US 20190217933A1

(19) **United States**

(12) **Patent Application Publication**

KAMEI

(10) **Pub. No.: US 2019/0217933 A1**

(43) **Pub. Date: Jul. 18, 2019**

(54) **LIFE JACKET**

(71) Applicant: **Takashina Life Preservers Co., Ltd.**, Osaka (JP)

(72) Inventor: **Yuki KAMEI**, Hyogo (JP)

(73) Assignee: **Takashina Life Preservers Co., Ltd.**, Osaka (JP)

(21) Appl. No.: **16/242,570**

(22) Filed: **Jan. 8, 2019**

(30) **Foreign Application Priority Data**

Jan. 12, 2018 (JP) 2018-003625

Publication Classification

(51) **Int. Cl.**

B63C 9/125 (2006.01)

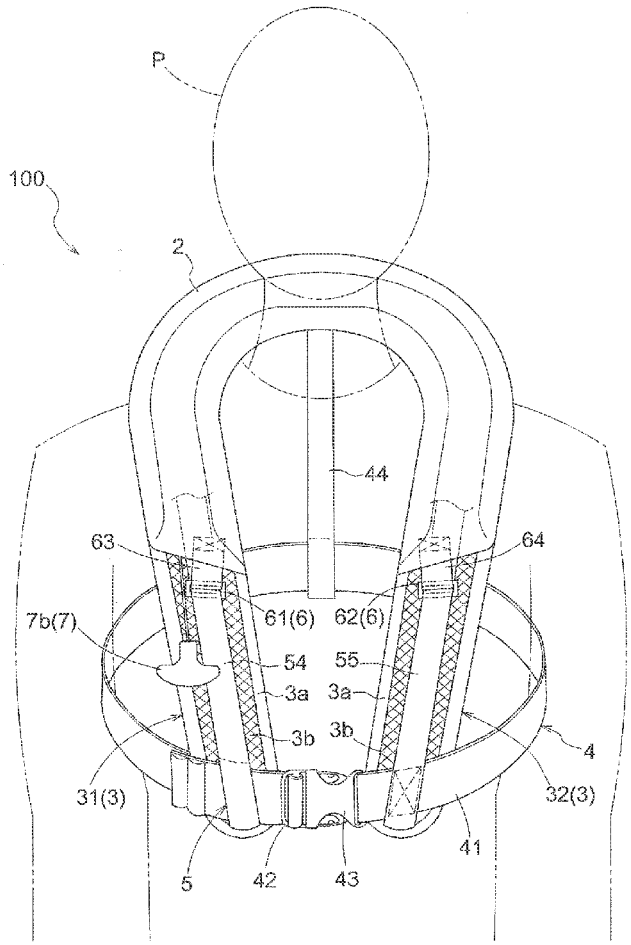
B63C 9/18 (2006.01)

(52) **U.S. Cl.**

CPC ***B63C 9/1255*** (2013.01); *B63C 2009/007* (2013.01); ***B63C 9/18*** (2013.01)

(57) **ABSTRACT**

In order to provide a small life jacket that is unlikely to obstruct movement of a wearer, a life jacket includes: a float member that changes from an uninflated state to an inflated state with gas being supplied to an internal portion thereof, a cover that covers the float member in the uninflated state; a connecting member and a waist belt as a wearable member that is to be worn by a wearer; a guide member that is linked to the connecting member and the waist belt; and a slidable member that is linked to the float member and that slides along the guide member.



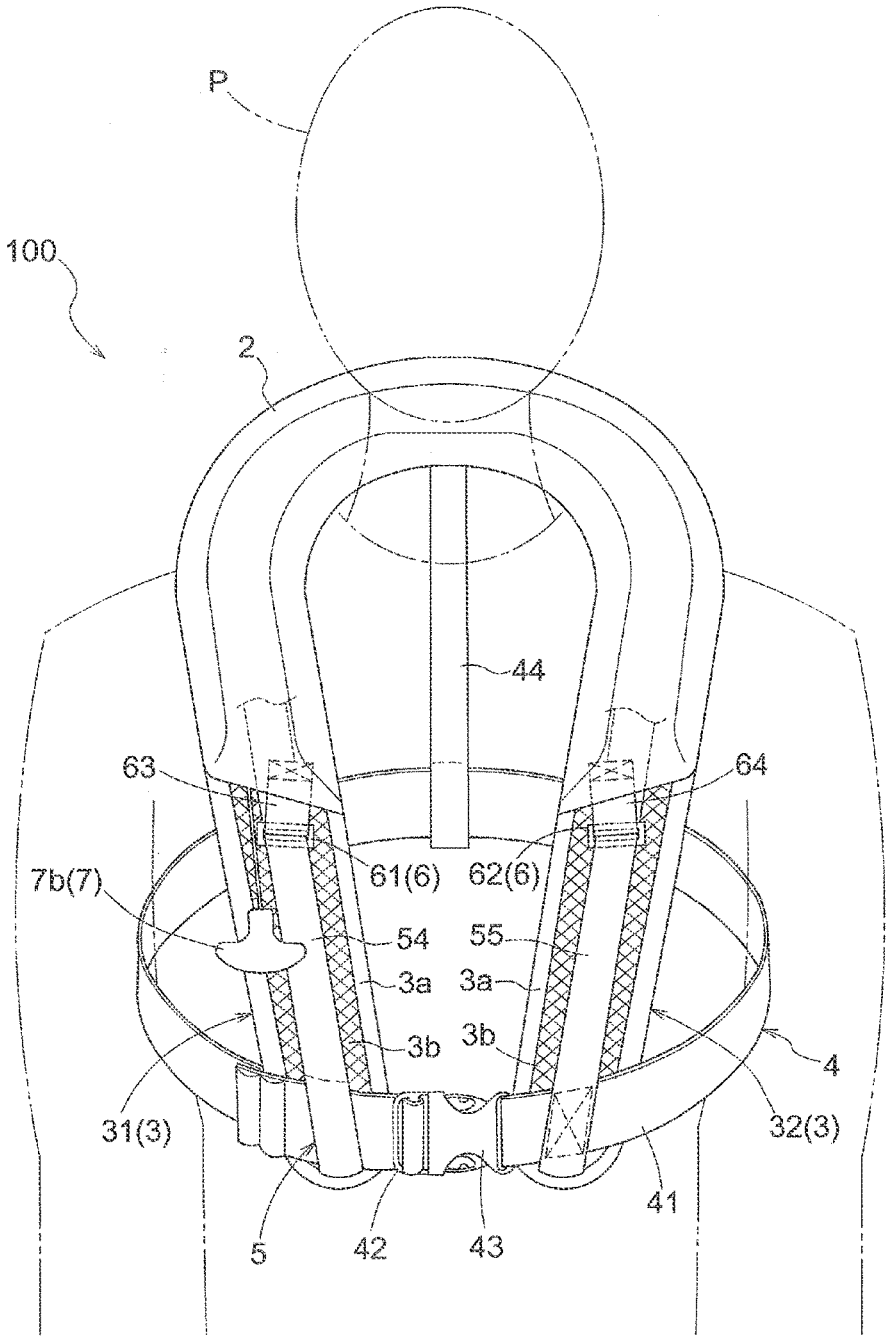


FIG.1

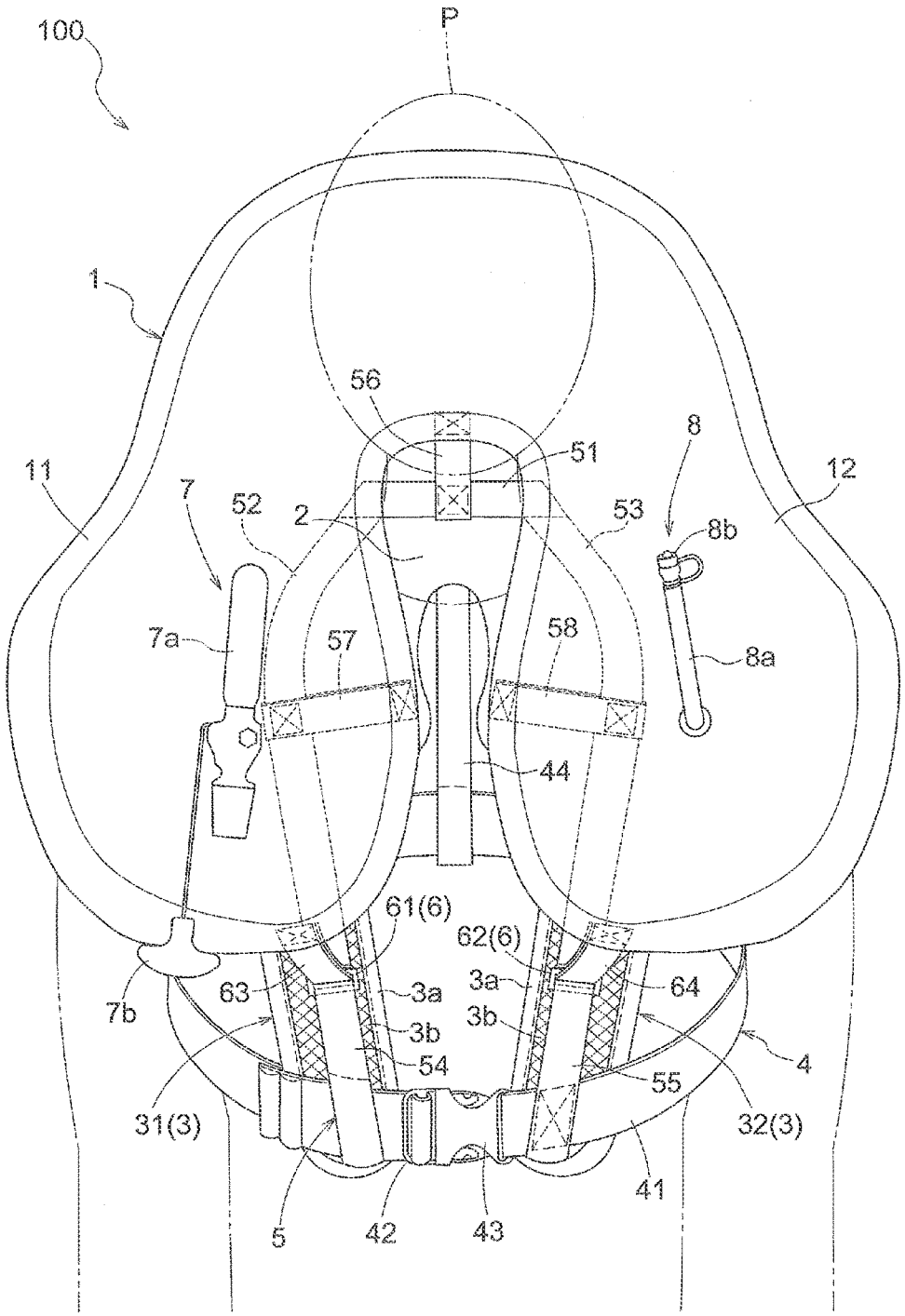

100
P
1
56
51
8
11
12
7
52
2
53
8b
7a
57
58
8a
44
61(6)
62(6)
63
3a
3a
64
7b
3b
3b
4
54
55
31(3)
32(3)
41
5
42
43

FIG.2

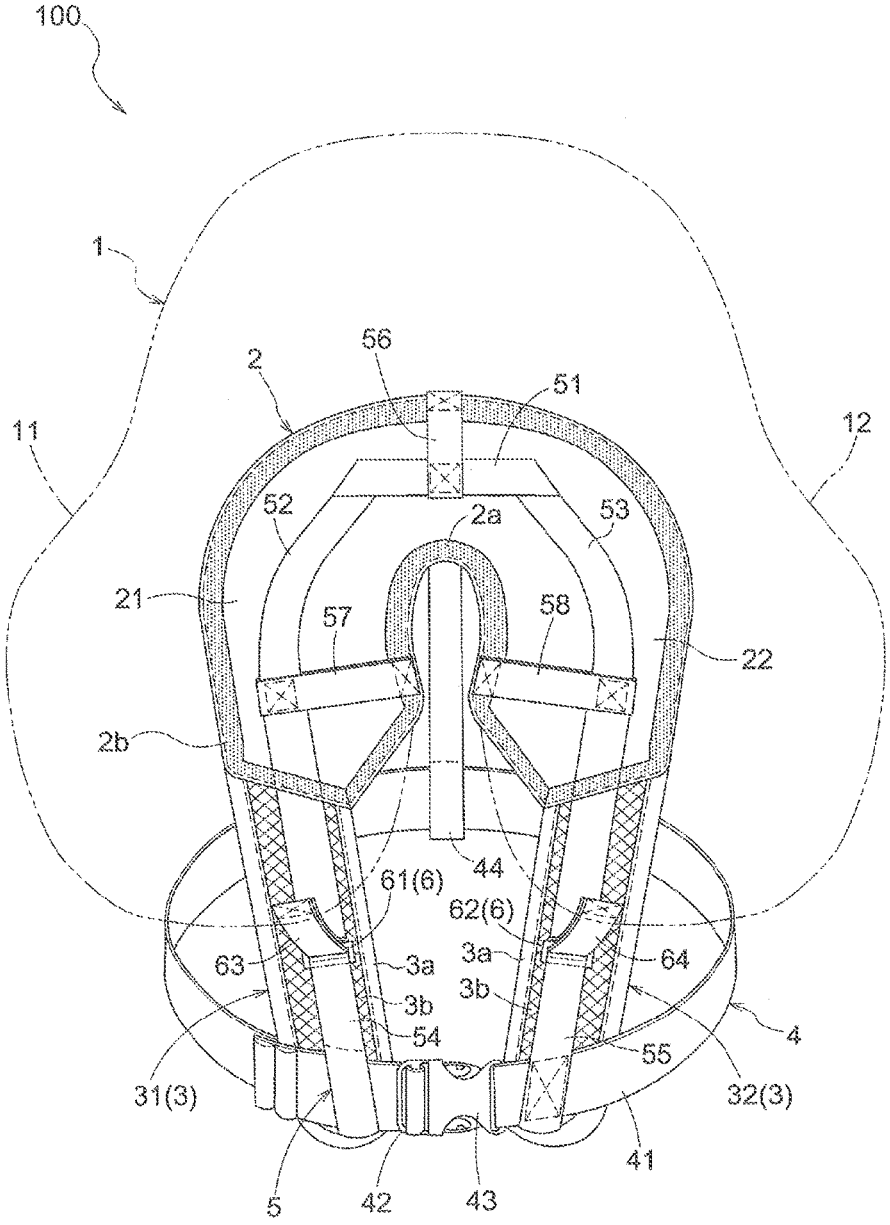

100
1
2
56
51
11
12
52
2a
53
21
57
58
22
2b
44
61(6)
62(6)
63
3a
3a
64
3b
3b
54
4
55
31(3)
32(3)
41
5
42
43

FIG.3

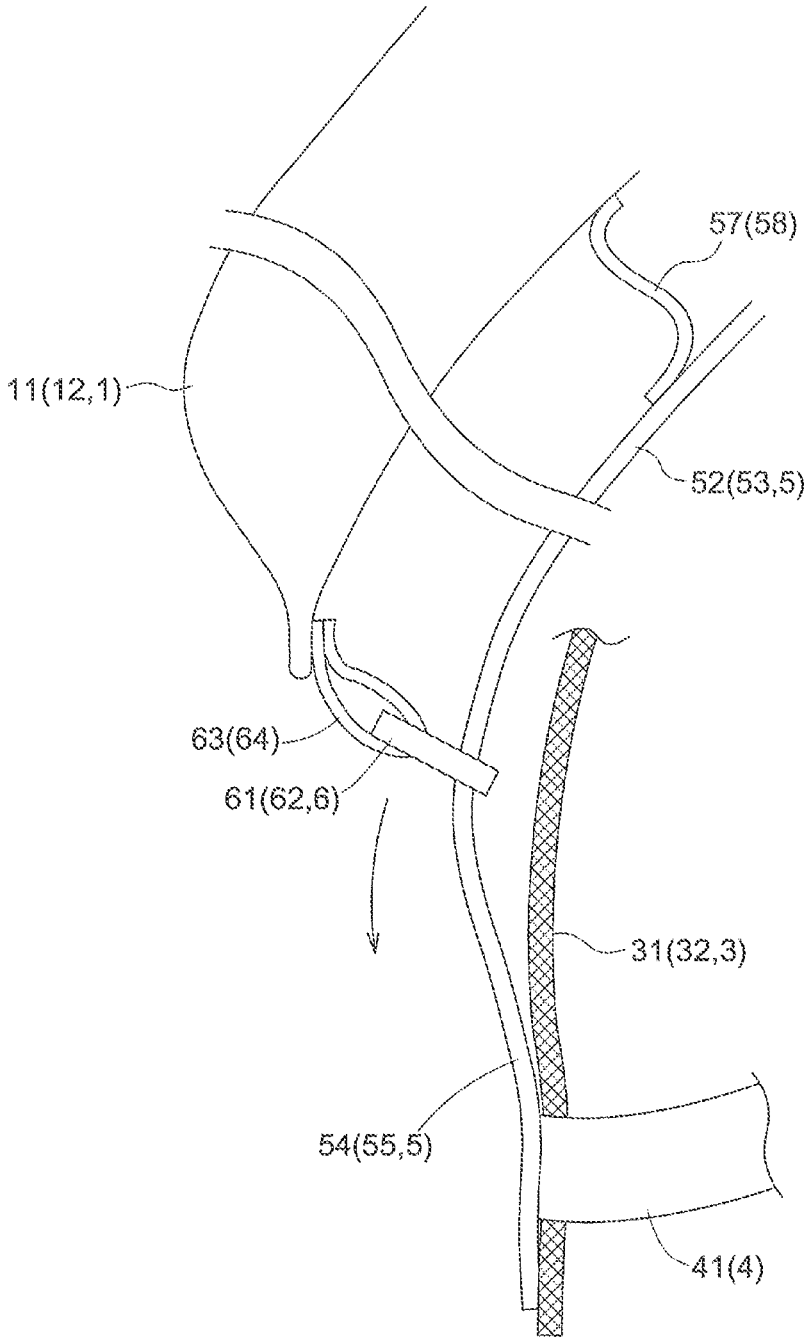


FIG.4

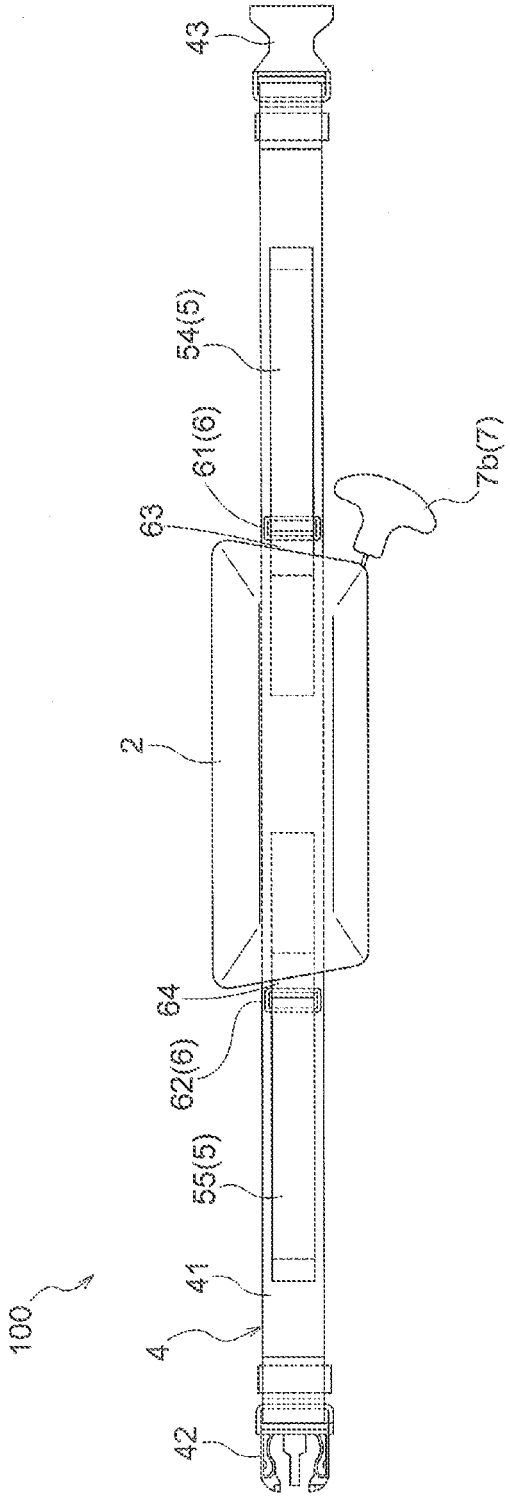


FIG.5

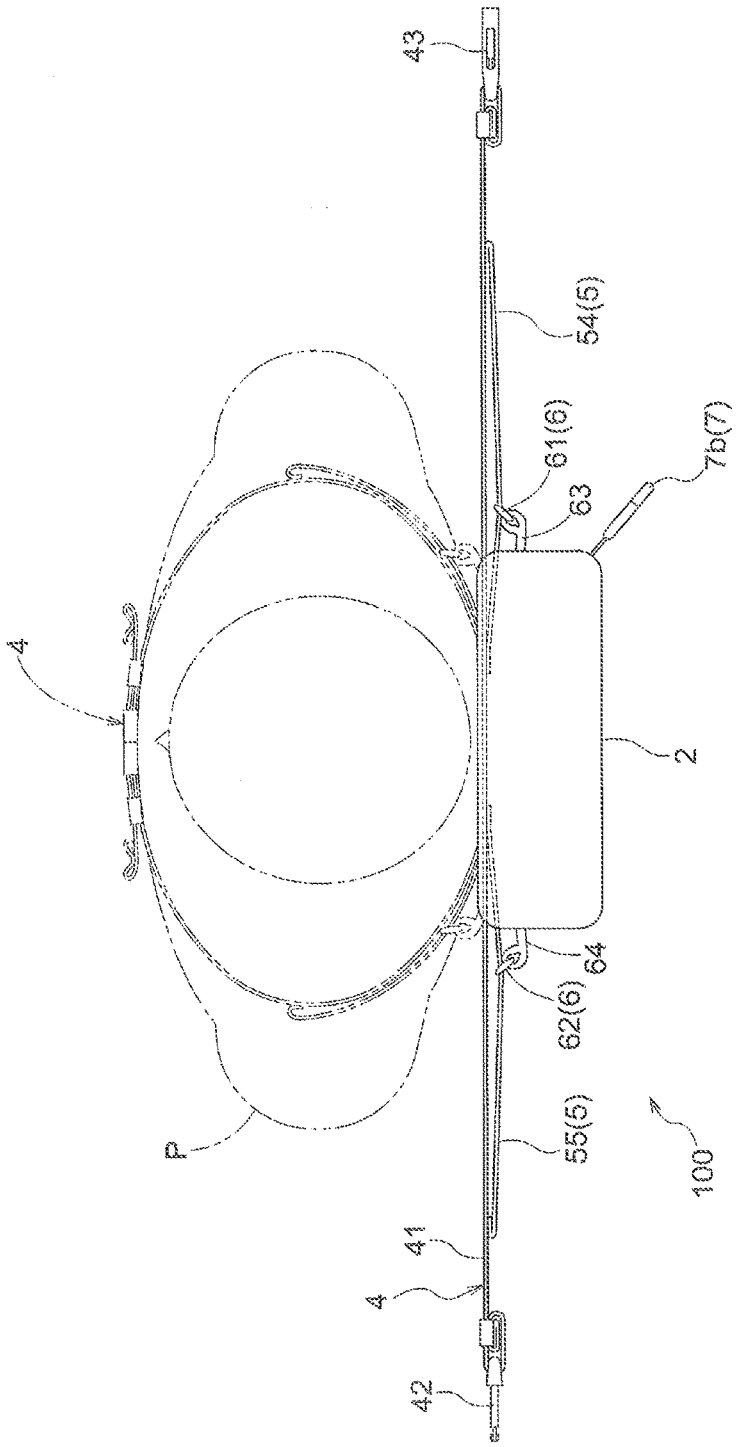


FIG.6

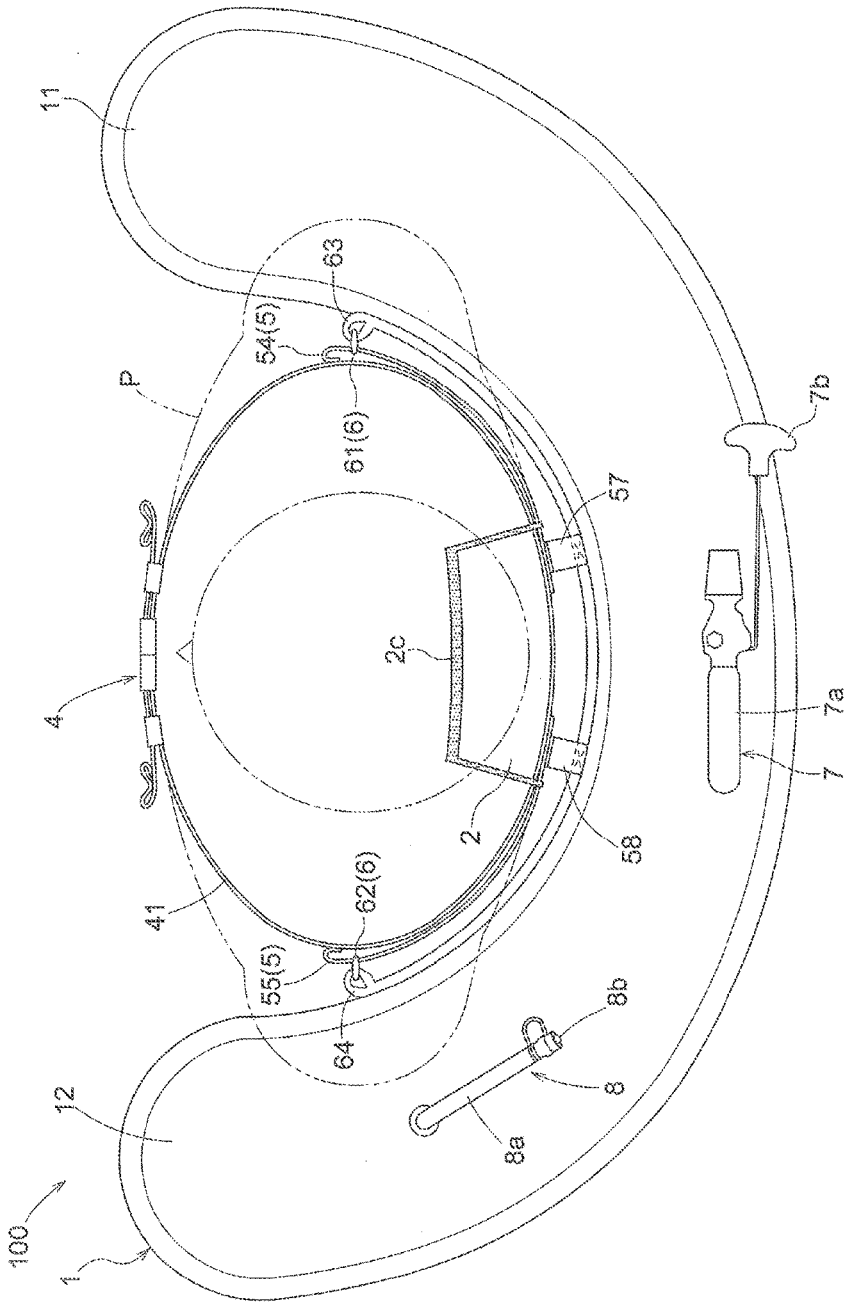


FIG.7

LIFE JACKET

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a life jacket including a float member that changes from an uninflated state to an inflated state with gas being supplied to an internal portion thereof, a cover that covers the float member in the uninflated state, and a wearable member that is to be worn by a wearer.

2. Description of Related Art

[0002] JP 2004-98936A discloses a life jacket including a float member (a float 2) that changes from an uninflated state to an inflated state with gas being supplied to an internal portion thereof, a cover (a cover 1) that covers the float member (the float 2) in the uninflated state, and a wearable member (a belt 5) that is worn by a wearer (a wearer 4). The constituent elements and reference numerals shown in parentheses are as in JP 2004-98936A.

[0003] In order to provide a life jacket that is unlikely to obstruct movement of the wearer, the life jacket of JP 2004-98936A has a size that has been reduced by accommodating the float member (the float 2) in the uninflated state in the cover (the cover 1).

[0004] However, the life jacket of JP 2004-98936A has to be provided with the cover (the cover 1) over a relatively large area in conformity with the position of the float member (the float 2) that is attached to the wearable member (the belt 5) such that the float member is located at an ideal position in the inflated state. In this regard, it cannot be said that the size of the life jacket of JP 2004-98936A has been sufficiently reduced, and there is room for improvement.

SUMMARY OF THE INVENTION

[0005] Thus, there is a demand for a small life jacket that is unlikely to obstruct movement of a wearer.

[0006] In view of these circumstances, a life jacket is characterized by including:

[0007] a float member that changes from an uninflated state to an inflated state with gas being supplied to an internal portion thereof,

[0008] a cover that covers the float member in the uninflated state;

[0009] a wearable member that is to be worn by a wearer;

[0010] a guide member that is linked to the wearable member; and

[0011] a slidable member that is linked to the float member and that slides along the guide member.

[0012] With these characteristics, when changing the float member between the uninflated state and the inflated state, the slidable member is slid along the guide member, and thus the portion of the float member that is linked to the slidable member can be moved along the guide member. Accordingly, the float member can be folded in a compact size and accommodated in the cover, by sliding the slidable member to the position suited for the float member to be folded in a compact size in the uninflated state. When the float member changes to the inflated state, the slidable member slides to the position in conformity with the shape of the float member in the inflated state, and thus the portion of the float member that is linked to the slidable member moves along the guide member linked to the wearable member. Accordingly, the float member in the inflated state is properly worn by a wearer. Thus, it is possible to reduce the size of the float member in the uninflated state and the cover that covers the float member, and thus it is possible to realize a small life jacket that is unlikely to obstruct movement of a wearer.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. **1** is a view showing a state in which a life jacket according to a first embodiment is worn by a wearer.

[0014] FIG. **2** is a view showing a state in which a float member of the life jacket according to the first embodiment is in an inflated state.

[0015] FIG. **3** is a view showing a state in which the float member of the life jacket according to the first embodiment is in an inflated state.

[0016] FIG. **4** is a view showing a state in which a slidable member of the life jacket according to the first embodiment slides along a guide member.

[0017] FIG. **5** is a front view of a life jacket according to a second embodiment.

[0018] FIG. **6** is a plan view showing a state in which the life jacket according to the second embodiment is worn by a wearer.

[0019] FIG. **7** is a plan view showing a state in which a float member of the life jacket according to the second embodiment is in an inflated state.

DETAILED DESCRIPTION OF THE INVENTION

1. First Embodiment

[0020] Hereinafter, a life jacket **100** according to the first embodiment will be described with reference to the drawings. As shown in FIG. **1**, the life jacket **100** according to the first embodiment is configured to be put around the neck of a wearer P, and to be worn around the waist of the wearer P. The life jacket **100** according to the first embodiment includes a float member **1**, a cover **2**, a connecting member **3**, a waist belt **4**, a guide member **5**, and a slidable member **6**.

[0021] The float member **1** is a sealed bag that changes from an uninflated state to an inflated state with gas being supplied to an internal portion thereof. As shown in FIG. **1**, the float member **1** in the uninflated state is folded and accommodated in the cover **2**. As shown in FIG. **2**, the float member **1** in the inflated state projects out of the cover **2** and is exposed to the outside. In this embodiment, the float member **1** in the inflated state extends from the back side of the neck of the wearer P to the front of both sides of the chest. Accordingly, the float member **1** has a first float portion **11** located on one arm side (the right arm side, in the example shown in the drawings) of the wearer P in the inflated state, and a second float portion **12** located on the other arm side (the left arm side, in the example shown in the drawings) of the wearer P in the inflated state. The first float portion **11** and the second float portion **12** are continuous with each other on the neck side of the wearer P, and are away from each other on the chest side of the wearer P. That is to say, in the inflated state, the float member **1** is in the shape of a C, and is located such that the first float portion **11** and the second float portion **12** surround the wearer P.

[0022] As shown in FIG. **2**, the float member **1** is provided with a gas filling apparatus **7** for inflating the float member **1** by supplying gas to the internal portion of the float member **1**. As the gas filling apparatus **7**, those with various known configurations can be used. In this embodiment, the gas filling apparatus **7** includes a cylinder **7***a* containing compressed gas such as carbon dioxide, a supply device having a continuous hole continuous with the internal portion of the float member **1** and configured to, upon activation, supply the gas in the cylinder **7***a* into the float member **1**, an automated activation device configured to, upon detection of dropping into water, automatically activate the supply device, and a manual activation device configured to activate the supply device in response to an operation of an operating portion **7***b*. There is no particular limitation on the location of the gas filling apparatus **7**, but, in this example, in order to make the gas filling apparatus **7** unlikely to obstruct movement of the wearer P, the gas filling apparatus **7** is located on the surface of the first float portion **11** that is opposite to the side facing the wearer P when the float member **1** is in the inflated state. The gas filling apparatus **7** also may be a manual gas filling apparatus configured to inflate the float member **1** only through a manual operation using the operating portion **7***b*, not including the above-described automated activation device.

[0023] Furthermore, the float member **1** is provided with a filling amount adjusting tube **8**. In this embodiment, the filling amount adjusting tube **8** includes a tube **8***a* continuous with the internal portion of the float member **1**, a cap **8***b* configured to be fitted to clog an opening end of the tube **8***a*, and a check valve (not shown) provided inside the tube **8***a* near its opening end and configured to allow only gas that flows into the float member **1** to pass therethrough. The wearer P blows a breath into the float member **1** through the filling amount adjusting tube **8** when the inflation level of the float member **1** is not sufficient, and releases gas out of the float member **1** by opening the check valve when the inflation level of the float member **1** is excessive. Accordingly, the wearer P can adjust the inflation level of the float member **1**. There is no limitation on the location of the filling amount adjusting tube **8**, as long as the wearer P can easily blow a breath into the float member **1**. In this example, the filling amount adjusting tube **8** is located on the surface of the second float portion **12** that is opposite to the side facing the wearer P when the float member **1** is in the inflated state.

[0024] As shown in FIG. **1**, the cover **2** can accommodate the float member **1** in the uninflated state. As shown in FIG. **3**, in this embodiment, the cover **2** is formed in the shape of a band extending from the back side of the neck of the wearer P to the front of both sides of the chest, and also functions as a "wearable member" that is to be worn by the wearer P. Below, for the sake of ease of description, the surface of the cover **2** that faces the wearer P when the float member **1** is in the inflated state is referred to as a "wearing face", and the surface that is opposite to the side facing the wearer P is referred to as a "non-wearing face". Note that the "wearing face" and the "non-wearing face" are defined in a similar manner also in the connecting member **3** and the waist belt **4**.

[0025] As shown in FIG. **3**, in this embodiment, the cover **2** includes a first cover portion **21** located on one arm side (the right arm side, in the example shown in the drawings) of the wearer P, and a second cover portion **22** located on the other arm side (the left arm side, in the example shown in the drawings) of the wearer P. The first cover portion **21** and the second cover portion **22** are continuous with each other on the neck side of the wearer P, and are away from each other on the chest side of the wearer P. That is to say, the cover **2** is in the shape of a C as in the case of the float member **1**, and is located such that the first cover portion **21** and the second cover portion **22** surround the wearer P.

[0026] Furthermore, in this embodiment, the cover **2** can be formed into the shape of a cylinder that can accommodate the float member **1** in the uninflated state. Specifically, as shown in FIG. **3**, an inner edge hook-and-loop fastener component **2***a* and an outer edge hook-and-loop fastener component **2***b*, which are a pair of hook-and-loop fastener components that can be attached to and detached from each other, are provided along the edge of the non-wearing face of the cover **2**. The inner edge hook-and-loop fastener component **2***a* is located closer to the inner side than the outer edge hook-and-loop fastener component **2***b* is, when the float member **1** is in the inflated state. The cover **2** can be formed into the shape of a cylinder by fastening the inner edge hook-and-loop fastener component **2***a* and the outer edge hook-and-loop fastener component **2***b* to each other. The fastening strength between the pair of hook-and-loop fastener components is set such that the pair of hook-and-loop fastener components are peeled apart from each other through inflation of the float member **1**.

[0027] The connecting member **3** is a member that connects the cover **2** and the waist belt **4**, and functions as a "wearable member" that is to be worn by the wearer P. In the example shown in the drawings, the connecting member **3** includes a frame member **3***a* located along the edge of the connecting member **3**, and a mesh member **3***b* located inside the frame member. The connecting member **3** includes a first connecting portion **31** secured to the first cover portion **21**, and a second connecting portion **32** secured to the second cover portion **22**. Note that, in this application, "secure" refers to sewing, adhering, or the like. The first connecting portion **31** extends from the portion secured to the first cover portion **21** to the waist belt **4**, and the second connecting portion **32** extends from the portion secured to the second cover portion **22** to the waist belt **4**.

[0028] The waist belt **4** is a belt that is worn around the waist of the wearer P, and functions as a "wearable member" that is to be worn by the wearer P. The waist belt **4** includes a band-like belt main body **41**, and a male buckle **42** and a female buckle **43** that are respectively provided on both ends of the belt main body **41** and that can be attached to and detached from each other. At least one of the male buckle **42** and the female buckle **43** is provided with a length adjusting mechanism for adjusting the length of the belt main body **41**. The wearer P can properly wear the waist belt **4** around his or her waist, by putting the belt main body **41** around the waist, engaging the male buckle **42** with the female buckle **43**, and adjusting the length of the belt main body **41**.

[0029] In this embodiment, the belt main body **41** includes a back-side connecting member **44**. The back-side connecting member **44** extends from the belt main body **41** toward the cover **2**, and is secured to the cover **2**. In the example shown in the drawings, the back-side connecting member **44** is formed in the shape of a band, wherein one end in the longitudinal direction of the back-side connecting member **44** has a loop through which the belt main body **41** is inserted, and the other end in the longitudinal direction of the back-side connecting member **44** is sewn to the center

(the boundary between the first cover portion **21** and the second cover portion **22**) of the wearing face of the cover **2** and the center of a later-described center wearable member linking portion **51**. Accordingly, one end in the longitudinal direction of the back-side connecting member **44** slides along the belt main body **41**.

[0030] The guide member **5** is linked to the "wearable member" that is to be worn by the wearer P, and is a member separate from the "wearable member". In this embodiment, the guide member **5** is formed in the shape of a band, and is linked to the cover **2**, the connecting member **3**, and the waist belt **4** functioning as the "wearable member". In this embodiment, the guide member **5** is located along the body surface of the wearer P. In this embodiment, the guide member **5** includes a center wearable member linking portion **51**, a first wearable member linking portion **52**, a second wearable member linking portion **53**, a first guide portion **54**, and a second guide portion **55**.

[0031] The center wearable member linking portion **51** is located at the center of the guide member **5**, and is secured to the cover **2**. The center wearable member linking portion **51** is linked to the float member **1** via a center linking member **56**. That is to say, the center linking member **56** functions as a "linking member" that links the float member **1** and the guide member **5**. In this embodiment, the center linking member **56** is located on the back side of the wearer P. In the example shown in the drawings, the center linking member **56** is formed in the shape of a band, wherein one end in the longitudinal direction of the center linking member **56** is sewn to the center (the boundary between the first float portion **11** and the second float portion **12**) of the float member **1**. In a state in which the center wearable member linking portion **51** is positioned between the center linking member **56** and the cover **2**, the other end in the longitudinal direction of the center linking member **56**, the center (the boundary between the first cover portion **21** and the second cover portion **22**) of the cover **2**, and the center wearable member linking portion **51** are sewn to each other. Accordingly, in the example shown in the drawings, the center linking member **56** links the float member **1** and the guide member **5** while restricting a change in the positional relationship therebetween.

[0032] Furthermore, the center wearable member linking portion **51** extends toward the first cover portion **21** and the second cover portion **22**, and is connected to the first wearable member linking portion **52** and the second wearable member linking portion **53**. In the example shown in the drawings, the center wearable member linking portion **51** is formed in one piece with the first wearable member linking portion **52** and the second wearable member linking portion **53**.

[0033] The first wearable member linking portion **52** is located on one arm side (the right arm side, in the example shown in the drawings) of the wearer P, and is secured to the first cover portion **21**. The first wearable member linking portion **52** is linked to the first float portion **11** via a first linking member **57**. That is to say, the first linking member **57** functions as a "linking member" that links the float member **1** and the guide member **5**. In the example shown in the drawings, the first linking member **57** is formed in the shape of a band, wherein one end in the longitudinal direction of the first linking member **57** is sewn to the portion of the first float portion **11** that faces the second float portion **12** when the float member **1** is in the inflated state. In a state in which the first wearable member linking portion **52** is positioned between the first linking member **57** and the cover **2**, the other end in the longitudinal direction of the first linking member **57**, the first cover portion **21**, and the first wearable member linking portion **52** are sewn to each other. Accordingly, in the example shown in the drawings, the first linking member **57** links the float member **1** and the guide member **5** while restricting a change in the positional relationship therebetween.

[0034] Furthermore, the first wearable member linking portion **52** extends from the portion connected to the center wearable member linking portion **51**, to the portion secured to the first cover portion **21** and the first connecting portion **31**, and is connected to the first guide portion **54** at the secured portion. In the example shown in the drawings, the first wearable member linking portion **52** is formed in one piece with the first guide portion **54**.

[0035] The second wearable member linking portion **53** is located on the other arm side (the left arm side, in the example shown in the drawings) of the wearer P, and is secured to the second cover portion **22**. The second wearable member linking portion **53** is linked to the second float portion **12** via the second linking member **58**. That is to say, the second linking member **58** functions as a "linking member" that links the float member **1** and the guide member **5**. In the example shown in the drawings, the second linking member **58** is formed in the shape of a band, wherein one end in the longitudinal direction of the second linking member **58** is sewn to the portion of the second float portion **12** that faces the first float portion **11** when the float member **1** is in the inflated state. In a state in which the second wearable member linking portion **53** is positioned between the second linking member **58** and the cover **2**, the other end in the longitudinal direction of the second linking member **58**, the second cover portion **22**, and the second wearable member linking portion **53** are sewn to each other. Accordingly, in the example shown in the drawings, the second linking member **58** links the float member **1** and the guide member **5** while restricting a change in the positional relationship therebetween.

[0036] Furthermore, the second wearable member linking portion **53** extends from the portion connected to the center wearable member linking portion **51**, to the portion secured to the second cover portion **22** and the second connecting portion **32**, and is connected to the second guide portion **55** at the secured portion. In the example shown in the drawings, the second wearable member linking portion **53** are formed in one piece with the second guide portion **55**.

[0037] The first guide portion **54** is located on the non-wearing face of the first connecting portion **31**. In the example shown in the drawings, the first guide portion **54** is located on the mesh member **3***b* of the first connecting portion **31**, and extends from the portion connected to the first wearable member linking portion **52**, to the portion intersecting the belt main body **41**. The portion of the first guide portion **54** that intersects the belt main body **41** has a loop through which the belt main body **41** is inserted. Accordingly, the end of the first guide portion **54** on the side that is opposite to the portion connected to the first wearable member linking portion **52** slides along the belt main body **41**. The portion of the first guide portion **54** that intersects the belt main body **41** is sewn to the first connecting portion **31** at two portions between which the belt main body **41** is positioned.

[0038] The second guide portion **55** is located on the non-wearing face of the second connecting portion **32**. In the example shown in the drawings, the second guide portion **55** is located on the mesh member **3***b* of the second connecting portion **32**, and extends from the portion connected to the second wearable member linking portion **53**, to the portion intersecting the belt main body **41**. The portion of the second guide portion **55** that intersects the belt main body **41** is secured to the belt main body **41**. In this example, in a state in which the belt main body **41** is positioned between the second guide portion **55** and the second connecting portion **32**, the second guide portion **55**, the second connecting portion **32**, and the belt main body **41** are sewn to each other.

[0039] With this configuration, in the life jacket **100** according to this embodiment, the waist belt **4** that is worn around the waist of the wearer P, and the guide member **5** that is worn over the area from the back side of the neck of the wearer P to the abdomen side and that is linked to the waist belt **4** have a function of linking the wearer P and the float member **1** and preventing them from coming off each other when the float member **1** is in the inflated state on the water surface. Thus, the waist belt **4** and the guide member **5** are each made of a material that can ensure a necessary tensile strength.

[0040] The slidable member **6** is linked to the float member **1**, and is configured to slide along the guide member **5**. In this embodiment, the slidable member **6** includes a first slidable portion **61** and a second slidable portion **62**.

[0041] The first slidable portion **61** is attached to the first guide portion **54** so as to slide along the first guide portion **54**. In the example shown in the drawings, the first slidable portion **61** is formed in the shape of a quadrangular ring (rectangular ring), and the first guide portion **54** is inserted through the first slidable portion **61**. The first slidable portion **61** is linked to the first float portion **11** via a first slidable linking portion **63**. In the example shown in the drawings, the first slidable linking portion **63** is formed in the shape of a band, and is inserted through the rectangular ring-like first slidable portion **61**. Both ends in the longitudinal direction of the first slidable linking portion **63** are sewn to the portion of the first float portion **11** that is at the lower end when the float member **1** is in the inflated state.

[0042] The second slidable portion **62** is attached to the second guide portion **55** so as to slide along the second guide portion **55**. In the example shown in the drawings, the second slidable portion **62** is formed in the shape of a quadrangular ring (rectangular ring), and the second guide portion **55** is inserted through the second slidable portion **62**. The second slidable portion **62** is linked to the second float portion **12** via a second slidable linking portion **64**. In the example shown in the drawings, the second slidable linking portion **64** is formed in the shape of a band, and is inserted through the rectangular ring-like second slidable portion **62**. Both ends in the longitudinal direction of the second slidable linking portion **64** are sewn to the portion of the second float portion **12** that is at the lower end when the float member **1** is in the inflated state.

[0043] As shown in FIG. **1**, in the uninflated state, the float member **1** is accommodated in the cover **2** in a state of being folded. Meanwhile, the first slidable portion **61** and the second slidable portion **62** are located on the outer side of the cover **2** even when the float member **1** is in the uninflated state, in order to suppress the possibility that the slidable portions are caught on the cover **2** when sliding along the guide member **5** in accordance with inflation of the float member **1**.

[0044] As shown in FIG. **4**, the first slidable portion **61** is guided by the first guide portion **54** to slide between the first guide portion **54** and the first connecting portion **31**. The second slidable portion **62** is guided by the second guide portion **55** to slide between the second guide portion **55** and the second connecting portion **32**. That is to say, in this embodiment, the connecting member **3** functions not only as the "wearable member" but also as a "sliding support member" located between the guide member **5** and the wearer P along the guide member **5**.

[0045] Furthermore, in this embodiment, the first guide portion **54** is located along the side of the first connecting portion **31** that is opposite to the side facing the wearer P, and the second guide portion **55** is located along the side of the second connecting portion **32** that is opposite to the side facing the wearer P. That is to say, the guide member **5** is located along the side of the connecting member **3** as the "wearable member" that is opposite to the side facing the wearer P.

[0046] As shown in FIG. **4**, in accordance with a change of the float member **1** from the uninflated state to the inflated state, the slidable member **6** linked to the float member **1** slides along the guide member **5** in a direction away from the linking members **56**, **57**, and **58**. In this embodiment, when the float member **1** changes from the uninflated state to the inflated state, the first slidable portion **61** slides along the first guide portion **54** in a direction away from the first linking member **57** (downward, in the example shown in the drawings), and the second slidable portion **62** slides along the second guide portion **55** in a direction away from the second linking member **58** (downward, in the example shown in the drawings). Accordingly, in this embodiment, the first slidable portion **61** is linked to the portion of the first float portion **11** that is away from the first linking member **57** when the float member **1** is in the inflated state, and the second slidable portion **62** is linked to the portion of the second float portion **12** that is away from the second linking member **58** when the float member **1** is in the inflated state. That is to say, the slidable member **6** is linked to the position that is away from the "linking member" when the float member **1** is in the inflated state.

2. Second Embodiment

[0047] Hereinafter, a life jacket **100** according to the second embodiment will be described with reference to the drawings. The life jacket **100** according to the second embodiment is different from the life jacket **100** according to the first embodiment in that it is configured to be worn only around the waist of the wearer P. Below, a description will be given mainly on the difference from the foregoing first embodiment. It is assumed that those not described in particular are as in the foregoing first embodiment.

[0048] As shown in FIG. **5**, the life jacket **100** according to the second embodiment includes the float member **1**, the cover **2**, the waist belt **4**, the guide member **5**, and the slidable member **6**.

[0049] As shown in FIG. **7**, in this embodiment, the float member **1** in the inflated state extends from the back side of the waist of the wearer P to both sides of the waist, and includes the first float portion **11** and the second float portion **12**. The first float portion **11** and the second float portion **12**

are continuous with each other on the back side of the waist of the wearer P, and are away from each other on both sides of the waist of the wearer P. That is to say, in the inflated state, the float member **1** is in the shape of a C, and is located such that the first float portion **11** and the second float portion **12** surround the wearer P.

[0050] As shown in FIG. **6**, in this embodiment, the cover **2** is located on the back side of the waist of the wearer P, and has a size that does not allow the cover **2** to reach the left and right sides of the waist of the wearer P. As in the foregoing first embodiment, a pair of hook-and-loop fastener components **2***c* that can be attached to and detached from each other are provided along the edge of the non-wearing face of the cover **2** according to this embodiment, and the cover **2** can be formed into the shape of a cylinder that can accommodate the float member **1** in the uninflated state.

[0051] The waist belt **4** functions as a "wearable member" that is to be worn by the wearer P also in this embodiment. As shown in FIG. **7**, in this embodiment, the cover **2** is attached to the belt main body **41** of the waist belt **4**. In this embodiment, the cover **2** does not have to function as the "wearable member", and may be attachable to and detachable from the belt main body **41**.

[0052] In this embodiment, the guide member **5** is linked to the waist belt **4** functioning as the "wearable member". In this embodiment, the guide member **5** is located along the body surface of the wearer P. In this embodiment, the guide member **5** includes the first guide portion **54** and the second guide portion **55**.

[0053] As shown in FIG. **6**, in this embodiment, the first guide portion **54** extends along the belt main body **41**, and is located on the non-wearing face of the belt main body **41** on one arm side (the right arm side, in the example shown in the drawings) of the wearer P. Both ends in the longitudinal direction of the first guide portion **54** are secured to the belt main body **41**. The second guide portion **55** extends along the belt main body **41**, and is located on the non-wearing face of the belt main body **41** on the other arm side (the left arm side, in the example shown in the drawings) of the wearer P. Both ends in the longitudinal direction of the second guide portion **55** are secured to the belt main body **41**. In the example shown in the drawings, the first guide portion **54** and the second guide portion **55** are located away from each other, and extend from the back side of the waist of the wearer P respectively to the right and left sides of the waist.

[0054] As shown in FIG. **7**, in this embodiment, the belt main body **41** and the first guide portion **54** are linked to the first float portion **11** via the first linking member **57**. In this embodiment, the first linking member **57** is located on the back side of the wearer P. In the example shown in the drawings, the first linking member **57** is formed in the shape of a band, wherein one end in the longitudinal direction of the first linking member **57** is sewn to the portion of the first float portion **11** that is on the back side of the waist of the wearer P when the float member **1** is in the inflated state. In a state in which the cover **2**, the belt main body **41**, the first guide portion **54**, and the first linking member **57** are sequentially layered from the wearer P side, the cover **2**, the belt main body **41**, the portion of the first guide portion **54** that is on the back side of the wearer P, and the other end in the longitudinal direction of the first linking member **57** are sewn to each other.

[0055] Furthermore, the belt main body **41** and the second guide portion **55** are linked to the second float portion **12** via the second linking member **58**. In this embodiment, the second linking member **58** is located on the back side of the wearer P. In the example shown in the drawings, the second linking member **58** is formed in the shape of a band, wherein one end in the longitudinal direction of the second linking member **58** is sewn to the portion of the second float portion **12** that is on the back side of the waist of the wearer P when the float member **1** is in the inflated state. In a state in which the cover **2**, the belt main body **41**, the second guide portion **55**, and the second linking member **58** are sequentially layered from the wearer P side, the cover **2**, the belt main body **41**, the portion of the second guide portion **55** that is on the back side of the wearer P, and the other end in the longitudinal direction of the second linking member **58** are sewn to each other.

[0056] In this embodiment, the first slidable portion **61** of the slidable member **6** is linked to the first float portion **11** via the first slidable linking portion **63**. In the example shown in the drawings, the first slidable linking portion **63** is located on the portion of the first float portion **11** that faces the right side of the waist of the wearer P when the float member **1** is in the inflated state. The second slidable portion **62** of the slidable member **6** is linked to the second float portion **12** via the second slidable linking portion **64**. In the example shown in the drawings, the second slidable linking portion **64** is located on the portion of the second float portion **12** that faces the left side of the waist of the wearer P when the float member **1** is in the inflated state.

[0057] As shown in FIG. **5**, also in this embodiment, the float member **1** in the uninflated state is accommodated in the cover **2** in a state of being folded. Meanwhile, the first slidable portion **61** and the second slidable portion **62** are located on the outer side of the cover **2** even when the float member **1** is in the uninflated state, in order to suppress the possibility that the slidable portions are caught on the cover **2** when sliding along the guide member **5** in accordance with inflation of the float member **1**.

[0058] As shown in FIG. **7**, the first slidable portion **61** is guided by the first guide portion **54** to slide between the first guide portion **54** and the belt main body **41**. The second slidable portion **62** is guided by the second guide portion **55** to slide between the second guide portion **55** and the belt main body **41**. That is to say, in this embodiment, the waist belt **4** functions not only as the "wearable member" but also as a "sliding support member" located between the guide member **5** and the wearer P along the guide member **5**.

[0059] Furthermore, in this embodiment, the first guide portion **54** and the second guide portion **55** are located along the side of the belt main body **41** that is opposite to the side facing the wearer P. That is to say, the guide member **5** is located along the side of the waist belt **4** as the "wearable member" that is opposite to the side facing the wearer P.

[0060] As shown in FIG. **7**, in accordance with a change of the float member **1** from the uninflated state to the inflated state, the slidable member **6** linked to the float member **1** slides along the guide member **5** in a direction away from the linking members **57** and **58**. Also in this embodiment, when the float member **1** changes from the uninflated state to the inflated state, the first slidable portion **61** slides along the first guide portion **54** in a direction away from the first linking member **57** (rightward from the back side of the waist of the wearer P), and the second slidable portion **62**

slides along the second guide portion **55** in a direction away from the second linking member **58** (leftward from the back side of the waist of the wearer P). Accordingly, also in this embodiment, the first slidable portion **61** is linked to the portion of the first float portion **11** that is away from the first linking member **57** when the float member **1** is in the inflated state, and the second slidable portion **62** is linked to the portion of the second float portion **12** that is away from the second linking member **58** when the float member **1** is in the inflated state. That is to say, the slidable member **6** is linked to the position that is away from the "linking member" when the float member **1** is in the inflated state.

3. Other Embodiments

[0061] (1) In the foregoing embodiments, the configuration in which the slidable member **6** includes two slidable portions **61** and **62** respectively located on the right and left arm sides of the wearer P was described as an example. However, there is no limitation to such a configuration, and it is also possible that the slidable member **6** has only one slidable portion, or has three or more slidable portions. In the foregoing embodiments, the cover **2**, the connecting member **3**, the guide member **5**, and the slidable member **6** each have two portions respectively located on the right and left arm sides of the wearer P, but, also in these constituent elements, there is no limitation on the number of portions.

[0062] (2) In the foregoing embodiments, the configuration in which the cover **2**, the connecting member **3**, and the waist belt **4** each function as a "wearable member" was described as an example. However, there is no limitation to such a configuration, and any "wearable member" may be used as long as it is worn so as to be in contact with the body of the wearer P.

[0063] (3) In the foregoing embodiments, the configuration in which the "linking member" (the center linking member **56**, the first linking member **57**, and the second linking member **58**) links the float member **1** and the guide member **5** while restricting a change in the positional relationship therebetween was described as an example. However, there is no limitation to such a configuration, and it is also possible that the "linking member" links the float member **1** and the guide member **5** while allowing the float member **1** to move relative to the guide member **5**. In this case, the float member **1** can be moved to any position.

[0064] (4) In the foregoing embodiments, the configuration in which the guide member **5** is formed in the shape of a band was described as an example. However, there is no limitation to such a configuration, as long as the slidable member **6** can slide along the guide member **5**. For example, it is also possible that the guide member **5** is a cord-like member such as a wire or a rope, or that the guide member **5** is a rail-like member having a groove and the slidable member **6** is a member configured to slide along the groove.

[0065] (5) In the foregoing embodiments, the configuration in which the slidable member **6** slides downward and the configuration in which the slidable member **6** slides from the back side of the waist of the wearer P to the right and left sides were described as an example. However, the direction in which the slidable member **6** slides is not limited to such a configuration. For example, it is also possible that the slidable member **6** slides upward in accordance with a change of the float member **1** from the uninflated state to the inflated state. For example, it is also possible that, contrary to the foregoing first embodiment, the float member **1** accommodated in a state of being folded near the chest of the wearer P in the uninflated state is inflated toward the neck side of the wearer P. In this case, it is possible to facilitate sliding movement of the slidable member **6**, using the buoyancy of the float member **1** during a change from the uninflated state to the inflated state in water.

[0066] (6) In the foregoing embodiments, the configuration in which the center linking member **56** as the "linking member" is located on the back side of the wearer P and the configuration in which the first linking member **57** and the second linking member **58** as the "linking member" are located on the back side of the wearer P were described as an example. However, there is no limitation to such a configuration, and it is also possible that the "linking member" is located, for example, at the abdomen, the chest, the side, or the like of the wearer P, instead of the back side of the wearer P.

[0067] (7) In the foregoing embodiments, the configuration in which the connecting member **3** functions as a "sliding support member" and the configuration in which the waist belt **4** functions as a "sliding support member" were described as an example. However, there is no limitation to such a configuration, and, for example, it is also possible that another member may be provided as a "sliding support member". Furthermore, it is also possible that the "sliding support member" is not provided.

[0068] (8) In the foregoing embodiments, the configuration in which the slidable member **6** is located on the outer side of the cover **2** when the float member **1** is in the uninflated state was described as an example. However, there is no limitation to such a configuration, and it is also possible that the slidable member **6** is covered by the cover **2** when the float member **1** is in the uninflated state.

[0069] (9) In the foregoing embodiments, the life jacket **100** (the first embodiment) that is put around the neck of the wearer P and worn around the waist of the wearer P and the life jacket **100** (the second embodiment) that is worn around the waist of the wearer P were described as an example. However, there is no limitation to the life jacket **100** with such a configuration, and the life jacket **100** may be worn by the wearer P at any section of the body of the wearer P. For example, it is also possible that the life jacket **100** is worn about the chest or the back of the wearer P.

[0070] (10) In the foregoing embodiments, the configuration in which the slidable member **6** slides along the guide member **5** by inflating the float member **1** by causing the gas filling apparatus **7** to supply gas to the internal portion of the float member **1** was described as an example. However, there is no limitation to such a configuration, and, for example, it is also possible that the wearer P takes the float member **1** out of the cover **2**, and blows a breath into the float member **1** through the filling amount adjusting tube **8**, thereby inflating the float member **1**.

[0071] (11) In the foregoing embodiments, the configuration in which the float member **1** is inflated by causing the gas filling apparatus **7** to supply gas to the internal portion of the float member **1** was described as an example. However, there is no limitation to such a configuration, and, for example, it is also possible that the float member **1** is provided with an elastic member such as a rubber or a spring, and inflation of the float member **1** is facilitated using the restoring force of the elastic member.

[0072] (12) In the foregoing embodiments, the configuration in which the first guide portion **54** and the second guide

portion **55** in the shape of bands are respectively inserted through the first slidable portion **61** and the second slidable portion **62** in the shape of rectangular rings linked to the float member **1**, and the first slidable portion **61** and the second slidable portion **62** respectively slide along the first guide portion **54** and the second guide portion **55** was described as an example. However, there is no limitation to such a configuration, and, for example, it is also possible that a zipper including a pair of rows of meshing teeth and a slider is provided on the float member **1** and the guide member **5**. Specifically, one row of meshing teeth is provided on the float member **1**, and the other row of meshing teeth is provided on the guide member **5**. When the wearer P operates the slider so as to close the zipper while taking the float member **1** out of the cover **2**, the float member **1** is fixed along the guide member **5**.

[0073] (13) The configurations disclosed in the foregoing embodiments can be used in combination with configurations disclosed in other embodiments, as long as there are no contradictions. The embodiments disclosed in this specification are, in all respects, illustrative and not limiting. Various modifications may be made without departing from the gist of the invention.

4. Summary of Foregoing Embodiments

[0074] Hereinafter, the summary of the life jacket described above will be described.

[0075] A life jacket includes:

[0076] a float member that changes from an uninflated state to an inflated state with gas being supplied to an internal portion thereof,

[0077] a cover that covers the float member in the uninflated state;

[0078] a wearable member that is to be worn by a wearer;

[0079] a guide member that is linked to the wearable member; and

[0080] a slidable member that is linked to the float member and that slides along the guide member.

[0081] With this configuration, when changing the float member between the uninflated state and the inflated state, the slidable member is slid along the guide member, and thus the portion of the float member that is linked to the slidable member can be moved along the guide member. Accordingly, the float member can be folded in a compact size and accommodated in the cover, by sliding the slidable member to the position suited for the float member to be folded in a compact size in the uninflated state. When the float member changes to the inflated state, the slidable member slides to the position in conformity with the shape of the float member in the inflated state, and thus the portion of the float member that is linked to the slidable member moves along the guide member linked to the wearable member. Accordingly, the float member in the inflated state is properly worn by a wearer. Thus, it is possible to reduce the size of the float member in the uninflated state and the cover that covers the float member, and thus it is possible to realize a small life jacket that is unlikely to obstruct movement of a wearer.

[0082] Furthermore, it is preferable that the life jacket further includes a linking member that links the float member and the guide member,

[0083] wherein the slidable member is linked to a portion of the float member that is away from the linking member when the float member is in the inflated state.

[0084] With this configuration, in the float member in the inflated state, the portion that is linked to the linking member and the portion that is linked to the slidable member are located away from each other. Accordingly, the float member in the inflated state can be located over a relatively large area. Thus, it is easy for a wearer to properly wear the float member in the inflated state. The movement of the entire float member with respect to the guide member is restricted by the linking member. Thus, it is possible to easily stabilize the posture of the wearer on the water surface.

[0085] In the configuration including the linking member, it is preferable that the linking member is located on the back of the wearer.

[0086] With this configuration, the portion of the float member that is linked to the linking member is located on the back side (the back) of the wearer. The portion of the float member that is linked to the linking member is covered by the cover when the float member is folded in the uninflated state. Since this portion is located on the back side (the back) of the wearer, the size of the portion, of the float member in the uninflated state and the cover that covers the float member, that is located on the abdomen side (the front) of the wearer can be reduced. Thus, it is possible to realize a small life jacket that is, in the uninflated state, more unlikely to obstruct movement of a wearer.

[0087] Furthermore, it is preferable that, when the float member changes from the uninflated state to the inflated state, the slidable member slides along the guide member in a direction away from the linking member.

[0088] With this configuration, when the float member folded in the uninflated state changes to the inflated state, the float member is inflated while spreading from the side close to the linking member, toward the abdomen side (the front) of the wearer. Thus, it is possible to realize a small life jacket that is, in the uninflated state, unlikely to obstruct movement of a wearer, and that allows the wearer to properly wear the float member in the inflated state.

[0089] Furthermore, it is preferable that the life jacket further includes a sliding support member that is located along the guide member between the guide member and the wearer,

[0090] wherein the slidable member is guided by the guide member to slide between the guide member and the sliding support member.

[0091] With this configuration, the sliding support member is located between the guide member and the wearer. Accordingly, the possibility that sliding movement of the slidable member is obstructed by the slidable member being caught on clothing of the wearer or the like when sliding along the guide member can be suppressed. Thus, the reliability of inflation of the float member that is linked to the slidable member can be improved.

[0092] Furthermore, it is preferable that the guide member is located along a side of the wearable member that is opposite to a side facing the wearer.

[0093] With this configuration, the wearable member is located between the guide member and the wearer, and thus the wearable member can function as a sliding support member that supports sliding of the slidable member. Accordingly, the possibility that sliding movement of the

slidable member is obstructed by the slidable member being caught on clothing of the wearer or the like when sliding along the guide member can be suppressed. Thus, the reliability of inflation of the float member that is linked to the slidable member can be improved.

[0094] Furthermore, it is preferable that the float member includes a first float portion that is located on one arm side of the wearer in the inflated state, and a second float portion that is located on the other arm side of the wearer in the inflated state, and

[0095] the slidable member includes a first slidable portion that is linked to the first float portion, and a second slidable portion that is linked to the second float portion.

[0096] With this configuration, the float member in the inflated state is located such that the portion on one arm side of the wearer and the portion on the other arm side surround the wearer. Thus, it is possible to easily stabilize the posture of the wearer on the water surface.

[0097] Furthermore, it is preferable that, in the uninflated state, the float member is accommodated in the cover in a state of being folded, and the slidable member is located on an outer side of the cover.

[0098] With this configuration, when the float member changes from the uninflated state to the inflated state, the cover is unlikely to obstruct sliding movement of the slidable member. Thus, the reliability of inflation of the float member that is linked to the slidable member can be improved.

[0099] Furthermore, it is preferable that the guide member is located along a body surface of the wearer.

[0100] With this configuration, when the float member changes from the uninflated state to the inflated state, the slidable member slides along the body surface of the wearer. Accordingly, the float member in the inflated state is located along the body surface of the wearer. Thus, it is possible to easily stabilize the posture of the wearer on the water surface.

[0101] The technique according to this disclosure can be applied to a life jacket including a float member that changes from an uninflated state to an inflated state with gas being supplied to an internal portion thereof, a cover that covers the float member in the uninflated state, and a wearable member that is to be worn by a wearer.

What is claimed is:

1. A life jacket including:
- a float member that changes from an uninflated state to an inflated state with gas being supplied to an internal portion thereof,
- a cover that covers the float member in the uninflated state;
- a wearable member that is to be worn by a wearer;
- a guide member that is linked to the wearable member; and
- a slidable member that is linked to the float member and that slides along the guide member.

2. The life jacket according to claim **1**, further comprising a linking member that links the float member and the guide member,
- wherein the slidable member is linked to a portion of the float member that is away from the linking member when the float member is in the inflated state.

3. The life jacket according to claim **2**, wherein the linking member is located on the back of the wearer.

4. The life jacket according to claim **3**, wherein, when the float member changes from the uninflated state to the inflated state, the slidable member slides along the guide member in a direction away from the linking member.

5. The life jacket according to claim **1**, further comprising a sliding support member that is located along the guide member between the guide member and the wearer,
- wherein the slidable member is guided by the guide member to slide between the guide member and the sliding support member.

6. The life jacket according to claim **1**, wherein the guide member is located along a side of the wearable member that is opposite to a side facing the wearer.

7. The life jacket according to claim **1**,
- wherein the float member includes a first float portion that is located on one arm side of the wearer in the inflated state, and a second float portion that is located on the other arm side of the wearer in the inflated state, and
- the slidable member includes a first slidable portion that is linked to the first float portion, and a second slidable portion that is linked to the second float portion.

8. The life jacket according to claim **1**, wherein, in the uninflated state, the float member is accommodated in the cover in a state of being folded, and the slidable member is located on an outer side of the cover.

9. The life jacket according to claim **1**, wherein the guide member is located along a body surface of the wearer.

* * * * *