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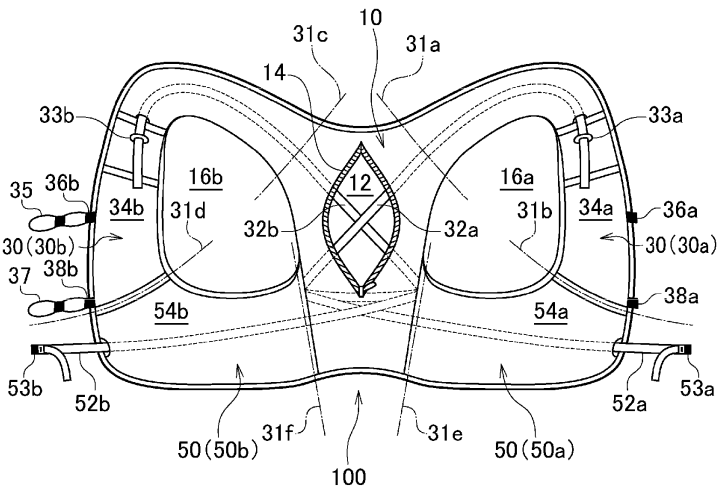
(54) BACKPACK

(57) A backpack 100 is provided with a main body 10 including a housing 12, and a shoulder belt 30 extending from an upper portion of the main body 10, a fastening strap 32 that passes through an inside of the housing 12 is attached to the main body 10 in such a manner that a housed object 60 is able to be biased toward a back of a wearer in the housing 12, the fastening strap 32 is arranged in such a manner that one end of which is directly or indirectly secured to a predetermined position in a lower portion of the housing 12, attached along the shoulder belt 30 from the predetermined position through the inside of the housing 12, and the other end of which is located on a front side than a top of a shoulder of the wearer, and has a fastening length adjustable at a position on the front side of the wearer.

FIG. 1



EP 4 091 499 A1

Description

[TECHNICAL FIELD]

[0001] The present invention relates to a backpack. This especially relates to a backpack used for trail running.

[BACKGROUND ART]

[0002] In trail running, a player needs to carry a backpack due to characteristics or regulations of game. A volume and weight of baggage to be housed in the backpack vary depending on a running distance, a replenishment condition and the like. The running distance in the game is often long, such as several tens of kilometers to a hundred and several tens of kilometers, and for ease of running and reduction of a burden on a body, a vest-type having a high degree of adhesion to the body is a mainstream, and its form is close to a garment. In order to increase the degree of adhesion to the body, one that tightly fasten a strap on a chest to adjust is known (refer to, for example, Patent Literature 1).

[CITATION LIST]

[Patent Literature]

[0003]

[Patent Literature 1] JP 2012-148036 A
[Patent Literature 2] JP 4677513 B2

[SUMMARY OF INVENTION]

[TECHNICAL PROBLEM]

[0004] However, even though a degree of adhesion of a backpack itself increases, when a housed object swings inside, the swinging is likely to propagate to an entire backpack, and thus this swinging might be felt by a wearer as the swinging of the backpack itself.

[0005] The present invention is achieved in view of such a situation, and an object thereof is to provide a backpack that suppresses swinging of a housed object.

[SOLUTION TO PROBLEM]

[0006] In order to solve the above-described problem, a backpack according to an aspect of the present invention is provided with a main body including a housing, and a shoulder belt extending from an upper portion of the main body. A fastening strap that passes through an inside of a housing is attached to a main body in such a manner that a housed object is able to be biased toward a back of a wearer in the housing, the fastening strap is arranged in such a manner that one end of which is directly or indirectly secured to a predetermined position in a lower portion of the housing, attached along the shoulder belt from the predetermined position through the inside of the housing, and the other end of which is located on a front side than a top of a shoulder of the wearer, and has a fastening length adjustable at a position on the front side of the wearer.

[ADVANTAGEOUS EFFECTS OF INVENTION]

[0007] According to the present invention, it is possible to provide a backpack that suppresses swinging of a housed object.

[BRIEF DESCRIPTION OF DRAWINGS]

[0008]

Fig. 1 is an external view of an entire backpack.
Fig. 2 is an external view of the backpack as seen from a front side.
Fig. 3 is a view illustrating an arrangement example of a fastening strap and an auxiliary strap.
Fig. 4 is a view illustrating a biasing direction of the strap in a use state of the backpack.
Fig. 5 is a view illustrating a stacked structure of a main body.
Fig. 6 is a view illustrating a structure of a fastening strap in a second embodiment.
Fig. 7 is a view illustrating a structure of a fastening strap and a biasing belt in a third embodiment.
Fig. 8 is a view illustrating a structure of a fastening strap and an auxiliary fabric material in a fourth embodiment.
Fig. 9 is a view illustrating a structure of a fastening strap and a small auxiliary fabric material in a fifth embodiment.
Fig. 10 is a view illustrating a structure of a fastening strap and a biasing strap in a sixth embodiment.
Fig. 11 is a view illustrating a structure of a fastening strap and a biasing strap in a seventh embodiment.
Fig. 12 is a view illustrating a structure of a fastening strap in an eighth embodiment.
Fig. 13 is a view illustrating a structure of a fastening strap and an auxiliary fabric material in a ninth embodiment.
Fig. 14 is a view illustrating a structure of a fastening strap and an auxiliary fabric material in a tenth embodiment.
Fig. 15 is a view illustrating a structure of a fastening strap and an auxiliary fabric material in an eleventh embodiment.
Fig. 16 is a view illustrating arrangement and a structure of a fastening strap in a twelfth embodiment.
Fig. 17 is a view illustrating arrangement and a structure of an auxiliary strap in a thirteenth embodiment.
Fig. 18 is a view illustrating arrangement and a structure of an auxiliary strap in a fourteenth embodiment.
Fig. 19 is a view illustrating arrangement of a fasten-

ing strap and a plurality of catches and a first use example in a fifteenth embodiment.

Fig. 20 is a view illustrating arrangement of a fastening strap and a plurality of catches and a second use example in the fifteenth embodiment.

Fig. 21 is a view illustrating a first use example regarding a fastening strap and a securing structure in a sixteenth embodiment.

Fig. 22 is a view illustrating a second use example regarding the fastening strap and the securing structure in the sixteenth embodiment.

Fig. 23 is a view illustrating a third use example regarding the fastening strap and the securing structure in the sixteenth embodiment.

Fig. 24 is a view illustrating arrangement of a fastening strap and a dial fastening mechanism in a seventeenth embodiment.

Fig. 25 is an external view of an entire backpack according to an eighteenth embodiment.

Fig. 26 is an external view of the backpack as seen from a front side according to the eighteenth embodiment.

Fig. 27 is a view illustrating an arrangement example of a fastening strap and an auxiliary strap in the eighteenth embodiment.

[DESCRIPTION OF EMBODIMENTS]

First Embodiment

[0009] In this embodiment, a plurality of intersecting fastening straps and a plurality of intersecting auxiliary straps are provided in a main body of a backpack. The plurality of fastening straps and the plurality of auxiliary straps bias a housed object and the backpack main body toward a back of a wearer. This suppresses the housed object from swinging and suppresses an entire backpack from swinging when a backpack wearer runs.

[0010] Fig. 1 is an external view of the entire backpack. A backpack 100 is provided with a main body 10, a shoulder belt 30, and a side belt 50. The backpack 100 in this embodiment is a backpack assumed to be mainly used in trail running, and is formed as a vest-type backpack that may be worn like a garment to increase a degree of adhesion to a body. Therefore, the main body 10, the shoulder belt 30, and the side belt 50 are continuously and integrally formed like one garment. Note that, an application of this backpack is not limited to trail running, and this may also be used for running in general. In addition, this may also be used in applications other than running, for example, as a backpack for carrying baggage in light mountain climbing such as highspeed hiking, fast packing, and trekking, or in daily life. Boundaries between the main body 10, the shoulder belt 30, and the side belt 50 are not strictly defined, and a boundary line does not appear in appearance, but an example of the boundary is illustrated as a guide. In the drawing, the shoulder belt 30 generally refers to a portion from a shoulder to a front body; for example, a portion from first chain line 31a to second chain line 31b corresponds to a right shoulder belt 30a, and a portion from third chain line 31c to fourth chain line 31d corresponds to a left shoulder belt 30b. The side belt 50 generally refers to a portion brought into contact with a side and a waist; for example, a portion from second chain line 31b to fifth chain line 31e corresponds to a right side belt 50a, and a portion from fourth chain line 31d to sixth chain line 31f corresponds a left side belt 50b. A remaining portion, for example, a portion surrounded by first chain line 31a, second chain line 31b, fifth chain line 31e, and sixth chain line 31f corresponds to the main body 10. Note that, in a variation, as in a typical backpack that is not a vest-type for trail running, at least one of the main body 10, the shoulder belt 30, and the side belt 50 may be formed separately from the other portions. For example, the shoulder belt 30 and the side belt 50 may be formed separately, and the shoulder belt 30 and the side belt 50 may be connected by a predetermined strap. Alternatively, it is also possible to form only of the main body 10 and the shoulder belt 30 without the side belt provided, and the shoulder belt 30 may be connected to a lower portion of the main body 10 by a predetermined strap.

[0011] The main body 10 is a portion located on a back side of the wearer wearing the backpack 100 on the body. The main body 10 is formed by sewing edges together in a state in which a plurality of pieces of fabric is stacked, and includes a housing 12 capable of housing baggage such as equipment and a carried article as a space between the stacked pieces of fabric. A fastener 14 that may be opened and closed in a vertical direction is provided at the center of an outer surface of the main body 10, and when the fastener 14 is opened, the carried article may be taken in and out of the housing 12, which is an internal space. A length of the fastener 14 is about 2/3 of a length in the vertical direction of an entire main body 10, and a size in the vertical direction of the housing 12 is also about 2/3 of the length in the vertical direction of the entire main body 10. The housing 12 is a main baggage space that occupies most of an upper portion volume of the main body 10, and has a larger capacity than other pockets and the like. Here, in a case where the backpack 100 is used for trail running, it is desirable, when running, to keep the center of gravity at a high position in such a manner that heavy baggage is placed on the back as close as possible to a neck and shoulders rather than a low position close to hips. Therefore, the housing 12 is provided in the upper portion of the main body 10 so that a major part of the housing 12 occupies an upper half of the main body 10, and the housing 12 has a structure not to continue to the lower portion, especially to a lowermost end of the main body 10, so that heavy baggage does not descend to a low position.

[0012] The shoulder belt 30 is a belt-shaped portion continuously formed from the upper portion of the main body 10 toward a portion corresponding to the front body on a front side through a portion above the shoulder of

the wearer, and includes the right shoulder belt 30a extending to a side of the right shoulder of the wearer and the left shoulder belt 30b extending to a side of the left shoulder of the wearer. The right shoulder belt 30a and the left shoulder belt 30b are provided with a right chest pocket 34a and a left chest pocket 34b, respectively, capable of housing a drink bottle, a soft flask and the like on the front side of the wearer. An upper chest strap 35, a first catch 36a, a second catch 36b, a lower chest strap 37, a third catch 38a, and a fourth catch 38b are described with reference to a next drawing.

[0013] The side belt 50 is a belt-shaped portion continuously formed from the lower portion of the main body 10 through a portion beside the side of the wearer toward the front side, and includes the right side belt 50a extending to a side of a right side of the wearer and the left side belt 50b extending to a side of a left side of the wearer. The right side belt 50a is provided with a right side pocket 54a, and the left side belt 50b is provided with a left side pocket 54b. An upper portion of a front side end of the right side belt 50a is continuously formed with the right shoulder belt 30a to be connected thereto. An upper portion of a front side end of the left side belt 50b is continuously formed with the left shoulder belt 30b to be connected thereto.

[0014] In this manner, the main body 10, the shoulder belt 30, and the side belt 50 are continuously formed into an annular shape to form the vest-type backpack like a garment, and the wearer may wear the backpack 100 like a garment by inserting both arms through a right arm passable portion 16a and a left arm passable portion 16b formed inside the annular portion.

[0015] A plurality of fastening straps 32 that passes through the inside of the housing 12 is attached to the main body 10 in such a manner that the housed object may be biased toward the back of the wearer in the housing 12. The fastening strap 32 is arranged in such a manner that one end of which is secured directly or indirectly to a predetermined position in the lower portion of the housing 12, attached along the shoulder belt 30 from the predetermined position through the vicinity of the center in the housing 12, and the other end of which is located on the front side than the top of the shoulder of the wearer. The fastening strap 32 is formed of a right fastening strap 32a and a left fastening strap 32b. The fastening strap 32 is formed of a non-elastic tape-shaped material having a width of 1 cm to 3 cm, for example, synthetic fibers such as nylon. Note that, in a variation, a material having elasticity to the extent that a fastening state is not impaired may be used as the fastening strap 32. As illustrated in the drawing, the right fastening strap 32a and the left fastening strap 32b in this embodiment intersect in the upper portion of the main body 10, especially inside the housing 12 in the vicinity of the center position of an opening opened by the fastener 14. This intersection position corresponds to the center position of the housing 12 provided in the upper portion of the main body 10, and is designed so that the intersection portion is brought into contact with the vicinity of the center of the baggage in the housing 12.

[0016] The right shoulder belt 30a and the left shoulder belt 30b are formed in such a manner that at least a portion brought into contact with the shoulder is formed of a plurality of pieces of fabric overlapping with each other. In the right shoulder belt 30a and the left shoulder belt 30b, a tubular passage formed between the pieces of fabric in each shoulder portion is continuous to the housing 12, and the right fastening strap 32a and the left fastening strap 32b are arranged so as to pass through the passages. Note that, the term "tubular" as used herein merely means that a state in which overlapping pieces of fabric are separated from each other may become the tubular passage, and usually, a state in which the pieces of fabric overlap with each other and the "tube" is folded is maintained. The right fastening strap 32a is allowed to pass through the passage in the right shoulder belt 30a, and an upper end thereof is exposed to the outside from a front side opening of the passage. The left fastening strap 32b is allowed to pass through the passage in the left shoulder belt 30b, and an upper end thereof is exposed to the outside from a front side opening of the passage. The passage in the shoulder belt 30 may be provided with a strap loop for securing the fastening strap 32 passing through the same onto a predetermined route to prevent positional displacement. Anti-slip treatment may be applied to the fastening strap 32. A right cord stopper 33a and a left cord stopper 33b for preventing returning to the passage in the shoulder belt 30 are attached to portions exposed to the outside of the right fastening strap 32a and the left fastening strap 32b, respectively. Note that, in a variation, the fastening strap 32 may be arranged not in the inner passage of the shoulder belt 30 but on an outer surface of the shoulder belt 30 along the same. In this case, the outer surface of the shoulder belt 30 may be provided with a strap loop for securing the fastening strap 32 passing through the same onto a predetermined route to prevent positional displacement.

[0017] The right fastening strap 32a and the left fastening strap 32b are arranged so that both ends of each strap are diagonally located in the housing 12, thereby intersecting in the housing 12, and a plurality of intersecting fastening straps 32 may bias the housed object toward the back of the wearer in the housing 12. A lower end of the right fastening strap 32a is directly secured, for example, by being sewn to a lower left position of the housing 12, and a lower end of the left fastening strap 32b is directly secured, for example, by being sewn to a lower right position of the housing 12. Since the right fastening strap 32a and the left fastening strap 32b are not fixed in the housing 12 except the lower ends secured, the housed object may be interposed between the two intersecting straps 32 and an inner surface on the back side. Since the lower end of the right fastening strap 32a and the lower end of the left fastening strap 32b are sewn to the main body 10 to be fixed in position, when an upper

end of the right fastening strap 32a and an upper end of the left fastening strap 32b are pulled downward on the front side, the right fastening strap 32a and the left fastening strap 32b intersecting in the housing 12 are tensioned, and the housed object may be biased toward the inner surface on the back side. The wearer may adjust a fastening length of the strap by fixing the right cord stopper 33a and the left cord stopper 33b at any position after pulling the right fastening strap 32a and the left fastening strap 32b. That is, it is possible to prevent a distal strap portion from the position at which the cord stopper 33 is fixed from returning from the front side into the tubular passage, and to maintain the fastening length of the strap and a biasing state in the housing 12 of the housed object.

[0018] An auxiliary strap 52 a fastening length of which is adjustable at a position on the front side of the wearer is attached to the side belt 50 along the side belt 50 from the lower portion of the main body 10 to the front side. The auxiliary strap 52 is formed of a right auxiliary strap 52a and a left auxiliary strap 52b. The auxiliary strap 52 is formed of an elastic tape-shaped material having a width of 1 cm to 3 cm, for example, synthetic fibers such as nylon in order to alleviate compression around the waist such as the side and abdominal. Note that, in a variation, a non-elastic tape-shaped material to the extent that the waist is not compressed too much may be used as the auxiliary strap 52.

[0019] The right side belt 50a and the left side belt 50b are formed of a plurality of pieces of fabric overlapping with each other. In the right side belt 50a and the left side belt 50b, a tubular passage formed between the pieces of fabric is continuous to the lower portion of the housing 12, and the right auxiliary strap 52a and the left auxiliary strap 52b are arranged so as to pass through the passages. They are arranged so that the main body 10 may be biased toward the back of the wearer in the lower portion of the main body 10 by adjusting the fastening lengths of the two auxiliary straps 52. That is, the two auxiliary straps 52 are arranged so that both ends of each of the auxiliary straps 52 are diagonally located in the lower portion of the main body 10, thereby intersecting at the center of the lower portion of the main body 10. One end of each of the two auxiliary straps 52 is secured to a predetermined position in the lower portion of the main body 10, and the other ends thereof are connected to each other via a length adjusting member at the position on the front side of the wearer interposed between the right and left side belts 50. More specifically, the right auxiliary strap 52a is allowed to pass through the passage in the right side belt 50a, and a distal end thereof is exposed to the outside from a front side hole of the passage. The left auxiliary strap 52b is allowed to pass through the passage in the left side belt 50b, and a distal end thereof is exposed to the outside from a front side hole of the passage. A fifth catch 53a and a sixth catch 53b are attached as the length adjusting members to portions exposed to the outside of the right auxiliary strap 52a and the left auxiliary strap 52b, respectively. The fifth catch 53a and the sixth catch 53b are buckles that may fix the adjusted strap lengths and be connected to each other.

[0020] Fig. 2 is an external view of the backpack 100 as seen from the front side. On the right shoulder belt 30a and the left shoulder belt 30b, along edges opposed to each other when the backpack 100 is worn, a first catch 36a and a second catch 36b are attached to an upper portion so as to be opposed to each other, and a third catch 38a and a fourth catch 38b are attached to a lower portion so as to be opposed to each other. By hooking the upper chest strap 35 to the first catch 36a and the second catch 36b and hooking the lower chest strap 37 to the third catch 38a and the fourth catch 38b, positions of the right shoulder belt 30a and the left shoulder belt 30b in the worn state may be fixed. The upper chest strap 35 and the lower chest strap 37 are formed of an elastic material, for example, a synthetic resin coated with synthetic fibers such as a bungee cord.

[0021] The fifth catch 53a and the sixth catch 53b are attached to the exposed distal ends of the right auxiliary strap 52a and the left auxiliary strap 52b, respectively. These catches are connected to each other, so that positions of the right auxiliary strap 52a and the left auxiliary strap 52b are fixed, and a close contact state of the right side belt 50a and the left side belt 50b with the side is maintained. The fifth catch 53a and the sixth catch 53b also serve as the length adjusting members of the right auxiliary strap 52a and the left auxiliary strap 52b, respectively, and it is possible to adjust the length and fastening of each strap by pulling each strap to adjust a length of a distal end portion folded back of the right auxiliary strap 52a and the left auxiliary strap 52b.

[0022] Fig. 3 illustrates an arrangement example of the fastening strap 32 and the auxiliary strap 52. In each strap, a portion other than the distal end exposed to the outside is arranged inside the fabric of the outer surface and does not appear in appearance, but in order to illustrate the arrangement of the strap, the strap is drawn on the outer surface of the backpack for convenience in this drawing. The right fastening strap 32a passes through a right chest, the right shoulder, and the center of the back of the wearer along the right shoulder belt 30a, and is sewn to be secured to a first locking point 70 in the vicinity of a lower left portion of the back. The left fastening strap 32b passes through a left chest, the left shoulder, and the center of the back of the wearer along the left shoulder belt 30b, and is sewn to be secured to a second locking point 71 in the vicinity of a lower right portion of the back. The first locking point 70 and the second locking point 71 are positions at a lower right corner and a lower left corner inside the housing 12, respectively, and are positions about 2/3 from the top of the main body 10. The right fastening strap 32a and the left fastening strap 32b intersect at a center point 72 at the center of the back. The right fastening strap 32a and the left fastening strap 32b bias a housed object 60 under the straps toward the back of the wearer in the housing 12 around the center

point 72 where they intersect.

[0023] The right auxiliary strap 52a passes from the right side of the wearer through the lower portion of the main body 10 along the right side belt 50a, and is sewn to be secured to a third locking point 73 in the vicinity of the lower left portion of the back. The left auxiliary strap 52b passes from the left side of the wearer through the lower portion of the main body 10 along the left side belt 50b, and is sewn to be secured to a fourth locking point 74 in the vicinity of the lower right portion of the back. Positions of the third locking point 73 and the fourth locking point 74 are in the vicinity of portions immediately below the first locking point 70 and the second locking point 71, respectively, and are positions about 2/3 from the top of the main body 10. The right auxiliary strap 52a and the left auxiliary strap 52b intersect at a center point 75 in the lower portion of the main body 10. Between the third locking point 73 and the fourth locking point 74, a reinforcing strap 55 formed of the same non-elastic tape-shaped material as that of the fastening strap 32 is attached, and both ends thereof are sewn to the third locking point 73 and the fourth locking point 74, respectively. The reinforcing strap 55 is attached for maintaining a lateral width and a shape of the main body 10. In a variation, in place of the reinforcing strap 55, a reinforcing material such as a resin for more firmly maintaining the lateral width and shape of the main body 10 may be attached.

[0024] Note that, the housing 12 is provided at a position above the third locking point 73 and the fourth locking point 74 in the main body 10, and a position where the reinforcing strap 55 is attached and a portion where the right auxiliary strap 52a and the left auxiliary strap 52b intersect are sites that do not form a part of the housing 12. Therefore, the two auxiliary straps 52 do not have a function of biasing the housed object unlike the right fastening strap 32a and the left fastening strap 32b. Note that, in a variation, a housing may be provided also in the lower portion of the main body 10, and the housed object may be biased toward the back by the two intersecting auxiliary straps 52. The two auxiliary straps 52 may be provided so as to be parallel without intersecting.

[0025] Fig. 4 illustrates a biasing direction of the strap in a use state of the backpack. Four straps of the right fastening strap 32a, the left fastening strap 32b, the right auxiliary strap 52a, and the left auxiliary strap 52b are attached to the backpack 100. In each strap, a portion other than the distal end exposed to the outside is arranged inside the fabric of the outer surface and does not appear in appearance especially as seen from the back side, but in order to illustrate the biasing direction of the strap, the strap arrangement is drawn on the outer surface of the backpack for convenience in the drawing.

[0026] The wearer may fasten the right fastening strap 32a by pulling a distal end of the right fastening strap 32a exposed in the vicinity of the right chest on the front side in a first direction 62a from the back side toward the right chest beyond the top of the right shoulder (that is, by adjusting the fastening length). Similarly, the wearer may fasten the left fastening strap 32b by pulling a distal end of the left fastening strap 32b exposed in the vicinity of the left chest on the front side in a second direction 62b from the back side toward the left chest beyond the top of the left shoulder (that is, by adjusting the fastening length). As a result, the right fastening strap 32a and the left fastening strap 32b bias the housed object 60 in a biasing direction 64, which is the direction from a rear side toward the back, at the center portion of the back where they intersect, so that it is possible to suppress the housed object 60 from separating from the back and to suppress the housed object 60 from swinging. It is also possible to suppress the entire main body 10 from separating from the back of the wearer, and to suppress the entire main body 10 from swinging. By suppressing the baggage and the entire main body 10 from swinging, it is possible to reduce a phase difference between a motion of the wearer during running and the swinging of the housed object 60 and the main body 10. Since the fastening length may be appropriately adjusted according to a size and a capacity of the housed object 60, the housed object 60 may be appropriately biased in the biasing direction 64. That is, an appropriate fastening degree may be provided to the housed object 60. Furthermore, by arranging the fastening strap 32 so as to be pulled over the shoulder, there also is an effect that the center of gravity of the baggage may be lifted upward and kept at a high position.

[0027] The wearer may fasten the right auxiliary strap 52a by pulling a distal end of the right auxiliary strap 52a exposed in the vicinity of the right side on the front side in a third direction 63a from the back through the right side toward the front side. Similarly, the wearer may fasten the left auxiliary strap 52b by pulling a distal end of the left auxiliary strap 52b exposed in the vicinity of the left side on the front side in a fourth direction 63b from the back through the left side toward the front side. The distal ends of the right auxiliary strap 52a and the left auxiliary strap 52b are connected to each other with the fifth catch 53a and the sixth catch 53b, so that their respective pulling states are maintained. The right auxiliary strap 52a and the left auxiliary strap 52b bias the lower portion of the main body 10 in the biasing direction 64, which is the direction from the rear side toward the back, so that it is possible to suppress the main body 10 and the right and left side belts 50 from separating from the back and side of the wearer and to suppress the entire main body 10 from swinging.

[0028] Note that, by arranging the right fastening strap 32a and the left fastening strap 32b so as to intersect in the vicinity of the center of the back and pass over the shoulder in place of an arm such as an upper arm, it is easy to prevent the intersecting fastening straps 32 from abutting a shoulder blade of the wearer even in a case where there is few baggage and the like, and it is possible to suppress hindrance of a motion of the shoulder blade and an arm swinging motion. Longitudinal widths of the

right and left side belts 50 are designed to be in positions at which the right and left sides of the wearer are substantially covered. Here, among human ribs, a tenth rib is at a lowermost end of a costal arch, which is a portion corresponding to the side. If a lower end of the side belt 50 is located above the tenth rib, a longitudinal width of the entire main body 10 is reduced accordingly, and the capacity of the housing 12 is also reduced, so that a housing capacity, which is an original function as the backpack, might be reduced. In contrast, when the lower end of the side belt 50 is located below the tenth rib, a fitting property of the side belt 50 to the side is impaired, and the swinging of the main body 10 might be large. Therefore, by designing the position and longitudinal width of the side belt 50 so that the lower end of the side belt 50 is arranged approximately in the vicinity of the tenth rib of the wearer, or by preparing a product in a plurality of sizes in accordance with various physical constitutions, both the capacity of the housing 12 and the fitting property of the main body 10 may be secured

[0029] Fig. 5 illustrates a stacked structure of the main body 10. In the main body 10, a first layer 20, a second layer 21, a third layer 22, and a fourth layer 23 are stacked in this order from a surface side toward a rear side. The first layer 20 on an outermost surface is elastic fabric made of synthetic fibers such as polyester and nylon, and is provided with the fastener 14 for opening and closing a slit-shaped opening for taking the baggage in and out of the housing 12 at both edges of the opening. As the second layer 21, the intersecting right and left fastening straps 32a and 32b and the intersecting right and left auxiliary straps 52a and 52b are overlapped. As the third layer 22, a liner 18 forming the inner surface of the housing 12 is overlapped. The liner 18 has such a longitudinal length that overlaps with the intersecting right and left fastening straps 32a and 32b, but does not overlap with the right and left auxiliary straps 52a and 52b. The liner 18 is provided with a first inner pocket 19a and a second inner pocket 19b that serve as pockets for a carried article. A housing position of the carried article housed in the first inner pocket 19a and the second inner pocket 19b is maintained as long as this is housed in the pocket, and the carried article may continuously receive a biasing force from the intersecting right and left fastening straps 32a and 32b, so that swinging is especially easily suppressed. As the fourth layer 23, a lining 24 that is mesh fabric of synthetic fibers is overlapped. A space formed by overlapping the first layer 20 and the third layer 22 and sewing the peripheries thereof together serves as the housing 12 in which the baggage may be housed. A space formed by overlapping the third layer 22 and the fourth layer 23 and sewing peripheries thereof together may mainly house a hydration system. The right auxiliary strap 52a and the left auxiliary strap 52b are arranged in a space obtained by overlapping the first layer 20 and the lining 24. Note that, on the lining 24, a band-shaped mesh material is sewn along an ideal arrangement route in design of the right auxiliary strap 52a and the left auxiliary strap 52b to form a tubular passage, and the right auxiliary strap 52a and the left auxiliary strap 52b are allowed to pass through the passage. The right auxiliary strap 52a and the left auxiliary strap 52b may be freely pulled in a direction from the back side to the front side through the vicinity of the side in the passage. Although a four-layer stacked structure is described as an example with reference to the drawing, the number of layers is not limited to four, and a stacked structure of three or fewer layers in which some layers are omitted, and a stacked structure of five or more layers in which additional layers are provided are also possible. For example, in a case where the number of layers is five or larger, a fourth layer may be a lining, a fifth layer may be mesh fabric, and a space formed by overlapping the fourth layer and the fifth layer and sewing peripheries thereof together may house a hydration system.

Second Embodiment

[0030] This embodiment is different from the first embodiment in that a different structure is adopted as a right fastening strap 32a and a left fastening strap 32b and is common in other configurations. Hereinafter, the difference is mainly described, and description of common points is omitted.

[0031] Fig. 6 illustrates a structure of a fastening strap 32 in a second embodiment. A right fastening strap 32a passes from a right chest to a right shoulder of a wearer along a right shoulder belt 30a, and is coupled to a first biasing belt 40a at a portion where the right shoulder belt 30a is connected to a main body 10. The first biasing belt 40a is coupled to the right fastening strap 32a at a first coupling point 76 in an upper right portion of the main body 10, passes through a center point 72 at the center of a back, and is sewn to be secured to a first locking point 70 in the vicinity of a lower left portion of the back. In this manner, one end of the right fastening strap 32a is indirectly secured to the main body 10 via the first biasing belt 40a. A left fastening strap 32b passes from a left chest to a left shoulder of the wearer along a left shoulder belt 30b, and is coupled to a second biasing belt 40b at a portion where the left shoulder belt 30b is connected to the main body 10. The second biasing belt 40b is coupled to the left fastening strap 32b at a second coupling point 77 in an upper left portion of the main body 10, passes through the center point 72 at the center of the back, and is sewn to be secured to a second locking point 71 in the vicinity of a lower right portion of the back. In this manner, one end of the left fastening strap 32b is also indirectly secured to the main body 10 via the second biasing belt 40b. The first biasing belt 40a and the second biasing belt 40b are formed of synthetic fibers such as nylon as a non-elastic tape-shaped material having a width of 3 cm to 6 cm, for example. Note that, in a variation, a material having elasticity to the extent that a biasing force is not impaired may be used as the biasing belt 40. The first biasing belt 40a and the second biasing

belt 40b intersect at the center point 72 at the center of the back. The first biasing belt 40a and the second biasing belt 40b bias a housed object 60 under the two biasing belts intersecting in the housing 12 toward the back of the wearer around the center point 72 where they intersect. The first biasing belt 40a and the second biasing belt 40b are formed to be wider than the right fastening strap 32a and the left fastening strap 32b, respectively, so that the housed object 60 may be stably biased accordingly. Note that, although the first biasing belt 40a and the second biasing belt 40b are formed separately, they may be connected by being sewn to each other and the like at the center point 72 in a variation.

Third Embodiment

[0032] This embodiment is different from the first and second embodiments in that a different structure is adopted as a fastening strap 32 and a biasing belt 40 and is common in other configurations. Hereinafter, the difference is mainly described, and description of common points is omitted.

[0033] Fig. 7 illustrates a structure of a fastening strap 32 and a biasing belt 40 in a third embodiment. This embodiment has a structure in which the fastening strap 32 in the first embodiment and the biasing belt 40 in the second embodiment are used in combination. That is, a right fastening strap 32a passes through a right chest, a right shoulder, and a center point 72 at the center of a back of a wearer along a right shoulder belt 30a, and is sewn to be directly secured to a first locking point 70 in the vicinity of a lower left portion of the back. A left fastening strap 32b passes through a left chest, a left shoulder, and the center point 72 at the center of the back of the wearer along a left shoulder belt 30b, and is sewn to be directly secured to a second locking point 71 in the vicinity of a lower right portion of the back. In addition, a first biasing belt 40a is provided below the right fastening strap 32a, and the first biasing belt 40a is attached to the right fastening strap 32a at a first coupling point 76 in an upper right portion and a fourth coupling point 79 at a lower left portion of a main body 10. Similarly, a second biasing belt 40b is provided below the left fastening strap 32b, and the second biasing belt 40b is attached to the left fastening strap 32b at a second coupling point 77 in an upper left portion and a third coupling point 78 at a lower right portion of the main body 10. The first biasing belt 40a and the second biasing belt 40b are formed of synthetic fibers such as nylon as a non-elastic tape-shaped material having a width of 3 cm to 6 cm, for example. Note that, in a variation, a material having elasticity to the extent that a biasing force is not impaired may be used as the biasing belt 40. The first biasing belt 40a and the second biasing belt 40b may be formed to be detachable from the right fastening strap 32a and the left fastening strap 32b, respectively. A combination of the right fastening strap 32a and the first biasing belt 40a and a combination of the left fastening strap 32b and the second biasing belt 40b intersect at the center point 72 at the center of the back. The combination of the right fastening strap 32a and the first biasing belt 40a and the combination of the left fastening strap 32b and the second biasing belt 40b bias a housed object 60 under the biasing belt 40 in a housing 12 toward the back of the wearer around the center point 72 where they intersect. Since the first biasing belt 40a and the second biasing belt 40b are formed to be wider than the right fastening strap 32a and the left fastening strap 32b, respectively, the housed object 60 may be stably biased accordingly, and furthermore, the housed object 60 may be more stably biased with a higher fastening strength by the right fastening strap 32a and the left fastening strap 32b.

Fourth Embodiment

[0034] This embodiment is different from the third embodiment in that an auxiliary fabric material is used in place of the biasing belt 40 in the third embodiment. Other configurations are common to those of the third embodiment. Hereinafter, the difference is mainly described, and description of common points is omitted.

[0035] Fig. 8 illustrates a structure of a fastening strap 32 and an auxiliary fabric material in a fourth embodiment. In this embodiment, instead of attaching the biasing belt 40 of the third embodiment to the fastening strap 32, an auxiliary fabric material 41 is attached. The auxiliary fabric material 41 is a planar fabric member having an area capable of entirely covering a housed object 60, and is attached to a right fastening strap 32a at a first coupling point 76 in an upper right portion and a fourth coupling point 79 in a lower left portion of a main body 10, and is attached to a left fastening strap 32b at a second coupling point 77 in an upper left portion and a third coupling point 78 in a lower right portion of the main body 10. A size of the auxiliary fabric material 41 is substantially the same as or slightly smaller than an inner diameter of a housing 12. Note that, the auxiliary fabric material 41 is attached to the fastening strap 32 so as to be detachable from the fastening strap 32.

Fifth Embodiment

[0036] This embodiment is different from the fourth embodiment in that a small auxiliary fabric material is used in place of the auxiliary fabric material 41 in the fourth embodiment. Other configurations are common to those of the fourth embodiment. Hereinafter, the difference is mainly described, and description of common points is omitted.

[0037] Fig. 9 illustrates a structure of a fastening strap 32 and a small auxiliary fabric material in a fifth embodiment. In this embodiment, instead of attaching the auxiliary fabric material 41 of the fourth embodiment to the fastening strap 32, a small auxiliary fabric material 43 is attached. The small auxiliary fabric material 43 is a planar fabric member smaller than the auxiliary fabric material

41 and having an area capable of covering only the vicinity of the center of a housed object 60. The small auxiliary fabric material 43 is attached to a right fastening strap 32a at a first coupling point 76 in an upper right portion and a fourth coupling point 79 in a lower left portion, and is attached to a left fastening strap 32b at a second coupling point 77 in an upper left portion and a third coupling point 78 in a lower right portion. The small auxiliary fabric material 43 has a size of, for example, 5 cm x 5 cm square. Note that, the small auxiliary fabric material 43 is attached to the fastening strap 32 so as to be detachable from the fastening strap 32.

Sixth Embodiment

[0038] This embodiment is different from the second embodiment in that a plurality of biasing straps is used in place of the biasing belt 40 in the second embodiment. Other configurations are common to those of the second embodiment. Hereinafter, the difference is mainly described, and description of common points is omitted.

[0039] Fig. 10 illustrates a structure of a fastening strap 32 and a biasing strap in a sixth embodiment. In this embodiment, instead of attaching the biasing belt 40 of the second embodiment to the fastening strap 32, a plurality of biasing straps 42 is attached. That is, one end of the fastening strap 32 is indirectly secured to a main body 10 via the plurality of biasing straps 42. Although the biasing strap 42 is a strap narrower than the fastening strap 32, it is possible to apply a biasing force to a housed object 60 over a wider range than that with the fastening strap 32 by using a plurality of them. A first biasing strap 42a and a second biasing strap 42b are attached to a right fastening strap 32a at a fifth coupling point 80 in an upper right portion, and sewn to be secured to a first locking portion 82a and a second locking portion 82b in a lower left portion. A third biasing strap 42c and a fourth biasing strap 42d are attached to a left fastening strap 32b at a sixth coupling point 81 in an upper left portion, and sewn to be secured to a third locking portion 82c and a fourth locking portion 82d in a lower right portion.

Seventh Embodiment

[0040] This embodiment is different from the sixth embodiment in using three biasing straps in place of the two biasing straps in the sixth embodiment. Other configurations are common to those of the sixth embodiment. Hereinafter, the difference is mainly described, and description of common points is omitted.

[0041] Fig. 11 illustrates a structure of a fastening strap 32 and a biasing strap in a seventh embodiment. In this embodiment, three biasing straps 42 are attached to the fastening strap 32. Although the biasing strap 42 is a strap narrower than the fastening strap 32, the larger the number of them to be used, the wider a range in which they may apply a biasing force to a housed object 60. A fifth biasing strap 42e, a sixth biasing strap 42f, and a seventh biasing strap 42g are attached to a right fastening strap 32a at a fifth coupling point 80 in an upper right portion, and sewn to be secured at a fifth locking portion 82e, a sixth locking portion 82f, and a seventh locking portion 82g, respectively, in a lower left portion. An eighth biasing strap 42h, a ninth biasing strap 42i, and a tenth biasing strap 42j are attached to a left fastening strap 32b at a sixth coupling point 81 in an upper left portion, and sewn to be secured at an eighth locking portion 82h, a ninth locking portion 82i, and a tenth locking portion 82j, respectively, in a lower right portion. Note that, as the number of biasing straps to be used is increased, a wider fan shape may be formed, and the biasing force to the housed object 60 may be stabilized. Although not illustrated, a mesh-shaped member obtained by braiding a large number of straps in various patterns may be formed.

Eighth Embodiment

[0042] This embodiment is different from the seventh embodiment in using a fastening strap 32 obtained by bundling three straps in place of the fastening strap 32 and the three biasing straps 42 in the seventh embodiment. Other configurations are common to those of the seventh embodiment. Hereinafter, the difference is mainly described, and description of common points is omitted.

[0043] Fig. 12 illustrates a structure of a fastening strap 32 in an eighth embodiment. In this embodiment, three straps are bundled to form one fastening strap 32. A portion from a shoulder to a front side of a right fastening strap 32a is fixedly bundled into one, and a distal end thereof is exposed to the outside on the front side. A portion from the shoulder through a back to a lower left portion of a main body 10 of the right fastening strap 32a is separated into three straps, and respective ends are secured to the lower left portion of the main body 10 by a first variable catch 83a, a second variable catch 83b, and a third variable catch 83c. A portion from a shoulder to a front side of a left fastening strap 32b is fixedly bundled into one, and a distal end thereof is exposed to the outside on the front side. A portion from a shoulder through the back to a lower right portion of the main body 10 of the left fastening strap 32b is separated into three straps, and respective ends are secured to the lower right portion of the main body 10 by a fourth variable catch 83d, a fifth variable catch 83e, and a sixth variable catch 83f. Positions at which the six variable catches 83 secure may be determined to any positions in a vertical direction, and arrangement and an interval thereof may be adjusted. For example, when the interval is increased, a housed object 60 may be stably biased over a wide range, and conversely, when the interval is decreased, the vicinity of the center of the housed object 60 may be intensively biased.

[0044] As above, this embodiment describes an example in which the three straps are bundled to form one

fastening strap 32. In a variation, two straps may be bundled to form one fastening strap 32, or four or more straps may be bundled to form one fastening strap 32.

Ninth Embodiment

[0045] This embodiment is common to the fourth embodiment in using an auxiliary fabric material 41, but is different from the fourth embodiment in that two fastening straps 32 do not intersect. Other configurations are common to those of the fourth embodiment. Hereinafter, the difference is mainly described, and description of common points is omitted.

[0046] Fig. 13 illustrates a structure of a fastening strap 32 and an auxiliary fabric material 41 in a ninth embodiment. In this embodiment, two fastening straps 32 are not intersected to be secured to right and left diagonal positions, but the two fastening straps 32 are secured on the same side of right and left sides via the auxiliary fabric material 41. That is, a right fastening strap 32a passes through a first coupling point 76 in an upper right portion and a third coupling point 78 in a lower right portion of the auxiliary fabric material 41 to be secured to a second locking point 71 in a lower right portion of a housing 12. A left fastening strap 32b passes through a second coupling point 77 in an upper left portion and a second coupling point 77 in a lower left portion of the auxiliary fabric material 41 to be secured to a first locking point 70. In this manner, since the two fastening straps 32 are indirectly secured to a main body 10 via the auxiliary fabric material 41, a structure in which the right fastening strap 32a is secured on the right side and the left fastening strap 32b is secured on the left side without intersecting is also possible. In this case, when the right fastening strap 32a and the left fastening strap 32b are pulled, the auxiliary fabric material 41 is pulled rightward and leftward, so that an area of a portion brought into contact with a housed object 60 is expanded and maximized. Accordingly, the housed object 60 may be more stably biased over a wide range. Note that, the auxiliary fabric material 41 is coupled to the fastening strap 32 so as to be detachable from the fastening strap 32.

Tenth Embodiment

[0047] This embodiment is common to the fourth and ninth embodiments in using an auxiliary fabric material 41, but is different from the fourth and ninth embodiments in using four fastening straps 32 to couple to four corners of the auxiliary fabric material 41. Other configurations are common to those of the fourth and ninth embodiments. Hereinafter, the difference is mainly described, and description of common points is omitted.

[0048] Fig. 14 illustrates a structure of a fastening strap 32 and an auxiliary fabric material 41 in a tenth embodiment. In this embodiment, two fastening straps 32 are not intersected to be secured to right and left diagonal positions, but four fastening straps 32 are coupled to four corners of the auxiliary fabric material 41. More specifically, a right fastening strap 32a is coupled to a first coupling point 76 in an upper right portion of the auxiliary fabric material 41, and a left fastening strap 32b is coupled to a second coupling point 77 in an upper left portion of the auxiliary fabric material 41. Furthermore, a lower right strap 32d is coupled to a lower right portion of the auxiliary fabric material 41, and a lower left strap 32c is coupled to a lower left portion of the auxiliary fabric material 41. One end of the lower right strap 32d is coupled to a third coupling point 78 in the lower right portion of the auxiliary fabric material 41, and the other end is secured to a second locking point 71. One end of the lower left strap 32c is coupled to a fourth coupling point 79 in the lower left portion of the auxiliary fabric material 41, and the other end is secured to a first locking point 70. In this manner, one end of the right fastening strap 32a is indirectly secured to a main body 10 via the auxiliary fabric material 41 and the lower left strap 32c, and one end of the left fastening strap 32b is also indirectly secured to the main body 10 via the auxiliary fabric material 41 and the lower right strap 32d. When the right fastening strap 32a is pulled, the upper right portion of the auxiliary fabric material 41 is pulled in a direction toward a right shoulder, and when the left fastening strap 32b is pulled, the upper left portion of the auxiliary fabric material 41 is pulled in a direction toward a left shoulder. Since positions of the lower right portion and the lower left portion of the auxiliary fabric material 41 are fixed by a resistance force against pulling by the lower right strap 32d and the lower left strap 32c, an area of a portion brought into contact with a housed object 60 of the auxiliary fabric material 41 is enlarged and maximized by the pulling of the upper portion rightward and leftward. Accordingly, the housed object 60 may be more stably biased over a wide range. Note that, although fabric having a size capable of covering a major part of the housed object 60 is used as the auxiliary fabric material 41 in this embodiment, in a variation, fabric having a size enough to cover only the vicinity of the center portion of the housed object 60 as the small auxiliary fabric material 43 in the fifth embodiment may be used.

Eleventh Embodiment

[0049] This embodiment is common to the fourth and ninth embodiments in that an auxiliary fabric material 41 is used and two fastening straps 32 are used, and is common to the tenth embodiment in that an upper portion of the auxiliary fabric material 41 is coupled to the two fastening straps 32. Note that, this is different from the fourth, ninth, and tenth embodiments in that a part of the auxiliary fabric material 41 is directly secured to a lower portion of a housing 12, that is, the two fastening straps 32 are indirectly secured to the housing 12. Other configurations are common to those of the fourth, ninth, and tenth embodiments. Hereinafter, the difference is mainly described, and description of common points is omitted.

[0050] Fig. 15 illustrates a structure of a fastening strap 32 and an auxiliary fabric material 41 in an eleventh embodiment. In the auxiliary fabric material 41 in this embodiment, an upper right portion is coupled to a right fastening strap 32a, and an upper left portion is coupled to a left fastening strap 32b. In contrast, the auxiliary fabric material 41 has a shape in which a lower right corner and a lower left corner extend in a band shape in such a manner that a lower right portion is secured to a second locking point 71 and a lower left portion is secured to a first locking point 70. That is, one end of the fastening strap 32 is indirectly secured to a main body 10 via the auxiliary fabric material 41. As a result, the auxiliary fabric material 41 may be secured to a lower right portion and a lower left portion of a housing 12 without using the lower left strap 32c and the lower right strap 32d in the tenth embodiment. In this case also, as in the tenth embodiment, when a right fastening strap 32a is pulled, the upper right portion of the auxiliary fabric material 41 is pulled in a direction toward a right shoulder, and when a left fastening strap 32b is pulled, the upper left portion of the auxiliary fabric material 41 is pulled in a direction toward a left shoulder. Since positions of the lower right portion and the lower left portion of the auxiliary fabric material 41 are fixed, an area of a portion brought into contact with a housed object 60 of the auxiliary fabric material 41 is enlarged and maximized by the pulling of the upper portion rightward and leftward. Accordingly, the housed object 60 may be more stably biased over a wide range. Note that, in a variation, a part of or an entire lower side or a part of or entire both sides of the auxiliary fabric material 41 may be sewn to be secured to the housing 12 by a shape different from that of the auxiliary fabric material 41 in the eleventh embodiment.

Twelfth Embodiment

[0051] This embodiment is common to the first and third to fifth embodiments in that two fastening straps 32 are intersected, but is different from the first and third to fifth embodiments in that a lower end of the fastening strap 32 is secured not inside but outside a housing 12, that is, outside a main body 10. Other configurations are common to those of the first and third to fifth embodiments. Hereinafter, the difference is mainly described, and description of common points is omitted.

[0052] Fig. 16 illustrates arrangement and a structure of a fastening strap 32 in a twelfth embodiment. They are common to those of the first and third to fifth embodiments in that lower ends of intersecting right fastening strap 32a and left fastening strap 32b are attached to a lower right position and a lower left position of the housing 12, respectively. Note that, in this embodiment, the lower ends of the right fastening strap 32a and the left fastening strap 32b are exposed to the outside via strap holes 45a and 45b, respectively, and are secured to the outside of a main body 10. The strap hole 45a is provided at a position away from an outer edge of the main body 10 by about 5 cm to 10 cm on a route through which the right fastening strap 32a passes. The strap hole 45b is also provided in a position away from the outer edge of the main body 10 by about 5 cm to 10 cm on a route through which the left fastening strap 32b passes. Between the outer edge of the main body 10 and the strap hole 45a or 45b, a space in which a rod-shaped object or a cylindrical object may be interposed is generated, and the rod-shaped object or the cylindrical object may be allowed to pass to be interposed between the lower end of the fastening strap 32 and an outer surface of the main body 10. For example, a folded trail running pole or trekking pole as illustrated or a drink bottle may be allowed to pass between the fastening strap 32 and the outer surface of the main body 10. When the fastening strap 32 is pulled with these pole and bottle interposed by the fastening strap 32, the pole and bottle may be firmly fixed. In this case, not only swinging of a housed object inside a housing 12 but also swinging of the pole and bottle may be suppressed at the same time, and swinging of an entire main body 10 may be suppressed.

Thirteenth Embodiment

[0053] This embodiment is different from the first to twelfth embodiments in that a plurality of straps is used to form one auxiliary strap 52. Other configurations are common to those of the first to twelfth embodiments. Hereinafter, the difference is mainly described, and description of common points is omitted.

[0054] Fig. 17 illustrates arrangement and a structure of an auxiliary strap 52 in a thirteenth embodiment. One end of each of a first auxiliary strap 52c, a second auxiliary strap 52d, and a third auxiliary strap 52e is secured to a third locking point 73 in an upper left portion of a lower portion of a main body 10, they pass through the inside of a right side belt 50a, and the other end of each of them is exposed to the outside from an opening provided at a distal end of the right side belt 50a. One end of each of a fourth auxiliary strap 52f, a fifth auxiliary strap 52g, and a sixth auxiliary strap 52h is secured to a fourth locking point 74 in an upper right portion of the lower portion of the main body 10, they pass through the inside of a left side belt 50b, and the other end of each of them is exposed to the outside from an opening provided at a distal end of the left side belt 50b. The number of openings provided at the distal end of the side belt 50 may be the same as the number of auxiliary straps 52, or the opening may have a size corresponding to the number of auxiliary straps 52.

[0055] As above, this embodiment describes an example in which three straps are used to form one auxiliary strap 52. In a variation, two straps may be used to form one auxiliary strap 52, or four or more straps may be used to form one auxiliary strap 52.

Fourteenth Embodiment

[0056] This embodiment is common to the thirteenth embodiment in using a plurality of straps to form one auxiliary strap 52 but is different from the thirteenth embodiment in a bundled structure. Other configurations are common to those of the thirteenth embodiment. Hereinafter, the difference is mainly described, and description of common points is omitted.

[0057] Fig. 18 illustrates arrangement and a structure of an auxiliary strap 52 in a fourteenth embodiment. In this embodiment, a distal end portion of the auxiliary strap 52 exposed from a hole at a distal end of a side belt 50 is one strap, and is branched from one strap into a plurality of straps inside the side belt 50. In other words, a plurality of auxiliary straps is bundled inside the side belt 50 and exposed to the outside as one auxiliary strap 52. A distal end of a right auxiliary strap 52a is exposed as one auxiliary strap 52 from a right side belt 50a, and the other end side is in such a form that three straps of a first auxiliary strap 52c, a second auxiliary strap 52d, and a third auxiliary strap 52e are bundled to be coupled to the right auxiliary strap 52a. The first auxiliary strap 52c, the second auxiliary strap 52d, and the third auxiliary strap 52e are secured to a lower left edge of a main body 10 by a first variable catch 83a, a second variable catch 83b, and a third variable catch 83c, respectively. A distal end of a left auxiliary strap 52b is exposed as one auxiliary strap 52 from a left side belt 50b, and the other end side is in such a form that three straps of a fourth auxiliary strap 52f, a fifth auxiliary strap 52g, and a sixth auxiliary strap 52h are bundled to be coupled to the left auxiliary strap 52b. The fourth auxiliary strap 52f, the fifth auxiliary strap 52g, and the sixth auxiliary strap 52h are secured to a lower right edge of the main body 10 by a fourth variable catch 83d, a fifth variable catch 83e, and a sixth variable catch 83f, respectively. Positions at which the six variable catches 83 secure may be determined to any positions in a vertical direction, and arrangement and an interval thereof may be adjusted.

[0058] As above, this embodiment describes an example in which the three straps are bundled to be coupled to one auxiliary strap 52. In a variation, two straps may be bundled to be coupled to one auxiliary strap 52, or four or more straps may be bundled to be coupled to one auxiliary strap 52.

Fifteenth Embodiment

[0059] This embodiment is different from the first to fourteenth embodiments in using a catch for securing to a shoulder belt 30 in place of a cord stopper 33 in order to adjust a fastening length of a fastening strap 32. Other configurations are common to those of the first to fourteenth embodiments. Hereinafter, the difference is mainly described, and description of common points is omitted.

[0060] Fig. 19 illustrates arrangement of a fastening strap 32 and a plurality of catches and a first use example in a fifteenth embodiment. A right shoulder belt 30a and a left shoulder belt 30b are provided with six catches, respectively, along opposing edges. The right shoulder belt 30a is provided with a first right catch 84a, a second right catch 84b, a third right catch 84c, a fourth right catch 84d, a fifth right catch 84e, and a sixth right catch 84f from above along the edge. The left shoulder belt 30b is provided with a first left catch 85a, a second left catch 85b, a third left catch 85c, a fourth left catch 85d, a fifth left catch 85e, and a sixth left catch 85f from above along the edge. A right strap side catch 86a is provided at a distal end of a right fastening strap 32a and this may be selectively secured to any of the first to sixth right catches 84a to 84f. The right strap side catch 86a and the first to sixth right catches 84a to 84f may be formed of a set of male/female connectors such as magnets, clips, and a hook-and-loop fastener, for example. A fastening length of the right fastening strap 32a may be made shorter as it is secured to an upper catch out of the first to sixth right catches 84a to 84f, and the fastening length of the right fastening strap 32a may be made longer as it is secured to a lower catch. A left strap side catch 86b is provided at a distal end of a left fastening strap 32b and this may be selectively secured to any of the first to sixth left catches 85a to 85f. The left strap side catch 86b and the first to sixth left catches 85a to 85f may also be formed of a set of male/female connectors such as magnets, clips, and a hook-and-loop fastener, for example. A fastening length of the left fastening strap 32b may be made shorter as it is secured to an upper catch out of the first to sixth left catches 84a to 84f, and the fastening length of the left fastening strap 32b may be made longer as it is secured to a lower catch. As used herein, the "fastening length" refers to a length from a top of a shoulder to a distal end or a length of a portion exposed to a front side of the fastening strap 32; the longer the "fastening length", the higher a fastening strength of the fastening strap 32 and it is tight, and the shorter the "fastening length", the lower the fastening strength and it is loose. In a case of the illustrated state, the right fastening strap 32a is in such a manner that the right strap side catch 86a is secured to the first right catch 84a on an uppermost stage, and the right fastening strap 32a has the shortest fastening length, that is, the loosest fastening strength. The left fastening strap 32b is in such a manner that the left strap side catch 86b is secured to the fourth left catch 85d on a fourth stage from above or a third stage from below, and the left fastening strap 32b is the third longest, that is, this has the third tightest fastening strength. In this manner, a wearer may adjust the fastening lengths of the right and left fastening straps 32 separately by selecting the catch to which this is secured according to a situation such as a size and a shape of baggage and weight distribution in the housing 12. Especially, it is possible to adjust in stages as many as the catches arranged in a vertical direction, that is, in six stages in the example of this drawing.

[0061] Fig. 20 illustrates arrangement of the fastening strap 32 and a plurality of catches and a second use example in the fifteenth embodiment. This use example is the same as the first use example in the structure and arrangement of the fastening strap 32 and a plurality of catches, but is different from the first use example in that the right fastening strap 32a and the left fastening strap 32b are intersected on a front side to be secured to the catches. More specifically, the right strap side catch 86a at a distal end of the right fastening strap 32a is selectively secured not to a right shoulder belt 30a side but to any one of the first to sixth left catches 85a to 85f on a left shoulder belt 30b side on the opposite side. Similarly, the left strap side catch 86b at a distal end of the left fastening strap 32b is selectively secured not to a left shoulder belt 30b side but to any one of the first to sixth right catches 84a to 84f on a right shoulder belt 30a side on the opposite side. In a case of the illustrated state, the right strap side catch 86a of the right fastening strap 32a is secured to the fourth left catch 85d on the third stage from below on the left shoulder belt 30b side, and the left strap side catch 86b of the left fastening strap 32b is secured to the fourth right catch 84d on the third stage from below on the right shoulder belt 30a side. In this case, the right and left fastening straps 32 are elongated to the opposite side, so that fastening lengths become longer than those in a case where they are fastened to the catches on the same sides, and the fastening strength may be increased. Furthermore, since it may be adjusted in vertical six stages, respectively, so that it may be adjusted in total of 12 stages by adjusting vertically and laterally.

Sixteenth Embodiment

[0062] This embodiment is different from the fifteenth embodiment in securing a distal end of a fastening strap 32 to another strap such as an auxiliary strap 52 in order to adjust a fastening length of the fastening strap 32. Other configurations are common to those of the first to fifteenth embodiments. Hereinafter, the difference is mainly described, and description of common points is omitted.

[0063] Fig. 21 illustrates a first use example regarding a fastening strap 32 and a securing structure in a sixteenth embodiment. In the first use example, a strap side catch 86 at a distal end of the fastening strap 32 is hooked to be secured to an auxiliary strap 52. A right strap side catch 86a at a distal end of a right fastening strap 32a is hooked to a right auxiliary strap 52a, and a left strap side catch 86b at a distal end of a left fastening strap 32b is hooked to a left auxiliary strap 52b. In this case, as compared with the fifteenth embodiment, it is not necessary to install a receiving side catch on a shoulder belt 30, and a fastening length and fastening strength of the fastening strap 32 may be adjusted only by hooking to a strap in an existing shape. Since a position of the auxiliary strap 52 corresponds to a position of a catch on a lowermost stage such as the sixth right catch 84f or the sixth left catch 85f in the fifteenth embodiment, it is possible to increase the fastening length of the fastening strap 32 to a longest level and increase the fastening strength to a strongest level.

[0064] Fig. 22 illustrates a second use example regarding the fastening strap 32 and the securing structure in the sixteenth embodiment. The second use example is different from the first use example in that the strap side catch 86 at the distal end of the fastening strap 32 is hooked not to the auxiliary strap 52 but to an upper chest strap 35 or a lower chest strap 37. In the illustrated example, the right strap side catch 86a at the distal end of the right fastening strap 32a is hooked to a lower right chest strap 37a, and the left strap side catch 86b at the distal end of the left fastening strap 32b is hooked to a lower left chest strap 37b. In this case, since the fastening strap 32 is secured to a position one stage higher than that in the first use example, the fastening length of the fastening strap 32 may be made shorter than that in the first use example to loosen the fastening strength. Furthermore, when this is secured to an upper right chest strap 35a and an upper left chest strap 35b higher by one stage, the fastening length of the fastening strap 32 may be further shortened to loosen the fastening strength. In this manner, by hooking the fastening strap 32 to any one of the auxiliary strap 52, the lower chest strap 37, and the upper chest strap 35, the fastening length and the fastening strength may be adjusted in three stages.

[0065] Fig. 23 illustrates a third use example regarding the fastening strap 32 and the securing structure in the sixteenth embodiment. The third use example is common to the first use example in that the strap side catch 86 of the fastening strap 32 is hooked to the auxiliary strap 52, but this use example is different in that the right fastening strap 32a and the left fastening strap 32b are intersected and hooked to the opposite sides. More specifically, the right strap side catch 86a of the right fastening strap 32a is hooked to the left auxiliary strap 52b on the left side, and the left strap side catch 86b of the left fastening strap 32b is hooked to the right auxiliary strap 52a on the right side. As a result, the right fastening strap 32a and the left fastening strap 32b intersect, so that the fastening length increases and the fastening strength increases accordingly. A method of allowing the right fastening strap 32a and the left fastening strap 32b to intersect may also be applied to a case where the strap side catch 86 is hooked to the upper chest strap 35 or the lower chest strap 37, and it is possible to increase the fastening length to adjust the fastening strength to be higher as compared with a case where this is hooked to the upper chest strap 35, the lower chest strap 37, and the auxiliary strap 52 without intersection. A total of six stages of adjustment may be performed by three stages of hooking positions and the presence of intersection.

Seventeenth Embodiment

[0066] This embodiment is different from the first to fourteenth embodiments in using a predetermined dial fastening mechanism in order to adjust a fastening length of a fastening strap 32. Other configurations are common to those of the first to fourteenth embodiments. Hereinafter, the difference is mainly described, and description of common points is omitted.

[0067] Fig. 24 illustrates arrangement of a fastening strap 32 and a dial fastening mechanism in a seventeenth embodiment. In this embodiment, a dial mechanism 87 is used in place of the cord stopper 33 in the first to fourteenth embodiments. The dial mechanism 87 is a mechanism capable of winding a wire by rotation of the dial and releasing a winding state only by pressing a central button once. This winding and releasing of the dial mechanism 87 implements pulling and releasing of the fastening strap 32. A right strap dial mechanism 87a and a wire thereof are attached to a distal end of a right fastening strap 32a, and a left strap dial mechanism 87b and a wire thereof are attached to a distal end of a left fastening strap 32b. The dial mechanism 87 is also used as a connector for an upper chest strap 35, a lower chest strap 37, and an auxiliary strap 52. An upper chest strap dial mechanism 87c is used to connect and fasten an upper right chest strap 35a and an upper left chest strap 35b, and a lower chest strap dial mechanism 87d is used to connect and fasten a lower right chest strap 37a and a lower left chest strap 37b. An auxiliary strap dial mechanism 87e is used to connect and fasten a right auxiliary strap 52a and a left auxiliary strap 52b.

Eighteenth Embodiment

[0068] This embodiment is common to the first to seventeenth embodiments mainly in providing a fastening strap 32 in an upper portion of a main body 10 and an auxiliary strap 52 in a lower portion of the main body 10, but is different from the first to seventeenth embodiments in further providing an auxiliary strap in the upper portion of the main body 10. Other configurations are common to those of the first to seventeenth embodiments. Hereinafter, the difference is mainly described, and description of common points is omitted.

[0069] Fig. 25 is an external view of an entire backpack 100 according to an eighteenth embodiment. In this embodiment, a right chest auxiliary strap 56a and a left chest auxiliary strap 56b are provided in directions parallel with a right auxiliary strap 52a and a left auxiliary strap 52b, respectively. The right chest auxiliary strap 56a is arranged in parallel with the right auxiliary strap 52a from a main body 10 toward a front side through a right armpit above the right auxiliary strap 52a. The left chest auxiliary strap 56b is arranged in parallel with the left auxiliary strap 52b from the main body 10 toward the front side through a left armpit above the left auxiliary strap 52b. The right chest auxiliary strap 56a and the left chest auxiliary strap 56b are arranged so as to intersect in a housing 12 in the main body 10, exposed to the outside from holes provided under the right and left armpits toward the front side, pass through the inside of right and left shoulder belts 30a and 30b from holes on an extension line thereof, and distal ends thereof are exposed to the outside from holes on an extension line thereof. A seventh catch 53c and an eighth catch 53d are attached to the distal ends of the right chest auxiliary strap 56a and the left chest auxiliary strap 56b, respectively.

[0070] Fig. 26 is an external view of the backpack 100 as seen from a front side according to the eighteenth embodiment. The right chest auxiliary strap 56a and the left chest auxiliary strap 56b are arranged so as to be horizontal at least on the front side at a height near the armpit or near a lower portion of a chest of the wearer. The distal ends of the right chest auxiliary strap 56a and the left chest auxiliary strap 56b are exposed to the outside at a position between the right shoulder belt 30a and the left shoulder belt 30b, and parts thereof are also exposed to the outside near the right and left armpits. The seventh catch 53c and the eighth catch 53d are attached to the exposed distal ends of the right chest auxiliary strap 56a and the left chest auxiliary strap 56b, respectively. These catches are connected to each other, so that positions of the right chest auxiliary strap 56a and the left chest auxiliary strap 56b are fixed, and a close contact state of the right shoulder belt 30a and the left shoulder belt 30b around the chest is maintained. The seventh catch 53c and the eighth catch 53d also serve as length adjusting members of the right chest auxiliary strap 56a and the left chest auxiliary strap 56b, respectively, and it is possible to adjust a length and fastening of each strap by pulling each strap to adjust a length of a distal end portion folded back of the right chest auxiliary strap 56a and the left chest auxiliary strap 56b.

[0071] Fig. 27 illustrates an arrangement example of a fastening strap and an auxiliary strap in the eighteenth embodiment. Also in this drawing, a strap is drawn on an outer surface of the backpack for convenience to illustrate the arrangement of the strap. The illustrated arrangement of the fastening strap 32 and auxiliary strap 52 is similar to the configuration and arrangement in the first embodiment, but they may be replaced with the configuration and arrangement including the fastening strap 32 and the auxiliary strap 52 in the second to seventeenth embodiments. In addition, the right chest auxiliary strap 56a and the left chest auxiliary strap 56b are further arranged horizontally in the vicinity of the center in the upper portion of the main body 10. One end of the right chest auxiliary strap 56a is sewn to a fifth locking point 90, which is an edge on a left side of a center point 72 where the right fastening strap 32a and the left fastening strap 32b intersect in the housing 12, and is directly fixed to the main body 10. The right chest auxiliary strap 56a passes from the fifth locking point 90 through the center point 72 and is once exposed to the outside in the vicinity of the right armpit, and passes through the inside of the

front side of the right shoulder belt 30a, then the distal end thereof is exposed to the outside on the front side. One end of the left chest auxiliary strap 56b is sewn to a sixth locking point 91, which is an edge on a right side of the center point 72 where the right fastening strap 32a and the left fastening strap 32b intersect in the housing 12, and is directly fixed to the main body 10. The left chest auxiliary strap 56b passes from the sixth locking point 91 through the center point 72 and is once exposed to the outside in the vicinity of the left armpit, and passes through the inside of the left shoulder belt 30b, then the distal end thereof is exposed to the outside on the front side. In a case where the fastening around the chest by the right auxiliary strap 52a and the left auxiliary strap 52b is not required, distal portions from inner passages of the right shoulder belt 30a and the left shoulder belt 30b may be pulled out rearward to be folded and stored in the housing 12 or fastened to the side of the main body 10 by a bungee cord and the like to be secured.

[0072] Note that, in the example of this drawing, a point where the right chest auxiliary strap 56a and the left chest auxiliary strap 56b intersect is designed to be at the same position as the center point 72 where the right fastening strap 32a and the left fastening strap 32b intersect. More specifically, the fifth locking point 90 and the sixth locking point 91 are provided at a position about 1/2 from the top in a longitudinal width of the upper portion of the main body 10 or the housing 12, or at a position about 1/3 from the top in the longitudinal width of the entire main body 10. By aligning the point where the right chest auxiliary strap 56a and the left chest auxiliary strap 56b intersect in the vicinity of the center of the housed object 60, it is possible to more intensively apply a biasing force to the center point of the housed object 60 together with the right fastening strap 32a and the left fastening strap 32b intersecting at the same position. Note that, in a variation, the right chest auxiliary strap 56a and the left chest auxiliary strap 56b may be designed to intersect above the center point 72, or may be designed to intersect below the center point 72. That is, the positions of the fifth locking point 90 and the sixth locking point 91 may be moved to a position above the illustrated position, for example, a position about 2/5 from the top in the longitudinal width of the main body 10, or a position below the illustrated position, for example, a position about 1/2 from the top in the longitudinal width of the main body 10. In these cases, the housed object 60 may be supported at two points of the point where the right chest auxiliary strap 56a and the left chest auxiliary strap 56b intersect and the center point 72, and the biasing force may be applied in a distributed manner.

[0073] In the illustrated example, the right chest auxiliary strap 56a and the left chest auxiliary strap 56b are intersected on an outer layer of the right fastening strap 32a and the left fastening strap 32b, but they may be intersected on an inner layer of the right fastening strap 32a and the left fastening strap 32b, that is, on a layer between the fastening strap 32 and the housed object 60.

[0074] As above, the present invention is described based on the embodiments. Those skilled in the art understand that these embodiments are exemplary and various variations are possible in combination of the components, and that such variations are also within the scope of the present invention. A new embodiment generated by the combination has effects of each of the combined embodiments and variations.

[0075] For example, in each of the above-described embodiments, the aspect in which the fastening strap and the auxiliary strap pass through the inside of the shoulder belt and the side belt has been described, but there is no limitation in a variation, and the belts may be exposed to the outside. In a case where they are exposed, it is preferable to provide a plurality of loops serving as guides, for example, so that they are less likely to deviate from normal positions.

[REFERENCE SIGNS LIST]

[0076] 10 main body, 12 housing, 30 shoulder belt, 32 fastening strap, 50 side belt, 52 auxiliary strap, 60 housed object, 100 backpack

[INDUSTRIAL APPLICABILITY]

[0077] The present invention mainly relates to a backpack used for trail running.

Claims

1. A backpack comprising:

a main body including a housing; and
a shoulder belt extending from an upper portion of the main body, wherein
a fastening strap that passes through an inside of the housing is attached to the main body in such a manner that a housed object is able to be biased toward a back of a wearer in the housing,
the fastening strap is arranged in such a manner that one end of which is directly or indirectly secured to a predetermined position in a lower portion of the housing, attached along the shoulder belt from the predetermined position through the inside of the housing, and the other end of which is located on a front side than a top of a shoulder of the wearer, and has a fastening length adjustable at a position on the front side of the wearer.

2. The backpack according to claim 1, wherein the fastening strap is formed of a plurality of fastening straps, both ends of each of the fastening straps are diagonally located in the housing, so that the plurality of fastening straps intersects in the housing, and the plurality of intersecting fastening straps is able to bi-

as the housed object toward the back of the wearer in the housing.

3. The backpack according to claim 1 or 2 further comprising:

a side belt that extends from a lower portion of the main body toward a front side and is connected to a lower end of the shoulder belt, wherein
an auxiliary strap a fastening length of which is adjustable at the position on the front side of the wearer is attached to the side belt along the side belt from the lower portion of the main body to the front side, and
the auxiliary strap is arranged so as to be able to bias the main body toward the back of the wearer in the lower portion of the main body by adjusting the fastening length.

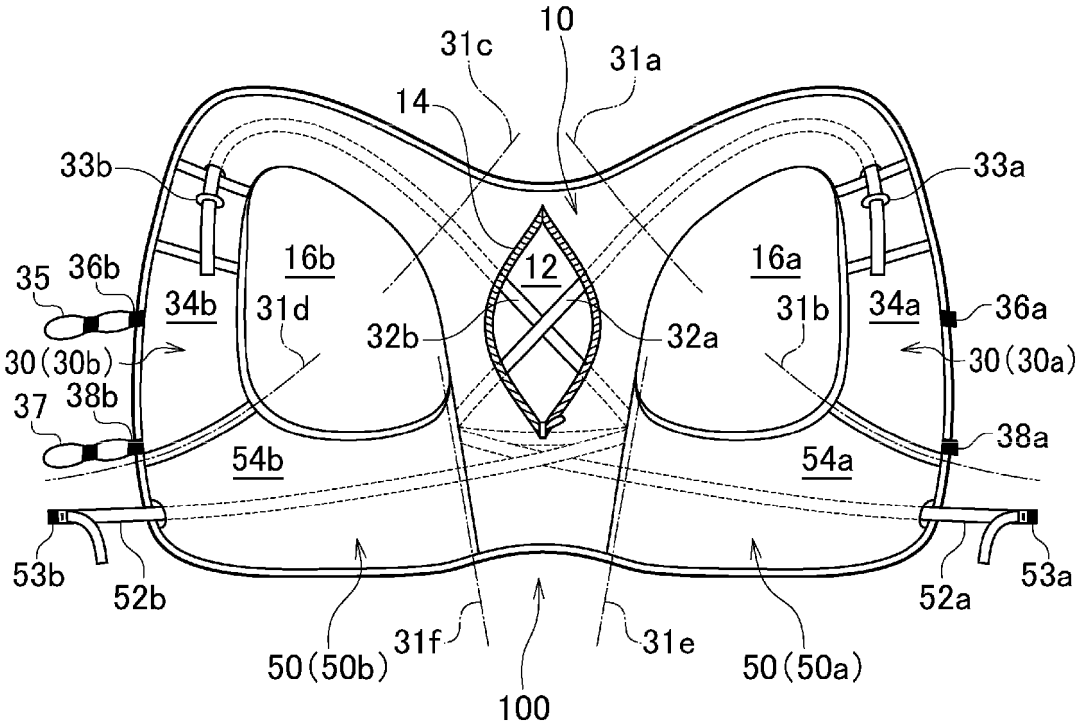
4. The backpack according to claim 3, wherein

the auxiliary strap is formed of a plurality of auxiliary straps,
the side belt is formed of a plurality of side belts arranged on right and left sides, and
one ends of the plurality of auxiliary straps are secured to the main body, and the other ends of the plurality of auxiliary straps are connected to each other via a predetermined length adjusting member at the position on the front side of the wearer interposed between right and left side belts.

5. The backpack according to claim 3, wherein the auxiliary strap is formed of a plurality of auxiliary straps, and both ends of each of the auxiliary straps are diagonally located in the lower portion of the main body, so that the plurality of auxiliary straps intersects at a center of the lower portion of the main body.

6. The backpack according to any one of claims 1 to 5, wherein the fastening strap is formed of a non-elastic material.

FIG. 1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14
33b
33a
16b
12
16a
35
36b
34b
31d
32b
32a
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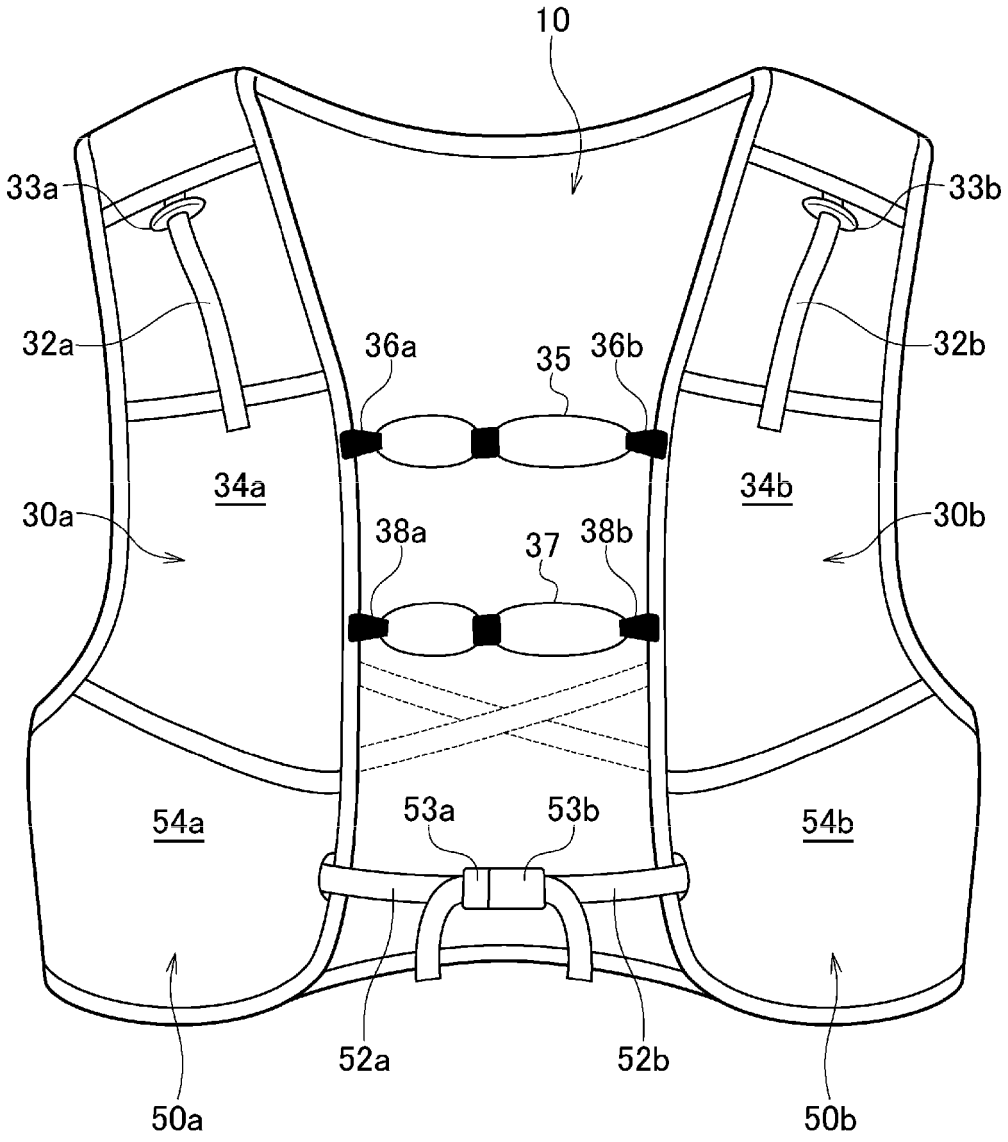
36a
30(30b)
30(30a)
37
38b
38a
54b
54a
53b
52b
52a
53a
50(50b)
31f
31e
50(50a)
100

FIG. 2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32b
36a
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36b
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53b
54b
52a
52b
50a
50b

FIG. 3

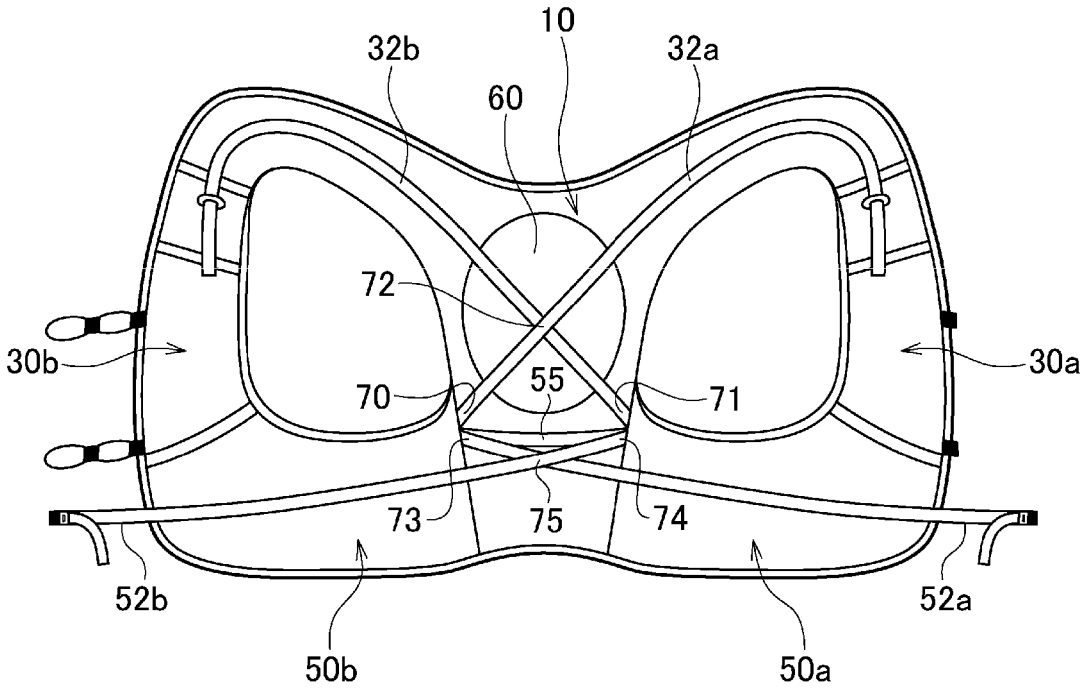


FIG. 4

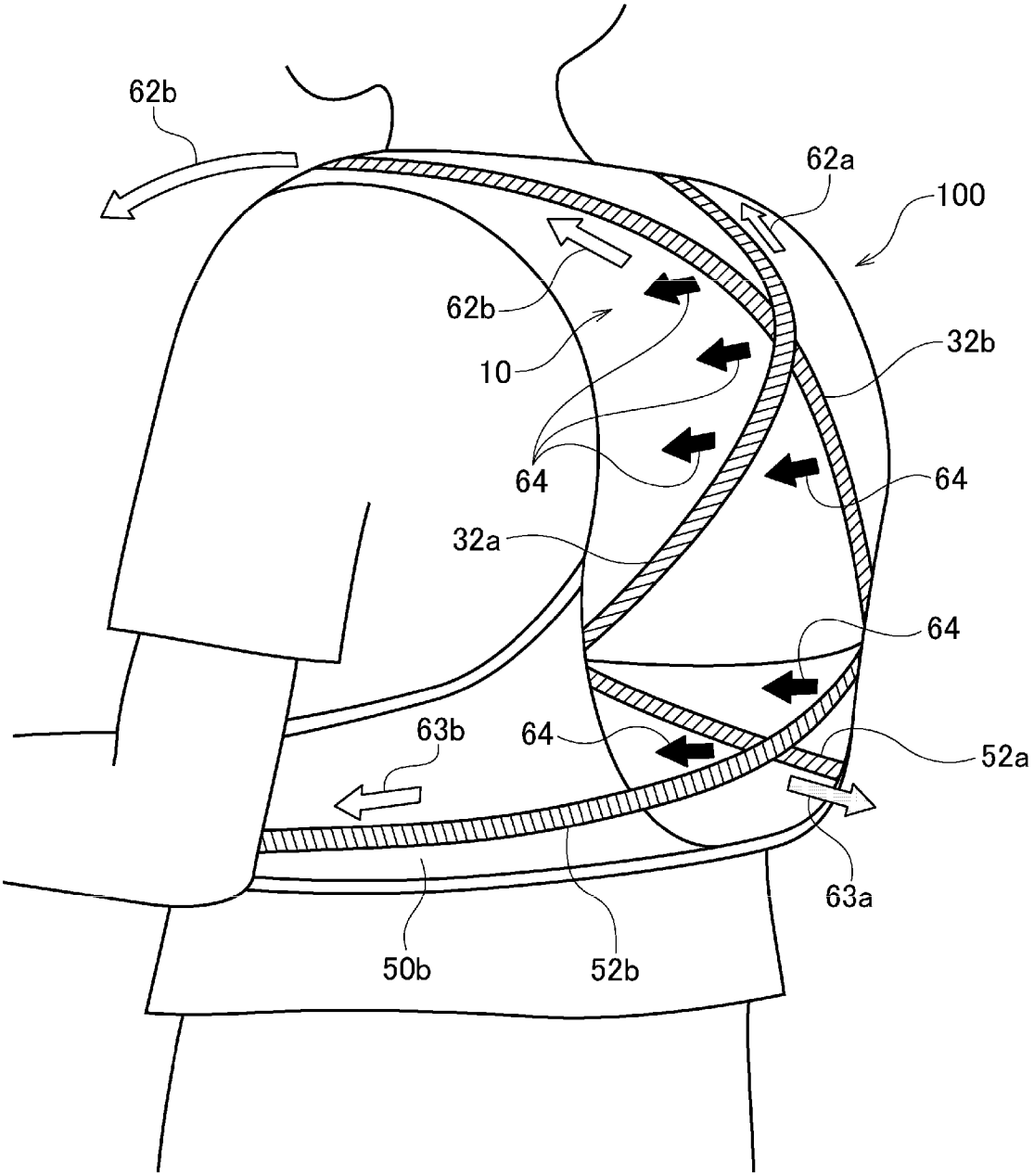


FIG. 5

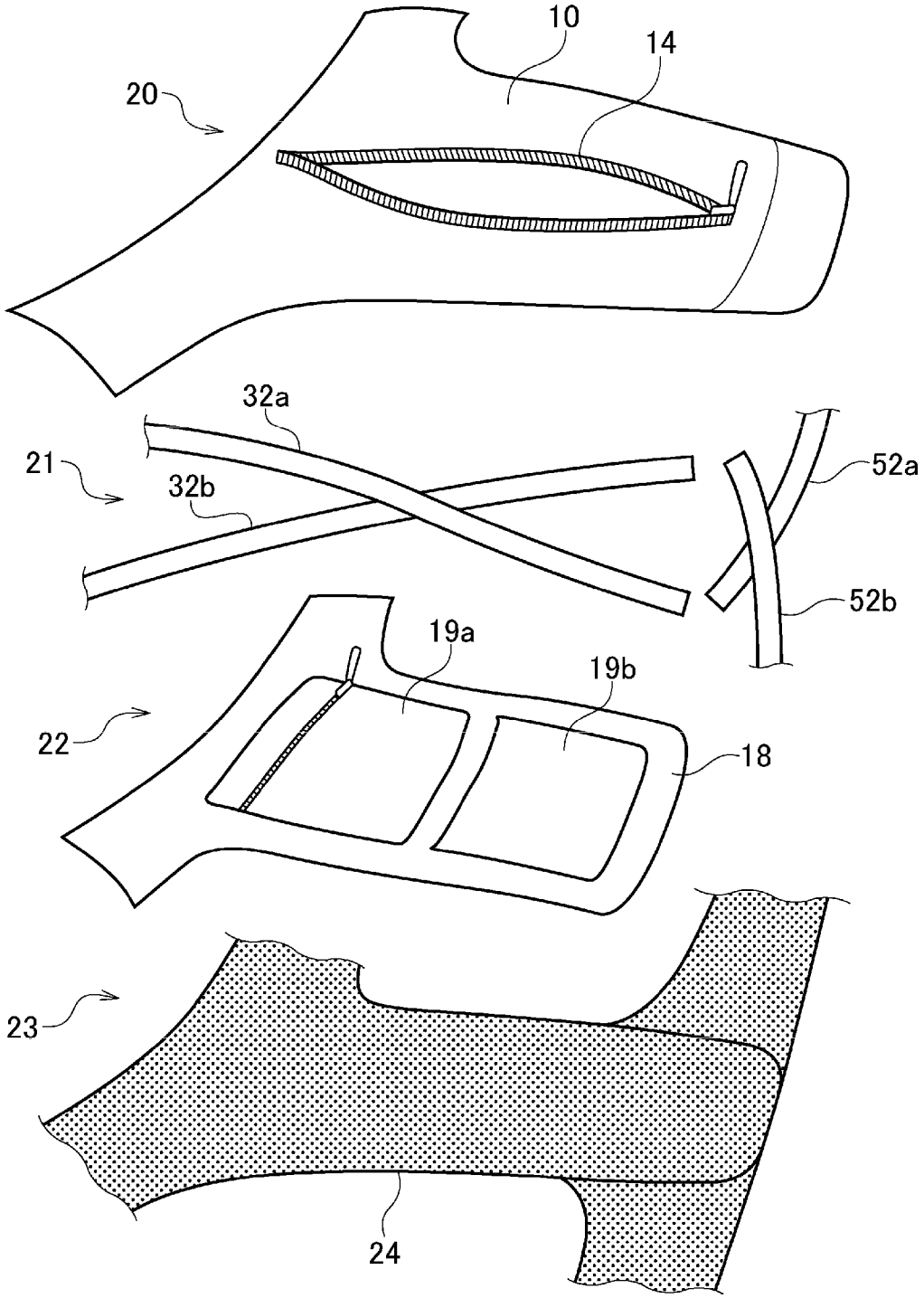
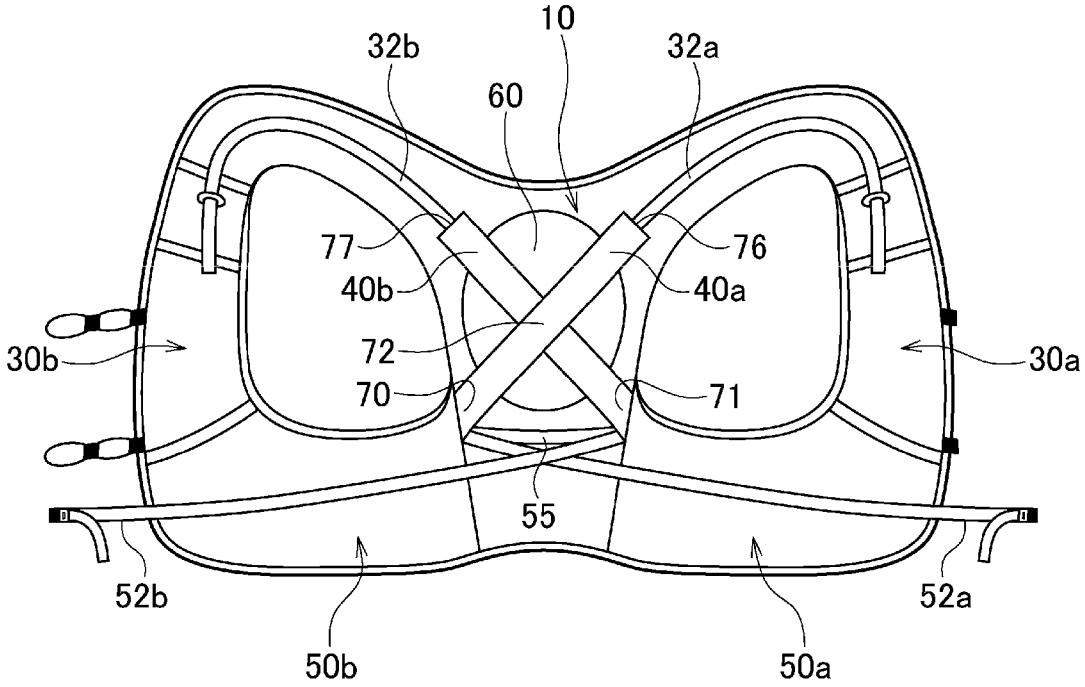


FIG. 6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32b
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40a
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30b
30a
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71
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52b
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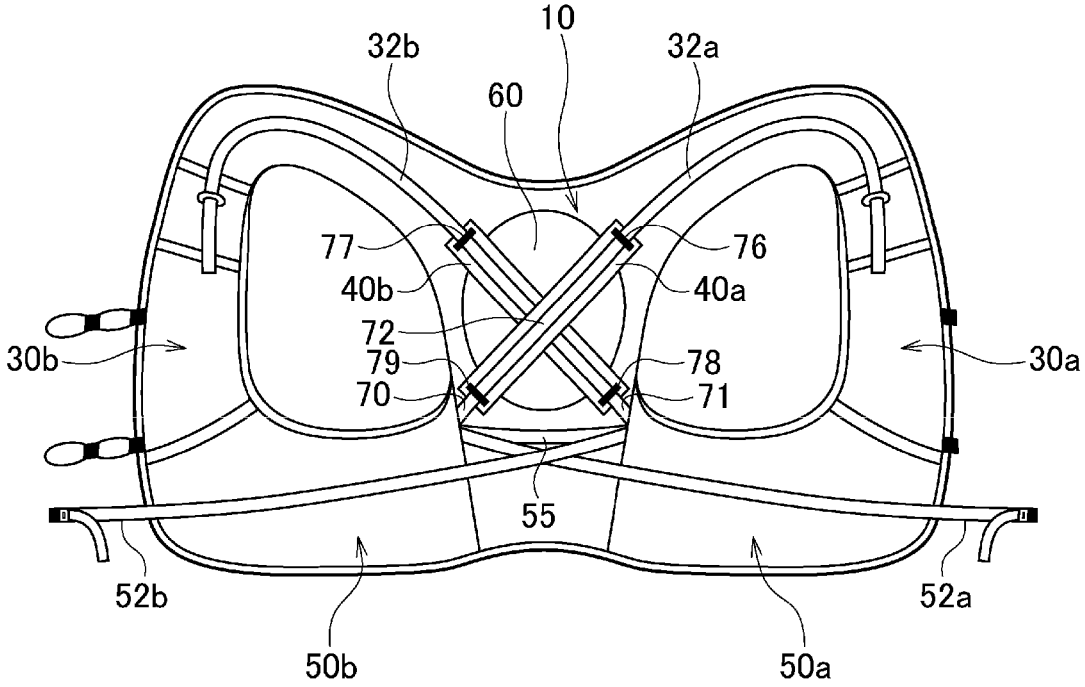
50b
50a

FIG. 7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32a
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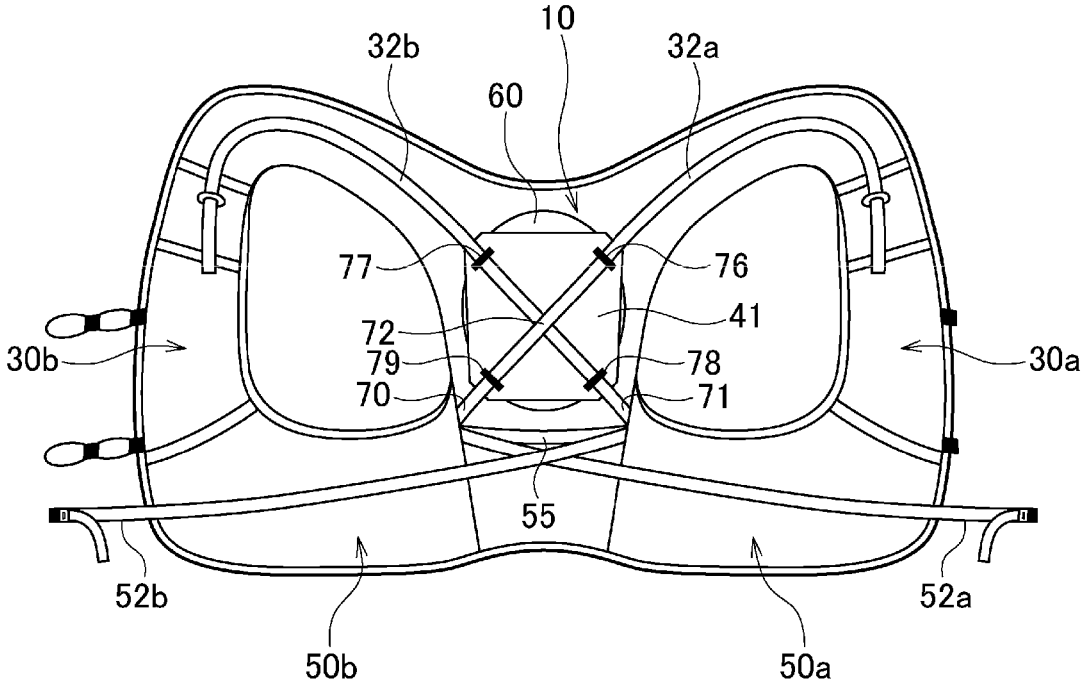
50b
50a

FIG. 8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30a
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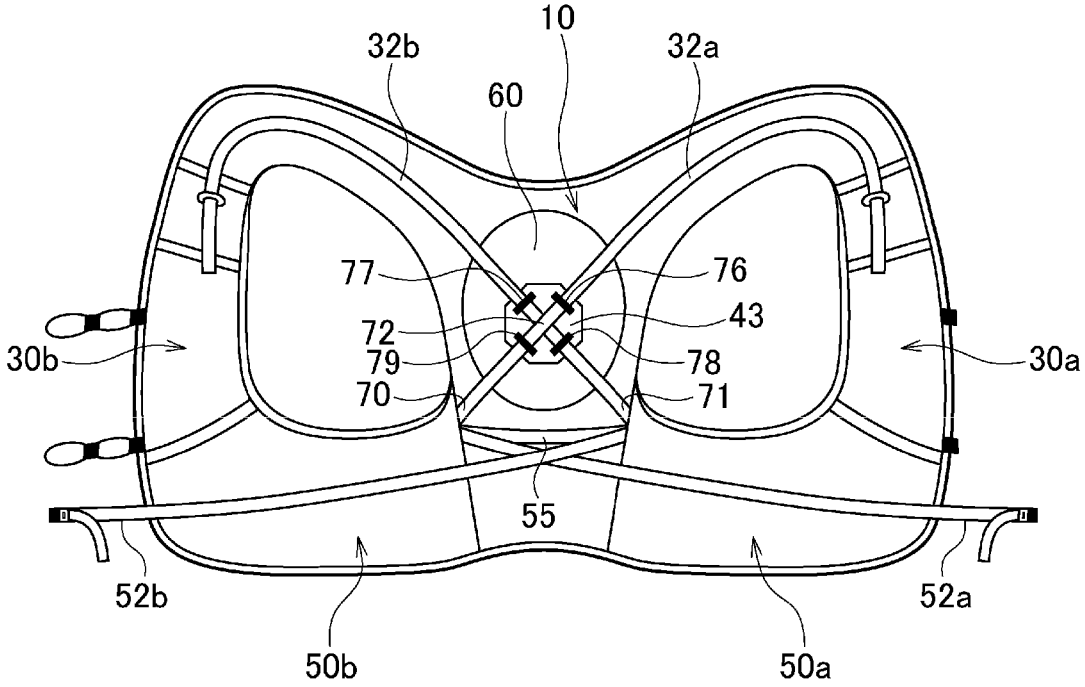
50b
50a

FIG. 9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30a
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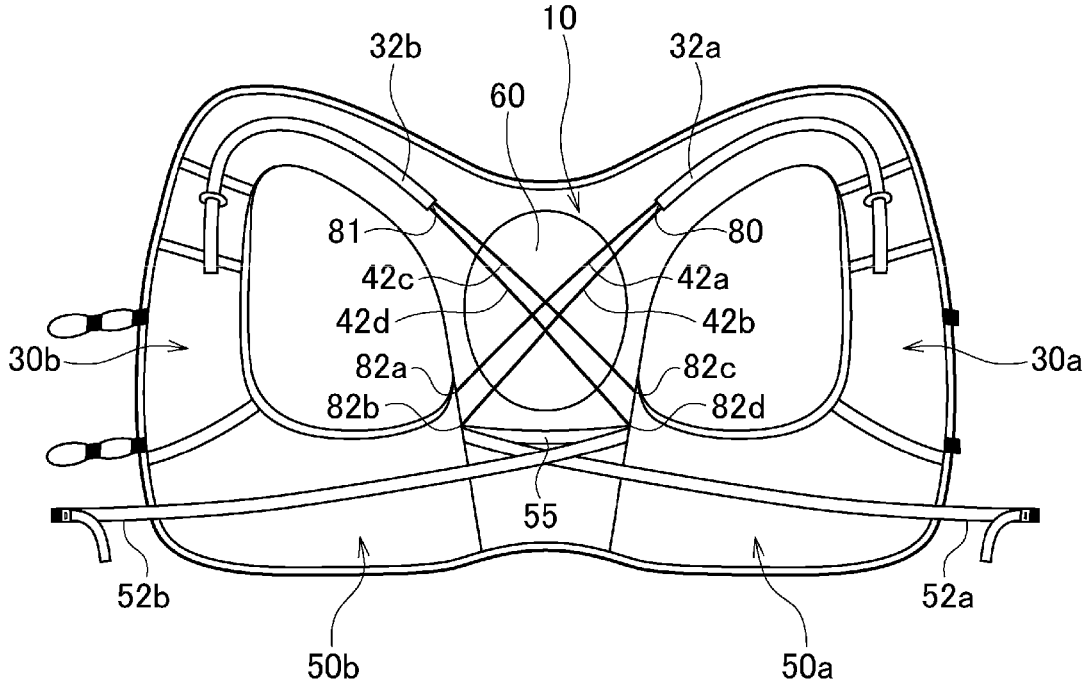
50b
50a

FIG. 10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81
80
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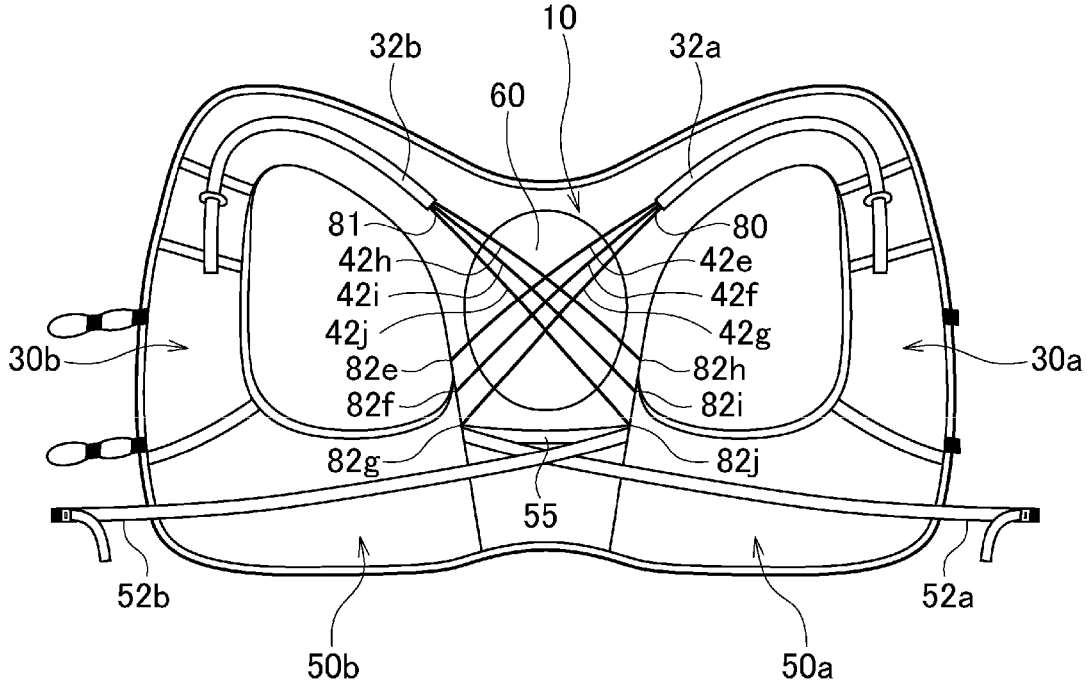
55
52b
52a
50b
50a

FIG. 11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82j
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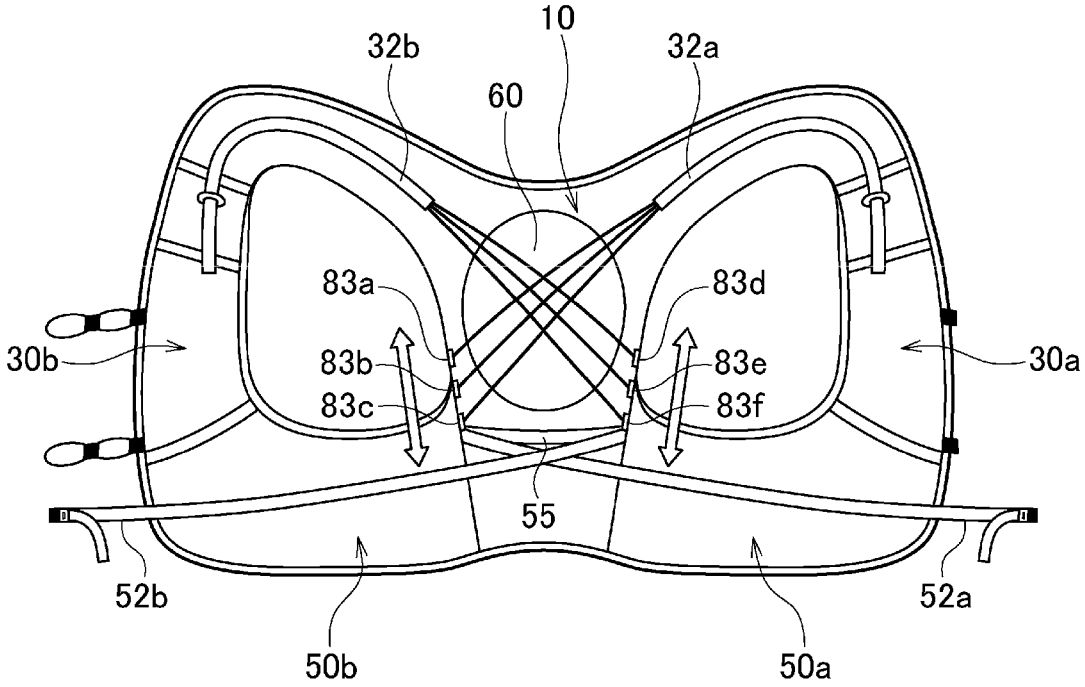
50b
50a

FIG. 12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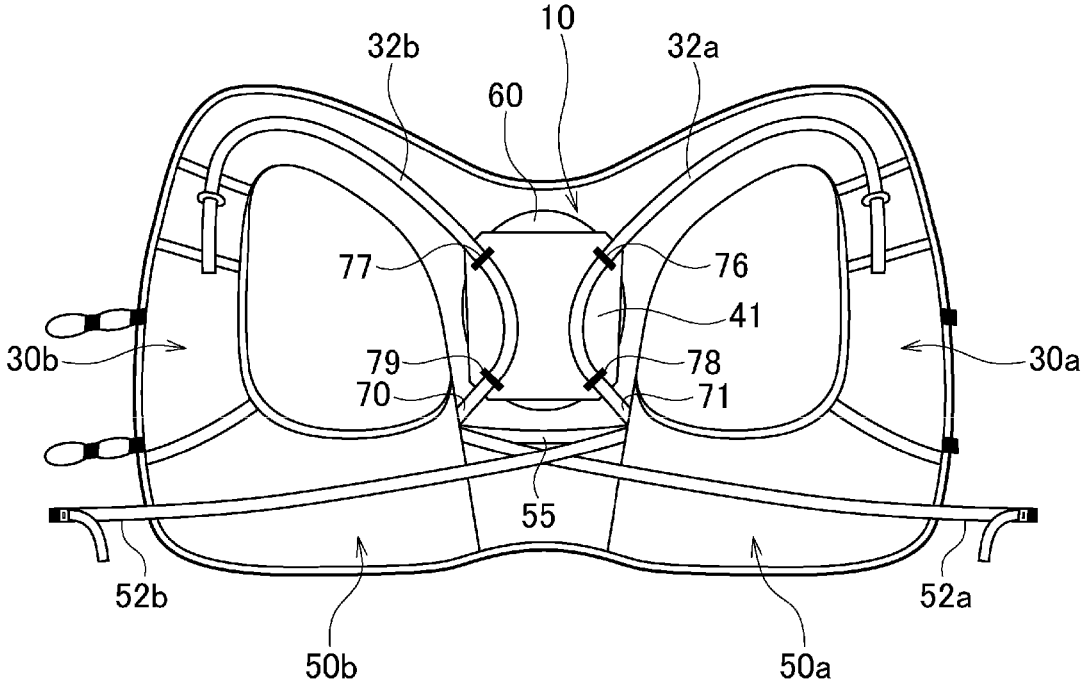
52a
50b
50a

FIG. 13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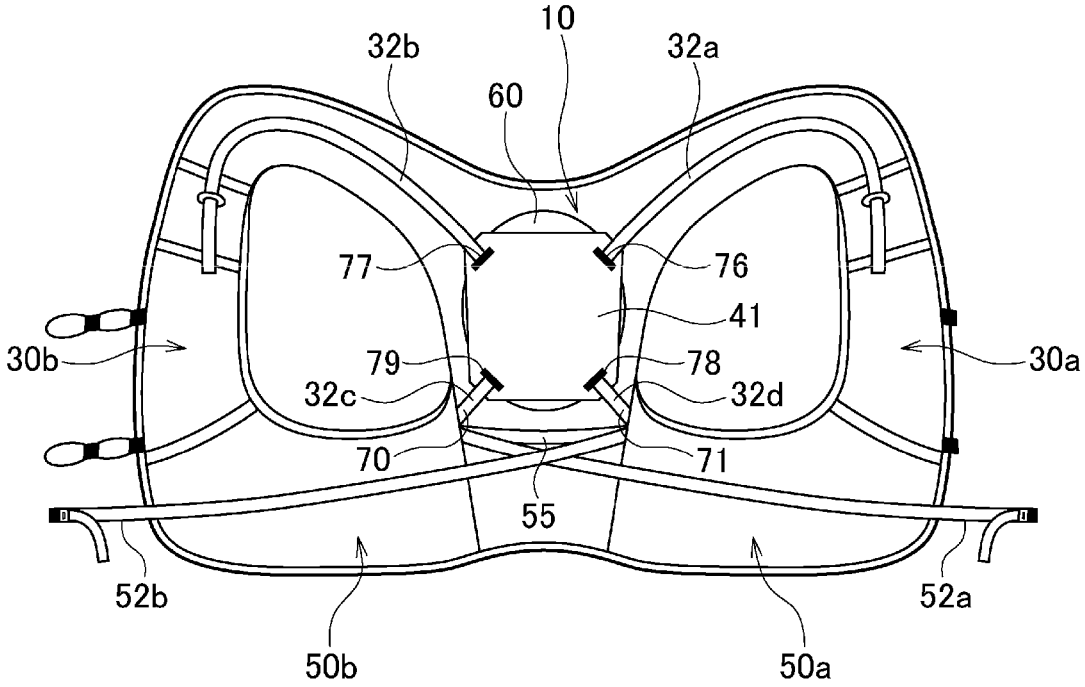
50b
50a

FIG. 14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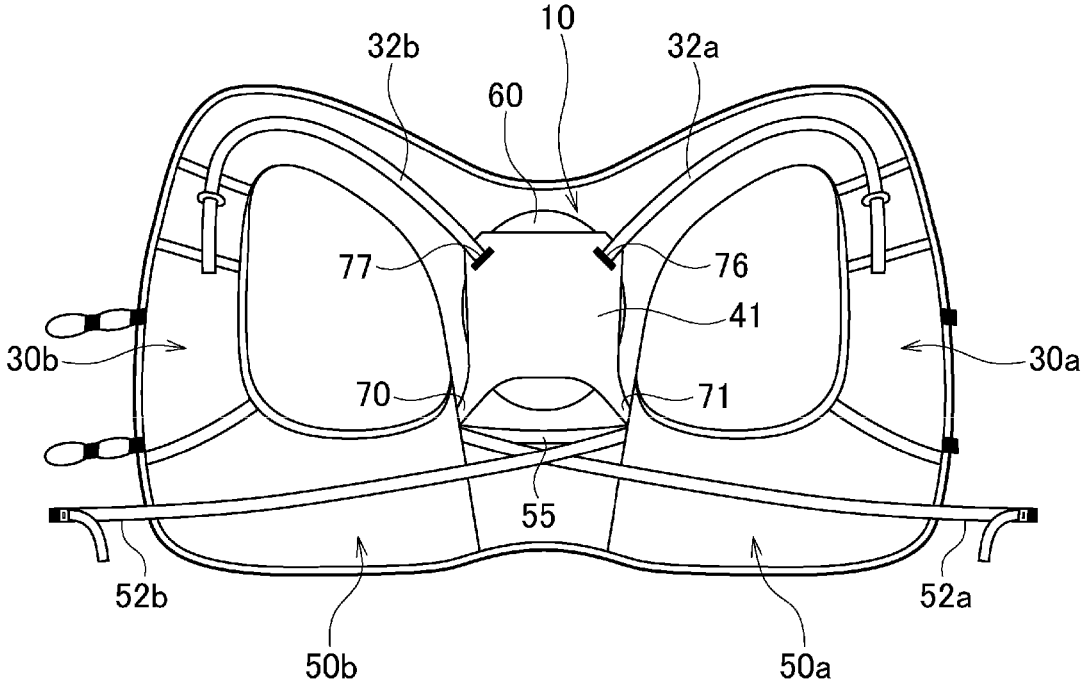
50b
50a

FIG. 15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52b
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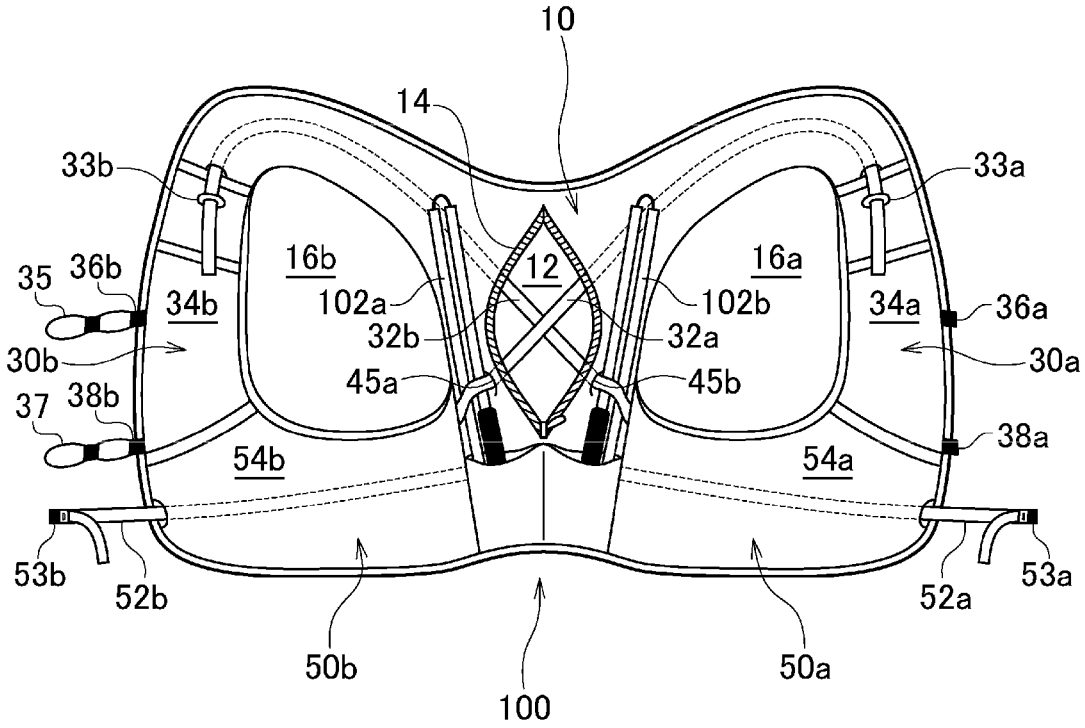
50b
50a

FIG. 16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36b
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53b
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52a
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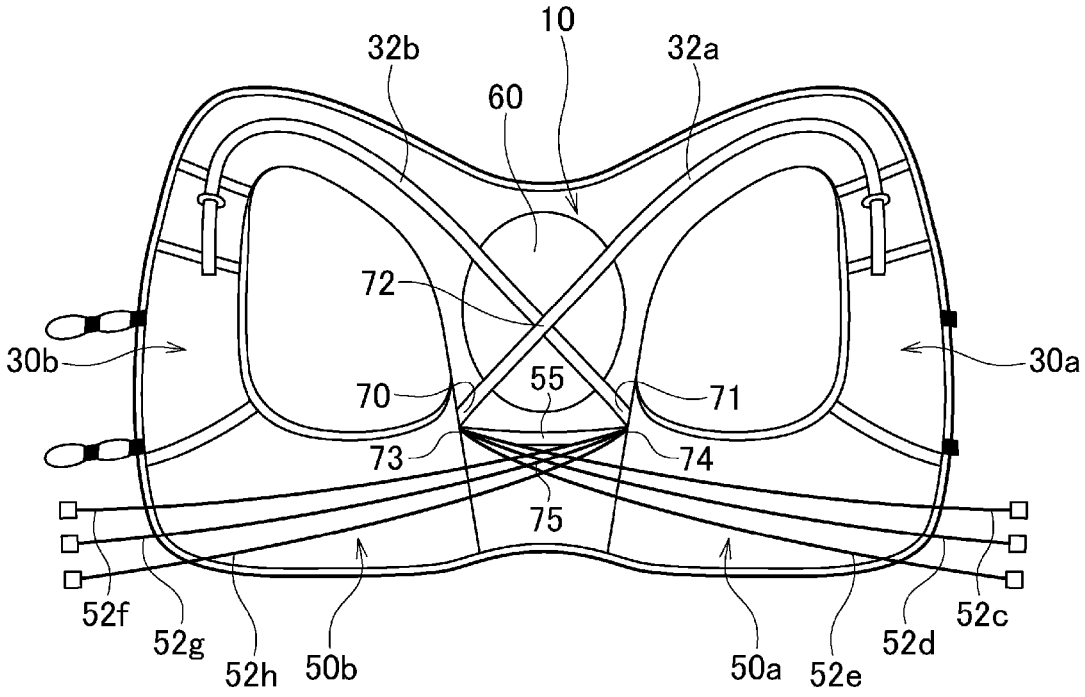
50b
50a
100

FIG. 17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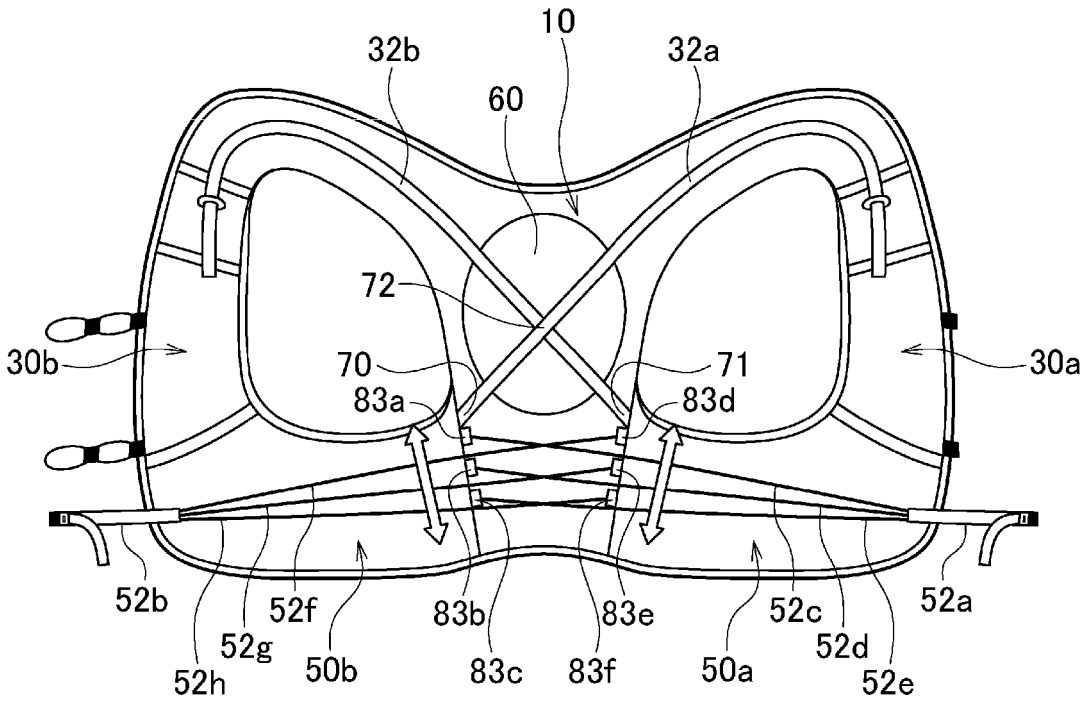
52e
52d
52c

FIG. 18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83f
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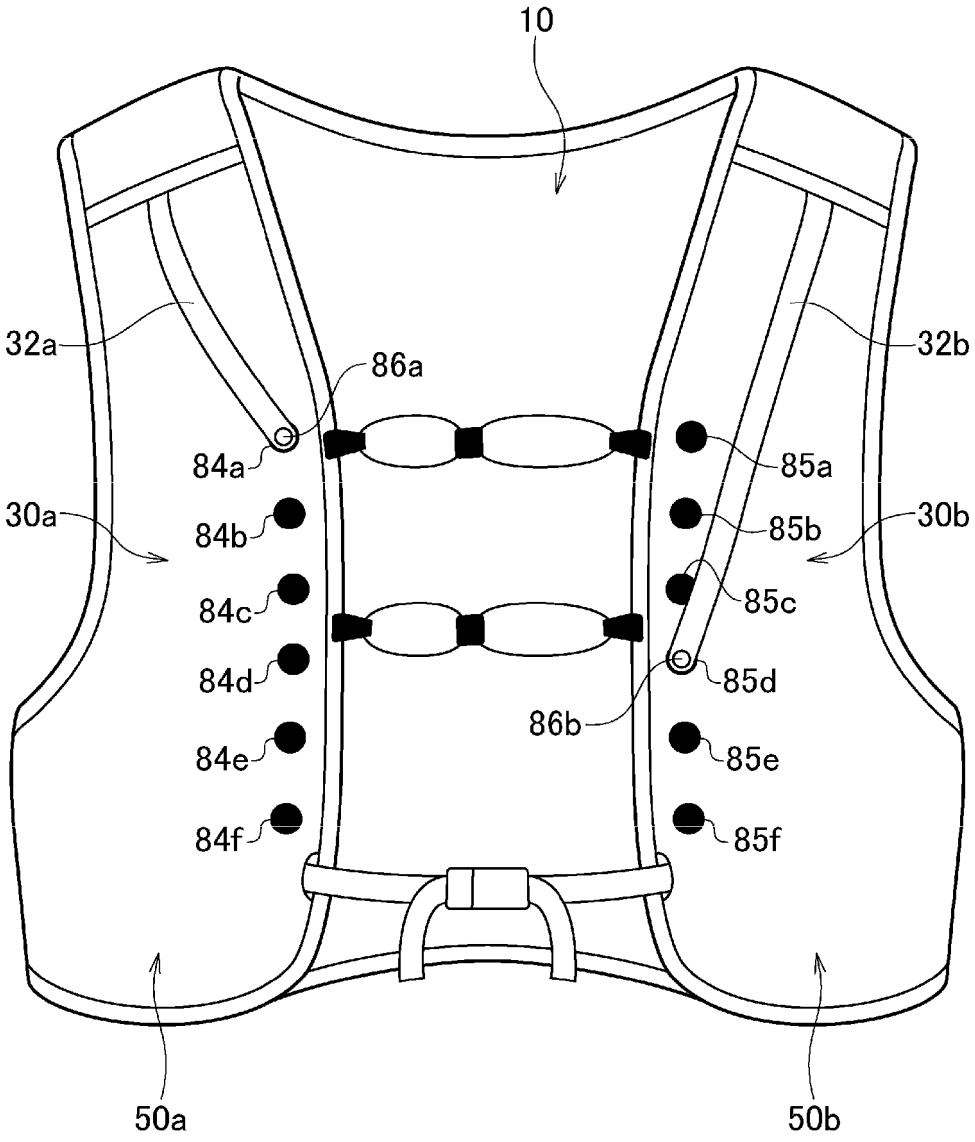
52d
52e

FIG. 19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85a
30a
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30b
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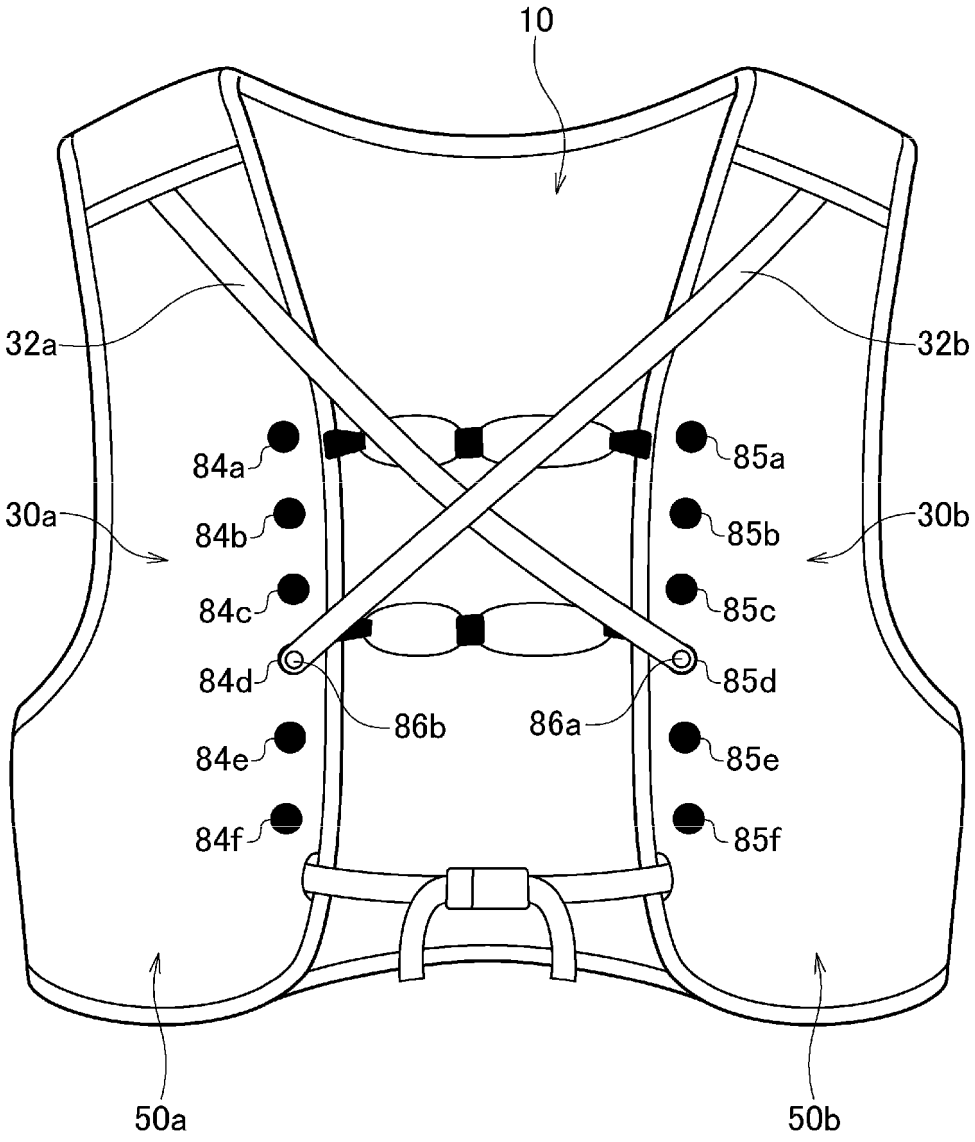
85e
84f
85f
50a
50b

FIG. 20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30a
84b
85b
30b
84c
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84d
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86b
86a
84e
85e
84f
85f
50a
50b

FIG. 21

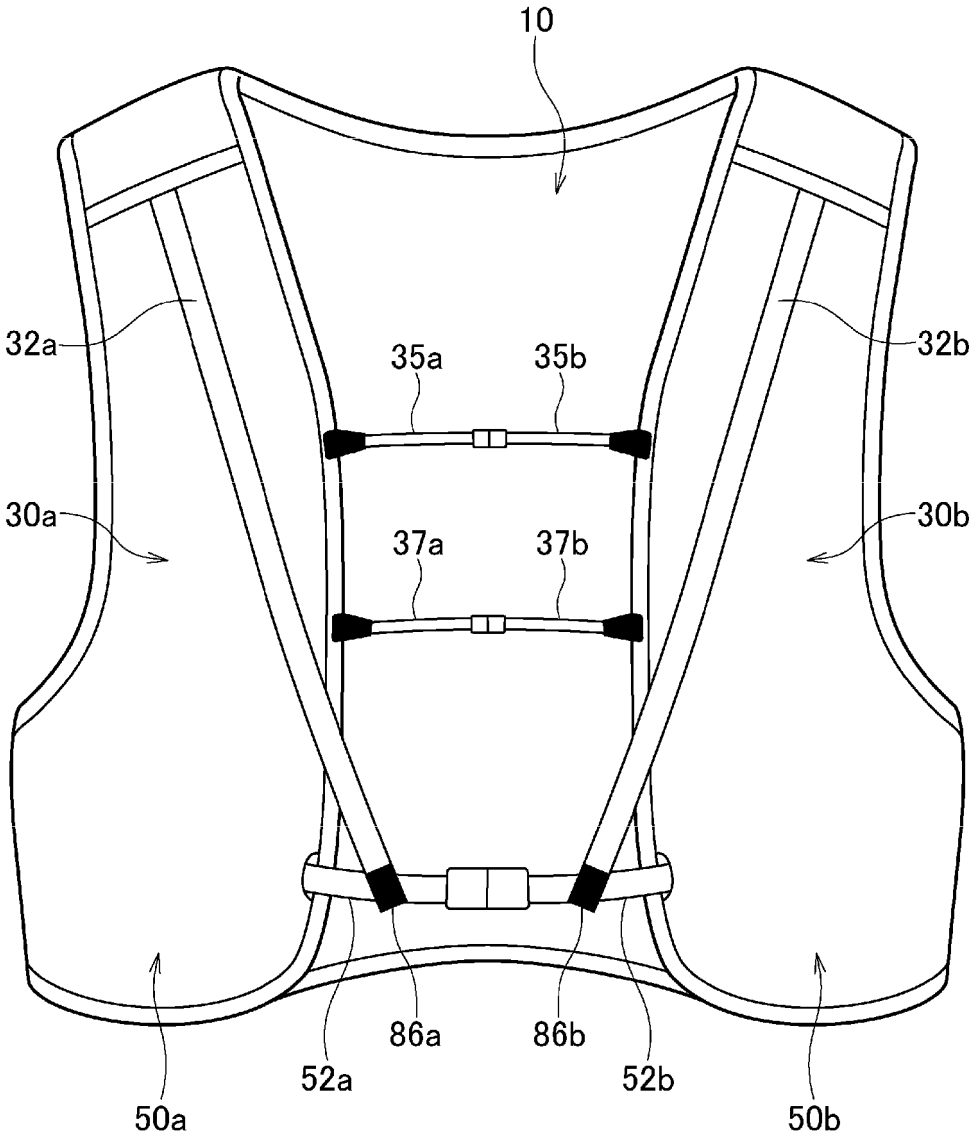


FIG. 22

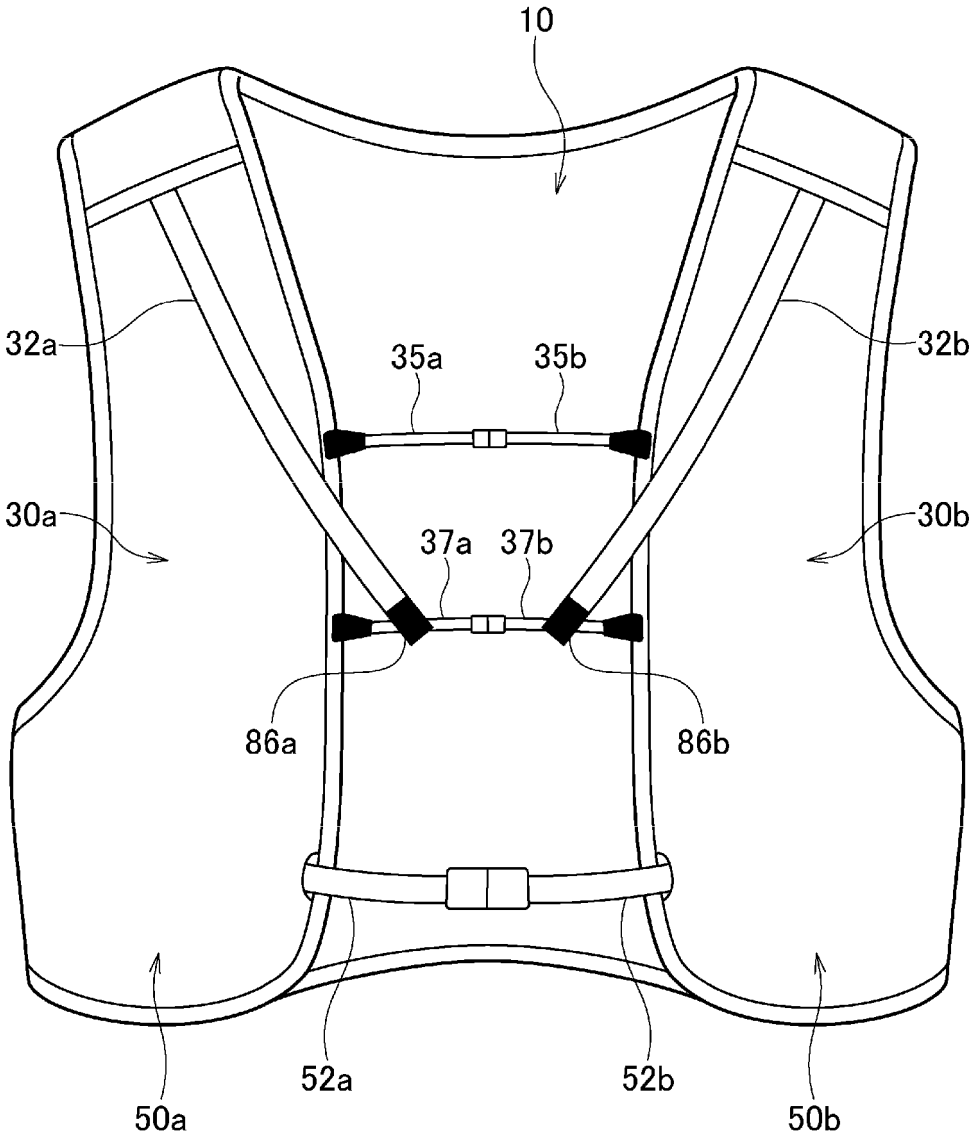


FIG. 23

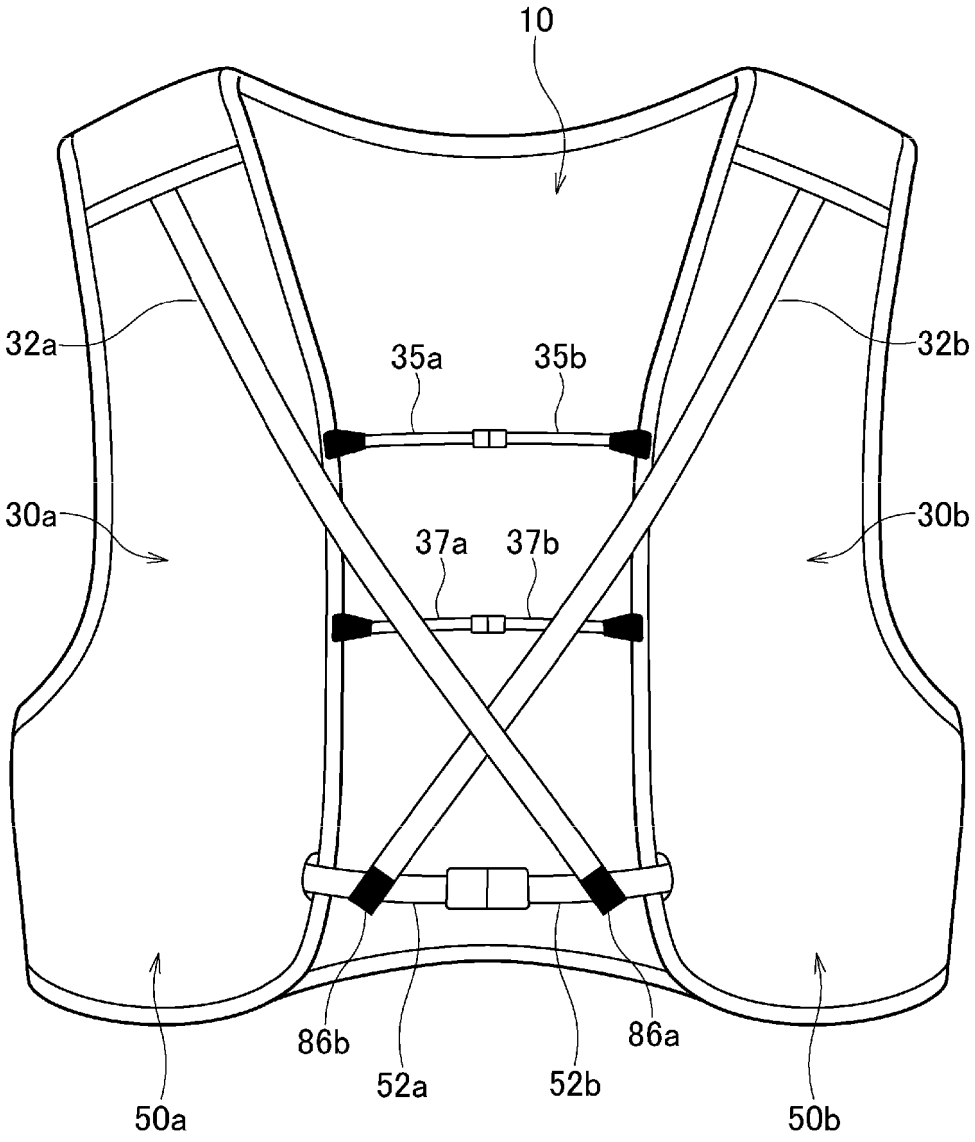


FIG. 24

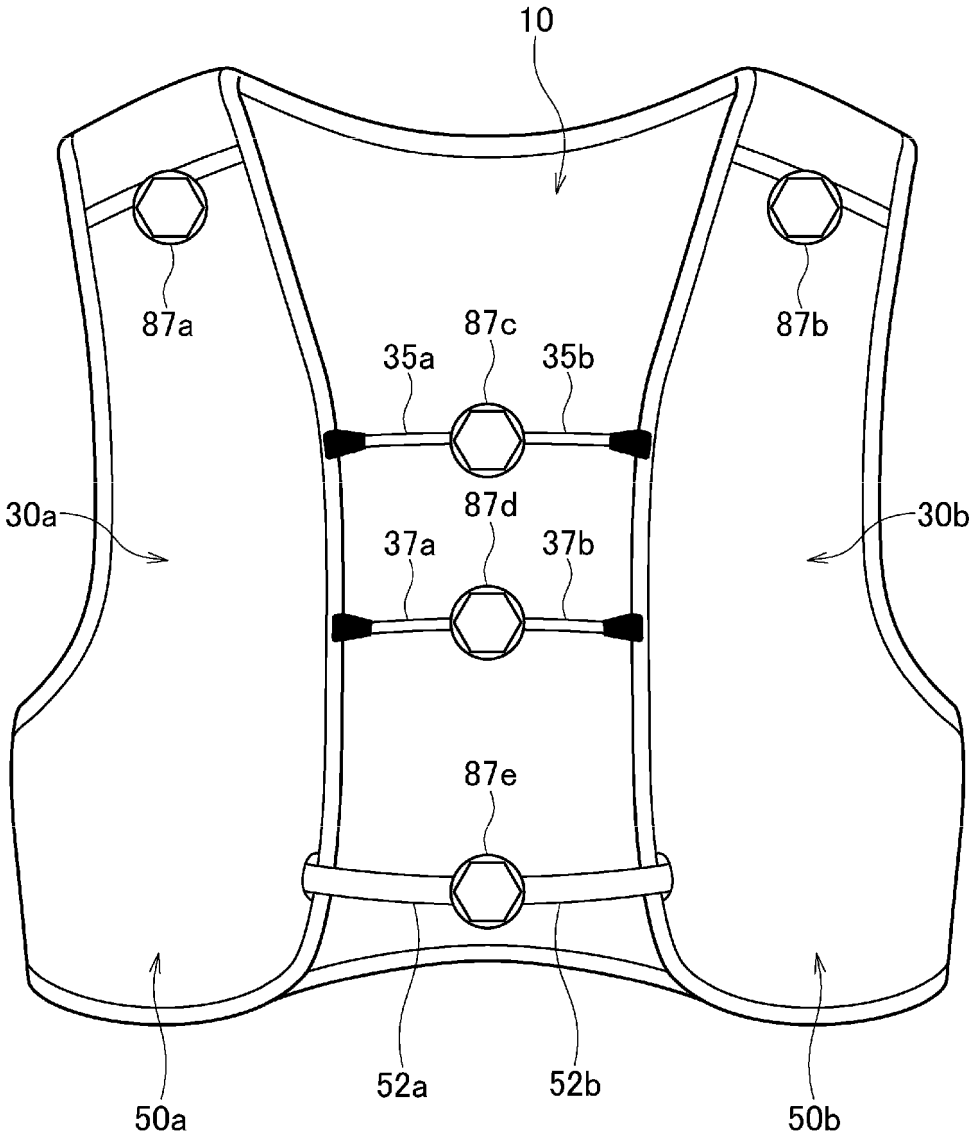
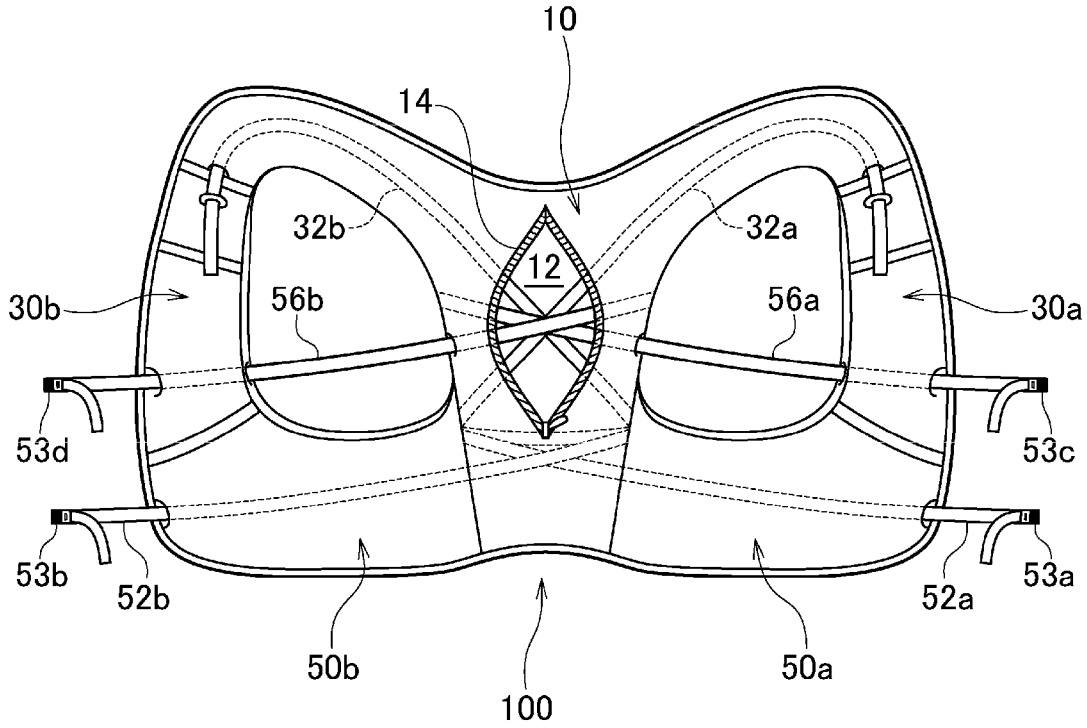


FIG. 25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14
32b
32a
12
30b
56b
56a
30a
53d
53c
53b
52b
52a
53a
50b
50a
100

FIG. 26

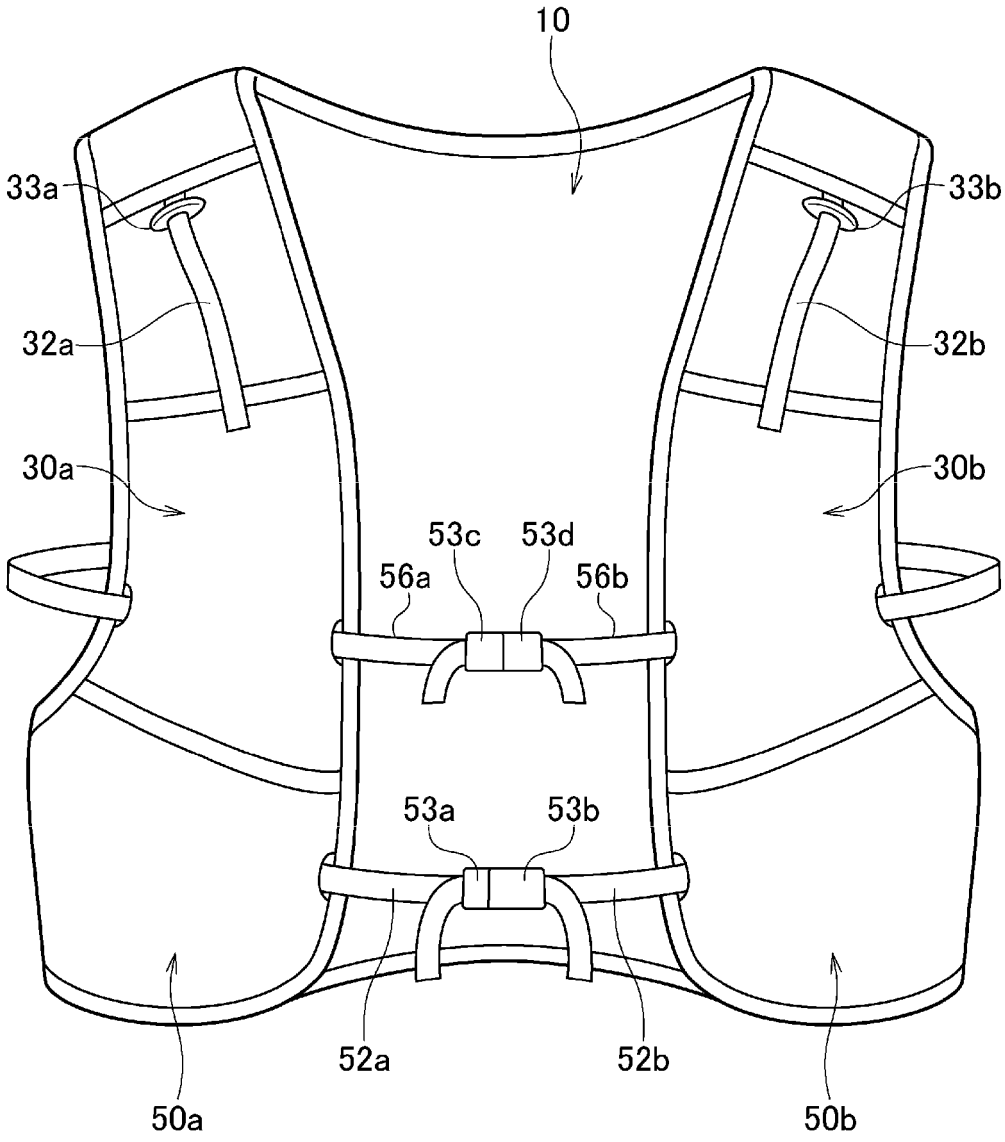
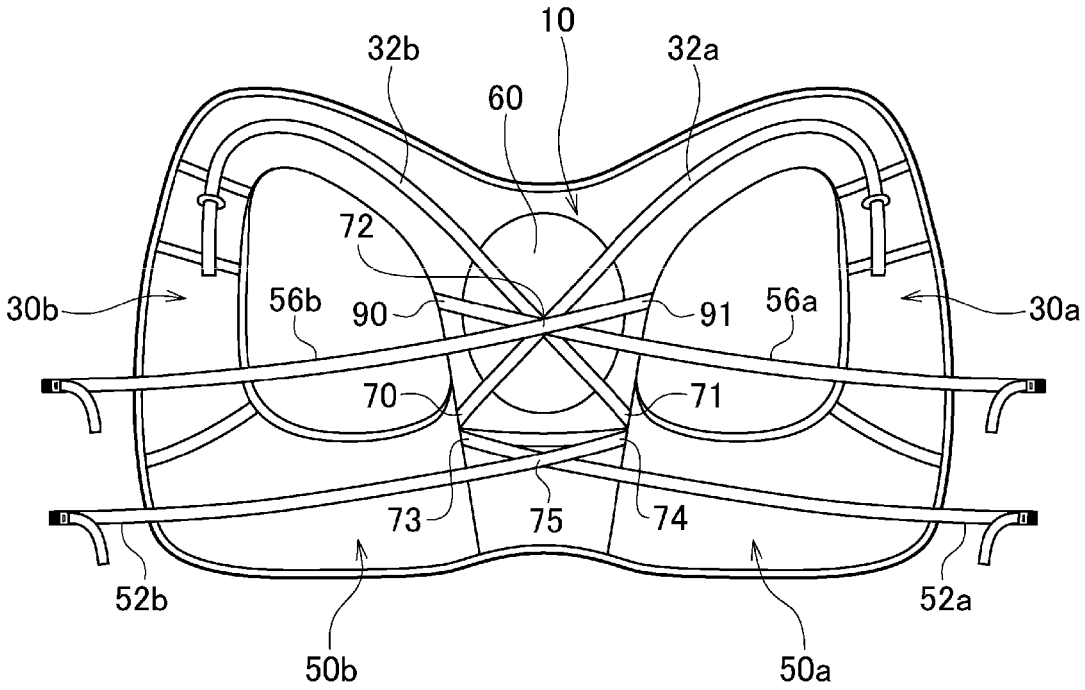

10
33a
33b
32a
32b
30a
30b
53c
53d
56a
56b
53a
53b
52a
52b
50a
50b

FIG. 27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32b
32a
60
72
30b
56b
90
91
56a
30a
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71
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75
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52b
52a
50b
50a

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2020/007159

A. CLASSIFICATION OF SUBJECT MATTER
Int. Cl. A45F3/04(2006.01)i
FI: A45F3/04 300

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
Int. Cl. A45C1/00-A45C15/05, A45F3/00-A45F3/15, A45F4/02-A45F4/12

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Published examined utility model applications of Japan 1922-1996
Published unexamined utility model applications of Japan 1971-2020
Registered utility model specifications of Japan 1996-2020
Published registered utility model applications of Japan 1994-2020

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2010/0308086 A1 (CHAPUIS, Serge) 09 December 2010, entire text, all drawings	1-6
A	US 2017/0099932 A1 (THULE ORGANIZATION SOLUTIONS ING.) 13 April 2017, entire text, all drawings	1-6
A	US 2016/0174691 A1 (SALOMON S.A.S.) 23 June 2016, entire text, all drawings	1-6
A	US 2014/0008404 A1 (PEI, Li) 09 January 2014, entire text, all drawings	1-6
A	JP 4677513 B1 (NIWA, Toshihiro) 27 April 2011, entire text, all drawings	1-6

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
08.04.2020	21.04.2020
Name and mailing address of the ISA/ Japan Patent Office 3-4-3, Kasumigaseki, Chiyoda-ku, Tokyo 100-8915, Japan	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2020/007159

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 3082428 U (MATSUZAKI KK) 14 December 2001, entire text, all drawings	1-6

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/JP2020/007159

Patent Documents referred to in the Report	Publication Date	Patent Family	Publication Date
US 2010/0308086 A1	09.12.2010	US 2014/0353346 A1 entire text, all drawings EP 2258234 A1 EP 2384663 A1 EP 2394529 A2 FR 2946237 A1 AT 547964 T ES 2384027 T	
US 2017/0099932 A1	13.04.2017	(Family: none)	
US 2016/0174691 A1	23.06.2016	EP 3037015 A1 entire text, all drawings FR 3030205 A1	
US 2014/0008404 A1	09.01.2014	US 2016/0029775 A1 entire text, all drawings WO 2014/005132 A1 CN 104703508 A	
JP 4677513 B1	27.04.2011	JP 2012-120786 A entire text, all drawings	
JP 3082428 U	14.12.2001	(Family: none)	

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2012148036 A **[0003]**
- JP 4677513 B **[0003]**