

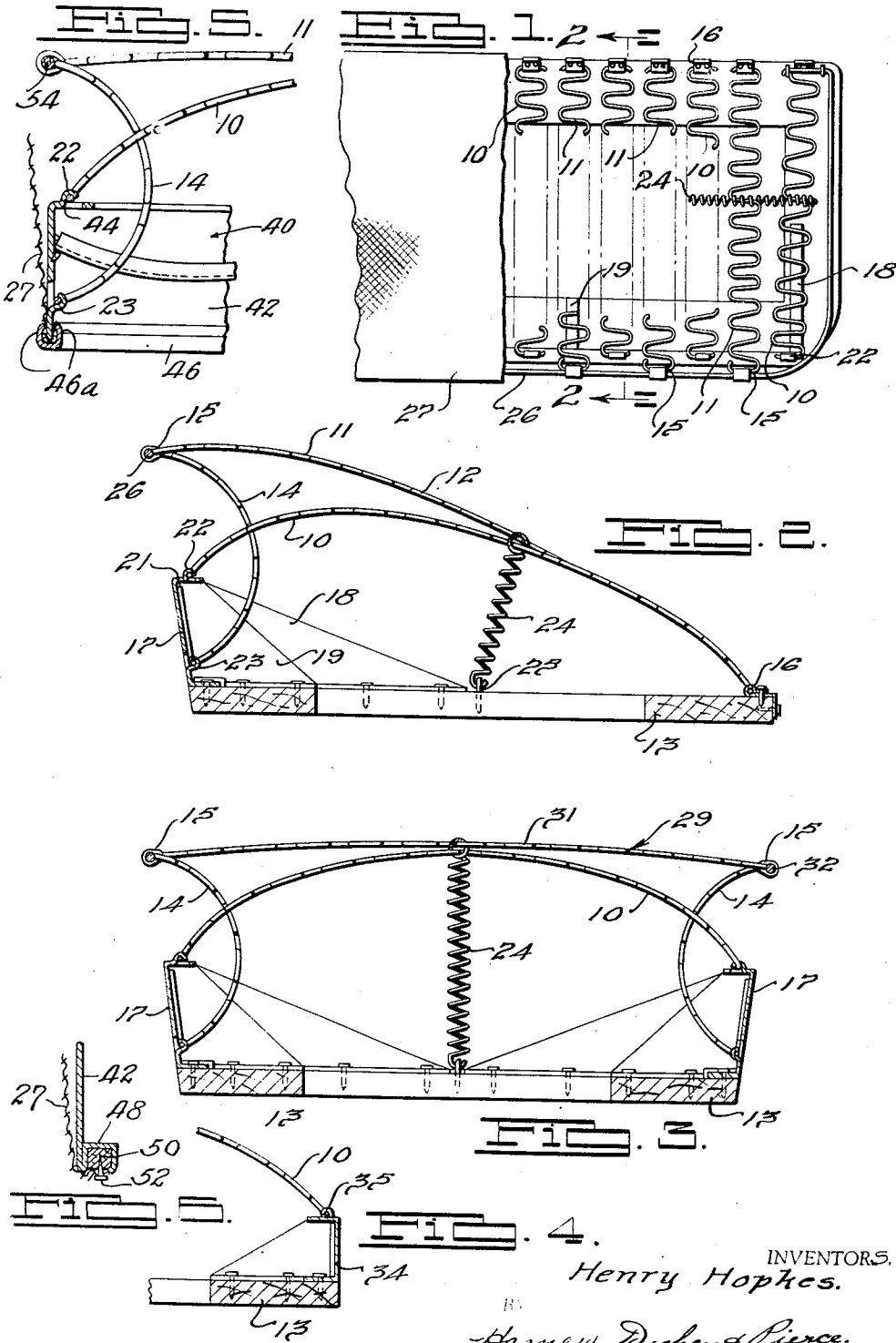
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H. HOPKES

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SPRING CONSTRUCTION

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INVENTORS.
Henry Hopkes.
Harness, Dickey & Pierce.
ATTORNEYS.

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SPRING CONSTRUCTION

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

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The present 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.

When employing strips of spring material such as that formed of a wire bent in zig-zag form, 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 Kaden Patent No. 2,002,399, issued May 21, 1935, under which the assignee of the present application is a licensee. When such a spring has both of its ends secured to a frame, ample support for the weight of the occupant is provided thereby but such construction lacks the soft edge which provides additional support at the extreme edge of the seat.

In practicing the present invention, the Kaden type of spring is preferably employed, having both of its ends secured in the well known manner and having alternately disposed therewith similar strips having the ends reversely bent to provide the soft edge construction. Such soft edge construction may be provided at the front edge only, or both the front and back edges may be made soft, as in a mattress or similar construction. A suitable frame is provided for anchoring the alternating spring elements to rigidly support the end of one element and to resiliently support the edge of an adjacent element. The one set of elements is employed primarily to take the load of the occupant while the adjacent element provides the soft edge construction.

Accordingly, the main objects of the present invention are to provide a spring construction employing spring strips so formed and alternately disposed as to provide a load carrying portion and a portion producing a soft edge construction; to provide a frame with a projecting flange, on the top part of which certain of the spring elements are secured while on the lower portion thereof are secured resilient supports for additional elements; to provide alternating strips of resilient material portions of which support the occupant while other portions provide a soft edge construction to the seat; to provide a spring surface formed of a plurality of arcuate spring elements having alternating therewith additional spring elements formed to provide a soft edge construction; and in general, to provide a spring construction having a resilient edge which

is simple in construction and economical of manufacture.

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

Figure 1 is a plan view, with parts broken away, illustrating a spring construction embodying features of the invention;

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

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

Fig. 4 is a view of a structure similar to that illustrated in Fig. 2 showing a further form which the invention may assume;

Fig. 5 illustrates a modified frame construction; and

Fig. 6 illustrates a further modification of the frame construction.

Figs. 1 and 2 illustrate a seat formed of spring elements so constructed as to provide a soft resilient front edge. The spring elements are formed of wire bent in zig-zag configuration and preferably coiled to have a set on an arc of small radius to provide a resistance to downward displacement when the ends of the elements are spread and secured on an arc of greater radius, as described and claimed in the above identified Kaden patent.

Additional spring elements, also of the above identified type, are employed along with the elements, in alternate relation therewith, and in combination therewith, provide a resistance to load and also a soft edge construction. The spring elements herein illustrated have a portion which is disposed across a seat frame and an additional portion reversely bent to provide an edge supported thereby. The rear ends of the elements are secured by clips to the rear edge of the frame in any suitable manner.

A channel shaped border element is secured to the front end of the frame having side extending portions which brace the channel member at the ends. Additional braces may be employed to secure the channel element to the frame medially of its length. The top flanged edge of the border element has a plurality of tongues stamped therefrom which are utilized to secure the front ends of the

elements 10. Similar tongues 23 are stamped from the web portion of the border element 17 and are utilized for securing the ends of the resilient portions 14 of the spring elements 11. A coil spring 24 interconnects the plurality of elements 10 and 11 medially of their ends to limit lateral deflection of the elements 10 and 11 relative to each other. The ends of the spring 24 are bent downwardly and secured to the frame by staples 25 or similar means. The portion 12 projecting forwardly of the coil spring 24 extends above the portion of the element 10 disposed frontwardly thereof.

The edge 15 of the elements 11 is formed by clipping the ends of portions 12 and 14 to a border wire 26 which retains the ends in aligned relation and provides for unit operation of the elements. Suitable padding or covering material 27 is secured over the elements 10 and 11 and tacked or otherwise secured to the frame 13.

The seat thus constructed depends upon the elements 10 for supporting the major portion of the load while elements 11 provide the soft edge construction to the seat and also support a minor portion of the load. The elements 10 and 11 may be made of the same gauge of wire or may be made of wire of different gauge, depending upon the characteristics desired in the seat construction. If an extremely soft edge seat is to be constructed the wire in the element 11 may be of less gauge than the wire in the element 10, while if the load is to be light, the size of the wire in both of the elements may be the same. It is also within the purview of my invention to employ a lower number of the elements 11 than the elements 10, or conversely, a greater number of the elements 11 may be employed than the elements 10. It will be seen that by selecting the proper number of the one or other elements with the proper gauge of wire, material variation may be obtained in the hardness or softness of the resultant seat and likewise of the seat edge.

Fig. 3 illustrates a further form which the invention may assume wherein both front and rear edges of the seat are provided with a resilient edge. In this construction a spring element 29 has a central portion 31 extending across the seat with the end portions 14 reversely bent to provide spring edges 15. These spring edges are joined by a border wire 32 which may extend entirely around the frame and be secured to the front and rear edges 15 of the elements 29. In this construction, a border element 17 is provided at the rear of the frame and utilized to support the ends of the elements 10 and 29 in the manner herein described relative to Fig. 2. Such a construction may be employed for bed springs and particularly box springs the resultant structure providing a soft central portion with correspondingly soft spring edges.

Fig. 4 illustrates a construction which may be employed with the structure illustrated in Fig. 2. A channel element 34 may be secured along the rear edge of the frame having tongues 35 projecting therefrom which secure the rear edge of the elements 10 and 11 to the channel element. This raises the rear end of the spring construction above that illustrated in Fig. 2.

Fig. 5 illustrates an alternative frame construction, particularly applicable in connection with structures of the kind shown in Fig. 3, in which the flanged elements 17 are replaced by a continuous flanged member 40 having a web 42 and a right angled flange 44, and which may extend entirely around the structure. The spring ele-

ments 10 are secured to the flange 44 by eyes 22, as previously described, and the spring portions 14 are secured to the web 44 by eyes 23 also corresponding to those previously described. In the illustrated arrangement, the base of the web 42 fits into a channel-shaped holder 46 which may extend entirely around the frame structure, and thus forms a base for the frame. The web 42, as well as the covering material 27, may be secured within the channel holder 46 in any suitable way, as by inwardly pressing the legs 46a of the holder 46 so that they grip the web 42 and covering material 27. With this arrangement, in addition to acting as a base for the frame, the holder 46 also acts to form a simple, economically produced and positive securing means for the covering material 27.

In the arrangement of Fig. 6, the holder 46 of Fig. 5 is replaced by reversely bending the base of the web 42 to form a downwardly presenting channel 48, which receives a filler member 50, to which the covering material 27 may be tacked as by tacks 52. As will be appreciated, the channel portion 48 may be so formed as to positively grip the filler 50.

Although specific embodiments of the invention have been described in detail, it will be appreciated that various modifications in the form, number and arrangement of parts may be made within the spirit and scope thereof.

What is claimed is:

1. In a seat construction, a frame, a flanged element extending along the front edge of the seat frame, a plurality of spring strips secured to the rear edge of the frame and to the flanged element, additional spring elements, means securing one end of the additional elements to the rear edge of the frame, and resilient means secured to the flanged element for supporting the other ends of the additional elements above the strips.

2. In a seat construction, a frame, a flanged element extending along the front edge of the seat frame, a plurality of spring strips secured to the rear edge of the frame and to the flanged element, additional spring elements, means securing one end of the spring elements to the rear edge of the frame, resilient means secured to the flanged element for supporting the other ends of the spring elements above the spring strips, and a border wire securing the resiliently supported ends of the spring elements in unit relation.

3. In a seat construction, a frame, spring strips having their ends secured to the frame, additional spring strips alternately disposed relative to said first strips and having the rear ends thereof secured to the frame, resilient means for supporting the front ends of the additional strips above said first strips and a border wire securing said resiliently supported ends together.

4. In a seat construction, a frame, a plurality of spring strips spanning said frame and having front and rear ends rigidly secured thereto, and additional strips spanning said frame and having end portions thereof reversely bent and secured to said frame, said end portions supporting said additional strips above said first mentioned strips.

5. In a seat construction, a frame, spring strips spanning and having their ends secured to the frame, additional strips spanning the frame and alternately disposed relative to said first strips, means securing one end of each additional strip to the frame, and resilient means for securing the

other ends of the additional strips to the frame and for holding them above the first mentioned strips.

5 6. In a seat construction, a frame, a plurality of spring strips spanning said frame and having their ends secured thereto, a plurality of additional spring strips arranged adjacent said first spring strips in alternate relation thereto, said additional spring strips lying in substantially the same arcuate level as said first named spring strips over a portion of the lengths thereof and means resiliently supporting at least one end of each additional spring strip in a position above the corresponding ends of the first mentioned spring strips so as to provide at least one soft edge for the seat.

10 7. In a seat construction, a frame, a first series of spring elements spanning the frame and having the ends thereof connected to the frame, an additional series of spring elements spanning the frame, said additional spring elements being arranged between the elements of the first series, and means for connecting the ends of the addi-

tional spring elements to the frame, including resilient means adapted to support one end of each additional spring element above the level of the adjacent first mentioned elements, so as to provide a soft edge for said seat.

5 8. In a seat construction, a frame, a first series of spring elements spanning the frame and having the ends thereof connected to the frame, an additional series of spring elements, said additional spring elements being arranged between the elements of the first series, means directly connecting one end of each additional spring element to the frame, said additional elements being so arranged that they lie in substantially the same arcuate level over a portion of their lengths adjacent said one end as said first series of spring elements and additional resilient means for connecting the other end of each additional spring element to the frame and for supporting said other end above the level of the adjacent first mentioned element, so as to provide a soft edge for said seat.

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HENRY HOPKES.