INFLATABLE MATTRESS OR THE LIKE

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This invention relates to a mattress, cushion or similar article and more particularly to improvements in such articles of the pneumatic type in which enclosed air supplies the necessary yielding quality to provide comfort to the user. Heretofore many kinds of pneumatic mattresses and cushions have been designed for use under various conditions such as in homes, hospitals, camping or the like. However, in the past the compression of air in inflatable articles has been depended upon to provide the cushioning effect and, in order to provide comfort to the user, partial inflation has been required inasmuch as the weight of the user on the cushion increases the internal pressure to such an extent that a fully inflated article would become uncomfortably rigid. Such prior art articles also required that the partial inflation be of a sufficient degree to resist complete collapse when a substantial concentration of weight was placed on a relatively small area of the surface, and the degree of inflation of any of these prior art articles for any individual has been largely a trial and error operation. Partial inflation for the purpose of comfort has also produced an undesired physical appearance of the article when not in use.

In short, desirable characteristics of an inflatable article include yieldability that will resiliently support a person during use and a firm filled out appearance similar to that of conventional felt or inner spring constructions when not in use.

The principal object of the present invention is to provide an inflatable article that will overcome the deficiencies of the prior art and which will fulfill the desired characteristics of an inflatable article. A further main object of the invention is to overcome the rigid effect produced by the compression of air in supporting a person by providing auxiliary yielding means to compensate for the compression air in the article and thus increase its resilience.

It is also an object to provide an inflatable mattress which is inexpensive to manufacture, simple and sturdy in construction, light in weight and providing the comfort in use and the appearance when not in use of conventional mattress constructions.

Further objects and advantages of the present invention will become more apparent hereinafter.

Briefly, the invention comprises an inflatable article having a main compartment and an end compartment, the end compartment having distensible means therein in communication with the main compartment and being filled with resilient packing means normally collapsing the distensible means and being yieldable when pressure is exerted on the main compartment to displace air into the distensible means.

The invention also consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed. In the accompanying drawings which form a part of the specification and in which like numerals refer to like parts wherever they occur:

FIG. 1 is a perspective view of an inflatable mattress embodying the present invention.

FIG. 2 is a cross-sectional view taken along line 2—2 of FIG. 1.

FIG. 3 is a fragmentary sectional view taken substantially along line 3—3 of FIG. 1, and

FIG. 4 is a view similar to FIG. 3 showing the operation of the mattress when a force is exerted thereon.

Referring now to the drawings, it will be seen that an inflatable mattress 10 embodying the present invention comprises a main body portion 11 and similar end portions 12, one of which will function as a pillow in use. The body portion 11 of the mattress 10 includes upper and lower opposed walls 13 and 14 and exterior side walls 15 defining a main compartment 16, which is divided into a plurality of smaller compartments 16' by vertical partitions 17 secured to the upper and lower walls 13 and 14. The end portions 12 of the mattress 10 are similar in construction and, therefore, only one will be described in detail. The end portion 12 has upper and lower wall portions 18 and 19 extending on substantially the same planes as the upper and lower walls 13 and 14 of the main body portion 11, side walls 20 extending conterminously with the side walls 15 of the main body portion 11, and a free end wall 21. The end portion walls define an end compartment 22 which is in communication with the atmosphere through a plurality of perforations 23 formed in the free end wall 21.

The mattress 10 is formed of an air impervious, flexible material such as rubber or plastic capable of being sealed to like material by vulcanizing, heat sealing or with adhesives as desired. The vertical partitions 17 are sealed as at 23 along horizontal lines to the upper and lower walls 13 and 14 in a manner to provide a quilted or tufted appearance, and the ends of each partition 17 have a relief or cut-out 24 to provide free air flow communication between the individual compartments 16' and throughout the main compartment 16. The main body portion 11 also is provided with horizontal partitions 25 extending between the exterior walls 15 and next adjacent vertical partition 17 and being sealed thereto, as at 26, intermediate the upper and lower walls 13 and 14. As will become apparent, the horizontal partitions 25 resist distortion of the side walls 15 when the main compartment 16 is filled with air in order to provide a substantially straight side wall 15 appearance.

Referring particularly to FIG. 3, it will be seen that the main body portion 11 is defined at the ends by an interior end wall 27 secured to a similar interior end wall 28 of the end portion 12. A flexible tubular element 29 defining an auxiliary expandable or distensible chamber 30 is positioned in the end compartment 22 of the end section 12 and is secured to the interior end wall 28 of the end section 12. An inlet opening or port 31 is formed through the walls 27 and 28 to provide air flow communication at all times between the auxiliary chamber 30 of the expansion tube or tubular element 29 and the main compartment 16 of the main body portion 11.

The end compartment 22 of the end section 12 is filled with a suitable yieldable material 32, such as a polyurethane foam or the like, having sufficient volume and inherent resilience or spring-back to exert a force on the tubular element 29 that will oppose and overcome the normal air pressure in the main compartment 16 and normally maintain the tubular element 29 in a substantially collapsed condition. In other words, the air pressure in the main compartment 16 completely fills out the walls of the main body section 11, but is not alone sufficient to overcome the inherent force exerted by the yieldable material 32 on the tubular element 29. It will also be understood that the material 29 is of the type through which or from which air can pass during compression of the material.

When the mattress 10 is filled with air to a predetermined pressure through a suitable valve 33, the main compartment 16 is filled out and presents a firm appearance and feel to the touch. The yieldable material 32 keeps the walls of the end section 12 distended to the normal shape and appearance thereof and maintains the
expandable tube 29 in a collapsed state. When a force, such as the weight of a person, is applied to the upper surface 13 of the main section 11, air is displaced from the main compartments 16' through the opening 31 into the auxiliary chamber 30 to distend or expand the tubular element 29 and exert a compressive force on the yieldable material 32 to displace air therefrom through the perforations 22' in the end wall 12 to atmosphere. However, due to the fact that the opening 31 forms a restriction in air passage to the tubular element 29 and due to the rate of air displacement from the material 32 in the end chamber 22, immediate air displacement from the main compartment 16 is resisted and a gradual yielding or settling effect is produced by the compression of the main section 11 by the weight of a user.

When the mattress 10 is not under compression, the shape and appearance of the side walls 15 of the main section 11 is also maintained by the strengthening pieces 25.

It will be apparent that a rounded condition of the end section 12 will occur when the tubular element 29 is fully expanded, but this will be satisfactory as the end section 12 will function as a pillow during use.

It will also be apparent that either one or two end sections 12 may be used in carrying out the present invention, but that two sections 12 increase the air displacement potential of the mattress 10.

Modifications and changes in the foregoing disclosure will be apparent to all skilled in the art and are contemplated as within the scope of the present invention, which is limited only by the claims which follow.

What I claim is:

1. An inflatable article comprising a main body section defining a main compartment, a second section defining an end compartment, distensible means in said end compartment in air flow communication with said main compartment, and yieldable means in the end compartment normally maintaining said distensible means in a substantially collapsed condition.

2. The inflatable article according to claim 1 including a plurality of partitions subdividing said main compartment into smaller compartments in communication at one end, and transverse partition means connecting at least one of said first mentioned partitions with an exterior wall of said main section.

3. The inflatable article according to claim 2 in which said main section includes top, bottom and side walls, and said plurality of partitions extend between said top and bottom walls and said transverse partition extends between a side wall and the first-mentioned partition adjacent thereto substantially equi-distant from said top and bottom walls.

4. The inflatable article according to claim 1 in which said main and end sections are divided by interior end wall means, and said distensible means comprises a flexible closed tubular element defining an auxiliary expansion chamber and being connected to said interior end wall means, and a restricted air port extending through said interior end wall means between said main compartment and said auxiliary expansion chamber to provide said air flow communication therebetween.

5. The inflatable article according to claim 4 in which said yieldable means comprises foam packing material normally distending said end section to a predetermined shape, and a plurality of perforations in said end section to vent said end compartment to atmosphere.

6. An inflatable article comprising a main body section defining a main compartment, an end section defining an end compartment, means forming a common wall between said main body and end sections, first air passage means through said common wall means between said main and end compartments, second air passage means between said end section and atmosphere, yieldable means within said end section normally distending said end section, and other means for preventing loss of air pressure from said main compartment to atmosphere through said second air passage means.

7. The inflatable article according to claim 6 in which said other means is constructed and arranged in association with said first air passage and together with said main compartment normally forming an air-tight structure for resilient support purposes.

8. An inflatable article comprising a main body section defining a main compartment, an end section defining an end compartment, wall means between said main body and end sections, expandable means positioned in said end compartment and being connected internally with said main compartment through said wall means, means for inflating said main body section to provide an internal pressure therein, and yieldable means in said end compartment externally of said expandable means and normally maintaining said expandable means in a substantially collapsed condition against the internal pressure in said main compartment.

9. The inflatable article according to claim 8 including a plurality of perforations in said end section for venting atmosphere said end compartment externally of said expandable means.

References Cited in the file of this patent

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