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(54) **MATTRESSES WITH REINFORCEMENT
INSERTS AND DENSIFIED STITCH ZONES**

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(76) **Inventors: David Michael Moret,**
Winston-Salem, NC (US); **James A.**
Beamon, Jamestown, NC (US)

(57) **ABSTRACT**

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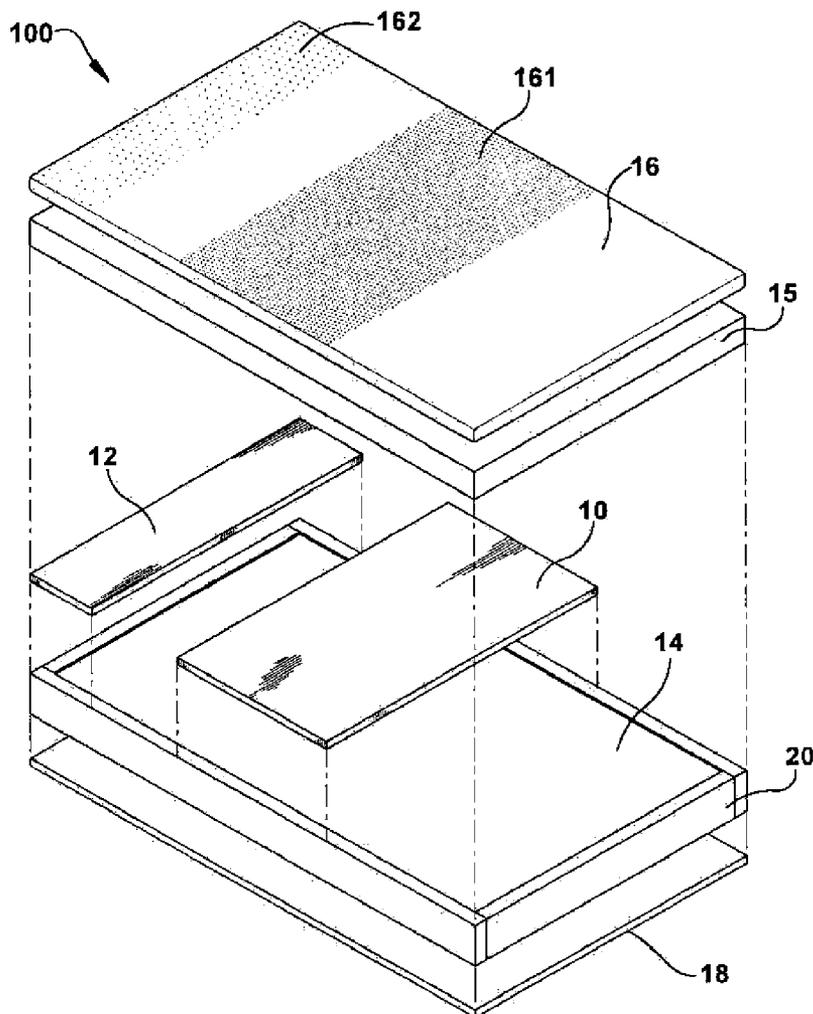
Reinforced mattresses have a mattress core and one or more reinforcement pads located proximate to the mattress core, and corresponding higher density stitch patterns in a quilt package layer which are co-located with the reinforcement pads. The one or more reinforcement pads are located in higher load areas of the mattress such as the pelvic region or head and shoulders region to provide additional support and to resist or prevent permanent indentation of the mattress support surface and provide increased support. In one embodiment, the one or more reinforcement pads have a length that is less than the length of the mattress core and a width that is substantially the width of the mattress core, with corresponding areas in the quilt package layer of higher density stitching. The higher density stitching in those areas of the quilt package layer provide a pre-compressed support structure in combination with the reinforcement pads which provides greater support and pressure distribution and resistance to permanent indentation of the support structure.

Related U.S. Application Data

(63) Continuation-in-part of application No. 12/552,657, filed on Sep. 2, 2009.

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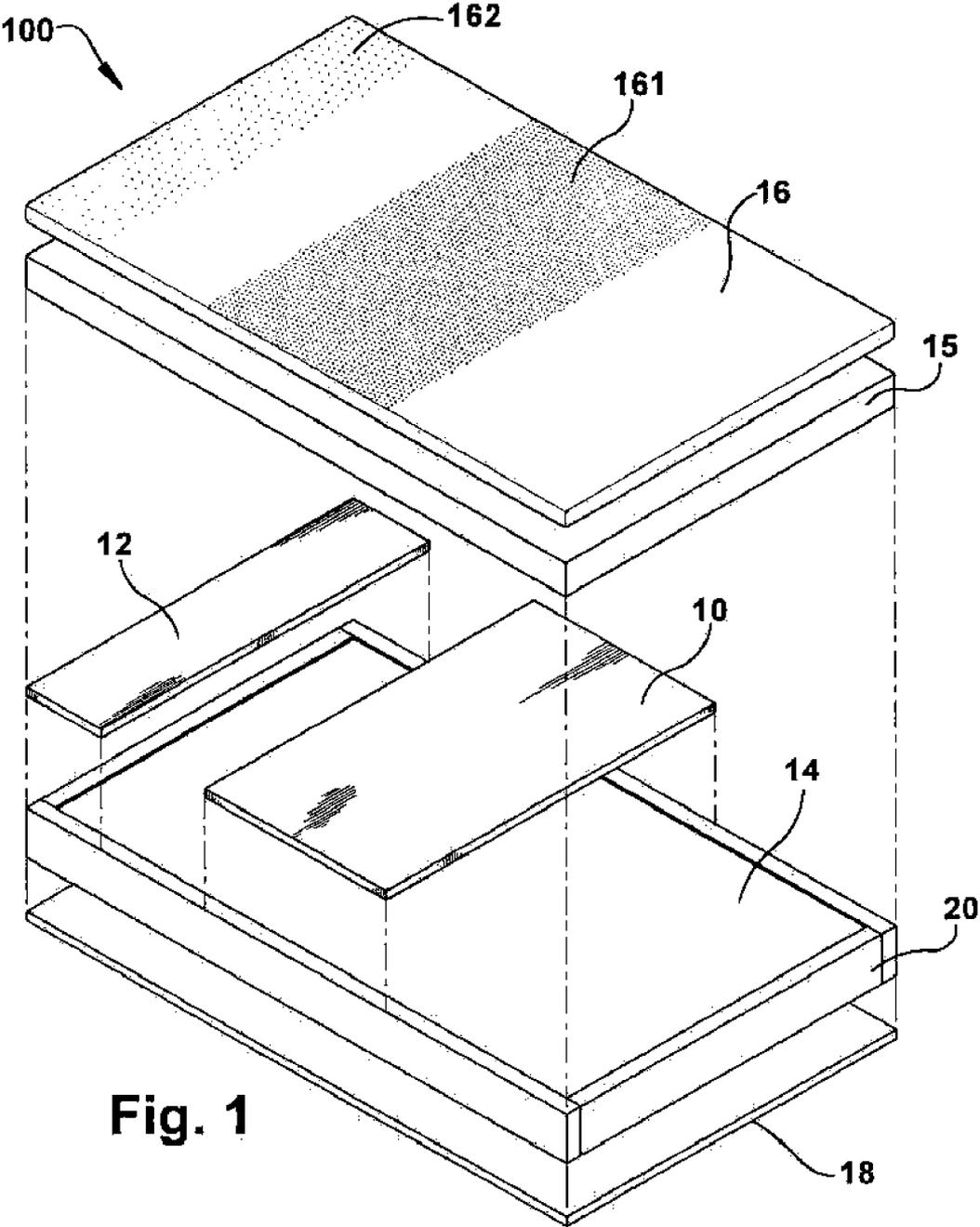


Fig. 1

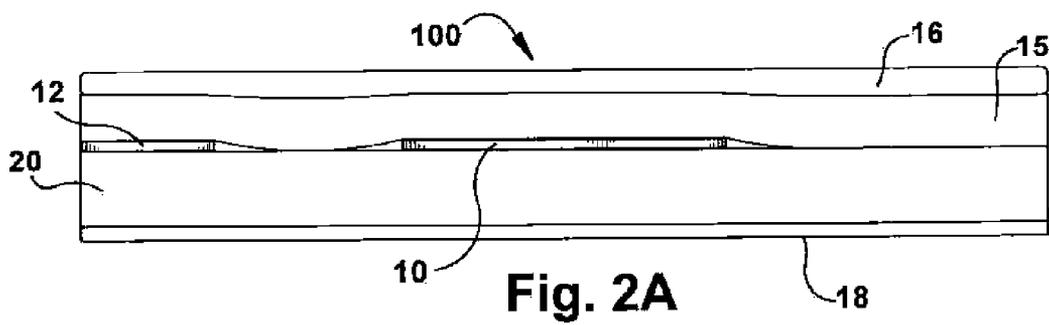


Fig. 2A

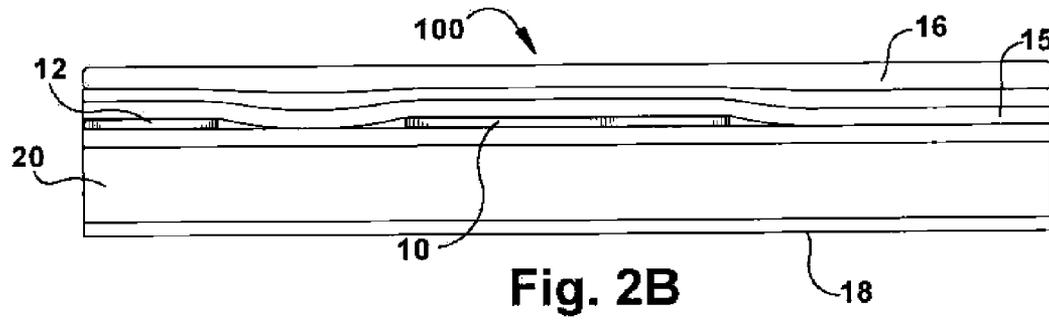


Fig. 2B

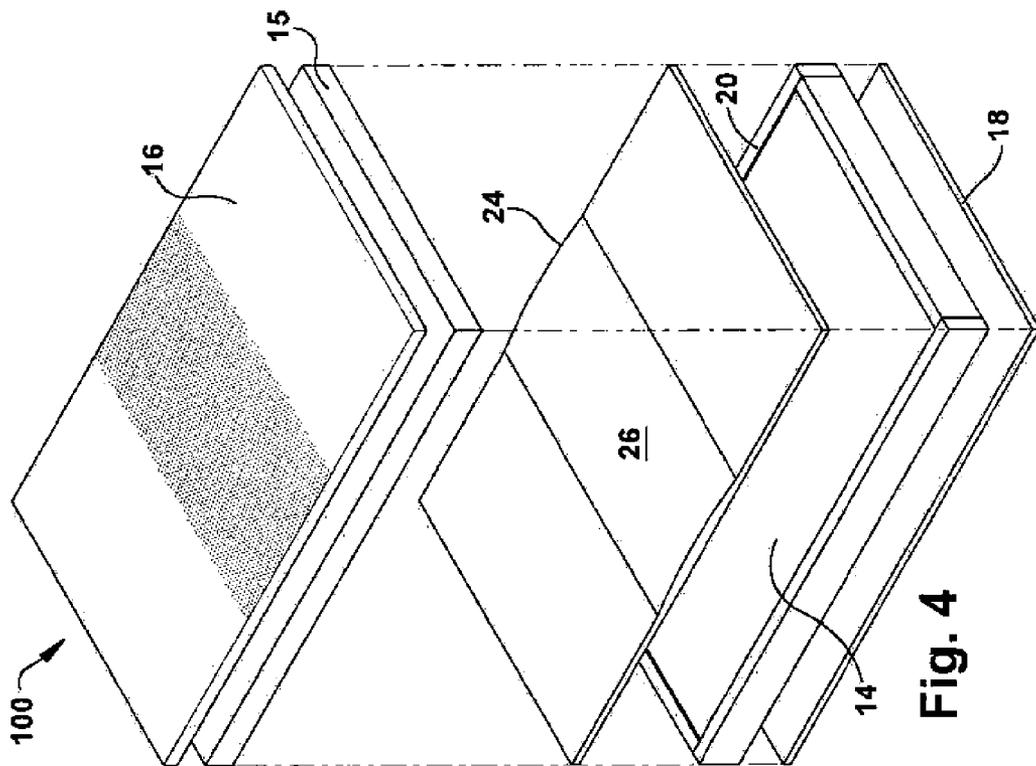


Fig. 4

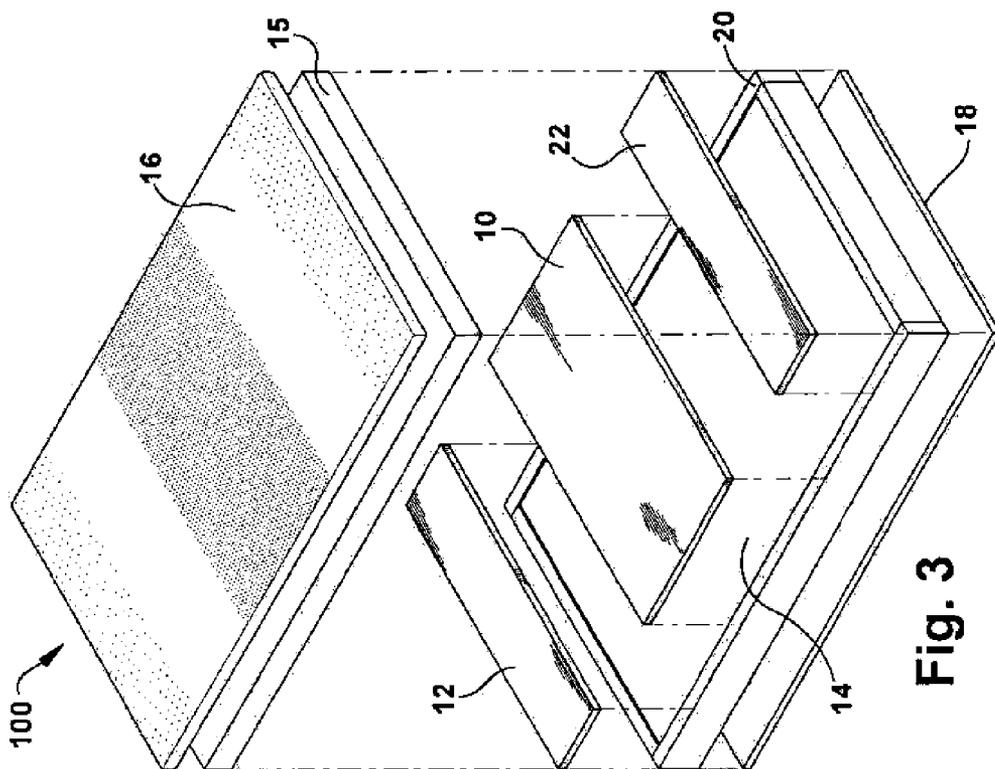


Fig. 3

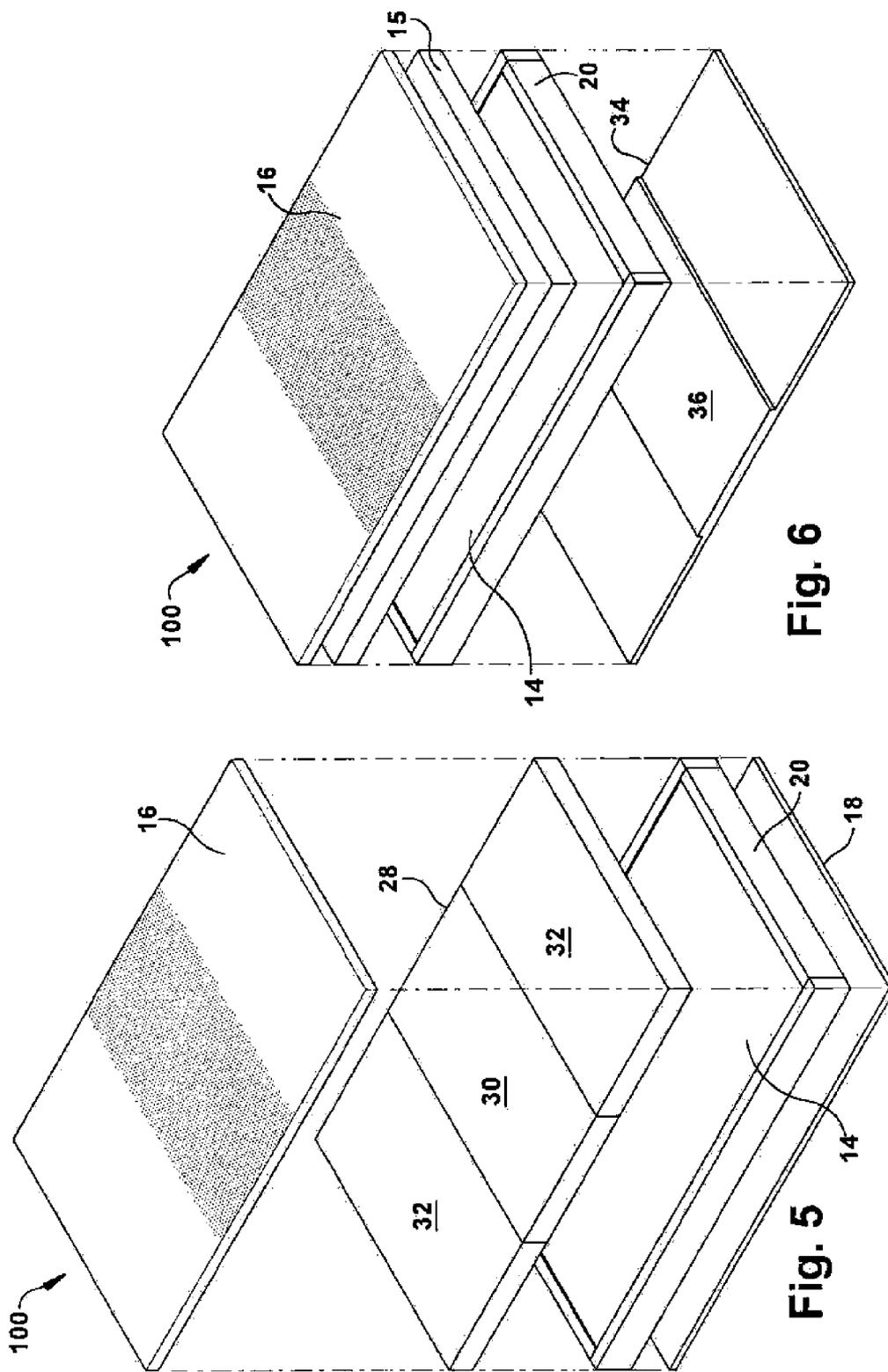


Fig. 6

Fig. 5

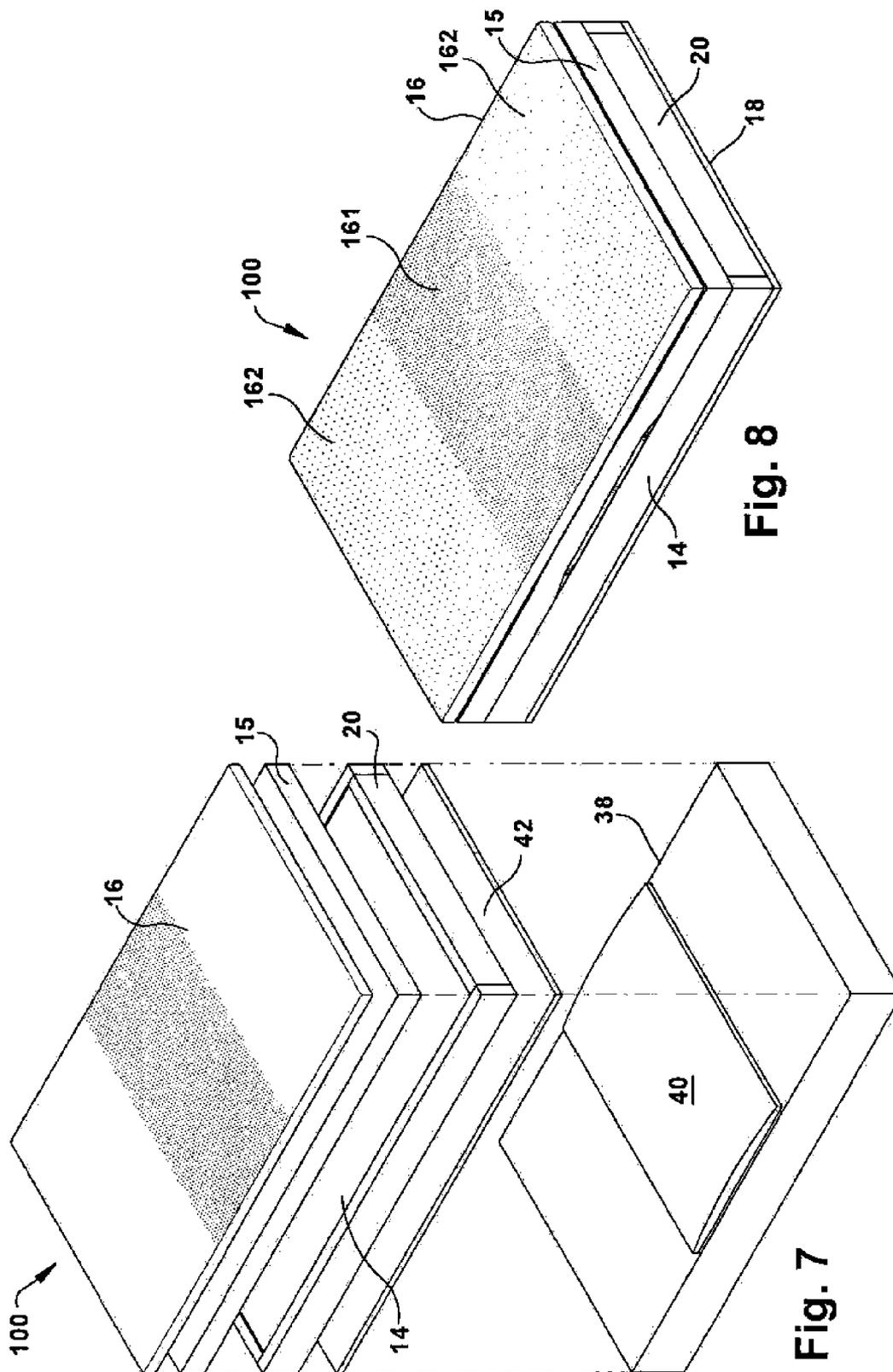


Fig. 8

Fig. 7

MATTRESSES WITH REINFORCEMENT INSERTS AND DENSIFIED STITCH ZONES

RELATED APPLICATIONS

[0001] This application is a continuation-in-part of U.S. patent application Ser. No. 12/552,657 entitled “Surface Impression Removal Technology System” filed on Sep. 9, 2009, which is incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The present invention relates to mattresses, and mattress and foundation sleep systems.

BACKGROUND OF THE INVENTION

[0003] Mattresses have conventionally been constructed with a primary structural support system such as wire springs or “innerspring” which is covered by multiple layers of padding of foam or fiber materials, all of which is enclosed by upholstery or “tick” which is commonly quilt-stitched fabric with a foam or fiber backing. In this type of mattress construction, each primary component is largely homogeneous throughout, and there is no difference in structure in any particular area of the mattress. Because the mass and distribution of the human body varies widely from head to toe, this places substantially more pressure on a mattress in areas such as the pelvic and shoulder regions than in others. This results in a concentration of pressure on those areas of the mattress and over a period of time compresses the structure to a noticeably greater extent than the other areas of the mattress. The relatively recent trend to one-sided mattresses compounds this effect.

[0004] The most prominent area of concentrated and prolonged pressure is in the central region of the mattress between the head and foot ends. The next highest area of loading is the shoulder region. In many mattresses, permanent impressions in the top support surface are visible and perceptible after a relatively short period of use. Some attempts have been made to reinforce the mattress structure in these areas, such as by reinforcement of the innerspring. A particular challenge of such modifications which has not been successfully met is to modify an otherwise homogeneous construction in a particular area or areas while maintaining a uniform feel across the entire support surface of the mattress.

SUMMARY OF THE INVENTION

[0005] The reinforced mattresses of the present disclosure and related inventions include a mattress core, one or more reinforcement pads having a top surface, a bottom surface which is opposite the top surface, and four side surfaces which extend between the top surface and the bottom surface, the bottom surface being in contact with the mattress core. The mattress assembly also includes one or more upholstery layers that are in contact with a top surface of the one or more reinforcement pads and a quilted layer which envelopes the entire mattress assembly. The first reinforcement pad is placed laterally across the width of the mattress core from one side edge to an opposite side edge at approximately the middle 1/3 of the mattress core as measured from a top or head of the mattress to the bottom or foot of the mattress.

[0006] In another aspect of the disclosure and related inventions, reinforced mattress assemblies are disclosed having an innerspring with a top surface and a bottom surface, a first reinforcement pad having a substantially planar top surface

that is opposite a substantially planar bottom surface and four substantially planar side surfaces extending between the top surface and the bottom surface. The first reinforcement pad is positioned above the innerspring and has a width measurement equal to the width of the innerspring and a length that is less than the length of the innerspring. Also included in the mattress assembly is a second reinforcement pad having a substantially planar top surface that is opposite a substantially planar bottom surface and four substantially planar side surfaces extending between the top surface and the bottom surface. The second reinforcement pad is positioned above the innerspring and has a width equal to the width of the innerspring and a length that is less than the length of the innerspring. The mattress assembly also includes one or more upholstery layers and a quilted layer which encloses the entire mattress assembly, a top outer surface thereof having a first quilting pattern and a second quilting pattern, the first quilting pattern located directly above the first and second reinforcement pads.

[0007] In another aspect of the present disclosure and related inventions, a reinforced mattress has an innerspring having a top surface and a bottom surface; a first reinforcement pad having a substantially planar top surface that is opposite a substantially planar bottom surface and four substantially planar side surfaces extending between the top surface and the bottom surface, the first reinforcement pad having a width dimension that is equal to or less than a width of the innerspring and a length dimension that is equal to or less than a length of the innerspring, the first reinforcement pad positioned proximate to the innerspring and spaced from a first end of the innerspring and a second end of the innerspring; one or more upholstery layers positioned over a support surface of the innerspring; a quilt package layer which extends over the one or more upholstery layers and the innerspring and the first reinforcement pad, the quilt package layer having a first stitch pattern and a second stitch pattern, the first stitch pattern having a greater density of stitches than the second stitch pattern, the first stitch pattern in an area of the quilt package layer which overlies the first reinforcement pad, and the second stitch pattern in areas of the quilt package layer which do not overlie the first reinforcement pad.

[0008] These and other aspects of the present disclosure and related inventions are described in detail herein with reference to the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is an exploded view of a preferred embodiment of a reinforced mattress of the present disclosure;

[0010] FIG. 2A is a cross-sectional view the reinforced mattresses of FIG. 1;

[0011] FIG. 2B is a cross-sectional view of an alternate embodiment of a reinforced mattress of the present disclosure;

[0012] FIG. 3 is an exploded view of an alternate embodiment of the reinforced Mattress of FIG. 1 having a foot reinforcement pad;

[0013] FIG. 4 is an exploded view of an alternate embodiment of a reinforced mattress of the present disclosure;

[0014] FIG. 5 is an exploded view of an alternate embodiment of a reinforced mattress of the present disclosure;

[0015] FIG. 6 is an exploded view of an alternate embodiment of a reinforced mattress of the present disclosure;

[0016] FIG. 7 is an exploded view of an alternate embodiment of a reinforced mattress of the present disclosure, and

[0017] FIG. 8 is a perspective assembled view of the reinforced mattress of FIG. 1.

DETAILED DESCRIPTION OF PREFERRED AND ALTERNATE EMBODIMENTS

[0018] A typical mattress assembly includes a rigid base or mattress foundation (also referred to as a “box spring”), a mattress core, one or more insulator pads or layers, mattress upholstery or one or more comfort layers and quilting which extends around and envelops the mattress assembly components. The reinforced mattress assemblies of the present invention and related disclosure include one or more additional layers that are used to reinforce particular areas or regions of the mattress, to provide additional structural support to areas known to undergo relatively higher loading, and to thereby resist indentation or permanent impression from the higher loads.

[0019] In an exemplary embodiment, as shown in FIGS. 1 and 8, a reinforced mattress assembly contains one or more reinforcement pads that reinforce particular areas or regions of the mattress, such as for example the head and/or lumbar regions of the mattress 100. For example, a reinforcement pad 10 can be positioned across the central region of the horizontal surface of the mattress 100, for example in the area of the mattress which bears the distributed weight of the pelvic and lumbar regions. The reinforcement pad 10 extends transversely across the width of the mattress 100 or across the core 14 of the mattress, and can extend across substantially an entire width of the mattress or the core, to each edge of the innerspring or to an extent slightly or substantially less than a total width of the core 14, for example one or more inches from each edge of the core 14. The reinforcement pad 10 has a substantially planar top surface and a substantially planar bottom surface which is opposite the top surface and four substantially planar side surfaces that extend between the top and bottom planar surfaces of the reinforcement pad 10. The reinforcement pad 10 can be made of visco-elastic or memory foam, latex, polyurethane or polyethylene foam or any flexible polymer or fiber material, and could be constructed with one or more layers of any of these materials, and further including a barrier or skin layer on one or both sides of the pad which resists the formation of impressions in the reinforcement pad such as for example from springs underneath the reinforcement pad. The reinforcement pad 10 has a preferred density in a range of approximately 1.0 lbs./in² to 2.0 lbs./in² and a preferred density of approximately 1.5 lb/in². Other materials and densities can also be used which provide the described functions of the reinforcement pads. The thickness of the reinforcement pad 10 is preferably in a range of approximately 0.125 to 0.75 inches, and more preferably in a range of 0.25 to 0.75 inches. The reinforcement pad preferably has a width dimension that is proportional to or the same as the corresponding width for the core 14 of the mattress 100. Preferably the reinforcement pad 10 covers a substantial portion of the width of the mattress 100 or core 14, and has a representative length of approximately 30 inches or shorter or longer in relation the mattress 100 or core 14 and in order to extend over a lumbar region for most adult users of the mattress 100. Also, the reinforcement pads 10 do not necessarily have to be rectangular in shape or symmetrical, and do not have to be of uniform thickness, topography (e.g. planar or undulated or convoluted) or homogeneous in density or hardness. Reinforcement pads 10 with different thickness and length dimensions not expressly disclosed herein are within

the scope of the invention. Since the reinforcement pad 10 preferably extends generally across a substantial width of the mattress 100 or core 14, the pad's width is dependent upon the size of the mattress 100 or innerspring. The horizontal middle one third (113) area of the mattress 100 includes the pelvic and lumbar support areas of the mattress 100. The reinforcement pad or pads 10 located in this area add support to the pelvic and lumbar areas where higher loads and pressure occurs. The reinforcement pad 10 also adds additional resistance to development of body impressions across this portion of the mattress 100, as may otherwise develop in the support surface of the mattress. In this embodiment, the reinforcement pad 10 is located on top of a mattress core 14 and below the upholstery layer or layers 15, and a quilt package layer 16 (sometimes alternatively referred to as a “quilt package”, “quilt layer” or “quilted layer”) which typically includes an outer fabric, a relatively thin foam layer and a non-woven backing layer, and quilt stitching which extends through all three of these layers. The upholstery layers 15 can be one or more layers of cushioning, as shown for example in FIG. 2B, and may include one or more left and/or wicking materials, woven or non-woven and natural or synthetic, such as foam, cotton, wool, animal hair, feathers, etc. The quilt package layer 16 is conventionally a layer of fabric such as woven upholstery fabric which is quilt-stitched with a backing such as a thin layer of foam or other backing material. An insulator pad (not shown) may optionally be placed between the mattress core and the reinforcement pad 10, in which case the reinforcement pad 10 is still considered to be proximate to the mattress core 14. The insulator pad may be, in one embodiment, for example a 5/32-inch thick polyethylene pad that is placed on top of the mattress core 14, for example as a primary insulator between the mattress core 14 and the various layers or the mattress 100. Alternatively, the reinforcement pad 10 can be placed above the upholstery layer(s) 15 and directly below the quilt package layer 16. And as a further alternate embodiment, the reinforcement pad 10 can be located within the upholstery layer 15, or between layers of a multi-layer upholstery layer 15, as shown for example in FIG. 2B.

[0020] In a similar manner, a second reinforcement pad 12 may be provided for example in a region which bears the next greatest amount of pressure in use which is the head and shoulder region, which is generally located at one end of the mattress, for example one quarter of the length of the mattress at the head end, as also shown in FIG. 1. Similarly, a third reinforcement pad may be provided at a foot end of the mattress, or that region of the mattress which bears the weight of the legs which is typically the next or third greatest amount of pressure in use.

[0021] As further shown in FIG. 1, the quilt package layer 16 has an increased material density or higher stitch density in areas which correspond to the locations of the underlying reinforcement pad or pads such as pads 10 and 12. The increased material density in the quilt package layer 16 can be formed in this embodiment by a greater number of quilt-type stitches, such as for example in the form of higher density stitches or stitch patterns 161, 162, in any form, pattern or patterns, and which extend through the upholstery layer or which are in the fabric of the quilt package layer 16. The higher density stitches 161, 162 may be formed in the quilt package layer 16 by a quilting machine or by hand, or be in the fabric of the quilt package layer 16 wherein the fabric would have a greater stitch density or higher stitch count in those

areas or regions which correspond to the location or locations of the reinforcement pads. When formed by a quilting machine, the higher density stitch areas may be in any shape or pattern, such as for example in a matrix of evenly spaced and repeated stitch patterns. The higher density stitches **161**, **162** increase the density of the quilt package layer **16** in the co-located areas of the reinforcement pad or pads, and cooperate with the reinforcement pad(s) to create regions or zones of the mattress which have a higher density of support materials and consequently stronger support characteristics and greater resistance to formation of permanent deformation of body impressions. The higher density stitches **161**, **162** also serve to pre-compress the quilt package layer in those areas which may be elevated and given extra loft by the underlying reinforcement pads **10** and **12** and thereby reduce or eliminate crowning of the mattress support surface. The higher density stitches **161**, **162** also serve to pre-compress those regions of the quilt package layer **16** which correspond in location to the reinforcement pads. This results in a substantially level finish to the top surface of the quilt package layer **16** and the presence of the reinforcement pads is not telegraphed through the various layers of the mattress or through the quilt package layer **16**. The combination and cooperation of the reinforcement pads **10** and **12** with stitches **161**, **162** produces a mattress with increased firmness and support in those areas and which resists permanent indentation or "body impressions" in those areas. In general, the combined structure of the reinforcement pads and the corresponding increased stitch density produces a higher density support with a higher indentation load deflection force than the other areas of the mattress, and which requires a greater force to compress the mattress structure.

[0022] In another embodiment, a head and shoulders region reinforcement pad **12** or "head reinforcement pad" is optionally positioned at one end of the mattress **100** and extends across a substantial portion of the width of the core **14**. The head reinforcement pad **12** has a substantially planar top surface, a substantially planar bottom surface opposite the top surface and four substantially planar side surfaces that extend between the top and bottom surfaces of the head rest pad **12**. The head reinforcement pad **12** can be made of visco-elastic or memory foam, latex, polyurethane or polyethylene foam or any flexible polymer or fiber material, and could be constructed with one or more layers of any of these materials, and further including a barrier or skin layer on one or both sides of the pad which resists the formation of impressions in the reinforcement pad such as for example from springs underneath the reinforcement pad. The head reinforcement pad **12** has a preferred density in a range of approximately 1.0 lbs./in² to 2.0 lbs./in² and a preferred density of approximately 1.5 lb/in². Other materials and densities can also be used which provide the described functions of the reinforcement pads. The thickness of the head reinforcement pad **12** is preferably in a range of approximately 0.125 to 0.75 inches, and more preferably in a range of 0.25 to 0.75 inches. The head reinforcement pad **12** has a width dimension that is proportional to, less than, or the same as the corresponding width for the core **14** of the mattress **100**. The thickness of the head reinforcement pad **12** rest is preferably between approximately 0.5 and 0.75 inches with a width that is dependent upon the size of the mattress. The length of the head reinforcement pad **12** is in a representative embodiment approximately 10 inches, although different thickness and length measurements and in proportion to the size of the mattress are within

the scope of the invention. The head reinforcement pad **12** may be the same as pad **10**, or of lesser or greater density, or of a different material or materials than pad **10**. The head reinforcement pad **12** gives added support to a user's head, neck and shoulder area, distributes pressures more evenly, and resists permanent indentation. Within the mattress assembly, the head reinforcement pad **12** is positioned on top of the mattress core **14** and below the upholstery or comfort **15** and quilt package layer **16**. An optional insulator pad may be placed between the head reinforcement pad **12** and the mattress core **14**.

[0023] In addition to the two reinforcement pads **10**, **12** described above, an optional or additional foot reinforcement pad (hereinafter referred to as "foot reinforcement pad") **22** can be positioned at the bottom of the mattress **100** and extend transversely across the width of the mattress **100**, across a substantial amount of the width of the core **14** although preferably not the entire width of the core. The foot reinforcement pad **22** is located in the foot region of the mattress which generally experiences the next concentration of loads. The foot reinforcement pad **22** may be the same as the other pads **10**, **12** or of lesser or greater density, or of a different material or materials than pads **10** or **12**. A length of the foot reinforcement pad **22** can be substantially the same as the head reinforcement pad **12**, which then allows the mattress **100** to be rotated 180 degrees without changing the overall support characteristics of the mattress. In such case the foot reinforcement pad **22** would be the same as or substantially the same as the head rest **12**, as described above.

[0024] In another embodiment, shown in FIG. 4, the reinforced mattress assembly contains at least one additional reinforcement pad **24** having one or more raised areas **26** which provide additional support to certain areas of the mattress **100**. For example, as shown in FIG. 4, the pad **24** may have at least one raised area **26** for example in a central region of the pad **24** which corresponds to area of the mattress **100** that supports the pelvic and lumbar areas. This raised area **26** provides additional support to the pelvic, back and lumbar region and also adds additional padding and support to prevent body impressions in this area of the mattress **100**. The pad **24** may additionally contain a raised area **26** at the head and/foot ends of the mattress **100** similar to reinforcement pads **12** and **22** as described. The pad **24** may span substantially the entire length and width of the mattress **100** or may have length and width measurements that are less than the length and width of the mattress core **14**. The pad **24** is positioned within the mattress assembly between the mattress core **14** and the one or more upholstery **15** and quilting **16** layers, or can alternatively be located underneath the mattress core **14**. The raised areas of the pad such as area **26** may be formed integrally with or as part of the pad **24**, or may be a separate layer of component which is positioned over and/or fastened or adhered to pad **24**.

[0025] In another embodiment, shown in FIG. 5, a reinforced mattress assembly of the present disclosure and related inventions may contain a zoned upholstery component **28** which includes a center zone **30** and two end zones **32**. The center zone **30**, which is approximately located at the horizontal center $\frac{1}{3}$ of the mattress **100**, may be made of a material or materials that differs from the material or materials of the two end zones **32**, such as for example foams or other materials of different types and/or densities, or may contain the same type of foam but with different foam attributes, such as for example differing density or Indentation Load Deflec-

tion (ILD), for example of greater density and higher ILD than the adjoining end zones **32**, or differing dimensional attributes such as sculpting, convolutions, perforations or slits. The attributes of the center zone **30** preferably provide a firmer or more supportive area—for the pelvic and lumbar support regions of the mattress **100**—than the two end zones **32**. The pad **28** may span substantially the entire length and width of the mattress **100** or may have length and width measurements that are less than the length and width measurements of the mattress **100**. The pad **28** is located within the mattress assembly between the mattress core **14** and the quilt **16** layer. The quilt package layer **16** has an area of higher density stitches **161** which correspond in location to the higher or highest density or firmer or firmest material of the pad **28**.

[0026] In still another embodiment, shown in FIG. 6, the reinforced mattress assembly may contain a base reinforcement pad **34** that is placed at the base of the mattress assembly (hereinafter referred to as “base pad”), below the mattress core **14**. This base pad **34** may contain one or more raised areas **36** which may be, for example, across the horizontal center $\frac{1}{3}$ of the mattress **100** and at the head of the mattress **100** to provide extra support to the pelvic and lumbar regions and to prevent body impressions from developing in those areas. The base pad **34** may contain length and width measurements that are equal to or less than the length and width dimensions of the mattress core **14**. The quilt package layer **16** has an area of higher density stitches **161** which correspond in location to the raised area or areas **36** or the base reinforcement pad **34**.

[0027] In yet another embodiment, shown in FIG. 7, a reinforced mattress assembly of the present invention may contain a foundation reinforcement pad **40** which is located on top of the mattress foundation **38** (hereinafter referred to as “foundation pad” and synonymous with “first reinforcement pad” such as pads **10**, **26** and **36** as described). The foundation reinforcement pad **40** creates a raised area between the mattress foundation **38** and a mattress bottom pad **42**. The mattress bottom pad **42**, and/or the bottom of the mattress core **14**, can be configured with an opening therein to receive the raised or projecting profile of the foundation reinforcement pad **40** which protrudes into the bottom of the mattress core **14**. The mattress bottom pad **42** is located between the mattress foundation **38** and the mattress core **14**. In an alternate construction the mattress bottom pad **42** is excluded, in which case the foundation reinforcement pad **40** protrudes directly into the mattress core **14**. The foundation pad **40** may be positioned in a central region of the mattress **100** to reinforce the pelvic and lumbar areas of the mattress **100**, or the foundation pad **40** may be placed at any location between the head and foot of the mattress **100**, or there may be multiple foundation pads **40** located on the foundation **38**. The higher density stitching **161** in quilt package layer **16** is preferably of greater density in the area or areas overlying the foundation pad(s) **38** as with the previously described embodiments, to provide the same or similar combination of increased support and density which provides more even distribution of pressure and resistance to permanent deformation.

[0028] While the raised areas of the pad described in the previous embodiments are described as corresponding to the head/neck and lumbar regions of the mattress, the raised areas may be located anywhere from head to foot of the mattress. The raised areas may be achieved by a mechanical device or assembly to allow for adjustability both vertically and later-

ally (head to foot). This includes pneumatic and fluid mediums. The raised areas may alternatively be achieved by materials including, but not limited to: polyethylene foam; polyurethane foam; visco-elastic (memory) foam; latex foam; wood; rubber; fibers; cardboard; cloth/ticking; blended fabrics; and hard polymers (nylon, delrin, etc.).

[0029] The upholstery or comfort layers **15** of the mattress assembly of the present invention include one or more foam layers that are placed above the one or more reinforcement pads, as described above, and below the quilted package layer **16**. The comfort layers **15** can include anywhere from one to five foam layers of the same or different types of foam. In one embodiment, the comfort layer is comprised of one layer of regular or super soft polyurethane foam ranging from 1 inch to 3 inches in thickness and ranging in density from 1.10 lbs/ft³ to 1.135 lbs/ft³. In another embodiment, the comfort layers are comprised of two foam layers that are made of either regular or super soft polyurethane foam, visco-elastic foam or a combination thereof. Each of the two layers ranges in thickness from 1 inch to 3 inches and each layer range in density from 1.10 lb/ft³ to 2.5 lbs/ft³. In still another embodiment, the comfort layers are comprised of three foam layers that can be regular, super soft or high performance polyurethane, visco-elastic or a combination thereof. Each of the three layers ranges in thickness from 1 to 3 inches and range in density from 1.10 lb/ft³ to 1.45 lb/ft³. In still another embodiment, the comfort layers are comprised of four foam layers that can be regular, super soft, or high performance polyurethane, visco-elastic or latex. Each of the four layers ranges in thickness from 1 to 3 inches and range in density from 1.10 lb/ft³ to 1.45 lb/ft³. In yet another embodiment, the comfort layers are comprised of five foam layers that can be regular, super soft, or high performance polyurethane, visco-elastic or latex. Each of the five layers ranges in thickness from 1 to 3 inches and range in density from 1.10 lb/ft³ to 1.45 lb/ft³. In each of the embodiments described herein, the foam may be crushed or pre-compressed during the manufacturing process or before or after being sliced into layers. This process, which breaks some of the interstitial bonds in the foam material network causes the foam layers to have less of a change in ILD or less change in feel of the mattress as it is repeatedly compressed over time. Also, with regard to the comfort layer(s) **15**, a layer or inner panel of fabric may be placed between the various layers of the comfort or upholstery layers, or one or more fabric layers may be placed between the mattress and the pillow top.

[0030] A mattress core **14** provides a distributed, generally homogenous reflexive support system to provide underlying support for the mattress. In the present invention, the mattress core **14** may be, in one embodiment, an innerspring having a plurality of interconnected spring elements or coils. The springs elements are arranged in rows and columns, each spring having a body with a first end and a second end, the body of each coil being generally cylindrical and having a longitudinal axis and an outer diameter, the springs being spaced apart in the rows and columns and connected together in a spaced apart arrangement with each spring being spaced from each other spring in the array. The coils may be connected or laced together using helical lacing wires. In another embodiment, the coils may be placed in individual pockets of fabric and sewn or bonded together.

[0031] In an alternate embodiment, a foam support core can be used in place of an innerspring as the mattress core. A foam support core may consist of a single monolithic piece of foam

or may contain multiple foam layers of one or multiple types of foam such as polyurethane, visco-elastic or latex foam. The foam layers may be made of different types of foam having different densities and thickness measurements. Each of the described mattress constructions can be implemented with a foam core or an innerspring core.

[0032] An optional edge support system **20** may also be used to increased support the perimeter of the innerspring. In one embodiment, a mattress foundation perimeter structure **20** is made of one or more foam square or rectangular shaped three-dimensional components which extend from a frame of the foundation to a border wire of the foundation. The from components of the perimeter structure **20** have at least some attributes of structural rigidity, flexure and resilience which cooperates with movement or deflection of the border wire and/or the grid. In another embodiment, the perimeter wall structure **20** is made of foam or other compressible material, and can be formed as a single molded structure which fits at the perimeter of a mattress core **14** and extends from the frame to the grid of the mattress foundation **18**. In another embodiment, the inner wall of the perimeter structure **20** contains fingers which extend out into the innerspring and mechanically engage the coils located along the outer edge or perimeter of the innerspring. In yet another embodiment, the inner wall of the perimeter structure **20** may contain a scalloped shape so that portions of the perimeter structure **20** do not extend into the coils, but fill in the space between each of the coils in the innerspring. In still another embodiment, the edge support system **20** includes a substantially planar base pad that is placed below the innerspring. This base pad extends beyond the length and width of the innerspring and contains a narrow pre-formed slit or opening at each of the four corners of the pad. The slit or opening at each corner allows the excess material to be folded in an upward direction, thereby enveloping the perimeter of the innerspring.

[0033] In addition to the optional mattress edge support system **20**, as described above, various foam inserts may also be used in combination with a mattress innerspring to provide additional support and to soften the feel of the innerspring. For example, individual foam inserts may be placed between the convolutions of certain coils to provide additional support in areas of the mattress that are heavily used or where the most pressure is concentrated. Alternatively, foam inserts may be placed in the space between individual coils of the innerspring.

[0034] In a preferred embodiment, the reinforced mattress assembly of the present invention includes a quilt package layer **16** which incorporates zoned stitching, i.e., areas of greater stitch density, as shown for example in FIGS. **1** and **8**, wherein zones of relatively higher density of stitch density are formed in the quilt package layer **16** in areas or regions which correspond with the underlying reinforcement pad or pads. As used herein, "zoned stitching" or "zoned quilting" refers to the different densities or patterns of stitches or the amount of space between individual stitches in certain areas of the quilt package layer **16**. When in the form of quilt stitches, the higher density stitches may extend entirely through the upholstery layer, or from the top surface of the mattress to one or more of the underlying layers. Additional density in those areas may also be in the fabric material of the tick fabric, where additional yarns are added, or the yarn density is increased through the woven or knit pattern of the fabric. Adding additional stitches or creating a more densely arranged pattern in certain areas of the outer top surface of the

mattress creates zones which are firmer and more compressed than the other areas containing fewer stitches or a more openly spaced stitch pattern. Higher stitch density in the quilt package layer can also be achieved by tufting which extends through the quilt package layer and compresses the layers together. Tufting can be in the form of stitches or repeated stitch patterns or designs, or twine or string or tape which extends through the quilt package layer. The zoned quilting selectively pre-compresses areas of the mattress beneath which one or more reinforcement pads are positioned, such as for example, the reinforcement pad in the central and/or head and/or foot regions of the mattress as described. The additional foam components may cause these areas to be elevated with relation to the other areas of the mattress that don't include the extra foam layers while the reinforcement padding raises the elevation of those portions of the mattress, the zoned quilting selectively compresses those same areas or regions, thereby creating relatively more dense area and an even or level top surface in the quilt package layer of the mattress, and providing built in resistance to any permanent indentation of those areas as may otherwise occur in a homogeneous mattress construction. The color or pattern of the quilt stitching or outer fabric of the quilt package layer may be varied by zone so that a user may visually identify the areas of the mattress that are reinforced or that provide additional foam padding. Zone quilting may be used in combination with any of the additional foam reinforcement pads, as described above.

[0035] It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly described. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive. Other features and aspects of this invention will be appreciated by those skilled in the art upon reading and comprehending this disclosure. Such features, aspects, and expected variations and modifications of the reported results and examples are clearly within the scope of the invention where the invention is limited solely by the scope of the following claims.

What is claimed is:

1. A mattress comprising:

- a mattress core;
- one or more reinforcement pads having a top surface, a bottom surface which is opposite the top surface and four side surfaces which extend between the top surface and the bottom surface, the bottom surface positioned proximate to the mattress core;
- one or more upholstery layers in contact with the top surface of the one or more reinforcement pads;
- a quilt package layer which substantially covers the upholstery layers and the mattress core;
- a first reinforcement pad positioned to extend transverse of the mattress core proximate to a middle region of the mattress core of the mattress assembly, and
- an area of the quilt package layer which overlies and substantially corresponds in location to the first reinforcement pad having a greater density of stitches than a stitch density of other areas of the quilt package layer.

2. The mattress of claim **1**, further comprising a second reinforcement pad positioned to extend transversely across a width of the mattress core and spaced from the first reinforcement pad, and a second area of the quilt package layer which

overlies and substantially corresponds in location with the second reinforcement pad having a greater density of stitches than a stitch density of other areas of the quilt package layer and a substantially similar stitch density to the area of the quilt package layer which overlies the first reinforcement pad.

3. The mattress of claim 1, wherein the quilt package layer on a top surface of the mattress assembly contains a stitch pattern over an area of the mattress where the first reinforcement pad is located that is different from a stitch pattern in a remainder of the quilt package layer.

4. The mattress of claim 2, wherein the quilt package layer on a top surface of the mattress assembly contains a stitch pattern over areas of the mattress where the first and second reinforcement pads are located that is different than a stitch pattern in a remainder of the quilt package layer.

5. The mattress of claim 1, wherein the one or more reinforcement pads have a thickness dimension in an approximate range of 0.5 to 0.75 inches.

6. The mattress of claim 1, wherein the one or more reinforcement pads are made of visco-elastic foam.

7. The mattress of claim 6, wherein the one or more reinforcement pads have a density of approximately 1.5 lb/in².

8. The mattress of claim 1, wherein the length of the first reinforcement pad is approximately 30 inches.

9. The mattress of claim 2, wherein the height of the second reinforcement pad is approximately 10 inches.

10. The mattress of claim 1 wherein the mattress core is an innerspring assembly.

11. The mattress of claim 1 wherein the mattress core is comprised of foam.

12. The mattress of claim 1 further including an edge support system located along the perimeter of the mattress core.

13. The mattress of claim 10 further including one or more foam constructs located between the convolutions of one or more coils of the innerspring.

14. The mattress of claim 3, wherein stitch pattern in the quilt package layer which overlies the first reinforcement pad is made with thread of a different color than in a remainder of the quilt package layer.

15. The mattress of claim 2 further comprising a third reinforcement pad positioned to extend laterally across a width of the mattress core and spaced from the first reinforcement pad and the second reinforcement pad.

16. The mattress of claim 15 further comprising a stitch pattern in an area of the quilt package layer which overlies the third reinforcement pad which is different than a stitch pattern in areas of the quilt package layer which do not overlie the first, second or third reinforcement pads.

17. The mattress of claim 16 wherein the stitch pattern in the areas of the quilt package layer which overlie the first, second and third reinforcement pads is in a common location.

18. The mattress of claim 1 further comprising a resilient pad which is aligned with and proximate to substantially the entire mattress core.

19. The mattress of claim 1 wherein the first reinforcement pad is positioned on top of or extends from a resilient pad which is aligned with substantially the entire mattress core.

20. The mattress of claim 1 wherein the first reinforcement pad is located on top of the mattress core.

21. The mattress of claim 1 wherein the first reinforcement pad is located under the mattress core.

22. The mattress of claim 1 further comprising a bottom pad which extends over substantially an entire bottom surface

of the mattress core, and the first reinforcement pad located between the bottom pad and the mattress core.

23. The mattress of claim 2 wherein the second reinforcement pad is located on top of the mattress core.

24. The mattress of claim 2 wherein the second reinforcement pad is located under the mattress core.

25. The mattress of claim 2 wherein the second reinforcement pad is located at a head region of the mattress.

26. The mattress of claim 1 wherein the first reinforcement pad is located approximately one third of a length of the mattress from a foot end of the mattress, and approximately one third of the length of the mattress from a head end of the mattress.

27. A mattress comprising:

an innerspring having a top surface and a bottom surface;

a first reinforcement pad having a substantially planar top surface that is opposite a substantially planar bottom surface and four substantially planar side surfaces extending between the top surface and the bottom surface, the first reinforcement pad having a width dimension that is equal to or less than a width of the innerspring and a length dimension that is equal to or less than a length of the innerspring, the first reinforcement pad positioned proximate to the innerspring and spaced from a first end of the innerspring and a second end of the innerspring;

one or more upholstery layers positioned over a support surface of the innerspring;

a quilt package layer which extends over the one or more upholstery layers and the innerspring and the first reinforcement pad, the quilt package layer having a first stitch pattern and a second stitch pattern, the first stitch pattern having a greater density of stitches than the second stitch pattern, the first stitch pattern in an area of the quilt package layer which overlies the first reinforcement pad, and the second stitch pattern in areas of the quilt package layer which do not overlie the first reinforcement pad.

28. The mattress of claim 27 further comprising a second reinforcement pad having a substantially planar top surface that is opposite a substantially planar bottom surface and four substantially planar side surfaces extending between the top surface and the bottom surface, the second reinforcement pad having a width dimension less than or equal to a width of the innerspring and a length dimension that is less than a length of the innerspring and less than the length dimension of the first reinforcement pad, the second reinforcement pad positioned proximate to the innerspring and spaced from the first reinforcement pad;

the first stitch pattern of the quilt package layer in an area of the quilt package layer which overlies the first reinforcement pad and the second reinforcement pad, and the second stitch pattern of the quilt package layer in areas of the quilt package layer which do not overlie the first reinforcement pad or the second reinforcement pad.

29. The mattress of claim 28, wherein the first and second reinforcement pads are made of visco-elastic foam, polyurethane or latex.

30. The mattress of claim 27 wherein a the first reinforcement pad is located approximately one-third a length of the innerspring from a first end of the innerspring and approximately one-third a length of the innerspring from a second end of the innerspring which is opposite the first end of the innerspring.

31. The mattress of claim **27** wherein the first stitch pattern is a different color than the second stitch pattern.

32. The mattress of claim **27** wherein the quilt package layer is compressed by the first stitch pattern to a greater extent than by the second stitch pattern.

33. The mattress of claim **27** further comprising a foam edge supports positioned about a perimeter of the innerspring.

34. A mattress comprising:

a mattress core;

one or more upholstery layers proximate to the mattress core;

a quilt package layer positioned over the mattress core and the one or more upholstery layers;

at least one reinforcement pad positioned proximate to the mattress core;

the quilt package layer having an area of higher stitch density located over a support surface of the mattress wherein the area of higher stitch density is greater than a stitch density in a remainder of the quilt package layer, and wherein the area of higher stitch density in the quilt package layer is located over the at least one reinforcement pad.

35. The mattress of claim **34** wherein the at least one reinforcement pad is located on a top surface of the mattress core.

36. The mattress of claim **34** wherein the at least one reinforcement pad is located under the mattress core.

37. The mattress of claim **34** wherein the at least one reinforcement pad is located between upholstery layers.

38. The mattress of claim **34** wherein the at least one reinforcement pad is located with the upholstery layer.

39. The mattress of claim **34** wherein the area of the quilt package layer which is located over the at least one reinforcement pad is of a different color than other areas of the quilt package layer.

40. The mattress of claim **34** in combination with a foundation which underlies and supports the mattress, and wherein the at least one reinforcement pad is proximate to the foundation.

41. The mattress of claim **34** wherein the higher stitch density in the quilt package layer is comprised of tufting.

42. The mattress of claim **41** wherein the tufting is comprised of tufting twine or tufting tape.

43. The mattress of claim **34** wherein at least one of the upholstery layers is made of foam which has been pre-compressed.

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