July 18, 1961 H. H. MOHLER 2,992,855

CHAIR WITH ADJUSTABLE BACK

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FIG. 1.

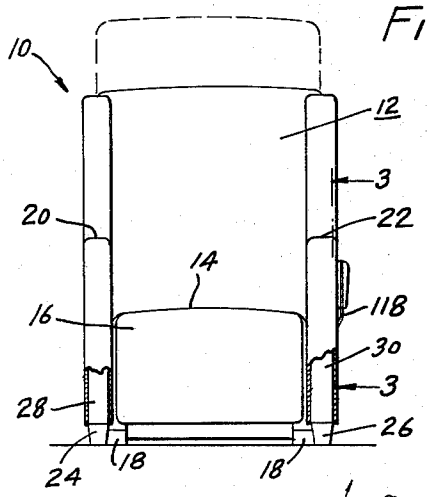

FIG. 2.

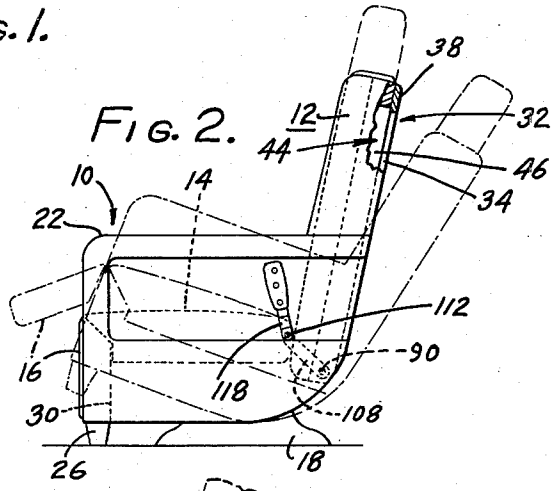

FIG. 10.

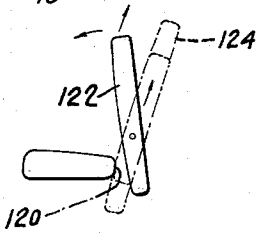

FIG. 3.

INVENTOR.
HARVEY H. MOHLER
BY
Orville R. Seidner
AGENT

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CHAIR WITH ADJUSTABLE BACK

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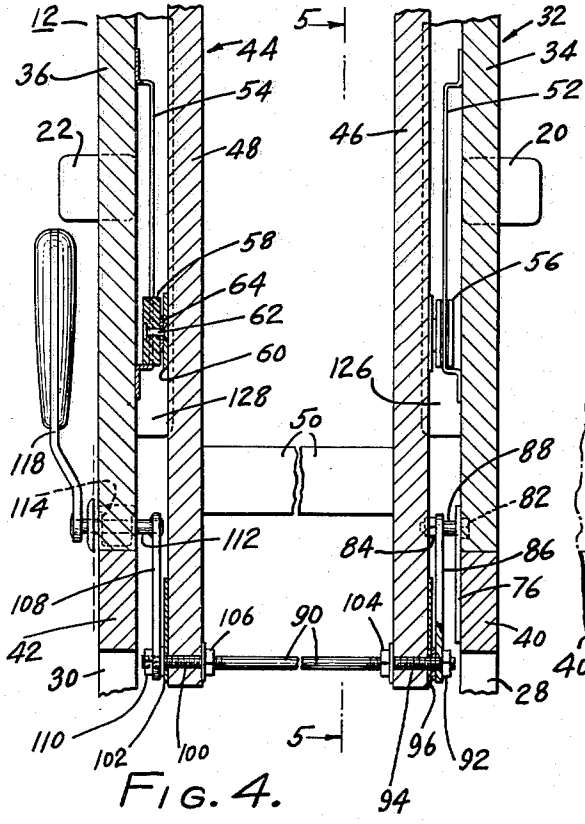

FIG. 4.

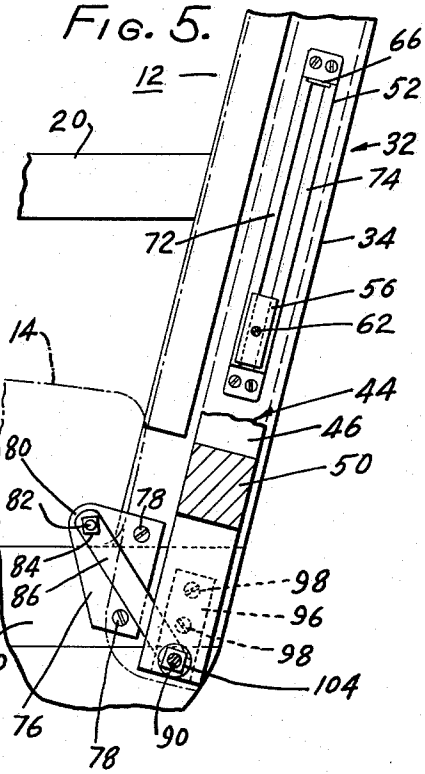

FIG. 5.

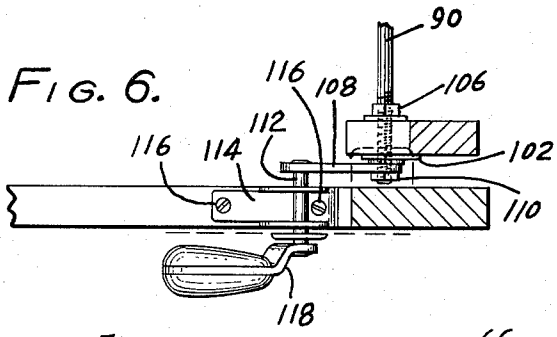

FIG. 6.

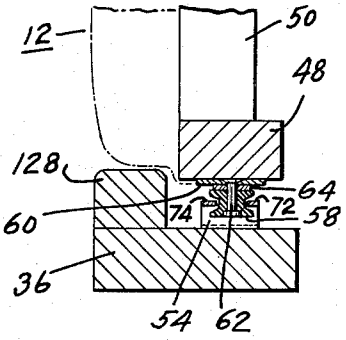

FIG. 7.

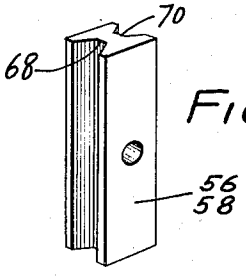

FIG. 8.

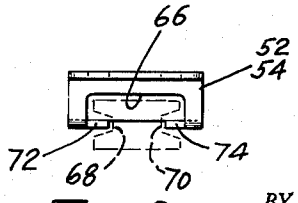

FIG. 9.

INVENTOR.
HARVEY H. MOHLER
BY Orville R. Seidney
AGENT

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2,992,855

CHAIR WITH ADJUSTABLE BACK

Harvey H. Mohler, 5647 N. Rosemead Blvd., Temple City, Calif.

Filed June 1, 1959, Ser. No. 817,397
12 Claims. (Cl. 297—353)

This invention relates generally to an article of furniture, and more particularly relates to a chair having a movable back rest portion.

In my prior copending application for Adjustable Chair, Serial No. 755,471, filed August 18, 1958, there is disclosed a novel chair of the tilt back reclining type. A distinguishing feature of that particular chair is its compact construction which lends itself to modern living decor without the look of heavy bulk which characterized chairs of this type in the prior art.

Massive chairs find little favor with today's living room schemes, and massiveness is inherent with the usual tilt back type since provision must be made for head rest when the chair is tilted backwardly. But when the chair is returned to normal sitting position, the high back silhouette creates the "heavy" look. In another prior copending application of mine for Article of Adjustable Furniture, Serial No. 573,766, filed March 26, 1956, now Patent No. 2,954,819, granted October 4, 1960, there is disclosed a lounge type of furniture in which the back may be moved to a reclined position. The lounge is characterized by a disappearing pillow rest in which support for the head is provided when the chair is moved to the rest or reclining position. When the chair is returned to the normal position, the pillow may be removed after which the pillow rest is caused to be retracted. This feature permits a low silhouette when the chair is unoccupied.

However, the aforesaid arrangement is somewhat inconvenient from the standpoint of manipulation and operativeness, since the pillow is a separate article and not always at hand.

The present invention stems primarily from the first mentioned copending application, Serial No. 755,471, in that provision is made for bodily movement of the chair back between raised and lowered positions. It will be understood, however, that although the present disclosure is in connection with such a chair, the invention is susceptible of adaptation to any form of chair including those of the fixed seat and fixed back (i.e. fixed against angular movement) type as well as those of the reclining chair or lounge types.

It is therefore a primary object of this invention to provide a chair back apparatus for movement of the back supporting structure between raised and lowered positions whereby a head rest is provided in the raised position and a low silhouette is obtained in the lowered position.

In any chair, it is particularly desirable that the lower front portion of the upholstered back be in close contact with the rear end of the upholstered seat with no space separating them. Thus, if the moving back rest member were to be of the usual construction, it would move upwardly and the bottom end would separate from the seat, leaving an undesirable gap.

However, the present invention contemplates a back rest member that extends downwardly from the seat when the back is in lowered position, then moves upwardly, when the back is raised, to obviate the gap which would be present. In both positions the upholstered back is in contact with the rear of the seat.

Of course, if the back is to be raised or lowered, it is not good for the contact to be maintained throughout the movement since the rubbing action between the back of the seat and the upholstered back member would cause

wear and also be a source of friction which would make movement of the back somewhat difficult. The present invention solves that difficulty by providing a link mechanism disposed between the back rest member and the chair frame whereby the lower end of the back rest member is caused to swing away from the seat when the member is raised or lowered, pivotal action for the swing being provided by way of the cooperative action of glide and guide members which also serve to guide the back rest member in its upward and downward movements.

It is therefore a further object to provide a chair back apparatus having link mechanism disposed between the back rest frame and fixed parts of the chair frame for moving the lower end of the back rest into contact with the seat at raised and lowered positions of the back rest frame.

It is a particular object to dispose the aforesaid link mechanism adjacent the lower end of the back rest frame where the mechaniesm is out of sight and readily hidden by usual upholstering techniques. In connection with this object it is a still further object to provide glide and guide means for the pivotal and gliding movements of the back rest frame.

It is another object to provide support for the back rest at the upper portion by stop means against which the back rest frame is disposed in raised and lowered positions. Further support for the back rest is provided by the glide and guide members. By this structural means, the entire pressure against the back rest (of a person reclining in the chair) is carried by the support at the upper portion and by the glide and guide members; hence little or no force is exerted against the link mechanism which might cause the back rest member to move angularly away from its contact with the rear end of the seat.

It is a further object to provide manual means by way of a lever handle disposed along the side of chair and having a connection with the link mechanism, whereby the raising and lowering movements of the back rest frame are easily accomplished by a person sitting in the chair.

Other and further objects will be apparent to those skilled in the art upon consideration of the following description when read in connection with the accompanying drawings wherein:

FIG. 1 is a front elevation view of a chair embodying the invention with the back rest shown in normal lowered position in full line and in raised position by the dashed lines;

FIG. 2 is a side elevation view of the chair with a portion broken away to show (in section) the top slat against which the back rest is disposed;

FIG. 3 is an enlarged fragmentary view of the chair taken on line 3—3 of FIG. 1, with parts broken away to show the invention;

FIG. 4 is an enlarged partly sectional fragmentary view taken on the line 4—4 of FIG. 3;

FIG. 5 is a view taken on the line 5—5 of FIG. 4 with part of the back rest frame broken away to show one of the glide and guide means, and showing the link mechanism on one side of the chair;

FIG. 6 is a partly sectional fragmentary view taken on the line 6—6 of FIG. 4;

FIG. 7 is a view similar to FIG. 6 but taken on the line 7—7 of FIG. 4;

FIG. 8 is an isometric view of one of the crosshead glide members;

FIG. 9 is an end view of one of the guide members; and

FIG. 10 is a side elevation schematic on reduced scale to illustrate the raised and lowered positions and one

intermediate position of the back rest with respect to the chair seat.

Referring now to the drawings wherein like reference numerals refer to like parts, the chair **10** of FIGS. 1 and 2 is seen to resemble the chair disclosed in the aforementioned copending application Serial No. 755,471. That is, the chair **10** comprises major members designated as a back **12**, seat **14**, front panel **16**, base **18**, and arms **20** and **22**. Front legs **24** and **26** depend from the front stiles **28** and **30** of the arms **20** and **22**, respectively. In FIG. 2 it is seen that the chair is of the reclining type with the tilt back position illustrated by the dot-dash lines. Also, the raised position of the back rest is illustrated in this figure by the dashed lines. Reference may be had to the aforementioned copending application Serial No. 755,471 for details of the mechanism by which the chair **10** may be caused to assume the reclining position with the front panel **16** extended.

Since the present application is directed to the movable back rest, only the structural details of this mechanism and the cooperating parts will be described.

The back **12** comprises a chair back frame generally indicated at **32** and having uprightly disposed framing members **34** and **36** spaced apart adjacent the upper end thereof by a slat **38** and fixedly secured at their lower ends to the side rails **40** and **42**, respectively, of the seat **14**. The rear ends of the arms **20** and **22** are secured to the framing members **34** and **36** to hold the members and arms in rigidly fixed relationship to the seat.

The back **12** further comprises a back rest frame generally indicated at **44** and having framing members **46** and **48** disposed intermediate and adjacent the back framing members **34** and **36**. Back rest framing members **46** and **48** are secured in spaced apart relationship by a slat **50** adjacent the lower end of the members which also may have a slat (not shown) adjacent the upper end thereof to hold the members in fixed relationship.

The back rest frame **44** is movable upwardly and downwardly relative to the chair back frame **32**, and to this end there is provided guide and glide members disposed between the framing members **34** and **46**, and between the framing members **36** and **48**. An elongated guide member **52** is secured on the interior face of the framing member **34**, and a similar guide member **54** is secured on the interior face of the framing member **36**. Disposed in sliding relationship to the guide members **52** and **54** are the crosshead glide members **56** and **58**, respectively.

A plate **60** secured to the outer face of the framing member **48** has the glide member **58** pivotally disposed thereon by means of a headed rivet **62**, a washer **64** being disposed between the glide member **58** and the plate **60**. The glide member **56** is similarly secured to the framing member **46**.

By reference to FIG. 9 it is seen that the upper ends of the guide members are formed with an opening **66** to permit the entry of the glide members which are channeled on opposite faces, as at **68** and **70** in FIG. 8. The longitudinal ways of the guide members, as at **72** and **74** of FIG. 9, form tracks for the channeled faces **68** and **70**, respectively, of the glide members. It is now seen that the back rest frame **44** is adapted for upward and downward movement relative to the chair back frame **32**, and that pivotal movement of the rest frame **44** is available at the point where the glide members **56** and **58** are pivotally secured to the framing members **46** and **48**, respectively.

The aforesaid cooperative arrangement will be recognized to be typically that of a crosshead, and it will be pointed out later that the provision for pivotal movement of the back rest frame relative to the chair back frame forms an important feature of the invention.

From the foregoing description it will be apparent to

those skilled in the art that a double-flanged wheel, for example, could be substituted for the elongate glide members **56** and **58**. However, it is preferred that the members **56** and **58** present a rather substantial area to the tracks on the guide members **52** and **54** in order to minimize wear of the glide members, which latter could be formed of a suitable plastic material and thereby obviate the need for lubrication.

In order to obtain the necessary movement of the back rest frame relative to the chair back frame, there is provided a link means between these two frames. Preferably, the link means is disposed in such fashion as to be hidden from view by the upholstered parts of the chair, and in the present embodiment the link means is located adjacent the lower ends of the frames. A link bracket plate **76** is secured to the lower end of the chair back framing member **34** and to the side rail **40**, where it joins the member **34**, by means of screws **78**. It is seen that the plate **76** is disposed well below the top level of the cushion of the seat **14** (FIG. 5).

An ear portion **80** of the plate **76** extending toward the front of the chair is provided with a threaded bore through which the bolt **82** is threadably received and secured. The outer end of the bolt **82** has pivotally secured thereon by means of a nut **84** one end of a link member **86** spaced from the plate ear **80** by a spacer bushing **88** (FIG. 4). The other end of the link **86** is threadably received on one end of an actuating bar **90** and secured thereto by the nut **92** on the bar **90** which is rotatably disposed within a bore **94** at the extreme lower end of the chair rest framing member **46**. A reinforcing plate **96**, through which the bar **90** passes, is also secured at the lower end of the member **46** by screws **98**.

The bar **90** is also rotatably disposed in a bore **100** at the lower end of the framing member **48**, a reinforcing plate **102** being utilized at this point similar to the plate **96** on member **46**. Nuts **104** and **106** on the bar **90** adjacent the inner faces of the back rest framing members **46** and **48**, respectively, serve to prevent undue endwise movement of the bar **90**.

One end of a link member **108** is threadably received on the end of the bar adjacent the framing member **48** and is secured by means of a nut **110** on the end of the bar **90**. The other end of the link **108** is secured, as by brazing or welding, to one end of a stub shaft rod **112** which is pivotally disposed in a bracket **114** secured by screws **116** to the upper surface of the rail **42**. An actuating lever **118** has one end thereof secured, as by brazing or welding, to the other end of the stub shaft rod **112** (FIGS. 4 and 6).

It will be observed that the actuating rod **90** provides synchronized operation of the two link members **86** and **108**. It is also seen that the location of the rod with respect to the framing members **46** and **48** lies substantially on a projection of the axes of the guide members **52** and **54** when the back rest frame **44** is at its upper and lower limits of movement with respect to the chair back frame **32**. This arrangement has been found to be the best compromise between lengths of the links **86** and **108** (and the location of their pivotal connections with the brackets **76** and **114**, respectively) and location and length of the actuating lever **118** for most expeditious operation of the back rest between its raised and lowered positions. It will be understood, of course, that tension or compression springs could be interposed between the chair back and back rest frames or parts of them in order to contribute to ease of raising the back rest frame.

As noted hereinabove, a major consideration in the design of any piece of furniture that is to be placed in a living room, or family room, is that it must be acceptable from the standpoint of its aspect, or "how it meets the eye" of a critical homemaker. The chair of the instant invention meets this test in that it requires no massive outboard structure for its functional operation. If de-

sired, the chair can be constructed without the handle **118**, in which event no parts which might contribute to a "foreign" look would be in view. In such an instance the chair back rest is operable by hand from its lowered position merely by grasping the top of the back rest by hand and pulling up on it until it is in its raised position.

In connection with the back rest movement, reference is made to FIGS. 3 and 10 where it will be seen that the back rest, in its lowered position, has a portion of its upholstered surface in contact with the back side of the seat **14**, as shown by the dot-dash lines **120**. As the raising movement of the back rest begins, the link members cause the back rest frame to pivot about the rivets **62** in the glide members **56** and **58**. The pivotal movement causes the lower end of the back rest to move away from the back of the seat, and thus all movement is accomplished without rubbing movement therebetween. The intermediate position of the back rest between lowered and raised positions is illustrated in full line **122**.

Pivotal movement of the back rest about the rivets **62** is accompanied by upward gliding movement of the glide members **56** and **58** in the guide members **52** and **54**. From the intermediate position on up to the raised position the bottom of the back rest again approaches the back of the seat until it is again in contact, as shown by the dashed line **124**.

Concealment of the guide and glide members is accomplished by extending the chair back frame members **34** and **36** inwardly by securing thereto the wood strips **126** and **128**, respectively, as best seen in FIGS. 4, 5, and 7, to form inwardly directed wings.

While the foregoing description has been in terms of frames, frame members, rails, slats, and other structural details, it will be appreciated that the structure described is readily susceptible of covering with upholstery materials as desired, and such is the intendment of the invention.

I claim:

1. Chair back apparatus comprising: a chair back frame having uprightly disposed framing members on either side of the chair and secured thereto adjacent their lower ends; a back rest frame disposed adjacent said framing members; a pair of guide members secured to one of said frames; a pair of glide members cooperatively disposed with said guide members and secured to the other of said frames; link means having pivotal connections with both said frames, whereby said back rest frame occupies raised and lowered positions parallelly disposed to said chair back frame but angularly disposed thereto in intermediate positions; and rest means on said chair back frame distally disposed from the lower ends of said chair back framing members, said rest means providing a stop against which said back rest frame is disposed in raised and lowered positions.

2. Chair back apparatus comprising: a chair back frame having uprightly disposed framing members on either side of the chair and secured thereto adjacent their lower ends; a back rest frame having back rest framing members disposed adjacent said chair back framing members; a pair of guide members, one of each being secured to the framing members of one of said frames; a pair of glide members cooperatively disposed with said guide members, one of each being secured to the framing members of the other of said frames; link means having pivotal connections with both said frames, whereby said back rest frame occupies raised and lowered positions parallelly disposed to said chair back frame but angularly disposed thereto in intermediate positions; and rest means of said chair back frame distally disposed from the lower ends of said chair back framing members, said rest means providing a stop against which said back rest frame is disposed in raised and lowered positions.

3. Chair back apparatus comprising: a chair back frame having uprightly disposed framing members on either side of the chair and secured thereto adjacent their lower ends; a back rest frame having back rest framing members disposed adjacent said chair back framing members; a pair of guide members, one of each being secured to said chair back framing members; a pair of glide members cooperatively disposed with said guide members, one of each being secured to said back rest framing members; link means having pivotal connections with both said frames, whereby said back rest frame occupies raised and lowered positions parallelly disposed to said chair back frame but angularly disposed thereto in intermediate positions; and rest means on said chair back frame distally disposed from the lower ends of said chair back framing members, said rest means providing a stop against which said back rest frame is disposed in raised and lowered positions.

4. Chair back apparatus comprising: a chair back frame having uprightly disposed framing members on either side of the chair and secured thereto adjacent their lower ends; a back rest frame disposed adjacent said framing members; a pair of elongate guide members secured to one of said frames; a pair of glide members cooperatively disposed with said guide members and secured to the other of said frames; link means having pivotal connections with both said frames, whereby said back rest frame occupies raised and lowered positions parallelly disposed to said chair back frame but angularly disposed thereto in intermediate positions, the pivotal connection of said link means to said one of said frames lying substantially along a projection of the axis of one of said guide members in the raised and lowered positions of said back rest frame; and rest means on said chair back frame distally disposed from the lower ends of said chair back framing members, said rest means providing a stop against which said back rest frame is disposed in raised and lowered positions.

5. Chair back apparatus comprising: a chair back frame having uprightly disposed framing members on either side of the chair and secured thereto adjacent their lower ends; a back rest frame disposed adjacent said framing members; a pair of guide members secured to one of said frames; a pair of glide members cooperatively disposed with said guide members and secured to the other of said frames; link means having pivotal connections with both said frames, whereby said back rest frame occupies raised and lowered positions parallelly disposed thereto in intermediate positions; rest means on said chair back frame distally disposed from the lower ends of said chair back framing members, said rest means providing a stop against which said back rest frame is disposed in raised and lowered positions; and manual means formed with said link means for moving said back rest frame manually between raised and lowered positions.

6. Chair back apparatus comprising: a chair back frame having a pair of generally parallelly and uprightly disposed framing members secured to said chair adjacent their lower ends; a back rest frame having a pair of generally parallelly disposed back rest framing members, said back rest frame being disposed intermediate said chair back framing members; a pair of guide members secured to one of said frames; a pair of glide members cooperatively disposed with said guide members and secured to the other of said frames; link means having pivotal connections with both said frames, whereby said back rest frame occupies raised and lowered positions parallelly disposed to said chair back frame but angularly disposed thereto in intermediate positions; and rest means on the back side of said framing members of said chair back frame distally disposed from the lower ends of said chair back framing members, said rest means providing a stop against which said back rest framing members are disposed in raised and lowered positions.

7. Chair back apparatus comprising: a chair back frame having a pair of generally parallelly and uprightly disposed framing members secured to said chair adjacent

their lower ends; a back rest frame having a pair of generally parallelly disposed back rest framing members, said back rest frame being disposed intermediate said chair back framing members; a pair of guide members, one of each being secured to the framing members of one of said frames; a pair of glide members cooperatively disposed with said guide members, one of each being secured to the framing members of the other of said frames; link means having pivotal connections with both said frames, whereby said back rest frame occupies raised and lowered positions parallelly disposed to said chair back frame but angularly disposed thereto in intermediate positions; and rest means on the back side of said framing members of said chair back frame distally disposed from the lower ends of said chair back framing members, said rest means providing a stop against which said back rest framing members are disposed in raised and lowered positions.

8. Chair back apparatus comprising: a chair back frame having a pair of generally parallelly and uprightly disposed framing members secured to said chair adjacent their lower ends; a back rest frame having a pair of generally parallelly disposed back rest framing members, said back rest frame being disposed intermediate said chair back framing members; a pair of guide members, one of each being secured to said chair back framing members; a pair of glide members cooperatively disposed with said guide members, one of each being secured to said back rest framing members; link means having pivotal connections with both said frames, whereby said back rest frame occupies raised and lowered positions parallelly disposed to said chair back frame but angularly disposed thereto in intermediate positions; and rest means on said chair back frame distally disposed from the lower ends of said chair back framing members, said rest means providing a stop against which said back rest frame is disposed in raised and lowered positions.

9. Chair back apparatus comprising: a chair back frame having a pair of generally parallelly and uprightly disposed framing members secured to said chair adjacent their lower ends; a back rest frame having a pair of generally parallelly disposed back rest framing members, said back rest frame being disposed intermediate said chair back framing members; a pair of elongate guide members, one of each being secured to said chair back framing members; a pair of glide members cooperatively disposed with said guide members, one of each being secured to said back rest framing members; a pair of links, one end of each link having a pivotal connection with said back rest frame on either side thereof, the other end of each link having a pivotal connection with said chair back frame on either side thereof, whereby said back rest frame occupies raised and lowered positions parallelly disposed to said chair back frame but angularly disposed thereto in intermediate positions, the pivotal connections of said links to said back rest frame lying substantially along a projection of the axes of said guide members in the raised and lowered positions of said back rest frame; rest means on the back side of said framing members of said chair back frame distally disposed from the lower ends of said chair back framing members, said rest means providing a stop against which said back rest framing members are disposed in raised and lowered positions; and manual means formed with one of said links for moving said back rest frame manually between raised and lowered positions.

10. Chair back apparatus comprising: a chair back frame having an uprightly disposed chair back framing member on one side of the chair and secured thereto adjacent the lower end of said framing member; a back rest frame having a back rest framing member disposed adjacent said chair back framing member; a guide member secured to one of said framing members; a glide member cooperatively disposed with said guide member, and secured to the other of said framing members; link means having pivotal connections with both said frames, whereby said back rest framing member occupies raised and lowered positions parallelly disposed to said chair back framing member but angularly disposed thereto in intermediate positions; and rest means on said chair back frame distally disposed from the lower end of said chair back framing member, said rest means providing a stop against which said back rest frame is disposed in raised and lowered positions.

11. Chair back apparatus comprising: a chair back frame having an uprightly disposed chair back framing member on one side of the chair and secured thereto adjacent the lower end of said framing member; a back rest frame having a back rest framing member disposed adjacent said chair back framing member; a guide member secured to said chair back framing member; a glide member cooperatively disposed with said guide member, and secured to said back rest framing member; link means having pivotal connections with both said frames, whereby said back rest framing member occupies raised and lowered positions parallelly disposed to said chair back framing member but angularly disposed thereto in intermediate positions; and rest means on said chair back frame distally disposed from the lower end of said chair back framing member, said rest means providing a stop against which said back rest frame is disposed in raised and lowered positions.

12. Chair back apparatus comprising: a chair back frame having an uprightly disposed chair back framing member on one side of the chair and secured thereto adjacent the lower end of said framing member; a back rest frame having a back rest framing member disposed adjacent said chair back framing member; a guide member secured to one of said framing members; a glide member cooperatively disposed with said guide member, and secured to the other of said framing members; link means having pivotal connections with both said frames, whereby said back rest framing member occupies raised and lowered positions parallelly disposed to said chair back framing member but angularly disposed thereto in intermediate positions; rest means on said chair back frame distally disposed from the lower end of said chair back framing member, said rest means providing a stop against which said back rest frame is disposed in raised and lowered positions; and manual means formed with said link means for moving said back rest frame manually between raised and lowered positions.

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