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Applicant : **MEDICAL SUPPORT SYSTEMS  
LIMITED**  
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**Mattresses.**

This invention relates to mattresses such as pressure reducing mattresses. A mattress 10 comprises an H-section core 11, which forms upper and lower recesses 12,13 and a pair of inserts 14,15 which can be fitted into respective recesses 12,13.

This invention relates to mattresses and in particular to pressure reducing mattresses for use in hospitals.

Many hospital mattresses are now made from foam and some designs attempt to provide different support characteristics along the length of the mattress in order to allow for the different masses of the sections of the patient's body and thereby reduce the reaction pressure on the body, whilst giving firm support. However many of these mattresses do not fall easily within the turning regime traditionally used in hospitals and they have other problems which will be identified below.

According to the present invention there is provided a mattress including a core comprising a base extending at least substantially across the width and along the length of the mattress and having upstanding wall portions extending along the length of the mattress to define a recess and an insert, disposed in the recess for supporting the user, the core having a greater hardness than the insert.

In a preferred embodiment the core is generally H-shaped in cross section and defines a pair of opposed recesses for receiving respective inserts. In that case the wall portions are constituted by the upright portions of the H. The inserts may be formed with zones for providing different degrees of support for different portions of the body and the zones may be distinguished by thickness, resilience or density and/or a combination thereof. The zones will normally be formed in a single integral insert, but the insert could be made up of a number of sections.

The hardness of the core may lie in the range of 140 to 180 Newtons and the hardness of the insert may lie in the range 120 to 160 Newtons, provided of course that the core is harder than the insert. Preferably the core is always 10 to 60 Newtons harder than the insert.

Conveniently the core and the insert are both made of foam, in which case the core may have a density in the range of 38 to 42 Kg/m<sup>3</sup> and the insert may have a density in the range of 48 to 52 Kg/m<sup>3</sup>.

The inserts may be attached to the core by any convenient means, but it is most preferred that they are slightly oversized with respect to the recess so that they form a friction fit within the recess.

The mattress may further comprise a removable cover containing the core and inserts.

Although the invention has been defined above it is to be understood that it includes any inventive combination of the features set out above or in the following description.

The invention may be performed in a number of ways and a specific embodiment will now be described, by way of example, with reference to the accompanying drawing which is a perspective view of a mattress according to the invention with the inserts partially removed.

Referring to the Figure the mattress 10 comprises an H-section core 11 which forms upper and lower recesses 12,13, and a pair of inserts 14,15 which can be fitted into respective recesses 12,13.

The inserts and the core are made of foam and it is preferred that the core is carved from a single block of foam. Typically the foam will be high density combustion modified foam and it is intended that the core should always have a greater hardness than that of the inserts 12,13. This arrangement gives a rigidity as a whole to the mattress which is necessary both from the comfort point of view and from the requirements that the mattress be easily turned and rotated. The uprights 16,17 of the core 11 also provide more rigid edges to the mattress, which will help to prevent patients falling off the side of the mattress when their weight is transferred to the edge. This can be particularly important, for example, for stroke victims who may not be able to lift a limb if it should slip from the edge of the mattress.

The desired range of hardness and foam densities for the core and inserts has been specified above. In a typical example the mattress will have a total thickness of 180 mm with the inner core having a thickness of 165 mm at its edges. The channels may each have a depth of 58 mm and the inserts may be very slightly oversized.

Whilst it is preferred that the parts should be easily replaceable on an individual basis, the inserts and core could be bonded together if required.

Normally the mattress 10 will be provided with a cover not shown, which typically will be waterproof and zipped around three edges for easy removal. The cover is also preferably made of a high two-way stretch factor material so that it can be tight fitting and it may be vapour permeable to minimise the build up of heat and moisture around the patient.

## Claims

1. A mattress including a core comprising a base extending at least substantially across the width and along the length of the mattress and having upstanding wall portions extending along the length of the mattress to define a recess and an insert disposed in the recess to receive the user, the core having a greater hardness than the insert.
2. A mattress as claimed in Claim 1 wherein the core is generally H-shaped in cross-section and defines a pair of opposed recesses for receiving respective inserts and wherein the wall portions are constituted by the upright portions of the H.
3. A mattress as claimed in Claim 1 or Claim 2 wherein the inserts are formed with zones for

providing different degrees of support for different parts of the body.

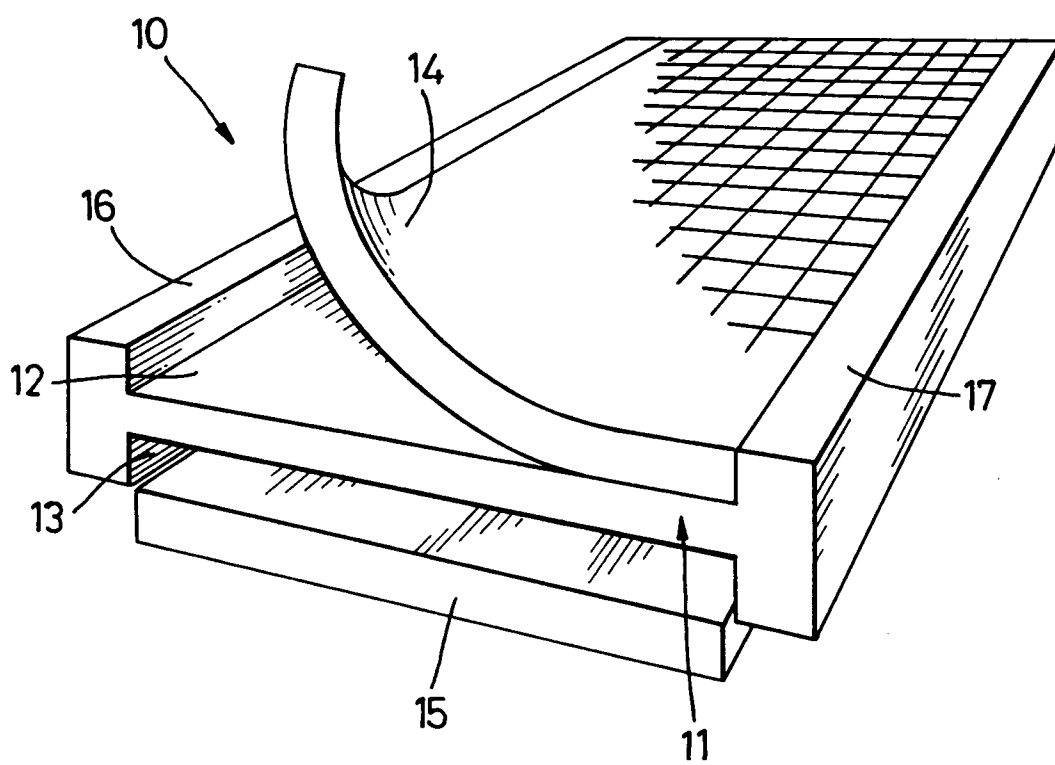
4. A mattress as claimed in Claim 3 wherein the zones are distinguished by thickness, resilience and/or density or a combination thereof. 5
5. A mattress as claimed in any one of the preceding claims, wherein the hardness of the core lies in the range 140-180 Newtons and the hardness of the insert lies in the range 120-160 Newtons, provided always that the core is harder than the insert. 10
6. A mattress as claimed in Claim 5 wherein the core is between 10-60 Newtons harder than the insert. 15
7. A mattress as claimed in any one of the preceding claims wherein the core and the insert are made of foam. 20
8. A mattress as claimed in Claim 7 wherein the core has a density in the range of 38 to 42 kg/m<sup>3</sup>. 25
9. A mattress as claimed in Claim 8 wherein the insert has density in the range of 48 to 52 kg/m<sup>3</sup>.
10. A mattress as claimed in Claim 1 wherein the insert is friction fit within the recess. 30
11. A mattress as claimed in any one of the preceding claims further comprising a removable cover for containing the core and inserts. 35
12. A mattress substantially as hereinbefore described with reference to the accompanying drawings. 40

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# EUROPEAN SEARCH REPORT

Application Number

EP 93 30 2828

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.5)
Y	DE-A-3 021 534 (WESTERHEIDE) * page 6, line 7 - line 23; claims 1,3; figures 1,2 * ---	1,3-9	A47C27/14
Y	GB-A-1 559 851 (EVANS) * page 3, line 8 - line 75; figures 2,3 * -----	1,3-9	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A47C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 13 SEPTEMBER 1993	Examiner MYSLIWETZ W.P.
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>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</p> <p>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  .....  &amp; : member of the same patent family, corresponding document</p>			

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# CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- ☒ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid,  
namely claims: 11
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.