United States Patent [19]

Simon

[11] **3,840,915**

[45] **Oct. 15, 1974**

[54] **FOUNDATION SPRING UNIT**

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[73] Assignee: **Seeta, Inc.,** Chicago, Ill.

[22] Filed: **Feb. 8, 1973**

[21] Appl. No.: **330,656**

[52] **U.S. Cl.** **5/261,** 5/246, 5/267

[51] **Int. Cl.** **A47c 23/04,** A47c 23/02

[58] **Field of Search** 5/246, 256, 261, 267, 272, 5/277, 354, 345

[56] **References Cited**

UNITED STATES PATENTS

871,871	11/1907	Hirschman	5/275 X
3,242,505	3/1966	Tyhanic	5/267
3,327,331	6/1967	Simon	5/267
3,685,063	8/1972	Morgan	5/345 R

Primary Examiner—Casmir A. Nunberg

Attorney, Agent, or Firm—Neuman, Williams, Anderson & Olson

[57] **ABSTRACT**

A foundation spring unit is disclosed, the unit comprising a plurality of coil springs arranged in longitudinally extending columns and transversely extending rows. An outer border wire extends around the unit and is connected to the coil springs at the periphery and a central support member is provided at approximately the central one-third of the unit. The support member comprises a substantially rectangular peripheral element and preferably two elongated connecting elements. The connecting elements are disposed parallel to one another and to the end portions of the peripheral element, and are connected to the edge portions of the peripheral element. These connecting elements extend diametrically across and are connected to the coil springs of a respective one of said transverse rows, and the central portion of the foundation unit is thus reinforced particularly in the transverse direction.

10 Claims, 4 Drawing Figures

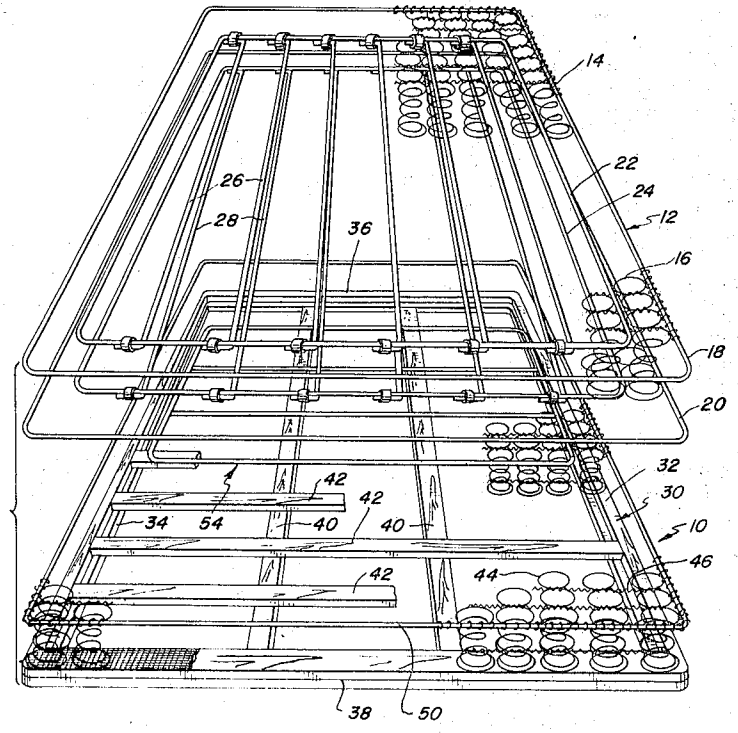


FIG. 1

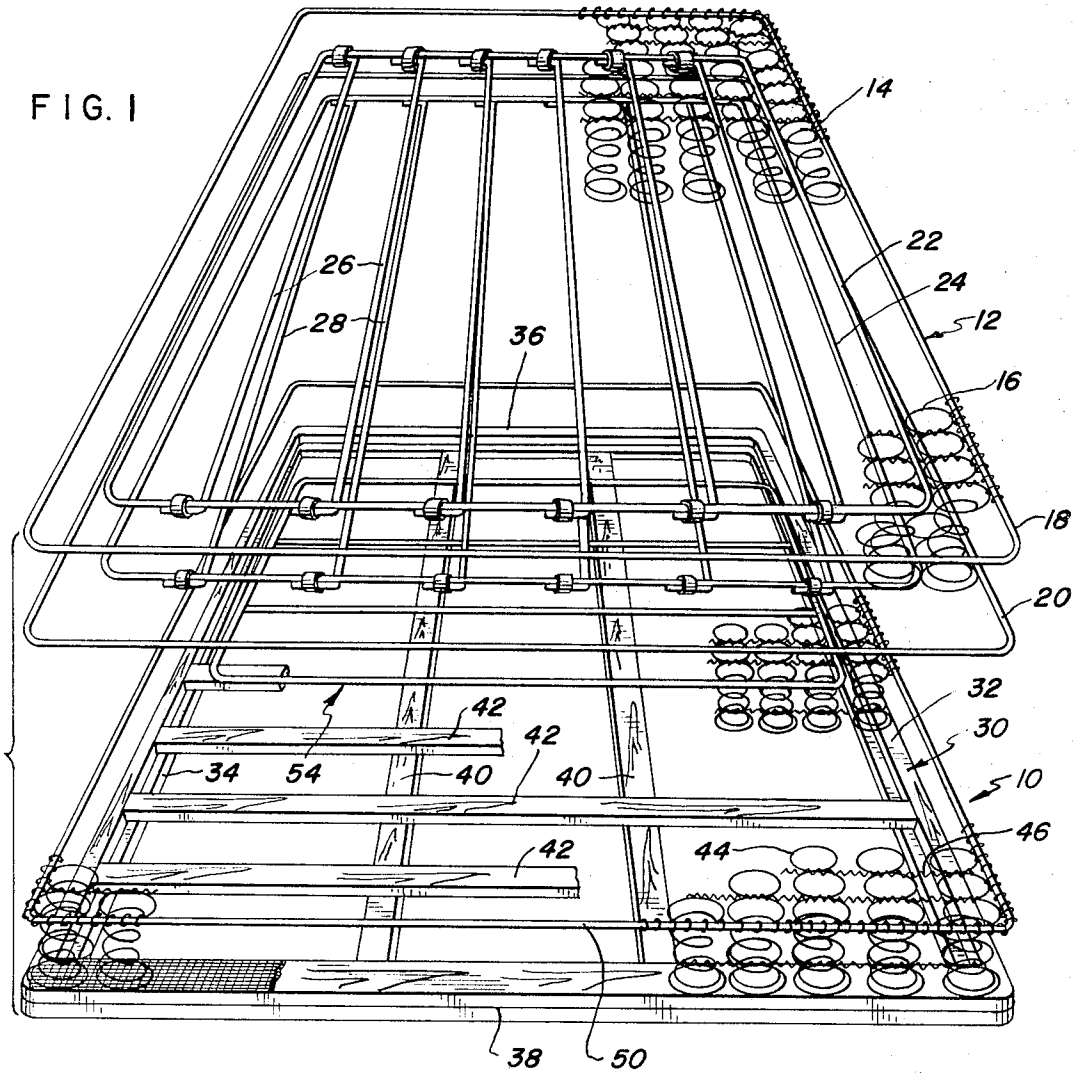

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FIG. 3

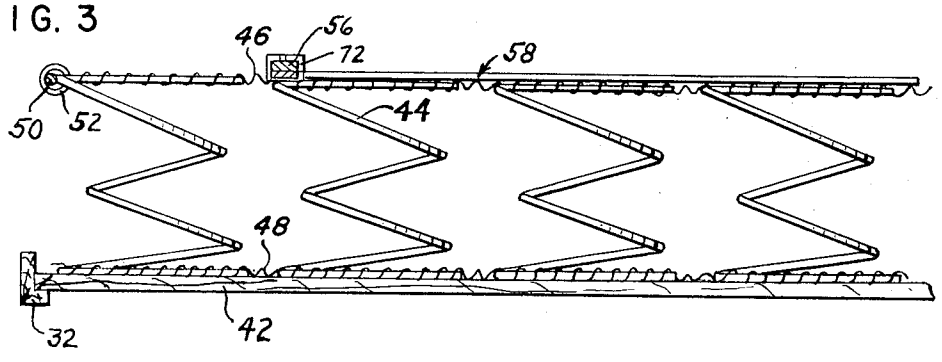

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FIG. 2

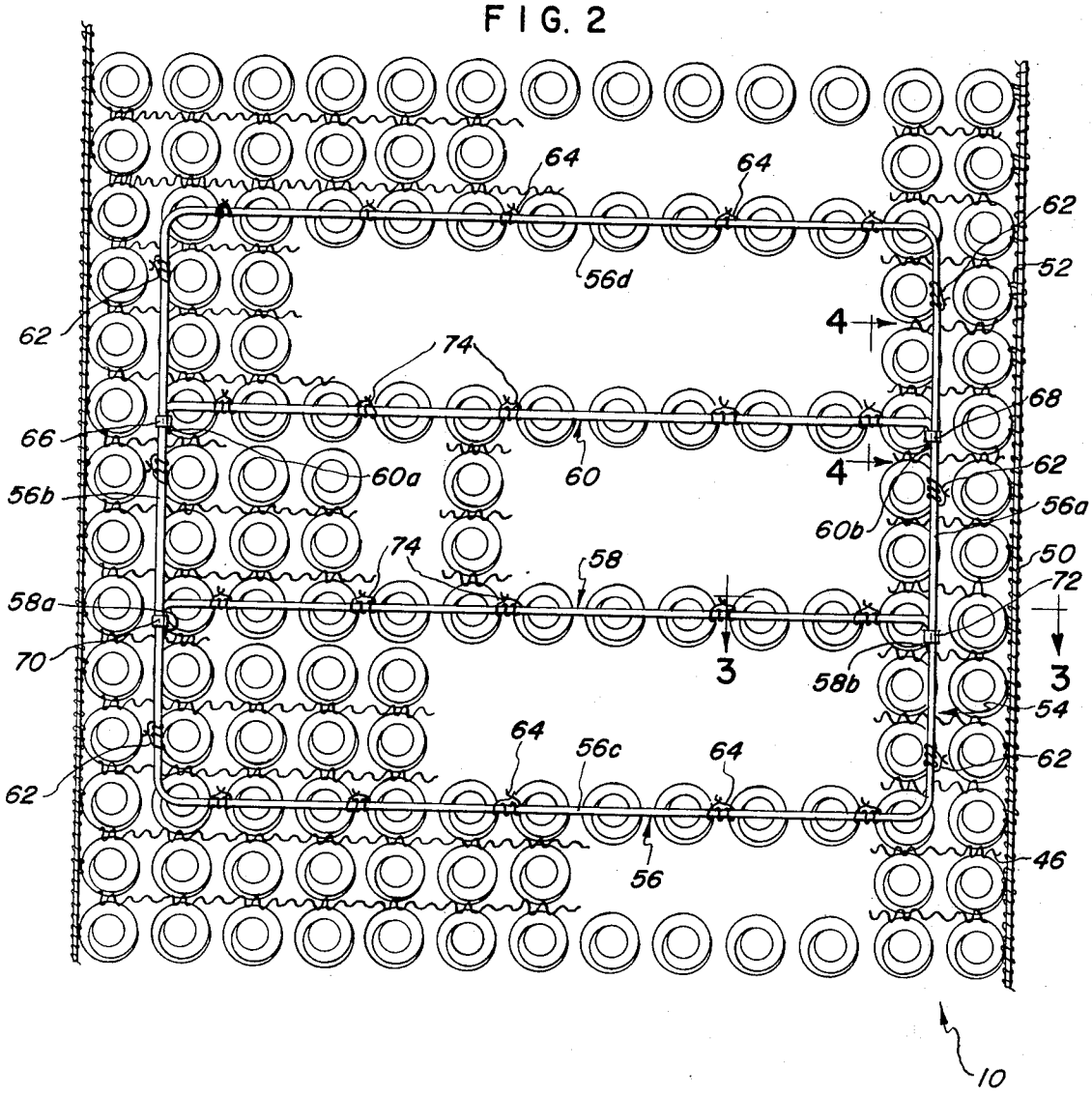
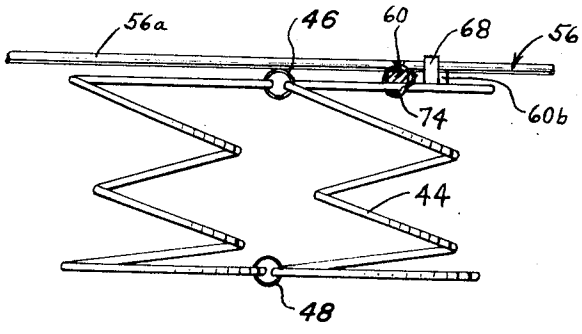

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56d
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74
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66
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56b
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58a
72
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3
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58b
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56c
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FIG. 4


56a
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60b
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FOUNDATION SPRING UNIT

BACKGROUND OF THE INVENTION

This invention relates to an improved foundation spring unit or box spring for supporting a mattress. The unit is particularly adapted to support a mattress which employs a spring unit constructed in accordance with U.S. Pat. No. 3,242,505. In that patent there is disclosed a mattress spring unit having a plurality of spaced, parallel, longitudinally extending columns and transversely extending rows of coil springs. A featured part of that construction is the provision of top and bottom inner border bands with a plurality of flat connecting bands extending longitudinally across several of the longitudinal columns of coil springs to unite the coil springs particularly in the longitudinal direction so that the coil springs work together to provide improved support.

With a foundation unit constructed in accordance with the present invention, an improved support is provided for the mattress, particularly in the central portion of the unit and particularly in the transverse direction. Combined with a mattress structure which employs longitudinally extending bands across the coils at the top and bottom of the mattress, the foundation unit employs a novel transversely extending banded structure that extends across the coils at the top of the unit, and thus there is provided a grid support for improved comfort from the combination of the mattress and foundation unit.

SUMMARY OF THE INVENTION

In accordance with one aspect of this invention, the foundation spring unit for supporting a mattress comprises a plurality of longitudinally extending columns and transversely extending rows of coil springs. An outer border means in the form of a border wire extends around the unit and is connected to the coil springs at the periphery of the unit and a central support member provided. This support member comprises a substantially rectangular peripheral element and at least one and preferably two elongated connecting elements. The peripheral element is disposed with its edge portions extending longitudinally and with each of its end portions extending diametrically across and being connected to coil springs in a respective one of said transverse rows of coil springs. The size and positioning of the peripheral element is such that the end portions are disposed at a distance inwardly from the longitudinal ends of the unit at least one-fourth the length of the unit, an the connecting element or elements are disposed parallel to the end portions of the peripheral element and extend between and are connected to the edge portions of the peripheral element. The connecting element is connected to the coil springs of a respective one of the transverse rows, whereby the central portion of the foundation unit will be reinforced particularly in the transverse direction.

It is preferred that the longitudinal edge portions of the peripheral element be connected to the coil springs in the respective penultimate or next-to-outer columns of coil springs, and helical means is provided for operatively connecting the penultimate or next-to-outer columns of coils to the longitudinal edge portions of said outer border means.

The novel construction of the foundation unit cooperates in a novel respect with the type of mattress

which employs a plurality of longitudinally extending reinforcement bands across the top and bottom of the coil springs. The foundation unit provides the transverse support, particularly in the central portion of the combined structure.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a foundation spring unit constructed in accordance with this invention and a mattress spring unit which is adapted to be supported by the foundation spring unit, portions of the two units having been broken away for illustration purposes;

FIG. 2 is a top plan view of the central portion of the foundation spring unit illustrated in FIG. 1;

FIG. 3 is a transverse sectional elevational view taken substantially along line 3—3 of FIG. 2; and

FIG. 4 is a longitudinal sectional elevational view of the foundation spring unit taken substantially along line 4—4 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

With further reference to the drawings and particularly to FIG. 1, there is illustrated a foundation spring unit 10 and a mattress spring unit 12. The mattress spring unit 12 is of the type described and claimed in Tyhanic Patent No. 3,242,505 issued Mar. 29, 1966. That mattress spring unit comprises briefly a plurality of coil springs 14 which are arranged in spaced longitudinal columns and juxtaposed transverse rows. Adjacent transverse rows of the coil springs 14 are tied together preferably by means of transversely helical spring wires 16 at both the top and bottom of the mattress. Extending along and connected to the outer edges of the coil springs in the terminal transverse rows and terminal longitudinal columns thereof are top and bottom border wires 18 and 20. A flat substantially rectangular inner border band 22 is disposed at the top surface of the spring unit and a similar flat substantially rectangular inner border band 24 is provided at the bottom surface of the mattress spring unit 12. Extending longitudinally across the coil springs 14 between and affixed to the end portions of the top inner border band 22 are a plurality of flat connecting bands 26. Each of these connecting bands also extend across and is connected to the coil springs in a respective longitudinal column of coil springs. Similar longitudinally extending flat connecting bands 28 extend between and are connected to the end portions of the bottom inner border band 24. Each of these connecting bands also extends across and is connected to the coil springs in a respective longitudinal column of coil springs. The longitudinally extending connecting bands 24, 26 and 28 unit the coil springs in the longitudinal columns over which they extend and thus provide a support and reinforcement particularly in the longitudinal direction, that is, from one end of the mattress or head to the other end or foot.

The foundation spring unit 10 has a frame 30 consisting of a pair of parallel, longitudinally extending side members 32 and 34 and a pair of parallel transversely extending end embers 36 and 38. A pair of longitudinally extending elements 40 extend between the end elements and members 36 and 38 and a plurality of transversely extending elements 42 extend between the side members 32 and 34 traversing the longitudinal ele-

ments 40. This frame is preferably constructed of wood.

Supported on the frame 30 are a plurality of coil springs 44. These coil springs are preferably arranged in the same standard construction as the coils 16 in the mattress unit 12. In the present embodiment they are arranged in a plurality of longitudinally extending columns which are laterally spaced apart. This arrangement is best illustrated in FIG. 2. The coil springs 44 are also aligned in lateral or transverse rows. A plurality of helical or pigtail wire connections 46 and 48 extend transversely across the unit 10 at the top and bottom thereof respectively and connect the adjacent transverse rows of coil springs together as best illustrated in FIGS. 2 and 4. These helical or pigtail wire connections 46 and 48 also serve to tie the longitudinal columns of coil springs together and thus they tie the unit together both longitudinally and transversely.

A top border member 50 extends along and is connected to the outer edges of the coil springs in the terminal or outermost columns and to the outer edges of the coil springs of the terminal or outermost rows. This border member 50 is preferably constructed of round wire that is of substantially heavier gage than the wire of the coil springs 44. The border member 50 is connected to the outer edges of the coil springs of the terminal columns and terminal rows by means of a standard helical or pigtail wire connection 52.

A feature of this invention is the provision of a central support member 54 at the top surface of the foundation spring unit 10. The central support member comprises a flat substantially rectangular peripheral element 56 and at least one, and preferably two or more, elongated connecting elements. In the illustrated embodiment, as best shown in FIG. 2, there are two connecting elements 58 and 60.

The peripheral element 56 of the central support member has parallel longitudinally extending edge portions 56*a* and 56*b* and parallel end portions 56*c* and 56*d* which extend transversely or laterally across the foundation spring unit 10. The dimension of the peripheral element 46 in the longitudinal direction, i.e., between the end portions 56*c* and 56*d* is at least one-fourth and preferably about one-third the longitudinal dimension or length from head to foot of the foundation spring unit 10. The peripheral element is centrally positioned with respect to the spring unit 10 such that the distance of the end portions 56*c* and 56*d* from the respective longitudinal ends of the spring unit 10 is at least one-fourth the length of the unit and preferably about one-third the length of the unit.

For example, the illustrated spring unit consists of 312 coil springs arranged in 13 longitudinally extending transversely spaced columns of 24 coil springs each. The end portion 56*d* of the peripheral element will extend diametrically across and be connected to the coil springs of the eighth transverse row of coil springs from the upper end of the head of the spring unit 10, and the end portion 56*c* of the peripheral element will extend diametrically across and be connected to the coil springs of the eighth transverse row of coil springs as measured from the opposite lower end or foot of the spring unit 10. Not counting the coils in the rows traversed by these end portions of the peripheral element 56, there are eight rows of springs between the end portions 56*c* and 56*d* of the peripheral element.

The lateral or transverse dimension of the peripheral element 56, i.e., the distance between edge portions 56*a* and 56*b* is approximately equal to the distance between the outer edges of the penultimate columns or next-to-outer columns of coil springs. Thus the peripheral element does not extend between the outer columns of the coils, but instead terminates short of these outer columns and overlies the outer edges of the springs in the penultimate columns. The peripheral element edge portions 56*a* and 56*b* are preferably connected to the springs in the penultimate columns of springs by means of clips or wire ties 62, although it may be desirable to employ standard helical or pigtail wire connections similar to the connections 46. In this case, of course, the connections would extend in the longitudnal direction. The end portions 56*c* and 56*d* of the peripheral element 56 are connected to at least several of the coil springs in the row traversed by these end portions, the connection being preferably by either clips or wire tie connections 64.

A flat band connecting element 60 has a transverse end portion 60*a* which is connected to the edge portion 56*b* of the peripheral element by means of a clip 66 and the opposite transverse end 60*b* of this connecting element is connected to the edge portion 56*a* of the peripheral element by means of a clip 68. In like manner, the flat band connecting element 58 has a transverse end portion 58*a* which is connected to the peripheral element edge portion 56*b* by means of a clip 70 and the opposite end 58*b* is connected to the peripheral element edge portion 56*a* means of a clip 72. The portions of the connecting elements 58 and 60 intermediate the end thereof are parallel to each other and to the end portions 56*c* and 56*d* of the peripheral element 56. Both of the connecting elements 58 and 60 extend diametrically across the coils in a respective transverse row of coils and are connected to selected coils by means of clips or wire connectors 74.

In the illustrated embodiment there are two untraversed transverse rows of coil springs between the two rows of coil springs which are traversed by the connecting elements 58 and 60 respectively. In like manner, there are two untraversed rows of coils between the coils traversed by the connecting element 60 and the end portion 56*d* of the peripheral element 56, and there are two untraversed rows of coils between the row of coils traversed by the connecting element 58 and the end portion 56*c* of the peripheral element 56. It is very desirable to have at least one untraversed row of coils between the rows of coils traversed by each of these laterally or transversely extending elements and portions of the central support member 54, although in the illustrated preferred embodiment there are two coils between each traversed row of coils.

By constructing the peripheral element 56 and the connecting elements 58 and 60 of relatively flat steel band material, a resilient stiffness and strength is provided in the plane parallel to the surface of the spring unit 10 and this stiffness and strength is particularly provided in the transverse direction or laterally across the width of the mattress substantially normal to the direction in which it is provided in the mattress spring unit 12. Thus, the construction of the box spring or foundation unit 10 cooperates with the construction of the mattress spring unit in order to provide a unique and very comfortable supporting system for the mattress and box spring combination.

The relationship between the longitudinally extending edges **56***a* and **56***b* of the peripheral element of the central support member and the longitudinal edges of the border wire **50** is another important feature of the foundation spring unit **10.** Since the peripheral element edge portions **56***a* and **56***b* are connected to the penultimate columns of coil springs the only connection between the central support member and the border wire **50** is through the resilient helical or pigtail wire connections **46.** This resilient connection minimizes edge distortion and yet provides additional reinforcement in the lateral or transverse direction. In an alternative construction, these edge portions **56***a* and **56***b* of the support member would not be connected in any way to the penultimate columns of coil springs over which they extend but would be free to move laterally with respect to the coils and with respect to the longitudinally extending portions of the border wire **50.** It is preferred, however, that there be some connection between the penultimate columns of coils and the edge portions **56***a* and **56***b* of the support member giving additional resilience, stiffness and strength to the foundation springs unit in the transverse direction.

Although the invention has been described with a certain degree of particularly, it is understood that the present disclosure has been made only by way of example and various modifications may be made by those skilled in the art without departing from the spirit and scope of the invention as hereinafter claimed.

I claim:

1. A foundation spring unit for supporting a mattress, said unit comprising a plurality of longitudinally extending columns and transversely extending rows of coil springs, outer border means extending around said unit and being connected to the coil springs at the periphery of said unit, a central support member comprising a substantially rectangular peripheral element and at least one elongated connecting element, said peripheral element being disposed with its edge portions extending longitudinally and with each of its end portions extending diametrically across and being connected to coil springs of a respective one of said transverse rows at a distance inwardly from the longitudinal ends of said unit of at least one-fourth the length of said unit, said connecting element being disposed parallel to the end portions of said peripheral element and extending between and being connected to the edge portions of said peripheral element and extending diametrically across and being connected to coil springs of a respective one of said transverse rows, whereby the central portions of said foundation unit will be reinforced particularly in the transverse direction.

2. The foundation spring unit of claim **1** wherein the edge portions of said peripheral element are connected to coil springs in the respective next-to-outer columns of coil springs, and helical coil means operatively connecting said next-to-outer columns of coils to the longitudinal edge portions of said outer border means.

3. The foundation unit of claim **1** wherein the spacing between the end portions of said peripheral element and said connecting element is at least equal to the diameter of one of said coil springs.

4. The foundation unit of claim **1** wherein there are a plurality of connecting elements with the spacing between said elements being substantially equal to the spacing between each of the end portions of said peripheral elements and the next adjacent connecting element.

5. The foundation unit of claim **1** wherein said peripheral element and said connecting element are flat bands.

6. In combination with a mattress having a plurality of coil springs and a plurality of elongated support members traversing said springs at the top and bottom thereof and extending longitudinally from adjacent the terminal coils at one end of the mattress to adjacent the terminal coils at the other end; a foundation unit comprising a plurality of coil springs, bottom support means for said coil springs, and a plurality of elongated support members traversing said springs at the top thereof and extending laterally from adjacent the terminal coils at one edge of the unit to adjacent the terminal coils at the other edge of the unit, whereby when the mattress is placed in aligned overlying relationship with respect to said foundation unit the elongated support members in said foundation unit will extend substantially normal to the elongated support members in said mattress.

7. The combination of claim **6** wherein said foundation unit further includes a substantially rectangular peripheral element the ends of which are spaced inwardly from the ends of said unit at a distance at least one-fourth the length of said unit and the edges of said peripheral element are spaced at least one coil spring diameter from the edges of said unit.

8. In combination with mattress having a plurality of coil springs and a plurality of elongated support members traversing said coil springs at the top and bottom thereof and extending longitudinally from adjacent the terminal coil springs at one end of the mattress to adjacent the terminal coil springs at the other end; a foundation unit comprising a plurality of parallel, longitudinally extending columns and transversely extending rows of coil springs, bottom support means for said coil springs, a central member comprising a substantially rectangular peripheral element and at least one connecting element, said peripheral element being disposed with its edge portions extending longitudinally and with each of its end portions extending diametrically across and being connected to coils of a respective one of said transverse rows at a distance inwardly from the longitudinal ends of said unit of at least one-fourth the length of said unit, said connecting element being disposed parallel to the end portions of said peripheral element and extending between and being connected to the edge portions of said peripheral element and extending diametrically across and being connected to coils of a respective one of said transverse rows, whereby the central portion of said foundation unit will be reinforced particularly in the transverse direction.

9. The combination of claim **8** wherein a substantially rectangular top outer border member extends around the foundation unit in spaced surrounding, substantially coplanar relationship with said central support member and means is provided for connecting said border member rows and terminal columns of coil springs.

10. A foundation spring unit for supporting a mattress, said unit comprising a plurality of longitudinally extending columns and transversely extending rows of coil springs, outer border means extending around said unit and being connected to the coil springs at the periphery of said unit, a central support member compris-

ing a substantially rectangular peripheral element and a plurality of elongated connecting elements, said peripheral element being disposed with its edge portions extending longitudinally and with each of its end portions extending diametrically across and being connected to coil springs of a respective one of said transverse rows at a distance inwardly from the longitudinal ends of said unit of at least one-fourth the length of said unit, said connecting elements being disposed parallel to the end portions of said peripheral element and extending between and being connected to the edge portions of said peripheral element and extending diametrically across and being connected to coil springs of a respective one of said transverse rows, the space between the connecting elements being equal, with at least two untransversed rows of coil springs being disposed between adjacent connecting elements and between each of the end portions of said peripheral element and the next adjacent connecting element, whereby the central portion of said foundation unit will be reinforced particularly in the transverse direction.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,840,915 Dated October 15, 1974

Inventor(s) Leroy J. Simon

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Assignee "Seeta, Inc." should be --Serta, Inc.--

Col. 1, line 40, before "provided" insert --is--

Col. 1, line 51, "an" should be --and--

Col. 2, line 38, before "border" insert --outer--

Col. 2, line 46, "extend" should be --extends--

Col. 2, line 55, "unit" should be --unite--

Col. 2, line 63, "embers" should be --members--

Col. 3, line 43, "46" should be --56--

Col. 4, line 31, before "means" insert --by--

Col. 4, line 33, "end" (first occurrence) should be --ends--

Col. 5, line 23, "springs" should be --spring--

Col. 5, line 25, "particularly" should be --particularity--

Col. 5, line 52, "portions" should be --portion--

Col. 6, line 1, "elements" should be --element--

Col. 6, line 29, before "mattress" insert --a--

Col. 6, line 38, after "central" insert --support--

Signed and sealed this 14th day of January 1975.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

FORM PO-1050 (10-69)

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