

Dec. 24, 1963

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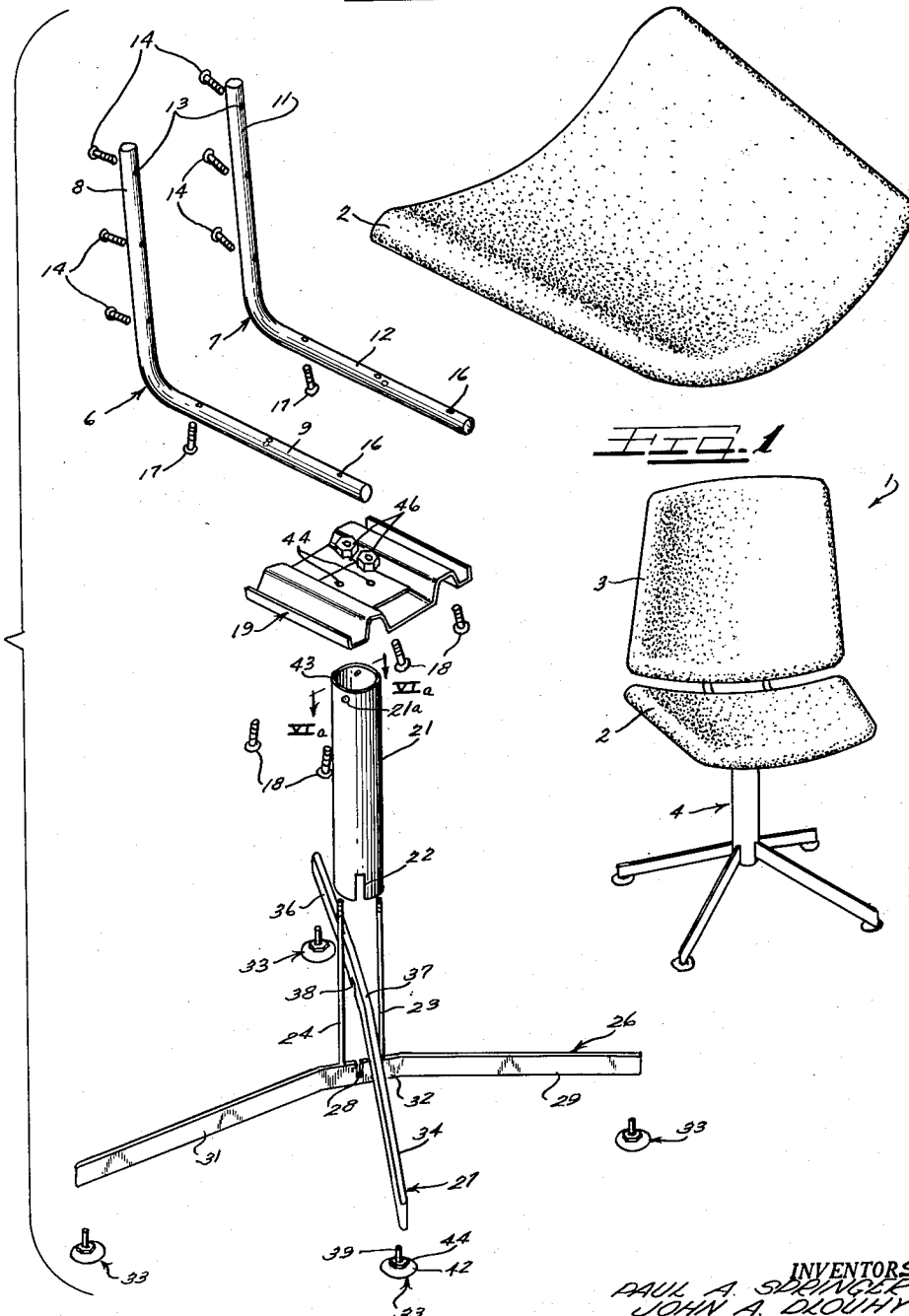
3,115,368

CHAIR STRUCTURE AND SUPPORT

Filed April 26, 1962

3 Sheets-Sheet 1

FIG. 2



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3 Sheets-Sheet 2

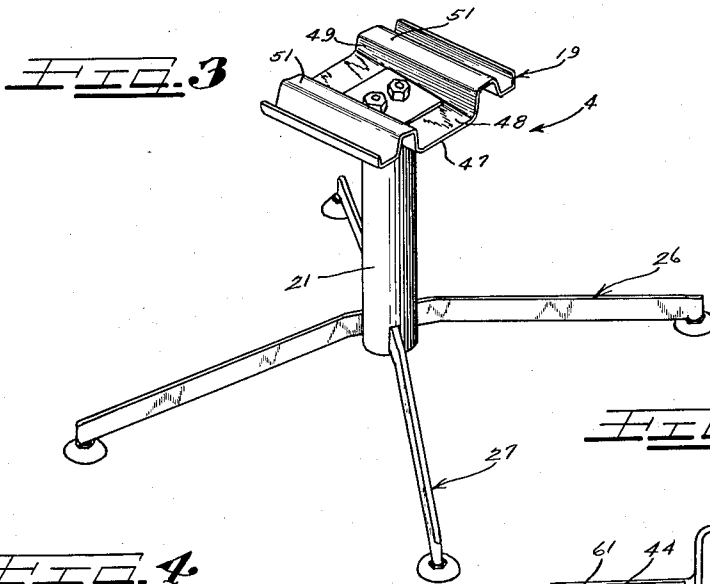


FIG. 4

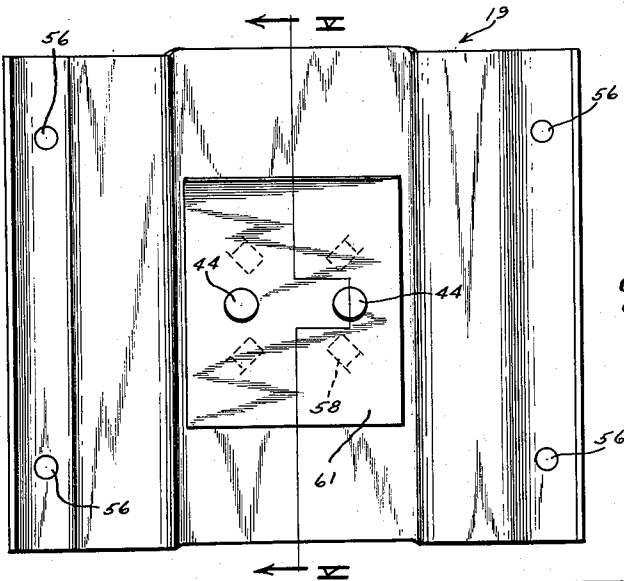


FIG. 7

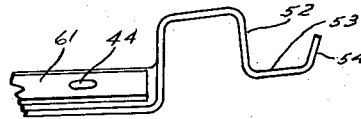


FIG. 6

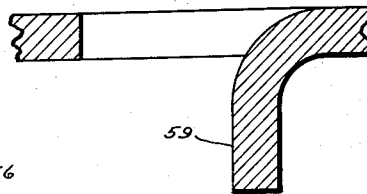


FIG. 5

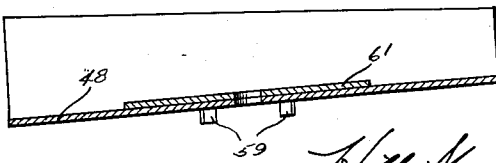
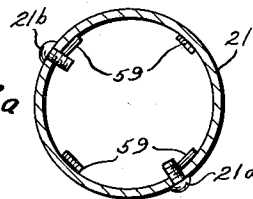


FIG. 6a



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3,115,368

Filed April 26, 1962

3 Sheets-Sheet 3

FIG. 8

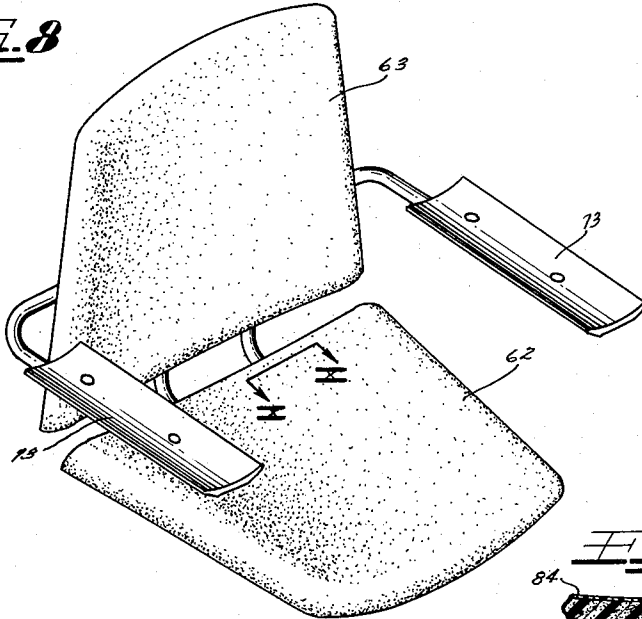
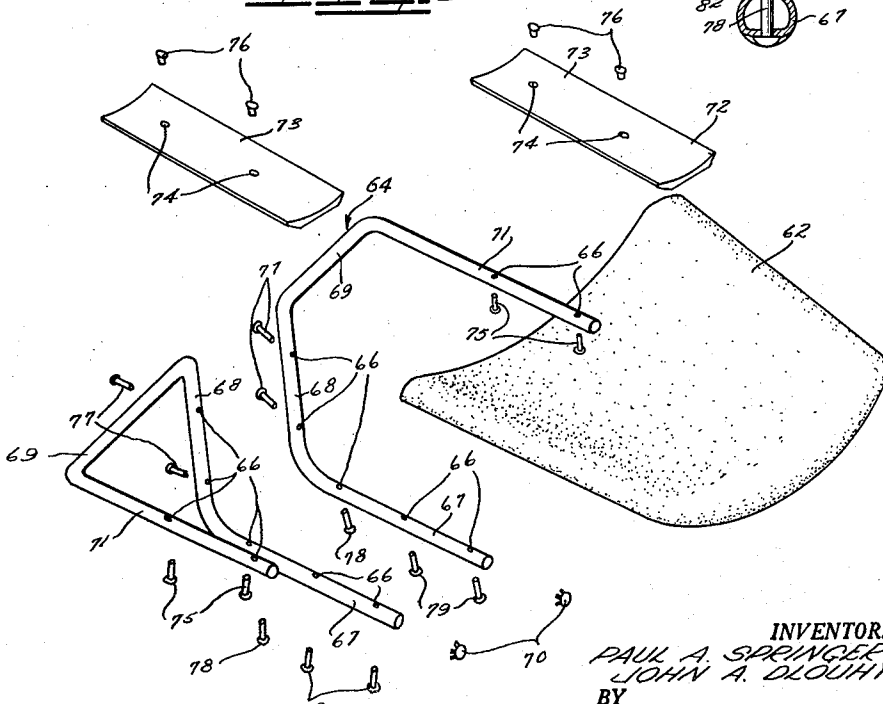
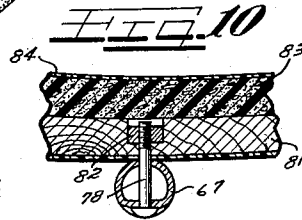


FIG. 9



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1

3,115,368

CHAIR STRUCTURE AND SUPPORT

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Filed Apr. 26, 1962, Ser. No. 191,402
11 Claims. (Cl. 297-451)

This invention generally relates to a chair and more specifically relates to a long enduring, inexpensive, sturdy chair for commercial use.

The chair manufacturing industry is highly competitive. The industry is always striving to build a long enduring inexpensive chair. The present invention provides such a chair in reducing high labor cost, and the complexity of the numerous parts that have to be assembled to produce chairs. Therefore an economical long lasting chair is possible with the present invention.

A chair which is used in commercial offices, such as the chair of the present invention, is subjected to abusive treatment and therefore it must have unusual stability and endurance. These chairs are occupied by people of various sizes and shapes and must support these various people comfortably.

An ideal chair for commercial use, is one that "fits" all users; has a long life; has "eye pleasing" appearance; has readily replaceable parts; has a strong resistance to abusive treatment; and is relatively inexpensive. The chair of the present invention revolutionizes the chair industry by having all these ideal attributes. The chair is well suited to use as a beauticians chair for example and will have longer life span with an inexpensive repair and replacement cost.

It is therefore an object of the present invention to provide a commercial chair which can be produced economically, which is attractive in appearance, and is very comfortable.

It is another object of the present invention to produce a chair having a long life span and utilizing a minimum of parts.

It is still another object of the present invention to manufacture a commercial chair using parts which may be readily replaced by spare parts.

It is still another object of the present invention to produce a commercial chair having long lasting durability and stability with an inexpensive repair and replacement index.

On the drawings:

FIGURE 1 is a front elevational view of a commercial chair of the present invention.

FIGURE 2 is an elevational view of the individual parts utilized in forming the chair of FIG. 1.

FIGURE 3 is an elevational perspective view of the face support of the chair shown in FIG. 1.

FIGURE 4 is a cross elevational view of the seat support plate used to support the seat of FIG. 1.

FIGURE 5 is a side elevational view taken along the lines V-V of FIG. 4.

FIGURE 6 is a fragmentary elevational view taken along the lines VI-VI of FIG. 4.

FIGURE 6a is a horizontal sectional view taken substantially along line VIa-VIa of FIG. 2, with the section taken with the parts assembled.

FIGURE 7 is a fragmentary elevational view taken along the lines VII-VII of FIG. 4.

FIGURE 8 is a front elevational view of another seat embodiment of the present invention.

FIGURE 9 is an elevational view of the individual parts utilized to produce the seat of FIG. 8.

FIGURE 10 is a fragmentary sectional view taken along the lines X-X of FIG. 8.

2

As shown on the drawings:

Present commercial chairs are easily damaged by the abusive treatment they receive from customers. These chairs cannot withstand the constant hard use to which they are subjected. Further, when they are damaged, they have to be repaired by a skilled laborer and in the majority of cases completely renovated. These repairs, of course, add to the "life" cost of the chair. That is the total cost of a chair for its entire life.

The present invention not only provides a chair whose initial cost is less but provides a chair with a drastically lower "life" cost. The chairs of the present invention have parts which are interchangeable and are readily replaceable—similar to spare parts in the automotive industry.

Another factor, of course, is that the spare parts in the chair of the present invention do not require any special training to install on the chair. All that is needed is the ability to operate a screwdriver and wrench. Therefore, our chair provides the chair industry with a chair having an inexpensive repair and replacement index. The repair and replacement cost is less than known chairs because the purchaser of the chair may merely order the individual part which is mass produced and stock piled and install it himself. The present invention has therefore solved the perennial problem of producing a simple economical yet long enduring chair for commercial use.

Referring to FIG. 1 there is shown a commercial chair 1 of the present invention having a seat 2 and a back rest 3. The chair is mounted on a support assembly 4. As is shown in FIG. 2 one of the valuable assets of the present invention is the fact that it uses a minimum of parts and that the parts may be manufactured on an assembly line type of operation whereby a spare part inventory may be built up. The seat cushion 2 and the back cushion 3 have a concave face 5 and are of the same configuration and are interchangeable. By using interchangeable parts manufacturing costs are reduced to a minimum in that only one standard piece need be upholstered to serve for both the back and the seat. Also, the use of concave configuration for the seat and back cushion prevents sacrificing the seating comfort of the chair. The cushion therefore will be referred to as merely a cushion 2 when describing FIG. 2. It being understood that it also forms the back cushion.

The seat and back cushions are assembled by a pair of angle cushion support frames 6 and 7. The seat-back frames 6 and 7 are formed by bending a rod or tube member to have legs at an angle to each other and being of an equal length. The frame 6 has legs 8 and 9 equal in length to each other and the frame 7 has equal legs 11 and 12. Legs 8 and 11 each have three holes 13 drilled therethrough to accommodate bolts 14. Each leg 9 and 12 has three holes 16 drilled therethrough to accommodate bolts 17 and 18. The frames 6 and 7 are shown as being bent with their legs at substantially right angles but it is understood that the frames may be bent at any desired angle to obtain the right angle for the comfort of the occupant.

It is noted, that the frames 6 and 7 are interchangeable with each other and that also the legs of each frame are also interchangeable. Therefore, either leg of each frame may be used to fasten the seat or the back rest. It may once again be seen by this feature that the present chair has an economical feature of manufacture. Only one seat-back frame need be manufactured and thereby manufacturing costs are drastically reduced as are the assembly costs.

The seat support assembly 4 comprises a mounting plate 19, hereinafter described, having a mounting tube 21 with four equally spaced slots 22 cut in the base

thereof. The mounting tube is fastened to the mounting plate 19 by bolts 23 and 24.

The base of the seat support assembly is formed by two intersecting legs 26 and 27. The leg 26 has equal arms 29 and 31 that incline from their ends and are joined by a horizontal joining arm 32. The horizontal joining arm has bolts 23 and 24 extending perpendicular therefrom and a slot 28 cut in the center between the bolts 23 and 24 in the top portion thereof. The ends of the arms 29 and 31 have threaded bores in the bottom thereof to accommodate leveling glides 33.

The leg 27 has equal arms 34 and 36 that incline from their ends and are joined by a horizontal joining arm 37. The bottom of the horizontal joining arm has a slot 38 which is used to join the leg 27 to the leg 26. The ends of said arms 34 and 36 have threaded bores, at the bottom thereof, to receive leveling glides 33.

Each leveling glide 33 is composed of an extending bolt 39, that is threaded into the bores at the respective ends of the legs 26 and 27, and a nut 41 which securely adjusts the height of the leveling glide 33 to said leg ends. The extending bolt 39 may be pivotally connected to the base 42 of the leveling glide to enable the base 42 to sit firmly on any irregular floor surface.

Referring to FIG. 3 there is shown the assembled seat support 4. The legs are assembled by placing the slot 38 in the slot 28 and having the top surface of arm 32 flush with the top surface of arm 37. The mounting tube 21 is slid over the bolts 23 and 24 and keyed to the legs 26 and 27 at their respective horizontal arms 32 and 37, by the slots 22 in the bottom of the mounting plate 21. The bolts 23 and 24 extend beyond the mouth 43 of the mounting tube 21 when said mounting tube is in position. The mounting plate 19 is fastened to the mounting tube by accommodating holes 44 and nuts 46 which fasten the mounting plate 19 onto the bolts 23 and 24. The leveling glides are then threaded into the ends of the legs 26 and 27 and the seat support 4 is then complete, as is shown in FIG. 3.

Referring to FIGS. 4 through 7, there is shown in detail the mounting plate 19. The mounting plate 19 is used to hold the seat in a position declining from the front edge to the back of the seat. The mounting plate is a rectangular plate having a front edge 47. In the central portion of the plate 19 is formed a well 45 formed by an inclining base 48 and two sides 49 which are normal to the base 48. The base 48 inclines from the front edge 47 to the rear of the plate 19. Extending from each side 49 is a stepped flange 50 having a flat surface 51 that inclines from the sides 49. The flat surface 51 is bent downwards to form a depression having a side 52, normal to the flat surface 51; a base 53, whose plane is parallel to the plane of the flat surface 51; and an up-turned end side, which forms an obtuse angle with the base 53. The surfaces 51 and 53 preferably incline approximately $5\frac{1}{2}^\circ$ to the horizontal plane. The surface 53 does not have to be parallel to the plane of the surface 51 and the incline of the surfaces 53 and 51 depends upon the curvature of the seat cushion.

Through the base 53 are drilled holes 56 and drilled through the inclined well base 48 are holes 57. The holes 57 are in the center of the base 48 and are 180° apart with the center line that connects them being normal to the two sides 49. Spaced 45° from each side of each hole 57 are formed four rectangular apertures equally spaced 90° apart from each other. The rectangular apertures 58 are formed by the inwardly pushed tabs 59. The apertures 58 and holes 57 are within a circumference formed by the bore in the mounting tube 21 and the tabs 59 aid in securing the plate to the mounting tube.

On top of the base 48 is spot welded a rectangular mounting plate stiffener 61. The mounting plate stiffener 61 has holes which align with the holes 57 in the well base 48. The stiffener plate extends the entire width of the base 48 but only a portion of the length.

It is noted, that preferably the only surface on an incline to the edge 47 is the surface 48, the incline of which is dependent on how much incline of the chair is desired. The surfaces 51 and 53 extend parallel to the front edge 47 of the mounting plate 19.

The inturned tabs 59 contact the inner circumference or inner surface of the mounting tube 21 and thus aid in fastening the mounting plate to the mounting tube 21.

As shown in FIGURE 6a, the mounting plate 19 is prevented from rotating with respect to the tube 21 by radially extending rotation preventing screws 21a and 21b. These screws are threaded radially inwardly in threaded holes in the tube, and self tapping screws may be used if desired, with the screws positioned so that they engage the lateral sides of the tabs. The seat is thereby prevented from rotating relative to the legs and will be located in a fixed rotational position at the time of assembly.

The cushion frames 6 and 7, with the seat and back cushion fastened thereto, are then attached to the mounting plate 19 by screws 18 inserted through the holes 56 in the mounting plate and the holes 16 in the frames and screwed into nuts embedded in the back side of the seat cushion.

It is seen, that to assemble the chair of the present invention, all that is needed is a screwdriver and a wrench. Therefore, the chair may be easily assembled with a minimum of operations which substantially lowers the cost of the chair.

Another top frame arrangement is shown by FIGS. 8 to 10. This structure shows interchangeable concave cushions 62 and 63 being fastened together by two integral seat-back-arm frames 64. The seat-back-arm frame 64 has a tubular construction with holes 66 drilled therethrough. The frame 64 is formed by bending a tube or rod to form a horizontal seat leg 67; a back leg 68, which is perpendicular to the seat leg; a leg 69 extending towards a side of the chair, which forms a plane with the leg 68 that extends perpendicular to the plane formed by the legs 67 and 68; and an arm rest leg 71 extending towards the front of the chair, which forms a plane with the leg 69 that is perpendicular to the plane formed by the legs 69 and 68. Inserts 70 are placed on the ends of the arm legs 67 to form smooth round ends. The two seat-back-arm frames are bent to form rounded corners and the leg 69 is preferably declined from the leg 68. It is of course understood that the back-seat-arm frame may be bent, as desired, to have an angular relationship between its respective legs other than that described above.

An arm rest 72 is held parallel to the seat cushion by the leg 71. It has a concave top surface 73 with holes 74 drilled therethrough and is attached to each leg 71 by screws 75 passing through the holes 66 and into the holes 74. The arm studs 76 have a top surface that is flush with the arm surface and forms a smooth contour therewith when the arm 72 is fastened to the arm support 71.

The back cushion is fastened to the two back legs 68 by screws or bolts 77 which pass through the hole 66 therein and are screwed into nuts embedded in wood frame which backs the rear surface of the back cushion. This wood frame is shaped and may be formed of plywood.

The seat cushion is fastened onto the seat legs 67 by screws or bolts 78 passing through holes 66 and screwed into nuts embedded in wood frame the underside of the seat cushion 62.

The seat assembly as illustrated by FIG. 8 may be placed onto the base support assembly as illustrated by FIG. 3 by placing the bolts 79 through the holes 66 in the seat leg 67 and through the holes 56 in the mounting plate 19 and then screwing the bolts into nuts embedded in the underside of the seat cushion 62.

FIG. 10 shows the manner in which the bolts are fastened onto the cushion. FIG. 10 shows the seat leg 67

5

with the bolt 78 extending therethrough and into the wood frame 81 of the seat 62. The wood frame has a nut 82 embedded therein to threadedly engage the bolt 78 and thus fasten the rod supports to the cushions. The cushions are made from a foam body 83 and a leather or vinyl covering 84.

It has been contemplated that the chair of the present invention be utilized as a reception chair. However, it is understood that the chair of the present invention may also be utilized as a beauticians chair. To utilize it as an adjustable beauticians chair, all that is necessary is to place a hydraulic lift member within the mounting tube 21 or substitute it for the mounting tube.

It is therefore seen that the present invention provides a commercial chair that is economically manufactured and assembled. Further, the chair of the present invention provides a chair which has many major and minor parts which are identical for ease of assembly and reduction of cost.

Although various modifications might be suggested by those versed in the art, it should be understood that we wish to embody within the scope of the patent warranted hereon all such embodiments as reasonably and properly come within the scope of our contribution to the art.

We claim as our invention:

1. A chair having a seat and means to support said chair on a floor whereby said support means comprises: legs for holding the chair seat a predetermined distance above the floor, and a mounting plate for mounting said chair seat to said legs, said mounting plate having a central well, means received in said well fastening said legs to said mounting plate, a base of said well being inclined to the horizontal plane from a front edge of said mounting plate, and the sides of said well extending normal from said base, a pair of stepped flanges extending from each side of said well, and said stepped flanges connected to the underside of said seat to mount the seat whereby the seat is supported on a decline.
2. A chair having a seat and means to support said seat on a floor whereby said support means comprises: a pair of legs holding the chair seat a predetermined distance above the floor, each leg having two arms with an end of each arm supported on the floor, each arm being inclined to the floor from said end, means to connect the two legs to each other, and a mounting plate for mounting said chair seat to said legs, said mounting plate having a central well, means received in said well fastening said legs to said mounting plate, a base of said well being inclined to the horizontal plane from a front edge of said mounting plate, and the sides of said well extending normal from said base, a pair of stepped flanges extending from each side of said well, and said stepped flanges connected to the underside of said seat to mount the seat whereby the seat is supported on a decline.
3. A chair having a separate back cushion and a separate seat cushion comprising: two cylindrical angle means to fasten the seat cushion to the back cushion, said back cushion being interchangeable with said seat cushion,

6

- a pair of legs holding the chair seat a predetermined distance above the floor, each leg having two arms with an end of each arm supported on the floor, each arm being inclined to the floor from said end, means to connect the two legs to each other, a mounting plate for mounting said chair seat to said legs, said mounting plate having a central well with means to fasten said legs to said mounting plate, a base of said well being inclined to the horizontal plane from a front edge of said mounting plate, and the sides of said well extending normal from said base, a pair of stepped flanges extending from each side of said well, and said stepped flanges connected to the underside of said seat cushion to mount the seat cushion whereby the seat is supported on a decline.
4. A chair having a separate back cushion and a separate seat cushion comprising: two cylindrical angle means to fasten the seat cushion to the back cushion, each cylindrical angle means having a leg to mount the back cushion, a leg to mount the seat cushion at an angle to the back cushion, and the seat cushion leg being interchangeable with the back cushion leg, said two angle means being interchangeable with each other, a pair of legs holding the chair seat a predetermined distance above the floor, each leg having two arms with an end of each arm supported on the floor, each arm being inclined to the floor from said end, means to connect the two legs to each other, a mounting plate for mounting said chair seat to said legs, said mounting plate having a central well with means for fastening said legs to said mounting plate, a base of said well being inclined to the horizontal plane from a front edge of said mounting plate, and the sides of said well extending normal from said base, a pair of stepped flanges extending from each side of said well, and said stepped flanges connected to the underside of said seat cushion to mount the seat cushion whereby the seat is supported on a decline.
5. A chair having a separate concave back cushion and a separate concave seat cushion comprising: two cylindrical angle seat-back frames fastening the seat cushion to the back cushion, each cylindrical angle frame having a leg to mount the back cushion, a leg mounting the seat cushion normal to the back cushion, and the seat cushion leg being of an equal length and interchangeable with the back cushion leg, said two angle means being interchangeable with each other, said seat cushion being interchangeable with said back cushion, a pair of legs holding the chair seat a predetermined distance above the floor, each leg having three arms, a horizontal central arm, a pair of side arms declining from said central arm and contacting the floor at their respective ends,

7

a pair of bolts extending vertically from the top of the horizontal arm of one leg,
 a slot defined by the top surface between the bolts on said one leg,
 an accommodating slot defined by the bottom surface of the horizontal arm on the other leg,
 a mounting tube enclosing said bolts,
 said bolts extending beyond a mouth of said mounting tube,
 leveling glides adjustably attached to the floor contacting ends of said leg side arms,
 a rectangular mounting plate for mounting said chair seat to said legs,
 said mounting plate having
 a central rectangular well,
 a rectangular base of said well being inclined to the horizontal plane from a front edge of said mounting plate,
 sides of said well extending normal from said base,
 protruding tabs formed in the base to snugly fit into the mouth of the mounting tube, and
 holes formed in the base accommodating said bolts and thereby insure the mounting plate on the mounting tube,
 a stiffener plate affixed to the well base,
 a pair of stepped flanges extending on an incline from each side of said well,
 each flange defining a longitudinal rectangular depression that extends the length of the rectangular mounting plate,
 said depressions accommodating the seat legs of the seat-back frames, and
 means to mount the mounting plate to said seat legs and the underside of said seat cushion
 whereby the seat is supported on a decline.

6. A chair having a separate concave back cushion and a separate concave seat cushion, and a pair of arm rests comprising:
 two cylindrical angle seat-back-arm frames fastening the seat cushion and rests to the back cushion,
 each cylindrical angle frame having
 a leg to mount the back cushion,
 a leg mounting the seat cushion normal to the back cushion, and
 a leg mounting one of the arm rests parallel to said concave seat cushion,
 said seat cushion being interchangeable with said back cushion,
 a pair of legs holding the chair seat a predetermined distance above the floor,
 each leg having three arms,
 a horizontal central arm,
 a pair of side arms declining from said central arm and contacting the floor at their respective ends,
 a pair of bolts extending vertically from the top of the horizontal arm of one leg,
 a slot defined by the top surface between the bolts on said one leg,
 an accommodating slot defined by the bottom surface of the horizontal arm on the other leg,
 a mounting tube enclosing said bolts,
 said bolts extending beyond a mouth of said mounting tube
 leveling glides adjustably attached to the floor contacting ends of said leg side arms,
 a rectangular mounting plate for mounting said chair seat to said legs,
 said mounting plate having
 a central rectangular well,
 a rectangular base of said well being inclined to the horizontal plane from a front edge of said mounting plate,

8

sides of said well extending normal from said base,
 protruding tabs formed in the base to snugly fit into the mouth of the mounting tube, and
 holes formed in the base accommodating said bolts and thereby securing the mounting plate on the mounting tube,
 a stiffener plate affixed to the well base,
 a pair of stepped flanges extending on an incline from each side of said well,
 each flange defining a longitudinal rectangular depression that extends the length of the rectangular mounting plate,
 said depressions accommodating the seat legs of the seat-back frames, and
 means to mount the mounting plate to said seat legs and the underside of said seat cushion
 whereby the seat is supported on a decline.

7. A chair assembly comprising
 a back and seat,
 a base means having a mounting tube with an open upper end,
 a mounting plate attached beneath the seat and having centering members projecting downwardly at circumferentially spaced locations for centering and laterally supporting the plate on the upper end of said mounting tube,
 and means connected between the plate and base vertically holding the plate against the mounting tube.

8. A mounting plate for a chair having a seat and means to support said seat on a floor wherein said support means has legs for holding the chair seat a predetermined distance above the floor comprising:
 a rigid plate for mounting said chair seat to said legs,
 said plate having a central well,
 means received in said well fastening said legs to said mounting plate,
 a base of said well being inclined to the horizontal plane from a front edge of said mounting plate, and
 a pair of stepped flanges extending from each side of said well to connect the underside of said seat to said plate,
 whereby the seat is supported on a decline.

9. A mounting plate for a chair having a seat cushion and means to support said chair on floor wherein the support means has legs and a mounting means for holding the seat cushion a predetermined distance above the floor
 a rectangular rigid plate for mounting said chair seat to said legs,
 said mounting plate having
 a central rectangular well,
 a rectangular base of said well being inclined to the horizontal plane from a front edge of said mounting plate,
 sides of said well extending normal from said base,
 downwardly protruding tabs formed in the base to center said plate on the chair mounting means,
 a stiffener plate affixed to the well base,
 a pair of stepped flanges extending on an incline from each side of said well,
 each flange defining a longitudinal depression that extends the length of the rectangular plate to connect the underside of said seat cushion to the plate,
 whereby the seat cushion is supported on a decline.

10. A chair assembly comprising:
 a base including a central vertical mounting tube and means for supporting the mounting tube on a floor surface,
 a rigid plate secured on the upper end of said mounting tube having spaced longitudinally extending depressions therein,
 a pair of one-piece angle rods having upwardly extend-

9

ing back leg portions and forwardly extending seat leg portions,
 a back rest secured to said back leg portions,
 a seat secured to said seat leg portions,
 said forwardly extending seat leg portions being seated 5
 in said depressions, and
 means securing the rods in said depressions so that stresses from said back are transmitted through the rods directly to said base through said rigid plate.
 11. A chair assembly comprising, 10
 a base including a central vertical mounting tube and means for supporting the mounting tube on a floor surface,
 a rigid plate secured on the upper end of said mounting tube, 15
 a pair of one-piece angle rods having upwardly ex-

10

tending back leg portions and forwardly extending seat leg portions,
 a back rest secured to said back leg portions,
 a seat secured to said seat leg portions,
 means rigidly securing the rod seat leg portions to said plate so that stresses from said back are transmitted through the rods directly to said base through said rigid plate.

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