

[54] **CONVERTIBLE SOFA-BED WITHOUT INTEGRAL SUPPORT STRUCTURE**

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[58] Field of Search **5/12, 352, 345, 355, 5/357, 361 R, 349, 350**

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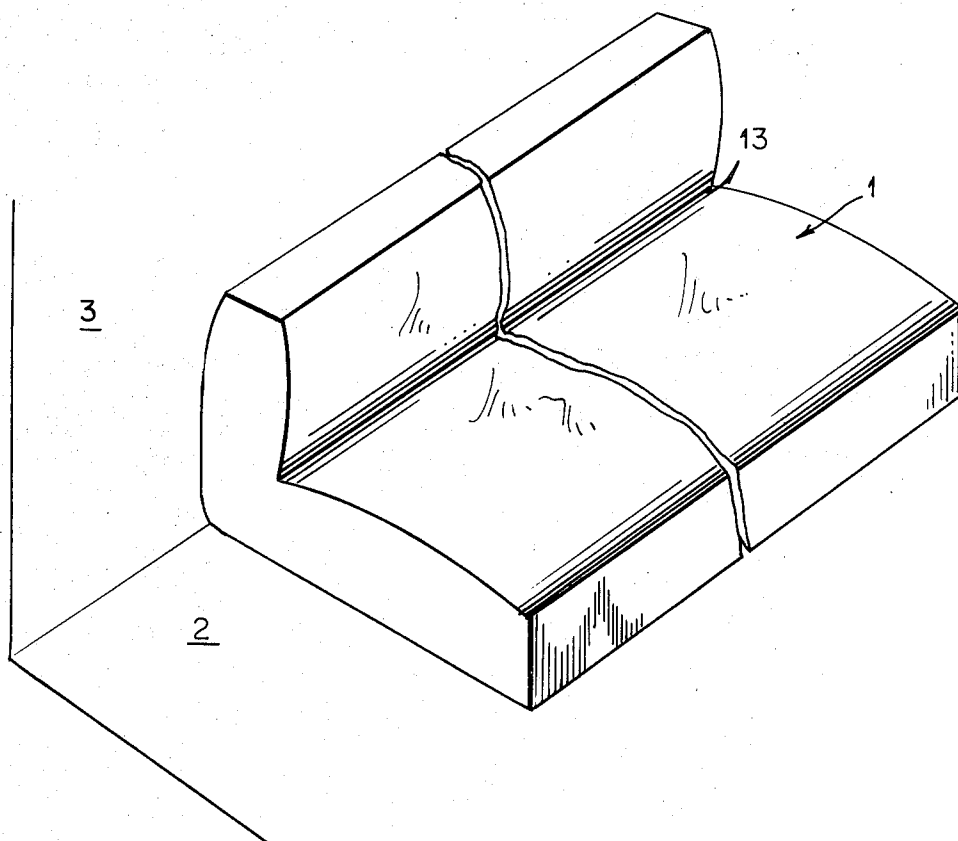
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[57] **ABSTRACT**

A convertible sofa-type bed without an integral support structure which is formed of a cushion structure adapted to be selectively folded against a corner of a floor and a wall, or the like. The cushion structure includes a central core of firm, but yieldable material, an outer layer of resilient, fluffy material such as foam chips, shredded foam, or the like, and an outer fabric covering over the outer layer of resilient fluffy material. Interposed between the core and the outer covering is at least one flexible dividing elements to divide the fluffy material into a plurality of isolated cells.

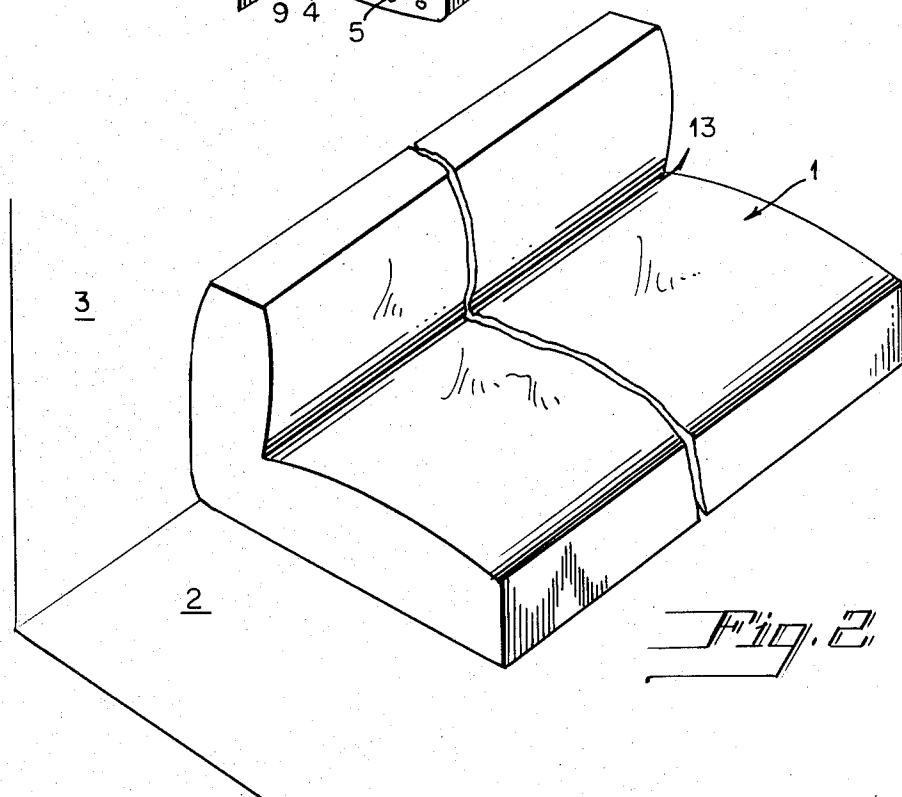
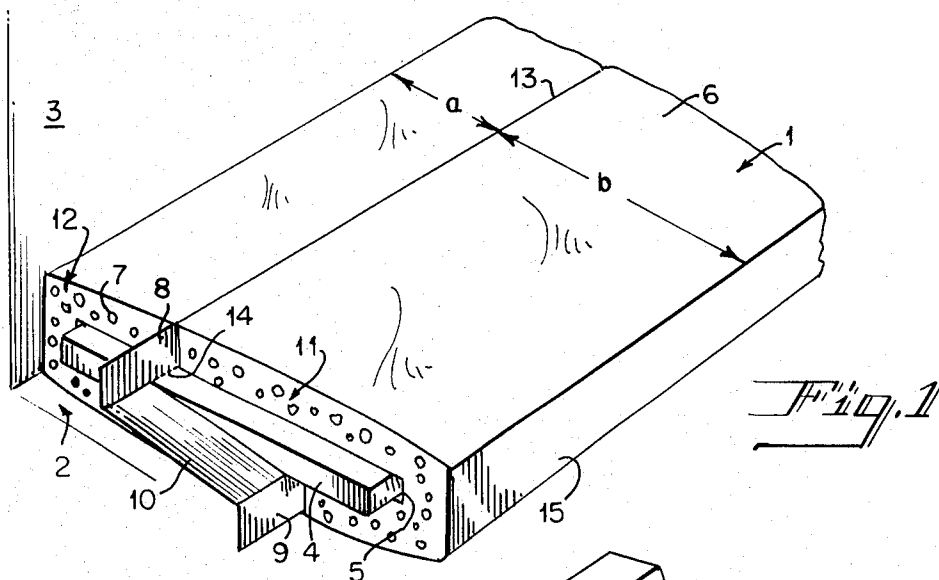
17 Claims, 5 Drawing Figures



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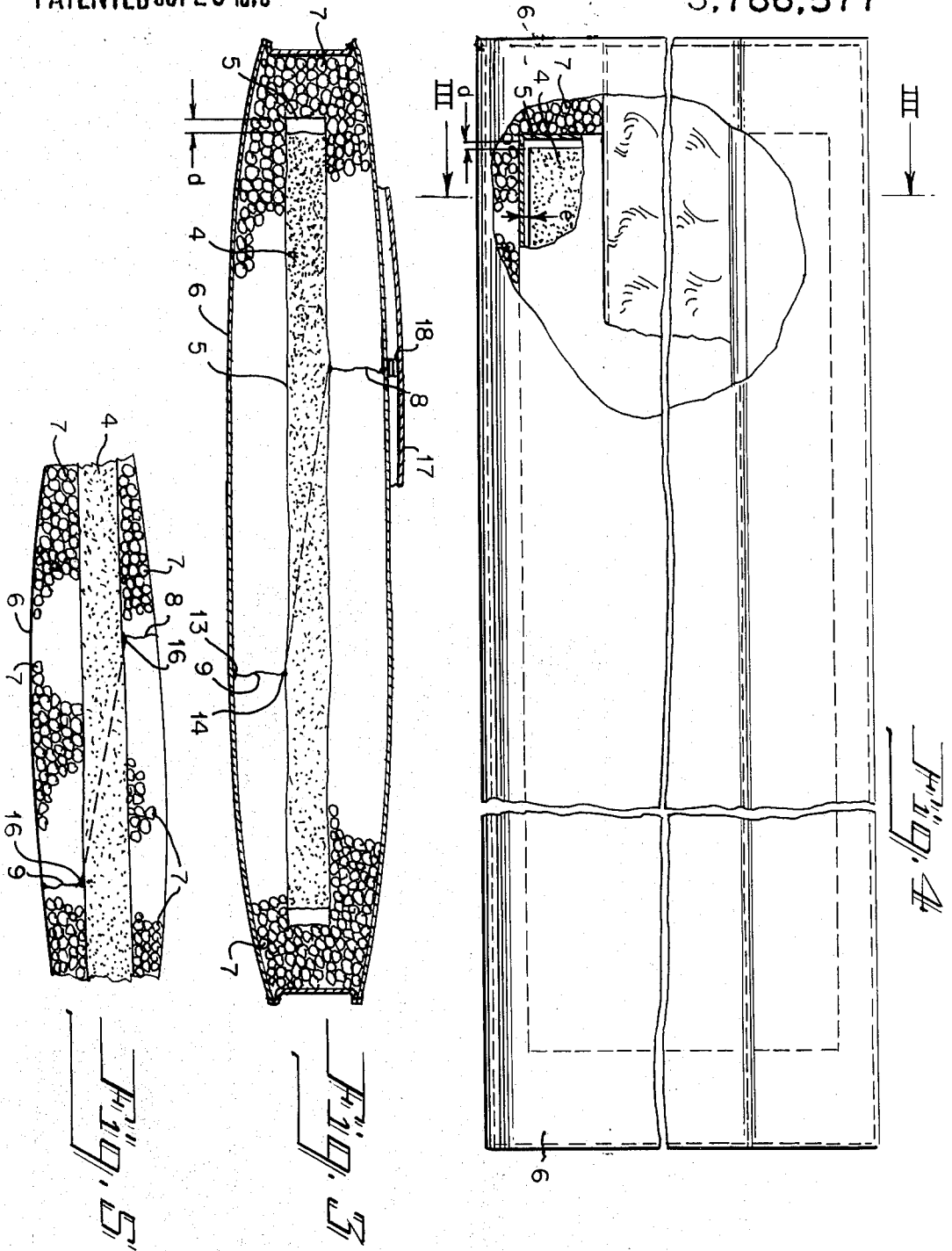
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CONVERTIBLE SOFA-BED WITHOUT INTEGRAL SUPPORT STRUCTURE

The present invention relates to convertible sofa-type beds, and more particularly, to an improved sofa-bed which does not include or require an integral support structure therefor.

Generally, the sofa-beds known in the art are rather complex and include a support structure, such as a frame which folds down. In most sofa-beds, the bed is incorporated into a sofa having a folding mechanism for withdrawing the mattress into a hidden position. All of these sofa-beds are relatively complex in structure, sometimes difficult to operate, and are relatively expensive.

The main object of the present invention is to provide a new and improved sofa-bed which does not utilize an integral support and folding mechanism, which is simple to operate, attractive in use, simple in construction and which is relatively inexpensive to fabricate.

SUMMARY OF THE INVENTION

In accordance with the present invention, a sofa-bed comprises a cushion structure which is adapted to be folded against a corner of a floor and wall, or the like, with a first portion of the cushion in a substantially vertical position, and a second portion of the cushion in a substantially horizontal position. The cushion structure includes a central core formed of a firm, but yieldable material, such as latex or polyurethane foam, and an outer layer of resilient, but fluffy material such as foam chips, shredded foam, or the like, which is interposed between an outer fabric covering and the core of the cushion structure. Further included are flexible dividing elements which divide the fluffy material, such as the foam chips, into a plurality of cells between the core and outer covering. The flexible dividers not only retain the fluffy material in position during prolonged use of the sofa-bed of the present invention, but they also aid in maintaining the structural integrity of the cushion over long periods of use, and aid in maintaining the cushion in proper shape in its folded position against, for example, the juncture of the floor and the wall. The flexible dividing elements can also define folding points of the cushion to aid in converting the cushion from a bed to a sofa, or lounge. In a further embodiment, the core is eliminated and an elongated flexible dividing element is connected between opposing major surfaces of the outer flexible sheet material and passing through the resilient material in the direction of the thickness of the material to divide the resilient, fluffy material into a plurality of separated cells.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view, partially in section, of an embodiment of the present invention, shown in the "bed" position;

FIG. 2 is an illustration of the embodiment of FIG. 1 in the "sofa" position;

FIG. 3 is an enlarged cross-sectional view of the embodiment of FIGS. 1 and 2, taken along line III—III in FIG. 1;

FIG. 4 is a top view, partially broken, of the embodiments of FIGS. 1 and 2; and

FIG. 5 is a cross-sectional view of another embodiment of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

FIG. 1 illustrates the sofa-bed according to the present invention in the "bed" position, and FIG. 2 illustrates the sofa-bed in the "sofa" position. In FIG. 1 the cushion structure 1 is lying flat on the floor and in FIG. 2 the cushion structure 1 is supported at the juncture between the floor 2 and an adjacent wall 3. It should be clear that the cushion structure 1 can be fabricated in any suitable size, depending upon the intended use.

Referring particularly to FIG. 1, the cushion structure 1 of the present invention includes a central core 4 formed of a firm, but yieldable material, such as latex or polyurethane foam. The core 4 in one embodiment is contained within a loosely fitting outer fabric covering 5, the characteristics of which will be discussed in more detail below with respect to FIGS. 3 and 4. The cushion structure 1 is covered with an outer covering 6, with a layer of resilient, but fluffy material 7 such as foam chips, shredded foam, or the like, interposed between the core 4 and the outer covering 6. Flexible dividing elements 8, 9 and 10 are provided in order to divide the portion of the cushion structure between the inner core and the outer covering into a plurality of cells 11 and 12, for example.

In the embodiment shown in FIG. 1, and which will be described in more detail below with respect to FIGS. 3 and 4, the upper flexible divider 8 is seamed to the outer covering 6 at seam 13 and is seamed to the fabric covering 5 for the core 4 at seam 14. Likewise, flexible divider 9 is seamed to the outer covering and to the fabric covering 5, as is end flexible dividing element 10. Dividing element 10 is also seamed to elements 8 and 9 as shown in FIG. 1. Instead of providing the dividing elements 8, 9 and 10 as separate elements which are seamed together, it is possible to form the dividing elements into a single continuous flexible element which is then merely seamed to the outer fabric covering 5 for the core 4, and to the outer covering 6 for the cushion structure. This will provide a simpler and easier to fabricate structure. The dividing elements are preferably of elastic material.

As generally represented in FIG. 1, the distance between the flexible dividing element 8 and its nearest end wall of the cushion is approximately one third of the overall width of the cushion structure. Thus, the dimension a is approximately one half the value of the dimension b as shown in FIG. 1. The flexible dividing element 9 is likewise located on the reverse side of the cushion structure with the shorter one-third dimension being measured from the end wall 15 of the cushion structure. This provides a symmetrical arrangement and enables the cushion structure of the present invention to be reversible, thus equalizing wear on the outer covering and making same more suitable for use in widely diverse applications.

As shown in FIG. 2, when the cushion structure is adapted for use as a sofa, the cushion structure is folded over on itself in approximately the vicinity of one of the seams, such as seam 13, and is supported by adjacent wall 3 and floor 2. If desired, the user can tuck the seam into the fold to obscure same and to provide a more plush, luxurious appearance.

Since the dividing elements 8, 9 and 10 are flexible, this will minimize "pulling in" of a seam when the cushion structure is folded as shown in FIG. 2. Preferably,

the dividing elements 8, 9 and 10 are yieldable elastic materials so that even when the cushion is folded in substantially any position, the dividing elements do not exert a substantial pulling-in action and therefore, the resulting structure exhibits a smooth outer appearance. As shown in FIG. 3, the dividing elements 8 and 9 are preferably formed with slack to accommodate for relative movement between the inner fabric covering 5 and the outer fabric covering 6.

As shown more clearly in FIGS. 3 and 4, the fabric covering 5 for the central core 4 is larger than the core 4 by an amount which allows sufficient movement of the core 4 within the fabric covering 5 during folding and unfolding of the sofa-bed to prevent binding up and thereby ensuring a smoother appearance. This also facilitates folding of the cushion structure 1 between a wall and floor as shown in FIG. 2 since the various constituent elements of the cushion structure will not bind up during the folding operation.

FIG. 5 illustrates a further embodiment of the present invention. In this embodiment, the foam central core 4 is not provided with an outer covering 5 as shown in FIGS. 1 - 4. The flexible dividing elements 8 and 9 are bonded directly to the surface of the central core as shown at 16 in FIG. 5. Depending upon the type of outer covering 6 used, the dividing elements 8 and 9 may either be bonded to the inner surface of the outer covering, or may be seamed thereto by conventional processes. Of course, when using bonding of the various elements, the materials used must be compatible for such use. The advantage of the embodiment of FIG. 5 is that a less expensive structure results in that it is no longer necessary to provide the outer covering 5 for the central core. However, the advantages of the loose fitting central core cover whereby the adjacent elements of the cushion structure are prevented from "binding up" are not incorporated in the embodiment of FIG. 5.

As used herein, the term "fabric" is intended to denote all types of flexible sheet materials whether of conventional woven yarns or the sheet plastic type. While the various materials mentioned herein are preferred, it should be clear that various other equivalent materials can be used in place thereof.

In the illustrated embodiments, the creation of two isolated cells 11 and 12 for the fluffy material 7 has been illustrated. However, it should be clear that the number of cells could be varied by inserting additional dividing elements, such as elements 8 and 9, in the interior of the cushion structure, as required. Further, the core 4 may be eliminated and cushion may be fabricated solely of resilient, fluffy material with a flexible divider element connected between opposing major surfaces of the outer flexible sheet material and passing through the resilient material in the direction of the thickness of the cushion structure. Thereby, the resilient, fluffy material is separated into a plurality of cells in accordance with the present inventive concept. Such modifications clearly fall within the scope of the present invention.

In a typical embodiment of the present invention, wherein the sofa-bed is of the standard 54 inch bed size, the clearance between the ends of the core 4 and the ends of the fabric covering 5 for the core is approximately 2½ inches on either end, as illustrated by the dimension *d* in FIG. 3. As shown in FIG. 4, clearance is also provided on the longer sides of the core as illustrated by the dimension *e* in FIG. 4. In a typical em-

bodiment, the dimension *e* is approximately 1 - 2 inches on either side. In a typical bed 54 inches wide and about 75 inches long, the foam core 4 is approximately 4 inches thick, and is preferably about 42 inches wide by about 60 inches long. The overall cushion structure is preferably about 13 inches deep, maximum, and about 9 inches deep at its extreme edges. The above dimensions are given merely by way of example and are in no way limiting upon the present inventive concept.

The flexible dividing elements 8 and 9, in addition to dividing the internal portions of the cushion structure into individual cells, serve the important function of stabilizing the overall cushion structure and retaining the foam slab 4 in place. This adds further structural integrity to the cushion structure and insures that the cushion structure will remain stable and properly formed during its useful life.

In some embodiments, it may be desired to cover the complete cushion structure illustrated in the drawings by a decorative outer covering, such as, for example, fabric, plastic, or any other decorative sheet material. In this event, the cover 6 is preferably of a sturdy, non-decorative fabric which is permanently sewn together. The outer decorative covering, which is practically shown for example, by 17 in FIG. 3, is preferably of a slip cover arrangement with zippers for easy removal for cleaning or for replacement. In FIG. 3, the outer covering 17 is shown spaced from the cushion for ease of illustration.

When using a removable slip cover 17 for the cushion structure, snaps 18 are preferably provided for fastening the outer decorative covering 17 to the covering 6 of the cushion structure preferably in the vicinity of seams 13 and 14. FIG. 3 only shows the outer covering 17 in the vicinity of seam 13. It should be clear that the outer covering 17 completely surrounds the cushion structure and is symmetrically shaped to the outer side of the cushion structure in the vicinity of seams 13 and 14. This type of arrangement insures that when the cushion is folded, for example as shown in FIG. 2, the slip cover 17 is positively tucked into the fold by means of being retained to the covering 6 by the snaps 18. In a preferred embodiment, the snaps 18 spaced along the seams 13 and 14 at suitable intervals.

While the invention has been described above with respect to specific embodiments, various alterations and modifications can be made thereto within the scope of the present invention as defined in the appended claims.

I claim:

1. A convertible sofa-bed without an integral support structure, comprising a cushion structure adapted to be selectively folded against a corner of a floor wall, or the like, with a first portion of said cushion in a substantially vertical orientation, and a second portion of said cushion in a substantially horizontal orientation, said cushion structure including:

a central core formed of a firm, but yieldable and foldable material and having opposing major, generally flat surfaces;

an outer layer of resilient, fluffy material surrounding said central core;

an outer flexible sheet material covering surrounding said outer layer of resilient material; and

at least one elongated flexible dividing element connected between said central core and said outer

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sheet material covering and passing through said resilient material in the direction of the thickness of said cushion structure to divide said resilient material into a plurality of separated cells.

2. A structure according to claim 1 wherein said at least one flexible divider is connected to said central core and said outer covering with a slack therein to allow free flexure of said cushion structure.

3. A structure according to claim 1 wherein said at least one flexible divider is of yieldable material.

4. A structure according to claim 3 wherein said at least one flexible divider is of elastic material.

5. A structure according to claim 1 including at least two flexible divider elements connected respectively to each major flat surface of said central core for dividing said resilient material into at least two separated cells.

6. A structure according to claim 5 including a further flexible divider element interconnecting said at least two flexible divider elements at the ends thereof, and further connected to said outer flexible sheet material covering.

7. A structure according to claim 6 wherein said flexible divider section elements are comprised of a single integral flexible divider.

8. A structure according to claim 1 including a flexible sheet material covering directly covering said central core.

9. A structure according to claim 8 wherein at least one said flexible dividing element is stitched to at least one of said central core covering and said outer sheet material covering.

10. A structure according to claim 8 wherein said central core covering has dimensions larger than said central core.

11. A structure according to claim 1 wherein said at least one flexible dividing element is bonded to at least one of said central core and said outer sheet material covering.

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12. A structure according to claim 1 wherein said central core is a solid foam material.

13. A structure according to claim 1 wherein said resilient, fluffy material comprises at least one of foam chips, shredded foam, or the like.

14. A structure according to claim 1 wherein said at least one flexible dividing element is substantially perpendicular to the major surface of said core.

15. A convertible sofa-bed without an integral support structure, comprising a cushion structure adapted to be selectively folded against horizontal and vertical fixed members, with a first portion of said cushion in substantially vertical orientation against said vertical member, and a second portion of said cushion in a substantially horizontal orientation against said horizontal member, said cushion structure including:

a layer of resilient, fluffy material;

an outer flexible sheet material covering surrounding said resilient, fluffy material and retaining said resilient, fluffy material in a generally slab-shaped configuration, said outer flexible sheet material covering having continuous upper and lower major surfaces; and

at least one elongated flexible dividing element connected between opposing major surfaces of said outer flexible sheet material and passing through said resilient fluffy material generally in the direction of the thickness of the slab-shaped configuration to divide said resilient, fluffy material into a plurality of separated cells.

16. A structure according to claim 15 wherein said at least one elongated flexible dividing element is substantially perpendicular to said major surfaces of said outer flexible sheet material covering.

17. A structure according to claim 15 wherein said at least one elongated flexible dividing element is of a substantially inelastic material.

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