March 12, 1940. D. E. SARGENT 2,193,743

SPRING CONSTRUCTION

Filed May 7, 1938

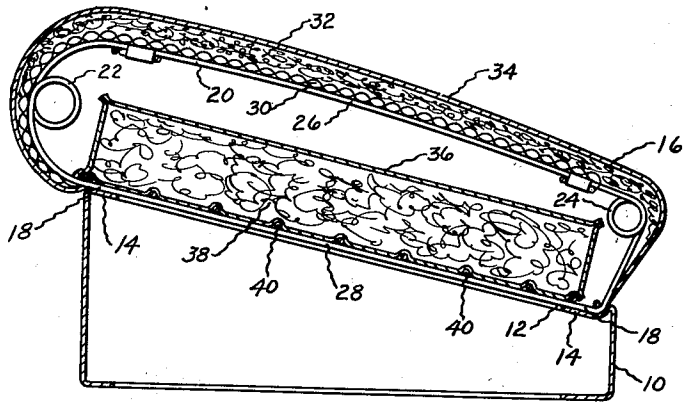


Fig. 1

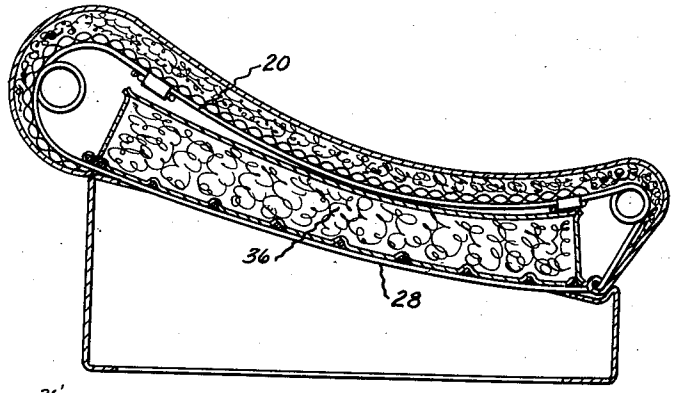


Fig. 2

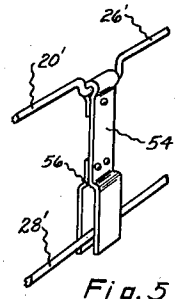


Fig. 5

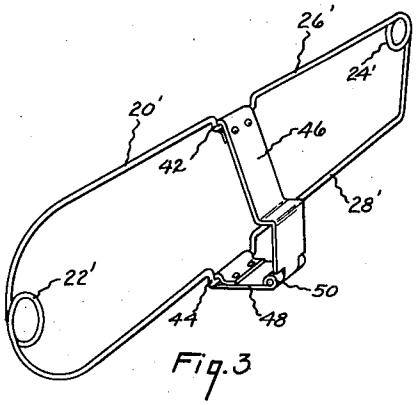


Fig. 3

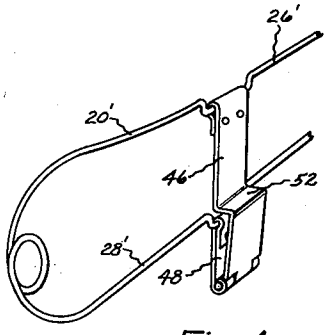


Fig. 4

Inventor

Donald E. Sargent

By Beaman & Langford

Attorney

Patented Mar. 12, 1940 2,193,743

UNITED STATES PATENT OFFICE

2,193,743

SPRING CONSTRUCTION

Donald E. Sargent, Jackson, Mich., assignor to Reynolds Spring Company, Jackson, Mich., a corporation of Michigan

Application May 7, 1938, Serial No. 206,565

4 Claims. (Cl. 155—179)

The present invention relates to improvements in cushion spring construction of the type disclosed in U. S. application Serial No. 199,887, filed April 4, 1938. As in the case of the aforesaid application, the present invention is concerned with cushion spring construction embodying transverse deflectable springs, as distinguished from conventional torsional coil springs. In most cases the deflectable spring will take the form of an elongated, flat loop of spring steel wire. Preferably, the cushions made from this type of spring elements are marginally supported so that an occupant of the cushion will not strike the bottom of the construction upon unusual deflection. With such an arrangement it is the upper and lower portions of the spring elements which furnish the necessary support.

Thus, it becomes the object of the present invention to provide means whereby a supported load upon the upper portion of the spring elements may be transferred to the lower portion thereof, with the result that a construction is provided having what may be referred to as a soft or pliable upper supporting surface, and yet at the same time provide adequate support to the supported load in service.

Another object of the invention is to provide a novel spring construction having upper and lower load supporting spring elements with means interposed therebetween for transferring and distributing a supported load from one to the other.

Another object of the invention is to provide a cushion construction in which there are provided spaced load supporting resilient elements with interposed means for distributing a supported load between said elements.

A further object of the invention is to provide a cushion spring construction in which an upper load supporting spring element functions independently of a lower load supporting spring element under certain load conditions, with means interposed between said elements for transferring and distributing the load between the upper and lower elements.

These and other objects and advantages residing in the novel combination and arrangement and construction of parts will be more fully described in the following specification and set forth in the annexed claims. In the drawing, wherein I have illustrated two different forms of the invention:

Fig. 1 is a cross-sectional view through a seat frame and cushion construction embodying the present invention,

Fig. 2 is a view similar to Fig. 1 showing the seat construction as deflected by a supported load,

Fig. 3 is a perspective view of a spring element showing a hinged link for transferring the load from one portion of the element to another,

Fig. 4 is a view similar to Fig. 3 showing the link in a position transferring a portion of the load from one portion of the spring element to another, and

Fig. 5 is a perspective view of a link of a different form for transferring a load from one portion of the tension spring element to another.

Referring to the drawing, in Fig. 1 is shown a rectangular shaped metal seat frame 10 having a rectangular opening 12 defined by a continuous flange 14 for supporting the cushion spring construction 16 along the marginal edge portion 18. The cushion construction 16, as more fully described in the above identified application, is made up of a plurality of longitudinally spaced deflectable springs 20 in the form of elongated, flat loops of heat treated spring wire, which may be provided with loops 22 and 24 for softening the front and rear edges of the upholstered cushion. The spring elements 20 run transversely of the cushion construction and have upper and lower portions 26 and 28, which furnish the major portion of the support afforded to the occupant of the cushion construction. A woven wire strap 30 is shown disposed over the top and front of the cushion construction for the purpose of supporting the padding 32, over which the upholstery 34 is placed. Disposed between the upper and lower portions 26 and 28 and the spring elements 20 is pad or filler 36, which may be very inexpensively fabricated from burlap or the like with an inner stuffing 38 of excelsior or other suitable stuffing material characterized by being resilient yet offering considerable body. The pad 36 extends longitudinally of the cushion construction and preferably is of slightly less thickness than the unstressed distance between the spring portions 26 and 28. However, this is not necessary as the padding 36 may completely fill the space between the spring portions 26 and 28.

It should be well understood that the upper portion 26 of the spring element 20 will afford a certain amount of support to any load to which the cushion is subjected. If the load increases, or in the event of greater deflection of the portion 26 resulting from road shock or for similar reasons, the portion 26 will engage with the padding 36, as more clearly shown in Fig. 2, deflecting and compressing the same and transferring

thereto and distributing to the lower portion 28 a portion of the load to which the cushion is being subjected. The load transmitted through the pad or filler 36 will be directed against the lower portion 28 of the spring 20, deflecting the same as shown in Fig. 2. With this arrangement a lighter gauge wire may be used for the fabrication of the spring elements 20 than would otherwise be the case if it was necessary for the upper portion 26 to afford the entire support to a supported load upon the cushion. When the upper portions 26 of the spring elements 20 are functioning alone, the cushion feels pliable and soft to the occupant. In other words, it responds when it is deflected by relatively small loads. When the weight to be supported is that of a heavy adult person or the cushion is to be used in an automobile where unusual deflection may result from road shock, a portion of the load will be transferred to the lower spring portion 28, with the result that adequate support is furnished and excessive deflection of the upper spring portion 26 is avoided. As shown, a plurality of longitudinally extending wires 40 supported upon the lower spring portions 28 give additional support to the pad or filler 36. The necessity for such an arrangement depends upon the spacing of the spring elements 20 and the construction of the pad 36.

Figs. 3 and 4 show a spring element 20', which is identical with the spring element 20 of Figs. 1 and 2 with the exception that offset portions 42 and 44 have been provided to form an anchorage for the straps 46 and 48 disposed thereon and hingedly connected to each other at 50. The strap 46 is provided with an offset 52 for the purpose of avoiding contact between the strap 46 and the lower wire portions 28' with the strap 46 in the vertical position shown in Fig. 4. As should be well understood, in a cushion spring construction made up of a plurality of similar spring elements 20' no substantial part of a load supported by the upper spring portions 26' will be transmitted or distributed to the lower portions 28' except in the event the upper portion is deflected to engage with the lower portion unless means are provided for transferring the load from one to the other. In the form of the invention shown in Figs. 3 and 4, when the upper portion 26' has been sufficiently deflected to dispose the strap 48 in the vertical position shown in Fig. 4, any additional deflection of the portions 26' will result in equal deflection of the portion 28'. The straps 46 and 48 are preferably of relatively rigid material and will usually be of metal.

In Fig. 5 is shown a slightly different type of strap 54 interposed between the upper and lower portion of the spring element. This strap is forked at the lower end and acts upon the lower portion 28' following sufficient deflection to engage the portion 28' with the crotch 56. To eliminate rattle or clicking noises, the element 20' may be rubberized, cloth covered, or otherwise treated to prevent metal to metal contact with the interposed strap shown in Figs. 4 and 5.

It is to be understood that the forms of the invention herein disclosed are submitted solely by way of demonstrating the principles of the present invention and not for the purpose of placing any restriction upon the scope thereof. The pad or filler 36 may take numerous forms, shapes and characters. Likewise, the illustration of Figs. 4 and 5 will suggest numerous other combinations capable of a similar result. I wish to broadly claim the invention as appears from the annexed claims.

Having thus described my invention, what I desire to claim and secure by Letters Patent is:

1. In a spring cushion, spring elements in the form of elongated flattened loops having spaced central portions, means supporting said spring elements, said supporting means being located adjacent the ends of the horizontal spring elements, and means interposed between said portions and spaced from one of said portions for distributing a supported load therebetween upon predetermined deflection of certain of said portions.

2. In combination, a rigid seat frame having an opening defined by a marginal supporting structure, a spring cushion structure comprising spaced upper and lower horizontal spring elements bridging said opening and supported upon said marginal supporting structure, spaced upper and lower spring elements bridging said opening, and means interposed between said upper and lower spring elements and spaced from one of said elements for deflecting said lower elements upon predetermined deflection of said upper elements.

3. In a spring structure, spaced upper and lower spring elements, and a pad spaced from said upper element interposed between said upper and lower elements for distributing a supported load between said elements upon a predetermined deflection of said upper element.

4. In a spring structure, spaced upper and lower horizontal elongated spring elements, means supporting said spring elements, said supporting means being located adjacent the ends of the horizontal spring elements, and means spaced from one of said elements interposed between said upper and lower elements, for distributing a supported load between said elements upon a predetermined deflection of said other element.

DONALD E. SARGENT.