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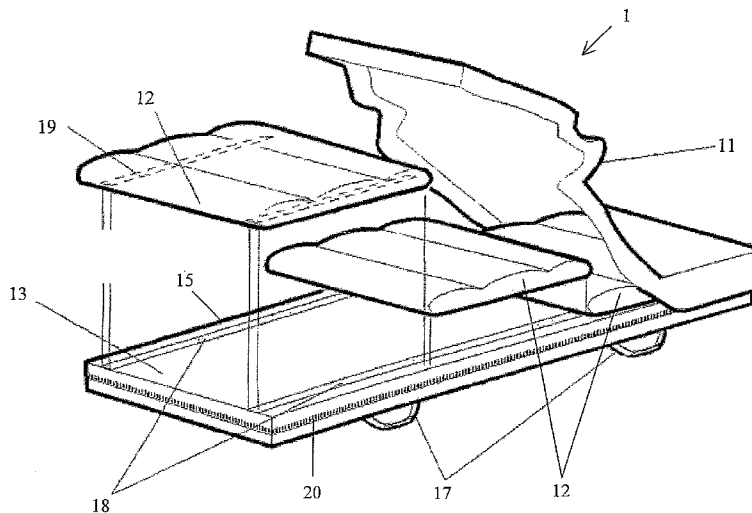
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(54) Title: MATTRESS WITH A WATER RESISTANT COVER AND INTERCHANGEABLE CUSHIONS



(57) Abstract: A home care or healthcare mattress (1) includes a base foam package (13), a plurality of interchangeable equal sized quilted cushions (12) fastened on the top of the base foam package, and a top cover (11) covering the cushions and connected to the base foam package by a zipper (20) on the side of the mattress. The base foam package includes one or more foam pieces enclosed in a cover. The top cover is water resistant, flame retardant and antimicrobial.

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## MATTRESS WITH A WATER RESISTANT COVER AND INTERCHANGEABLE CUSHIONS

This application claims priority from U.S. Provisional Patent Application No.  
5 60/733,483, filed November 4, 2005, which is herein incorporated by reference in its entirety.

### BACKGROUND OF THE INVENTION

This invention relates to mattresses, and in particular, to home care or healthcare  
mattresses.

10

### SUMMARY OF THE INVENTION

The present invention provides a mattress which includes a base foam package, a  
plurality of cushions fastened to a top side of the base foam package, and a top cover that  
includes a water resistant material, the top cover covering the cushions and is connected to  
15 the base foam package.

### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a partial exploded view of a mattress according to an embodiment of the  
present invention.

20 Figure 2 is a cutaway view showing the base foam package of the mattress of Fig. 1  
turned upside down.

Figure 3 is an exploded view of the base foam package of Fig. 2 without the cover.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

25 As illustrated in Fig. 1, a mattress 1 according to an embodiment of the present  
invention includes a top cover 11, a plurality of quilted cushions 12 (three equal sized  
cushions are shown in Fig. 1), and a base foam package 13. The base foam package 13  
includes one or more foam pieces 14 (see Fig. 3, where four foam pieces are shown) enclosed  
in a cover 15. As shown in Fig. 1 and 2, the lower side 15a of the cover 15 of the base foam  
30 package 13 has four linen locks 21 at the corners, a zipper 16 providing access to the foam  
pieces 14, and a number of handles 17 on the side (four handles total, two on each side, are  
shown in Fig. 1). The upper side of the cover 15 has two Velcro™ strips 18 extending the  
full length of the base foam package. Alternatively, the Velcro strips may be intermittence as  
long as they collectively cover substantially the full length of the base foam package. Each

of the quilted cushions 12 has two Velcro strips 19 on the bottom side corresponding to the Velcro strips 18 on the cover 15. The three quilted cushions 12 are fastened to the base foam package 13 by the Velcro strips 18 and 19, and their positions are interchangeable. The top cover 11 covers the cushions 12. The top cover 11 and the bottom cushion cover 15 are  
5 connected together by a 360-degree zipper 20 around the side edge of the mattress 1. Alternatively, although less preferred, a 270-degree zipper may be used.

A specific example of a mattress is described in more detail below. The size of the mattress is 191x88.5x13 cm<sup>3</sup> (Model 1) or 191x80.5x13 cm<sup>3</sup> (Model 2). The top cover 11 is made of a cotton/poly terry knit (Periwinkle) material with a 1 mil urethane film laminate.  
10 The cover 11 is moisture resistant with a MVTR (moisture vapor transfer rate per ASTM 96-95 Method B) of 156.8 g/m<sup>2</sup>/24hrs. The cover 11 is also flame retardant and passed the California Technical Bulletin #117E test. In addition, the cover 11 is antimicrobial and passed the AATCC 147 test. The cushions 12 include three equal sized sections, which are 885(W)x640(L) mm<sup>2</sup> for Model 1 and 805(W)x640(L) mm<sup>2</sup> for Model 2. Each cushion is  
15 made of three layers. The top layer is made of 1.5 oz. thermo-bonded polyester fiber (18-20% recycled fiber); the bottom is made of 1.4 oz. needle punched polyester fiber, and the center booster layer is made of 1.0 oz needle punched polyester fiber. Covering all around each cushion section 12 is cotton/polyester sheeting with loop side of Velcro loop/hook strip for attaching the cushions to the base foam package 13.

The cover 15 of the base foam package 13 includes a bottom panel 15a and top and side panels 15b. The bottom panel 15a is made of a waterproof material, and top and side panels made of another material. In the example, the bottom panel 15a is made of polyester Poly-Tuff with PVC laminate. The material is flame retardant (passed California Technical Bulletin #117E) and antimicrobial (passed AATCC 147). The zipper 16 is a spiral zipper  
20 located off center and extending the full length of the foam package 13 for core access. The four handles (2 on each side of bottom panel) are centered at 550 mm apart. The top and side panels 15b of the cover 15 are made of nylon taffeta fabric with PVC laminate. It is waterproof with a MVTR of 14.4 g/m<sup>2</sup>/24hr. The material is also flame retardant (passes California Technical Bulletin #117) and antimicrobial (passed AATCC 147-1988). Hook  
25 side strips of Velcro loop/hook strips are sewn on the top surface of the bottom cushion cover 15 on lengthwise sides of the bottom cushion cover. Loop side strips of Velcro loop/hook stripes are sewn onto the corresponding sides of the individual cushions 12. The 360-degree zipper 20 is 559 cm in length for Model 1 and 543 cm for Model 2.  
30

The base foam package 13 is formed of multiple foam pieces 14, forming a two layer foam core (see Fig. 3). The top layer 14a is made of Visco foam (3 lbs./ft<sup>3</sup> 15 IFD Visco Elastic) covering the full length and width of the mattress with a height of 1.5". The bottom layer includes a full length foam 14b (1.85 lbs./ft<sup>3</sup> 42 IFD foam) of 1.75" in height, and a 4" wide, full length extra firm side rail 14c made of 1.80 lbs./ft<sup>3</sup> 55 IFD foam on each side. The polyurethane foam is treated with an anti-microbial agent (for example, Vinyzene) injected into the mixture at the mixing head at the foaming process. The foam is manufactured to meet California Technical Bulletin #117.

Notably, the mattress according to embodiments of the present invention has the following advantageous features.

First, all parts of the mattress are replaceable. Second, the mattress has a three-section cushion 12, i.e. it has three equal sized cushions 12 that can be interchanged. This allows different sections to be rotated or replaced to prevent uneven wear. Third, the top cover 11 is moisture resistant in order to minimize or prevent foreign liquid materials from entering the mattress. It includes a terry cloth laminated to a stretchable polyurethane backing. The cover is antimicrobial and flame retardant according to California Technical Bulletin 117E and has an acceptable moisture vapor transfer rate (MVTR) per ASTM 96-95 Method B (for example, a MVTR of less than 170 g/m<sup>2</sup>/24hr will typically be acceptable). An existing mattress had a 75/25% terry cloth absorbable, stretchable top cover. There is no waterproof terry cloth cover used in the U.S. for full-sized hospital mattresses that the inventors are aware of.

The details provided in the examples above are intended to illustrate specific examples of mattresses according to embodiments of the present invention. Not all detailed features are essential to the invention, and the invention should not be limited to any specific feature described or illustrated here. It will be apparent to those skilled in the art that various modification and variations can be made in the mattress of the present invention without departing from the spirit or scope of the invention.

## WHAT IS CLAIMED IS:

1. A mattress comprising:  
a base foam package;  
a plurality of cushions fastened to a top side of the base foam package; and  
a top cover that includes a water resistant material, the top cover covering the cushions and is connected to the base foam package.
2. The mattress of claim 1, wherein the top cover is made of a cotton/poly terry knit (Periwinkle) material with a urethane film laminate.
3. The mattress of claim 2, wherein the top cover has a MVTR of less than 170 g/m<sup>2</sup>/24hrs.
4. The mattress of claim 2, wherein the top cover is flame retardant and antimicrobial.
5. The mattress of claim 1, wherein each cushion is made of multiple layers of fiber materials.
6. The mattress of claim 1, wherein the plurality of cushions are interchangeable.
7. The mattress of claim 1, wherein the base foam package includes a foam core and a cover.
8. The mattress of claim 7, wherein the cover of the base foam package is made of a waterproof, flame retardant and antimicrobial material.
9. The mattress of claim 7, wherein the foam core includes a plurality of foam pieces.
10. The mattress of claim 7, wherein a top side of the cover of the base foam package includes one or more Velcro strips cover substantially a full length of the base foam package.
11. The mattress of claim 10, wherein each cushion includes one or more Velcro strips on its bottom side corresponding to the Velcro strips on the cover of the base foam package for fastening the cushions to the base foam package.

12. The mattress of claim 7, wherein the base foam package further includes a plurality of linen locks and a plurality of handles attached to the cover, and a zipper on the cover for providing access to the foam core.

13. The mattress of claim 1, wherein the top cover is connected to the base foam package by a zipper located along four sides of the base foam package.

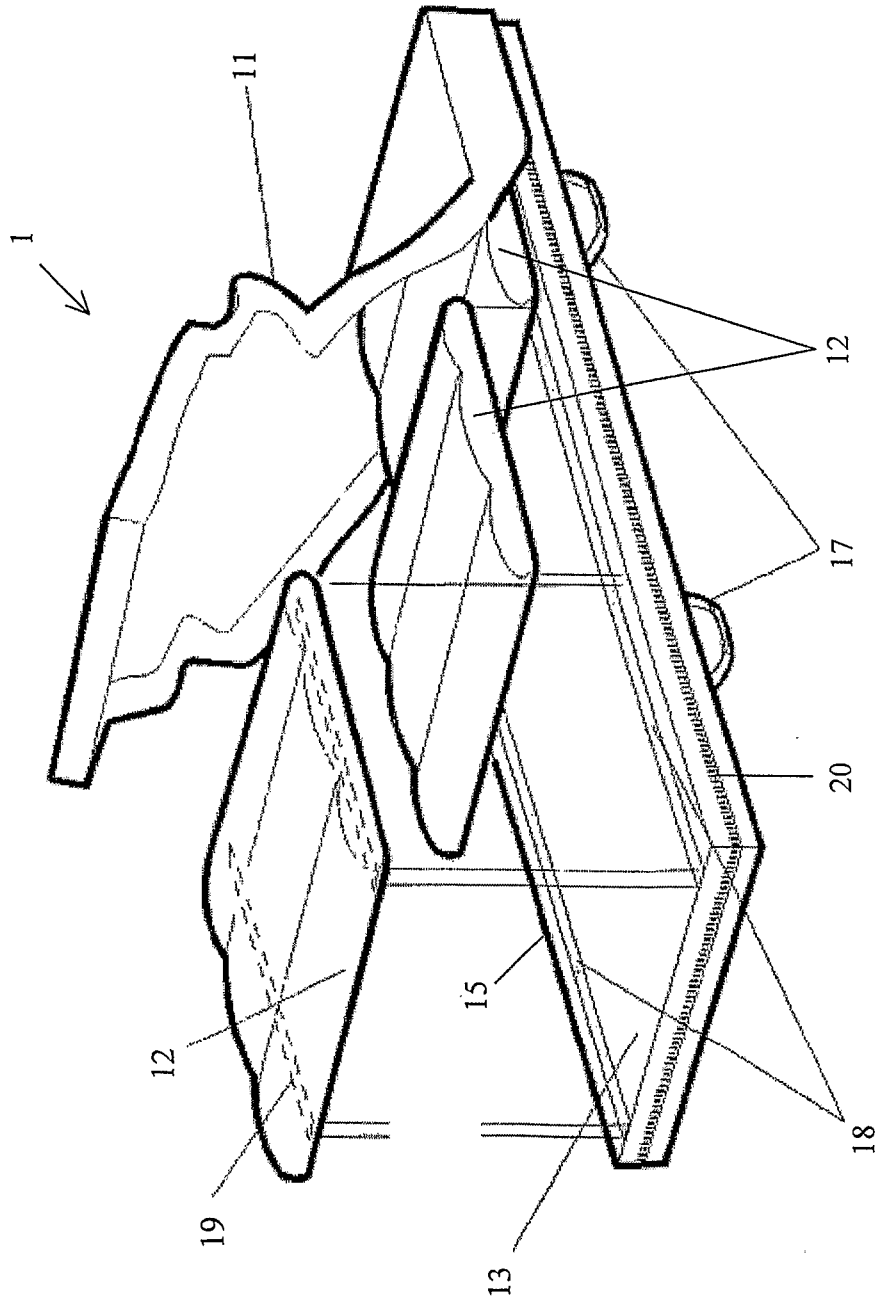


Fig. 1

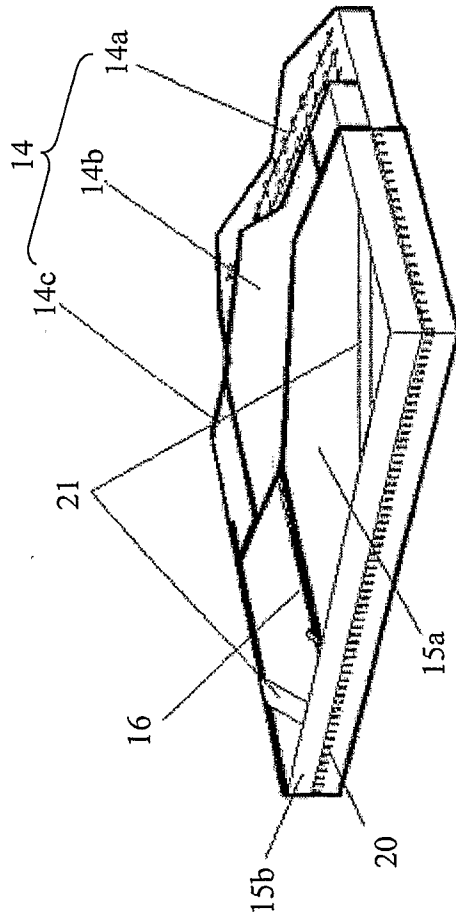


Fig. 2

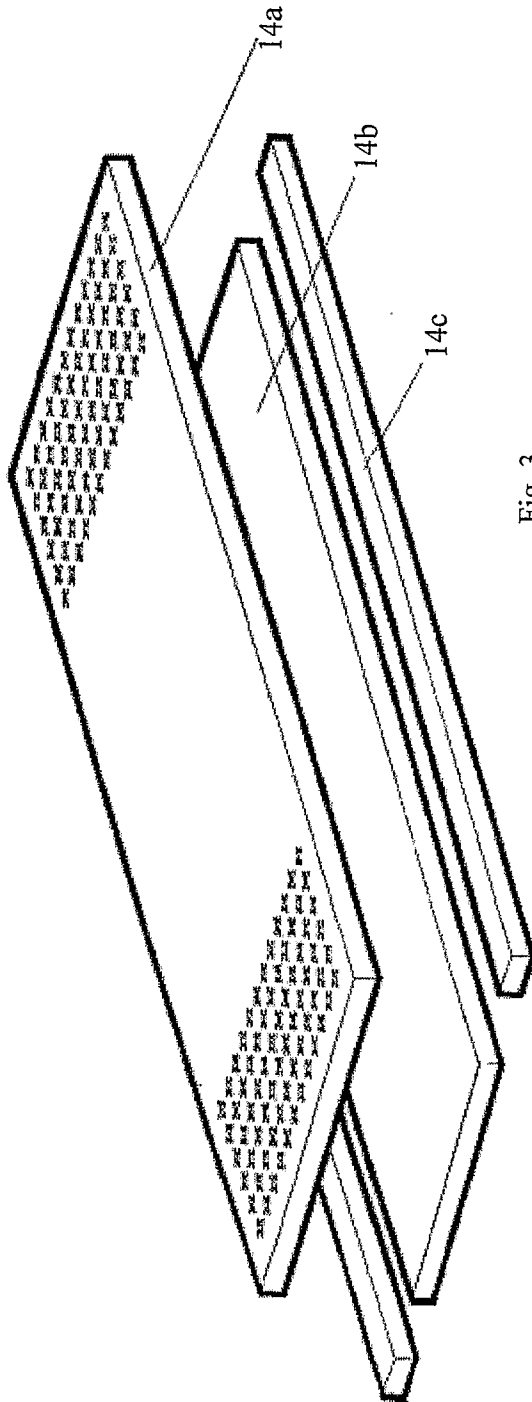


Fig. 3



**INTERNATIONAL SEARCH REPORT**

International application No.

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**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC: **A47C 17/00(2006.01)**

USPC: **5/740,738,727**  
 According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
 U.S. : 5/740,738,727

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,804,848 (ROSE) 19 October 2004 (19.10.2004), figure 2.	1-13
Y	US 5,136,741 (BALONICK et al) 11 August 1992 (11.08.1992), column 1, lines 15-20, figures 4-6.	1-13
Y	US 6,651,277 (MARSON) 25 November 2003 (25.11.2003), column 3, lines 51-62.	5
Y	US 6,952,852 (REEDER et al) 11 October 2005 (11.10.2005), figure 30.	12
A	US 5,201,780 (DINSMOOR, III et al) 13 April 1993 (13.04.1993), figure 4.	12

Further documents are listed in the continuation of Box C.       See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

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