Sept. 5, 1933. A. EHLENBECK ET AL 1,925,868

SPRING MATTRESS, CUSHION, OR THE LIKE

Filed Feb. 27, 1931

Fig. 1.

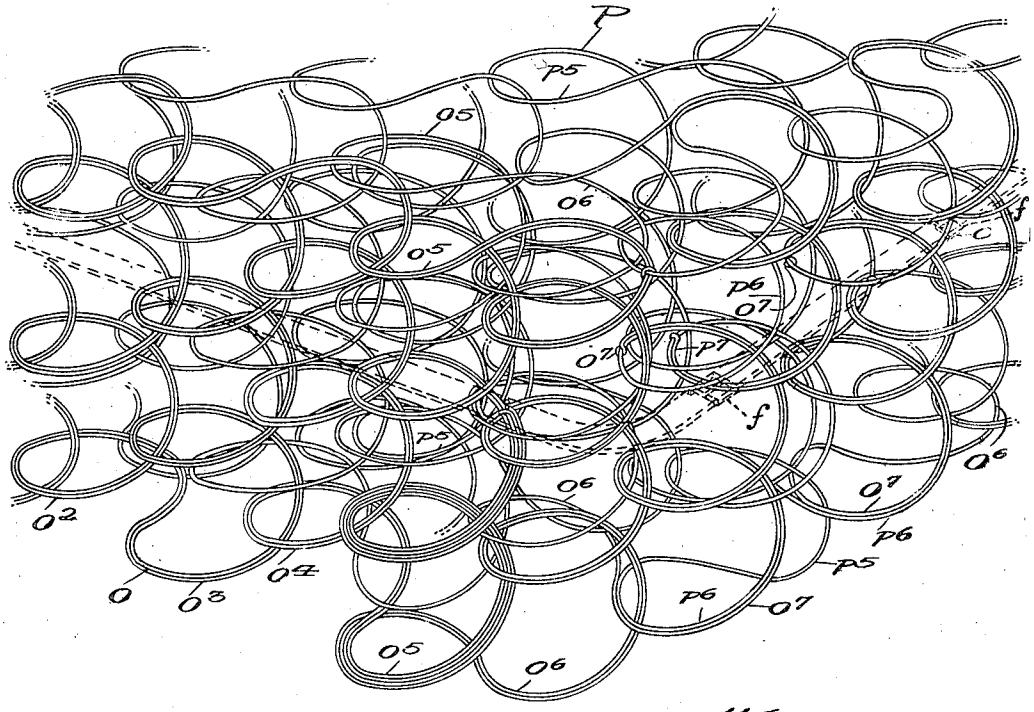


Fig. 3.

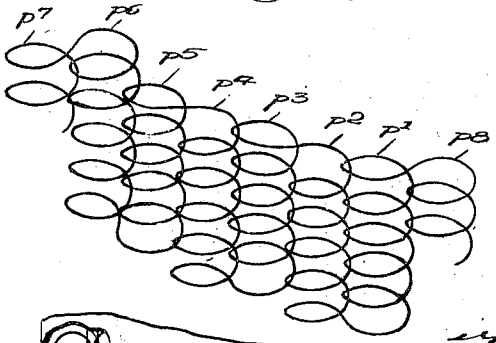


Fig. 2.

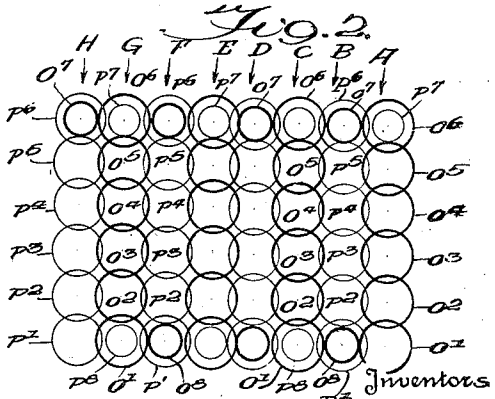
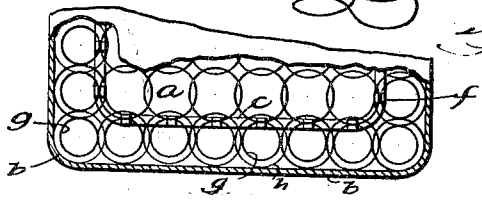


Fig. 4.



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SPRING MATTRESS, CUSHION, OR THE LIKE

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Application February 27, 1931, Serial No. 518,690, and in Germany March 1, 1930

9 Claims. (Cl. 5—246)

The invention relates to a spring bottom or insertion for mattresses, cushions, or the like, which, in the present invention, is formed of a number of upright helical springs arranged next to each other, and in which the retaining frame provided on the edge of the spring bottom or insertion (hereinafter called "spring bottom") is fitted at about half way up the springs.

A spring bottom thus made has, inter alia, the disadvantage that the edge springs are exposed at their top and bottom turns, which are not kept up by a retaining frame, to a pull exerted by the springs located in the middle of the spring bottom. The spring turns situated above and below the frame are pulled inwards, so that the outer border of the edge springs forms a line with an outward angular break. Since the side walls of the spring bottom are formed by a covering lying on the outer border line of the edge springs, the side surfaces would, especially when the springs have a comparatively large height, have an outward break at about half the height of the spring bottom. Apart from the fact that in the case of this angular break in the side surfaces the spring bottom acquires an unpleasing shape and, moreover, renders it difficult to obtain a perfect fitting and fastening of the cushion cover, there is the further disadvantage that the protruding frame, as well as the sheet metal fastening clamps, come into contact with the cover, thus injuring it and wearing it through.

These disadvantages are obviated according to the present invention by forming at least the edge springs of the spring bottom, either wholly or for a part of their length, of at least two mutually supporting approximately parallel wires. In the case of a spring bottom, the adjacent helical springs of which mostly consists of a number of rows of springs made of one common wire and arranged side by side, the outer end spring of a single row may, in some cases, be advantageously bent at 90° to its longitudinal axis. Two adjacent rows of springs are in this case so arranged that the edge springs of one row of springs are supported, i. e. doubled, by the bent off turns of the adjacent row which are fixed to the frame with their ends.

Owing to such an arrangement, the top and bottom turns of the edge springs, no longer supported by a frame, are pressed outwards by the elastic pressure of the bent off spring turns, so that in the first place side walls with even surfaces are produced which give the cushion a good shape and, furthermore, an easy fitting of the cover is ensured. The doubling and mutual support of the edge springs has the further advantage that, owing to the strength of edge produced thereby, the fitting of the retaining frame is no longer effected on the outer peripheral portions of the middle turns of the springs, but on the parts of the spring turns lying more towards the middle of the cushion. Advantageously, the frame is arranged on the inner periphery of the turns of the edge springs, and is at the same time secured to these and to the adjacent springs located on the inside of the edge springs.

The advantages of this new arrangement, include, in addition to those already mentioned, the further advantage that the presence of any hard part of the frame on the outside of the cushion is avoided. There is obtained, not only on the top and bottom surfaces, but also on the side walls, an extraordinarily elastic spring bottom in the case of which no hard frame portion can be felt on the outside. Moreover, the cover surrounding the spring bottom is thoroughly protected, because all contact of the retaining frame, or of the sheet metal clamps used for fastening the spring turns, with the cushion cover is avoided. Further, owing to the reinforcement of the edge springs, it is made possible to employ comparatively long springs for the manufacture of a cushion of which the middle portion of its springs is supported, so that, even when the cushion is subjected to a compression load, the side walls of the spring mattress retain their shape, and notwithstanding this, the cushion is ensured of an extraordinarily high degree of softness and elasticity.

Two embodiments of the subject matter of the invention are shown by way of example in the accompanying drawing, in which:—

Fig. 1 is a perspective of one corner of a cushion, showing a preferred form;

Fig. 2 is a diagrammatic plan view showing the scheme of reinforcement;

Fig. 3 is a perspective of one row of springs showing the coil windings and interlocking relation of the several coils; and

Fig. 4 is a partial plan view of a modified form of cushion with part of the cover cut away.

Referring more specifically to the drawing in which like reference numerals indicate like parts, there is disclosed a spring bottom, as shown in Figs. 1 to 3, formed of a number of rows of springs O, P, arranged side by side and engaging each other with their turns, the individual rows being, for the sake of clearness, represented alternately by heavy and light lines. Each row of springs O, P is in this case constituted by, for example, six springs o^1 to o^6 or p^1 to p^6, which are

formed by a single continuous wire and are connected with each other at the top and bottom alternately (see Figure 3).

In the form of the invention illustrated there are eight rows of springs, designated in Fig. 2 as A, B, C, D, E, F, G and H, from right to left. Row A comprises interengaging coils O^1, O^2, O^3, O^4, O^5, O^6. At the end coil O^6 the wire is reversely bent to form coil O^7 disposed at the end of row B and at right angles to row A. The extension coil O^7 is connected to frame *c* and extends only one-half the length of the spring insert or bottom.

The next row B is formed from coils P^6, P^5, P^4, P^3, P^2, P^1, the coil P^6 being reinforced for half its length by coil O^7. The coil P^6 is extended to form coil P^7 at one end of row A overlapping and reinforcing coil O^6 for half its length. Coil P^7 is secured to frame *c*. At the other end of row B coil P^1 is extended to form coil P^8 at one end of row C, coil P^8 being secured to frame *c*.

Row C is formed by interengaging coils O^1, O^2, O^3, O^4, O^5, O^6, and O^6 is extended at right angles to form O^7 at one end of row D.

Each length of intercoiled springs, except those forming rows A and H is shaped thus



and the coils W X and Y Z being extensions of the coils forming the row X Y. The construction of the rows of springs is clearly shown in Fig. 3. While row P is illustrated in Fig. 3, it will be evident that row O is exactly the same, except that the end extensions will run in the opposite direction from the middle bracing member or frame *c*. Thus at the two ends of each row of spring O, P, reinforcing coils O^8, O^7 (P^8, P^7) are bent off at right angles to the axes of said coils and in opposite directions; as may be seen from Figures 1 and 3, these coils extend half the height of the cushion, and are secured by their ends to the frame *c*. The bent off spring O^7 of the row of springs O serves for supporting the end spring p^6 of the adjacent row of springs P, the spring p^6 being pressed outwards by the force of the bent off spring coils. The bent off spring coils P^8 and P^7 of the adjacent row of springs P, serve in turn, to support the edge spring o^6 of the row O, the bottom half being doubled in the case of the edge spring o^6, and the top half being doubled in the case of the adjacent edge spring p^6.

The upper portions of the coils at the ends of the rows are S-shaped or reversely bent, as shown at O^1, O^6, P^7, P^6, etc. It will be observed that the rows of springs that form the edge portions of the cushion are preferably double strand, but will be single strand throughout the major interior portion of the cushion. Thus it will be observed that the rows O forming the right hand end of Fig. 2 will be double strand and that while the rows O which alternate with the rows P progressing to the left of Fig. 2, will be single strand, that nevertheless, due to the portions O^7, O^8, which will interengage with the coil or row P at the edges, the equivalent of a double strand will be formed, and the same is true where the single strand coils P^7 and P^8 interengage with the edges of the cushion with coils of row O. The quadruple strand shown in the lower center of Fig. 1 at O^5 is the beginning of the coil formation.

Instead of being formed of a number of rows of springs, as described, above the spring bottom may as shown in Fig. 4 be composed of a row of single springs *a* arranged side by side and engaging in each other with their turns, and is enclosed in the known manner in a cover *b*. Located at the edge of the spring bottom is a retaining frame *c* which conforms to the particular shape of the cushion, and which is secured at half the height of the edge springs, i. e. to about the middle turns thereof, by means of sheet metal clamps *f*, or in some other manner.

As may be seen especially from Fig. 4, in the case of the spring bottom kept up only by a single frame *c* at the middle, the edge springs are doubled, being reinforced, for at least a portion of their length, by coiling a number of spring turns *g*, *h* one within the other, so that the springs take up a position that is perpendicular to the plane of the frame and cannot be drawn inwards at their top and bottom ends by the springs *a* located inside the cushion. The stiffness of edge of the spring bottom thus obtained enables the retaining frame *c* to be fitted in the novel manner, i. e., this frame is no longer, as hitherto, secured to the outer peripheral portions of the middle turns of the springs, but to the inner peripheral portions of the edge springs *g*, *h*. By means of the sheet metal clamps *f* used for fastening the latter, the adjacent springs *a* lying inside the edge springs are at the same time held on the frame *c*.

It will be seen that in this way there is provided a spring bottom which is distinguished by a high degree of elasticity and softness, not only on its top and bottom faces, but also on its side walls, owing to the avoidance of all hard surface parts. Moreover, a premature wearing through or injury of the cover encasing the spring bottom is obviated by reason of the fact that the retaining frame and the generally sharp-edged sheet metal clamps no longer come into contact with cover.

Naturally, the invention is not restricted to the examples represented, but other embodiments thereof are possible. In particular, the new frame arrangement may be applied to cushions in which the edge springs are reinforced by a multiple coiling of spring coils within each other realized in some other manner. Similarly, the new frame arrangement may be used in cushions in which the springs do not engage directly with each other by means of their turns. The doubling is not restricted to the edge springs alone, but springs lying towards the middle of the cushion may be doubled for the purpose of obtaining and increased stiffness and durability of shape. Finally, instead of the one frame, a number of them may be provided on the spring bottom, ad fitted not right at the ends of the coils. but rather intermediately of the top and bottom ends of the springs.

We claim:

1. A spring bottom comprising a plurality of rows of coil springs, each row being formed from a continuous wire, the wires being extended from end coils of said rows to form coils engaging and reinforcing the end coils of adjacent rows.

2. A spring bottom comprising a plurality of rows of springs, each row being formed from a continuous wire and the adjacent coils of each row and adjacent rows being interengaged, the wires being extended from end coils of said rows to form coils engaging and reinforcing the end coils of adjacent rows.

3. A spring bottom comprising a plurality of rows of springs, each row being formed from a continuous wire and the adjacent coils of each

row and adjacent rows being interengaged, the wires being extended from end coils of said rows to form coils engaging and reinforcing the end coils of adjacent rows, the wire in the reinforcing coils being substantially parallel to the wire in the coils reinforced.

4. A spring bottom comprising a plurality of rows of springs, each row being formed from a continuous wire and the adjacent coils of each row and adjacent rows being interengaged, the wires being extended from end coils of said rows to form coils disposed substantially at right angles to the rows from which they are extended to engage and reinforce the end coils of adjacent rows.

5. A spring bottom comprising a plurality of rows of springs, each row being formed from a continuous wire and the adjacent coils of each row and adjacent rows being interengaged, the wires being extended from end coils of said rows to form coils engaging and reinforcing the end coils of adjacent rows, and a frame secured to the inner peripheries of the outer rows of springs intermediate the upper and lower ends thereof.

6. A spring bottom comprising a plurality of rows of springs, each row being formed from a continuous wire and the adjacent coils of each row and adjacent rows being interengaged, the wires being extended from end coils of said rows to form coils engaging and reinforcing the end coils of adjacent rows, and a frame secured to the inner peripheries of the outer rows of springs intermediate the upper and lower ends thereof, said reinforcing coils being secured to said frame.

7. A spring bottom comprising a plurality of rows of springs, each row being formed from a continuous wire and the adjacent coils of each row and adjacent rows being interengaged, the wires being extended from end coils of said rows to form coils reinforcing the end coils of adjacent rows, and a frame secured to the inner peripheries of the outer rows of springs intermediate the upper and lower ends thereof, certain of the reinforcing coils being disposed above the frame and others being disposed below the frame.

8. A spring bottom comprising a plurality of rows of coil springs, each row being formed from a continuous wire, the wires being extended from end coils of said rows to form coils engaging and reinforcing the end coils of adjacent rows, and a frame secured to the inner peripheries of the outer rows of springs intermediate the upper and lower ends thereof, said reinforcing coils terminating at a point adjacent said frame.

9. A spring bottom comprising a plurality of rows of coil springs, each row being formed from a continuous wire, the wires being extended from end coils of said rows to form coils engaging and reinforcing the end coils of adjacent rows, and a frame secured to the inner peripheries of the outer rows of springs intermediate the upper and lower ends thereof, said reinforcing coils terminating at a point adjacent said frame, certain of the reinforcing coils being disposed above the frame and others being disposed below the frame.

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