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(54) **STACKABLE BEDDING FOUNDATION
HAVING POCKETED TOPPER**

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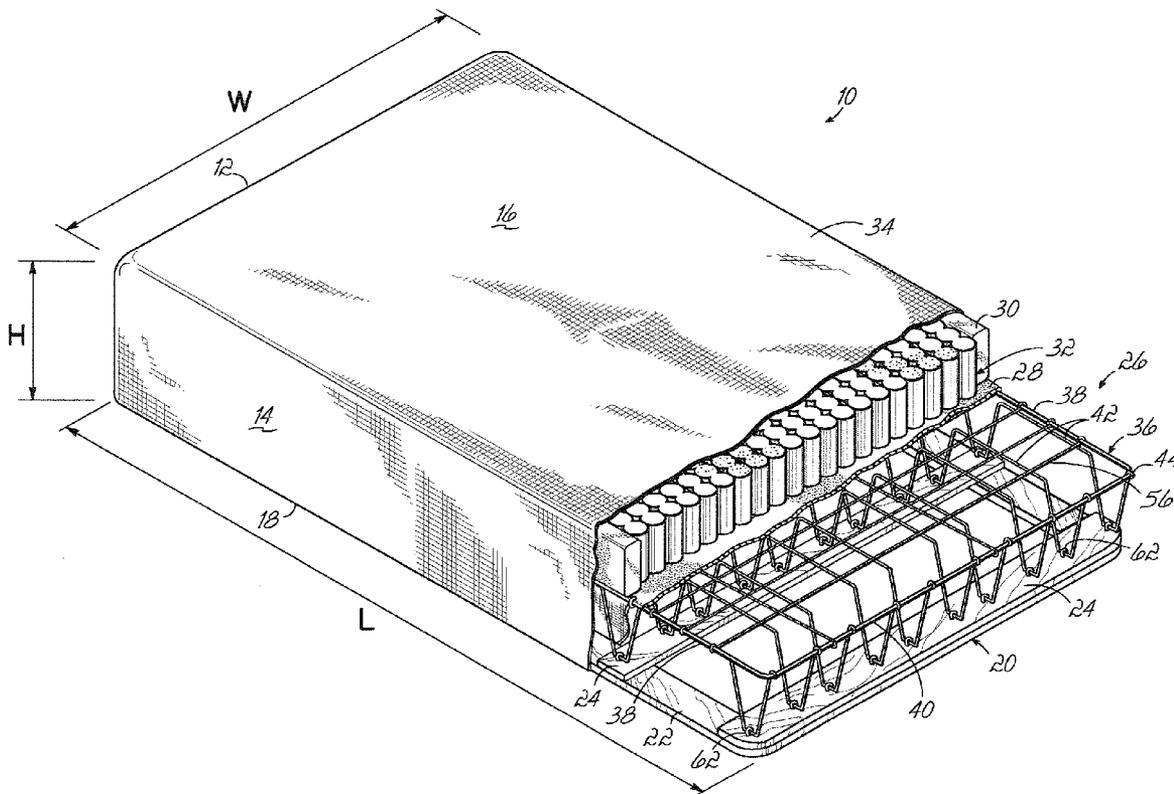
(57) **ABSTRACT**

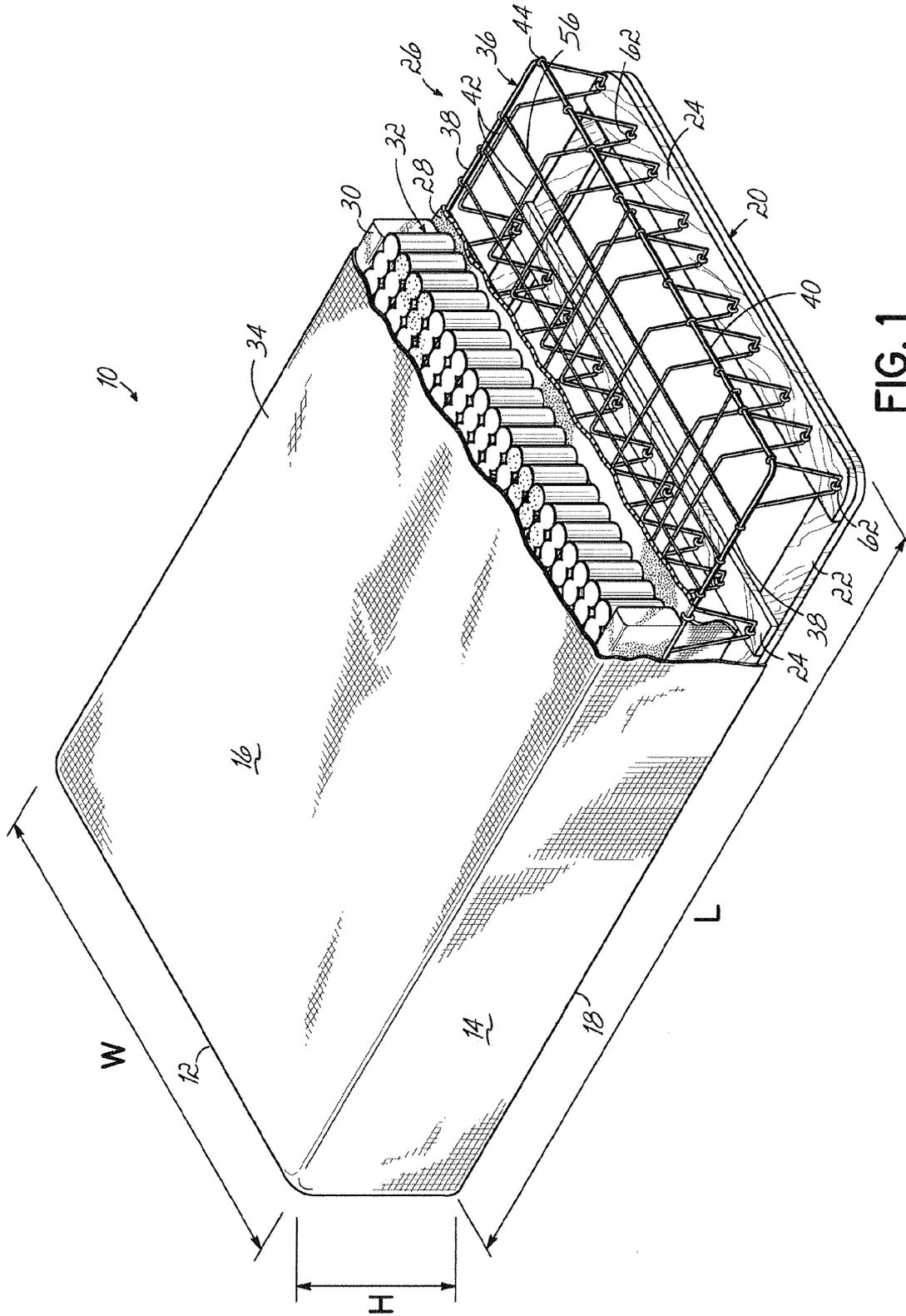
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A nestably stackable spring assembly is incorporated into a bedding foundation. The foundation includes a pocketed spring assembly which functions as a cushioning layer, thereby providing additional comfort. The spring assembly includes a number of corrugated support wires having alternating flattened peaks and valleys. The pocketed spring assembly fits inside a border which provides edge firmness to the foundation.

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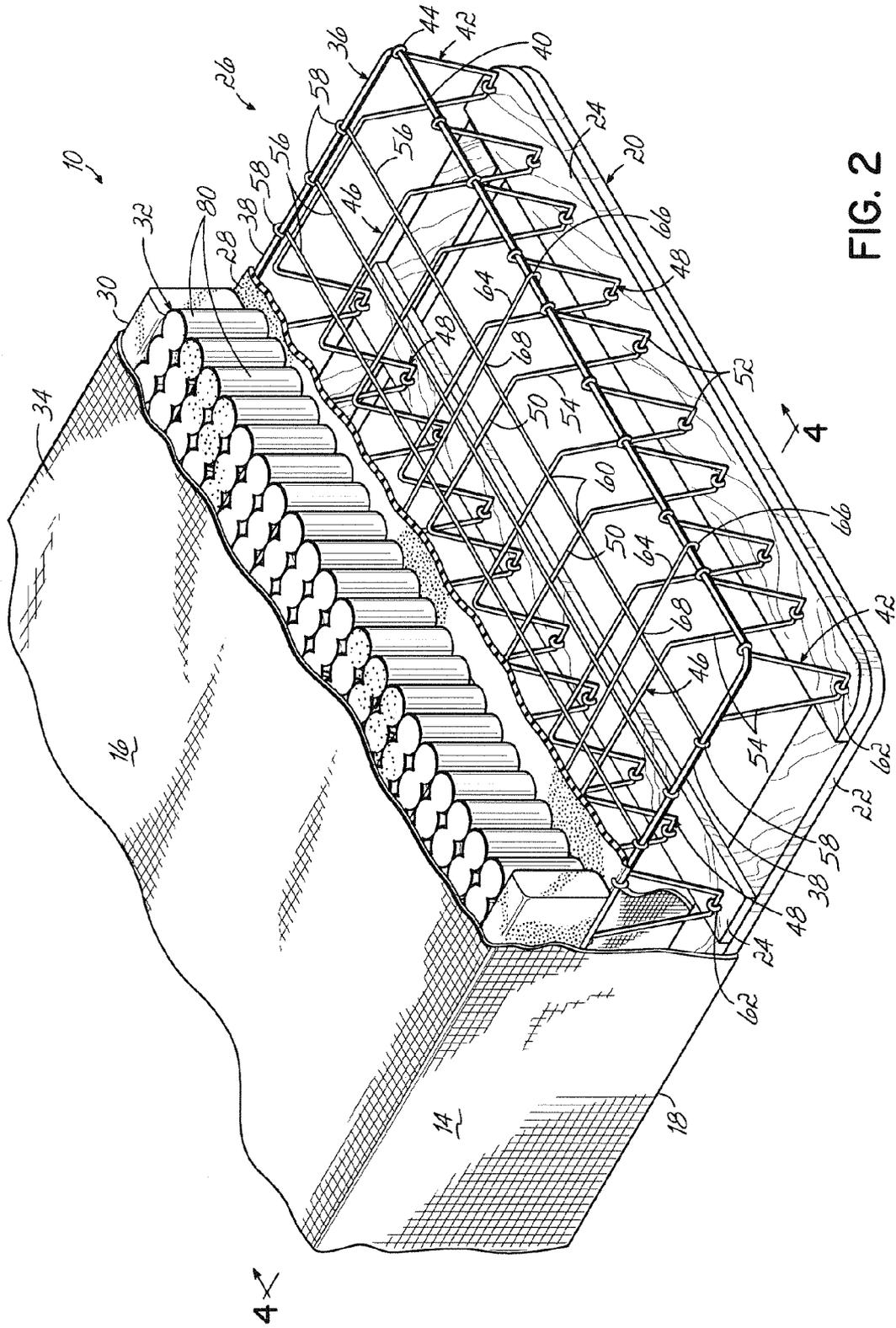


FIG. 2

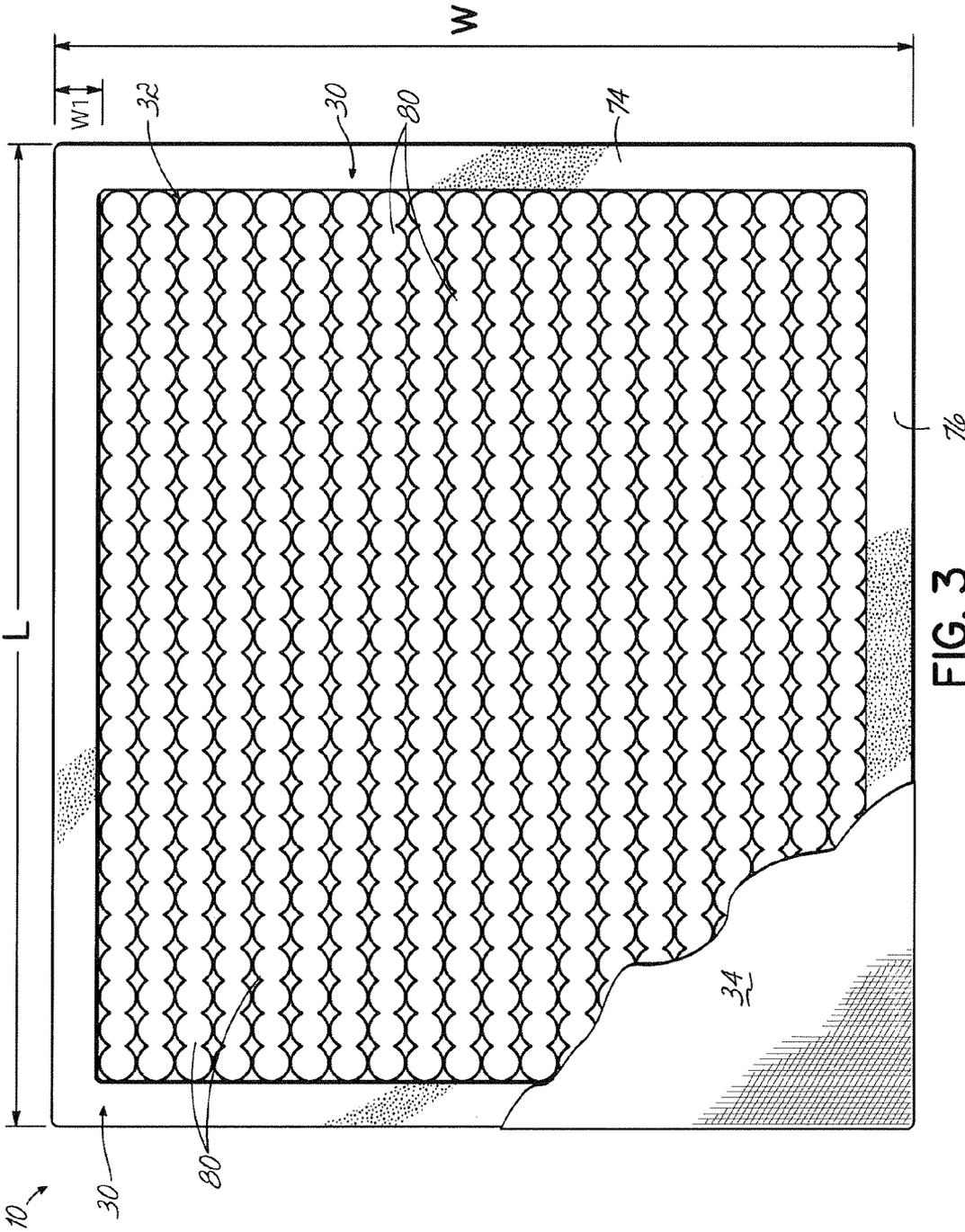


FIG. 3

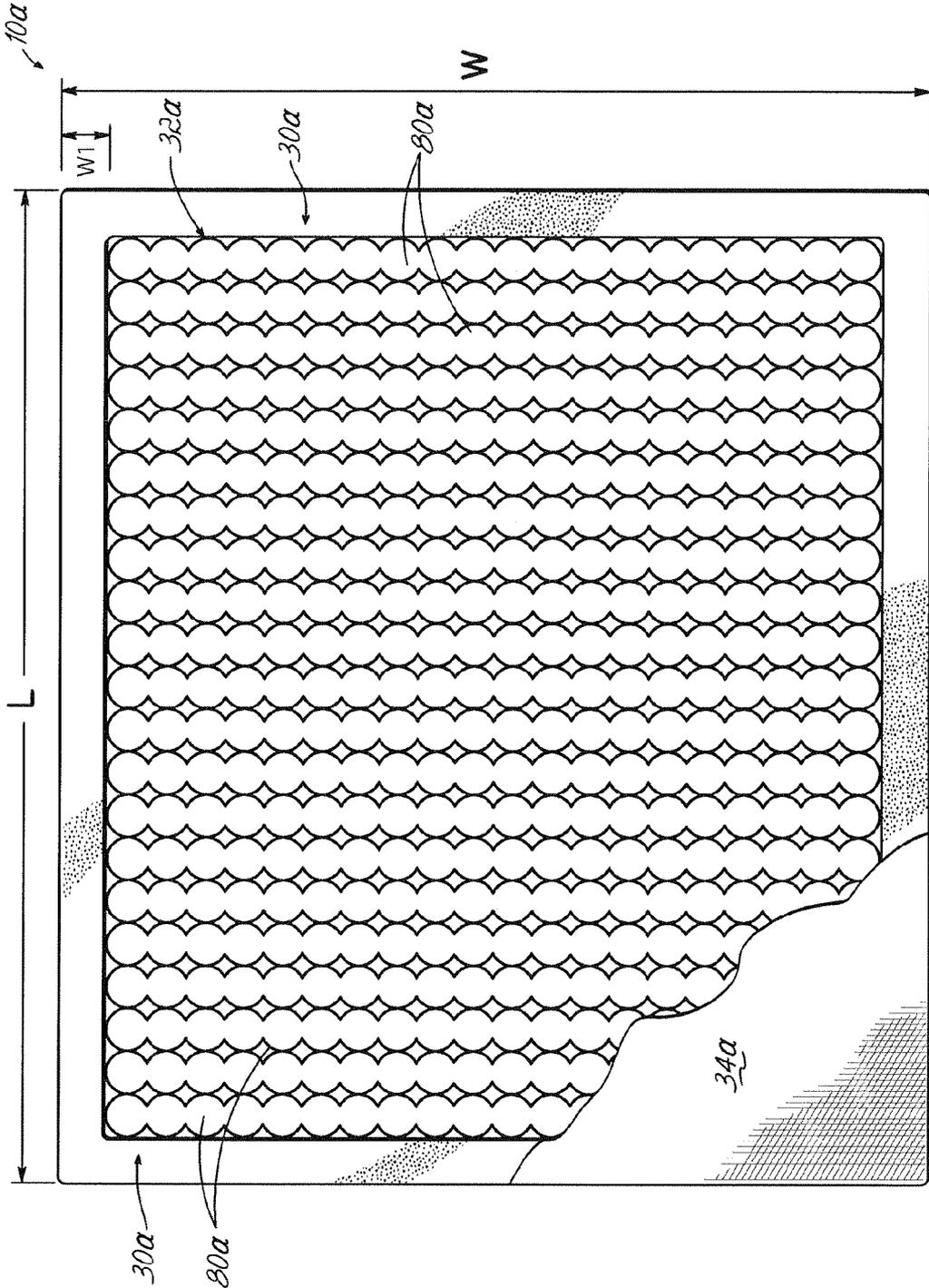


FIG. 3A

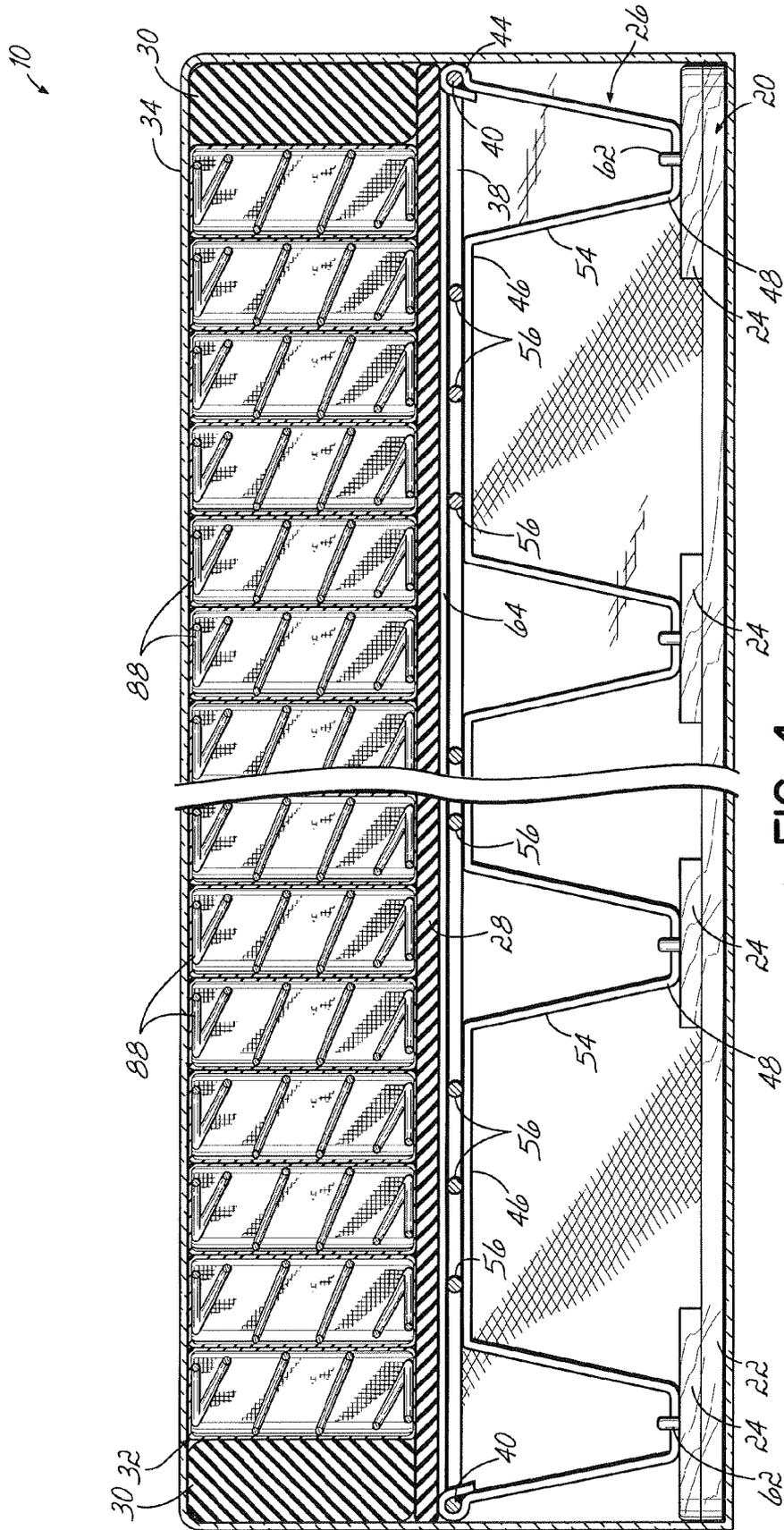


FIG. 4

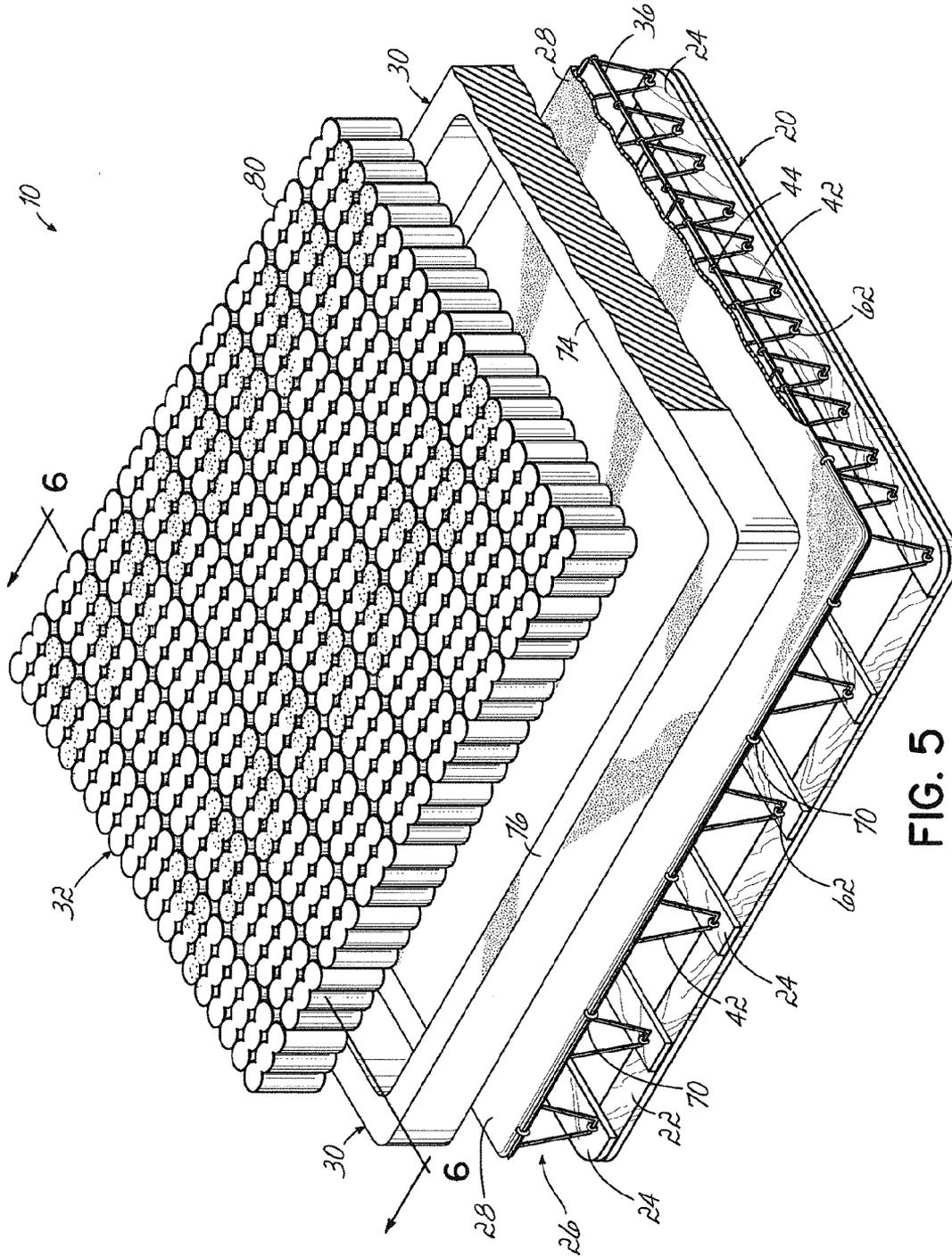


FIG. 5

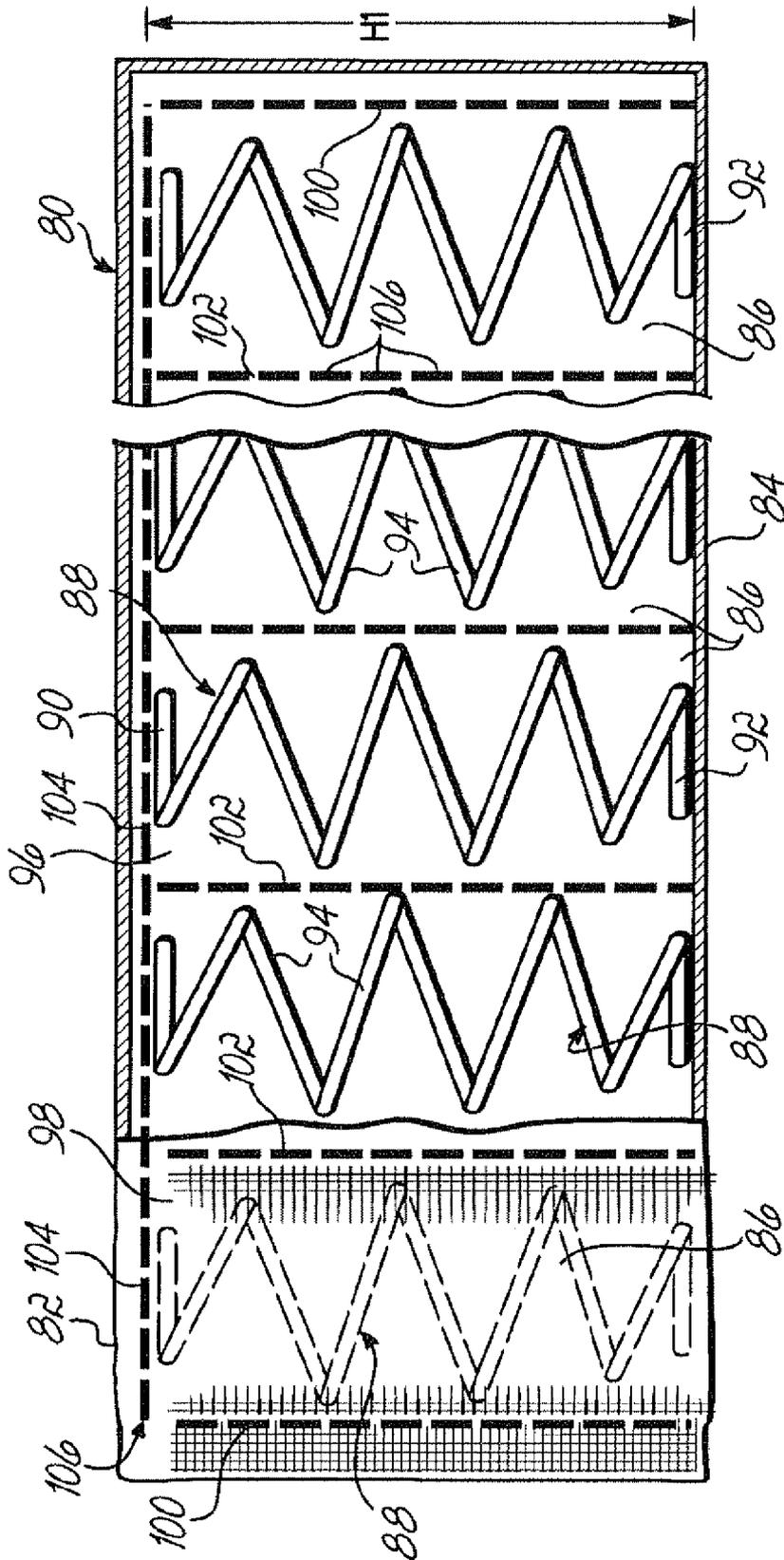


FIG. 6

**STACKABLE BEDDING FOUNDATION
HAVING POCKETED TOPPER**

BACKGROUND OF THE INVENTION

[0001] This invention relates generally to bedding, and more particularly to a nestably stackable bedding foundation.

[0002] Bedding foundations or so-called box spring assemblies generally include spaced border wires between which coil or bent wire spring modules are located. As thus manufactured, these box spring assemblies are bulky and shipping them to the manufacturer for application of padding and covering thereto is costly because of space requirements. To reduce the space requirements, it is customary to compress the assemblies to reduce their individual thicknesses and to tie them in their compressed state. This involves using presses and ties which are expensive, and the extra operations of pressing and tying the assemblies also adds to their manufacturing cost. At the delivery end, the manufacturer must cut and discard the ties before applying the covering. These additional material and handling expenses increase the end cost of box spring assemblies.

[0003] Box spring assemblies or bedding foundations by their very nature are intended to provide a stable, firm support foundation for mattresses or other bedding placed on top thereof. Toward that end, the spring modules commonly used in the box spring assemblies are relatively firm and provide little cushioning capability. Some users find that such bedding foundations are too rigid for their liking; they would prefer a softer bedding foundation or box spring. It would be desirable for such persons to have a bedding foundation with a cushioning layer to: 1) improve mattress support; 2) improve the lifespan of the mattress; and 3) increase the user's comfort.

[0004] Therefore, a bedding foundation having a cushioning layer that can be stacked for shipping without having to compress and tie the assembly would be desirable.

[0005] Additionally, a bedding foundation having a cushioning layer, which is relatively simple to manufacture, and which may substitute for a traditional box spring assembly having no cushioning layer would also be desirable.

SUMMARY OF THE INVENTION

[0006] This invention provides a solution to these and other problems in the art. In one embodiment, this invention is a bedding foundation having nestably stackable components for use in place of the traditional box spring assembly. Bedding foundations having nestably stackable components are disclosed in U.S. Pat. Nos. 5,052,064 and 7,237,282, both of which are fully incorporated herein. This bedding foundation includes a rectangular base comprising a rectangular base frame and a plurality of intermediate transverse slats.

[0007] The bedding foundation further comprises a spring assembly fixedly attached atop the base. The spring assembly comprises a generally rectangular border wire having two parallel sides and two parallel ends and a plurality of transversely-spaced, parallel, and longitudinally-extending support wires parallel to the border wire sides and with ends connected to the border wire ends. These support wires are generally corrugated along their lengths, having peaks and valleys with the peaks being generally coplanar with the plane defined by the border wire and the valleys being displaced beneath and intermediate of the peaks. Longitudinally-spaced, parallel and transversely-extending upper connector wires are parallel to the border wire ends, having ends con-

nected to the border wire sides and connected along their lengths to the flattened distal portions of the peaks of the support wires.

[0008] The longitudinal voids between the peaks of the support wires are of a greater dimension than the valleys of the support wires. This configuration enables one bedding foundation assembly of this invention to be nestably stacked atop a second assembly since the support wire valleys of the first assembly fit into the voids between the peaks of the support wires of the second assembly. Such a nested and stacked arrangement results in a total height dimension which is less than the sum of the individual assembly height dimensions.

[0009] The bedding foundation assembly further comprises a cushioning pad overlaying the spring assembly. The cushioning pad may be hog ringed or secured in any desired manner to the spring assembly.

[0010] A border or edge railing is secured to the cushioning pad around the perimeter of the cushioning pad with adhesive or in any other suitable manner. This border or edge railing is preferably made of foam but may be made of any material. This border or edge railing provides containment for a pocketed spring assembly which resides inside the border or railing. The pocketed spring assembly rests on top of the cushioning pad and may be secured to the cushioning pad. The pocketed spring assembly comprises strings of individually pocketed coil springs, as is conventional in the art. The strings of springs are joined together and may extend either longitudinally (from head to foot) or transversely (from side to side).

[0011] One advantage of this invention is that it provides a bedding foundation assembly having a cushioning layer, the components of which may be independently shipped, some of the component being tightly nested, compacted and shipped in a minimum of space to an assembly destination, thereby reducing the ultimate cost of the unit to the assembler.

[0012] Yet another advantage of this invention is avoiding the need for costly presses and ties necessary to compress a conventional box spring assembly for transportation.

[0013] A further advantage of this invention is that bedding foundation assemblies may be rapidly unloaded without the time consuming and labor intensive tasks of clipping and discarding the tie wires used to hold conventional box spring assemblies in a compressed state.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The objectives and features of the invention will become more readily apparent from the following detailed description taken in conjunction with the accompanying drawings in which:

[0015] FIG. 1 is a perspective view, partially broken away, of a bedding foundation according to one embodiment of this invention;

[0016] FIG. 2 is an enlarged perspective view, partially broken away, of a portion of the bedding foundation of FIG. 1;

[0017] FIG. 3 is a top plan view, partially broken away, of the bedding foundation of FIG. 1;

[0018] FIG. 3A is a top plan view, partially broken away, of an alternative embodiment of bedding foundation in accordance with the invention;

[0019] FIG. 4 is a cross sectional view, partially broken away, of the bedding foundation of FIG. 1;

[0020] FIG. 5 is a partially exploded view of the bedding foundation of FIG. 1; and

[0021] FIG. 6 is a view taken along the line 6-6 of FIG. 5.

DETAILED DESCRIPTION OF THE INVENTION

[0022] Referring first to FIG. 1, a bedding foundation or box spring 10 according to one embodiment of this invention is illustrated. The bedding foundation has a longitudinal dimension or length L defined as the distance between end surfaces 12 of the foundation; a transverse dimension or width W defined as the distance between side surfaces 14 of the foundation and a height H defined as the distance between upper and lower surfaces 16, 18, respectively, of the foundation 10.

[0023] The foundation 10 has a generally rectangular base 20 including a generally rectangular base frame 22 on which transverse slats 24 are attached. The base 20 is preferably made of wood but may be made of any suitable material such as plastic.

[0024] A nestably stackable spring assembly or wire core 26 is atop the base 12 and particularly the transverse slats 24. A cushioning pad 28 overlies the nestably stackable spring assembly 26, a border 30 is fixedly secured to the perimeter of the cushioning pad 28, a pocketed spring assembly 32 located inside the border 30 and a fabric covering 34 surrounds the base 20, nestably stackable spring assembly 26, cushioning pad 28, border 30 and pocketed spring assembly 32.

[0025] The nestably stackable spring assembly 26 includes a rectangular steel border wire 36 having two parallel sides 38 and two parallel ends 40. In the illustrated embodiment, the parallel sides 38 are longer than the parallel ends 40. However, in a square foundation, the sides 38 and ends 40 of border wire 36 would be the same length.

[0026] The nestably stackable spring assembly 26 further comprises a plurality of transversely-spaced, parallel, and longitudinally-extending steel support wires 42 parallel to the border wire sides 38. Each of these support wires 42 has ends 44 which are crimped around the ends 40 of the border wire 36. These support wires 42 are formed so as to be generally corrugatedly-shaped along their lengths, having peaks 46 and valleys 48. These peaks 46 and valleys 48 are flattened at their respective distal portions 50 and 52, respectively. The adjacent distal portions 50, 52 are joined together by connecting portions 54 of the support wire 42. As disclosed in U.S. Pat. No. 7,237,282, which is fully incorporated by reference herein, according to various embodiments of this invention, these flattened valley distal portions 52 may be twisted relative to the plane defined by the flattened peak distal portions 50 and vertically spaced beneath and intermediate of the flattened peak distal portions 50.

[0027] The nestably stackable spring assembly 26 further comprises longitudinally-spaced, parallel, and transversely-extending steel upper connector wires 56 which extend parallel to the border wire ends 40 and have ends 58 which are crimped around the border wire sides 38. These upper connector wires 56 are welded intermediate of their ends 58 along their lengths at 60 to the flattened peak distal portions 50 of the support wires 42.

[0028] The support wires 42 have flattened distal peak portions 50 and flattened distal valley portions 52, with the support wire ends 44 being crimped around the border wire ends 40. In the illustrated embodiment, three upper connector wires 56 per flattened distal peak portion 50 are illustrated. In other embodiments, any number of upper connector wires 56

may be welded or secured to each flattened distal peak portion 50. The distal valley portions 52 of the support wires 42 are stapled with staples 62 to the transverse slats 24 of base 20. However, the distal valley portions 52 of the support wires 42 may be otherwise secured to the transverse slats 24 of base 20.

[0029] If desired, additional steel end wires (not shown) may be added either before or after the stackable spring assembly 26 has reached its final assembly destination. These end wires have spaced ends which are crimped around the border wire 36 and the endmost upper connector wire 56, respectively. These end wires provide additional stiffness to the stackable spring assembly 26 in an edge most location of the ends of the assembly 26 so as to prevent the end border wires from deflecting and being permanently distorted when a person sits on the end of a bed of which the foundation forms a part. Such steel end wires are shown in U.S. Pat. No. 5,361,434, which is hereby incorporated by reference in its entirety.

[0030] Referring again to FIGS. 1 and 2, continuous longitudinal wires 64 are included in the nestably stackable spring assembly 26. These longitudinal wires 64 have their ends 66 crimped around the border wire ends 40 and pass over upper connector wires 56. These longitudinal wires 64 may be welded along their lengths to the upper connector wires 56 at locations 68 as desired. In the illustrated bedding foundation 10, two longitudinal wires 64 are illustrated as being part of the nestably stackable spring assembly 26. However, any number of longitudinal wires 64 may be incorporated into the nestably stackable spring assembly 26.

[0031] As best shown in FIGS. 2 and 5, the bedding foundation 10 further comprises a cushioning pad 28 overlaying the nestably stackable spring assembly 26. The cushioning pad 28 is secured to the border wire 36 with hog rings 70. The cushioning pad 28 is preferably made of polyethylene foam or shredded fabric, but may be made of any desirable material.

[0032] As shown in FIG. 5, the bedding foundation 10 further comprises a generally rectangular border 72 having opposed end portions 74 and opposed side portions 76, the border 72 being secured to the cushioning pad 28 around the perimeter of the cushioning pad 28. As shown in FIG. 3, the border 72 has a width W1. Although the border 72 is illustrated as being one piece of material, it may comprise multiple pieces joined together. The border 72 is preferably adhesively secured to the upper surface of the cushioning pad 28 but may be secured to the cushioning pad 28 in any known manner. The border 72 is preferably made of polyethylene or polyurethane foam, but may be made of any desirable material. Although the border 72 may be any desired height, it is preferably between one and a half inches and four inches tall, the same height as the pocketed spring assembly 32. The border functions as an edge reinforcement and increases the edge firmness of the bedding foundation 10.

[0033] As best shown in FIGS. 3, 5 and 6, the bedding foundation 10 further comprises pocketed spring assembly 32 for supporting a mattress (not shown) and providing an additional cushioning layer to the bedding foundation 10. Pocketed spring assembly 32 is made to fit inside generally rectangular border 72. The pocketed spring assembly 32 may or may not be secured to the upper surface of the cushioning pad 28. As shown in the drawings, pocketed spring assembly 32 includes a plurality of longitudinally extending strings of springs 80 joined together as shown in FIG. 5. Adjacent strings of springs 80 are preferably glued together but be joined to each other using any known technology such as ultrasonic welding.

[0034] FIG. 6 illustrates a string of springs **80** having an upper surface **82** and a bottom or lower surface **84**, the distance between which defines the height **H1** of the string of springs **80**. Each string of springs **80** comprises a row of interconnected fabric pockets **86**, each fabric pocket **86** containing a coil spring **88**. As shown in FIG. 6, each coil spring **88** has an upper end turn **90**, a lower end turn **92** and a plurality of central convolutions **94** between the end turns **90**, **92**. Although one configuration of coil spring is shown, any other spring, whether a coil spring or not, may be used with the present invention.

[0035] Preferably, only one piece of fabric is used to form a string of springs **80**, the piece of fabric being folded over onto itself around the coil springs **88** to create a first ply **96** and a second ply **98**. As illustrated in FIG. 6, the first ply **96** is behind the second ply **98**. As is known in the art, opposite sides or plies of the fabric are sewn, welded or otherwise secured together to create a pair of outermost seams **100**, a plurality of parallel internal seams **102**, and a longitudinal top seam **104**. Although seams **100**, **102** and **104** are illustrated as a plurality of spaced, linear segments **106**, they may comprise continuous lines or a series of dots or other arrangement without departing from the spirit of this document.

[0036] In one embodiment, the height H_i of the strings of springs **80** is approximately one inch. Therefore, the height of the pocketed spring assembly **32** is approximately one inch. However, the strings of springs and pocketed spring assembly may be any desired height. Heights which have proven satisfactory are between one and a half to four inches.

[0037] The spring assembly **26** of bedding foundation **10** is generally manufactured by a supplier, who then ships it to an assembler. The assembler adds to the spring assembly **26** the wooden base **20**, cushioning pad **28**, secures the border **30** to the cushioning pad **28**, inserts the pocketed spring assembly **32** into the opening in the border **30** and lastly sews or adds the upholstery **34** to make a completed product. In combination, the pocketed spring assembly **32** and border **30** provide a cushioning layer which gives the foundation a softer feel than known foundations. The combination may form what is known in the industry as a topper.

[0038] FIG. 3A illustrates an alternative embodiment of the present invention comprising a bedding foundation **10a** having a covering **34a**. The bedding foundation **10a** is just like the adjustable bed **10** shown in the other drawings and described herein. However, the bedding foundation **10a** has a pocketed spring assembly **32a** having transversely extending strings of springs **80a** instead of longitudinally extending strings of springs like those shown in the other drawings. In accordance with the present invention, any bedding foundation contemplated by the present invention may have a pocketed spring assembly with transversely, rather than longitudinally extending strings of springs. The pocketed spring assembly **32a** is located inside border **30a** as described above.

[0039] One of ordinary skill in the art will readily recognize that the alternative embodiments of the foundation **10** shown and/or described herein are exemplary only of a wide variety of alternative configurations that are readily possible within the scope of this invention.

[0040] From the above disclosure of the general principles of the present invention and the preceding detailed description of at least one preferred embodiment, those skilled in the art will readily comprehend the various modifications to

which this invention is susceptible. Therefore, we desire to be limited only by the scope of the following claims and equivalents thereof.

We claim:

1. A bedding foundation comprising:
 - a rectangular base;
 - a spring assembly fixedly attached atop the base;
 - a cushioning pad overlying the spring assembly;
 - the spring assembly comprising:
 - a generally rectangular border wire having two parallel sides and two parallel ends;
 - a plurality of spaced and longitudinally-extending support wires extending between the border wire ends, each support wire having a plurality of peaks and a plurality of valleys, flattened distal portions of the peaks being generally coplanar with the border wire and flattened distal valley portions being vertically displaced beneath and intermediate of the distal peak portions;
 - a pocketed spring assembly on top of said cushioning pad; and
 - a fabric covering surrounding the spring assembly, the base, the pocketed spring assembly and the cushioning pad.
2. The bedding foundation of claim 1 further comprising:
 - a plurality of longitudinally-spaced, parallel, and transversely-extending upper connector wires parallel to the border wire ends and having ends connected to the border wire sides, the upper connector wires being connected intermediate of their ends along their lengths thereof to the distal peak portions of the support wires.
3. The bedding foundation of claim 1 wherein longitudinal voids between the distal peak portions are of a dimension greater than the distal valley portions.
4. The bedding foundation of claim 1 wherein the rectangular base comprises a rectangular base frame and a plurality of intermediate transverse slats.
5. The bedding foundation of claim 1 further comprising a border around the pocketed spring assembly.
6. The bedding foundation of claim 1 wherein the pocketed spring assembly comprises strings of springs joined together.
7. The bedding foundation of claim 6 wherein the strings of spring extend longitudinally.
8. The bedding foundation of claim 6 wherein the strings of springs extend transversely.
9. The bedding foundation of claim 1 wherein border wire sides are longer than the border wire ends.
10. The bedding foundation of claim 1 wherein each of the support wires is a continuous length of wire.
11. The bedding foundation of claim 5 wherein the border is made of foam.
12. The bedding foundation of claim 5 wherein the border is adhesively secured to the cushioning pad.
13. A bedding foundation comprising:
 - a rectangular base comprising a rectangular base frame and a plurality of intermediate transverse slats;
 - a spring assembly fixedly attached atop the base, the spring assembly comprising:
 - a generally rectangular border wire having two parallel sides and two parallel ends;
 - a plurality of spaced and longitudinally-extending support wires extending between the border wire ends, each support wire having a plurality of peaks and a plurality of valleys, flattened distal portions of the peaks being generally coplanar with the border wire and flattened

- distal valley portions being vertically displaced beneath and intermediate of the distal peak portions;
- a cushioning pad overlying the spring assembly and secured to the border wire;
 - a generally rectangular border secured to the cushioning pad;
 - a pocketed spring assembly inside said generally rectangular border; and
 - a fabric covering surrounding the base, the spring assembly, the cushioning pad, the border and the pocketed spring assembly.
- 14.** The bedding foundation of claim **13** wherein the support wires are generally parallel with each other.
- 15.** The bedding foundation of claim **13** wherein the pocketed spring assembly comprises strings of springs joined together.
- 16.** The bedding foundation of claim **15** wherein the strings of spring extend longitudinally.
- 17.** The bedding foundation of claim **15** wherein the strings of springs extend transversely.
- 18.** The bedding foundation of claim **13** wherein the border is made of foam.

- 19.** The bedding foundation of claim **13** wherein the border is adhesively secured to the cushioning pad.
- 20.** A bedding foundation comprising:
- a rectangular base comprising a rectangular base frame and a plurality of intermediate transverse slats;
 - a spring assembly fixedly attached atop the base, the spring assembly comprising;
 - a generally rectangular border wire having two parallel sides and two parallel ends;
 - a plurality of spaced and longitudinally-extending support wires extending between the border wire ends, each support wire having a plurality of peaks and a plurality of valleys, flattened distal portions of the peaks being generally coplanar with the border wire and flattened distal valley portions being vertically displaced beneath and intermediate of the distal peak portions;
 - a cushioning pad overlying the spring assembly and secured to the border wire;
 - a generally rectangular border secured to the cushioning pad;
 - a pocketed spring assembly inside said generally rectangular border.

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