July 28, 1970 M. E. PEARSON 3,521,929

FURNITURE CONSTRUCTION

Filed Nov. 9, 1967 5 Sheets-Sheet 1

Fig. 1.

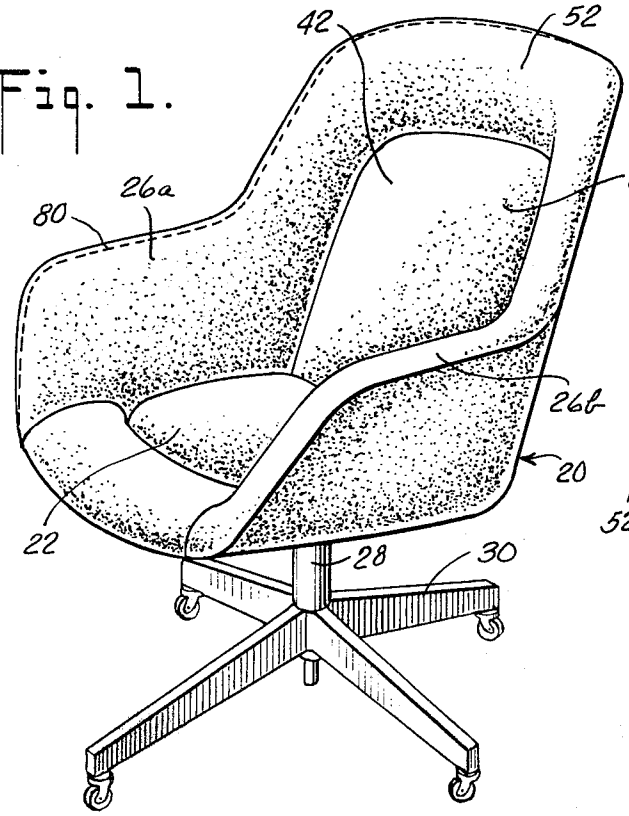
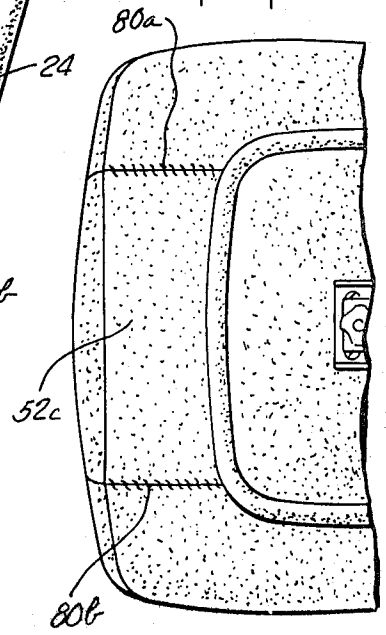



Fig. 1A.



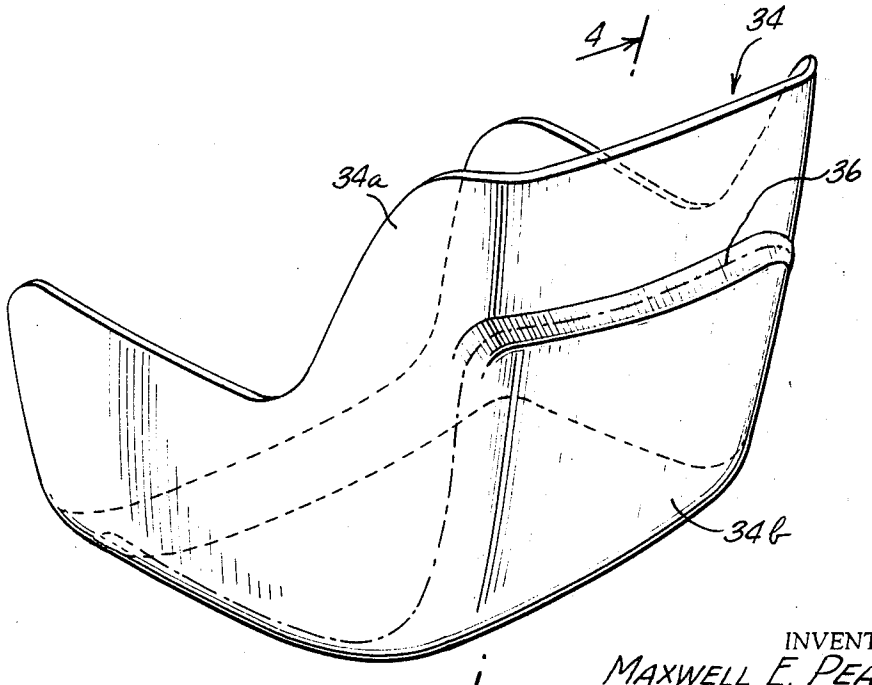




Fig. 2.

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ATTORNEY

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Fig. 3.

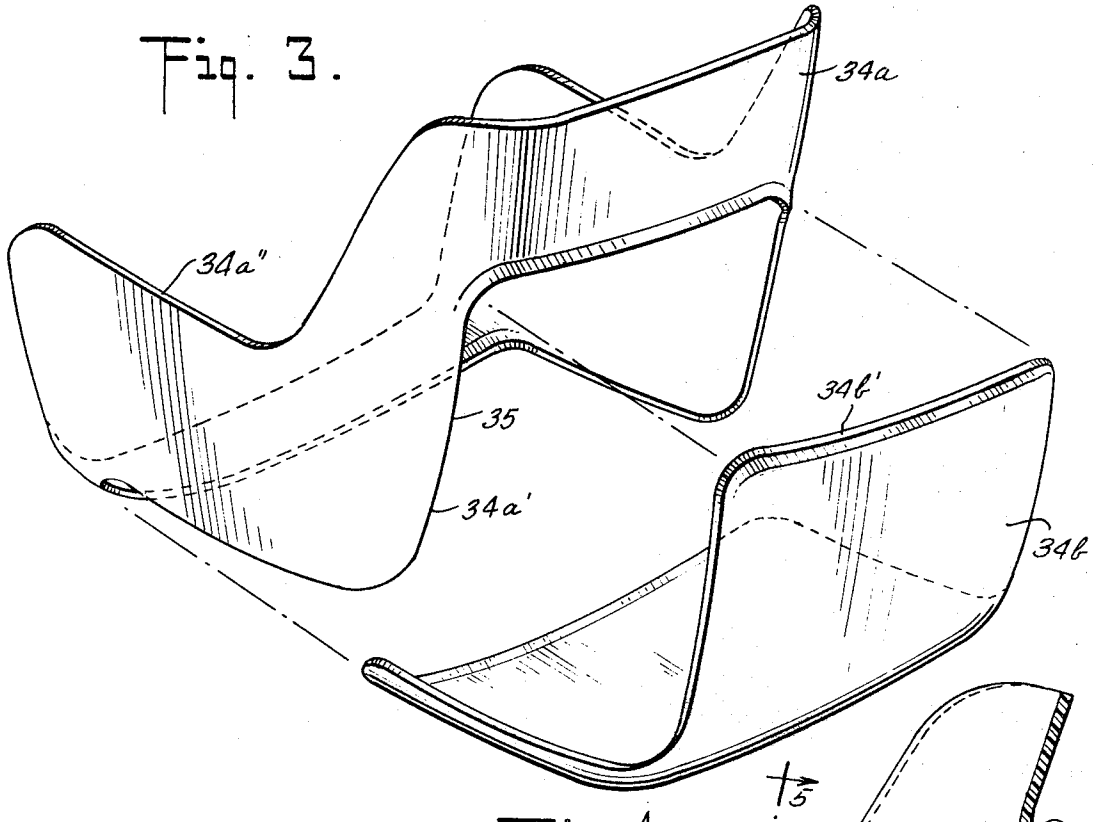



Fig. 4.

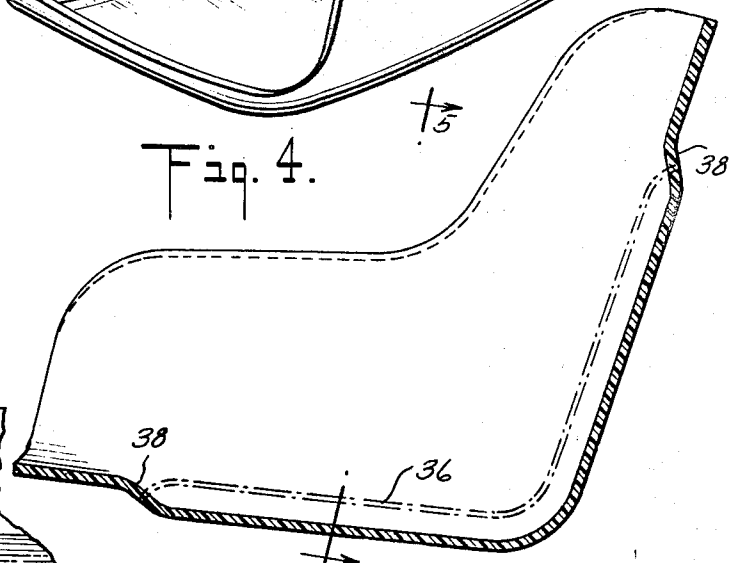
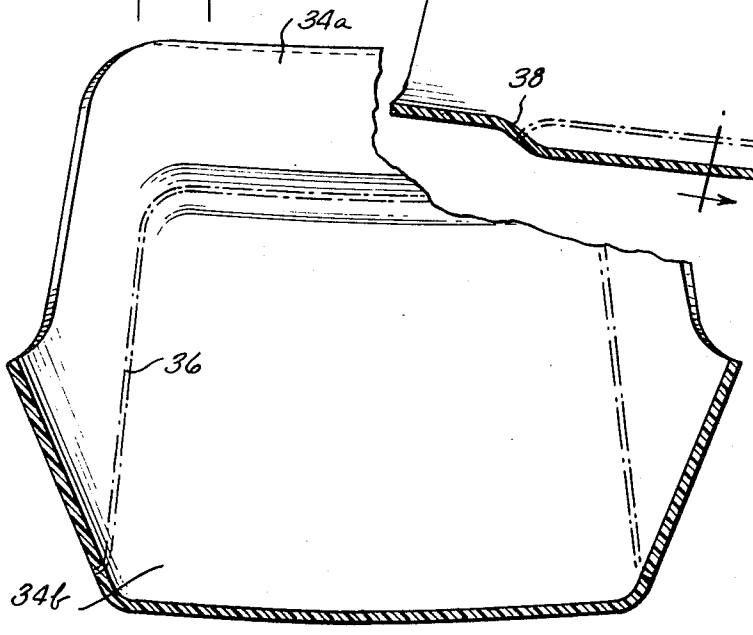



Fig. 5.



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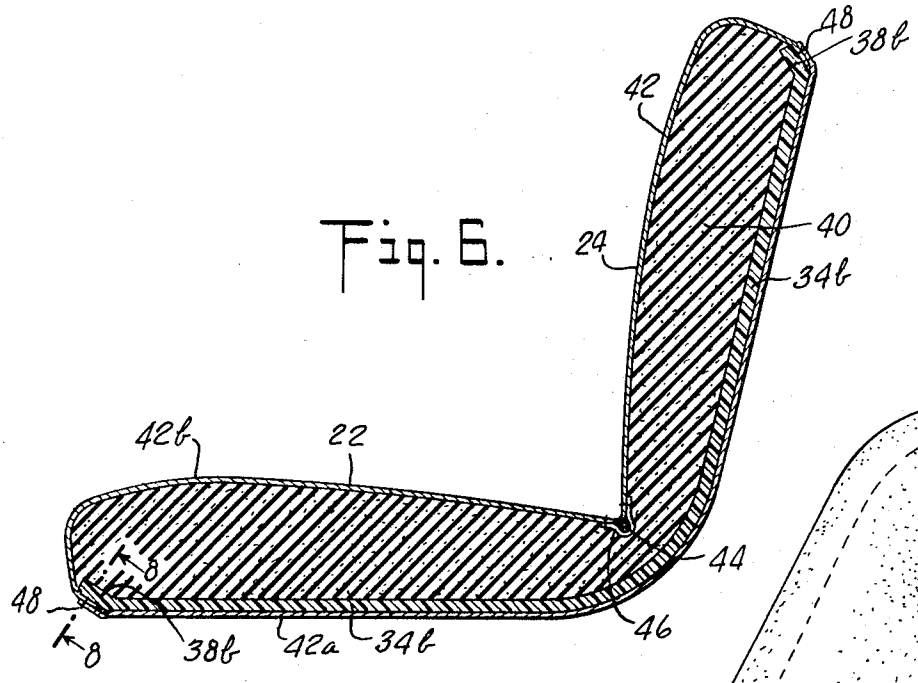
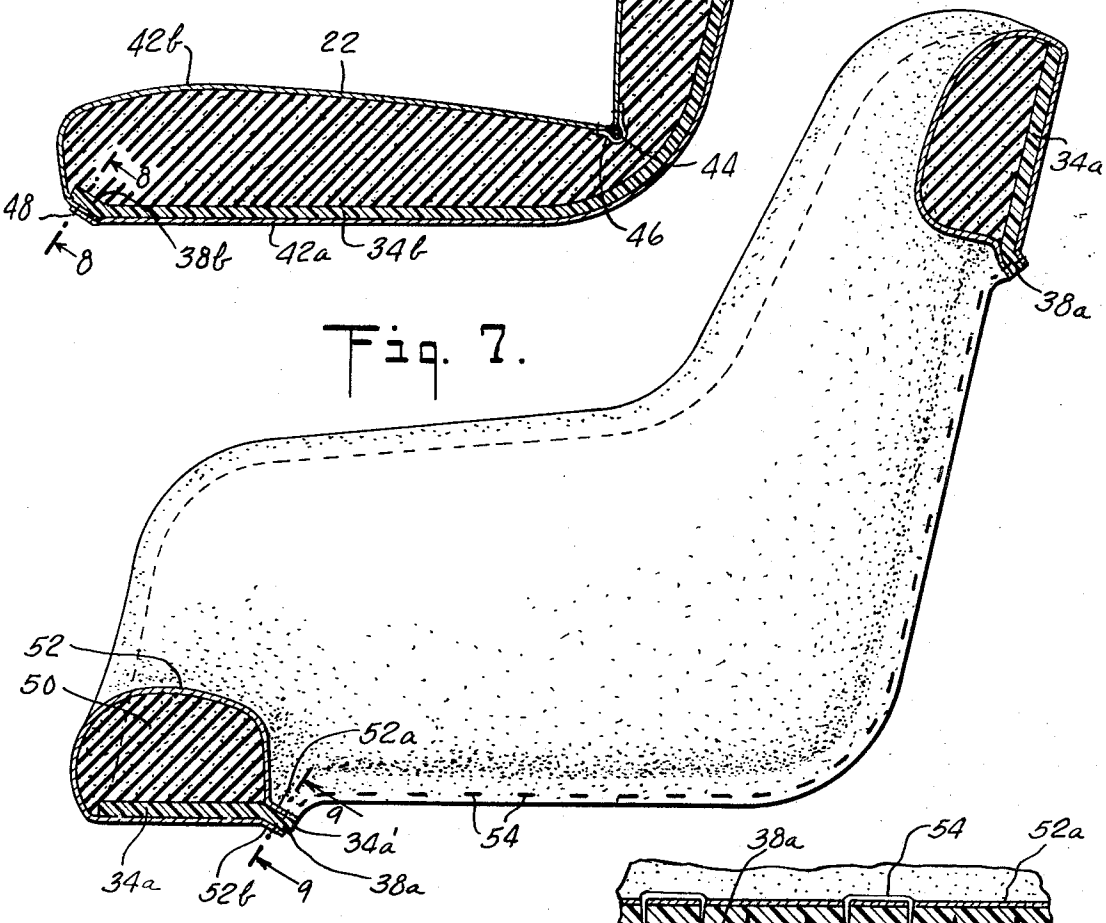



Fig. 6.

Fig. 7.



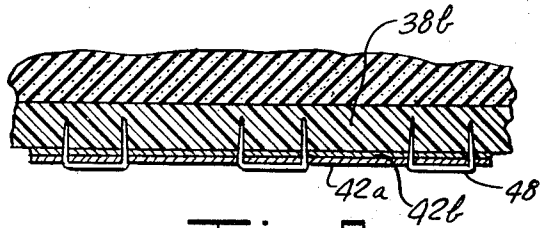




Fig. 8.

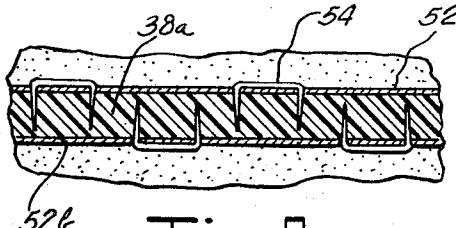



Fig. 9

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Fig. 12.

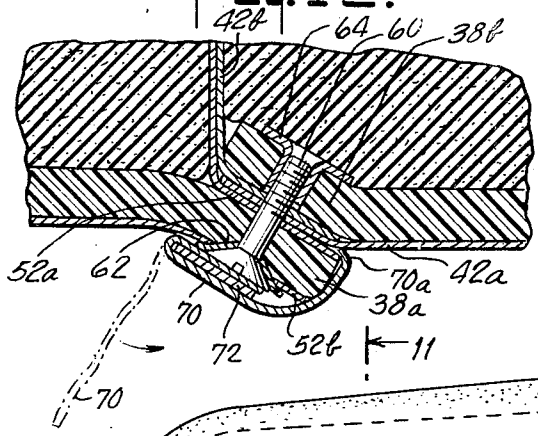



Fig. 10.




Fig. 11.

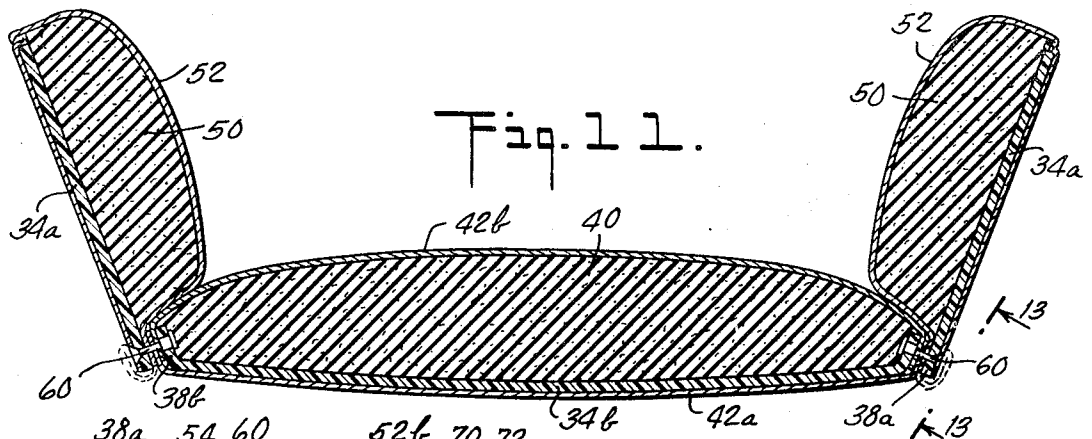
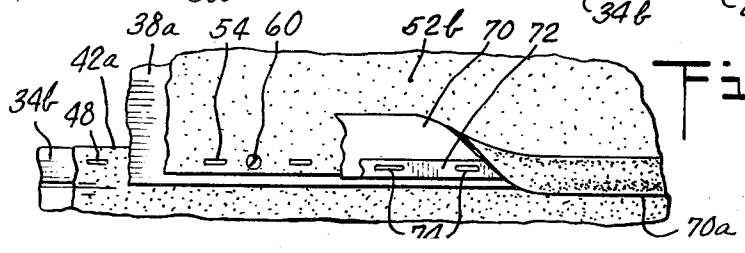



Fig. 13.



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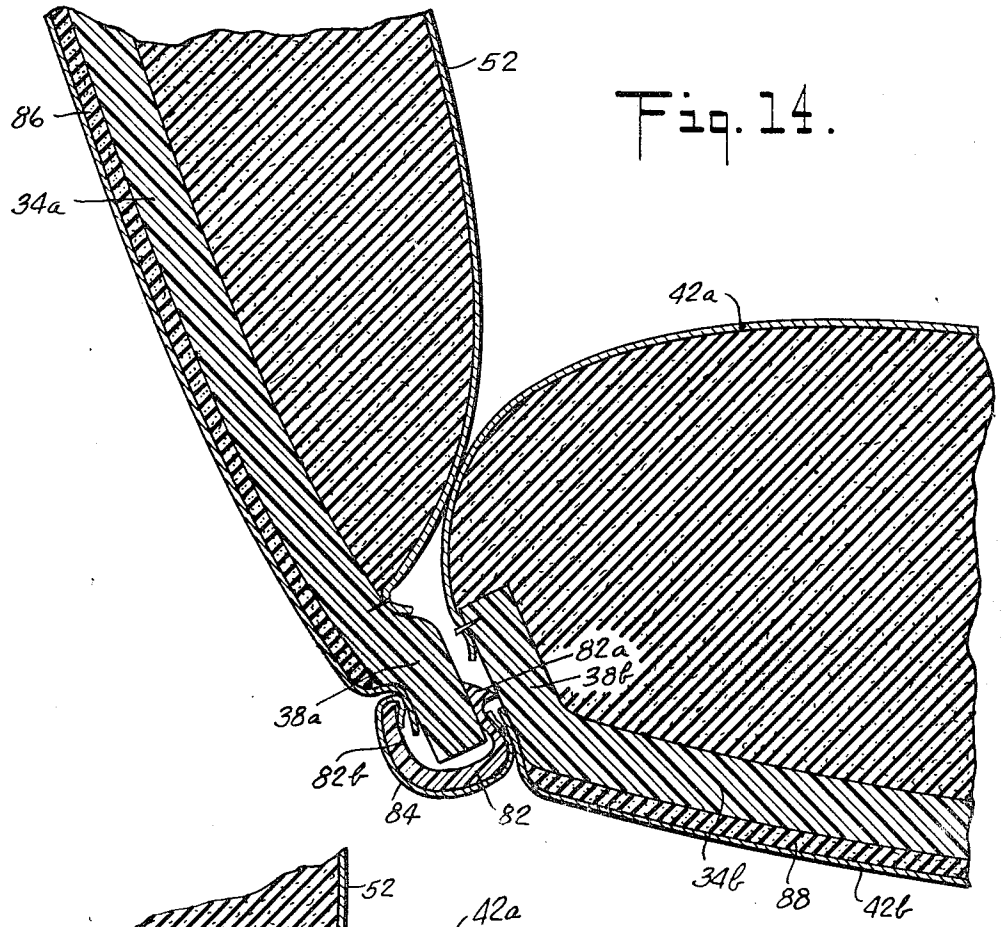



Fig. 14.

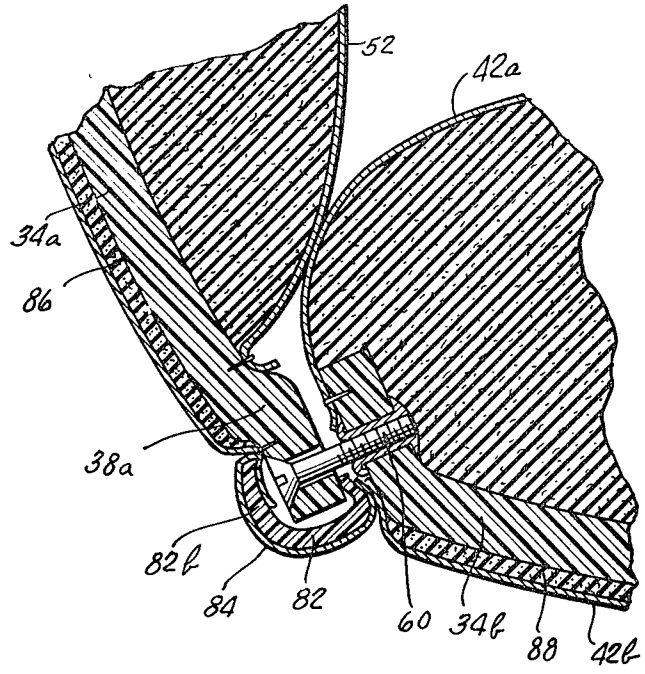



Fig. 15.

United States Patent Office 3,521,929 Patented July 28, 1970



3,521,929

# FURNITURE CONSTRUCTION

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Filed Nov. 9, 1967, Ser. No. 681,803
Int. Cl. A47c 1/12; 7/02
U.S. Cl. 297—454 20 Claims

## ABSTRACT OF THE DISCLOSURE

A chair or similar article of furniture employing molded shells which mate to complete an integral shell. Two shells are employed: a perimeter shell having an aperture therein and a center shell that mates with the perimeter shell so as to close off the aperture in the perimeter shell. The two shells are advantageously molded first as one piece which is then cut into the two shells. Each shell is separately upholstered with upholstery connections being located along an edge portion of the shell. The two shells are thereafter joined together along the edge portions; upholstery connections along the edge portions are concealed between the joined-together portions.

The mating shells may incorporate flanges along the edges thereof which abut in joining the shells together. In such a case, and when one flange presents an outwardly exposed surface, a doubled-over piece of upholstery may be employed to cover the exposed surface. The doubling over of the upholstery conceals the upholstery connections into the exposed surface as well as the fastening elements used to join the two shells together. A free edge of the doubled-over upholstery is then tucked between the abutting flanges to complete the upholstery. Alternatively, an extrusion may be employed as a spacer between the abutting flanges of the two shells, with a portion thereof extending over the outwardly exposed flange surface. The extrusion may have upholstery adhered thereto, and thus conceals the upholstery connections and the fastening elements used to join one shell to the other.

The upholstery for the perimeter shell is a machine-sewed fabric envelope, eliminating all hand-stitching except for the sewing of a small flap under the front of the shell.

## BRIEF SUMMARY OF THE INVENTION

This invention relates to articles of furniture and, in particular, to the making of an upholstered article of furniture.

The present invention is directed particularly to the making of an upholstered article of furniture, such as a chair, in which all of the upholstered connections are concealed. The invention involves the utilization of shells which together form the article of furniture. For example, in the making of a chair, two mating shells are employed, namely, a perimeter shell having an aperture therein and a center shell which closes off the aperture in the completed chair. The perimeter and center shells may be molded separately, or a single integral shell may be molded and then cut or severed into the distinct perimeter and center shells. The molding of a single integral shell which is then cut or severed into the perimeter and center shells is preferred, since only one molding tool is needed in the molding process. The separate



shells are then separately upholstered, and upholstery connections are employed along edge portions thereof. In this fashion, when the separately upholstered shells are joined together to complete the article of furniture, the connections along the edges thereof are concealed between the joined edges.

The shells may include flanges along the edges thereof which abut in joining the shells together. One of the flanges will be exteriorly exposed. In such a case, the exposed surface of the flange may be covered by a doubled-over piece of upholstery, the doubling over of which conceals the upholstery connections into the exposed surface as well as the fastening elements used to join the two shells together. The free edge of the upholstery may then be tucked between the flanges to complete the upholstering of the article. By this technique, all upholstery and shell fastening connections may be concealed from view. Typically, upholstery connections on the bottom of a chair, for example, are visible. In the present invention, all connections may be concealed, providing a much better over-all appearance for the entire article.

Alternatively, an extrusion may be employed extending between the abutting flanges of the shells and serving as a spacer for the flanges. The extrusion may include a wedgeshaped edge portion which makes contact with both shell flanges for the entire length of the abutting flanged surfaces. The wedge-shaped configuration prevents the extrusion from being pulled out after tightening of the fastening elements joining the two flanges together. The extrusion includes a flexible portion thereof extending over the exteriorly exposed surface of one of the flanges, so as to cover all fastening elements employed to maintain the two shells together, as well as upholstery connections into the surface. The extrusion may advantageously have an upholstery material adhered thereto so as to render it unnoticeable.

## BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings:

FIG. 1 is a perspective view of a chair embodying the invention.

FIG. 1A is a bottom view of a part of the chair of FIG. 1, to an enlarged scale.

FIG. 2 is a perspective view of an integral chair shell forming a part of the chair of FIG. 1.

FIG. 3 is a perspective view of two shells forming the integral shell of FIG. 2.

FIGS. 4 and 5 are sectional views of the chair shell respectively shown in FIGS. 2 and 4, taken respectively along the section lines **4—4** and **5—5** of these figures.

FIGS. 6 and 7 are sectional views of the chair shells shown in FIG. 3, with upholstery attached thereto.

FIGS. 8 and 9 are sectional views of the parts of the chair shown in FIGS. 6 and 7, taken respectively along section lines **8—8** and **9—9** of those figures and showing the details of upholstery connections.

FIG. 10 is a sectional view of the completed chair.

FIG. 11 is a sectional view of the chair shown in FIG. 10, taken along the section line **11—11** in FIG. 10.

FIG. 12 is a view, to an enlarged scale, of a connection between abutting shells in the completed chair of FIG. 10.

FIG. 13 is an enlarged view of an part of the completed chair shown in FIG. 11, looking in the direction of the arrows **13—13** in FIG. 11 and showing the details of

a further upholstery technique in accordance with the invention.

FIGS. 14 and 15 are sectional views similar to FIG. 12, to an enlarged scale, showing an alternative form of construction employing a vinyl extrusion separating the abutting shells.

## DETAILED DESCRIPTION

Referring to FIG. 1, an article of furniture, namely, a chair **20**, is shown embodying the invention. The chair includes a seat support **22**, a back support **24**, and arm rests **26***a* and **26***b*. The chair is supported by a vertical spindle **28** terminated at its lower end by a base **30**. The chair **20** is covered by upholstery **42** and **52**.

FIG. 2 illustrates an integral chair shell **34** employed in making the chair of FIG. 1. The chair shell **34** may be made of any suitable material; e.g., the shell may be molded from sisal-reinforced plastic. The integral shell **34** includes two distinct parts: a perimeter shell **34***a* and a center shell **34***b* (see also FIG. 3). The integral chair shell **34** shown in FIG. 2 may be molded to the shape shown in FIG. 2 and subsequently cut or severed along line **36** to produce the perimeter and center shells **34***a* and **34***b*, or the perimeter and center shells may be separately formed. Either technique of producing the distinct shells may be employed, although the technique of forming a single complete shell and then cutting it into two distinct shells is the most advantageous technique from the standpoint of reducing production costs. In particular, when the chair is molded in one piece and then cut apart into two separate shells, only one molding tool is required. Separate molding tools would be needed in the event that the shells were separately molded, thereby increasing the cost of the operation substantially by requiring an additional molding tool.

The perimeter shell **34***a* includes an inner peripheral edge **34***a'* that defines aparture **35** in the perimeter shell and an outer peripheral edge **34***a''*. The center shell **34***b* includes an outer peripheral edge **34***b'*. When the perimeter and center shells are cut from a single shell molded to the shape shown in FIG. 2, the single shell should include a portion **38** thereof (see FIG. 4) that forms an angle with the adjacent parts of the shell. The single shell is then severed by cutting throughout the angled part **38** (cut **36**) to produce the two separate shells **34***a* and **34***b* shown in FIG. 3. The angled portion of the single shell thus creates flanges **38***a* and **38***b* (FIG. 10) along the edges of the respective shells. In particular, the flange **38***a* is formed along the inner peripheral edge of the perimeter shell **34***a*, and the flange **38***b* is formed along the outer peripheral edge of the center shell **34***b*. The flanges **38***a* and **38***b* abut, as shown in FIG. 11. By providing the angled part **38** in a single shell which is thereafter severed to produce the perimeter and center shells, provision is made so that the perimeter and center shells may thereafter be joined together along the edge flanges **38***a* and **38***b*. Without such an angled part of the shell, about which the cut is made, the perimeter and center shells would have no overlapping portions about which they could be rejoined. On the other hand, if separate perimeter and center shells are independently molded, then angled flanges need not be employed, since the parts may be molded to insure that the edge portions thereof overlap to provide for the joining together of the shells to complete the article of furniture.

In any event, the perimeter and center shells are separately upholstered, as shown in FIGS. 6 and 7. Typically, a padding material **40** is positioned over the upper surface of center shell **34***b*, and an upholstery material **42** (pieces **42***a* and **42***b*) covers both the shell **34***b* and the padding **40**. A stiffener element **44** may be employed inside the upholstery **42** in the region in which the back support **24** joins the seat support **22**. The stiffening element **44** may be retained in place by a strip of fabric **46** which is stitched to the upholstery piece **42***b*.



The upholstery **42** may be secured to the center shell **34***b* along the outer edge portion of flange **38***b* by staples **48**, as shown in FIG. 8. Typically, the edges of the upholstery pieces **42***a* and **42***b* overlap along the underside of flange **38***b*. Staples **48** are driven through the upholstery pieces and into the flange **38***b* to maintain the upholstery in place.

Similarly, as shown in FIG. 7, the perimeter shell **34***a* is upholstered by the use of a padding material **50** and an upholstery material **52**. The upholstery material **52** may be secured to the shell **34***a* along the flange **38***a* by staples **54** shown in FIG. 9. In particular, one edge **52***a* of the upholstery material may be secured to an upper surface of the flange **38***a*, while another edge **52***b* may be secured by the staples to an under surface of the flange. Alternatively, either of the upholstery edges **52***a* and **52***b* could pass around the inner edge **34***a'* of the perimeter shell and underlap or overlap the other upholstery edge.

The upholstery for the perimeter shell **34***a* is typically a machine-sewed fabric envelope which is easily slipped over the shell and padding material **50**. The machine-sewing eliminates all hand-stitching except for a small flap under the front of the seat section **22**. In particular, referring to FIGS. 1 and 1A, stitching **80** may be employed to create the envelope **52** of upholstery material used to cover the perimeter shell. A small flap **52***c* of material is left unsewed under the bottom of the chair, which may be stitched by hand as at **80***a* and **80***b* to complete the envelope. The ability to provide for machine-sewing of almost all of the upholstery material for the perimeter shell **34***a* permits appreciable savings in labor needed to complete the assembly of the chair.

The separately upholstered perimeter and center shells are joined together as shown in FIGS. 10 and 11. Particularly, the flanges **38***a* and **38***b* abut with upholstery material therebetween, as shown in the figures. The shells may be secured together by any number of connections along the flanges, one of which is shown in FIG. 12. Each connection may employ a screw **60**, the head of which is seated against a washer **62** positioned against the flange **38***a* of the perimeter shell. The screw passes through the flange **38***a* and through the flange **38***b* of the center shell, and is secured in place by a threaded fastening element **64** in the flange **38**.

The screw **60** used to join together the perimeter and center shells **34***a* and **34***b* may be covered by upholstery material, as shown in FIGS. 12 and 13. A strip of upholstery material **70** may be employed for this purpose, one edge of which is positioned over the screws **60** and held in place by a cardboard or similar strip **72** of reinforcing material which is held in place by staples **74** that pass through the cardboard strip and upholstery strip **70** into the flange **38***a*. The upholstery strip **70** is then doubled over to conceal the staples **74** and cardboard strip **72**, and free end **70***a* of the strip may be tucked into the joint between the flanges **38***a* and **38***b*, as shown in FIG. 12, to be sandwiched between the fabric pieces **42***a* and **52***a*. The tucking of the edge **70***a* may be completed by use of a screw driver or any other suitable instrument, and is done after the upholstered perimeter and center shells have been completely fastened together by the screws **60**.

FIGS. 14 and 15 show an alternative arrangement for completing the fastening together of the perimeter shell **34***a* and center shell **34***b*. Specifically, a vinyl or other flexible extrusion **82** is employed having a wedge-shaped edge portion **82***a*. The extrusion extends about the entire periphery of the shells between the abutting flanges **38***a* and **38***b*. The extrusion acts as a spacing element between the flanges; it is employed to fill the space between the flanges produced by the upholstery between the flanges. The wedge-shaped edge **82***a* pre-

vents the extrusion from being pulled out when screws **60** fastening together the shells are tightened. In this regard, the extrusion **82** includes a series of openings therein, through which the screws **60** pass. The extrusion includes an edge portion **82***b* which extends over the outer surface of the flange **38***a* of the perimeter shell **34***a*. The edge portion **82***b* thus covers all the screws **60** as well as the upholstery connections into the flange **38***a*. There is sufficient flexibility in the extrusion edge portion **82***b* to permit it to be pulled back in order to gain access to the screws **60**. Advantageously, an upholstery fabric **84** is glued to the outer surface of the extrusion **82** so as to cover the extrusion. Such an upholstery piece eliminates the need for tacking a strip of upholstery, such as strip **70** in FIG. 12, to the perimeter shell and tucking the loose flap between the flanges of the two shells, as explained above in connection with FIG. 12.

Additionally, FIGS. 14 and 15 show paddings **86** and **88** of foam or other material between the shells and the upholstery material on the outer surfaces of the shells. For example, the foam material **88** is positioned between the upholstery **42***b* and the center shell **34***b*. Such foam or padding material provides a soft resilient touch to the outer surface of the chair; in the other figures of the application, the upholstery material is shown directly against the outer surfaces of shells **34***a* and **34***b*.

It will be noted that the present invention involves an article of furniture in which connections of upholstery material to the corresponding shells are concealed by locating the connections between abutting edge portions of the shells or by employing a doubled-over strip of upholstery material or an extrusion. A unique shell construction has been provided involving mating perimeter and center shells, wherein the center shell covers an aperture in the perimeter shell.

The invention should not be deemed limited to the specific embodiments shown in the drawings. For example, although an armchair has been shown, the invention is eminently suitable for an armless chair and other items of furniture.

I claim:

**1.** An article of furniture formed from mating shells, wherein the improvement comprises:

(a) a perimeter shell having an aperture therein; and

(b) a center shell that mates with the perimeter shell, so as to close the aperture in the perimeter shell.

**2.** An article of furniture as defined in claim **1**, wherein the perimeter shell has an inner peripheral edge portion that bounds the aperture in the shell, the center shell has an outer peripheral edge portion, the edge portions of both shells abutting with each other in the assembled article of furniture.

**3.** An article of furniture as defined in claim **2**, including upholstery on the perimeter and center shells, connections of upholstery to each shell being concealed between the abutting outer peripheral edge portion of the center shell and the inner peripheral edge portion of the perimeter shell.

**4.** An article of furniture as defined in claim **3**, wherein the upholstery on the perimeter shell comprises an envelope having a loose flap at an edge section thereof which may be sewed to adjacent upholstery material of the envelope after the envelope has been placed over the perimeter shell.

**5.** An article of furniture as defined in claim **1**, wherein the mating perimeter and center shells are formed from a unitary shell structure which is severed to provide two separate shells.

**6.** An article of furniture as delned in claim **1**, wherein the mating perimeter and center shells comprise a chair shell.

**7.** An article of furniture as defined in claim **6**, wherein the center shell comprises a seat and back support of the chair.

**8.** An article of furniture as defined in claim **7**, wherein the perimeter shell has portions thereof comprising parts of the seat and back support of the chair.

**9.** An article of furniture as defined in claim **8**, wherein said perimeter shell has portions thereof comprising arm rests of the chair.

**10.** An article of furniture as defined in claim **2**, wherein the inner peripheral edge portion of the perimeter shell is formed from a flange extending at an angle with respect to the adjacent part of the perimeter shell, the outer peripheral edge portion of the center shell is formed from a flange extending at an angle with respect to the adjacent portion of the center shell, the flanges of the perimeter and the center shells abutting each other with upholstery therebetween, and connection of the upholstery to the respective shells being positioned between the abutting flanges so as to be hidden by the flanges.

**11.** An article of furniture as defined in claim **10**, wherein one of the abutting flanges presents an outwardly exposed surface with respect to the article of furniture, said outwardly exposed surface being covered by upholstery which is secured by connections through the upholstery and through the surface into the associated flange, the upholstery being doubled over to conceal said connections into the surface, and a free edge of the doubled-over upholstery being tucked into the space between the abutting flanges.

**12.** An article of furniture as defined in claim **2**, wherein the inner peripheral edge portion of the perimeter shell is formed from a flange extending at an angle with respect to the adjacent part of the perimeter shell, the outer peripheral edge portion of the center shell is formed from a flange extending at an angle with respect to the adjacent portion of the center shell, the flanges of the perimeter and the center shells abutting each other, and a spacing element positioned between the abutting flanges and having an edge portion thereof which extends over the outwardly exposed surface of one of the abutting flanges.

**13** An article of furniture as defined in claim **12**, wherein the spacing element has a wedge-shaped edge thereof between the abutting flanges to maintain the spacing element in position when the flanges are tightened against each other.

**14.** An article of furniture as defined in claim **12**, wherein the spacing element is of extruded vinyl.

**15.** An article of furniture as defined in claim **12**, wherein the spacing element includes an upholstery material adhered thereto on an outer surface thereof.

**16.** An article of furniture comprising abutting flanges of two shells, one of the abutting flanges presenting an outwardly exposed surface with respect to the article of furniture, the outwardly exposed surface being covered by upholstery which is secured by connections through the upholstery and through the surface into the associated flange, the upholstery being doubled over to conceal said connections into the surface, and a free edge of the doubled-over upholstery being tucked into the space between the abutting flanges.

**17.** An article of furniture, comprising abutting flanges of two shells, one of the abutting flanges presenting an outwardly exposed surface with respect to the article of furniture, a spacing element positioned between the abutting flanges and having an edge portion thereof which extends over said outwardly exposed surface.

**18.** An article of furniture as defined in claim **17**, whereing the spacing element includes a wedge-shaped edge thereof between the abutting flanges to maintain the spacer in position when the flanges are tightened against each other.

**19.** An article of furniture as defined in claim **17**, wherein the spacing element is of extruded vinyl.

**20.** An article of furniture as defined in claim **17**, where-

in the spacing element includes an upholstery material adhered thereto on an outer surface thereof.


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U.S. Cl. X.R.

297—452