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INFLATABLE BED PAD PROVIDING BED PAN SPACE

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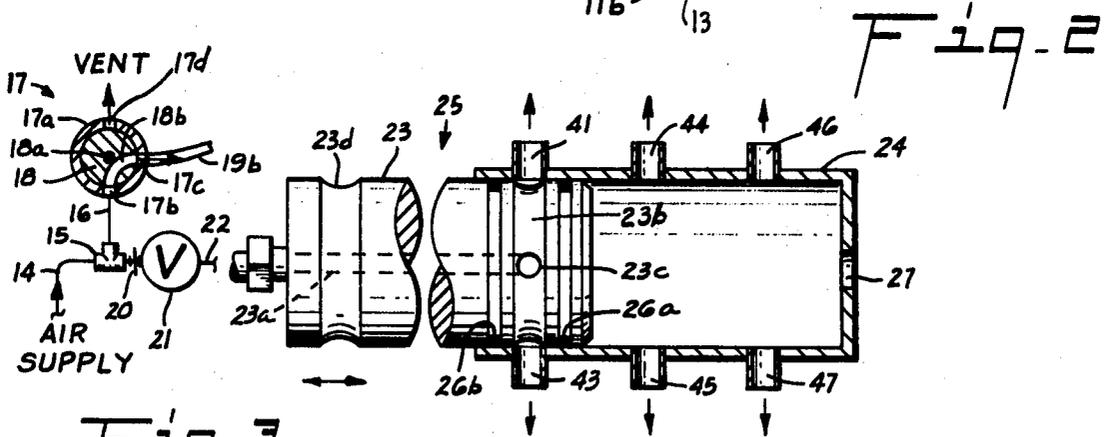
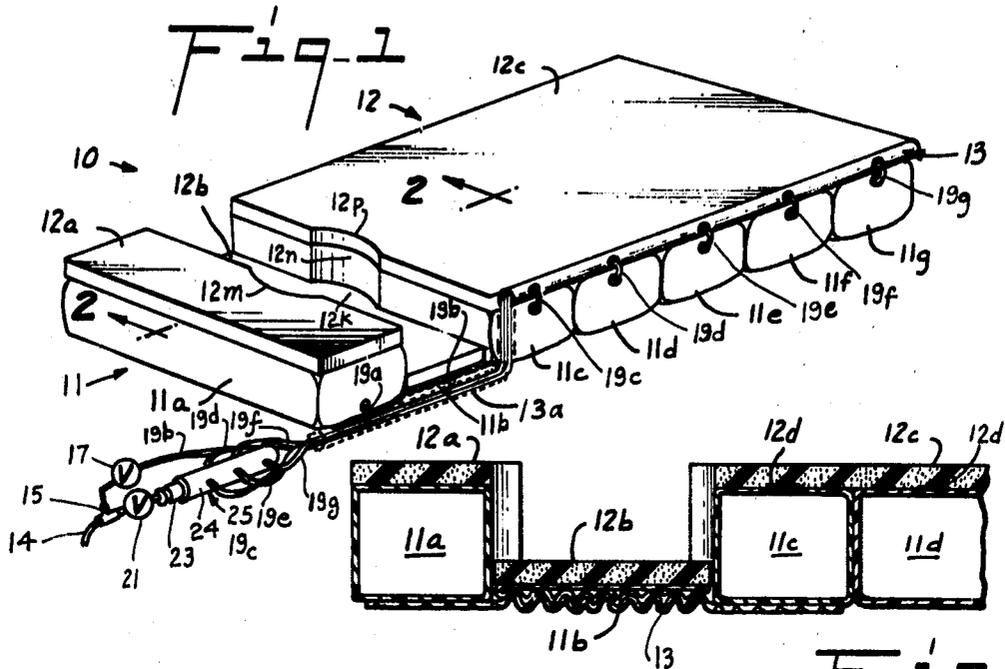


Fig-3

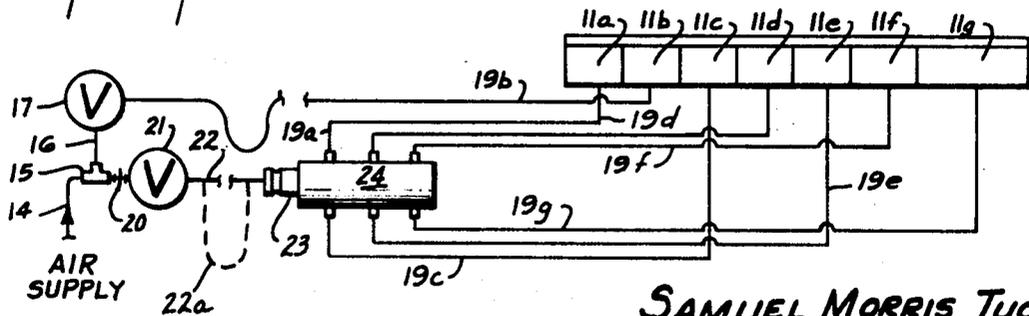


Fig-4

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1

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INFLATABLE BED PAD PROVIDING BED PAN SPACE

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8 Claims

ABSTRACT OF THE DISCLOSURE

The disclosure is to a bed pad that ties together in abutment, under the pad cover, inflatable compartments occupying successive areas across the pad from foot to head. A bed pan supporting compartment with cover thereupon separates compartment means with lower cover thereupon from a plurality of compartments with upper cover thereupon. A spool valve is provided selectively to be advanced to allow compressed air to pass successively through individual channels to inflate in succession the compartment means and then the compartments, preferably two at a time. The compressed air supply is split so that compressed air may be selectively directed to inflate the bed pan supporting compartment to the level of the other inflated compartments at times when it is not desired to have this compartment deflated to provide space for service insertion, as by a bed pan.

The invention is directed to a bed pad to be placed over a mattress, with inflatable compartment disposition under bed pad cover in manner that compartment selective inflation may isolate an uninflated compartment into which a service means, as a bed pan, may be inserted under a patient upon the cover means above the inflated compartments.

As a primary object the invention sets out to provide an inflatable bed pad to be placed upon a hospital mattress, the patient being upon cover means over selectively inflatable compartments, whereby inflation may isolate a space under the patient and thus above an uninflated compartment so that a service means, as a bed pan, may be inserted into the space thus provided.

It is also an important object of the invention to provide an inflatable bed pad of the class described, which includes easily and accurately manipulatable valve means, with the bed pan supporting, inflatable compartment being selectively inflated and deflated through a valve means separate from the valve means employed to inflate or deflate the other compartments of the pad.

It is still another object of the invention to provide an inflatable bed pad of this class in which the compartments may be deflated successively from top to foot, for instance, the uppermost compartments will be deflated as the head bed frame section is first raised, and successively lower compartments will be deflated as the head bed frame section is raised further.

It is also a further and desired object of the invention to provide a bed pad of this class providing selective compartment inflation thus to isolate service space below a patient for insertion of service means other than a bed pan, as, for instance, an inspection mirror.

Other and further objects will be apparent when the

2

specification is considered in connection with the drawing, in which:

FIG. 1 is an isometric view of a bed pad generally disclosing an embodiment as disposed to provide space for service means, as bed pan insertion;

FIG. 2 is a fragmentary, longitudinal sectional elevational view taken along line 2—2 of FIG. 1;

FIG. 3 is a view of spool valve housing in section, with spool valve element therein, with valving upstream thereof shown in diagram; and

FIG. 4 is a diagrammatical view showing valving and compartmentation flow diagram.

Referring now in detail to the drawings in which like reference numerals are applied to like elements in the various views, a bed pad 10 is shown in FIG. 1 represented as including an assembly of compartments 11, including a compartment means 11a as foot compartment, (which could be comprised of more than one compartment), a bed pan supporting compartment 11b, (deflated), and a plurality of upper compartments 11c, 11d, 11e, 11f, 11g and 11h. Also the bed pad 10 is shown as including a cover assembly 12 including a lower cover 12a, a bed pan supporting compartment cover 12b, and an upper cover 12c.

As shown in FIG. 2, a longitudinally extending strip, band, or sheet 13, indicated as being of flexible material, fabric, leather, elastic, is connected to the under sides of the inflated compartments 11a, the uninflated bed pan supporting compartment 12b, and the lowermost (closest to the foot) compartment 12c of the upper compartments, (compartments above the bed pan supporting compartment 11b). A compressed air conduit sheath 13 is shown in FIG. 1 as installed along the right side or edge of the upper cover 12c, as will be hereinbelow described.

A compressed air supply line 14, FIGS. 1, 3 and 4, indicated as flexible, connects into a T 15 from which a nipple 16 extends to a three-way valve housing 17a of a three-way valve 17. The valve core or valve element 18 thereof is indicated as being rotated by a handle 18a, with passage 18b through the core placing nipple 16, connected into housing port 17b, into communication, via housing port 42, with a flexible conduit 19b to the bed pan supporting compartment 11b.

A union 20 connects into the leg of the T 15 not heretofore brought into play, and connects oppositely to a stop-cock 21 which in turn is oppositely connected, by a conduit member 22 to the stem or valve element 23 of a spool valve 25. The valve element 23 slides in the valve cylinder or housing 24 of the spool valve 25, which has opposed ports 41, 43 therein; also opposed ports 44, 45 therein; and also opposed ports 46, 47, therein. From the respective ports 41, 43, 44, 45, 46 and 47, respective flexible conduits 19a, 19c, 19d, 19f and 19g extend to the respective inflatable compartments 11a, 11c, 11d, 11e, 11f and 11g, (shown elongated in FIG. 4).

In construction the valve element 23 is drilled centrally to provide an axial bore or passage 23a with which the conduit member 22 communicates by virtue of its connection into the outer end of the valve stem or element 23. Successively from its inner end outwardly, the spool valve stem 23 has an O-ring 26a provided to seat in a groove therearound, a larger annular groove 23b therein to carry fluid or compressed air to be delivered therefrom, an O-ring 26b provided to seat in a groove therearound, and at least one radial port 23c is provided in the valve

stem 23 to establish communication between the axial passage 23a and the delivery groove or passage 23a. The end of the spool valve housing or cylinder 24 opposite the valve stem 23 is open to provide a vent 27 through which the compressed air is voided when the compartments are deflated.

Obviously, since the valve 17, nipple 16, T 15, valve 21, conduit 22, and valve stem 23 are rigidly connected together, the nipple 16 may be grasped as a handle in moving the valve stem 23 inwardly to successive compartment inflating positions, or outwardly to successive compartment deflating positions. Or, for intimate movement of the valve stem 23, an annular grasp groove 23d is shown around the outer end of the valve stem 23. In case the compressed air supply is rigidly piped to the T 15, then in that case flexibility would have to be provided, as in a conduit in place of the conduit 22, having flexibility therein, as indicated by the dotted line 22a in FIG. 4.

The compartments are inflatable from foot to head in succession, except for the bed pan supporting compartment 11b. Thus with the valve stem 23 in the position shown, the stopcock 21 being open, the compartment means 11a and the compartment 11c being first inflated as the valve stem 23 is disposed in the position shown in FIG. 3. Then with the valve stem 23 urged further into the cylinder or housing 24 to place the delivery groove 23b in communication, via the ports 44, 45, with the respective conduits 19d, 19e, to inflate the respective compartments 11d, 11e. As this occurs the ports 41 and 43 are occluded, thus locking the compartment means 19a and compartment 19c in inflated position. Correspondingly, if the valve stem 23 is now urged further forward to place the groove 23b in communication, via the ports 46, 47, with the respective conduits 19f, 19g, to inflate the respective compartments 11f, 11g. As this occurs the ports 44, 45, are occluded, thus locking the compartments 19d, 19e in inflated position, the ports 41, 43, also remaining occluded so that the compartment means 11a and the compartment 11c remain locked in inflated position. Should this condition be desired for any continued time, the valve stem 23 may be urged still further forward to occlude the ports 46, 47, thus additionally locking the last inflated compartments 11f, 11g, in inflated position, as all of the previously inflated compartments remain thus locked. At this point, the stopcock 21 may be closed to cut off pressure variation responsive to any supply line conditions.

The pad 12 may be in full inflated position when the patient is to lie flat, then, assuming partially raising the upper or head section of the bed frame, including mattress thereon, the upper pad compartments 11f, 11g, may first be deflated, as by pulling the valve stem 23 rearwardly to uncover the ports 46, 47, thus to permit the respective compartments 11f, 11g, to void through the valve housing end discharge port 27. Then, upon further raising of the head section of the bed frame, further retraction of the valve stem may uncover the ports 44, 45, thus to permit the respective compartments 11d, 11e, to void through the valve housing end discharge port 27.

Then, should it be desired that the patient lie flat, without any bed pan or other service unit in place on the pad 10, the valve stem 23 may be further retracted to uncover the ports 41, 43, the bed frame head being lowered back down to level position. The compartment means 11a and the compartment 11c thus may void through the discharge port 27.

As to the operation of the three-way valve 17, in an independent circuit from the spool valve 25, at any time the valve handle 18a is manipulated to place the passage 18b in the position shown in FIG. 3, the flow of compressed air through the conduit 19b inflates the compartment 11b to raise this compartment, as to the level that the adjacent compartment means 11a, and the compartment 11c may stand.

To lock the compartment 11b in inflated position, it is

only necessary that the handle 18a to rotate the valve element or core 18 to occlude the housing ports 17b, 17c. To deflate the compartment 11b at any time desired, it is only necessary to rotate the valve element 18 to place the conduit 19b, via the housing port 17c and passage 18b, in position whereby the compartment 11b may be voided through the vent port 17d.

As to further details of construction, the compartments 11c, 11d, 11e, 11f and 11g, or the upper compartments under the upper cover 12c, may be connected to the underside of the upper cover 12c, as by glue strips 12d extending laterally or transversely across the under side of the top cover 12c, and centrally of the upper, outer surface of the respective compartments. Noticeably the sheath 13 for the respective conduits to the compartments may be extended, as shown by an extension sheath 13a in FIG. 1, to any appropriate position for valve location.

The invention is susceptible to various modifications of structure and arrangements, all going to the broad principle of manipulation or operation of a pad on top of a hospital mattress to elevate a patient on the cover thereof at any desired time, to provide a bed pan or service item space below the patient; the claims completing this application are presented as exemplary.

Noticeably, in FIG. 1, as another feature of construction, the cover 12b (and compartment 11b) are enlarged centrally toward the foot, and also oppositely centrally toward the compartment 11c (at 12k), while the compartment means 11a and lower cover 12a (at 12m), and the compartment 11c and upper cover 12c, respectively at 12n and 12p, are correspondingly recessed. This provides an ample service item area, as for a full sized bed pan.

What is claimed is:

1. A bed pad for installation over a mattress and including, in alignment and in successive abutment from the foot, inflatable compartment means with a lower cover thereover, an inflatable bed pan supporting compartment with a bed pan supporting cover thereover, and a plurality of inflatable compartments with an upper cover thereover, a source of compressed air and a supply conduit therefrom bifurcated to a three-way valve and a stop cock, a connection from stop cock to the valve element of an included spool valve having a housing to receive said valve element therein and vented opposite the spool valve entry side thereof, individual conduits from said housing to said compartment means and to said compartments and disposed with relation to spool valve ports, as selectively positionable by spool valve manipulation whereby said compartment means and said compartments may be successively inflated by valve element insertion and successively deflated by valve element withdrawal, a vent from said three-way valve and a conduit therefrom to said bed pan supporting compartment whereby said three-way valve may be selectively manipulated respectively to deflate said bed pan supporting compartment for bed pan insertion upon said bed pan supporting cover and to inflate said bed pan supporting compartment to the level of respective immediately adjacent compartment means and at least the adjacent compartment.

2. An inflatable bed pad as claimed in claim 1 in which said supply conduit is flexible upstream from said bifurcations, and wherein said conduit from said three-way valve to said bed pan supporting compartment is flexible.

3. An inflatable bed pad as claimed in claim 1 in which said connection between said stop cock and said valve element is in part flexible and of length to permit spool valve element movement.

4. An inflatable bed pad as claimed in claim 1 in which said bed pan supporting cover and compartment are enlarged centrally on opposite transverse sides thereof and in which said compartment means and said lower cover and the lowermost of said compartments and the upper cover thereover are correspondingly recessed.

5

5. An inflatable bed pad as claimed in claim 1 in which said conduits from said valve housing to said compartments extend within a included common sheath and in which the aforesaid conduits extend from said common sheath to their respective compartments.

6. An inflatable bed pad as claimed in claim 5 in which said sheath is disposed along an edge of said upper cover.

7. An inflatable bed pad as claimed in claim 5 in which said compartment means, said bed pan supporting compartment and the lowermost of said upper compartments adjacent said bed pan supporting compartment are joined together underneath by longitudinally extending means.

8. An inflatable bed pad as claimed in claim 1 in which at least the upper surface of said upper cover is smooth to avoid rough contact through any material thereover against patients.

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5—348; 128—292; 137—625.13