

[54] **SELF INFLATABLE AIR MATTRESS, AND SLEEPING BAG WITH AIR PRESSURE CONTROL**

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[51] Int. Cl. **A47g 9/00; A47c 23/00**

[58] Field of Search..... **5/343, 344, 347, 348-350, 5/355; 9/11 A, 11, 13, 2 A**

[56] **References Cited**

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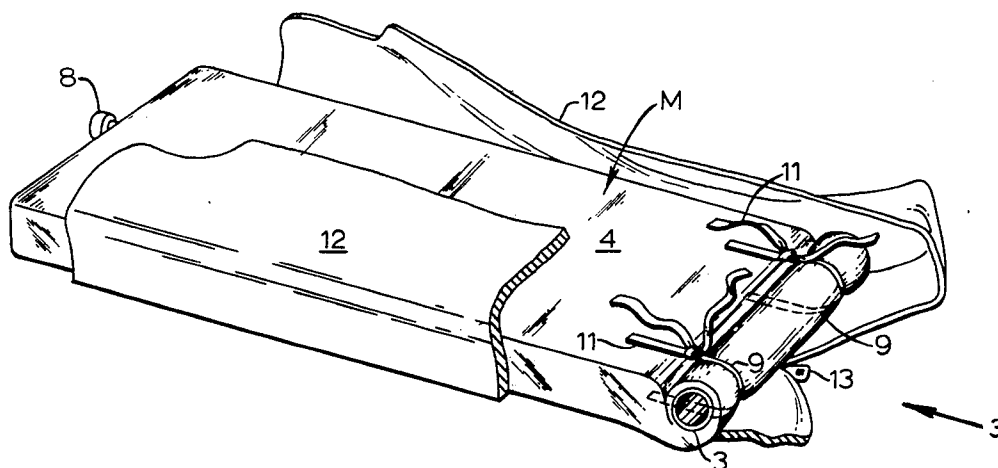
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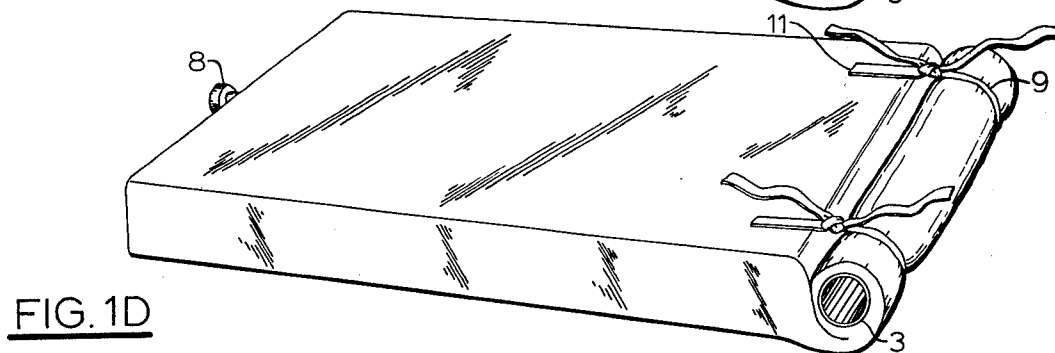
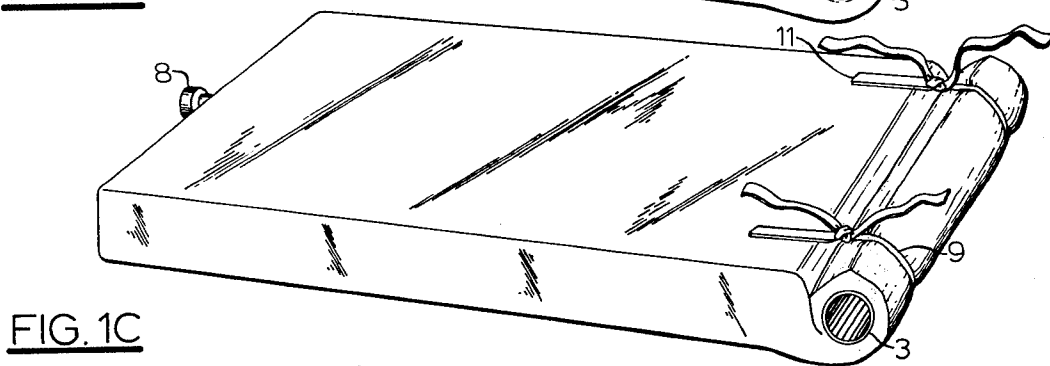
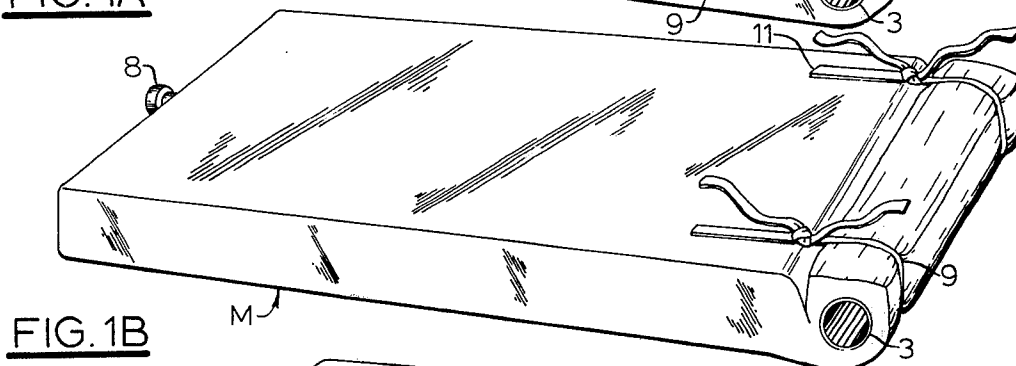
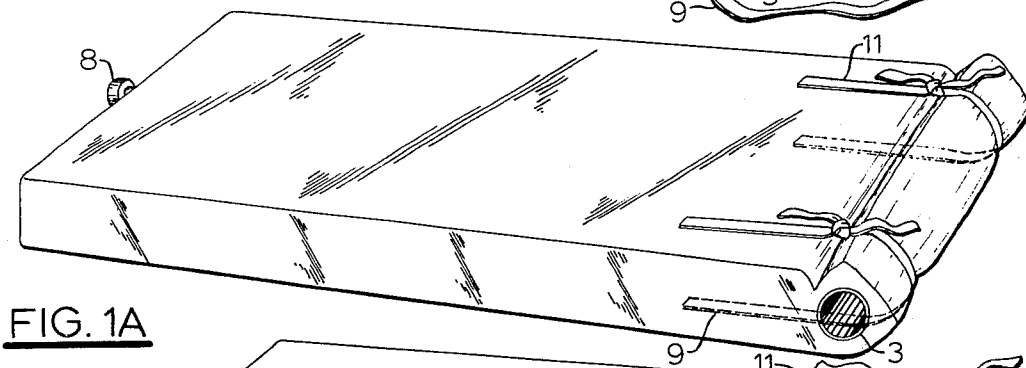
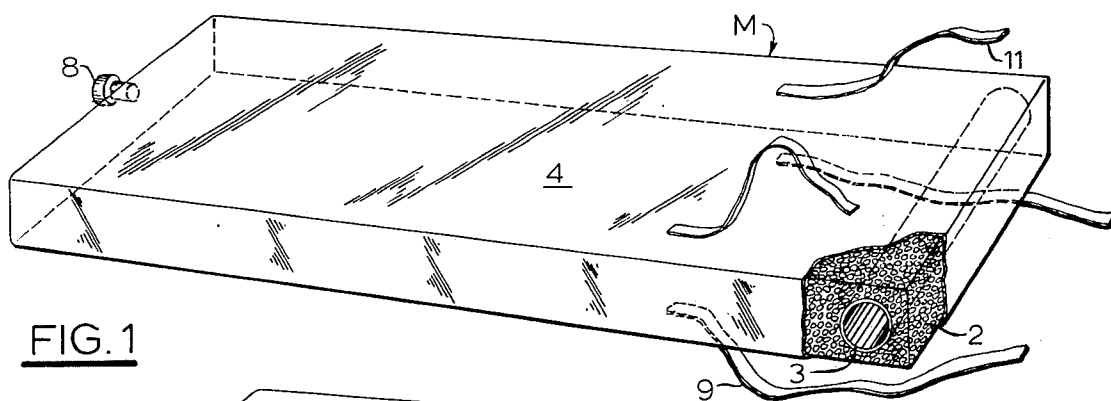
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[57] **ABSTRACT**

A self inflatable air mattress having a core of flexible and resilient cellular material of the open cell type, and an air tight flexible jacket enclosing the core. A tube communicating with the interior of the jacket allows flow of air into and from the core cells; and a closure for the tube maintains the cells filled to form a resilient air cushion. A mandrel adjacent an end of the mattress enables it to be flattened and readily wound into a compact roll. Detachable connecting means on the mattress jacket provides means for fixing the mandrel in a partially rolled position to maintain increased pressure. A cover attached to the jacket provides a sleeping bag.

8 Claims, 9 Drawing Figures





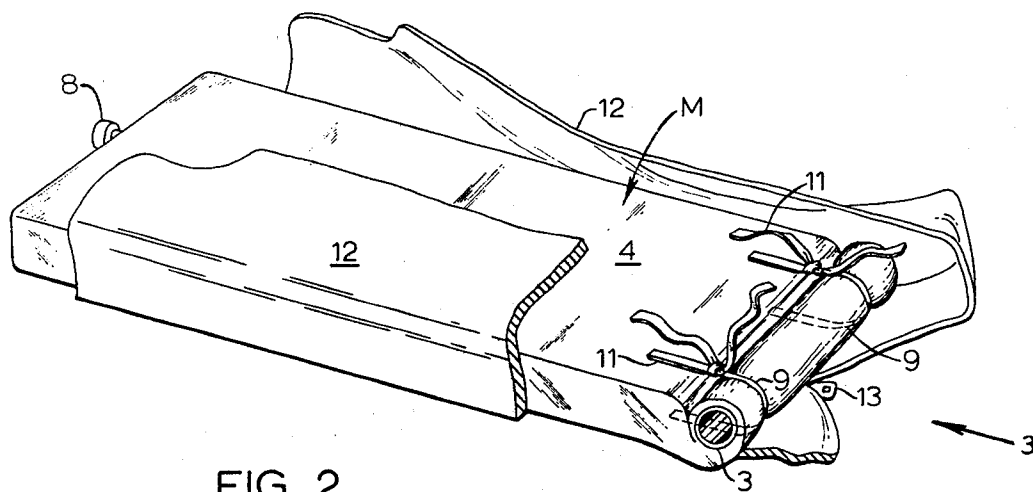


FIG. 2

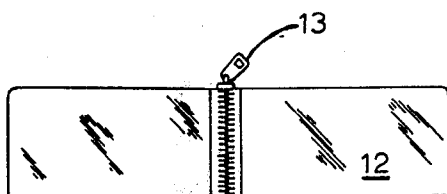
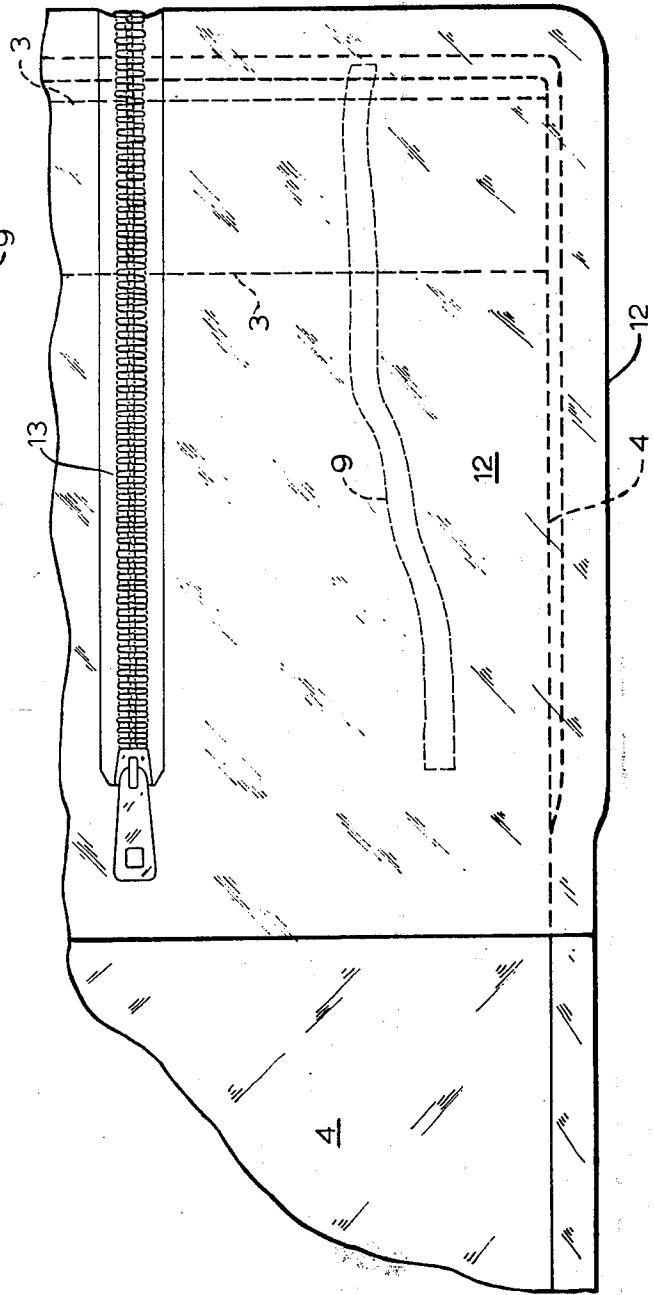
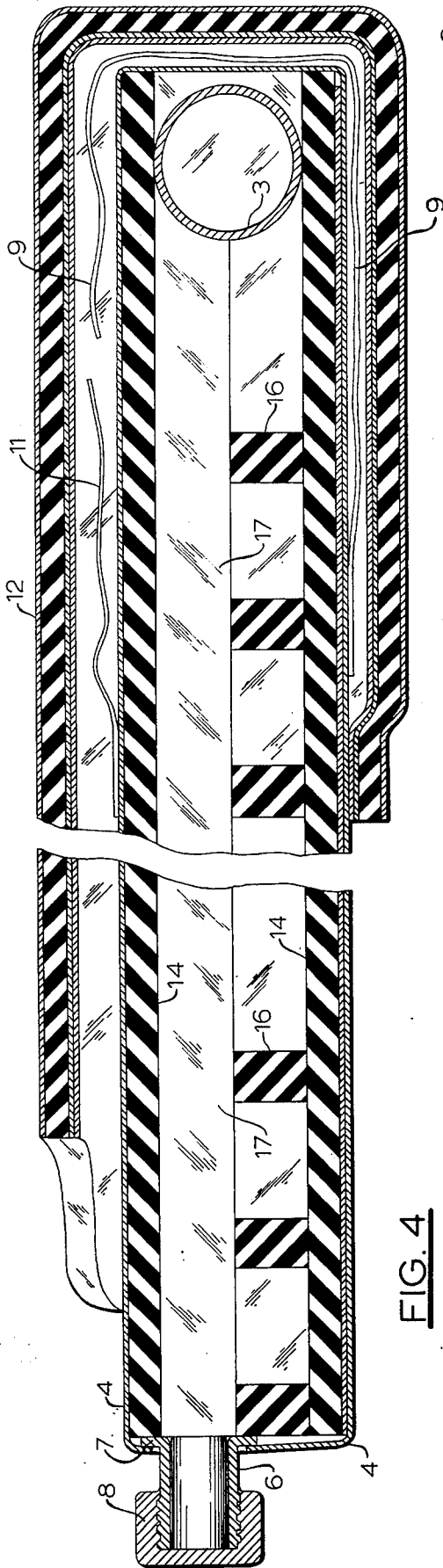


FIG. 3



SELF INFLATABLE AIR MATTRESS, AND SLEEPING BAG WITH AIR PRESSURE CONTROL

BACKGROUND OF THE INVENTION

This invention relates to a self inflatable air mattress, and sleeping bag of the type disclosed and claimed in applicant's U.S. Pat. No. 3,798,686, dated Mar. 26, 1974. In such structure, a core of flexible and resilient cellular material of the open cell type allows free passage of air therethrough, and is enclosed within a substantially air tight flexible jacket. A tube communicating with the interior of the jacket provides for flow of air into and from the cells of the core. The tube is openable and reclosable by a closure which in the closed position and with the cells filled with air prevents escape of air from the cells to provide a resilient air cushion.

When the closure is open and the mattress placed under compression, air escapes from the cells resulting in flattening of the mattress when it is wound into a roll. To facilitate rolling of the mattress to compress the same, a mandrel is provided adjacent one end thereof about which the mattress can be wound. A cover may be provided on the mattress, which is openable and reclosable by detachable connecting means, such as a slide fastener, to provide a sleeping bag.

SUMMARY AND OBJECTS OF THE INVENTION

In the invention hereof, the same type of mattress and sleeping bag structure is provided with the improvement of detachable connecting members on the mattress jacket to hold the mandrel in a substantially fixed adjusted position when the mandrel has been partially rolled, to maintain increased pressure in the mattress. Advantageously, the detachable connecting members for holding the mandrel in an adjusted position are flexible ties (such as tapes or cords), one of which is attached at one end to the top face of the jacket and another at one end to the bottom face of the jacket. They hold the mandrel in such substantially fixed rolled position when tied together.

From the preceding, it is seen that the invention has as its objects, among others, the provision of an improved air mattress, and sleeping bag which is self inflatable and in which pressure above atmospheric pressure when so desired can be readily obtained by adjustment of the position of a mandrel upon which the mattress can be rolled, and which are of simple and economical construction, and the provision of a method of obtaining and maintaining increased pressure above atmospheric in a self inflatable air mattress.

Other objects will become apparent from the following more detailed description and accompanying drawings, in which:

DESCRIPTION OF THE DRAWINGS

FIG. 1 is an isometric view of the mattress provided with detachable connecting members adjacent one end thereof; a corner portion of the structure being shown broken away to illustrate the construction;

FIGS. 1A through 1D are similar isometric views illustrating how the mattress can be rolled about the mandrel adjacent one end thereof to provide various stages of increased pressure above atmospheric;

FIG. 2 is an isometric view of the air mattress of FIG. 1 in combination with a sleeping bag cover and with the mandrel in an adjusted rolled position fixed by the detachable connecting members; portions of the structure

being shown broken away to illustrate the construction;

FIG. 3 is an end view looking in the direction of arrow 3 in FIG. 2 with the sleeping bag closed;

FIG. 4 is a longitudinal vertical section of a sleeping bag of the type of construction disclosed in applicant's aforementioned patent, in combination with detachable connecting members for holding the mandrel in a fixed position when desired; and

FIG. 5 is a fragmentary bottom view of FIG. 4.

DETAILED DESCRIPTION

Referring to FIGS. 1, 2 and 3, mattress M comprises core 2 of resilient flexible cellular material of the open cell type which allows free passage of air therethrough because in such material all the cells of the material are in intercommunication. Adjacent one end thereof the core has imbedded therein a mandrel 3, desirably a hollow tube of suitable plastic material but which may be of any other material, such as metal. Mandrel 3 is desirably hollow to save weight although it may be a solid. A suitable material for core 2 is of the character disclosed in applicant's aforementioned U.S. Pat. No. 3,798,686, namely an elastomeric material such as polyurethane or polyether foam. Lightweight material having a density in the range of about 0.8 to 1.5 pound per cubic foot is preferable. A desirable foam product is a polyether foam, AP22/24 manufactured by Expanded Rubber & Plastic Corp. of Gardena, Calif.

Core 2 is enclosed within an air tight jacket 4 of flexible material. Any suitable material may be employed for such purpose, such as nylon of the non-rip type or relatively thick polyethylene film desirably about 4 mils. in thickness. Other suitable material for the jacket are impervious rubberized fabrics and saran type films. Jacket 4 fits tightly about core 2 and may be adhesively bonded to the core at substantially all areas of contact therewith although this is not necessary as long as the jacket and core fit relatively close and the jacket is of air tight material so as to retain air therein.

At the end opposite the core end, a valve tube 6 extends through an aperture in the jacket so as to communicate with the interior of the jacket from exteriorly thereof whereby air may flow into and from the core cells. Tube 6, as is shown in FIG. 4 which discloses a lattice type cellular core shown in the aforementioned patent, is provided with an inner flange 7 adhesively bonded by any suitable adhesive in sealed relationship to an end portion of the core and to the portion of the jacket 4 overlying an end of the core. A suitable adhesive for such bonding may be those of the latex type, epoxy resin cements or polyester resins.

A closure cap 8 is removably mounted on the exterior end of valve tube 6 by a threaded connection, and can thus be readily closed manually on the tube, or removed therefrom after being closed. When cap 8 is opened, atmospheric air can readily flow through valve tube 6 and quickly fill all the voids of the core; and after the cap is screwed onto the tube to close the same, air cannot escape through air tight jacket 4 from the core cells, thus providing a resilient air cushion. By the same token when the mattress is wound into a roll about mandrel 3 at one end of the mattress, which is opposite valve tube 6, air within the core cells will be expelled under compression resulting from the rolling. After the air is thus expelled and the cap is again closed, the mattress will be flattened because of collapse of the cells. It is advantageous that tube 6 have a

relatively wide mouth to allow rapid ingress and egress of air; a suitable size being about three-fourths of an inch diameter.

From the preceding it is seen that when the mattress is flat and tube 6 is opened to the atmosphere, and then closed by closure cap 8 the pressure within the cells of core 2 will be at atmospheric pressure. This provides substantial resiliency and cushioning effect. For the purpose of increasing pressure above atmospheric and thereby enhancing resiliency, means is provided by the provision of connecting members on the jacket adjacent its end portion at mandrel 3, to hold the mandrel when it is partially rolled in an adjusted position. When the mandrel is thus partially rolled after valve tube 6 has been closed, and as is depicted in FIGS. 1A through 1D, air is expelled from the core cells adjacent the mandrel thus increasing pressure in the remaining cells above atmospheric pressure.

The increase in pressure is a function of the extent the mandrel is rolled. In other words, the further the mandrel is rolled the more the pressure will be increased between the mandrel and the opposite end of the mattress adjacent tube 6. In this connection, only a fraction of a complete turn of the mandrel will result in significant pressure increase, and consequently enhanced cushioning effect.

Any suitable connecting means on the mattress may be provided for holding the mandrel in an adjusted position according to the desire of the user of the mattress. Such means comprises a lower flexible strap 9 and an upper flexible strap 11 connected to the mattress adjacent one side edge thereof. Straps 9 and 11 are desirably of the same type of material as the jacket but may be of leather or any other suitable flexible material. They are attached at their inner ends by a suitable adhesive such as the aforementioned latex type, epoxy resin cements or polyester resins, or by stitching, to the bottom face and the top face, respectively, of the jacket.

Lower tie member is of a length sufficient to extend over the mandrel end of the jacket and over the top thereof, and is longer than upper strap 11 so that when the mandrel is partially rolled, straps 9 and 11 may be tied together as shown in FIGS. 1A through 1D, to hold the mandrel in a desired adjusted position. Desirably a pair of such straps is provided adjacent each side edge of the mattress.

It will be noted that both straps 9 and 11 have their locations of attachment to the jacket in front or ahead of mandrel 3. This enables partial rolling of the mandrel end of the jacket without interfering with the straps. FIG. 1A through 1D illustrate various partially rolled positions of the mandrel end of the jacket after the mandrel end has been tied at an adjusted position. Each successive FIG. illustrates an increased stage of the rolling with consequent increased pressure in the mattress.

FIGS. 2 and 3 illustrate the mattress of FIG. 1 with an openable and reclosable cover 12 which provides a sleeping bag. The cover is fastened along its sides by a suitable adhesive, in the manner disclosed in the aforementioned U.S. Pat. No. 3,798,686, to portions of the side edges of the mattress jacket 4. It is made of two half-sections as in the patent, which can overlap in the unoccupied condition of the bag to thus provide room for an occupant when the bag is used. The two cover

sections may be detachably connected by a slide fastener 13.

In addition to being attached to side edge portions of the mattress it will be noted from FIG. 2, and FIG. 4 illustrating a lattice type mattress, that the bottom of the cover extends partially over the bottom face of the mattress and is attached to such bottom face at a position ahead of the location of attachment of bottom straps 9, and that the slide fastener 13 extends over the mandrel end of the jacket and over the bottom. Also, the sides of the cover are preferably unattached to the side edges of mattress at a location between the mandrel end and the location at which bottom straps 9 are attached. This enables cover 12 to be freely opened at the mandrel end of the mattress to allow partial rolling of the mandrel for the purpose described, without interference from the sleeping bag cover.

The FIG. 4 embodiment is essentially the same as that of FIG. 2 except that a lattice type mattress disclosed in the aforementioned patent is shown, instead of a unitary or solid mass of the mattress material. Such lattice type comprises upper and lower pads 14 of the cellular material, and cross members 16 and 17 which form the lattice structure. Otherwise, the aforescribed arrangement of sleeping bag cover 12, mandrel 3, slide fastener 13 and upper and lower straps 9 and 11, respectively, remain the same.

I claim:

1. A self inflatable air mattress comprising a core of flexible and resilient cellular material of the open cell type allowing free passage of air therethrough, a substantially air tight flexible jacket enclosing said core, a tube communicating with the interior of said jacket from exteriorly thereof for flow of air into and from the cells of said core, and an openable and reclosable closure for said tube which in its closed condition with the cells filled with air prevents escape of air from said cells and maintains them filled with air to provide a resilient air cushion, and which when open and the mattress placed under compression allows escape of air from said cells and flattening of said mattress, said mattress having a mandrel about which it can be wound into a roll to compress the same and thus expel air from said tube and flatten the mattress when said closure is open, said mandrel when rolled with said tube closure closed expelling air from the core cells adjacent said mandrel while increasing pressure in the remaining cells above atmospheric pressure, and detachable connecting members on said mattress jacket to hold said mandrel in a substantially fixed adjusted position to maintain increased pressure with said tube closure closed.

2. The mattress of claim 1 wherein said detachable connecting members comprise flexible ties, one of which is attached at one end thereof to the top face of the jacket and another at one end thereof to the bottom face of said jacket, said ties holding the mandrel in said substantially fixed adjusted position when tied together.

3. The mattress of claim 2 wherein a pair of said flexible ties is provided adjacent each side edge of the mattress.

4. The mattress of claim 2 wherein the tie attached to said bottom face is of a length sufficient to extend over the mandrel end of the jacket and over the top face thereof.

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5. A sleeping bag comprising a self inflatable air mattress having a core flexible and resilient cellular material of the open cell type allowing free passage of air therethrough, a substantially air tight flexible jacket enclosing said core and adhesively bonded thereto, a tube communicating with the interior of the jacket from exteriorally thereof for flow of air into and from the cells of said core, a manually removable cap for said tube whereby air can fill the core cells when the cap is removed and upon closing of said cap maintain the cells filled to provide a resilient air cushion, a cover overlying said jacket and attached thereto adjacent one end and opposite sides thereof, said cover having adjacent portions provided with an openable and reclosable closure to enable opening and closing of the cover, and said sleeping bag having adjacent an end thereof a mandrel about which the bag can be wound into a roll, said mandrel when being rolled with said tube closure closed expelling air from the core cells adjacent said mandrel while increasing pressure in the remaining cells above atmospheric pressure, and detachable connecting ties on said mattress jacket to hold said mandrel in a substantially fixed adjusted position to maintain increased pressure with said tube closure closed, one of said ties being attached to the top face of said mattress jacket at one end thereof, the attachment of said cover adjacent said one end of the jacket being to the bottom face of the jacket at a position ahead of said mandrel, and another of said ties being attached to the bottom face of the jacket between said mandrel and the location of attachment of the cover to said bottom face whereby the mandrel can be rolled up toward such lo-

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cation of attachment of said cover to said bottom face without interference from said cover.

6. The mattress of claim 5 wherein the tie attached to said bottom face of the jacket is of a length sufficient to extend over the mandrel end of the jacket and over the top face thereof.

7. The mattress of claim 5 wherein a pair of said flexible ties is provided adjacent each side edge of the mattress.

8. The method of adjusting pressure in a self inflatable air mattress of the type comprising a core of flexible and resilient cellular material of the open cell type allowing free passage of air therethrough, a substantially air tight flexible jacket enclosing said core, a tube communicating with the interior of said jacket from exteriorally thereof for flow of air into and from the cells of said core, and an openable and reclosable closure for said tube which in its closed condition with the cells filled with air prevents escape of air from said cells and maintains them filled with air to provide a resilient air cushion, and which when open and the mattress placed under compression allows escape of air from said cells and flattening of said mattress; said method comprising providing a mandrel adjacent an end of the mattress, when said mattress is inflated at atmospheric pressure and said closure for said tube is closed, rolling the mandrel to expel air from the core cells adjacent the mandrel to thereby increase pressure in the remaining cells above atmospheric pressure, and providing means to hold the mandrel in a substantially fixed adjusted position.

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