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SAMPLE SCRIPT A

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Drainage Device

The present invention relates to a drainage device for a dingy and to a dingy incorporating a drainage device.

Dinghies, and particularly inflatable dinghies are known to be useful as life rafts to keep one or more people afloat, and protected from the elements, when in water.

Often, whenever a person enters a dinghy, a large amount of water will be taken on board. It is therefore desirable to be able to remove water from the inside of the dingy, whist the dingy is in the water.

Known ways of doing this include a scoop, used to bail out the water, but this requires access to an open side of the dingy, which is not always desirable in stormy seas. Alternatives to a scoop would include a pump, such as a bilge pump, which can be used while at sea to pump water from a vessel and out through the side of the vessel above the waterline.

Unfortunately such pumps are comparatively large and heavy and would not suit use in a dingy, particularly the inflatable types.

The invention is defined in the claims to which reference is now directed.

A first aspect of the present invention provides a dingy according to Claim 1. The provision of a non-return valve within the passage between the inside and the outside of the boat allows water to exit the dingy but prevents water from entering via the same path.

Preferably the passage passes through the dingy floor allowing the drainage device to be positioned in a convenient location for the user.

Preferably, the non-return valve comprises an inlet and outlet end, with the outlet having two panels held flat together. Such a non-return valve is easy to construct by simple methods such as stitching.

Preferably, the valve is comprised of a fabric and even more preferably a rubberised fabric making construction simpler and leading to a lightweight design.

Preferably a second non-return valve is provided within the trunk allowing water to be removed by a pumping action rather than waiting for it to drain.

Preferably the first valve is located above the floor of the dingy and the second valve is located below the floor of the dingy to allow water to pass to the space defined between the two valves and subsequently be urged out through the second valve.

Preferably the two valves are rotated with request to each other to prevent both valves opening if the trunk is squeezed.

Preferably a funnel is provided, the funnel being connected to the trunk inlet and making it easier to direct water into the inlet. The mouth of the funnel may be reinforced by a reinforcing ring to retain the shape. It is preferred that the funnel mouth has a diameter of 15-25cm to allow an operator to use the device with one hand.

Preferably one or more straps are provided extending along the trunk and across the body (and preferably the floor) of the dingy so as to hold the trunk firmly into the dingy body.

Preferably, a cover is provided with a fastener for stowing the trunk, and funnel, where provided, when not in use.

Preferably, all components, including the dingy, are formed of a flexible material such as rubberised fabric to improve the lightness and ease of construction.

A second aspect of the invention provides a drainage device for use with a dingy according to Claim 1. Such a device can be retro-fitted to existing dinghies and the flexible trunk allows the non return valve to be opened by a squeezing force to allow air to pass through the valve for hand operation.

As with the first aspect of the invention, a second non-return valve can be provided, which can be rotated relative to the first valve with the same associated advantages.

Preferably, as with the first aspect of the invention a funnel is provided, optionally with a reinforcing ring and/or a mouth diameter of 15-25cm. The same advantages as the first aspect apply.

The device may be comprised of a rubberised fabric for ease of construction.

An embodiment of the invention will now be described with reference to the figures which

- Figure 1 shows a side view of a dingy according to an embodiment of the invention
- Figure 2 shows a cross section of the dingy of Figure 1 along the line X - X.
- Figure 3 shows a cross sectional view of the dingy of Figures 1 and 2 from above along the line Y – Y.
- Figure 5A shows a cross sectional view of a known non-return valve.
- Figure 5B shows a perspective view of the non-return valve of figure 5A.

Figure 1 shows an example of a dingy. An inflatable rim 3 provides buoyancy when the dingy is in the water. An additional inflatable covering 5 provides additional buoyancy and shelter. The bottom portion of a drainage device 10 can be seen extending from the floor of the dingy.

Figure 2 shows the location of the drainage device in greater detail, providing a passage with an inlet 12 and outlet 14 from the inside to the outside of the dingy via the floor 7 of the dingy.

Figure 3 shows the drainage device in greater detail. The passage between the inlet 12 and outlet 14 is provided by a trunk 16 being a cylindrical body that is hollow – i.e. a tube that

tapers towards the dingy floor 7. The trunk also has a further portion that extends beneath the dingy floor, tapering away from the floor. This tapering assists in holding the drainage device in place.

A first non-return valve 18 is situated within the trunk just below the inlet 12 and above the floor 7 of the dingy. A second non-return valve 19 can be positioned within the trunk below the floor of the dingy. The valves are rotated relative to one another with respect to the axis of the length of the trunk by 90°.

A funnel 20 is connected to the inlet of the trunk 16. The funnel provides a bigger surface area for capturing water, and preferably has a mouth diameter of 15-25cm so that it can be manipulated with one hand. The funnel, which has a circular mouth shape, is reinforced with a reinforcement ring, or a wire, so as to maintain a circular mouth shape.

The reinforcement ring or wire can be made of plastic or metal.

At least one reinforcement strap 22 is provided which extends along the trunk surface and across the dingy floor 7, to provide additional anchoring of the trunk to the floor. These straps are glued or sewn in place.

A welded seam is provided above and below the dingy floor to ensure a watertight seal between the trunk wall and the dingy floor.

The elements of the device, including the valves, the trunk and the funnel are all comprised of the same flexible material, and preferably the same material as used for the dingy. This is usually a rubberised fabric of some kind and preferably a synthetic rubber reinforced with a woven fabric.

In use the funnel is manipulated to catch water within it. Typically, the water level in the dingy may be above or below the funnel, but pulling the funnel captures water which then passes down through the first valve 18. As the dingy moves up and down in the water, water trapped between the two valves is able to exit through the second, lower, valve 19. However, to speed up the drainage the user can use a peristaltic type motion on the trunk. By squeezing the trunk at the top, and then sliding his hand down water can be urged though the lower valve is not required to drain water, it is necessary if it is desired to urge the water out otherwise water would return to fill the trunk 16.

Figures 5A and 5B show an example of the preferred type of non-return valve. A cylinder of material, or cone, is flattened at one end and stitched to hold it flat. The result is a valve with an inlet and two facing panels 53 of material which are flat together. Water is able to pass from the inlet through the panels but cannot return the other way as it will force the panels shut.

Other types of non-return valves can be used.

Figure 4 demonstrates the covers 26 which can be secured by a fastener such as Velcro under which the device can be stored when not in use. The fastened cover prevents water ingress after bailing the dingy out and also provides a storage space for a sponge to wipe up additional water.

The drainage device is located in the middle of the dingy floor in a position that will ideally be between the users legs in use.

A drainage device being formed of a flexible material can be retrofitted to existing dinghies.

CLAIMS

1. A dingy having a trunk having an inlet and an outlet that defines a passage for water from the inside to the outside of the dingy; and a non-return valve located in the trunk.

2. A dingy according to Claim 1 wherein the passage passes from the inside to the outside of the dingy through the dingy floor.

3. A dingy according to Claim 1 or 2 wherein the non return valve comprises an inlet end and outlet end, the outlet having two panels held flat together.

4. A dingy according to any preceding claim wherein the valve is comprised of fabric and preferably a rubberised fabric.

5. A dingy according to any preceding claim whereas a second non-return valve is provided within the trunk.

6. A dingy according to Claim 5 wherein the first valve is located above the floor of the dingy.

7. A dingy according to Claim 6 wherein the second valve is located below the floor of the dingy.

8. A dingy according to any of Claims 5 to 7 wherein the two valves are rotated relative to each other about the axis of the trunk.

9. A dingy according to any preceding claim whereas a funnel is connected to the inlet of the trunk.

10. A dingy according to Claim 9 wherein the funnel mouth is reinforced by a reinforcing ring.

11. A dingy according to a Claim 9 or 10 wherein the funnel mouth has a diameter of 15-25cm.

12. A dingy according to any preceding claim wherein one or more reinforcing straps are provided, the straps extending along the trunk and across the body of the dingy.

13. A dingy according to any preceding claim having a cover, securable by a fastener, for stowing the trunk when not in use.

14. A dingy according for any preceding claim whereas all components of formed from rubberised fabric.

15. A drainage device for a dingy comprising:
    a trunk having an inlet and an outlet; and
    a non-returnable valve located within the trunk;
    wherein the trunk and the valve are comprised of a flexible material.

16. A drainage device for a dingy according to Claim 15 further comprising a second non return valve within the trunk.

17. A drainage device according to Claim 16 wherein the first and second valves are rotated relative to each other.

18. A drainage device according to any of Claims 15 to 17 having a funnel connected to the inlet of the trunk.

19. A drainage device according to Claim 18 wherein the funnel mouth is reinforced by a reinforcing ring.

20. A drainage device according to any of Claims 18 or 19 wherein the funnel mouth has a diameter of 15-25cm.

21. A drainage device according to any preceding claim whereas the components are comprised of a rubberised fabric.

22. A dingy as hereinbefore described within reference to the figures.

23. A drainage device for a dingy as hereinbefore described with reference to the figures.

Abstract

Dingy with Drainage Device

A dingy having a drainage device 10 comprising a trunk 16 that defines a passageway for water between the inside and outside of the dingy. A non-return valve 18 is provided within the trunk to allow water to be evacuated from the dingy, but preventing water entering from the same passage.

Figure 3

3 pages of drawings follow

* * * * * * * * * *

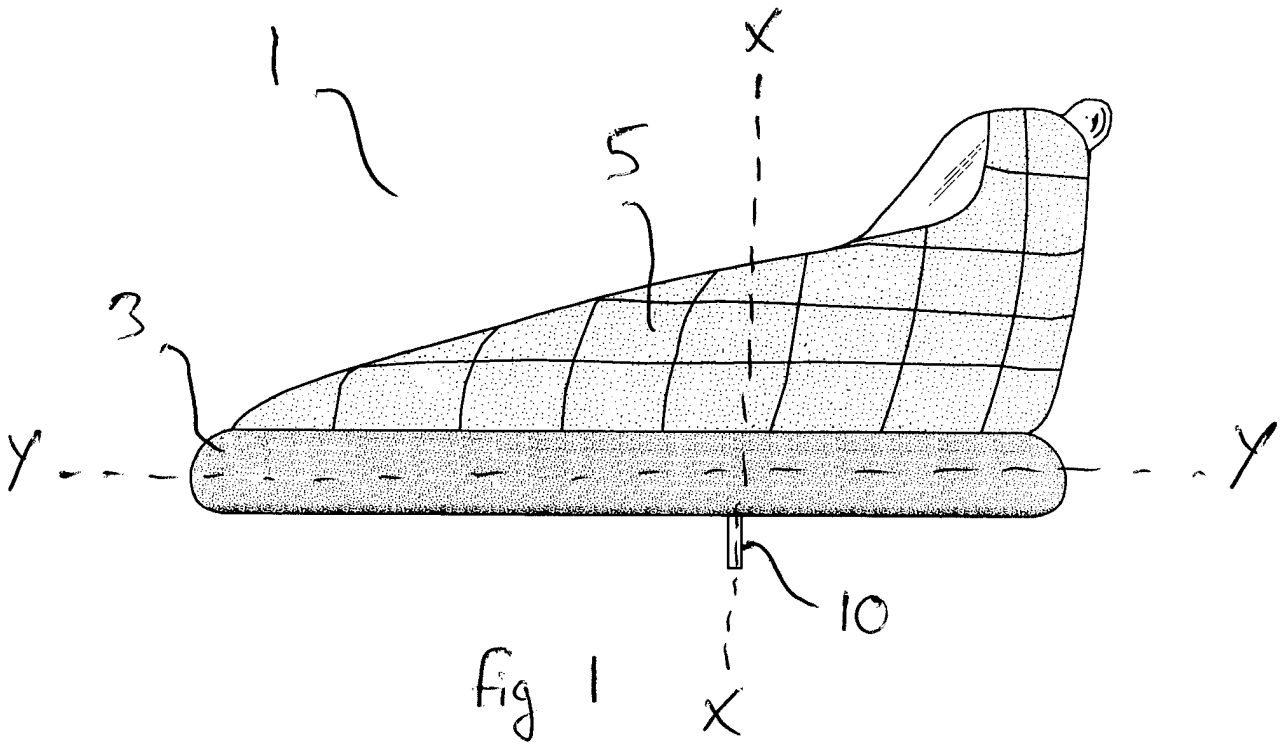

fig 1

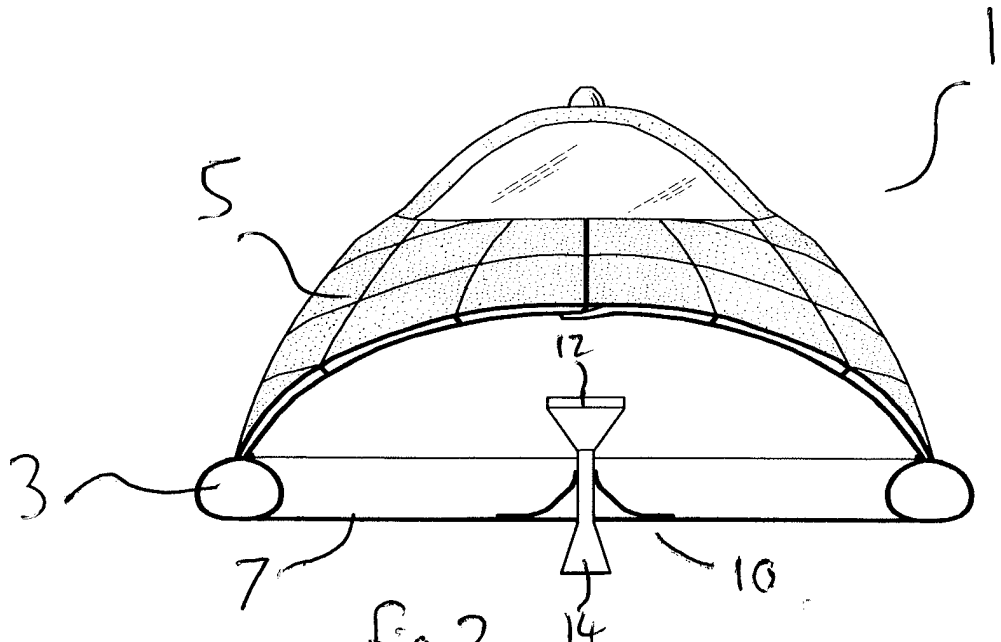

fig 2

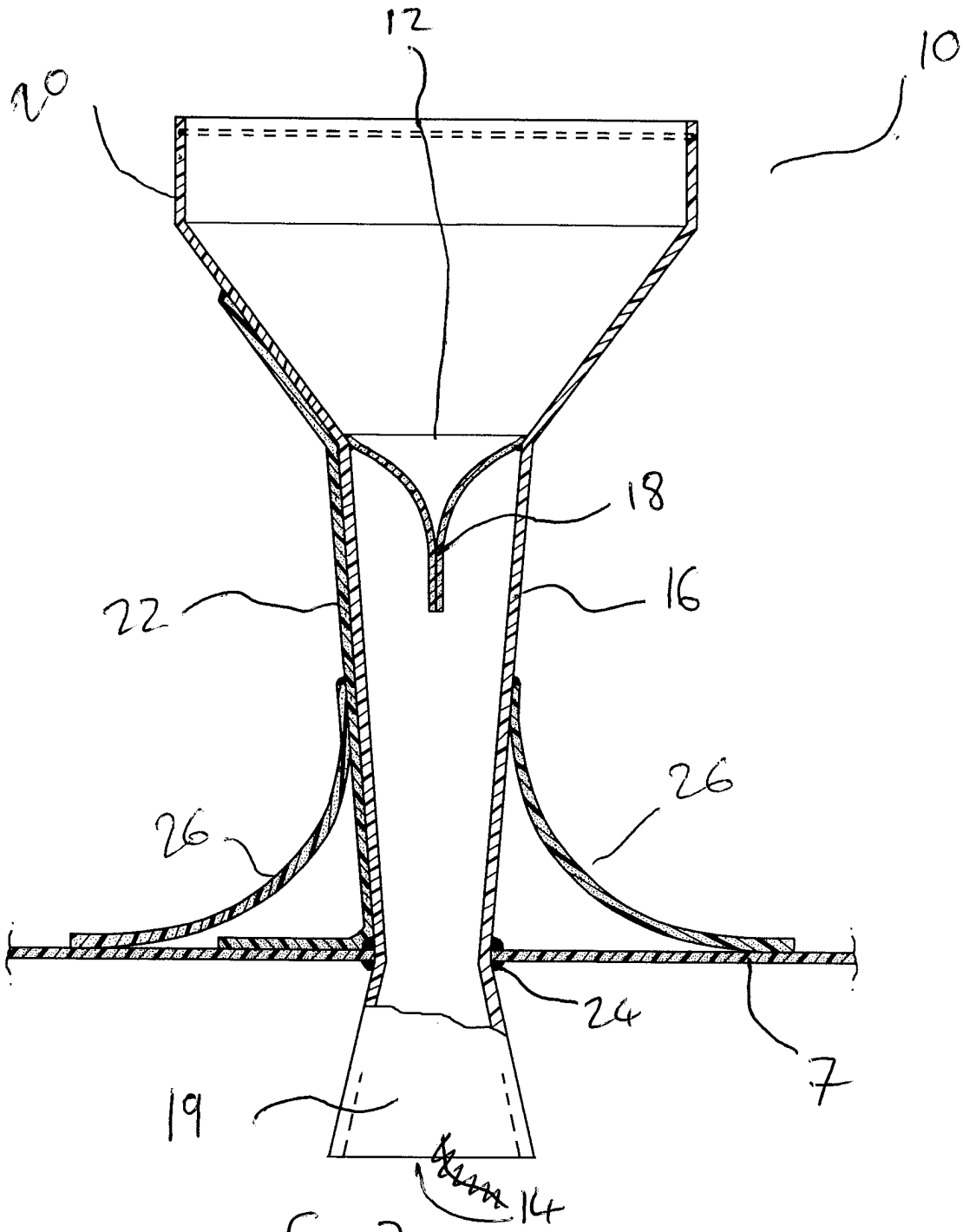

fig 3

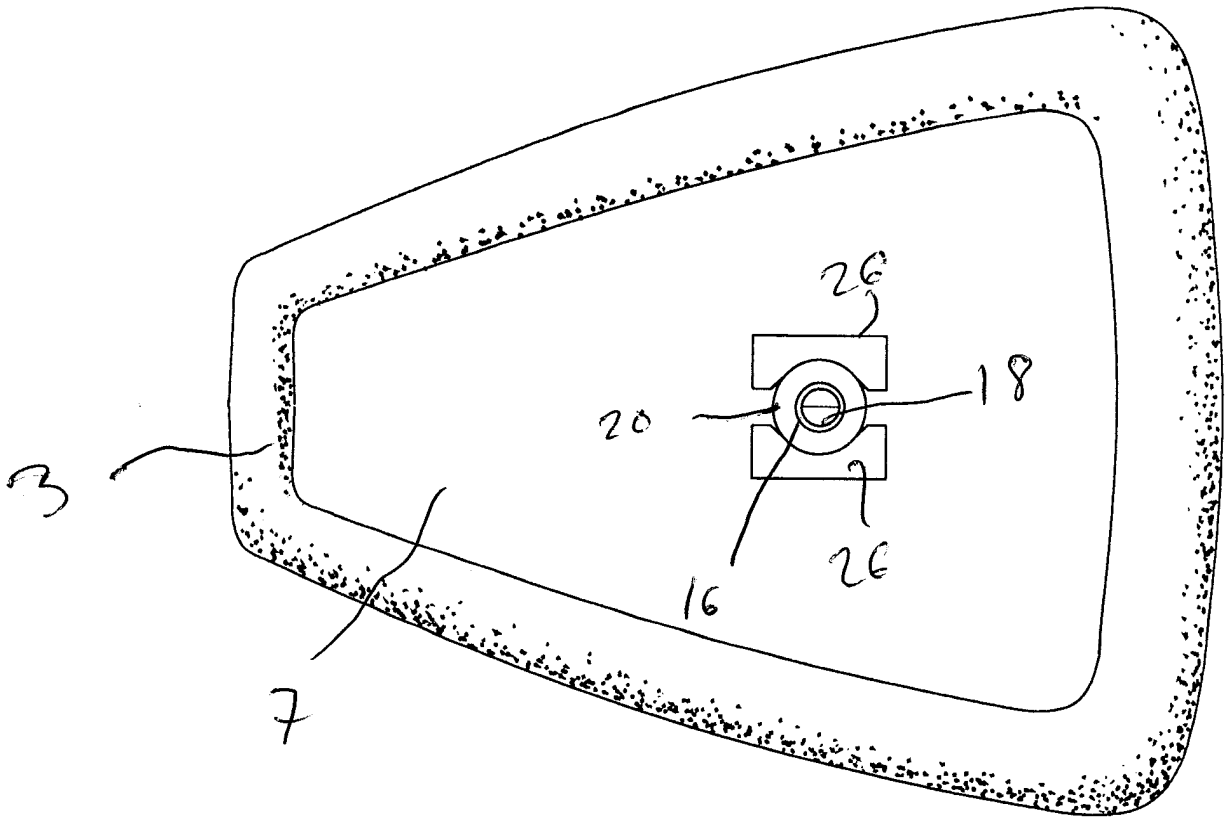

fig 4

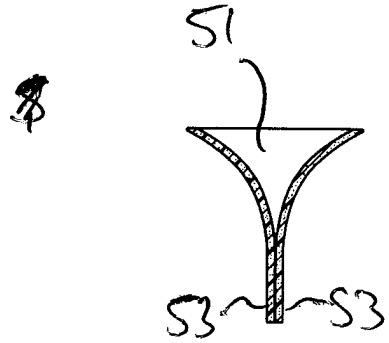

fig 5A

fig 5B

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SAMPLE SCRIPT B

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A Bailing Device

The present invention relates to a bailing device for use at sea, in particular to a device for removing water from an inflatable dinghy.

It is a well known problem that ships must avoid filling with water to avoid sinking. Accordingly, small boats commonly use a cup or a bucket to bail water over the side of the boat or, if the boat is stored on land, a plugable drain hole through which unwanted sea water can be drained without bailing or rotating the boat.

For larger ships which are never lifted from the water, manually or electrically driven bilge pumps are commonly used to remove any unwanted sea water by pumping it over the side of the ship.

Inflatable survival dinghies are used to help stranded mariners or ejected pilots survive at sea. Since it is necessary to allow the dinghy to inflate before climbing aboard it is often the case that the survivor must clamber into the dinghy while wet from the sea. This introduces a large amount of undesirable sea water into the dinghy.

In a conventional survival dinghy there is provided a lightweight fabric bailing scoop and a sponge to remove as much water as possible. This is essential since being wet increased the likelihood that the survivor will suffer from exposure. Commonly dinghys have inflatable canopies to reduce the exposure experienced.

Unfortunately, using a bailing cup requires the survivor to lean out of the canopy, which, since it is open, can allow even more water in. Furthermore, even where there is no canopy the bailing action increases the likelihood of the dinghy capsizing as the survivor bails over the side.

Accordingly, there exist a desire for a simple bailing device that can be operated from within a closed canopy or at least that does not require the user to lean over the side of the craft.

It is an object of the present invention to provide a bailing device that addresses at least some of the problems associated with the prior art.

Accordingly, in a first aspect the present invention provides a bailing device according to Claim 1. The combination of the scoop in fluid communication with a non-return valve allows water to be forced out of the dinghy. The device is to be installed in the floor of the dinghy so that the non-return valve has an outlet outside the dinghy. Advantageously, there is therefore, no need for a bailer to lean overboard when bailing or to open the canopy of a canopied-dinghy when bailing.

If should be understood that “forced through” includes the action of gravitational force acting on collected water when it is raised above sea level and also any force exerted by the user on the scoop to squeeze water through the non-return valve.

A scoop may be flexible or rigid but includes a least a mouth through which water can be collected and passed to the non-return valve.

Preferably, the scoop comprises on elongate trunk section connecting the mouth of the scoop to the non-return value. By having a elongate trunk, the scoop may be used to bail any portion of the dinghy. Furthermore, it allows the scoop to be raised up and thus gravitational force on water within the trunk of the scoop will force it through the non-return valve. It also, advantageously, provides a section upon which a user can provide a compressive/squeezing force to drive water through the non-return valve.

Preferably, the trunk comprises one or more reinforcing straps. These preferably extend the length of the trunk. At least they reinforce the connection of the scoop to the dinghy. This is advantageous since a user, especially if panicked, may yank overly hard on the scoop when bailing quickly. This could disastrously disconnect the scoop from the dingy and could even tear a hole in the dinghy floor. The straps are preferably made of the same material as the trunk for simplicity of manufacture and are preferably welded, glued and/or sewn to the trunk and/or dinghy.

Preferably the mouth of the scoop is provided with a rim reinforced with a plastic or metal ring. Since the scoop is preferably made of a flexible material, the inclusion of a firm rim allows for easier handling of the scoop, particularly when it is operated one-handed. It also allows for the scoop to be pushed along the bottom of the dingy more easily.

Any non-return valve may be used in the device of the present invention. However, a particularly preferred one, used on sink outlets in the army (sinks not being suitable for use as a scoop!) comprises two facing panels formed from an end of the scoop (the end distal from the mouth of the scoop) arranged so that, when submerged in water, the pressure of the surrounding water urges the panels together. In this way, water passing from the scoop forces the panels apart which then close backup preventing water ingress. This simple design using the material of the scoop allows for easy and cheap manufacture of the device of the present invention.

Preferably the bailing device comprises a second non-return valve in addition to the non-return valve recited in Claim 1 (the first one). This valve is preferably located close to the mouth of the scoop and, indeed, it may be desirable to have one non-routine valve at each end of an elongate trunk position formed from the scoop. In this way a peristaltic force (much like swallowing) can be exerted to remove water from a dinghy.

Water from the scoop can pass readily past the upper non-return valve, but may struggle to pass through the lower which may be held closed by sea water pressure (if the valve is not held above the water, which advantageously it is). By applying pressure to the scoop, the water is then forced through the lower non-return valve to the sea since it cannot pass through the upper non-return valve.

When using the above described two panel non-return valves for the first and second non-return valves it is preferred that they are provided with a relative rotational stagger. This is because a transverse squeeze on the valve could cause it to open in use. Providing a stagger prevents both valves opening in this way in use when squeezed by the user.

Preferably the scoop is formed from a synthetic rubber reinforced with a woven fabric. Preferably this is the same material as the dinghy in which it is installed. Use of the reinforced synthetic rubber allows the device to be lightweight, cheap and easy to construct.

According to a second aspect of the present invention there is provided an inflatable dinghy having a bailing device according to the first aspect of the present invention installed therein.

Preferably the device is installed in the floor of the dinghy. However it should be appreciated that, providing a sufficient length of trunk is used to connect the scoop to the non-return valve it is possible for the valve outlet to be located on any surface of the dinghy. For ease of operation it is preferred that the device is installed in the middle of the dinghy floor.

Preferably the dinghy comprises a sealable cover under which the bailing service may be stored when not in use. This provides added security against water ingress after bailing is finished. The cover may, for example be sealed with Velcro. [RTM]

The invention will now be described with reference to the following figures, provided by way of example, in which

Figure 1 shows a side view of an inflatable dinghy fitted with a bailing device according to an embodiment of the present invention;

Figure 2 shows a cross-sectional front view of the dinghy shown in Figure 1;

Figure 3 shows a cross-sectional view of an embodiment of the bailing device of the present invention when installed on the dinghy floor, including a partial cut-away of a non-return valve.

Figure 4 shows a top down view of a dinghy without a canopy, fitted with a device according to an embodiment of the present invention;

Figure 5a shows a cross-sectional view of a non-return valve suitable for use in the present invention; and

Figure 5b shows a perspective view of the non-return valve shown in Figure 5a.

Figure 1 shows the key features of an inflated dinghy 1. The dinghy 1 is made entirely from a synthetic rubber reinforced with a woven fabric. The dinghy 1 has an inflated rim 3 around the periphery, across which is stretched the floor 5 of the dinghy. The dinghy 1 has an inflated quilted canopy 7 attached to the rim 3 and defining an internal space 9 for a survivor to sit in. The canopy 7 has a transparent window 11 so that a survivor (not shown) can watch for rescue. The canopy 7 also has a light 13 at the highest point to aid any rescuers searching for the dinghy 1. An outlet 15 protruding from the middle of floor 5 is also shown.

Figure 2 shows a frontal cross-section of the dinghy 1. The canopy 7 has an opening 17 which is shown in its sealed configuration, closed by Velcro[RTM]. Figure 2 also shows the bailing device 19 of the invention.

The bailing device 19 is installed in the middle of the floor 5. It has a scoop 21 comprising a funnel shaped head 21a with a metal reinforced circular rim 23, and a tube section 21b which connects the head 21a to the outlet 15 via a non-return valve 25 (not shown in this figure). The head 21a and the tube section 21b are flexible and maybe collapsed and stored under the Velcro[RTM] sealable flaps 27a and 27b which are attached to the floor 5.

Figure 3 shows a bailing device 19 installed in the floor of a dinghy 1. This figure clearly shows the non-return valve 25 which is formed from material at the end of the tube section 21b by flattening it and holding it in a flat form with stitching 29 along either side of the valve 25.

The valve 25 is arranged so that it passes through a hole 33 formed in the floor 5 of the dinghy 1. The valve 25 is sealed to the floor 5 with welds 31.

A reinforcing strip 35 is adhered to the floor 5 of the dinghy 1 and extends along the tube section 21b and part-way up the head 21a. It is adhered all the way along its length.

Figure 3 shows a particular embodiment having a further non-valve 37 located at the interface of the head 21a and the tube section 21b. The further non-return valve has two panels (37a, 37b) shown in cross-section which resist water flowing up the tube section 21b.

Of note, the total height of the device 19 is around 30cm when fully taut from the floor 5 of the dinghy 1. The circular rim 23 describes a diameter of around 20cm.

In use, the scoop 21 is manipulated by a user sitting in the dinghy 1 to capture water in the head 21a. By lifting the head 21a to pull the device 19 taut from the floor 5, the water will pass through the panels (37a, 37b) of the further non-return valve 37 into the tube section 21b. If the user pushes down on the device 19 or squeezes the tube section 21b in any other way then any water remaining in the tube section 21b will be forced through the hole 33 into the non-return valve 25 and out of the dinghy 1 through the outlet 15.

Figure 4 shows a top down view of the Device 19 in a dinghy 1 without a canopy 7. As can be seen, the flaps 27a and 27b are sufficiently flexible that in use they simply rest against the sides of the device 19 when it is unstowed for use.

Figures 5a and 5b show different views of a non-return valve 25. The valve 25 works because the force B exerted by the seawater keeps the panels 39 of the valve 25 closed unless a greater force A is applied so that water exits between the panels 39. Once force A diminishes, forces B close the panels 39 and prevent ingress of water. There is a risk that force B could be sufficient to invert the panels 39 and for water to enter. This is why the edges of the valve 25 are stitched with stitches 29 to strengthen the valve.

It is not intended that the device of the present invention be limited to the foregoing device and indeed, various variations can be contemplated.

In particular, the dimensions can be varied It is preferred that the total device 19 height is form 25 to 35cm and the rim 23 diameter from 15cm to 25cm.

Although the tube section 21b shown as tapered, it does not need to be. More than one reinforcing strip 35 can of course be used. The hole 33 through which the device 19 is installed need not be on the floor 5 of the dinghy 1.

Furthermore, the device is suitable for installation in non-inflatable boats as well as dinghys, such as rowing boats and rigid lifeboats.

It does not need to be installed in the middle of the floor.

Claims:

1. A bailing device for installation in the floor of a dinghy, the device comprising;
   a scoop having a mouth; and

a non-return valve in fluid communication with the scoop

arranged so that, in use, water collected in the scoop can be forced through the non-valve and out of the dinghy.

2. A bailing device according to Claim 1 wherein the scoop comprises an elongate trunk section connecting the mouth of the scoop to the non-return valve.

3. A bailing device according to Claim 2 wherein the elongate trunk further comprises at least one reinforcing straps which, in use, reinforce the connection of the scoop to the dinghy.

4. A bailing device according to any of the preceding claims wherein the mouth of the scoop has a reinforced rim, reinforced with a plastic or metal ring.

5. A bailing device according to any of the preceding claims wherein the non-return valve comprises two facing panels formed from an end of the scoop arranged so that, when submerged in water, the pressure of the surrounding water urges the panels together.

6. A bailing device according to any of the preceding claims wherein the device further comprises a second non-return valve in fluid communication with the first non-return valve.

7. A bailing device according to Claim 5 wherein the device further comprises a second non-return valve in fluid communication with the first non-return valve and wherein the first non-return valve is arranged with a rotational stagger relative to the second non-return valve.

8. A bailing device according to any of the proceeding claims wherein the scoop is formed from a synthetic rubber reinforced with a woven fabric.

9. An inflatable dinghy comprising a bailing device according to any of the preceding claims installed therein.

10. An inflatable dinghy according to Claim 9 further comprising a sealable cover under which the bailing device may be stored when not in use.

11. A bailing device substantially as described herein with reference to figures 1 to 4, 5a and 5b.

Abstract

A Bailing Device

A bailing device 19 having a scoop 21 connected to a non-return valve 25 located in the floor 5 of a dinghy 1 is provided. The device 19 allows for simple removal of water from the dinghy 1 while minimising the users exposure to the sea elements.
<Figure 3>

3 pages of drawings follow

* * * * * * * * * *

Fig 1.

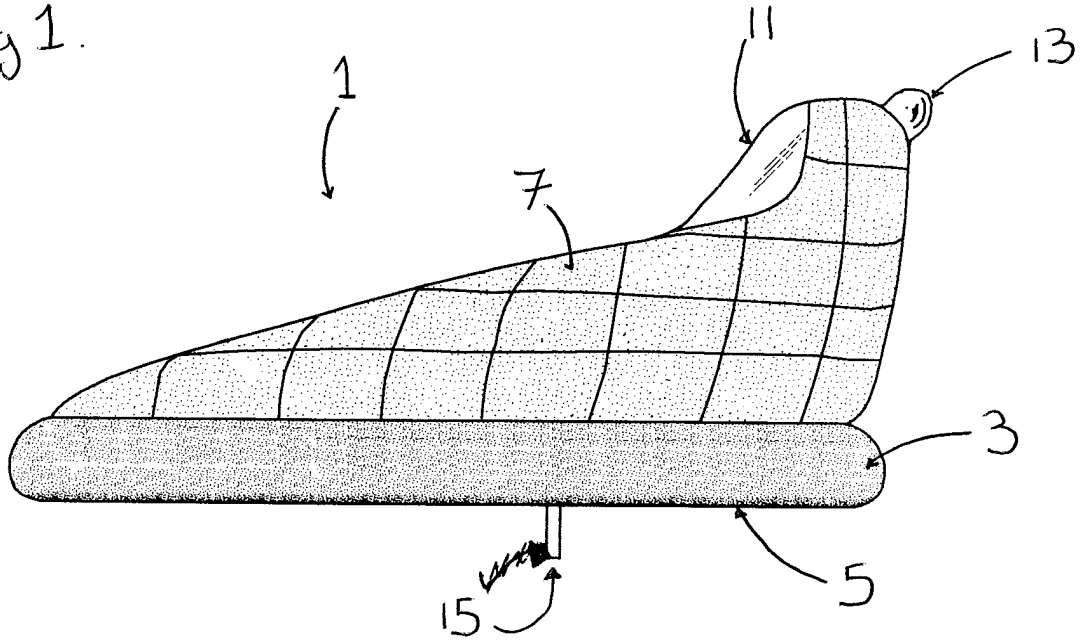


Fig 2.

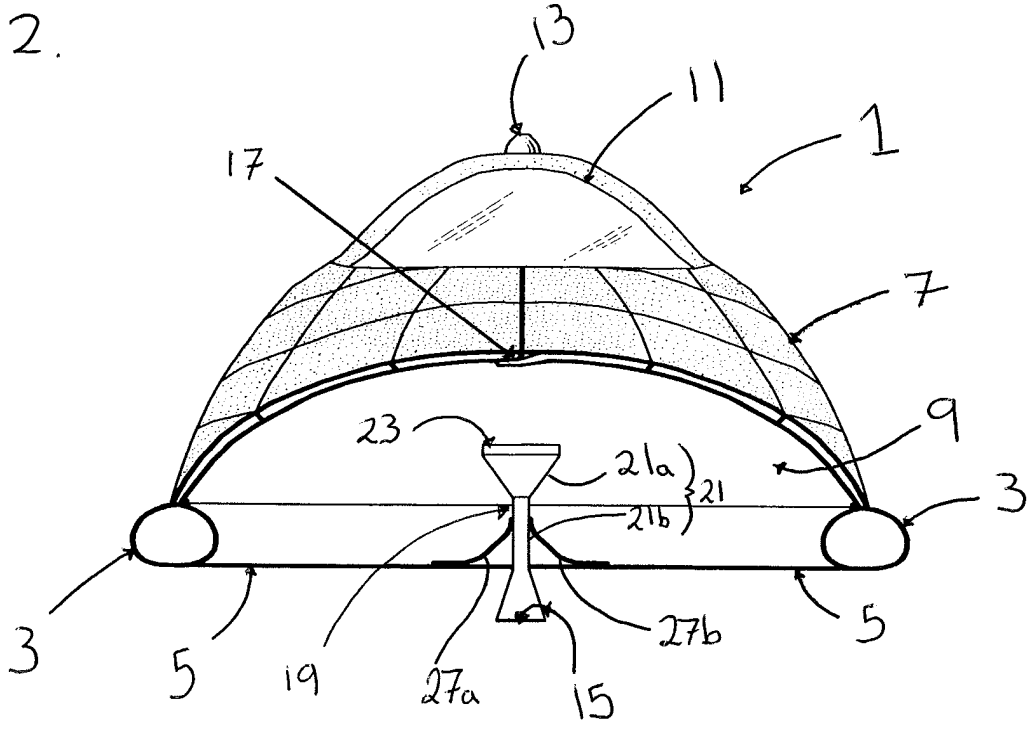


Fig 3.

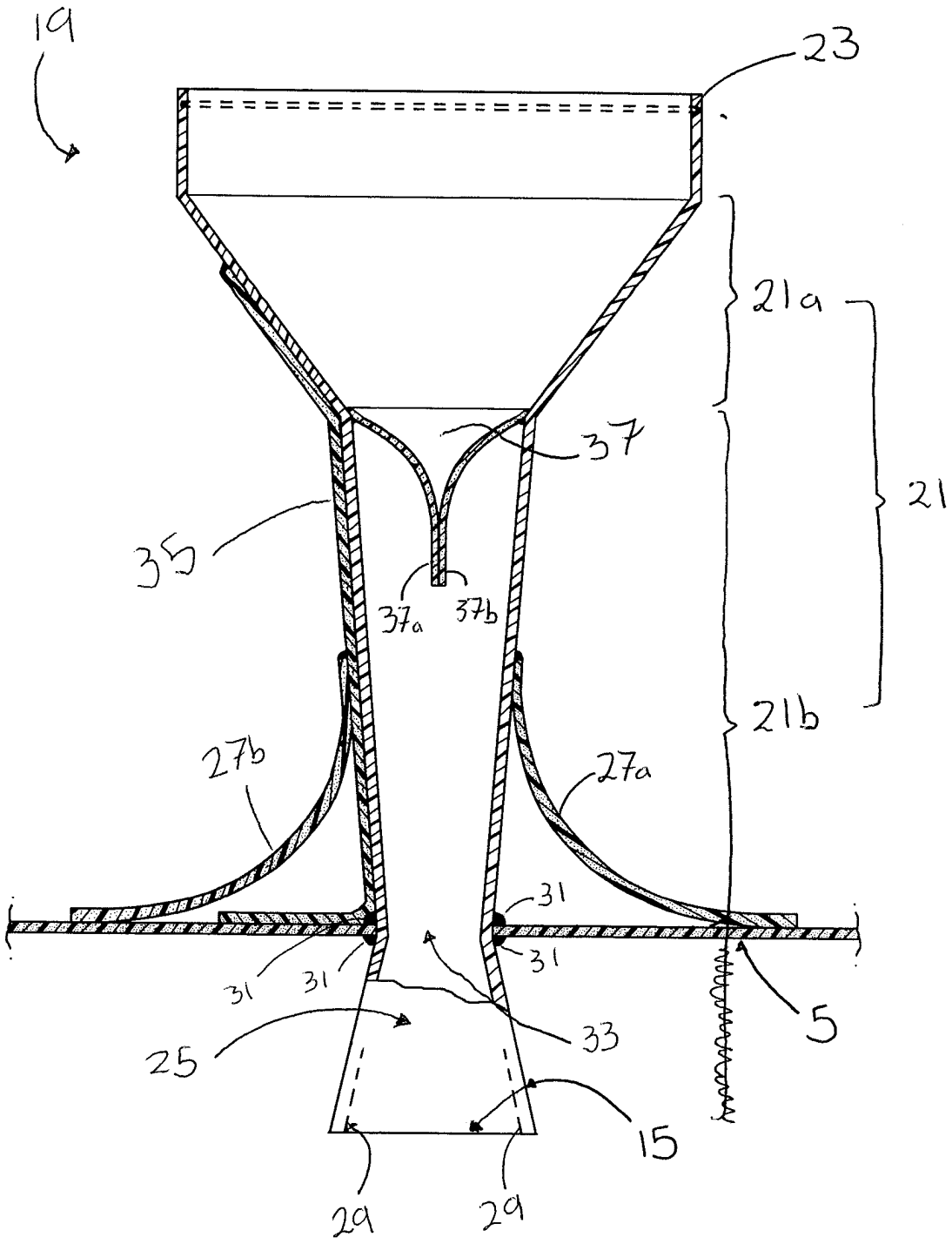


Fig. 4

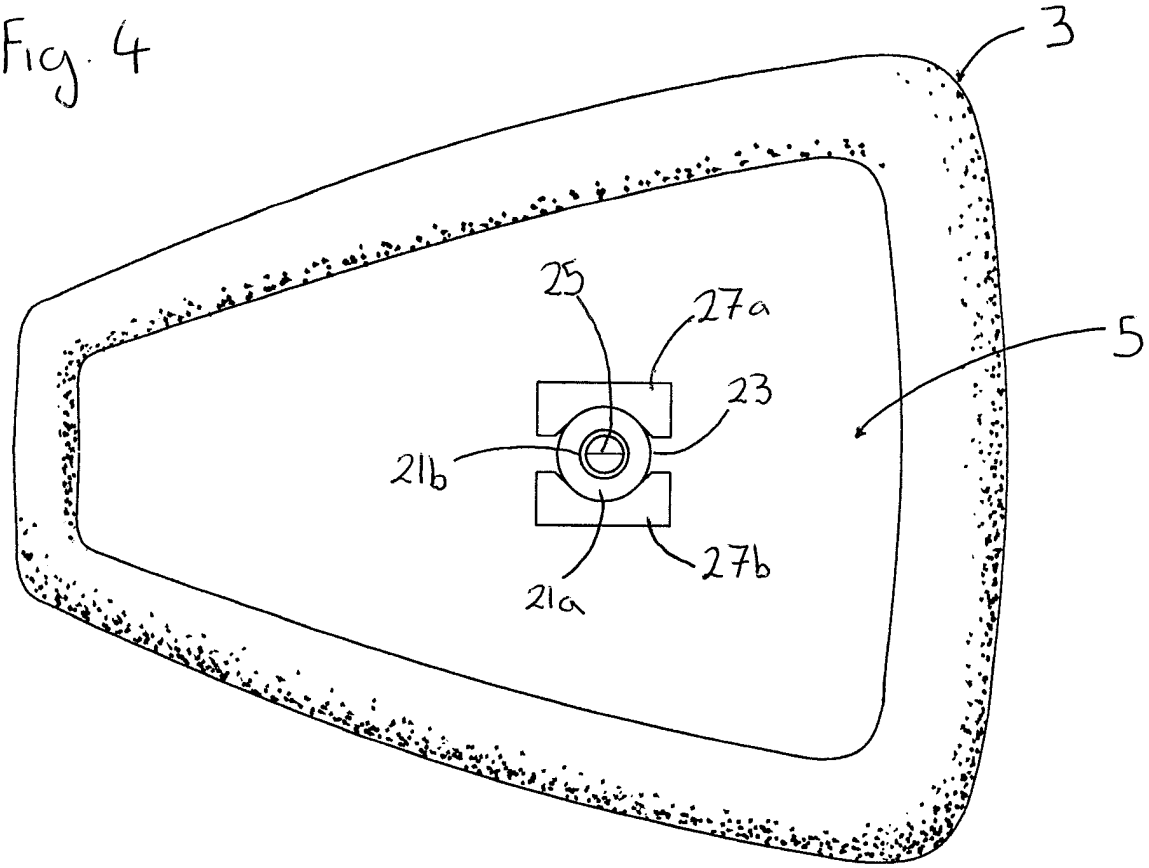


Fig 5a.

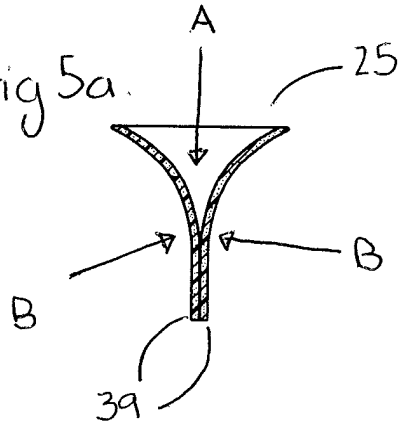
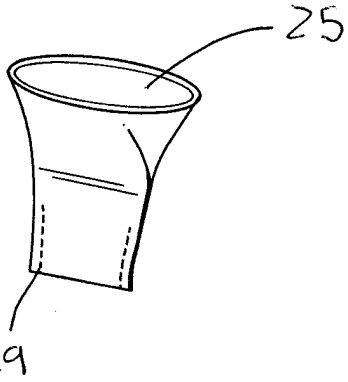


Fig 5b.



2009 PAPER P3

SAMPLE SCRIPT C

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Bailing Pump

The present invention relates to a bailing pump and particularly to a bailing pump for an inflatable dinghy.

Small craft such as inflatable dinghies sit low on the water so that wind and waves can cause water to lap over the side and water-log the craft. This is a particular problem for survival dinghies, which are typically deployed in rough weather and need to keep occupants afloat and preferably dry in such conditions.

It is known to provide an inflatable dinghy with a pan-shaped fabric scoop for the occupant to bail water out over the side. However, especially in a survival scenario, water can re-enter the dinghy faster than the occupant can bail. Survival dinghies are often equipped with a canopy for the express purpose of keeping out water; but this, of course, needs to be opened to bail water using the known bailer-scoop. Furthermore, the scoop may be lost overboard.

According to an aspect of the present invention, there is provided [Claim 1].

This bailing pump can be installed in a dinghy (either as a retro-fit device, or by being manufactured as an integral part of the dinghy) to enable an occupant to bail water by manual pumping instead of scooping. This means that if the dinghy has a cover, it is no longer necessary to open this to eject water from the craft.

The non-return exit valve provides for one-way passage of water out of the boat, while preventing ingress of water from outside.

The chamber defined by the trunk creates (when its mouth is closed) a compressible volume which can be squeezed to create the pressure differential necessary to operate the non-return valve.

Preferably, the durable mouth of the trunk has a non-return entry valve.

This prevents water to be bailed from being expelled back into the boat when the trunk is compressed. It may also permit the pump to be operated with one hand, instead of two.

Preferably, the non-return valve or valves are fabric valves.

Fabric valves mean that the pump is both light and can be stored in a folded or rolled configuration occupying minimal space when the pump is not in use. These benefits are particularly important in a survival dinghy, which is itself usually stowed deflated and folded until it is required.

When both valves are fabric valves, they may be arranged one above the other and substantially perpendicular in horizontal orientation.

This means that a squeezing action in one vertical plane tends to open one valve while squeezing the other shut. This is beneficial because it is desirable not to allow both valves to open at the same time (as this could allow back-flow of water through the pump).

The pump may have a funnel in fluid communication with the closable mouth, for scooping up water to be bailed.

The rim of the funnel is wide than the mouth of the trunk, in this variation, so it makes it easier to scoop water.

The funnel is preferably formed of flexible waterproof material. The benefits of flexibility are similar to those for flexibility of the values, when fabric valves are used.

The funnel may be formed of the same material as the trunk and/or the fabric valves. It may have a rigidly reinforced rim to help keep it open for scooping water.

According to another aspect of the invention there is provided an inflatable dinghy comprising a bailing pump as described above.

The pump may be installed in the floor of the inflatable dinghy such that the non-return exit valve is under water when afloat.

The external water pressure can then help to keep this valve closed. By locating the pump in the floor, it is easy to collect water to be bailed in the trunk, ready for expulsion via the exit valve.

There may be a reinforcing strap connecting the trunk to the floor, for relieving tensile forces on the trunk when in use.

It is natural, when bailing frantically to pull on the trunk when trying to fill it with water. A reinforcing strap helps prevent damage to the pump, or its detachment from the floor of the dinghy.

It may be beneficial to provide a cover for stowing the pump when not in use – preferably a fastenable cover.

As well as the convenience of keeping the pump neatly stowed, this can bring additional security by preventing water ingress through the valve (or valves) when not bailing.

Most preferably, the dinghy is a survival dinghy suitable for one occupant and having a canopy for preventing water ingress from over the side (or from above).

The pump is then preferably located centrally in the floor of the dinghy such that it is between the thighs of the occupant when sitting in the dinghy. This allows convenience access to the pumps for both operation and inspection (when not bailing).

The invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a vertical section through a bailing pump according to an embodiment of the invention;

Figure 2 has a personal survival dinghy having the bailing pump of Figure 1 installed, in side elevation;

Figure 3 is a sectional front elevation in the plane indicated 3 – 3' in Figure 2;

Figure 4 is a sectional plan view, in the plane 4 – 4' indicated in Figure 2; and

Figures 5A and 5B illustrate the basic construction of a fabric valve.

Figure 1 shows a bailing pump 5 according to an embodiment of the invention. It comprises a trunk 10 of flexible waterproof material with a non-returnable valve 20 at its lower end. The mouth 15 at the upper end of the trunk is closable, so that the trunk defines a chamber 18 for water which it is desired to pump out of the boat. The non-returnable exit valve 20 allows water to flow in one direction only – outward from the chamber 18. This enables it to expel water when the mouth 15 is closed and the trunk 10 compressed.

The trunk 10 is tubular and is installed in a dinghy 100 (see Figure 2) so that the base of the trunk passes through an opening in the floor 105 of the dingy 100. Welded seam 110 provides a water-tight connection between the trunk and floor 105. The non-return exit valve 20 projects from the floor of the dinghy so that it will be underwater when the dinghy is afloat.

In this embodiment, the closure of the upper end of the trunk 10 is aided by a second valve – non-return entry valve 30, fitted in the mouth 15. Above this mouth the trunk widens to form a funnel 50.

The funnel is thus formed of the same flexible waterproof material as the trunk 10. It has a circular mouth 54 created by a wire reinforcement 56 in the rim 55.

A flexible reinforcing strap 40 is provided on one side of the trunk 10. This extends from the floor 105 of the dinghy, up along the side of the trunk 10, to the side of the funnel 50. It is made of stronger material than the trunk or funnel and prevents damage to the latter if they are pulled excessively when in use.

Storage flaps 60a, 60b are positioned either side of the pump 5, fixed to the floor 105 of the dinghy. These lie loosely against the sides of the trunk 10 when the pump is compacted and in use. When not in use, the pump can be stowed under the flaps (e.g. by rolling or folding it up). The flaps can be secured to one another by a suitable fastener when the pump is stowed, to give additional protection against leakage of water back through the pump. Suitable fasteners include, for example, hook and loop type fastening material.

Figure 2 shows a side view of a survival dinghy 100 with the pump 5 installed. The dinghy has a canopy 120 for protecting the occupant from the elements. The non-return exit value 20 of the pump can be seen projecting below the floor of the dinghy.

Figure 3 shows the same dinghy in a sectional front elevation in the plane 3 – 3'.

Figure 4 shows a plan view looking down on the floor of the dinghy through the plane 4 – 4'.

Figure 5 illustrates a fabric value suitable for use in the pump. This comprises a cylinder of material 22 which is glued or sewn at sides 24a, b at one end. This construction tends to hold the stitched/glued end flat so that high pressure on this side of the valve tends to seal it shut. To pass fluid in the forward direction, a pressure differential must be created.

In use, the occupant of the dinghy scoops water into the mouth 15 of the trunk 10 using the funnel 50. Because of the trunk is flexible, there is a limited range of movement sufficient for this task.

The water scooped up flows freely through the valve 30 into the chamber 18 of the trunk.

The occupant now squeezes the trunk at the top end with one hand, closing the mouth 15. With the other hand the trunk is used like an udder, squeezing and comprising it, to force water out through the exit valve 20. The positive pressure created by the squeezing tends to seal the entry valve 30, aiding the closure of the mouth 15.

By repeating the process, the dinghy can be bailed from inside without opening the canopy.

As will be apparent by now, the pump is therefore particularly well suited to survival rafts.

Various modifications are possible.

The entry valve 30 can be eliminated. In this case, the user simply holds the mouth 15 shut by manual force alone.

Although shown installed with the exit valve below the waterline, this is of course not absolutely essential. Accordingly, the trunk need not be installed through the floor of the craft.

Fabric valves are lightweight, flexible and effective. However, other non-return valves may be used in their place.

The funnel mouth may be of the order of 15-25cm in diameter and the overall height of the pump inside the vessel may be similar.

The survival raft of Figures 2 – 4 may have the usual safety features, such a strobe light, windscreen etc.

Claims

1. A bailing pump for an inflatable dinghy, comprising:
   a trunk of flexible, waterproof material, defining a chamber for water;
   the trunk having a closable mouth for admitting the water and;
   a non-return exit valve for expelling the water when the mouth is closed and the trunk compressed.

2. A bailing pump according to Claim 1, wherein the closable mouth includes a non-return entry valve.

3. A bailing pump according to Claim 2, wherein the non-return entry and exit valves comprise fabric valves.

4. … according to Claim 3, wherein the fabric valves are arranged one above the other and oriented substantially perpendicularly to one another in the horizontal plane.

5. … any preceding claim, further comprising a funnel in fluid communication with the closable mouth, for scooping up water to be bailed.

6. … Claim 5, wherein the funnel is formed of flexible, waterproof material.

7. … Claim 6, wherein the rim of the funnel is reinforced to hold it open.

8. An inflatable dinghy comprising a bailing pump according to any preceding claim.

9. An inflatable dinghy according to Claim 8, wherein the pump is installed in the floor of the dinghy such that the non-return exit valve is underwater when the dinghy is afloat.

10. … Claim 8 or Claim 9, further comprising a reinforcing strap connecting the trunk of the pump to the floor of the dinghy, for relieving tensile forces on the trunk when the pump is in use.

11. … any of the Claims 8 to 10, further comprising a cover for stowing the pump when not in use.

12. … Claim 11, wherein the cover is securable by a fastener to stow the pump.

13. … any of the Claims 8 to 12, wherein the dinghy is a survival dinghy for one occupant and comprises a canopy.

14. … Claim 13, wherein the pump is located in the floor of the dinghy so as to lie between the thighs of the occupant when the dinghy is in use.

15. A bailing pump or inflatable dinghy substantially as described herein with reference to Figures 1 to 4.

Abstract

Bailing Pump

A bailing pump 5 for an inflatable dinghy 100. The pump comprises a trunk 10 of flexible waterproof material, having a closable mouth 15 for admitting water to a chamber defined by the trunk and a non-return exit valve 20 for expelling the water when the mouth is closed and the trunk compressed. This allows easy bailing of a dinghy without the need to scoop water over the side.

3 Pages of drawings follow

* * * * * * * * * *

FIG. 1

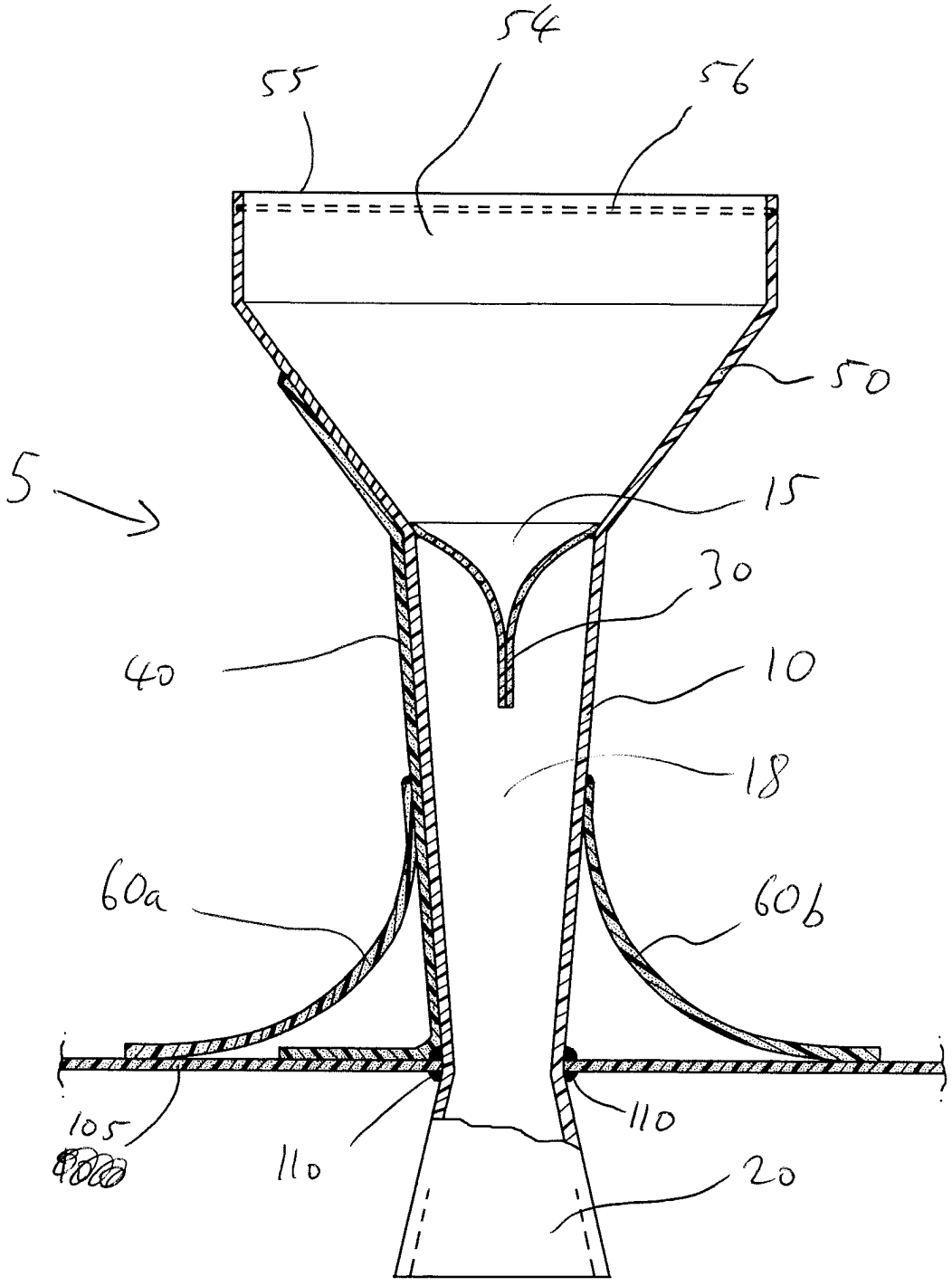

Fig. 2

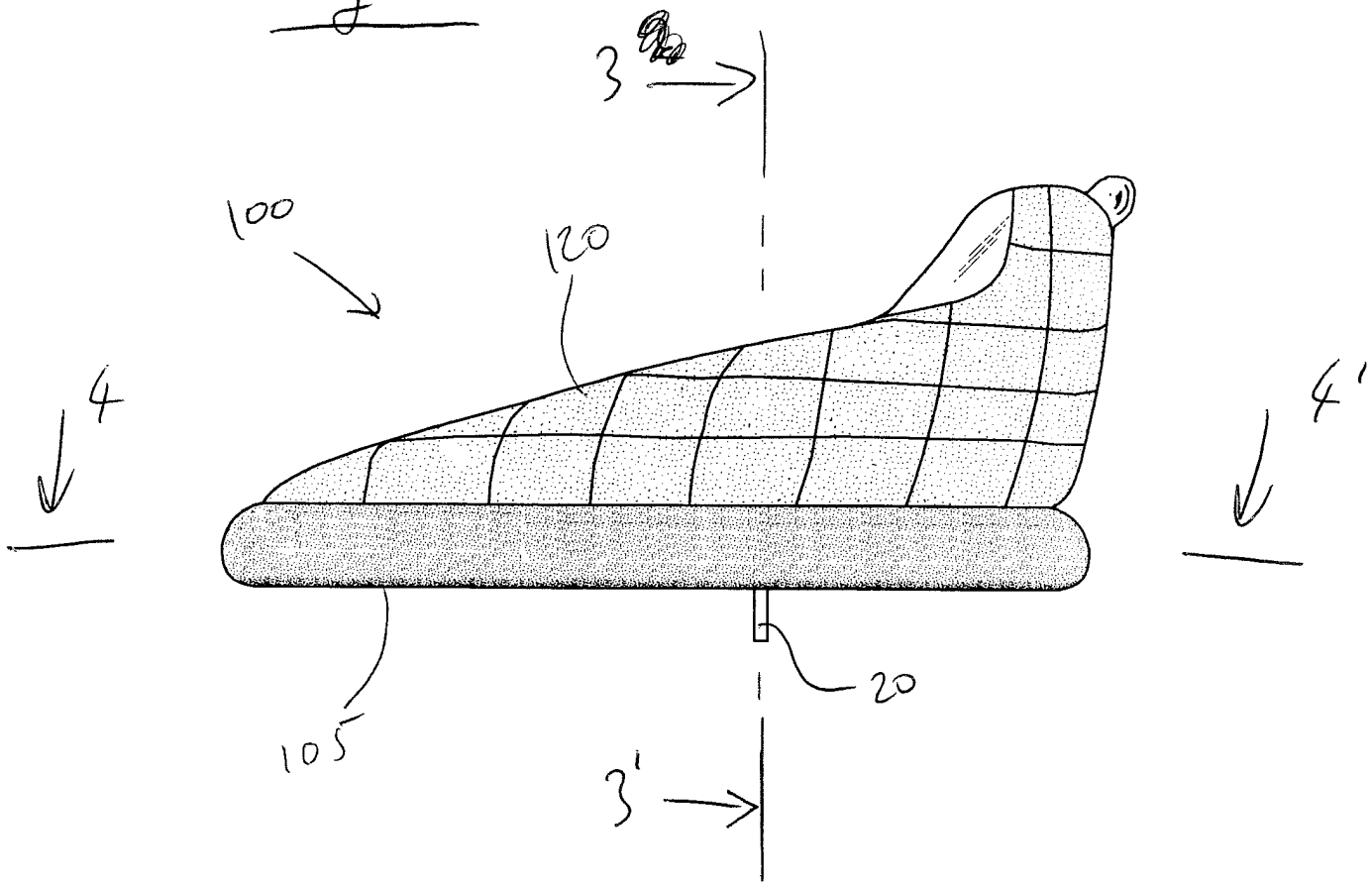

Fig. 3

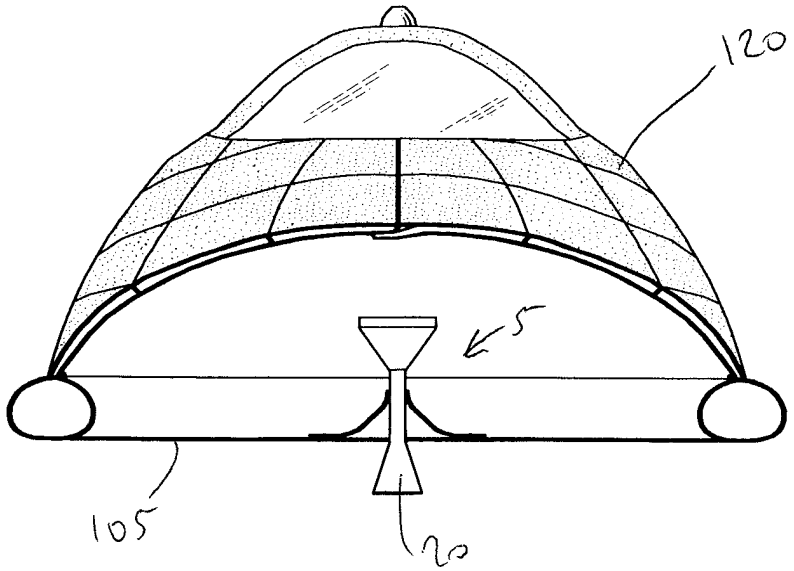

Fig. 4

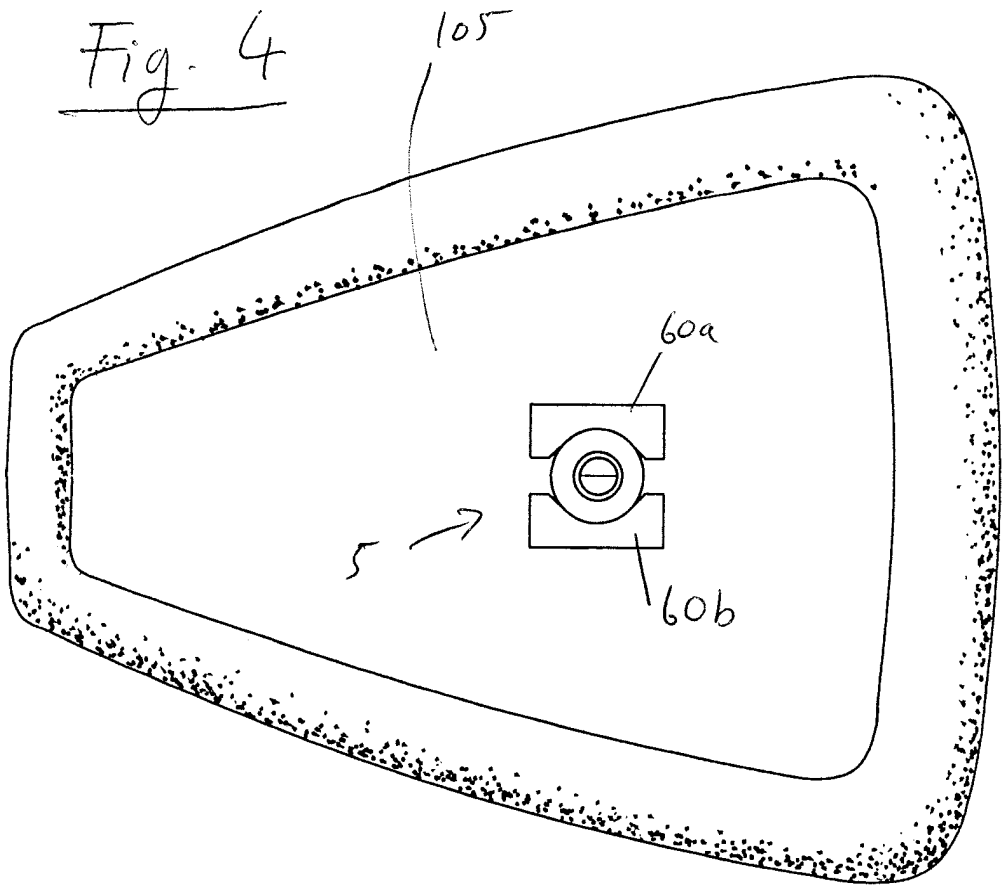

Fig. 5A

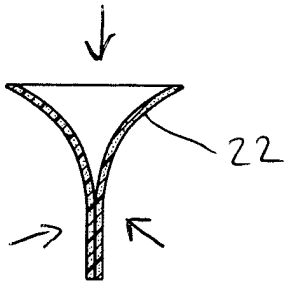

Fig. 5B