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Chaffee

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(54) **INFLATABLE DEVICE WITH RECESSED FLUID CONTROLLER AND MODIFIED ADJUSTMENT DEVICE**

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(51) **Int. Cl.**
A47C 27/08 (2006.01)

(52) **U.S. Cl.** **5/706**; 5/655.3

(58) **Field of Classification Search** 5/710, 5/713, 655.3, 711, 708, 706; 297/284.6; 137/565.16, 565.18
See application file for complete search history.

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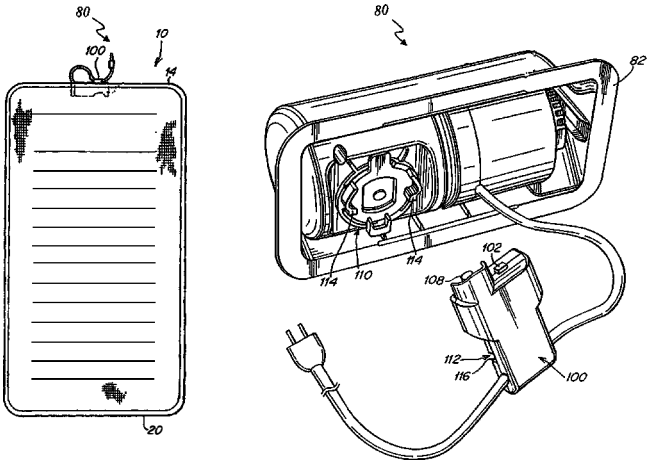
(57) **ABSTRACT**

The application is related to inflatable devices, and, more specifically, to an inflatable device with a recessed fluid controller and improved adjustment device. In one embodiment, the application is directed to an inflatable device comprising a substantially fluid impermeable bladder and a fluid controller comprising an electrically powered pump at least partly positioned within the bladder. In another embodiment, the application is directed to a combination of a fluid controller comprising an electrically powered pump and an inflatable device. The combination comprises the fluid controller connected to the inflatable device such that the exterior profile of the fluid controller and inflated inflatable device in combination is essentially the same as the exterior profile of the inflated inflatable device. In another embodiment, the application is directed to an inflatable system comprising a substantially fluid impermeable bladder and a fluid controller comprising pump in fluid communication with the bladder. The fluid controller further comprises a first locking mechanism and a adjustment device including a second locking mechanism sized and adapted to reversibly mate with the first locking mechanism.

40 Claims, 6 Drawing Sheets



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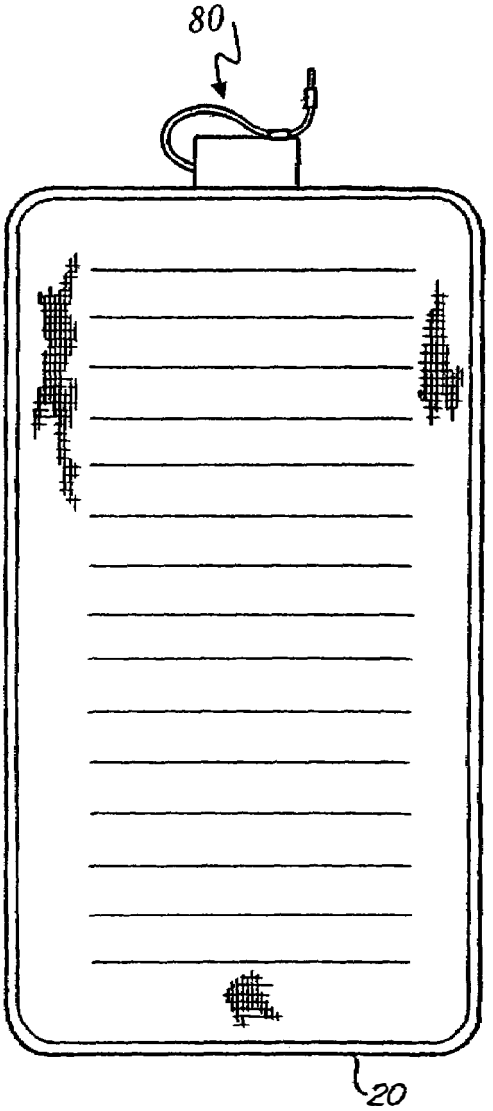

Fig. 1
(PRIOR ART)

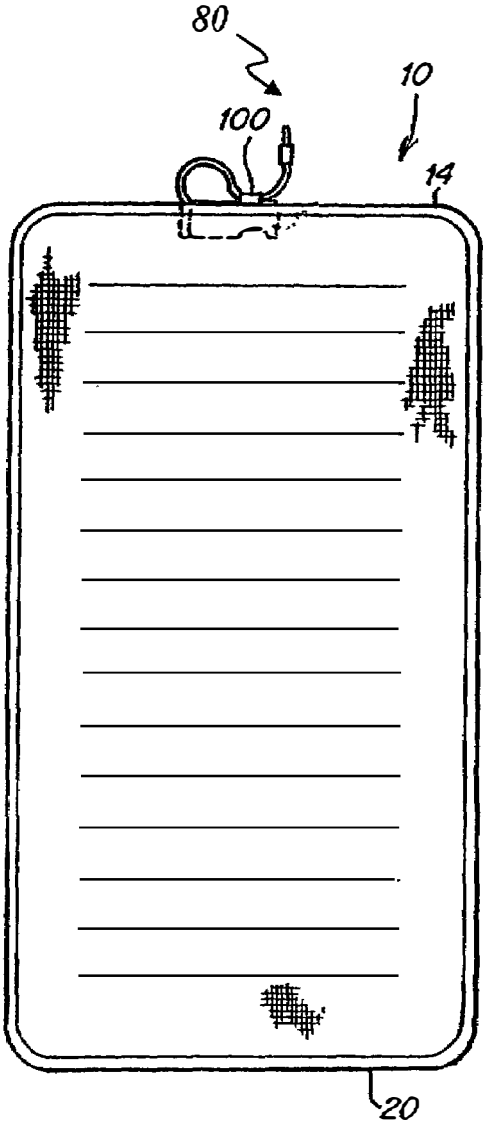

Fig. 2

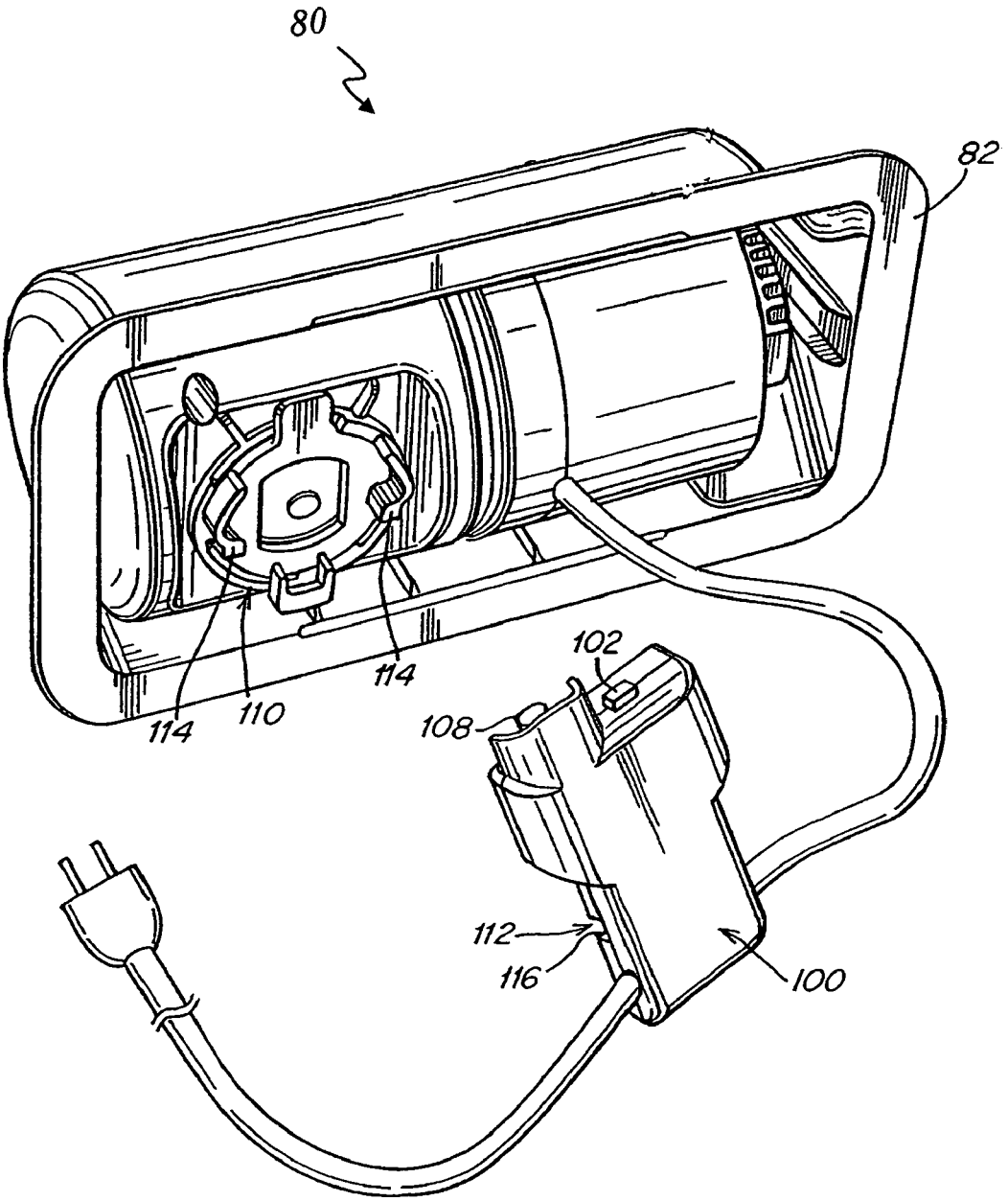

Fig. 3

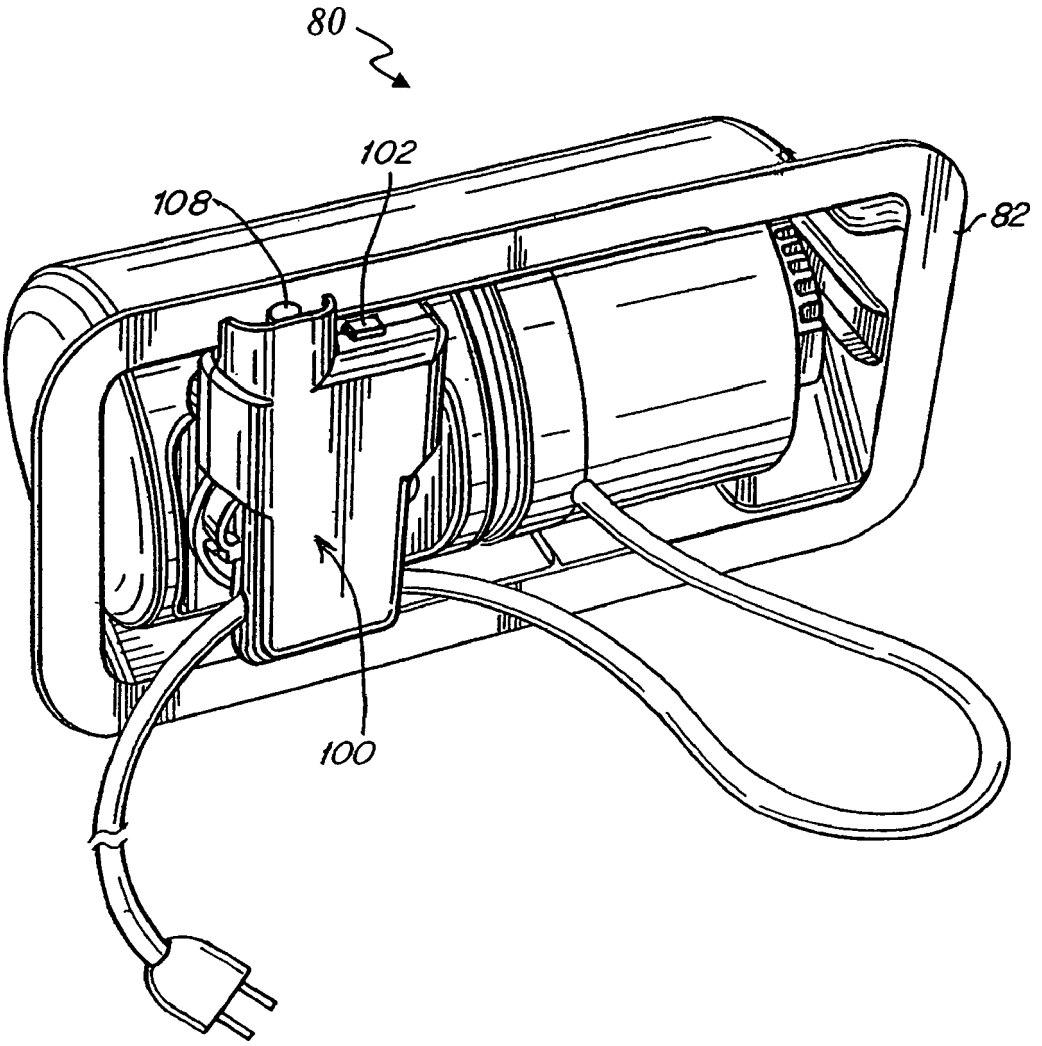

Fig. 4

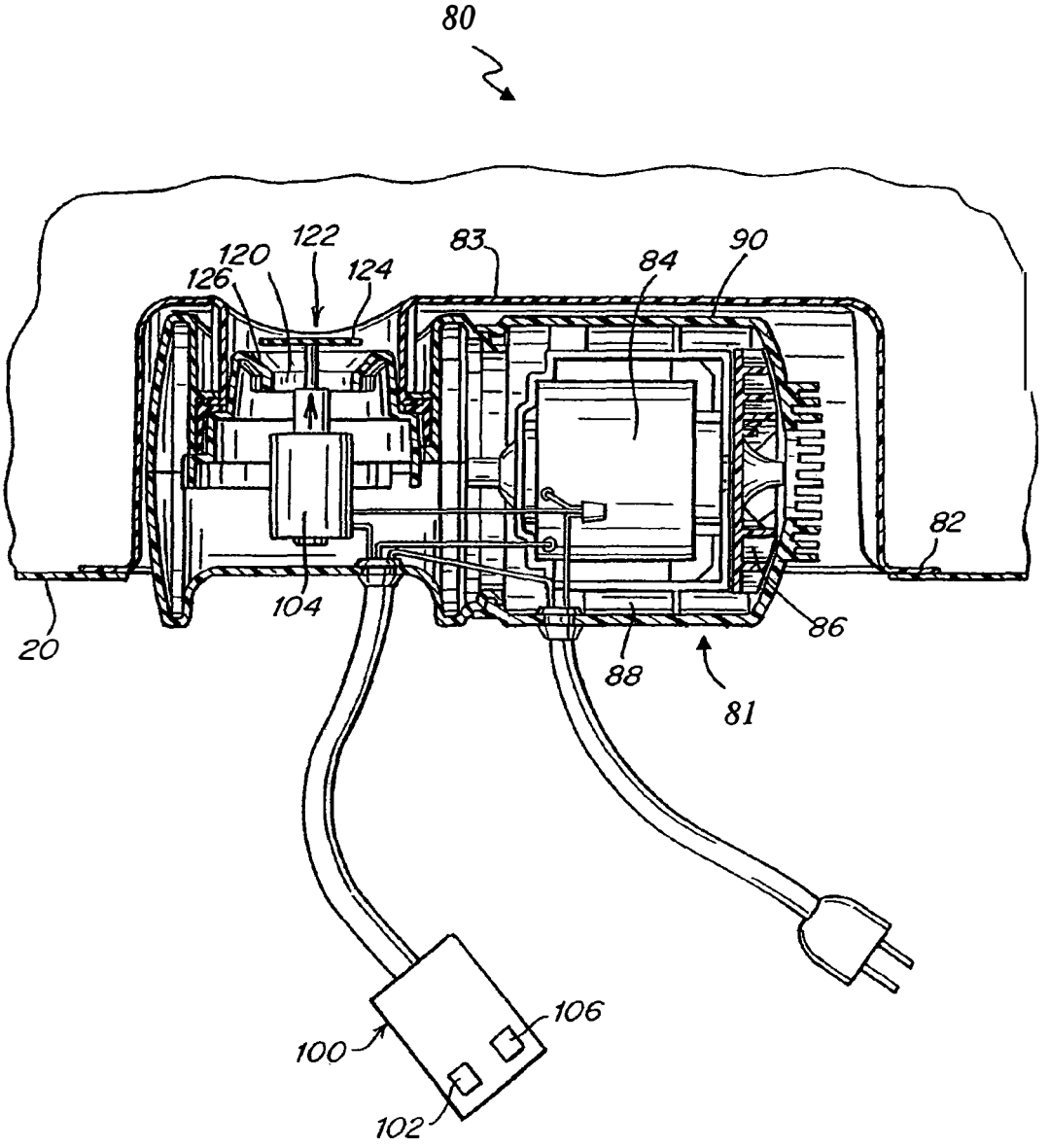

Fig. 5

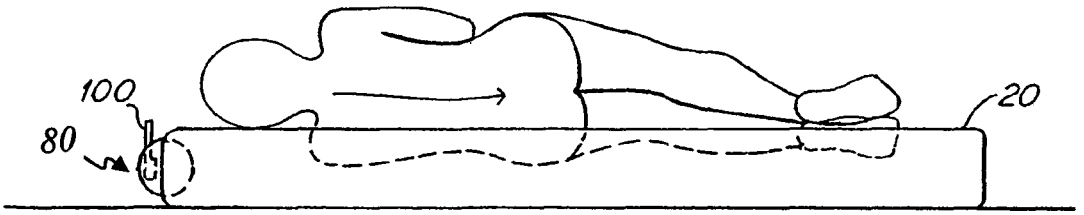

Fig. 6

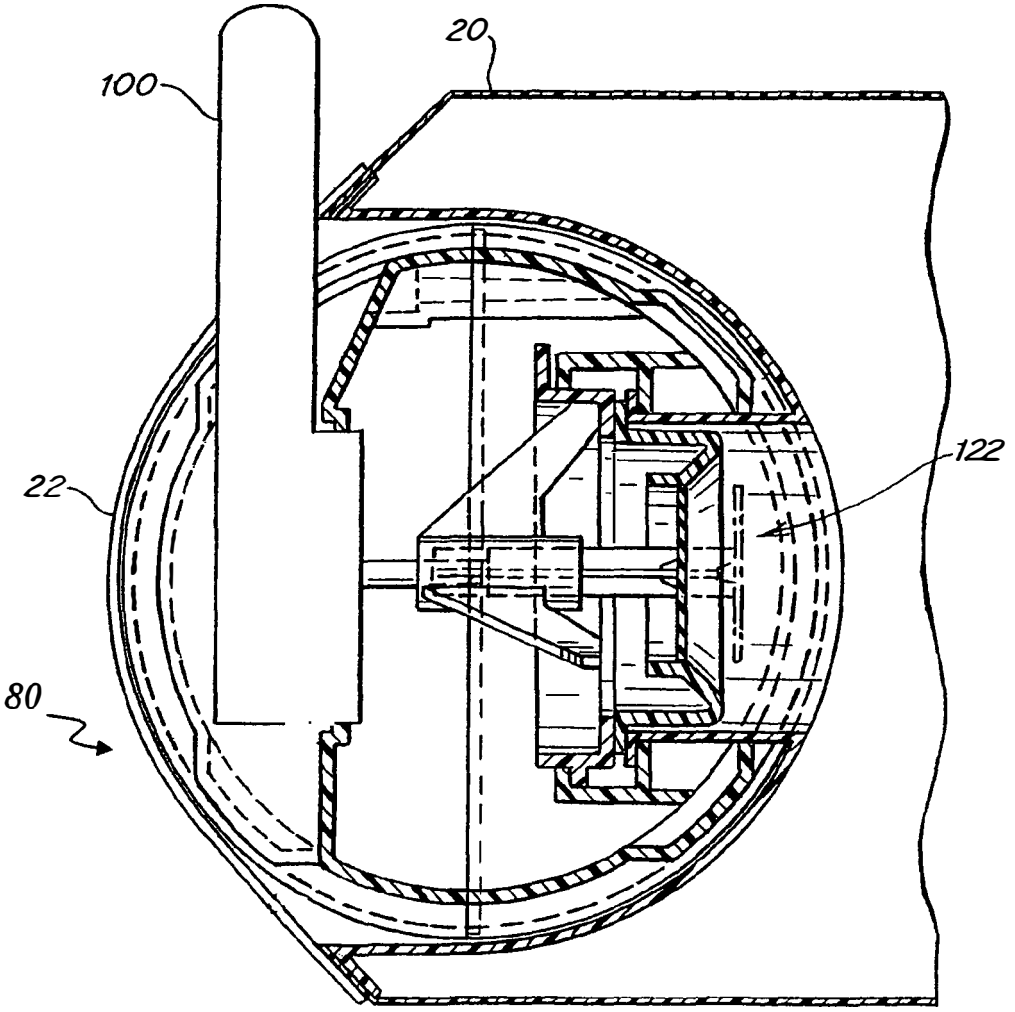

Fig. 7

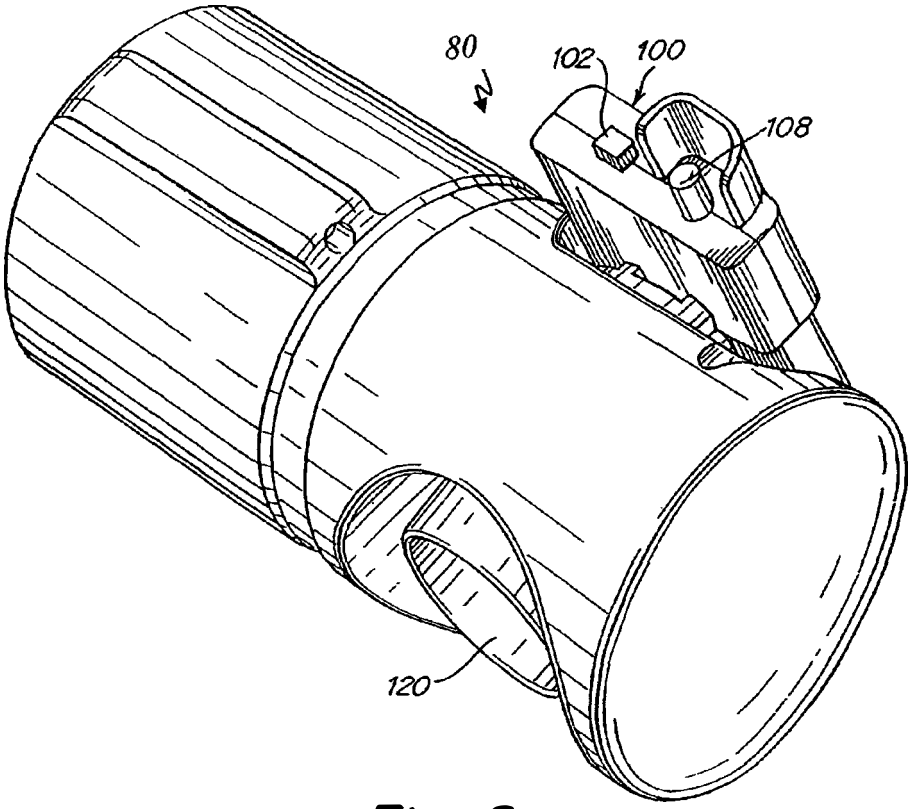

Fig. 8

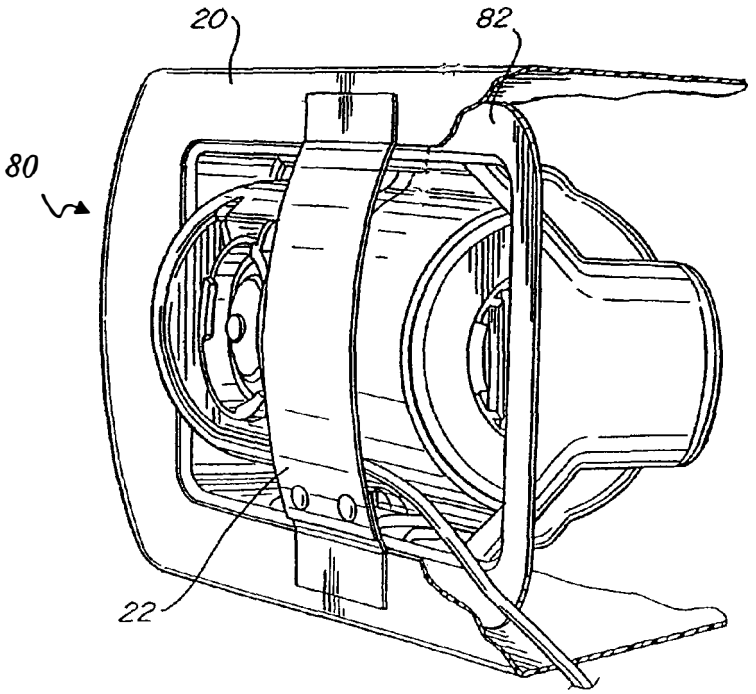

Fig. 9

INFLATABLE DEVICE WITH RECESSED FLUID CONTROLLER AND MODIFIED ADJUSTMENT DEVICE

This application claims priority to U.S. Provisional Patent Application Ser. No. 60/204,836, filed May 17, 2000 and to U.S. Provisional Patent Application Ser. No. 60/280,040, filed Mar. 30, 2001.

BACKGROUND

1. Field of the Application

The application is related to inflatable devices, and, more specifically, to an inflatable device with a recessed fluid controller and modified adjustment device.

2. Description of the Related Art

Inflatable devices are used in a variety of contexts, such as where buoyancy or a cushioned support is needed, where space is limited or portability is desired. For example, inflatable mattresses, cushions and other body supports are used for applications such as camping, hospital bedding, and both occasional and everyday bedding in the home. Such inflatable devices have the additional advantage that the degree of inflation of the support can be adjusted to provide selective support of an irregular object, such as a person. Other examples of inflatable devices include boats, rafts and other devices for use in the water.

A variety of methods are known for providing a fluid, such as air, to inflate an inflatable device. Typically, a pump is used to supply fluid to an orifice in the inflatable device. In most instances, fluid is introduced into inflatable devices through an inlet that may be sealed to retain fluid within the inflatable device. The inlet may also serve as an outlet for deflating the inflatable device. A pump for use with an inflatable device may include a motor that drives an impeller, moving the fluid into, or out of, the inflatable device. Motorized pumps may be powered by electricity. Typically, such electricity is provided by a connection to standard house current or, where portability is desired, batteries.

One known inflatable device is illustrated in FIG. **1**. This inflatable device is adapted for use as a mattress and includes a bladder **20** constructed to contain air in the shape of a mattress. The inflatable device also includes a fluid controller **80** connected to bladder **20** comprising a pump adapted to inflate bladder **20** when connected to household electric current. One such pump is described in U.S. Pat. No. 5,267,363, herein incorporated by reference.

SUMMARY

In one embodiment, the application is directed to an inflatable device comprising a substantially fluid impermeable bladder and a fluid controller comprising an electrically powered pump at least partly positioned within the bladder.

In another embodiment, the application is directed to a combination of a fluid controller comprising an electrically powered pump and an inflatable device. The combination comprises the fluid controller connected to the inflatable device such that the exterior profile of the fluid controller and inflated inflatable device in combination is essentially the same as the exterior profile of the inflated inflatable device.

In another embodiment, the application is directed to an inflatable system comprising a substantially fluid impermeable bladder and a fluid controller comprising a pump in fluid communication with the bladder. The fluid controller further comprises a first locking mechanism and an adjustment device including a second locking mechanism sized and adapted to reversibly mate with the first locking mechanism.

In another embodiment, the application is directed to an inflatable device, comprising a substantially fluid impermeable bladder and a fluid controller. The fluid controller comprises an electrically powered pump, a self-sealing valve, and an adjustment device. The adjustment device comprises a first switch electrically connected to the pump and a power source such that the first switch may selectively energize the pump, and a second switch electrically connected to a power source and electro-mechanically connected to a valve of the fluid controller such that it may selectively open the valve.

The term "recess" is defined herein as an indentation. For example, a recess in a bladder may comprise an indentation in a wall of the bladder, in which an object (e.g., a fluid controller) may be located.

The term "profile of a bladder" is defined herein as an outermost outline of the bladder, exclusive of any irregularities. For example, the profile of the bladder **20** is illustrated in FIG. **2** by solid line **14**. The profile excludes any recess in bladder **20** in which fluid controller **80** may be disposed.

BRIEF DESCRIPTION OF DRAWINGS

The foregoing and other advantages of the application will be more fully appreciated with reference to the following drawings in which:

FIG. **1** is a top, plan view of a prior art inflatable device;

FIG. **2** is a top, plan view of an inflatable device according to one embodiment of the application;

FIG. **3** is a perspective, plan view of a fluid controller according to one embodiment of the application;

FIG. **4** is a perspective, plan view of a fluid controller according to another embodiment of the application;

FIG. **5** is a top, cross-sectional view of one embodiment of the application;

FIG. **6** is a side, cross-sectional view of another embodiment of the application;

FIG. **7** is a side, cross-sectional view of another embodiment of the application;

FIG. **8** is a perspective, plan view of another embodiment of the application; and

FIG. **9** is a perspective, plan view of another embodiment of the application.

DETAILED DESCRIPTION

The application is directed to an inflatable device with a recessed fluid controller and modified adjustment device. As used herein, a fluid controller is a device capable of regulating fluid flow and may include various components, such as a housing, valve, fluid conduit, pump, and the like. In one embodiment, the application is directed to an inflatable device including a substantially fluid impermeable bladder and a fluid controller comprising an electrically powered pump at least partly positioned within the bladder. As used herein, an object, such as a fluid controller, that is "positioned within" a bladder occupies a portion of the volume that would normally be occupied by the bladder, but need not be within the wall of the bladder. For example, a fluid controller could be located within a recess in the wall of a bladder and be "positioned within" the bladder, as this term is defined and used herein.

Referring now to the figures, and, in particular FIG. **2**, one embodiment of an inflatable device according to the application will be described by way of example. The embodiment illustrated in FIG. **2** includes an inflatable device **10** having a substantially fluid impermeable bladder **20** and a fluid controller **80** comprising an electrically powered pump at least partly positioned within bladder **20**.

Bladder **20** may be constructed in any manner and of any material(s) capable of retaining a desired fluid under a degree of pressure necessary for its intended application. For example, bladder **20** may be constructed of a substantially fluid impermeable barrier and may be shaped in accordance with its intended use. Where bladder **20** is intended for use as a mattress, bladder **20** may be constructed in the shape and thickness of a conventional mattress.

Bladder **20** may include internal structure, such as ribs or partitions. For example, bladder **20** may be divided into two or more separate fluid containing compartments. Bladder **20** may also include internal structure to control the movement of fluid within bladder **20**. For example, bladder **20** may include baffles or walls within bladder **20** to improve the flow of fluid when bladder **20** is inflated or deflated.

A wall of bladder **20** may be any thickness required to substantially contain a fluid under pressures at which bladder **20** will be used. A thickness of the wall of bladder **20** may depend upon material from which bladder **20** is constructed. For example, more durable or elastic materials may not require the wall of bladder **20** to be as thick as less durable or elastic materials. Typically, the wall of bladder **20** may be 4–16 mils thick for polyvinyl chloride (PVC) film and polyurethane materials.

Bladder **20** may be constructed of any material or materials capable of substantially containing a fluid and forming a bladder **20** strong enough to withstand a pressure at which bladder **20** is to be used. For example, bladder **20** may be constructed of a polymeric material, such as a thermoplastic. Bladder **20** may be constructed from a relatively inexpensive, easy to work with and durable material. Some example materials include polyvinyl chloride (PVC) film and polyester. The manner of making bladder **20** may depend on its material of construction and configuration, as will be recognized by one of ordinary skill in the art.

Bladder **20** may include additional materials to improve the utility and comfort of bladder **20**. For example, bladder **20** may include outer layers or coatings for durability, support or comfort. In some embodiments, bladder **20** may be coated with a material that is more pleasant to the touch than the material from which bladder **20** is constructed. Where inflatable device **10** is for use in supporting a person, bladder **20** may also include a layer to provide additional comfort, particularly where the person is to contact bladder **20**. For example, bladder **20** may include a comfort layer. The comfort layer may be located on any surface of bladder **20** that may come into contact with a user of inflatable device **10**. The comfort layer may improve the texture and feel of bladder **20** and, further, may allow air and moisture to pass between a person and bladder **20**, preventing discomfort.

Fluid controller **80** may be constructed in any manner and using any materials that allow fluid controller **80** to control the flow of fluid into and/or out of bladder **20**. In one embodiment, fluid controller **80** includes a pump **81** that may be constructed in any manner and using any materials that allow it to inflate and/or deflate bladder **20**. For example, as illustrated in FIG. **5**, the pump **81** may be a conventional fluid pump including a motor **84** that drives an impeller **86** moving air into, or out of, bladder **20**. Where the pump includes motor **84**, motor **84** may be powered by electricity. Electricity may be provided by a connection to standard house current or, where portability is desired, by batteries. Other types of pumps, such as diaphragm pumps, may also be used so long as they allow the pump to inflate bladder **20** to within a desired pressure range, which may include a pressure range that can be adjusted by, for example, another fluid pumping device, such as someone blowing into a conventional valve stem within the bladder, a foot pump, and the like.

Fluid controller **80** may direct fluid flow in any manner consistent with its construction. For example, where fluid controller **80** includes a pump **81** with motor **84** and impeller **86**, impeller **86** may draw fluid into, or out of, bladder **20** through a conduit **88**. In some embodiments, conduit **88** may be positioned between motor **84** and a housing **90**, as an annulus. For example, in the embodiment illustrated in FIG. **5**, fluid controller **80** includes a housing **90** that surrounds the inner workings of the pump. Housing **90** may also serve, for example, to protect the inner workings of the pump and to provide a connection between fluid controller **80** and bladder **20**.

Preferably, where a pump is included in fluid controller **80**, the pump is able to inflate bladder **20** in a relatively short time period, such as in less than a minute for an inflatable mattress. The pump may be designed to include an appropriately powerful fluid moving mechanism to achieve a desired pumping time to fill a particular inflatable device. The pump also may be small and consume as little power as possible. Low power consumption is particularly desirable where the pump is to be powered by batteries, as it may extend battery life. The pump may also be configured to be quiet in operation. A balance of pumping capacity, size, power consumption, noise generation and cost may be selected for a particular application as will be recognized by those of skill in the art.

Fluid controller **80** may be constructed of any material or materials that allow it to function as desired. Typical materials of construction of the various components of fluid controller **80** will vary with the nature of fluid controller **80** and any pump and are known to those of skill in the art.

Fluid controller **80** may be connected to bladder **20** in any manner that allows a pump to supply bladder **20** with fluid, inhibits undesired escape of fluid from bladder **20** and does not interfere with the use of bladder **20**. For example, inflatable device **10** may be constructed with at least a portion of fluid controller **80** positioned within bladder **20**. Where fluid controller **80** is positioned at least partially within bladder **20**, fluid controller **80** will not interfere with the use of inflatable device **10**. In one embodiment, the exterior profile (total volume and shape) of the fluid controller and inflated device in combination are essentially the same as the exterior profile of the inflated device absent the combination, thus reducing the opportunity for fluid controller **80** to impact or interfere with the use of inflatable device **10**. For example, where fluid controller **80** is located substantially within bladder **20** in a mattress application, it allows an inflatable standard sized mattress to fit into a standard sized bed frame. Where fluid controller **80** is located within bladder **20**, it may be sized such that it will not come into contact with bladder **20** when bladder **20** is inflated, except at the point(s) of connection.

Where at least a portion of fluid controller **80** is positioned within bladder **20**, it may be connected to bladder **20** in any manner that will not interfere with the use of inflatable device **10** or allow undesired escape of fluid from bladder **20**. For example, bladder **20** may be adhered or sealed to a

portion of fluid controller **80**, such as with an adhesive or heat seal. In one embodiment, an outlet **120** (illustrated in FIG. **8**) of fluid controller **80** is sealed to bladder **20**.

Fluid controller **80** may include structure to facilitate connection to bladder **20**. for example, fluid controller **80** may include a portion adapted to connect to bladder **20**, such as a flange **82** as illustrated in FIGS. **3**–**5**. Flange **82** may, for example, extend from housing **90** or may be a separate component connected to housing **90**. As best seen in FIG. **5**, flange **82** may include additional structure, such as a fluid impermeable wall **83**, that may allow it to perform other functions in fluid controller **80** in addition to providing a connection point for bladder **20**. Where flange **82** is connected to housing **90**, it may be connected anywhere and in any manner that allows it to fluid tightly connect fluid controller **80** and bladder **20**. For example, where flange **82** includes a fluid impermeable wall **83**, flange **82** may be connected to housing **90** at or near outlet **120** from housing **90**.

Flange **82** may be constructed of any material that allows it to durably and fluid tightly connect fluid controller **80** to bladder **20**. For example, flange **82** may be constructed of a material that is more flexible than housing **90**, but less flexible than bladder **20**, bridging the flexibility gap between the two structures and resulting in a durable seal that may be performed, for example, by heat sealing. One example of a suitable material of construction of flange **82** is PVC. The thickness of flange **82** may also affect its flexibility, with thinner flanges generally being more flexible than thicker flanges. Thus the thickness of flange **82** may be selected to provide a desired flexibility with a given material.

Where flange **82** connects to housing **90** or another portion of fluid controller **80**, it is preferred that such connection be reversible. For example flange **82** may snap or screw together with another portion of fluid controller **80**. Additional structure may be included to promote a fluid seal between flange **82** and the remainder of fluid controller **80**. For example, a seal, such as an o-ring, may be placed between flange **82** and the remainder of fluid controller **80**. It is also possible to construct the inflatable device such that bladder **20** and fluid controller **80** are reversibly connected, rather than two portions of fluid controller **80** being reversibly connected. In either case, the reversible connection allows the removal of portions of fluid controller **80** for repair or replacement, preventing the entire inflatable device from having to be disposed of in the event of a failure of one component.

Bladder **20** may also include structure to facilitate the connection between bladder **20** and fluid controller **80**. For example, bladder **20** may have a portion constructed to facilitate connection of fluid controller **80** to bladder **20**, such as a retainer **22** as illustrated in FIGS. **7** and **13**. Retainer **22** may be constructed in any manner that will facilitate connection between bladder **20** and fluid controller **80**, such as by mechanically supporting fluid controller **80**. For example, retainer **22** may be constructed as a strap positioned across fluid controller **80**.

It will now be clear that fluid controller **80** may be positioned within bladder **20** in a variety of ways. For example, fluid controller **80** may include a flange **82** that positions it at least partially within bladder **20**. The size and shape of flange **82** may be selected to control the portion of pump **81** that is positioned within bladder **20**. Alternatively, bladder **20** may include a recess and fluid controller **80** may be positioned within the recess and attached to bladder only at a pump outlet, or at other locations within the recess.

Fluid controller **80** may be operated by any conventional control mechanism, such as a conventional power switch. Fluid controller **80** may also include a structure for controlling fluid controller **80**, such a as an adjustment device **100**. Adjustment device **100** may be separate or separable from fluid controller **80** to allow fluid controller **80** to be controlled remotely. In one embodiment, adjustment device **100** is a hand-held device for controlling fluid controller **80**.

Adjustment device **100** may include structure for controlling the operation of fluid controller **80**. For example, adjustment device **100** may include a conventional power switch **102** that energizes and de-energizes a pump within fluid controller **80**. Switch **102** may be any of the many well-known mechanisms for selectively connecting two conductors to supply electricity to a point of use. Switch **102** may allow the pump to be energized such that it inflates bladder **20**. Adjustment device **100** may also include structure that directs the deflation of bladder **20**. For example, a second switch may reverse the direction of the pump to deflate bladder **20**. In some embodiments, fluid controller **80** may incorporate a valve which must be opened to allow deflation of bladder **20**. In these embodiments, adjustment device **100** may also include structure to mechanically or electro-mechanically open a valve to allow deflation of bladder **20**. For example, a switch **106** may act upon a mechanical opening mechanism or activate a solenoid **104** to open a valve, such as valve **122**, and allow deflation of bladder **20**. In one embodiment, the valve that is opened is a self-sealing valve, meaning that it is held closed, at least in part, by pressure within bladder **20**. For example, a self sealing valve may include a diaphragm **124** that is urged against a valve seat **126** by fluid pressure from within bladder **20**. Optionally, switch **106** may also energize the pump to withdraw fluid from bladder **20**.

In one embodiment, adjustment device **100** is connectable to fluid controller **80**. In this embodiment, adjustment device **100** may be connected to fluid controller **80** at a conveniently located position such that it is easily found, particularly when inflatable device **10** is in use. For example, where inflatable device **10** is a bed, fluid controller **80** may be located at the head of the bed such that adjustment device **100** may be connected thereto for easy access when the bed is in use. Any control elements on adjustment device **100**, such as switches **102**, **106** or a button **108** may be located on adjustment device **100** for easy access. For example, the control elements may be located on a top portion of adjustment device **100**, as illustrated in FIG. **4**. Attachment of adjustment device **100** to fluid controller **80** may also facilitate deflation of bladder **20** with adjustment device **100**. For example, where a valve must be opened to deflate bladder **20**, adjustment device **100** may be in mechanical communication with fluid controller **80** to disengage the valve. In one embodiment, a button **108** on adjustment device **100** may be in mechanical communication with fluid controller **80** to open a valve.

The connection between adjustment device **100** and fluid controller **80** may be secure. For example, in one embodiment, adjustment device **100** reversibly locks to fluid controller **80**. Where adjustment device **100** locks to fluid controller **80**, adjustment device **100** and fluid controller **80** may include mating locking mechanisms **110**, **112**. Locking mechanisms **110** and **112** may be constructed in any manner and using any material(s) that allow locking mechanisms **110**, **112** to reversibly lock together. By "lock" it is meant that two mechanisms fit together in such a way that a force must be overcome to separate them. In one embodiment, one locking mechanism **110** includes one or more spring latches

114 that mate with impressions 116 in other locking mechanism 112. Either locking mechanism 110, 112 may be located on either of adjustment device 100 or fluid controller 80.

Having thus described certain embodiments of the inflatable device of the application, various alterations, modifications and improvements will be apparent to those of ordinary skill in the art. Such alterations, variations and improvements are intended to be within the spirit and scope of the application. Accordingly, the foregoing description is by way of example and is not intended to be limiting. The application is limited only as defined in the following claims and the equivalents thereto.

What is claimed is:

1. An inflatable device, comprising:

a substantially fluid impermeable bladder; and

a fluid controller comprising an electrically powered pump, the pump being disposed at least partially within a profile of the bladder, and the fluid controller being coupled to the inflatable bladder in a position, and in the position the fluid controller being adapted to permit air to exit the bladder through the fluid controller and to be provided to the bladder through the fluid controller; and

wherein the fluid controller is permanently coupled to the bladder.

2. The inflatable device of claim 1, wherein the fluid controller is constructed and arranged such that a majority of the fluid controller is positioned within the profile of the bladder.

3. The inflatable device of claim 2, wherein the fluid controller is constructed and arranged such that substantially all of the fluid controller is positioned within the profile of the bladder.

4. The inflatable device of claim 1, wherein the fluid controller comprises a housing.

5. The inflatable device of claim 4, wherein the housing comprises a flange impermeably connected to the bladder.

6. The inflatable device of claim 1, wherein the fluid controller comprises a flange impermeably connected to the bladder.

7. The inflatable device of claim 6, wherein the flange comprises a fluid impermeable wall that connects to a housing of the inflatable device.

8. The inflatable device of claim 7, wherein the flange is in contact with the housing at an outlet of the housing.

9. The inflatable device of claim 6, wherein a remainder of the fluid controller is constructed and arranged to be removable from the flange.

10. The inflatable device of claim 1, wherein the fluid controller comprises a first locking mechanism and an adjustment device including a second locking mechanism sized and adapted to mate with the first locking mechanism.

11. The inflatable device of claim 10, wherein the adjustment device further comprises:

a first switch electrically connected to the pump and a power source such that the first switch may selectively energize the pump; and

a second switch mechanically connected to a valve of the fluid controller such that it may selectively open the valve;

wherein the first switch and second switch are in fixed proximity to one another.

12. The inflatable device of claim 11, wherein the adjustment device further comprises a top portion and the first switch and the second switch are positioned on the top portion.

13. The inflatable device of claim 1, further comprising an adjustment device, including:

a first switch electrically connected to the pump and a power source such that the first switch may selectively energize the pump; and

a second switch electrically connected to a power source and electro-mechanically connected to a valve of the fluid controller such that it may selectively open the valve.

14. The inflatable device of claim 13, wherein the electro-mechanical connection comprises a solenoid.

15. The inflatable device of claim 1, wherein the fluid controller comprises a valve and a member connected to the valve that moves the valve between an open and a closed position.

16. The inflatable device of claim 15, wherein the member is adapted to be actuated by a switch on an adjustment device.

17. The inflatable device of claim 6, wherein the flange comprises a recess.

18. The inflatable device of claim 1, wherein a recess is formed by the fluid controller.

19. The inflatable device of claim 1, wherein the pump is at least partially positioned within a recess in the wall of the bladder.

20. The inflatable device of claim 1, wherein the pump is entirely external to the bladder.

21. The inflatable device of claim 1, wherein the pump is externally accessible.

22. The inflatable device of claim 1, further comprising a flange impermeably connected to the bladder, the flange forming a recess, wherein the pump is at least partially positioned within the profile of the bladder.

23. The inflatable device of claim 1, wherein the pump is at least partially external to the bladder.

24. The inflatable device of claim 1, wherein the bladder is shaped and sized so as to form a mattress.

25. The inflatable device of claim 1, wherein the fluid controller comprises a valve through which the air exits the bladder.

26. An inflatable system, comprising:

a substantially fluid impermeable bladder; and

a fluid controller comprising:

a pump in fluid communication with the bladder through a valve and comprising a first locking mechanism; and

an adjustment device including a first switch mechanically connected to the valve and adapted to mechanically actuate the valve, and a second locking mechanism sized and adapted to mate with the first locking mechanism; and

wherein the pump is an electrically powered pump and wherein substantially all of the fluid controller is positioned within the profile of the bladder.

27. The inflatable system of claim 26, wherein the adjustment device further comprises:

a top portion;

a second switch having a first position and a second position, positioned on the top portion and electrically connected to the pump and a power source; and

wherein the first switch is positioned on the top portion.

28. The inflatable system of claim 26 wherein the bladder includes a recess sized and configured to accommodate at least a portion of the fluid controller.

29. The inflatable system of claim 26, wherein the fluid controller includes a housing and the housing includes a flange that connects to the bladder.

30. The inflatable system of claim 26, wherein the bladder is shaped and sized so as to form a mattress.

31. An inflatable device, comprising:

a substantially fluid impermeable bladder;

a fluid controller comprising:

an electrically powered pump, and

a self-sealing valve; and

an adjustment device, comprising:

a first switch electrically connected to the pump and an at least one power source such that the first switch may selectively energize the pump, and

a second switch electrically connected to the at least one power source and electro-mechanically connected to the self-sealing valve of the fluid controller, such that it may selectively open the self-sealing valve.

32. The inflatable device of claim 31, wherein the electro-mechanical connection comprises a solenoid.

33. The inflatable device of claim 31, wherein the bladder is shaped and sized so as to form a mattress.

34. An inflatable device, comprising:

an inflatable bladder; and

a fluid controller including an electrically powered pump, the fluid controller being at least partially positioned within a profile of the bladder such that the exterior profile of the fluid controller and inflatable bladder in combination is essentially the same as the exterior profile of the inflatable bladder, at least a portion of the fluid controller that is positioned within the profile of the bladder being accessible from the exterior of the bladder, and the fluid controller being adapted to permit exhaustion of air from the bladder through the fluid controller; and

wherein the fluid controller is permanently connected to the bladder.

35. An inflatable device, comprising:

an inflatable bladder; and

a fluid controller including an electrically powered pump, the fluid controller being at least partially positioned within a profile of the bladder such that the exterior profile of the fluid controller and inflatable bladder in combination is essentially the same as the exterior profile of the inflatable bladder, at least a portion of the fluid controller that is positioned within the profile of the bladder being accessible from the exterior of the bladder, and the fluid controller being adapted to permit exhaustion of air from the bladder through the fluid controller; and

wherein the fluid controller comprises:

a valve, and

a user interface mechanically coupled to the valve, the user interface being adapted to permit a user to mechanically manipulate the valve.

36. An inflatable device, comprising:

an inflatable bladder; and

a fluid controller including an electrically powered pump, the fluid controller being at least partially positioned within a profile of the bladder such that the exterior profile of the fluid controller and inflatable bladder in combination is essentially the same as the exterior profile of the inflatable bladder, at least a portion of the fluid controller that is positioned within the profile of the bladder being accessible from the exterior of the bladder, and the fluid controller being adapted to permit exhaustion of air from the bladder through the fluid controller; and

wherein the pump is at least partially accessible from the exterior of the bladder.

37. An inflatable device, comprising:

an inflatable bladder; and

a fluid controller including an electrically powered pump, the fluid controller being at least partially positioned within a profile of the bladder such that the exterior profile of the fluid controller and inflatable bladder in combination is essentially the same as the exterior profile of the inflatable bladder, at least a portion of the fluid controller that is positioned within the profile of the bladder being accessible from the exterior of the bladder, and the fluid controller being adapted to permit exhaustion of air from the bladder through the fluid controller; and

wherein the pump is at least partially accessible from the exterior of the bladder.

38. An inflatable device, comprising:

an inflatable bladder; and

a fluid controller including an electrically powered pump, the fluid controller being at least partially positioned within a profile of the bladder such that the exterior profile of the fluid controller and inflatable bladder in combination is essentially the same as the exterior profile of the inflatable bladder, at least a portion of the fluid controller that is positioned within the profile of the bladder being accessible from the exterior of the bladder, and the fluid controller being adapted to permit exhaustion of air from the bladder through the fluid controller; and

wherein the bladder forms a mattress.

39. An inflatable device, comprising:

an inflatable bladder; and

a fluid controller including an electrically powered pump, the fluid controller being at least partially positioned within a profile of the bladder such that the exterior profile of the fluid controller and inflatable bladder in combination is essentially the same as the exterior profile of the inflatable bladder, at least a portion of the fluid controller that is positioned within the profile of the bladder being accessible from the exterior of the bladder, and the fluid controller being adapted to permit exhaustion of air from the bladder through the fluid controller; and

wherein the fluid controller comprises a valve through which the air exits the bladder.

40. An inflatable device, comprising:

a substantially fluid-impermeable bladder; and

a fluid controller comprising an electrically powered pump, the fluid controller being permanently connected to the bladder, and the fluid controller being at least partially positioned within a profile of the bladder such that the external profile of the fluid controller and bladder in combination is essentially the same as the exterior profile of the bladder alone, at least a portion of the fluid controller being accessible from the exterior of the bladder, and the fluid controller being adapted to permit exhaustion of air from the bladder through the fluid controller; and

wherein the fluid controller comprises a valve through which the air exits the bladder.

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