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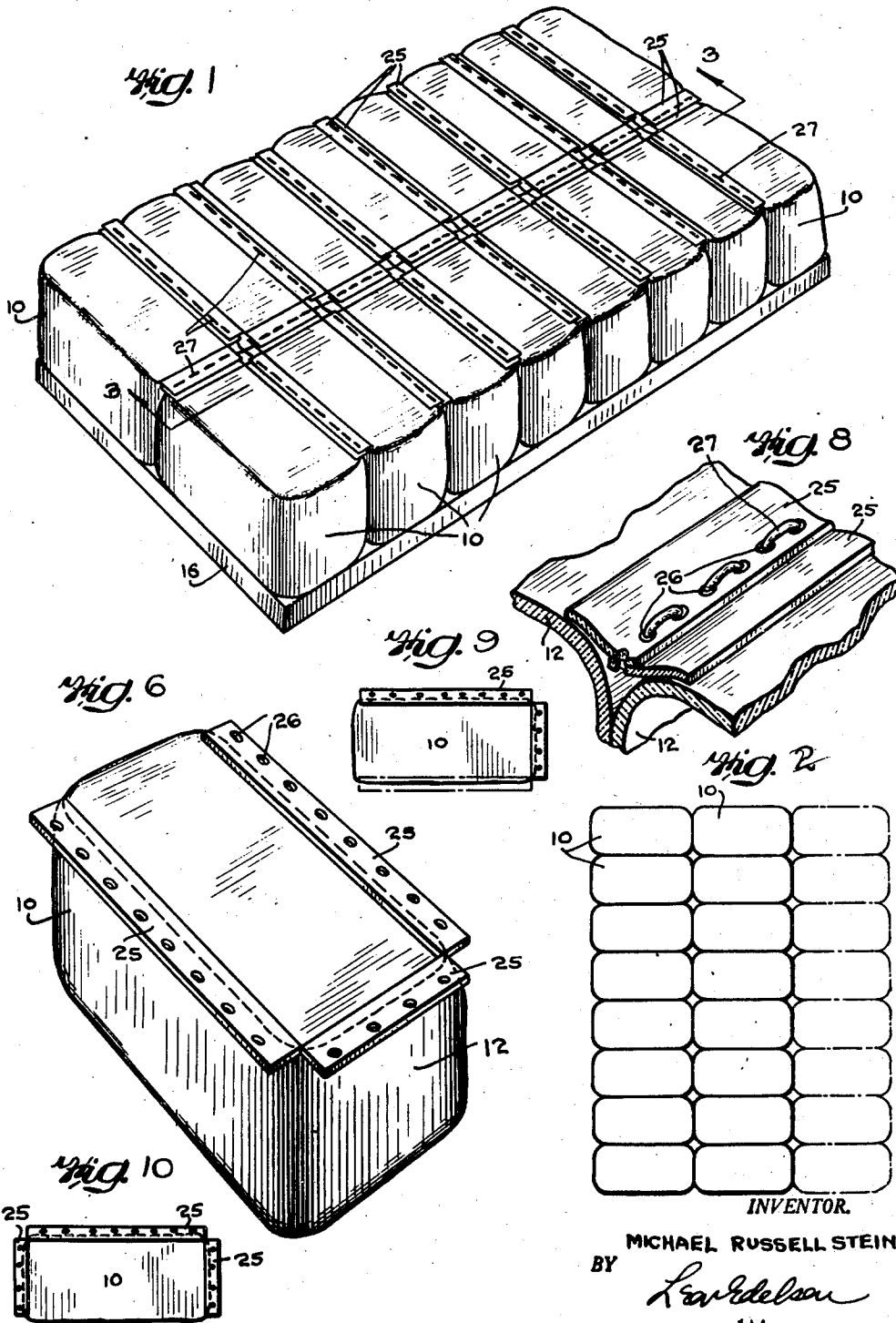
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2,415,150

PNEUMATIC MATTRESS

Filed June 8, 1945 .

3 Sheets-Sheet 1



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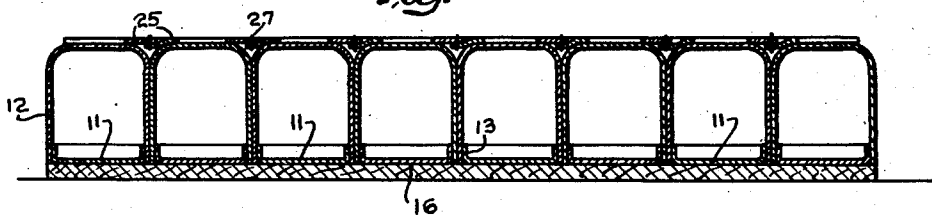
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PNEUMATIC MATTRESS

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Fig. 3



Mid.

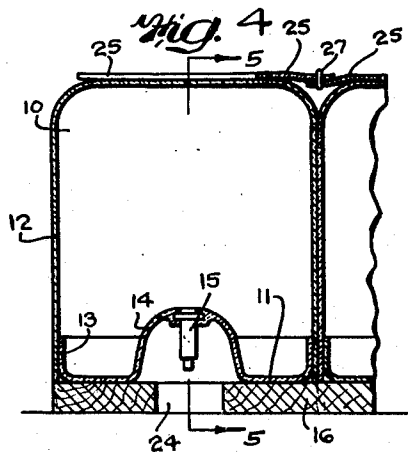
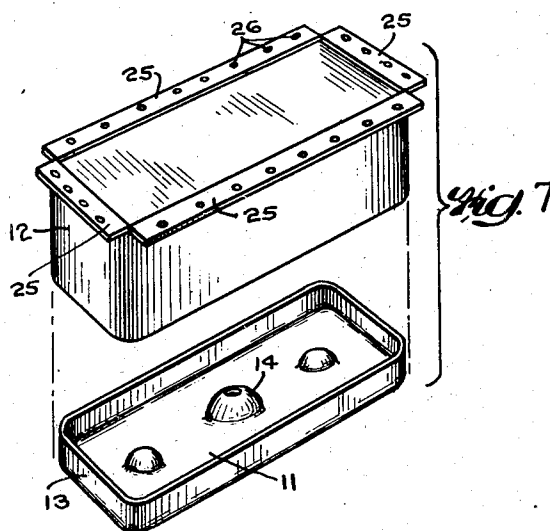


Fig. 7



sig 11

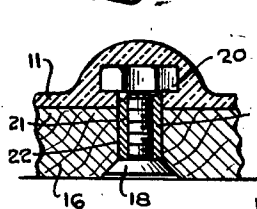


Fig. 5

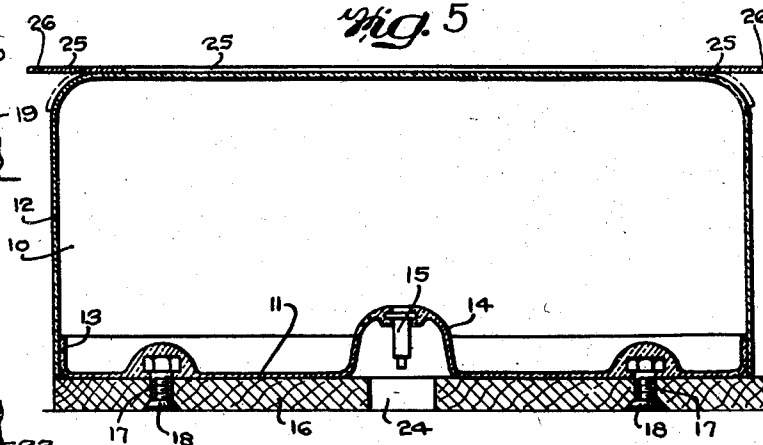
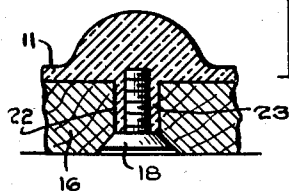


fig. 12



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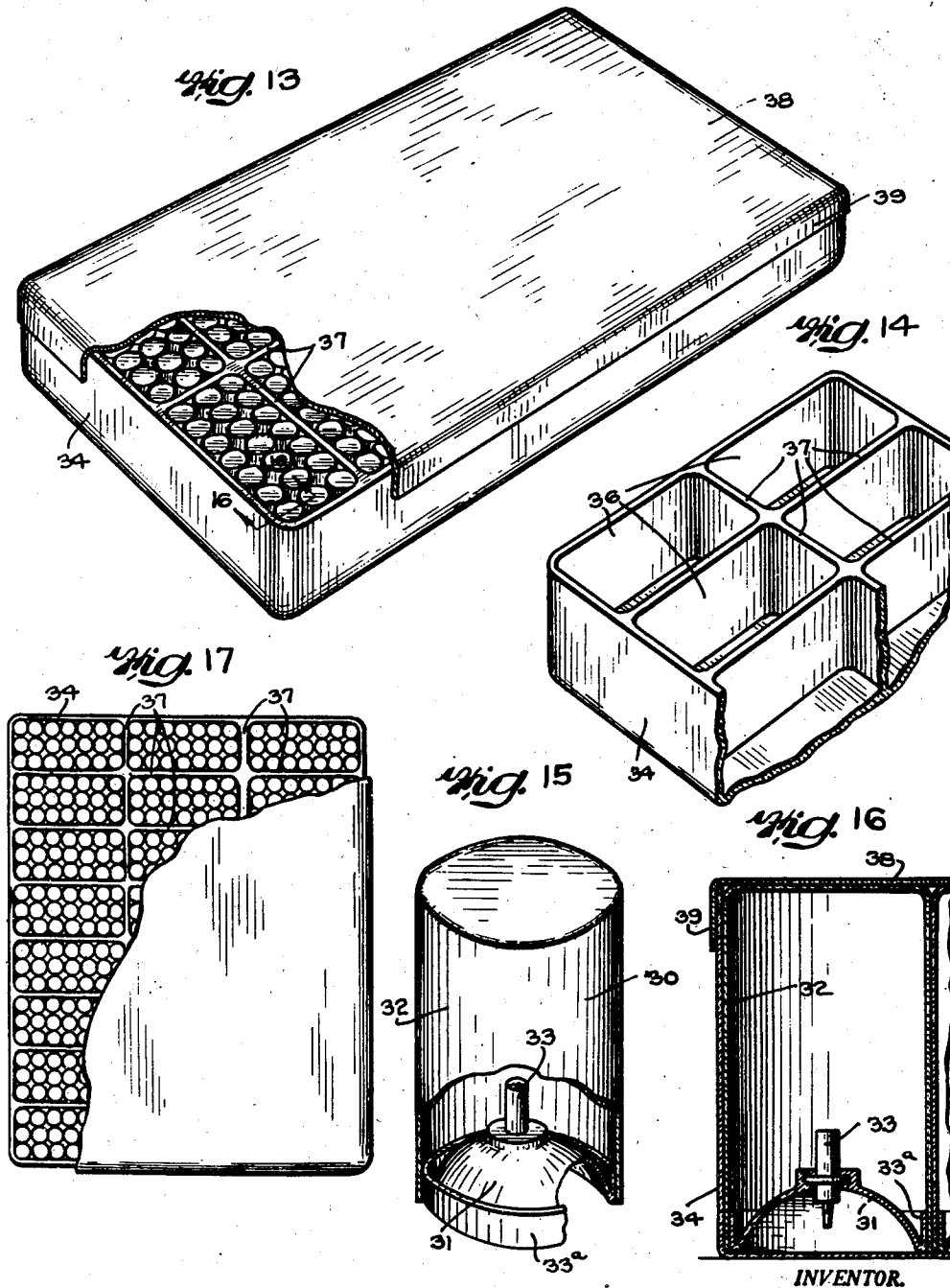
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PNEUMATIC MATTRESS

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3 Sheets-Sheet 3



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PNEUMATIC MATTRESS

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3 Claims. (Cl. 5—348)

1

This invention relates generally to pneumatic upholstery such as mattresses, cushions and the like and more particularly to the construction of an inflatable cellular core adapted to serve as the foundation for such upholstery.

Among the principal objects of the present invention is to provide a resilient and comfortable construction of pneumatic mattress and the like which is characterized by the fact that it is made up of a number of individual cellular units adapted to be conveniently assembled to provide a mattress or cushion of any desired size and shape.

A further object is to construct the pneumatic cells out of a sheet material formed of a vinyl resin or other such plastic which, while sufficiently pliable for its intended purpose, is not so stretchable as to require the use of excessive air pressures to maintain the cells against collapse under the weight of the person resting on the mattress. Further, inasmuch as such material is immune to fluids, is resistant to fungi, mold and acid and is not subject to rot at high temperatures, the mattress of the present invention when constructed of such plastic material is ideally suitable for use in hospitals and infant cribs as well as in tropical countries.

Still another object of the invention is to provide a cellular construction of mattress and the like wherein the various cells thereof may be filled with air at different pressures to produce zones or areas of differing degrees of hardness in the same mattress, thereby adapting the same for the correction of postural irregularities and for insuring maximum normal sleeping comfort.

Still another and important object is to provide cellular units of such typical and standardized construction as to permit of their interchangeable use in the fabrication of a mattress of any desired shape and size, and to facilitate their manufacture as individual units, the cells being so constructed as to permit their assembly and securement together expeditiously and without the use of any special tools or equipment.

Other objects and advantages of the invention will appear more fully hereinafter, it being understood that the said invention consists substantially in the combination, construction, location and relative arrangement of parts, as described more fully hereinafter, as shown in the accompanying drawings and as finally pointed out in the appended claims.

In the accompanying drawings, which illustrate certain preferred embodiments of the present invention,

2

Figure 1 is a perspective view of a pneumatic mattress constructed in accordance with and embodying the principles of the said invention;

Figure 2 is a plan view showing in full line a single bed mattress and in dotted lines an additional section to make up a three-quarter size mattress;

Figure 3 is a longitudinal sectional view taken on the line 3—3 of Figure 1;

Figure 4 is a partial sectional view of a pair adjoining cellular units as employed in the construction of Figure 1;

Figure 5 is a sectional view taken on the line 5—5 of Figure 4;

Figure 6 is a perspective view of one form of cellular unit;

Figure 7 is a perspective view showing in separated relation the component parts of a cellular unit;

Figure 8 is a detail perspective view of a preferred means for securing together adjacent cellular units of the mattress;

Figure 9 is a top plan view of an end cellular unit such as may be employed in the construction of mattress shown in Figure 1;

Figure 10 is a top plan view of an end cellular unit such as may be employed in the construction of the three-quarter size mattress shown in Figure 2;

Figures 11 and 12 are sectional views showing different means for securing the cellular units to a bottom posture board;

Figure 13 is a perspective view of still another form of pneumatic mattress constructed in accordance with and embodying the principles of the present invention;

Figure 14 is a partial perspective view of a flexible cellular compartment for receiving a plurality of pneumatic cell units;

Figure 15 is a perspective view, partly broken away, showing a modified form of pneumatic cell unit;

Figure 16 is a sectional view of the cell unit of Figure 15; and

Figure 17 is a top plan view of a double-bed size mattress generally similar in construction to that of Figure 13.

In the construction of the pneumatic mattress of the present invention, the inflatable cellular units thereof are constructed of a non-stretching but flexible sheet material which is impervious to the passage of air therethrough, such material preferably being a vinyl resin or other such plastic variously known in the trade as "Vinylite."

3

Referring now to the drawings and more particularly to Figures 1 to 13 thereof, it will be observed that in one preferred construction of the mattress of the present invention, it is constructed of a plurality of cellular units 10 each of generally rectangular shape and adapted to be assembled to form a single, three-quarter or double size mattress as desired. Figure 1 illustrates the single size mattress, while Figure 2 illustrates the manner of increasing the same to three-quarter or double size by the addition of one or more additional rows of units such as are shown in dotted lines.

Each of the cellular units 10 is essentially composed of two principal parts, namely, a lower base member 11 formed of rigid or semi-rigid plastic material of the character hereinbefore referred to, and an upper chamber-forming member 12 formed of a flexible sheet of the same plastic material. The base member 11 of the cell is preferably molded into shape to provide it with a marginal upstanding flange 13 which is adapted to be perimetally embraced by the lower free edge of the upper member, the overlapping portions of the members 11 and 12 being cemented or otherwise secured together to provide an air-tight joint therebetween. An effective air-tight seal between the parts is obtained by subjecting the lapped parts to electronic heating and so effecting an integral bond therebetween, the vinyl resin or other such plastic of which the members 11 and 12 are formed being adapted to such bonding under the application of heat and pressure.

Molded centrally in the base member 11 is an inverted cup-shaped element 14 to provide a recessed chamber disposed above the plane of the bottom surface of the base member, this chamber housing therein an air valve 15. Preferably, the air valve body is permanently set into the bottom wall of the recess as shown (see Figure 5) during the process of molding the base member 12.

As many of the pneumatic cells 12 are assembled together as are necessary to form the desired shape and size of the mattress. Thus, as shown in Figure 1, sixteen of such cells are assembled in two rows of eight each to produce a single bed size of mattress. By adding an additional row, as represented by the dotted lines of Figure 2, a larger size mattress may be obtained.

In order to secure the cells together in their assembled relation, they may be supported upon a foundation or posture board 16, in which event the individual cells are provided in their base members 12 with internally threaded sockets 17 for reception of threaded bolts 18 projecting upwardly through the foundation or posture board 16. These sockets 17 may be variously formed as illustrated in Figures 11 and 12. In the arrangement of Figure 11, the socket is in the form of a tubular metal insert 19 which is set into the base member 11 of the cell during the molding thereof, the insert 19 having an enlarged head 20 embedded in the base member and an internally threaded shank 21 projecting outwardly of the base member for reception within an aperture 22 provided therefore in the posture board.

In the arrangement as illustrated in Figure 12, the internally threaded shank 23 which projects outwardly of the base member 12 of the cell is formed as an integral part of said base member. In either case, it is preferable to provide each pneumatic cell with a pair of such securing elements respectively arranged to either side of the

4

centrally disposed valve 15, it being noted that the foundation board is provided with openings 24 respectively in registry with the valves 15 of the several cells in order to provide access to the valves for inflating or deflating the cells.

To further secure the cells in assembled relation, the upper edges thereof may be provided with laterally extending flap elements 25 each of which includes a line of spaced lacing holes 26. These flap elements 25 are secured to the upper edge portions of the cells in any suitable manner, as by cementing or electronic heating and extend laterally of the cell to an extent sufficient to permit the flap elements of adjoining cells to be disposed in overlapped relation, as shown in Figure 8, with the lacing holes of the overlapped flaps in registry with each other. A lacing cord 27, also formed of vinyl resin or the like, may then be interlaced through the registering holes of these overlapping flaps to secure them together and so hold the adjoining cells in closely assembled relation.

In the mattress assembly as shown in Figure 1, the individual cells are provided with lacing flaps only along the edges thereof which are in adjoining relation, there being no real necessity for such flaps along the outer free edges of the cells. Accordingly, the four cells which form the corners of the mattress are provided with flaps along only their two inner edges, as illustrated in Figure 9, while the remaining cells are each additionally provided with a flap such as that shown in broken line in said Figure 9, to provide a cell of the appearance shown in Figure 6. In the case of a three row assembly of the cells, as in Figure 2, the intermediate cells of the central row require lacing flaps on all four sides thereof (see Figure 7), while the endmost cells of said row require only three flaps as shown in Figure 10. It will be understood, therefore, that the individual cells may be provided with as many lacing flaps as are necessary depending upon the location of the cell with relation to others in the assembly, and that it is within the scope and spirit of the present invention to provide each cell with flaps along all marginal edges thereof, as shown in Figure 7, so as to standardize their construction and permit their disposition at any point in the assembly. In such latter case, those flaps which are unnecessary to be used in lacing together the cells may be left free to fold over the outer edge of the cell, as shown in dotted lines in Figure 5.

In Figures 13 to 17 inclusive are shown modifications of the constructions hereinbefore described without involving any departure from the general principles of the present invention. Thus, Figures 15 and 16 illustrate a cell construction of cylindrical rather than rectangular form, the cylindrical unit 30 being constructed of two main parts, to wit, the relatively rigid or semi-rigid base member 31 and the flexible upper member 32, the base member being provided with a peripheral flange 33^a which snugly fits within and is sealed to the lower marginal edge portion of the hollow cylindrical member 32. The base member 31 of the unit 30 is of concave shape as shown and the air valve 33 is fitted in the center thereof so as to render it freely disposed above the bottom plane of the unit.

The cylindrical air cells 30 are adapted to be disposed within a flexible container 34 in the form of an open-topped box-like structure, this structure being divided into a plurality of separate compartments 36 by means of the longitudinally

5

and transversely extending partition walls 37. The structure 34 is formed of the vinyl resin or other such flexible plastic material, the depth of the compartments 36 being approximately equal to the overall depth of the air cell units disposed therein, these latter being retained in position against displacement by means of a top cover member 38 having a marginal flange 39 which embraces and is adapted to be cemented or otherwise united or bonded to the marginal side walls of the compartmented supporting structure for the air cells. Inasmuch as the members 34 and 38 are formed of flexible material, it will be apparent that the construction of mattress as shown in Figures 13 and 17 will provide an exceedingly comfortable cushioned support for the body of a person resting thereon. By varying the air pressure in the several cells of the mattress so constructed, localized areas of varying degrees of hardness may be obtained to secure the maximum degree of comfort and correct support for the recliner. Figure 13 illustrates a construction of mattress intended for single bed design, while Figure 17 illustrates a larger construction, as for a three-quarter or double size bed.

It will be understood, of course, that the present invention is susceptible of various changes and modifications which may be made from time to time without departing from the real spirit or general principles thereof, and it is accordingly intended to claim the same broadly, as well as specifically, as indicated in the appended claims.

What is claimed as new and useful is:

1. A pneumatic mattress or the like comprising a plurality of inflatable cells each formed of a flexible hollow body and a relatively rigid base member fitted in and secured to one end of the hollow body to provide a closed air chamber,

6

valve means in said base member for inflating the cell and means for detachably securing together a group of said cells arranged in a plurality of rows of several cells each.

2. A pneumatic mattress of the character defined in claim 1 wherein said cells are respectively provided with perforated flap elements extending along the top edges thereof, and wherein overlapping flap elements of contiguous cells are secured together by an interlacing cord threaded through the registering apertures of said overlapping flap elements.

3. A pneumatic mattress or the like comprising a plurality of inflatable cells each formed of a flexible hollow body and a relatively rigid base member fitted in and secured to one end of the hollow body to provide a closed air chamber, valve means in said base member of each cell for inflating the same, a rigid support underlying a group of said cells arranged in a plurality of rows of several cells each, and means in the base members of said cells for individually anchoring the same to said support.

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