Nov. 16, 1943. V. ASARO 2,334,305

SPRING STRUCTURE

Filed April 28, 1942 2 Sheets-Sheet 1

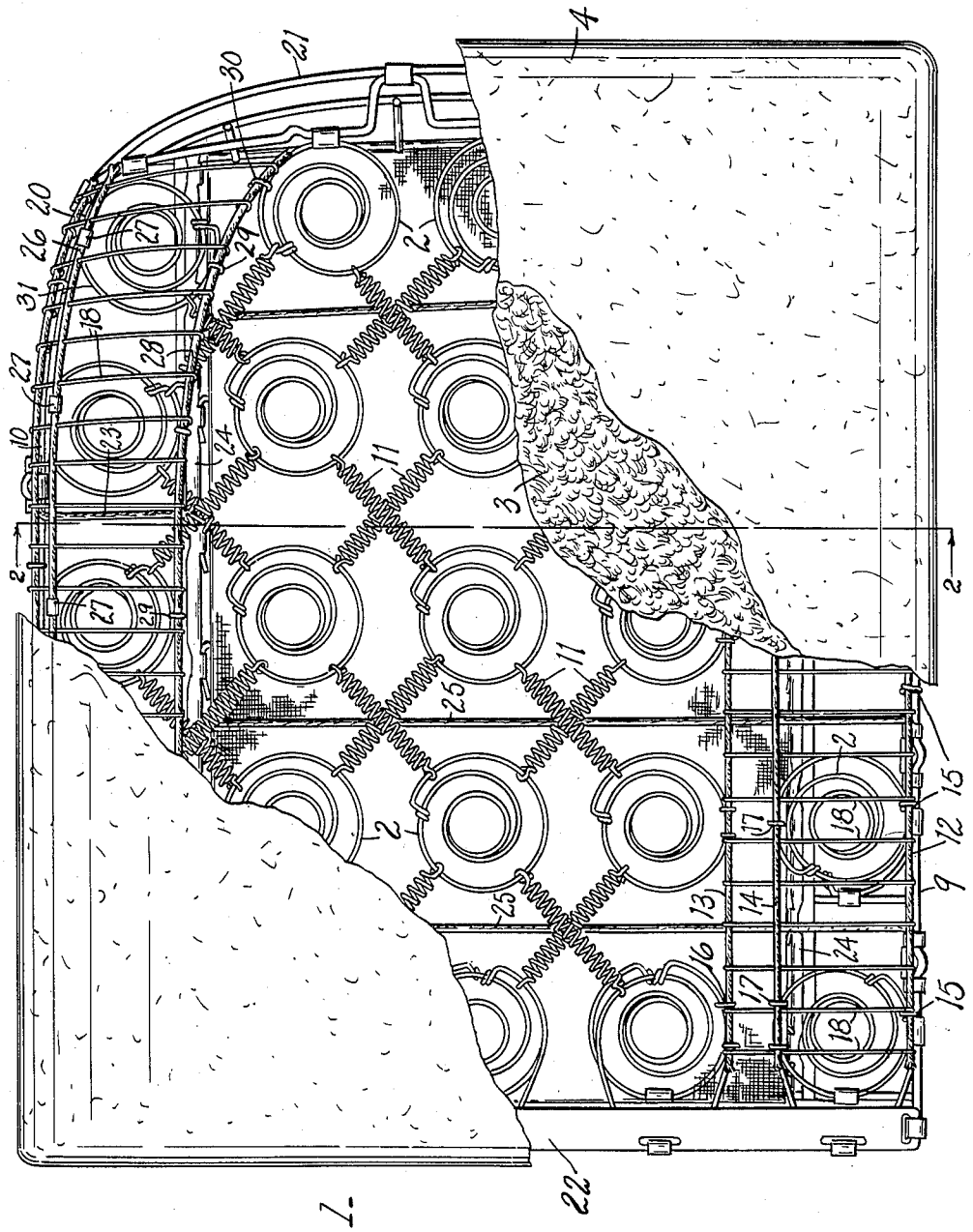


Fig. 1.

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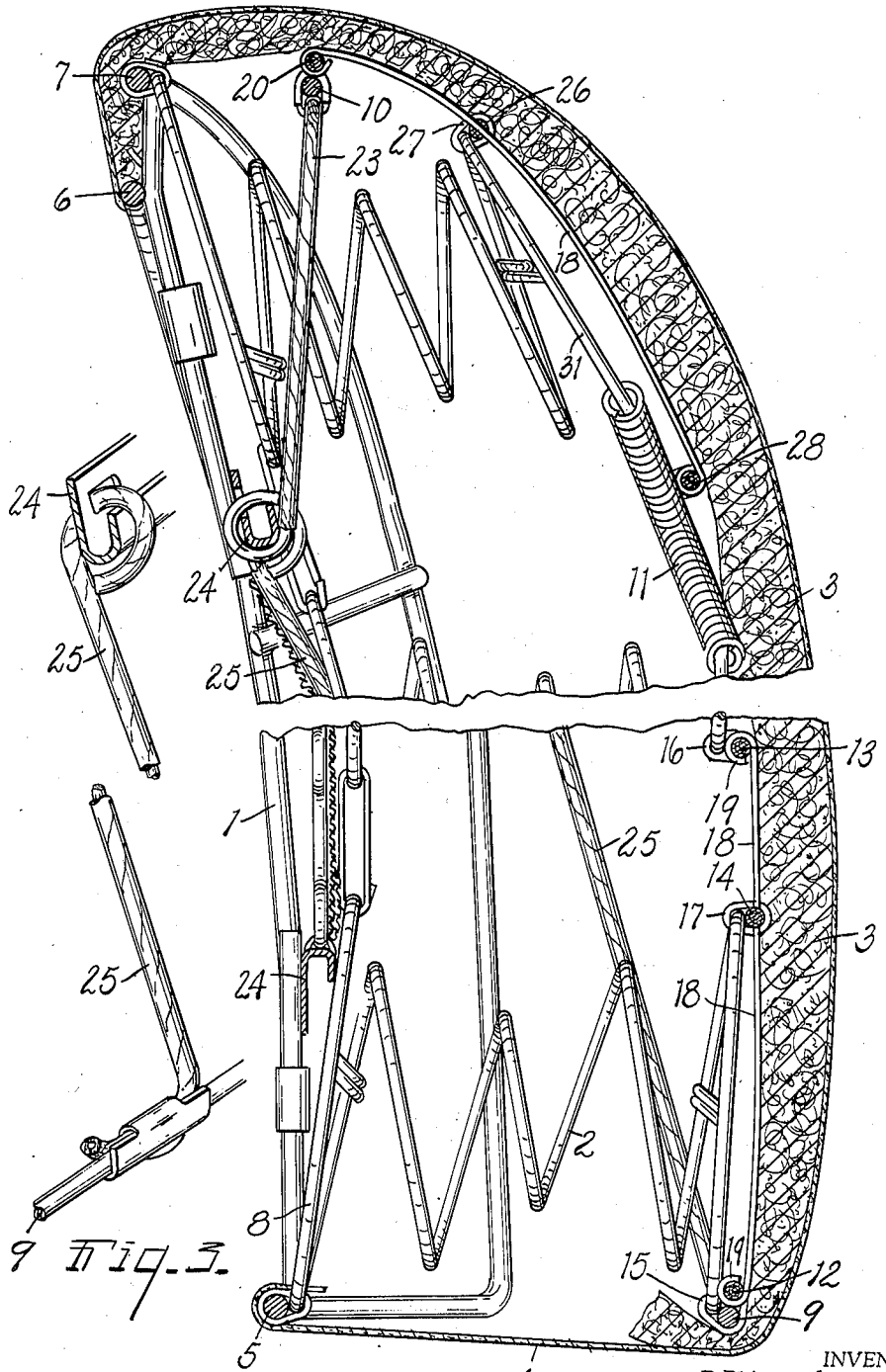


Fig. 3.

Fig. 2.

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Patented Nov. 16, 1943 2,334,305

UNITED STATES PATENT OFFICE

2,334,305

SPRING STRUCTURE

Vito Asaro, Detroit, Mich., assignor to L. A. Young Spring and Wire Corporation, Detroit, Mich., a corporation of Michigan

Application April 28, 1942, Serial No. 440,801

14 Claims. (Cl. 155—181)

This invention relates to improvements in spring structures.

The main objects of this invention are:

First, to provide a spring structure which is well adapted for use as an automobile seat back in which the upholstery is effectively supported at the top and bottom of the structure where distortions are most likely to occur.

Second, to provide an upholstery spring structure in which the edge portion is effectively supported in a desired conformation with the use of a minimum of padding material.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined in the claims.

A preferred embodiment of the invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmentary plan view of a cushion structure embodying my invention as embodied in an automobile seat back.

Fig. 2 is an enlarged fragmentary vertical section on a line corresponding to line 2—2 of Fig. 1 of the structure illustrated in Fig. 1.

Fig. 3 is a fragmentary perspective view showing the details of one view of one of the brace members.

While I have illustrated my invention as embodied in a back structure, it will be understood that it is capable of a wide variety of uses in automobile and furniture upholstery.

Referring to the accompanying drawings, 1 designates a supporting base structure for the helically coiled springs 2. The details of this base structure form no part of my present invention and therefore the details are not described herein. However, the base structure illustrated is substantially that of my copending application, filed April 28, 1942, Serial No. 440,801.

The body springs 2 are arranged in rows, the bottom coils of the springs being suitably secured to the supporting base structure.

The upholstery 3 is provided with a skirt 4 secured to the bottom border frame member 5 while the top portion of the upholstery with its padding is carried around the upper end of the cushion and secured to the bottom or base member 6 which is inset from the bottom border member 7, see Fig. 2.

The bottom coils 8 of the lower row of border springs are secured to the base or bottom border member 5 while the bottom coils of the upper border springs are secured to the bottom border member 7.

A top frame is provided comprising a bottom border member 9 and a top border member 10. The body springs are connected by the crossed helical tie members 11.

At the top and bottom of the cushion, I provide upper and lower upholstery supporting units which provide an effective supporting surface for the upholstery and also effectively maintain the shape of the cushion in these areas.

The lower upholstery supporting unit comprises a longitudinal border member 12 preferably of flexible fibrous material, an inner member 13 preferably of flexible fibrous material, and an intermediate member 14 also preferably of flexible fibrous material. These are arranged in substantially parallel relation, the outer member being secured to the top coils of the bottom row of springs at their outer sides by means of clips 15. The member 13 is secured to the top coils of the row of springs by means of the clips 16, while the member 14 is secured to the top coils of the border springs at the inner sides thereof by means of the clips 17.

The resilient wire strands 18 are threaded through the intermediate member and their ends 19 are clamped around the border and inner longitudinal members, this clamping engagement being such as to prevent their movement longitudinally of the strands. The strands are arranged in spaced parallel relation and are sufficiently close together to form an effective support for the overlying upholstery.

The top upholstery supporting unit comprises the outer longitudinal member 20 preferably of flexible fibrous material which is secured to the top border member 10 which is not connected to the top border springs but is supported at its ends on the end top frame members 21 and 22 and is further supported against inward collapsing movement by the brace members 23, the inner ends of which are connected to the brace member 24. Similar brace members 25 are provided for the bottom border member 9.

The intermediate longitudinal member 26 also preferably of flexible fibrous material is secured to the outer side of the top coils of the top border springs by means of clips 27 while the inner longitudinal member 28 is secured to the inner side of the top coils of the top border springs by means of clips 29, and in the embodiment illustrated the extreme ends of this inner member are secured to the outer side of the end springs of the adjacent row by means of clips 30. The strands 18 are arranged through these

members 20, 26 and 28 in the same manner as described for the lower unit.

It will be noted that the upper coils 31 of the top border springs are canted outwardly and they are held in this canted relation and the upholstery unit maintained with its strands 18 in the bowed or curved relation by the connection of the member 20 to the top border member 10 which, it will be noted, is supported adjacent to the top border member 7 of the supporting base. This provides an effective rounded supporting surface for the upholstery, giving the desired shape at the top and also supporting the upholstery at the points or in the zones where it is subject to the greatest strain or stress likely to displace the upholstery and its padding.

While I have illustrated my improvements as embodied by me in a back cushion for automobiles, it should be understood that it is capable of a wide range of adaptations. I have not shown these various adaptations as it is believed that this disclosure will enable those skilled in the art to embody or adapt my improvements as may be desired.

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

1. In a back spring structure, the combination with a supporting base, of a plurality of body springs comprising upper and lower border springs and intermediate springs arranged in rows, an upper border member, upper and lower upholstery supporting units each comprising an outer, an inner and an intermediate longitudinal member of flexible fibrous material, and a plurality of transverse strands of resilient wire disposed in spaced relation, the strands being arranged through the intermediate longitudinal member and the ends of the strands being clamped around the inner and outer longitudinal members, the outer and intermediate longitudinal members of the lower unit being secured to the top coils of the lower border springs at the outer and inner sides thereof, respectively, and the inner longitudinal member being secured to the top coils of an adjacent row of springs, the inner and intermediate longitudinal members of the upper unit being secured to the top coils of the top border springs at the inner and outer sides thereof, respectively, and the outer longitudinal member of said upper unit being secured to said upper border member, the upper border springs being thereby held in outwardly canted relation with the upper unit in outwardly curved position.

2. In a back spring structure, the combination with a supporting base, of a plurality of body springs comprising upper and lower border springs and intermediate springs arranged in rows, an upper border member, upper and lower upholstery supporting units each comprising an outer, an inner and an intermediate longitudinal member, and a plurality of transverse strands of resilient wire disposed in spaced relation and secured to said longitudinal members, the outer and intermediate longitudinal members of the lower unit being secured to the top coils of the lower border springs at the outer and inner sides thereof, respectively, and the inner longitudinal member being secured to the top coils of an adjacent row of springs, the inner and intermediate longitudinal members of the upper unit being secured to the top coils of the top border springs at the inner and outer sides thereof, respectively, and the outer longitudinal member of said upper unit being secured to said upper border member, the upper border springs being thereby held in outwardly canted relation with the upper unit in outwardly curved position.

3. In a spring structure, the combination with a supporting base, of a plurality of body springs arranged thereon, an upholstery supporting unit comprising an outer, an inner and an intermediate longitudinal member of flexible fibrous material, and a plurality of transverse strands of resilient wire disposed in spaced relation, the strands being arranged through the intermediate longitudinal member and the ends of the strands being clamped around the inner and outer longitudinal members, the outer and intermediate longitudinal members of the unit being connected to the top coils of border springs at the outer and inner sides thereof, respectively, and the inner longitudinal member being connected to the top coils of an adjacent row of springs.

4. In a spring structure, the combination with a supporting base, of a plurality of body springs arranged thereon, an upholstery supporting unit comprising an outer, an inner and an intermediate longitudinal member, and a plurality of transverse strands of resilient wire disposed in spaced relation and secured to said longitudinal members, the outer and intermediate longitudinal members of the unit being connected to the top coils of border springs at the outer and inner sides thereof, respectively, and the inner longitudinal member being connected to the top coils of an adjacent row of springs, said strands terminating inwardly at said inner longitudinal member to permit greater flexibility of the spring structure.

5. In a spring structure, the combination with a supporting base, of a plurality of body springs arranged thereon, a top border member, an upholstery supporting unit comprising an outer, an inner and an intermediate longitudinal member of flexible fibrous material, and a plurality of transverse strands of resilient wire disposed in spaced relation, the strands being arranged through the intermediate longitudinal member and the ends of the strands being clamped around the inner and outer longitudinal members, the inner and intermediate longitudinal members of the unit being connected to the top coils of border springs at the inner and outer sides thereof, respectively, and the outer longitudinal member of said unit being connected to said top border member to flex said strands, the upper border springs being thereby held in outwardly canted relation with the upper unit in outwardly curved position.

6. In a spring structure, the combination with a supporting base, of a plurality of body springs arranged thereon, a top border member, an upholstery supporting unit comprising an outer, an inner and an intermediate longitudinal member, and a plurality of transverse strands of resilient wire disposed in spaced relation and secured to said longitudinal members, the inner and intermediate longitudinal members of the unit being connected to the top coils of border springs at the inner and outer sides thereof, respectively, and the outer longitudinal member of said unit being connected to said top border member to flex said strands, the upper border springs being thereby held in outwardly canted relation with the upper unit in outwardly curved position.

7. In a back spring structure, the combination with a supporting base, of a plurality of body springs arranged in rows thereon, a border member of flexible fibrous material secured to the top coils of the lower row of springs at the lower side

thereof, an inner longitudinal member of flexible fibrous material secured to the top coils of an adjacent row of springs at the lower side thereof, an intermediate longitudinal member of flexible fibrous material secured to the top coils of the lower row of springs at the upper side thereof, and a plurality of transverse strands of resilient wire disposed in spaced parallel relation to constitute, with said border and longitudinal members, an upholstery supporting mat, said transverse strands being arranged through said intermediate longitudinal member, the ends of the strands being clamped around the border member and inner longitudinal member, said strands terminating inwardly at said inner longitudinal member to permit greater flexibility of the spring structure.

8. In a back spring structure, the combination with a supporting base, of a plurality of body springs arranged in rows thereon, a border member secured to the top coils of the lower row of springs at the lower side thereof, an inner longitudinal member secured to the top coils of an adjacent row of springs at the lower side thereof, an intermediate longitudinal member secured to the top coils of the lower row of springs at the upper side thereof, and a plurality of transverse strands of resilient wire disposed in spaced parallel relation to constitute, with said border and longitudinal members, an upholstery supporting mat, said transverse strands being secured to said border, inner and intermediate longitudinal members, said strands terminating inwardly at said inner longitudinal member to permit greater flexibility of the spring structure.

9. In a spring structure, the combination with a supporting base, of a plurality of body springs arranged in rows thereon, a border member of flexible fibrous material secured to the top coils of the border springs, an inner longitudinal member of flexible fibrous material secured to the top coils of an adjacent row of springs, an intermediate longitudinal member of flexible fibrous material secured to the top coils of the border springs at the inner sides thereof, and a plurality of transverse strands of resilient wire disposed in spaced parallel relation to constitute with said border and longitudinal members an upholstery supporting mat, said transverse strands being arranged through said intermediate longitudinal member, the ends of the strands being clamped to said border and inner longitudinal members.

10. In a spring structure, the combination with a supporting base, of a plurality of body springs arranged in rows thereon, a border member secured to the top coils of the border springs, an inner longitudinal member secured to the top coils of an adjacent row of springs, an intermediate longitudinal member secured to the top coils of the border springs at the inner sides thereof, and a plurality of transverse strands of resilient wire disposed in spaced parallel relation to constitute with said border and longitudinal members an upholstery supporting mat, said transverse strands being secured to said border, inner and longitudinal members, said strands terminating inwardly at said inner longitudinal member to permit greater flexibility of the spring structure.

11. In a spring structure, the combination with a plurality of border body springs, and a plurality of inner body springs associated therewith, a border member of flexible fibrous material connected to the top coils of the border body springs at the outer side thereof, an inner longitudinal member of flexible fibrous material connected to the top coils of inner body springs, an intermediate longitudinal member of flexible fibrous material connected to the top coils of the border springs at the inner side thereof, and a plurality of transverse strands of resilient wire disposed in spaced parallel relation to constitute, with said border and longitudinal members, an upholstery supporting strip along one edge of the spring structure, said transverse strands being arranged through said intermediate longitudinal member, the ends of the strands being clamped around the border member and inner longitudinal member.

12. In a spring structure, the combination with a plurality of border body springs, and a plurality of inner body springs associated therewith, a border member connected to the top coils of the border body springs at the outer side thereof, an inner longitudinal member connected to the top coils of inner body springs, an intermediate longitudinal member connected to the top coils of the border springs at the inner side thereof, and a plurality of transverse strands of resilient wire disposed in spaced parallel relation to constitute, with said border and longitudinal members, an upholstery supporting strip along one edge of the spring structure, said transverse strands being connected to said border, inner and intermediate longitudinal members, said strands terminating inwardly at said inner longitudinal member to permit greater flexibility of the spring structure.

13. In a spring structure, the combination with a plurality of border body springs, of a top border frame member, a border member of flexible fibrous material secured to said top border frame member, an inner longitudinal member of flexible fibrous material secured to the top coils of said border springs at the inner sides thereof, an intermediate longitudinal member of flexible fibrous material secured to the top coils of the border springs at the outer sides thereof, and a plurality of transverse strands of resilient wire disposed in spaced parallel relation, said strands being arranged through said intermediate longitudinal member, the ends of the strands being clamped around said border member and inner longitudinal member, the top coils of said border springs being held in outwardly canted relation by the said border, inner and intermediate longitudinal members and said strands of resilient wire which parts also constitute a curved upholstery supporting mat.

14. In a spring structure, the combination with a plurality of border body springs, of a top border frame member, a border member secured to said top border frame member, an inner longitudinal member secured to the top coils of said border springs at the inner sides thereof, an intermediate longitudinal member secured to the top coils of the border springs at the outer sides thereof, and a plurality of transverse strands of resilient wire disposed in spaced parallel relation, said strands being secured to said border and longitudinal members, the top coils of said border springs being held in outwardly canted relation by the said border, inner and intermediate longitudinal members and said strands of resilient wire which parts also constitute a curved upholstery supporting mat.

VITO ASARO.