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(54) **BACKPACK WITH ADJUSTMENT OF THE HEIGHT OF THE SHOULDER STRAPS**

(57) The invention relates to a backpack (1) comprising a case (2) having a fixed backrest (4), a movable backrest (7), which can be moved along the fixed backrest (4), two shoulder straps (8), which are carried by the movable backrest (7) and are fastened to the case (2), adjustment means (10) for adjusting the position of the movable backrest (7) and of the shoulder straps (8) along a vertical axis (A) of the fixed backrest (4), and releasable locking means (11) for fixing the movable backrest (7) and the shoulder straps (8) in the desired position; the fixed backrest (4) comprises a pocket (20), which is delimited towards the outside by a flexible rear wall (23), and an ergonomic stiffening panel (25), which is housed in said pocket (20); the rear wall (23) and the stiffening panel (25) comprise respective upper and lower openings (29, 30, 31, 32) aligned along the vertical axis (A); the adjustment means (10) comprise an adjustment belt (35), which is arranged so as to go through the upper and lower openings (29, 30, 31, 32) and is wound so as to form a loop around the rear wall (23) and the stiffening panel (25) so that it can annularly slide and allow the position of the movable backrest (7) and of the shoulder straps (8) along the vertical axis (A) to be adjusted.

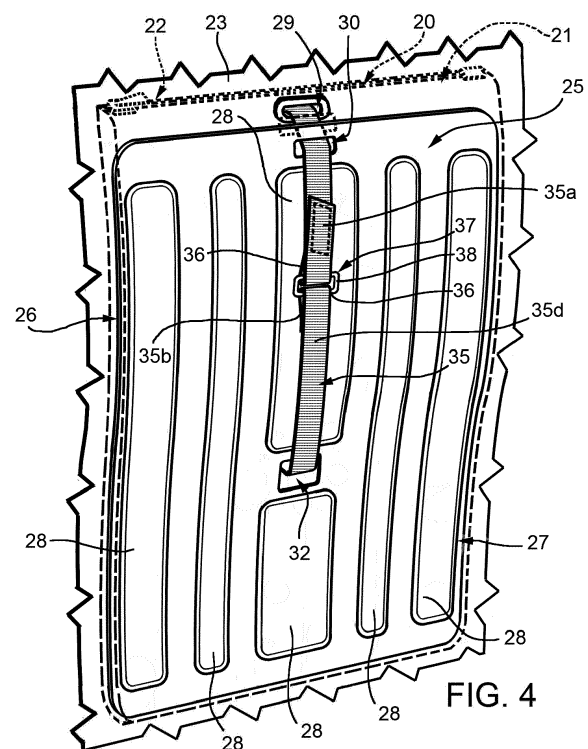


FIG. 4

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This patent application claims priority from Italian patent application no. 102022000007277 filed on April 12, 2022, the entire disclosure of which is incorporated herein by reference.

TECHNICAL FIELD

[0002] The invention relates to a backpack, in particular of the kind used for school or spare time, to which explicit reference will be made in the description below without, because of this, losing generality.

STATE OF THE ART

[0003] Backpacks of the type indicated above are known, which basically comprise a flexible material case, defining an inner containing space for transporting a load, and a pair of shoulder straps for carrying the backpack on a user's shoulder.

[0004] In particular, the case is usually delimited by a fixed backrest, which, in use, can be placed in contact with the user's back, by a front, which is opposite the fixed backrest, and by two sides.

[0005] The case can simply be closed by a zip or it can be open at the top and be capable of being closed both with a string and with a closing element, for example a sort of lid or a simple flap, fastened, on one side, to the upper area of the fixed backrest, so that it can rotate from and to the front. In the position in which it partly covers the front, the closing element can be fixed to the front in a releasable manner by means of one or more snapping coupling devices.

[0006] Each shoulder strap usually has a first end portion, which is fixed to an upper area of the fixed backrest, and an opposite second end portion, which is fastened to a lower area of the fixed backrest or to a respective side of the case, usually by means of a respective length adjustment belt.

[0007] Backpacks of the type described above are also known, in which it is possible to adjust the height of the shoulder straps in a vertical direction relative to the fixed backrest.

[0008] In these solutions, the backpack usually also comprises a movable backrest carrying the shoulder straps and fixed to the adjustment belt, which can vertically slide relative to the fixed backrest.

[0009] The movement of the movable backrest is guided by guide elements, for example rigid rods or bars, which are parallel to one another and are arranged on opposite sides of the adjustment belt.

[0010] This solution, despite allowing the movable backrest to be effectively guided, is extremely complicated and, above all, fails to be user-friendly, since the rigid guide bars or rods can bother or inconvenience the back,

which, as it is known, is provided with a natural bending that hardly adjusts to the straight shape of the guide bars or rods.

5 SUBJECT-MATTER AND SUMMARY OF THE INVENTION

[0011] Therefore, the object of the invention is to provide a backpack, which allows the height of the shoulder straps to be effectively and simply adjusted without bothering or disturbing users.

[0012] According to the invention, this object is reached by a backpack as claimed in claim 1.

15 BRIEF DESCRIPTION OF THE DRAWINGS

[0013] The invention will be best understood upon perusal of the following description of a preferred non-limiting embodiment, which is provided by mere way of example, with reference to the accompanying drawings, wherein:

- figure 1 is a rear-side perspective view of a backpack according to the invention;
- 25 - figure 2 is a rear-side perspective view of the backpack of figure 1 in an assembling condition;
- figure 3 is a front-side perspective view, on a smaller scale, of the backpack of figure 1 in a further assembling condition;
- 30 - figure 4 shows, in a front-side perspective view and on a larger scale, a detail of the backpack of figure 3;
- figure 5 is similar to figure 1 and shows the backpack of the invention in a different configuration;
- 35 - figures 6 and 7 are cross-sections, on a larger scale, along plane VI-VI of figure 1, in two different operating conditions of the detail shown.

40 DETAILED DESCRIPTION

[0014] With reference to figures 1 to 3 and 5, number 1 indicates, as a whole, a backpack according to the invention, in particular a backpack for school and spare time.

[0015] The backpack 1 basically comprises a case 2, preferably made of a flexible material, which defines an inner containing space 3 (figure 3) for transporting a load and is delimited by a fixed backrest 4, which can be placed, in use, in contact with a user's back (and is known and not shown), by a front 5 opposite the fixed backrest 4 and by two sides 6.

[0016] The backpack 1 further comprises a movable backrest 7, which can be moved along the fixed backrest 4, two shoulder straps 8 for carrying the backpack 1 on the shoulders, which are joined to opposite side portions 7a, 7b of the movable backrest 7, an adjustment assembly 10 for adjusting the position of the movable backrest 7 and of the shoulder straps 8 along a vertical axis A of

the fixed backrest 4, and releasable locking means 11 for fixing the movable backrest 7 and the shoulder straps 8 in the desired position along the fixed backrest 4.

[0017] In the example shown herein, the case 2 of the backpack 1 comprises a main body 12, which is open at the top and is delimited, besides by the fixed backrest 4, by the front 5 and by the sides 6, also by a lower bottom 13 and by an upper covering element 14, which is opposite the bottom 13 and is fastened, on one side, to an upper area 15 of the fixed backrest 4 so as to rotate from and to the front 5 in order to open or close the main body 12.

[0018] The front 5 is preferably provided with one or more pockets 5a and with a releasable snapping closing system 16 (which is known and not described in detail) of the covering element 14 on the front 5.

[0019] With reference to figures 1, 2 and 5, each shoulder strap 8 has a first end portion 8a, which is joined or fastened, at the top, to a respective side portion 7a, 7b of the movable backrest 7, and an opposite second end portion 8b, which is fastened, at the bottom, to a side separation edge 18 between the fixed backrest 4 and a respective side 6 of the case 2.

[0020] More in detail, the end portions 8b of the shoulder straps 8 are fastened to the respective side edges 18 of the main body 12 by means of respective connection belts 19 (which are known and not described in detail), which allow, in a known manner, the overall length of the assembly consisting of the shoulder straps 8 and of the connection belts 19 to be adjusted.

[0021] According to a possible alternative which is not shown herein, the backpack 1 could also comprise one single shoulder strap 8, for example of the type that can be worn by a user crosswise, namely from one shoulder to the opposite side.

[0022] Advantageously (figures 3 and 4), the fixed backrest 4 comprises a pocket 20, which is provided with an upper opening 21 that can be closed, for example, by means of a zip 22 and is delimited, towards the outside, by a flexible rear wall 23, and a stiffening panel 25, which is preferably obtained from a plastic material by means of a thermoforming process and is housed in the pocket 20.

[0023] The stiffening panel 25 is shaped and defines, in the use of position of the backpack on the user's back and considering the side facing the user, an upper concavity 26 and a lower convexity 27 designed to allow the fixed backrest 4 to adapt to the natural bends of the user's back.

[0024] The stiffening panel 25 is further provided with longitudinal ribs 28 extending, in use, parallel to the axis A.

[0025] As shown in figures 1, 2, 4, 5, 6 and 7, the rear wall 23 and the stiffening panel 25 comprise respective upper slots 29, 30 and respective lower slots 31, 32 aligned along the axis A, whose function will be described more in detail below.

[0026] With reference to figures 1, 2, 4, 5, 6 and 7,

again, the adjustment assembly 10 comprises an adjustment belt 35 mounted on the fixed backrest 4 in a movable manner along the axis A and carrying the movable backrest 7.

[0027] Advantageously, the adjustment belt 35 is arranged so as to go through the upper slots 29, 30 and the lower slots 31, 32 and is wound so as to form a loop around the rear wall 23 and the stiffening panel 25 so that it can annularly slide and allow the position of the movable backrest 7 and of the shoulder straps 8 along the axis A to be adjusted.

[0028] The inner branch 35a of the adjustment belt 35 preferably is entirely housed in the pocket 20.

[0029] The adjustment belt 35 is further fixed on the outside of the movable backrest 7.

[0030] More in detail, as shown in figure 4, the adjustment belt 35 comprises opposite end portions 35a, 35b wound like a loop around respective transversal members 36 of a connection buckle 37 adapted to allow a traction force to be transferred and arranged on the side of the stiffening panel 25 opposite the one facing the rear wall 23.

[0031] More precisely, the transversal members 36 of the connection buckle 37 extend, in use, orthogonally to the axis A and parallel to the adjustment belt 35. Furthermore, at least the end portion 35a of the adjustment belt 35 wound like a loop around the respective transversal member 36 of the connection buckle 37 is further fixed, in a releasable manner, to the transversal member 36 by means of a hook-and-loop fastener, such as velcro®.

[0032] In the example shown herein, the connection buckle 37 simply consists of a rectangular frame element formed by the two transversal members 36 and by two vertical connection elements 38, which join corresponding vertexes of the transversal members 36.

[0033] Therefore, in the use condition, the adjustment belt 35 has an outer branch 35c, which is arranged on the outside of the fixed backrest 4, namely on the outside of the rear wall 23, and an inner branch 35d, which is arranged inside the backpack 1; the outer branch 35c is movable, in use, in an opposite direction relative to the inner branch 35d.

[0034] Advantageously, the locking means 11 comprise at least one control buckle 40 for controlling the sliding of the adjustment belt 35, which can selectively be set to a locking condition (figure 7), in which it prevents the adjustment belt 35 from sliding with respect to the fixed backrest 4, and to a release condition (figure 6), in which it allows the adjustment belt 35 to freely slides with respect to the rear wall 23 and to the stiffening panel 35.

[0035] The control buckle 40 comprises a frame 42, which is crossed in a through manner by the adjustment belt 35 and is externally fixed, by means of an auxiliary belt 41, to the top of the rear wall 23 of the fixed backrest 4, and a lever 43, which is hinged to the frame 42 around an axis B, which is orthogonal to the axis A and parallel to the surface of the adjustment belt 35.

[0036] The lever 43 can rotate relative to the frame 42

around the axis B between a first position (figure 7), in which it presses the adjustment belt 35 against the frame 42, thus defining the locking condition, and a second position (figure 6), in which it is detached from the adjustment belt 35 or, despite touching it, allows it to freely slide so as to define the release condition.

[0037] In the example shown in the accompanying figures, the locking means 11 further comprise two releasable hook-and-loop fasteners 45, for example velcro®, which are obtained on the outer surface of the rear wall 23 on opposite sides of the adjustment belt 35 and cooperate, in use, with the movable backrest 7.

[0038] According to a preferred embodiment of the invention, the locking means 11 can also include further anchoring means 46, in the case shown herein comprising:

- two series of first engagement elements 47 obtained on opposite sides of the outer surface of the rear wall 23 on two respective vertical lines parallel to the axis A; and
- two second engagement elements 48 carried by the opposite side portions 7a, 7b of the movable backrest 7, respectively, and adapted to be selectively coupled to respective engagement elements 47 of the two series placed at the same height with respect to the axis A.

[0039] In the example shown herein, the engagement elements 47 consist of slots and the engagement elements 48 consist of hooks projecting from the opposite side portions 7a, 7b of the movable backrest 7.

[0040] The locking means 11 could also include the sole control buckle 40 or the sole control buckle 40 and the hook-and-loop fasteners 45; therefore, the anchoring means 46 are a possible, though not necessary option.

[0041] In use, in order to change the height of the movable backrest 7 and, hence, of the shoulder straps 8 along the fixed backrest 4, the following steps have to be carried out:

- uncoupling the engagement elements 48, namely the hooks, from the respective engagement elements 47, namely the slots;
- detaching the movable backrest 7 from the hook-and-loop fasteners 45;
- moving the lever 43 of the control buckle 40 from the first position of figure 7 to the second position of figure 6, so that the adjustment belt 35 is free to slide;
- moving the movable backrest 7 with the shoulder straps 8 upwards or downwards along the axis A until the desired position is reached;
- moving the lever 43 of the control buckle 40 back to the first position of figure 7, in which it prevents the adjustment belt 35 from sliding;
- having the movable backrest 7 adhere again to the hook-and-loop fasteners 45 carried by the fixed backrest 4; and

- coupling the engagement elements 48 to new corresponding engagement elements 47 at the desired height.

[0042] In case the anchoring means 46 are not present, users only need to act upon the control buckle 40 and the hook-and-loop fasteners 45.

[0043] The features of the backpack 1 disclosed above, which is manufactured according to the invention, clearly reveal the advantages that can be obtained.

[0044] In particular, thanks to the fact that the adjustment belt 35 is wound not only around the lower wall 23 of the main body 12 of the backpack 1, but also around a stiffening panel 25, which is housed in a pocket 20 of the fixed backrest 4 and is shaped so as to adapt to the normal bending of the human back, rigid bars or rods on the outside of the backpack are no longer needed in order to guide the adjustment of the position of the movable backrest 7 and of the shoulder straps 8.

[0045] Basically, the stiffening panel 25, besides stiffening the fixed backrest 4, defines a support on which to wind the adjustment belt 35 and features the characteristic bending of the human back, thus making the backpack 1 more ergonomic compared to known backpacks.

[0046] Furthermore, the solution disclosed herein allows the adjustment operation to be carried out in a very simple and reliable fashion.

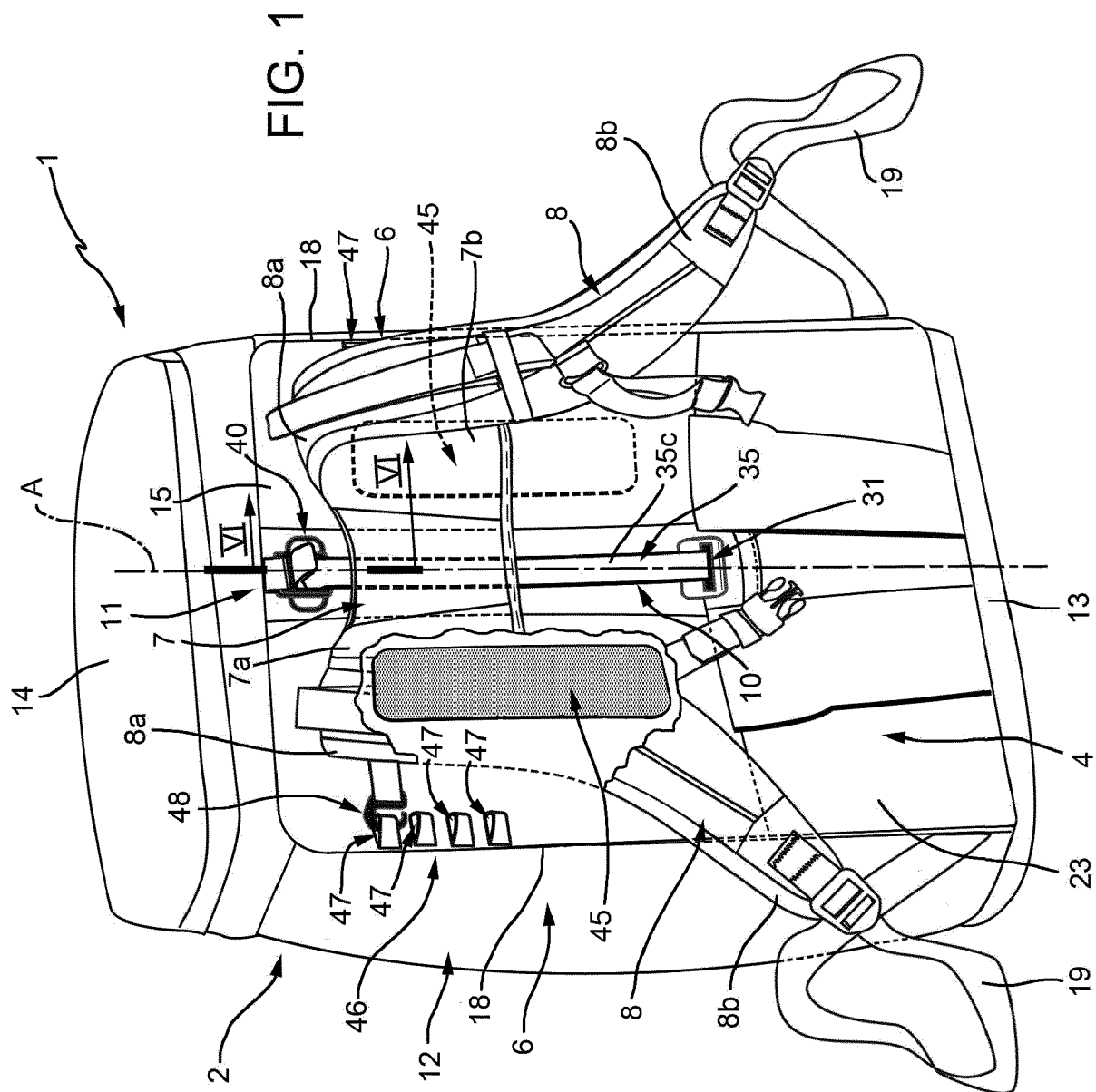
[0047] Finally, the backpack 1 described and shown herein can be subjected to changes and variations, without for this reason going beyond the scope of protection set forth in the appended claims.

Claims

1. Backpack (1) comprising:

- a case (2) defining a containing space (3) for carrying a load and bounded at least by a fixed backrest (4), available in use in contact with the user's back, and by a front (5), opposite to the fixed backrest (4);
- a movable backrest (7) displaceable along said fixed backrest (4);
- at least one shoulder strap (8) for carrying the backpack (1) on the shoulders, having a first end portion (8a) connected to said movable backrest (7) and a second opposite end portion (8b) fastened to said fixed backrest (4) or to one side of said casing (2);
- adjustment means (10) for adjusting the position of said movable backrest (7) and of said shoulder strap (8) along a vertical axis (A) of said fixed backrest (4); and
- releasable locking means (11) to fix said movable backrest (7) and said shoulder strap (8) in the desired position along said fixed backrest (4);

- wherein said adjustment means (10) comprise an adjustment belt (35) mounted on said fixed backrest (4) in a movable way along said axis (A) and carrying said movable backrest (7);
- characterized in that** said fixed backrest (4) comprises a pocket (20), delimited towards the outside by a flexible rear wall (23), and a stiffening panel (25) housed in said pocket (20) and shaped to adapt to the normal curvature of the human back;
- in that** said rear wall (23) and said stiffening panel (25) comprise respective upper openings (29, 30) and respective lower openings (31, 32) aligned along said axis (A); and
- in that** said adjustment belt (35) is arranged passing through said upper openings (29, 30) and said lower openings (31, 32) and is wound to form a loop around said rear wall (23) and said stiffening panel (25) so as to be able to slide annularly and allow the adjustment of the position of said movable backrest (7) and of said shoulder strap (8) along said axis (A).
2. Backpack according to claim 1, wherein said locking means (11) comprise at least one control member (40) for controlling the sliding of the adjustment belt (35), which can be selectively set in a locking condition, in which it locks the sliding of the adjustment belt (35) with respect to the fixed backrest (4), and in a release condition, in which it allows the free sliding of the adjustment belt (35) with respect to the rear wall (23) and to the stiffening panel (25).
 3. Backpack according to claim 2, wherein said control member comprises a control buckle (40) fixed externally to said rear wall (23) of said fixed backrest (4), engaged by said adjustment belt (35) and provided with a lever (43) movable between a first position, in which it presses said adjustment belt (35) against a frame (42) of the control buckle (40) itself defining the locking condition, and a second position, in which it allows the free sliding of said adjustment belt (35) so as to define the said release condition.
 4. Backpack according to any one of the preceding claims, comprising two said shoulder straps (8) joined together by said movable backrest (7).
 5. Backpack according to any one of the preceding claims, in which the said adjustment belt (35) comprises a first and a second end portion (35a, 35b) wrapped in the manner of loops around respective transversal members (36) of a connection buckle (37) adapted to allow the transfer of a traction force and arranged on the side of the stiffening panel (25) opposite to that facing said rear wall (23).
 6. Backpack according to any one of the preceding claims, in which said locking means (11) comprise two releasable tear-off closures (45), made of fabric, obtained on the external surface of said rear wall (23) on opposite sides of said adjustment belt (35) and cooperating in use with said movable backrest (7).
 7. Backpack according to any one of the preceding claims, in which said locking means (11) comprise:
 - two series of first engagement elements (47) obtained on opposite sides of the external surface of said rear wall (23) on two respective vertical lines parallel to said axis (A); and
 - two second engagement elements (48) carried by respective opposite side portions (7a, 7b) of said movable backrest (7) and adapted to selectively couple with respective first engagement elements (47) of the two series placed at the same height with respect to said axis (A).
 8. Backpack according to Claim 7, in which said first engagement elements (47) are slots and in which said second engagement elements (48) are hooks projecting cantilevered from said opposite side portions (7a, 7b) of the said movable backrest (7).
 9. Backpack according to any one of the preceding claims, wherein said stiffening panel (25) defines, in use, towards said rear wall (23), an upper concavity (26) and a lower convexity (27).
 10. Backpack according to any one of the preceding claims, wherein said casing (2) comprises:
 - a main body (12) open at the top and delimited, in addition to the fixed backrest (4) and the front (5), also by a bottom (13); and
 - an upper covering element (14), opposite to said bottom (13) and fastened on one side to said fixed backrest (4) so as to be able to rotate to and from said front (5).



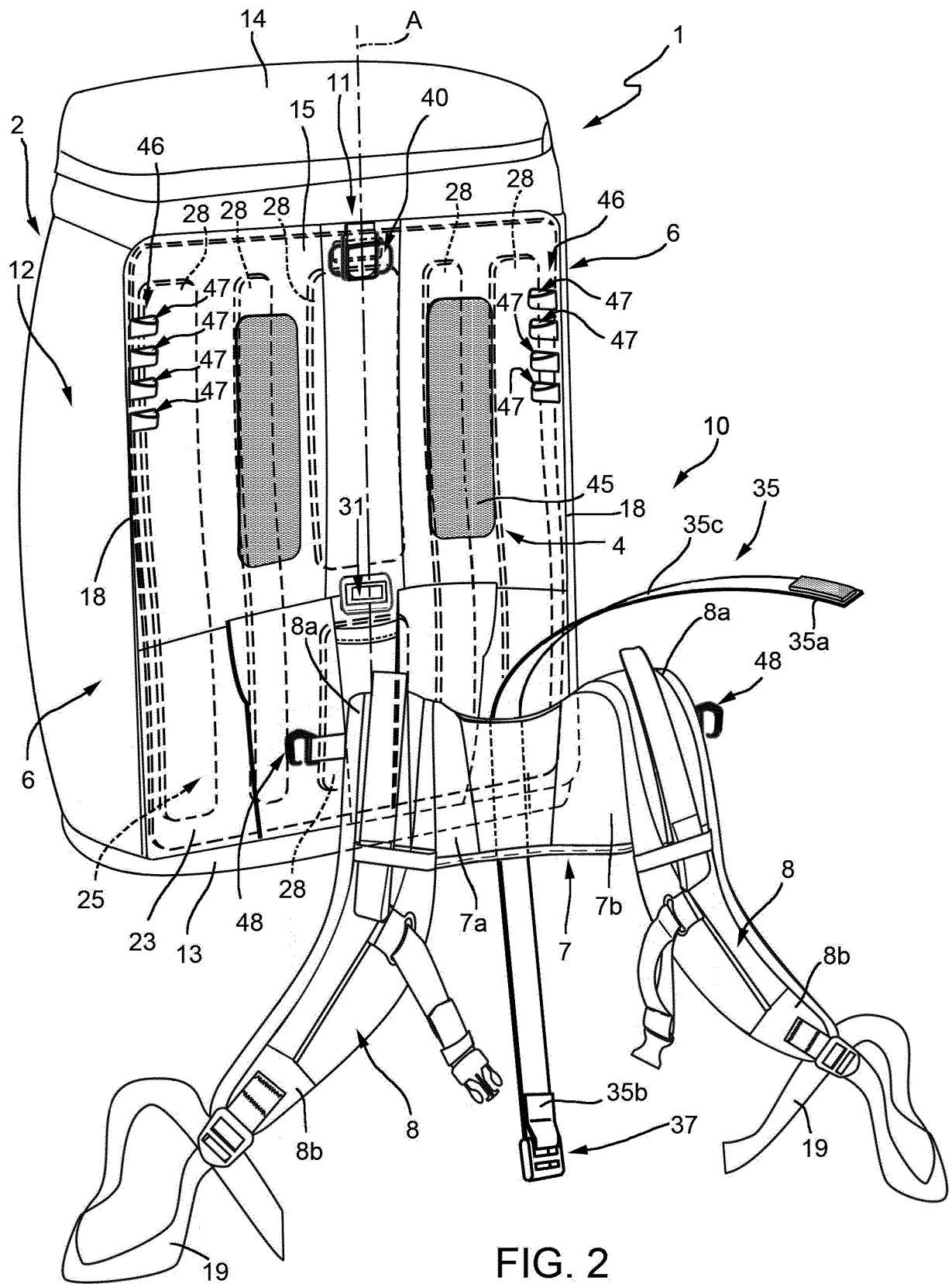
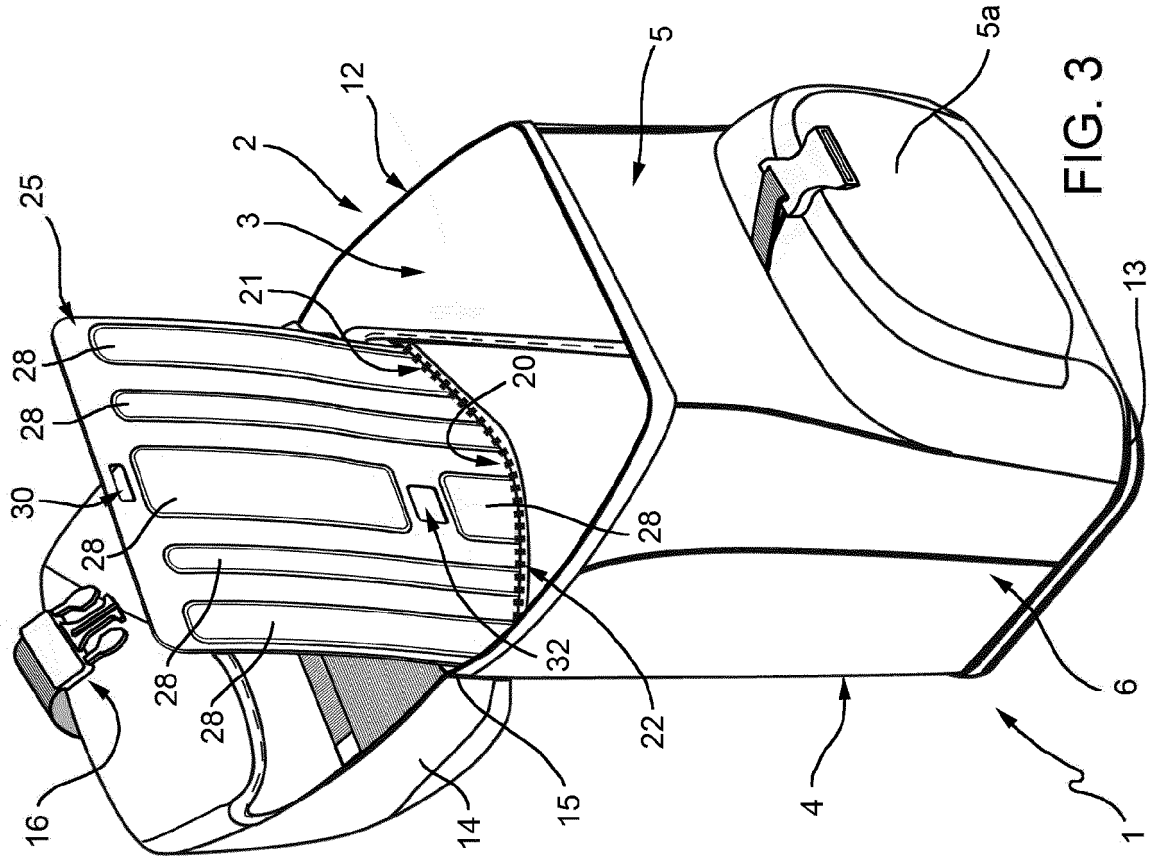
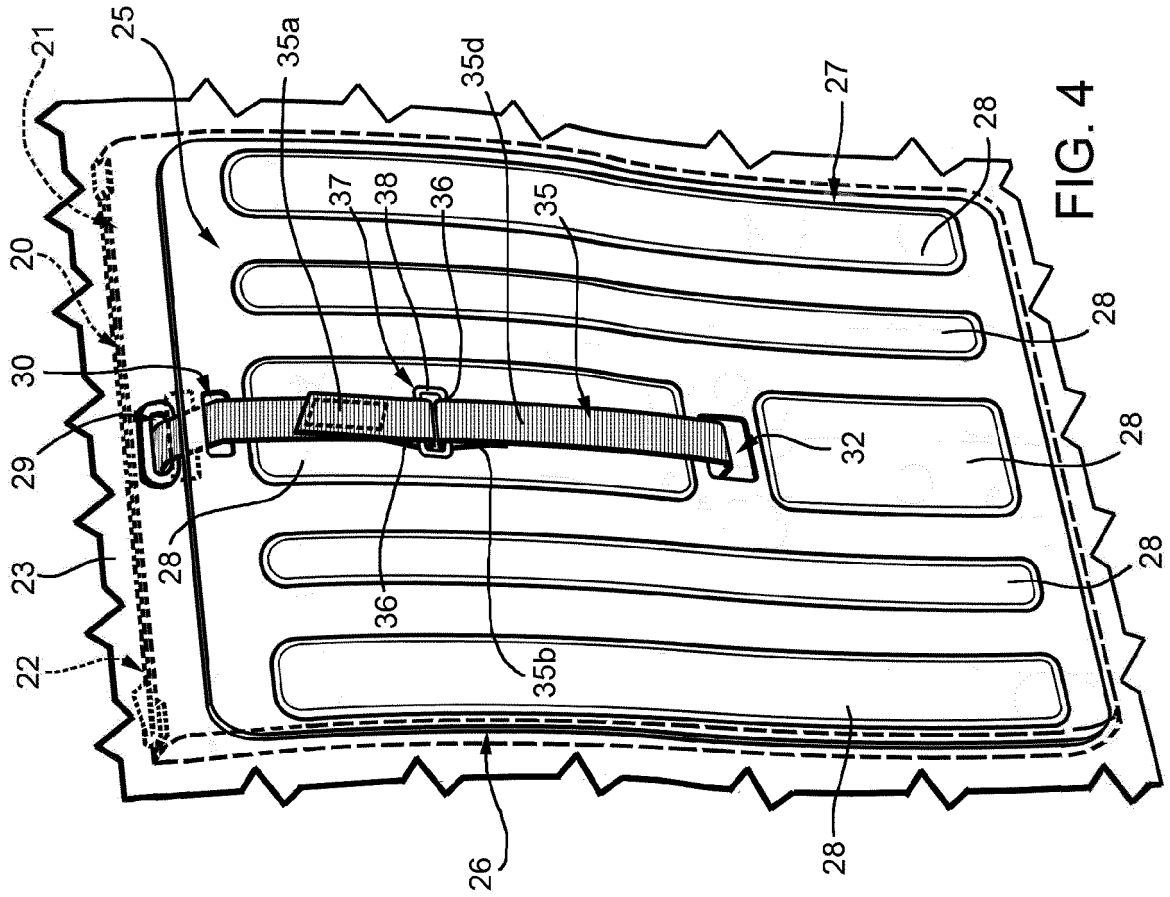
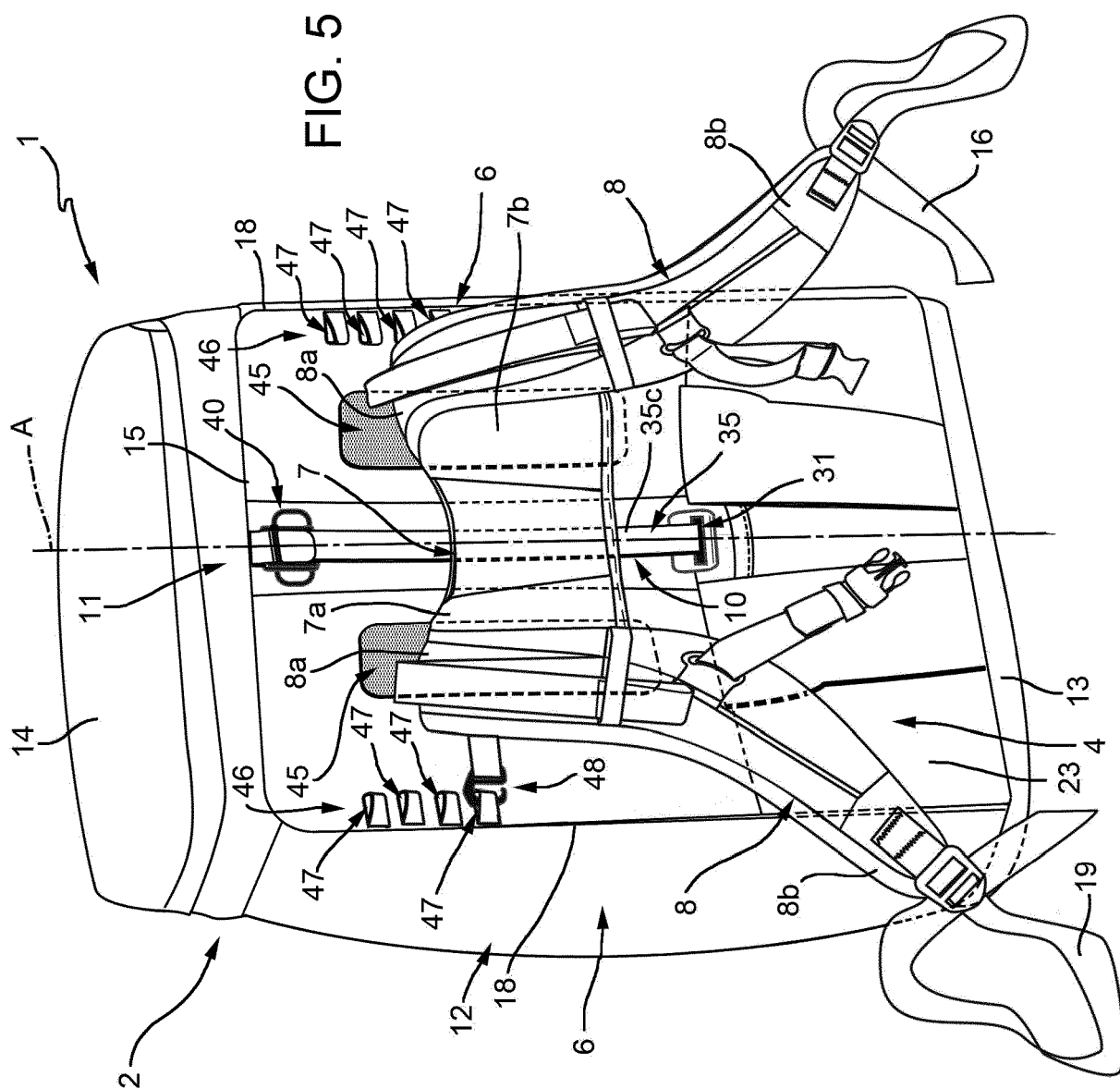


FIG. 2





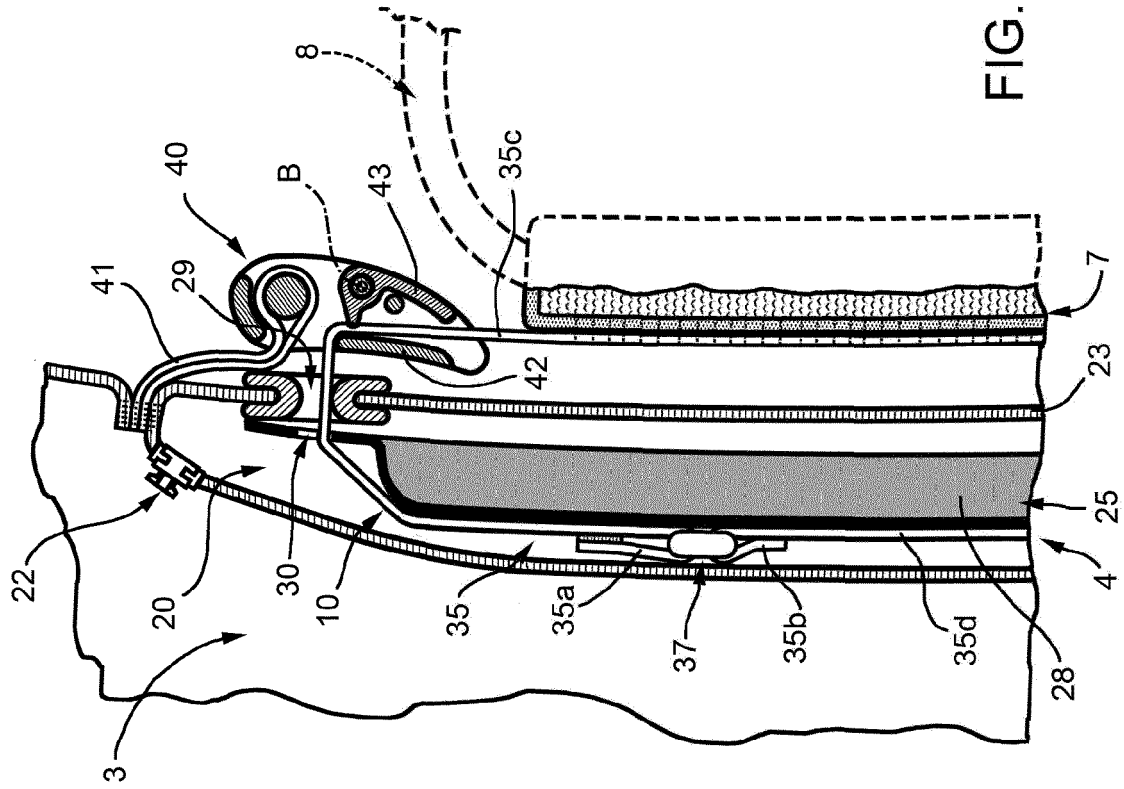


FIG. 7

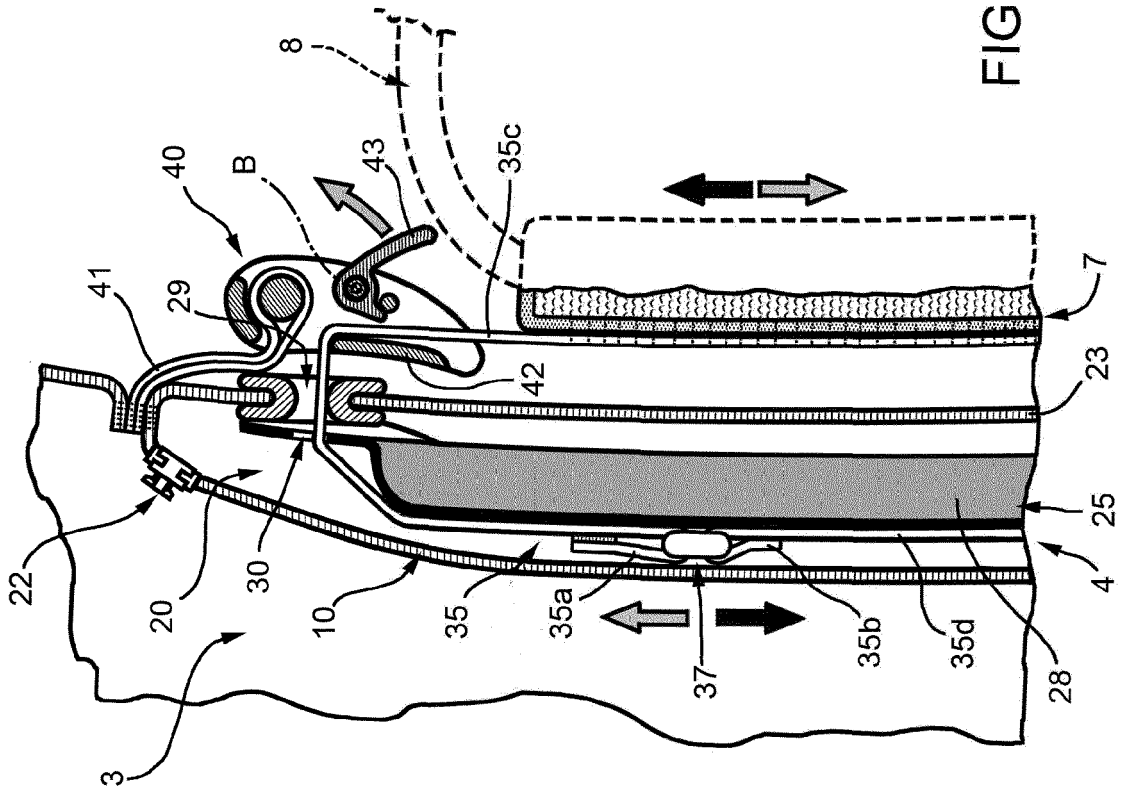


FIG. 6



EUROPEAN SEARCH REPORT

Application Number

EP 23 16 7282

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EPO FORM 1503 03.82 (P04C01)

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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26 July 2023	Examiner Witkowska-Piela, A
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EP 23 16 7282

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