Aug. 20, 1968 W. F. RICHARDSON 3,397,914

LISTING MATERIAL FOR UPHOLSTERED FURNITURE

Filed Oct. 31, 1966 2 Sheets-Sheet 1

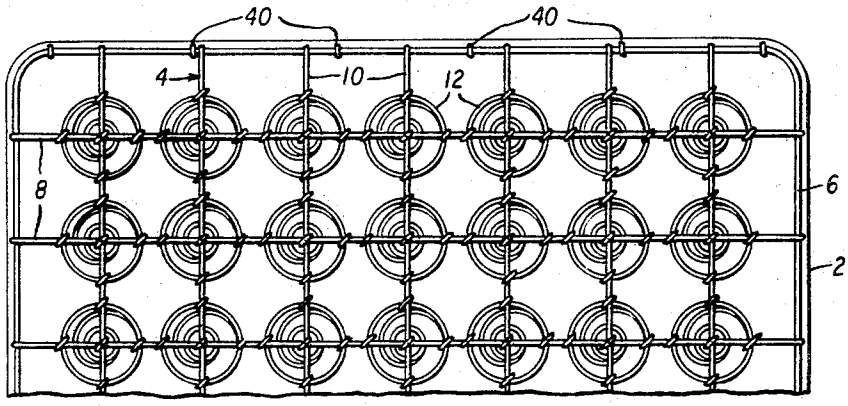


Fig. 1

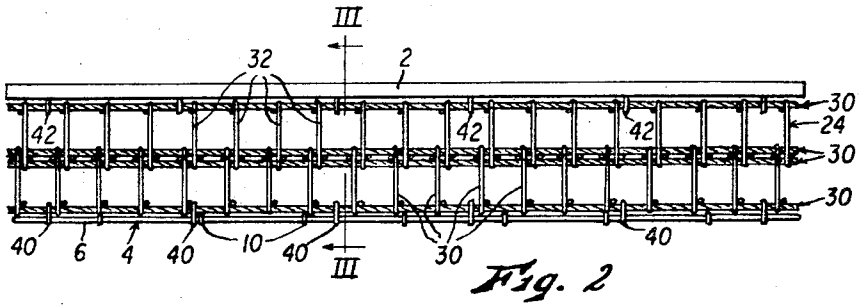


Fig. 2

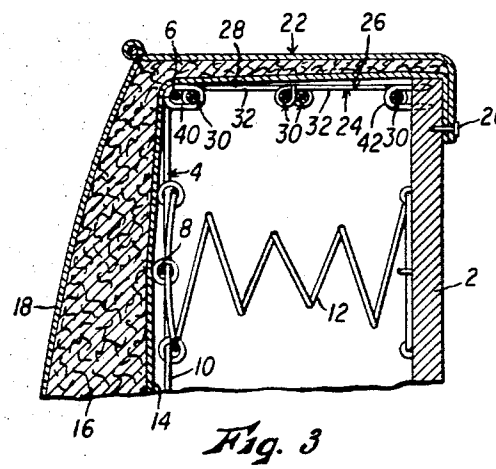


Fig. 3

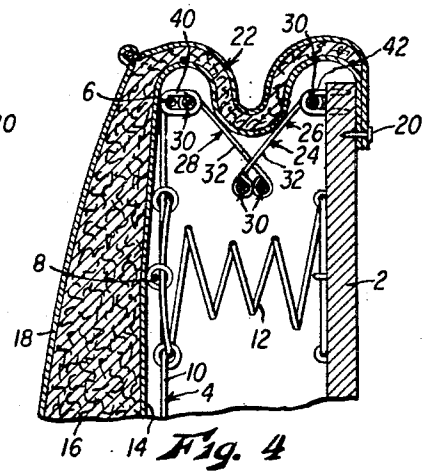


Fig. 4

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LISTING MATERIAL FOR UPHOLSTERED FURNITURE

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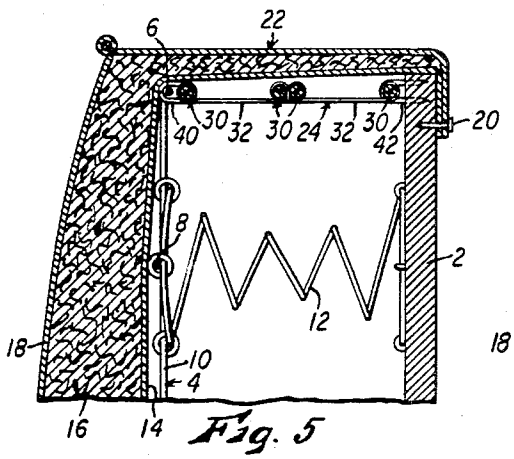


Fig. 5

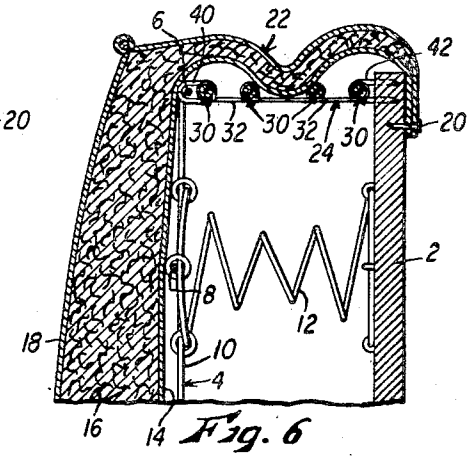


Fig. 6

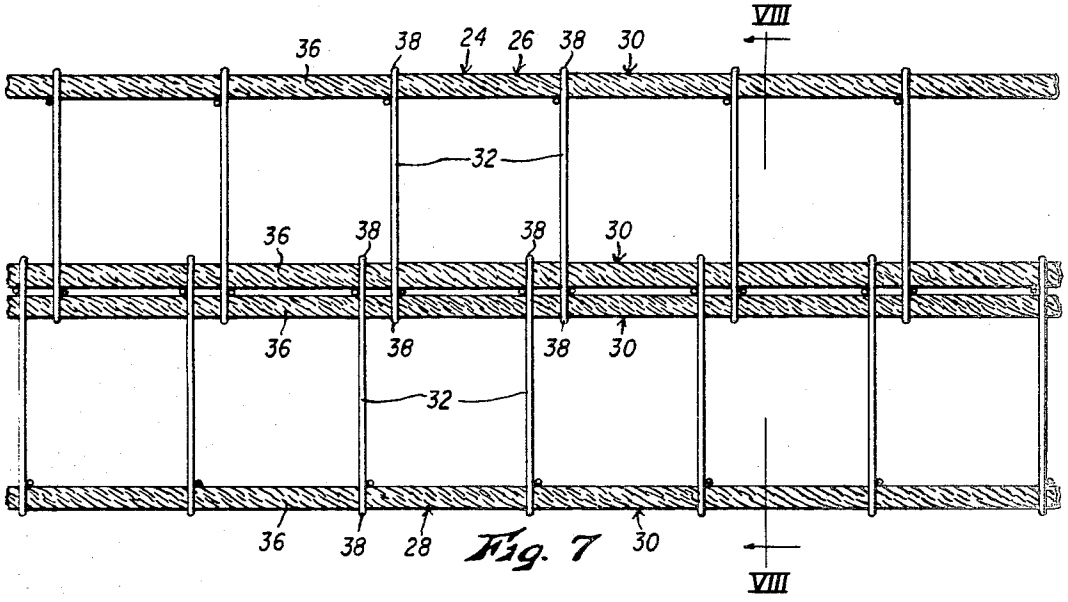


Fig. 7

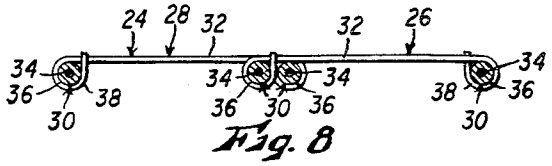


Fig. 8

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LISTING MATERIAL FOR UPHOLSTERED FURNITURE

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18 Claims. (Cl. 297—456)

ABSTRACT OF THE DISCLOSURE

Listing material for upholstered furniture comprising a planar strip adapted to bridge the space between the peripheral edges of the spring deck and the frame in upholstered furniture, said spring deck being resiliently yieldable toward said frame, said listing strip being elongated in a direction parallel to said peripheral edges and divided intermediate its longitudinal edges into two semi-rigid panels, the distal edges of said panels being adapted to be connected respectively to the peripheral edges of said spring deck and said frame, and the contiguous edges of said panels being connected by means preventing their separation, said connecting means being operable to permit relative pivotal movement of said panels about the axis of their connection in one direction from a position in which they are coplanar, but not in the opposite direction, and to permit coplanar relative sliding movement of said panels in a direction at right angles to the axis of their connection.

This invention relates to new and useful improvements in upholstered furniture accessories, and has particular reference that that element of upholstered furniture assemblies commonly known as "listing."

In most upholstered seating structures, there is included a generally planar base and a generally planar deck supported in parallel, spaced apart relation to the base by resiliently yieldable springs of one type or another. Upholstery layers, including padding covered by the final decorative layer of leather, plastic or fabric, are then laid over the deck to complete the structure. The decorative outer layer, and sometimes the padding itself, are extended to cover the space between the peripheral edges of the deck and the base, and secured to the base along the edges thereof. These edge portions of the upholstery layers are normally maintained smooth and taut by the tension of the springs, but of course go slack in folds or wrinkles whenever the cushion is compressed in use by movement of the deck toward the base. Due to this constantly repetitive wrinkling and straightening, these portions of the upholstery commonly become permanently wrinkled and unsightly in appearance, and furthermore are sometimes damaged. While the wrinkling or folding itself can hardly be avoided in the common types of upholstery, the unsightliness and damage may be largely eliminated, and this is the principal object of the present invention. These undesirable occurrences may result, for example, from the fact that the upholstery layers do not have sufficient support or foundation therebeneath when the cushion is expanded, so that there is nothing aside from spring tension, to retain them in a flat, neat appearance after having been wrinkled, and the spring tension may be entirely inadequate. Also, if the springs are installed under heavy tension so as to pull the edge portions of the upholstery smooth and taut with a greater force, the upholstery layers must support this strain, and are sometimes cracked or torn thereby, particularly if the upholstery layers are weakened by thousands of alternate wrinklings and straightening. Also, when wrinkled in use, the upholstery layers tend

to fold or extend into the space between the edge of the spring deck and the edge of the base, and are sometimes pinched and eventually damaged by these members.

Various types of devices have been proposed for preventing some or all of these occurrences, and are commonly known as "listing" material. Perhaps most commonly, listing consists of a narrow, elongated strip of heavy cloth such as burlap, adapted to have its longitudinal edges secured respectively to the edge or margin of the spring deck and to the edge of the base member, extending across the space therebetween and normally being maintained in tension by the upholstery springs. However, while this type of listing is generally effective in some respects, such as the fact that it does remove tensile stress from the upholstery layers, it is deficient in other respects, in that the listing material itself is subject to the same wrinkling and creasing damage as the upholstery layers, so that it may provide only an inadequate "platform" for supporting the upholstery layers, and does not prevent the upholstery layers from entering between and being pinched or damaged by the deck and base members.

In carrying out the general object of providing a listing material overcoming the objectionable features of prior listing materials, the present invention contemplates a listing material comprising an elongated planar strip adapted to be secured along its respective edges to the marginal edge of the spring deck and to the base structure, said member normally constituting a rigid or semi-rigid platform whereby to support the overlying upholstery layers fully and to remove tensile stress from said layers, but being yieldable to permit the spring deck to move toward the base when the cushion is compressed in normal usage. The yieldability may be provided by dividing the listing member longitudinally into two panels pivotally connected together along their juncture line, and pivoted along their distal edges respectively to the spring deck and base. Thus the panels can buckle inwardly into the interior of the spring assembly when the deck yields toward the base, so as not to interfere with the deck action, but will be drawn into coplanar relation to form an upholstery-supporting platform when the cushion is again allowed to expand. The panels, however, are so connected that they cannot buckle outwardly.

The yieldability of the listing can also be provided by forming it in two panels as described above, and so connecting the panels that they can move slidably into greater or lesser degrees of overlapping as the deck is moved toward or from the base. Thus the panels form a generally planar upholstery-supporting panel at all times, and do not fold or buckle. Either type of yieldability may be preferable in a given set of circumstances, as will be described. With the listing structure as shown, either type of yieldability may be provided selectively.

Other objects are simplicity and economy of construction, efficiency and dependability of operation, and adaptability for rapid and economical production by automatic machinery.

With these objects in view, as well as other objects which will appear in the course of the specification, reference will be had to the accompanying drawing wherein:

FIG. 1 is a fragmentary front elevational view showing the top portion of the base and spring assembly of an upholstered chair back, with the upholstery layers omitted, and including listing material embodying the present invention,

FIG. 2 is a top plan view of the structure shown in FIG. 1, including a plan view of the listing material installed to provide inward buckling or folding thereof,

FIG. 3 is an enlarged, fragmentary sectional view taken

on line III—III of FIG. 2, with the upholstery layers included and with the cushion fully expanded,

FIG. 4 is a view similar to FIG. 3, but with the cushion compressed as in normal usage,

FIG. 5 is a view similar to FIG. 3, but showing the listing material inverted to provide coplanar slidable overlapping of the panels thereof,

FIG. 6 is a view similar to FIG. 5, but with the cushion compressed as in normal usage,

FIG. 7 is an enlarged plan view of a section of the listing material only, and

FIG. 8 is a sectional view taken on line VIII—VIII of FIG. 7.

Like reference numerals apply to similar parts throughout the several views. FIGS. 1–6 show the upper portion of the back portion of an upholstered seat construction, it being understood that the invention is applicable to both furniture and automotive seating. As shown, the seat back cushion structure includes a generally planar and rigid base or frame **2**, which is usually wood in the case of furniture and steel in automotive seating, although this is irrelevant to the invention. Spaced apart from but substantially coextensive with the base is a spring deck indicated generally by the numeral **4**, this deck also being generally planar and parallel to the plane of the base, and being adapted to support the upholstery layers as will be described. The deck may take many forms, also largely not material to the invention, but as shown consists of a heavy marginal spring wire **6** defining the periphery of the deck, and a series of parallel, spaced apart horizontal wires **8** and vertical wires **10** extending across the area defined by the margin wire and secured at their ends to said margin wire by any suitable means, whereby in effect said deck constitutes a coarse wire mesh. Said deck is supported for resiliently yieldable movement toward base **2** by springs interposed therebetween. These springs also may have various forms within the scope of the invention, but as shown consist of a series of coil springs **12** spaced regularly over the area of the deck, each spring being secured at one end to the wires of deck **4** and at its opposite end to base **2**, by any suitable means.

Upholstery layers are applied over deck **4**. As shown, these layers include an insulating layer **14** applied directly over the deck and which may consist of a fabric, wire mesh, or wire-reinforced fabric sheet, then a layer of padding material **16**, and finally an outer decorative cover **18** of fabric, leather, plastic or the like. At least the cover **18** and often also the padding and insulating layers, are usually extended rearwardly around the marginal edges of the deck, across the space between the deck and the base, and are secured to the marginal edges of base **2**, as by tacks **20** or other suitable means, these extended edge portions of the upholstery layers normally being secured under sufficient tension to maintain springs under partial compression even when no load is applied to the cushion. Thus the tension of the springs serves normally to maintain the upholstery layers smooth and taut, and hence to preserve a neat, tailored appearance thereof.

However, the portions of the upholstery layers bridging the space between the spring deck and the base, further generally designated by the numeral **22** in the drawing, of course go slack and become wrinkled or folded as shown in FIGS. 4 and 6, whenever the deck **4** is moved toward base **2** by loading of the cushion in normal usage, with the possible resulting damage thereto or unsightly appearance thereof as described above at considerable length, as a result of undue strain on, inadequate support for, or pinching, tearing or other damage to portions **22** of the padding layers between the deck and base.

The listing material forming the subject matter of the present invention is indicated generally by the numeral **24**, and consists of an elongated, generally planar strip having a width sufficient to bridge the normal space between the deck and the base. Said strip is divided longitudinally into a pair of panels indicated respectively by the numerals **26** and **28** (see FIGS. 7 and 8), each panel consisting of a pair of parallel side strands **30**, connected by a series of rather closely spaced apart cross strands **32**. As detailed in FIGS. 7 and 8, each side strand **30** preferably consists of a flexible spring wire core **34** having a sheath **36** of cushioning material such as twisted kraft paper, and each cross strand **32** may consist of a short length of spring wire having its end portions secured to its associated side strands as by being wrapped tightly thereabout as shown at **38**. The identability of the paper sheaths **36** of the side strands provides a good purchase for the cross strands thereon, so as to prevent slippage therebetween. Finally, it will be seen that the cross strands **32** of each panel extend alternately between the cross strands of the other panel, whereby the two panels are permanently joined together in a manner permitting relative movement therebetween, as will appear. Also for reasons to be described, the plane defined by the cross strands **32** of each panel are disposed parallel to but at one side of the plane determined by the axes of the side strands thereof.

In use, the listing material may be installed as shown in FIGS. 2–4, the panels **26** and **28** thereof being disposed in coplanar relationship and bridging the space between the marginal edges of the spring deck and the base. The disposition of all of cross strands **32** at one side of the plane of the side strands permits the panels to move into coplanar relationship despite the interlocking engagement of their contiguous edges. The distal side strands **30** of the two panels are secured respectively to the marginal edges of the spring deck and the base by means permitting rotary movement of said strands around their own axes. For example, one of said distal side strands may be secured to margin wire **6** of the spring deck by split-ring clips **40** commonly known as "hog rings," engaged loosely about the side strand and margin wire at intervals therealong, while the other distal side strand may be connected to base **2** by a series of staples **42** engaged loosely about the side strand and driven into base **2**, providing that the base is wooden. If the base were steel, perforations could be provided for receiving hog rings the same as at the opposite edge of the listing. Virtually all of the spring deck structures in use include either marginal wires as shown, or other marginal members to which the listing may be secured. The total width of the listing is such that when it is installed as described, the action of springs **12**, when the cushion is not loaded, will tension the listing laterally, pulling the two intermediate side strands firmly together and pivoting the two panels **24** and **26** thereof into coplanar relation, as shown in FIG. 3. The upholstery layers may then be applied so that portions **22** thereof are smooth and neat, but nevertheless under very little or no tension, and the listing will thereafter support substantially all of the force of springs **12** tending to push the spring deck away from the base. The padding layers **22**, thus relieved of the spring tension, are less likely to be damaged by this tension, which otherwise might cause tearing or ripping particularly after said layers have been creased and worn by constantly repeated flexures in extended periods of use. Also, the listing normally provides a substantially planar "platform" disposed directly beneath and supporting padding layers **22**, whereby to promote a smooth, neat appearance thereof. The "platform" provided thereby is smooth and not likely to sag or lose its shape, since the panels **26** and **28** thereof are at least semi-rigid due to the stiffness of the side and cross wires, and are not subjected in use to any forces which might tend to deform them. The "platform" provided by the listing is of course only skeletal, being formed of spaced apart wires, but these wires may be spaced closely enough to form a fully adequate support for layers **22**. For this purpose, a spacing of about one to one and one-half inches between cross wires **32** has been found adequate, although this of course can be re-

duced or increased as may appear appropriate in specific circumstances.

In the type of installation shown in FIGS. 2–4, the listing is positioned with side strands **30** at the side of cross wires **32** toward the interior of the spring assembly. Thus, when deck **4** is pressed toward base **2** by loading of the cushion as in normal usage, causing compression of springs **12**, the panels **26** and **28** buckle inwardly as shown in FIG. 4, so as not to interfere with the normal spring action. Said panels cannot buckle outwardly, both because this is prevented by the pressure of upholstery layers **22** thereagainst, and also because outward buckling would necessitate that the intermediate side strands **30** pass "through" the cross strands, which of course cannot occur. Nevertheless, when the cushion is unloaded, and springs **12** are allowed to recover, the listing panels **26** and **28** are returned by the spring tension to their coplanar relation as shown in FIG. 3. This type of installation tends to reduce the maximum outward bulging of the upholstery layers **22** when the cushion is loaded, but does permit said upholstery layers to enter between the deck and the base to some extent, as shown in FIG. 4. Therefore, this type of installation may be desirable where, as with closely spaced edge-to-edge cushions in an automobile, excessive outward bulging of layers **22** might cause interference between the cushions and rubbing therebetween. In this connection, it should be noted that while the listing is shown as applied to the top edge of a seat back cushion, it is equally applicable to the vertical side edges of back cushions, and also to the forward and side edges of seat cushions. This type of installation may also be indicated where there is ample interior space within the spring assembly to accommodate the inwardly buckled listing material, and where the normal spacing between the deck and base is sufficiently great that there is little or no chance that the layers **22**, if they enter between the deck and base when folded, could be tightly pinched and damaged therebetween.

In the installation shown in FIGS. 5 and 6, the listing material is simply inverted as compared to FIGS. 3 and 4, so that side strands **30** are disposed at the side of cross strands **32** away from the interior of the spring assembly. Thus, when the cushion is compressed in usage as before, the listing panels **26** and **28** cannot buckle inwardly due to interference between cross wires **32** and the two intermediate side strands **30**, and will not ordinarily buckle outwardly due to the pressure of upholstery layers **22** thereagainst. Instead the panels remain in coplanar relation, and slide into a greater or less degree of overlapping relation, as shown in FIG. 6, whereby not to interfere with the spring action. In fact, with this installation it is not necessary that the distal side strands **30** be connected to the deck and base for rotation about their axes. They could be rigidly attached. Nevertheless, the rotary attachment is shown, both because it is simple and economical and also because it does have the advantage of being better able to accommodate the listing to the relative positions of the deck and the base as the former becomes deformed, or as springs **12** may become permanently deformed, in extended periods of use. The FIGS. 5–6 installation has the advantage that since the listing does not buckle inwardly it does not require space within the spring assembly, which may render its use advantageous wherein the deck **4** is mounted on the base **2** by the "edge" springs at the periphery of the assembly, which could block any inward folding of the listing. Also, it positively prevents the upholstery layers **22** from entering between the deck and the base. This adapts the listing especially for use with "thin" cushions, wherein the edges of the deck are often pressed tightly against the base, and could pinch and tear any upholstery layers folded or wrinkled therebetween.

The specific structure of the listing material as shown also has certain advantages. The flexibility of side strands **30**, or of the spring wire cores **34** thereof, permits the listing to be readily adapted to assemblies wherein the deck **4** and base **2** are not precisely planar nor the peripheral edges thereof perfectly straight, and permits localized deflection of the deck. It also permits the listing to be applied continuously around the corners of cushions. The spacing between the cross wires **32** of the respective panels **26** and **28** permits the panels to shift longitudinally relative to each other, and the flexibility of the cross wires permits the side strands of each panel to shift longitudinally relative to each other. Thus the freedom of movement of deck **4** in its own plane is not materially restricted, and the uncomfortable sensation of "boxing" of the cushion, wherein it can yield only at right angles to its plane, is avoided. Nevertheless the cross wires may be sufficiently stiff, and closely spaced, that each panel is rigid, or at least semirigid, so that the listing can more effectively perform its padding-support function. The soft, indentable paper sheath **36** of each of the side strands not only provides an effective grip for the cross wires thereon, as previously described, but also prevents the objectionable rattling, grinding or rubbing noises which might otherwise occur as a result of relative movement between the side strands and cross strands of the listing, or between the distal side strands and the deck and base to which they are attached. Also particularly in the installation as shown in FIGS. 5 and 6, the paper sheathing provides a low-friction bearing for the sliding movement of the cross wires on the two intermediate side strands. Finally, it will be seen that the listing material is readily adapted for production by automatic machinery, and can be made in continuous lengths which may easily be severed in the exact lengths required for each job.

While I have shown and described a specific embodiment of my invention, it will be readily apparent that many minor changes of structure and operation could be made without departing from the spirit of the invention as defined by the scope of the appended claims.

What I claim as new and desire to protect by Letters Patent is:

1. A listing material for upholstered seating comprising a generally planar, elongated strip divided longitudinally intermediate its edges into two semi-rigid generally planar panels interconnected along their contiguous edges by means preventing separation thereof by lateral forces applied oppositely to the respective longitudinal edges of said strip, said panels being urged toward and normally maintained in a coplanar relation by said forces, said interconnecting means being yieldable to permit said opposite longitudinal edges of said strip to be moved toward each other without deforming either of said panels from its generally planar form.

2. A listing material as recited in claim **1** wherein said interconnecting means joins the contiguous edges of said panels for free relative pivotal movement of said panels about an axis generally coincident with the line of joinder of said panels.

3. A listing material as recited in claim **2** wherein said interconnecting means is operable to permit free relative pivoting movement of said panels in one direction from a position in which said panels are coplanar, but not in the opposite direction.

4. A listing material as recited in claim **1** wherein said interconnecting means is operable to permit relative coplanar movement of said panels, transversely of said strip, into greater or lesser degrees of overlapping relation, whereby to vary the spacing between the longitudinal edges of said strip.

5. A listing material as recited in claim **1** wherein said interconnecting means is operable to permit free relative pivotal movement of said panels, about an axis longitudinal to said strip and intermediate the edges thereof, in one direction from a position in which said panels are coplanar, but not in the opposite direction, and which additionally is operable to permit relative

coplanar movement of said panels, transversely of said strip, into greater or lesser degrees of overlapping relation.

6. A listing material as recited in claim **1** wherein each of said panels comprises:

(a) a pair of spaced apart, generally parallel side strands extending longitudinally of said strip, and

(b) a series of cross strands extending laterally between and affixed at their ends to said side strands at spaced apart intervals therealong, the cross strands of each panel passing between the cross strands of the other panel, whereby said panels are permanently interconnected together by means permitting relative movement therebetween.

7. A listing material as recited in claim **6** wherein the portions of said cross strands of each panel extending between the side strands thereof are disposed all at the same side of a plane determined by the side strands of said panel, whereby said panels may be moved into coplanar relation without interference between said side and cross strands.

8. A listing material as recited in claim **6** wherein said side and cross strands of each panel are formed of resiliently flexible material.

9. A listing material as recited in claim **6** wherein each of said side strands is provided with a sheath of soft, indentable, non-metallic material.

10. A listing material as recited in claim **6** wherein each of said side strands of each panel constitutes a spring wire core having a soft, non-metallic sheath, and wherein each of said cross strands constitutes a spring wire having its ends twisted tightly about the respective side strands of the panel, the portions of said cross strands extending between said side strands being disposed parallel to and all at one side of a plane determined by said side strands.

11. In a spring-upholstered seating construction including a generally planar base, a generally planar spring deck generally parallel to and coextensive with said base, but spaced apart therefrom, resilient means interposed between said base and deck whereby the latter is supported for yieldable movement toward the former, and pliable upholstery layers overlying said spring deck and being turned around the peripheral edge of said deck and extended across the space between said deck and base and secured to said base, a listing material comprising:

(a) a generally planar, elongated strip having a width sufficient to bridge the space between the peripheral edges of said deck and base, and disposed between said edges inside of said upholstery layers, said strip being divided along a line intermediate and parallel with the longitudinal edges thereof into two semi-rigid panels interconnected along their contiguous edges by means preventing separation of said panels but permitting relative movement of said panels without deforming either of them from their generally planar configuration, and

(b) means connecting the distal edges of said panels respectively to the peripheral edges of said spring deck and said base.

12. The structure as recited in claim **11** wherein said means interconnecting said panels is operable to permit relative pivotal movement of said panels about an axis generally coincident with the line of juncture of said panels, and wherein said means connecting the distal edges of said panels to said deck and said base are each operable to permit pivotal movement of the associated panel about an axis generally coincident with the edge thereof connected to said deck or said base.

13. The structure as recited in claim **11** wherein said means interconnecting said panels is operable to permit relative sliding movement of said panels, in a direction at right angles to the longitudinal extent of said strip, into greater or lesser degrees of overlapping relation.

14. The structure as recited in claim **12** wherein said means interconnecting said panels is operable to permit said relative pivotal movement of said panels in one direction from a position in which said panels are coplanar, but not in the opposite direction, and is operable to permit relative coplanar sliding movement of said panels, in a direction at right angles to the longitudinal extent of said strip, into greater or lesser degrees of overlapping relation, said listing material being installed in the assembly selectively either so as to permit inward pivoting of the panels thereof into the space between said deck and said base by the pressure of said upholstery layers thereagainst when said deck is moved toward said base, but to prevent outward pivoting of said panels, or in a relatively inverted position wherein inward pivoting of said panels is prevented by said interconnecting means and outward pivoting thereof is prevented by pressure of said upholstery layers thereagainst, whereupon movement of said deck toward said base is accommodated by coplanar movement of said panels into overlapping relation.

15. The structure as recited in claim **14** wherein each of the panels of said listing material strip comprises:

(a) a pair of generally parallel, flexible side strands extending longitudinally thereof in spaced apart relation, and

(b) a series of spaced apart flexible cross strands extending transversely between said side strands at regularly spaced intervals therealong and secured at their ends to said side strands, the cross strands of each panel extending between the cross strands of the other panel whereby said panels are permanently interconnected, but relative movement therebetween is permitted.

16. The structure as recited in claim **15** wherein all of the cross strands of both of said listing panel sare disposed against one side of the side strands of their associated panel, in a plane parallel to a plane determined by the axes of said side strands, whereby said panels may be relatively pivoted about their juncture line in one direction from a position in which said panels are coplanar, and whereby relative pivoting of said panels in an opposite direction is prevented by interference between said side and cross strands of the panels.

17. The structure as recited in claim **16** wherein each of the side strands of both of said panels is provided with a soft, non-metallic sheath.

18. The structure as recited in claim **16** wherein all of said side strands and said cross strands constitute flexible spring wires.

References Cited

UNITED STATES PATENTS

2,857,603	10/1958	Rymland	5—260
2,978,715	4/1961	Blecker	5—351
3,049,377	8/1962	Asaro et al.	267—107 X
3,151,853	10/1964	Richardson et al.	267—107 X
3,200,417	8/1965	Costello	5—260

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