April 6, 1943. H. HOPKES 2,315,706

SPRING CONSTRUCTION

Filed May 8, 1939

Fig. 1.

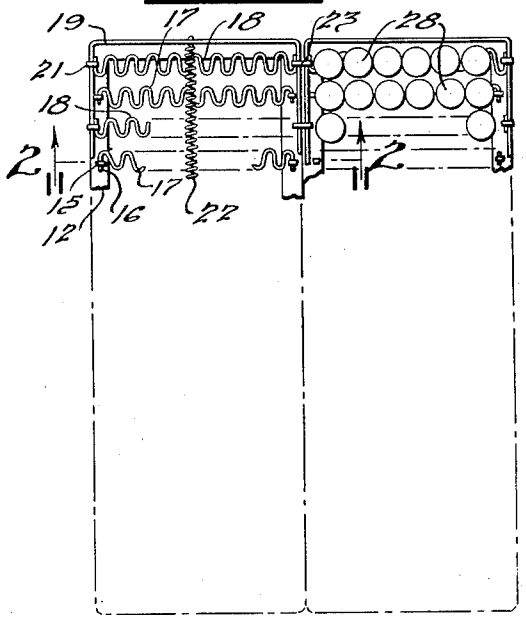
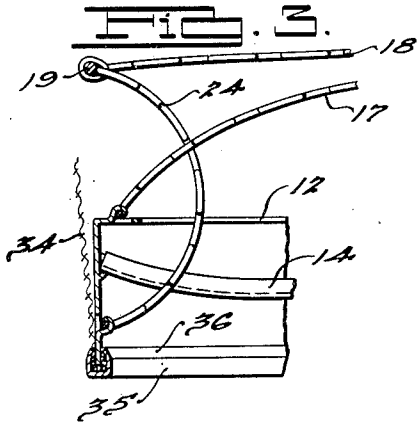


Fig. 3.



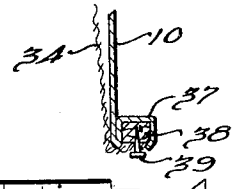


Fig. 4.

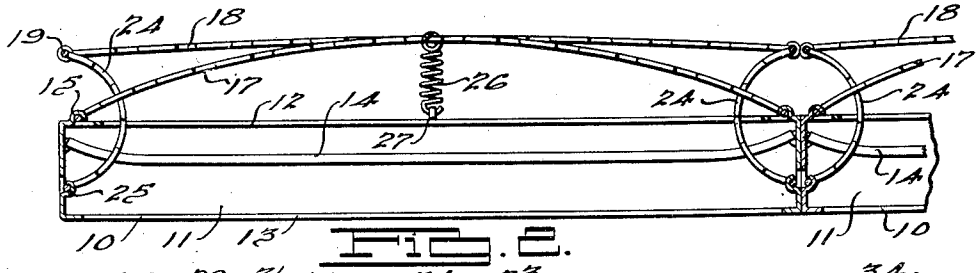


Fig. 2.

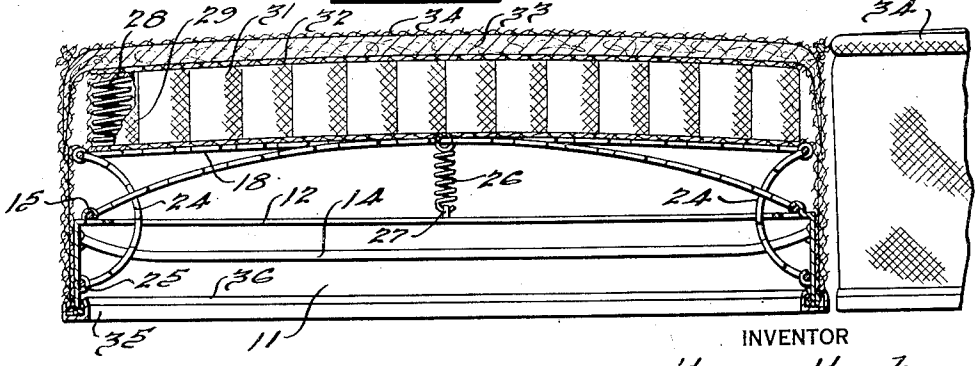


Fig. 5.

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UNITED STATES PATENT OFFICE

2,315,706

SPRING CONSTRUCTION

Henry Hopkes, Grosse Pointe, Mich., assignor to No-Sag Spring Company, Detroit, Mich., a corporation of Michigan

Application May 8, 1939, Serial No. 272,333

3 Claims. (Cl. 5—351)

The present application is a continuation in part of my prior copending application, Serial No. 133,111, filed March 26, 1937, and assigned to the assignee of the present invention.

This invention relates to spring constructions for seats, seat backs, chairs, davenports, mattresses and the like, and particularly to spring constructions employing sinuous wire so formed, arranged and interconnected as to provide a soft edge construction which forms a support for nested coil springs. When employing strips of spring material, such as that formed of a wire bent in zig-zag formation, difficulty is experienced in obtaining a soft edge construction in an assembly. Such a spring, provided with a permanent set on an arc smaller than the arc upon which it is employed, is illustrated, described and claimed in the Karl Kaden Reissue Patent No. 21,263, issued November 14, 1939, and assigned to the assignee of the present invention. When such a spring has both of its ends secured to a frame, ample support for the weight of an occupant is provided thereby, but such construction lacks the soft edge which provides support at the extreme edge of the seat. The present invention contemplates the employment of nested coil springs mounted upon the sinuous springs when the alternate springs have their ends attached and projected to form a soft edge. The structure illustrated in the drawing discloses alternate spring strips with the end of one strip anchored to the frame with the adjacent strips projecting thereabove and resiliently supported. The coil springs may be disposed in pockets of cloth material to form a row, with the rows of coil springs secured in position with each row aligned with a spring strip upon which it is supported. The hog rings or other suitable means retain the nest of coil springs in position, and an exceedingly soft resilient spring structure is provided thereby. A sound deadening material may be provided between the surface of the spring strips and the bottoms of the coil springs.

Accordingly, the main objects of my invention are; to provide a frame spanned by sinuous spring strips upon which a nest of coil springs are secured, with a row of the springs aligned with one of the strips; to mount sinuous spring strips with their ends resiliently supported to provide a soft edge and secure thereto nested coil springs, each row of which is aligned with one of the strips; to form a spring structure from sinuous spring strips which are alternately disposed to have the ends of one strip anchored to the frame and the adjacent strips projected thereabove to form a soft edge construction and mount a nest of coil springs on the spring strips, with a row of the coil springs aligned with one of the strips; to secure a nest of coil springs on a surface formed of sinuous spring strips, with a row of the coil springs aligned with an individual strip and in general, to provide a spring construction which is exceedingly resilient, having a resilient edge, and which is economical to manufacture.

Other objects and features of novelty of my invention will be either specifically pointed out or will become apparent when referring, for a better understanding of my invention, to the following description taken in conjunction with the accompanying drawing, wherein:

Figure 1 is a broken plan view of a spring construction embodying features of my invention;

Fig. 2 is an enlarged broken sectional view of the structure illustrated in Fig. 1, taken on the line 2—2 thereof;

Fig. 3 is a view of structure similar to that illustrated in Fig. 2, showing a modified form thereof;

Fig. 4 is a view of structure, similar to that illustrated in Fig. 3, showing a further form which my invention may assume; and

Fig. 5 is a sectional view of structure similar to that illustrated in Figs. 1, 2, and 3, after the trimming operation.

In Figs. 1 and 2 I have illustrated a spring and mattress unit having a base 10, of inwardly presented channel construction embodying a web 11, top flange 12, and a bottom flange 13. When the frame is of material length, one or more braces 14 may be provided between the web portions 11 thereof to prevent the frame from bowing inwardly so that a light material may be employed for the base 10. A plurality of tongues 15 are struck upwardly from the top flange 12 and are bent over the end 16 of spring strips 17 which are formed of a wire bent in zig-zag formation and which are rolled on an arc of small radius to provide an inherent set against downward deflection when the ends are extended and anchored across the base frame. Similar strips 18 are disposed between the strips 17 which are anchored to the top flange 12 having the ends secured to a border frame element 19 by clamping rings 21. A centrally disposed coil spring 22 joins the strips 17 and 18 together. The structure so assembled may be employed as a base for a davenport, a spring for a bed or the like, and when employed as a mattress two of the sections may be joined to-

gether by rings 23 to form a unit construction. The spring strips 18 have the ends reversely bent to form a spring supporting portion 24 for the end of the strip 18 forming the top surface of the assembly, the edges of which project over the base frame 10. Resilient support is provided to the edge of the resulting spring surface while material support is provided by the spring strips 17 disposed therebetween. Tongues 25 project inwardly from the web 11 of the base frame and provide an anchoring means for the end of the reversely bent portion 24 of the strips 18.

As illustrated in Figs. 1 and 5, rows of coil springs 28 may be mounted on each of the sinuous spring strips 17 and 18 for providing a more resilient top surface for the assembly. As illustrated in Fig. 5, the springs 28 are disposed in pockets 29 which are formed in a strip of fabric material 31 which forms the rows of the springs. The diameter of the springs is such that the springs adjoin each other so as to provide a unit assembly of the springs. Burlap or other fibrous material 32 may be first employed on the top of the spring surface formed by strips 17 and 18 to prevent wear of the material 31 forming the pockets, and to deaden any sound which may occur between the movement of the spring strips and the coil springs. As illustrated in Fig. 5, the springs span the end portions of the spring strips 17 and form engagement therewith as the load increases. This provides a soft edge to the construction which may deflect under a lighter load than the central portion of the assembly.

A similar sheet of burlap or like material 32 is provided on the top of the coil spring assembly, over which a pad 33 of cotton or similar material is disposed, to be covered by trim material 34 which is stretched thereover and over the sides of the assembly and secured to the base frame by a channel element 35. The side portion 36 of the channel element is deflected inwardly to secure the trim cloth about the end of the web 11 of the frame when the bottom flange 13 thereof is omitted. This assembly is illustrated more clearly in Fig. 3. In Fig. 4 I have illustrated the web portion 10 as being reversely bent and formed into a channel 37 for supporting a tack receiving element 38 in which the end of the upholstering material is secured by tacks 39.

I have, accordingly, illustrated a spring assembly embodying a spring surface formed of sinuous strips over which rows of coil springs are disposed in aligned relation with the strips. I have illustrated alternately disposed strips, one series of which is arched across the base frame while the series disposed therebetween has the ends extended over the base frame and resiliently supported from the base frame. The coil springs are secured together, and while contacting both sets of springs at the central portion, are spaced from the alternate springs which are disposed on an arc between the frame so that a softer surface will be provided at the edge than at the central portion with increasing support provided by the arched spring as the load increases.

While I have described and illustrated several embodiments of my invention, it will be apparent to those skilled in the art that various changes, omissions, additions and substitutions may be made therein without departing from the spirit and scope of my invention, as set forth in the accompanying claims.

I claim:

1. A spring assembly including, in combination, a frame, a plurality of spring strips secured to opposite sides of said frame and disposed thereover, additional spring strips alternating with the first said strips, resilient means supporting the ends of said additional spring strips above said frame, and means for securing coil springs to said strips.

2. In a spring construction, a sub-spring assembly comprising a frame, zig-zag spring strips spanning said frame and supported thereby, with one end of the strips resiliently supported above said frame to provide a soft edge construction and rows of coil spring supported by said sub-assembly with each row aligned with a spring strip.

3. A spring assembly including, in combination, a frame, a plurality of spring strips spanning said frame above the top edge thereof, resilient means supporting some of the ends of said strips, means for attaching other ends of said strips to said frame, and coil springs secured to each other and supported upon said resiliently supported strips with each row of springs aligned with one of said strips to form a soft spring construction having a soft edge.

HENRY HOPKES.