

U.S. Patent No. 5,904,172 Claim Listing

No.	Limitation
Claim 2	
2.a.1	An improved valve enclosure assembly for use with an air inflatable mattress having at least one air bladder inflated by compressed air,
2.a.2	a pump fluidly coupled to the at least one air bladder for providing compressed air thereto, and
2.a.3	a processor for providing commands to the improved valve enclosure assembly during an inflate/deflate cycle,
2.a.4	the improved valve enclosure assembly being fluidly coupled intermediate the pump and the at least one air bladder for controlling the inflation of the at least one air bladder, comprising:
2.b.1	an enclosure defining a substantially fluidly sealed air chamber and having at least one air inlet to the air chamber being fluidly coupled to the pump,
2.b.2	a plurality of guides and stops being disposed within the enclosure for correctly positioning components within the enclosure; and
2.c	pressure monitor means being operably coupled to the processor and being in fluid communication with the at least one bladder for continuously monitoring the pressure in the at least one bladder.
Claim 3	
3.a	The improved valve enclosure assembly of claim 2 further including at least one solenoid operated valve disposed within the enclosure,
3.b	said plurality of guides and stops for disposing the solenoid with respect to the valve.
Claim 4	
4.a.1	An improved valve enclosure assembly for use with an air inflatable mattress having at least one air bladder inflated by compressed air,
4.a.2	a pump fluidly coupled to the at least one air bladder for providing compressed air thereto, and
4.a.3	a processor for providing commands to the improved valve enclosure assembly during an inflate/deflate cycle,

WA 11522478.2

American National Manufacturing, Inc. Ex. 1004 – Page 1

WA 11522478.2

4.a.4	the improved valve enclosure assembly being fluidly coupled intermediate the pump and the at least one air bladder for controlling the inflation of the at least one air bladder, comprising:
4.b	an enclosure defining a substantially fluidly sealed air chamber and having at least one air inlet to the air chamber being fluidly coupled to the pump
4.c	at least one valve being disposed within the enclosure, the at least one valve being snap fit in an aperture defined in a wall of the enclosure; and
4.d	pressure monitor means being operably coupled to the processor and being in fluid communication with the at least one bladder for continuously monitoring the pressure in the at least one bladder.
Claim 5	
5.a	The improved valve enclosure assembly of claim 4 wherein the at least one valve has a circumferential ramped face,
5.b	said ramped face for compressively engaging a circumferential beveled face of the aperture to effect the snap fit of the at least one valve.
Claim 6	
6.a.1	An improved valve enclosure assembly for use with an air inflatable mattress having at least one air bladder inflated by compressed air,
6.a.2	a pump fluidly coupled to the at least one air bladder for providing compressed air thereto, and
6.a.3	a processor for providing commands to the improved valve enclosure assembly during an inflate/deflate cycle,
6.a.4	the improved valve enclosure assembly being fluidly coupled intermediate the pump and the at least one air bladder for controlling the inflation of the at least one air bladder, comprising:
6.b.1	an enclosure defining a substantially fluidly sealed air chamber and having at least one air inlet to the air chamber being fluidly coupled to the pump,
6.b.2	the enclosure being formed of an enclosure portion and a rear cover portion,
6.b.3	a flexible seal being compressively interposed between the

WA 11522478.2

American National Manufacturing, Inc. Ex. 1004 – Page 2

WA 11522478.2

	enclosure portion and a rear cover portion to effect a substantially fluid tight seal therebetween; and
6.c	pressure monitor means being operably coupled to the processor and being in fluid communication with the at least one bladder for continuously monitoring the pressure in the at least one bladder.
Claim 7	
7.a	The improved valve enclosure assembly of claim 6 wherein the enclosure further includes a plurality of lead grooves defined in the enclosure portion proximate the rear cover portion,
7.b	said lead grooves for passing electrical leads into the enclosure.
Claim 8	
8	The improved valve enclosure assembly of claim 7 wherein the flexible seal fluidly seals the lead wires disposed in the lead grooves.
Claim 9	
9.a	A method of effecting a desired pressure in a bladder of an air inflatable mattress, comprising the steps of:
9.b	providing a commanded desired pressure of the bladder;
9.c	opening a valve fluidly coupled to the bladder, wherein the valve is one of a plurality of valves at least partially contained within, or formed integral to, a substantially fluidly sealed air chamber of a valve enclosure assembly;
9.d.1	continuously monitoring the existing pressure in the bladder at a tap on the valve enclosure assembly,
9.d.2	the tap defining an opening through the valve enclosure assembly and into an interior of the air chamber;
9.e	determining the differential between the existing pressure in the bladder and the desired pressure in the bladder;
9.f	exhausting air from the bladder through the valve when the differential indicates that the existing pressure in the bladder is greater than the desired pressure;
9.g	energizing a pump fluidly coupled to the valve for providing compressed air to the bladder when the differential indicates that the desired pressure in the bladder is greater than the existing pressure in the bladder to inflate the bladder; and

WA 11522478.2

WA 11522478.2

9.h	closing said valve when the existing pressure in the bladder substantially equals the desired pressure in the bladder.
Claim 11	
11.a.1	An improved valve enclosure assembly for use with an air inflatable mattress having at least one air bladder inflated by compressed air,
11.a.2	a pump fluidly coupled to the at least one air bladder for providing compressed air thereto, and
11.a.3	a processor for providing commands to the improved valve enclosure assembly during an inflate/deflate cycle,
11.a.4	the improved valve enclosure assembly being fluidly coupled intermediate the pump and the at least one air bladder for controlling the inflation of the at least one air bladder, comprising:
11.b	an enclosure defining a substantially fluidly sealed air chamber and having at least one air inlet to the air chamber being fluidly coupled to the pump;
11.c.1	at least one valve operably coupled to the enclosure being in selective fluid communication with the air chamber and being in fluid communication with the at least one air bladder for selectively fluidly coupling the air chamber to at least one air bladder,
11.c.2	the at least one valve being fluidly sealingly disposed in a valve aperture defined in the enclosure by a snap-fit engagement therewith and being in fluid communication with both the exterior of the enclosure and with the air chamber; and
11.d	pressure monitor means being operably coupled to the processor and being in fluid communication with the at least one valve for monitoring the pressure in the at least one bladder.
Claim 12	
12.a.1	An improved valve enclosure assembly for use with an air inflatable mattress having at least one air bladder inflated by compressed air,
12.a.2	a pump fluidly coupled to the at least one air bladder for providing compressed air thereto, and
12.a.3	a processor for providing commands to the improved valve

WA 11522478.2

WA 11522478.2

	enclosure assembly during an inflate/deflate cycle,
12.a.4	the improved valve enclosure assembly being fluidly coupled intermediate the pump and the at least one air bladder for controlling the inflation of the at least one air bladder, comprising:
12.b.1	an enclosure defining a substantially fluidly sealed air chamber and having at least one air inlet to the air chamber being fluidly coupled to the pump,
12.b.2	a plurality of guides and stops being disposed within the enclosure for correctly positioning components within the enclosure;
12.c	at least one valve operably coupled to the enclosure being in selective fluid communication with the air chamber and being in fluid communication with the at least one air bladder for selectively fluidly coupling the air chamber to at least one air bladder; and
12.d	pressure monitor means being operably coupled to the processor and being in fluid communication with the at least one valve for monitoring the pressure in the at least one bladder.
Claim 13	
13.a	The improved valve enclosure assembly of claim 12 further including at least one solenoid operated valve disposed within the enclosure,
13.b	said plurality of guides and stops for disposing the solenoid with respect to the valve.
Claim 14	
14.a.1	An improved valve enclosure assembly for use with an air inflatable mattress having at least one air bladder inflated by compressed air,
14.a.2	a pump fluidly coupled to the at least one air bladder for providing compressed air thereto, and
14.a.3	a processor for providing commands to the improved valve enclosure assembly during an inflate/deflate cycle,
14.a.4	the improved valve enclosure assembly being fluidly coupled intermediate the pump and the at least one air bladder for controlling the inflation of the at least one air bladder, comprising:
14.b.1	an enclosure defining a substantially fluidly sealed air chamber

WA 11522478.2

WA 11522478.2

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