

TITLE

A Pillow.

FIELD OF THE INVENTION

- 5 The present invention relates to a pillow, preferably a leg pillow designed to be positioned between a user's legs when resting or sleeping, to support the knees, ankles and feet.

BACKGROUND

- 10 Various types of long pillows have been marketed as "leg pillows", but in general these are simply an elongated version of a standard pillow and do not offer uniform and reliable support over the desired areas (i.e. knees, ankles and feet). In particular, these known pillows taper at the ends and along the sides, and so fail to provide uniform cushioning over the whole of the pillow. Tapering may also increase the likelihood of a user's legs being undesirably displaced from the pillow. Pillows of some types do not allow for body
15 heat to escape with consequent overheating, which can cause discomfort to the user.

OBJECT

- It is an object of preferred embodiments of the invention to go at least some way towards addressing at least one or more of the above shortcomings. However, it should be
20 appreciated that the object of the invention in its broadest form is not so limited and is simply to provide the public with a useful choice.

DEFINITIONS

- The term "comprises" or "has", when used in this document in relation to one or more
25 components or features, should not be seen as excluding the option of additional unmentioned components or features. The same applies to derivative terms such as "comprising" and "having".

- 30 The terms "about", "substantially" or "approximately", if and when used in relation to a numerical value, mean plus or minus 0%, 1%, 2%, 3%, 4%, 5%, 6%, 7%, 8%, 9% or 10%.

Reference in this document to a heat exchange layer means a layer that is able to receive and at least partially retain heat drawn away from another layer.

5 The term KulKote as used in this document refers to a coating comprising water based polymers and phase change materials, for example as documented at <https://kulkote-inside.com/technical/what-is-kulkote> and marketed by KulKote LLC Park City, UT, USA. It is suitable for retaining heat drawn away from the area around it.

SUMMARY OF THE INVENTION

- 10 According to a main aspect of the invention there is provided a pillow, comprising:
- one or more inner heat exchange layer (eg KulKote);
 - one or more inner padding layer (eg of wool, for example felted wool, or polyester, for example felted polyester fibres); and
 - outer padding layers (eg of memory foam).

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Options

The following options apply to the pillow noted above either alone or in any combination thereof.

- 20 The pillow may have substantially planar top and bottom faces.

The pillow may be substantially uniform in thickness, being 50 – 150 mm thick, 60 – 120 mm thick, or 80 – 100 mm thick, or 70 – 90 mm thick, or about 80 mm thick.

- 25 The pillow may be 300 – 900 mm long, or 350 - 850 mm long, 400-800 mm long, 450-750 mm long, 500-700 mm long, 550 – 650 mm long, 560 – 580 mm long, or about 570 mm long .

The pillow may be 150 - 500 mm wide, or 200 – 400 mm wide, or about 250 mm wide.

The heat exchange layer may be 1 - 6 mm thick; 2-4 mm thick, or about 3 mm thick.

- 30 The outer padding layers (eg comprising memory foam) may each be 10 – 50 mm thick, 20 – 30 mm thick, or about 20 mm thick.

The one or more inner padding layer (eg wool, optionally felted wool) may in each case be 20 – 120 mm thick, or 30 - 70 mm thick, 40 – 60 mm thick, 30 – 50 mm thick, or about 50 mm thick.

- 5 If there are two inner padding layers (eg wool, optionally felted wool) then each such layer may be 20 – 50 mm thick, or 22 – 28 mm thick; 24 – 26 mm thick, or about 25 mm thick.

- 10 The pillow may have one or more rigidity imparting inner layers (eg sheet material that, if considered in isolation, does not substantially sag under gravity, optionally sisal fibre).

In each case the rigidity imparting layer may be 4 – 16 mm thick or, 4 - 12 mm thick, 6 – 10 mm thick, or about 8 mm thick.

- 15 In each case the rigidity imparting layer may stop short of each end and/or each side of the pillow, eg by 10 – 50 mm, or by 5 – 40 mm, or by 10 – 30 mm or by 15 – 25 mm, or by about 30 mm.

- 20 Any or all of the inner padding layer(s), the outer padding layers, and the rigidity imparting layer(s), may have apertures to facilitate the movement of heat to the heat exchange layer(s).

The pillow may have rounded corners.

- 25 The pillow may have a flexible cover enveloping the other parts of the pillow so that they are not visible from the outside of the pillow.

Preferences

In a **first preference** the pillow comprises, in the following order from top to bottom:

- 30
- a layer of memory foam (being 10 – 40 mm thick);
 - a heat exchange layer (being 1 - 5 mm thick);
 - a felted wool layer (being 20 – 120 mm thick, or 30 - 70 mm thick);
 - a further heat exchange layer (being 1 - 5 mm thick);
 - a further layer of memory foam (being 10 – 40 mm thick).
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More preferably each memory foam layer is about 20 mm thick, each heat exchange layer is about 3 mm thick, and the felted wool layer is about 50 mm thick.

Any one or more of the optional features mentioned above apply to this first preference
5 for the pillow, to the extent that the language for the options permits.

In a **second preference** the pillow comprises, in the following order from top to bottom:

- a layer of memory foam (being 10 – 45 mm thick);
- a felted wool layer (being 10 - 45 mm thick);
- a heat exchange layer (being 1 - 5 mm thick);
- 10 • a further felted wool layer (being 10 - 45 mm thick);
- a further layer of memory foam (being 10 – 45 mm thick)

More preferably each memory foam layer is about 22 mm thick, the heat exchange layer is about 3 mm thick, and each felted wool layer is about 22 mm thick.

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There may also be a pair of sisal fibre layers immediately either side of the heat exchange layer, each sisal fibre layer being 4 – 12 mm thick.

Any one or more of the optional features mentioned above apply to this first preference
20 for the pillow, to the extent that the language for the options permits.

DRAWINGS

Some preferred embodiments of the invention will now be described by way of example and with reference to the accompanying drawings, or which:

- 25 **Figure 1** is a cross-sectional view of part of a leg pillow formed from five layers ;
- Figure 2** is a cross-sectional view of an alternative leg pillow also formed from five layers;
- Figure 3** is a cross-sectional view of a further alternative leg pillow formed from seven layers; and
- 30 **Figure 4** is a plan view illustrating the exterior look of the pillows of Figures 1, 2 and 3.

DESCRIPTION

Referring to Figure 1, this embodiment of the pillow comprises two outer layers 1 of memory foam, two heat exchange layers 2 each being immediately inside a respective
35 one of the memory foam layers, and a central or core layer 3 of felted wool immediately

between the two heat exchange layers. Each layer is glued to its neighbouring layer and the glue, when cured, provides a degree of rigidity to the pillow in that it is able to largely hold its shape when in use or subjected to gravity. That said, when in use it will compress somewhat and is such that it can, to the extent needed for comfort, follow the contour of a human user's legs when one end is placed between the knees and the other end is between their ankles and/or feet. The pillow is preferably long enough to achieve this and may come in more than one size to accommodate taller or shorter people. Preferably the pillow is used between the legs when the user is laying on their side, but it can also be used in other bodily orientations if desired, for example between the legs when seated or under the knees when seated or laying on their back.

Preferably each memory foam layer has a series of holes formed through it, top to bottom, so that warm air and/or heat generally, in each case generated by the user's body, can more readily transfer through to the heat exchange layers where it is retained while the pillow is in use. In this embodiment each heat exchange layer is comprises or consists of KulKote. The arrangement helps to keep the user relatively cool between their legs while using the pillow, to help avert overheating, sweating or the like. Optionally each heat exchange layer is sprayed onto the associated memory foam layer during manufacture of the pillow, or is sprayed onto an alternative layer (eg the felted wool or a supplementary thin layer of fabric or foam).

Figure 2 illustrates an alternative embodiment of the pillow, comprising a different arrangement of the sorts of layers described for Figure 1. In each case the same reference number is used as for Figure 1 to indicate the same material. As shown, from top to bottom, the pillow has a memory foam layer 1, a felted wool layer 3, a heat exchange layer 2, a further felted wool layer 3, and a further memory foam layer 1. The Figure 2 pillow is formed by gluing its layers together and is for use and performs in substantially the same manner as the pillow of Figure 1.

Figure 3 is another embodiment of the pillow, comprising the same arrangement as for Figure 2, except that there are two sisal fibre layers 4, each immediately adjacent a respective face of the heat exchange material. The Figure 3 pillow is also formed by gluing its layers together and is for use and performs in substantially the same manner as the pillow of Figure 1. However, the sisal fibre layers assist to give the pillow a degree of rigidity and to help the pillow to better retain its general shape when in use, except that it of course flexes to accommodate the contour of the legs and compresses a little as

with the other pillows to provide cushioning to the user. As the sisal fibre layers have a degree of rigidity, they stop short of the sides and ends of the pillow (eg by about 30 mm) so as to keep the relative stiff or harder portion of the pillow away from close contact with the user for better comfort.

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Figure 4 is a top plan view which applies to the pillow of each of Figures 1, 2 and 3. The bottom plan view (not shown) is the same. As illustrated, each pillow is elongated with rounded corners. The rounded corners may make the pillow more manoeuvrable when used inside bedding. Further, the upper and lower faces of each pillow are substantially planar and parallel to one another when the pillow is not in use. The circles in dotted lines 5 illustrate some of the holes in the memory foam layer to allow heat to more easily transfer to the heat exchange layer(s), but such holes will preferably not be visible from outside the pillow as it has an aesthetic cover/case. The holes may for example be 10 mm – 16 mm in diameter, may be present in a quantity of 20 – 80, and in some embodiments the holes may have a variety of diameters. Optionally, there are about 73 x 14 mm holes, or about 52 x 14 mm holes and/or about 31 x 16 mm holes. These are predominately clustered along the longitudinal centre of the pillow. In a particular embodiment, there may be 31 x 16 mm holes extending along the longitudinal centre and 52 x 14 mm holes spaced throughout the remaining surface area of the layer.

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All of the options mentioned in the summary of invention section of this document, alone or in any combination, apply to the pillows of Figures 1, 2 and 3, that is to the extent that there is no conflict between them.

25 The Figure 1, 2 and 3 pillows are formed to support the user's legs and the leg joints (i.e. knees, ankles and feet), and are effective in eliminating or reducing uncomfortable pressure points on these, for example as caused by leg on leg contact. The layer construction of these pillows also helps reduce deformation and bunching, to facilitate a more reliable, consistent and comfortable experience for the user.

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In some embodiments of the invention polyester fibre layers may be used with or instead of the felted wool fibres.

It is envisaged that other materials could be substituted for the various layers mentioned above.

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Preferably the thickness of the pillow in each case is selected such that the user's legs are spaced apart sufficiently to keep the knees, and therefore the upper part of the legs, approximately parallel. This may help reduce the likelihood of lower back pain for some people, for example it may help avoid misalignment of the hips and/or help to prevent or
5 alleviate sciatica. In each case the pillow may also assist the user to achieve correct hip and spine alignment when sleeping on their side.

It is preferable that in each case the pillow provides support which is uniform along the length and width of the pillow and that the support is firm but comfortable. If the support
10 is too soft, then the weight of the upper leg will tend to unduly crush the pillow and the advantage of using the support pillow may be reduced. Conversely, a pillow which is too firm may be uncomfortable to use. In each case the pillow will preferably generally keep its shape when in use to provide consistent support.

15 In use, in each case a person sleeping on one side or the other may place the leg pillow between their legs, supporting the legs from at least the knees to the ankles. As described above, the thickness of the pillow may be such that the knees and legs are parallel and are spaced apart sufficiently that they are correctly aligned with the hips. This is believed to be of assistance in alleviating or at least reducing lower back pain and
20 sciatica. The memory foam layers provide a soft but firm contact surface for the legs, to give comfortable support and to avoid veins on the legs being restricted with the pressure of one leg on the other. Pressure points caused by this type of pressure can lead to considerable discomfort and even to medical problems such as circulation disruption. This discomfort may disrupt the person's sleep.

25 In each case the wool or polyester layers may be relatively dense so as to be only sparingly compressible to help avoid the pillow deforming or bunching in use.

30 Having a flat smooth surface on the top and on the bottom of the pillow gives the user the ability to easily reposition the pillows of Figures 1, 2 and 3 with one hand, even when the pillow is being used between two layers of bedding. It also provides a more even surfaces to reduce the likelihood of the user's legs being undesirably displaced from the pillow in use.

35 Having rounded corners also assists the leg pillow to be easily moved, and controlled within the layers of the users bedding.

The design also assists the user to change their leg position from straight to bent, or vice versa, without any loss of support or comfort.

- 5 While some embodiments of the invention have been described by way of example, it should be appreciated that modifications and improvements can be made without departing from the scope of the accompanying claims.

- 10 In terms of disclosure, this document envisages and hereby posits any feature mentioned herein in combination with a repeat of itself (eg two of the same) and/or any other feature or features mentioned herein, even if the combination is not claimed below.

CLAIMS

1. A pillow, comprising:
 - one or more inner heat exchange layer (eg KulKote);
 - one or more inner padding layer (eg of wool, for example felted wool); and
 - outer padding layers (eg of memory foam).
2. A pillow according to claim 1 wherein:
 - the one or more inner heat exchange layer comprises KulKote;
 - the one or more inner padding layer comprises felted wool or polyester fibre; and/or
 - the outer padding layers comprise memory foam.
3. A pillow according to claim 1 or 2, having substantially planar top and bottom faces.
4. A pillow according to claim 1, 2 or 3, which is substantially uniform in thickness, being 50 – 150 mm thick, or 60 – 120 mm thick, or 80 – 100 mm thick, or 70 – 90 mm thick, or about 80 mm thick.
5. A pillow according to any one of the preceding claims, being 300 – 900 mm long, or 350 - 850 mm long, 400-800 mm long, 450-750 mm long, 500-700 mm long, 550 – 650 mm long, 560 – 580 mm long, or about 570 mm long .
6. A pillow according to any one of the preceding claims, being 150 - 500 mm wide, or 200 – 400 mm wide, or about 250 mm wide.
7. A pillow according to any one of the preceding claims, wherein the heat exchange layer is 1 - 6 mm thick; 2-4 mm thick, or about 3 mm thick.
8. A pillow according to any one of the preceding claims, wherein outer padding layers are 10 – 50 mm thick, 20 – 30 mm thick, or about 20 mm thick.
9. A pillow according to any one of the preceding claims, wherein the one or more inner padding layer (eg wool, optionally felted wool) may in each case be 20 – 120 mm thick, or 30 - 70 mm thick, 40 – 60 mm thick, 30 – 50 mm thick, or about 50 mm thick.

10. A pillow according to any one of the preceding claims, wherein if there are two inner padding layers (eg wool, optionally felted wool) then each such layer may be 20 – 50 mm thick, or 22 – 28 mm thick; 24 – 26 mm thick, or about 25 mm thick.
11. A pillow according to any one of the preceding claims, comprising one or more rigidity imparting inner layers (eg sisal fibre).
12. A pillow according to claim 11, wherein in each case the rigidity imparting layer may be 4 – 16 mm thick, or 4 - 12 mm thick, 6 – 10 mm thick, or about 8 mm thick.
13. A pillow according to claim 11 or 12, wherein in each case the rigidity imparting layer stops short of each end and/or each side of the pillow, eg by 10 – 40 mm, or by 5 – 40 mm, or by 10 – 30 mm or by 15 – 25 mm, or by about 30 mm.
14. A pillow according to any one of the preceding claims, wherein any or all of the inner padding layer(s), the outer padding layers, and the rigidity imparting layer(s) (if the claim dependency permits), have apertures to facilitate the movement of heat to the heat exchange layer(s).
15. A pillow according to any one of the preceding claims, having rounded corners.
16. A pillow according to any one of the preceding claims, comprising a flexible cover enveloping the other parts of the pillow so that they are not visible from the outside of the pillow.
17. A pillow according to claim 1, comprising, in the following order from top to bottom:
 - a layer of memory foam (being 10 – 40 mm thick);
 - a heat exchange layer (being 1 - 5 mm thick);
 - a felted wool layer (being 20 – 120 mm thick, or 30 - 70 mm thick);
 - a further heat exchange layer (being 1 - 5 mm thick); and
 - a further layer of memory foam (being 10 – 40 mm thick).
18. A pillow according to claim 17, wherein each memory foam layer is about 20 mm thick, each heat exchange layer is about 3 mm thick, and the felted wool layer is about 50 mm thick.

19. A pillow according to claim 1, comprising, in the following order from top to bottom:
 - a layer of memory foam (being 10 – 45 mm thick);
 - a felted wool layer (being 10 - 45 mm thick);
 - a heat exchange layer (being 1 - 5 mm thick);
 - a further felted wool layer (being 10 - 45 mm thick); and
 - a further layer of memory foam (being 10 – 45 mm thick)
20. A pillow according to claim 19, wherein each memory foam layer is about 22 mm thick, the heat exchange layer is about 3 mm thick, and each felted wool layer is about 22 mm thick.
21. A pillow according to claim 19 or 20, wherein there is a pair of sisal fibre layers immediately either side of the heat exchange layer, each sisal fibre layer being 4 – 12 mm thick.