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(54) CHAIRS

(71) We, STEELCASE INC, a Corporation organised and existing under the laws of the State of Michigan, United States of America, of 1120 36th Street, S.E., Grand Rapids, Michigan, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:–

This invention relates to chairs and particularly but not exclusively to office chairs. Many types of chairs are sold in the office furniture industry. So-called "shell chairs" are characterised by a external visible shell of some sort which is three dimensional and curvilinear in configuration, resembling a clam shell or egg shell and encompassing both the underside of the seat and the rear of the back areas of the chair.

According to the present invention, a shell-type chair includes: an inner member defining a seat and a back; an outer shell covering the rear and undersurfaces of the seat and back of the inner member; the shell including groove means comprising at least one narrow groove extending inwardly towards the inner member, the base of the groove making contact with at least portions of the inner member; the or each groove being visible when the chair is viewed from the rear; and fasteners located in the groove and securing the shell to the inner member; the or each groove being sufficiently deep and narrow that the fasteners are not readily visible on casual viewing of the chair and can be seen only by more careful inspection of the or each groove in the shell.

A sling type chair is characterised by spaced side rails, either visible or readily apparent, which support some type of seat and/or back upholstery slung thereby. In a preferred construction of the shell-type chair according to the invention, the chair is adapted so that a sling-type chair can be produced by substituting upholstery and cushioning means and removing the shell, the additional components comprising: sling-type upholstery and cushion means shaped and adapted to cover the front surface of the back portion and the upper surface of the inner member without covering the side rails at the rear of and beneath the inner member.

The invention may be carried into practice in various ways but a number of components and the way in which these can be assembled into two chairs will now be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a sling type chair;

Figure 2 is a perspective view of a shell type chair;

Figure 3 is a perspective view of the stretcher and spaced side rails employed in each of the two chairs;

Figure 4 is a bottom plan view of the stretcher and spaced side rails;

Figure 5 is a perspective view of the assembled, common components of both the sling and shell type chair, with the exception that the particular arms and particular base of the sling type chair are shown;

Figure 6 is a fragmentary view taken at the lower front corner of the chair, from the undersurface thereof, at the corner identified by Arrow VI in Figure 5;

Figure 7 is a fragmentary view of the upper rear corner of the chair, taken from the rear of the chair, at the point indicated by Arrow VII in Figure 5;

Figure 8 is a fragmentary cross-sectional view taken along plane VIII-VIII of Figure 5;

Figure 9 is a rear elevational view of the juncture of the supporting seat and back of the chair at the area shown in Figure 8;

Figure 10 is a generally rear perspective view of the upholstered inner back member of the sling type chair;

Figure 11 is a generally bottom perspective view of the upholstered inner seat member of the sling type chair;

Figure 12 is a cross-sectional view taken along plane XII-XII of Figure 1;

Figure 13 is a cross-sectional view taken along plane XIII-XIII of Figure 1;

Figure 14 is a cross-sectional view of the upper portion of the shell type chair without the shell attached, taken along plane XIV-XIV of Figure 2;

Figure 15 is a bottom plan view of that portion of the shell type chair shown in Figure 14;

Figure 16 is a side elevational view of the shell of the shell type chair;

Figure 17 is a rear elevational view of the shell;

Figure 18 is a fragmentary cross-sectional view taken along plane XVIII-XVIII of Figure 2; and

Figure 19 is an exploded perspective view of the various components employed in the shell type chair.

Figure 1 shows a sling type chair while Figure 2 shows a shell type chair, both made using the same basic system. The sling type chair shown in Figure 1 is so called because it has the characteristic spaced side rails so often seen in such chairs. Technically, the Figure 1 chair is a marriage of a sling type chair, which usually includes a loose fabric slung between the spaced side rails, and a stacking type of chair in which moulded plastics seat and back members are secured to some sort of frame. The sling type chair as shown in Figure 1 is itself described and claimed in our Patent No. 1 451 426.

In the present invention, some of the basic components of the chair of our previous invention are employed in the shell-type chair of the present invention. Thus, the construction of that prior chair will again be explained in this specification as it relates to the sling type chair and as certain of the components relate to the shell chair of the present invention.

In the constructions shown in the drawings, each of the chairs 1 and 2 comprises a stretcher 20 operably mounted on a base 10 for supporting at its ends a pair of spaced side rails 30 (Figure 3). Secured to the side rails are a formed plastics supporting seat 40 and a formed plastics supporting back 50 (Figure 5) each having at its side edges side channels 41 and 51 respectively which are seated over side rails 30 (Figures 5, 6 and 7).

The first alternative chair 1 of the system is upholstered and cushioned by inner seat and back 60 and 80 and upholstery coverings 70 and 80 (Figures 1, 10 and 11). Secured to the seat 40 is the formed plastics inner seat 60 having a configuration conforming generally to that of the supporting seat 40 and being covered by upholstery covering 70 (Figures 1, 11 and 12). Secured to the back 50 is the formed plastics inner back 80 which is covered by back upholstery covering 90 (Figures 1, 10 and 13). The optional arms 100 of the chair 1 may be attached to the chair by securing them to the stretcher 20 (Figures 1 and 4).

The second alternative chair 2 which is shown in Figure 2 is a shell type chair in which the inner seat and back 60 and 80 are eliminated and a different type of upholstery assembly 210 and 220 are employed to upholster and cushion the supporting seat and back members 40 and 50. Basically, cushion members are adhered to the inner seat and back members and an upholstery covering is wrapped around to the rear sides of the supporting seat and back members 40 and 50 so that it covers the spaced side rails 30. Shell 230 is then secured to the rear of the chair by means of fasteners 232 located in the rear of shell 230 (Figs. 17 and 18).

COMPONENTS COMMON TO BOTH THE SHELL CHAIR AND SLING CHAIR

Base 10 is a pedestal type of base having a post 11 with a plurality of legs 12 projecting outwardly from generally the bottom thereof and with a chair tilter control 13 or other mounting mechanism positioned generally at the top of post 11 (Fig. 1). Stretcher 20 includes an enlarged, generally square shaped central mounting pan 21 to which control 13 is fastened by bolts or like fasteners.

Stretcher 20 is formed of stamped steel. Projecting outwardly from each side of central mounting pan 21 are a front strut 22 and a rear strut 23 (Figs. 3 and 4). Bent over along the front of stretcher 20 is a front wall 24 which extends downwardly across the front edge of mounting pan 21 and across the leading edge of both front struts 22. Projecting downwardly from the rear edge of stretcher 20 is rear wall 25 which extends along the rear edge of mounting pan 21 and along the rear edges of rear struts 23. In a similar fashion, a side wall 26 extends downwardly and runs along the side edges of mounting pan 21 and extends outwardly along the inside edges of front and rear struts 22 and 23 which face each other. All of these downwardly depending walls 24, 25 and 26 help to hide from view the control 13 of base 10 and its securement to stretcher 20. Also, the downwardly depending walls give added strength to stretcher 20. Finally, in extending along struts 22 and 23, these walls give the struts a generally downwardly opening channel shaped configuration which facilitates the mounting of arms 100 or 200 to the struts 22 and 23 of stretcher 20. Preferably, the front channels 22 and front wall 24 are formed as one piece, the rear channels 23 and rear wall 25 are formed as one piece and mounting pan 21 is formed as one piece. These three pieces are then welded together to form an integral stretcher 20.

Stretcher 20 also includes an upwardly protruding dome 27 generally in the centre

of mounting pan 21 which leaves clearance space for the top of control 13 of base 10. Dome 27 also provides a support for supporting seat 40. The distance between the bottom of supporting seat 40 and the top of dome 27 is about 3/8 inch. It is sufficiently small a distance that when a person sits on the chair, supporting seat 40 comes to rest on the top of dome 27 before sufficient stress is put on channels 41 to cause them to unwrap from or, in other words, be pulled off side rails 30. In essence, dome 27 serves as a support so that at least some of the load imposed on the chair is transmitted directly axially downwardly onto dome 27 and from thence to the column 11 of base 10.

The side rails 30 which are welded to the ends of struts 22 and 23 are tubular steel members bent to define a seat supporting portion 31 and a back supporting portion 32 (Fig. 3). They can be bent into any of a number of different configurations to give the sling type chair 1 a particular aesthetic or ornamental appearance.

Supporting seat 40 is formed by injection moulding of a polypropylene copolymer (approximately 13% polyethylene). Other plastics and other forming methods can be used. Seat 40 should be quite rigid, having a thickness of approximately 5/32 inch. When supported on side rails 30, supporting seat 40 serves to support a person seated in the chair. While the shape of supporting seat 40 is to some extent dictated by comfort considerations, the ornamental designer does have some leeway and can affect the design theme of chair 1 by varying the shape to be given seat 40, particularly at the front, rear and side edge portions. Of course, such changes have no significant bearing in the appearance of shell chair 2.

The channels 41 which are formed at each side of seat 40 are raised generally with respect to the rest of seat 40 so as to define a well 42 between the spaced channels 41 (Fig. 12). It is not essential that the entire surface of seat 40 be below the level of the tops of channel 41 (it will be noticed that seat 40 rises somewhat towards the middle) but it is preferable that there be a well-like depression at least in the area adjacent the side channels 41. In this manner, when the upholstered inner seat 60 is secured to supporting seat 40, its edges will be positioned fairly closely adjacent the inside wall of the raised channels 41 and it will be more difficult to get underneath the seat upholstery pad 60 and pry it upwardly. This is not imperative with respect to shell chair 2.

At the underside of seat 40, at each front corner of seat 40, each side channel 41 terminates in a recessed pocket 49 into which the forward end of side rail 30 extends (Fig. 6). This not only serves to hide the end of side rail 30, but also serves to secure supporting seat 40 in place at the front of the chair.

Back 50 is formed by injection moulding of a polypropylene copolymer (approximately 13% polyethylene). Other plastics and other forming methods can be used. Back 50 should be quite rigid, having a thickness of approximately 5/32 inch. When supported on side rails 30, supporting back 50 serves to support a person leaning back in the chair. As with seat 40, the shape of supporting back 50 is to some extent controlled by comfort considerations. However, the designer has some leeway for purely ornamental considerations, particularly along the top, bottom and side portions. The channels 51 are formed at each side of back 50 so as to define a well 52 between the spaced channels 51 (Fig. 13). It is not essential that the entire surface of back 50 be below the level of the tops of channel 51, but it is preferable that there be a well-like depression at least in the area adjacent the side channels 51. In this manner, when the upholstered inner back 80 is secured to supporting back 50, its edges will be positioned fairly closely adjacent the inside wall of the raised channels 51 and it will be more difficult to get underneath the back upholstery pad 80 and pry it upwardly. Again, this is important only with respect to sling type chair 1, not shell chair 2.

At the backside of back 50, at each top corner of back 50, each side channel 51 terminates in a recessed pocket 59 into which the upper end of side rail 30 extends (Fig. 7). This not only serves to hide the end of side rail 30, but also serves to secure back 50 in place at the back of the chair.

The side channels 41 of seat 40 include projecting portions or seat channel projections 43 which project rearwardly and upwardly from the rear edge of seat 40 towards back 50 (Figs. 5 and 9). Similarly, the side channels 51 of back 50 include projecting portions or back channel projections 53 which project downwardly from the bottom of back 50 towards seat 40. Channel projection 43 terminates in a channel shaped flange 44 while channel projection 53 terminates in a channel shaped overlying flap 54. Flap 54 overlaps flange 44 so that the side channels 41 and 51 meet in such a way as to align channel projections 53 and 43 and to define a continuous, smooth flowing surface with only a slight line being visible at the junction. Once flap 54 is seated over flange 44, a screw is passed through a screw hole 54*a* in the inside of channel projection 53 (Figs. 8 and 9), above flap 54, and is threaded into underlying side rail 30. Similarly, a screw is passed through screw hole 44*a* in the inside of channel projection 43 and is threaded into underlying side rail 30. This positively locks supporting seat 40

and supporting back 50 in place at their rear and bottom respectively so that once the ends of side rails 30 are in place in the pockets 49 and 59 of seat 40 and back 50 respectively and once the projecting side channel portions 43 and 53 are in their proper overlapping condition and secured by screws through holes 54*a* and 44*a*, the back 50 and seat 40 are firmly secured to side rails 30.

THE SLING TYPE CHAIR

The first type of upholstery and cushioning used in the system comprises an upholstered inner seat 60 and an upholstered inner back 80. This first system is employed in the sling type chair.

Inner seat 60 is preferably injection moulded of basically the same plastics of which supporting seat 40 and supporting back 50 are made and has a thickness of approximately 1/8 inch. It should have sufficient thickness and rigidity that it will hold its shape when secured to supporting seat 40 and such that it will not be bent out of shape when it is covered with upholstery covering 70. It is moulded to have a configuration conforming generally to the configuration of the inside of supporting seat 40 within well 42 (Figs. 11 and 12). Inner seat 60 is approximately as wide as the distance between the inwardly facing walls of side channels 41 of supporting seat 40.

For securing inner seat 60 to supporting seat 40, seat 40 is rolled over along its front edge 45 and includes three integrally moulded buttons 47 projecting from its front edge 45 at spaced intervals therealong (Fig. 5). Projecting from the rear edge 46 of seat 40 are three spaced integrally moulded tabs 48. In a somewhat similar manner, four integrally moulded buttons 58 project upwardly at spaced intervals from the rolled over top edge 56 of back 50 and three integrally moulded buttons 57 project downwardly from the rolled over bottom edge 55 of back 50. These integrally moulded projecting buttons and tabs facilitate securement of the upholstered inner seat 60 and inner back 80 to seat 40 and back 50 respectively. Inner seat 60 is rolled over along its front edge to define a front lip 61 and it is turned sharply over along its rear edge to define a rear lip 62. Front lip 61 includes three spaced holes 63 therein, whose positions correspond generally to the front projecting buttons 47 of seat 40. In this manner, inner seat 60 is secured along the front edge of supporting seat 40 by snapping the enlarged heads of projecting buttons 47 through the holes 63 of inner seat 60. Rear lip 62 includes three spaced slots 64 (Fig. 11) spaced at intervals corresponding to the spacing of tabs 48, and each having a length corresponding approximately to the width of a tab 48, so that the rear of inner seat 60 is secured in place by snapping rear lip 62 over the rear edge 46 of supporting seat 40 with tabs 48 projecting into slots 64.

Inner back 80 is similarly moulded of basically the same plastics of which supporting seat 40 and supporting back 50 are moulded and has a thickness of approximately 1/8 inch. As with inner seat 60, inner back 80 must have sufficient thickness and rigidity to hold its shape during the covering process and to hold its shape when secured to supporting back 50. Inner back 80 is moulded to have a configuration corresponding generally to the configuration of the front surface of supporting back 50 in the area of the well 52 of back 50 (Figs. 10 and 13). Inner back 80 is approximately as wide as the distance between the inwardly facing walls of side channels 51 of supporting back 50. Inner back 80 includes a rolled over bottom lip 81 and a rolled over top lip 82 which fit over the bottom edge 55 and top edge 56 of back 50 respectively. Top lip 82 includes four spaced holes 84 therein which receive the four spaced top projecting buttons 58 of back 50 and bottom lip 81 includes three spaced bottom holes which are spaced to correspond to buttons 57 and into which snap the heads of bottom buttons 57. The bottom holes are formed in a manner similar to holes 84.

Inner seat 60 is covered with an upholstery covering composite 70 which includes a layer of cushioning material 71 and suitable upholstery material 72 (Figs. 11 and 12). The cushioning material is adhered to the top surface of inner seat 60 with a suitable adhesive. Similarly, the upholstery 72 is adhered to the cushioning material 71 by suitable adhesive. Additionally, the upholstery 72 is wrapped around all of the edges of inner seat 60 and is attached by adhesive or possibly by other fastening means along the upholstery edges to the rear surface of inner seat 60. Fig. 11, which is a view of inner seat 60 from the underside, is helpful in illustrating the manner in which the upholstery 72 is wrapped around the edges of inner seat 60 and adhered to the rear undersurface thereof.

Back upholstery covering composite 90 is similar and includes a layer of cushioning material 91 which is adhered to the front surface of inner back 80 and a layer of upholstery 92 which covers cushioning 91 (Fig. 13). Upholstery 92 is wrapped around all of the edges of inner back 80 and is attached to the rear surface thereof as above. Fig. 10 is a generally rear perspective view of inner back 80 and shows the manner in which upholstery 92 is wrapped over its edges and adhered to the rear surface thereof.

Arms 100 of the present chair are an optional attachment (Figs. 3 and 4). Each

arm 100 is a bar of metal such as cast aluminium formed sheet steel, or the like which is generally U-shaped in configuration and which includes a forward end portion 101 and a rear end portion 102 which project inwardly toward the centre of the chair, out of the generally vertical plane of the remainder of the generally U-shaped arm 100. The forward projecting end portion 101 fits snugly into the channel defined by front strut 22 of stretcher 20 and the rear end portion 102 fits snugly into the channel defined by rear strut 23. Each end portion includes a pair of spaced threaded bolt holes 103 therein whereby a suitable bolt fastening can be used to secure the end portions 101 and 102 to their respective struts 22 and 23. It will be noted that matching holes 104 are provided in all of the struts to facilitate passing of the bolts through the struts.

In assembly, the inner seat 60 and inner back 80 are covered with cushioning 71 and 91 respectively and upholstery 72 and 92 respectively in the manner indicated above. Arms 100 may be added optionally to the struts of stretcher 20. The supporting seat 40 and supporting back 50 are then secured to the side rails 30 in the manner indicated above and the covered inner seat and inner back are secured to the supporting seat and supporting back respectively in the manner indicated above. The completed assembly is then secured to base 10.

THE SHELL TYPE CHAIR

The second type of upholstery and cushioning comprises a seat upholstery and cushion assembly 210 and a back upholstery and cushion assembly 220 (Fig. 14). An urethane foam pad 211 of relatively firm density is glued directly to supporting seat 40. Glued to it is a less dense material 212 and lying on top of it is a top pad 213 which is approximately the same density as layer 212, but which lies loosely on top of layer 212 whereas layer 212 itself is glued to the bottom pad 211. All of this generally conventional cushioning is in turn covered with an upholstery layer 214 which is wrapped around the edges of supporting seat 40 and is stapled, glued or both to the rear surface of supporting seat 40 as shown in both Figures 14 and 15. It will be noted by reference to Figure 15 and Figure 18 that the spaced side rails 30 are completely covered by the upholstery material 214.

In a similar manner, the upholstery and cushion assembly 220 which covers supporting back 50 includes a bottom pad or cushion 221 of relatively firm density which is loosely covered by a less dense pad 223. The bottom edges of these upholstery pads are simply allowed to project through the space between supporting seat 40 and supporting back 50. An upholstery covering 224 covers these pads and is wrapped around the top and side edges of supporting back 50 and is glued and/or stapled to the rear of supporting back 50 in such a way that the spaced side rails 30 are covered.

The bottom edge of upholstery material 224 is pulled down through the opening between supporting seat 40 and supporting back 50 and is wrapped around and stapled or glued to the underside of supporting seat 40 along its rear edge (Figs. 14 and 15). It is actually lapped over the top of the rear edge of upholstery covering 214. In this way, the supporting seat 40 and back 50 are covered in a continuous manner as though they were a single unit, and no space shows between the two in the finally assembled chair. This is in contrast to the sling type chair where a space between the upholstered supporting seat 40 and back 50 is clearly visible and is part of the design.

One advantage to having the space between the supporting seat and back is the ability to easily pull the bottom of covering 224 through the space and secure it to the rear edge of supporting seat 40, thereby creating a neat tuck or seam appearance at the juncture of the seat and back of the shell type chair. Another advantage is that while the lumbar region is clearly supported by the supporting back 50, the rear of the buttocks of a person seated in the shell type chair are more softly received and supported by that portion of the back cushion assembly which projects through the space between supporting seat 40 and back 50, thereby providing a softer comfort in that area of the body.

Shell 230 is a moulded plastics shell with integral seat and back covering portions (Figs. 16, 17 and 19). It is moulded of a material such as polypropylene, polyethylene or the like of a soft, flexible grade so that it will give or yield slightly when it comes into contact with an article of furniture.

Moulded into shell 230 is a groove 231 which opens to the rear and bottom of the chair. It extends generally along the top and side edges of the shell, spaced a short distance in from the edge of the shell. The depth of groove 231 is approximately 3/4 inch, although at some points it is shallower, particularly at the points where the arms are to be secured to the chair, along the side of the seat covering portion of shell 230 (Figs. 16 and 19). Groove 231 is also relatively narrow, approximately 1/4 inch, although it is slightly wider at the top than at the bottom to facilitate withdrawal of shell 230 from the mould. Because of the depth and narrowness, it serves to conceal from casual view the small fastener screws 232 which are used to secure shell 230 to the rest of the chair 2.

Specifically, shell chair 2 is assembled by

first assembling the basic components shown in Figure 5 (excluding arms 100 and base 10). The upholstery and cushion assemblies 220 and 210 are then secured to supporting back 50 and supporting seat 40 as explained above. Shell 230 is then located to the rear of the assembly shown in Figure 14 and is secured to spaced side rails 30 by means of fastening screws 232 (Figs. 18 and 19). The screws 232 are located within groove 231 at various points along the seat and back portions of spaced side rails 232. For good measure, one or two fastening screws 232 may be located in that portion of groove 231 which runs along the upper back of the chair, with the fastening screws 232 extending into inner supporting back 50. A similar arrangement could be employed along the front of the seat, although it is not necessary. In fact, no groove 231 is provided along the front edge of shell 230 in the preferred embodiment.

An alternative set of arms 200 may be secured to shell type chair 2. In assembly, the alternative arms 200 would be secured prior to securing shell 230. Arms 100 could be used if the outer shell was modified to provide greater clearance in notch 233 (Figs. 16 and 19), but the use of the alternative arm 200 adds further variety to the two different lines of chairs. Arm 200 is an oval type arm with a flange 201 including inwardly projecting mounting portions 203 which bolt within the channels defined by the struts 22 and 23 of stretcher 20, just as the ends of arms 100 fit into and are bolted to struts 22 and 23 (see Figs. 4 and 6). The inwardly protruding groove 231 is reduced or eliminated and shell 230 is notched slightly at 233 to accommodate the passage of flange 201 and projections or mounting portions 203 through shell 230 and into the receiving channels defined by struts 22 and 23. A suitable arm cap assembly 202 is also provided as a further decoration.

Just as arms 200 are different from arms 100 employed in the sling type chair, so too a different base 10*a* can also be employed in the shell type chair (Figure 19). Once shell 230 is assembled to the chair, the entire assembly can be secured to the base 10*a*. A suitable aperture 234 is provided in the bottom of shell 230 to allow the passage of the upper pan of chair control 13 of base 10*a* through shell 230 and to facilitate its securance to stretcher assembly 20.

CONCLUSION

While we have specifically described a sling type chair similar to that described in our Patent No. 1 451 426, and while we have described a particular shell type chair as part of the system, it will be apparent that various changes and alterations can be made to both the sling chair design and the shell chair design.

RELATED APPLICATIONS

Attention is directed to the specification and claims of Patent Application No. 1654/78 (Serial No. 1 600 141) from which this application has been divided and Patent Applications Nos. 25115/78 (Serial No. 1 600 142) and 25117/78 (Serial No. 1 600 144) which have also been divided from Application No. 1654/78.

WHAT WE CLAIM IS:–

1. A shell-type chair including: an inner member defining a seat and a back; an outer shell covering the rear and undersurfaces of the back and seat of the inner member; the shell including groove means comprising at least one narrow groove extending inwardly towards the inner member, the base of the groove making contact with at least portions of the inner member; the or each groove being visible when the chair is viewed from the rear; and fasteners located in the groove and securing the shell to the inner member; the or each groove being sufficiently deep and narrow that the fasteners are not readily visible on casual viewing of the chair and can be seen only by more careful inspection of the or each groove in the shell.

2. A shell chair as claimed in Claim 1 in which the groove means is located at least at either side of the shell in the back portions thereof.

3. A shell chair as claimed in Claim 1 or Claim 2 in which the inner member is a body supporting member capable of supporting the weight of a person seated in the chair in normal usage, the outer shell being a decorative non-load-bearing trim member secured to the inner member and being spaced therefrom over most of its area, with the exception at least of portions of the groove means which come into contact with the inner member.

4. A shell chair as claimed in Claim 1 or Claim 2 or Claim 3 in which the inner member comprises seat and back members secured in a frame, the fasteners extending into the frame to secure said shell to said inner member.

5. A chair as claimed in Claim 4 in which there is a space between the seat and back; upholstery and cushioning means being adapted to fill in and cover the space between the seat and back.

6. A chair as claimed in Claim 5 in which the upholstery and cushioning means comprises cushioning covering the back and extending downwardly into the space between the seat and back; back upholstery being wrapped around the top and side edges of the back and including a downwardly extending portion extending down behind the rear edge of the seat and being wrapped around and secured along the bottom surface of the seat along its rear edge.

7. A chair as claimed in Claim 6 in

which the upholstery and cushioning means includes cushioning secured to the seat and seat upholstery covering the cushioning and being wrapped around the front, side and rear edges of the seat and being secured to the undersurfaces of the seat; the downwardly extending back upholstery which covers the back being secured to the rear undersurface of the seat overlapping that portion of the seat upholstery which wraps around and is secured to the underside of the seat along its rear edge.

8. A chair as claimed in any of the preceding claims in which the inner member is secured in a frame comprising two side rails, and which is adapted so that a sling-type chair can be produced by substituting upholstery and cushioning means and removing the shell, the additional components comprising: sling-type upholstery and cushion means shaped and adapted to cover the front surface of the back portion and the upper surface of the inner member without covering the side rails at the rear of and beneath the inner member.

9. A chair as claimed in Claim 8 in which the sling-type upholstery and cushion means comprises formed plastics inner seat and back means having a shape conforming generally to the front surfaces of the back portion and the upper surface of the seat portion of the inner member and cushioning and upholstery covering the face of the inner member, the said upholstery including portions wrapped around the edges of the inner member to the rear surface thereof and secured thereto.

10. A chair as claimed in Claim 8 or Claim 9 in which the inner member includes an integrally formed channel immediately at each side edge thereof whereby the body supporting portions of the inner member can lie entirely between the said channels, each said channel being seatable over one of said spaced side rails generally to follow the contour of its respective side rail as it extends along the seat and back supporting portions of its respective side rail; the sling-type upholstery and cushioning means terminating along its side edges short of and adjacent said channels whereby the presence of said side rails is accentuated and readily apparent when a sling-type chair is produced.

11. A chair as claimed in Claim 10 in which the inner member comprises a separate seat and a separate back with a space therebetween when a sling-type chair is produced; the sling-type upholstery covering means comprising means for separately covering the supporting seat and the supporting back such that the said space therebetween is clearly visible when a sling-type chair is produced; the first upholstery and cushioning means being adapted to fill in and cover the said space between the supporting seat and supporting back means when a shell type chair is created.

12. A chair as claimed in Claim 11 in which the first upholstery and cushioning means comprises cushioning covering the supporting back and extending downwardly into the space between the supporting seat and back; back upholstery being wrapped around the top and side edges of the supporting back and including a downwardly extending portion extending down behind the rear edge of the supporting seat and being wrapped around and secured along the bottom surface of the supporting seat along its rear edge.

13. A chair as claimed in Claim 12 in which the first upholstery and cushioning means includes cushioning secured to the supporting seat and seat upholstery covering the said cushioning and being wrapped around the front, side and rear edges of the supporting seat and being secured to the rear surfaces of the supporting seat; the downwardly extending back upholstery which covers the back being secured to the rear undersurface of the supporting seat overlapping that portion of the seat upholstery which wraps around and is secured to the undersurface of the supporting seat along its rear edge.

14. A chair as claimed in any one of claims 8 to 13, which includes first and second sets of arms which are different from one another, one set of arms being secured when a sling-type chair is desired and the other set of arms being secured when a shell-type chair is desired.

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1600143 COMPLETE SPECIFICATION
9 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 1

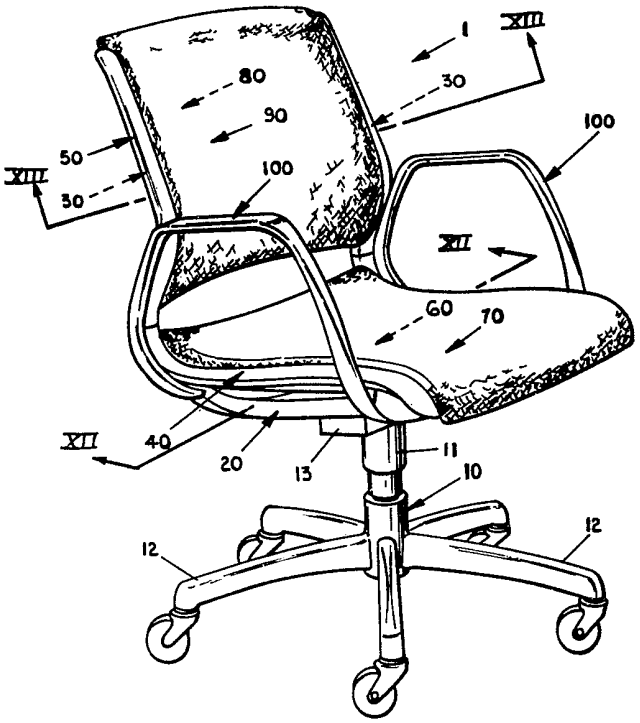

FIG. 1.

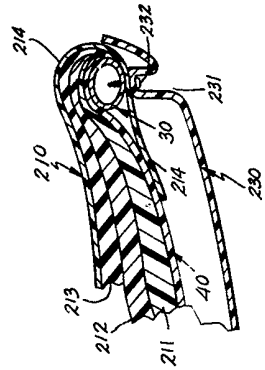

FIG.18.

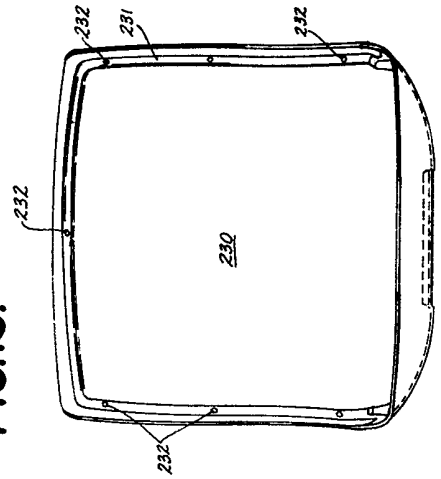

FIG.17.

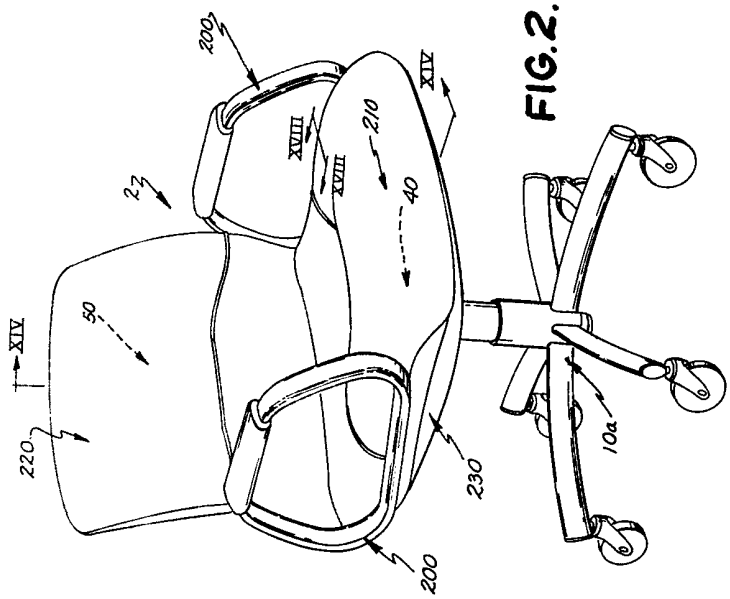

FIG.2.

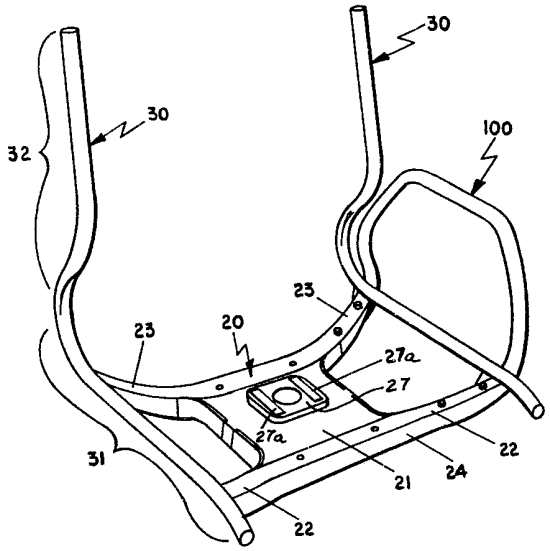
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FIG. 3.

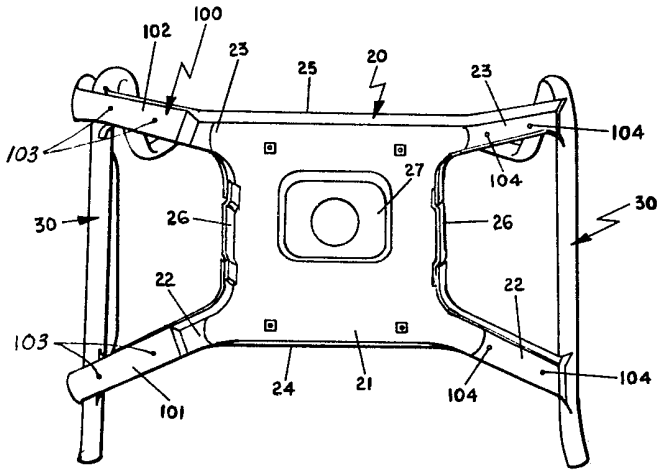
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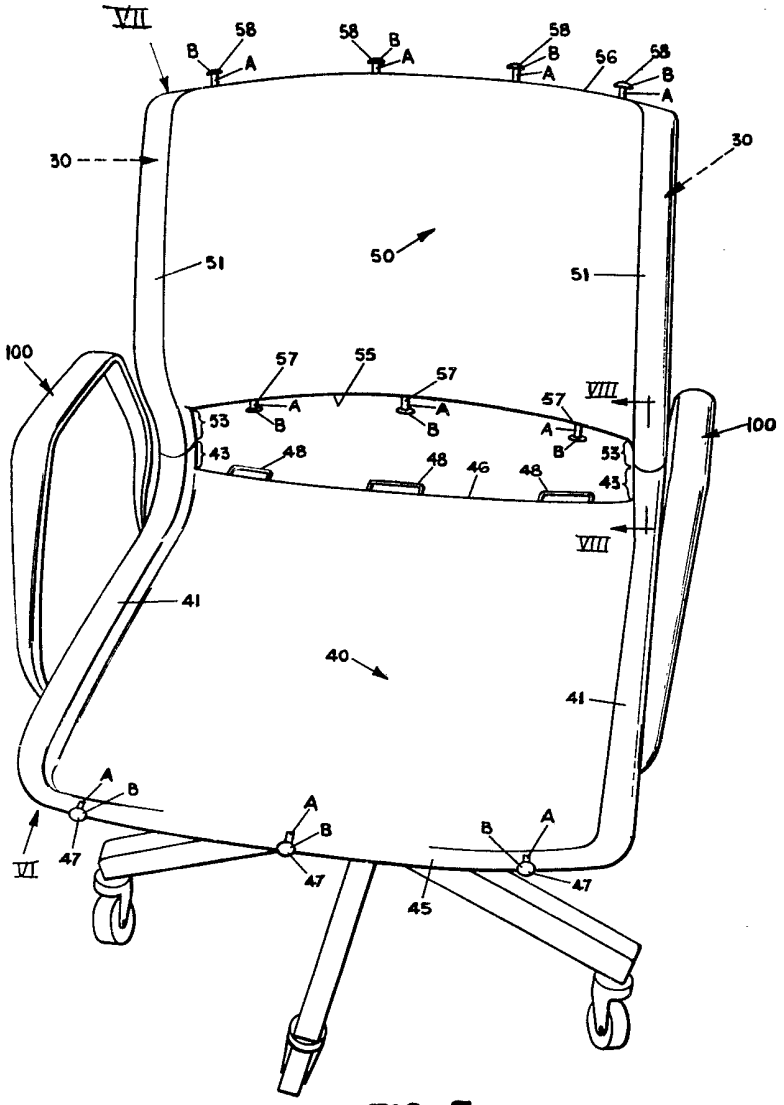
FIG. 4.



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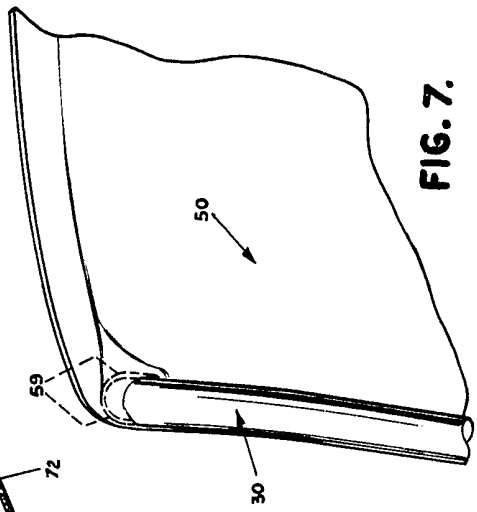

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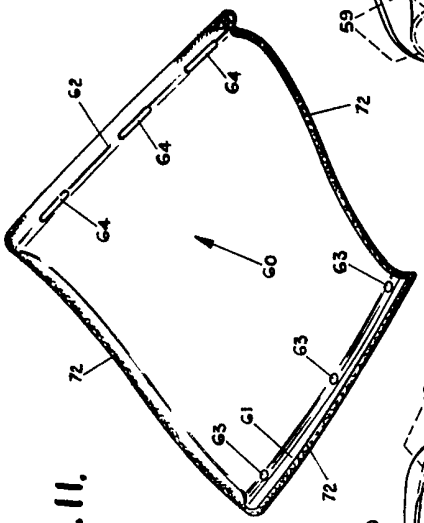

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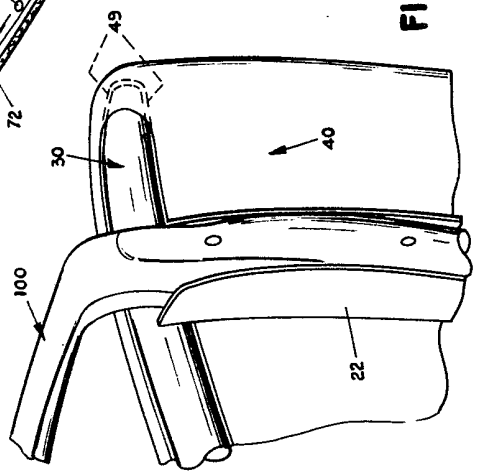
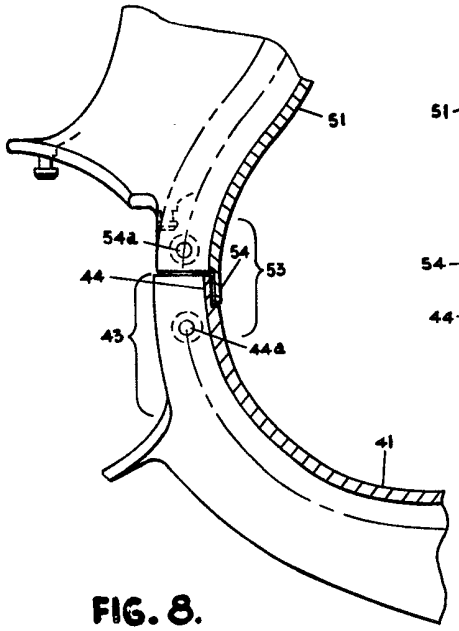


FIG. 6.



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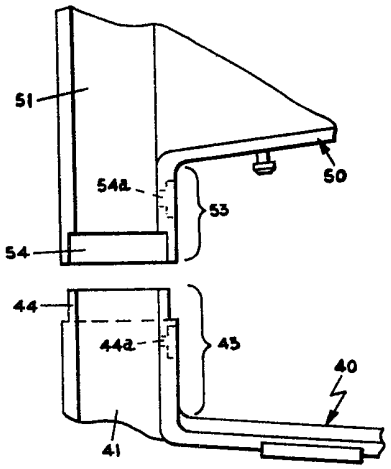


FIG. 9.

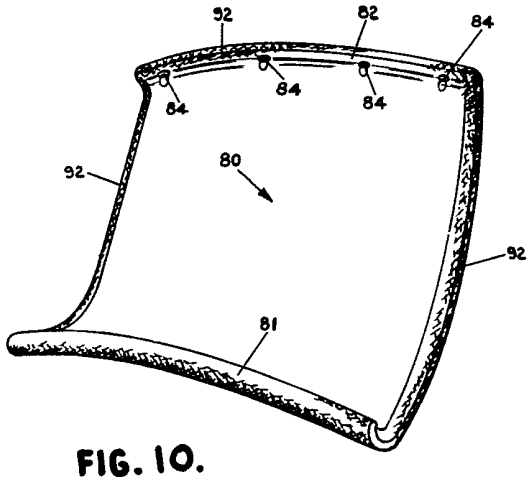
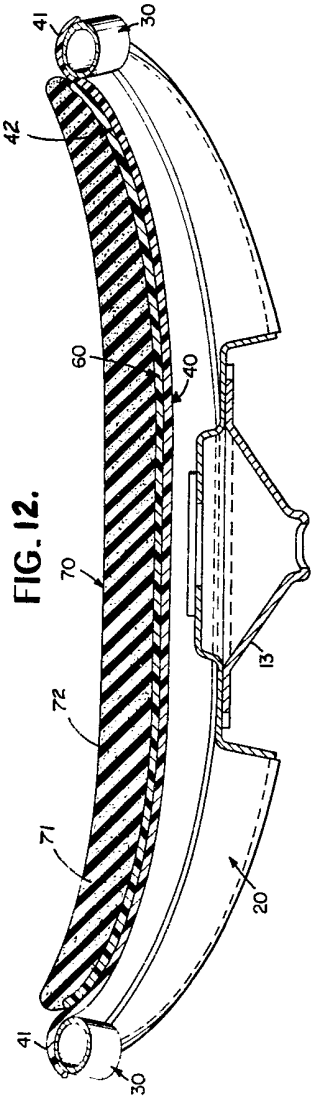


FIG. 10.



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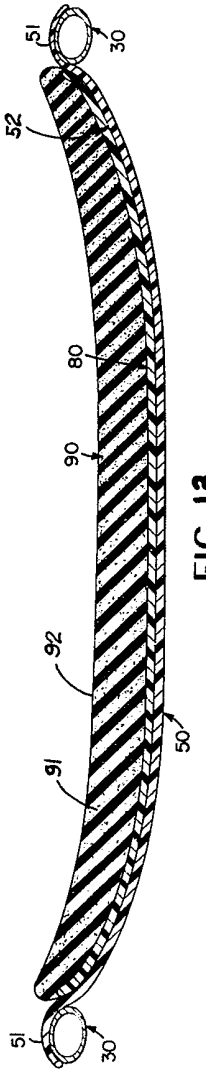

FIG. 13.

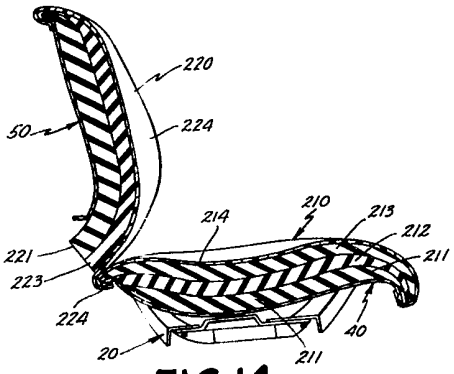

FIG. 14.

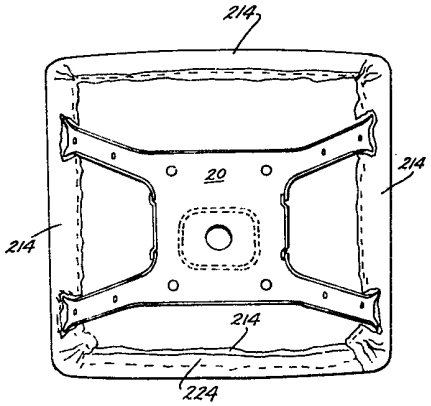

FIG. 15.

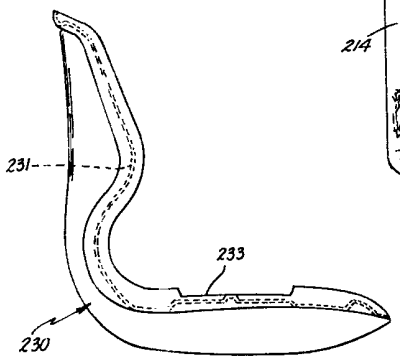

FIG. 16.

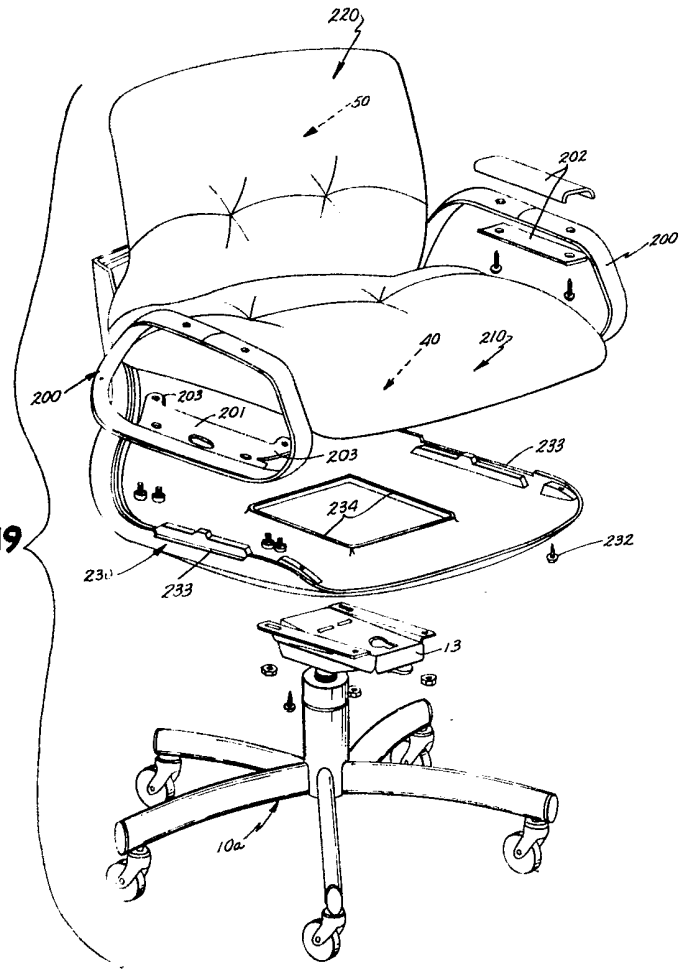

FIG.19