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(54) **STAND ALONE INTEGRATED CUSHION**

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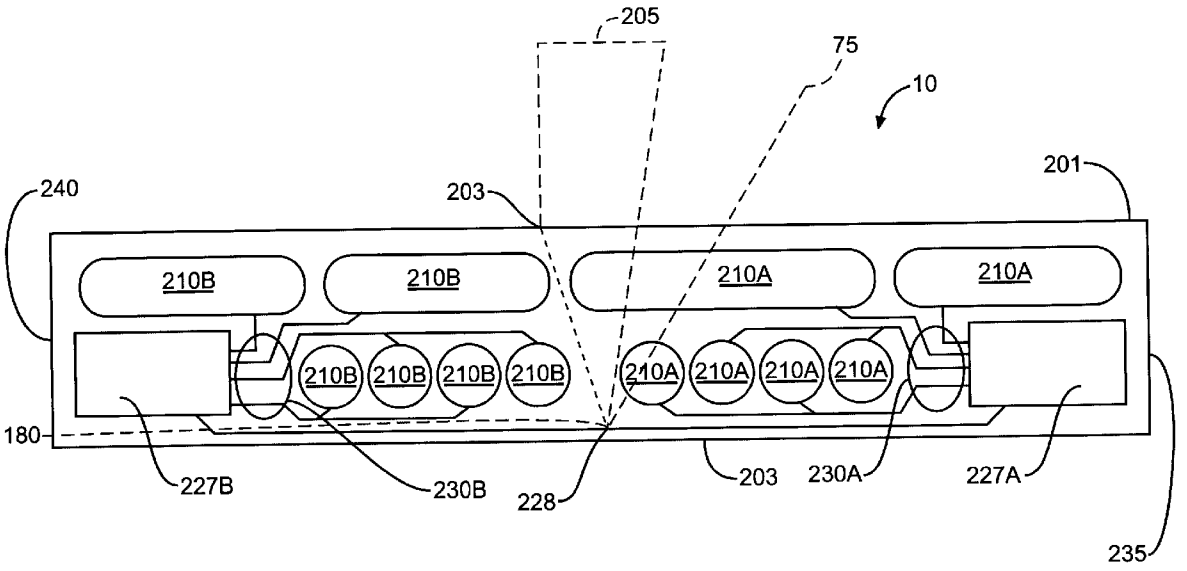
(57) **ABSTRACT**

The present invention is directed to a stand alone integrated mattress. The system has a self-contained mattress unit, at least one inflatable bladder, at least one fluid source, at least one dispersion unit and at least one control unit. The self-contained mattress unit has at least a head section and a foot section, and is capable of converting from a horizontal position or an inclined position to a chair-like conformation. There is at least one inflatable bladder in each section of the self-contained mattress unit. There is also at least fluid source. In addition there is at least one dispersion unit in each section and each dispersion unit provides a fluid, obtained from the fluid source, to a conduit which directs the fluid into the inflatable bladder positioned in the section of the dispersion unit. The control system is positioned in one of the sections and interconnected to each dispersion unit to control the dispersion of the fluid to the inflatable bladders in each section.



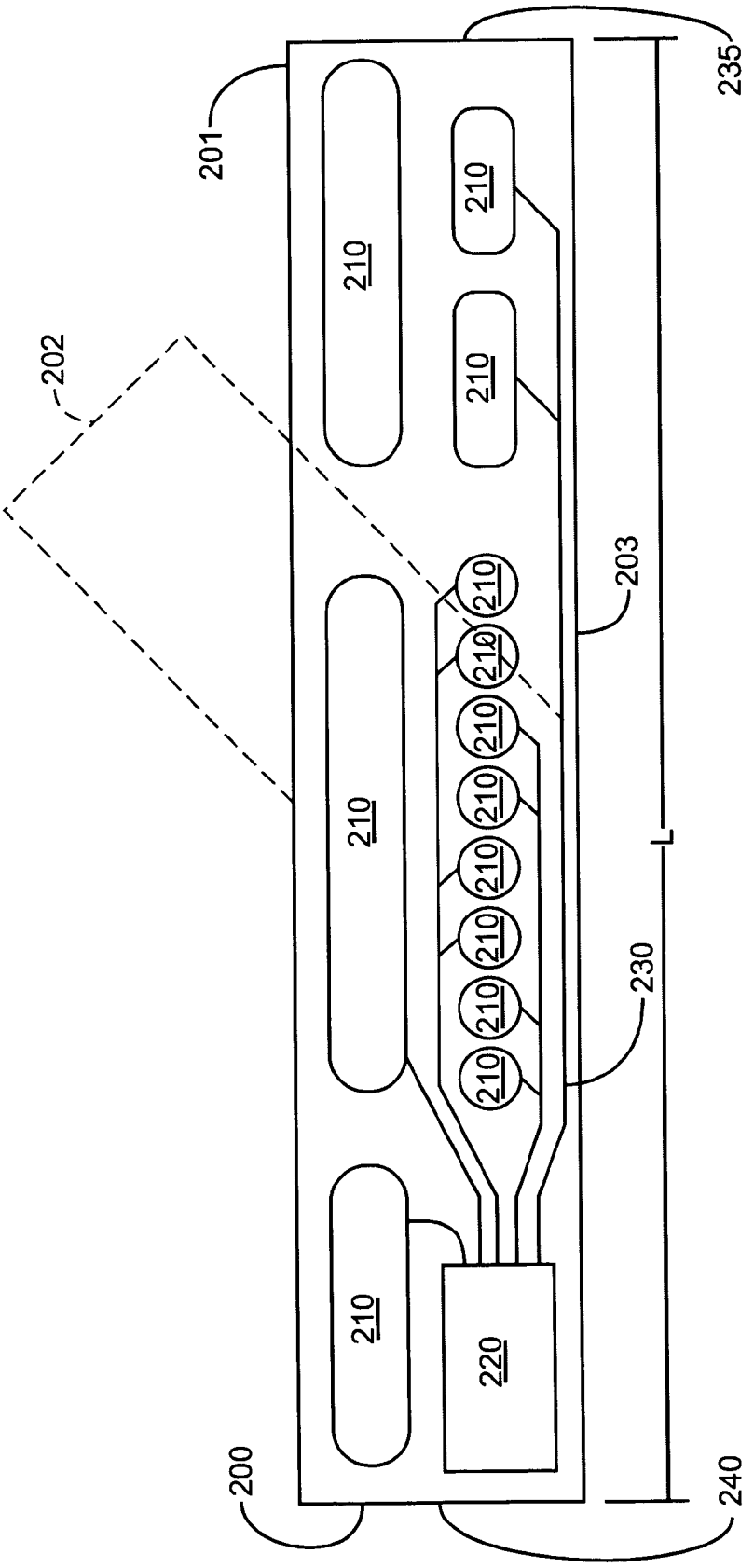


FIG. 1
(PRIOR ART)

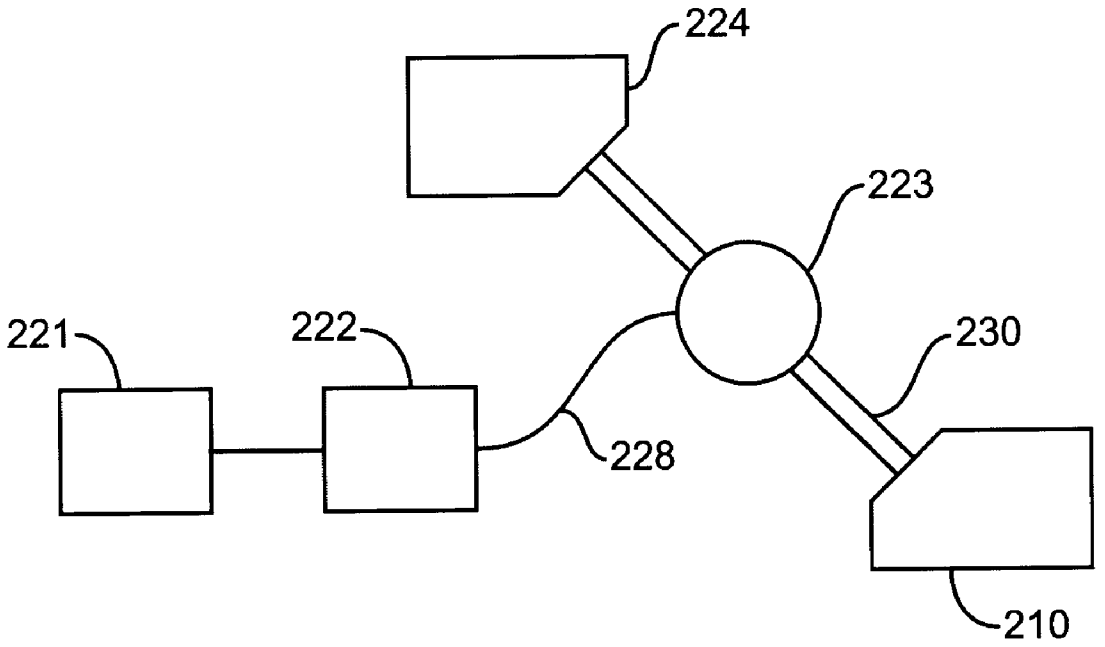


FIG. 2
(PRIOR ART)

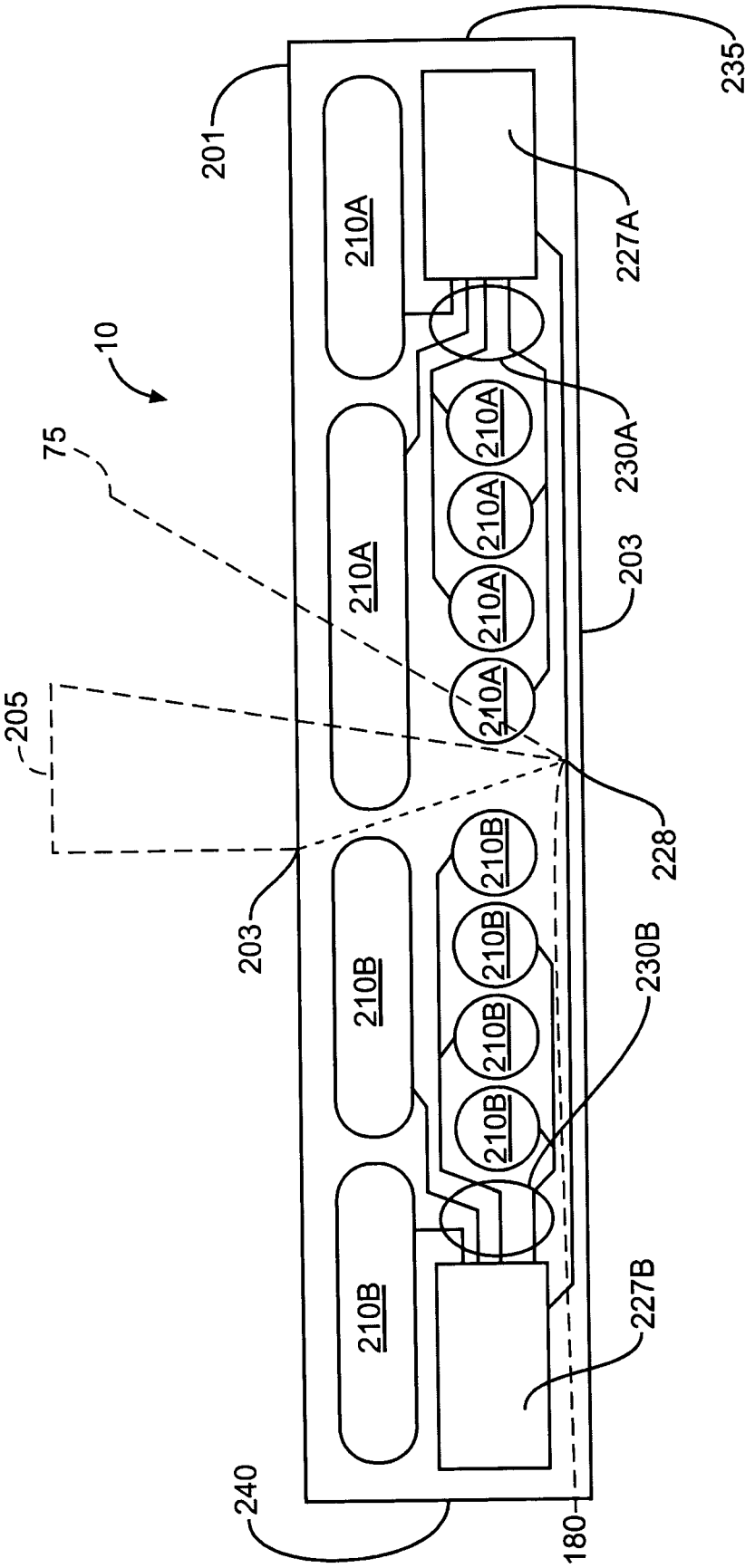


FIG. 3

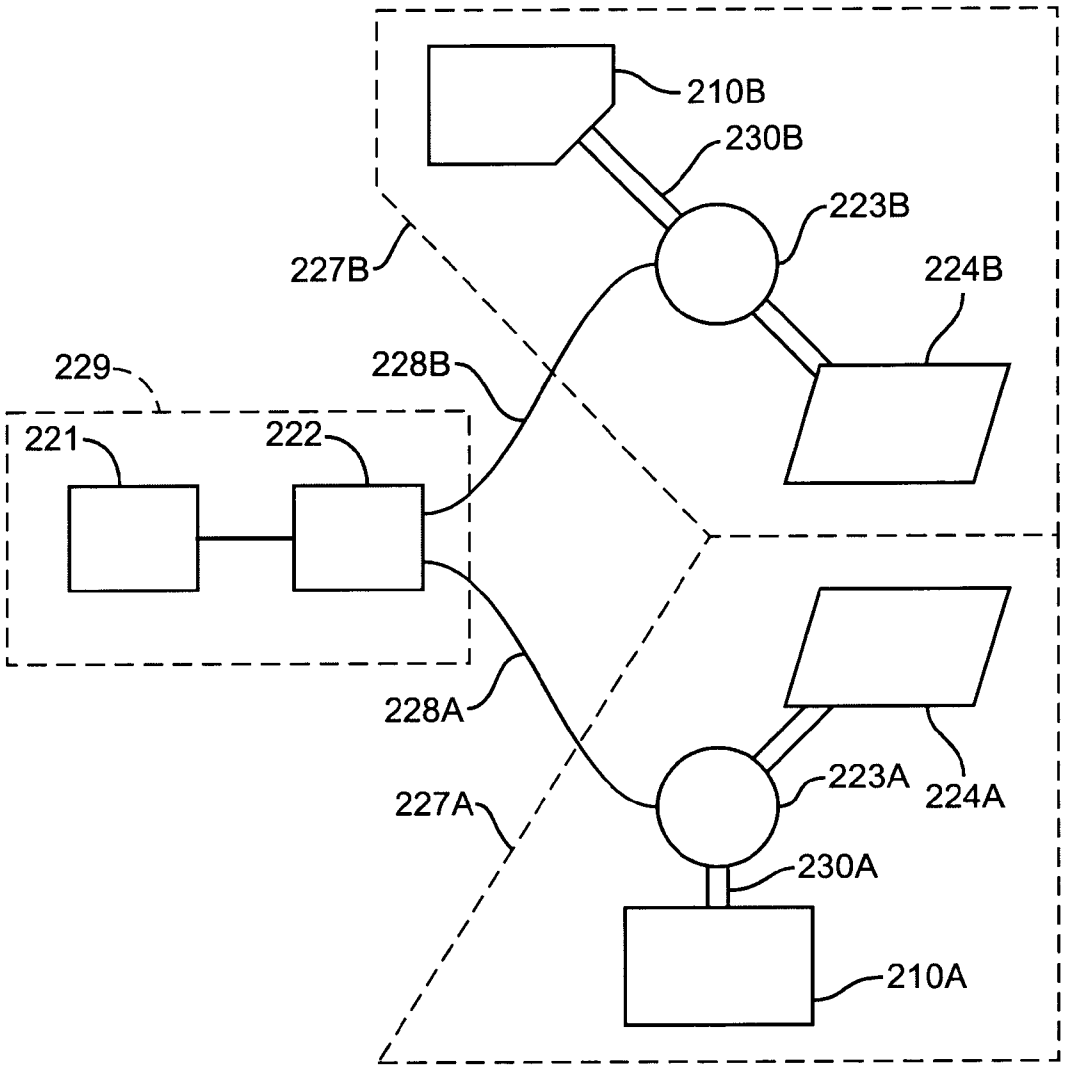

210B
230B
223B
224B
227B
229
228B
221
222
228A
223A
224A
227A
230A
210A

FIG. 4

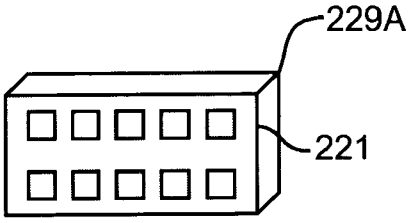


FIG. 5A

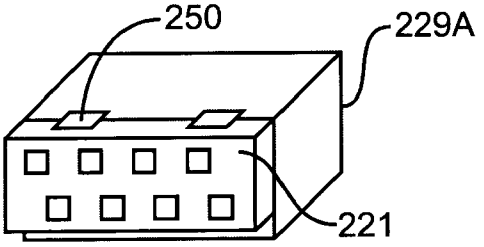


FIG. 5B

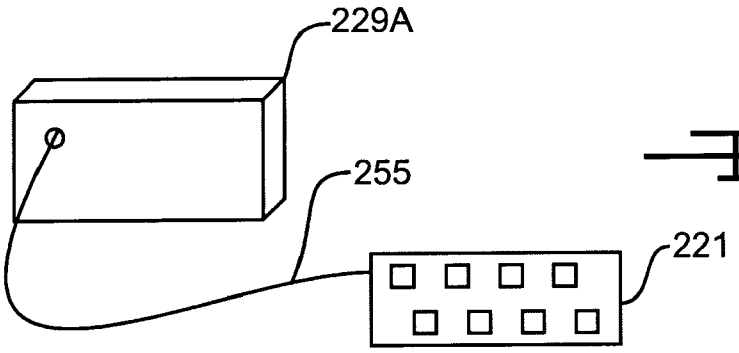


FIG. 5C

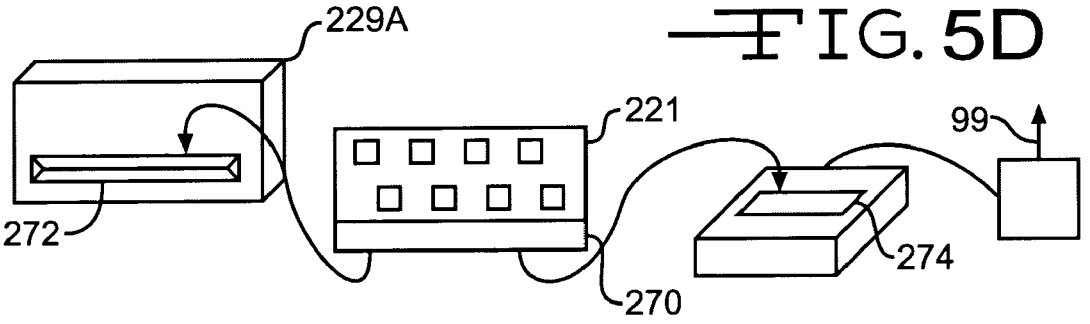


FIG. 5D

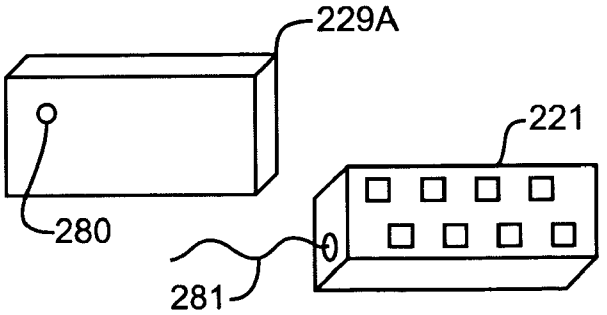


FIG. 5E

STAND ALONE INTEGRATED CUSHION

FIELD OF THE INVENTION

[0001] The present invention is directed to a cushion unit capable of having a portion of the cushion raised and lowered in relation to at least other portions of the cushion.

BACKGROUND OF THE INVENTION

[0002] Gaymar Industries, Inc., the assignee of this application, is a manufacturer of cushion like devices. These cushions which have at least one bladder are designed to contain fluids. In many cases the fluid is aqueous solutions and/or air. These cushions are used as seat cushions, mattresses, overlays and any other cushion designed to have a patient positioned thereon. Most of the cushions made by Gaymar are designed for therapeutic purposes.

[0003] Inflatable therapeutic cushions for patients have been known for many years. Many therapeutic cushions are designed to reduce "interface pressures"; the pressure encountered between a cushion and a patient's skin positioned on the cushion. It is known that interface pressures can significantly affect the well-being of immobile patients in that higher interface pressures can reduce local blood circulation, tending to cause bed sores and other complications. With inflatable cushions, such interface pressures depend (in part) on the air pressure within the inflatable support cushions.

[0004] There are numerous types of inflatable cushion designs. These designs have combinations of bladders that can (1) vibrate, (2) rotate, (3) create wave motions, (4) provide percussion, (5) provide support, and (6) combinations thereof (hereinafter referred to as "Objectives") to a user of the cushion. These designs have been incorporated in numerous cushion designs by Gaymar Industries, Inc. as of the filing of this application.

[0005] In particular, those cushion designs have been used in numerous Gaymar mattress systems. Those mattress systems **200**, as illustrated in **FIG. 1**, have at least one inflatable bladder capable of performing an Objective **210**, a control unit **220**, and a conduit **230** that interconnects the control unit **220** to the inflatable bladder(s) **210**. The control unit **220** can be outside the mattress system **200** (not shown) or within the mattress system **200**, as illustrated in **FIG. 1**. For purposes of this application, we will only address those mattress systems that have the control unit within the mattress system.

[0006] We are making this limitation because the present invention is directed solely to self-contained mattress systems. Self-contained mattress systems are preferred in hospital settings because they are easier to clean—no disconnecting of hoses from the control unit and the bladder(s).

[0007] Self-contained mattress systems have the control unit **220** normally and preferably at the foot of the system **240**, a plurality of bladders **210** designed to accomplish at least one Objective, and a plurality of conduits **230** that interconnect the bladders **210** to the control unit **230**. In all prior Gaymar mattress systems and those known to Gaymar, there is a single control unit **220**.

[0008] That single control unit **220**, as illustrated in **FIG. 2**, has a plurality of input keys **221** interconnected to at least a microprocessor **222**. That microprocessor **222** is at least interconnected to pumps, fans, valves and/or switches **223** that push, pull and/or allow (by potential energy contained in the bladder(s)) a fluid through the conduits **230** and the bladder(s) **210**. The fluid is contained within a reservoir and/or ambient environment **224**. In any case, the fluid is used in the respective bladder to obtain the desired Objective.

[0009] There are numerous problems with such self-contained mattress systems **200**. One of these problems is that such mattress systems can remain horizontal **201** and/or incline from the horizontal position **201** to about a 45° incline **202** relative to the horizontal position **201** and from a bend point **203**. The mattress systems with the above-identified technology is unable to effectively and reliably continue to obtain the Objectives and simultaneously convert the mattress system from a horizontal position to a chair-like position (having an angle greater than 75° (line **75**) and less than 180° (line **180**) relative to the horizontal position and taken from the bend point **203**, and hereinafter referred to as the "Conversion").

[0010] Conventional mattress systems are unable to reliably make the Conversion because the one control unit, normally positioned at and/or near one of the ends **235**, **240**, has a plurality of conduits extending the length (L) of the mattress system **200**. When the mattress system is converted from the horizontal position **201** and/or the inclined position **201** to a chair like conformation (greater than 75°) the conduits **230** kink, become deformed, and do not properly transfer the desired amount of fluid to the bladder(s) **210**. And if the bladder(s) **210** fail to receive the desired amount of fluid, the bladder(s) **210** do not complete its Objective.

[0011] The present invention solves this problem and others.

SUMMARY OF THE INVENTION

[0012] The present invention is directed to a stand alone integrated mattress. The system has a self-contained mattress unit, at least one inflatable bladder, at least one fluid source, at least one dispersion unit and at least one control unit. The self-contained mattress unit has at least a head section and a foot section, and is capable of converting from a horizontal position or an inclined position to a chair-like conformation. There is at least one inflatable bladder in each section of the self-contained mattress unit. There is also at least fluid source. In addition there is at least one dispersion unit in each section and each dispersion unit provides a fluid, obtained from the fluid source, to a conduit which directs the fluid into the inflatable bladder positioned in the section of the dispersion unit. The control system is positioned in one of the sections and interconnected to each dispersion unit to control the dispersion of the fluid to the inflatable bladders in each section.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] **FIG. 1** is a prior art illustration of a conventional inclinable and/or horizontal mattress system.

[0014] **FIG. 2** is a prior art schematic of how the mattress system of **FIG. 1** operates.

[0015] **FIG. 3** illustrates the present invention.

[0016] **FIG. 4** illustrates the schematic of how the present invention operates.

[0017] **FIGS. 5***a-e* illustrate alternative embodiments of the present invention.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

[0018] The present invention is directed to a mattress system **10** capable of being converted from the horizontal position **201** to a chair-like position **205**, which has an angle of greater than 75° relative to the horizontal position **201** and the bend point **203**. That in itself is not novel. There are plenty of such Conversion mattress systems and the mechanics of how the system moves from one position to another position is well known to those of skill in the art and therefore is not a part of the scope of this application. None of the conversion mattress systems, however, are self-contained systems that use inflatable bladders. The reasons are simple, self-contained mattress systems that use conduits kink, and disrupt the fluid dynamics in the conduits **230** to the inflatable bladders **210**. That problem is solved by the present invention.

[0019] The present Conversion mattress system **10** has at least two inflatable bladders **210***a,* **210***b* and each is capable of performing an Objective, the same or different. The first inflatable bladder **210***a* is located at and/or between the distal end **235** and at least one of the bend point(s) **203**; while the second inflatable bladder **210***b* is located at and/or between the proximal end **240** and at least one of the bend point(s) **203**. The inflatable bladders **210***a,* **210***b* are capable of performing the Objective when each inflatable bladder receives a fluid. Each inflatable bladder **210***a,* **210***b* receives the fluid through a conduit **230***a,b* from at least one of two fluid dispersion units **227***a,* **227***b.* The fluid is obtained from a reservoir **224***a,b.* The reservoirs **224***a,b* can be the same or different and can provide the same or different fluids. The fluids can be an aqueous solution and/or a gas, like air.

[0020] The dispersion units **227***a* is positioned at or near the distal end **235**, and the dispersion unit **227***b* is positioned at or near the proximal end **240**. They are positioned near the ends **235**, **240** because the normal human being who will be using the Stand alone integrated mattress system **10** applies and receives the least amount of pressure at these positions.

[0021] By having two dispersion units **227***a,b* the present invention (1) decreases the length of the conduit **230***a,b* to the respective bladder(s) **210***a,b* from the dispersion unit **227***a,b,* (2) generates less vibration, heat, and noise (less distance to push and/or pull the fluid), (3) decreases the chances of kinks and air occlusion in the conduits **230***a,b,* and (4) increases the reliability of the inflatable bladders **210***a,b* in the self-contained with inflatable bladder stand alone integrated mattress system **10**. The two dispersion units **227***a,b* are interconnected together through a control system **229**. The control system **229** merely incorporates the input system **221** and the microprocessor unit **222** of the conventional control unit **220**. Except in the present system **10**, the control system **229** transmits its signals that control the units **223***a,b* through respective transmission lines **228***a, b.* Transmission lines **228***a,b* can become kinked and not adversely affect (1) the transmission of the signal from the microprocessor **222** to the dispersion units **227***a,b,* and (2) the operation of the system **10** when it converts from the horizontal position **201** to anything up to and including the chair-like position **205**. Obviously, the control system **229** can be incorporated with the either dispersion unit **227***a* or dispersion unit **227***b.* Alternatively, each dispersion unit **227***a,b* could have control system **229**, but that is undesired because it increases the cost of the unit and the technical ability to operate the system.

[0022] In addition, the input system **221** can have various designs. The input system **221** can be an integrated part of a control system box **229***a* which contains at least the microprocessor **222** and possibly the dispersion units **227***a, b,* as illustrated in **FIG. 5***a.* This type of system is commonly used in conventional self-contained incline mattress systems, **FIG. 1**. The input system **221** can be electrically hinged **250** to the system box **229***a,* as illustrated in **FIG. 5***b.* Alternatively, the input system **221** can be electrically tethered **255** to the system box **229***a,* as illustrated in **FIG. 5***c.* In another embodiment, the input system **221** can be electronically slaved to the system box **229***a.* An example of being electrically slaved to the system box **229***a* includes and not limited to the input system **221** having a daughter SIMM board unit **270** extending from therefrom that is keyed only to fit into a particular SIMM socket **272** of control box **229***a,* and a master SIMM socket **274** to reprogram through a computer system **99**, if necessary, the input of the input unit **221**, as illustrated in **FIG. 5***d.* It is understood that the mattress system **10**, **200** will not operate if the input unit **221** is not installed in the particular SIMM socket **272**. Another alternative embodiment, has the input unit **221** transmit a conventional remote signal **281**, like rf or ir, to a respective receiver **280** on the control box **229***a,* as illustrated in **FIG. 5***e.*

[0023] While the preferred embodiment of the invention has been illustrated and described, it will be clear that the invention is not so limited. Numerous modifications, changes, variations, substitutions and equivalents will occur to those skilled in the art without departing from the spirit and scope of the present invention as defined by the appended claims.

1. A stand alone integrated mattress comprising:

a self-contained mattress unit having at least a head section and a foot section, and capable of converting from a horizontal position or an inclined position to a chair-like conformation;

at least one inflatable bladder in each section of the self-contained mattress unit;

at least one fluid source;

at least one dispersion unit in each section and each dispersion unit provides a fluid, obtained from the fluid source, to a conduit which directs the fluid into the inflatable bladder positioned in the section of the dispersion unit;

a control system positioned in one of the sections and interconnected to each dispersion unit to control the dispersion of the fluid to the inflatable bladders in each section.

2. The stand alone integrated mattress of claim 1 wherein the at least one fluid source is ambient air.

3. The stand alone integrated mattress of claim 1 wherein the at least one fluid source is selected from the group consisting of a reservoir, ambient air and combinations thereof.

4. The stand alone integrated mattress of claim 1 wherein the fluid is selected from the group consisting of air and an aqueous solution.

5. The stand alone integrated mattress of claim 1 wherein the inflatable bladders are capable of vibrating, rotating, creating wave motions, providing not direct percussion, providing support, and combinations thereof to a user of the mattress.

6. The stand alone integrated mattress of claim 1 wherein the control system has an input unit that allows an operator to input data to control at least the inflation and/or deflation of the inflatable bladders.

7. The stand alone integrated mattress of claim 6 wherein the input unit is interconnected to the control unit as an integrated component thereof.

8. The stand alone integrated mattress of claim 6 wherein the input unit is interconnected to the control unit by a tethered electrical connection.

9. The stand alone integrated mattress of claim 6 wherein the input unit is interconnected to the control unit through an electrically connected hinge.

10. The stand alone integrated mattress of claim 6 wherein the input unit has a SIMM daughter board that interconnects to the control unit.

11. The stand alone integrated mattress of claim 6 wherein the input unit transmits a remote wireless signal to a receiver on the control unit.

12. A stand alone integrated mattress comprising:

a mattress unit having at least a head section and a foot section;

at least one inflatable bladder in each section of the self-contained mattress unit;

at least one fluid source;

at least one dispersion unit in the mattress and the dispersion unit provides a fluid, obtained from the fluid source, to a conduit which directs the fluid into the inflatable bladder;

a control system positioned in one of the sections and interconnected to each dispersion unit to control the dispersion of the fluid to the inflatable bladders

wherein the control system has an input unit that allows an operator to input data to control at least the inflation and/or deflation of the inflatable bladders

wherein the input unit is selected from the group consisting of the input unit (1) is interconnected to the control unit by a tethered electrical connection, (2) transmits a remote signal to a receiver on the control unit, (3) has a SIMM daughter board that interconnects to the control unit, or (4) is interconnected to the control unit through an electrically connected hinge.

13. The mattress of claim 12 wherein the mattress unit is a self-contained capable of converting from a horizontal position or an inclined position to a chair-like conformation;

wherein each section has at least one dispersion unit and each dispersion unit provides the fluid, obtained from the fluid source, to the conduit which directs the fluid into the inflatable bladder positioned in the section of the dispersion unit;

the control system positioned in one of the sections and interconnected to each dispersion unit to control the dispersion of the fluid to the inflatable bladders in each section.

14. The mattress of claim 13 wherein at least one fluid source is ambient air.

15. The mattress of claim 13 wherein the at least one fluid source is selected from the group consisting of a reservoir, ambient air and combinations thereof.

16. The mattress of claim 13 wherein the fluid is selected from the group consisting of air and an aqueous solution.

17. The mattress of claim 13 wherein the inflatable bladders are capable of vibrating, rotating, creating wave motions, providing percussion, providing support, and combinations thereof to a user of the mattress.

* * * * *