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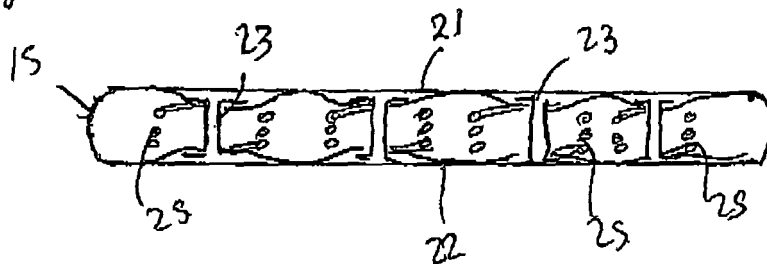
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(54) **Support cushion and inflatable pad therefor**

(57) A support cushion 10 comprises an outer cover consisting of a pouch-shaped upper part 11 and a flat lower part 12. The cover encloses a lower pad 14 and an upper cover pad 16 both of expanded polyurethane, and an inflatable pad 15 accommodated in a recess in

lower pad 14. An inflation tube 17 of pad 16 is sheathed in a spigot 13 of the cover part 11. The inflatable pad 15 comprises an envelope of air impermeable material presenting upper and lower main surfaces, which are connected by a plurality of tubes 23 passing between the surfaces, and surrounded by springs 25.

Fig. 5



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Description

[0001] This invention relates to a support cushion particularly for relieving pressure for bed-ridden or chair-bound patents.

[0002] Support cushions of this kind usually comprise pads of for example foamed or cellular synthetic material, and/or an inflatable air cushion, contained within hard wearing washable covers for example of polyurethane-coated textiles.

[0003] A problem encountered with prior art cushions or support pads is that air cushions, because they have to be air tight, are not breathable and as they comprise two panels of flexible material joined only by a seam around the periphery of the panels, tend to bulge to form a convex surfaced body rather than a flat surfaced panel suitable for rectangular cushions.

[0004] It is an object of the invention to provide a support cushion and an inflatable pad for a support cushion which enable a fully breathable cushion to be obtained with an inflatable pad as its core, and also enable control of the geometry of the fully inflated pad to be achieved.

[0005] From a first aspect, the invention provides an inflatable pad for a support cushion comprising an outer airtight membrane providing upper and lower surfaces, and an array of tube means extending through the pad between said upper and lower surfaces, and providing air passages passing through said pad.

[0006] The tube means may each comprise a tube provided with a flange at each end which engages with the outer faces of the air tight membrane in contact with the respective upper and lower surfaces.

[0007] Each tube means may be associated with a respective tension spring means between said upper and lower surfaces, whereby the spring means tends to draw the upper and lower surfaces towards each other, thereby countering the pressure of air within the pad to prevent bulging of the pad when inflated.

[0008] The tension spring means may be concentrically disposed about respective tube means. The springs may be welded polyurethane discs.

[0009] The invention also provides, from a second aspect, a support cushion including an inflatable pad according to the first aspect of the invention as part of the internal structure of the cushion.

[0010] The support cushion may additionally comprise one or more pads of foamed or expanded plastics material, e.g. polyurethane, and one or more thereof may be shaped to provide a recess or recesses to accommodate the inflatable pad.

[0011] The support cushion may be covered with a cover of polyurethane coated fabric, such as a jersey knit. This may comprise two parts, such as a flat base, and a shallow pouch, which can be separated for removal for washing or replacement.

[0012] The cover preferably has a nozzle formed therewith to accommodate an inflation tube for the inflatable cushion.

[0013] A preferred embodiment of inflatable pad for a support cushion, according to the invention, and of a cushion according to the invention incorporating the pad, will now be described by way of example with reference to the accompanying drawings, wherein:-

Figure 1 is an exploded perspective view of a support cushion according to the invention;
 Figure 2 is a perspective view of the cushion of figure 1 assembled;
 Figure 3 is a perspective view of an inflatable pad according to the invention forming part of the support cushion of Figures 1 and 2,
 Figure 4 is a cross-section of the pad of Figure 3 taken parallel to the major surfaces of the pad,
 Figure 4a is a detailed cross section of part of the pad, and
 Figure 5 is a cross-section of the pad of figures 3 and 4 taken on line V-V of figure 4.

[0014] Referring first to figures 1 and 2, a support cushion 10, which is especially suitable for providing long term support and comfort to bed - and chair - ridden, patients to help to prevent pressure ulcers and facilitate healing of injuries or operation scars, comprises an outer cover consisting of a pouch-shaped upper part 11 with a top, and four side walls, and a square base part 12 which can be joined to and separated from the upper part 11 so that the cover can be removed for washing or replacement. The cushion 10 provides an overall shallow square box shape.

[0015] The cushion 10 also has a tubular spigot 13 projecting from one face thereof, to accommodate the inflation tube of an inflatable pad within the cushion as described below.

[0016] As shown in figure 1, the interior of the cushion 10 comprises a lower pad 14 of expanded polyurethane foam, formed with a hollow to accommodate an inflatable pad 15, and an upper cover pad 16 also of polyurethane foam. The inflatable pad 15 has an inflation tube 17 which extends out through the cover via the spigot 13.

[0017] The inflatable pad is as shown in more detail in figures 3, 4, 4a and 5. The pad comprises an airtight skin 20, having an upper web providing an upper surface 21 and a lower web providing a lower surface 22. The inflation tube 17 communicates with the interior of the pad 15 for inflation and deflation of the pad.

[0018] The upper web 21 of the airtight skin 20 provides for a micro climate between the foam pad 16 and the upper part 11 of the outer cover, This assists the circulation of air within the cushion enabled by the use of the foam pads 14 and 16 and the inflatable pad 15.

[0019] The pad 15 has a plurality of tube means 23 which pass through the pad between the upper and lower surfaces of the pad, so that air can pass through the pad, and the pad be rendered 'breathable'.

[0020] The tube means 23 are arranged in an array of 4 x 4 (sixteen in total) in the embodiment shown, and

each consist of a tubular member which is open at each end, and is provided at each end with a respective flange 24 which is sealed e.g. by thermal welding to the skin 20 around the edges of the aperture. The number and distribution thereof may be varied as required by the shape and size of the cushion.

[0021] The tube means 23 are each surrounded by a respective tension spring 25 in the form of a welded polyurethane disc which acts to bias the respective opposed surfaces 21 and 22 together against the expansive force of air under pressure introduced from the inflation tube 17. This acts to prevent bulging of the pad 15, so that even when fully inflated it can fit within the geometry of the core of the cushion 10.

[0022] The springs 25 may be distributed in any suitable pattern, not necessarily in relation to the tube means 23, which ensures even distribution of tension in the skin 20.

[0023] The cover 11 and 12 of the cushion 10 is a polyurethane coated jersey knit which has good washability properties, and is effectively impervious thereby preventing soiling of the core of the cushion, in particular the polyurethane foam pads 14, 16 and the inflatable pad 15.

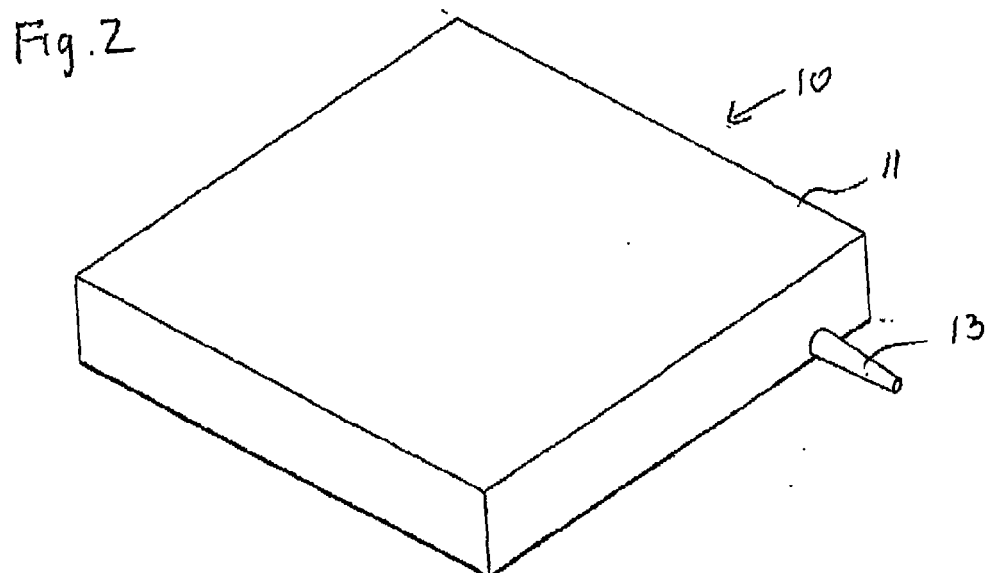
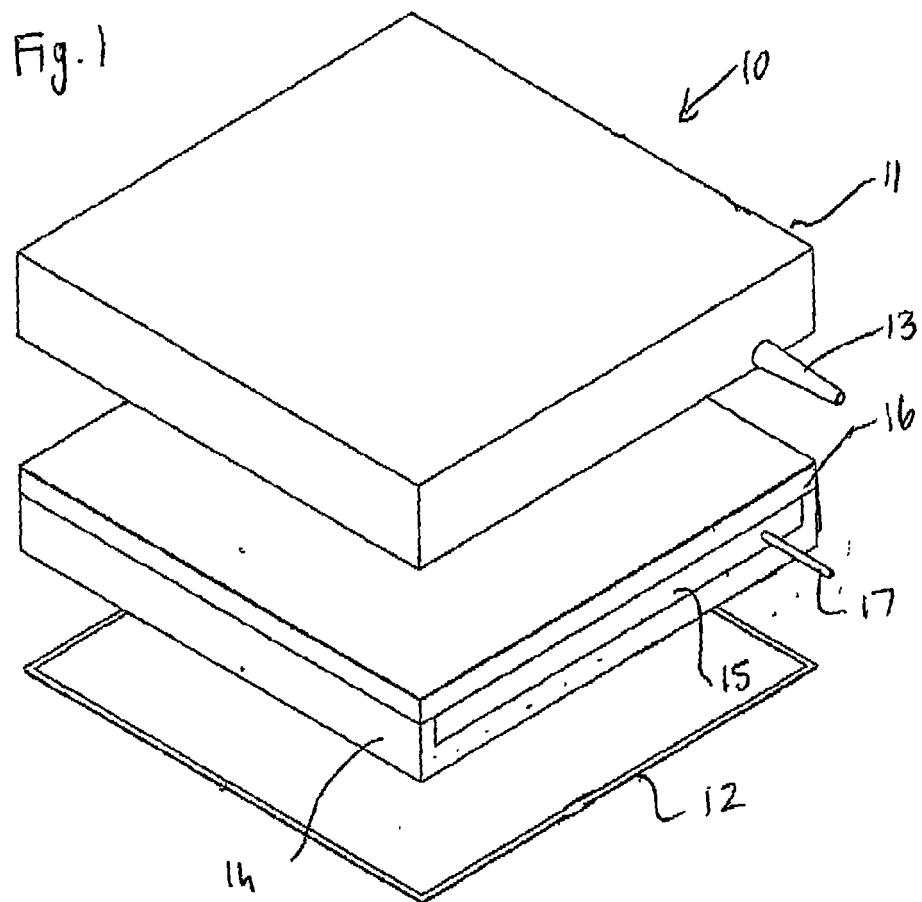
[0024] A cushion of the kind described, in accordance with the invention provides good support and comfort for bed-ridden or chair bound patients and will help to prevent or limit pressure sores and ulcers when and facilitate the healing of injuries and operation scars, and the cushion will preferably be manufactured to suit specific bedding users and domestic furniture (such as chairs, settees etc as part of the upholstery, and for wheel chairs).

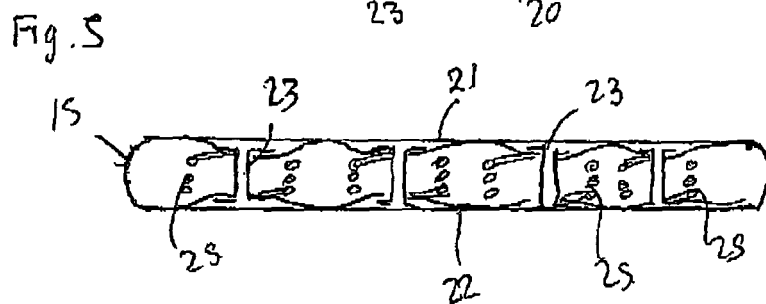
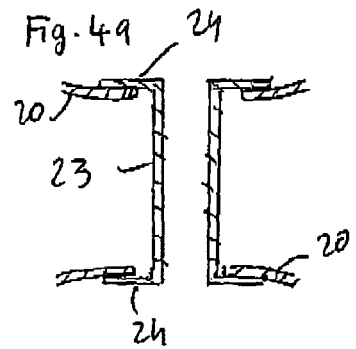
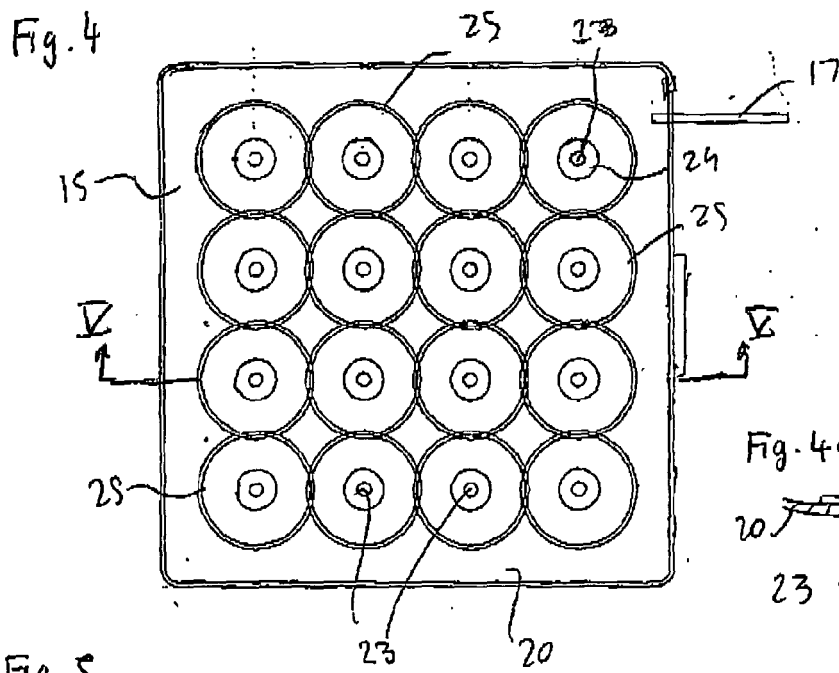
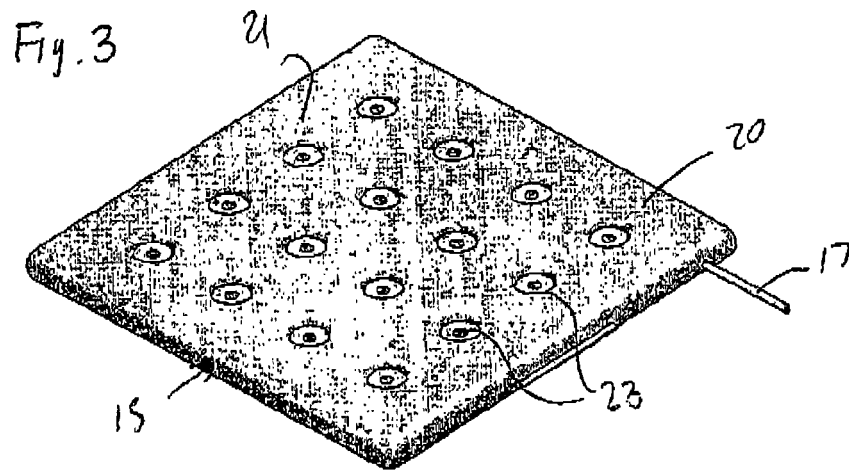
spective tube means.

5. A pad according to Claim 3 or 4, wherein the spring means each comprise a welded polyurethane disc.
6. A support cushion, **characterised in that** it includes an inflatable pad according to any one of Claims 1 to 5.
7. A support cushion according to Claim 6, which additionally comprises one or more pads of foamed or expanded plastics material.
8. A support cushion according to Claim 7, wherein one or more of said further pads is shaped to provide a recess or recesses to accommodate the inflatable pad.
9. A support cushion according to any one of Claims 6 to 8 wherein the support cushion is covered with a cover of polyurethane coated fabric.
10. A support cushion according to Claim 9, wherein the cover comprises two parts, a flat base and a shallow pouch which can be separated.
11. A support cushion according to claim 9 or 10 wherein the cover has a nozzle formed therewith to accommodate an inflatable tube for the inflatable cushion.

Claims

1. An inflatable pad for a support cushion, the pad comprising an airtight outer membrane providing upper and lower surfaces of the pad, and an array of tube means extending through the pad between said upper and lower surfaces, and providing air passages passing through said pad.
2. A pad according to Claim 1, wherein the tube means each comprise a tube provided with a flange at each end, each said flange engaging with a respective outer face of the air-tight membrane, in contact with the respective upper and lower surfaces.
3. A pad according to Claim 2, wherein each tube is associated with a respective tension spring means between said upper and lower surfaces, whereby the spring means tends to draw the upper and lower surfaces towards each other, thereby counteracting the pressure of air within the pad and preventing bulging of the pad when inflated.
4. A pad according to Claim 3, wherein the spring means are each concentrically disposed about re-







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EUROPEAN SEARCH REPORT

Application Number
EP 05 25 7468

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 2 228 193 A (KENNETH * CALDWELL) 22 August 1990 (1990-08-22) * page 9, paragraph 6 *	1,2,6	A47C27/08 A61G7/057
X	GB 721 252 A (NORBERT JACQUIGNON) 5 January 1955 (1955-01-05) * page 1, line 65; figure 3 *	2	
A	DE 297 21 150 U1 (CHANG, CHUNG TAI, YUNG KANG SHIH, TAINAN, TW) 12 February 1998 (1998-02-12) * claim 2; figure 2 *	3	
A	US 6 511 501 B1 (AUGUSTINE SCOTT DOUGLAS ET AL) 28 January 2003 (2003-01-28) * the whole document *	1-11	
			TECHNICAL FIELDS SEARCHED (IPC)
			A61G A47C
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 4 April 2006	Examiner Lassen, S
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 05 25 7468

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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04-04-2006

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2228193	A	22-08-1990	NONE	

GB 721252	A	05-01-1955	NONE	

DE 29721150	U1	12-02-1998	DE 29804244 U1	18-06-1998

US 6511501	B1	28-01-2003	AU 742395 B2	03-01-2002
			AU 4548199 A	14-02-2000
			CA 2333389 A1	03-02-2000
			EP 1096907 A1	09-05-2001
			WO 0004853 A1	03-02-2000
			US 6102936 A	15-08-2000

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82