

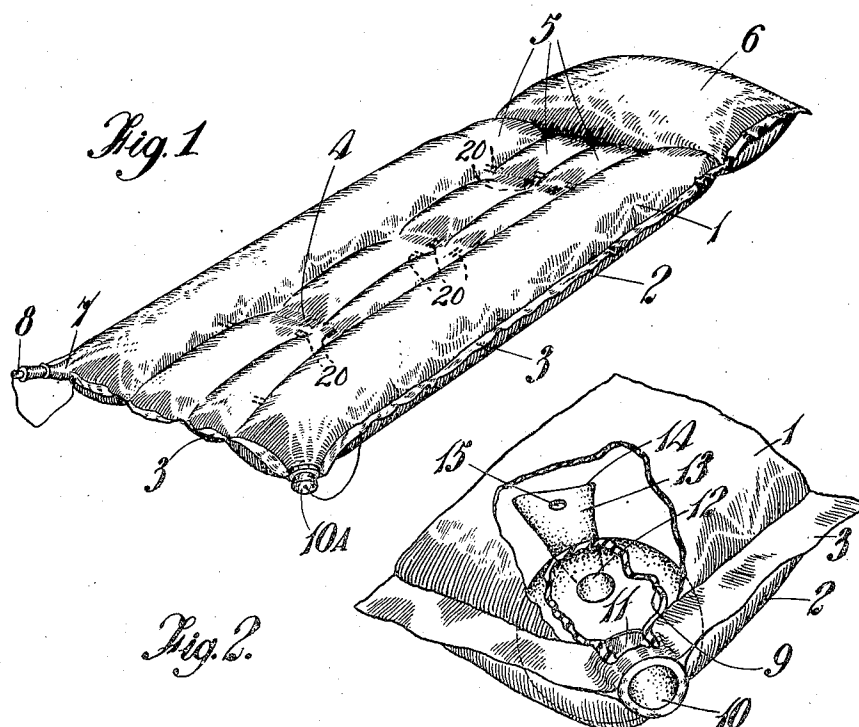
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INFLATABLE BED OR MATTRESS AND THE LIKE

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INFLATABLE BED OR MATTRESS AND
THE LIKE

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3 Claims. (Cl. 5—348)

This invention relates to inflatable mattresses and the like of the known kind which are often made by attaching together marginally two sheets or layers of non-porous or impermeable fabric and also discontinuously interattaching them along lines which form the margins of pneumatically interconnected air-cells, extending over the whole area of coextensivity of the layers, giving a somewhat quilted effect. The marginal attachment and inter-cell attachment may be by stitching or vulcanizing or both, but in any case no one cell is completely isolated from the others, except possibly where the mattress has an integral continuation forming a separate pillow; even in this case the pillow may have intercommunication with another cell or cells. The invention may be found applicable more particularly where inflation requires a considerable expenditure of energy, even though it may only be to a small pressure. In many mattresses means are provided for inflation by the mouth or by some small auxiliary such as a separate bellows or inflator. The mattresses to which the invention applies are more particularly those which are nowadays sold for use at the sea-side, either for comfort on land or for buoyancy on the water. The invention provides a self-contained means of inflation in such a form that it may be quite inconspicuous and may in effect form an integral part of the mattress. The invention is not deemed to be limited strictly to mattresses, but may be applied to like objects in which the same problems arise, and in which the inflatable part is divided into compartments or cells.

According to this invention, inflatable mattresses and the like of the kind comprising cells or chambers interconnected by air passages, which passages may be very restricted, are provided with one cell having incorporated therein a self-distending vessel of rubber or the like, which vessel is equipped with an atmospheric one-way inlet port or valve leading into it from the atmosphere and a non-return outlet valve leading to the interior of the inflater cell. By alternate forcible contraction and self distension, the vessel may be used as a pump to inflate the mattress or the like.

The invention will be described with reference to the accompanying drawing, in which:—
Figure 1 illustrates a preferred embodiment of the present invention; and

Figure 2 is a fragmentary view similar to Figure 1, but upon a larger scale, and broken away to illustrate the preferred self-distending rub-

ber vessel equipped with one-way inlet and exhaust valves.

In one of the corner cells 5 of the mattress there is incorporated a spherical rubber vessel 9 which is moulded and is of sufficient elasticity to be self distending. Within this rubber sphere and in continuation of the inlet orifice 10 is a non-return admission valve formed at 11. The non-return or one-way valve 11 admits air from the atmosphere to the vessel 9, but prevents the expulsion of air from the vessel 9 to the atmosphere. Other more elaborate forms of non-return valve may be employed as the inlet valve if desired. From the sphere to the interior of the cell which contains the sphere, there leads a rubber mouth 12 projecting outwards and in the form of a flattened tube, which may be deformed by being vulcanized or by being moulded so as to form a reed-like non-return escape valve 13, having elongated lips at 14 which normally contact but which separate during the expulsion of air from the sphere 9 to the interior of the cell. The lips may be pierced transversely as at 15 so as to eliminate noise effects. The parts forming the inlet passage 10 and the outlet non-return valve, may be formed integrally with or may be solutioned or otherwise attached to the sphere 9. The passage 10 may be provided with a removable bung 10A if required. It will be observed that if the sphere 9 be squeezed or compressed it will expel the air it contains into the cell which contains the sphere, and thence expel air into the remainder; if pressure is now released the valve will automatically distend itself, the lips 14 close together, and the admission valve 11—formed of similar lips—will open, admitting atmospheric air. The process is repeated until the whole of the mattress is sufficiently inflated.

It is desirable that the sphere should be attached over a part of its surface to the sheet material forming the walls of the cell in which it is placed and it should be easily accessible from the walls of the cell over its area in projection in the direction of the application of the pressure.

The complete mattress is shown in Figure 1 formed of an upper sheet or layer 1 and a lower sheet or layer 2 of rubberized fabric the marginal edges of which are vulcanized or otherwise attached to form the seam 3. The sheets 1 and 2 have lines of interattachment at 4 dividing the space they enclose into cells 5 and the mattress may have an integral pillow formed as a separate cell 6. The interconnecting passages between

the cells 5 are shown at 20. The mattress is formed with an independent exhaust port in one corner 7 which is normally closed by a bung 8. By removing this bung 8 the mattress may be deflated in the ordinary way without interfering with the inlet port of the inflating cell which might damage its efficiency. Moreover, for the purpose of assisting deflation the interconnecting passages of the cells other than the said corner cell 5 may be made of a size suitable for this purpose without affecting the efficiency of these passages which serve as outlet ports from the said corner chamber 5. It will be observed that the pump means is virtually an integral part of the whole mattress and not distinguished from the remaining parts by any obvious appearance, nor does it call for any elaborate or expensive construction. It is preferred that the interconnection between the cells is in the form of restricted air passages, since this may provide for some increase in comfort in actual use.

What I claim is:—

1. An inflatable air mattress or the like comprising two coextensive layers of air-impermeable flexible material united along their edges and interattached along lines between said layers to form a plurality of pneumatic air-cells extending over the whole area of coextensivity of the layers, the cells being connected by ports, distending means of flexible material in one of the cells to which pressure may be applied from outside the walls of the said one cell, and means comprising a one-way inlet valve communicating with the atmosphere to permit air to be sucked in from the atmosphere during the distending action of the distending means but to prevent air escaping to the atmosphere during the contraction of the distending means, and the distending means having also a one-way outlet valve connecting the said one cell with the distending means to permit air to enter the said one cell from the distending means during the contraction of the distending means but to prevent air entering the distending means from the said one cell during the distending action of the distending means, whereby the distending means may be caused to operate as a pump for inflating the mattress or the like, the said one cell being sufficiently narrow compared to the dimensions of the distending means so that the distending means is easily accessible from the said walls of the said one cell over its area in projection in the direction of the said pressure application.

2. An inflatable air mattress or the like comprising two coextensive layers of air-impermeable flexible material united along their edges and interattached along lines between said layers to form a plurality of pneumatic air-cells extend-

ing over the whole area of coextensivity of the layers, the cells being connected by ports, and a self-distending vessel of flexible material in one of the cells to which pressure may be applied from outside the walls of the said one cell, the vessel having a one-way inlet valve connecting the vessel with the atmosphere to permit air to enter the vessel from the atmosphere during the distending action of the vessel but to prevent air escaping to the atmosphere from the vessel during the contraction of the vessel, and the vessel having also a one-way outlet valve connecting the said one cell with the vessel to permit air to enter the said one cell from the vessel during the contraction of the vessel but to prevent air entering the vessel from the said one cell during the distending action of the vessel, whereby the vessel may be caused to operate as a pump for inflating the mattress or the like, the said one cell being sufficiently narrow compared to the dimensions of the vessel so that the vessel is easily accessible from the said walls of the said one cell over its area in projection in the direction of the said pressure application.

3. An inflatable air mattress or the like comprising two coextensive layers of air-impermeable flexible material united along their edges and interattached along lines between said layers to form a plurality of pneumatic air-cells extending over the whole area of coextensivity of the layers, the cells being connected by ports and a self-distending vessel of flexible material in one of the cells to which pressure may be applied from outside the walls of the said one cell, the vessel having a one-way inlet valve connecting the vessel with the atmosphere to permit air to enter the vessel from the atmosphere during the distending action of the vessel but to prevent air escaping to the atmosphere from the vessel during the contraction of the vessel, and the vessel having also a one-way outlet valve connecting the said one cell with the vessel to permit air to enter the said one cell from the vessel during the contraction of the vessel but to prevent air entering the vessel from the said one cell during the distending action of the vessel, whereby the vessel may be caused to operate as a pump for inflating the mattress or the like, the said one cell being sufficiently narrow compared to the dimensions of the vessel so that the vessel is easily accessible from the said walls of the said one cell over its area in projection in the direction of the said pressure application, the one-way outlet valve being constituted of flexible lips integral with the vessel, and the flexible lips being normally in contact with each other and being provided with means for eliminating noise effects.

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