United States Patent [19]

Davis

[11] **3,895,403**

[45] **July 22, 1975**

[54] **PATIENT ORIENTING DEVICE**

[76] Inventor: **Sanford Davis,** Stoney Creek Ln., Colts Neck, N.J. 07722

[22] Filed: **Apr. 5, 1974**

[21] Appl. No.: **458,171**

[52] **U.S. Cl.** ..... **5/81 R;** 5/61; 297/284

[51] **Int. Cl.** **A61g 7/10**

[58] **Field of Search** ..... 5/68, 61, 81, 348 R

[56] **References Cited**

UNITED STATES PATENTS

3,526,908	9/1970	Davis	5/81 R
3,775,781	12/1973	Bruno et al.	5/81 R

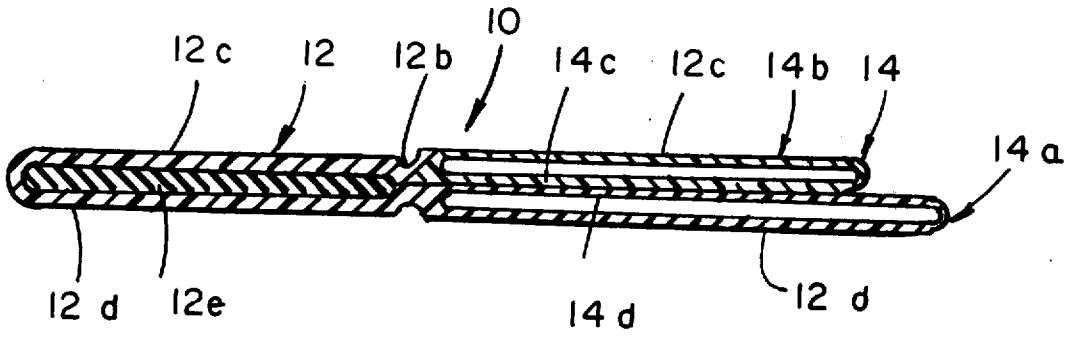
Primary Examiner—Casmir A. Nunberg

Attorney, Agent, or Firm—Friedman & Goodman, Esqs.

[57] **ABSTRACT**

An inflatable device effective in causing a body-turning maneuver for a hospital patient and the like is described wherein a first inflatable body lifts the patient partially on his side and then a second inflatable body, during its inflation, bears on one side against the already inflated first body and with its opposite side exerts pushing contact against the patient to complete a body turning maneuver or support the patient in an intermediate inclined position. A pneumatic air control system is provided for selectively inflating and deflating the inflatable bodies to a desired level of pressure. In another embodiment, independently inflatable first and second bodies are provided adjacent each side of the patient to thereby permit turning of the patient side to side.

11 Claims, 16 Drawing Figures



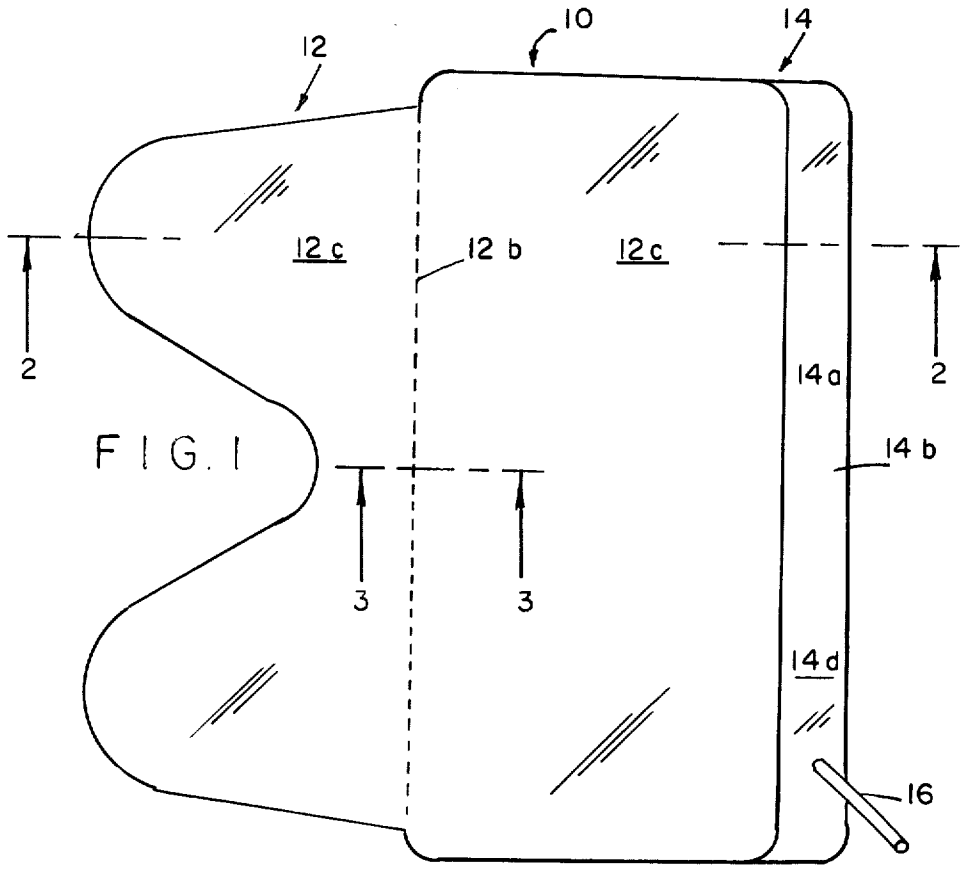


FIG. 1

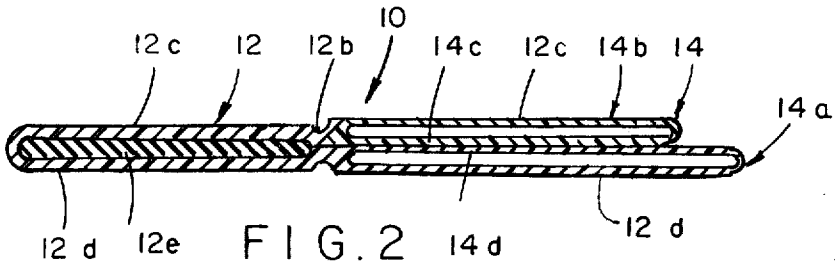


FIG. 2

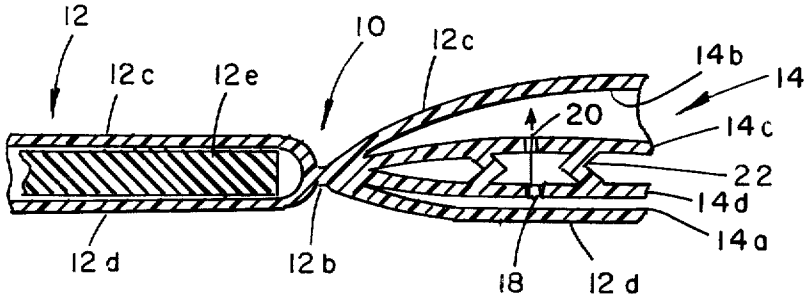


FIG. 3

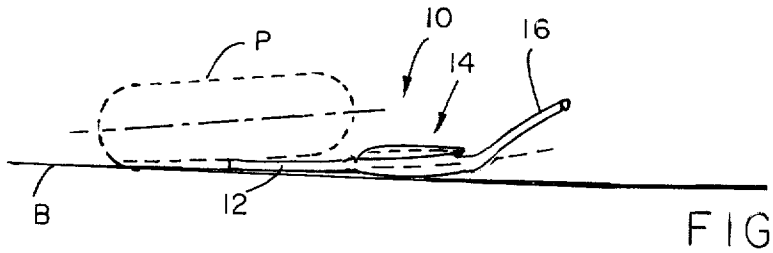


FIG. 4

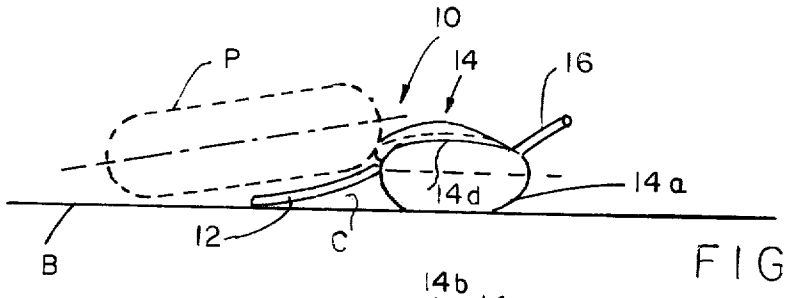


FIG. 5

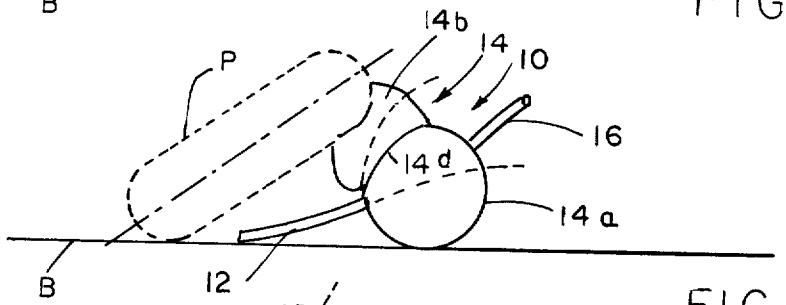


FIG. 6

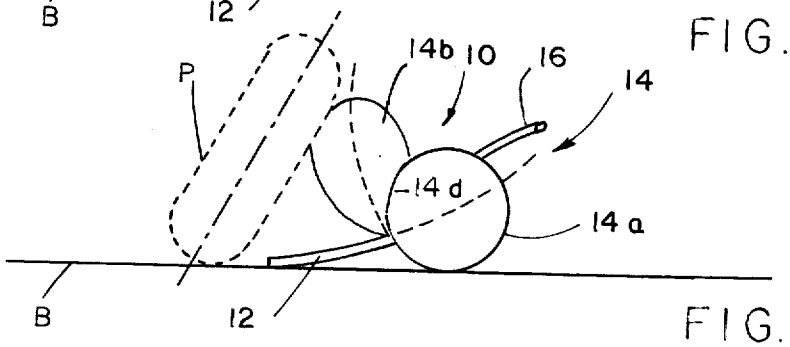


FIG. 7

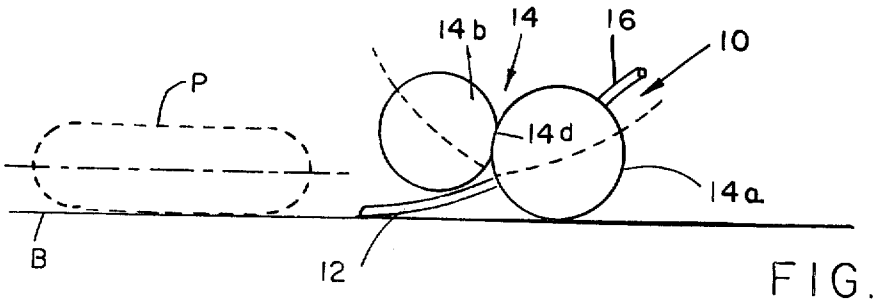


FIG. 8

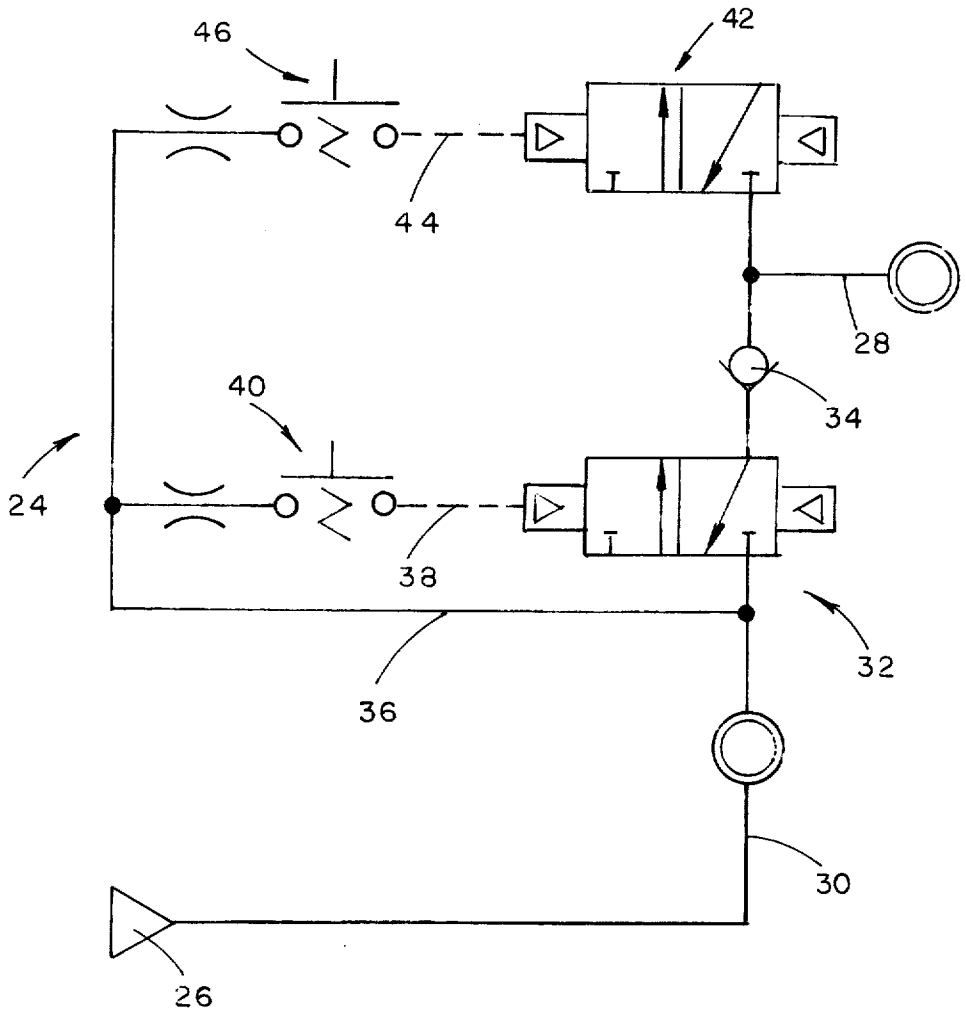
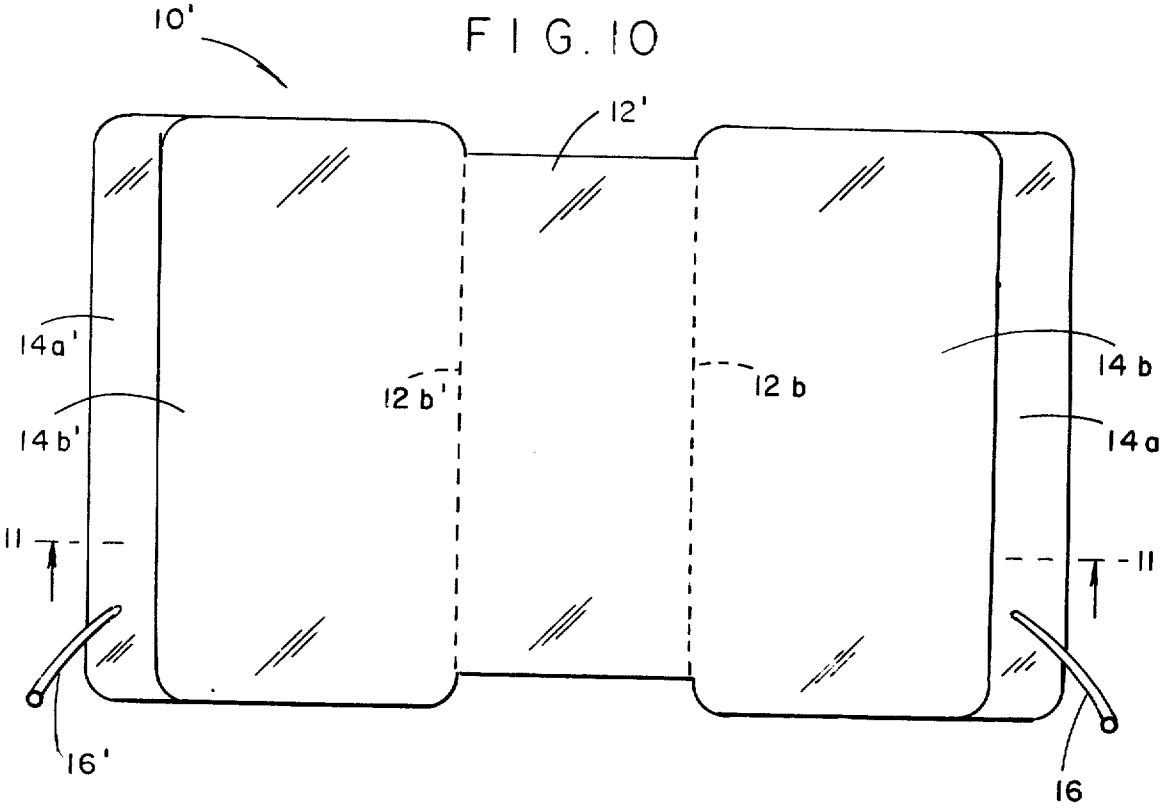


FIG. 9

FIG. 10



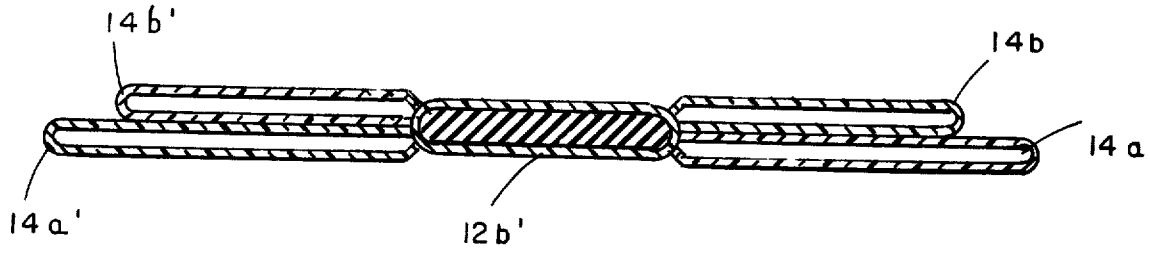


FIG. 11

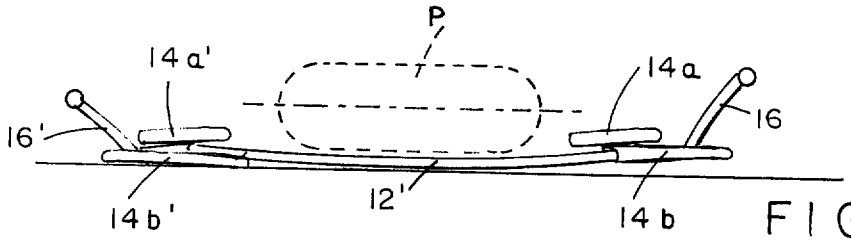


FIG. 12

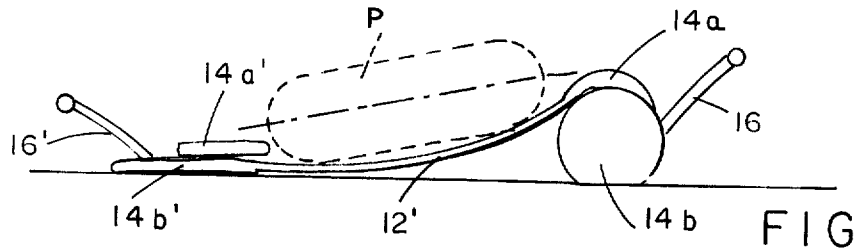


FIG. 13

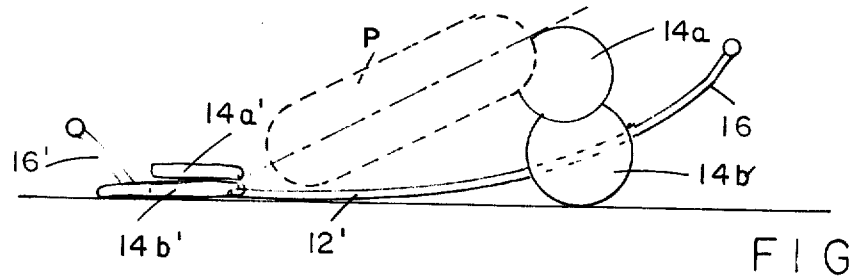


FIG. 14

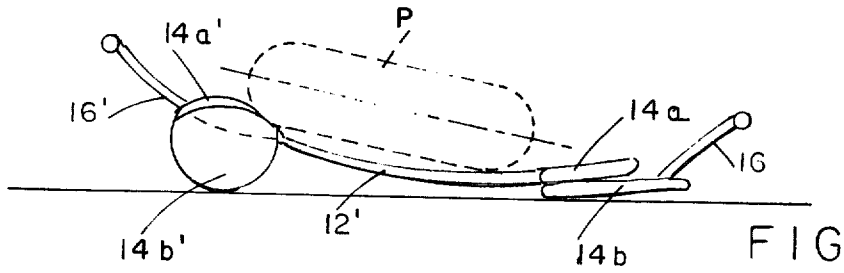


FIG. 15

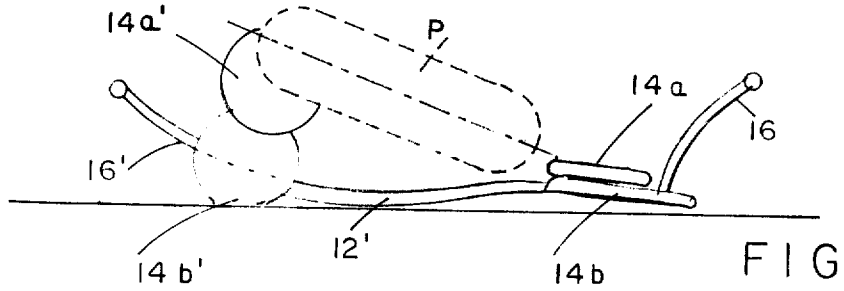


FIG. 16

PATIENT ORIENTING DEVICE

BACKGROUND OF THE INVENTION

The present invention generally relates to a useful medical or patient-care aid, and more particularly to an inflatable device effective in causing a body-turning maneuver for a hospital patient or for selectively supporting the patient at an intermediate inclined position.

While reclining and adjustable beds are known for elevating or lowering the head or legs of a patient or to generally adjust his inclination along his length, turning a patient from side to side or selectively supporting him in an intermediate inclined position is still an inconvenient and sometimes difficult procedure. Accordingly, there is a need for a device that can be used by a nurse or hospital orderly to assist in turning a bed-ridden patient or supporting him in a desired inclination, particularly in circumstances where the patient's size makes handling difficult, or his health condition is such that he cannot be expected to significantly assist in this maneuver. A body-turning device for a hospital patient of the general type under consideration is described in my U.S. Pat. No. 3,526,908.

It is also frequently desirable to turn the patient or to support a patient in an intermediate inclined position facing one direction or the other. Again, there is not presently known a simple an economical device for accomplishing such a function.

The present invention is a useful aid for hospitals and the like and contemplates embodiments which are partially positioned beneath a patient to thereby eliminate the requirement of fully lifting a patient, where this is impractical. However, the present invention, in accordance with further embodiments thereof, may also be fully disposed beneath the patient or may be maintained beneath the patient during his confinement. Alternately, the present invention may be incorporated within a bed or rest surface upon which a patient is disposed. With the latter embodiments, additional flexibility results in the manner in which the patient may be supported or turned.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a patient-orienting device which is not possessed for the disadvantages associated with prior art comparable devices.

It is another object of the present invention to provide a patient-orienting device which is simple in construction and economical to manufacture.

It is still another object of the present invention to provide a body-turning device for achieving the foregoing and other commerical requirements. More specifically, it is an object to provide an inflatable device which, without any significant effort to difficulty, can be positioned under one side of the patient and then, during subsequent inflation exert firm but gentle, pushing contact against the patient to move the patient through a body-turning maneuver.

It is yet another object of the present invention to provide a body-orienting device which is pneumatically controlled or selectively supporting the patient in any intermediate inclined position.

It is a further object of the present invention to provide a patient-orienting device which includes independently inflatable bodies disposed to each side of a patient to permit turning the patient or supporting the patient in an intermediate position facing one direction or the other.

To achieve the above objects, as well as others which will become apparent hereafter, a patient-orienting device suitable for hospital use and the like in accordance with the present invention comprises a resilient body having an operative position partially disposed beneath the patient within exposed edge therealong adjacent one side of the patient. A first inflatable body is provided which is connected along said exposed edge for at least partially lifting said resilient body and the patient positioned thereon in response to inflation of said first inflatable body. A second inflatable body in provided which is operatively arranged adjacent said exposed edge and adapted to be inflated subsequent to the inflation of said first inflatable body. At least a portion of said second inflatable body is at least partially supported by said first inflatable body and an opposite other portion thereof is in pushing contact against the patient. Said inflatable bodies are in pushing contact with each other and together arranged to bear against and push the patient relative to said resilient body when said inflatable bodies are inflated. Pneumatic air supply means is provided for selectively inflating and deflating said inflatable bodies to a desired level of pressure to fully turn the patient to support the latter in an intermediate inclined position.

In accordance with another presently preferred embodiment, said resilient body is provided with two edges each disposed adjacent another side of the patient. First and second inflatable bodies, which are independently inflatable, are connected along the two edges. In this manner, selectively inflating or deflating the inflatable bodies on one or the other side of the patient permits the patient to be fully turned or be supported in intermediate inclined positions facing one or the other direction.

BRIEF DESCRIPTION OF THE DRAWINGS

With the above and additional objects and advantages in view, as will hereinafter appear, this invention comprises the devices, combinations and arrangements of parts hereinafter described by way of example and illustrated in the accompanying drawings of a preferred embodiment in which:

FIG. 1 is a top plan view of a body-turning device for a hospital patient according to the present invention, the device being illustrated in a deflated condition;

FIG. 2 is a side elevational view, in section, taken on line 2—2 of FIG. 1, illustrating further structural features of the device;

FIG. 3 is a fragmented enlargedd side elevational view similar to FIG. 2 illustrating still further structural features of the device, particularly of an exemplary valve means connected between the two inflatable bodies of the device;

FIGS. 4–8 inclusive, are simplified diagrammatic views sequentially illustrating both the manner and the condition of the device which contributes to its ability to incline or turn a hospital patient.

FIG. 9 is a schematic representation of the pneumatic control system for selectively inflating and deflating the body-turning device shown in FIGS. 1–8;

FIG. 10 is a top plan view of the further embodiment of the present invention, wherein inflatable bodies are provided on opposing sides to turn the patient or inclining the latter in one direction or another;

FIG. 11 is a sectional view of the embodiment shown in FIG. 10, taken along line 11—11;

FIGS. 12–14 inclusive, are simplified diagrammatic views sequentially illustrating both the manner and the condition of the device of FIGS. 10 and 11 during successive steps in orienting a patient in one direction; and

FIGS. 15–16 are similar to FIGS. 12–14, but showing the device in successive steps when orienting the patient in the other direction.

DESCIPTION OF THE PREFERRED EMBODIMENTS

Reference is now made to the drawings, wherein identical or similar parts have been designated by the same reference numerals throughout, and first referring to FIGS. 1–3, there is shown a useful aid for hospitals or the like consisting of a body-turning device 10. In a preferred embodiment as illustrated herein, the device 10 is fabricated of plastic, such as vinyl or of elastomeric coated materials, and includes, as best illustrated in FIGS. 1, 2, two main parts, namely, a non-inflatable resilient body 12 which is that portion delineated by an undulating free edge 12*a* and a substantially straight heat seal line 12*b*, and a remaining inflatable portion 14 consisting of a large first inflatable body 14*a* and a second smaller superposed inflatable body 14*b*.

Specifically, the resilient body 12 is formed by upper and lower vinyl panels 12*c*, 12*d*, heat sealed or adhesively bonded together to form an enclosure for an appropriately shaped internal member 12*e* which is preferably fabricated of hard rubber, cellular rubber or other such resilient material.

Turning now to the construction of the inflatable body portion 14, the previously noted vinyl panels, 12*c*, 12*d* also cooperate with two additional intermediate panels 14*c*, 14*d*, respectively, to form the previously noted first and second inflatable bodies 14*a* and 14*b*. For reasons which will soon be apparent, only the inflatable body 14*a* has a main inlet connection 16 for pressure air, preferably supplied by a compressor or similar mechanical means, whereas inflation of the second inflatable body 14*b* is achieved by controlled passage of pressure air, as best shown in FIG. 3, from the inflated body 14*a* through valve openings 18 and 20 into the inflatable body 14*b*. The pressure air during passage between these bodies 14*a*, 14*b* is channeled through the valve openings 18 and 20 by an accordion-folded enclosure panel 22 which is appropriately heat sealed to the facing vinyl panels 14*c*, 14*d* around the valve openings 18, 20.

The significance of the structural features of the body-turning device 10 as has just been described will be better appreciated when considered in conjunction with the following description and illustrations, as set forth in FIGS. 4–8, of the manner in which the device 10 is effective in causing the turning of a lying patient P, who, it will be assumed, for health reasons must be turned very carefully and gently and, for the same health reasons, cannot be expected to significantly assist in this maneuver. It is contemplated that the nurse or hospital orderly can, without too much effort or difficulty, raise the patient P sufficiently so that the resilient body 12 can be placed beneath the patient's shoulder and buttocks, all as clearly illustrated in FIG. 4. Since the patient P only has the shoulder and buttocks resting on the resilient body 12, the medial portion of body 12 which thus performs no function may be removed to result in the undulated shape of the edge 12*a*.

Next, pressure air is channeled through the inlet 16 causing inflation of the first inflatable body 14*a* and has two significant consequences: first, the inflation of the body 14*a* elevates the portion of the resilient body 12 adjacent to and connected to it, all as is clearly illustrated in FIG. 5, and thus effectively raises one side of the patient P to the extent of the clearance C; seconds, the inflated condition of the inflatable body 14*a* advantageously presents the upper panel or wall –*d* of this body in an elevated position and as structure against which further pressure can be brought to bear in the body-turning maneuver. In this connection, it should be apparent that not all body-turning maneuvers occur in exactly the same way, but nevertheless, these maneuvers do successfully occur, despite slight variations, and are the result of use of the elevated wall 14*d* as appropriate structure against which to exert pressure. Further, by comparison of FIGS. 5 and 6, it will also be noted that the inclination of the wall 14*d* appropriately changes so that in progressive positions of movement of the patient P the wall 14*d* essentially assumes a position beneath the patient P (as illustrated in FIG. 6) such that the second inflatable body 14*b* can be advantageously inflated against the then appropriately oriented wall 14*d* this being effective in exerting a pushing pressure against the patient P. More particularly, upon continued introduction of pressure air into the inflatable body 14*a*, a point is ultimately reached where there is controlled passage of some of the pressure air from the inflated body 14*a* through the previously noted valve openings 18, 20 into the second inflatable body 14*b*, the introduction of such pressure air being effective, of course, to start causing the inflation of the second inflatable body 14*b*. Thus, the condition of the device 10 progresses from that shown in FIG. 5 to that shown in FIG. 6 wherein the inflating body 14*b* starts to expand between the elevated wall 14*d* and the patient P with the result that there is a significant lifting of the side of the patient P in contact with the device D.

As intended to be illustrated in the progressive diagrammatic views of FIGS. 7, 8, ultimately there is an extent of inflation of both of the inflatable bodies 14*a*, 14*b* that the patient P is lifted to an extent that he is lying only on one side and is then able to reach out with one of both of his hands, make contact with the bed B, and thereafter gently ease himself back down in contact with the bed and, in the process, complete a body-turning maneuver.

As described above, air under pressure is channeled into the inlet 16 to result in inflation of the first and second inflatable bodies 14*a* 14*b*. Referring to FIG. 9, presently preferred embodiment of the invention includes a pneumatic control device 24 for selectively inflating and deflating the inflatable bodies 14*a* and 14*b* to a desired level of pressure. Clearly, while the above described device can be utilized for fully turning a patient, the same device may be utilized to support a patient in an intermediate inclined position, such as suggested in FIGS. 5–7. To maintain a patient P in one of the latter positions, it is necessary that the air pressure within the inflatable bodies 14*a* and 14*b* be maintained at an appropriate level. The pneumatic control device 24 permits selective control of the air pressure within the inflatable bodies and, accordingly, the precise orientation of the patient.

The pneumatic control device **24** includes a supply of air under pressure **26** and an output line **28** which is connected to the inlet **16** of the inflatable body **14***a*. A supply line **30** is connected to the air supply **26** and an inlet air valve **32** is provided between the output line **28** and the supply line **30.** The inlet valve **32** is advantageously a fluidic air pilot three-way air valve. Such valves are conventional and, as will become clear to a person skilled in the art, other equivalent valves may be utilized since the precise type of valve used is not critical for the purposes of the present invention.

The pneumatic control device **24** advantageously includes a check valve **34** which permits flow of air only from the inlet valve **32** towards the output line **28,** but not in a reverse direction. The reason for the check valve **34** will become evident from the description that follows. Also connected to the supply line **30** is a valve control line **36.** The air pressure in the valve control line **36** is maintained at the same pressure as that in the supply line **30.**

The inlet air valve **32** includes inlet, outlet and control ports. A fill control line **38** is provided between the valve control line **36** and the control port of the inlet air valve **32.** Actuating means in the form of a push button valve **40** is provided within the fill control line **38.** In this manner, depression of the fill push button **40** applies the air pressure within the valve control line **36** to the control port of the inlet air valve **32** to shift the latter to an operataive position wherein the supply line **30** is placed in fluid flow communication with the output line **28.** The air within the supply line **30** continues to flow to the output line **28,** and into the inlet **16** of the inflatable chamber **14***a*, so long as the push button **40** is maintained in a depressed condition. As soon as the fill push button **40** is released, the inlet air valve reverts to the position shown wherein the fluid flow communication between the output line and the supply line is interrupted. At such time, further air under pressure cannot be transmitted to the inflatable bodies and a desired level of pressure may be achieved and maintained within the bodies to cause the same to assume one of the conditions illustrated in FIGS. **4–8.** Clearly, this permits the patient either to fully turn or be supported in an intermediate inclined position. A pressure of less than the maximum supplied by the supply **26** may be obtained within the inflatable bodies by releasing the fill push button **40** before filling is completed as suggested in FIG. **8.**

The pneumatic valve device **24** also includes a fluidic air control three-way air valve **42** which is similar in construction to the inlet air valve **32.** Both air valves **32** and **42** are normally in their closed or inoperative conditions. The valve **42** is also connected to the output line **28.**

An exhaust control line **44** is connected to the valve control line **36** and an exhaust actuation means **46** is provided within the exhaust control line **44.** The exhaust actuation means **46** is similar to the actuation means **40** in the fill control line and is also advantageously in the form of a push button valve.

When the push button valve **46** is depressed, the air pressure within the valve control line **36** is transmitted to the control port of the valve **42** to shift the same to an operative position wherein the output line **28** is placed in communication with the atmosphere. In this manner, air under pressure within the output line **28,** and within the inflatable bodies **14***a* and **14***b*, may be evacuated into the atmosphere by suitable actuation of the air valve **42.** Evacuation of air from the inflatable bodies continues so long as the push button **46** is depressed. The pressure within the device **10** may be reduced, not necessarily to zero, by depressing the push button until the desired level is reached, and then releasing it. In this manner, the patient may be moved from a more inclined to a less inclined position, such as, for example, from the position shown in FIG. **6** to a position shown in FIG. **4** or **5.**

The device **10** described above is clearly suitable for orienting the position of a patient without initially fully raising the patient. The resilient body **12** need only be partially disposed beneath the shoulders and buttocks of the patient. While the device **10** has been illustrated in FIGS. **4–7** as being disposed on one side of the patient P for orienting the patient in one direction, clearly the device **10** can be disposed along the other side of the patient for turning or orienting the patient to the other side. As viewed in FIGS. **4–7,** the patient **P** is turned in a counter-clockwise direction. As suggested above, the device **10** can likewise be utilized to turn the patient in a clockwise direction by merely placing the device along the other side of the patient.

Referring to FIG. **10,** a patient orienting device **10′** is shown which is suitable for use where a patient is to be frequently turned or oriented from side to side. The device **10′** includes a resilient body **12′** which differs from the resilient body **12** shown in FIG. **1** in that two straight lines **12***b* and **12***b′* are provided which are spaced from each other to be positionable along or adjacent opposing sides of a patient P. The device **10′** includes additional first and second inflatable bodies **14***a′* and **14***b′* which are similarly constructed and connected as the bodies **14***a* and **14***b*. An inlet connection **16′** is provided for the inflatable body **14***a′* similarly as the inlet connection **16** is provided for the body **14***a*. In essence, the device **10′** is very similar to the device **10** in FIG. **1,** with the exception that two opposing similar or identical sets of inflatable bodies are provided at the lines **12***b* and **12***b′*. Advantageously, the inlet **16** is utilized to inflate the bodies **14***a* and **14***b* while the inlet **16′** is utilized to inflate the bodies **14***a′*and **14***b′*.

The uses and operation of the device **10′** is similar as that described in connection with the device **10.** However, as best depicted in FIGS. **12–14,** the device **10′** is disposed with the resilient body **12′** below the patient P. In this manner, the edges or lines **12***b* and **12***b′* extend substantially adjacently to the sides of the patient P. As opposed to the device **10,** the device **10′** must be placed beneath the patient P before the latter reclines on the rest surface or bed, or the patient P must be lifted. For this reason, the device **10′** may be placed on the rest surface before the patient P reclines thereon. Alternately, the device **10′** may be incorporated into the rest surface and form a permanent part thereof.

In the use of the device **10′**, since two inlet connections **16** and **16′** are provided, either a single pneumatic control system or two parallel systems may be utilized. Where a single control device such as the device **24** is utilized, the output line **28** may be selectively connected to one or teh other of the inlet connections **16** or **16′**. It is also possible, clearly, to provide two separate independent pneumatic control devices **24** each with a corresponding output line **28** thereof connected to one of the inlet connections of the device **10′**.

Referring to FIGS. 12–14, the inflatable bodies 14*a* and 14*b* are shown to be increasingly inflated to continuously shift the orientation of the patient P in a counter-clockwise direction similar to the manner shown in FIGS. 4–7. However, the device 10′ enjoys the versatility that shifting the patient P in the other direction is easily accomplished without raising the patient or shifting the device 10′ by simply filling the inflatable bodies 14*a*′ and 14*b*′ as shown in FIGS. 15 and 16. As the device 10 shown in FIG. 1, the device 10′ permits selective orientation of the patient P as well as turning in the manner described above.

Although the devices 10 and 10′ have been described as useful aids in turning hospital patients in bed, it will be appreciated that the use thereof is not strictly limited to this purpose but can include, for example, turning of a patient onto a stretcher, or some other similar body turning maneuver which may require care in its execution.

Numerous alterations of the structure herein disclosed will suggest themselves to those skilled in the art. However, it is to be understood that the present disclosure relates to a preferred embodiment of the invention which is for purposes of illustration only and is not to be construed as a limitation of the invention.

What is claimed is:

1. A patient orienting device for hospital patients and the like comprising a resilient body provided with two spaced opposing edges arranged adjacent to each side of a patient when the patient is supported by said resilient body, first and second inflatable bodies being provided along each edge of said resilient body, each first inflatable body being arranged for at least partially lifting said resilient body and the patient positioned thereon in response to inflation of the respective first inflatable body, each second inflatable body being arranged to be inflated subsequent to substantial inflation of an associated first inflatable body, at least a portion of each second inflatable body being at least partially supported by said associated first inflatable body and having an opposite other portion thereof in pushing contact against the patient, the inflatable bodies in each pair being in pushing contact with each other and together arranged to bear against and push the patient relative to said resilient body when the respective pair of inflatable bodies are inflated; and pneumatic air supply means for independently and selectively inflating and deflating said bodies on each side of said resilient body to a desired level of pressure to turn the patient or to support the latter in an intermediate inclined position, whereby a patient may be fully turned or inclined in the direction of one or the other of said exposed edges.

2. A patient orienting device as defined in claim 1, wherein said first inflatable body includes a pair of upper and lower panels connected along said exposed edge, the portion of said second inflatable body supported by said first inflatable body bearing against said upper panel.

3. A patient orienting device as defined in claim 2, including an inlet connected to said first inflatable body for the introduction of air under pressure thereto; and valve means connected from said first inflatable body to said second inflatable body for channeling the air under pressure from said first inflatable body into said second inflatable body to thereby produce sequential infation.

4. A patient orienting device as defined in claim 3, wherein said valve means includes a valve opening of a lesser extent than said inlet to said first inflatable body.

5. A patient orienting device as defined in claim 1, wherein said resilient body is provided with two spaced opposing edges arranged adjacent to each side of a patient when the patient is supported by said resilient body, first and second inflatable bodies bening provided along each edge of said resilient body, said pneumatic air supply means being arranged to independently and selectively inflate and delfate said inflatable bodies on each side of said resilient body, whereby a patient may be fully turned or inclined in the direction of one or the other of said exposed edges.

6. A patient orienting device as defined in claim 1, further including an inlet connected to said first inflatable body for introduction of air under pressure thereto, and wherein said pneumatic supply means includes a supply of air under pressure, a supply line connected to said supply of air; an inlet air valve connected between said supply line and said inlet; and fill actuation means for selectively actuating said air valve for opening and closing the flow path between said supply line and said inlet.

7. A patient orienting device as defined in claim 6, wherein said actuation means includes a push button valve, wherein said inlet valve maintains the air flow path between said supply line and said inlet open as long as said push button is depressed.

8. A patient orienting device as defined in claim 7, further comprising a check valve arranged between said input air valve and said inlet, whereby air under pressure within said inlet is prevented from returning to said supply line by way of said inlet air valve when said push botton is depressed.

9. A patient orienting device as defined in claim 6, further comprising an outlet air valve connected to said inlet, and further comprising exhaust actuation means for actuating said outlet air valve for placing said inlet in flud flow communication with the atmosphere, whereby air under pressure at said inlet is permitted to be evacuated during such time as the exhaust actuation means is actuated.

10. A patient orienting device as defined in claim 9, wherein said exhaust actuation means comprises a push button valve, said outlet air valve being arranged in a position for evacuation of air under pressure from said inlet during such time as the exhaust push button is depressed.

11. A patient orienting device as defined in claim 10, wherein said inlet and outlet air valves are pneumatically controlled by application of pressure air at a control port, further comprising an exhaust control line and a fill control line connected to said supply line and the respective inlet and outlet air valve control ports, said exhaust actuation means comprising a pneumatic push button valve disposed within said exhaust control line and said fill actuation means comprising a pneumatic push button valve within said fill control line, whereby only that air valve is placed into the operative mode when the corresponding push button valve is depressed to apply air under pressure to a respective control port.

* * * * *