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(54) Title: MARKER AND RECOVERY DEVICE

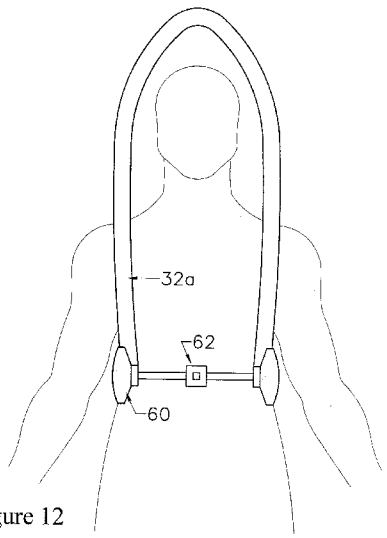


Figure 12

(57) Abstract: A marker and recovery device has a body for securing to a torso and an arch secured to the body at spaced locations. The arch is extendable from a stored to a deployed condition. In the deployed condition, the arch extends from the torso of the wearer to function as a visible marker. The arch facilitates recovery of the wearer.

MARKER AND RECOVERY DEVICE

CROSS REFERENCE

[0001] The present application claims priority from US Provisional Application No. 61/493,734 filed June 6, 2011, incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The present invention relates to a personal marker and recovery device for waterborne activities.

DESCRIPTION OF THE PRIOR ART

[0003] When engaged in waterborne activities, such as boating, there is a constant risk of unintentionally falling into the water and being separated from the vessel. To mitigate the risk of drowning, personal floatation devices (PFDs), otherwise known as life jackets, are in widespread use and are responsible for saving countless lives from drowning. The PFDs come in many different configurations but essentially all provide a vest-like structure that fits over the upper torso. The vest is secured by a harness, in the simplest form tie straps, so that the vest is retained on the upper torso. The vest is buoyant and is effective to maintain the wearer afloat and face-up in water.

[0004] The vest may be naturally buoyant, such as when made with a closed-cell foam, or may be inflatable to achieve the requisite buoyancy. Inflation may come from a small pressurized gas cylinder and/or a manual inflation valve. When properly utilized, the vest is capable of supporting the wearer and maintaining them afloat in a stable condition indefinitely.

[0005] However, although the PFD supports the wearer, the prompt recovery of the wearer is important due to the exposure to adverse conditions, such as the water temperature and loss of body heat.

[0006] Whilst the vests are made from a high visibility material, such as a day glow orange or other fluorescent material, the rescue of the wearer does depend upon the wearer being visually locatable. In even a relatively small body of calm water, the wearer may not be readily discernable from the general surrounding environment, and, if the wearer is unconscious, is not able to attract attention to rescuers through waving and/or shouting. This problem is exacerbated when there is any degree of wave motion and of course the ability to spot an individual from an aircraft is extremely difficult.

[0007] Various proposals have been made to enhance the visibility to facilitate rescue.

[0008] US Patent 3,877,096 to Scesney shows an inflatable floatation device that forms a tetrahedron that can be inflated by a person in distress. This does however require the device to be inflated by the user and remain tethered to the user once deployed.

[0009] US Patent 5,800,227 shows a PFD with a folded marker device on the back of the PFD. The marker device may be released. This device however is relatively bulky and may create imbalance such that the face of the wearer is in fact held in to the water rather than supported above the water.

[0010] US Patent 3,638,258 discloses a PFD in which an elongate bar is attached to the PFD. The bar may be inflated so that a wand is provided that enhances visibility. The wand is intended to be detachable and therefore its position relative to the wearer may vary.

[0011] It is object to the present invention to obviate or mitigate the above disadvantages.

SUMMARY OF THE INVENTION

[0012] According to the present invention a marker and recovery device includes a body to be secured to the torso of a wearer. An arch is secured to the body at spaced locations. The arch is extendable from a stored condition to a deployed condition in which the arch extends from the torso of the wearer.

[0013] Preferably an attachment is provided on the arch approximate the middle of the arch to facilitate rescue of the wearer.

[0014] As a further preference, the arch in its flaccid state passes behind the head of the wearer and, upon inflation, moves forward of the head to project normally from the torso of the wearer.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Embodiments of the invention will now be described by way of example only with reference to the accompanying drawings in which:

[0016] Figure 1 is a front elevation of a personal flotation device incorporating a marker and recovery device.

[0017] Figure 2 is a front elevation similar to figure 1 showing the personal floatation device in a deployed condition.

[0018] Figure 3 is a side view of the personal floatation device of figure 1.

[0019] Figure 4 is a perspective view of a personal floatation device in a uninflated condition.

[0020] Figure 5 is a view similar to figure 4 showing the personal floatation device in a partially inflated position.

[0021] Figure 6 is a view similar to figure 4 showing the personal floatation device in a fully deployed position.

[0022] Figure 7 is a side view of the personal floatation device as deployment is initiated.

[0023] Figure 8 is a view similar to figure 7 showing the personal floatation device partially inflated.

[0024] Figure 9 is a side view similar to figure 7 showing the personal floatation device fully inflated.

[0025] Figure 10 is a view of an alternative embodiment of a marker and recovery device.

[0026] Figure 11 is a side view of the device of figure 10.

[0027] Figure 12 is a view similar to figure 10 with the marker deployed.

[0028] Figure 13 is a side view of the embodiment of figure 12.

[0029] Figure 14 is a view similar to figure 10 of a further alternative embodiment.

[0030] Figure 15 is a plan view of the embodiment of figure 14, and;

[0031] Figure 16 is a plan view similar to figure 14 with the marker deployed.

DETAILED DESCRIPTION OF THE INVENTION

[0032] Referring therefore to figure 1, a marker and recovery device is incorporated in to personal floatation device 10. The device 10 has a body formed as a vest 12 dimensioned to cover the upper torso of a wearer. It will be appreciated that the vest 12 will be sized according to the typical dimensions of a wearer and may take many different forms depending on the intended application and the severity of the environment in which the PFD 10 is to be utilized. In the embodiment illustrated in figure 1, the PFD includes a harness generally indicated at 14 with a buckle 16 to secure the harness around the waist of the wearer. Leg loops 18 are also provided to further secure the vest to the user.

[0033] Other common personal floatation devices do not utilize the leg loops 18 and the vest 12 may be secured to the torso with simple straps or buckles that pass around the waist of the wearer.

[0034] The vest 12 includes a pair of bladders 20 that are sewn into the material of the vest. The bladders 20 are connected to a gas cylinder 22 incorporated into the vest 12. The gas cylinder may be deployed either manually or automatically upon contact with the water to supply pressurized gas into the bladders 20 and inflate the front facing panels of the vest 12. Additionally, a manual valve 24 is incorporated on the vest to allow manual inflation of the bladders in the event that the pressurized canister 22 fails to inflate the bladders adequately.

[0035] A marker and recovery device in the form of an elongate arch, generally indicated at 30, is secured at spaced locations to the vest 12. The arch 30 comprises a tubular sleeve of air impermeable material. The opposite ends of the sleeve are secured to the vest, one on each of the front panels 13, and are connected to the pressurized canister 22. The connection to the canister 22 may be through a separate supply line or in directly by connection to the bladder 20. Alternatively, a separate cylinder, indicated in ghosted outline 26, is provided to supply the arch 30 with pressurized gas.

[0036] The tubular sleeve 32 is made from a flaccid, impermeable material such as thermoplastic polyurethane (TPU) or PVC coated nylon fabric. In a typical application, the sleeve 32 has an overall length of between 24 and 48 inches and a diameter of between 2 and 4 inches. Enhanced visibility may be obtained by increasing the length of the sleeve and arrangements with an overall length of sleeve of 96" and a diameter of 2" have been found to be viable.

[0037] As can be seen more clearly in figures 3 and 4, the sleeve 32 is located on the front panels 13 and, when stored, is folded back on itself so as to pass behind the head aperture 15 of the vest 12. Although not shown for the sake of clarity, the sleeve 32 is preferably covered by a detachable panel or strap so that it is securely stored when not in use within the body of the vest 12. The detachable panel is a flap of material sewn to the vest 12 with hook and loop fastener, referred to as Velcro, tabs that locate the panel and maintain it *in situ*.

[0038] A tab 34 is secured to the sleeve 32 at its midpoint, which coincides with a central position behind the head of the wearer. The tab 34 has a closed opening 36 that is intended to receive a hook or rope allowing the wearer of the PFD 10 to be lifted readily from the water.

[0039] As can be seen from figures 3 and 4, prior to deployment, the sleeve 32 is maintained in a stored condition within the vest 12 and does not interfere with normal operation of the wearer. If however floatation is required from the PFD 10, the pressurized gas 22 is released, causing the bladders 20 to inflate. This may occur prior to immersion in the water or subsequent to immersion in the water depending upon the particular conditions.

[0040] Inflation of the bladders 20 supplies pressurized fluid to the interior of the sleeve 32 causing the arch 30 to begin inflation. Referring to figures 5 and 7, initial inflation of the arch 30 causes the covering panel to be released and the midpoint of the arch 30 to move forward from behind the head of the wearer. Continued inflation of the arch 30 moves the arch progressively forward as seen is figure 8 until it attains a deployed condition where it is fully pressurized and extends normally from the front panels of the vest 12. If necessary, additional inflation can be provided from the manual inflation 24 to ensure that the arch 30 is fully inflated.

[0041] When fully inflated, the vest 12 maintains the wearer face-up in the water. In that position, the arch 30 is projected upwardly and enhances the visibility of the user in the water. With the typical dimensions of the tube, the mid point of the tube is approximately 24 to 48 inches above the torso of the user which facilitates the identification of the user from a distance. It will also be noted that the arch 30 does not interfere with the normal buoyancy and stability provided by the vest 12 and thereby ensures that the wearer is maintained face-upward in the water.

[0042] Recovery of the user is facilitated by the provision of the tab 34 which enables the user to be bodily lifted from the water. The tab 34 may be located by a boat hook and a rope attached to the islet 36. Thereafter the wearer may be hoisted from the water and secured on board the rescue vessel.

[0043] Deflation of the vest 12 similarly causes deflation of the arch 30 allowing it to be restored for reuse with the vest 12.

[0044] Various alternative arrangements may be utilized with the vest 12. The arch 30 may be formed as two separate chambers connected at the tab 34 and inflated separately by the bladders 20. As noted above, the sleeve 32 may be inflated by a separate gas supply. The arch 30 may be incorporated in naturally buoyant PFDs in which case the canister 22 is provided simply to inflate the sleeve 32. If necessary, a passive inflation device, such as a

foam rubber, coil spring or mechanical linkage could be utilized, but a gas inflation device is preferred.

[0045] The sleeve 32 may be made to be detachable by providing releasable connectors, such as a zipper, between the sleeve and vest. In this way an existing PFD may be retrofitted with the arch 30, or the arch 30 replaced if necessary.

[0046] An alternative embodiment that may be utilized in combination with an existing PFD, or on its own where enhanced buoyancy is not required, is shown in figures 10 through 13. Like reference numerals will be used to identify like components with a suffix 'a' added for clarity.

[0047] In the embodiment of figures 10 through 13, the arch 30a similar in construction to that described above with respect to figures 1 through 9, is secured to a belt 60 that passes about the torso of the wearer. The belt 60 is secured about the torso by a buckle 62, which is adjustable to provide a snug fit about the torso. The belt 60 may be buoyant to provide some enhanced buoyancy for the wearer, or may be a simple fabric belt when intended for use with an existing PFD.

[0048] The arch 30a is formed from the tubular sleeve 32a which, as described above, is folded back upon itself and passes behind the head of the wearer. Releasable straps 64 hold the sleeve 32a in place until inflated. The spaced locations at which the arch 30a is secured to the belt 60 are forward of the arms of the user so that inflation in of the arch 30a extends the arch and allows it to move forward to a position in advance of the torso. The disposition of the arch 30a when deployed, as shown in figure 13, is generally normal to the surface of the water in which the wearer is immersed and so projects upwardly from the water.

[0049] A further embodiment is shown in figures 14 through 16 in which like components will be identified with a like reference numeral with a suffix 'b' for clarity. In the embodiment of figures 14 through 16, a belt 60b is utilized, either buoyant or not, and the arch 30b is secured at spaced locations along the belt. A buckle 62b is provided but located at the rear of the wearer. The arch 30b is formed from a tube 34b, as described above, which is folded back on itself along the body of the belt 60b. A detachable flap or strap 64b secures the tube in 34b the folded condition so as to be constrained within the general envelope provided by the belt.

[0050] A canister for inflating the tube 34b is secured to the belt as indicated at 26b and upon inflation causes the arch to project forwardly of the wearer. The arrangement shown in figures 14 through 16 may be combined with a PFD to provide a marker and recovery device in addition to the buoyancy provided with the PFD.

[0051] It will also be appreciated that various fastening devices may be provided for the vest 12 and that ancillary equipment such as whistles and flashlights may be incorporated into the vest 12 as is conventional.

CLAIMS

1. A marker and recovery device includes a body to be secured to the torso of a wearer, and an arch secured to the body, said arch being extendable from a stored condition to a deployed condition in which said arch extends from the torso of the torso of the wearer.

2. The marker and recovery device of claim 1 wherein the arch is secured at spaced locations.

3. The device according to claim 2 wherein an attachment point is provided intermediate said spaced locations.

4. The device according to claim 1 to 3 wherein said arch is inflatable to move between said stored condition and said deployed condition.

5. The device according to any one of claims 1 to 4 wherein said arch, in said stored condition, is folded back on itself to provide a close fit to the torso of a wearer.

6. The device according to any one of claims 1 to 5 wherein said arch, in its stored condition, is arranged to pass behind the head of a wearer and, upon deployment, moves forward of said head to the deployed condition.

7. The device according to any one of claims 1 to 6 wherein said body is a vest of a personal floatation device and said arch is secured to said vest at spaced locations.

8. The device of claim 7 wherein said arch is maintained in a stored condition by detachable panels.

9. The device according to any preceding claim wherein said arch is formed by the tubular sleeve.

10. The device according to claim 9 wherein said sleeve is inflatable to attain said deployed condition.

11. The device according to claim 10 wherein said sleeve is formed from a flaccid, impermeable material.

12. The device according to claim 11 wherein said material is a thermoplastic polyurethane or PVC coated nylon fabric.

13. The device of claim 10 wherein said tube is inflated by a pressurized gas canister secured to said body.

14. The device of any one of claims 1 to 6 wherein said body is a belt secured about the torso of a wearer.

15. The device of claim 14 wherein said belt is secured by a fastening.

16. The device of claim 15 wherein said arch is stored along the belt by folding the arch back on itself between said paced locations.

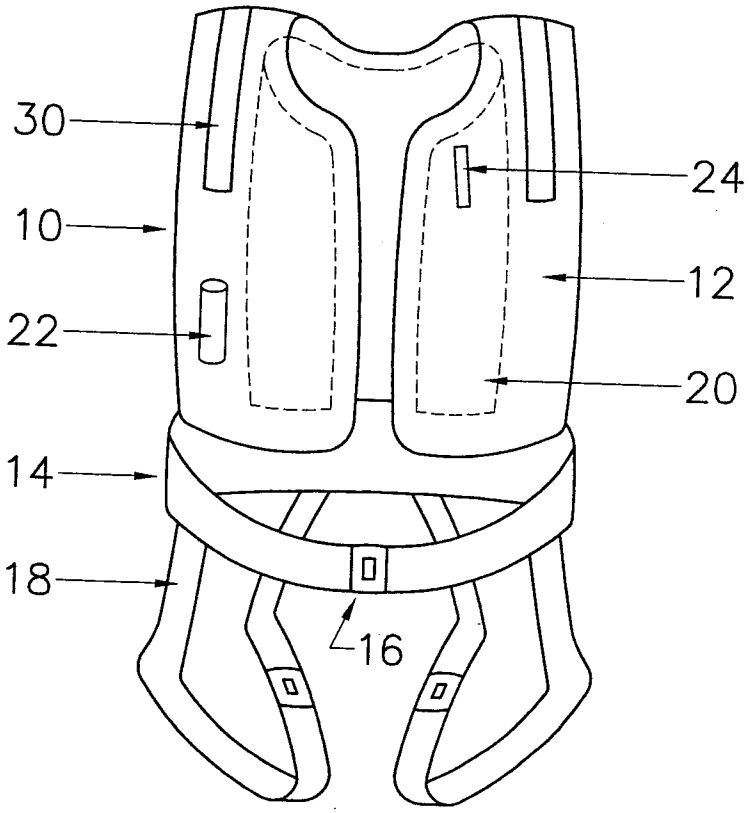


Figure 1

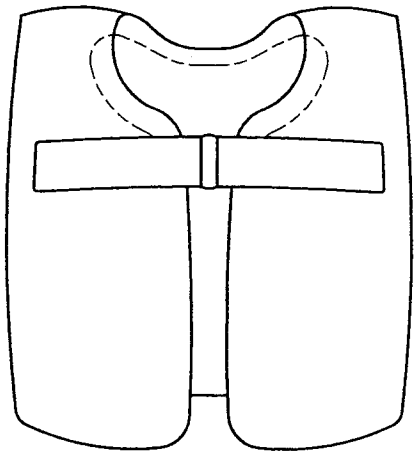


Figure 2

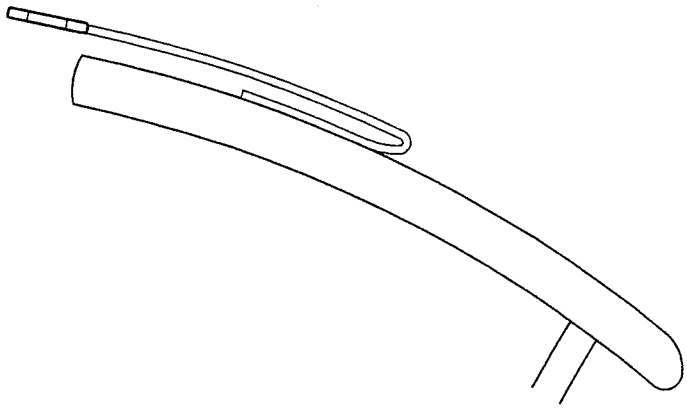


Figure 3

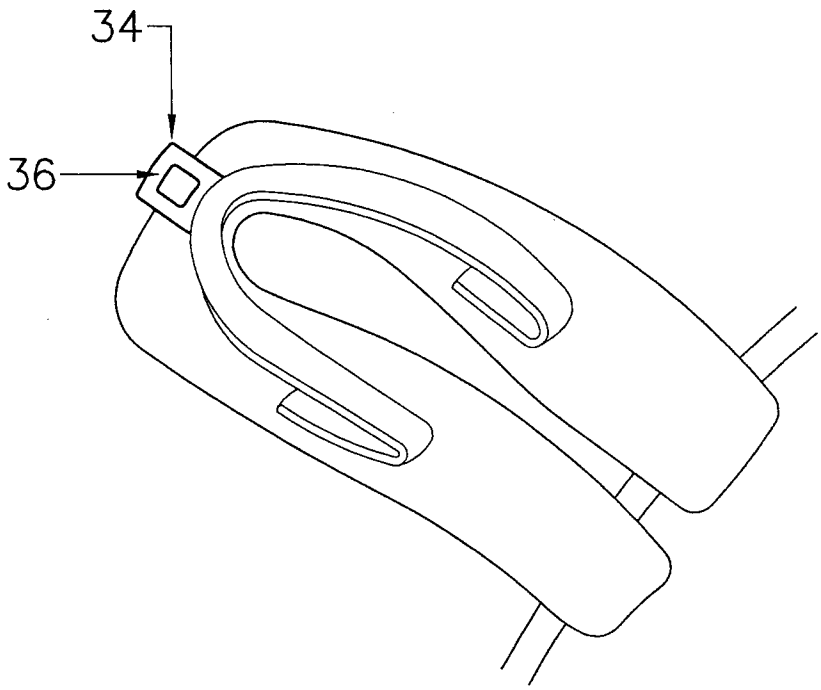


Figure 4

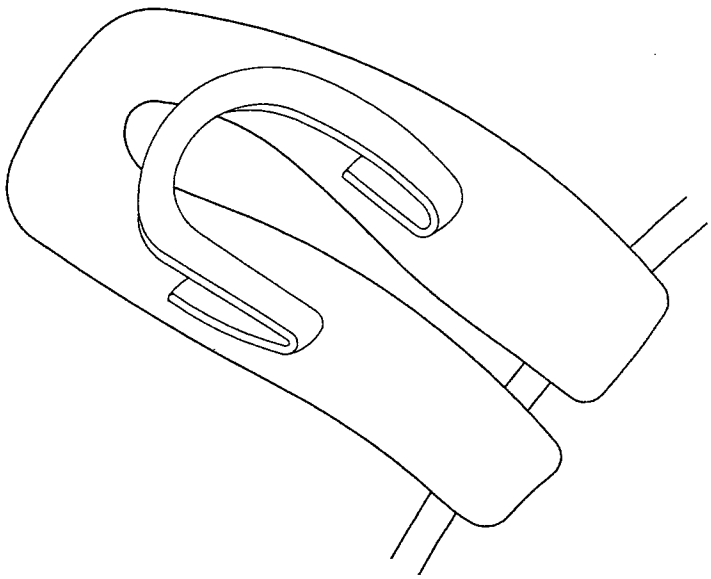


Figure 5

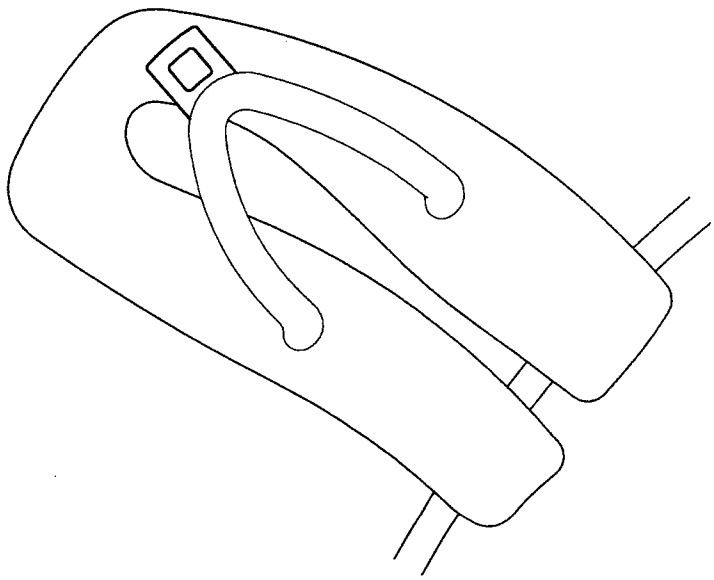


Figure 6

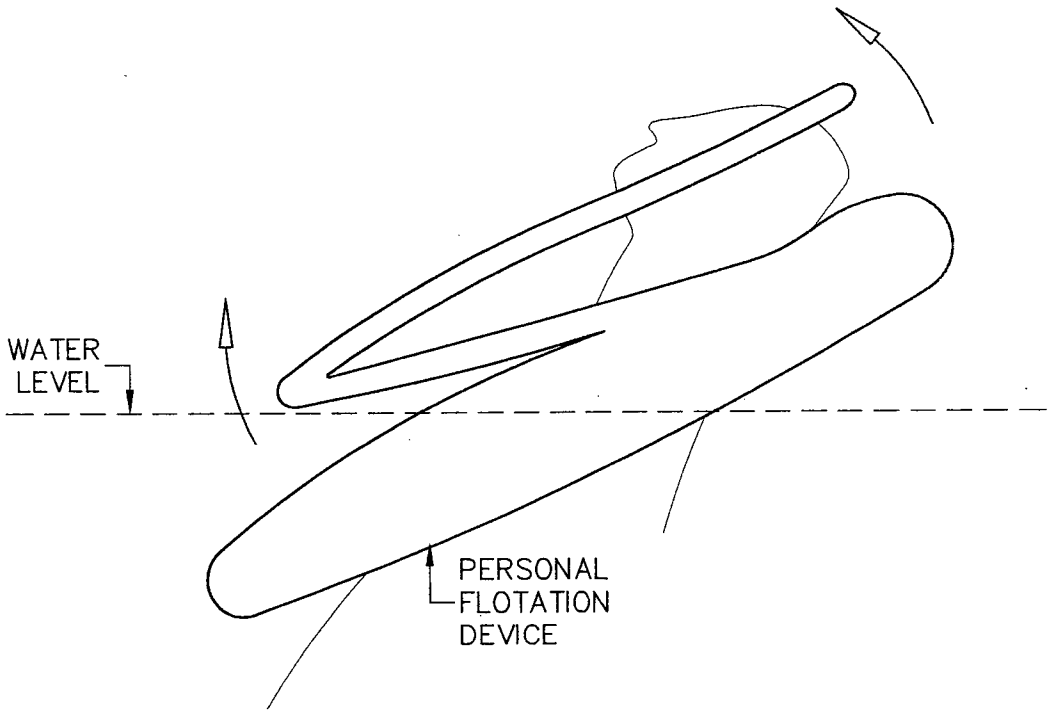


Figure 7

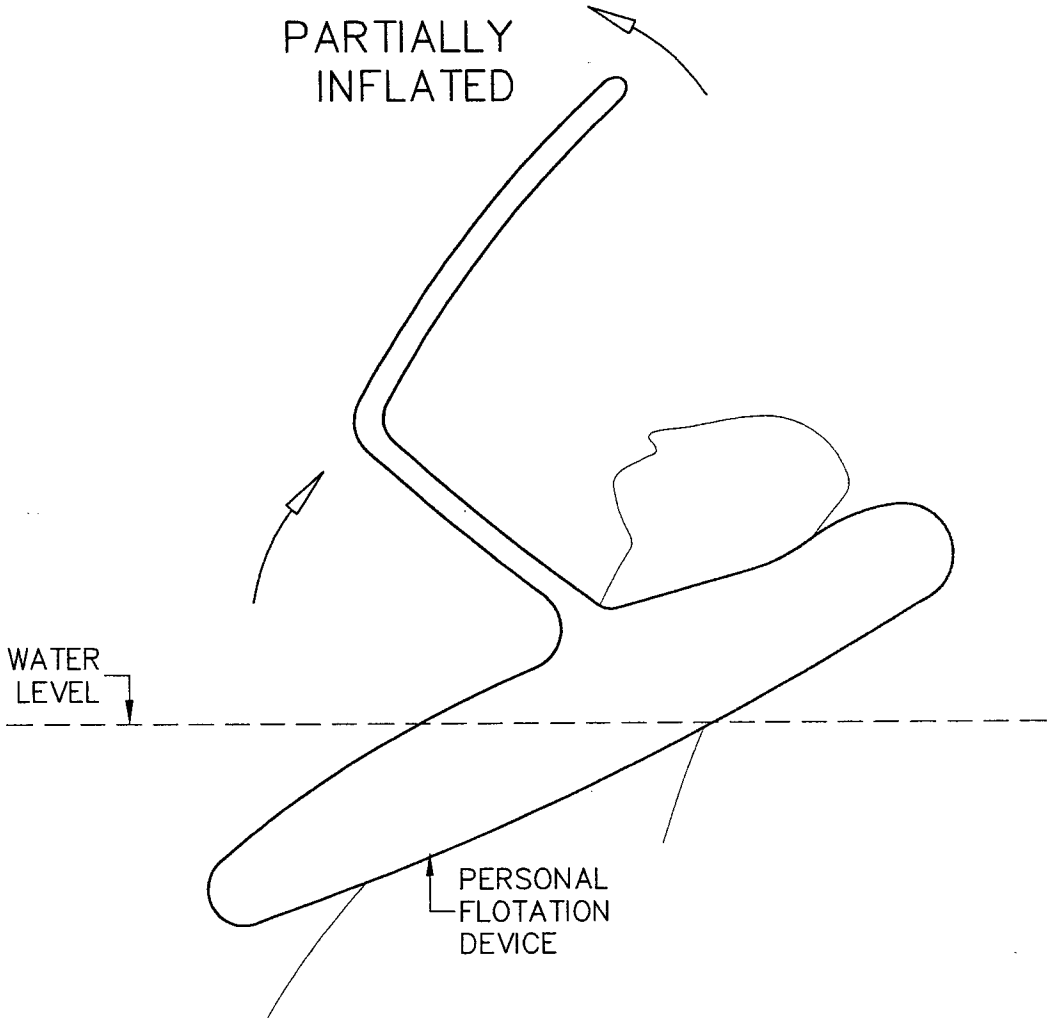

PARTIALLY
INFLATED
WATER
LEVEL
PERSONAL
FLOTATION
DEVICE

Figure 8

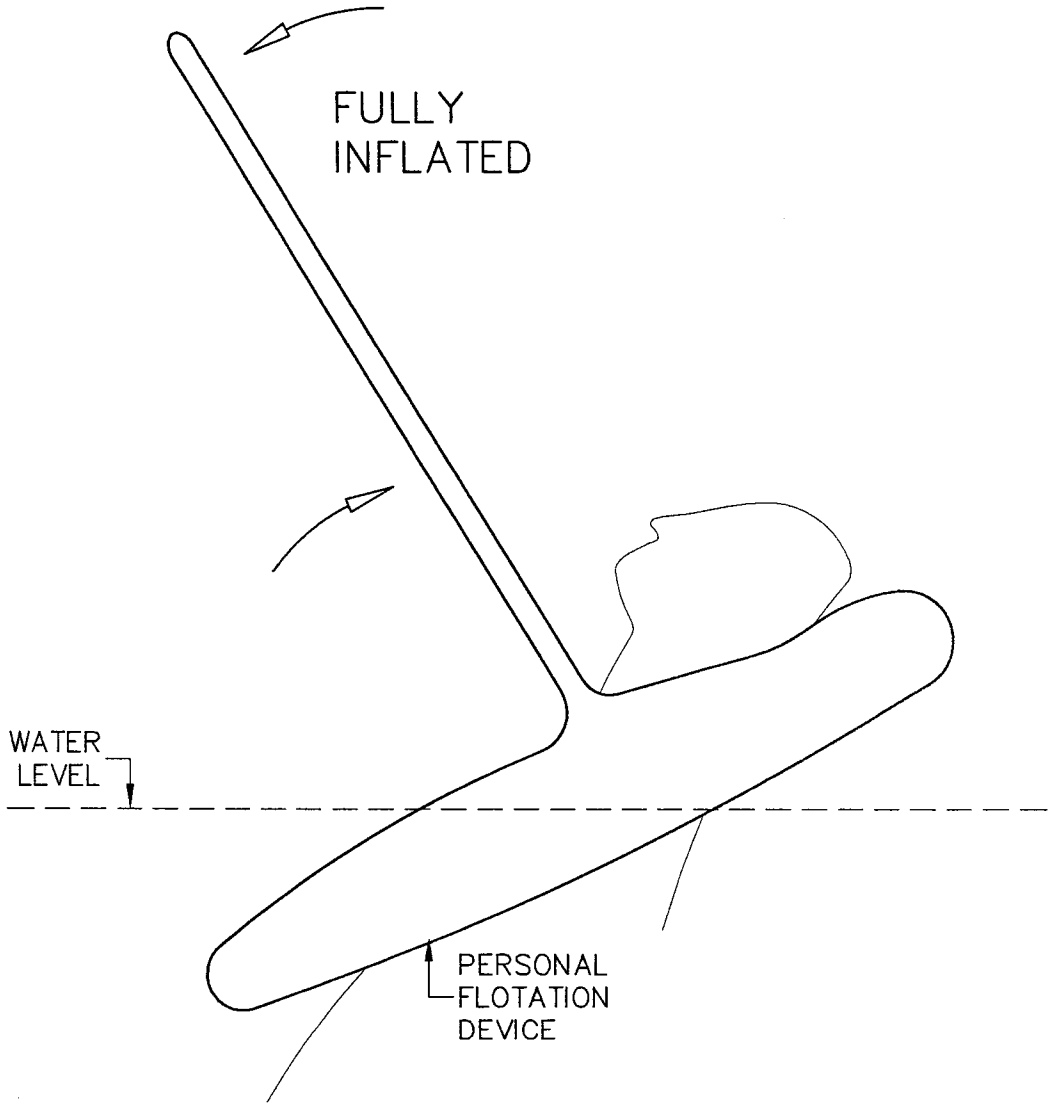


Figure 9

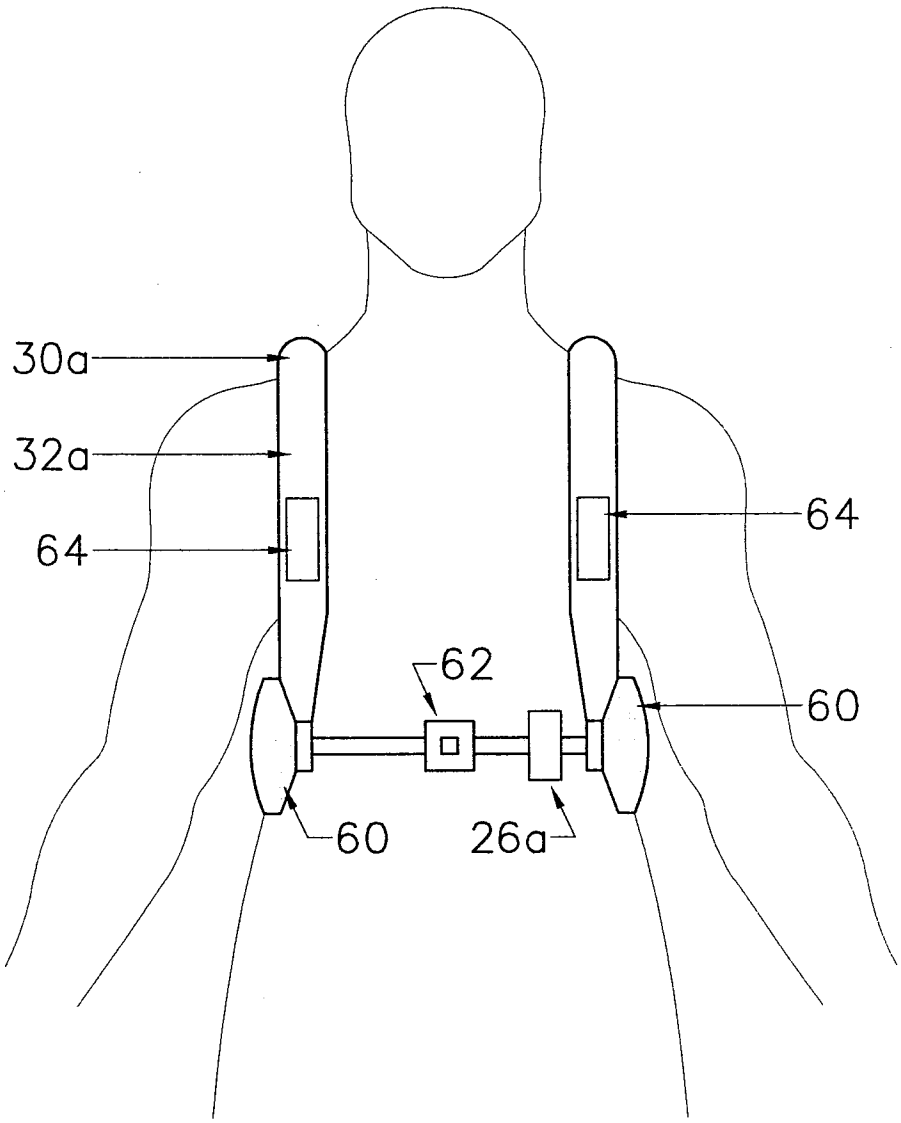


Figure 10

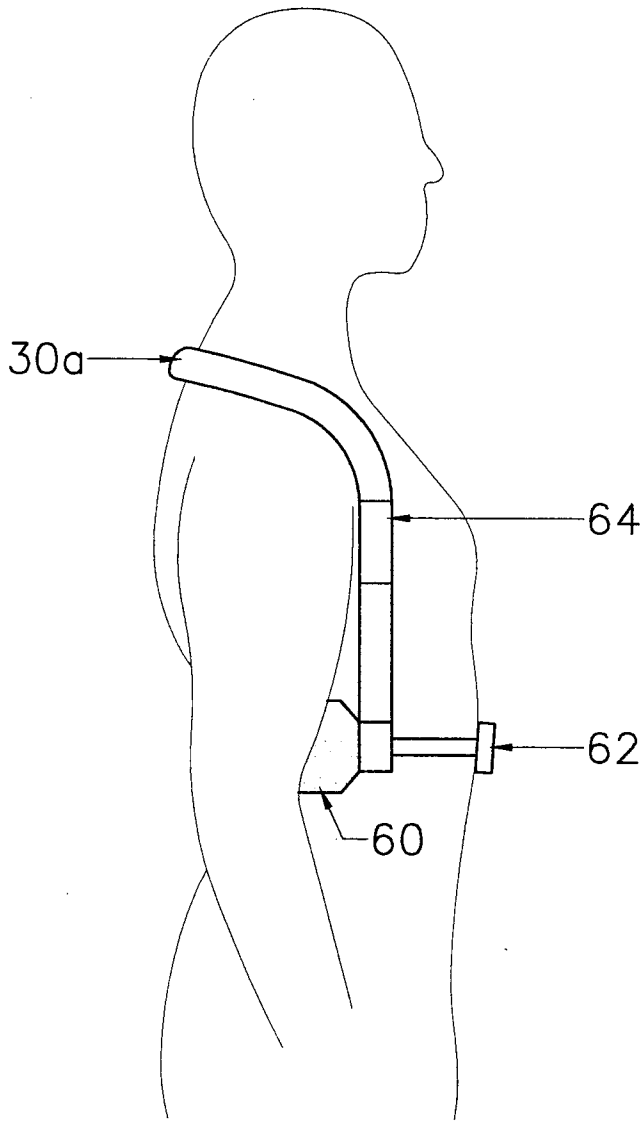


Figure 11

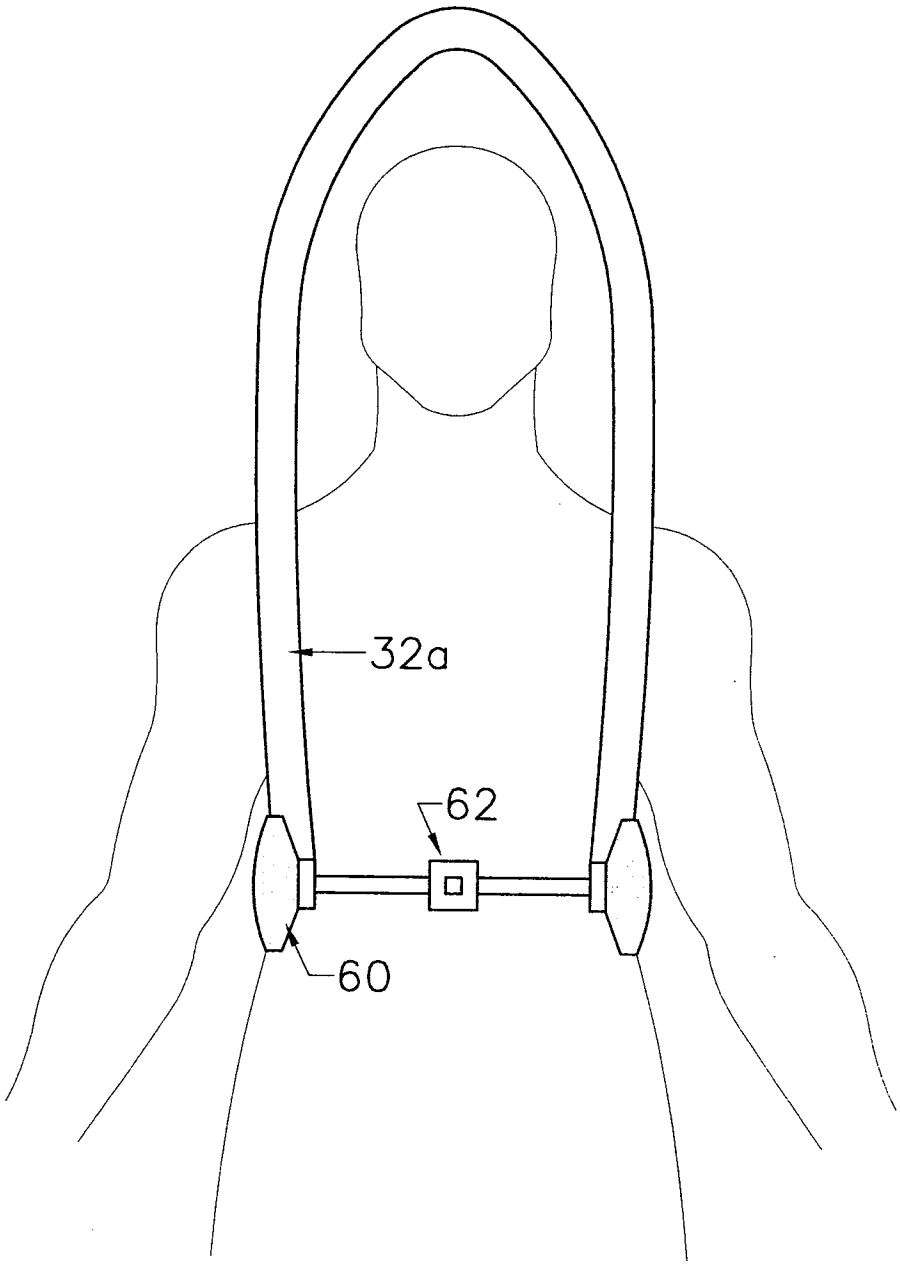


Figure 12

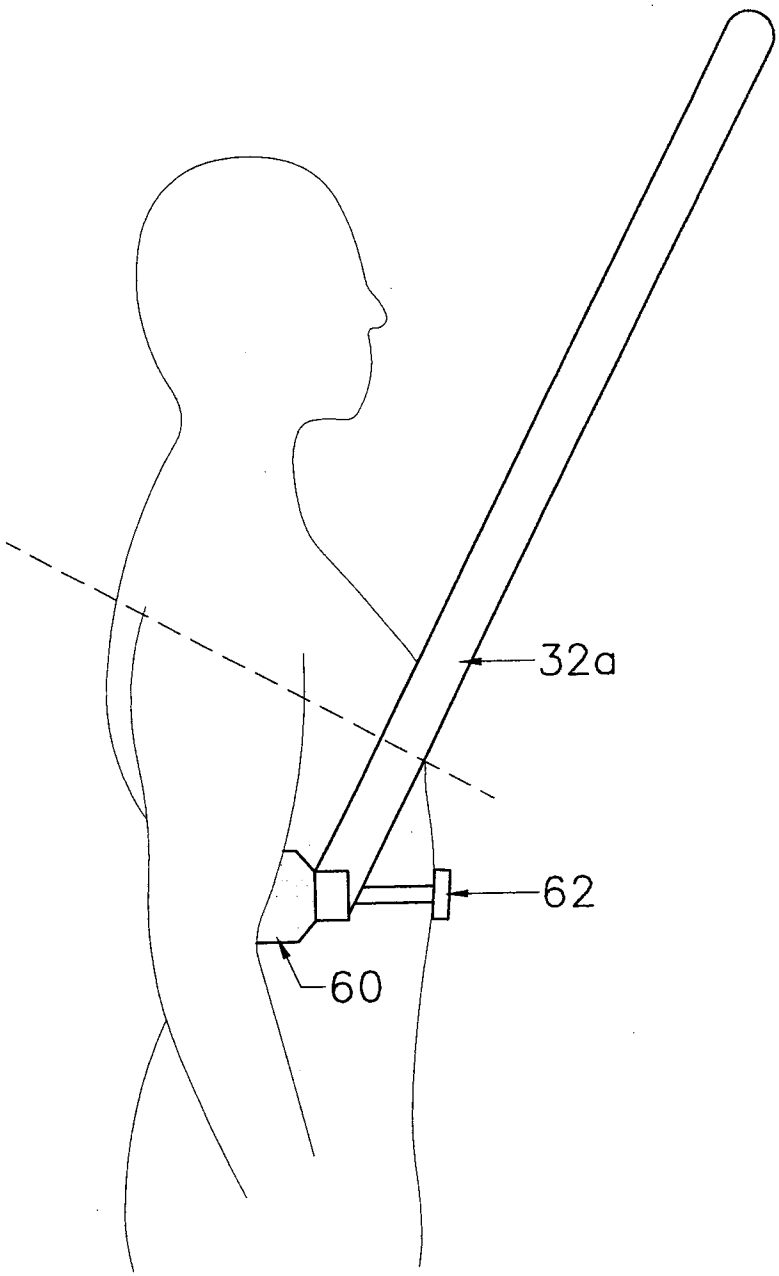


Figure 13

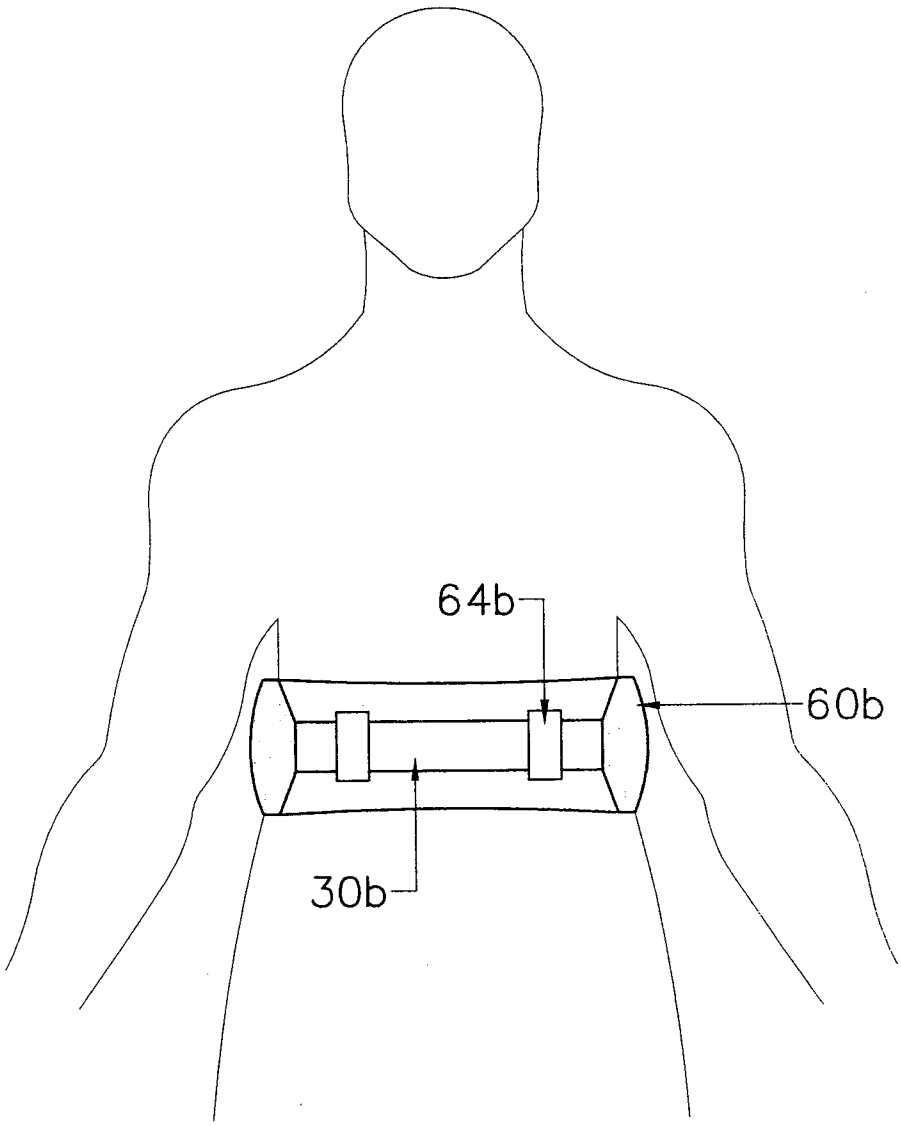


Figure 14

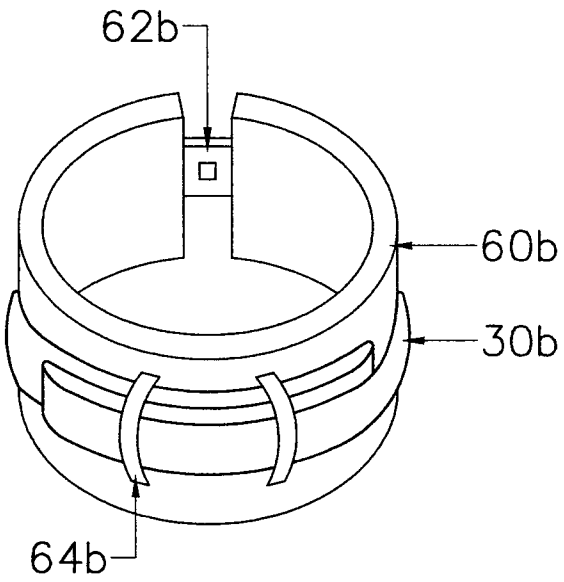


Figure 15

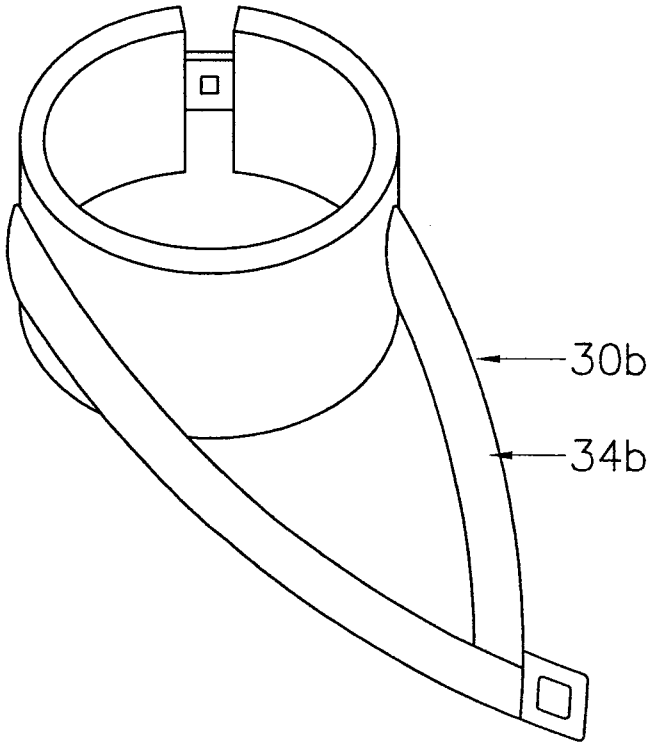


Figure 16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2012/050382

A. CLASSIFICATION OF SUBJECT MATTER
IPC: ***B63C 9/20*** (2006.01) , ***B63C 9/125*** (2006.01)
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)
IPC&ECLA(2006.01): B63C 9/20, B63C 9/125

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
none

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)
Databases: Epoque, Canadian Patent Database (CPD)
Keywords: Refer to Extra Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	JPH0342799U 23 April 1991 (23-04-1991) *Figures 1-6*	1, 2, 4, 5, 7-11, 13 3, 6
X	US3877096A (SCESNEY) 15 April 1975 (15-04-1975) *cited by the applicant* *Figures 1-4, col. 2 line 34-col. 3 line 65*	1, 4, 5, 9-12, 14-16
A	WO0073143A1 (FRINK) 07 December 2000 (07-12-2000) *the whole document*	1-16
A	US5344351A (DANIELSON) 06 September 1994 (06-09-1994) *the whole document*	1-16

[ ] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
17 September 2012 (17-09-2012)	21 September 2012 (21-09-2012)

Name and mailing address of the ISA/CA	Authorized officer
Canadian Intellectual Property Office Place du Portage I, C114 - 1st Floor, Box PCT 50 Victoria Street Gatineau, Quebec K1A 0C9 Facsimile No.: 001-819-953-2476	Bethany Seaman (819) 934-2643

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CA2012/050382

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
JPH0342799U	23 April 1991 (21-04-1991)	None	
US3877096A	15 April 1975 (15-04-1975)	None	
WO0073143A1	07 December 2000 (07-12-2000)	AT276918T	15 October 2004 (15-10-2004)
		AU5307600A	18 December 2000 (18-12-2000)
		DE60014095D1	28 October 2004 (28-10-2004)
		EP1196324A1	17 April 2002 (17-04-2002)
		EP1196324A4	15 January 2003 (15-01-2003)
		EP1196324B1	22 September 2004 (22-09-2004)
		US6332424B1	25 December 2001 (25-12-2001)
		US2002050243A1	02 May 2002 (02-05-2002)
		US6688253B2	10 February 2004 (10-02-2004)
		WO0073143A9	18 April 2002 (18-04-2002)
US5344351A	06 September 1994 (06-09-1994)	None	

Extra Sheet

Continuation of Box B.

Keywords: inflat*, arch*, curv*, arc*, dome, signal*, detect*, visib*, rescue, deploy*, mark*, expos*, life, jacket?, vest?, pfd?, personal, flotation, belt?, water, rescue, recover*