United States Patent [19]

Simjian

[11] **3,905,642**

[45] **Sept. 16, 1975**

[54] **CHAIR WITH MOVING SEAT AND MIRROR**

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[52] **U.S. Cl.** **297/185;** 297/349; 350/305

[51] **Int. Cl.**[2] **A47C 7/62**

[58] **Field of Search** 297/185, 240–242, 297/349; 108/103, 134; 248/425; 350/305

[56] **References Cited**

UNITED STATES PATENTS

2,510,351	6/1950	Simjian	297/185 X
2,811,083	10/1957	Simjian	350/305
2,897,727	8/1959	Simjian	350/305
3,806,189	4/1974	Simjian	297/185

Primary Examiner—James C. Mitchell

[57] **ABSTRACT**

A chair construction in which a rotating seat causes counter rotation of a mirror secured to the rear of the chair. Cam means are provided to retain the face of the mirror during rotation of the seat tangential to a circle having its center forward of the center of rotation of the seat.

15 Claims, 7 Drawing Figures

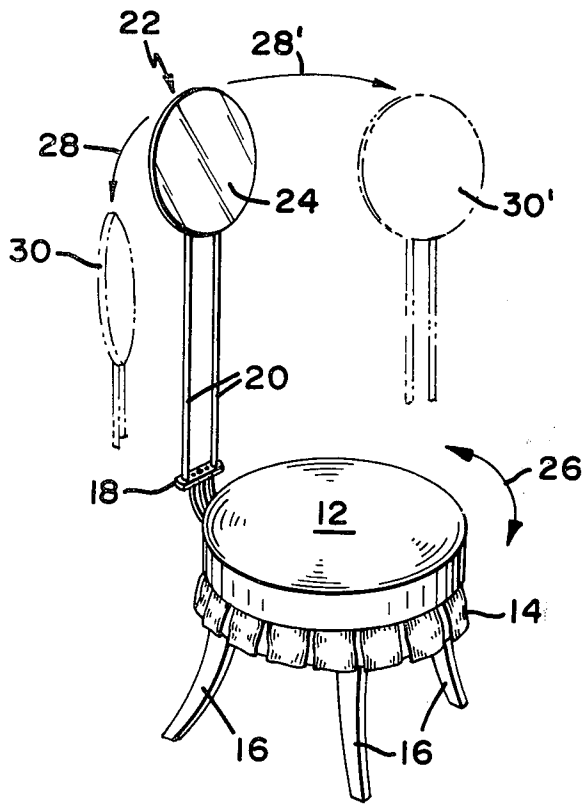


FIG. 1

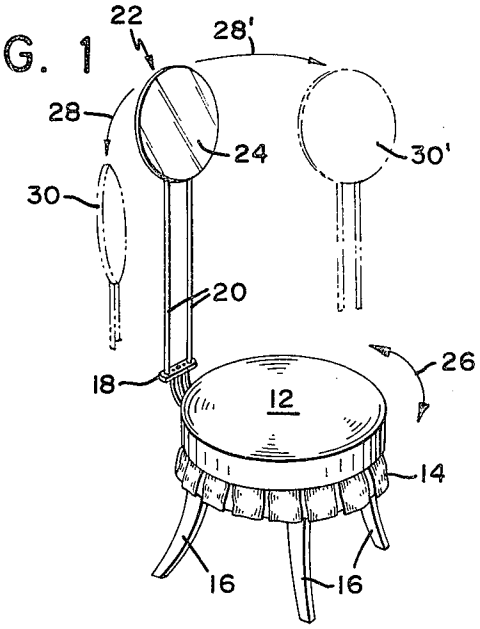


FIG. 5

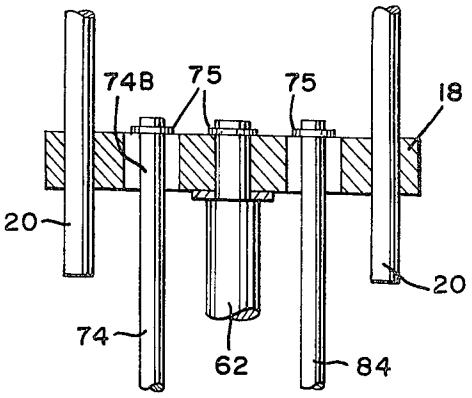


FIG. 2

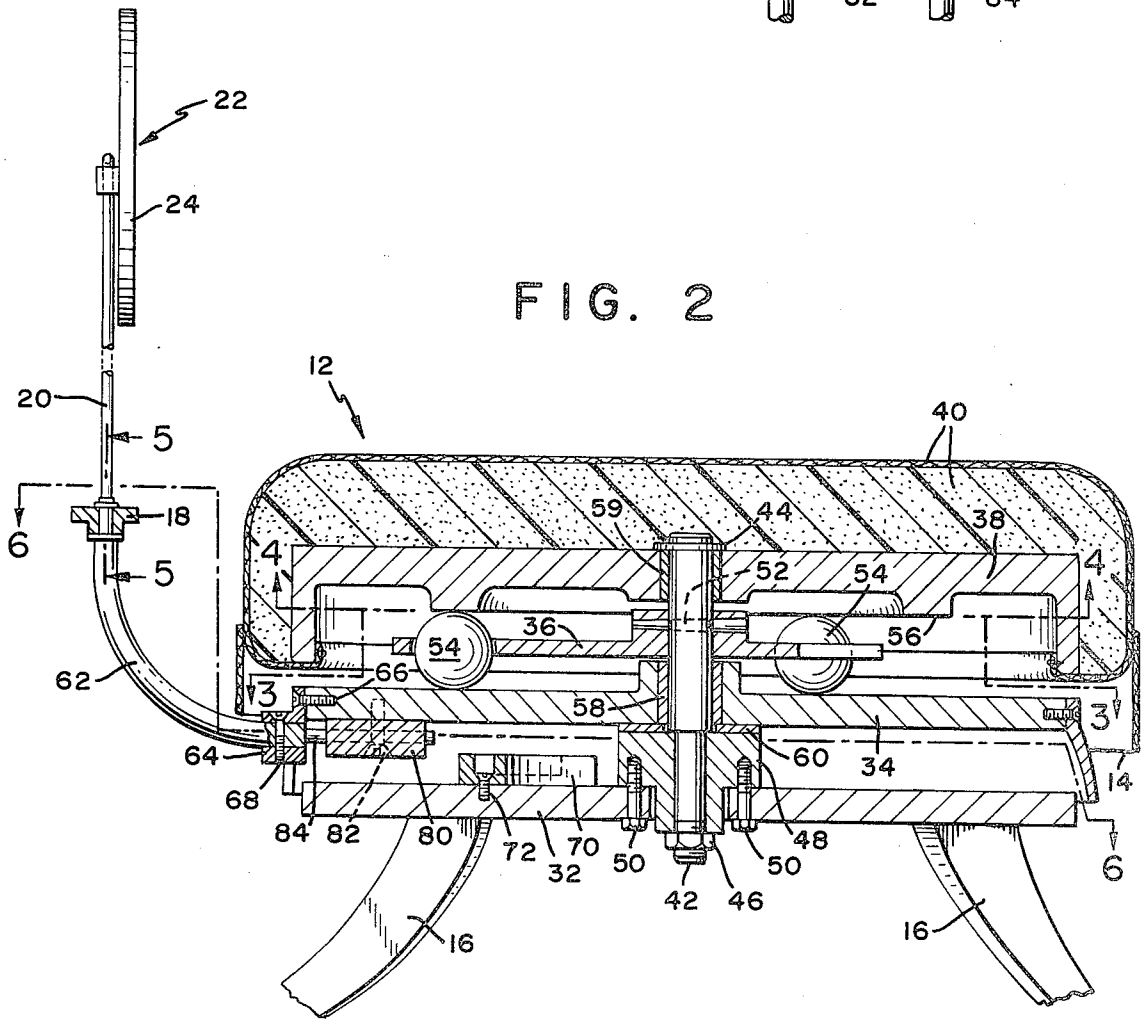


FIG. 3

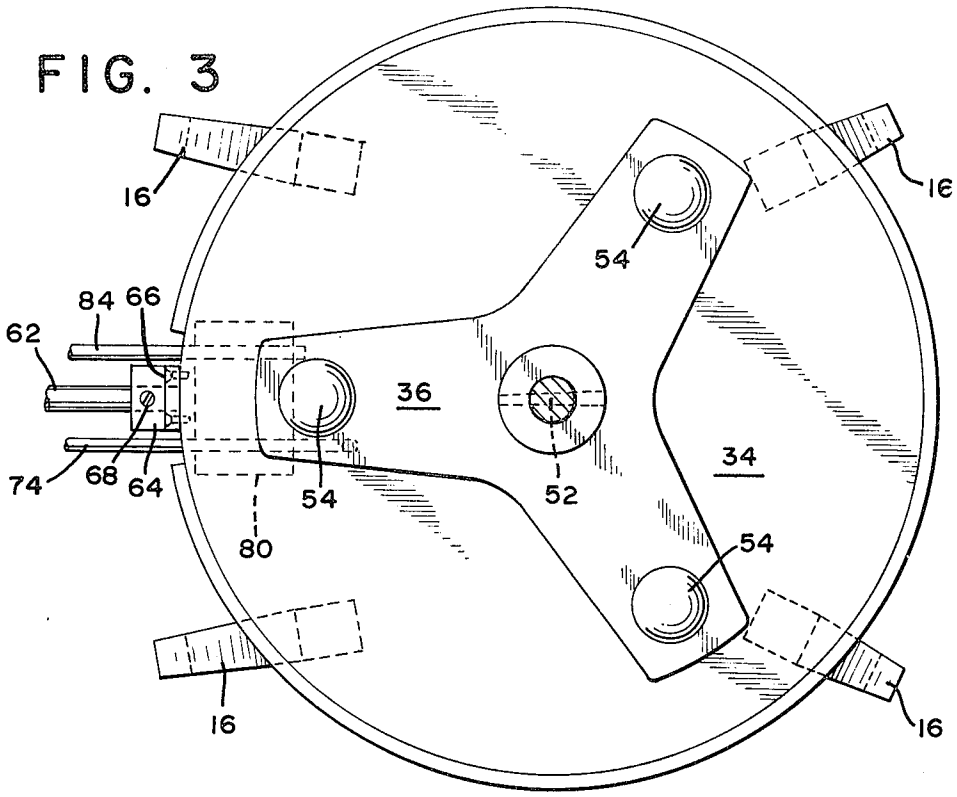
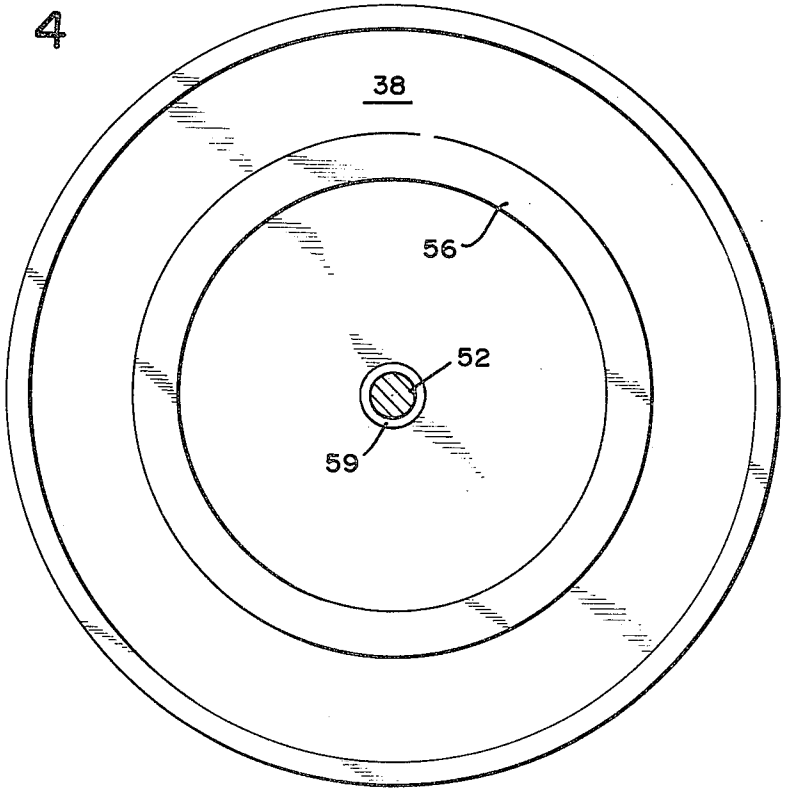


FIG. 4



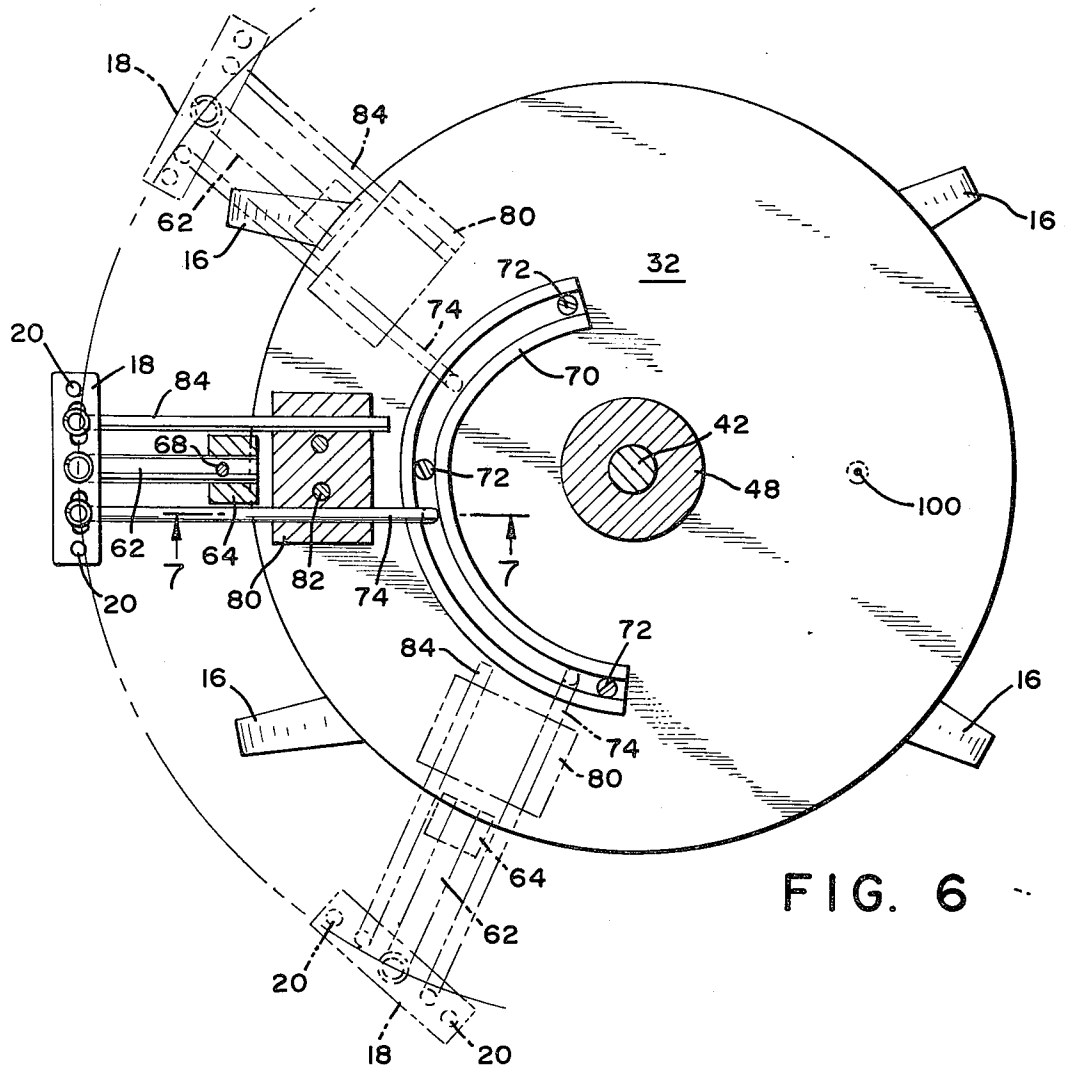

18
84
62
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FIG. 6

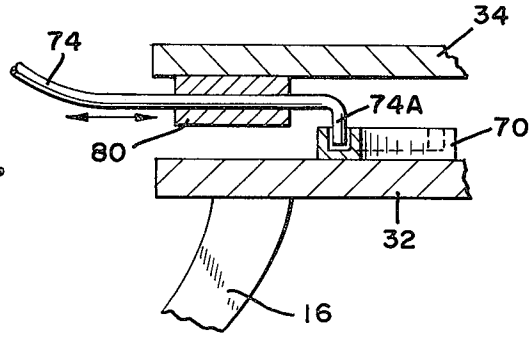

34
74
74A
70
80
32
16

FIG. 7

CHAIR WITH MOVING SEAT AND MIRROR

BRIEF SUMMARY OF THE INVENTION

This invention is related to a chair construction having a mirror mounted for movement with the chair seat in coordinated manner. Chairs of this type have been disclosed by me in U.S. Pat. Nos. 2,218,301; 2,218,302; 2,510,351; 2,811,083; 2,897,727 and 3,806,189.

These patents reveal a chair construction in which a rotating seat is adapted to rotate a mirror carried by the chair so that a person occupying the seat of the chair may adjust the mirror relatively to a stationary cooperating mirror. Chairs of this particular type are used by persons in adjusting their hair and clothing, as those skilled in the art will fully appreciate.

The present invention concerns a chair construction in which further simplifications have been made with a view of providing a kit which can be sent through the mail and assembled by the recipient. It will be appreciated by those skilled in the art that a kit of this type must be easy to assemble with ordinary tools, should comprise a minimum number of parts and last, but not least, should be economical in its manufacture so as to assure widest distribution. In line with this aim, the present invention discloses individual components which in combination produce a new and unique chair construction which is not only inexpensive to manufacture, but the individual components are light for shipping, yet when assembled provide a sturdy and rugged chair assembly well adapted to support a person.

I have thus outlined broadly the more important features of my invention in order that the detailed description thereof which follows may be better understood, and in order that my contribution to the art may be better appreciated. There are, of course, additional features of my invention that will be described hereinafter and which will form the subject of the claims appended hereto. Those skilled in the art will appreciate that the concept on which my disclosure is based may readily be utilized as a basis for the designing of other structures for carrying out the several purposes of my invention. It is important, therefore, that the claims be regarded as including such equivalent constructions as do not depart from the spirit and scope of my invention.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

FIG. 1 is a perspective view of the assembled chair with mirror;

FIG. 2 is an elevational sectional view disclosing some of the constructional features of the present invention;

FIG. 3 is a plan view along section line 3—3 in FIG. 2;

FIG. 4 is a plan view along section line 4—4 in FIG. 2;

FIG. 5 is a sectional view showing certain details of the mirror support bracket;

FIG. 6 is a sectional view along line 6—6 in FIG. 2, and

FIG. 7 is a sectional view along line 7—7 in FIG. 6.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the figures and FIG. 1 in particular,

there is shown a chair comprising a rotatable seat 12 which is mounted upon a base assembly concealed in FIG. 1 by an ornamental skirt 14. The base assembly is supported from the floor by a set of legs 16 of conventional shape. The base assembly, by components to be described later, supports a bracket 18 from which extend a pair of vertical rods 20 which at their upper end secure a mirror 22 having a face 24.

The seat 12 is mounted for limited rotation as is indicated by the arrow 26 and responsive to the rotation of the seat 12 the mirror 22 is urged into corresponding counterrotation as shown by the arrow 28 and 28', causing the mirror to move either toward the position 30 or the position 30' which may be considered approximately the end positions. The limit of rotation is selected arbitrarily, but it has been found that a rotational angle greater than 90° and less than 180° is satisfactory.

Referring now to FIGS. 2, 3 and 4, the legs 16 support a stacked assembly comprising a stationary base plate 32, a mirror mounting plate 34, a bearing support means, such as a spider 36, and a seat 12 comprising a plate 38 and suitable upholstery 40 covering the plate 38. The seat 12, which includes the plate 38, the spider 36, the mirror mounting plate 34 and the base plate 32 are held together by a centrally disposed bolt 42 whose head includes a washer 44 and whose opposite threaded end is engaged by a nut 46 which is tightened against a bushing 48. A set of screws 50 hold the bushing 48 stationary in the base plate 32. The nut 46 is tightened to cause the bolt 42 to be under sufficient tension so that the bolt 42 is retained in a non-rotating condition. The spider 36 is fastened to the non-rotating bolt 42 by means of a taper pin 52, thereby causing the spider 36 to be held stationary also. The spider 36 retains a set of bearing elements for rolling contact between the seat plate 38 and the mirror support plate 34. In the present case, the bearing elements are disclosed as spherical members 54, but it will be apparent that other bearing means may be used in a similar manner. The spherical members 54 engage a circular track or race 56, see FIG. 4, at the underside of the seat plate 38 and engage the mirror support plate 34 along a similar circular path.

For providing easy rotation of the mirror support plate 34, there is disposed a sleeve bushing 58 in the space between the bolt 42 and the hub of the mirror support plate 34, and a thrust washer 60 in the space between the stationary bushing 48 and the underside of the rotatable plate 34. Similarly, a sleeve bushing 59 is pressed into the hub of the seat plate 38.

As has been described previously, the spider 36 is retained stationary, that is, non-rotating. Hence, responsive to rotation of the seat 12 which causes the spherical members 54 to rotate, the mirror support plate 34 is caused to rotate in the opposite direction, that is, counterrotation. Therefore, as previously described in connection with FIG. 1, rotation of the seat 12 in one direction produces counterrotation of the mirror 22 which is supported by the mirror support plate 34. This construction will be more clearly apparent from the following description. The weight exerted by the person sitting on the seat aids in providing engagement thrust between the bearing members 54 and the seat plate 38 and the mirror support plate 34.

Referring specifically to FIGS. 2, 5, 6 and 7, it will be seen that the mirror support bracket 18 is secured to

the mirror support plate 34 by means of a curved arm 62 which at its upper and distal end supports the bracket 18 and which at its lower end is secured to a bracket 64 which is attached to the rim of the mirror support plate 34 by means of a set of screws 66. A screw 68 secures the arm 62 in the bracket 64. The bracket 64 is attached to the mirror support plate 34 at, what may be considered, the rear of the chair, and the arm 62, therefore, extends from the mirror support plate, underneath the seat, radially outward and then is curved upward. The bracket 18 is attached to the distal end of the arm 62 for limited pivotal motion about the vertical axis.

Pivotal motion of the bracket 18 responsive to the angle of rotation of the seat is achieved by a cam means 70 fastened to the upper side of the stationary base plate 32 by a set of screws 72, see FIG. 6. The cam means is a channel in the form of a U and linkage between the bracket 18 and the cam means 70 is provided by a rod 74 whose proximate end 74A engages the cam means 70 and whose distal end 74B is fed through an aperture in the bracket 18. The rod 74 is supported for motion with the mirror support plate 34 by being fed slidably through a bore in a mounting bracket 80 which is secured to the underside of the plate 34 by suitable screw means 82.

It follows, therefore, that as the seat 40 rotates about the center axis of the stationary bolt 42, the mirror support plate 34 undergoes counterrotation carrying with it the mirror support arm 62 and bracket 18 as well as the linkage rod 74 which travels in engagement with and along the cam means 70. A further arm 84 extends from the support 80 toward the bracket 18, but the arm 84 is non-functional and provided only for appearance.

The cam means 70 is constructed to provide that as the seat 12 is rotated from a center position either toward the left or toward the right, the face 24 of the mirror 22 is maintained tangential to a circle having its center forward of the center of rotation of the seat 12 and mirror support plate 34. This center of rotation is indicated in FIG. 6 by numeral 100. It will be apparent that this center can be moved further in the forward direction and that its position is selected to provide a proper image reflection at the complementary stationary mirror disposed forward of the chair. The necessary pivoting of the bracket 18 for retaining the mirror face plate tangential to the circle having center 100 is indicated in FIG. 6 wherein the solid lines show the central position and the dashed lines indicate the pivotal motion of the bracket 18 toward the left and right responsive to the rotation of the seat 12. The cam means 70 in the present instance are not of semi-circular shape but are curved to assume a partially spiral form. It will be apparent that by providing other pivotal mechanisms for changing the orientation of the mirror face plate, other curves will be used. Suitable stop means (not shown) are provided on the seat, the mirror mounting plate or the cam means for limiting the rotational motion of the seat and the mirror. Snap rings 75 are provided at the upper ends of rods 74 and 84 and the upper distal end of arm 62 to retain the respective members in the bracket 18.

A set of rods 20, see also FIG. 1, extend from the bracket 18 for supporting the mirror 22 so that its face 24 is in a substantially vertical plane. As desired, some provisions may be made to slightly tilt the mirror relative to the vertical plane. The rods 20 cooperate with the bracket 18 to provide for an adjustable vertical position of the mirror 22 and to this end the rods 20 pass through at least one aperture of oblong shape provided in the bracket 18 as is clearly illustrated in FIG. 5 of my previous U.S. Pat. No. 3,806,189 which patent is incorporated herein for reference.

It will be apparent that the above described construction uses a relatively simple stacked assembly of plates in combination with cam means and a linkage means for obtaining alignment of the mirror face to be tangential along a circle having a rotational axis which differs from the rotational axis of the seat and that of the vertical mirror support. The mirror support, the seat and the mirror support plate rotate about a radius having its center through the bolt 42.

As shown in the foregoing illustrations, the cam means is designed for pivoting the mirror face gradually responsive to rotation of the seat. It will be apparent that cam means can be constructed to change the pivotal angle of the mirror from its mid-position abruptly at certain pre-determined angles of seat rotation.

What is claimed is:

1. A chair comprising:

the stacked assembly of a stationary base plate, a rotatably mounted mirror support plate, a rotatably mounted seat, and a stationary bearing support means supporting a plurality of rolling members disposed between said mirror support plate and said seat for causing rotation imparted to said seat to be transmitted by said rolling members to said mirror support plate to effect counterrotation thereof;

a support arm secured with one end to said mirror support plate for motion therewith, said arm radially extending from said mirror support plate rearwardly of said seat and supporting at its distal end a bracket adapted to undergo pivotal motion relative to said support arm;

means extending from said bracket for supporting a mirror above the height of said seat and in a generally vertically disposed plane;

cam means disposed on said base plate, and

linkage means coupling said cam means to said bracket for pivoting said bracket and the face of the mirror supported by said bracket from a central position responsive to the rotation of said seat and said mirror support plate.

2. A chair as set forth in claim 1, said cam means and linkage means in combination causing said bracket to be pivoted for retaining the face of said mirror substantially tangential to a circle having its center located forward of the axis of rotation of said seat.

3. A chair as set forth in claim 1, said cam means being a curved track and said linkage means comprising a rod coupled with one end to said track and with the other end to said bracket.

4. A chair as set forth in claim 3, said rod being supported by said mirror support plate for rotation therewith.

5. A chair as set forth in claim 1, said support arm being curved and said bracket being supported by said arm for pivotal motion about a substantially vertical axis.

6. A chair as set forth in claim 5, said means extending from said bracket providing the mirror to be adjusted in its height above the level of said seat.

7. A chair as set forth in claim 1, said rolling members comprising spherical elements.

8. A chair as set forth in claim 1, said mirror support plate, said seat and said bearing support means being secured by a non-rotating central bolt to said base plate, and means disposed for securing said bearing support means to said bolt.

9. A chair as set forth in claim 1, said base having legs extending therefrom for elevating said assembly from a support surface.

10. A chair as set forth in claim 1, and stop means disposed for limiting the rotational excursion of said mirror support plate.

11. A chair comprising:

the stacked assembly of a stationary base plate, a rotatably mounted mirror support plate, a rotatably mounted seat, and bearing means disposed between said mirror support plate and said seat for causing rotation of said seat to be transmitted by said bearing means to said mirror support plate for effecting counterrotation thereof;

a support arm secured with one end to said mirror support plate for motion therewith, said arm radially extending from said mirror support plate underneath said seat rearwardly thereof and supporting at its distal end a bracket mounted to said arm for limited pivotal motion relative to said arm;

means extending upwardly from said bracket for supporting a mirror in a generally vertically disposed plane;

cam means disposed on said assembly, and

linkage means coupling said cam means to said bracket for pivoting said bracket responsive to the rotation of said seat for causing the face of said mirror to be retained substantially tangential to a circle having its center located forward of the axis of rotation of said seat.

12. A chair as set forth in claim 11, said bracket mounted for pivotal motion about a vertically disposed axis.

13. A chair as set forth in claim 12, said cam means being disposed stationary relative to the rotation of said seat and mirror support plate, and said linkage means comprising a rod moving along said cam means responsive to motion of said seat.

14. A chair comprising:

the stacked assembly of a stationary base plate, a rotatably mounted mirror support plate, a rotatably mounted seat, and bearing means disposed between said mirror support plate and said seat for causing rotation of said seat to be transmitted by said bearing means to said mirror support plate for effecting counterrotation thereof;

a support arm secured with one end to said mirror support plate for motion therewith, said arm radially extending from said mirror support plate underneath said seat rearwardly thereof and having a continuing vertical portion directed upwardly and including at its distal end means for securing thereupon a substantially vertically positioned mirror, and

means cooperatively associated with said support arm and said assembly for causing responsive to rotation of said seat the face of said mirror to be disposed substantially tangential to a circle having its center located forward of the axis of rotation of said seat.

15. A chair comprising:

the stacked assembly of a stationary base plate, a rotatably mounted mirror support plate, a rotatably mounted seat, and bearing means disposed between said mirror support plate and said seat for causing rotation of said seat to be transmitted by said bearing means to said mirror support plate for effecting counterrotation thereof;

a support arm secured with one end to said mirror support plate for motion therewith, said arm radially extending from said mirror support plate underneath said seat rearwardly thereof and having a continuing vertical portion directed upwardly and including at its distal end means for securing thereupon a substantially vertically positioned mirror, and

means cooperatively associated with said support arm and said assembly for causing responsive to rotation of said seat the face of said mirror to be pivoted.

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