

Description

The present invention relates to a chair comprising a support structure, a seat connected to the support structure by means of at least one parallelogram linkage comprising members in the form of tie-rods, the first ends of which are hinged to the seat and the second ends of which are hinged to the support structure, so that the seat is able to move between a lowered position and a raised position, and a backrest with a backrest supporting structure hinged to the chair supporting structure and operationally connected to the seat so as to be able to pivot between an upright position corresponding to the lowered position of the seat and a reclined position corresponding to the raised position of the seat.

Such a type of chair is described in French Patent No.2,045,120 in the name of Dupart.

The seat illustrated and described in the aforementioned document, although allowing the backrest to exert, on the back of the user, a force proportional to the weight of the user himself, proves to be somewhat complicated and, moreover, the parallelogram linkage associated with the system for controlling displacement of the seat by the backrest has relatively large dimensions.

The object of the present invention is to provide a chair equipped with a seat/backrest connecting system which is particularly simple, compact and does not possess the drawbacks of the solutions previously adopted.

According to the invention, this object is achieved owing to the fact that the backrest supporting structure is rigidly connected to one of the tie-rod members and owing to the fact that the parallelogram linkage is provided with elastic means which are arranged in such a way as to bias the backrest towards its upright position.

As a result of the abovementioned characteristic features, the parallelogram linkage has particularly small dimensions, allowing it to be used even in the case of so-called stackable chairs. Furthermore, because of the compactness of the backrest/seat connecting system, it is possible to obtain a chair which is both aesthetic and offers the same features as a chair or armchair which is considerably more complex, costly and larger in size.

Preferably, in the chair according to the invention, at least one of said tie-rod members has, on the end hinged to the chair support structure, an auxiliary arm, and the abovementioned elastic means are interposed between the auxiliary arm and the chair support structure.

Further characteristic features and advantages of the chair according to the invention will emerge from the following detailed description provided by

way of a non-limiting example, with reference to the attached drawings in which:

- Figure 1 is a side view of the chair according to the invention;
- Figure 2 is a perspective view showing the parallelogram linkage;
- Figure 3 is a sectional view along the line III-III of Figure 2, showing the configuration where the seat is lowered;
- Figure 4, is a view similar to Figure 3, showing the seat in the raised position;
- Figure 5 is a sectional view along the line V-V of Figure 4; and
- Figure 6 is a sectional view along the line VI-VI of Figure 4.

With reference to the drawings, 10 denotes in its entirety a chair of the stackable type, comprising a support structure 12 consisting of front legs 13, rear legs 14, a front tubular cross-piece 15 joining the front legs 13 at the top, a rear tubular cross-piece 16 joining the rear legs 14 at the top, and a pair of longitudinal braces 18 consisting of U-shaped profiled sections joining together the front cross-piece 15 and the rear cross-piece 16.

The chair 10 also has a seat 19 and a backrest 20 provided with an internal supporting structure consisting of metal tubes 21.

Each brace 18 has, at the front, a first pair of lugs 22 and, at the rear, a second pair of lugs 23 adjacent to the rear cross-piece 16 of the chair 10. A first pair of plates 25 is hinged, at 24, to the first pair of lugs 22, while a second pair of plates 27 is hinged, at 26, to each second pair of lugs 23. Each first plate 25 has a first end 25a hinged, at 29, to the seat 19 and a second end 25b hinged, at 30, to a metal rod 31.

In exactly the same way, each plate 27 has a first end 27a hinged, at 32, to the seat 19 and a second end 27b hinged, at 33, to the metal rod 31.

The first ends 25a and 27a of the first and second plates are hinged to the seat 19 by U-shaped metal members 50 and 51 and are fixed, at 52 and 53, to the ends of a metal bar 34 having openings 35 for connecting it, by means of screws 36, to the seat 19.

Each plate 27 has, in the vicinity of the point 26 where it is hinged to the longitudinal brace 18, a portion 27c which is welded to the metal structure 21 of the backrest 20, and also has a stop portion 27d, located in the vicinity of the end 27b, which is designed to abut against the bottom wall of the brace 18.

The rod 31, which is hinged to the second ends 25b and 27b of the plates 25 and 27, has an annular shoulder 31a facing an abutment member 40 which is substantially fork-shaped and is fixed to the walls of the longitudinal brace 18 and inside which the said rod 31 is slidably mounted. Between

the projection 40 and the annular shoulder 31a there is located a helical spring 42 which is coaxial with the rod 31 and the mode of operation of which will be explained below.

Figure 3 shows the "rest" condition of the chair where the backrest 20 assumes an upright position indicated by A. In this condition, the spring 42 acts on the parallelogram linkage of the longitudinal brace 18, the seat 19, and the portions of the plates 25 and 27 located between the hinging points 24 and 29 and the hinging points 26 and 32, respectively, so as to keep the seat 19 in the lowered position, indicated by B, where the stop portions 27d of the plates 27 are in contact with the respective braces 18.

It will be seen that the portions of the plates 25, 27 extending between the hinging points 24, 29 and 26, 32 respectively, perform the function of tie-rods, whilst the portions of such plates extending between the hinging points 24, 30 and 26, 33 respectively perform the function of auxiliary arms for the connection to the rod 31.

In the operative condition, i.e. when the user presses with his/her back against the backrest 20, the latter pivots backwards into a reclined stable position, indicated by C, at the same time causing, by means of the metal structure 21 fixed to the second plates 27, the seat 19 to be raised, owing to rotation of the plates 25 and 27 about their respective fulcrums 24 and 26, until the stable condition indicated by D in the drawings is reached. This stable condition is shown in detail in Figure 4.

In the stable condition C, the backrest 20 exerts, on the back of the user, a force proportional to the weight of the user himself, further increased by the force due to the helical spring 42. In this way, it is possible to minimise the dimensions of the plates 25 and 27 and hence of the entire parallelogram linkage, ensuring reliable and comfortable operation for the user.

The seat/backrest connecting system may be advantageously used for any type of chair or arm-chair.

Claims

1. A chair comprising a support structure (18), a seat (19) connected to the support structure (18) by means of at least one parallelogram linkage comprising members in the form of tie-rods (25, 27) the first ends of which are hinged to the seat (19) and the second ends of which are hinged to the support structure (18) so that the seat (19) is able to move between a lowered position and a raised position substantially parallel to each other; and a backrest (20) with a backrest supporting structure (21) hinged to

the chair support structure (18) and operationally connected to the seat (19) so as to be able to pivot between an upright position corresponding to the lowered position of the seat (19) and a reclined position corresponding to the raised position of the seat (19), characterized in that the backrest supporting structure (21) is rigidly connected to one (27) of the tie-rod members and in that said parallelogram linkage (18, 19, 25, 27) is provided with elastic means (42) which are arranged in such a way as to bias the backrest (20) towards its upright position (A).

2. A chair according to Claim 1, characterized in that at least one (27) of the tie-rod members has, on the end hinged to the chair support structure (18), an auxiliary arm and in that the above mentioned elastic means (42) are interposed between the auxiliary arm and the chair support structure (18).
3. A chair according to Claim 2 characterized in that a rod (31) is hinged to said auxiliary arm, which rod (31) is provided with a shoulder (31a) facing an associated abutment member (40) fixed to the support structure (18), a helical spring (42) coaxial with said rod (31) being arranged between said shoulder (31a) and said abutment member (40).
4. A chair according to Claim 3, characterized in that both tie-rod members (25, 27) of each parallelogram linkage are provided with auxiliary arms which are pivotally connected to the ends of said rod (31), respectively.
5. A chair according to Claim 3 of Claim 4, in which the chair support structure (12) comprises a pair of longitudinal braces (18) adjacent to the seat (19), characterized in that each longitudinal brace (18) pivotally supports a first and a second pair of plates (25, 27) adjacent to the front end and the rear end, respectively, of the longitudinal brace, each plate including a first portion constituting the tie-rod member and a second portion constituting the associated auxiliary arm. The second pair (27) of said plates being provided with third portions (27c) to which the supporting structure (21) of the backrest (20) is fixed.
6. Seat according to Claim 5, characterized in that the said longitudinal cross-pieces (18) consist of U-shaped metal profiled sections inside which the abovementioned rods (31) and the abovementioned helical springs (42) are contained.



the projection 40 and the annular shoulder 31a there is located a helical spring 42 which is coaxial with the rod 31 and the mode of operation of which will be explained below.

Figure 3 shows the "rest" condition of the chair where the backrest 20 assumes an upright position indicated by A. In this condition, the spring 42 acts on the parallelogram linkage of the longitudinal brace 18, the seat 19, and the portions of the plates 25 and 27 located between the hinging points 24 and 29 and the hinging points 26 and 32, respectively, so as to keep the seat 19 in the lowered position, indicated by B, where the stop portions 27d of the plates 27 are in contact with the respective braces 18.

It will be seen that the portions of the plates 25, 27 extending between the hinging points 24, 29 and 26, 32 respectively, perform the function of tie-rods, whilst the portions of such plates extending between the hinging points 24, 30 and 26, 33 respectively perform the function of auxiliary arms for the connection to the rod 31.

In the operative condition, i.e. when the user presses with his/her back against the backrest 20, the latter pivots backwards into a reclined stable position, indicated by C, at the same time causing, by means of the metal structure 21 fixed to the second plates 27, the seat 19 to be raised, owing to rotation of the plates 25 and 27 about their respective fulcrums 24 and 26, until the stable condition indicated by D in the drawings is reached. This stable condition is shown in detail in Figure 4.

In the stable condition C, the backrest 20 exerts, on the back of the user, a force proportional to the weight of the user himself, further increased by the force due to the helical spring 42. In this way, it is possible to minimise the dimensions of the plates 25 and 27 and hence of the entire parallelogram linkage, ensuring reliable and comfortable operation for the user.

The seat/backrest connecting system may be advantageously used for any type of chair or arm-chair.

Claims

1. A chair comprising a support structure (18), a seat (19) connected to the support structure (18) by means of at least one parallelogram linkage comprising members in the form of tie-rods (25, 27) the first ends of which are hinged to the seat (19) and the second ends of which are hinged to the support structure (18) so that the seat (19) is able to move between a lowered position and a raised position substantially parallel to each other; and a backrest (20) with a backrest supporting structure (21) hinged to the chair support structure (18) and operationally connected to the seat (19) so as to be able to pivot between an upright position corresponding to the lowered position of the seat (19) and a reclined position corresponding to the raised position of the seat (19), characterized in that the backrest supporting structure (21) is rigidly connected to one (27) of the tie-rod members and in that said parallelogram linkage (18, 19, 25, 27) is provided with elastic means (42) which are arranged in such a way as to bias the backrest (20) towards its upright position (A).
2. A chair according to Claim 1, characterized in that at least one (27) of the tie-rod members has, on the end hinged to the chair support structure (18), an auxiliary arm and in that the above mentioned elastic means (42) are interposed between the auxiliary arm and the chair support structure (18).
3. A chair according to Claim 2 characterized in that a rod (31) is hinged to said auxiliary arm, which rod (31) is provided with a shoulder (31a) facing an associated abutment member (40) fixed to the support structure (18), a helical spring (42) coaxial with said rod (31) being arranged between said shoulder (31a) and said abutment member (40).
4. A chair according to Claim 3, characterized in that both tie-rod members (25, 27) of each parallelogram linkage are provided with auxiliary arms which are pivotally connected to the ends of said rod (31), respectively.
5. A chair according to Claim 3 of Claim 4, in which the chair support structure (12) comprises a pair of longitudinal braces (18) adjacent to the seat (19), characterized in that each longitudinal brace (18) pivotally supports a first and a second pair of plates (25, 27) adjacent to the front end and the rear end, respectively, of the longitudinal brace, each plate including a first portion constituting the tie-rod member and a second portion constituting the associated auxiliary arm. The second pair (27) of said plates being provided with third portions (27c) to which the supporting structure (21) of the backrest (20) is fixed.
6. Seat according to Claim 5, characterized in that the said longitudinal cross-pieces (18) consist of U-shaped metal profiled sections inside which the abovementioned rods (31) and the abovementioned helical springs (42) are contained.



Revendications

1. Chaise comprenant une structure de support (18), une assise (19) reliée à la structure de support (18) par au moins une tringlerie à parallélogramme qui comprend des éléments présentant la forme de tirants (25, 27) dont les premières extrémités sont articulées à l'assise (19) et les secondes extrémités sont articulées à la structure de support (18), de sorte que l'assise (19) peut se déplacer entre une position abaissée et une position relevée sensiblement parallèles entre elles, et un dossier (20) comprenant une structure support de dossier (21) articulée à la structure support (18) de la chaise et reliée fonctionnellement à l'assise (19) de manière à pouvoir pivoter entre une position redressée qui correspond à la position abaissée de l'assise (19) et une position inclinée qui correspond à la position relevée de l'assise (19), caractérisée en ce que la structure support de dossier (21) est reliée rigidement à l'un (27) des tirants et en ce que la tringlerie à parallélogramme (18, 19, 25, 27) est munie de moyens élastiques (42) qui sont agencés de manière à solliciter le dossier (20) vers sa position redressée (A).
2. Chaise selon la revendication 1, caractérisée en ce qu'au moins un (27) des tirants possède un bras auxiliaire sur son extrémité qui est articulée sur la structure de support (18) de la chaise et en ce que les moyens élastiques précités (42) sont interposés entre le bras auxiliaire et la structure de support (18) de la chaise.
3. Chaise selon la revendication 2, caractérisée en ce qu'une tige (31) est articulée sur ledit bras laquelle tige (31) est munie d'un épaulement (31a) qui fait face à un élément de butée (40) correspondant fixé à la structure de support (18), un ressort hélicoïdal (42) coaxial à ladite tige (31) étant agencé entre ledit épaulement (31a) et ledit élément de butée (40).
4. Chaise selon la revendication 3, caractérisée en ce que les deux tirants (25, 27) de chaque tringlerie à parallélogramme sont munis de bras auxiliaires qui sont articulés sur les extrémités de ladite tige (31) respectivement.
5. Chaise selon la revendication 3 ou la revendication 4, dans laquelle la structure de support (12) de la chaise comprend une paire d'entretoises longitudinales (18) adjacentes à l'assise (19), caractérisée en ce que chaque entretoise longitudinale (18) supporte par des articula-

tions une première et une deuxième paire de plaques (25, 27) respectivement adjacentes à l'extrémité avant et à l'extrémité arrière de l'entretoise longitudinale, chaque plaque comprenant une première portion qui constitue le tirant et une deuxième portion qui constitue le bras auxiliaire correspondant. La deuxième paire (27) de ces plaques étant munie de troisièmes portions (27c) auxquelles est fixée la structure de support (21) du dossier (20).

6. Chaise selon la revendication 5, caractérisée en ce que lesdites pièces transversales longitudinales (18) sont constituées par des profilés métalliques en U à l'intérieur desquels sont logés les tiges (31) précitées et les ressorts hélicoïdaux (42) précités.

Patentansprüche

1. Stuhl, der einen Tragaufbau (18), einen Sitz (19), der mit dem Tragaufbau (18) über zumindest eine Parallelogrammverbindung verbunden ist, die Glieder in Form von Verbindungsstangen (25, 27) enthält, deren erste Enden mit dem Sitz (19) und deren zweite Enden mit dem Tragaufbau (18) gelenkig verbunden sind, so daß sich der Sitz (19) zwischen einer abgesenkten Stellung und einer angehobenen Stellung bewegen kann, die im wesentlichen parallel zueinander sind; sowie eine Rückenlehne (20) mit einem Rückenlehnen-Tragaufbau (21) besitzt, der mit dem Stuhl-Tragaufbau (18) gelenkig verbunden und betriebsmäßig mit dem Sitz (19) so verbunden ist, daß sich die Rückenlehne (20) zwischen einer aufrechten Stellung, die der abgesenkten Stellung des Sitzes (19) entspricht, und einer zurückgelehnten Stellung verschwenken kann, die der angehobenen Stellung des Sitzes (19) entspricht, dadurch gekennzeichnet, daß der Rückenlehnen-Tragaufbau (21) starr mit einem (27) der Verbindungsstangen-Glieder verbunden ist, und daß die Parallelogrammverbindung (18, 19, 25, 27) mit einer Federeinrichtung (42) versehen ist, die so angeordnet ist, um die Rückenlehne (20) zu ihrer aufrechten Stellung (A) vorzuspannen.
2. Stuhl gemäß Anspruch 1, dadurch gekennzeichnet, daß zumindest eines (27) der Verbindungsstangen-Glieder an jenem Ende, das mit dem Stuhl-Tragaufbau (18) gelenkig verbunden ist, einen Hilfsarm besitzt, und daß die oben erwähnte Federeinrichtung (42) zwischen dem Hilfsarm und dem Stuhl-Tragaufbau (18) liegt.



3. Stuhl gemäß Anspruch 2, dadurch gekennzeichnet, daß mit dem Hilfsarm eine Stange (31) gelenkig verbunden ist, wobei die Stange (31) mit einer Schulter (31a) versehen ist, die einem zugeordneten Anschlagglied (40) gegenüberliegt, das am Tragaufbau (18) befestigt ist, wobei eine Schraubenfeder (42) coaxial mit der Stange (31) zwischen der Schulter (31a) und dem Anschlagglied (40) angeordnet ist. 5
4. Stuhl gemäß Anspruch 3, dadurch gekennzeichnet, daß beide Verbindungsstangen-Glieder (25, 27) einer jeden Parallelogrammverbindung mit Hilfsarmen versehen sind, die mit den Enden der Stange (31) schwenkbar verbunden sind. 10 15
5. Stuhl gemäß Anspruch 3 oder 4, wobei der Stuhl-Tragaufbau (12) ein Paar von Längsstreben (18) neben dem Sitz (19) enthält, dadurch gekennzeichnet, daß jede Längsstrebe (18) ein erstes und zweites Paar von Platten (25, 27) neben dem Vorderende bzw. dem Hinterende der Längsstrebe schwenkbar trägt, wobei jede Platte einen ersten Teil aufweist, der das Verbindungsstangen-Glied bildet, sowie einen zweiten Teil aufweist, der den zugeordneten Hilfsarm bildet, wobei das zweite Paar (27) der Platten mit dritten Teilen (27c) versehen ist, an denen der Tragaufbau (21) der Rückenlehne (20) befestigt ist. 20 25 30
6. Stuhl gemäß Anspruch 5, dadurch gekennzeichnet, daß die länglichen Querstücke (18) aus U-förmigen Metallprofilteilen bestehen, in denen die oben erwähnten Stangen (31) und die oben erwähnten Schraubenfedern (42) enthalten sind. 35

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