United States Patent [19]

Herman

[11] **3,856,346**

[45] **Dec. 24, 1974**

[54] **RECLINING CHAIR**

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[73] Assignee: **Herman, Kulo & Modell,** Los Angeles, Calif.

[22] Filed: **Dec. 11, 1972**

[21] Appl. No.: **313,787**

[52] **U.S. Cl.** **297/61,** 297/318

[51] **Int. Cl.** **A47c 1/037**

[58] **Field of Search** 297/61, 85, 318, 112, 343, 297/317, 434, 436; 5/48, 47

[56] **References Cited**

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Primary Examiner—Francis K. Zugel

Attorney, Agent, or Firm—Spensley, Horn & Lubitz

[57] **ABSTRACT**

A reclining chair which includes a concealable headrest and extensible footrest is disclosed. The lower end of the backrest of the chair, when moved into a reclining chair, moves forward on rollers which engage curved guide slots. Thus, the chair reclines without extending as far backwards beyond its base as other reclining chairs.

4 Claims, 5 Drawing Figures

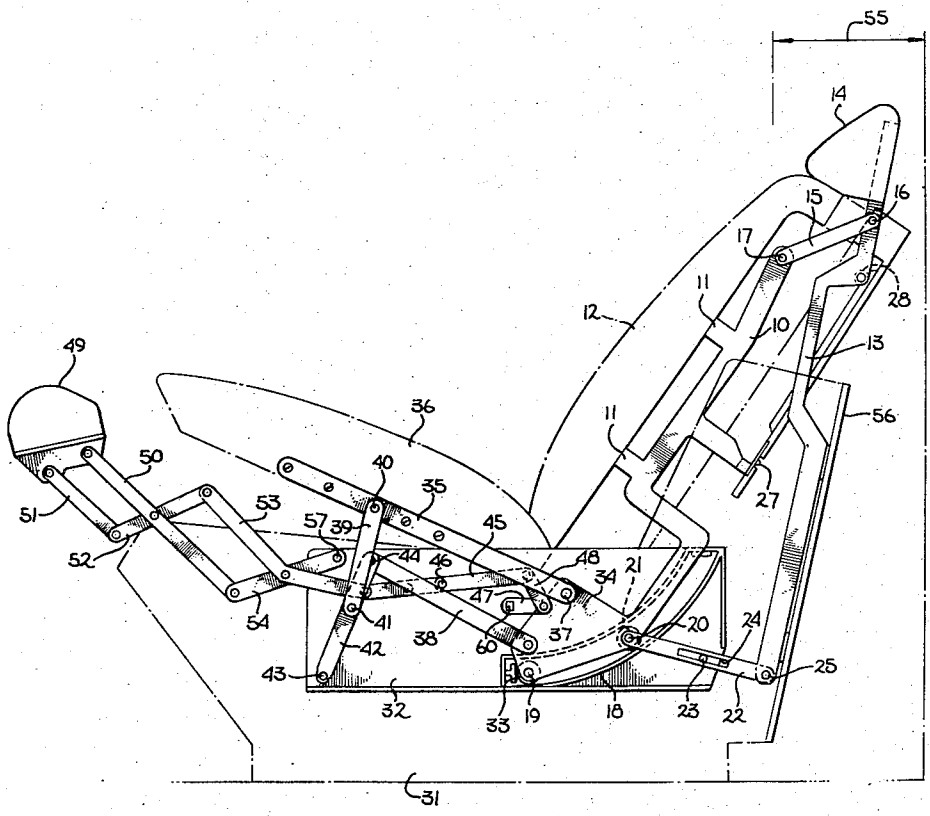
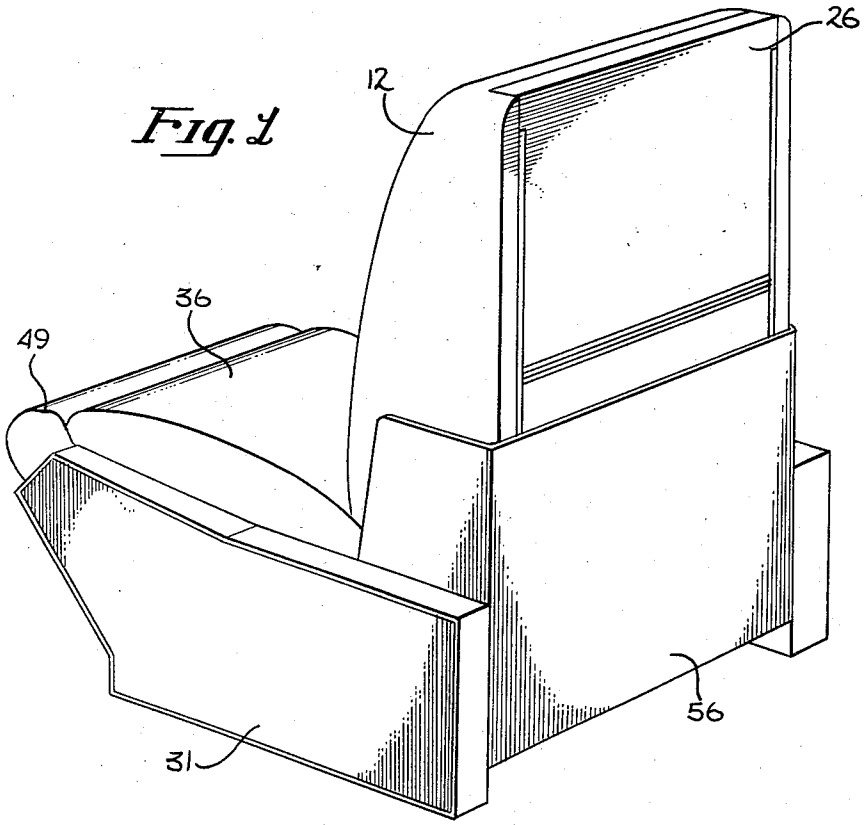


Fig. 1



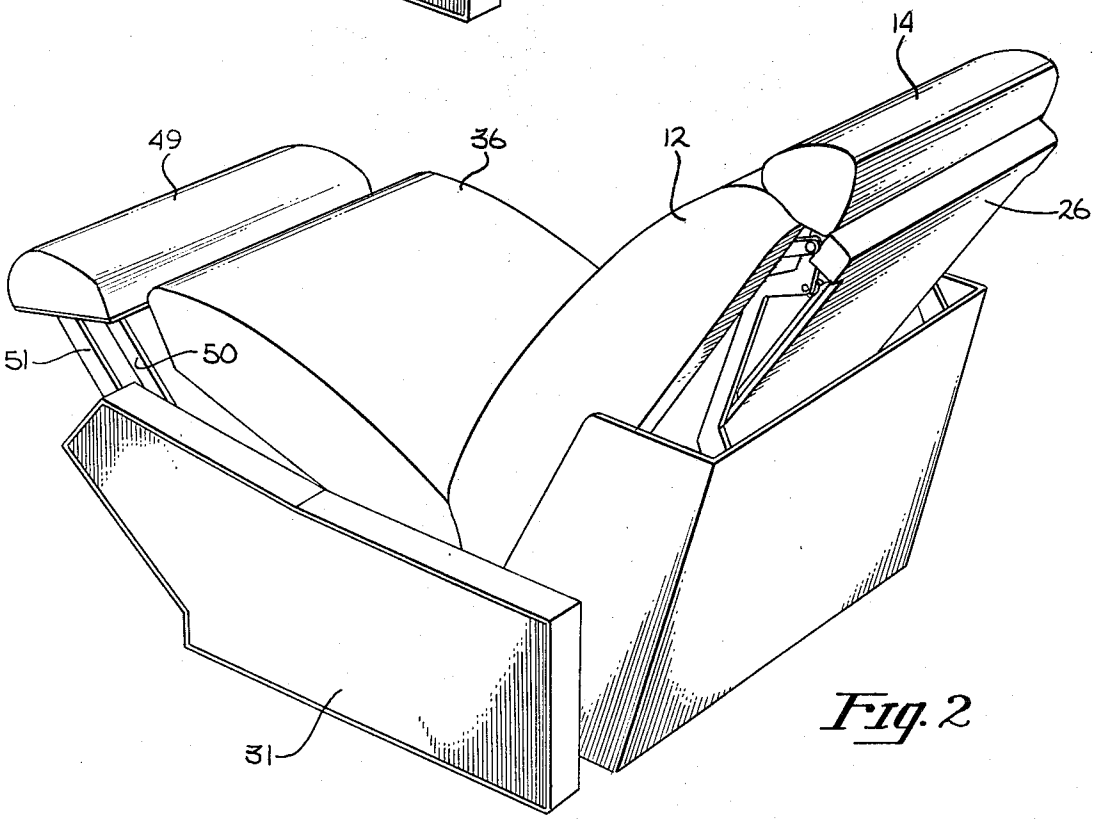


Fig. 2

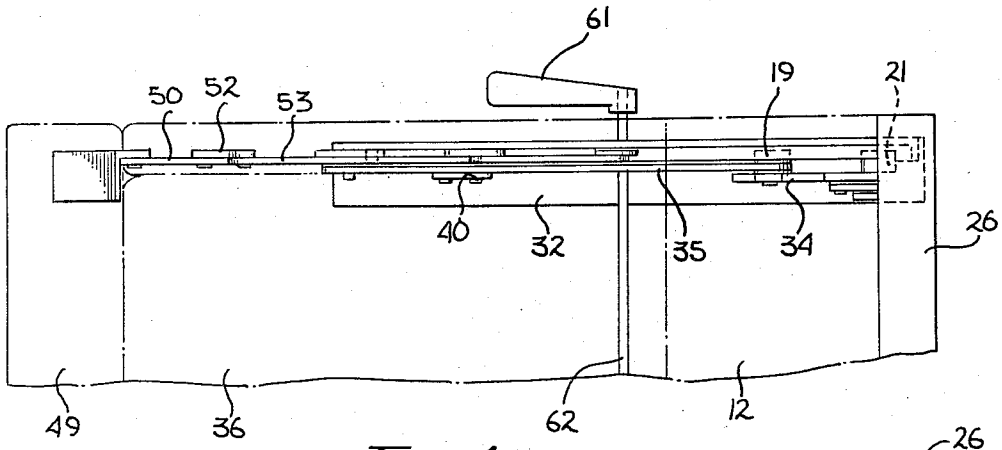

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Fig. 4

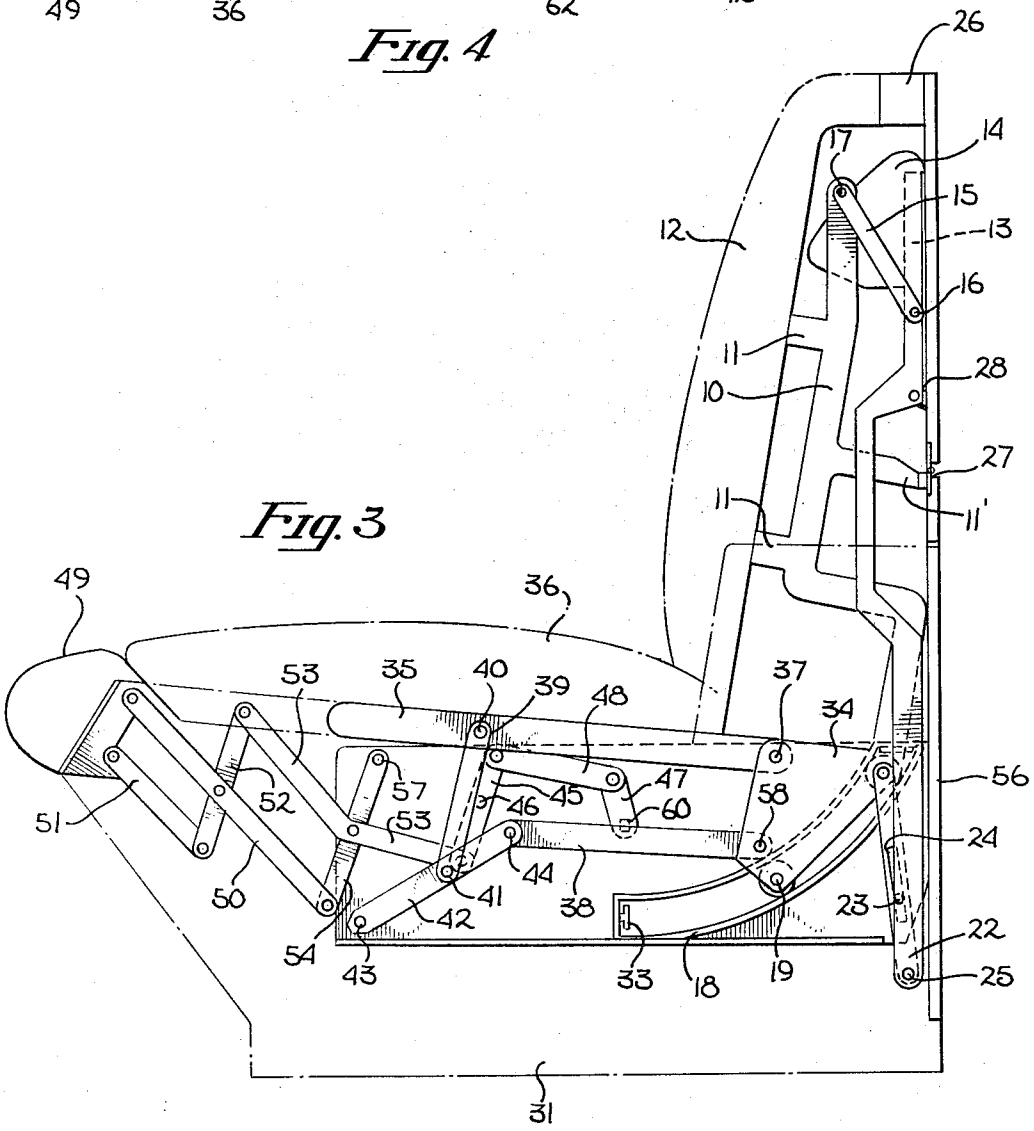
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Fig. 3

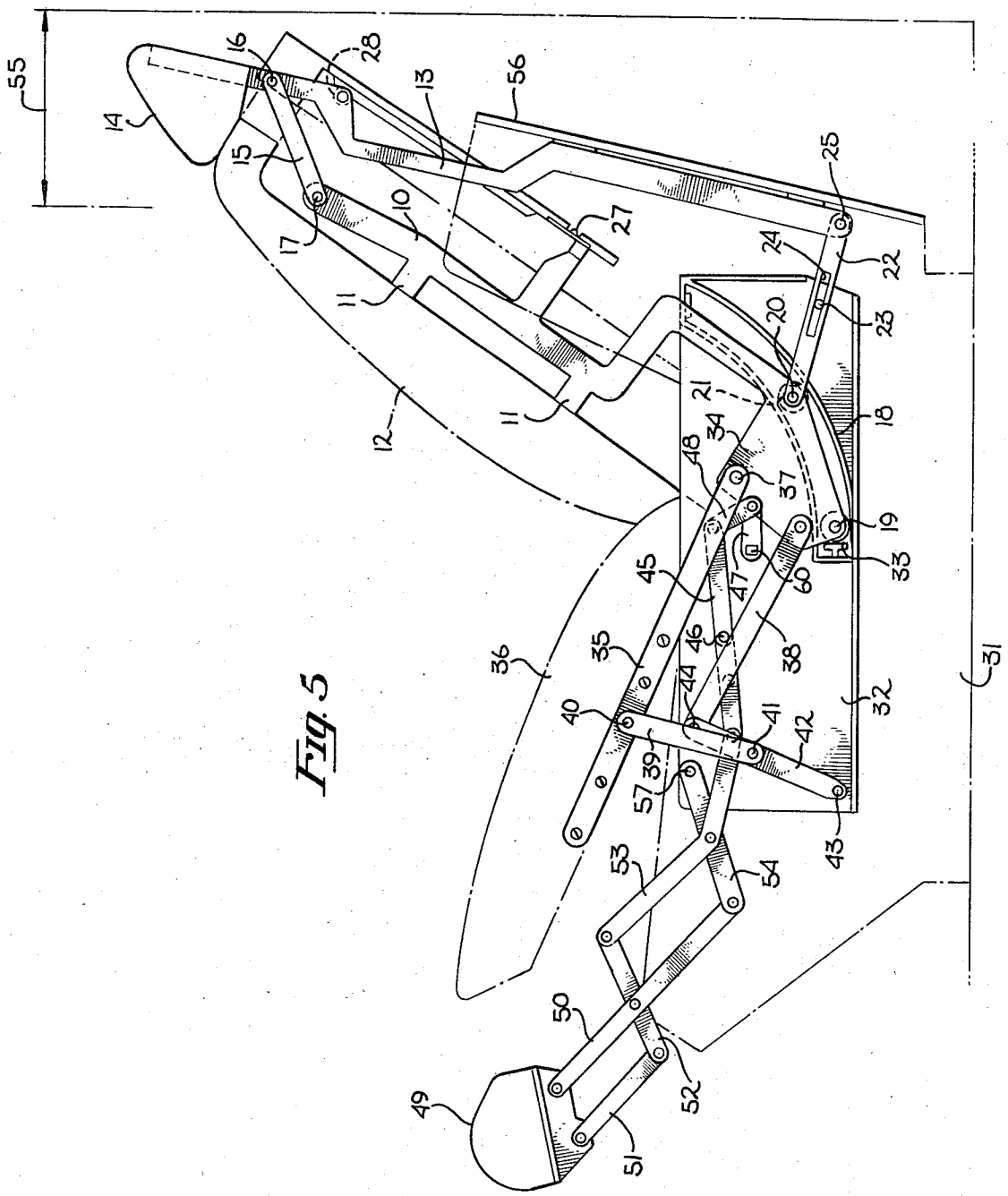
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Fig. 5

RECLINING CHAIR

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to the field of reclining chairs.

2. Prior Art

Reclining chairs such as those shown in U.S. Letters Pat. No. 3,652,125 and 3,147,037 are well known in the prior art. One problem encountered with prior art reclining chairs is that as the backrest is brought into a reclining position the upper part of the backrest and the headrest moves backwards, thus making it difficult to place the chair in a reclining position when the chair is close to a wall or other obstacle. This occurs since the backrest pivots about a single point such as pivot **81** shown in FIGS. **2** and **3** of U.S. Letters Pat. No. 3,652,125. As will be seen in the present invention, an equivalent pivotal means moves forward as the backrest is reclined, thereby preventing the upper portion of the backrest and headrest from moving backwards as far as it does in the prior art chairs.

Also in prior art chairs the headrest often extends above the backrest, preventing the chair from having a low profile. As will be seen in the presently disclosed chair, the headrest is completely concealed within the backrest when the backrest is in its upright position and protrudes and extends upwards as the backrest is reclined.

SUMMARY OF THE INVENTION

A reclining chair is disclosed which includes a concealable headrest, a reclinable backrest, a seat portion which moves in conjunction with the backrest and an extensible footrest. The backrest frame and carriage is mounted on rollers within a pair of sector or curved shaped guide slots which are disposed within the base of the chair. As the backrest is reclined, the pivotal axis of the backrest moves forward within the guide slots, moving the base of the backrest forward as it reclines. The seat support links are coupled to the lower portion of the backrest frame and carriage, causing the end of the seat adjacent to the backrest to move downward and forward as the seat is reclined while the other end of the seat adjacent to the footrest moves forward and upward. A footrest is disposed on a scissor-type assembly and is extensible. The headrest of the chair is pivotally mounted to the upper and lower ends of the backrest frame and carriage. The link coupling the lower end of the backrest carriage to the headrest translates the downward and forward movement of the backrest carriage to a generally upward movement of the headrest causing the headrest to extend upward as the backrest is reclined. The headrest is totally concealed within the backrest when the chair is in the upright position. Thus the reclining chair, unlike the prior art chairs, has a low profile and additionally, when reclined does not require as much space behind the chair as do the prior art chairs.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of the presently invented reclining chair primarily illustrating the back and side of the chair. This view is taken with the chair in its upright position.

FIG. **2** illustrates the chair of FIG. **1** from the same perspective view but with the chair illustrated in its reclined position.

FIG. **3** is a cross-sectional side view of the chair in its upright position illustrating the various linkages and other mechanisms used in the operation of the chair.

FIG. **4** is a partial top view of the chair of FIG. **3**.

FIG. **5** is a cross-sectional side view of the chair similar to FIG. **3**, except that the chair is shown in the reclined position with the headrest and footrest extended.

DETAILED DESCRIPTION OF THE DRAWINGS

As is readily seen from the figures, the presently disclosed chair is a reclining chair with an extensible headrest and footrest. In the presently preferred embodiment, the chair is mounted on a base **31** which may be a fabric covered wooden base. A plurality of linkages and other mechanisms are mounted within and to the base as is commonly done with reclining chairs.

It should be noted that in FIGS. **3** and **5**, only a single side of the various linkages and mechanisms are illustrated and that on the opposite side of the chair a mirror image exists of all the linkages and mechanisms shown in FIGS. **3** and **5** except those described as not having a corresponding mirror image part. Generally, all the linkages may be made from metal, such as steel, utilizing known techniques. The pivotal connections may comprise ordinary metal pivotal connections commonly utilized in reclining chairs or may include bearing inserts, such as nylon inserts.

Referring to FIGS. **1** and **2**, the upholstered embodiment of the seat includes a base **31**, a seat cushion **36** and extensible footrest **49**, a back member **56**, a back cushion **12**, an extensible headrest **14**, and a headrest cover **26**. As is readily apparent from FIGS. **1** and **2**, when the headrest **14** is extended, the headrest cover **26** moves rearward. In the presently preferred embodiment when the chair is reclined, as shown in FIG. **2**, the headrest automatically extends.

The backrest frame and carriage **10** includes a pair of elongated arms, each of which terminate in their lower portion in a generally triangular shaped shoe **34**. The upper end of the carriage **10** is coupled to connecting link **15** at pivot **17** while the arms are interconnected by a pair of cross bars **11**. The cross bars **11** provide a supporting surface for the backrest cushion **12**. Additional cross arms **11'** are disposed on the opposite edge of the arms from cross bars **11** and are utilized to support a hinge **27**. Rollers **19** and **20** are coupled to each of the shoes **34** and in the presently preferred embodiment these rollers comprise nylon members pivotally coupled to the shoes for cooperatively engaging guide slots **18**. Obviously only a single hinge **27** is utilized in the chair.

A pair of side plates **32** are coupled to the sides of the base **31** and provide a support upon which various linkages may be mounted. These side plates in part define the guide slots **18** which have a generally curved shape comprising approximately 90° or one quadrant of an ellipse. As is readily apparent from FIGS. **3** and **5**, the upper end of the guide slots **18** are at the back of the chair, while the forward end of the slots **18** are forward and lower than the upper ends of the slots. Thus, as the carriage **10** moves from the position illustrated in FIG. **3** to the position illustrated in FIG. **5**, the backrest cushion **12** moves both downward and forward as the

backrest reclines. A resilient stop **33** is mounted in the lower end of each of the guide slots **18.** These stops provide surfaces against which the shoe rollers may rest when the chair is in its reclined position.

The headrest **14** is coupled to a pair of elongated headrest links **13.** The upper portion of these links are coupled to the carriage **10** by the connecting links **15** which are pivotally coupled to the backrest links **13** at pivots **16.** The lower portions of the backrest links **13** are pivotally coupled to the shoes **34** through connecting links **22.** The connecting links **22** are pivotally connected at pivot **25** to the links **13** and are pivotally coupled to the shoes **34** at pivots **20,** these connections being the same connections that couple roller **21** to the shoes. An elongated rectangular slot **24** is disposed through and defined by each of the links **22.** The links **22** are pivotally coupled to the plate **32** by pivots **23.** Thus, the connecting links **22** may pivot about pivots **23** in addition to being able to move along their lengths within the confines of the slots **24.** It is readily apparent when comparing the positions of the links **22** in FIGS. **3** and **5,** that these links translate the downward and forward movement of the shoes into generally rearward and upward movement of the headrest links **13.**

The headrest cover **26** includes an upholstered upper portion for mating with the upper contour of the backrest cushion **12** such that the upper portion of the chair, when in its upright position, has a smooth upper surface. A hinge **27** which is coupled to the cross bar **11'** allows the cover **26** to pivot about the hinge so as to expose the headrest **14** and allow it to move upwards above the cushion **12.** A spring **28** is coupled between the cover **26** and at least one of the links **13** to urge the upper portion of the cover **26** against the upper portion of the cushion **12.** It is readily apparent when comparing FIGS. **3** and **5** that as the backrest is reclined the links **13** will move upward as they pivot on connecting links **15** and **22.** As this occurs the cover **26** will open from the pressure exerted against it by the links **13,** allowing the headrest **14** to extend upward and abut the upper surface of the cushion **12.**

The seat cushion **36** is mounted on a pair of main seat links **35,** these links are coupled at one end at pivots **37** to the shoes **34.** Supporting links coupled to links **35** at pivots **40** provide support for the forward portion of the main seat links **35.** The supporting linkages include links **39** which are pivotally coupled at pivots **41** to links **42.** Links **42** are pivotally coupled at pivots **43** to the side plates **32** while the other end of links **42** are pivotally coupled to one end of the links **38** at pivots **44.** The other end of links **38** are pivotally coupled to the shoes **34** at pivots **58.** Thus, in comparing FIGS. **3** and **5,** as the carriage **10** moves downward and forward within the guide slots **18,** the links **38** and **42** will cause links **39** to move one end of links **35** upward while the other end of the links **35,** that is the ends coupled to the shoes, move downward. Also the entire links **35** are translated forward as the chair is reclined.

The footrest **49** is mounted on a generally scissor-type linkage assembly which includes the links **51** and **50,** these links being pivotally coupled to the footrest **49.** Links **50** are pivotally coupled between their ends to links **52,** and links **52** are coupled at their ends to one end of links **51** and one end of links **53.** Links **50** are pivotally coupled to one end of links **54,** while the other end of links **54** are pivotally coupled to the side plates **32** at pivots **57.** Links **53,** which define an obtuse angle, are pivotally coupled between their ends to approximately the mid-point of links **54.** One end of links **53** are pivotally coupled to one end of links **45,** while links **45** are pivotally coupled at pivots **46** to the side plates **32.** The other ends of links **45** are pivotally coupled to one end of links **48,** and the other ends of links **48** are pivotally coupled to one end of the terminal links **47.** The other ends of the terminal links **47** are pivotally coupled to the side plates **32** at pivots **60.** It is readily apparent when comparing FIGS. **3** and **5** that the footrest **49** may be manually extended. Note that in the presently preferred embodiment there is no interconnection between the linkages upon which the footrest **49** is mounted and those linkages which control the movement of the seat, backrest and headrest. A single lever arm **61** is mounted on a shaft **62** and is used to control the movement of the footrest **49.** A sector gear (not shown in order not to over complicate the drawings) is coupled to one of the links **47** and in cooperation with the shaft **62** controls the position of the footrest and enables selection of several footrest positions irrespective of position of the described reclining chair. In the presently preferred embodiment this position control means is a standard means, commonly used in the prior art.

The described reclining chair (with the exception of the footrest) has two positions, an upright position shown in FIGS. **1, 3** and **4** and a reclining position shown in FIGS. **2** and **5.** The chair may be readily manually moved from one position to the other. As the chair is reclined the headrest extends automatically. Because the carriage **10** is mounted within the curved guide slots **18,** the backrest, when reclining, does not move rearward as much as in prior art chairs. Thus, a reclining chair has been disclosed that has a low profile, and which may be reclined even when the back of the chair is close to a wall or other object.

I claim:

1. A reclining chair comprising:

a base which includes a pair of spaced-apart parallel guide slots each having a generally curved shape;

a backrest frame having an upper portion for receiving a cushion and a lower portion which includes a pair of spaced-apart parallel shoes;

connector means for movably coupling said shoes to said guide slots such that the movement of said shoes is restricted by said guide slots;

a pair of seat links for receiving a seat, each pivotally coupled at one end to one of said shoes;

seat support link means, pivotally coupled to said seat links for providing support to said seat links;

a headrest;

a first and a second connector links for pivotally coupling said headrest to said backrest frame, said second connector link being pivotally coupled to at least one of said shoes and to said base so that downward movement of said shoes is translated into upward movement of said backrest;

whereby as said chair is reclined said connector means advance within said guide slots and said backrest is raised.

2. The chair defined in claim **1** including a footrest mounted on a linkage assembly, said assembly coupling said footrest to said base.

3. The chair defined in claim 2 wherein said connector means includes a plurality of rollers.

4. The reclining chair defined in claim 1 including a headrest cover for covering said headrest, said headrest cover being coupled to said backrest frame such that when said headrest is raised said headrest cover uncovers said headrest.

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