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(54) **MATTRESSES**

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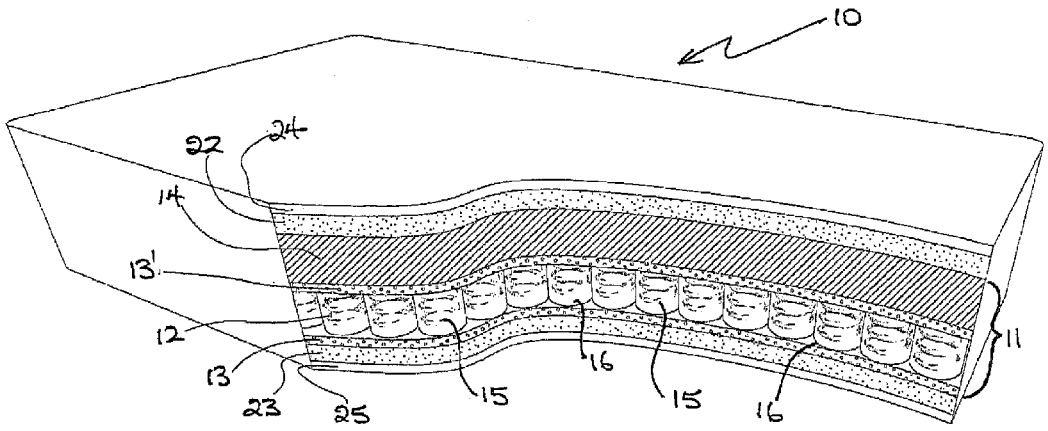
(57) **ABSTRACT**

Mattresses for cots and infant beds include a mattress core having first and second faces. Each face is overlayered by a comfort layer and a cover layer. The mattress core includes a relatively firm core layer and a relatively soft core layer. Suitably, the firm core layer includes an array of helical springs or a foamed polymeric or fibrous material.



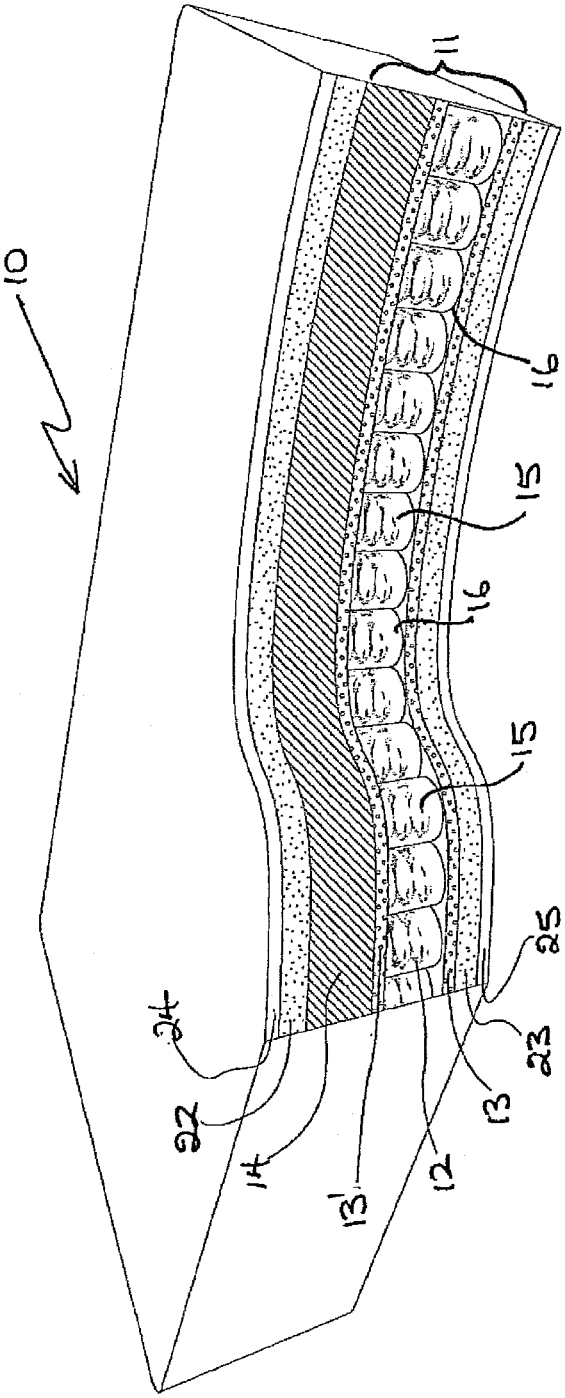


FIG 1

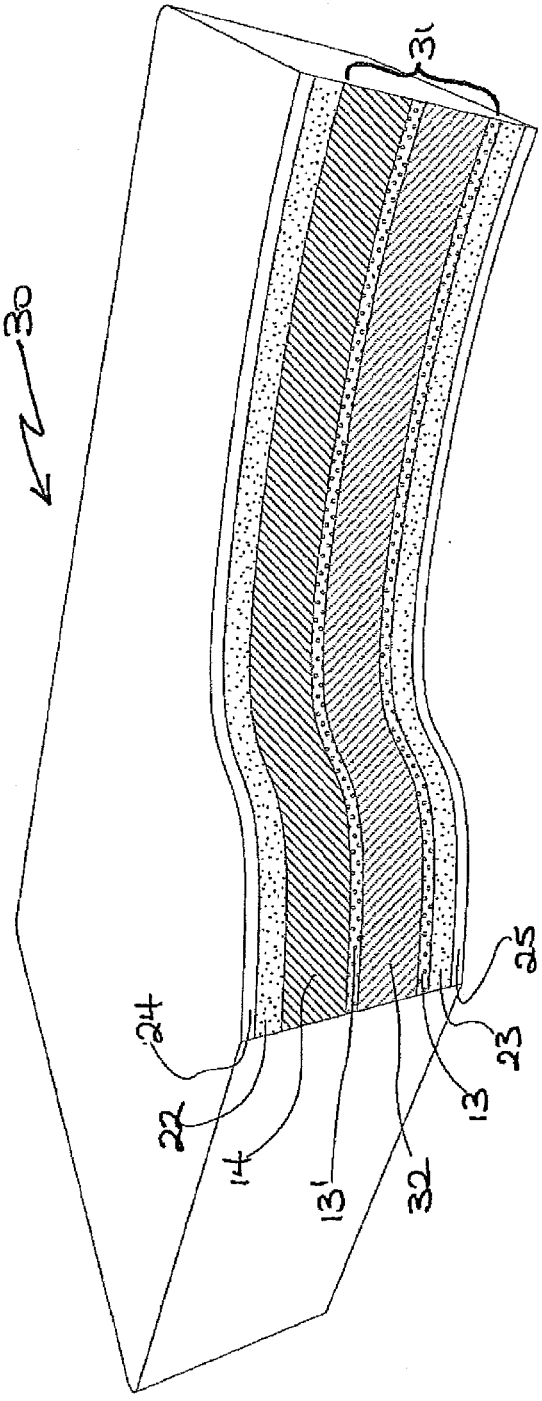


FIG 2

MATTRESSES

[0001] The present invention relates to mattresses. In particular, it relates to mattresses for cots and infant beds.

[0002] Traditionally, as a child grows and develops from a baby, it moves from sleeping in a cot to sleeping in a conventional bed. A cot mattress should be soft in comparison with a bed mattress to avoid damage to the developing bone structure of the child, such as flattening of the skull (positional plagiocephaly). A bed mattress is then firm in comparison with a cot mattress in order to provide good support for the child as their weight increases.

[0003] However, in recent years, there has been an increase in demand for cots which are convertible into beds as the child grows so that the need to purchase both a cot and a bed can be avoided. Nevertheless, although the frame can be converted from a cot to a bed, a replacement mattress has to be provided when the child moves from the cot configuration to the bed configuration. It is not possible to provide a single mattress that is both soft and firm due to safety legislation limiting the depth for cot mattresses, currently to 15 cm in the middle of the mattress and 10 cm at the edges.

[0004] The present invention seeks to provide a solution to this problem.

[0005] Accordingly, in its broadest sense, the present invention provides an infant mattress comprising a mattress core having first and second faces each face overlayered by a comfort layer and a cover layer. The mattress core comprises a relatively firm core layer and a relatively soft core layer.

[0006] Preferably, at least the firm core layer is overlayered on both faces thereof by a boundary layer.

[0007] Advantageously, the firm core layer comprises an array of helical springs.

[0008] Alternatively, the firm core layer comprises a foamed polymeric material or a fibrous material.

[0009] In one embodiment, the firm core layer comprises an array of open coil springs, preferably at a density of at least 87 springs per square metre.

[0010] In an alternative embodiment, the firm core layer comprises an array of individually pocketed springs Preferably, the springs are arranged in a density of at least 169 springs per square metre.

[0011] Preferably, the springs are formed of spring steel wire. Preferably, the wire of an open coil spring has a diameter between about 1.6 mm and 2.4 mm, more preferably from 1.9 to 2.2 mm. Preferably, the wire in a pocketed spring core has a diameter of between about 1.4 mm and 2.2 mm, more preferably from 1.5 to 1.9 mm.

[0012] Optionally, the array of springs of the firm core layer is further provided with a surround or border of a compressible material, suitably a foamed polymeric material.

[0013] Preferably, the soft core layer provides a soft, compressible surface. More preferably the soft core layer is formed of a foamed polymeric material; a polymeric fibrous material; or a natural material, such as wool.

[0014] Advantageously the firm core layer has a thickness of about 4 cm to 5 cm and the soft core layer has a thickness of about 3 cm to 5 cm.

[0015] Preferably, each boundary layer acts, in use, to distribute weight evenly over the firm core layer.

[0016] Preferably, each said boundary layer is formed of a fibrous layer material; more preferably a non-woven fibrous layer material. The boundary layer is advantageously formed of a felt or polypropylene material which may be woven or non-woven.

[0017] Suitably, the comfort layer is formed of a foamed polymeric material; a polymeric fibrous material or a natural material such as woven or non-woven wool.

[0018] Suitably, each comfort layer is at least about 1.5 cm in thickness, preferably up to about 2.5 cm in thickness. Advantageously, the comfort layers are of different thicknesses.

[0019] Suitably, at least one of the cover layers is formed of a breathable polyurethane sheet material.

[0020] The above and other aspects of the present invention will now be described in further detail, by way of example only, with reference to the accompanying drawings in which:

[0021] FIG. **1** is a schematic sectional view of a first embodiment of a mattress in accordance with the present invention; and

[0022] FIG. **2** is a schematic sectional view of a second embodiment of a mattress in accordance with the present invention.

[0023] FIG. **1** shows an embodiment of a mattress **10** in accordance with the present invention. The mattress has a mattress core **11**, comprising a relatively firm core layer **12**, bounded on upper and lower surfaces by boundary layers **13**, **13'**, and a relatively soft core layer **14**.

[0024] In the preferred embodiment shown, firm core layer **12** is formed of a plurality of helical compression springs **15** each retained in individual pockets **16** between the pair of opposed boundary layers **13**, **13'**. In alternative embodiments, (not shown), a low-height open coil spring layer is used.

[0025] The springs are typically formed of spring steel wire. Preferably, the wire of an open coil spring has a diameter between about 1.6 mm and 2.4 mm, more preferably from 1.9 to 2.2 mm and the array of open coil springs has a density of at least 87 springs per square metre. Preferably, the wire in a pocketed spring core has a diameter of between about 1.4 mm and 2.2 mm, more preferably from 1.5 to 1.9 mm and the springs are arranged in a density of at least 169 springs per square metre. Advantageously, each spring has an uncompressed length of between 2.5 and 6 cm.

[0026] Optionally, the array of springs of the firm core layer is further provided with a surround or border of a compressible material, suitably a foamed polymeric material.

[0027] Soft core layer **14** provides a soft compressible surface, particularly intended for a baby or younger child. It may be made of any correspondingly suitable material such as foamed polyurethane; polyester fibre or wool.

[0028] Advantageously, the soft core layer is formed of a foamed polymeric material; a polymeric fibrous material; or a natural material, such as wool.

[0029] Advantageously the firm core layer has a thickness of about 4 cm to 5 cm and the soft core layer has a thickness of about 3 cm to 5 cm.

[0030] Core **11** thereby has two surfaces, a first surface **20** to the soft core layer and a second surface **21** to the firm core layer. To each face **20**, **21** of core **11** is provided a respective comfort layer, first comfort layer **22**, associated with first core face **20**, and second comfort layer **23**, associated with second core surface **21**. In preferred embodiments, first comfort layer **22** is substantially thicker than second comfort layer **23**. This allows the surface of the mattress having the first comfort layer **22** to provide a softer, more compressible surface, suitable for a baby; and that having the second comfort layer **23** to provide a firmer surface, more suitable for an older child.

[0031] Comfort layers **22**,**23** can be formed from fire-retardant foamed materials of the type conventionally used in

child mattresses and complying with relevant safety requirements. Suitably, the comfort layer is formed of a foamed polymeric material; a polymeric fibrous material or a natural material such as woven or non-woven wool. Suitably, each comfort layer is at least about 1.5 cm in thickness, preferably up to about 2.5 cm in thickness.

[0032] Boundary layers **13**, **13'** act to distribute the weight of a body more evenly over the spring layer and prevent the springs from breaking into or through the comfort layers **22**,**23** or the soft core layer **14**. Suitably, the boundary layers are formed of woven or non-woven material such as felt or polypropylene. For an older child, the boundary layer may be formed by a coir slab, to provide additional stiffness or firmness to the mattress. In a pocketed spring firm core layer **12**, boundary layers **13**, **13'** are typically inherent in the construction of the spring pocketing.

[0033] First and second comfort layers **23**,**24** are then provided with respective first and second covers **24**,**25**. First cover **24** is appropriately formed from a conventional waterproof breathable polyurethane sheet material, as is conventional in mattresses for babies. Second cover **25** is suitably formed from a more comfortable woven fabric material, which becomes more appropriate for an older child as the risk of leaking nappies and so on diminishes. Additional covers may be provided as required and the covers may be removable.

[0034] FIG. **2** shows an alternative embodiment **30** in which the mattress core **31** is formed with a firm core layer **32** of a relatively firm foamed polymeric material or a more densely packed fibrous material, whether natural or synthetic, than is provided for the soft core layer. The other components of the mattress are as provided and described above in respect of the embodiment of FIG. **1**. Firm core layer **32** can be formed from fire-retardant foamed materials of the type conventionally used in child mattresses and complying with relevant safety requirements, such as foamed polyurethane, a polymerica fibrous material or a natural material such as woven or non-woven wool.

1. An infant mattress comprising a mattress core having first and second faces each face overlayered by a comfort layer and a cover layer; wherein the mattress core comprises a relatively firm core layer and a relatively soft core layer.

2. A mattress as claimed in claim **1** wherein the firm core layer comprises an array of helical springs.

3. A mattress as claimed in claim **2** wherein the firm core layer comprises an array of open coil springs, preferably arranged at a density of at least 87 springs per square metre.

4. A mattress as claimed in claim **2** wherein the firm core layer comprises an array of individually pocketed springs, preferably, the springs are arranged in a density of at least 169 springs per square metre.

5. A mattress as claimed in claim **2** wherein the array of springs of the firm core layer is further provided with a surround or border of a compressible material, suitably a foamed polymeric material.

6. A mattress as claimed in claim **1** wherein the firm core layer comprises a foamed polymeric material or fibrous material.

7. A mattress as claimed in claim **1** wherein the soft core layer is formed of a foamed polymeric material; a polymeric fibrous material; or a natural material, such as wool.

8. A mattress as claimed in claim **1** wherein at least the firm core layer is overlayered on both faces thereof by a boundary layer.

9. A mattress as claimed in claim **8** wherein each said boundary layer is formed of a fibrous layer material; preferably a non-woven fibrous layer material.

10. A mattress as claimed in claim **9** wherein the boundary layer is formed of a felt or polypropylene material.

11. A mattress as claimed in claim **1** wherein the comfort layer is formed of a foamed polymeric material; a polymeric fibrous material or a natural material such as woven or non-woven wool.

12. A mattress as claimed in claim **1** having a depth of 15 cm or less in a middle portion of the mattress.

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