

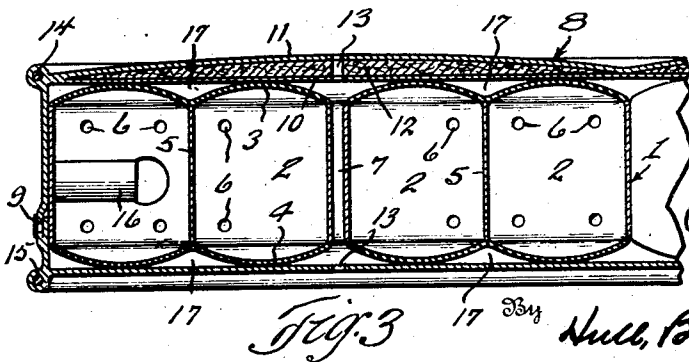
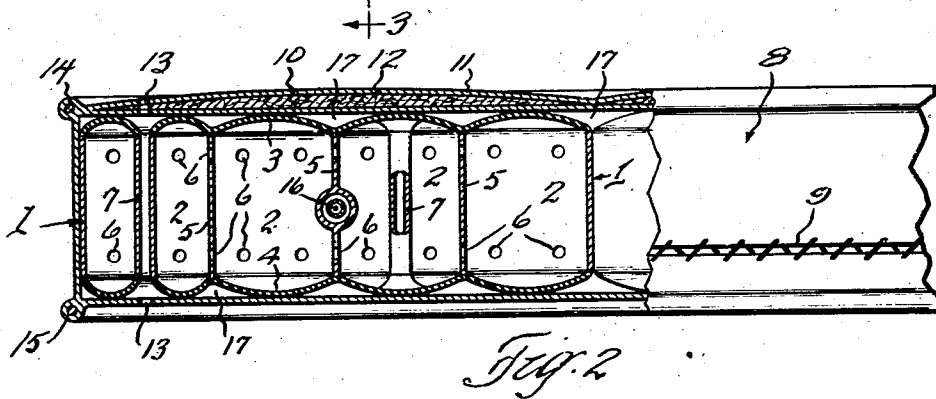
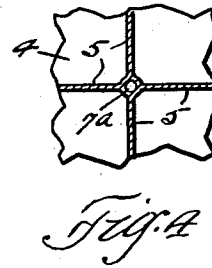
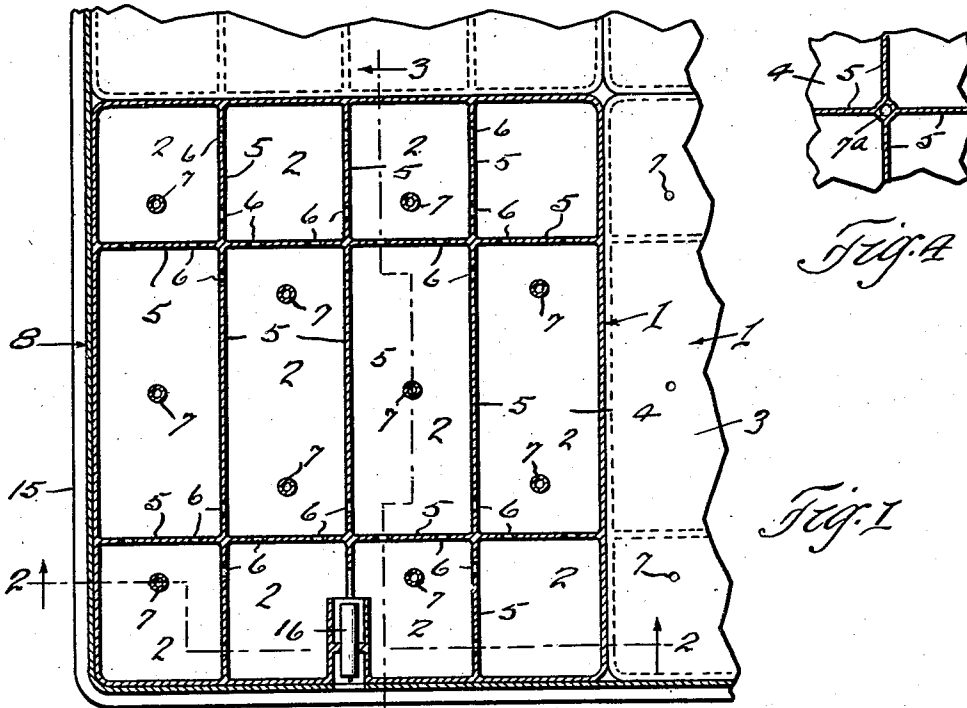
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PNEUMATIC CUSHION MATTRESS OR THE LIKE

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PNEUMATIC CUSHION MATTRESS OR THE LIKE

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3 Claims. (Cl. 5—348)

This invention relates generally to cushions or similar devices and more specifically to cushions of the inflatable type having an elastic, expandable chamber containing a compressible material, such as air; and which is enclosed in a separate flexible outer cover or casing.

One of the main objects of the invention is to provide a cushion of the general class referred to which is light in weight, yet rigid and dependable in construction and well adapted for production at comparatively low cost.

A further object of the invention is to provide an inflatable cushion of the character described, the interior pressure of which may be regulated and controlled to secure various degrees of softness and firmness and a uniformity of support on the cushion surface.

A further object of the invention is to provide a cushion of the character described in which the confined pressure is employed to produce a cushioning effect and also to support the weight of a body resting thereon.

A still further object of the invention is to provide a cushion of the character described which is made up of an inflatable bag which is confined within a flexible cover or casing and provided with means for permitting a circulation of air between the inflatable bag and the outer casing and also a circulation of air entirely through the whole unit.

A still further object of the invention is to provide an improved cushioning mattress or the like of the inflatable type having means providing for circulation of fresh air between the resilient unit and one's body when reclining or sitting thereon, the surface of the cushion being so constructed and arranged as to provide a plurality of air pockets or chambers which are disposed between the outer covering or casing and the inflatable bag proper.

Further and more limited objects of the invention will appear as the description proceeds and by reference to the accompanying drawing in which Fig. 1 is a fragmentary horizontal sectional view of a cushion or mattress made up of a plurality of our improved units, only one of which is disclosed in detail; Fig. 2 is a fragmentary vertical sectional view on the line 2—2 of Fig. 1; Fig. 3 is a fragmentary vertical sectional view on the line 3—3 of Fig. 1; and Fig. 4 is a fragmentary detail view disclosing a slightly modified form of ventilating means.

Referring now to the drawing, our improved cushion or mattress consists of an inner inflatable bag 1 which is divided into a plurality of communicating compartments 2 which are preferably

rectangular in shape. The top walls 3 and the bottom walls 4 of each of these compartments are preferably formed of elastic sheet rubber and the cross walls 5 of each compartment as well as the side walls are preferably formed of a heavy woven fabric which is more rigid than the top and bottom walls and is impregnated with rubber so as to be air-tight and non-porous. The side walls 5 are stiffer and less readily distended when the bag is inflated than are the top and bottom walls 3 and 4. The top and bottom walls are secured to the side walls and cross walls 5 which form the several compartments preferably by being vulcanized thereto. Each of the compartments or chambers 2 are in effect individual expansive containers which are in communication with each other through vent openings 6 provided in the side walls. Extending through each of the compartments 2 is a flexible tube 7 which is preferably formed of rubber, though other suitable material may be used. These tubes 7 permit a circulation of air entirely through the flexible bag. The cushion or mattress may be made up of one or more inflatable bags, as desired.

In Fig. 1, we have disclosed a cushion which is made up of a plurality of inflatable bags. The inflatable bags are inserted into the outer covering or casing 8 which is provided along opposite sides thereof with openings 9 through which the bags may be inserted. The outer covering or casing is preferably made of a medium weight, tough, durable, woven cloth and the top of the same is made up of an inner portion or lining 10 and an outer portion 11. Disposed between the lining and outer portion of the casing is a layer 12 of insulating material which may be formed of felt or any other suitable resilient material. It will be noted that the top and bottom of the casing are provided with openings 13 and that the layer of insulating material is also provided with vent openings which are disposed in communication with the openings in the casing whereby to permit a circulation of air between the inflatable bag and casing as well as entirely through the cushion. The layer of felt may be of any desired thickness and, if desired, may be provided on both the top and the bottom of the casing. The outer casing serves as a frame which imparts shape to the cushion and is provided at its top and bottom with reinforcing beads 14 and 15 which add to the rigidity of the construction. However, the entire unit, including the casing and bag, when deflated, is relatively soft and practically collapsible.

Carried by one of the cross walls 5 is a valve 16 which is held in place in any suitable manner and which serves as a means for inflating the bag. When the bag is inflated, the top and bottom walls thereof become more distended than do the side walls and the parts assume the position shown in Figs. 2 and 3. The top and bottom walls, being distended, as shown, provide between the bag and the outer casing a plurality of air pockets or chambers 17 at the top and bottom of the cushion. The openings 6 are of such size that air is permitted to circulate rather freely between each compartment of the bag, and the ventilating tubes 7 and openings 13 are also of such a size as to permit a rather free circulation of air entirely through the cushion.

A body reclining or resting upon the cushion and moving about in the act of resting causes a slight circulation of air to take place between the flexible casing and the bag somewhat similar to the action of a bellows. This bellows action also causes air to pass through the tubes 7. It will therefore be seen that fresh air circulates between the resilient bag and one's body when reclining or sitting upon the cushion and also that air will circulate between the bag and the outer covering or casing and through the air pockets formed by the distended top and bottom walls of each compartment, thus providing a uniformity of support as well as a variety of degrees of softness and firmness which adds materially to the comfort of the cushion.

When the bag is inflated to a proper degree, it neatly fills the outer casing. The cross walls do not become distorted to any great extent but retain approximately their original shape while the top and bottom walls of each compartment are slightly distorted and exert pressure against the inner walls of the top and bottom of the outer casing, such expansion compensating for the difference in size between the inflatable bag and the outer casing. The weight of the body resting on the cushion is supported not by the frame but by the confined air pressure.

It will now be clear that we have provided a cushion which will accomplish the objects of the invention as hereinbefore stated. It will also be seen that our improved cushion can be easily handled, thus permitting its use in various places and, being inherently collapsible, it will occupy little space, thus rendering it easy to transport, which further adds to its adaptability when used for a mattress or bed. The evenness and firmness of the support provided by our cushion render it highly desirable both from the standpoint of comfort and of health.

It is of course to be understood that various changes may be made in the form of the cushion and the respective parts used in its construction without departing from the spirit of our invention and the form of the invention herein disclosed is to be considered merely as illustrative and not in a limiting sense as the invention is limited only in accordance with the scope of the appended claims.

One modification of our invention is disclosed in Fig. 4 in which the ventilating tubes 7 are omitted and the ventilating tubes 7^a formed at the intersection of the side walls 5. It is of course to be understood that the size and shape of the

bag and its compartments may be varied, depending upon the type of cushion desired.

While we have disclosed a unit made up of a plurality of inflatable bags, it is of course to be understood that only a single inflatable bag may be used when and if desired. It is also to be understood that additional padding or insulating material may be used or provided between the bag and the casing on either or both sides thereof. If desired, the compartments in the bag may be omitted and only a single chamber used, in which case the tubes 7 would serve to prevent undue and unequal distortion of the top and bottom walls thereof.

One of the essential features of the invention is the combination in a cushion of an elastic chamber adapted to contain a compressible medium which is enclosed within a flexible casing, together with the anchoring construction or means for restricting the expansion of the bag at some points and allowing substantially unhindered expansion at still other points, thus producing an irregularly expanded surface which is confined to a general outline or shape which provides a cushion of regulated softness or firmness and a uniformity of support not heretofore obtained. Another important feature of the invention is the idea of cross ventilation and venting which permits circulation of air between the inflatable bag and its casing as well as entirely through the cushion.

Having thus described our invention, what we claim is:

1. A cushion comprising an inflatable bag made up of a plurality of communicating compartments having longitudinal and transverse side walls which are relatively stiffer than the top and bottom walls, and the top wall of which is flexible so that when inflated said top wall will be bulged outwardly to form a top surface having a plurality of convexities with longitudinal and transverse communicating depressions therebetween, ventilating tubes extending through the bag at the intersections of said walls and connected at their upper ends to the lower points of some of said depressions, and an outer flexible casing enclosing said bag and having perforations communicating with said depressions, the top wall of said casing normally resting on the high points of said convexities, whereby said depressions form crossed communicating passages permitting longitudinal and transverse flow of air between the top wall of the casing and the top wall of the bag.

2. A cushion as in claim 1, the bottom wall of the bag being also flexible and bulged outwardly at each compartment, the bulges resting on the bottom wall of the casing and forming crossed passages permitting longitudinal and transverse flow of air between the bottom of the bag and the bottom of the casing, the said tubes communicating at their lower ends with some of said passages, and the bottom of the casing having openings into said passages.

3. A cushion as in claim 1, and a layer of insulating material on the top wall of said casing, having perforations in line with the perforations in said wall.

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