Dec. 14, 1954 A. V. HANDREN, JR 2,696,871

SINUOUS SPRING FOR CUSHION CONSTRUCTION

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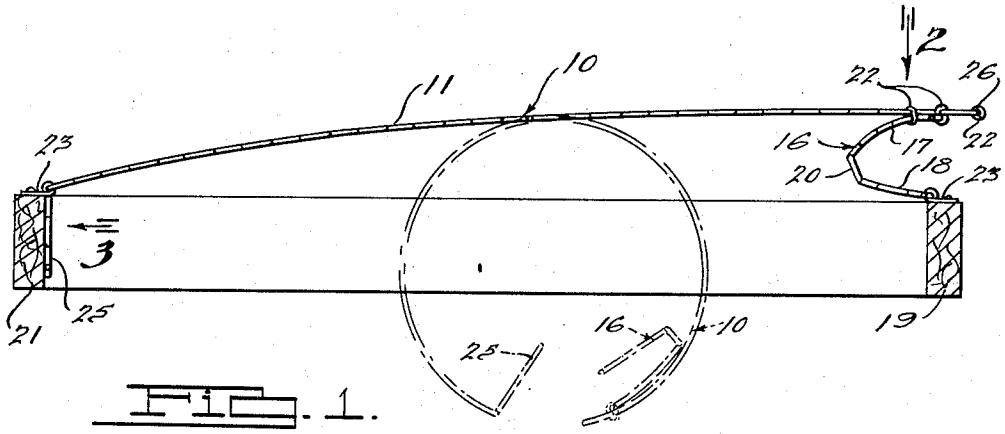


Fig. 1.

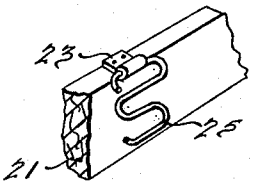


Fig. 3.

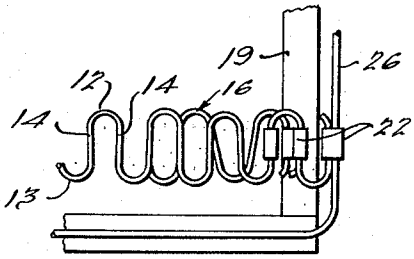


Fig. 2.

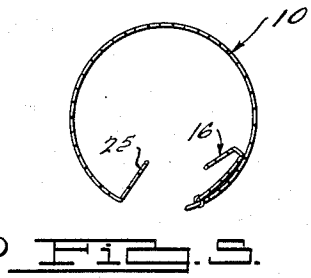


Fig. 5.

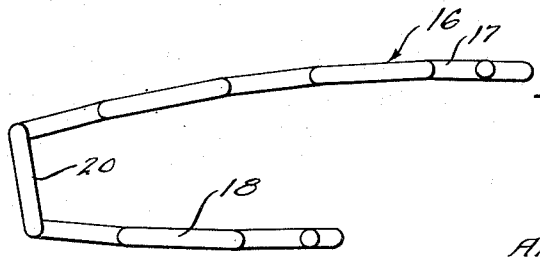


Fig. 4.

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SINUOUS SPRING FOR CUSHION CONSTRUCTION

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2 Claims. (Cl. 155—179)

This invention relates to spring constructions, and particularly to a spring assembly which provides a soft edge to a seating surface and offers resistance to the downward deflection thereof.

Sinuous spring strips made of wire bent back and forth to provide oppositely presenting adjacent loop portions joined by straight portions have been used in cushion constructions for quite some time. The spring strip is formed on an arc of substantially small radius to provide inherent resistance against downward deflection when the ends are extended and secured to a frame. Substantial stress was applied to the frame by the force set up in the arched springs when the ends were extended to span the frame and it was difficult to provide a soft edge construction along the edge of the frame.

The present invention pertains to the use of a U-shaped sinuous spring element which has one end anchored adjacent to the end of the sinuous spring strip so that the stresses in the load-supporting spring strips of the assembly may be resisted by the U-shaped element when its free end is anchored to the frame and the opposite end of the main spring strip is secured to the opposite side of the frame. This produces the desired contour to the resulting load-supporting portion of the assembly and at the same time provides a soft edge at the front of the assembly. To prevent the forward and rearward movement of the assembly, the rear end of the main spring strip may be bent downwardly to abut the inner face of the rear frame element.

Accordingly, the main objects of the invention are: to provide a spring assembly made of a main spring strip of arcuate form and a U-shaped spring element which is rigidly anchored near the end thereof; to form a spring assembly from a spring strip which is set on an arc of small radius by securing near one end thereof a U-shaped element and having the opposite end deflected at a substantial angle; to provide a U-shaped sinuous spring element having arcuate sides which are substantially parallel extending from one of the loops of the spring strip and rigidly anchoring one of its ends to the end of an arcuate spring strip and pivotally securing its opposite end to the frame, and, in general, to provide a spring assembly which is simple in construction and which is readily attachable to a frame.

Other objects and features of novelty of the 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 an elevational view of the spring assembly of the present invention when applied to a frame;

Fig. 2 is a broken plan view of a front corner of the assembly illustrated in Fig. 1;

Fig. 3 is a perspective view of the rear portion of the assembly illustrated in Fig. 1, as viewed from the point 3 thereof;

Fig. 4 is an enlarged view of the soft edge spring element before being stressed in assembly, and

Fig. 5 is a view of the spring assembly before being attached to the frame.

Referring to the figures, the spring assembly **10** embodies a sinuous spring strip **11** which in its free state is of arcuate form along its longitudinal dimension, as illustrated in dot and dash line in Fig. 1 and as illustrated in Fig. 5. The sinuous spring strips have adjacent oppositely disposed loops **12** and **13** which are joined by straight portions **14**. The arc of small radius provided longitudinally of the length of the spring strip **11** offers resistance against downward deflection and the hammock effect which would occur if a straight strip were anchored at the ends across

the frame. A spring element **16**, which may be of the same gauge or heavier gauge wire than that of the spring strip **11**, is formed to have a projecting arm **17** and a shorter anchoring arm **18** extending from a loop **20**. The end **17** of the spring **16** is secured to the straight portions of the next adjacent end loop of the spring strips **11** by suitable clamping bands **22** to securely attach the two spring elements together against any pivotal movement. The arms **17** and **18** are substantially parallel in the free state, as illustrated in Fig. 4, and are moved into angular relation to each other when the end of the arm **18** and the free end of the spring **11** are secured to the frame elements **19** and **21**.

The end of the portion **18** is secured by a suitable clip **23** to the frame element **19** and the opposite end of the strip **11** is stretched across the frame and secured by a clip **23** to the frame element **21**. In view of the arcuate form of the strip **11**, considerable force is exerted when drawing the end across the frame and the resulting stress is taken longitudinally of the arm **17** of the spring element **16**. To prevent the pivoting of the spring **11**, an end portion **25** thereof at the rear end of the strip is deflected downwardly substantially at right angles to the strip for abutment against the inner face of the frame member **21**, thereby preventing the rotation of the straight end portion of the spring within the clamp **23** and the front end of the spring from rocking upwardly. The end portion **25** causes the deflection of the spring **11** to be downwardly, with the front edge portion being spring supported to provide a soft edge.

The straight portions of the front projecting loops of the springs **11** are attached to a border wire **26** by bands **22**. By using a U-shaped spring **16** which has sides **17** and **18** which are disposed substantially parallel, the spring portion **11** may be formed on a substantial arc and still offer resistance against downward deflection when extended across the frame. The spring elements **16** may be constructed of different gauge wire from that of the spring strip **11** and preferably made of heavier gauge in view of the resistance which it must provide against deforming when the spring strip **11** is stretched to a desired form across the frame.

What is claimed is:

1. A spring unit including a sinuous spring strip formed on an arc of smaller radius than the arc thereof when the ends are extended and secured to dispose the strip in seating position, a U-shaped spring element having a pair of extending arms projecting toward one end of the strip, and means for rigidly securing the end of one arm against and directly to said strip spaced inwardly from said end thereof, the opposite end of said spring strip having a loop thereof deflected at an angle from the adjacent arcuate portion inwardly thereof.

2. A spring element made of wire bent back and forth to form adjacent oppositely presenting loops joined by straight portions, and a U-shaped spring element made of wire in a similar manner having the loop of one end secured rigidly to a loop adjacent to the end of said first spring element, the gauge of the wire of said second spring element being greater than the gauge of the wire from which said first spring element was made, the opposite end of the first said spring element being deflected inwardly at an angle to the adjacent arcuate portion.

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