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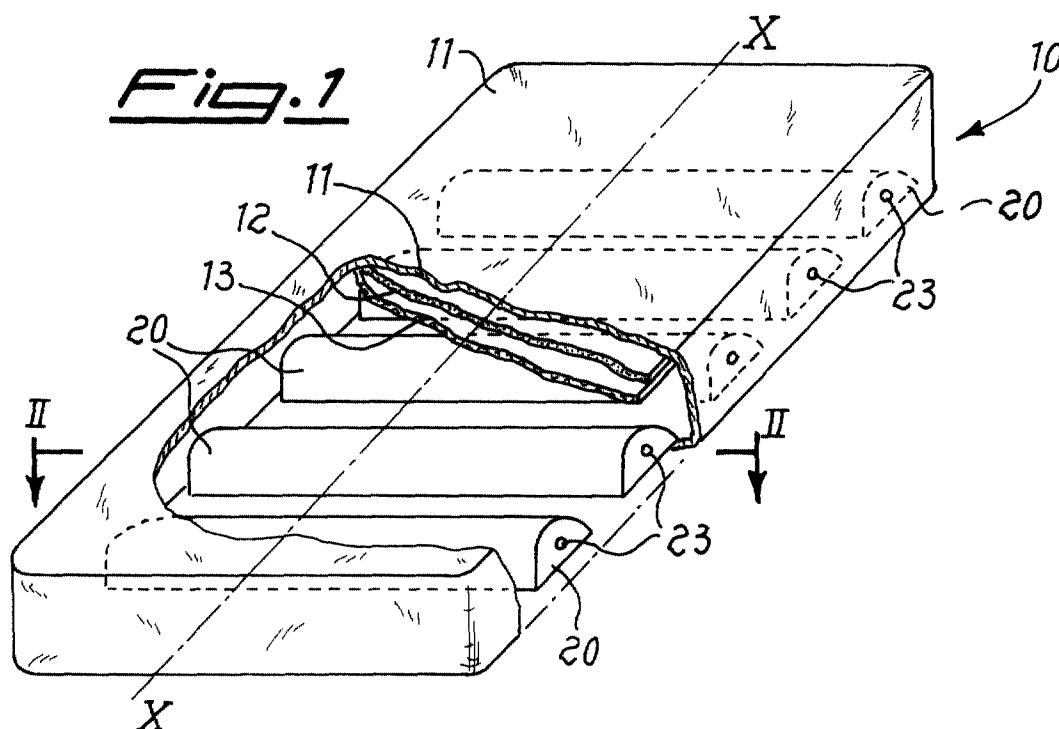
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(54) **Support device in the form of a mattress or the like with adjustable rigidity**

(57) Support device comprising a casing (10;100; 200) which has at least one tubular element (20; 120) arranged inside it, said tubular element being inflatable/

deflatable by corresponding means (23;123) associated therewith. In a preferred embodiment said tubular element (20;120) consists of an air chamber (21;121) which has foam material (22) arranged inside it.



Description

[0001] The present invention relates to a support device comprising a casing which has at least one tubular element arranged inside it, said tubular element being inflatable/deflatable by corresponding means associated therewith.

[0002] It is known in the technical sector relating to the production of mattresses and the like that there exists the need to manufacture them with a predefined compressive resistance - normally defined as the rigidity of a mattress - in accordance with the requirements of the end users.

[0003] In connection with this need it is sometimes required that the said mattress should have a different rigidity in different zones thereof.

[0004] In the production technique used for normal mattresses the latter are made more less rigid by filling them, to a greater or lesser extent, with suitable materials, such as latex and the like, or by means of greater or lesser rigidity of the vertical springs inserted inside the mattress.

[0005] It is also known that, as an alternative to and in order to produce these different degrees of rigidity, mattresses have been provided, having arranged inside them substantially tubular elements, in foam material, which can release or take in air by means of a one-way valve which allows the user to deflate, by means of compression, said tubular insert as required; vice versa, if the insert is released, it reinflates until it resumes the original configuration.

[0006] These mattresses of the known type have, however, the drawback consisting in the fact that the maximum degree of rigidity which can be obtained is defined a priori and the user at the most may only reduce it.

[0007] The technical problem which is posed, therefore, is that of providing a mattress which has means for adjusting its rigidity, able to allow the user the widest range of adjustment from a minimum value to a maximum value substantially determined by the sole resistance of the materials.

[0008] Within the context of this problem a further requirement is that these adjustable-rigidity mattresses may be packaged and stored with the smallest possible overall volume in order to reduce the associated storage and despatch costs.

[0009] A further object of the present invention is that of providing adjustable-rigidity mattresses which can be manufactured and used by the end user, easily and at a low cost.

[0010] These technical problems are solved according to the present invention by a support device comprising a casing which has at least one tubular element arranged inside it, said tubular element being inflatable/deflatable by corresponding means associated therewith.

[0011] In a preferred embodiment said tubular element consists of an air chamber inside which foam ma-

terial is arranged.

[0012] Further details may be obtained from the following description of a non-limiting example of embodiment of the invention provided with reference to the accompanying plates of drawings, in which:

- Figure 1 shows a partially sectioned perspective view of a support element according to the present invention in the form of a mattress;
- Figure 2 shows a cross-section along the plane indicated by the line II-II in Figure 1;
- Figure 3 shows a side view of the mattress according to Figure 1 with devices for inflating the tubular elements according to the invention;
- Figure 4 shows a perspective view of a support element according to the invention in the form of a pillow;
- Figure 5 shows a support device according to the invention in the form of a latticework of adjustable-rigidity slats; and
- Figure 6 shows a cross-section along the plane indicated by VI-VI in Fig. 5.

[0013] As illustrated in Figure 1, a mattress according to the invention is formed by means of a casing 10 comprising at least one outer layer 11 made of cotton fabric or the like, a more internal layer 12 of natural and/or synthetic fibre wadding ensuring the uniformity of the surface on which the user 1 rests and an optional core 13 consisting of latex/foam material/wool/cotton.

[0014] According to the invention said casing 10 has, arranged inside it, sealed tubular elements 20 which are arranged in the transverse direction with respect to the longitudinal axis X-X of the mattress.

[0015] Said tubular elements are formed by means of an outer air chamber 21 which has, arranged inside it, a padding 22 of foam material.

[0016] At one of its ends, said tubular element comprises a valve 23 which allows the introduction/emission of air inside the tubular element in order to inflate/deflate it as required.

[0017] As illustrated in Figure 3, inflation of the said tubular elements may be performed by means of a special device 30, for example consisting of a manual pump or an electric compressor, associated with a measuring element 31 able to provide an indication of the degree of pressure reached inside the tubular element.

[0018] Said inflation devices 30 may be connected to the respective valves 23 of the tubular elements by suitable means - schematically indicated in Figure 3 by a line 32 - able to allow simultaneous inflation of all the tubular elements to the same pressure or, on the other hand, a varied inflation of each tubular element with respect to all the other elements; in the first case uniform rigidity of the mattress will be obtained, while in the second case it will be possible to obtain a varied rigidity due to partial mattress volumes.

[0019] In a preferred embodiment, the mattress will

comprise from two to twelve tubular inserts with a cross-section ranging between 30 cm² and 1300 cm².

[0020] As illustrated in Figure 4, it is envisaged that a support element according to the invention may be provided in the form of a pillow 100 in which the tubular elements 20 are inserted in the direction parallel to the longitudinal axis X-X corresponding to the larger dimension of the pillow.

[0021] Figure 5, finally, shows a variation of an example of application of the support element according to the invention consisting of a latticework 200 comprising transverse slats 201, the respective opposite ends of which are inserted in tubular elements 121 provided with respective inflation valves 123 in turn supported by longitudinal elements 202 optionally articulated with each other.

[0022] By means of said inflation valves 123 it is possible to vary the rigidity of the tubular element 121 and therefore the rigidity of the slat-type latticework.

[0023] It is therefore evident how the support element according to the invention allows a wider adjustment of its rigidity, in particular enabling the latter to be adjusted during inflation of the tubular elements; this results in a greater degree of adjustment precision, due also to the greater sensitivity of the user who is able to detect the variation during inflation instead of deflation as performed in the known art.

[0024] In addition to this, the support according to the invention allows the packaging and despatch dimensions to be reduced to a minimum since the volume of the tubular elements is not increased until the moment of use of the latter.

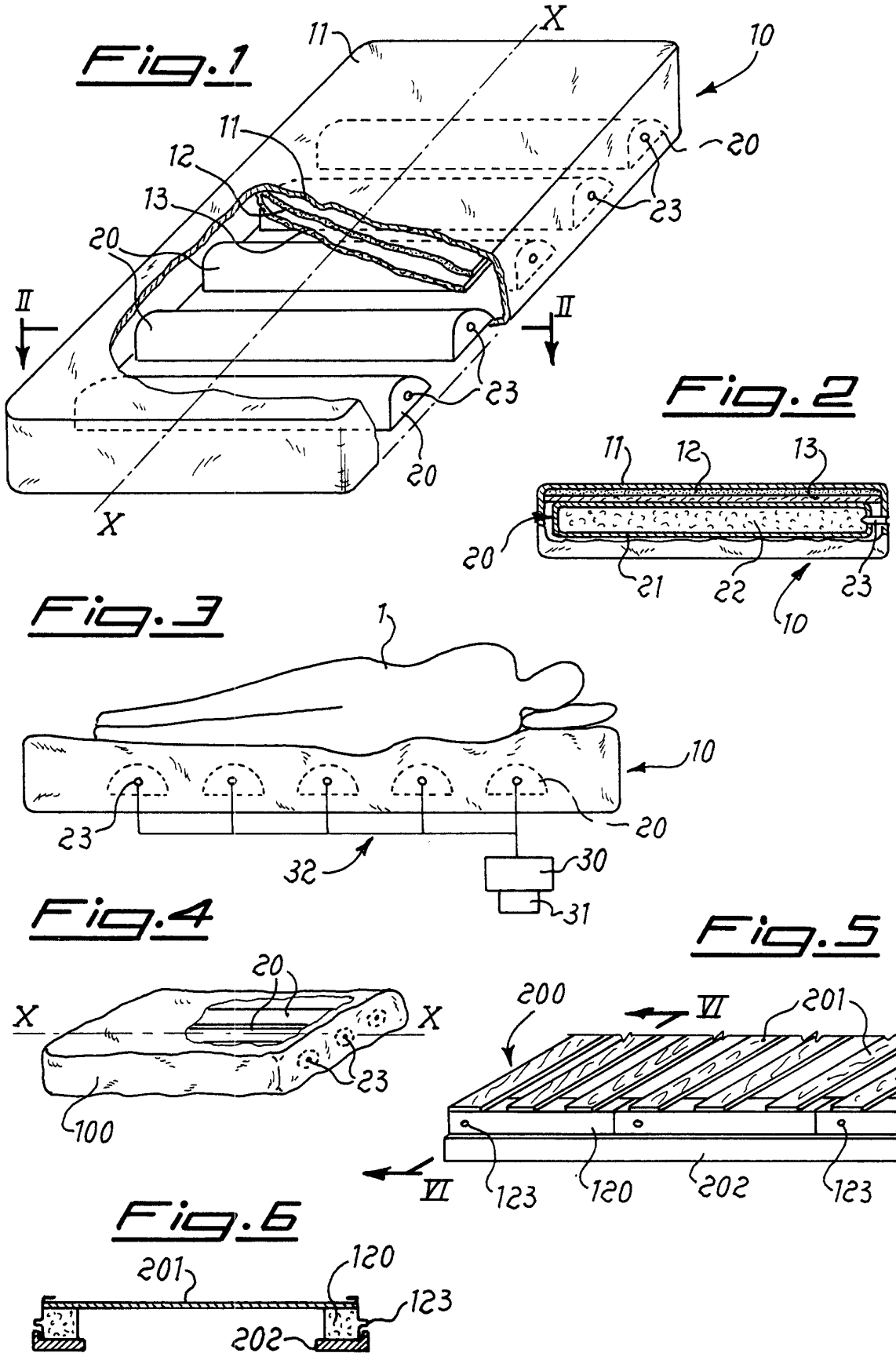
[0025] Owing to the presence of a plurality of separate tubes, moreover, it is also possible to maintain unaltered breathability characteristics of the latex which forms part of the mattress and/or pillow padding.

(12;13).

5. Device according to Claim 4, characterized in that said support is in the form of a mattress.
6. Device according to Claim 5, characterized in that said tubular elements (20) are inserted inside the mattress in a direction perpendicular to the longitudinal axis (X-X) of the mattress.
7. Device according to Claim 4, characterized in that said support is in the form of a cushion/pillow.
8. Device according to Claim 7, characterized in that said tubular elements (20) are inserted inside the pillow in a direction parallel to the longitudinal axis (X-X) of the pillow.
9. Device according to Claim 1, characterized in that said support is in the form of a latticework (200) comprising transverse slats (201), the ends of which are inserted in inflatable/deflatable tubular elements (121) supported by longitudinal members (202).
10. Device according to Claim 9, characterized in that an inflatable/deflatable tubular element (120) is arranged between said slats (201) and longitudinal members (202).

Claims

1. Support device comprising a casing (10;100;200) which has at least one tubular element (20;120) arranged inside it, characterized in that said tubular element is inflatable/deflatable by corresponding means (23;123) associated therewith.
2. Device according to Claim 1, characterized in that said tubular element (20;120) consists of an air chamber (21;121) inside which foam material (22) is arranged.
3. Device according to Claim 1, characterized in that said means for inflating/deflating the tubular element consist of a valve (23;123).
4. Device according to Claim 1, characterized in that said casing (10;100) is formed by a plurality of respective retaining layers (11) and padding layers





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 01 20 0214

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	GB 2 164 550 A (GRIFFIN) 26 March 1986 (1986-03-26) * the whole document *	1, 3-5, 9, 10	A47C27/18 A47C23/06
X	FR 2 231 187 A (GARNIER) 20 December 1974 (1974-12-20) * claims; figures *	1, 3-6	
A	FR 2 612 450 A (SAUNIÈRE) 23 September 1988 (1988-09-23) * claims; figures *	2, 7, 8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A47C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		9 May 2001	VandeVondele, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 20 0214

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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09-05-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2164550 A	26-03-1986	US 5524307 A	11-06-1996
		AT 62798 T	15-05-1991
		AU 577121 B	15-09-1988
		AU 4315585 A	27-03-1986
		BR 8504581 A	15-07-1986
		DE 3582664 D	29-05-1991
		EP 0186264 A	02-07-1986
		ES 296276 U	01-09-1987
		IN 167711 A	08-12-1990
		JP 1864348 C	08-08-1994
		JP 61094611 A	13-05-1986
		JP 5073405 B	14-10-1993
		MX 165241 B	04-11-1992
		NZ 212303 A	12-02-1988
		US 5692258 A	02-12-1997
		ZA 8507186 A	28-05-1986
FR 2231187 A	20-12-1974	DE 2424440 A	12-12-1974
FR 2612450 A	23-09-1988	NONE	