

Feb. 2, 1965

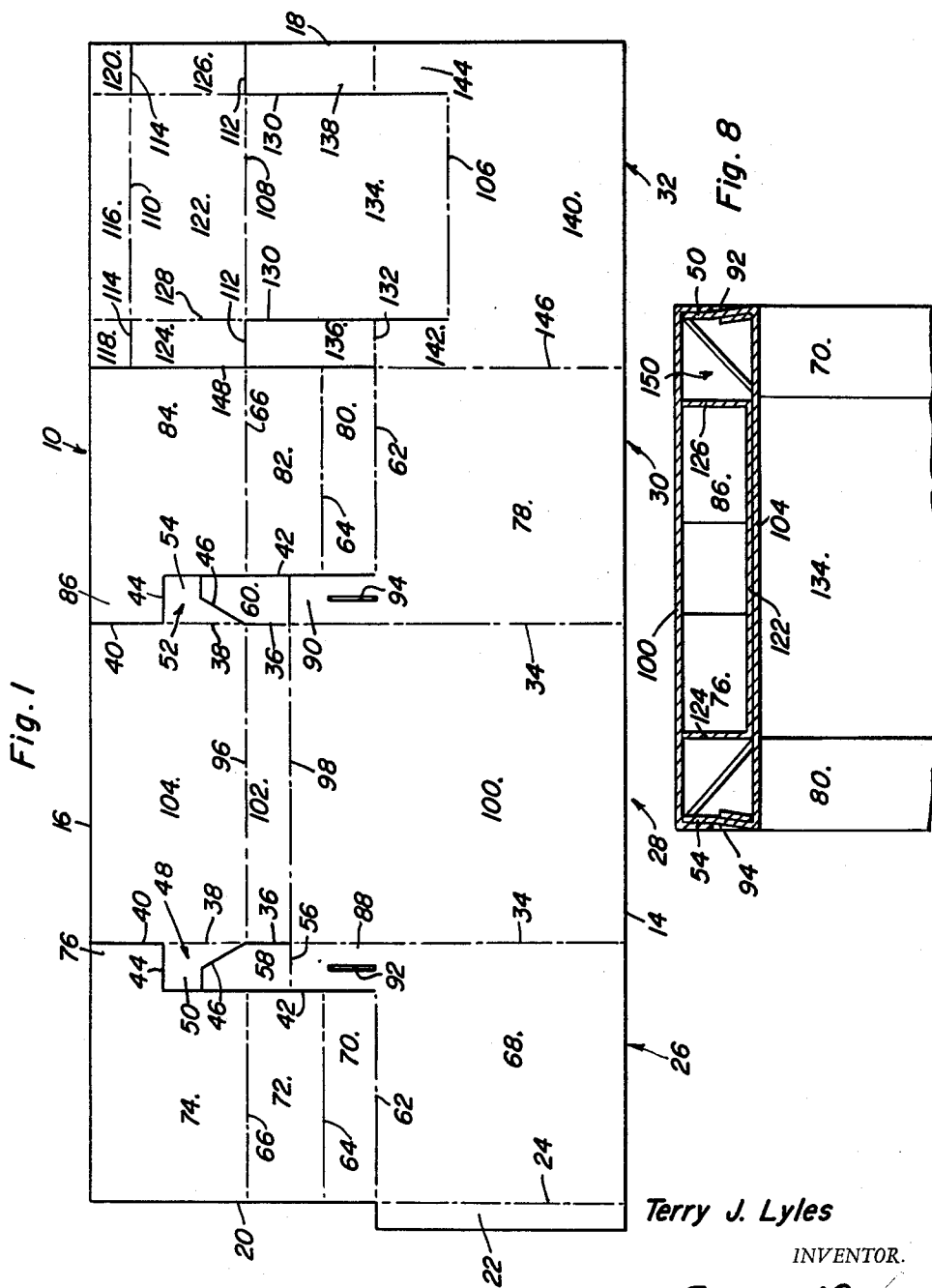
T. J. LYLES

3,168,347

FOLDING CARDBOARD CHAIR

Filed Feb. 26, 1963

3 Sheets-Sheet 1



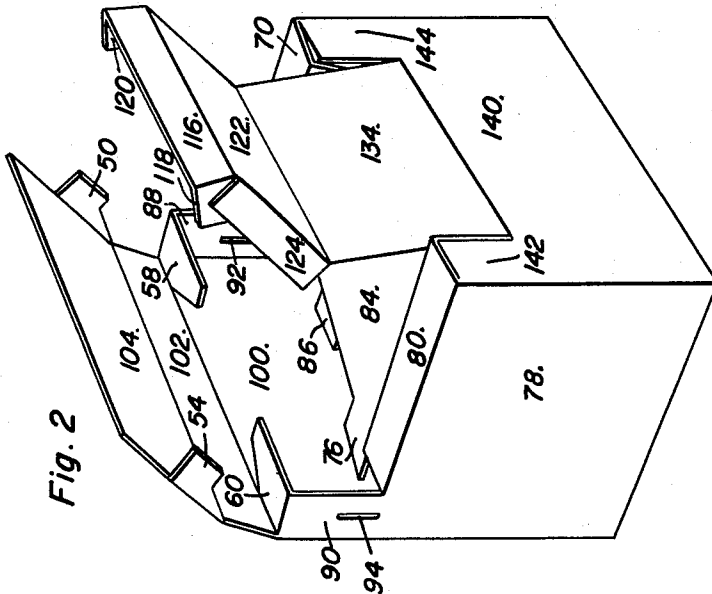
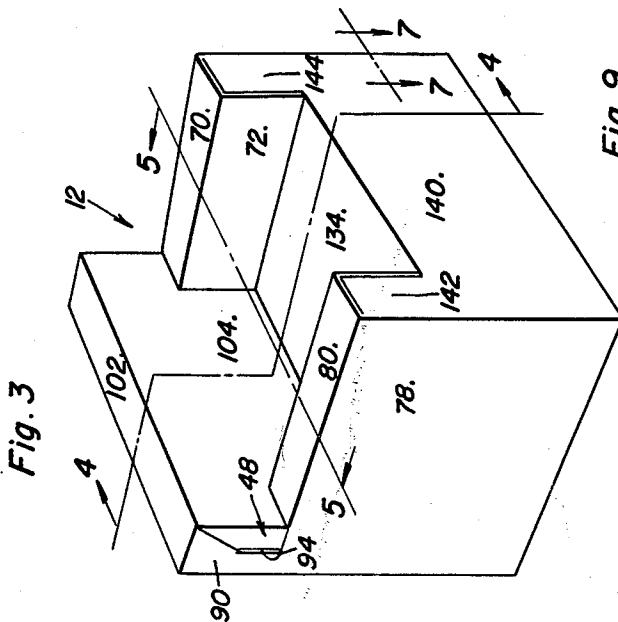
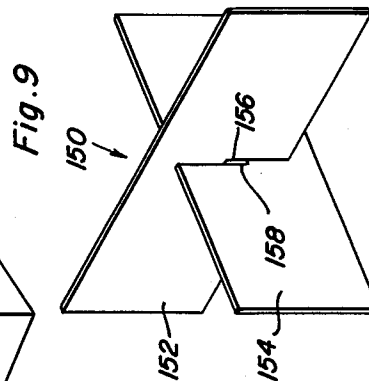
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3 Sheets-Sheet 2



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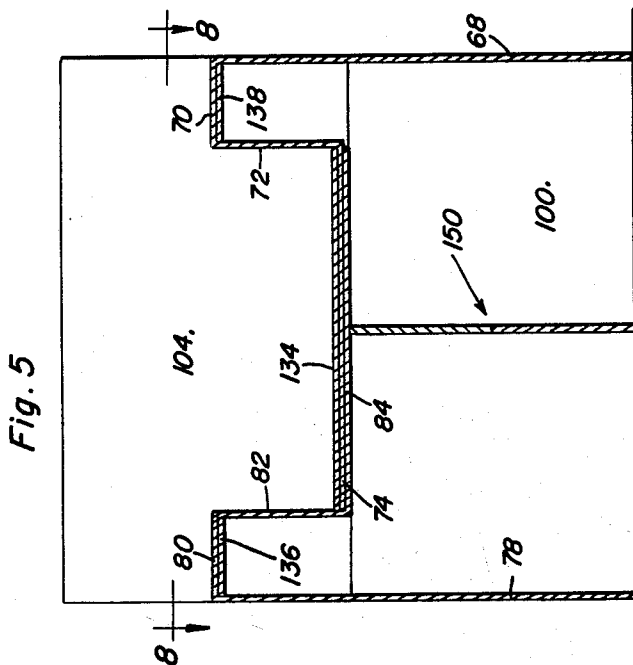
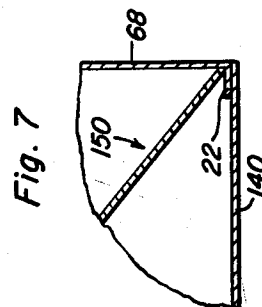
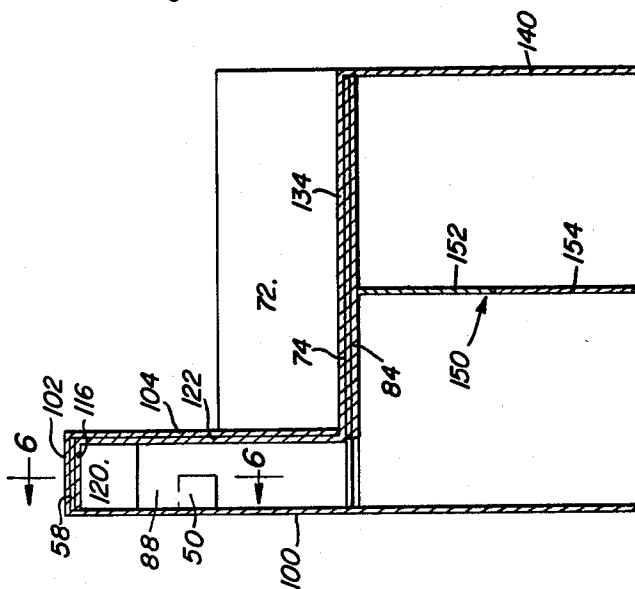
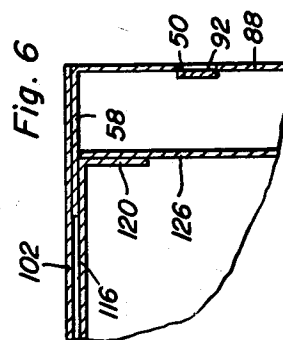
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FOLDING CARDBOARD CHAIR

Filed Feb. 26, 1963

3 Sheets-Sheet 3



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3,168,347

FOLDING CARDBOARD CHAIR

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Filed Feb. 26, 1963, Ser. No. 261,075

7 Claims. (Cl. 297-442)

The present invention is generally related to furniture, and is more particularly concerned with the provision of an armchair which can be easily and quickly assembled from essentially a single sheet of relatively stiff material, such as for example cardboard.

It is one of the primary objects of the present invention to provide an economical lightweight chair capable of being easily assembled in the home without any tools being necessary.

In conjunction with the above object, it is also an object of the present invention to provide for a folding chair which, upon erection, possesses a maximum amount of rigidity and strength.

Likewise, it is intended that the armchair of the present invention, aside from two flat interconnected brace members, be formed from a single sheet of stiff material provided with a series of slits and fold lines.

Furthermore, it is an object of the present invention to provide a foldable chair wherein each face of the chair which is to be directly engaged by a person sitting therein consist of at least two panels.

It is also an object of the present invention to provide a folding chair which, aside from the folding of the sheet of material, requires that only one edge be glued or otherwise fastened and two tongues be inserted within two slots so as to construct the chair.

It is yet another object of the present invention to provide a chair which, because it is constructed mainly of a single sheet of material, can be economically manufactured at a minimum cost with the shipping costs also being substantially decreased in that rather than shipping an assembled chair, only the precut flat sheet need be shipped, this sheet being assembled either just prior to sale to the ultimate purchaser, or assembled by the purchaser himself.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a view of the sheet of material from which the chair is formed, this sheet having both the slits and score lines arranged thereon in a specific predetermined pattern;

FIGURE 2 is a perspective view of an intermediate step in the assembly of the chair;

FIGURE 3 is a perspective view of the completely assembled chair;

FIGURE 4 is a cross-sectional view taken substantially on a plane passing along line 4-4 in FIGURE 3;

FIGURE 5 is a cross-sectional view taken substantially on a plane passing along line 5-5 in FIGURE 3;

FIGURE 6 is a partial cross-sectional view taken substantially on a plane passing along line 6-6 in FIGURE 4;

FIGURE 7 is a partial cross-sectional view taken substantially on a plane passing along line 7-7 in FIGURE 3;

FIGURE 8 is a partial cross-sectional view taken substantially on a plane passing along line 8-8 in FIGURE 5; and

FIGURE 9 is a perspective view of the cross brace in a partially assembled condition.

Referring now more particularly to the drawings, and with specific reference to FIGURE 1, reference numeral 10 has been used to generally designate the sheet or blank

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of stiff material from which the chair 12 is formed. This blank 10, of cardboard or any other similar suitable material, is generally rectangular in form and includes a bottom edge 14, top edge 16, right side edge 18, and left side edge 20. A vertically elongated side flap 22 extends laterally from the lower portion of the left side edge 20 and is integral with the adjoining portion of the blank 10 with a score line 24 forming an extension of the left side edge 20 and separating the side flap 22 from the remainder of the blank 10.

Aside from the side flap 22, the blank 10 is divided into four vertical sections 26, 28, 30 and 32, sections 26 and 30 being the reverse or mirror image of each other, and sections 28 and 32 each being symmetrical, that is, each of the sections 28 and 32 consist of mirror image portions on opposite sides of a vertical centerline (imaginary) extending therethrough.

Sections 26 and 30 are both separated from the intermediate section 28 by score lines 34 extending upwardly from the bottom edge 14 and each terminating in an aligned slit 36 which in turn terminates in an aligned second score line 38 which extends to a second slit 40 in alignment therewith and extending to the top edge 16.

Each of the sections 26 and 30 include a vertically extending slit 42 parallel to and spaced slightly from the adjoining slit 36, this slit 42 being generally centered on the slit 36 and terminating short of both the top edge 16 and the bottom edge 14.

Two transversely extending slits 44 and 46 are provided between each of the section slits 42 and the adjoining dividing line between the sections, the slit 44 being straight and extending between the uppermost limit of the slit 42 and the lowermost limit of the slit 40, and the slit 46 being angular and extending between an intermediate point of the slit 42 and the uppermost limit of the slit 36 thus forming, in the case of section 26 and in relation to the finished chair 12 as shown in FIGURE 3, the right securing flap 48 including the right securing tongue 50, the left securing flap 52 including the left securing tongue 54 being formed in the section 30. With continued reference to the blank 10 in FIGURE 1 and with reference to the assembled chair 12 as shown in FIGURE 3, it will be appreciated that a score line 56 is provided laterally between, in each of the sections 26 and 30, the vertical slit 42 and the lower limit of the adjoining slit 36 thus forming, between the slit 46 and the score line 56, a right top flap 58 and a left top flap 60.

Extending transversely across each section 26 and 30 between the vertical slit 42 and the opposite side of the section are three parallel score lines 62, 64 and 66, the lowermost one 62 of these score lines being in line with the lowermost limit of the slit 42 and with the uppermost limit of the side flap 22. The intermediate score line 64 is located between the lower limit of the slit 42 and the score line 56 with the upper score line 66 being located intermediate the score line 56 and the angular slit 46 at approximately the point of engagement between the slit 46 and the slit 36. These score lines 62, 64 and 66, in the case of the section 26, form the right side panel 68, the upper right arm panel 70, the right arm inside panel 72, and the middle seat panel 74, this middle seat panel including a middle seat rear projecting tab 76 above the slit 44. In regard to the section 30, the score lines 62, 64 and 66 form the left side panel 78, the upper left arm panel 80, the left arm inside panel 82, and the lower seat panel 84, this lower seat panel including a lower seat rear tab 86 formed between the slit 44 and the upper edge 16. It will also be noted that both the right side panel 68 and the left side panel 78 include right and left side back tabs 88 and 90 formed between the slits 42 and the adjoining score lines 34 below the score lines 56, these tabs 88 and 90 each including a vertical slot, the right slot

being indicated by reference numerals 92 and the left slot being indicated by reference numeral 94.

The section 28 includes two transversely extending score lines 96 and 98, the score line 96 extending between the upper limits of the slits 36 and the score line 98 extending between the lower limits of the slits 36 and thus dividing the section 28 into a rear panel 100, an upper top panel 102, and an outer back panel 104.

The final section, section 32, includes three transversely extending score lines 106, 108, and 110, these score lines extending along only an intermediate portion of the section 32 between the vertical edges thereof. Aligned slits 112 and 114 extend outwardly from both ends of the score lines 108 and 110 and terminate at the adjacent section edges thus forming, in conjunction with the score lines 108 and 110, a lower top panel 116, lower top side flaps 118 and 120, an inner back panel 122, an inner back left side flap 124, and an inner back right side flap 126. The above described flaps are separated from the adjoining panels by vertically extending score lines 128 interconnecting the vertically spaced outer ends of the score lines 108 and 110 and terminating in vertically extending slits 130 which terminate in the outer ends of the score line 106, a pair of score lines 132 extending outwardly from the slits 130 in line with the score lines 62 of the sections 26 and 30 thus further dividing the section 32 so as to form an upper seat panel 134, a lower left arm panel 136, a lower right arm panel 138, and a front panel 140, this front panel including both a left arm front tab 142 and a right arm front tab 144 formed between the slits 130 and the adjoining section edges. While not previously mentioned, it will be noted that the sections 30 and 32 are divided by a vertically extending score line 146 extending upwardly from the lower edge 14 and terminating on line with the score lines 62 and 132 from which point an aligned slit 148 extends, this slit 148 terminating at the upper edge 16.

In assembling the chair 12 from the blank 10, the vertical sections 26, 28, 30 and 32 are first folded at right angles to each other so as to form a rectangle with the side flap 22 being folded along line 24 and fastened, as by gluing, to the rear of the outer edge of the front panel 140. Next, the lower left and right arm panels 136 and 138 are bent rearwardly to approximately a 90 degree angle with the front panel. At this point, it is generally desirable to insert the cross brace 150 illustrated in FIGURE 9 and consisting of two flat elongated panels 152 and 154 having complementary recesses 156 and 158 at the mid-points thereof so as to allow for an interlocking of the members at right angles to each other in the manner illustrated in FIGURE 9. This cross brace 150 is to be of a height so as to enable the upper edges of the panels 152 and 154 to engage the lower surface of the chair seat when the lower end of the brace 150 is on the supporting surface upon which the chair 12 rests. Further, as will be appreciated from the various sectional views of the assembled chair, the outer ends of each of the panels 152 and 154 are to be positioned in abutting engagement in the angles formed by the adjacent sections thus not only functioning so as to resist any superimposed load, but also providing for a substantial increase in the lateral stability of the chair 12.

After the cross brace has been inserted, first section 30 and then section 26 are folded along the score lines 62, 64 and 66 so as to form the upper left and right arm panels 80 and 70, the left and right arm inside panels 82 and 72, and the lower and middle seat panels 74 and 84, the lower seat panel 84 being engaged with the upper edges of the cross brace 150 and the middle seat panel 74 resting directly thereon. It will be appreciated that in such a manner, the upper horizontal face of the arms is formed of two panels each.

Subsequently, the upper seat panel 134 is bent rearwardly so as to overlap and rest atop the middle seat panel 74 thus forming a seat of three panels, this folding being

along fold line or score line 106. Next, the section 32 is folded along lines 108 and 110 so as to form both the inner back panel 122 and the lower top panel 116, this being clearly shown in FIGURE 2. At the same time, the flaps 118, 120, 124 and 126 are folded rearwardly and inwardly, also as clearly seen in FIGURE 2, so as to act as spacers and rigidifiers between the inner back panel 122 and the rear panel 100 which is parallel thereto when the chair 12 is in its assembled condition.

After this, the right and left top flaps 58 and 60 are folded inwardly toward each other at 90 degrees to the adjacent side tabs 88 and 90, these flaps 58 and 60 resting on top of the lower top panel 116.

Finally, the section 28 is folded along score lines 98 and 96 so as to form the upper top panel 102 resting atop of the flaps 58 and 60, and the outer back panel 104 overlapping the inner back panel 122, thus providing a double back panel. The entire assembly is then locked together by folding the right and left securing flaps along fold or score lines 38 with the securing tongues 50 and 54 being inserted into the slots 92 and 94. It should also be noted that upon the folding of the outer back panel 104 over the inner back panel 122 that the outer back panel 104 is slid behind the arm panels thus further interlocking the structure. Additionally, attention is directed to the fact that, upon assembling the chair 12, the middle and lower seat rearwardly projecting tabs 76 and 86 extend rearwardly into engagement with the inner face of the rear panel 100 thus acting as an additional bracing and rigidifying means.

From the foregoing, it should be readily appreciated that a novel folding chair has been defined wherein all of the major portions therein function so as to strengthen and rigidify the over-all structure, the assembly of the chair being extremely easy and requiring no tools and only a minimum amount of skill.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A folding chair constructed of stiff sheet material slit and folded along predetermined lines, said chair consisting of a seat brace and a chair body, said chair body being formed of a single sheet of material, this body sheet being folded so as to initially present four right angular vertical sections, a right side section, a left side section, a front section, and a rear section, said right side, left side, and front sections each including a full seat panel folded therefrom, said seat panels being horizontally orientated and overlapped in superimposed relation to each other rearward of the initial vertical plane of the front section and between the initial vertical planes of the side sections so as to form a three layer seat portion, said front section and said rear section each including a seat back panel folded therefrom, said seat back panels being orientated vertically and overlapped between the side sections substantially in the vertical plane of the rear of said seat panels, said right side section and said front section each including a right arm panel folded therefrom, said right arm panels being orientated horizontally and overlapped in a plane above the seat panels and to the right thereof, and said left side section and said front section each including a left arm panel folded therefrom, said left arm panels being orientated horizontally and overlapped in a plane above the seat panels and to the left thereof.

2. The construction of claim 1 wherein said rear section includes a rear panel maintained in the initial vertical plane of the rear section, said seat back panels being spaced forward of said rear panel, and said front section

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seat back panel including a pair of rearwardly extending spacer flaps in abutting engagement with the rear panel so as to space the seat back panels therefrom.

3. The construction of claim 2 wherein said side sections each include a side panel maintained in the initial vertical plane of the side section, each side panel including a coplanar vertically projecting tab adjacent the rear edge thereof, each tab forming a closure for one side of the space between the seat back panels and the rear panel.

4. The construction of claim 3 wherein said side panel tabs each include a centrally located vertical slot there-through, and said rear section seat back panel includes a pair of rearwardly projecting securing flaps positioned against the outer surfaces of the side panel tabs, and a tongue on each flap received through the slots.

5. The construction of claim 4 wherein said seat brace consists of two vertical panels interlocked at the mid-point thereof, said seat brace being located beneath the seat panels and engaged therewith, the outer ends of each of the vertical brace panels being engaged within one of the corners between the right angular vertical sections.

6. A blank for the construction of a folding chair consisting of a single piece of stiff sheet material having dividing slits therein and being foldable along score lines, said piece being generally rectangular and having bottom, top, first side and second side edges, said piece being divided into four sections by a combination of aligned slits and score lines extending from the bottom to the top edge, the first and third sections being mirror images of each other, portions of each of the second and fourth sections on opposite sides of an imaginary centerline being mirror images of each other, three score lines extending transversely upwardly from the bottom edge, each at one of the intersections between adjoining ones of the four sections, the score lines between the first and second, and second and third sections each terminating at its upper end in an aligned slit which terminates in a second aligned score line which terminates in an uppermost aligned slit which extends to the top edge, the score line between the third and fourth section terminating in an aligned slit which extends to the top edge, said first and third sections each having a slit parallel to the slits between these sections and the second section, the first and third section slits each terminating short of both the top and bottom

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edges and having the upper limit thereof joined by a transverse slit to the bottom limit of the uppermost slit between the sections, a second slit extending between an intermediate portion of each section slit and the uppermost limit of the lower slit between the sections, three parallel score lines extending outwardly from each section slit to the opposite side of the section, the lowermost ones of these parallel score lines being on line with the lowermost limit of the section slits, a pair of parallel score lines extending across the second section, the upper line of this pair interconnecting the upper limit of the lower slits between the sections, and the lower line of this pair interconnecting the lower limit of the lower slits between the sections, said fourth section including three score lines extending across an intermediate portion thereof, the upper two of these fourth section score lines having aligned slits extending from each end thereof to the edge of the fourth section, and a pair of aligned score lines on line with the lowermost limit of the slit between the third and fourth sections extending inwardly from the edges of the fourth section to lines interconnecting the ends of the three score lines across an intermediate portion thereof, said interconnecting lines each consisting of a score line extending downwardly from the top edge to the middle one of said three score lines and a slit aligned therewith and continuing to the lower of these three score lines.

7. The construction of claim 4 wherein said rear section includes a top panel between the rear panel and the seat back panel, said top panel forming a closure for the top of the space between the seat back panels and the rear panel, and a top panel on the front section seat back panel underlying the rear section top panel.

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