PATENT SPECIFICATION

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(54) Title: A mattress

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"A mattress"

This invention relates to mattresses, cushions and the like products.

It is known to use viscoelastic foams in mattresses, cushions and the like because of their desirable properties. Examples of such products are to be found in our earlier filed European Patent Application No. 01650114.0 (Publication No. EP 1192925). Such viscoelastic foams have a low rebound property, are temperature sensitive and tend to mould themselves to the shape of a persons body in contact with the mattress to provide a more uniform pressure distribution for increased comfort. This is particularly advantageous in hospital beds with a view to minimising problems with bedsores and increasing a patients comfort generally. These types of foam are now finding increasing application in domestic furniture, particularly bedding.

These mattresses, in common with conventional mattresses, allow the dissipation of sweat from a persons body through the mattress in the form of water vapour, that is they are vapour permeable. However a problem arises in that when in use the atmosphere within the mattress has a relatively high humidity due to this transient water vapour. In such an atmosphere of relatively high humidity and when subject to the stresses applied to the mattress by the weight of the person being supported and due to their movement on the mattress, the upper surface of the viscoelastic foam will become highly cracked, particularly in those areas subjected to the greatest stress.

Further, while viscoelastic foams are permeable the migration of water vapour through the layer of foam is relatively slow. In use the portions of the mattress in contact with the user tends to heat up due to this warm water vapour and this is undesirable for the comfort of the user.

The present invention is directed towards overcoming these problems.

According to the invention there is provided a mattress, cushion or the like including a layer of viscoelastic foam characterised in that a vapour permeable reinforcing layer of stretchable material is laminated onto a top surface of the viscoelastic foam layer.

The reinforcing layer material should be breathable so that it does not trap moisture. It should also ideally have two-way stretchability so as not to diminish or at least only minimally effect the beneficial properties of the viscoelastic foam layer. Further, the reinforcing layer should have a relatively high strength so that it will not crack in use.

In one embodiment the reinforcing layer has a thickness in the range 1mm to 10mm and most preferably will have a thickness in the range 3mm to 6mm.

In another embodiment the reinforcing layer has a stretchability in the range 20% to 200% and most preferably in the range 60% to 150%.

In a particularly preferred embodiment the reinforcing layer comprises a spaced knitted fabric having a pair of spaced-apart knitted layers with spacer yarns between said knitted layers, one of said knitted layers being laminated onto the top surface of the viscoelastic foam layer.

The reinforcing layer may be laminated or bonded to the viscoelastic foam layer in any suitable fashion. For example, a solvent based adhesive or water based adhesive could be used. Other possible bonding methods include the use of hot melt adhesive or flame lamination. Further, the reinforcing layer can be bonded in a continuous or semi-continuous fashion to the viscoelastic foam layer.

In a preferred embodiment the reinforcing layer comprises a highly breathable fabric. This conveniently allows good airflow through the reinforcing layer which will be closest to the person in use, minimising heat and humidity between the mattress and the person in use for added comfort.

The reinforcing layer may be of any suitable material such as knitted polyester or other fabric material.

Preferably an outer cover or casing is provided around a resilient core formed by the reinforced viscoelastic foam panel.

The invention will be more clearly understood by the following description of some

embodiments thereof, given by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 is a perspective, partially cut-away, view of a mattress according to the invention;

Fig. 2 is a detail sectional elevational view showing portion of the mattress; and

Fig. 3 is a view similar to Fig. 2 of portion of another mattress according to the invention.

Referring to the drawings, and initially to Figs. 1 and 2 thereof, there is illustrated a mattress according to the invention indicated generally by the reference numeral 1. The mattress 1 comprises an outer cover 2 extending about a resilient core 3. In accordance with the invention the core 3 is formed from a block or layer 4 of viscoelastic foam with a vapour permeable reinforcing layer 5 of stretchable material laminated onto a top surface 6 of the viscoelastic foam layer 4.

The reinforcing layer 5 comprises a spaced knitted fabric having a pair of spaced-apart knitted layers, namely an inner layer 7 and an outer layer 8 with spacer yarns 9 between said knitted layers 7, 8. A suitable material for forming the reinforcing layer 5 is 3 mesh (Registered Trade Mark) material produced by Mueller Textil of Wiehl, Germany. This reinforcing layer 5 may typically be either 3mm or 6mm thick. It is bonded to the top surface 6 of the viscoelastic foam layer 4 in any suitable fashion.

In use, the mattress 1 is used in conventional fashion with the reinforcing layer 3 uppermost. During use the reinforcing layer 5 will resiliently deform following the contour of the viscoelastic foam layer 4 at the same time reinforcing the top surface 6 of the viscoelastic foam layer 4 to prevent cracking in the viscoelastic foam layer 4.

Where a mattress or cushion simply comprising the viscoelastic foam is required this may be sandwiched between two other layers of the reinforcing material so it can be used either side up.

Referring now to Fig. 3 an alternative construction for the core is shown and indicated generally by the reference numeral 20. Parts similar to those described previously are assigned the same reference numerals. In this case a bottom surface 21 of the viscoelastic foam layer 4 is laminated onto a bottom foam layer 22 of a combustion modified high resilience foam.

While the invention has been described in the embodiment in relation to mattresses it will be appreciated that it could also be applied to cushions, seats and the like which incorporate viscoelastic foam, or indeed any applications in which viscoelastic foam panels are subjected to relatively high humidity and stress in order to prevent cracking of the viscoelastic foam.

The invention is not limited to the embodiments hereinbefore described which may be varied in both construction and detail.

CLAIMS

1. A mattress (1), cushion or the like including a layer (4) of viscoelastic foam, a vapour permeable reinforcing layer (5) of stretchable material laminated onto a top surface (6) of the viscoelastic foam layer (4), said reinforcing layer (5) comprising a spaced knitted fabric having a pair of spaced-apart knitted layers (7, 8) with spacer yarns (9) between said knitted layers (7, 8) one of said knitted layers (7) being laminated onto the top surface (6) of the viscoelastic foam layer (4).

2. A mattress (1) as claimed in claim 1 wherein the reinforcing layer (5) is of knitted polyester material, the reinforcing layer (5) having a thickness in the range 3mm to 6mm.

3. A mattress (1) as claimed in any preceding claim wherein the reinforcing layer (5) is adhesively bonded to the viscoelastic layer (4).

4. A mattress (20) as claimed in any preceding claim wherein a bottom surface (21) of the viscoelastic foam layer (4) is laminated onto a bottom foam layer (22), the bottom foam layer (22) comprising a combustion modified high resilience foam.

5. A mattress substantially as hereinbefore described with reference to the accompanying drawings.

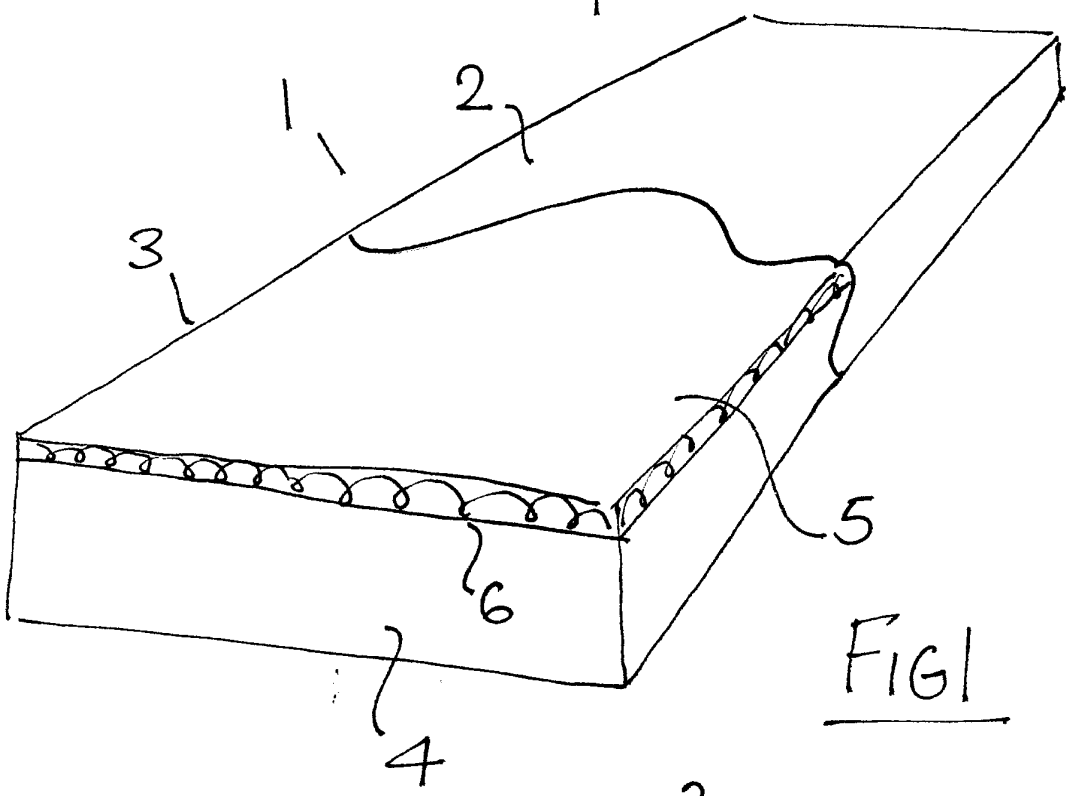

FIG1

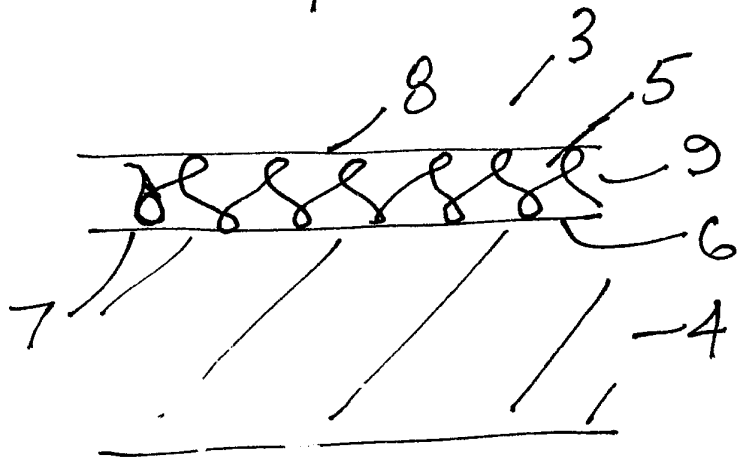

FIG2

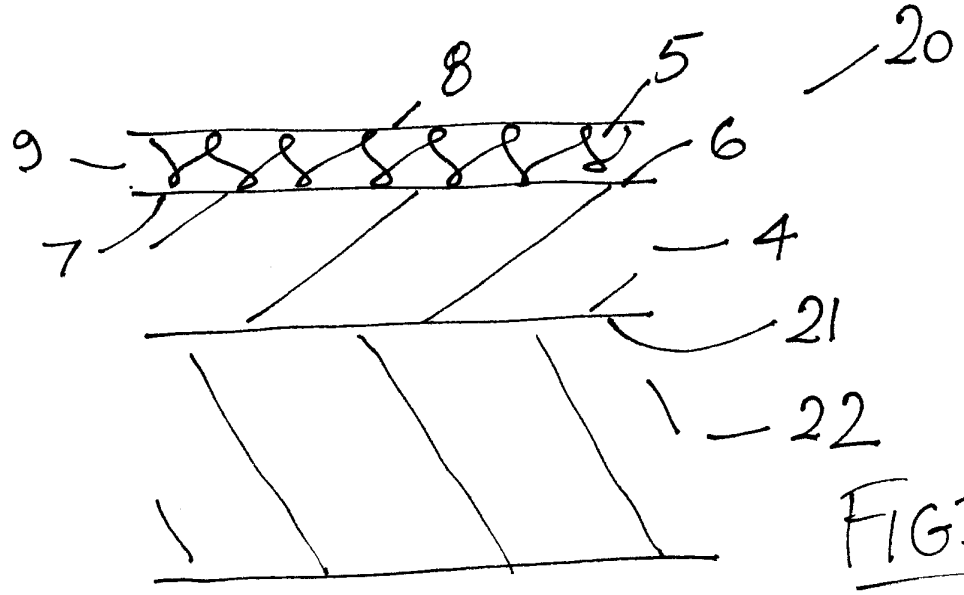

FIG3