Dec. 24, 1935. C. E. SOULE 2,025,621

BACK REST

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Fig. 1.

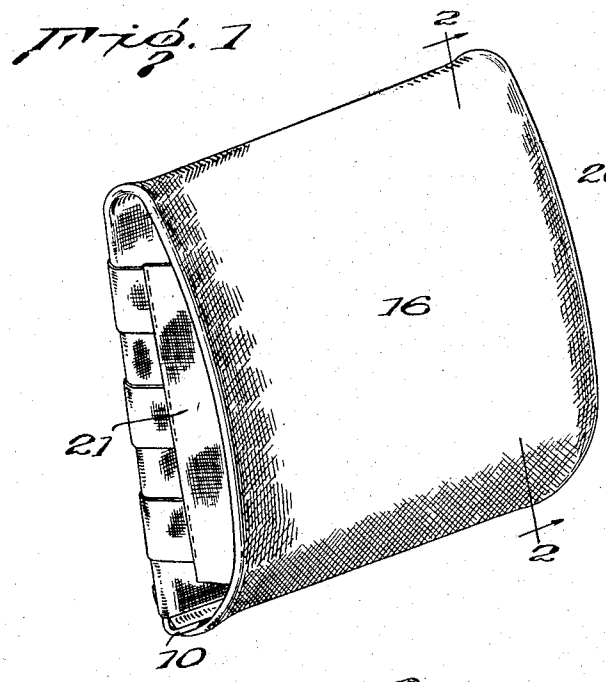
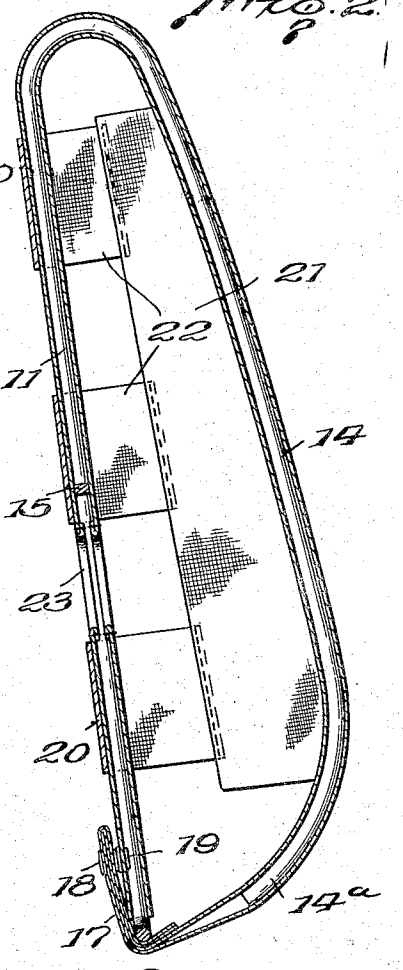


Fig. 2.



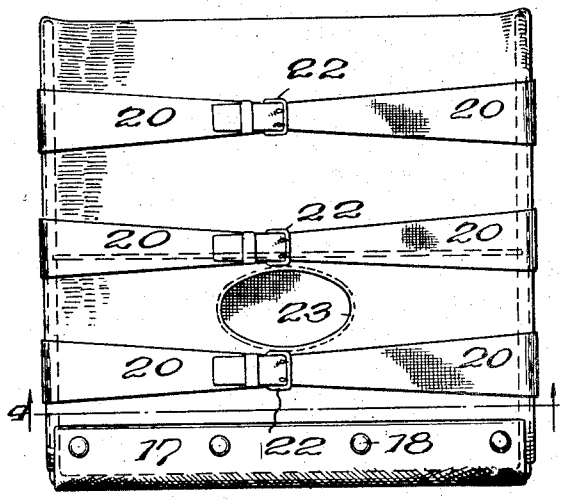


Fig. 3.

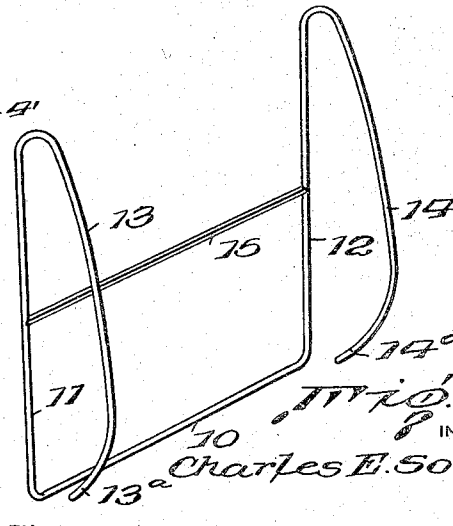


Fig. 5.

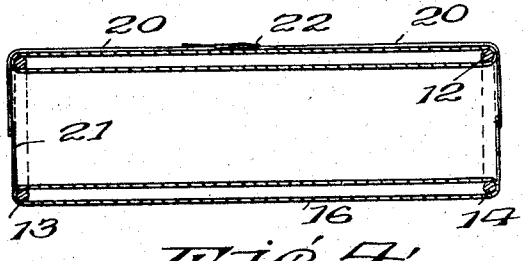


Fig. 4.

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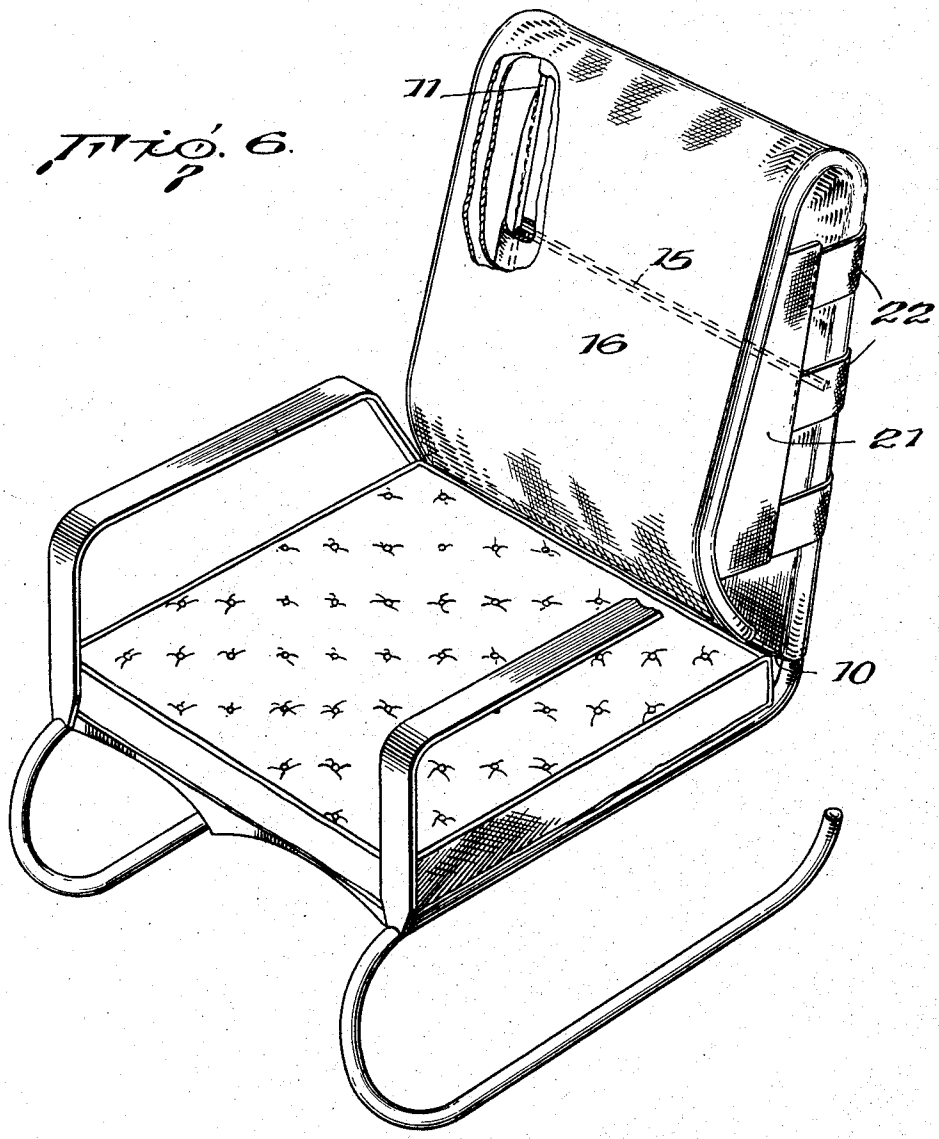
HIS ATTORNEY

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Fig. 6.



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Patented Dec. 24, 1935 2,025,621

UNITED STATES PATENT OFFICE

2,025,621

BACK REST

Charles Edward Soule, New Buffalo, Pa.; Effa M. Soule administratrix of said Charles E. Soule, deceased

Application September 1, 1934, Serial No. 742,483

10 Claims. (Cl. 155—182)

My invention relates to improvements in chair-back cushion structure.

It is a primary object of my invention to provide a resilient back-supporting structure which is characterized by the quality of being form-fitting and affords more nearly perfect support and comfort for the back of the user.

It is an object of my invention to provide a resilient back-supporting structure which is free from padding and permits free circulation of air across the back of the user.

It is an object of my invention to provide a filling-free wedge-type cushion for automobile use, which cushion affords more adequate support for the driver or passenger of the vehicle than heretofore attainable.

It is an object of my invention to provide a resilient cushion which is light in weight yet free from tendency to "mat" or collapse under severe use.

It is an object of my invention to provide a cushion of great resiliency and conformability without the use of fragile and expensive "inner springs" or resilient padding.

It is an object of my invention to provide a resilient cushion, the resiliency of which may be varied to suit requirements, and which may be tightened should slackness or flabbiness occur due to stretching of the fabric jacket in hard use.

It is an object of my invention to provide a resilient cushion the jacket or fabric covering of which may be easily removed for laundering, or replacement, if worn.

It is an object of my invention to provide a resilient back support or cushion which is of simple construction and which may be fabricated at low cost.

Further objects, and objects relating to details and economies of construction and use will more definitely appear from the detailed description to follow. In one instance, I accomplish the objects of my invention by the means set forth in the following specification. My invention is clearly defined in the appended claims. A structure representing the preferred embodiment of my invention in a wedge cushion for automobile use is illustrated in the accompanying drawings forming a part of this specification, in which:

Figure 1 is a view, in perspective, of my invention as embodied in a wedge-type cushion;

Fig. 2 is a vertical cross-sectional view, on an enlarged scale, of the same cushion, the view being taken on the line 2—2 of Fig. 1;

Fig. 3 is a view, in rear elevation, of the same cushion;

Fig. 4 is a horizontal sectional view of the same cushion, taken on the line 4—4 of Fig. 3;

Fig. 5 is a view, in perspective, of the resilient frame of the same cushion; and

Fig. 6 is a view, in perspective, of a chair of the conventional resilient frame type having an inbuilt back cushion embodying my invention.

The same reference numerals refer to the same parts throughout the several views.

In a broad sense, my invention is embodied in a back rest comprising a frame consisting of a substantially rectangular rear or body portion and a pair of substantially parallel, bow-shaped cantilever members, each of which lies in a plane common to the adjacent side edge of the body portion, is rigidly attached to the body portion of the frame solely at its upper end, spaced from the body portion at its lower end and conforms, generally, intermediate its ends, to the normal curvature of the human spine, and a substantially rectangular fabric sheet mounted upon the cantilever members in tautly-disposed web relation thereto, which fabric member is of such width and size as to conform to and support the back of the user.

More specifically, and with reference to Figs. 1 to 5 of the accompanying drawings in which there is disclosed a detachable wedge-type cushion intended for use as an auxiliary back rest in a vehicle seat, the preferred embodiment of my invention comprises a U-shaped frame formed of a spring steel rod having a bight portion 10, upstanding legs terminating in downwardly, forwardly bowed cantilever members 13 and 14 of a length substantially equal to the length of the first-half portions 11 and 12. The cantilever members 13 and 14 are toed rearwardly at their lower ends 13*a*, 14*a* and terminate slightly above the bight portion 10, and are spaced forwardly of the adjacent end portions of the members 11 and 12. The members 11, 13 and the members 12, 14, are respectively disposed in substantially common planes, and said planes are nearly parallel, having a slight tendency to converge toward their upper ends. A stay member 15, the ends of which are slightly notched, engages and bridges the members 11 and 12 and, by reason of the slight convergency thereof, will, when vertically shifted to various horizontal positions, vary the spacing of the members 11 and 12 and the flexibility of the frame as a whole, thus affording adjustability of the resistance of the members 13 and 14 to inward flexure. A flat tubular, porous fabric jacket 16 having a width substantially equal to that of the frame, is slid

or "slipped" upon the cantilever members 13 and 14 and also upon leg portions 11 and 12, so that when assembled thereon, the fabric member has the form, roughly, of an inverted U. The fabric member 16 thus constitutes a web across the cantilever members 13 and 14, which web, though taut, will, in use, conform to the longitudinal and lateral curvature of the back of the user and support, especially, that portion known as the "small" of the back. The web extending across the members 13 and 14 is spaced from the portion of the jacket which covers the members 11, 12 and 15 and permits free transverse circulation of air therebetween, one of the primary features of the invention. For the purpose of providing initial tension in the cantilever members 13 and 14, so that the cushion will not have too great springiness, an extension 17 is provided at the forward lower end of the fabric jacket, which extension 17 is provided with snap fasteners 17, which engage complementary elements 19 secured to the other or bight-adjacent end of the fabric member. The length of the extension 17, and the position of the fasteners 18 and 19, is such that it is necessary to rearwardly flex the cantilever members 13 and 14 in order to bring the fastening elements 18 and 19 into association. The fastening of the flap 17 to the rear portion of the jacket 16, thus described, is best shown in Fig. 2, and provides, in addition to the initial tensioning of the cantilever members 13 and 14, the appearance, in the jacket 16 and the flap 17, of a continuous band. In order to permit the taking up of any slack which may occur in the portion of the jacket forming the web between the cantilever members 13 and 14, due to prolonged severe use, a plurality of straps 20 are provided, which straps are secured to the jacket 16 by stitched strips 21. Buckles 22, of conventional form, are provided upon the ends of one series of the straps 20 so that adjustment of the effective length of the straps 20 may be readily effected and tautness provided in the forward portion of the jacket 16. An opening or handhole 23 is formed in the rear section of the jacket 16, thus enabling one to reach strut 15 to vertically adjust this member upon the leg portions 11 and 12.

It will be noted that the stitched strips 21 extend only partially across the side openings of the device, with the result that, when the device is used in an automobile in the fashion of the conventional wedge cushion, air entering through the adjacent window of the vehicle may readily circulate through the side openings and between the front and rear portions of the jacket 16. Jacket 16, as has been stated, is formed of porous fabric and, by reason of the circulation of air through the cushion thus described, the user enjoys the sensation of coolness resulting from the evaporation of any perspiration that may be present upon his back. The sensation is much like that experienced when rubbing down with alcohol or other highly volatile liquids. Another comfort feature of the invention results from the fact that the support of the back is uniformly distributed over a wide area, and the curvature of the web portion of the jacket 16, when associated with the back, is conducive to proper seating posture. Persons who normally experience fatigue after several hours of driving invariably find that, with the present back rest, fatigue does not occur even after many hours.

Conformity to the lateral and longitudinal curvature of the user's back is effected by the curved fabric sheet 16 in dishing rearwardly, and the spaced resilient cantilever member 13, 14 in flexing inwardly toward each other as well as rearwardly toward the members 11 and 12 of the frame. Where the cantilever members 13 and 14 are integral with the members 11 and 12 of the rear portion of the frame, a considerable portion of the mentioned inward flexing of the members 13 and 14 toward each other is effected or permitted by torsion in the members 11 and 12. I regard the said inward flexing and torsion to be a salient distinguishing feature of my invention.

Another important advantage of the device results from the fact that the jacket 16 is readily removable merely by detaching fasteners 18, 19, and slipping the jacket from the frame. The jacket may then be washed much in the same way as a pillow case and, if badly soiled or worn, may be replaced at low cost. Apart from the fact that after long use the jacket may become worn, the device is indestructible. While the device may be made up in numerous sizes, it has been found that a frame approximately 16" square having a maximum spacing between the cantilever members and the body portion of the frame of 4½", and a spacing between the ends of the cantilever members and the bight portion of 2½" will, in the case of ⅜" frame stock, provide a standard article adapted for use by individuals of a wide range of weight and size. Adjustment afforded by the stay 15 and the straps and buckles 20, 22, afford tension changes sufficient to meet individual requirements of any normal person.

Various materials may be employed for the jacket 16. A very satisfactory and long-wearing jacket may be made from canvas, although material such as commonly employed for automobile seat covers will also serve. If desired, a jacket of two-ply construction may be used, the inner ply being of a relatively strong material and the outer ply being of a lighter material bearing any appropriate pattern, for example one matching that employed in the upholstery of the vehicle.

I am aware that my invention is susceptible of embodiment in numerous forms and that, while I have disclosed its preferred embodiment in a wedge-type supplemental vehicle cushion, it may, of course, be embodied as an integral portion of a chair or the like. For example, in Fig. 6, I have illustrated a chair of the non-upholstered, resilient frame type generally similar to that disclosed in Nolan Patent No. 1,491,918 and provided with an integral backrest embodying my invention. Inasmuch as the specific cushion-back structure forming a part of the chair illustrated in this figure of the drawings is substantially identical with that illustrated in Figs. 1 to 5 inclusive, and the frame structure of the chair itself is well known in the art, it need only be mentioned that any conventional method, for example welding, may be employed to render the cushion proper integral with the chair frame. I therefore claim my invention broadly, as indicated by the appended claims.

What I claim is:

1. A chair-back cushion structure comprising: a frame consisting of a substantially vertical body member and a pair of spaced, substantially parallel, forwardly and downwardly extending bow-shaped resilient cantilever members attached at their upper extremities to said body member and having their lower portions free to flex inwardly toward each other and rearwardly toward

said body member, and a flexible fabric sheet mounted upon said spaced cantilever members in tautly-disposed web relation thereto and adapted to conform to the lateral and longitudinal curvature of the human back through the joint offices of said sheet in dishing and said cantilever members in flexing inwardly and rearwardly.

2. A chair-back cushion structure comprising: a frame consisting of a substantially vertical body member and a pair of spaced, independently sprung, substantially parallel, forwardly and downwardly extending bow-shaped cantilever members attached at their upper ends to said body member and having their lower portions free and independently flexible rearwardly toward said body member, and a flexible fabric sheet mounted upon said spaced cantilever members in tautly-disposed web relation thereto and adapted to conform to the lateral and longitudinal curvature of the human back through the joint offices of said sheet in dishing and said cantilever members in independently flexing.

3. A chair-back cushion structure comprising a frame consisting of a one-piece U-shaped member of resilient metal, the last-half portions of the legs of which are doubled back upon the first-half portions of said legs to constitute a pair of forwardly and downwardly extending bow-shaped cantilever members substantially parallel to each other and in alinement with said first-half portions of said legs, supported solely at their upper ends, spaced from the first-half portions at their lower ends, and conforming, generally, intermediate their upper and lower ends, to the normal curvature of the human spine, a substantially rectangular fabric sheet mounted upon said cantilever members in web relation thereto, and a stay bridging said first-half leg portions, said stay being adjustable to vary the spacing between said first-half leg portions and vary the tension of said fabric sheet.

4. A chair-back cushion structure comprising a frame consisting of a one-piece U-shaped member of resilient metal, the last-half portions of the legs of which are doubled back upon the first-half portions of said legs to constitute a pair of forwardly and downwardly extending bow-shaped cantilever members in alinement with said first-half portions of said legs, said first-half portions of said legs being spaced from each other at their lower ends a distance slightly greater than their spacing at their upper ends, said cantilever members being supported solely at their upper ends, being spaced from said first-half portions at their lower ends, and conforming, generally, intermediate their upper and lower ends, to the normal curvature of the human spine, a substantially rectangular fabric sheet mounted upon said cantilever members in web relation thereto, and a horizontal stay bridging said slightly convergent first-half leg portions and vertically shiftable thereon to vary the tension of said cantilever members upon said fabric sheet.

5. A chair-back cushion structure comprising: a frame consisting of a substantially vertical body member and a pair of spaced, substantially parallel, forwardly, downwardly and rearwardly extending bow-shaped resilient cantilever members sprung upon said body member solely at their upper ends, having their greatest curvature adjacent their lower, rearwardly extended ends, and having their said portions of maximum curvature yieldably displaceable rearwardly toward said vertical body member, and a flexible fabric sheet mounted upon said lower portions of maximum curvature and maintained thereby in tautly-disposed, correspondingly curved, web formation conformant to the lateral and longitudinal curvature of the "small" of the human back through the joint offices of said sheet in dishing and said cantilever members in flexing.

6. A chair-back cushion structure comprising: a frame consisting of a substantially vertical rear or body portion having substantially parallel torsion members defining the side edges thereof, and a forward portion constituted by a pair of substantially parallel, bow-shaped, resilient cantilever members the uppermost portion of each of which is rearwardly curved into a bight integrally attached to the upper end of one of said torsion members, the lower portion of each of which cantilever members is rearwardly curved, spaced from said body portion, and freely displaceable with respect to its mate and said body portion, and a flexible fabric sheet mounted upon said spaced cantilever members and adapted to receive and conform to the lateral and longitudinal curvature of the human back through the joint offices of said sheet in dishing, said cantilever members in flexing, and said torsion members in twisting about their axes.

7. A chair having a seat portion and an upstanding, rearwardly-inclined resilient back, said back comprising body members extending upwardly from the rear of said seat portion, a pair of spaced, substantially parallel, forwardly and downwardly extending resilient cantilever members attached at their upper ends to said body member and having their lower portions terminating well above said seat portion and flexible rearwardly toward said body member while maintaining spaced relation with said seat portion, and a flexible fabric sheet mounted upon said spaced cantilever members in tautly-disposed web formation providing an upstanding, slightly rearwardly inclined surface receptive of, and resiliently conformant to, the lateral and longitudinal curvature of the "small" portion of the human back.

8. A chair having a seat portion and an upstanding, rearwardly-inclined resilient back, said back comprising a body member extending upwardly from the rear of said seat portion, a pair of spaced, substantially parallel, forwardly and downwardly extending resilient cantilever members independently sprung at their upper ends upon said body member and having unconnected lower portions freely and independently flexible inwardly toward each other and rearwardly toward said body member, and a flexible fabric sheet mounted upon said spaced cantilever members in tautly-disposed web formation providing an upstanding, slightly rearwardly inclined surface receptive of, and conformant to the lateral and longitudinal curvature of the human back.

9. A chair-back cushion structure comprising a frame having a rear or body portion of which is substantially rectangular, and a forward portion constituted by a pair of substantially parallel bow-shaped, resilient cantilever members each of which lies in a plane common to the adjacent side edge of said body portion, is rigidly attached to said body portion solely at its upper end, spaced from said body portion at its lower end, and conforms, generally, intermediate its ends, to the normal curvature of the human spine, a flat, porous tubular fabric jacket slipped upon said body portion and said cantilever members, tautly webbing the latter for the full extent thereof yet allowing free transverse circulation of air

through the space between the cantilever webbing and the body portion of said frame, and means associated with said fabric jacket for maintaining said cantilever members under initial tension.

10. A wedge cushion for use as an auxiliary cushion in vehicle seats comprising: a frame consisting of a one-piece U-shaped member of resilient metal, the first-half portions of the legs of which are substantially parallel and the bight portion of which is substantially straight and square therewith, constituting a base for supporting the cushion upon the seat cushion of the vehicle, the last-half portions of the legs of which are doubled back upon the first-half portions to constitute a pair of forwardly and downwardly extending bow-shaped cantilever members supported solely at their upper ends, terminating above said bight portion in rearwardly-toed portions spaced from said first-half leg portions, and conforming, generally, intermediate their upper ends and said toed portions, to the normal curvature of the human spine, a flat, porous tubular fabric jacket slipped upon said body portion and said cantilever members, tautly webbing the latter for the full extent thereof yet allowing free circulation of air between the cantilever webbing and the body portion of said frame, and means constituting an extension of an end of said fabric jacket bridging the space between the rearwardly-toed portions of said cantilever members and said bight portion and maintaining said cantilever members under initial tension.

CHARLES E. SOULE.