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COMFORT PILLOW**Related Applications**

This application claims the benefit of U.S. Provisional Patent Application Serial
5 Number 60/383,169 filed on May 24, 2002, the entire contents of which is incorporated
herein by reference.

Field of the Invention

This invention relates generally to pillows or cushions, and more particularly to a
10 pillow or cushion for therapeutic use.

Background of the Invention

The neck of a person lying in a supine or sidelying position is often out of
alignment with the person's spine. This is commonly the case when the person's neck is
15 supported by a pillow or multiple pillows such that the neck lies at an angle defined by the
deflected height of the pillow(s), and this angle is typically not co-planar with the spine.
The deflected height of the pillow is closely related to its stiffness, which is conventionally
provided by filling material disposed within a fabric covering. Conventional filling
material can include feathers, cotton, or a synthetic filler.

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Summary of the Invention

To provide a pillow structure more likely to properly align the user's neck and
spine, the invention provides a pillow having multiple foam components.

One embodiment of the present invention includes a pillow having a viscoelastic
25 sleeve defining a cavity and filler material positioned within the cavity.

Another embodiment of the present invention includes a pillow having outer layers
and a filler material comprised of granulated viscoelastic foam disposed between the outer
layers.

Yet another embodiment of the present invention includes a pillow having outer
30 layers of reinforcing fabric, intermediate layers of viscoelastic foam, and a filler material
comprised of granulated viscoelastic foam disposed between the intermediate layers.

The present invention also includes a method for manufacturing a pillow. The
method includes providing a viscoelastic sleeve that defines a cavity, inserting filler



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material within the cavity, and closing the sleeve to maintain the filler material within the cavity.

5 The viscoelastic foam responds to changes in temperature such that body heat molds the pillow to conform to the curves of a body for comfort and support. This allows the shape of the pillow to more closely follow the contours of the body and to promote an improved alignment of the neck and spine when a person is in a supine or sidelying position.

10 A cover preferably encases the pillow and contours to the shape of the pillow. The cover is removable, washable, and has a resealable slot through which the pillow may be inserted or removed. The slot extends across an edge portion of the pillow and is preferably opened and closed by a zipper.

Brief Description of the Drawings

FIG. 1 is a perspective view illustrating a pillow embodying the present invention.

15 FIG. 2 is an exploded view of the pillow shown in FIG. 1.

FIG. 3 is a partial cross-sectional view of the pillow shown in FIG. 1.

Before the embodiments of the invention are explained in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangements of components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced or of being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting.

Detailed Description of the Preferred Embodiment

25 FIGS. 1-3 illustrate a pillow 10 of the present invention having a sleeve construction formed of multiple layers. The pillow 10 comprises a filler material 14 disposed between layers of viscoelastic foam 18. The viscoelastic foam layers 18 possess specific thermally responsive properties which cause the pillow 10 to conform to the shape of the portion of a person's body that contacts the pillow 10. The viscoelastic foam layers 18 have a lower stiffness or hardness at an elevated temperature as compared to the stiffness at a cooler temperature. Conversely, conventional pillow filler materials typically have a constant stiffness with respect to a changing temperature. The body heat of the person acts to soften the portion of the pillow 10 in contact with the body, while the

portion of the pillow 10 not contacting the body remains more firm. As a result, the pillow 10 embodying the present invention allows for greater comfort over a conventional pillow by accommodating each user's body form.

5 In one embodiment of the present invention, the filler material 14 is granulated, or shredded, viscoelastic foam having a density of about 85 kg/m^3 . However, a suitable density for the viscoelastic foam filler material 14 for an average weight pillow 10, for example, can be between about 30 and about 140 kg/m^3 . Further, a suitable density for the viscoelastic foam filler material 14 for a light-weight pillow 10, for example, can be less than about 40 kg/m^3 . Likewise, a suitable density for the viscoelastic foam filler material 10 14 for a heavy-weight pillow 10, for example, can be greater than about 130 kg/m^3 . Alternatively, the granulated viscoelastic foam utilized as the filler material 14 can have any density in accordance with the desired characteristics of the pillow 10. In addition, a suitable viscoelastic foam filler material 14 possesses an indentation load deflection, or "ILD," of 65% between 100-500 N loading, and a maximum 10% rebound according to 15 the test procedure governed by the ASTM-D-1564 standard.

The granulated filler material 14 can be made up of recycled, virgin, or scrap viscoelastic material. The granulated filler material 14 may consist of pieces of a nominal length, or the granulated filler material 14 may consist of pieces of varying lengths. For example, granulated filler material 14 may have a nominal length of about 1.3 cm. Also, 20 granulated filler material 14 may consist of varying lengths between about 0.6 cm and about 2 cm. The granulated filler material 14 can be as short as 0.3 cm and as long as 4 cm., or the filler material 14 can be any length in accordance with the desired characteristics of the pillow 10. In one preferred embodiment of the invention, the granulated filler material 14 is comprised of 16-20% having a length longer than 2 cm, 38- 25 42% having a length between 1 and 2 cm, and 38-42% of the pieces shorter than 1 cm. Significant cost savings and waste reduction can be realized by using scrap or recycled filler material 14 rather than virgin filler material 14. The viscoelastic foam used as the filler material 14 is made from a polyurethane foam material, however, the filler material 14 can be made from any other viscoelastic polymer material that exhibits similar 30 thermally-responsive properties.

The composition of the filler material 14 can be varied to alter the characteristics of the pillow 10 and the cost of the pillow 10. In another embodiment of the present invention, the filler material 14 is a combination of granulated viscoelastic foam and a fiber material. The fiber material can be made from any kind of textile, such as an organic

textile (cotton) or a synthetic textile, which is often less expensive than viscoelastic foam. In one embodiment of the present invention, the fiber material has a density of about 1 g/cm³. However, a suitable density for the fiber material for an average weight pillow 10, for example, is 0.1 – 2 g/cm³. Further, a suitable density for the fiber material for a light-weight pillow 10, for example, can be less than about 0.3 g/cm³. Likewise, a suitable density for the fiber material for a heavy-weight pillow 10, for example, can be greater than about 1.8 g/cm³. Alternatively, the fiber material utilized in combination with the granulated viscoelastic foam as the filler material 14 can have any density in accordance with the desired characteristics of the pillow 10.

In one preferred embodiment of the invention, the filler material 14 is comprised of about 50% fiber material, while the remaining composition includes the granulated viscoelastic foam. However, a suitable range of fiber material in the filler material 14 for an average-cost pillow 10, for example, can be between about 20% and about 80%. Further, a suitable range of fiber material in the filler material 14 for a more expensive pillow 10, for example, can be more than about 30% of the filler material 14. Likewise, a suitable range of fiber material in the filler material 14 for a less expensive pillow 10, for example, can be greater than about 70% of the filler material 14.

In yet another embodiment of the present invention, the filler material 14 is a combination of granulated viscoelastic foam and polystyrene balls, which are often less expensive than viscoelastic foam. The filler material 14 of this embodiment can also include an organic or synthetic fiber material depending on the desired characteristics of the pillow 10. The polystyrene balls may consist of balls of a nominal diameter, or the polystyrene balls may consist of balls of varying diameters. For example, the polystyrene balls may have a nominal diameter of about 5mm. Also, the polystyrene balls may consist of varying diameters between about 1 mm and about 10 mm. The polystyrene balls can also be as small as 0.5 mm and as long as 20mm, or the polystyrene balls can be any length in accordance with the desired characteristics of the pillow 10.

In one preferred embodiment of the invention, the filler material 14 is comprised of about 50% polystyrene balls, while the remaining composition includes the granulated viscoelastic foam. However, a suitable range of polystyrene balls in the filler material 14 for an average-cost pillow 10, for example, can be between about 20% and about 80%. Further, a suitable range of polystyrene balls in the filler material 14 for a more expensive pillow 10, for example, can be less than about 30% of the filler material 14. Likewise, a

suitable range of polystyrene balls in the filler material 14 for a less expensive pillow 10, for example, can be greater than about 70% of the filler material 14.

In another embodiment of the present invention, the filler material 14 can also include granulated highly-elastic ("HE") foam in addition to the granulated viscoelastic foam. HE foam is often less expensive than viscoelastic foam, thus yielding a potentially less expensive pillow 10. The filler material can be comprised of any single filler described above or any combination of the fillers. Alternatively, the filler material 14 can also include any conventional materials, such as feathers, granulated cotton, cotton fibers, etc. In one embodiment of the present invention, the filler material 14 includes HE foam having a density of about 35 kg/m^3 . However, a suitable density for the HE foam for an average weight pillow 10, for example, can be between about 20 and about 50 kg/m^3 . Further, a suitable density for the HE foam for a lightweight pillow 10, for example, can be less than about 25 kg/m^3 . Likewise, a suitable density for the HE foam for a heavyweight pillow 10, for example, can be greater than about 45 kg/m^3 . Alternatively, the HE foam utilized in the filler material 14 can have any density in accordance with the desired characteristics of the pillow 10.

The granulated HE foam may consist of pieces of a nominal length, or the granulated HE foam may consist of pieces of varying lengths. For example, the granulated HE foam may have a nominal length of about 1.3 cm. Also, the granulated HE foam may consist of varying lengths between about 0.6 cm and about 2 cm. The granulated HE foam can be as short as 0.3 cm and as long as 4 cm., or the granulated HE foam can be any length in accordance with the desired characteristics of the pillow 10. In one preferred embodiment of the invention, the granulated HE foam is comprised of 16-20% having a length longer than 2 cm, 38-42% having a length between 1 and 2 cm, and 38-42% of the pieces shorter than 1 cm.

In one preferred embodiment of the invention, the filler material 14 is comprised of about 50% granulated HE foam, while the remaining composition includes the granulated viscoelastic foam. However, a suitable range of HE foam in the filler material 14 for an average cost pillow 10, for example, is 20% - 80%. Further, a suitable range of granulated HE foam in the filler material 14 for a more expensive pillow 10, for example, can be less than about 30% of the filler material 14. Likewise, a suitable range of granulated HE foam in the filler material 14 for a less expensive pillow 10, for example, can be greater than about 70% of the filler material 14.

As previously mentioned, the filler material 14 is disposed between layers of viscoelastic foam 18. In one embodiment of the present invention, the layers of viscoelastic foam 18 have a density of about 85 kg/m^3 . However, a suitable density for the layers of viscoelastic foam 18 for an average weight pillow 10, for example, can be between about 30 and about 140 kg/m^3 . Further, a suitable density for the layers of viscoelastic foam 18 for a lightweight pillow 10, for example, can be less than about 40 kg/m^3 . Likewise, a suitable density for the layers of viscoelastic foam 18 for a heavyweight pillow 10, for example, can be greater than about 130 kg/m^3 . Alternatively, the layers of viscoelastic foam 18 can have any density in accordance with the desired characteristics of the pillow 10.

The layers of viscoelastic foam 18 are preferably about 10 mm thick and have thermally-responsive properties similar to the granulated viscoelastic foam of the filler material 14. Likewise, a suitable thickness for the layers of viscoelastic foam 18 for an average weight pillow 10, for example, can be between about 5 mm and 15 mm. However, a suitable thickness for the layers of viscoelastic foam 18 for a lightweight pillow 10, for example, can be less than about 7 mm. Further, a suitable thickness for the layers of viscoelastic foam 18 for a heavyweight pillow 10, for example, can be greater than about 13 mm. The layers of viscoelastic foam 18 are made from a polyurethane foam material, however, the layers of viscoelastic foam 18 can be made from any other viscoelastic polymer material that exhibits similar thermally-responsive properties.

The overall stiffness or hardness of the pillow 10 is dependent on the stiffness of the individual viscoelastic foam layers 18 and the filler material 14. As such, the overall stiffness or hardness of the pillow 10 may be affected by varying the stiffness of the individual viscoelastic foam layers 18 and/or the filler material 14.

As shown in FIGS. 1-3, reinforcing fabric layers 22 are positioned on the outside of the layers of viscoelastic foam 18. The reinforcing fabric 22 acts as an anchor for stitches 26 that secure together the layers of reinforcing fabric 22 and the layers of viscoelastic foam 18. Without the reinforcing fabric layers 22, the viscoelastic foam layers 18, which are less durable than the layers of reinforcing fabric 22, would have to directly anchor the stitches 26 such that the filler material 14 is secured between the viscoelastic foam layers 18. In a pillow having this construction (not shown), the viscoelastic foam layers 18 would likely tear near the stitches 26 as a result of normal use of the pillow. Further, if the viscoelastic foam layers 18 were to tear, then the filler material 14 would spill out. Therefore, the reinforcing fabric layers 22 provide a measure of durability to the

pillow 10. The reinforcing fabric 22 is preferably made from a durable material, such as a cotton/polyester blend.

5 A cover 30 surrounds and encases the pillow 10, and conforms to the shape of the pillow 10. The cover 30 is preferably made from a durable and washable fabric material, such as a cotton/polyester blend. As shown in FIG. 1, a slot 34 extends across the cover 30 along the cover's edge. The pillow 10 may be inserted into the cover 30 through the slot 34. The pillow 10 may also be removed from the cover 30 through the slot 34 to facilitate cleaning of the cover 30. The slot 34 is resealable to close the cover 30 around the pillow 10 and to open the cover 30 for removing the pillow 10. A closure device is
10 used to open and close the slot 34. In the preferred embodiment, the closure device is a zipper 38, although the closure device could also comprise snaps, buttons, hook and loop fasteners, overlapping flaps, laces, or other similar fasteners.

During manufacture, the layers of viscoelastic foam 18 are sewn together with the layers of reinforcing fabric 22 to form a sleeve or casing having an open end, wherein the
15 layers of viscoelastic foam 18 comprise the inner layers of the casing and the layers of reinforcing fabric 22 comprise the outer layers of the casing. The filler material 14 is then inserted through the open end of the casing until the desired amount of filler material 14 is reached within the casing. The open end is then sewn closed, thereby encasing the filler material 14 within the casing and defining a pillow 10. The pillow 10 is then inserted
20 within the cover 30 and the cover 30 is closed by the zipper 38.

Claims

I claim:

- 5 1. A pillow comprising:
 a viscoelastic sleeve defining a cavity; and
 filler material positioned within the cavity.
2. The pillow of Claim 1, wherein the sleeve includes
10 a first viscoelastic layer; and
 a second viscoelastic layer, the first and second viscoelastic layers being
connected together to form the cavity therebetween,
 wherein the filler material is positioned between the first and second
viscoelastic layers.
- 15 3. The pillow of Claim 2, wherein the first viscoelastic layer and the second
viscoelastic layer are between about 5 mm and 15 mm thick.
4. The pillow of Claim 3, wherein the first viscoelastic layer and the second
20 viscoelastic layer are about 10 mm thick.
5. The pillow of Claim 2, wherein the first viscoelastic layer and the second
viscoelastic layer have a density between about 30 kg/m³ and about 140 kg/m³.
- 25 6. The pillow of Claim 5, wherein the first viscoelastic layer and the second
viscoelastic layer have a density of about 85 kg/m³.
7. The pillow of Claim 2, further comprising
 a first fabric layer covering the first viscoelastic layer; and
30 a second fabric layer covering the second viscoelastic layer.
8. The pillow of Claim 7, wherein the first and second fabric layers are
connected to the first and second viscoelastic layers, respectively.

9. The pillow of Claim 8, wherein the first and second fabric layers are stitched to the first and second viscoelastic layers, respectively.

10. The pillow of Claim 1, further comprising a cover encasing the viscoelastic sleeve, the cover including a re-sealable slot.

11. The pillow of Claim 1, wherein the filler material includes granulated viscoelastic foam.

12. The pillow of Claim 11, wherein the granulated viscoelastic foam has a density between about 30 kg/m^3 and about 140 kg/m^3 .

13. The pillow of Claim 12, wherein the granulated viscoelastic foam has a density of about 85 kg/m^3 .

14. The pillow of Claim 11, wherein the granulated viscoelastic foam has a nominal length between about 0.6 cm and about 2 cm.

15. The pillow of Claim 14, wherein the granulated viscoelastic foam has a nominal length of about 1.3 cm.

16. The pillow of Claim 11, wherein approximately 16% to 20% of the granulated viscoelastic foam include lengths longer than about 2 cm.

17. The pillow of Claim 11, wherein between approximately 38% to 42% of the granulated viscoelastic foam include lengths between about 1 cm and about 2 cm.

18. The pillow of Claim 11, wherein approximately 38% to 42% of the granulated viscoelastic foam include lengths shorter than about 1 cm.

19. The pillow of Claim 1, wherein the filler material includes granulated viscoelastic foam and polystyrene balls.

20. The pillow of Claim 1, wherein the filler material includes granulated viscoelastic foam and granulated highly-elastic foam.

5 21. A method for manufacturing a pillow, the method comprising:
providing a viscoelastic sleeve that defines a cavity;
inserting filler material within the cavity; and
closing the sleeve to maintain the filler material within the cavity.

10 22. The method of Claim 21, further comprising
overlying a first viscoelastic layer with a second viscoelastic layer;
connecting a portion of the first and second viscoelastic layers to form the
sleeve containing the filler material; and
connecting a remaining portion of the first and second viscoelastic layers to
close the sleeve and maintain the filler material within the cavity.

15 23. The method of Claim 22, further comprising
covering the first viscoelastic layer with a first fabric layer; and
covering the second viscoelastic layer with a second fabric layer.

20 24. The method of Claim 23, further comprising
connecting the first fabric layer to the first viscoelastic layer; and
connecting the second fabric layer to the second viscoelastic layer.

25 25. The method of Claim 24, wherein connecting the first fabric layer with the
first viscoelastic layer includes stitching together the first fabric layer with the first
viscoelastic layer, and wherein connecting the second fabric layer with the second
viscoelastic layer includes stitching together the second fabric layer with the second
viscoelastic layer.

30 26. The method of Claim 21, further comprising
inserting the viscoelastic sleeve into a cover through a re-sealable slot; and
sealing the slot to secure the viscoelastic sleeve within the cover.

27. The method of Claim 21, further comprising shredding viscoelastic material into individual lengths to form the filler material.

28. A method for manufacturing a pillow, the method comprising:
5 providing at least two opposing viscoelastic foam layers and at least two reinforcing fabric layers covering the opposing viscoelastic foam layers;
sewing together the viscoelastic foam layers and the reinforcing fabric layers to form a casing having an open end, the viscoelastic foam layers comprising respective inner layers of the casing, and the reinforcing fabric layers comprising
10 respective outer layers of the casing;
inserting filler material through the open end of the casing; and
sewing together the open end of the casing to close the casing and secure therein the filler material.