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(54) **REMOVABLE MATTRESS TOPPER WITH VIBRATING UNITS**

(71) Applicant: **DREAMWELL, LTD.**, Doraville, GA (US)

(72) Inventor: **Rahul Kirtikar**, Atlanta, GA (US)

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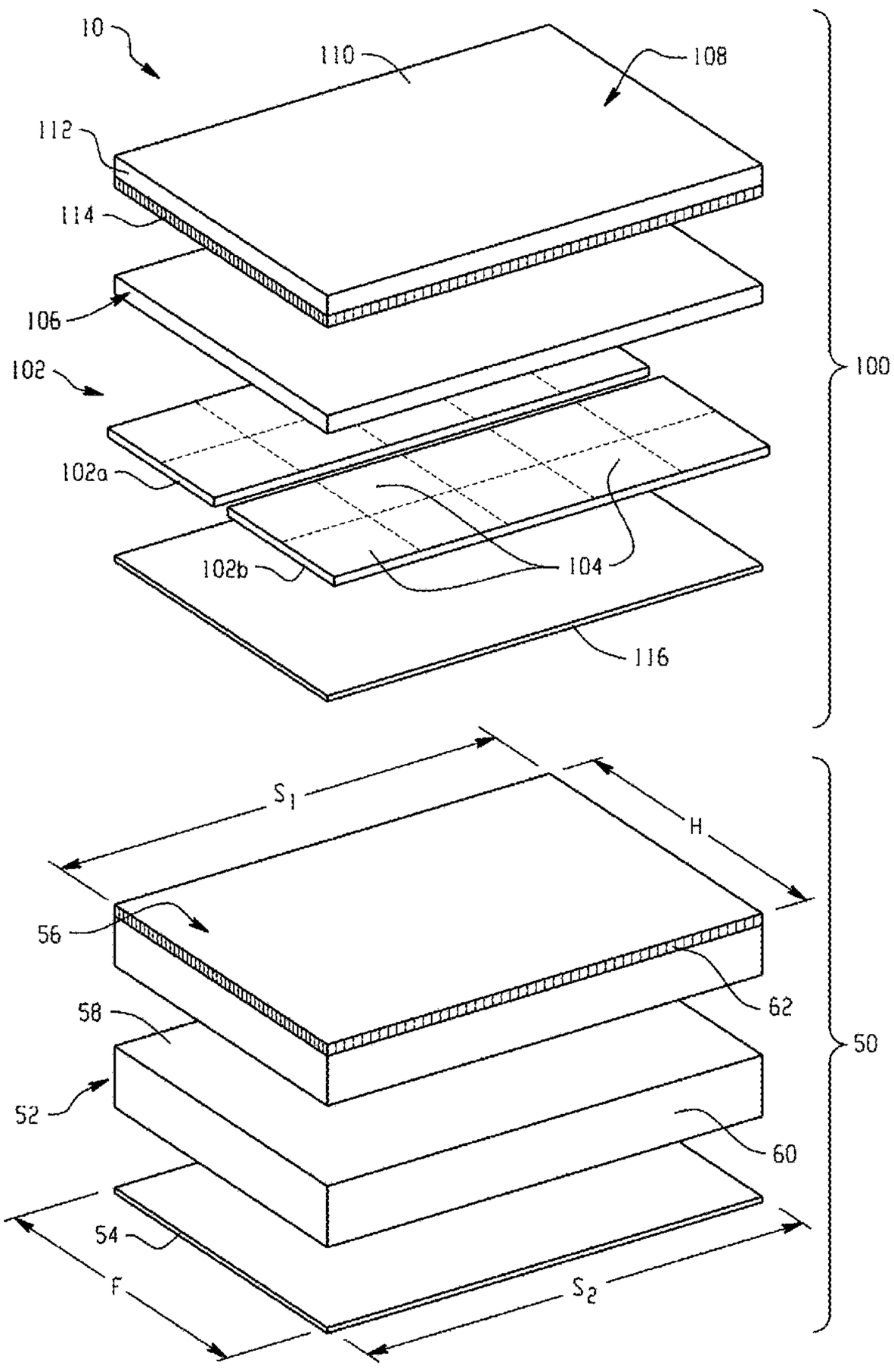
(57) **ABSTRACT**

A removable mattress topper for a mattress assembly is provided that includes a foam layer including one or more vibrating units. The removable mattress topper includes a cover encapsulating the foam layer. The cover includes a top panel, a bottom panel, and sidewalls extending between the top and bottom panels, wherein the bottom panel comprises a zippered portion extending about at least a portion of a peripheral edge of the bottom panel. Also disclosed are mattress assemblies including the removable mattress topper, wherein the mattress assembly includes a mattress core and a cover encapsulating the mattress core, wherein the cover includes a top panel and a zippered portion about a peripheral edge of the top panel. The zippered portion of the mattress core is configured to mechanically engage the zippered portion of the removable mattress topper.



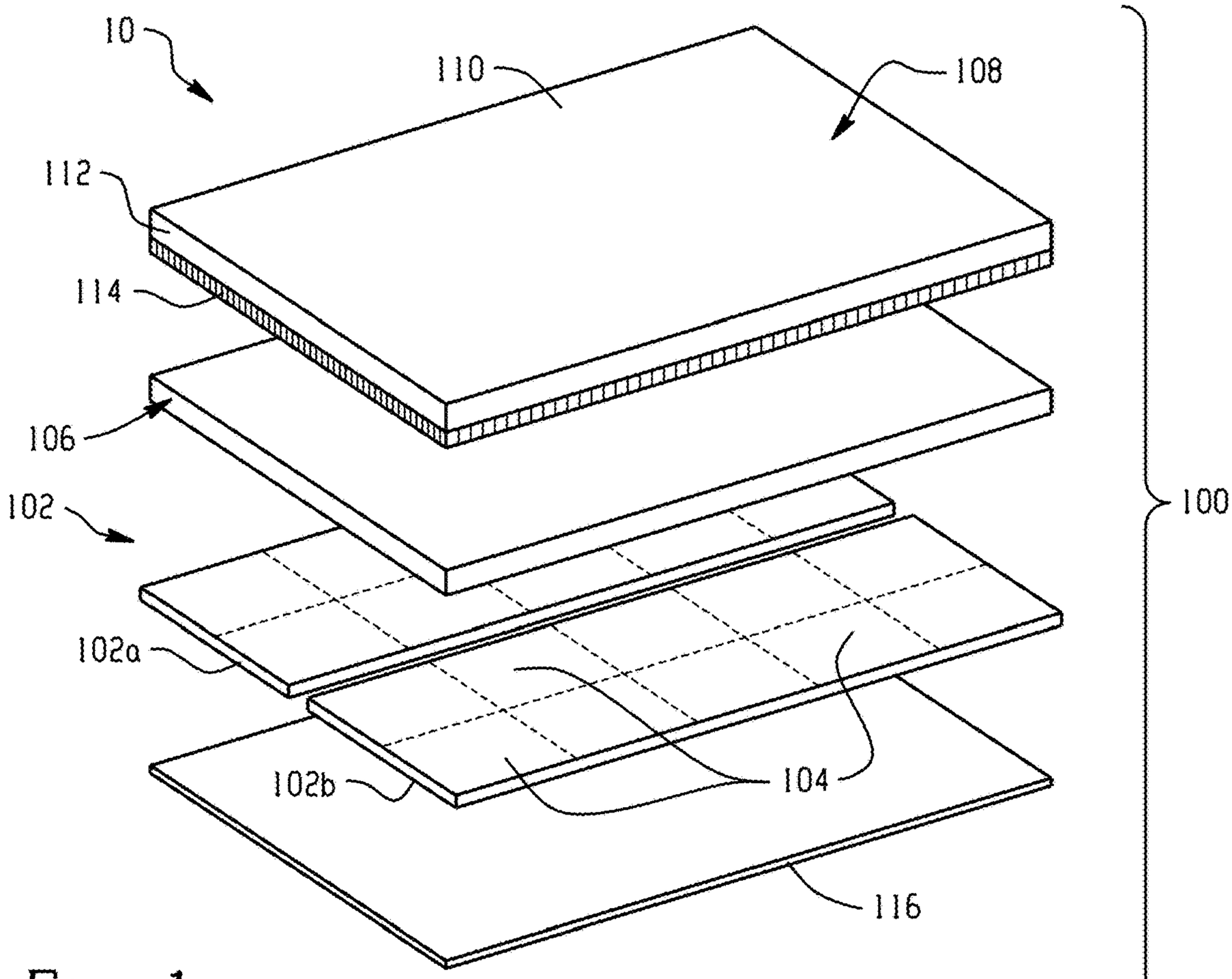
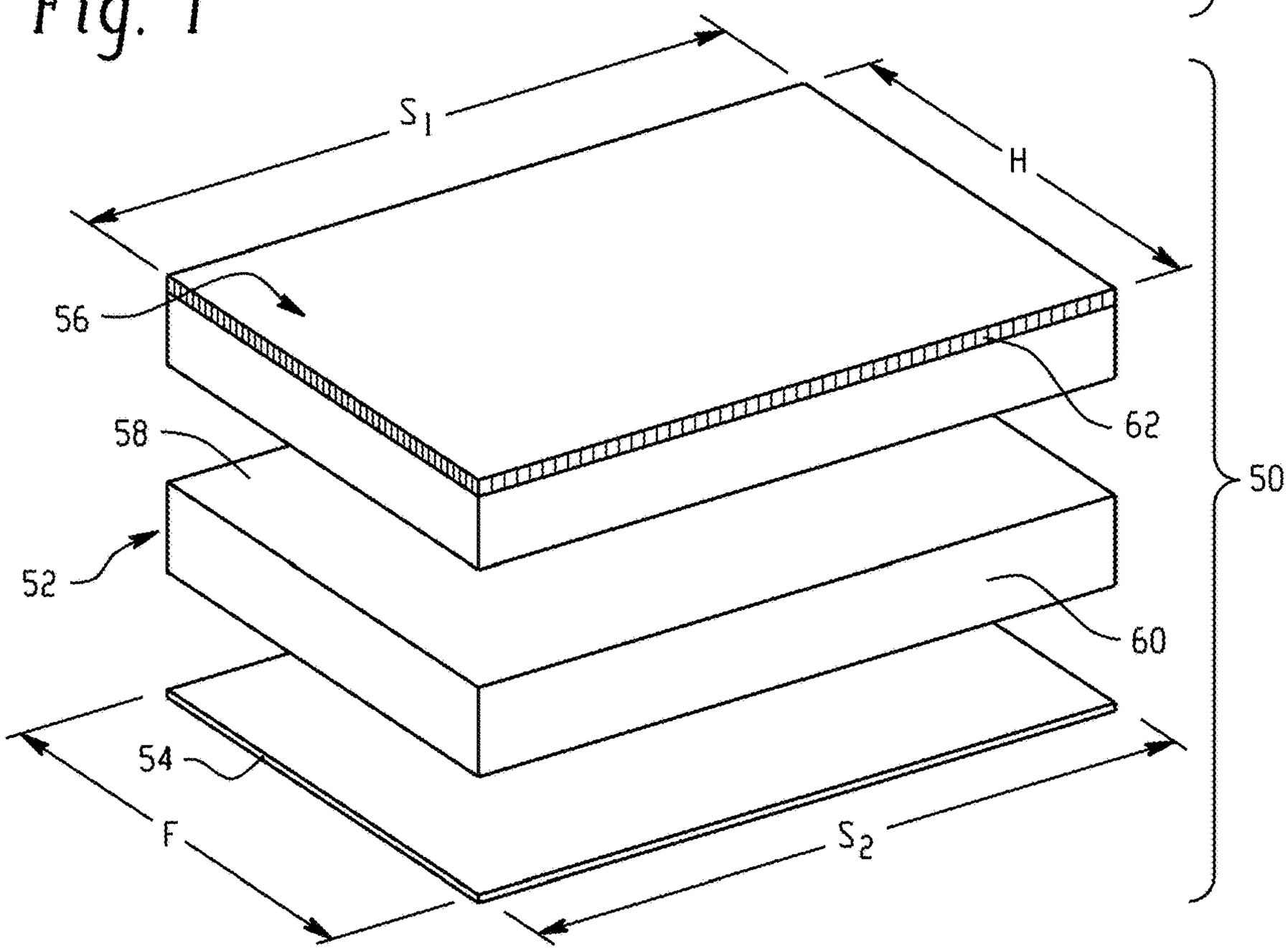

10
110
108
112
114
106
102
102a
102b
104
116
100

Fig. 1


S_1
H
56
58
62
52
60
54
F
S_2
50

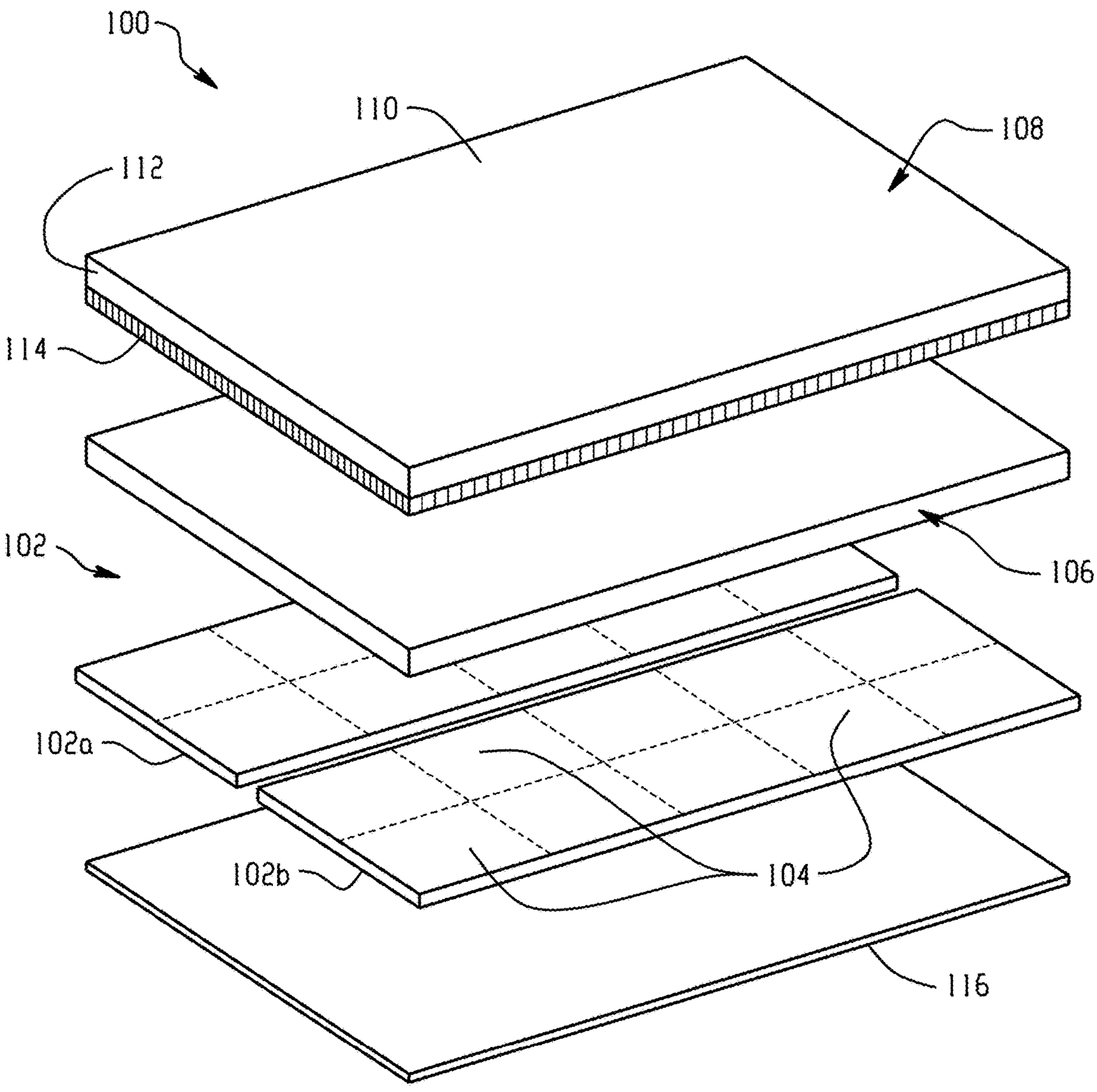


Fig. 2

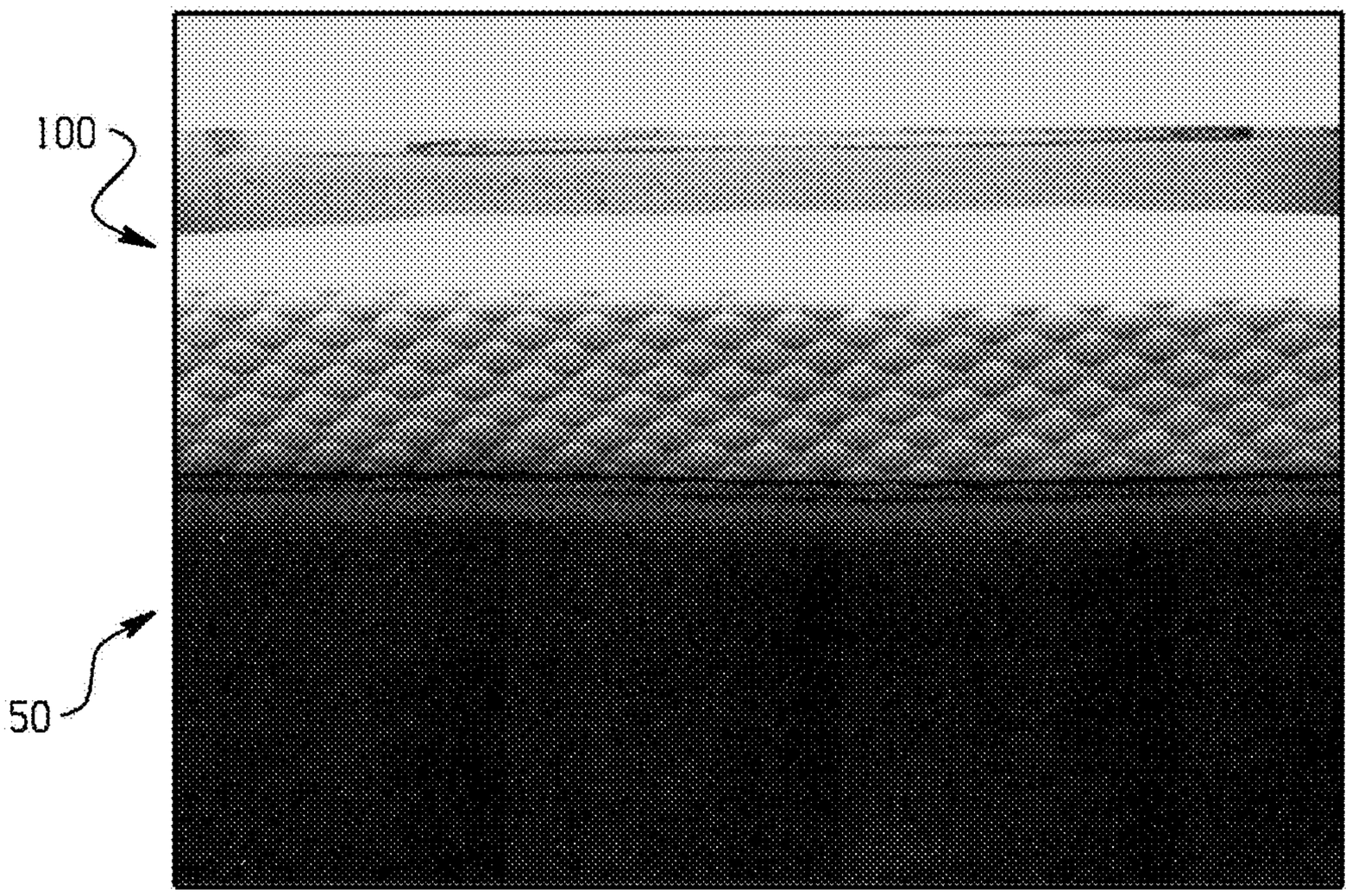


Fig. 3

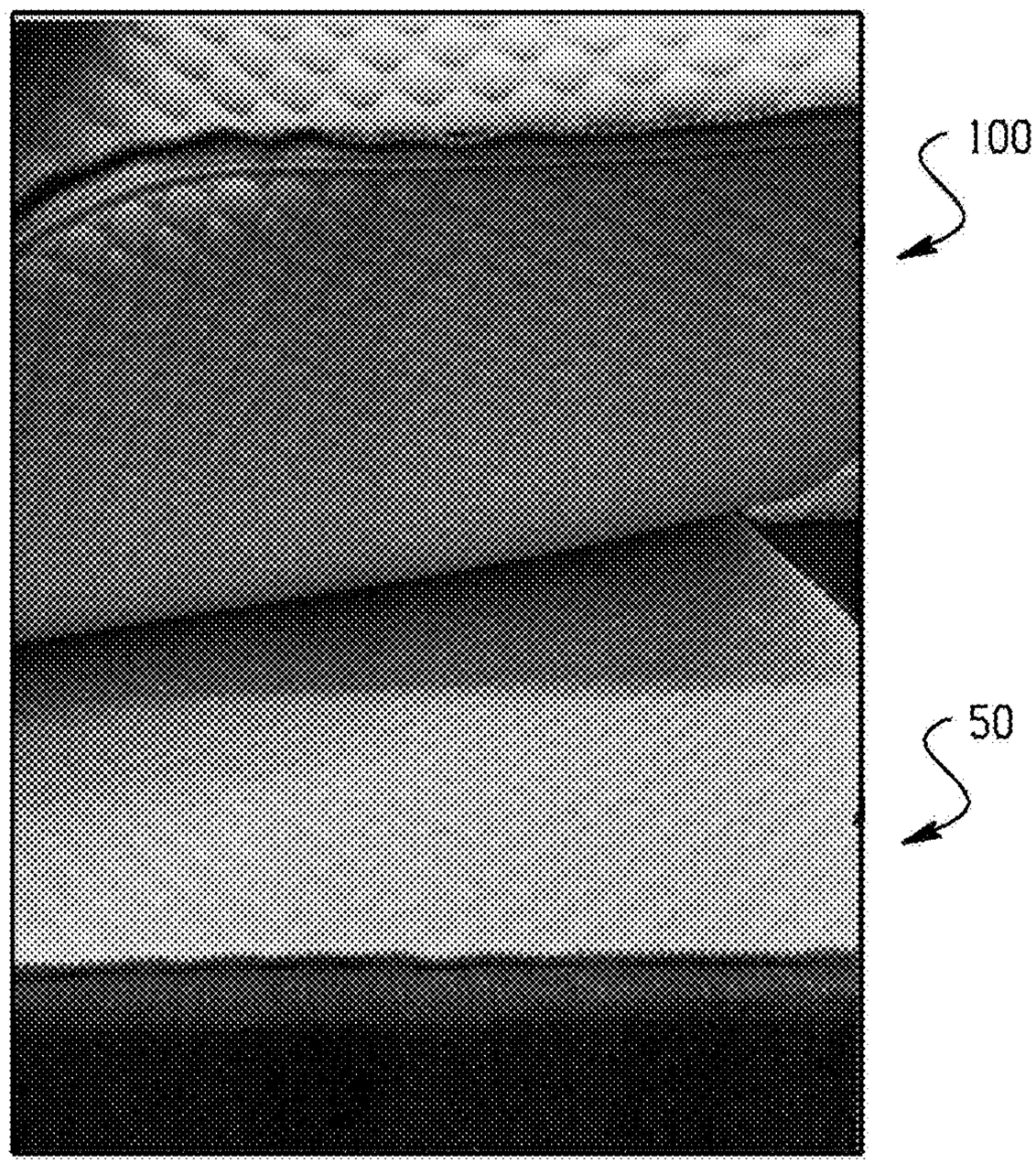


Fig. 4

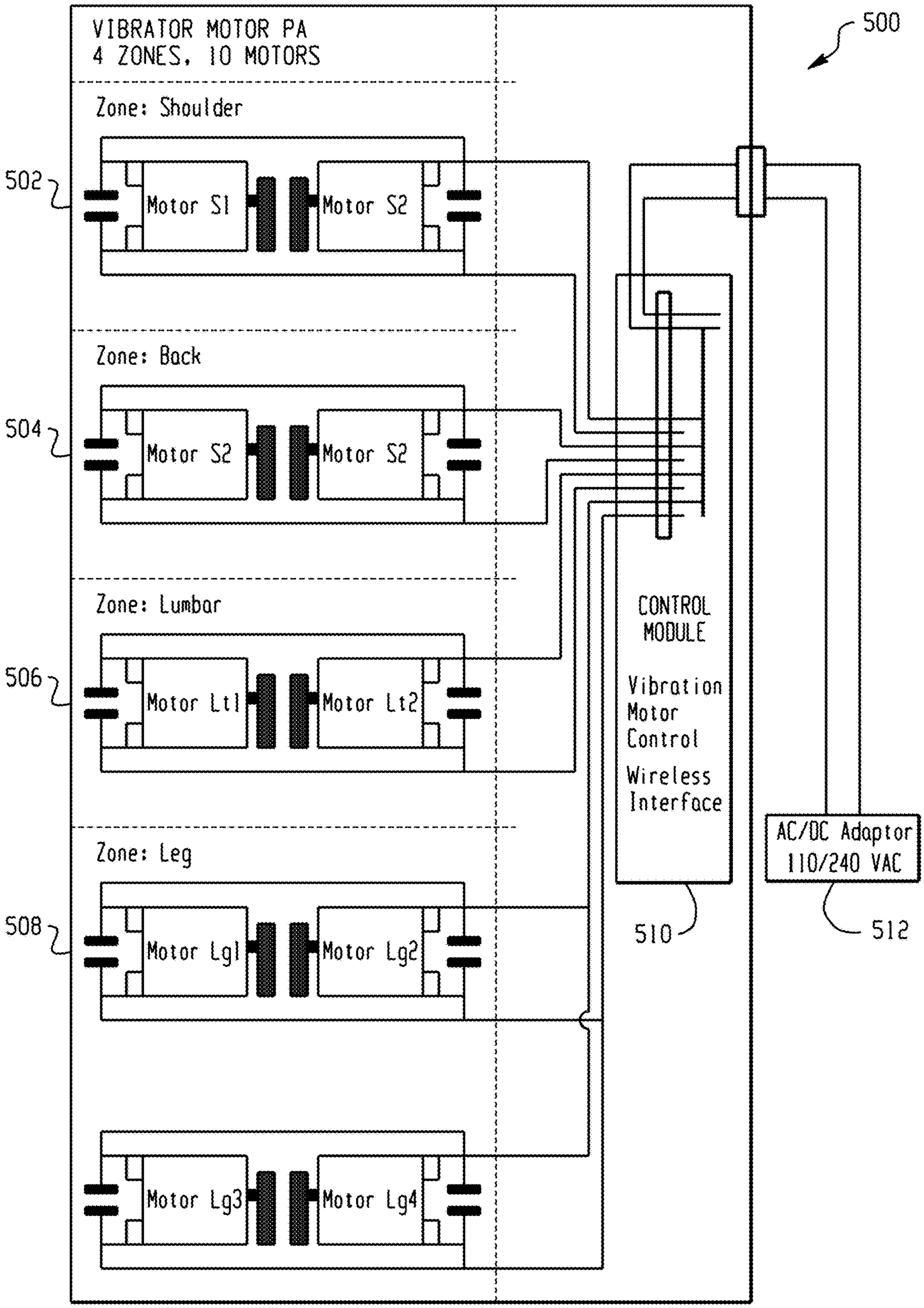

VIBRATOR MOTOR PA
4 ZONES, 10 MOTORS
500
Zone: Shoulder
502
Motor S1
Motor S2
Zone: Back
504
Motor S2
Motor S2
Zone: Lumbar
506
Motor Lt1
Motor Lt2
Zone: Leg
508
Motor Lg1
Motor Lg2
Motor Lg3
Motor Lg4
CONTROL MODULE
Vibration Motor Control
Wireless Interface
510
AC/DC Adaptor 110/240 VAC
512

Fig. 5

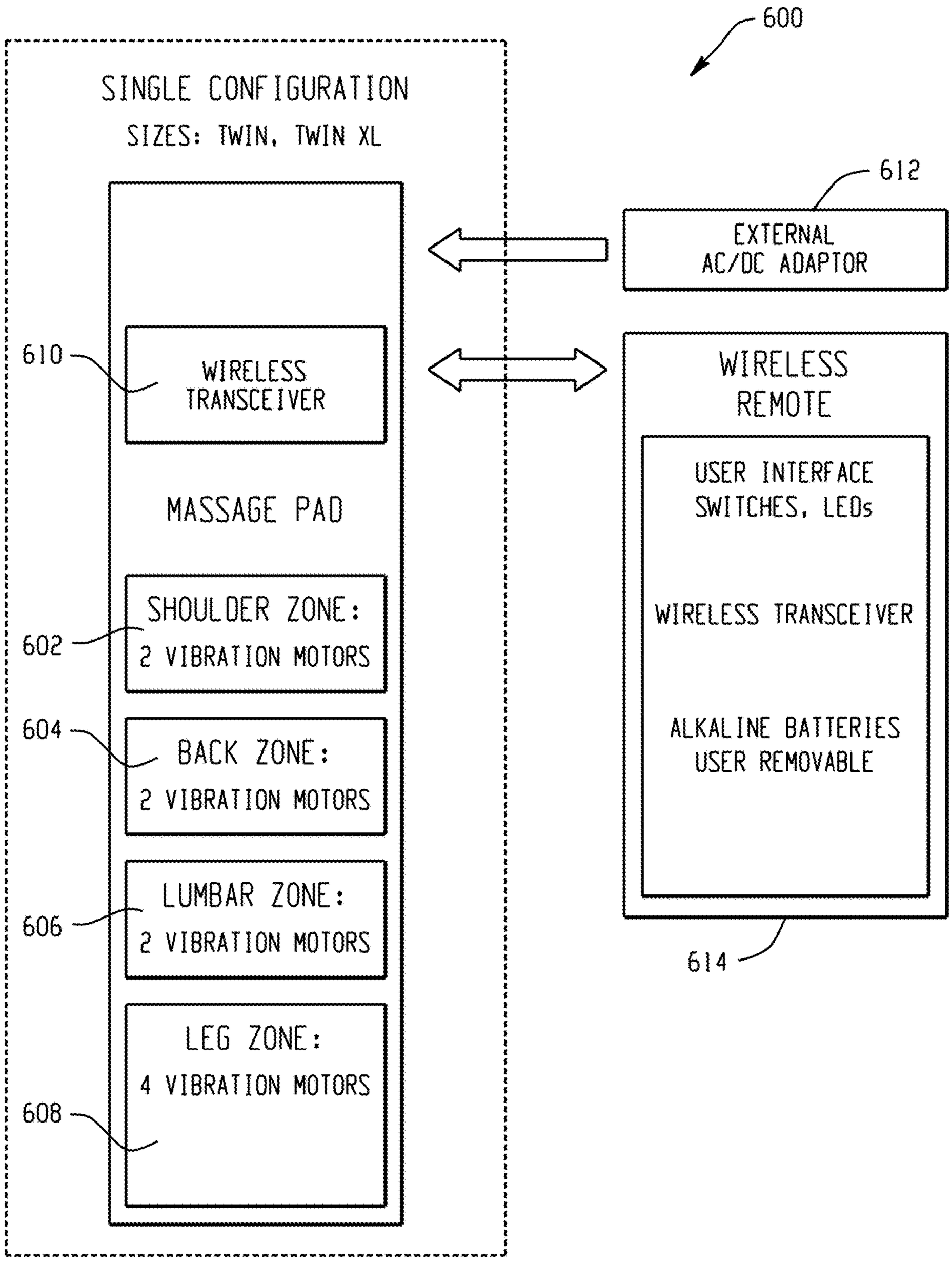

600
SINGLE CONFIGURATION
SIZES: TWIN, TWIN XL
610
WIRELESS TRANSCEIVER
MASSAGE PAD
602
SHOULDER ZONE:
2 VIBRATION MOTORS
604
BACK ZONE:
2 VIBRATION MOTORS
606
LUMBAR ZONE:
2 VIBRATION MOTORS
608
LEG ZONE:
4 VIBRATION MOTORS
612
EXTERNAL
AC/DC ADAPTOR
WIRELESS
REMOTE
USER INTERFACE
SWITCHES, LEDs
WIRELESS TRANSCEIVER
ALKALINE BATTERIES
USER REMOVABLE
614

Fig. 6

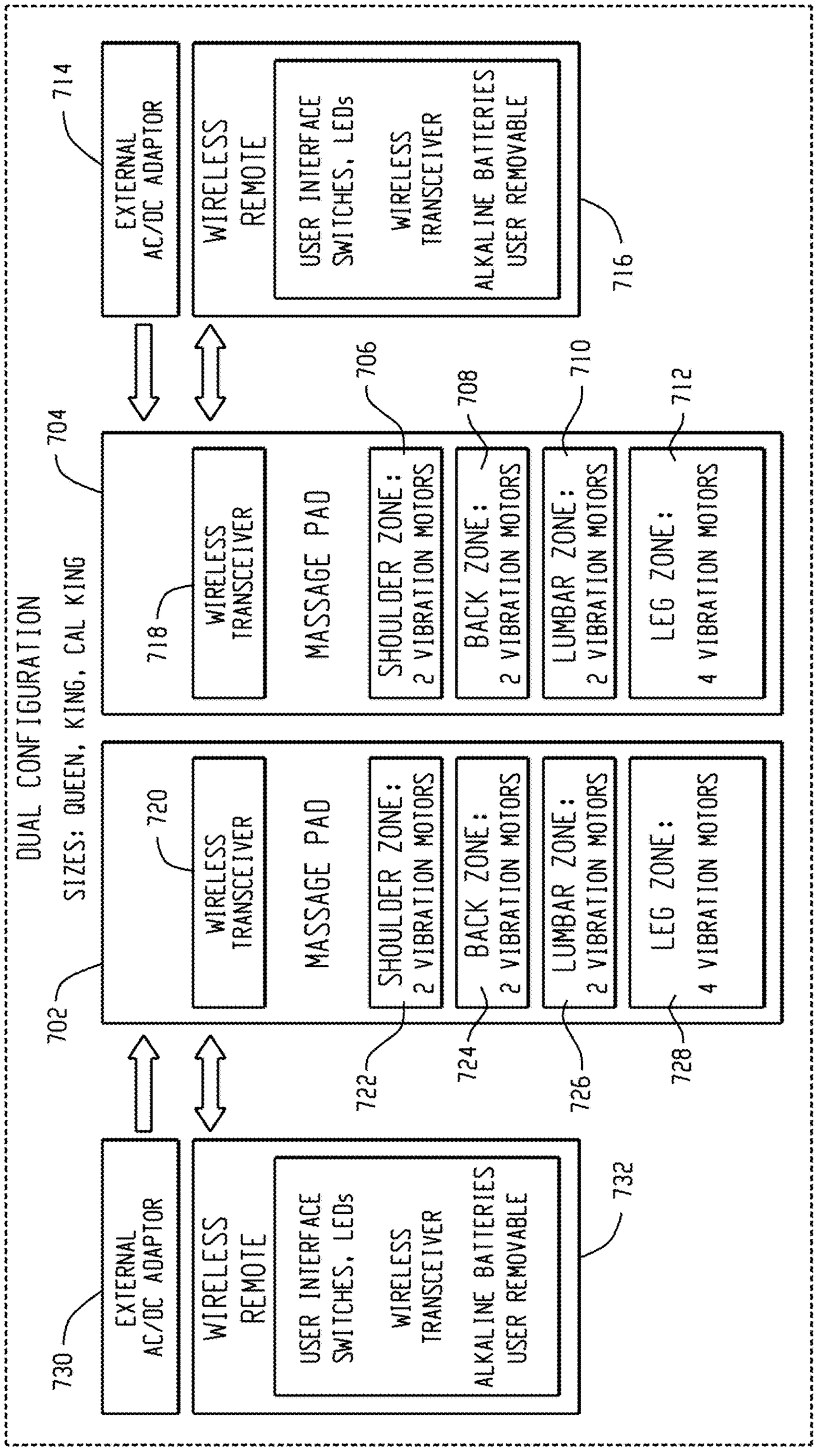

700
DUAL CONFIGURATION
SIZES: QUEEN, KING, CAL KING
702
704
706
708
710
712
714
716
718
720
722
724
726
728
730
732
EXTERNAL AC/DC ADAPTOR
WIRELESS REMOTE
USER INTERFACE SWITCHES, LEDs
WIRELESS TRANSCEIVER
ALKALINE BATTERIES USER REMOVABLE
WIRELESS TRANSCEIVER
MASSAGE PAD
SHOULDER ZONE: 2 VIBRATION MOTORS
BACK ZONE: 2 VIBRATION MOTORS
LUMBAR ZONE: 2 VIBRATION MOTORS
LEG ZONE: 4 VIBRATION MOTORS

Fig. 7

REMOVABLE MATTRESS TOPPER WITH VIBRATING UNITS

BACKGROUND

[0001] The present disclosure generally relates to mattress assemblies, and more particularly to removable mattress toppers including vibrating units.

[0002] Mattress assemblies including vibrating units for providing a massaging action to an end user are typically complex structures. For example, adjustable beds can include discrete powered massage elements built into the adjustable foundation upon which a mattress is disposed. Due to the spatial distance between the adjustable foundation and the mattress, the massage elements are dampened to such a degree that the massage elements often shake the bedding system in its entirety in order for the massaging action to be felt by the end user, which can disrupt sleep should the mattress be configured to accommodate more than one end user. Mattresses used in homes can also have massage motors built into the mattress portion of the bed. In each of these situations, when the massage mechanism becomes damaged, the entire complex structure must be serviced. The bed may be shipped back to the manufacturer for repair or a service technician may visit the user and remove or repair the massage mechanism. Standalone massage pads have been used in various cushioning structures such as chairs. However, because these pads vibrate and are not fastened to the underlying; structure, these types of apparatuses have a tendency to slide off the underlying surface. Moreover, these types of pads directly affect the intended comfort and breathability desired by the manufacture the mattress assembly.

[0003] Moreover, current vibrating mattress assemblies are unable to isolate the intended massage effect in order to target specific areas of the sleeper's body, due to the distance of the elements from the sleep surface (i.e., through an entire mattress). Instead, they are often configured to shake the whole bedding system, often disrupting a partner sleeping in the same bed.

BRIEF SUMMARY

[0004] Disclosed herein are removable mattress toppers for use with mattresses and mattress assemblies including the removable mattress topper. In one or more embodiments, a removable mattress topper includes a first foam layer comprising a plurality of spaced apart vibrating units embedded therein, wherein the vibrating units are in electrical communication with a control module and a power source; a second foam layer overlying the first foam layer; and a cover encapsulating the first and second foam layers, the cover comprising a top panel, a bottom panel, and sidewalls extending between the top and bottom panels, wherein the bottom panel comprises a zippered portion extending about at least a portion of a peripheral edge of the top panel.

[0005] In one or more embodiments, a mattress assembly includes a mattress core assembly comprising a mattress core and a cover encapsulating the mattress core, wherein the cover comprises a top panel and a zippered portion about a peripheral edge of the top panel; and a removable mattress topper comprising a first foam layer comprising a plurality of spaced apart vibrating units embedded therein, a second foam layer overlying the first foam layer, and a cover encapsulating the first and second foam layers, the cover further comprising a a zippered portion extending about at least a portion of a peripheral edge of a bottom panel, wherein the zippered portion is configured for mechanical and releasable engagement with the zippered portion of the mattress core assembly to maintain the removable mattress topper and the mattress core assembly in a fixed relationship.

[0006] In one or more embodiments, a process for operating a removable mattress topper including vibrating units includes securing the removable topper layer on an upper surface of a mattress and providing a power source to the vibrating units, wherein the vibrating units are embedded in a foam layer within the removable topper layer and arranged in zones along a length and width dimension thereof, wherein each zone includes one or more spaced part vibrating units; and activating the one or more spaced apart vibrating units within a selected one or more of the zones.

[0007] The disclosure may be understood more readily by reference to the following detailed description of the various features of the disclosure and the examples included therein.

BRIEF DESCRIPTION OF FIGURES

[0008] Referring now to the figures wherein the like elements are numbered alike:

[0009] Figure ("FIG.") **1** illustrates an exploded sectional view of a mattress assembly including a removable topper layer with vibrating units for use with the mattress assembly in accordance with the present disclosure;

[0010] FIG. **2** illustrates an exploded view of the removable mattress topper of FIG. **1** in accordance with the present disclosure;

[0011] FIG. **3** pictorially illustrates an enlarged view of a portion of a mattress assembly including a removable mattress topper including vibrating units fastened to the mattress assembly in accordance with the present disclosure; and

[0012] FIG. **4** pictorially illustrates an enlarged view of a portion of a mattress assembly including a removable mattress topper including vibrating units unfastened to the mattress assembly in accordance with the present disclosure;

[0013] FIG. **5** schematically illustrates a system for operating the mattress assembly including the vibrating units in accordance with the present disclosure;

[0014] FIG. **6** schematically illustrates an exemplary removable mattress topper including vibrating units configured for use with a single user mattress dimension in accordance with the present disclosure; and

[0015] FIG. **7** schematically illustrates an exemplary removable mattress topper including vibrating units configured for use with a dual user mattress dimension in accordance with the present disclosure.

DETAILED DESCRIPTION

[0016] Disclosed herein are mattress assemblies including removable mattress toppers including vibrating units configured to overlay an underlying mattress core. The removable mattress toppers generally include one or more massaging foam pads including vibrating units integrated therein. The removable mattress toppers are encapsulated within a cover that can be removably and fixedly fastened to an underlying mattress core assembly such as by a zipper fastener, for example. Optionally other attachment mechanisms, such as hook and loop fasteners, Velcro®, buttons, snaps, and/or combinations of such fasteners may be

employed to provide a fixed relationship between the mattress topper and the underlying mattress core assembly. The removable mattress toppers including the vibrating units overcome the problems noted in the art and provide on demand massaging action in close proximity to the end user with minimal noise and no foundation interaction. Advantageously, the removable mattress toppers including the vibrating units can be readily removed to provide portability, service and replacement as needed, and the opportunity to independently clean the cover as needed.

[0017] The mattress assemblies including the removable mattress toppers may be of any size, including standard sizes such as a twin, queen, oversized queen, king, or California king sized mattress, as well as custom or non-standard sizes constructed to accommodate a particular user or a particular room.

[0018] Conventional techniques related to manufacturing processes for mattress toppers and mattresses in general may or may not be described in detail herein. Moreover, the various tasks and process steps described herein can be incorporated into a more comprehensive procedure or process having additional steps or functionality not described in detail herein. In particular, various steps in the manufacture of mattress components such as the use of stitching, application of adhesives assembly steps, and the like are well known and so, in the interest of brevity, many conventional steps will only be mentioned briefly herein or will be omitted entirely without providing the well-known process details.

[0019] For the purposes of the description hereinafter, the terms "upper", "lower", "top", "bottom", "left," and "right," and derivatives thereof shall relate to the described structures, as they are oriented in the drawing figures. The same numbers in the various figures can refer to the same structural component or part thereof. Additionally, the articles "a" and "an" preceding an element or component are intended to be nonrestrictive regarding the number of instances (i.e. occurrences) of the element or component. Therefore, "a" or "an" should be read to include one or at least one, and the singular word form of the element or component also includes the plural unless the number is obviously meant to be singular.

[0020] Spatially relative terms, e.g., "beneath," "below," "lower," "above," "upper," and the like, can be used herein for ease of description to describe one element or feature's relationship to another element(s) or feature(s) as illustrated in the figures.

[0021] The following definitions and abbreviations are to be used for the interpretation of the claims and the specification. As used herein, the terms "comprises," "comprising," "includes," "including," "has," "having," "contains" or "containing," or any other variation thereof, are intended to cover a non-exclusive inclusion. For example, a composition, a mixture, process, method, article, or apparatus that comprises a list of elements is not necessarily limited to only those elements but can include other elements not expressly listed or inherent to such composition, mixture, process, method, article, or apparatus.

[0022] As used herein, the term "about" modifying the quantity of an ingredient, component, or reactant of the invention employed refers to variation in the numerical quantity that can occur, for example, through typical measuring and liquid handling procedures used for making concentrates or solutions. Furthermore, variation can occur from inadvertent error in measuring procedures, differences in the manufacture, source, or purity of the ingredients employed to make the compositions or carry out the methods, and the like.

[0023] It will also be understood that when an element, such as a layer, region, or substrate is referred to as being "on" or "over" another element, it can be directly on the other element or intervening elements can also be present. In contrast, when an element is referred to as being "directly on" or "directly over" another element, there are no intervening elements present, and the element is in contact with another element.

[0024] Referring now to FIG. **1**, an exploded view of an exemplary mattress assembly **10** including a mattress core assembly generally designated by reference numeral **50** and a removable mattress topper including vibrating units generally designated by reference numeral **100** is shown in accordance with the present disclosure. FIG. **2** illustrates an exploded view of the removable mattress topper **100** by itself.

[0025] The removable topper layer **100** is dimensioned to overlay the mattress core assembly **10** in its entirety and be removably attached to the uppermost user-facing surface thereof. Typically, the mattress core assembly **50** and the removable mattress topper **100** are generally rectangular shaped as is generally shown. As such, the mattress assembly **10** including the mattress core **50** and the removable mattress topper **10** generally has a head end (H), a foot end (F) and lateral sides (S1), (S2) extending from the head end H to the foot end (F). However, it should be apparent that other shapes are contemplated to accommodate irregular shaped mattresses, e.g., custom mattresses such as circular beds or the like. In use, the removable mattress topper layer **100** is configured to be positioned between the mattress core assembly **50** and a bed sheet (not shown) that is positioned over the mattress core assembly **50** and the removable mattress topper **100**.

[0026] The mattress core assembly **50** is not intended to be limited and generally includes one or more layers encapsulated within a cover. As shown in FIG. **1**, the exemplary mattress core assembly **50** includes a mattress core **52** that is encapsulated within a cover **56** overlaying the uppermost surface **58** and side surfaces **60** of the mattress core **52** that is fastened to a bottom panel **54**, when assembled. As such, the cover **56** includes a top panel and sidewall panels extending about a periphery of the top panel. The top panel may be implemented as a padded upholstery layer with a quilted top that represents the actual sleeping surface. The bottom panel **54** is fastened to the sidewalls to encapsulate the mattress core assembly. The cover **56** and the bottom panel **54** can be sewn together or fastened using a zipper or the like.

[0027] The cover **56** further includes a zippered portion **62** about a perimeter of the top panel surface and is configured for mechanical engagement to a complementary zippered portion **114** on the removable mattress topper **100**. The zippered portion **62** is at a peripheral edge of the cover and includes one or more strips of fabric, such as the fabric or fabrics employed as the upholstery material for the side panels of the cover. In one embodiment, the peripheral edge is secured, typically by stitching one edge of the fabric strip peripheral to the edge of the top cover panel. The opposite side of the fabric strip that forms the peripheral edge may include a zipper strip of the type that includes teeth that may

be joined to an opposing zipper strip e.g., zippered portion **114** of the removable mattress topper **100**.

[0028] The mattress core **52** can include one or more layers including, but not limited to foam layers, coil layers, air bladders, a side rail assembly extending about the sides of the mattress core, combinations thereof, and the like. The thicknesses of the various layers can vary and are generally from about ½ inch in thickness to about 14 inches or less in thickness, although greater thickness can be utilized. The uppermost layer **58** typically has a planar top surface adapted to substantially face the user resting on the mattress assembly and has length and width dimensions sufficient to support a reclining body of the user.

[0029] The coil layer, when present, generally includes coil springs that are not intended to be limited to any specific type or shape. The coil springs can be single stranded or multi-stranded, pocketed or not pocketed, asymmetric or symmetric, and the like. It will be appreciated that the pocketed coils may be manufactured in single pocket coils or strings of pocket coils, either of which may be suitably employed with the mattresses described herein. The attachment between coil springs may be any suitable attachment. For example, pocket coils are commonly attached to one another using hot-melt adhesive applied to abutting surfaces during construction.

[0030] Suitable foams for the different layers that include foam, include but are not limited to, polyurethane foams, latex foams including natural, blended and synthetic latex foams; polystyrene foams, polyethylene foams, polypropylene foam, polyether-polyurethane foams, and the like. Likewise, the foam can be selected to be viscoelastic or non-viscoelastic foams. Some viscoelastic materials are also temperature sensitive, thereby also enabling the foam layer to change hardness/firmness based in part upon the temperature of the supported part. Unless otherwise noted, any of these foams may be open celled or closed well or a hybrid structure of open cell and closed cell. Likewise, the foams can be reticulated, partially reticulated or non-reticulated foams. The term reticulation generally refers to removal of cell membranes to create an open cell structure that is open to air and moisture flow. Still further, the foams may be gel infused in some embodiments. The different layers can be formed of the same material configured with different properties or different materials.

[0031] The various foams suitable for use in the foam layer may be produced according to methods known to persons ordinarily skilled in the art. For example, polyurethane foams are typically prepared by reacting a polyol with a polyisocyanate ira the presence of a catalyst, a blowing agent, one or more foam stabilizers or surfactants and other foaming aids. The gas generated during polymerization causes foaming of the reaction mixture to form a cellular or foam structure. Latex foams are typically manufactured by the well-known Dunlap or Talalay processes. Manufacturing of the different foams are well within the skill of those in the art.

[0032] The different properties for each foam layer may include, but are not limited to, density, hardness, thickness, support factor, flex fatigue, air flow, various combinations thereof, and the like. Density is a measurement of the mass per unit volume and is commonly expressed in pounds per cubic foot. By way of example, the density of the each of the foam layers can vary. In some embodiments, the density decreases from the lower most individual layer to the uppermost layer. In other embodiments, the density increases. In still other embodiments, one or more of the foam layers can have a convoluted surface. The hardness properties of foam are also referred to as the indention load deflection (ILD) or indention force deflection (IFD) and is measured in accordance with ASTM D-3374. Like the density property, the hardness properties can be varied in a similar manner. Moreover, combinations of properties may be varied for each individual layer. The individual layers can also be of the same thickness or may have different thicknesses as may be desired to provide different tactile responses. Optionally, in some embodiments, one or more of the foam layers may be pre-stressed such as is disclosed in U.S. Pat. Pub. No. 2010/0072676, incorporated herein by reference in its entirety.

[0033] In other embodiments, the one or more layers overlying the foam layer including the vibrating units are coated with a phase change material (PCM), PCMs generally operate on the principle that a material requires a relatively significant amount of energy (heat) to change from a solid to a liquid and then back from a liquid to a solid. PCMs can therefore absorb large amounts of heat or energy from their environment and return large amounts of heat to their environment. This effective absorption, store and release of heat can be used to help regulate the temperature of an environment. The particular PCM is not intended to be limited and can be inorganic or organic. Suitable inorganic PCMs include salt hydrates made from natural salts with water. The Chemical composition of the salts is varied in the mixture to achieve required phase-change temperature. Special nucleating agents can be added to the mixture to minimize phase-change salt separation. Suitable organic PCMs include fatty acids; waxes (e.g., paraffins) or the like, which are generally known in the art.

[0034] Suitable air bladders can be self-inflating and/or inflatable using a pump or the like. Exemplary air bladders are disclosed in U.S. Pat. No. 10,357,114 and US Pat. Pub. No. 2019/174930 incorporated herein by reference in its entirety.

[0035] The mattress core assembly **50** can include other layers such as batting layers, fire retardant layers, waterproof liners, and so forth. In certain assemblies using coils, the one or more additional layers may include a relatively firm bottom panel layer that distributes the upward force of each spring top to provide a more uniform feel to the sleeping surface.

[0036] As shown more clearly in FIG. **2**, the removable mattress topper **100** includes a foam layer **102** including a plurality of vibrating units **104** embedded therein. Foam layer **102** can be a single foam layer or can be two foam layer **102***a* and **102***b* arranged in a side-by side relationship, with each foam layer **102***a* and **102***b* corresponding to different end users for those mattress assemblies dimensioned to accommodate two end users. That is, each of the foam layers **102***a* and **102***b* generally span about a length dimension intended for the mattress assembly and span about one half the width dimension. Foam layer **102** is not intended to be limited to any particular foam and generally includes recesses dimensioned to accommodate each one of the vibrating units at a specific location which are generally spaced apart and at locations corresponding to an end user's body position on the removable mattress topper **100**. The vibrating units can be seated in the recesses or can be adhesively affixed thereto. An optional channel (not shown)

can be provided in the foam layer **102** for the wiring of the vibrating units. Alternatively, the wiring can be provided on a surface of the foam layer **102**

[0037] The vibrating units **104** are contained within housings and generally include a variable speed motor with a shaft and an eccentric cam attached to the shaft causing the motor to vibrate when in use. The frequency of the vibrations produced within the mattress topper may be controlled by varying the speed of each motor. The amplitude of the vibration may be controlled by re-positioning the eccentric weight. Operation of the individual vibrating units thusly imparts a resonating effect to the various locations about the mattress topper and to a person reclining upon the mattress topper. By varying the frequencies of the vibratory impulses and the level of resonance, a person may recline upon the mattress topper and mattress assembly for its comforting effects or, alternatively, be slowly lulled to sleep. A control module is provided to control operation of the vibrating units **104**, which can include power regulation from a AC or DC voltage source, and is configured for communication to a wireless remote in a manner generally well-known in the art. The control module can be seated within a recess formed in the foam layer **102**.

[0038] Foam layer **106** overlays the foam layer **102** including the vibrating units **104** and generally has a thickness sufficient to prevent the end user from sensing the physical presence of the vibrating units **104** and associated wiring when in the off position.

[0039] The removable topper layer **100** further includes a cover **108** defined by a top panel **110** and sidewalls **112** extending from the top panel **110**. The sidewalls **110** are dimensioned to accommodate the combined thicknesses of layers **102**, **104** and **106**. A zippered portion **114** extends about a periphery of the sidewalls **110** and is engageable with zippered portion **62** of the mattress core assembly **50**. The cover **108** include a bottom panel **116**, which can be fixedly attached to the sidewalls **112** of the cover or removably fastened thereto. The cover and bottom panel fully encapsulate foam layer **102** including the vibrating units **104** and foam layer **106**. The cover further includes at least one opening for a power cord.

[0040] Optionally, the removable mattress topper **100** can include additional foam layers (not shown) overlying and/or underlying foam layer **102** including the vibrating units **104**.

[0041] The overall thickness of the removable mattress topper is generally from about 0.25 inches to about 6 inches. In one or more embodiments, the thickness of the removable mattress topper is from about 0.5 inches to about 3 inches in thickness, and in still one or more embodiments, the thickness of the removable mattress topper is from about 0.5 to about 2 inches in thickness.

[0042] FIGS. **3** and **4** pictorially illustrate enlarged views of a portion of a mattress assembly including a removable mattress topper **100** including vibrating units fastened and unfastened, respectively, to the mattress core assembly **50** in accordance with the present disclosure.

[0043] FIG. **5** illustrate a schematic diagram of an exemplary system for operating the mattress assembly including the vibrating units. Foam layer **500** includes two vibrating units **502** corresponding to a shoulder region of an end user, two vibrating units **504** corresponding to a back region of an end user, two vibrating units **506** corresponding to a lumbar region of an end user, and four vibrating units **508** corresponding to a leg and foot region of an end user. The vibrating units **502**, **504**, **506**, and **508** in each respective region are generally connected in parallel to a control module **510** to permit independent activation with respect to each region as may be desired by the end user. The control module **510** is connected to a power supply **512**. The control module **510** includes a wireless interface for connection to a control device accessible by the end user. In this manner, the end user can remotely select one or more different regions for a massaging action. In one or more embodiments, the control module communicates with a control device using any well-known or envisioned wireless communication technology, including, for example, Wi-Fi and Bluetooth™ wireless technologies. Exemplary control devices are not intended to be limited and include remote controls, phones, tablets, and the like that can be configured to wirelessly interact with the control module.

[0044] FIG. **6** schematically illustrates an exemplary mattress assembly including a removable mattress topper **600** as previously described including vibrating units at different zones for use with a mattress dimensioned for a single end user, e.g., a twin sized mattress. The different zones generally correspond to a shoulder zone **602**, a back zone **604**, a lumbar zone **606**, and a leg and foot zone **608**, which are in electrical communication with a control module including a wireless transceiver **610**. A power source **612** provides power to the control module and vibrating units. The control module can be configured to provide independent operation of one or more vibrating units or multiple vibrating units within a specific one or more zones, or all vibrating units. A wireless remote control **614** can be used to provide a user interface for selectively operating the vibrating units within the removable mattress topper.

[0045] FIG. **7** schematically illustrates an exemplary mattress assembly including vibrating units configured for use with a mattress dimensioned to accommodate two end users, e.g., king sized mattress, California king sized mattress, queen sized mattress, or the like. As shown, the foam layer includes the vibrating units that can be independently operated by each end user and can be a single layer or two separate side-by-side arranged layers as may be desired for different applications. The left half **702** of the removable mattress topper **700** includes different zones generally correspond to a shoulder zone **722**, a back zone **724**, a lumbar zone **726**, and a leg and foot zone **728**, which are in electrical communication with a control module including a wireless transceiver **720**. A power source **730** provides power to the control module and vibrating units. The control module can be configured to provide independent operation of one or more vibrating units or multiple vibrating units within a specific one or more zones, or all vibrating units. A wireless remote control **732** can be used to provide a user interface for selectively operating the vibrating units within the removable mattress topper **700**. The right half **704** of the removable mattress topper **700** includes different zones generally correspond to a shoulder zone **706**, a back zone **708**, a lumbar zone **710**, and a leg and foot zone **712**, which are in electrical communication with a control module including a wireless transceiver **718**. A power source **714** provides power to the control module and vibrating units. The control module can be configured to provide independent operation of one or more vibrating units or multiple vibrating units within a specific one or more zones, or all vibrating units. A wireless remote control **716** can be used to provide a user interface for selectively operating the vibrat-

ing units within the removable mattress topper. Optionally, the left and right halves of the foam layer can be powered using a single power source.

[0046] During operation, the vibrating units embedded in a foam layer within the removable topper layer can be arranged in zones along a length and width dimension thereof, wherein each zone includes one or more spaced part vibrating units. One or more of the zones can be simultaneously and selectively activated. Alternatively, the one or more spaced apart vibrating units within the zones can be sequentially activated and deactivated to provide, for example, an oscillating effect, which can be repeated for as long as desired.

[0047] This written description uses examples to disclose the invention, including the best mode, and also to enable any person skilled in the art to make and use the invention. The patentable scope of the invention is defined by the claims, and may include other examples that occur to those skilled in the art. Such other examples are intended to be within the scope of the claims if they have structural elements that do not differ from the literal language of the claims, or if they include equivalent structural elements with insubstantial differences from the literal languages of the claims.

What is claimed is:

1. A removable mattress topper comprising:

a first foam layer comprising a plurality of spaced apart vibrating units embedded therein, wherein the vibrating units are in electrical communication with a control module and a power source;

a second foam layer overlying the first foam layer; and

a cover encapsulating the first and second foam layers, the cover comprising a top panel, a bottom panel, and sidewalls extending between the top and bottom panels, wherein the bottom panel comprises a zippered portion extending about at least a portion of a peripheral edge of the bottom panel.

2. The removable mattress topper of claim **1**, wherein the second foam layer comprises a phase change material coated thereon.

3. The removable mattress topper of claim **1**, further comprising one or more additional layers overlying the first foam layer including the vibrating units.

4. The removable mattress topper of claim **1**, wherein the second foam layer comprises a viscoelastic layer.

5. The removable mattress topper of claim **1**, wherein each of the vibrating units is independently actuated.

6. The removable mattress topper of claim **1**, wherein the vibrating units are located in zones corresponding to head and should zone, a back zone, a lumbar zone and a leg and foot zone, wherein each zone comprises one or more vibrating units, and wherein each zone is independently actuated.

7. The removable mattress topper of claim **1**, wherein the control module comprises a wireless transceiver in wireless communication with a control device.

8. The removable mattress topper of claim **1**, wherein the top panel is quilted.

9. The removable mattress topper of claim **7**, wherein the control device comprises a remote control, a phone, a speaker, and combinations thereof.

10. A mattress assembly comprising:

a mattress core assembly comprising a mattress core and a cover encapsulating the mattress core, wherein the cover comprises a top panel and a zippered portion about a peripheral edge of the top panel; and

a removable mattress topper comprising a first foam layer comprising a plurality of spaced apart vibrating units embedded therein, a second foam layer overlying the first foam layer, and a cover encapsulating the first and second foam layers, the cover further comprising a zippered portion extending about at least a portion of a peripheral edge of a bottom panel, wherein the zippered portion is configured for mechanical and releasable engagement with the zippered portion of the mattress core assembly to maintain the removable mattress topper and the mattress core assembly in a fixed relationship.

11. The mattress assembly of claim **10**, wherein the mattress core assembly comprises multiple layers comprising foam layers, coils layers, air bladders, and combinations thereof.

12. The mattress assembly of claim **10**, wherein the second foam layer of the removable mattress topper comprises a phase change material coated thereon.

13. The mattress assembly of claim **10**, wherein the removable mattress topper further comprises one or more additional layers overlying the first foam layer including the vibrating units.

14. The mattress assembly of claim **10**, wherein the second foam layer of the removable mattress topper comprises a viscoelastic layer.

15. The mattress assembly of claim **10**, wherein each of the vibrating units in the removable mattress topper is independently actuated.

16. The mattress assembly of claim **10**, wherein the vibrating units in the removable mattress topper are located in zones corresponding to a head and should zone, a back zone, a lumbar zone and a leg and foot zone, wherein each zone comprises one or more vibrating units, and wherein each zone is independently actuated.

17. The mattress assembly of claim **10**, wherein the control module in the removable mattress topper comprises a wireless transceiver in wireless communication with a control device.

18. The mattress assembly of claim **17**, wherein the control device comprises a remote control, a phone, a speaker, and combinations thereof.

19. A process for operating a removable mattress topper including vibrating units, the process comprising:

securing the removable topper layer on an upper surface of a mattress and providing a power source to the vibrating units, wherein the vibrating units are embedded in a foam layer within the removable topper layer and arranged in zones along a length and width dimension thereof, wherein each zone includes one or more spaced part vibrating units;

activating the one or more spaced apart vibrating units within a selected one or more of the zones.

20. The process of claim **19**, wherein activating the one or more spaced apart vibrating units within the zones comprises sequentially activating and deactivating the zones and repeating the sequence.

21. The process of claim **19**, wherein securing the removable topper layer on the upper surface of the mattress comprises providing the removable topper layer with a cover encapsulating the foam layer, wherein the cover comprises a top panel, a bottom panel, and sidewalls extending

between the top and bottom panels, wherein the bottom panel comprises a zippered portion extending about at least a portion of a peripheral edge and the mattress comprises a top surface comprises a complementary zippered portion at about a portion of a peripheral edge of the top surface and zippering the zippered portions of the mattress and the removable topper layer.

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