

Pillow comprising Magnetic Devices

Technical Field

The present disclosure relates, in general terms, to pillows comprising magnetic
5 devices.

Background

Sleep has been considered to be a significant determinant of human health and well-being. Deprivation of sleep or poor quality sleep has been associated with
10 selected neurological and psychiatric disorders. Sleep deprivation negatively impacts the productivity and alertness of individuals and may lead to accidents in industrial or professional settings. Sleep disorders like sleep apnoea and insomnia may significantly impact the quality of life and productivity of individuals suffering from such disorders.

15 Support devices such as pillows have been used for supporting parts of the human body and head in particular. Pillows may in general improve the quality of sleep for individuals. However, not all pillows are alike and some pillows may be poorly designed or not suitable for improving human sleep quality. Instead
20 of improving sleep quality, poorly designed pillows may degrade the quality of sleep and lead to exacerbation of sleep related illnesses.

It would be desirable to alleviate at least one of the above-described problems with conventional support devices or provide an alternative support device.

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Summary

Disclosed is a magnetic support device comprising:

a housing comprising a planar surface for supporting at least a part of a person; and

30 at least two magnetic devices within the housing,
wherein the at least two magnetic devices are arranged to generate a magnetic field with a primary magnetic field direction extending outward with respect to

the planar surface.

The primary magnetic field direction may be a south pole radially extending outward with respect to the planar surface.

- 5 The housing may further comprise an auxiliary magnet formed of a single piece of magnetic material to increase a strength of a magnetic field along the primary magnetic field direction.

- 10 The at least two magnetic devices may be formed from a single piece of magnetic material.

The housing may further comprise structural elements to restrict movement of the at least two magnetic devices with respect to each other.

- 15 Each magnetic device may comprise a hemispheric surface, and the hemispheric surface of each magnetic device is directed towards the planar surface. The hemispheric surface may have a diameter in the range of 40mm to 50mm and the magnetic device has a height in the range of 20mm to 30mm.

- 20 There may be four magnetic devices and a distance between each of the magnetic devices is in the range of 12cm to 23cm.

- 25 The planar surface may comprise at least one raised portion positioned to contact at least one acupressure point on a neck region of a person. A part of the planar surface may comprise a support surface for supporting the cervical vertebrae of a person. The at least one raised portion may be provided on the support surface. The planar surface may comprise:

- 30 a first raised portion disposed substantially centrally on the planar surface to make contact below an occipital base of a person; and
second and third raised portions disposed substantially symmetrically with respect to the first raised portion.

The housing may further comprise:

at least one recessed portion for receiving an aromatherapy patch; and
at least one passageway to release aroma from the aromatherapy patch
towards the head.

- 5 The housing may be formed of two separable parts consolidated to form the housing. Where at least one recessed portion is provided, it may be defined by gaps between the two parts.

The housing may be formed at least partially of heat sensitive foam which can
10 vary a height of the pillow based on a temperature of the part of the person supported on the planar surface.

The housing may be formed at least partially of memory foam and a material of the memory foam is mixed with charcoal elements to provide anti-bacterial
15 functions.

Also disclosed is a pillow comprising the magnetic support device as described above and a method of applying acupressure to a person by resting a part of the person on the magnetic support device as described above.

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Brief description of the drawings

Embodiments of the present disclosure will now be described, by way of non-limiting example, with reference to the drawings in which:

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Figures 1A shows a schematic of a 3D view of a multi-function Total Sleep System (TSS) magnetic support device (presently a pillow) with both parts: upper cover and lower supporter, according to an example embodiment;

- 30 Figures 1B shows a schematic of a top view of the two parts of the TSS pillow upper part and lower part according to an example embodiment;

Figure 1C shows a schematic of a front view of the two parts of the TSS pillow of Figure 1A;

Figure 1D shows a schematic of a side view of the TSS pillow of Figure 1A;

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Figure 2 shows a schematic drawing illustrating a projection of the acupuncture structure of the TSS pillow of Figure 1A onto an outline of a person while in a supine position on the pillow;

10 Figure 3 shows a schematic drawing illustrating how the two parts of TSS pillow fit together as a whole pillow of Figure 1A. The boundary protrusions and four protrusions lines in the inner surface of the upper part fit the boundary grooves and four grooves lines on the upper surface of the lower part;

15 Figure 4 shows one example TSS pillow with some of its dimensions;

Figure 5 shows a view illustrating the pillow of Figure 1A with a pillowcase cover on the form as a finished product;

20 Figure 6 shows a part of a magnetic field generated by the magnetic structures shown in Figure 4;

Figure 7 shows a chart illustrating the improvement of the Apnoea Hypopnea Index (AHI) score of five individuals associated with the use of pillows according
25 to the embodiments;

Figure 8A is a chart illustrating the Pittsburgh Sleep Quality Index (PSQI) data for two sets of 14 individuals, one group using a pillow in accordance with the present disclosure with magnets and the other group using the same device but
30 without magnets;

Figure 8B is a chart illustrating PSQI data for a group of 14 students using a

placebo device and a device in accordance with present teachings but with magnets removed; and

Figure 9 illustrates a pillow with spaces for receiving aromatherapy patches.

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Detailed description

Disclosed herein are magnetic support devices such as pillows. Embodiments of the support devices improve sleep quality and relaxation. These benefits are achieved variously through magnetic field control, aromatherapy, heat and
10 other mechanisms as applied to a person.

Figure 1A shows a schematic of a 3D view of a magnetic support device in accordance with present teachings. Such magnetic support devices include a magnetic structure. The magnetic structure may include two or four magnetic
15 devices, or another number as suitable for a particular application – in Figure 1A, four recesses are designed to receive a respective magnetic device of the magnetic structure, which may also be referred to as a magnetic system or assembly. The magnetic support device may be a pillow or other device, for supporting a part of a person. For example, the magnetic support device may
20 be positioned between a person and a surface such as a bed, and may support the head and/or neck of the person, the leg, arm or other part. For illustration purposes, much of the following description will be made with reference to a magnetic support device being a pillow for supporting a head and/or neck of a person.

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The magnetic support device of Figure 1A is presently in the form of a multi-function Total Sleep System (TSS) magnetic support device 100 – i.e. a device that assists with sleep and provides multiple functions to do so. Device 100 comprises upper cover or housing 110 and a lower supporter or housing 120.
30 The upper cover 110 has a planar surface 115 to support a part of a body (e.g. head of a human – not shown). At least two magnetic devices are disposed in structural elements (presently recesses or indentations) 140, within the housing

formed by cover 110 and lower supporter 120. These structural elements 140 restrict movement of the magnetic devices. This ensures proper positioning of the magnetic field generated by those magnetic devices, during use, relative to the part of the user with which the device 100 is used.

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The magnetic devices are arranged to generate a magnetic field with a primary magnetic field direction extending outward with respect to the planar surface 115 – i.e. in the direction indicated by arrow X, and as generally inferred by the magnetic field of Figure 6. This may be achieved, for example, by forming each
10 magnetic device with a hemispheric surface directed towards the planar surface from within the housing 110, 120. The primary magnetic field direction may thus provide a pole, e.g. a north pole or south pole, radially extending (i.e. extending perpendicular to) from the planar surface 115. The magnetic field strength may be enhanced using additional, or auxiliary, magnets. Such
15 magnets may have any form – e.g. comprise a single piece, or multiple pieces, of magnetic material – and be positioned to increase the magnetic field along the primary magnetic field direction (i.e. north or, preferably, south) in a manner that will be evident to the skilled person in view of present teachings and particularly Figure 6.

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Also provided on the upper cover 110 are raised portions 130. The raised portions 130 serve to contact at least one acupressure point on a neck region of a person while in use.

25 Without limitation, an example individual magnetic device diameter could be 40-45mm, and height could be 20-25mm, or a hemisphere with a diameter of 40mm to 50mm and a height of 20mm to 30mm. As discussed above, the shape of the magnetic devices can be used to provide a primary magnetic interference field direction with south pole facing up (towards a head resting on the pillow of
30 the embodiments while in use). A hemisphere is useful since the rear surface is flat and therefore sits stably in the recess 140, while providing a strong magnetic field in a predictable direction – towards the head of the user, while

the head is in the indentation 150 discussed below. The rear surface of any such magnet may be shaped to conform to the surface (e.g. recess 140) on which or in which it is to be received, to maintain the position of the magnets in the pillow. Thus, the housing may receive two or four magnetic devices, or any
5 other number, in an individual arrangement such that the primary magnetic field directions are aligned in a way to optimize the benefit to the users of the pillow – e.g. all are directed through the planar surface 115.

The horizontal distance between two magnetic devices may be between 12-
10 14cm and the vertical distance between two devices may be 20-23cm. The vertical distances refer to the distance between magnetic devices located closer to an upper part of a head resting on the pillow and magnetic devices located closer to a neck or a lower part of a head resting on the pillow. The horizontal distances are measured perpendicular to the vertical distances. Thus, vertical
15 and horizontal are terms used with reference to a plane formed by the magnets, rather than being vertical or horizontal with respect to the surface of the Earth. Exemplary distances between four magnetic devices 400 of a pillow according to the embodiments are also illustrated in Figure 4. The dimension values in Figure 4 are in millimetres. The illustrated dimensions may be varied to provide
20 support devices of a different size to suit the morphology of a specific individual.

Figures 1B shows a schematic of a top view of the two parts of the support device 100. Indentation 150 may receive the head of a user (not shown) to maintain the position of the head during use. The head of the user is therefore
25 located in a known position relative to the magnetic devices.

While the pillow 100 may have any desired shape – e.g. circular or square – the present pillow 100 has an oval shape. As such, indentation 150 is closer to two opposite sides 152 of the pillow 100 than it is to the two opposite ends 154 of
30 the pillow 100. For increased cervical spine support, the user may lie with their spine extending from the indentation 150 towards one of the ends 154 of the pillow 100. Where lesser cervical spinal support is desired or when the user is

lying on their side, the user may lie with their spine extending from the indentation 150 towards one of the sides 152.

Figure 1C shows a schematic of a front view of the two parts of the TSS pillow
5 of Figure 1A. Figure 1D shows a schematic of a side view of the TSS pillow of
Figure 1A. In Figure 1D, the pillow 100 is slightly inflated relative to that shown
in Figure 1C, which may involve provision of an internal air bladder within the
pillow that is inflated through breath or a pump, in a known manner similar to
inflating a balloon or sports ball.

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Different types of magnetic devices may be used. In one example, each
magnetic device comprises a plurality of pieces. The pieces of magnetic
materials may be formed in a dome-shaped or hemispheric structure, or
potentially a frustoconical, rectangular or other shape structure. An auxiliary
15 magnet formed of a single piece of magnetic material may be provided to
increase a resulting magnetic interference field generated by the magnetic
device – e.g. a main magnet and auxiliary magnet may be brought together to
enhance magnetic field strength of the magnetic device formed by the main
magnet and auxiliary magnet, such as a dome shaped main magnet and disc
20 shaped auxiliary magnet at the flat base on the dome of the main magnet. In
this embodiment, a structural element in the form of a sleeve structure (or
structure of the shape of the magnet to be formed from multiple separate
pieces) is provided, formed of a non-magnetic material such as, but not limited
to, plastic, for improved rigidity of the stack of magnetic devices. The sleeve or
25 other structure may be referred to as a magnet housing.

The magnetic devices are positioned to create an optimum arrangement
regardless of sleeping position of the person resting their head on the support
device, or at least to provide magnetic field interference with the person
30 regardless of their sleeping position on the pillow. Considering the fact that a
person might change sleeping position several times throughout the night, the
positioning of the devices in the support device advantageously provides its

benefits regardless of changes in the person's position. Figure 7 shows the four devices' magnetic interference cloud effect which can cover the whole head during sleeping for the optimum benefits.

- 5 The devices placed in the specific arrangement illustrated in Figure 6 can improve blood circulation and blood oxygen levels by opening up the air passages and improving breathing during sleep. It can improve sleep quality and reduce sleep snoring and apnoea.
- 10 The entire arrangement can be positioned in a pillow case or sleeve 600, shown in Figure 5, the can be made from a hypoallergenic material or another material that assists with heat dissipation or dissipation of aroma emanating from aromatherapy patches discussed below.
- 15 The chart of Figure 7 shows the improvement of Apnoea Hypopnea Index (AHI) testing with 5 individuals. The data of Figure 7 compares the AHI values of the 5 individuals before and after the use of the support device. The chart of Figure 8A shows a comparison of Pittsburgh Sleep Quality Index (PSQI) values for two groups of 14 individuals, one of the groups using the use of the support device
- 20 of the disclosure and the second group using the same device without magnets. The PSQI score reduced from 8.4 to 4.8 when magnets were absent. A similar test was run on another group of 14 students that compared using a placebo device compared with the present device without magnets. The PAQI score increased from 6.8 to 8.4 when the present device (without magnets) was used.
- 25 A total of 50 students participated in the study, with 8 students unable to complete. Based on PSQI standard calculations of scoring, there was a 267% improvement in sleep quality using the device of the present disclosure – i.e. using M.I. (magnetic interference) cloud with magnets – and a 133% improvement using the placebo, when compared to sleep without using a M.I.
- 30 device (e.g. cloud pillow). This shows that the present device (with magnets removed) provides significantly increased sleep quality, and that the sleep quality is further dramatically improved by the provision of magnetic devices in

accordance with present teachings.

In improving rest, the devices disclosed herein can provide increased mental concentration and alertness and also relief from ailments such as chronic aches and pain or injuries or post-surgery recovery or illnesses in a manner that is non-intrusive, comfortable, and that does not inhibit a person's activities. The pillow with magnetic devices can improve breathing throughout the night during sleep, and therefore similarly improve rest and recuperation.

10 The pillow may be used as an acupressure pillow comprising a support surface 115 for supporting the cervical vertebrae of a person. The pillow can also include raised portions or protrusions 130 for contacting respective acupressure points on the person's head or neck. The raised portions 130 may be made from memory foam. Moreover, the raised portion or portions may be provided in any
15 arrangement, such as a single raised portion or multiple raised portions positioned as shown, with one raised portion 156 being located substantially centrally (with respect to the ends 154 of the pillow 100) to contact the below an occipital base of the person when lying with their spine extending towards the sides 152, and second and third raised portions 158, 160 disposed
20 substantially symmetrically relative to the ends 154 of the pillow and the first portion 156. The pillow 100 may also include acupressure raised portions on one side only, such that the user can sleep on occasions with acupressure and, by rotating the pillow 180°, without acupressure.

25 Figure 2 illustrates an outline of a person and acupressure points on the person's head/neck region that may be in contact with the peaked support structures of the acupressure pillow shown in Figure 1B (see also Figure 4A). Broken line 210 reflects the acupressure points where raised portion 156 would impact the user, and the two smaller oval-shaped regions reflect the acupressure points where
30 raised portions 158, 160 would impact the user.

Working the acupressure points as illustrated in Figure 2 located below the base

of the skull in the hollow between the large vertical neck muscles is beneficial in relieving arthritis, headaches and neck pain that cause insomnia. Working these acupressure points is also beneficial in relieving mental stress, burnout and exhaustion.

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Thus, a method of applying acupressure using the support device would include a person placing their neck on the acupressure portions (156, 158, 160), and receiving a pressure or massage effect from those portions 156, 158, 160. Where the portions 156, 158, 160 are made from memory foam, the massage
10 effect from the memory foam of the acupressure pillow will benefit the person when the person places their head on the centre curved indentation 150 as the portions 156, 158, 160 will massage the neck, particularly during respiration as the chest rises and falls and the pressure changes between the neck and pillow 100.

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Figure 4 illustrates an acupressure pillow with peaked support structures or raised portions according to an exemplary embodiment. The shape and number of the raised portions may change depending on where acupressure is to be applied, and how concentrated the pressure should be – e.g. smaller or more
20 prominent (i.e. higher) raised portions will provide greater pressure.

The pillow 100 may also comprise, or make use of, aromatherapy patches. The aromatherapy patches may comprise traditional herbals packed in a package which can be placed in the designated area (e.g. recessed portions 142) under
25 or within the pillow. Passageways 118 direct the aroma towards the user through the pillow 100. The recessed portions 142 are located towards opposite ends 154 of the pillow 100. Each recessed portion 142 is associated with channels 119 to allow air into the recessed portion 142 to carry the aroma up to the user.

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A plurality of passageways 118 are provided to widely disseminate aroma towards a head resting on the upper cover 110. Any number of passageways

118 and recessed portions 142 may be provided. The upper cover 110 and the lower supporter 120 may be assembled together to form a single body/unit that serves to support a part of the body such as a head, and the aromatherapy recesses 142 and patches (not shown) may be housed within that body. The
5 aroma can help to calm the mind and provide the sense of relaxation to the person. The pathways carry an optimum amount of aroma from herbal packets, such as lavender which can help calm the mind and encourage the production of neurotransmitters to give a sensation of relaxation. Figure 9 also illustrates a pillow with spaces for receiving aromatherapy patches. The patches 900 are
10 inserted into grooves 902. Holes 904 provide airflow through the pillow 906, through the patches 900 for delivery of aromatherapy or directly through to the indentation (e.g. indentation 150 discussed above) for delivery of fresh air.

In some embodiments, the air passageways 118 are provided on lateral sides
15 of the head – between the indentation 150 and ends 154. Similarly, passageways may also be provided extending into the indentation 150. Presently, channels 162 extend through the pillow 100 (i.e. through its entirety from one side to the other) and end in the indentation 150, to provide a flow of air to the head of the person in use, such that the head is substantially
20 surrounded by fresh air. This can cool down the head temperature during sleep, assisting with rest. Similarly, the passageways or air holes 118 in the vicinity of the regions 142 for receiving herbal packages not only allow herbal aroma to pass through but also allow the delivery of fresh air to the user's head – e.g. when no aromatherapy patch is used, or the patch is spent during the night,
25 fresh air will still travel through channels 119, recesses 142 and channels 118 upwardly towards the planar surface 115 and thus towards the user.

The support device may comprise heat sensitive foam (e.g. viscoelastic foam such as Latex or polyurethane foam, or memory foam) that slowly reduces the
30 height of the pillow according to the body temperature of the person sleeping on the pillow. The gradual reduction in the height of the acupuncture pillow may calm down the mind and will make the person feel cosy and fall asleep easily.

The heat sensitive foam adjusts the compressibility according to the ambient temperature. The body's temperature falls when one sleeps and the slight rise in height of foam helps to reduce snoring and improve breathing. The height of the foam may slowly change (e.g. reduce) according to the body temperature
5 of the part of the person supported by the pillow.

The pillow may also, or alternatively, be made from a memory foam that is mixed with charcoal (i.e. charcoal elements). Charcoal provides anti-bacterial functions. The charcoal mixed with foam creates an anti-bacterial effect and
10 also absorbs odour to keep the pillow odour free for a longer period of time than would otherwise be achievable.

Figure 3 illustrates an embodiment of a pillow 304 comprising two parts 300, 302 formed of a memory foam. The top part 302 comprises a rim 310. The
15 bottom part 300 comprises a peripheral slot or cutaway 330 for receiving the rim 306. Thus, the rim 310 and slot 330 maintain the two parts 300, 302 in register/alignment during use. The two parts 300, 302 may also be sealed together or formed of a single piece, to provide a unitary housing.

20 The boundary protrusions 310 and four protrusion lines 320 in the inner surface of the upper part 302 as illustrated in Figure 3 fit the boundary grooves 330 and four groove lines 340 on the upper surface of the lower part 300 illustrated in Figure 3. The two part structure makes it easy to replace the herbal patch or adjust the height of the pillow. The two parts are lockable so that they can be
25 fixed together. Locking occurs by engagement of protrusions 310 and protrusion lines 320 with grooves 330 and groove lines 340, and inserting the complete assembly into a pillow case – e.g. case 600 – that tightly fits around the pillow 304 to hold the portions 300, 302 together.

30 This support device also provides a magnetic interference based cloud effect as discussed above with reference to Figures 1A to 1D and 6, which improves blood circulation and can help tone up throat tissue and muscles opening breathing

air passageways to improve sleep apnoea problems. Moreover, since the acupressure raised portions are still provided, the acupressure point applications are still facilitated to massage the neck to calm down the user and make them comfortable and cosy.

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For conventional aromatherapy applications, many people have to place aromatherapy oil beside the bed on the table. This is inconvenient. The pillow according to embodiments of the invention comprises memory foam with enough thickness to support the user's head making it very comfortable to use
10 herbal medicine aromatherapy which is hidden at the bottom or within the pillow as described above.

It will be appreciated that many further modifications and permutations of various aspects of the described embodiments are possible. Accordingly, the
15 described aspects are intended to embrace all such alterations, modifications, and variations that fall within the spirit and scope of the appended claims.

Throughout this specification and the claims which follow, unless the context requires otherwise, the word "comprise", and variations such as "comprises"
20 and "comprising", will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

The reference in this specification to any prior publication (or information
25 derived from it), or to any matter which is known, is not, and should not be taken as an acknowledgment or admission or any form of suggestion that that prior publication (or information derived from it) or known matter forms part of the common general knowledge in the field of endeavour to which this specification relates.

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Claims

1. A magnetic support device comprising:
 - a housing comprising a planar surface for supporting at least a part
 - 5 of a person; and
 - at least two magnetic devices within the housing,
 - wherein the at least two magnetic devices are arranged to generate a magnetic field with a primary magnetic field direction extending outward with respect to the planar surface.
- 10 2. The magnetic support device of claim 1, wherein the primary magnetic field direction is a south pole radially extending outward with respect to the planar surface.
3. The magnetic support device of claim 1 or 2, wherein the housing further
- 15 comprises an auxiliary magnet formed of a single piece of magnetic material to increase a strength of a magnetic field along the primary magnetic field direction.
4. The magnetic support device of any one of the preceding claims, wherein
- 20 the at least two magnetic devices are formed from a single piece of magnetic material.
5. The magnetic support device of any one of the preceding claims, wherein the housing further comprises structural elements to restrict movement
- 25 of the at least two magnetic devices with respect to each other.
6. The magnetic support device of any one of the preceding claims, wherein each magnetic device comprises a hemispheric surface, and the hemispheric surface of each magnetic device is directed towards the
- 30 planar surface.
7. The magnetic support device of claim 6, wherein the hemispheric surface

has a diameter in the range of 40mm to 50mm and the magnetic device has a height in the range of 20mm to 30mm.

- 5 8. The magnetic support device of any one of the preceding claims, wherein there are four magnetic devices and a distance between each of the magnetic devices is in the range of 12cm to 23cm.
9. The magnetic support device of any one of the preceding claims, wherein the planar surface comprises at least one raised portion positioned to contact at least one acupuncture point on a neck region of a person.
- 10 10. The magnetic support device of claim 9, wherein a part of the planar surface comprises a support surface for supporting the cervical vertebrae of a person.
- 15 11. The magnetic support device of claim 10, wherein the at least one raised portion is provided on the support surface.
12. The magnetic support device of any one of claims 8 to 10, wherein the planar surface comprises:
- 20 a first raised portion disposed substantially centrally on the planar surface to make contact below an occipital base of a person; and second and third raised portions disposed substantially symmetrically with respect to the first raised portion.
- 25 13. The magnetic support device of any one of the preceding claims, wherein the housing further comprises:
- at least one recessed portion for receiving an aromatherapy patch; and
- 30 at least one passageway to release aroma from the aromatherapy patch towards the head.

14. The magnetic support device of any one of claims 1 to 13, wherein the housing is formed of two separable parts consolidated to form the housing.
- 5 15. The magnetic support device of claims 14 when dependent on statement 13, wherein the at least one recessed portion is defined by gaps between the two parts.
- 10 16. The magnetic support device of any one of claims 1 to 15, wherein the housing is formed at least partially of heat sensitive foam which can vary a height of the pillow based on a temperature of the part of the person supported on the planar surface.
- 15 17. The magnetic support device of any one of claims 1 to 16, wherein the housing is formed at least partially of memory foam and a material of the memory foam is mixed with charcoal elements to provide anti-bacterial functions.
- 20 18. A pillow comprising the magnetic support device of any preceding claim.
19. A method of applying acupressure to a person, the method comprising resting a part of the person on the magnetic support device of any one of claims 9 to 12.