

- [54] SEATING UNIT
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- [52] U.S. Cl. 297/440, 297/219, 297/416, 297/419, 297/443, 297/454
- [51] Int. Cl. A47c 4/02, A47c 7/54
- [58] Field of Search .. 312/257, 258, 262, 263; 5/341, 5/345, 354, 355, 356, 361; 297/218, 219, 416, 440-445, 452, 454-456

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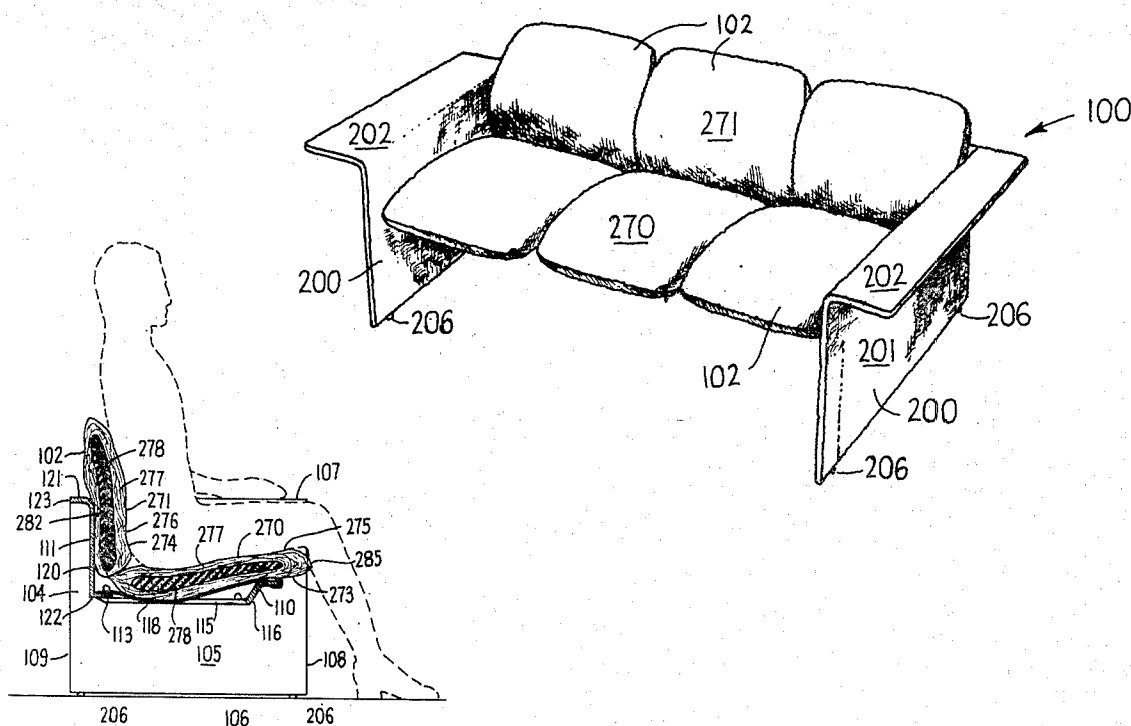
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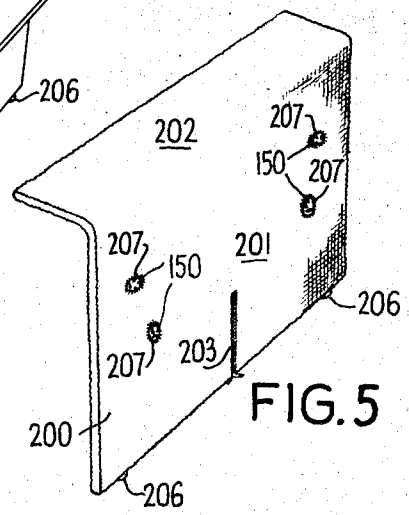
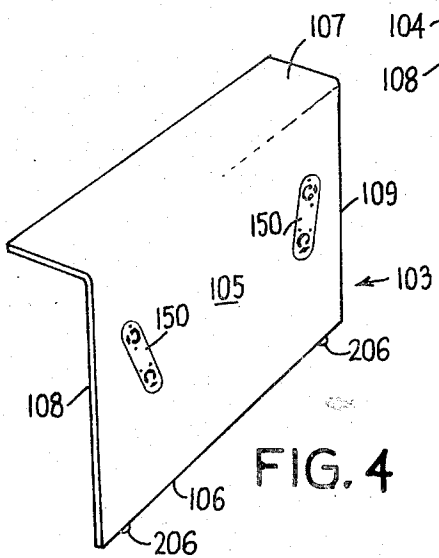
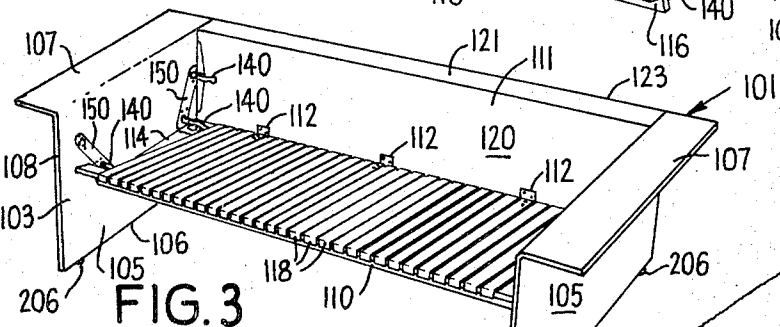
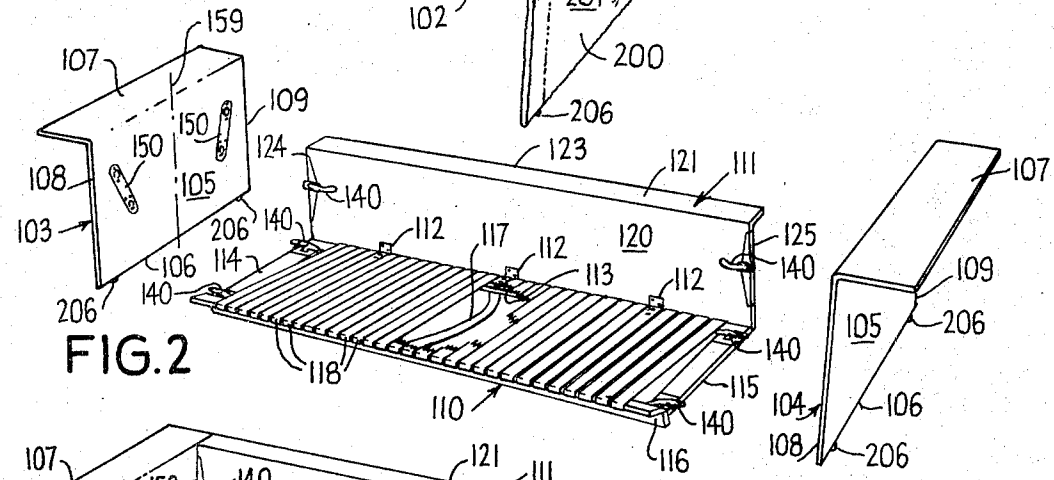
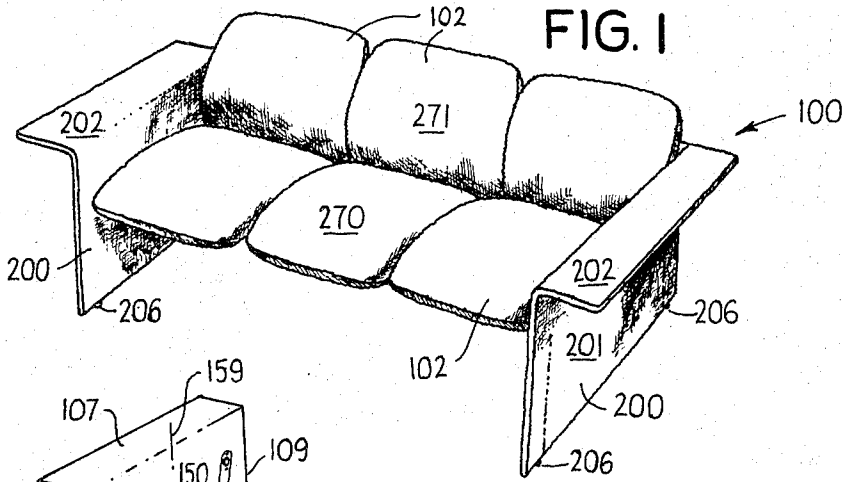
Primary Examiner—Casmir A. Nunberg
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[57] **ABSTRACT**

A seating unit, made up of: (1) a pair of side panel members, each comprising a planar vertical portion having a lower unit-supporting edge, often with a horizontal arm portion at its upper end, (2) a generally horizontal seat frame member, (3) a generally vertical back frame member having a generally vertical panel portion, often with a horizontal portion at its upper end, (4) releasable clamp or threaded means or other locking means securing each side panel member to the seat frame, (5) hinges securing the seat frame and back frame together, so that they can be folded together or erected at approximately a right angle, (6) releasable clamp or threaded means or other locking means securing the back frame to each side panel, and (7) at least one cushion with seat and back portions resting on the seat frame and back frame, the seat and back frames each being a single cushion wide or a width equal to an integral number of cushions. The unit may also have removable upholstery; this may comprise a casing of stretchable upholstery fabric with padding at least five times as thick as the fabric adhered to the fabric; a suitable undersize casing is secured releasably around each side panel and held in tension thereon, and a similar casing is held in tension on the back frame. There are numerous important structural features in the various elements.

44 Claims, 86 Drawing Figures





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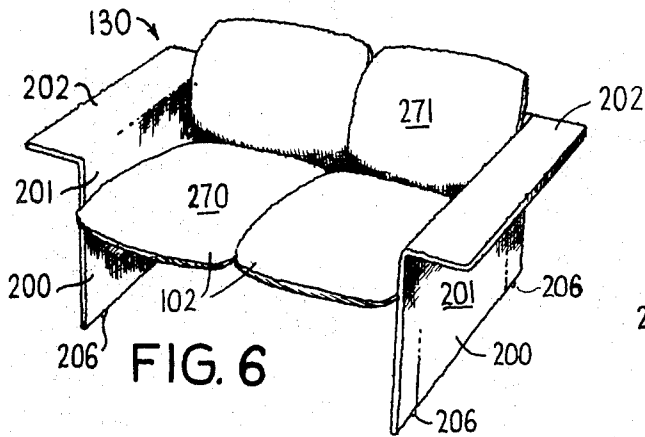


FIG. 6

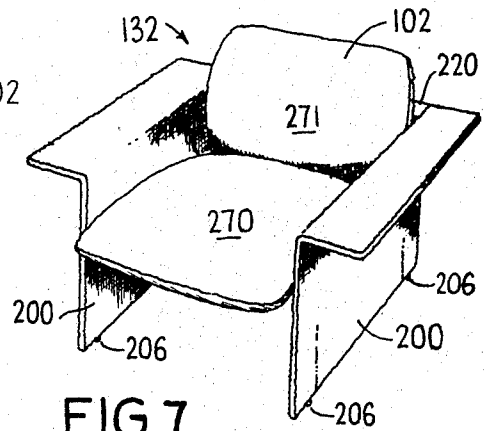


FIG. 7

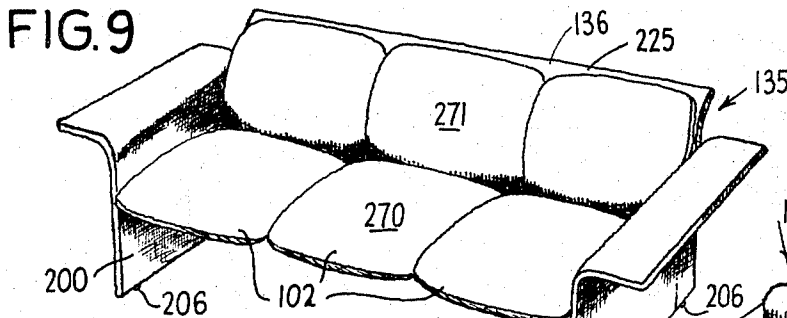


FIG. 9

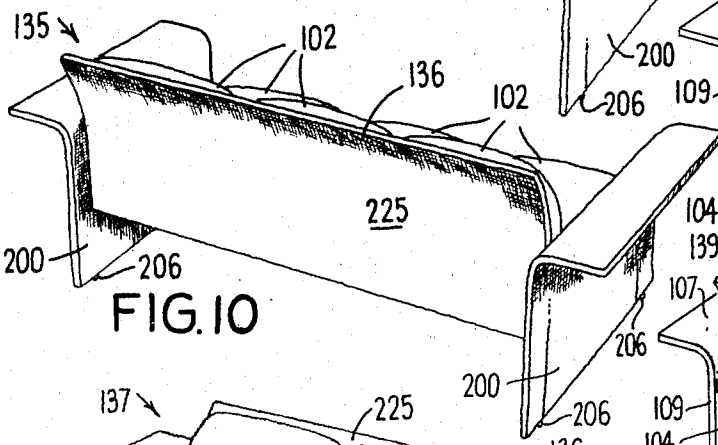


FIG. 10

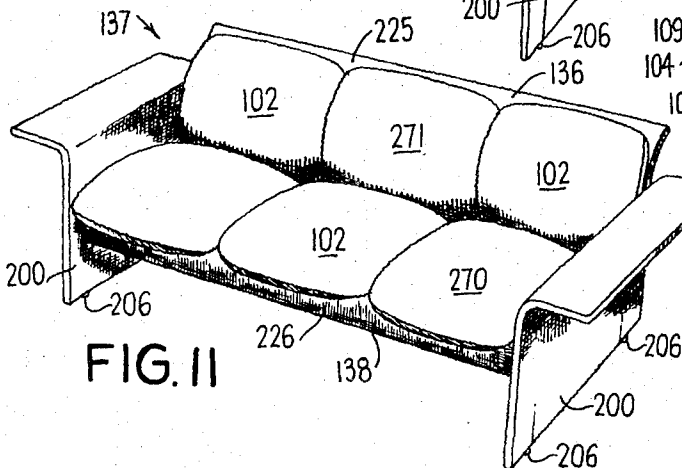


FIG. 11

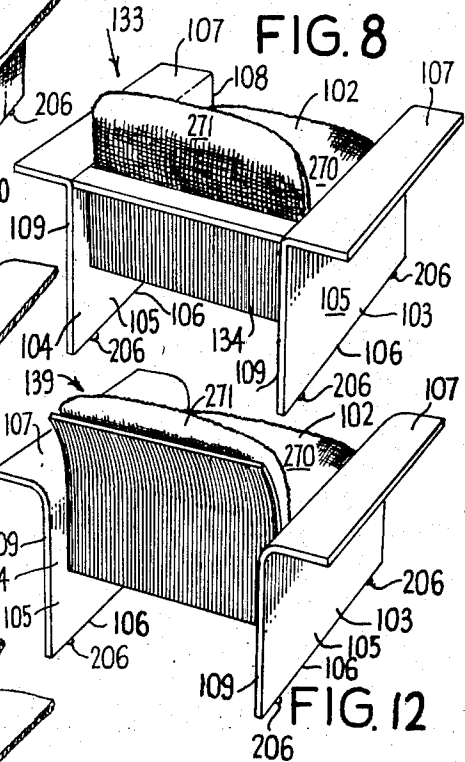


FIG. 8

FIG. 12

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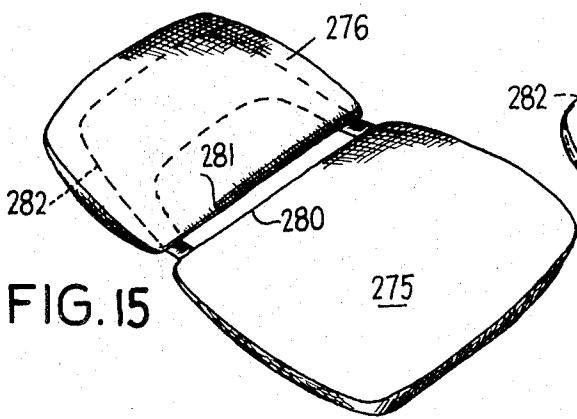


FIG. 15

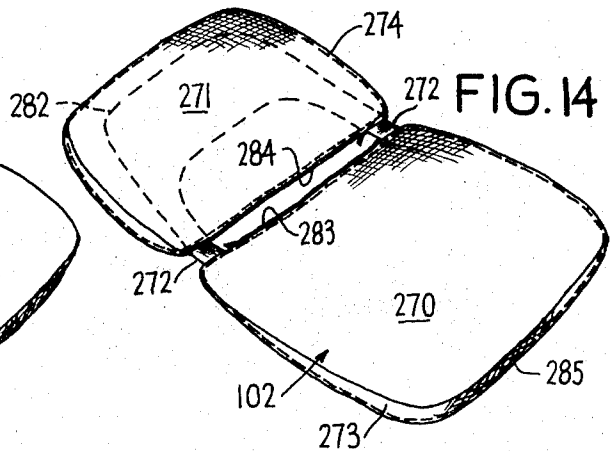


FIG. 14

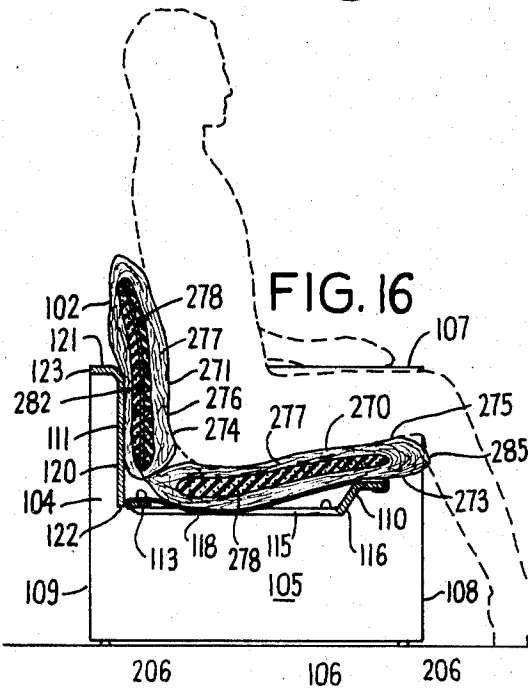


FIG. 16

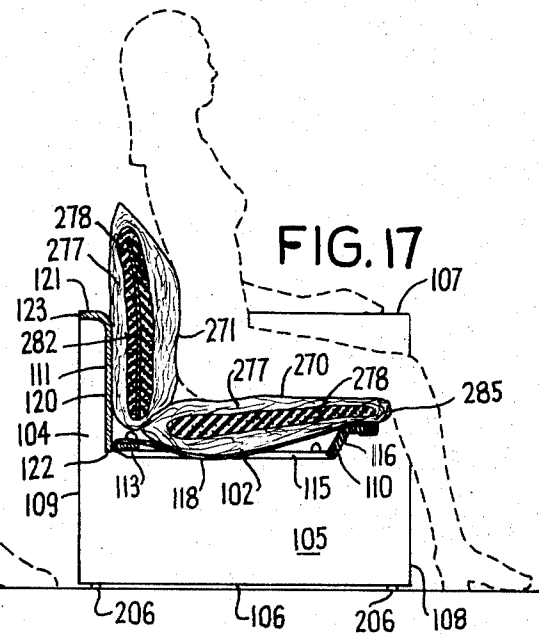


FIG. 17

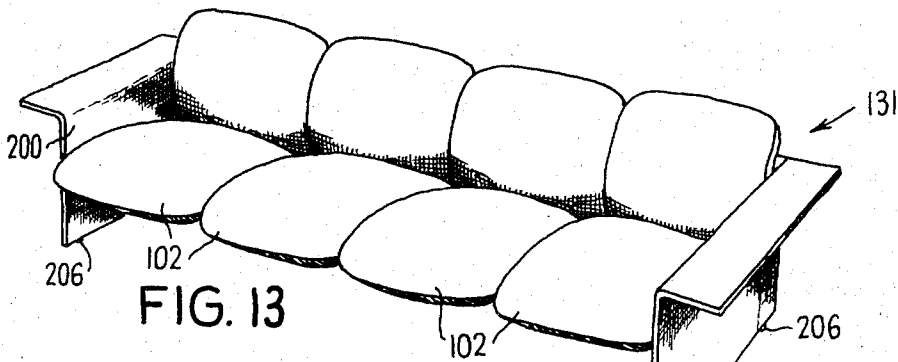
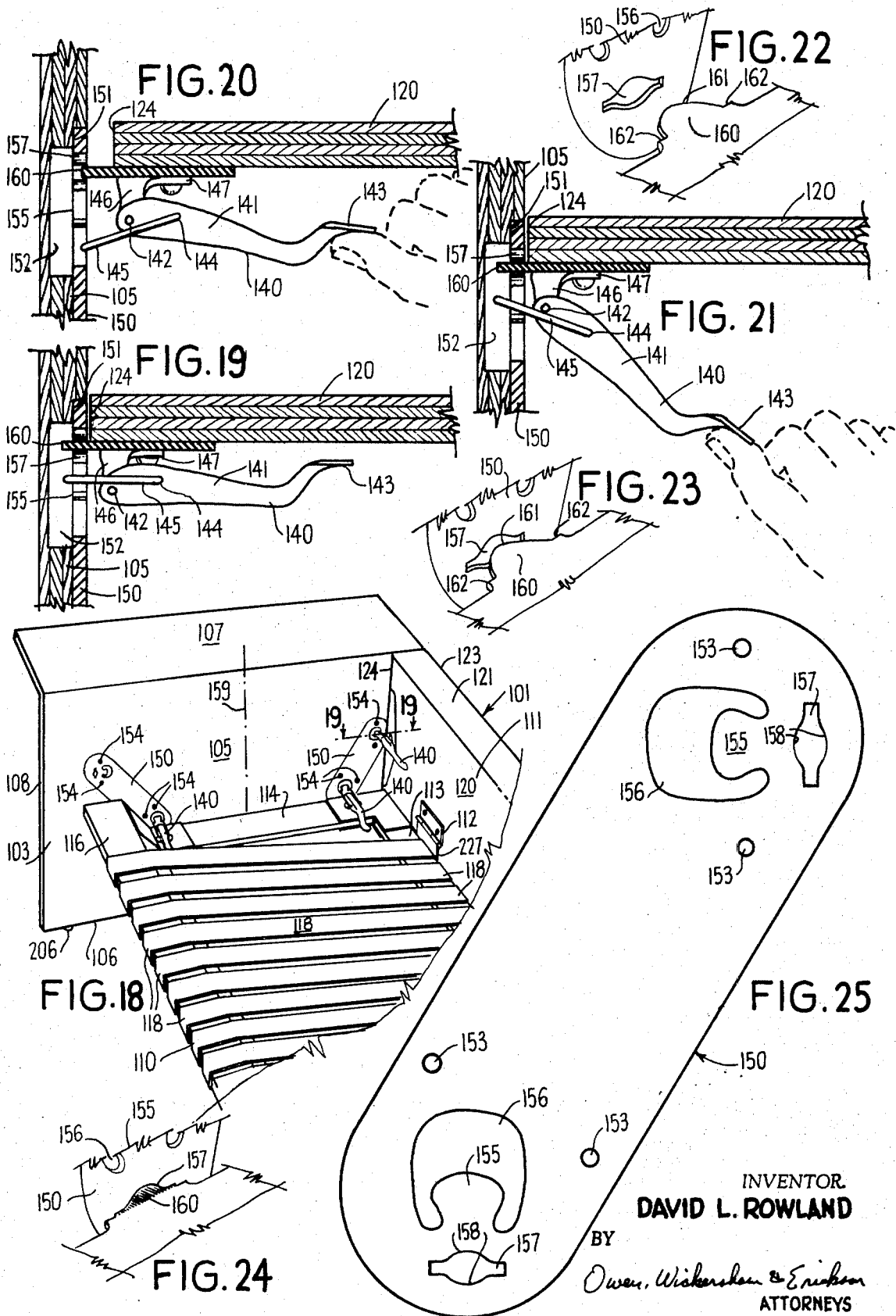


FIG. 13

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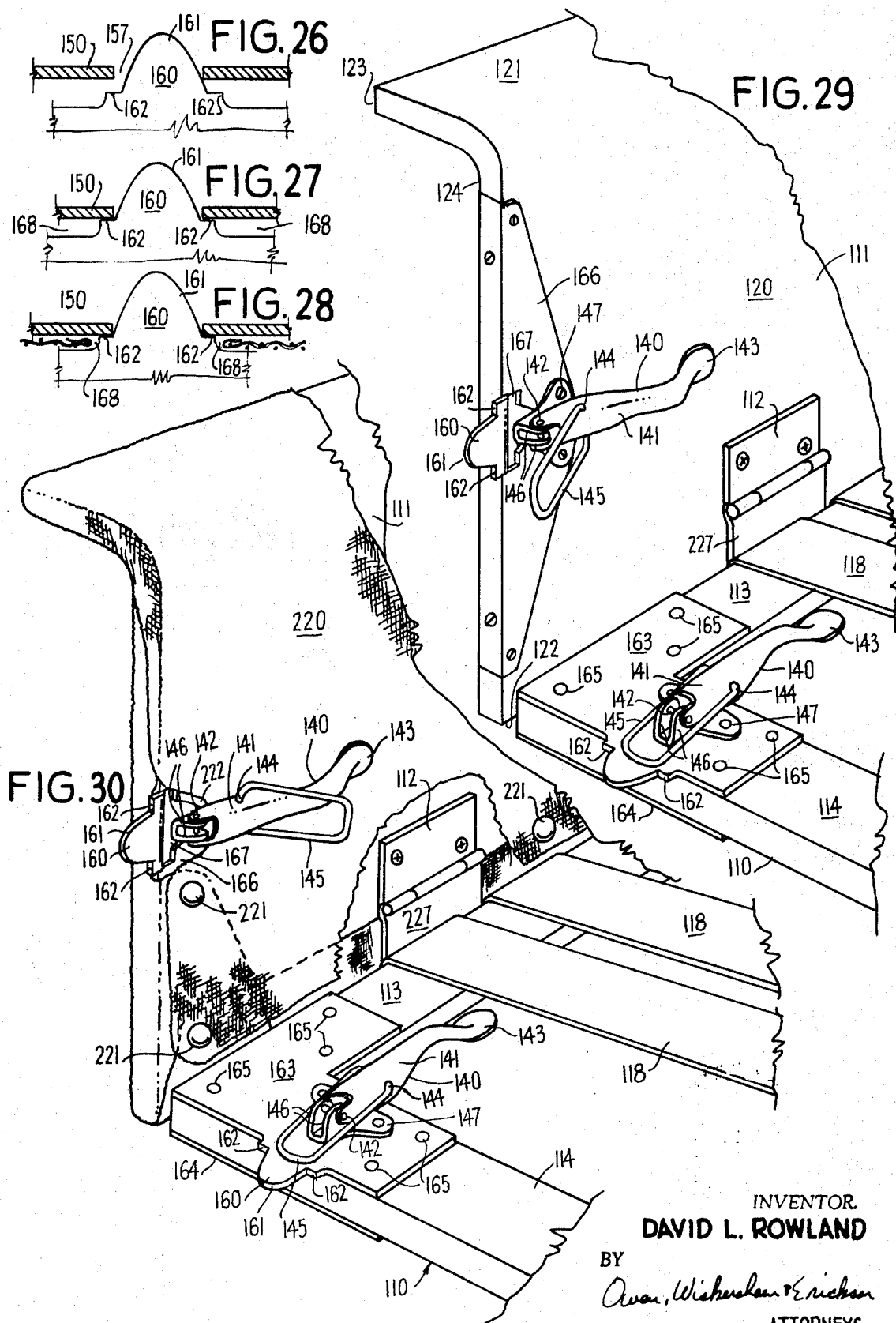
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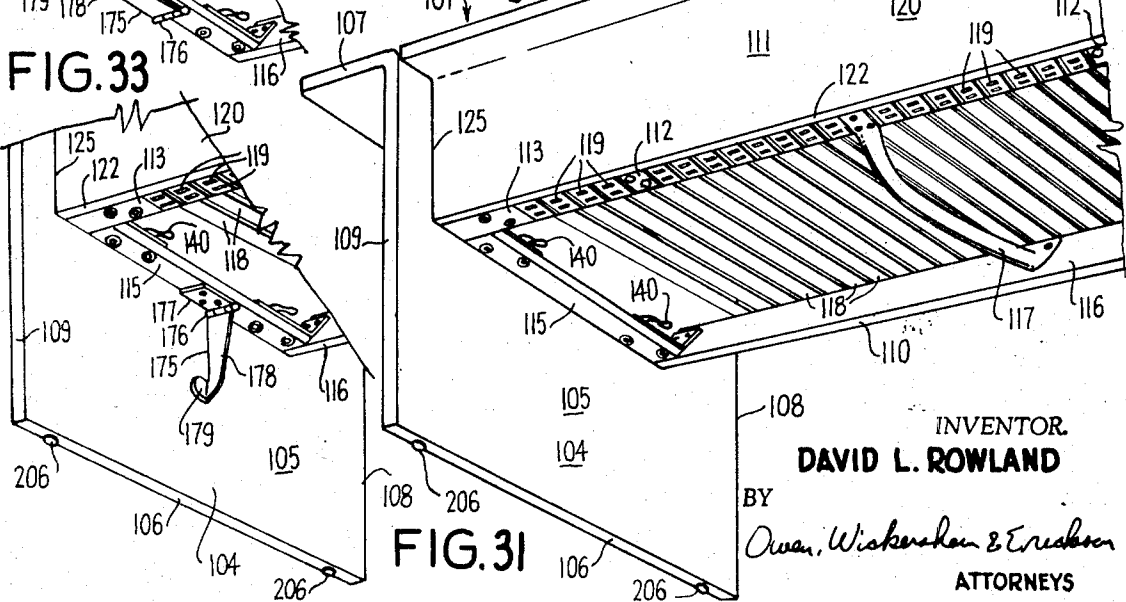
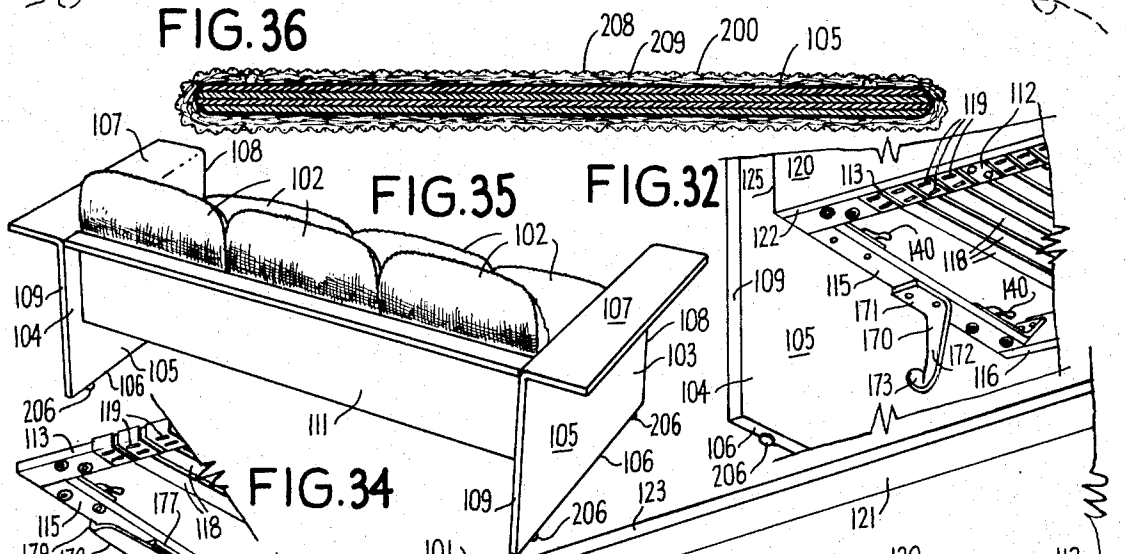
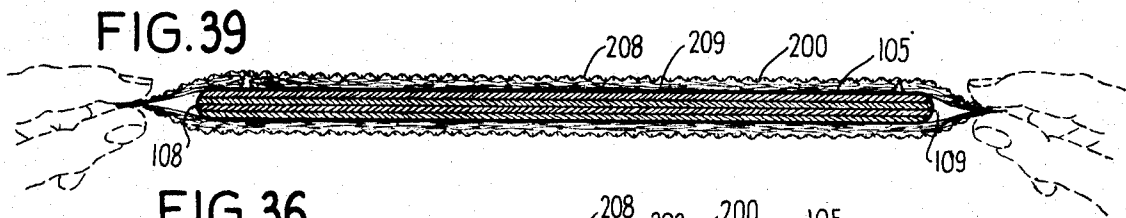
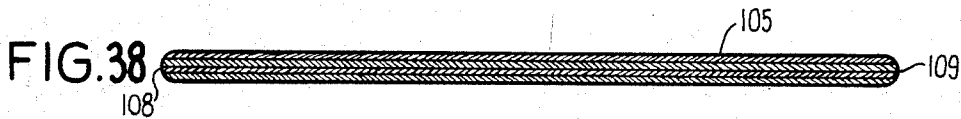
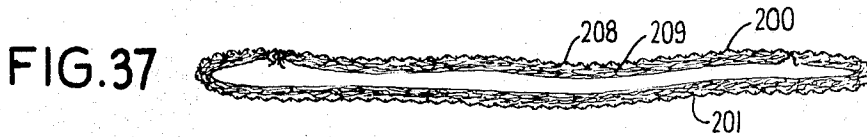
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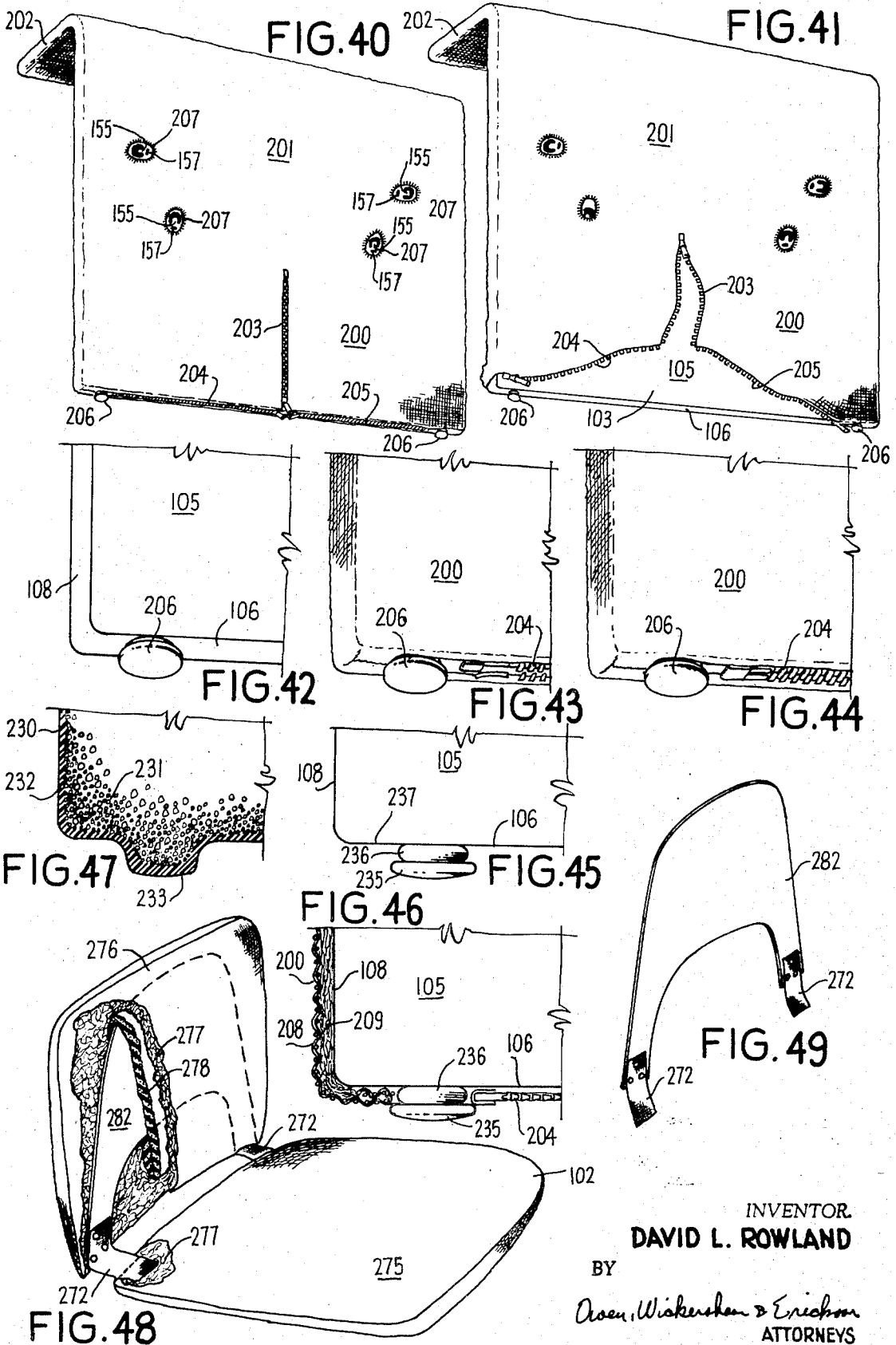
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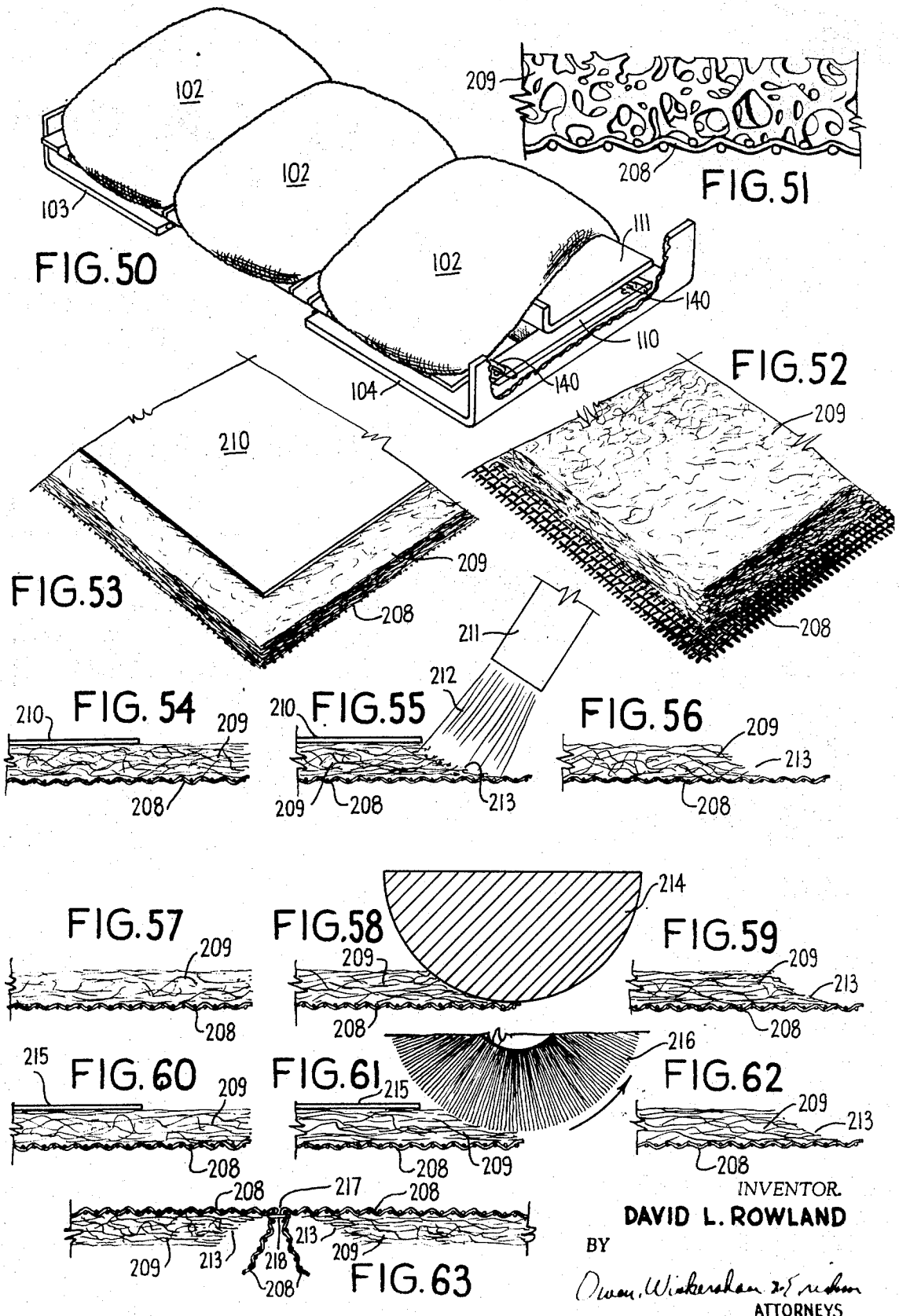
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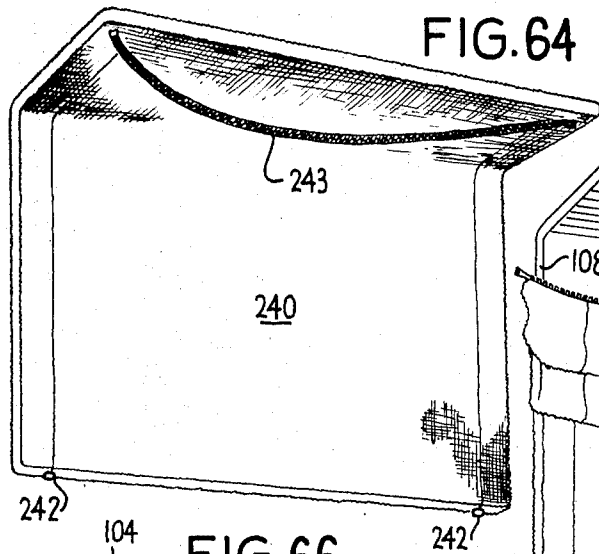


FIG. 64

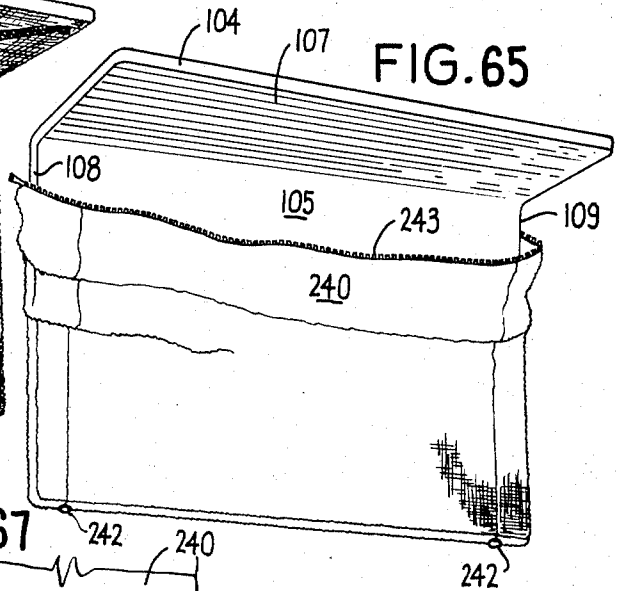


FIG. 65

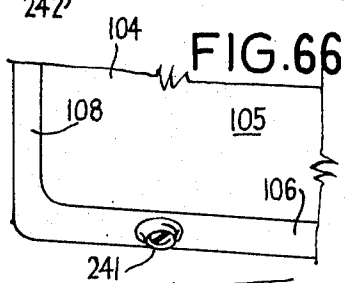


FIG. 66

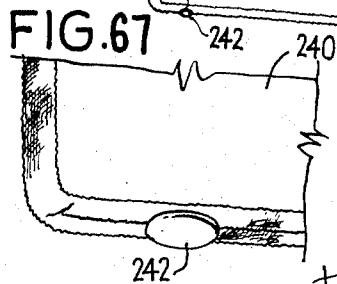


FIG. 67

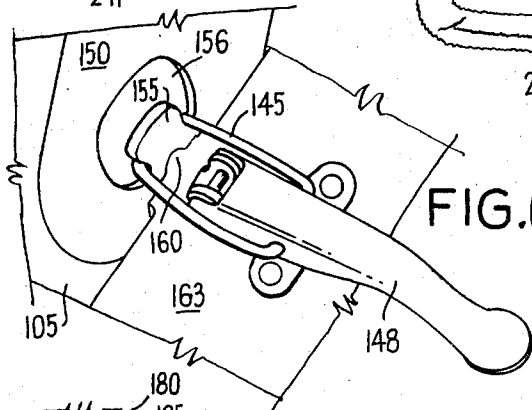


FIG. 68

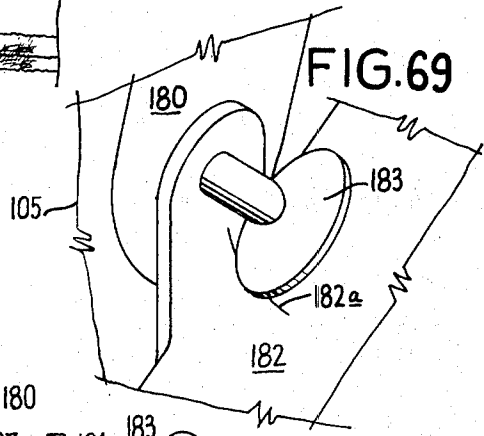


FIG. 69

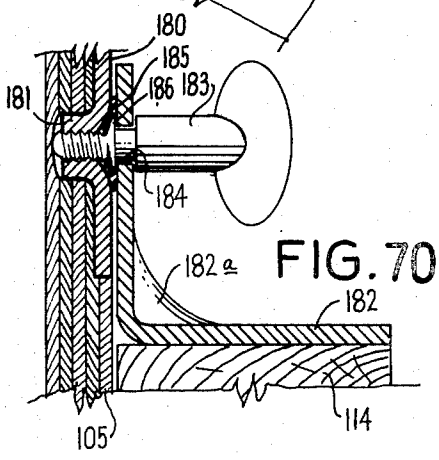


FIG. 70

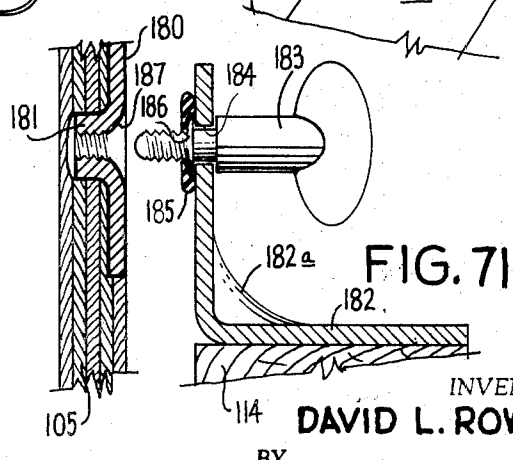
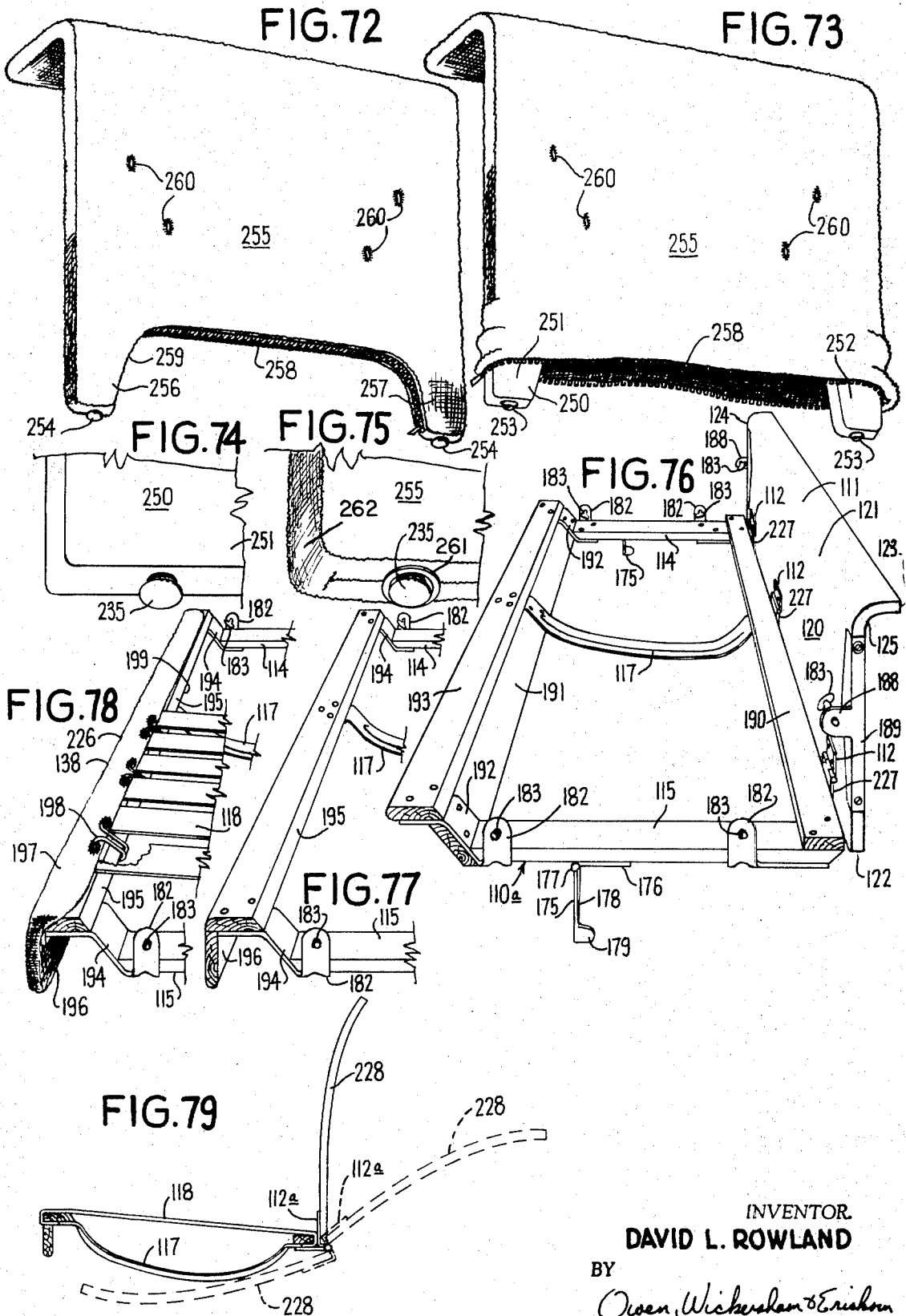


FIG. 71

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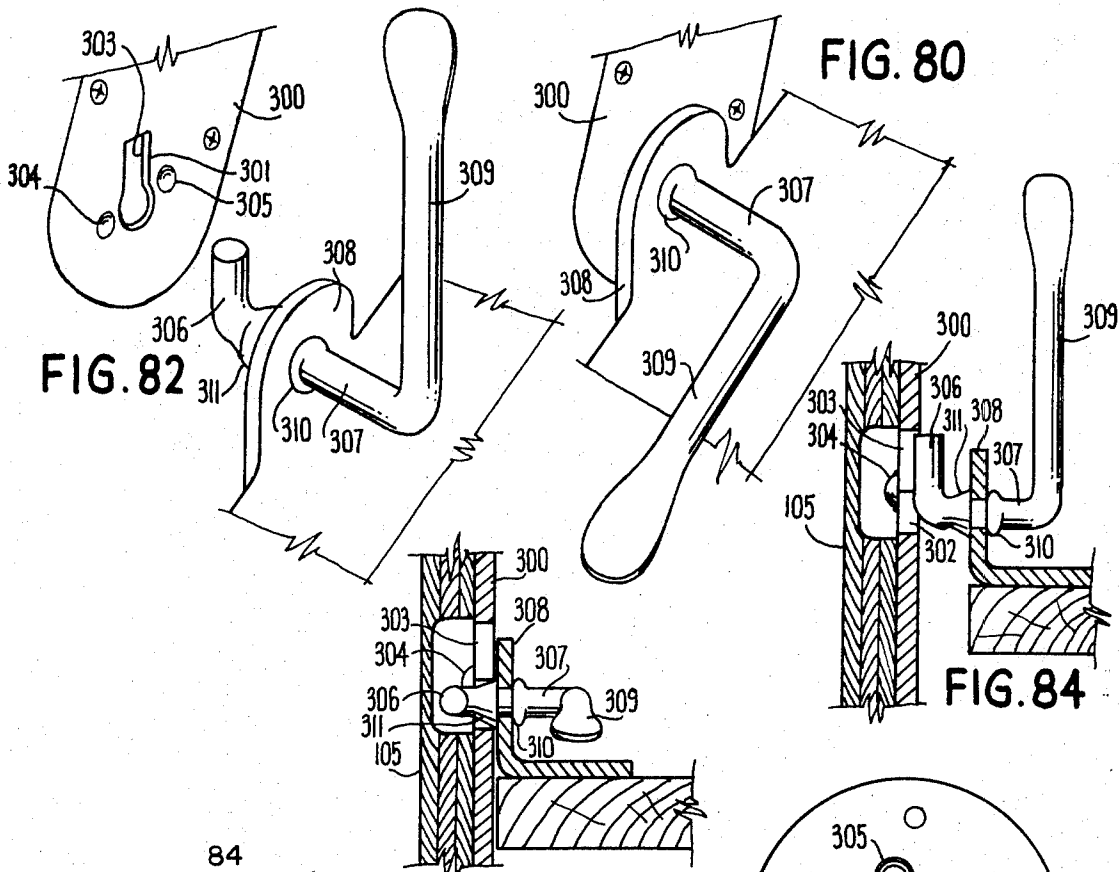


FIG. 86

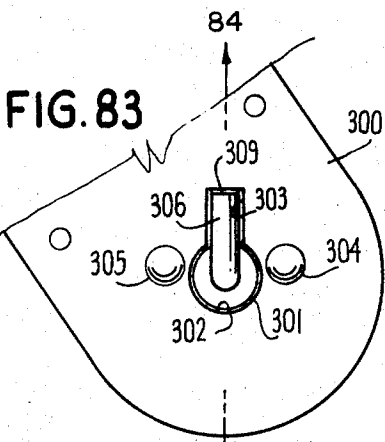


FIG. 85

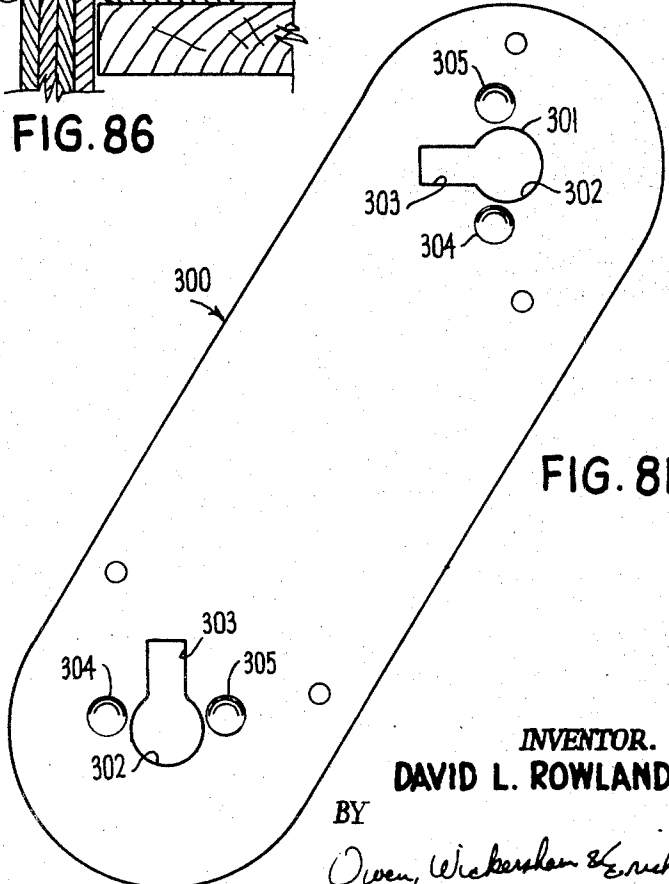
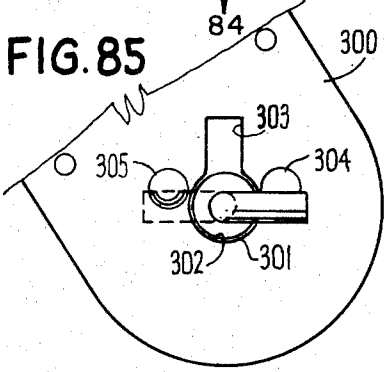


FIG. 81

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SEATING UNIT

This invention relates to improvements in furniture, such as sofas, loveseats, and lounge chairs.

Sofas, large lounge chairs, and other upholstered furniture have traditionally been cumbersome, heavy, and disposed to get dirty though they are not easy to clean. Typically, they have been available in a limited number of upholstery fabrics, have been expensive, and reupholstery has also been very expensive. The front edges of the arms of the sofa or chair have generally been exposed to the greatest traffic and so generally have become the first parts to wear. When they were worn through, it has usually been necessary to reupholster the whole sofa or chair or to discard it. The present invention is directed to a solution of these problems.

Customarily, sofas, for example, have been designed in two ways. In one, the backs are higher than the arms and in the other the arms have been equal to the height of the backs. The latter approach, although employed by several avant-garde designers in an endeavor to achieve a simple appearance, has heretofore sacrificed the comfort of the person sitting in it, because the arm has been put so high that it really could not properly function as an arm to support the arm of the sitter. The present invention enables the overcoming of these disadvantages and is also applicable to high-back sofas.

A typical housewife desiring to purchase a sofa or lounge chair has heretofore gone to a furniture or department store and chosen the product from a small choice of upholstery fabrics, placed an order, and waited for much later delivery to her home by a large truck. Occasionally, the store has had one on hand that pleased her, but even then she has had to wait for the delivery, which was often delayed and usually required the labor of two men. Once the sofa or chair had been delivered, it was difficult for her and her husband to move it around. Also, after she had used it a while, it began to get dirty. The cushions sometimes had removable covers so that cleaning of them was possible, but the actual upholstery on the body was generally tacked on and could only be properly cleaned by complete removal, for, while shampoo cleaning was possible on an installed sofa, it was usually difficult and unpleasant to do, and the product itself was, of course, not usable until the shampoo dried, which usually took several hours. Once wear occurred, reupholstery required the tedious job of removing the old fabric, then sewing and tacking on of new fabric.

The present invention is addressed to these problems and presents useful solutions. When furniture made by this invention is to be purchased and the housewife visits the furniture or department store, she can pick out the products, choose one or more of any of a very large number of available packaged upholstery fabrics and can carry the upholstery fabric and a compact package containing a partly disassembled sofa or chair out to her car by herself and take it home with her in an ordinary sized car. She may not even need help in carrying the package or lifting it into the car, although this help can be easily supplied by service personnel at the store. When she has the package at home, she is able to carry it into the house, unwrap it, slip the removable upholstery on it, and assemble the chair or sofa together without employing tools; it is then ready for

use. When it needs to be cleaned, the upholstery is readily removed and readily replaced.

One feature of the invention is its utilization of stretch fabrics in connection with zippers. Up to now it has generally not been practical to incorporate zippers on stretch fabrics such as slip upholstery covers, since the use of the zippers, which certainly do not stretch, defeats the purpose of utilizing stretch fabrics, which are used only so that they can be stretched wider than the object while putting them on. When a zipper is placed in its customary position along the opening, it opens and closes, but the non-stretch tape on each side of the zipper prevents the opening from stretching, and this is the very point where an opening should be able to be widened in order to use the stretchable fabric. The present invention also overcomes this difficulty and provides useful arrangements.

Many other objects, features, and advantages of the invention will appear from, and many are explained in detail in, the following description of some preferred forms thereof.

In the drawings:

FIG. 1 is a view in perspective of a three-seat upholstered sofa embodying the principles of this invention.

FIG. 2 is a partially exploded view in perspective of the sofa FIG. 1 with the cushions and upholstery removed and a portion of the seat frame springs broken away to show a stretcher member therebelow.

FIG. 3 is a view in perspective of the parts of FIG. 2 after assembly. It may also be regarded as showing an unupholstered sofa of this invention, without its cushions.

FIG. 4 is a view in perspective of one uncovered or unupholstered side panel of the sofa of FIG. 3.

FIG. 5 is a view similar to FIG. 4 of an upholstered side panel, as used on the sofa of FIG. 1.

FIG. 6 is a front view in perspective of an upholstered loveseat embodying the principles of the invention, having a low back, level with the arms, and generally like the sofa of FIG. 1 except for its length.

FIG. 7 is a similar view of an upholstered lounge chair having the same basic structure as the sofa and loveseat of FIGS. 1 and 6.

FIG. 8 is a rear view in perspective of a chair like the chair of FIG. 7, except that its rear frame and side panels are not upholstered.

FIG. 9 is a front view in perspective of a modified form of three-seat upholstered sofa embodying the principles of this invention and differing mainly from the sofa of FIG. 1 in having a high back.

FIG. 10 is a rear view in perspective of the sofa of FIG. 9.

FIG. 11 is a view similar to FIG. 9 of a similar sofa having a front fabric-covered upholstered panel.

FIG. 12 is a rear view in perspective of a chair with a high back, generally similar in construction to the sofa of FIGS. 9 and 10, but with its side panels and back frame unupholstered.

FIG. 13 is a view like FIG. 1 of a four-seat upholstered sofa, also embodying the principles of the invention and with a structure basically similar to that of the sofa of FIG. 1.

FIG. 14 is a view in perspective of an upholstered cushion assembly according to the principles of this invention, shown flattened out.

FIG. 15 is a similar view of the inner cover and contents of the assembly of FIG. 14 with the upholstery fabric outer cover removed.

FIG. 16 is a view in side elevation and in vertical section of a sofa or chair of the invention, showing how the cushions and springs act when sat on by a relatively heavy man, his outline being shown in broken lines.

FIG. 17 is a similar view showing how the sofa or chair acts when sat upon by a lighter women, her outline being shown in broken lines.

FIG. 18 is a fragmentary view in perspective of a portion of the sofa assembly of FIG. 3, showing how the elements are held together.

FIG. 19 is an enlarged fragmentary view in section taken along the line 19—19 in FIG. 18.

FIG. 20 is a view similar to FIG. 19 with the clamp loose and in an early stage of tightening, an outline of part of a hand being shown in broken lines.

FIG. 21 is a view similar to FIG. 20 with the clamp more nearly tightened.

FIG. 22 is a fragmentary view in perspective of the clamp retainer for the assembly of FIGS. 19 to 21 about to be inserted into an opening in the bracket.

FIG. 23 is a view similar to FIG. 22 with the insertion at a later stage.

FIG. 24 is a similar view with the insertion completed.

FIG. 25 is an enlarged view in elevation of the bracket shown in FIGS. 18 to 24.

FIG. 26 is a view, in horizontal section, somewhat enlarged, of the bracket-retainer assembly of FIGS. 22 to 24, at a stage in between FIGS. 23 and 24, there being no upholstery.

FIG. 27 is a view like FIG. 26 of the assembly in its position of FIG. 24, there being no upholstery.

FIG. 28 is a view like FIG. 27 with upholstery in place.

FIG. 29 is an enlarged fragmentary view in perspective of a seat-back sub-assembly at one edge, showing two clamps and clamp retainers. There is no upholstery.

FIG. 30 is a view similar to FIG. 29 with upholstery in place on the back, a portion thereof being broken away to show a hinge portion therebelow.

FIG. 31 is a fragmentary view in perspective looking from below of a portion of the sofa assembly of FIG. 3.

FIG. 32 is a fragmentary view in perspective of a modified form of structure having a hanging rest or buttress, shown here as rigid and not foldable.

FIG. 33 is a view similar to FIG. 32 showing a foldable hanging rest or buttress.

FIG. 34 is a view similar to FIG. 33 of a portion of the seat frame only, with the hanging rest or buttress folded flat.

FIG. 35 is a view in perspective from the rear of the sofa of FIG. 3, with the cushions in place, the side panels and back frame of the sofa being made from wood or plastic panels without upholstery.

FIG. 36 is an enlarged view in section of a plywood side panel having an upholstery cover thereon, in tension.

FIG. 37 is a similar view, on the same scale, of the cover alone, off the panel, showing that it is naturally smaller than the panel.

FIG. 38 is a similar view, on the same scale, of the panel alone, without the cover.

FIG. 39 is a similar view, on the same scale, of the panel with the cover being put on, stretched.

FIG. 40 is a view in perspective from below of one side panel of the sofa of FIG. 1 with a zippered upholstery cover installed.

FIG. 41 is a similar view with the zippers loosened to enable removal of the cover.

FIG. 42 is a fragmentary view in perspective of the bottom corner of the unupholstered side panel of FIG. 41; showing a conventional furniture glide in place.

FIG. 43 is a similar view with the upholstery cover put on but still unzipped.

FIG. 44 is a view like FIG. 43 with the cover zippered tight.

FIG. 45 is a fragmentary view in elevation of an uncovered side panel with a modified form of glide.

FIG. 46 is a view like FIG. 45 with an upholstery cover installed and shown in section.

FIG. 47 is a fragmentary view in elevation and in section of the lower corner of a modified form of side panel made from foamed plastic and with an integral glide portion.

FIG. 48 is a cutaway view in perspective of the inner case of a seat-back cushion assembly, partially broken away and shown in section.

FIG. 49 is a view in perspective of a back-stiffening insert used in the cushion of FIG. 48.

FIG. 50 is a view in perspective of the sofa of FIG. 1 disassembled and stacked for slipping, the upholstery covers being omitted and part of the arm portion of one side panel being broken away to show what lies behind.

FIG. 51 is a greatly enlarged fragmentary view in section of one type of upholstery of this invention, comprising plastic foam padding adhered to stretchable upholstery fabric.

FIG. 52 is a fragmentary view in perspective of another type of upholstery of this invention, wherein fiber batting or synthetic plastic foam is adhered to fabric.

FIG. 53 is a similar view of the structure of FIG. 52 at a stage during manufacture when it is partially covered with a metal or asbestos heat shield or stencil.

FIG. 54 is an enlarged fragmentary view in section of a portion of the structure of FIG. 53 before heat is applied.

FIG. 55 is a similar view wherein a hot air blast is applied to the structure of FIGS. 53 and 54.

FIG. 56 is a similar view of the upholstery product resulting from the process of FIG. 55.

FIG. 57 is a view like FIG. 54 of a modified form of upholstery structure like that of FIG. 52, wherein there is no heat shield or stencil.

FIG. 58 is a view like FIG. 57 showing a shaped hot iron applied to the structure of FIG. 57.

FIG. 59 is a similar view of the structure resulting from the process step of FIG. 58.

FIG. 60 is a view like FIG. 57 of a similar upholstery structure about to be treated and having an overlying stencil.

FIG. 61 is a view similar to FIG. 60 with a wire brush treating the structure of FIG. 60.

FIG. 62 is a view similar to FIG. 61 showing the structure resulting from the process step of FIG. 61.

FIG. 63 is a view in elevation and in section of the sewing together of two pieces like those of FIGS. 56, 59, and 62.

FIG. 64 is a view in perspective of a side panel like that in FIG. 1 with a modified form of upholstery cover, also embodying the principles of the invention.

FIG. 65 is a view like FIG. 64 with the cover partially removed.

FIG. 66 is a fragmentary view in perspective of a lower corner of a side panel like that of FIG. 64 without an upholstery cover put on, with a male snap-fastening member serving as glide.

FIG. 67 is a view similar to FIG. 66 with an upholstery cover put on and with a female snap-fastening member having engaged the male snap member and serving as a glide.

FIG. 68 is a fragmentary enlarged view in perspective of the clamp member of FIGS. 29 and 30, clamped in place on the bracket of FIG. 25.

FIG. 69 is a view basically similar to FIG. 68 of a modified form of securing structure employing a thumb screw instead of a clamp.

FIG. 70 is a view in elevation and in section of the FIG. 69 installation.

FIG. 71 is a view like FIG. 70 just before installation.

FIG. 72 is a view in perspective of a modified form of upholstered side panel, also embodying the principles of the invention.

FIG. 73 is a view like FIG. 72 with the upholstery cover partly removed.

FIG. 74 is a fragmentary view in perspective of the lower corner of the panel of FIGS. 66, and 73 with the upholstery cover removed and embodying a modified form of glide.

FIG. 75 is a view like FIG. 74 with the upholstery cover installed.

FIG. 76 is a view in perspective of a modified form of seat-back frame assembly of the invention, omitting the springs, the seat frame having a non-upholsterable front panel. A modified form of attachment member, like that of FIGS. 69-71, for securement to the side panels is also shown.

FIG. 77 is a fragmentary view in perspective of a modified form of seat frame having an upholstered front panel.

FIG. 78 is a view like FIG. 77 with upholstery applied to the front panel and showing some rubber springs.

FIG. 79 is a view in side elevation of a high-back seat-back frame assembly, showing in broken lines, the back frame first being folded down and then folded under the seat frame.

FIG. 80 is a fragmentary view in perspective of a modified form of releasable locking device for securing the side panels to the seat frame and back frame.

FIG. 81 is a view in elevation of a bracket for use in the locking device of FIG. 80.

FIG. 82 is a fragmentary view in perspective of the movable locking member about to be inserted in the bracket.

FIG. 83 is a fragmentary view in elevation of the same, looking from inside the bracket.

FIG. 84 is a view in section taken along the line 84-84 in FIG. 83.

FIG. 85 is a view similar to FIG. 83 of the device in its locked position; an alternative locking position is shown in broken lines.

FIG. 86 is a view in section taken along the line 86-86 in FIG. 85.

The sofa 100 shown in FIG. 1 is a typical example of a fully upholstered sofa embodying the present invention. It comprises a basic frame structure 101 (FIG. 3) supporting the upholstery and a series of seat cushion members 102. The basic frame structure 101 is shown assembled in FIG. 3 and is shown in exploded form in FIG. 2. As will be seen there, it comprises a pair of side panel members 103 and 104, which may be identical and serve as the "legs" for the sofa 100; they comprise vertical sheet-like members of strong plywood or plastic or metal, all of sufficient thickness and strength to support the sofa and its load. Each side panel member 103, 104 has a vertical portion 105 having a lower edge 106 and preferably has an upper horizontal arm portion 107 serving as arms for the sofa 100; for some designs the arm portion 107 may be omitted. There is a front edge 108 and a rear edge 109.

The side panel members 103 and 104 are joined together by and support, a seat frame 110 and a back frame 111, so that these four members comprise the basic frame structure 101, so that these four members comprise the basic frame structure 101. The seat frame 110 (see FIGS. 2, 18, and 29 to 31; also compare FIGS. 76-78 where a modified frame 110a is shown) is a generally rectangular open frame and is preferably hinged to the back frame 111 by a series of hinges 112. Thus the seat frame 110 and back frame 111 preferably comprise a single foldable sub-assembly. The back frame 110 may be folded over on top of the seat frame (FIG. 50) or; in a modified structure, may be folded beneath the seat frame (FIG. 79) by means of somewhat different hinges 112a. When erected, the seat frame 110 is horizontal, and the back frame 111 vertical, at substantially a right angle.

The seat frame 110 may have a rear bar 113, two side bars 114 and 115, and an up-raised front member 116; it may be constructed from wood with some metal reinforcements or attachments. The higher front member 116 adds to the comfort by inherently providing a down slope from the front to the rear and also helps hold the cushions 102 from sliding forward. One (or more) wood or metal stretcher member 117, preferably bowed, joins the front member 116 to the rear bar 113 in between the side bars 114 and 115 for sofas; for chairs no stretcher is needed.

Suitable cushion-supporting springs 118 may be provided, as shown in FIG. 3. Other types of springs may be used instead of what is shown. While the springs may be of nearly any type, flat springs are preferable, because they make a compact package and their whole top surface is a supporting platform, whereas coil springs extend far below the top ring, so that the top ring is not a supporting surface, and webbing and wire insulators would be required to hide the feel of those springs. While arcuate springs also work well, the flat bar-like rubber springs 118 can be installed by staples 119 (FIGS. 31-34) and hence are often preferred. The stretcher 117 helps to enable the frame 110 to withstand the tension which the installation of the springs 118 brings about.

The hinge connections 112 between the seat frame 110 and the back frame or panel 111 also imparts an important strength feature. The thin rear seat frame beam or bar 113 (see FIGS. 18, 29, and 30) could not alone carry the weight of a heavy person; it would only

take the horizontal tension of the springs 118. However, in erected position, the hinges 112 make the back structure into a right angle between the bar 113 and the back frame or panel 111. This imparts adequate strength to the bar 113 to carry the load of people. This novel combination provides the needed strength with a desirable lightness of weight and aids also in providing both of these with a folding structure, all cooperating in providing the take-home feature. If the bar 113 were to be hefty enough to be able to take by itself both the horizontal rear-to-front pull of the springs 118 and the vertically downward force of the people sitting, it would have to be very heavy, as are prior-art sofas. With the hinging, strength, light weight, and portability are all achieved.

The back frame 111 basically comprises a member shaped generally like the side panel members 103 and 104, though none of it rests on the floor; there is an upright back portion 120 and there may be a horizontal top portion 121, which is normally level with the arms 107. There is a bottom edge 122, a rear edge 123, and two side edges 124 and 125.

The sofa 110 may, if desired, be used in a non-covered version (like FIG. 3, except that the seat cushions 102 are put in place as in FIG. 1) in which the back 111, seat 110, and sides 103 and 104 are all made principally out of materials with a satisfactory surface for this purpose, such as a high quality wood or a suitable plastic or suitably decorated metal members, or a combination thereof. If they are to be used in that form, they do not need to be provided with any fabric covering, but otherwise they are provided with fabric covering in accordance with this invention in a manner which is described below.

FIGS. 6 to 13 illustrate the versatility of the invention. The same side panels 103 and 104 can be used with different lengths of seat frame 110 and back frame 111 to produce different articles of furniture, and the back frame 111 can be altered to produce a different design. The seat frame 110 and back frame 111 are made in lengths which correspond to an integral number of seat cushion assemblies 102. Other changes are, of course, quite practical, too, for these only illustrate the principle; they do not exhaust it. Notice also the differences achievable by different types of upholstery or by omission of upholstery.

FIG. 6 shows a fully upholstered love seat 130, differing from the sofa 100 of FIG. 1 only in that its seat frame and back frame are only long enough to support two seat cushions 102 instead of three. Similarly, FIG. 13 shows a fully upholstered four-seater sofa 13 exactly like the sofa 100 of FIG. 1 except that its seat frame and back frame are long enough to support four seat cushions 102 instead of three.

FIG. 7 shows an upholstered lounge chair 132 and FIG. 8 shows a lounge chair 133 whose panels 103 and 104 and back frame 134 are not upholstered. Both of them are very much like the sofa 100 except for the length of the seat frame and back frame, and both of them include the cushions 102. No stretcher 117 is required for the chair 132 and 133.

FIGS. 9 and 12 illustrate a similar line of sofas having a high back instead of the low back of the sofa 100, love seat 130, four seater 131, and chairs 132 and 133. A fully upholstered sofa 135 in FIGS. 9 and 10 differs

from the sofa 100 in its high back 136, curved at its upper end, due entirely to a different structure of the back frame. A similar high-back sofa 137 is shown in FIG. 11 and differs from the sofa 135 only in additionally having an upholstered front panel 138. FIG. 12 shows a chair 139 with the same high back structure, but with its frame upholstered, though still employing a cushion assembly 102. Obviously, love seats, four-seaters and many other variants are possible.

In all instances the side panels 103 and 104 are attached to the seat frame 110 and back frame 111 by readily releasable and readily securable fasteners. A preferable structure for the fasteners and the brackets to which they are secured is shown in FIGS. 2-5 and 20-30, and this important structure will now be described in detail.

An over-center pivoting type of clamp 140 is used in this embodiment. Two clamps 140 are mounted at each end of the seat frame 110 and one clamp 140 is mounted at each end of the back frame 111, so that each side panel 103, 104 is secured to the seat-back frame combination 110, 111 by three clamps 140. Each clamp 140 has a channeled handle portion 141 mounted on a pivot 142 at its front end and having a down-stepped and flattened rear end 143 suitable for engagement by one's thumb, as shown in FIGS. 19-21. Pivoted to the handle portion 141 at a location 144 to the rear of the pivot 142 is a clamp strap 145, which extends forward of the pivot 142 and does the actual clamping. The pivot 142 is supported across upstanding flanges 146 of a clamp base member 147. This clamp 140 is not the only possible structure, of course; but it is illustrative and is a presently preferred form. It is identical to a child's ski binding, and in fact may be a No. 600 child's ski binding manufactured by Dovre Ski Binding Inc., of West Concord, Massachusetts.

To receive the three clamp straps 145 and attach to them, each side panel 103, 104 preferably has two identical brackets 150, one of which is shown enlarged in FIG. 25. To receive the brackets 150 flush, as they preferably are in order to protect the upholstery from catching, the side panel portions 105 are provided with shallow recesses 151, and to enable the clamping action the portions 105 are also provided with wells 152 (FIGS. 19-21). Each bracket 150 has holes 153 (FIG. 25) for the rivets 154 that secure it to the portions 105 (FIG. 18). Each bracket 150 has two strap anchors 155, each defined by an adjacent oversize strap-receiving opening 156, enabling maneuvering of the straps 145, and it also has two stabilizer-receiving openings 157, each generally rectangular with opposed arcuate flairs 158. As a result, the anchor 155 is flush with the panel wall 105 and does not snag fabric, as would a projecting hook.

It will be noted that one anchor 155 is vertical and that directly beneath it the stabilizer opening 157 is horizontal, while the other anchor 155 is horizontal and a vertical stabilizer opening 157 lies directly to one side of it. Since the bracket 150 is a flat piece of metal and can be turned over, the panels 103 and 104 can be made identical to each other, the brackets 150 being located symmetrically to a vertical axis 159 midway between the front and rear edges 108 and 109. Thus, the side panels 103 and 104 are completely symmetrical about this same axis 159 and are reversible and in-

terchangeable. Only three of the anchors 155 are used in any one installation, the fourth one being present only because of this symmetry. It is obscured later by the cushions 102 and does not show in the finished article.

The preferred clamping structure of the invention is further characterized by a stabilizing structure involving the opening 157 and a stabilizing projection 160, having a rounded outer portion 161 and a pair of shoulders 162 (see FIGS. 22-24 and 26-28 especially, also FIGS. 19-21, 25, 29, and 30). As shown in FIGS. 29 and 30, the projections 160 may be an integral part of a plate 163 which is secured to the upper surface of the might of the seat frame 110; overlying another plate 164 on the lower surface, to strengthen the corner screws or rivets 165 holding the assembly together, the plate 163 also supporting the clamp base 147, which is riveted to it. Similarly, the projection 160 may be in integral part of an angle plate 166 that is secured to the back frame 111; in this instance the projections 160 may be bend out from a punched opening 167. The angle plate 166 stiffens the back frame 111, so that the clamp 140 can be put as low as possible and so that the upper openings 156 can be inconspicuously hidden by the seat cushions 102. However, formed, all the stabilizer projections 160 are preferably identical.

The stabilizer structure 160, 157 is very important. For some time it was difficult to keep the panels 103, 104 from shifting relatively to the seat frame 110 and back frame 111. The stabilizer structure 160, 157 prevents such shifting. It is not vital which part is male and which is female, but the structure shown is preferable because then there is no protrusion from the side panel member 103 and 104 that might catch on the fabric and might also produce a packing problem. At least one of the two shoulders 162 on each member 160 is needed, and the symmetrical structure is preferred. Without the shoulders 162 there is a problem with the fabric of the upholstered frame members getting in the way. As shown in FIG. 28 the shoulders 162 compensate for the fabric thickness, and even (as in FIG. 27) when there is no fabric, the shoulders 162 (which extend beyond the opening 157) abut against the bracket 150 and make the connection and location definite. The vacant space 168 in FIG. 27 causes no problems, and this space 168 is needed when (as in FIG. 28) there is a fabric cover. Whether or not there is fabric, the fasteners are equally tight. The tab or rounded portion 161 is shaped to enter the opening 157 easily, and the wide portion of the opening 157 provided by the arcuate edges 158 is for the same reason. FIGS. 26 and 22-24 illustrate what happens during insertion. As the member 160 is inserted it can, initially, be too high or too low or off to one side, since the opening 157 is oversize in both directions, but as it becomes seated it reaches its proper position.

The clamps 140 and stabilizers 160 are preferably put on the top of the seat frame 110 and on the front of the back panel 111 for the convenience of the customer, who then does not have to turn the chair or sofa over when assembling it. They could be put on the lower surface of the seat frame 110 and on the rear of the back frame 111 if desired, but that is less convenient during assembly or disassembly.

During assembly of the side or end panels 103 and 104 to the seat frame 110 and back frame 111 sub-assembly, the stabilizers 160 are inserted in the openings 157 and the straps 145 are inserted in the openings 156 and brought around the anchor 155. Then the handle lever 140 is depressed, as by thumb pressure on the flat portion 143 (FIGS. 20, 21, and 19) tightening both the clamp and the stabilizer simultaneously. Disassembly is done in the reverse order. As will be noted later, assembly can be and usually is done after upholstery.

A hanging rest or buttress 170 may be used to increase stability, where that is desired. FIG. 32 shows the buttress 170, having a base 171 secured to the lower surface of a side bar 115 of the seat frame 110; a depending portion 172 leads to an abutment 173 that bears against the panel portion 105.

FIGS. 33, 34, and 76 show a buttress 175 that is generally similar to the buttress 170 but is foldable, having a hinge 176 that joins its base 177 to its depending portion 178. Its abutment 179 engages the panel wall 105. In the folded position, (FIG. 34) the depending portion 178 lies against the bottom of the frame 110 and the abutment 179 lies along the side edge; this position is used for packing. Where a compact package of the disassembled sofa or chair is not required, the buttress 170 is just as suitable, but the buttress 175 does enable compact packaging. If the arm panels 103 and 104 are sufficiently rigid, the buttress 170 or 175 is not needed, but its use enables the use of less rigid panels, which may be desirable for various reasons.

The panels 103 and 104 can be secured to the seat frame 110 and back panel 111 in other ways than the clamp structure of FIGS. 18 to 30 and than the clamp structure of FIG. 68. FIGS. 69 to 71 and 76 to 78 show one such alternative securement, by way of example only. Here, each panel 103, 104 is provided with a flush-inset nut or nut-plate 180 having a threaded receptacle 181. The seat frame 110 has a pair of angle members 182 at each end, secured to the side bar 114 or 115, either to their upper surface (FIGS. 69-71) or to the lower surface (FIGS. 76-78) thereof and projecting upwardly. The angle member 182 may have a rigidizing buttress 182a. A thumb screw 183 projects through an opening 184 through the angle member 182 and is threaded into the receptacle 181. A rubber washer 185 may be used as a vibration lock, and the screw 183 may have an integral upset portion 186 serving to retain the position of the screw 183 relative to the opening 184. The receptacle 181 is preferably provided with a countersunk feed-in portion 187, to help the screw 183 to get into the threads. The back frame 111 may be similarly provided with an angle member like the member 182, or the equivalent action may be obtained from a bent-out portion 188 of an angle plate 189, as shown in FIG. 76.

Another releasable locking device is shown in FIGS. 80 through 86. A flush bracket 300, generally like the bracket 150, is provided with two keyhole-shaped openings 301, each with a circular portion 302 and a narrower extension 303. At each side of the lower part of extension 303 is a dimple 304 or 305, which project inwardly and serve as two separate latches, for locking in either direction. A latchkey 306 comprises a turned up end of a shaft 307 mounted rotatably in a support 308 generally like the angle member 182. A handle 309

turns the shaft 307 and the latchkey 306, while enlargements 310 and 311 on the shaft 307 prevent detachment from the support 308; they are formed after assembly of the shaft 307 and the support 308. During assembly, the latchkey 306 is aligned with the extension 303 of the opening 301 and after insertion the handle 309 is turned either way to lock the latchkey 306 by rotating it past either one of the latching dimples 304 and 305.

In FIG. 76 the seat frame 110a is somewhat different from the frame 110, in having a rear bar 190 that rests on the side bars 114 and 115 and is secured directly to them instead of being flush with them and secured to them by plates. Also, a somewhat different structure is provided at the front, where a bar 191 extends up at an angle and is joined to the side bars 114 and 115 by a plate or bracket 192, to which is secured a horizontal front member 193. FIG. 78 shows a still different front structure, having a bracket 194 extending up at an angle from the front end of each side bar 114, 115. A front rail 195 rests horizontally on the bracket 194, with a vertically depending front panel portion 196. As shown in FIG. 78, this panel-rail 195, 196 may be covered with upholstery 197. Wire hooks 198 sewed to the fabric 197 are hooked to an edge 199 and hold the upholstery 197 in place. Other means can be used to retain the upholstery, as have been previously discussed for other pieces.

Important as is the structure so far discussed it is certainly of no greater importance than the removable upholstery feature now to be discussed or than the cushion structure to be discussed later. While the panels 103 and 104 and the frame members 110 and 111 can be made without upholstery to look very good, the panels 103, 104 and 111 are usually upholstered, and the present invention makes it possible to remove the upholstery and quickly to put it back or to put on new upholstery, as explained in the introduction.

A close fitting upholstery cover 200 for either side panel 103 or 104 is shown in FIGS. 1, 5 to 7, 9 to 11, 13, 36, 37, 39 to 41, 43, 44, and 46. The cover 200 covers both sides of both the vertical portion 105 with a portion 201, covers the arm 107 with an arm portion 202 and covers all the edges, 108 and 109, and nearly all of the edge 106. While the cover 200 may be made in a variety of ways, a preferred way, shown more clearly in FIGS. 40 and 41, includes three zippers 203, 204, and 205. The zipper 203 preferably extends up a little more than one-third of the height of the portion 201, from the bottom up, along the line of the axis 159, that is centered between the edges 108 and 109. The two separable zippers 204 and 205, of the type used in coats and jackets, cover most of the edge 106, between the inside edges of a pair of glides 206, which are previously located on the edge 106. The cover 200 is provided in the portion 201 with four openings 207, with edges sewn like buttonholes, for exposing the four clamp anchors 155 and four stabilizer openings 157. If complete interchangeability and symmetry is not desired, three such openings 207 are enough, but with four any cover 200 can fit any panel 103 or 104. At any rate, the cushions 102 hide the unused opening 207 as well as the others.

The cover 200 is made of a special upholstery composite composed of stretchable fabric 208 and padding

209 adhered together; shown in FIGS. 51-63 and 36, 37, and 39. The fabric 208 is stretchy, as will be seen, and the padding 209 is able to move with the fabric 208, whether that be properly called stretching or not. It must not be assumed that the upholstery 200 of this invention is a simple cloth slip cover. Such material would wear through quickly at several major points and could not do the job. In fact, I have found it important for the padding 209 to be at least five times as thick as the fabric 208 whenever the fabric 208 is to be installed on panels 103, 104 or 111. This ratio protects against wear and gives a true upholstery, not just a thin fabric cover. It therefore makes the sofa or chair look like and feel like upholstered furniture, and it is truly upholstered.

Different kinds of fabric 208 and padding 209 may be used. Many kinds of fabric possess the needed ability to stretch the relatively minor amount needed in this invention, and many kinds of padding are quite stretchable, while many others are able to move with the fabric 208 sufficiently for the purposes of this invention. Thus, referring to FIGS. 36 to 39, it should first be understood that a smooth professional upholstered look requires that the cover 200 always remain in tension once it is installed on its panel 103, 104 or 111. Hence, the area of the cover may be no larger than about 99 percent of the area of the panel to be covered, but it should be stretchable to at least 101 percent thereof. It may be smaller than 99 percent and may be stretchable beyond 101 percent. Hence, FIG. 37 shows a cover 200 that is to be put on a panel, a portion 105 of which is shown in FIG. 38 as a laminated plywood panel with rounded edges 108 and 109. FIGS. 36-39 are all to the same, rather arbitrary, scale, with thickness exaggerated relative to length. The cover 200 is shorter than the panel 105, and when put on (FIG. 39) the cover 200 is stretched to be wider than the panel 105. When released, the cover 200 cannot fully resume its former size and so is kept in tension on the panel 105, giving a smooth and professional fit.

Another result of the combination of the use of fully detachable coat-type zippers with this stretch construction is that the zipper openings can be smaller than the edge 106 they cover. Ordinarily, even on stretch fabric, the zippers 204 and 205 would have to extend up the edges 108 and 109 a short distance in order to get a wider opening, because zippers and zipper tape do not stretch. This would make them unpleasantly conspicuous and ruin the decorative effect. Also, the third zipper 203 (or other inconspicuous means for making the complete opening wider than the panel) helps in overcoming that problem and enables the zippers 203, 204, and 205 to be used as shown.

As shown in FIG. 51, the padding 209 may be synthetic plastic foam, preferably with interconnected interstices or cells, so that cleaning liquids can readily pass through. The adherence to the fabric 200 may be by heat- and-pressure fusion or by cement. In FIG. 52, the padding 209 may be either fiber batting or synthetic plastic foam, again adhered to the fabric 208 by cement, or where applicable by heat treatment. The fibrous material may be a polyester such as Dacron. Whether the padding 209 is fibrous or cellular, the vacant spaces in it are interconnected, to aid in working or cleaning. This flushability, this ability to let cleaning

liquids flow through readily enables a housewife to put the upholstery covers 200 in a washing machine or to rinse them by hand in a bathtub or to clean them in a coin-operated dry-cleaning machine.

For ease in sewing together edges of the fabric 208, in making the closed bag-like covers 200, and to avoid a puckered look, it is necessary to remove some of the padding 209 near the edges of the fabric 208, giving a structure like that shown in FIGS. 52, 56, 59, 62, and 63. There may also be other reasons for local removal. The invention makes it possible to apply the padding 209 as a sheet or uniform layer and then to remove such areas locally, as shown in FIGS. 53 to 62.

Thus in FIG. 53, the layers 208 and 209 are coterminous, as they are in FIGS. 54, 57, and 60 also. A metal or asbestos heat shield 210 is placed over the padding 209 in FIGS. 53 and 54. Then, as shown in FIG. 54, a hot-air gun 211 may send a hot-air blast 212, at about 275° F or hotter, against the exposed padding 209 not protected by the shield 210. The hot air is at a temperature capable of melting the synthetic padding 209 but not capable of melting the fabric 208; this can be true even where the fabric 208 is made from the same material as the padding 209, because the fabric 208 has its fibers more closely packed and would take longer to melt. The resultant product, with the padding stopping along a surface 213, is shown in FIG. 56. In some circumstances direct flame or a radiant heater may be used similarly.

FIGS. 57 to 59 show another method of heat removal not requiring any shield. A hot iron 214 of a desired shape, heated between about 300° F and 500° F is able to melt or burn the padding fibers away from a desired area, determined by the shape of the hot iron press 214.

In FIGS. 60 to 62, a stencil 215 is placed over a desired area, and the exposed area is removed by a wire brush 216.

In all cases the result looks like FIG. 52 or like any of FIGS. 56, 59 or 62, and the result enables sewing at a seam 217 to be done neatly on one flat plane with thread 218.

A cover similar to the cover 200 may be used to cover the rear panel 111, but for the sake of illustrating more variety, a somewhat different cover 220 is shown in FIG. 30, employing snap fasteners 221 with an overlap. Both the male and female snap fastener members are on the fabric cover 220. Suitable openings 222 accommodate the clamps 140. The same kind of fabric 208 and padding are used with the same basic requirement for tension when installed and stretchability to enable installation. A similar type of cover 225 is shown for the high-backed structures of FIGS. 9-11. A basically similar cover 226 may be used for upholstery of the front panel 138 in FIGS. 11 and 78.

A feature of the back panel 111 that enables upholstery in this manner is that the hinges 112 each have a portion 227 that is set forward by the thickness of the cover 220 or 225 to afford room for the cover. See FIGS. 18, 29, and 30.

Modified forms of side panels and some covers therefor are shown in FIGS. 45-47, 64-67, and 72-75, and these will now be described.

FIG. 47 shows a portion 230 of a side panel member (generally like either panel 103 or 104) entirely, from foamed plastic in its entirety, having a foamed major

portion 231 and a hard skin 232. It may have an integral glide 233 formed as a protrusion. It may remain unupholstered or may be covered by a cover 200.

The panel portion 105 of FIGS. 45 and 46 is used to show a glide 235 spaced below the edge 106 by a smaller diameter rubber shock mount 236. The views also show an area 237 where the cover 200 hooks in order to be retained there.

FIGS. 64-67 show a wooden or plastic panel 104 covered with a basically similar but somewhat different padded cover 240. Here, the panel 104 has a male snap fastener 241 where the glide 206 was, and the cover 240 has a female snap fastener 242 that snaps to the member 241 and actually serves as a glide for the upholstered panel. The male fastener 241 may serve as a glide where the cover 240 is removed or where there is no cover. The cover 240 has a zipper 243 beneath the arm 107 and extending along a curved or crescent path. The zipper 243 is longer than the front-to-rear distance of the panel 104 (i.e., the distance between the edges 108 and 109), so that the cover 240 can slip on and off. It is still padded heavily and is still stretchable, still being made slightly smaller than the panel 104 to provide the needed tension when it is installed. Instead of a single zipper 243, the cover 240 may use two zippers whose movable parts meet in the center when closed.

FIGS. 72 and 73 show a modified form of side panel 250 differing chiefly from the panel 103 or 104 in being shaped along its lower edge to provide legs 251 and 252 instead of the flat lower edge 106. As in FIGS. 64-67, male snap fastener members 253 on the legs 251 and 252 and female snap fastener members 254 on the padded upholstery cover 255 are used to provide glides, which are present in one of these two forms on both the upholstered and unupholstered states. The cover 255 has leg portions 256 and 257, and a zipper 258 runs along substantially the full length of the lower edge 259 on the inner side of and between the legs. The edge 259 is longer, and the zipper 258 is longer than the front-to-back length of the panel 250; so the cover 255 is readily installed and removed. Stretchability and tension are again present; and openings 260, sewn like buttonholes, provide access to the clamp anchors 155 and stabilizing openings 157 or to the somewhat smaller openings for the thumb-screw fasteners of FIGS. 69-71.

FIGS. 74 and 75 show how a grommet 261 secured to the upholstery 262 can be used to align the upholstery 262. The grommet 261 is slightly larger than the glide 235 on which it is installed.

The seat-and-back cushions 102 (see especially FIGS. 14-17, 48 and 49) are fully reversible, and each comprises a seat portion 270 and a back portion 271 joined together, as by cloth hinges 272. Each portion 270, 271 has an outer case 273 or 274, usually of upholstery fabric, containing a muslin inner case 275 or 276 (FIGS. 15 and 18). The inner case 275 or 276 may contain filler such as feathers, down, polyester, other synthetic fiber, or cotton batting 277 and foam rubber or foam plastic 278. The inner cases 275 and 276 are sewed together along lines 280 and 281 connecting them to the cloth hinges 272. A stiffening insert 282 (see FIGS. 48 and 49) for the back cushion 271, made of plywood, fiberglass, paper fiber, steel, aluminum or something of that nature, is inside the foam member

278 for the back and is secured to the seat portion 270 by the fabric hinges 272, to which it is riveted. This stiffener 282 supports the thorax region of a person's back (see FIGS. 16 and 17) and extends higher than the sofa back portion 121, so that the sofa 100 is still comfortable even though the back 121 and the arms 107 are at the same level. The stiffener 282 is preferably made to be flexible enough to provide a curvature that gives contouring support to the lumbar region of the back. The fabric hinges on tabs 272 on the stiffener panel 282 are sewn through as the cushion is sewn through, that is, from the top surface to the bottom surface. The stiffener panel 282 is used to prevent the back of the panel from moving forward at its bottom and thus decreasing the effectiveness of the thorax support. Zippers 283 and 284 may be used for closing the cases 273 and 274, and are separable, as in a coat-type zipper, so that both pieces of upholstery separate and come off. As in the arm panels, this separation gives a little loose length of fabric near each end which is not bound by the non-stretchable zipper tape.

The seat cushions 102 comprise the interconnected seat 270 and back 271, and the interconnection helps to keep the back 271 from falling over backwards on a low-back sofa 100. The interconnection is not necessary on high-back sofas, but has advantages. However, the cushions 270 and 271 even if not interconnected are still made substantially as shown, except that the high back model needs no stiffener panel 282. On all models, the seat cushions 271 are preferably cantilevered beyond the fronts of the seat frame 110. This, of course, is not essential, but when done adds to the comfort of the sitter by imparting a variability in the distance from the front edge 285 to the back cushion 271, so that both short and tall people find that it adjusts properly to thigh length.

Somewhat of the functions of the seat cushions 102 are shown in FIGS. 16 and 17. Note that the cushions 270 and 271 of the heavier man may depress more than those of the lighter woman, because of the size and weight differences. This action makes the cushions automatically comfort-adjustable to each person. Also note that the seat cushion 270 compresses back from its front edge 285. The back insert 282 is necessary only for the low-back models, though it can be used in all types.

FIG. 50 shows the sofa 100 folded for shipment, ready for its carton. The back frame 111 folds over or under the seat frame 110, which is then placed over the panels 103 and 104. The cushions 102 are placed around as padding. It can be appreciated that the package is much smaller than the sofa. The upholstery covers 200 etc., can be included in the same package or can make up a different package. The covers 200, 220, 273 and 274 are usually identical in fabric but they can be different if desired. The cover 226 for the front panel 138, (FIG. 78) where used, is also matched or harmonized with the other fabric.

A feature of the invention is that the upholstery covers 200 etc., include their own fastening means. It is not necessary for the sofas and chair frames to contain mechanisms exclusively for the purpose of holding upholstery fabrics on. This avoids the waste and unnecessary cost that would otherwise be present when the user chooses not to use upholstery covers at all.

To those skilled in the art to which this invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the spirit and scope of the invention. The disclosures and the description herein are purely illustrative and are not intended to be in any sense limiting.

I claim:

1. A seating unit, including in combination:

a pair of side panel members, each comprising a planar vertical portion having a lower unit-supporting edge, said panel members having facing inner surfaces,

a generally horizontal seat frame,

a generally vertical back frame having a generally vertical panel portion hinged to said seat frame, readily releasable securing means for locking said seat frame to the inner surface of each said side panel member, and

readily releasable securing means for locking said back frame to the inner surface of each of said side panel members,

said seat frame and back frame lying entirely between said inner surfaces of said pair of side panel members and being the only members extending between said side panel members that are secured to said side panel members,

each said readily releasable securing means having all its parts irremovably secured partly to a said side panel member and partly to the said frame it locks thereto.

2. The seating unit of claim 1 having at least one cushion assembly having a seat portion and a back portion joined together and resting respectively on said seat frame and said back frame in a position hiding all said releasable securing means.

3. The seating unit of claim 2 wherein each cushion portion comprises

an inner cover filled with resilient stuffing, and an upholstery fabric outer cover and wherein each said cushion has,

a sheet-like stiffening member of generally rigid material inside said stuffing that is inside said inner cover in said back portion,

said stiffening member having a plurality of cloth tabs secured thereto,

said inner covers of each of said seat portion and said back portion each being sewn together by a seam whose threads pass through said tabs,

said tabs thereby serving not only to keep said stiffening member in place but also as cloth hinges joining said seat portion to said back portion.

4. The seating unit of claim 2 wherein each said cushion portion comprises

an inner cover filled with resilient stuffing, and an upholstery fabric outer cover having a separable zipper closure at the rear edge of the seat cushion portion and at the bottom edge of said back cushion portion, for easy withdrawal of said inner cover and contents.

5. The seating unit of claim 1 having upholstery secured thereto and comprising:

an upholstery unit secured releasably around each said side panel, and

an upholstery unit secured releasably around said back frame,

each said upholstery unit having openings for said readily releasable securing means,

each said upholstery unit being made from stretchable upholstery fabric with padding secured thereto and

being somewhat smaller in area than the panel or frame it is to cover, so that it is in tension thereon, and

having a closure opening larger than the width of the member or frame it is to cover.

6. The seating unit of claim 5 having fully separable zipper means arranged along the edges of said closure opening.

7. The seating unit of claim 6 wherein said zipper means comprise two releasable zippers opening one continuous opening along each said unit-supporting edge and a third zipper extending up vertically from said edge about one-third of the way up and centered relative to said edge and opening as part of said continuous opening.

8. The seating unit of claim 6 wherein each said side panel has a horizontal arm portion and the upholstery unit therefor has, as said zipper means, a generally arcuate zipper-closed opening positioned beneath said horizontal arm portion, said arcuate opening being longer than the front-to-rear width of said side panel.

9. The seating unit of claim 6 wherein each said side panel has its said unit-supporting edge recessed in the center to provide two supporting legs and a recessed edge portion in between the legs having a greater length than the front-to-rear depth of said side panel, said zipper means comprising a zipper extending along said length.

10. The seating unit of claim 5 wherein said upholstery unit is at least 1 percent smaller in area than said panel or frame when in a naturally reposed state and can be stretched to an area at least 1 percent greater than said panel or frame.

11. The seating unit of claim 1 wherein each said readily releasable securing means comprises

an over-center pivoting clamp having a handle pivotally mounted adjacent the edge of its said frame and having a strap pivoted on said clamp further from said edge than the clamp, and

an entirely flat plate bracket on said side panel member and having an opening therein defining a strap anchor,

said side panel member being recessed beneath said opening.

12. The seating unit of claim 11 wherein below and parallel to said strap is a stabilizer projection, said plate bracket having an opening to receive a portion of said stabilizer projection, said stabilizer projection having means for engaging said plate bracket to prevent shifting of said side panel member relative to the frame.

13. The seating unit of claim 12 wherein said stabilizer projection is flat with a curved nose portion for entering its opening, said opening being oversize, and a pair of shoulders to serve as said means for engaging, said shoulders providing clearance for upholstery between said plate and said stabilizer projection.

14. The seating unit of claim 12 having in addition a further stabilizer having a base secured to the under side of said seat frame near each end and having a depending portion ending in an abutment that rests against the adjacent side panel member.

15. The seating unit of claim 14 wherein said depending portion is hinged to its base and folds substantially flat against said seat frame when not used.

16. The seating unit of claim 12 wherein there are two said clamps near each end of said seat frame and one said clamp near each end of said back frame and wherein each said side panel member has two said plate brackets located symmetrically with respect to a central vertical axis of said side panel member, each said plate bracket having one vertically extending anchor for engagement with one of the clamps on said seat frame and an horizontally extending anchor for possible engagement with the back-frame clamp, only one said plate bracket of each said side panel actually being so engaged by said back-frame clamp, but the symmetrical location making the side panel members interchangeable.

17. The seating unit of claim 1 wherein each said readily releasable securing means comprises

a pair of brackets at each end of said seat frame having a vertically extending portion with an opening therethrough,

a bracket at each end of said back frame having a generally horizontally extending portion with an opening therethrough,

a thumb screw extending through each of said openings, having an upset portion on the opposite side of the bracket from its bend, retaining it thereon,

a vibration dampening grommet on said thumb screw abutting said upset portion, and

threaded means in each said side panel member for engaging each said thumb screw, said threaded means comprising

a pair of plates symmetrically located with respect to the vertical axis of said side panel,

each plate having two such threaded means, one for a said thumb screw mounted on a seat-frame-supported said bracket and one for a said thumb screw mounted on a back-frame-supported bracket.

18. The seating unit of claim 1 wherein each said readily releasable securing means comprises

two rotatable members near each end of said seat frame and one rotatable member near each end of said back frame,

each said rotatable member having a handle and a latchkey and being rotatably mounted adjacent the edge of its said frame, and

two flat plate brackets on said side panel member, each having a vertically extending keyhole opening therein for engagement with one of the latchkeys on said seat frame and at least one of them having an horizontally extending keyhole opening therein for engagement with the latchkey of said back frame,

each said keyhole opening having associated therewith projecting latch means for releasably retaining said latchkey when said latchkey is turned.

19. The seating unit of claim 18 wherein back frame and wherein each said side panel member has two said plate brackets located symmetrically with respect to a central vertical axis of said side panel member, only one said plate bracket of each said side panel actually being so engaged by said back-frame latchkey, but the

symmetrical location making the side panel members interchangeable.

20. The seating unit of claim 1 wherein the back frame is hinged to said rear frame by a plurality of hinges having an upper portion secured to said back frame and a lower portion spaced out therefrom by the thickness of upholstery to enable installation beneath it of upholstery on said back frame.

21. The seating unit of claim 1 wherein the two said side panels are identical and are completely interchangeable, being front-to-rear symmetrical so that one can be used in the other's position by turning it around.

22. The seating unit of claim 1 wherein said side panels are made from foamed plastic having a hard skin, said lower unit-supporting edges having integrally formed glide protrusions thereon.

23. The seating unit of claim 1 wherein said side panels each comprise a vertical portion terminating at its upper end in a horizontal outwardly extending arm portion.

24. The seating unit of claim 23 wherein said back frame comprises a vertical panel portion terminating at its upper end in a horizontal rearwardly extending portion level with said horizontal arm portion.

25. The seating unit of claim 23 wherein said back frame comprises a vertical panel portion extending well above said horizontal arm portion and terminating in a rearwardly curved portion.

26. The seating unit of claim 1 having a conspicuous generally vertical front panel supported by said seat frame below the upper end thereof.

27. The seating unit of claim 26 wherein said front panel is covered with a removable upholstered enclosure.

28. The seating unit of claim 1 wherein the front of said seat frame is substantially higher than the rear thereof.

29. A seating unit, including in combination:

a pair of vertical side members, each having lower unit-supporting means, said side members having facing inner surfaces,

a generally horizontal seat frame having end edges, a generally vertical back frame having end edges and a generally vertical panel portion secured to said seat frame,

readily releasable securing means for locking the end edges of said seat frame to the inner surface of each said side member, and

readily releasable securing means for locking the end edges of said back frame to the inner surface of each of said side members,

said seat frame and back frame lying entirely between said inner surfaces of said pair of side members and being the only members extending between said side members that are secured thereto,

each said readily releasable securing means having all its parts permanently secured, partly to a said side member and partly to the frame it locks thereto.

30. The seating unit of claim 29 having at least one cushion assembly having a seat portion and a back portion joined together and resting respectively on said seat frame and said back member in a position hiding all said releasable securing means.

31. The seating unit of claim 29 having upholstery releasably secured thereto and comprising:

an upholstery unit secured releasably around each said side member, and

an upholstery unit secured releasably around said back member,

each said upholstery unit having openings for said readily releasable securing means,

each said upholstery unit being made from stretchable upholstery fabric with padding secured thereto and being somewhat smaller in area than the member it is to cover, so that it is in tension thereon, and having a closure opening longer than the width of the member it is to cover,

each said upholstery unit including in itself all the fastening means required for its installation.

32. A seating unit, including in combination:

a pair of vertical side members, each having lower unit-supporting means, each said unit-supporting means including male snap fastener members usable as glides

a generally horizontal seat frame,

a generally vertical back member having a generally vertical panel portion secured to said seat frame,

readily releasable securing means for locking said seat frame to each said side member,

readily releasable securing means for locking said back frame to each of said side members,

an upholstery unit secured releasably around each said side member, said upholstery unit including female snap fastener members aligned to snap to said male fastener members and then to serve as glides, and an upholstery unit secured releasably around said back member.

33. A seating unit, including in combination:

a pair of vertical side members, each having lower unit-supporting means,

a generally horizontal seat frame,

a generally vertical back member having a generally vertical panel portion secured to said seat frame,

readily releasable securing means for locking said seat frame to each said side member,

readily releasable securing means for locking said back frame to each of said side members,

an upholstery unit secured releasably around each said side member, and

an upholstery unit secured releasably around said back member,

said upholstery units including openings for enabling operability of all said readily releasable securing means.

34. A seating unit, including in combination:

a pair of vertical side members, each having lower unit-supporting means, said unit supporting means being provided with supporting glide means,

a generally horizontal seat frame,

a generally vertical back member having a generally vertical panel portion secured to said seat frame,

readily releasable securing means for locking said seat frame to each said side member,

readily releasable securing means for locking said back frame to each of said side members,

an upholstery unit secured releasably around each said side member, said upholstery units for said side members leaving said glide means exposed and operable, and

an upholstery unit secured releasably around said back member.

35. A seating unit, including in combination:

- a pair of side panel members, each comprising a planar vertical portion with an inner surface and an outer surface and having a lower unit-supporting edge and a horizontal out-turned arm portion at its upper end extending out beyond said outer surface,
- a generally horizontal seat frame having end edges and front and rear edges,
- a generally vertical back panel member having end edges and a generally vertical portion with an upper end and a bottom edge and hinged along said bottom edge to the rear edge of said seat frame and having a horizontal rearwardly extending portion at its upper end, level with the horizontal arm portions,

releasable clamp means securing the end edges of said seat frame to the inner surface of each said side panel member, said clamp means being completely secured permanently, partly to said seat frame and partly to said side panel member,

releasable clamp means securing the end edges of said back panel member to the inner surface of each said side panel member, and itself completely secured irremovably partly to said back panel member and partly to said side panel member,

said seat frame and back panel member lying entirely between said inner surfaces of said pair of side panel members and being the only members extending between said side panel members that are secured to them, and

- a cushion assemblage covering the surface of said seat frame and said back panel member at the rate of one cushion assembly per seat, each said cushion assembly having a seat portion and a back portion resting respectively on said seat frame and said back panel member, said seat and back portions being joined together, each said seat portion extending forward of the front edge of said seat frame, each said back portion extending above said upper end of said back panel member.

36. A seating unit, including in combination:

- a pair of side panel members, each comprising a planar vertical portion having a lower unit-supporting edge and a horizontal arm portion at its upper end,
- a generally horizontal seat frame,
- a generally vertical back panel member having a generally vertical portion hinged to said seat frame portion and a horizontal rearwardly extending portion at its upper end level with the horizontal arm portions,

releasable clamp means securing said seat frame to each said side panel member,

releasable clamp means securing said back panel member to each said side panel member,

cushion assembly means covering said seat frame at the rate of one cushion per seat, each said assembly having a seat portion and a back portion resting respectively on said seat frame and said back panel member, said portions being joined together, said seat portions extending forward of said seat frame, said back portions extending above said back panel member,

casing means secured releasably around each said side panel with a zippered opening enabling installation and removal, and

casing means for said back panel member, having both male and female snap fastening means on said casing means for securing it in place removably, said casing means each being made from stretchable upholstery fabric with padding at least five times as thick as said fabric secured to said fabric and movable therewith during stretch of the fabric, each said casing being made slightly smaller than the panel around which it is to fit but stretchable to a size bigger than that panel, so that it can be installed there and when installed held in tension by said panel.

37. The seating unit of claim 36 wherein each said cushion portion comprises an inner cover and a removable upholstery outer cover of the same fabric as said casing means, said inner cover containing yieldable stuffing.

38. The seating unit of claim 37 wherein each said back cushion portion comprises a stiffening member inside the stuffing having a pair of tabs thereon and wherein said seat and back cushion portions are each sewn together by threads that pass through said tabs, so that said tabs serve as hinges.

39. The seating unit of claim 38 wherein each said cushion assembly is reversible between two outside main surfaces.

40. A seating unit, including in combination:

- a pair of side panel members, each comprising a planar vertical portion having a lower unit-supporting edge and a horizontal arm portion at its upper end,
- a generally horizontal seat frame,
- a generally vertical back panel member having a generally vertical portion hinged to said seat frame portion and a horizontal rearwardly extending portion at its upper end level with the horizontal arm portions,

releasable clamp means securing said seat frame to each said side panel member,

releasable clamp means securing said back panel member to each said side panel member,

a cushion assembly covering said seat frame at the rate of one cushion per seat, each said assembly having a seat portion and a back portion resting respectively on said seat frame and said back panel member, said portions being joined together, said seat portions extending forward of said seat frame, said back portions extending above said back panel member,

casing means secured releasably around each said side panel with a zippered opening enabling installation and removal, and

casing means for said back panel member, having both male and female snap fastening means on said casing means for securing it in place removably, the two side panel members with their upholstered casing on them being front-to-rear symmetrical, including their relationship to said clamp means, so that they can be interchanged with each other.

41. A stock of seating units, comprising:

1. a series of identical side panel members, each having a planar vertical portion with first and second surfaces and a lower unit-supporting edge

2. a plurality of identical cushion assemblies, each having a seat portion and a back portion joined together,
3. a series of generally horizontal seat frames of different lengths comprising substantially integral multiples of the length of a cushion assembly so that any one seat frame supports at least one seat cushion portion, some seat frames supporting only one, others two, others three, others four, each said seat frame having end edges and front and rear edges, and
4. a corresponding series of back frames of length the same as the seat frames and having end edges and top and bottom edges, each hinged along its bottom edge to the rear edge of a seat frame of the same length,

each said side panel member having on its said first surface only symmetrically located irremovable plates and recesses providing latch means, there being a pair of said latch means toward the front, one slightly above the level of the seat frame, and another higher, and another pair toward the rear located at the same heights,

each said seat frame having two releasable over-center clamps at each end adjacent said end edges, symmetrically located, one toward the front and one toward the rear, each clamp having a strap for engaging a said latch means at the lower level, and with all its parts irremovably secured to said seat frame,

each said back frame having at each end, adjacent said end edges, a releasable over-center clamp for engagement of one of the higher latch means, and with all its parts irremovably secured to said back frame,

said seat frame and back frame, upon assembly, lying entirely between said first surfaces of a pair of said side panel members disposed as facing inner surfaces and being the only members extending between them and secured to them,

all said latch means being obscured, upon assembly, by said cushion assemblage,

whereby complete chairs and sofas of various capacities can be assembled readily from said stock.

42. The stock of claim 41 having, in addition, a series of stretchable upholstery fabrics, each fabric being made into a set including

1. side panel coverings each comprising a casing of one said fabric having an inner lining of padding at least five times as thick as said fabric and secured thereto to follow the stretch thereof, each said casing being a little smaller than a side panel member but stretchable to a larger size and having an opening large enough to enable ready installation on a side panel member and ready removal therefrom, and means for closing said opening, so that the casing is retained in tension around said side panel member,
2. rear panel coverings with padding as for said side panel coverings and having means thereon for securing each covering to itself around a said rear panel and fitting it,
3. cushion casings for each cushion portion having an opening to enable ready installation and removal and closure means therefor,

whereby said seating units may readily be upholstered from stock.

43. A kit for making a seating unit, comprising:

1. a pair of identical side panel members, each having a planar vertical portion with an inner surface and an outer surface and a lower unit-supporting edge,
2. at least one cushion assembly having a seat portion and a back portion joined together,
3. a generally horizontal seat frame having end edges and front and rear edges and comprising a substantially integral multiple of the length of a cushion assembly so that said seat frame supports at least one seat cushion portion, and
4. a corresponding back frame having end edges and upper and lower edges, of length the same as the seat frame and hinged along its lower edge to the rear edge of said seat frame,

each said side panel member having on its said inner surface symmetrically located irremovable flat plates providing latch means, there being a pair of said latch means toward the front, one slightly above the level of the seat frame, and another higher, and another pair toward the rear located at the same heights,

said seat frame having two releasable over-center clamps at each end adjacent said end edges, symmetrically located, one toward the front edge and one toward the rear edge, each clamp having a strap for engaging a said latch means at the lower level, and having all its parts irremovably secured to said seat frame,

said back frame having at each end adjacent said end edge a releasable over-center clamp for engagement of one of the higher latch means, with all its parts irremovably secured to said back frame,

said seat frame and said back frame being adapted to lie, upon assembly, entirely between facing inner surfaces of said pair of side panel members with their end edges substantially abutting said inner surfaces and being the only members connecting the two side panel members together,

each group of said latch means being adapted to be obscured by a said cushion assembly when the seating unit is assembled,

whereby a complete seating unit can be assembled readily from said kit.

44. The kit of claim 43 having, in addition, a series of stretchable upholstery fabrics, each fabric being made into a set including

1. a pair of side panel coverings each comprising a casing of one said fabric having an inner lining of padding at least five times as thick as said fabric and secured thereto to follow the stretch thereof, each said casing being a little smaller than a side panel member but stretchable to a larger size and having an opening large enough to enable ready installation on a side panel member and ready removal therefrom, and means for closing said opening, so that the casing is retained in tension around said side panel member,
2. a rear panel covering with padding as for said side panel coverings and having means thereon for securing said covering to itself around said rear panel and fitting it,

3. a cushion casing for each cushion portion having an opening to enable ready installation and removal and closure means therefor, whereby said seating unit may readily be upholstered from stock.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,700,282 Dated October 24, 1972

Inventor(s) David L. Rowland

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 66, "assembly the chair" should read --assemble the chair--. Column 9, line 14, "might" should read --corner; line 22, "bend" should read --bent--. Column 13, line 67, "entirety, from" should read --made from--; line 68, "entirely" should read --entirety--. Column 18, lines 62-63, delete "back frame and wherein".

Signed and sealed this 13th day of March 1973.

(SEAL)

Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents