Aug. 21, 1945. C. A. PINK 2,383,157

SPRING CONSTRUCTION FOR MATTRESSES AND THE LIKE

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Fig. 1

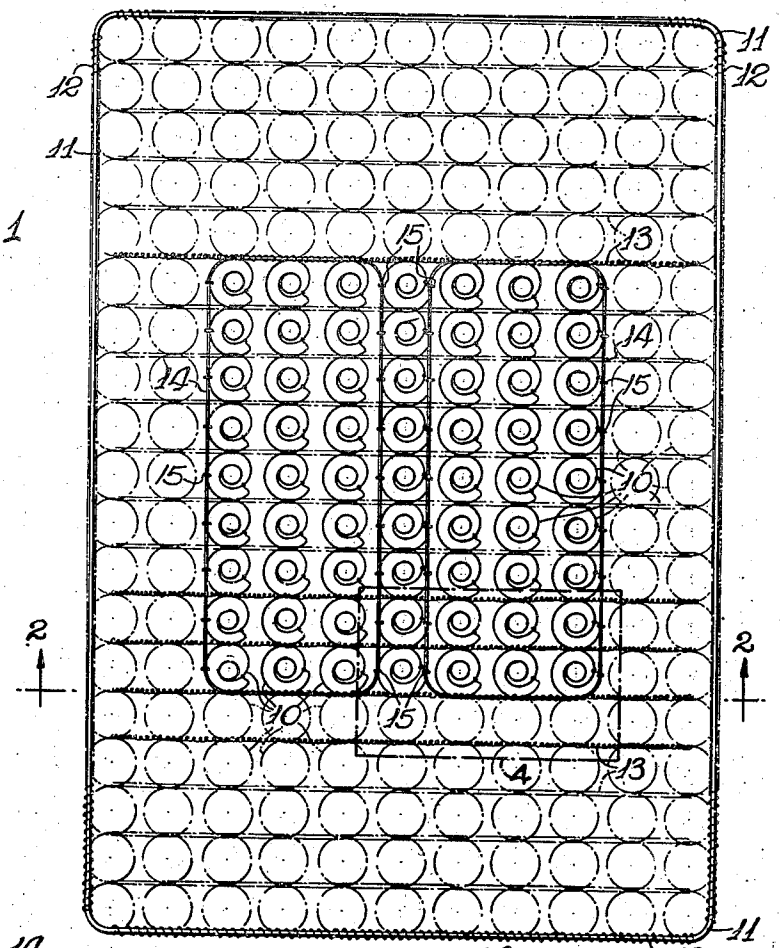


Fig. 2

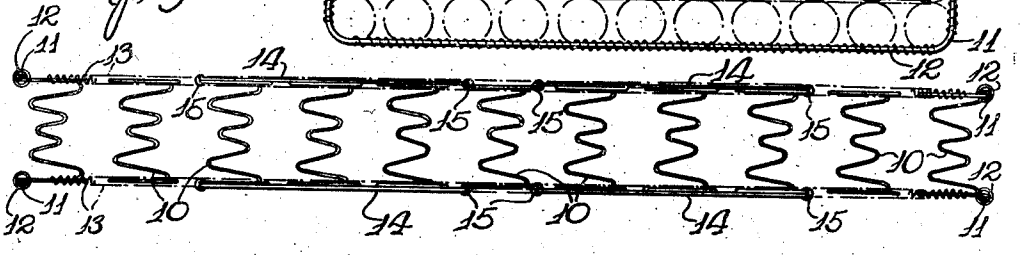
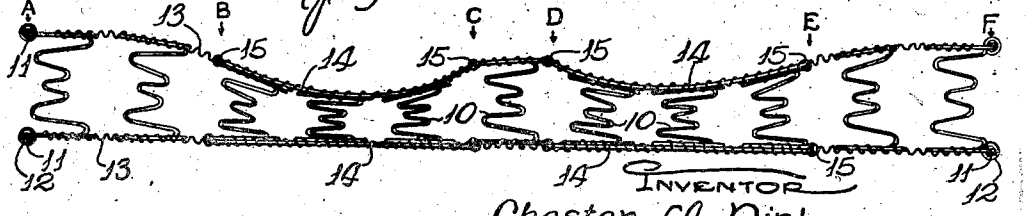


Fig. 3



INVENTOR

Chester A. Pink

By Parker, Carlton, Pitzner & Hubbard

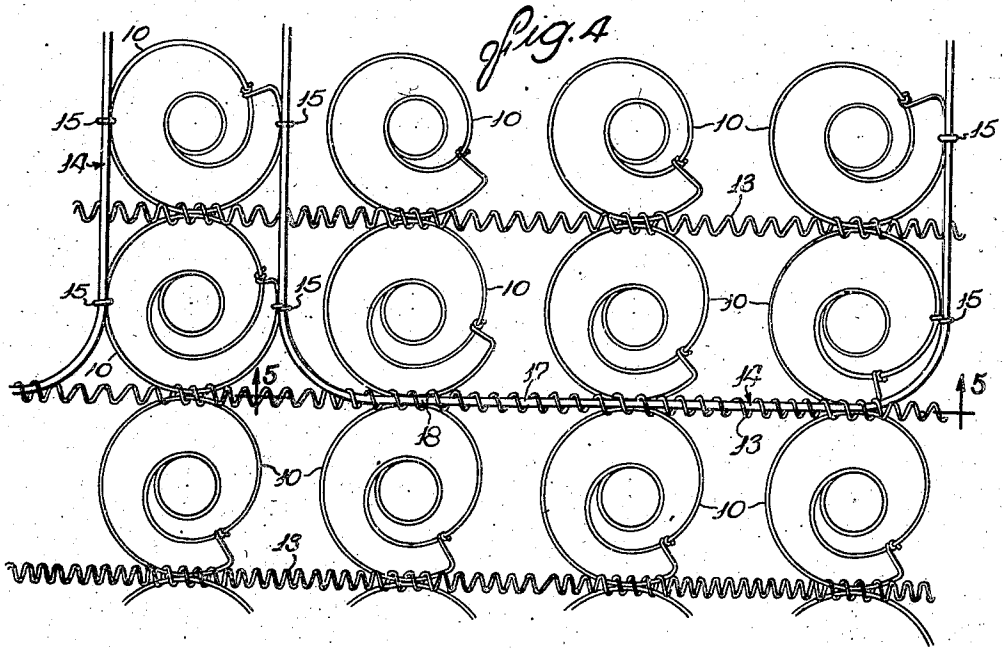
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SPRING CONSTRUCTION FOR MATTRESSES AND THE LIKE

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Fig. 4



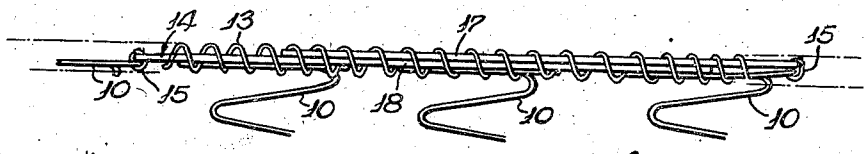


Fig. 5

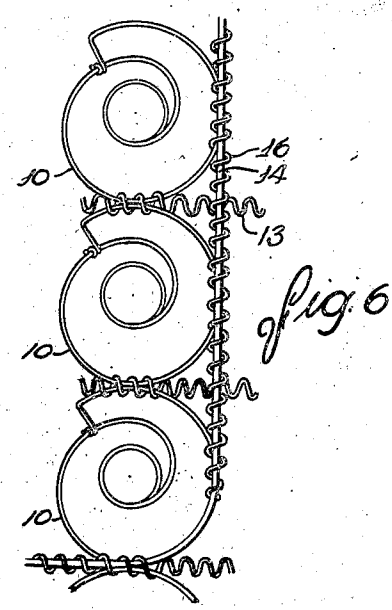


Fig. 6

INVENTOR

Chester A. Pink

By Parker, Carlson, Ryder & Hibbard

ATTORNEYS

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2,383,157

SPRING CONSTRUCTION FOR MATTRESSES AND THE LIKE

Chester A. Pink, Chicago, Ill., assignor to The Englander Company, Inc., a corporation of Delaware

Application October 13, 1941, Serial No. 414,801

3 Claims. (Cl. 5—248)

The invention relates to spring constructions for mattresses and the like and has as its general aim the provision in such structures of simple yet highly effective means for amplifying the support afforded by certain areas of the spring system without noticeably diminishing the yielding resiliency thereof.

In spring systems for mattresses the constructions employ a plurality of coil springs connected together and may or may not include border members at the margins of the system to which the outer rows of springs are connected. Systems of this nature are subject to the disadvantages that they yield throughout their surface area uniformly according to the weight thereon and that such yielding is widely distributed over and affects most of the spring system. Since certain portions of a reclining body are heavier than others uniformity of yielding is a disadvantage because the heavier parts will be inadequately supported if the spring system is constructed to give proper support to the average lighter body parts. Moreover, if the same springs of the system are consistently "over-loaded" actual deformation thereof may occur to produce permanently depressed areas.

A disadvantage resulting from the wide, uninterrupted distribution of stresses over the entire system arises when two persons of different weights occupy the same bed. Obviously, the heavier person will depress the system to a greater extent than the lighter person. The intermediate portions of the system between the persons will tend to equalize the stresses imposed by the two weights while the outer portions of the system tend only to distribute the weight of the person to the nearest border member. Consequently the lighter body will be supported at a higher level than the heavier body and the separating portion will have a definite downward slope tending to cause the lighter body to roll toward the heavier.

Various expedients have been proposed to overcome these difficulties. Spring systems have been tried in which stronger springs have been placed in those areas usually subjected to the heavier stresses. This arrangement is expensive to manufacture, it produces rather sharp lines separating the stronger and weaker springs and the stronger spring areas must be arbitrarily selected in manufacture. Spring reenforcing means in the nature of tie wires running through the spring system have also been proposed but such expedients do not accomplish the purpose of the present invention since such reinforcing means materially lessens the resiliency of the system as a whole and in some instances actually divides the system into two or more substantially independently acting sections separated either by a sharp uncomfortable ridge or by an equally undesirable gap.

An object of the invention is to provide a spring system which is especialy well adapted for inner spring mattresses and which embodies novel means for increasing the support afforded by certain areas of the system without materially diminishing the flexibility or yielding characteristic of such areas.

Another object is to provide in a spring system new and improved means for subdividing the system into a plurality of areas each having marginal support common to an adjoining area.

More specifically stated, an object is to provide a new and improved spring system embodying a plurality of resiliently connected springs located within the confines of border members and means in the form of one or more frames each enclosing the springs in a smaller part of the total area and connected only to the springs along the lines of the frames for subdividing the surface area of the system into smaller areas.

Other objects and advantages will become apparent in the following description and from the accompanying drawings in which:

Figure 1 is a somewhat diagrammatic view of the upper surface of the spring system embodying the features of the present invention.

Fig. 2 is a transverse sectional view an on enlarged scale taken substantialy along the line 2—2 of Fig. 1.

Fig. 3 is a sectional view similar to Fig. 2 but illustrates the positions that may be assumed by the springs of the system in use.

Fig. 4 is a fragmentary plan view on a greatly enlarged scale, showing approximately that portion of the system bounded by the broken line 4 in Fig. 1.

Fig. 5 is a fragmentary sectional view taken substantially along the line 5—5 of Fig. 4.

Fig. 6 is a view showing a detail of a modified form of connecting means.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawings and will herein describe in detail, the preferred embodiments, but it is to be understood that I do not thereby intend to limit the invention to the specific forms disclosed, but intend to cover all modifications and alternative constructions falling within the spirit

and scope of the invention as expressed in the appended claims.

For purposes of disclosure, the present invention has been illustrated and will be described in connection with the spring system of a type that is incorporated in an inner spring mattress dimensioned for a double width bed. It is to be understood, however, that the invention may be embodied in types of spring systems other than the particular one herein illustrated and described.

Referring particularly to Figs. 1 and 2, the spring system comprises a plurality of similar coil springs 10 arranged in closely spaced longitudinally and transversely alined rows. The springs are disposed in the same plane and provide opposite or upper and lower flat surfaces. End and side marginal rows of springs are traversed by top and bottom border members 11 (herein shown as flexible but relatively heavy wires) and the outer portion of the top and bottom end turns of each spring in these marginal rows are suitably secured to the border wires as by means of helically coiled wires 12, commonly termed "pigtails." Longitudinally adjoining coil springs are in this instance secured together by transversely extending helically coiled wires or pigtails 13. In such a spring system the yielding resiliency of the coil springs is substantially uniform throughout the total area of the system and the border wires are sufficiently flexible to yield with the marginal springs while affording points of suspension at the margins of the spring system.

According to the present invention the upper supporting surface area of the spring system is subdivided into a plurality of smaller areas each having its own points of suspension. Thus, as shown in Fig. 1, a closed frame 14 dimensioned to enclose an area that is substantially smaller than the total area enclosed by the border wire 11 is mounted upon the flat surface area of the spring system in inwardly spaced relation to the border wire 11. The frame 14 is preferably formed of wire of somewhat smaller gauge than the border wire so that the frame is less rigid and more flexible. The frame is so dimensioned that each end or side thereof will extend along alined portions of the end turns of predetermined longitudinal or transverse rows of coil springs. Each coil spring thus traversed by the frame wire is suitably secured thereto. Thus the coil springs of the transverse rows are preferably secured to the ends of the frame by the pigtails 13 that connect the transverse rows together whereby in this instance the frame ends are connected to two transverse rows of coil springs. The coil springs of the longitudinal rows may be suitably connected individually to the frame as by means of small wire loops or clips 15. In this connection, as shown in Fig. 6, the coil springs of the longitudinal rows might be joined to the frame 14 by longitudinally extending pigtails 16.

In constructing the frame 14 it has been found unnecessary to secure the meeting ends of the wire permanently together. Assembly is facilitated by merely overlapping the loose ends of the frame wire as indicated at 17 and 18 in Fig. 5 and holding these overlapping ends in position by the connecting pigtail 13.

It may be pointed out that since inner spring mattresses are reversible, subdividing frames 14 will be secured to the opposite surfaces of the spring system. In use the frame on the upper surface will be primarily the effective one, although the frame on the lower surface of a reversible mattress will have some effect where the mattress is yieldably supported. If the mattress is supported on an unyielding surface only the frame on the upper surface will be effective. In operation each subdividing frame 14 has the effect of providing additional suspension points for the springs between the points of suspension afforded by the border wires. Being firmly connected with each of the springs it traverses, the subdividing frame segregates the springs into small units outside as well as inside the frames. The smaller units have a spring action which appears to be the resultant of the connected springs in that the yielding support afforded by the springs in the smaller areas is increased even though the resiliency of each individual spring is unchanged. Any one frame has an action like that of the border wire and the springs within the confines of that frame afford greater support than those outside the frame. The frame 14, therefore, may be so located with respect to the surface area of the system as a whole that the springs located within its confines will occupy the area upon which the greatest weight will rest in the normal use of the mattress. Such an arrangement will provide greater support through the area where greater support is required without noticeably increasing the resistance offered by the springs in any part of the system.

When the invention is embodied in a mattress dimensioned for a double width bed a plurality of subdividing frames may be used to produce a highly desirable result. As shown in Fig. 1, two of the frames 14 are employed, these frames being identical in construction and connection with the coil springs and being located approximately centrally of the longitudinally divided halves of the system. It is to be noted that the inner and adjoining wires of the frames are connected with the opposite sides of the longitudinally extending central row of coil springs. Thus, throughout the longitudinal medial line of the spring system, both frames will have a suspending effect on the central row of coil springs which further increases the support afforded by this row of springs.

With this arrangement the spring system has in a transverse direction six effective points of suspension represented by the two outer longitudinally extending border wires and by the longitudinally extending portions of the frames 14. These points of suspension have been designated by the letters A to F, inclusive, in Fig. 3. In the use of the mattress by two persons of different weights, the heavier person will, of course, compress the springs which support him to a greater extent than will the lighter person. Thus, as shown in Fig. 3, a heavy person might compress the springs as indicated through the area B to C, while the lighter person might compress the springs to the extent indicated through the area D to E, whereas in spring systems as heretofore constructed the intervening springs between these areas would tend to slope downwardly toward the area of greater compression. The additional support afforded in the present spring system to the central row of springs by the segregating frames provides a definite separating elevation (as indicated by the portion C to D) between the heavier and lighter persons. Thus, the present invention overcomes the objectionable tendency of the lighter person to roll toward the heavier person. However, the inherent resiliency of each of the springs of the central row is not materially affected and the segregation of this row of springs

to provide a dividing or separating area cannot be noticed by a person lying thereon.

It will be evident from the foregoing that a novel spring system has been provided in which certain predetermined areas afford increased support to the heavier portions of the body without materially impairing the resiliency of the individual springs. Moreover the surface area of the system may be segregated into a plurality of areas in such fashion that individual areas may be occupied by different persons without affecting the area occupied by the other person. These advantages may be achieved by the simple and inexpensive arrangement and relationship of elements herein disclosed.

I claim as my invention:

1. In a spring system for mattresses or the like, the combination of a plurality of springs arranged in alined rows, a pair of frames located on the supporting surface of said system in spaced relation to each other, each of said frames subdividing said surface and defining smaller surface areas, and means for connecting each marginal spring of such smaller areas to the frame associated therewith, said frames having their adjacent sides extending along and directly attached to the opposite sides of the same row of springs.

2. In a spring system for spring mattresses or the like, the combination of a plurality of similar springs arranged in the same plane to provide a flat supporting surface and having the springs alined in longitudinally and transversely extending rows, means for connecting said springs into a unitary structure including border supporting means and transversely extending resilient ties connecting the springs in adjoining rows together, a pair of subdividing frames located on said supporting surface and disposed one on each longitudinally divided half of the system, said frames being flexible wire loops dimensioned to encircle a plurality of springs and to extend along the edges of predetermined lines of springs inwardly of said border supporting means, and means for directly connecting said frames to each of the springs in said predetermined lines of springs, the adjacent sides of said frames being directly connected respectively with opposite sides of the innermost or central line of springs.

3. In a spring system for mattresses or the like, the combination with a plurality of closely spaced springs and means connecting said springs into a unitary system having a substantially flat plane supporting surface, a plurality of flexible means located on said supporting surface and subdividing said surface into smaller spring areas within the margins of the system, said plurality of subdividing means being spaced relative to one another transversely of the length of the system, and means attaching each of the subdividing means directly to opposite sides of each of the associated springs in a central longitudinally extending row of springs, the attaching means preventing relative separating movement of the subdividing means and providing therewith a central area defined by said central row of said springs having their yielding characteristics modified by their connection with the subdividing means.

CHESTER A. PINK.