generally comprises an outer shell made of rigid plastic material, which is coupled to a soft inner layer having a high impact absorption power.

[0005] Pocket-like elements are usually applied inside the item (in the case of shoulders and elbows), or suitable pockets are provided on the inside and/or outside of the item (in the case of knees or shins).

[0006] As an alternative, the leather of the item is performed in the regions to be protected (shoulders, elbows, knees and shins) and then a shell of perforated plastic material is positioned, monolithically coupling the assembly by interposing a sandwiched foam injection.

[0007] Although they are now widely used, these structures entail several drawbacks, the most important of which are, in both cases, the difficulty in maintaining the correct position of the protections during use and in particular in case of a fall (for pocket-type protections), the tearing of the leather or other manufacturing material in case of a fall, the less than perfect fit of the item of clothing, since the rigid part of the protections (which is indispensable for the impact cushioning action) forms areas that cannot be made to conform to the build of the body and also cause the movements of the user to be difficult and clumsy.

[0008] The aim of the present invention is to provide an item of protective clothing whose structure eliminates the drawbacks noted above in known types.

[0009] Within this aim, an object is to provide an item of protective clothing whose structure, in case of a fall, reduces considerably the risks of tearing of the leather or of the material of which it is made.

[0010] Another object is to provide an item of protective clothing that allows to replace any broken protective parts and thus restore their action.

[0011] Another object is to provide an item of protective clothing that can be ventilated.

[0012] This aim and these and other objects that will become better apparent hereinafter are achieved by an item of protective clothing having a structure that is characterized in that it comprises, at a body part to be protected, a support made of plastic material that is monolithically associated with the outside of the item, with at least one protective rigid shield arranged in a preset re-

gion of said support and means for mutually fixing said support and said at least one protective shield.

[0013] Advantageously, the mutual fixing of said support and said at least one protective shield is of the reversible type.

[0014] Conveniently, said support and said protective shield have through holes for ventilating the item of clothing.

[0015] Further characteristics and advantages of the invention will become better apparent from the following detailed description of two embodiments thereof, illustrated by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a front view of a person wearing an item of clothing having the structure according to the invention in a first embodiment, which is configured like a motorcycling suit;

Figure 2 is a rear view of the person of Figure 1;

Figure 3 is an exploded enlarged-scale perspective view of a detail of the region of the back of the item of Figures 1 and 2;

Figure 4 is an exploded enlarged-scale perspective view of a detail of the arm region of the item of Figures 1 and 2;

Figure 5 is an exploded enlarged-scale perspective view of a detail of the back region of a second embodiment of the item according to the invention;

Figure 6 is a perspective view of a detail of an engagement means comprised within the item of Figure 5;

Figure 7 is a sectional view of a portion of the item of clothing of Figure 5;

Figure 8 is an exploded enlarged-scale perspective view of a detail of the arm region of the second embodiment of the item according to the invention;

Figure 9 is an enlarged-scale perspective view of a detail of the shoulder region of the item of Figures 1 and 2;

Figure 10 is another perspective view of a further detail of the shoulder region of the item according to the invention;

Figure 11 is a perspective view of a third detail of the shoulder region of the item according to the invention.

[0016] With reference to Figures 1 to 4, an item according to the invention has, in a first embodiment, a structure that comprises, at the part of the body to be protected, a support 10 that is made of plastics and is monolithically associated with the outside of an item 11 made of leather and/or fabric and/or other material, at least one rigid protective shield 12, which is arranged on a suitable region of the support 10 (or so as to cover a plurality of supports 10), and means 13 for mutually fixing the support 10 and the corresponding protective shield 12.

[0017] In particular, a preformed padding 14 is ar-

ranged externally with respect to the item 11 on the region to be protected and is contained peripherally by perimetric edges 15 of the support 10.

[0018] The perimetric edges 15 are suitable to join the support 10 to the item 11, for example by means of stitched seams that are not evident in the figures.

[0019] The padding 14 is contoured anatomically with respect to the body part to be protected, and can be conveniently made of shock-resistant material or any other material that absorbs external impact energies.

[0020] Another padding 14a can be arranged inside the item 11.

[0021] The support 10 is contoured internally so as to form at least one abutment and positioning seat 17 for at least one protective shield 12, and the fixing means 13 is slidably coupled in the seat 17 and in this case is constituted by a locking/release latch 18.

[0022] Said latch is constituted in practice by a slider, designated by the same reference numeral 18, that can slide in a pocket 19 formed in the support 10 within the seat 17 and protrudes from the support 10 with a tab 20 that is available to the action of the user.

[0023] The slider 18 has slotted holes 21, each of which lies along the sliding direction and comprises a wider portion 21a that is continued by a narrower portion 21b.

[0024] Each hole 21 can be accessed by way of the presence of through slots 22 on the outer part of the pocket 19.

[0025] The protective shield 12 is arranged on the support 10 and is engaged interchangeably therewith, since it is provided with fixing means 13 that are complementary to the slider 18 and are constituted by mushroom-shaped pins, designated by the reference numeral 23.

[0026] The pins 23 have a head 23a that is suitable to pass through the portion 21a of the hole 21 and a stem 23b that is suitable to pass through the portion 21b.

[0027] Thus, by arranging the slider 18, by way of the tab 20, so that the portions 21a are located at the pins 23, the heads 23a are allowed to pass through the portions 21a.

[0028] By then sliding the slider 18, the portions 21b are arranged at the stems 23b, coupling the shield 12 to the support 10.

[0029] Some of the shields 12 and respective supports 10 are provided with microperforations (and/or holes), respectively designated by the reference numerals 24 and 25, that are arranged correspondingly and allow the ventilation of the item 11; moreover, a waterproof and breathable membrane 26 can be arranged inside the shields 12 so as to protect the microperforations 24, in order to prevent the inside of the item 11 from getting wet in case of rain.

[0030] In particular regions, such as the elbows, it is possible to provide auxiliary shields 12a that are rigidly coupled by means of hinges 27 to the shields 12.

[0031] With reference now to Figures . 5 to 8, an item

according to the invention, in a second embodiment, has a structure that comprises, at the body part to be protected, a support 110 that is made of plastics and is monolithically associated with the outside of the item 111 made of leather and/or fabric and/or other material, at least one rigid protective shield 112 that is arranged in a preset region of the support 110, and means 113 for mutually fixing the support 110 and the corresponding protective shield 112.

[0032] In particular, a preformed padding 114 is arranged outside the item 111 on the region to be protected and is contained peripherally by perimetric edges 115 of the support 10.

[0033] The perimetric edges 115 are suitable to join the support 110 to the item 111, for example by means of stitched seams 116.

[0034] In this case also, the padding 114 is suitably shaped internally so as to correspond to the body part to be protected, and can be made of shock-resistant material or of any other material that absorbs external impact energies.

[0035] The support 110 is contoured internally so as to form at least one seat 117 for the abutment and positioning of at least one protective shield 112, and the fixing means 113 are located in the seat 117; in this case, the means are constituted by bridge-like tabs 118 that protrude outward.

[0036] The protective shield 112 is arranged on the support 110 and is coupled interchangeably thereto because it is provided with fixing means 113 that are complementary to the tabs 118 and are constituted by through slots 122 that are suitable to be crossed by the tabs 118, so that the connecting element 118a arranged between the wings 118b protrudes externally and so that it is possible to straddle the connecting element with a C-shaped locking/release pin 123, whose insertion end 123a can be conveniently arrow-shaped in order to form wings 123b for retention against unwanted disengagements.

[0037] In this case also, each shield 112 and each support 110 have microperforations (and/or holes), designated by the reference numerals 124 and 125, which are arranged correspondingly and allow the ventilation of the item 111; moreover, a waterproof and breathable membrane 126 can be arranged inside the shield 112 so as to protect the microperforations 124 in order to prevent the inside of the item 111 from getting wet in case of rain.

[0038] In particular regions, such as the elbow regions, it is possible to provide auxiliary shields 112a, which are rigidly coupled by means of hinges 127 to the shields 112.

[0039] With reference to Figures 9 to 11, an item according to the invention, in a third embodiment, has a structure that comprises, at the body part to be protected, for example a shoulder, a support 210 that is made of plastics and is monolithically associated with the outside of the item made of leather and/or fabric and/or oth-

er material and is provided with a rigid protective shield 212 that is connected to the support 210 by way of fixing means 213.

[0040] Such rigid protective shield is composed of a first part 212a, which is monolithically coupled to the shoulder, a second part 212b, which is monolithically coupled to the adjacent arm region, and a third central connecting part 212c.

[0041] The first part 212a and the second part 212b are locked by means 213 for reversible fixing to the support 210, while the third part 212c is rigidly coupled to the other two parts by means of two slots 230a and 230b for translational motion in which corresponding guiding pins 231a and 231b are inserted, each pin protruding monolithically from the corresponding first part 212a and second part 212b.

[0042] In order to facilitate the return of the protective shield 212 to the initial configuration, there are return springs 233 that are fixed by their ends to tabs 234a, 234b and 234c, which are provided respectively on the first part 212a, on the second part 212b, and on the third part 212c.

[0043] The springs 233 are connected to the tabs 234a, 234b and 234c by means of filaments 235 made of Kevlar®.

[0044] The slots 230a and 230b and the respective pins 231a and 231b allow a guided motion for elongation/shortening of the shield 212 in addition to the articulation of the part 212b related to the arm with respect to the part 212a related to the shoulder by interposition of the central part 212c.

[0045] The springs 233 assist this movement, facilitating the movements of the user.

[0046] The first part 212a and the second part 212b are made of plastics, while the central part 212c is made of carbon coinjector over plastics.

[0047] The padding 214 is sewn onto two longitudinal members 236 of the support 210, between the protective shield 212 and the underlying portion of the item of clothing, inside the perimetric edges 215 of the support 210.

[0048] As an alternative, the padding 214 is arranged in a pocket, not shown, internally or externally with respect to said item of clothing at the shield 212 and in particular at the third central part 212c.

[0049] The fixing means 213 are constituted by bridge-like tabs 218 on the support 210, which are suitable to be arranged in complementarily shaped seats 222 provided on the first part 212a and on the second part 212b of the shield 212.

[0050] The seats 222 have, at the openings 218a of the bridge-like tabs 218, holes 222a for the reversible interlocking of closure pins 223.

[0051] The pins 223 can be inserted and extracted conveniently by a user who needs to act in order to repair or replace components.

[0052] Additional fixing means 213 are provided inside the second part 212b of the shield 212 and above

the support 210, and are constituted by first slots 237b on the second part 212b and 237a on the support 210, which are suitable to mate with a reversible interlocking in order to improve the connection between the part 212b of the shield 212 and the support 210.

[0053] The support 210 is provided with ventilation holes 225.

[0054] The third embodiment of the invention, described for application at a shoulder, is also used to protect elbows and knees.

[0055] In practice it has been found that the intended aim and objects of the present invention have been achieved.

[0056] With respect to the prior art, there is in fact maximum stability of the protections on the regions to be protected, a reduction of the risks of tearing/spoiling of the leather in case of a fall by way of the presence of the interchangeable shields 12, 112, the assurance of maximum ergonomics in motorcycle driving because the item of clothing 11, 111 being worn is contoured anatomically on the body and has no internal interfering rigid elements, and ventilation of the user's body is allowed.

[0057] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0058] All the details may further be replaced with other technically equivalent elements.

[0059] Thus, for example, the fixing means 13, 113 can also be of another mechanical type or even of a chemical type (for example adhesive bonding) and/or of a thermal type (for example thermal bonding), and the protective shields 12, 112 can be made of any material and have any shape.

[0060] In practice, the materials employed, so long as they are compatible with the contingent use, as well as the dimensions, may be any according to requirements.

[0061] The disclosures in Italian Patent Application No. PD2002A000248 from which this application claims priority are incorporated herein by reference.

[0062] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. An item of protective clothing having a structure that is **characterized in that** it comprises, at a body part to be protected, a support (10, 110, 210) that is made of plastic material and is monolithically associated with the outside of the item (11, 111), with at least one protective rigid shield (12, 112, 212) arranged in a preset region of said support and means

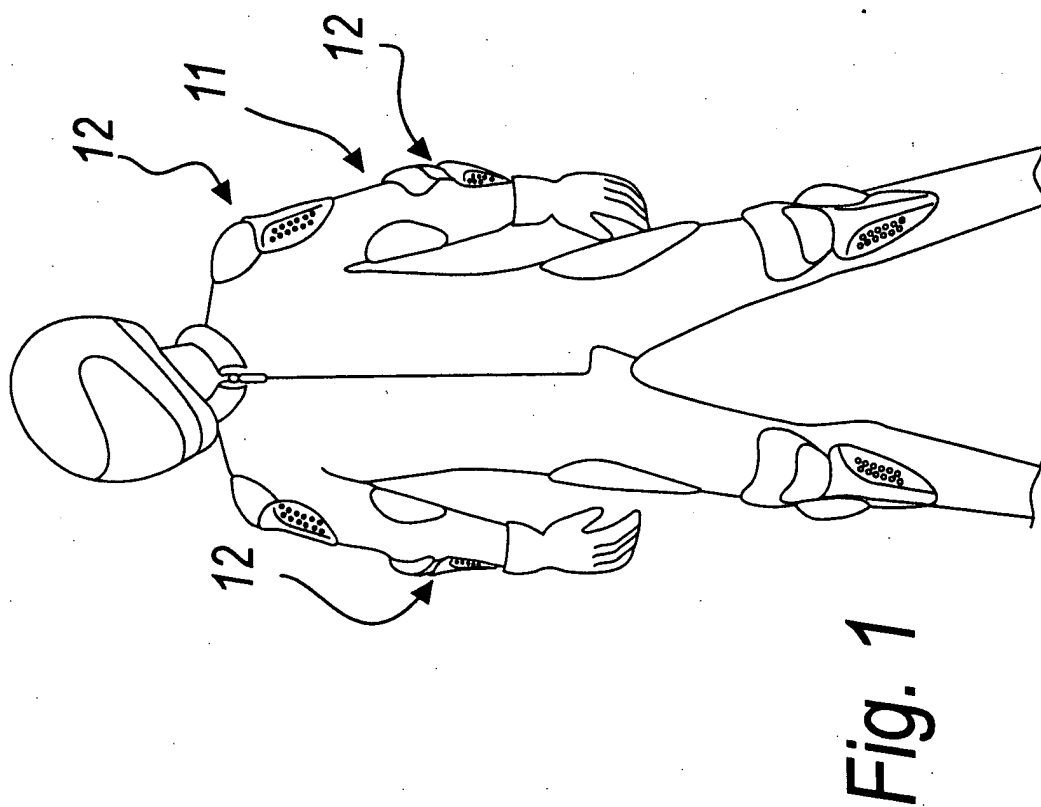
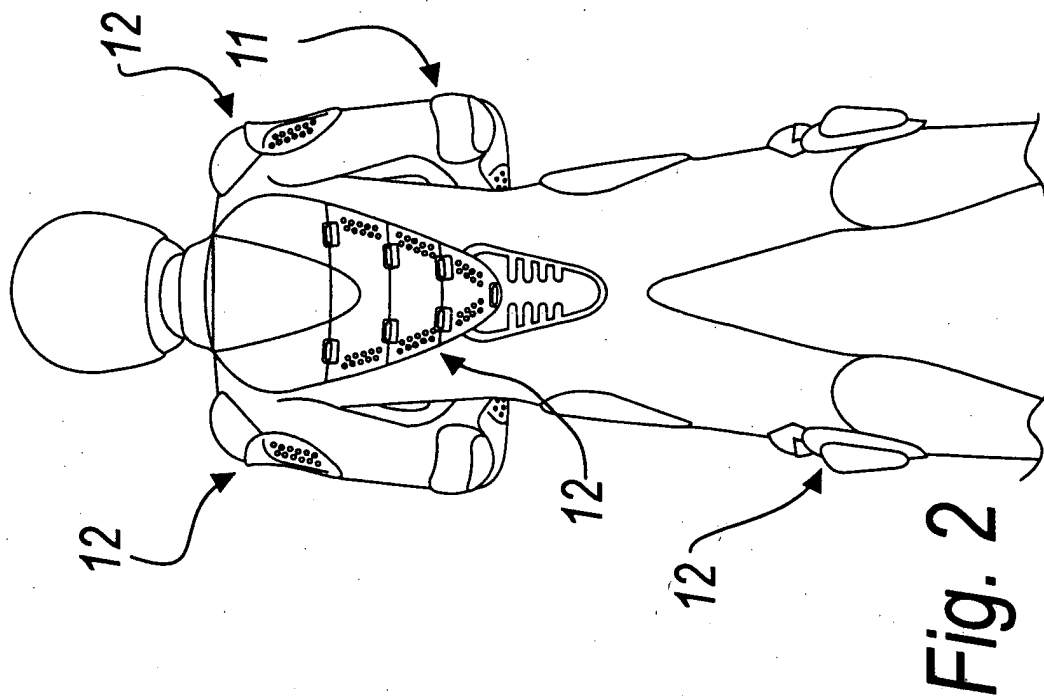
(13, 113, 213) for mutually fixing said support (10, 110, 210) and said at least one protective shield (12, 112, 212).

2. The item of protective clothing according to claim 1, **characterized in that** it comprises a preformed padding (14, 114, 214), which is arranged on the region to be protected and is contained peripherally by perimetric edges (15, 115, 215) that form the contour of said support (10, 110, 210), said perimetric edges (15, 115, 215) being suitable for coupling to the item (11, 111). 5
3. The item of protective clothing according to claim 2, **characterized in that** said coupling of said support (10, 110, 210) is provided by means of stitched seams (116) and/or by chemical and/or thermal fixing. 10
4. The item of protective clothing according to one or more of the preceding claims, **characterized in that** said support (10) is contoured internally so as to form at least one seat (17) for the abutment and positioning of said at least one protective shield (12). 15
5. The item of protective clothing according to claim 4, **characterized in that** at least one fixing means (13) is slidably coupled in said seat (17) and is constituted by a locking/release latch (18). 20
6. The item of protective clothing according to claim 5, **characterized in that** said locking/release latch (18) is constituted by a slider (18) that can slide in a pocket (19) that is formed in the support (10) with in the seat (17) and protrudes from said support (10) with a tab (20) that is available to the action of the user, said slider (18) having at least one slotted hole (21) which lies along the sliding direction and comprises a wider portion (21a) that is continued by a narrower portion (21b), each hole (21) being accessible by way of the presence of through slots (22) on the outer part of said pocket (19). 25
7. The item of protective clothing according to claims 5 and 6, **characterized in that** said protective shield (12) is arranged on said support (10) and is engaged interchangeably therewith, since it is provided with fixing means (13) that are complementary to said slider (18) and are constituted by mushroom-shaped pins (23) that have a head (23a) adapted to pass through said wide portion (21a) of said hole (21) and a stem (23b) adapted to pass through said narrow portion (21b). 30
8. The item of protective clothing according to one or more of claims 1 to 3, **characterized in that** said support (110, 210) is contoured internally so as to 35

form at least one seat (117) for the abutment and positioning of at least one protective shield (112, 212), and **in that** fixing means (113, 213) are provided in the seat (117), said means being constituted by bridge-like tabs (118, 218) that protrude outward. 40

9. The item of protective clothing according to claim 5, **characterized in that** said protective shield (112) is provided with fixing means (113) that are complementary to said tabs (118) and are constituted by through slots (122) that are suitable to be crossed by said tabs (118) so that the coupling element (118a) arranged between the wings (118b) protrudes outside and can be straddled by a C-shaped locking/release pin (123). 45
10. The item of protective clothing according to claim 9, **characterized in that** the insertion end (123a) of each pin (123) is arrow-shaped in order to form retention wings (123b) to prevent unwanted disengagements. 50
11. The item of protective clothing according to one or more of the preceding claims, **characterized in that** each shield (12, 112) and each support (10, 110) is provided with holes (24, 25, 124, 125, 225), which are arranged correspondingly and allow the ventilation of said item (11, 111). 55
12. The item of protective clothing according to claim 11, **characterized in that** a waterproof and breathable membrane (26) is arranged inside said shield (12, 112) so as to protect said holes (24, 124) in order to prevent the inside of said item (11, 111) from getting wet in case of rain.
13. The item of clothing according to one or more of claims 1 to 3, **characterized in that** said rigid protective shield (212) is composed of a first part (212a), which is associated with a first portion of a joint of a user; a second part (212b), which is rigidly coupled to a second portion of the same joint and is articulated with respect to said first part, and a third central part (212c), which connects said first part (212a) and said second part (212b) and protects the articulation of the joint.
14. The item of clothing according to claim 13; **characterized in that** said first part (212a) and said second part (212b) are locked by said means (213) for reversible fixing to said support (210), said third part (212c) being rigidly coupled to the two parts (212a, 212b) by means of two slots for translational motion (230a, 230b) in which corresponding guiding pins (231a, 231b) are inserted, each one of said pins (231a, 231b) protruding monolithically from the respective first part (212a) and second part (212b). 60

15. The item of clothing according to one or more of claims 13 and 14, **characterized in that** elastic return means (233) are provided inside said shield (212) and are stretched between said first part (212a) and said third part (212c) and between said second part (212b) and said third part (212c) of said shield, said elastic means (233) being fixed by their ends to tabs (234a, 234b and 234c) that are provided respectively on the first part (212a), on the second part (212b), and on the third part (212c).
16. The item of clothing according to one or more of claims 13 to 15, **characterized in that** said elastic means (233) are constituted by helical springs, said springs (233) being connected to said tabs (234a, 234b, 234c) by means of filaments (235) made of Kevlar®.
17. The item of clothing according to one or more of claims 13 to 16, **characterized in that** said fixing means (213) are constituted by bridge-like tabs (218) that are provided with openings (218a) on said support (210) that are suitable to be arranged in complementarily shaped seats (222) provided on the first part (212a) and on the second part (212b) of the shield (212), said seats (222) having, at said openings (218a), holes (222a) for the reversible interlocking of closure pins (223) that are suitable to engage in said openings (218a) and in said holes (222a).
18. The item of clothing according to one or more of claims 13 to 17, **characterized in that** additional fixing means (213) are provided inside the second part (212b) of the shield (212) and above the support (210) and are constituted by first slots (237b) on the second part (212b), which are suitable to mate by reversible interlocking with second slots (237a) on the support (210).



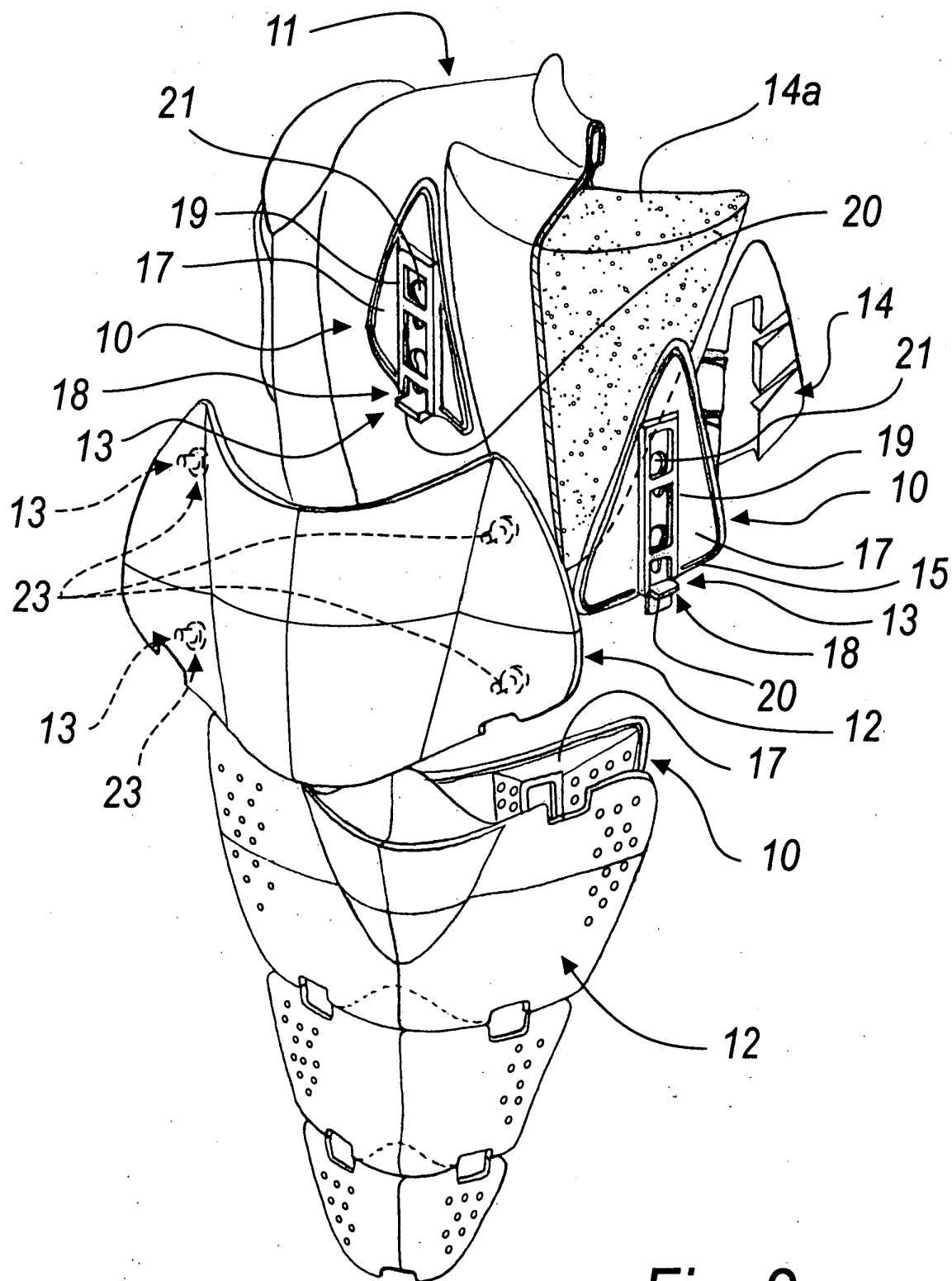


Fig. 3

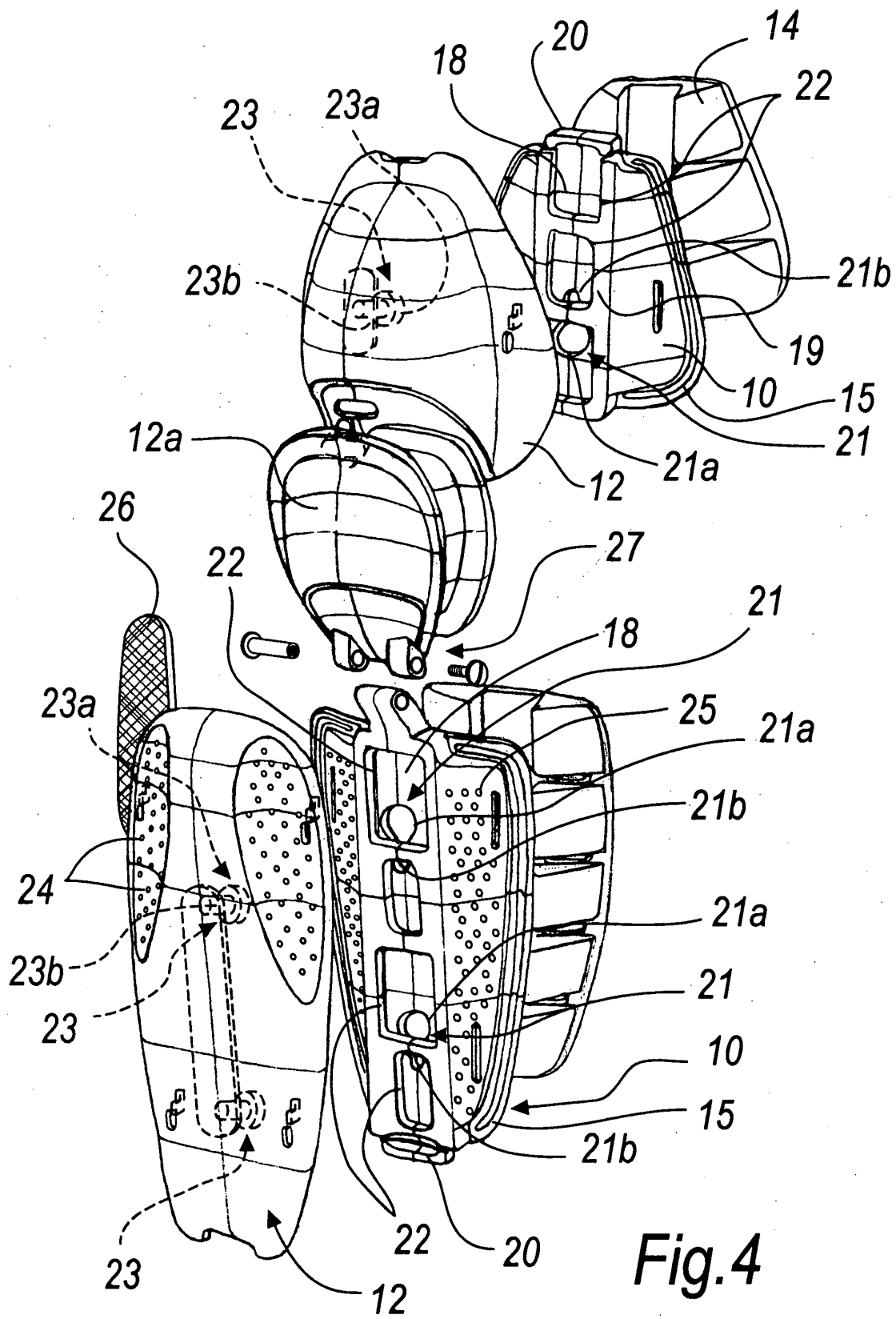
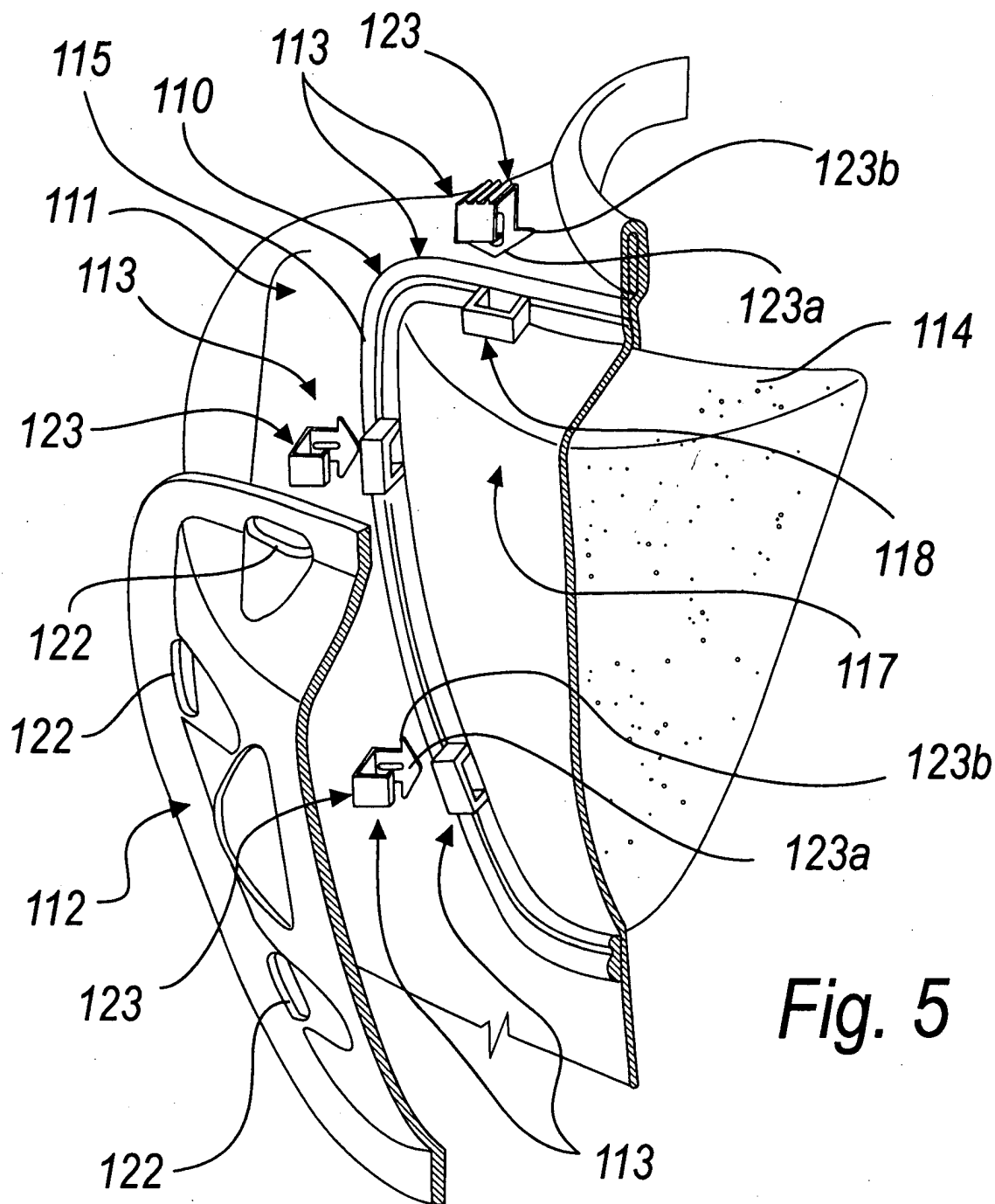
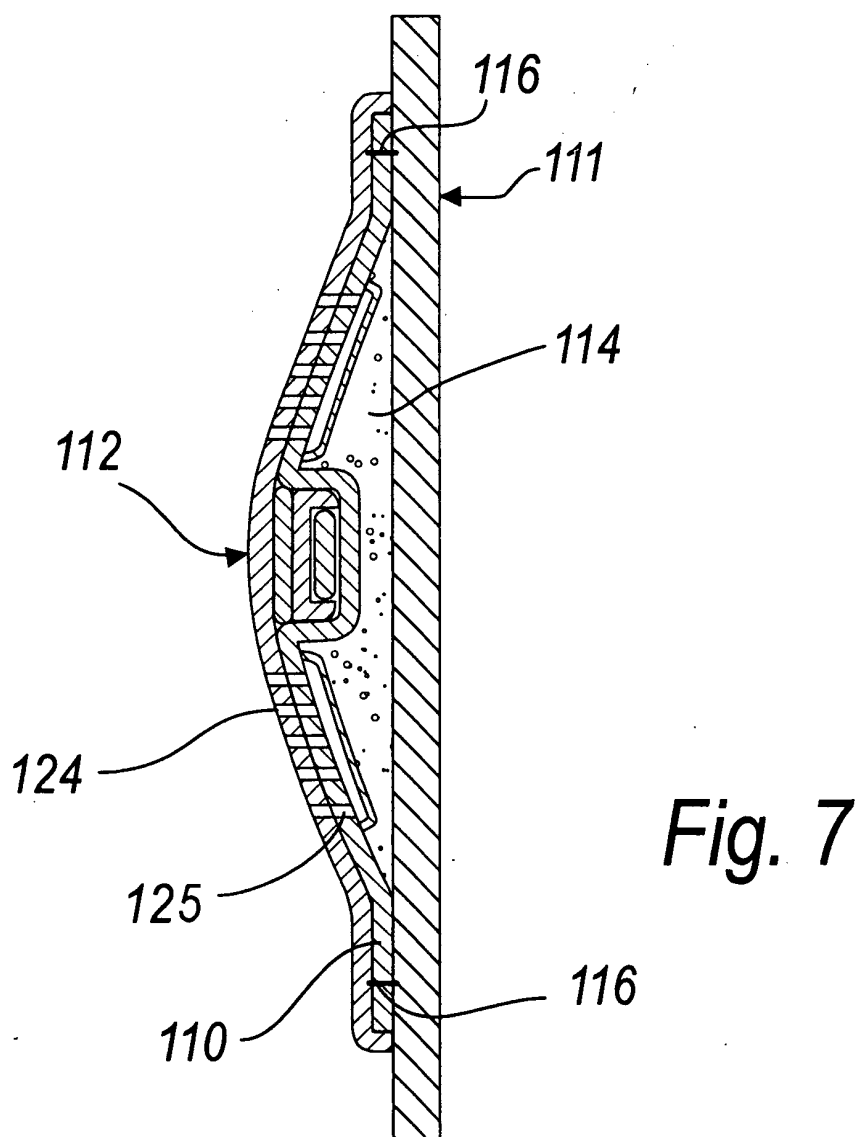
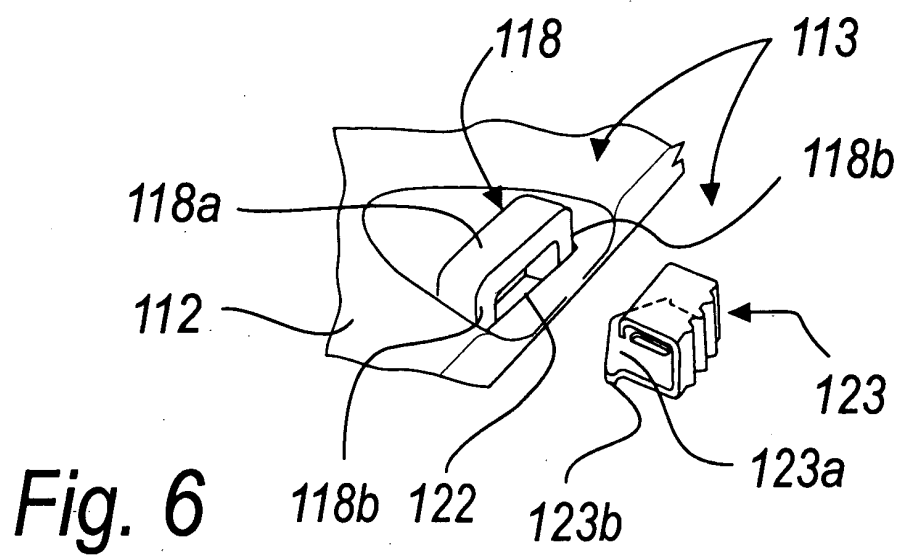


Fig.4





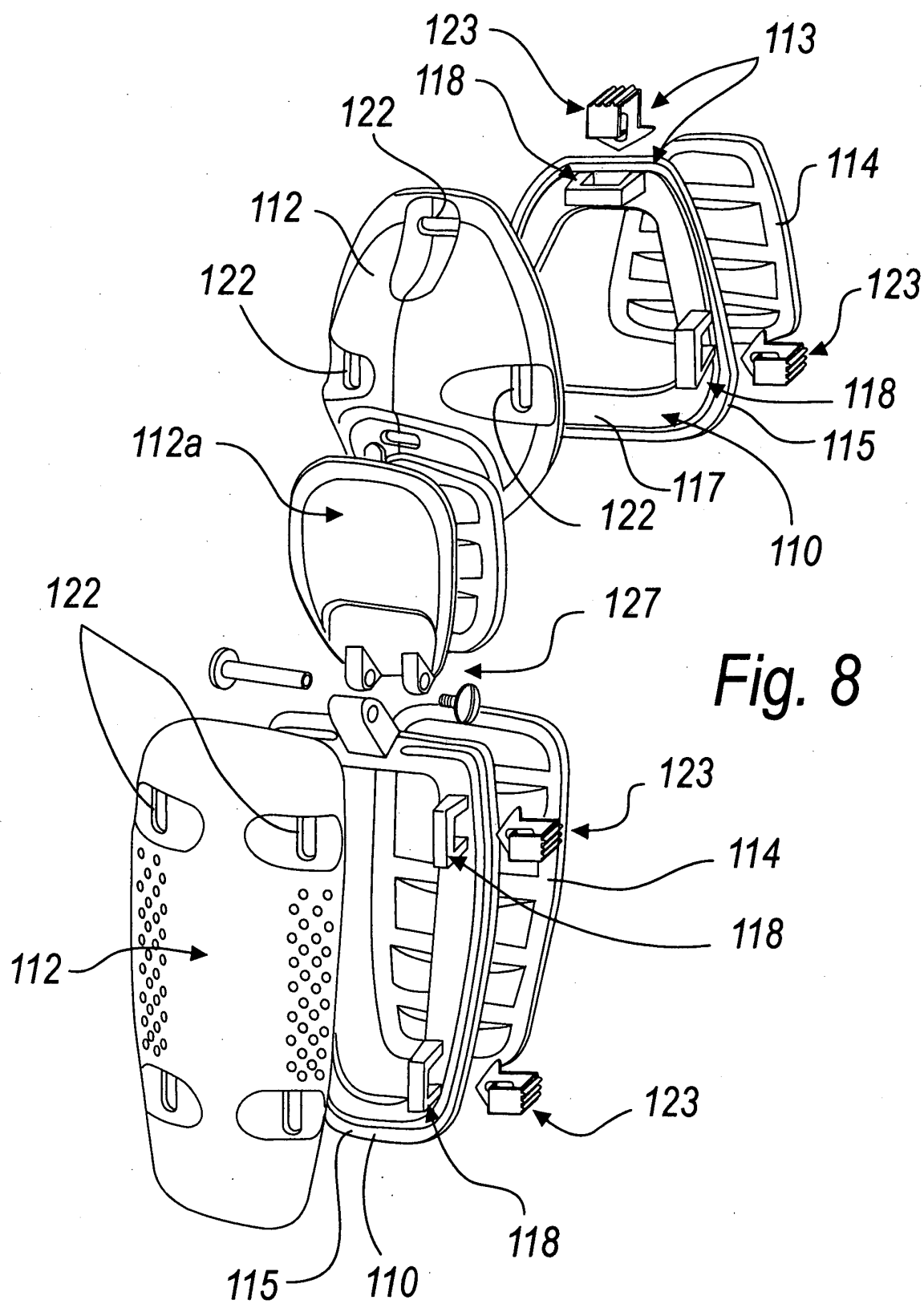


Fig. 8

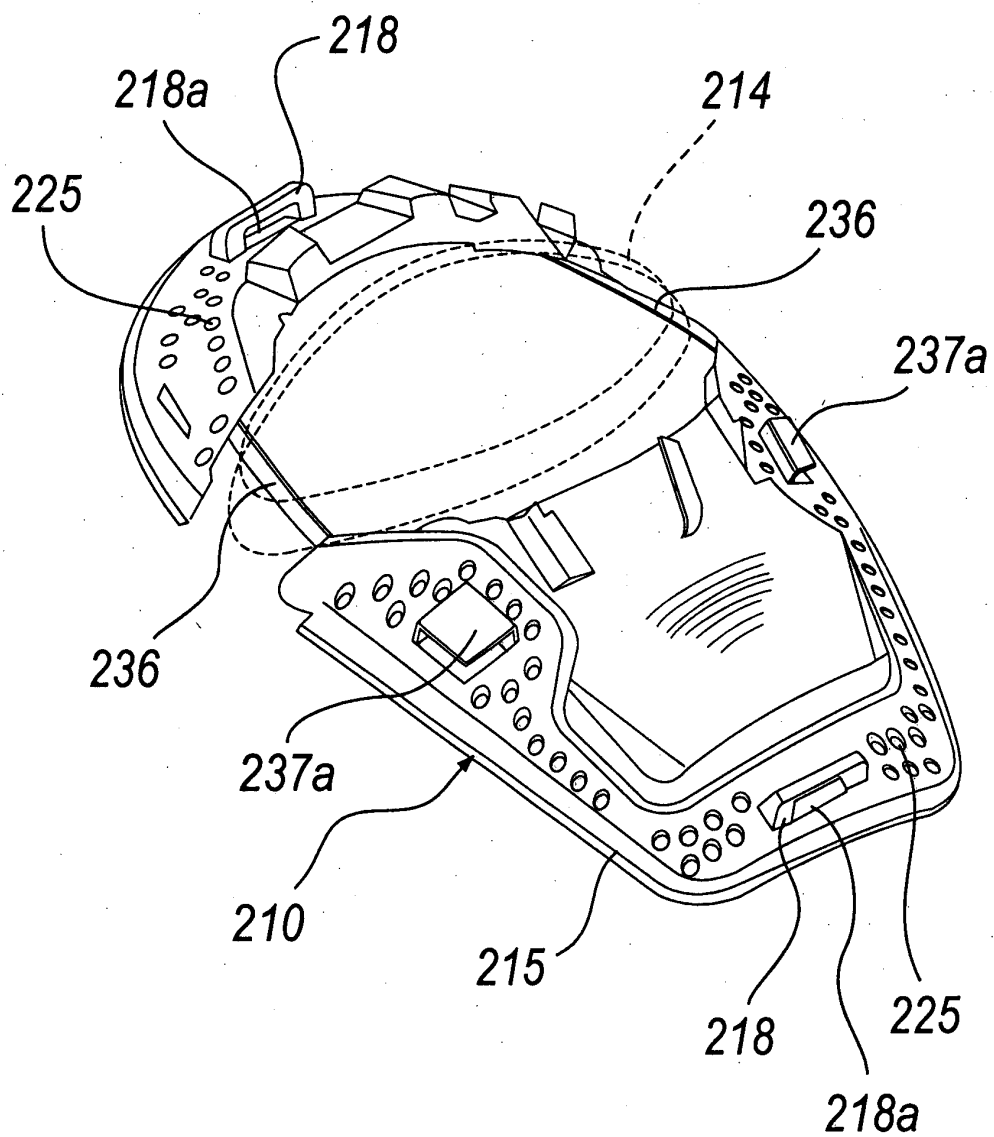


Fig. 9

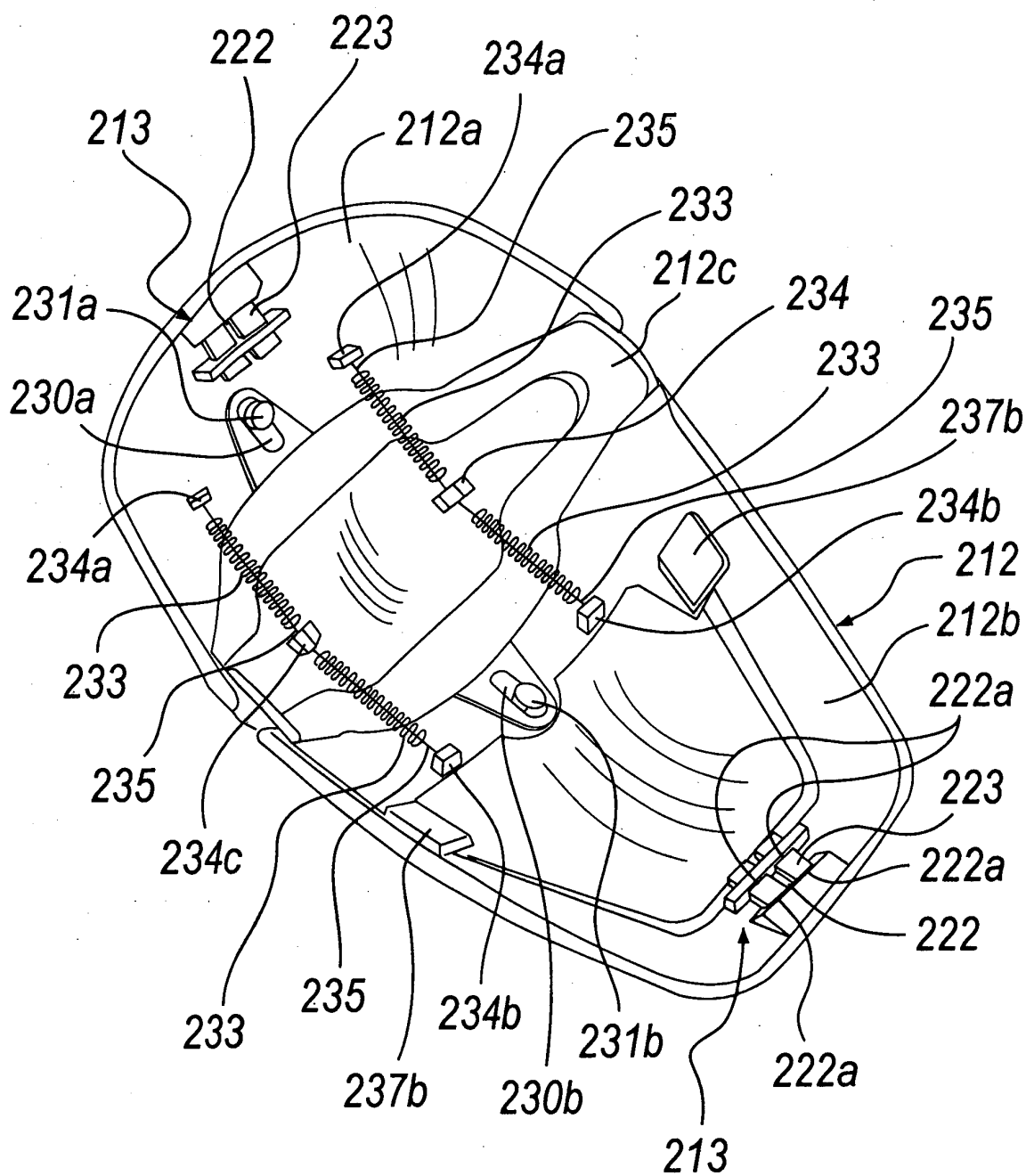


Fig. 10

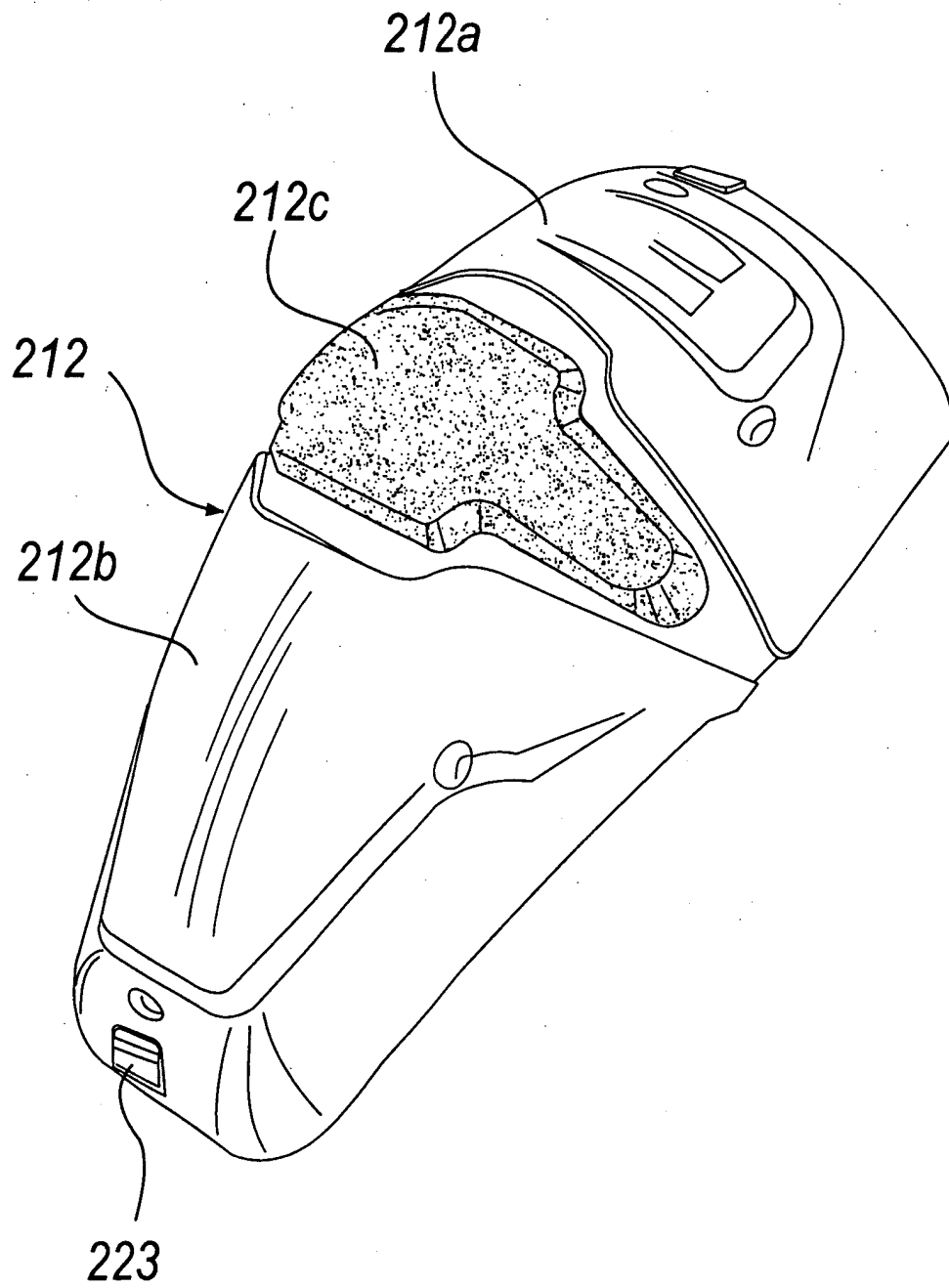


Fig. 11