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(54) **Outdoor reclining chair**

(57) A chair (100) includes a support frame (104), and a seat (110) connected to the support frame (104). The seat (110) is configured to support a user and move with respect to the support frame (104). The chair (100) includes a back portion (108) connected to the seat (110). The back portion (108) is configured to move with respect to the seat (110). The chair (100) includes a foot rest

(112) connected to the seat (110). The foot rest (112) is configured to move with respect to the seat (110). The chair (100) includes a lower strut (116) connected between the back portion (108) and the foot rest (112). The lower strut (116) is configured to move with respect to the back portion (108). The lower strut (116) is configured to move with respect to the seat (110).

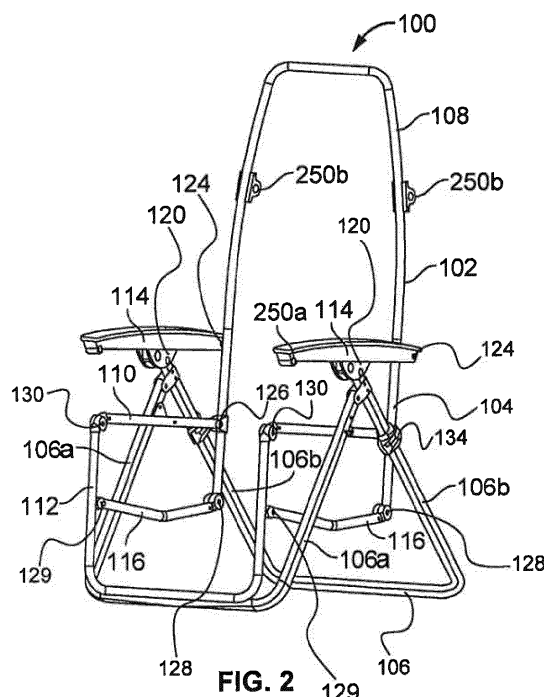


FIG. 2

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Description

FIELD OF THE INVENTION

[0001] The disclosure relates in general to a chair and, more particularly, to an adjustable chair that is positionable in a lay-flat position.

BACKGROUND

[0002] A number of different folding or reclining chairs are available in the marketplace. The chairs include various adjustable surfaces that can be manipulated to allow a user to sit in a comfortable and relaxed position. Generally, the chairs are adjustable between an upright, seated position and a partially reclined position. Sometimes the chairs are configured to include foot rests and recline sufficiently far that a user can achieve a 'zero gravity' position in which the user's legs are at approximately the same level, or higher than, the user's heart.

[0003] Some reclining chairs are designed for outdoor use. These chairs generally include a rigid frame. A fabric or other lightweight material is strung over the frame to provide a surface upon which the user sits or reclines. The frame includes a number of hinges and locking mechanisms that allow the position of portions of the frame to be adjusted, thereby providing a reclining function. Some chairs only provide a reclining back portion, while other chairs include both a reclining back portion as well as an adjustable foot rest.

[0004] In outdoor recliners that include a foot rest, the back portion of the recliner is usually connected to the foot rest portion. The connection between back portion and foot rest assists a user in operating the chair by ensuring that the act of reclining the back portion of the recliner simultaneously raises the foot rest. As an example, Figs. 1A and 1B show a conventional outdoor reclining chair in its upright and reclined positions, respectively. Recliner 10 includes back portion 12, seat 13, and foot rest 14. Arms 16 of recliner 10 connect back portion 12 to foot rest 14 so that a rotation of back portion 12 about pivot 20 is translated into a corresponding movement of foot rest 14 about pivot 24.

[0005] Arms 16 are connected to frame 18 with a lockable, sliding connection 22. When locked, the position of arms 16 with respect to frame 18 is fixed, thereby fixing a position of back portion 12 and foot rest 14. To move either back portion 12 or foot rest 14, arms 16 are first unlocked, and then the back portion or foot rest can be repositioned.

[0006] When in the desired position, arms 16 are locked, thereby fixing the position of back portion 12 and foot rest 14. As a user reclines back portion 12, foot rest 14 is pulled upwards, providing a comfortable place for the user to rest their feet. Conversely, when back portion 12 is pulled upright, foot rest 14 is pushed downwards, allowing the user to sit in a more upright position in recliner 10.

[0007] As shown in Fig. 1B, the connection between arms 16 and foot rest 14 restricts the movements of back portion 12 and foot rest 14 of recliner 10. Accordingly, recliner 10 can only be partially reclined (see, for example, Fig. 1B) - back portion 12, seat 13, and foot rest 14 cannot be positioned in a flat configuration. Because arms 16 are located above the height of seat 13 (for the user's comfort) and, therefore, above foot rest 14, foot rest 14 will always be slanted in order to connect between arms 16 and pivot 24. Accordingly, even in a fully-reclined position (see Fig. 1B), the recliner 10 is not perfectly flat, requiring the user to sit upon recliner 10. Because recliner 10 cannot lie flat, the user cannot lay upon his or her front.

[0008] Additionally, the design of recliner 10 limits the ability of recliner 10 to achieve a fully upright position. As shown in the recliner's upright position in Fig. 1A, foot rest 14 is not in a fully upright position - the back of recliner 10 is at least partially reclined away from an upright position. Accordingly, conventional recliners, such as recliner 10 shown in Figs. 1A and 1B are not suitable for situations calling for a fully upright seating position, such as when a user sits at a table. This can also make getting out of recliner 10 difficult.

BRIEF SUMMARY

[0009] The disclosure relates in general to chairs and, more particularly, to adjustable chairs being positionable in a lay-flat position.

[0010] In one implementation, the present invention is a chair. The chair includes a support frame, and a seat connected to the support frame. The seat is configured to support a user and move with respect to the support frame. The chair includes a back portion connected to the seat. The back portion is configured to move with respect to the seat. The chair includes a foot rest connected to the seat. The foot rest is configured to move with respect to the seat. The chair includes a lower strut connected between the back portion and the foot rest. The lower strut is configured to move with respect to the back portion. The lower strut is configured to move with respect to the seat.

[0011] In another implementation, the present invention is a chair. The chair includes a support frame, a seat connected to the support frame, and a back portion connected to the seat at a first connection. The back portion is configured to move with respect to the seat and having a top and a bottom. The chair includes a foot rest connected to the seat at a second connection. The foot rest is configured to move with respect to the seat and having a top and a bottom. The chair includes a strut connected to the back portion at a third connection and the foot rest at a fourth connection. The third connection is between the first connection and the bottom of the back portion and the fourth connection is between the second connection and the bottom of the foot rest.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

Figs. 1A and 1B show a conventional outdoor reclining chair in its upright and reclined positions, respectively;

Fig. 2 shows a perspective view of the frame of the present recliner in a seated, upright position;

Fig. 3 shows a side view of the frame of the recliner of Fig. 2 in the same seated, upright position as that shown in Fig. 2;

Fig. 4 shows a side view of the frame of the recliner of Fig. 2 in a fully reclined position, where a foot rest, seat, and back portion of the recliner are positioned 30 substantially in-line with one another and parallel to a ground surface;

Fig. 5 shows the recliner of Fig. 2 in a collapsed configuration that allows for easier transportation and storage;

Figs. 6A and 6B are illustrations showing a cup holder;

Figs. 7A and 7B are illustrations showing a cup holder mount;

Fig. 8 is a perspective view of the present recliner incorporating a fabric surface for use by a user;

Figs. 9A and 9B shows a side of the frame of the recliner of Fig. 2 incorporating an optional spring to facilitate transitioning the recliner out of a fully reclined position.

DETAILED DESCRIPTION OF THE DRAWINGS

[0013] The disclosure relates in general to chairs and, more particularly, to adjustable chairs being positionable in a lay-flat position. The present reclining chair allows a user to easily transition between a seated and a lay-flat position. The user can sit comfortably within the recliner in a number of different positions as well as lay on the recliner in a flat position. The recliner also allows a user to more easily transition between the recliner's upright and reclined positions.

[0014] The recliner can also include one or more cup holders that can be positioned about the frame of the recliner. The cup holders are configured to be correctly oriented for holding beverages when attached to the recliner.

[0015] Figs. 2-4 show various views of the same frame of recliner 100 in different view angles and in different configurations. Fig. 2 shows a perspective view of the

frame of recliner 100 in a seated, upright position. Fig. 3 shows a side view of the frame of recliner 100 in the same seated, upright position as that shown in Fig. 2. Fig. 4 shows a side view of the frame of recliner 100 in a fully reclined position, where a foot rest, seat, and back portion of the recliner are positioned substantially in-line with one another and parallel to a ground surface. In Figs. 2-4 some element numbers have not been duplicated across all figures where features of the frame have been obscured by a different view or to avoid unnecessary clutter of the drawings, however Figs. 2-4 should be considered to show different views of the same frame structure where a numbered component in one view is shown in all views, even if not identified with an element number in a different figure.

[0016] Recliner 100 includes frame 102 having a chair frame 104 and a support structure 106. Support structure 106 provides support for recliner 100 and is made up of front legs 106a and back legs 106b. Chair frame 104 is connected to support structure 106 and includes back 108, seat 110, and foot rest 112. Arm rests 114 are connected to chair frame 104 and support structure 106. As illustrated, back 108 of chair frame 104 includes a first section 108a (see Fig. 3) that extends above the connection 126 with seat 110. Back 108 also includes a second or lower section 108b (see Fig. 3) that extends below seat 110 to connect to lower struts 116.

[0017] Legs 106a and 106b of support structure 106 are pivotally connected at connection 118 and can be folded together, or away from one another, to provide a stable support for recliner 100. Legs 106a and 106b can be constructed from a tubular material such as steel or aluminum. In one implementation, support structure 106 is constructed from lengths of materials having an oval cross-section to provide additional strength.

[0018] Arms 114 connects to support structure 106 (in one particular implementation, arms 114 are connected to back legs 106b) with a lockable sliding connection 120. The position of connection 120 along each of arms 114 can be adjusted or locked into position. The chair may include an indicator showing whether arms 114 are in a locked or unlocked condition. In Fig. 3 connection 120 is located at approximately the centre of the length of arms 114. In Fig. 4, however, with recliner 100 in its reclined position, connection 120 is located closer to the end of arms 114.

[0019] Connection 120 can be locked to fix a position of arms 114 with respect to connection 120. For example, arms 114 may include a ratchet system to selectively fix a position of arms 114 with respect to connection 120. In that case, when arms 114 are lifted (disengaging the ratchet system), arms 114 connection 120 can be repositioned or slid along the length of arms 114. In that case, when arms 114 are lowered (locking the ratchet), the arms are fixed to connection 120 and connection 120 cannot be repositioned along arms 114. In some implementations, a lower surface of arms 114 includes a surface treatment (such as a number of ridges - see element

408 of Figs. 9A and 9B, for example) configured to engage with a locking member mounted to support structure 106. In that case, to allow arms 114 to move with respect to connection 120 or frame 106, the locking mechanism is lowered away from the lower surface of arms 114, thereby allowing arms 114 to move. To lock a position of arms 114, the locking mechanism is moved upwards to engage with the lower surface of arms 114, thereby locking arms 114 in position.

[0020] In other implementations, though, connection 120 may include a releasable cam device that provides a releasable locking cam that, when engaged against a surface of arms 114, fixes a position of arms 114 with respect to connection 120. Alternatively, connection 120 may include a spring-biased, releasable post that is configured to selectively engage with a plurality of holes formed along a length of arms 114 (or vice versa) to fix a position thereof. Any suitable locking mechanisms that can releasably fix a position of arms 114 with respect to connection 120, while selectively allowing arms 114 to slide with respect to connection 120, may be utilized to implement the functionality of connection 120.

[0021] Additionally, connection 120 is configured to rotate with respect to back leg 106b about connection 122. As shown in Figs. 3 and 4, for example, in different positions of back 108, connection 120 rotates with respect to back leg 106b.

[0022] Arms 114 are pivotally connected to back 108 at connection 124. Back 108 is pivotally connected to seat no at connection 126 and lower struts 116 at connections 128. Lower struts 116 are pivotally connected to foot rest 112 at connections 129 and foot rest 112 is pivotally connected to seat no at connection 130. As shown in Figs. 3 and 4, in one implementation lower struts 116 are not straight and instead have a slight bend. The bend facilitates the lifting of footrest 112 when the recliner is in a fully reclined position. Additionally, the bend facilitates correct folding of the recliner when the recliner is collapsed. In one implementation, the bend has an angle of between 10 and 15 degrees. In one specific implementation, the bend is equal to 13 degrees.

[0023] Seat 110 is pivotally connected to support structure 106 at connection 132 and connection 136 of sliding bracket 134. Sliding bracket 134 is configured to slide along a length of back leg 106b.

[0024] In one implementation of recliner 100, the geometry of the components of recliner 100 are as follows. The width of the frame of recliner 100 is approximately 610 millimeters (mm). The length of foot rest 112 is approximately 486 mm and the length of seat no is approximately 503 mm. The length of lower struts 116 is approximately 503 mm, though in one implementation the length is approximately 489 mm. The length of back 108 from the top of back 108 to connection 128 is approximately 996 mm. The distance from connection 130 to connection 129 is approximately 191 mm, the distance from connection 128 to connection 126 (along length of section 108b of back 108) is approximately 190 mm, the

distance from connection 126 to connection 124 is approximately 197 mm. The length of arms 114 are approximately 559 mm.

[0025] The dimensions provided above are only one example of an implementation of recliner too. Recliners having other dimensions may be constructed. In some cases, the geometry of the chair can be adjusted to meet particular design needs. For example, in one implementation the slope of the seat no when recliner 100 is in an upright position is selected to allow a person to more comfortably sit upon recliner 100. One approach for selecting a desired slope for seat no is to position pivot 132 at a particular location along front legs 106(a). By raising the position of pivot 132 along front legs 106(a) the front of seat 110 is raised in comparison to the rear. Conversely, by lowering the position of pivot 132 down front legs 106(a) the front of seat 110 is lowered in comparison to the rear.

[0026] In one implementation of recliner 100, the components are configured so that the length of seat no (indicated by l_{seat} on Fig. 3) is approximately equal to the length of lower strut 116 (indicated by l_{strut} on Fig. 3). Furthermore, the components may be configured so that the length of footrest between connection 130 and 129 (indicated by l_f on Fig. 3) is approximately equal to the length of the lower section 108b of back 108.

[0027] As discussed above, recliner 100 can be adjusted between an upright position and a lay-flat position, in addition to a number of intermediary positions. Fig. 3 shows recliner 100 in an upright position, suitable for use at a table, for example. To transition recliner 100 into a lay-flat position (shown in Fig. 4) from the upright position, the user first unlocks arms 114. This allows arms 114 to slide back and forth along and with respect to connection 120.

[0028] With arms 114 unlocked, the user pushes against back 108 of recliner 100. This causes back 108 to rotate about connection 126 pulling arms 114 backwards. As back 108 rotates backwards about connection 126, lower struts 116 are pushed forwards against foot rest 112 by the lower portion 108b of back 108. This causes foot rest 112 to rotate about connection 130, raising foot rest 112 into the lay-flat position shown in Fig. 4. In the lay-flat position, the components of chair frame 104 are supported by support frame 106 at connection 136 of sliding bracket 134 and connection 132. Foot rest 112 is supported by lower struts 116 and connection 130.

[0029] With recliner 100 in the lay-flat position, arms 114 may optionally be locked to fix a position of back 108, seat 110, and foot rest 112 of recliner 100. Because foot rest 112 is supported by struts 116, foot rest 112 is lifted into a position where the foot rest is level with seat 110 and back 108. In contrast to existing recliners, where the foot rest is connected to the recliner's arms, restricting the foot rest's ability to lay flat, the present recliner, by incorporating the lower strut system, has mitigated that problem. Accordingly, with the present recliner, as shown in Fig. 4, a lay-flat position is achievable.

[0030] The recliner 100, as described above, can be transitioned from an upright position to a lay-flat position by applying a force against back 108 of recliner 100. In other cases, though, instead of (or in addition to) applying force to back 108, other components of recliner 100 can be manipulated to transition recliner 100 into the lay-flat position. For example, a user may unlock arms 114 and then pull upwards on foot rest 112 instead.

[0031] In order to transition recliner too from the lay-flat position shown in Fig. 4 to the upright position shown in Fig 3, the process described above is reversed. First, arms 114 are unlocked. With arms 114 unlocked, the user presses downwards upon foot rest 112 (or pulls upwards upon back 108, or combinations thereof). This causes foot rest 112 to rotate downwards about connection 130. As foot rest 112 moves downwards, lower struts 116 push against the lower portion of back 108 causing back 108 to rotate about connection 126 in a counter-clockwise direction (as depicted in Figs. 3 and 4). This causes back 108 to rotate upwards into back 108's upright position as shown in Fig. 3.

[0032] With recliner 100 in the upright position shown in Fig. 3 (or an intermediary position between the upright and lay-flat positions), arms 114 can be locked with respect to connection 120 to fix a position of back 108, seat 110, and foot rest 112 of recliner 100. As shown in Fig. 3, the upright position of recliner 100 positions foot rest 112 in a substantially upright or vertical position. A user sitting in recliner 100, therefore, would have his or her feet positioned directly beneath their knees. This position greatly facilitates the act of standing up from recliner 100 and is in contrast to existing recliner devices where, even in their most upright position, the user's feet are positioned in front of the user's knees, making it difficult to stand up out of the recliner (see, for example, the foot rest position shown in Fig. 1A).

[0033] In many implementations of recliner 100, arms 114 can be locked in a number of intermediary positions allowing the user to fix the position of recliner 100 into a position somewhere between the upright position shown in Fig. 3 and the lay-flat position shown in Fig. 4.

[0034] Recliner 100 can also be collapsed. Fig. 5, for example, shows recliner 100 in a collapsed configuration that allows for easier transportation and storage. To collapse recliner 100, recliner 100 is first put into an upright position, as shown in Fig. 3. Arms 114 are then unlocked and back 108 is pushed forward. As the user pushes back 108 of recliner 100 forward, causing back 108 to rotate about connection 126, the user also lifts upwards upon the front portion of seat 110, causing sliding bracket 134 to slide downwards along leg 106b. As sliding bracket 134 moves downwards, the sliding bracket pulls along the length of connected seat 100, which, in turn, pulls against connection 132. As seat 110 pulls against connection 132, front leg 106a is pulled backwards to fold up against back leg 106b.

[0035] As sliding bracket 134 moves downwards along back leg 106b, seat 110 folds upwards against back 108.

As seat 110 is folded towards back 108, lower strut 116 constrains the position of foot rest 112, causing foot rest 112 to fold downwards against seat 100. The length of foot rest 112 is selected so that foot rest 112 can pass through the volume defined by front leg 106a to complete the collapsing action.

[0036] Recliner 100 may also include one or more cup holders positioned about the frame of recliner 100. Figs. 6A and 6B are illustrations showing cup holder 200 before attachment to recliner 100. Cup holder 200 includes a body 202 sized to receive a beverage container. Body 202 includes floor 204 configured to support the beverage container when a container is positioned within body 202 of cup holder 200.

[0037] Body 202 of cup holder 200 is connected to mounting post 206 for connecting cup holder 200 to a cup holder mount of recliner 100. The cup holder mounts are described in more detail with reference to Figs. 7A and 7B.

[0038] Mounting post 206 of cup holder 200 includes locking post 208. Locking post 208 is configured to removably secure cup holder 200 to a cup holder mount of recliner 100 to prevent the cup holder from accidentally falling out of, or being jostled from, the cup holder mount. When desired, however, a user can remove the cup holder 200 from the cup holder mount. The user may so remove the cup holder to move the cup holder to a different position on recliner 100, or to replace the cup holder with another cup holder having a similar mounting post.

[0039] To allow cup holder 200 to be removed from or installed into a cup holder mount, locking post 208 can be selectively withdrawn inside mounting post 206, allowing mounting post 206 to be slid into a portion of the cup holder mount that is sized to receive mounting post 206. When mounting post 206 is fully inserted into the cup holder mount, locking post 208 is extended out of mounting post 206 to engage with a locking structure of the cup holder mount to retain the cup holder post in the cup holder mount. This locks the cup holder to the cup holder mount while allowing the cup holder to rotate with respect to the cup holder mount. In one implementation, the user presses against button 210 to selectively withdraw locking post 208 into mounting post 206. In that case, locking post 208 may be spring biased in its outward position so that when the user releases button 210, locking post 208 extends into the outward position shown in Fig. 6A. Other user interfaces may be used for selectively withdrawing or extending locking post 208. In one implementation, for example, locking post 208 is spring biased into its outward position, but includes sloped edges allowing the user to simply push or pull cup holder 200 into or out of the cup holder mount with sufficient force. Other mechanisms may also be used for selectively engaging cup holder 200 with a cup holder mount.

[0040] In other implementations, however, the mounting post 206 of cup holder 200 does not include a locking post. Instead, mounting post 206 includes a cylindrical post of material that is configured to engage, via a friction

fit, a receiving hole provided on recliner 100. The diameter of the receiving hole is selected to securely receiving the mounting post of the cup holder. In that configuration, the mounting post of the cup holder can easily be introduced or removed from the receiving hole. Alternatively,

[0041] Figs. 7A and 7B are illustrations showing cup holder mount 250. Mount 250 includes opening 252 sized to receive mounting post 206 of cup holder 200 (see Figs. 6A and 6B). When mounting post 206 is correctly inserted into opening 252 of mount 250, locking post 208 of mounting post 206 is extended into locking channel 254 of mount 250. This prevents removal of cup holder 200 from mount 250, while also allowing cup holder 200 to rotate with respect to the cup holder mount causing locking post 208 to move back and forth along locking channel 254 as mounting post 206 rotates within opening 252 of mount 250. In this arrangement, cup holder 200, when installed into mount 250, is pulled downwards by gravity into an upright position allowing beverage containers (or other objects) to be safely seated within cup holder 200. In configurations of cup holder 200 where mounting post 206 includes a solid cylindrical piece of material and no locking post, locking channel 254 may not be incorporated into cup holder mount 250.

[0042] Mount 250 includes attachment points 256 for connecting mount 250 to the frame or armrests of recliner 100 to provide convenient attachment points for a cup holder. One or more screw or other fasteners can be introduced through attachment points 256 to connect mount 250 to the frame or armrests of recliner 100. Alternatively, mount 250 may be formed integrally with various components of recliner 100, such as arm rests 114.

[0043] A number of different positions for mount 250 are shown in Figs. 2-4. In one implementation, one or more mounts 250a are connected to or integrated into arm rests 114 of recliner 100. These mounts allow a user to connect cup holder 200 to the mounts 250a integrated into arm rests 114. In this configuration, when recliner 100 is in an upright, seated position (see, for example, Fig. 3), the cup holders will be usable by a seated user. Because the cup holders are able to at least partially rotate with respect to mounts 250a of arm rests 114, even if recliner 100 is partially reclined, the cup holders will automatically be oriented in an upright position. Generally, this is achieved by gravity pulling downwards upon the cup holder when the cup holder is connected to mount 250a.

[0044] Recliner 100 may include additional cup holder mounts 250b connected to the frame of recliner 100. Figs. 2, 3, and 4 show mount 250b connected to back 108 of chair frame 104 of recliner 100. With mount 250b so positioned, when recliner 100 is in a lay-flat position (as shown in Fig. 4) a cup holder can be coupled to mount 250b to provide a convenient location for beverage holding. As discussed above, because the cup holder is at least partially free to rotate with respect to mount 250b,

the cup holder is automatically rotated by gravity to an appropriate position for beverage holding even if recliner 100 is not in an entirely lay-flat position.

[0045] Figs. 2-4 show the tubular structural components of recliner 100. To provide the surface upon which a user rests, a fabric, or other material, is connected between the tubular portions of back 108, seat 110, and foot rest 112, as shown in Fig. 8. As shown in Fig. 8, fabric 302 includes a number of eyes 300 allowing fabric 302 to be attached to frame 104 of recliner 100. Fabric 302 provides a surface upon which a user sits or lays when using recliner 100. Although the fabric shown in Fig. 8 is shown as a largely contiguous surface, fabric 302 may instead be replaced by a number of straps that extend across the width of chair frame. In providing the seating surface, however, there are many different structures that could be coupled to chair frame 104 any of which is suitable for use in conjunction with recliner 100. Head cushion 304 and foot cushion 306 can be integrated into fabric 302 to provide support and comfort to the user. A gap 308 is formed in fabric 302 near the bottom of foot rest 112 allowing a user to rest his or her feet upon the lower bar 310 of foot rest 112.

[0046] In one implementation, the arms of recliner 100 include a spring mechanism to facilitate transitioning the recliner from a reclined to an upright position. Figs. 9A and 9B shows a side of frame 102 of the recliner 100 of Figs. 2-4 incorporating the optional spring to facilitate transitioning the recliner out of a fully reclined position. Fig. 9A shows a side view of recliner 100 with a portion of arm 114 removed to exposed the internal spring structure. Fig. 9B is a view of the arm of the recliner showing additional detail.

[0047] As seen in Figs. 9A and 9B, arm 114 includes a cavity 400 configured to receive spring 402. Spring 402 is mounted within cavity 400 to surface 404. Additionally, as seen in Fig. 9A, a portion of bracket 120, including surface 406, is disposed within cavity 400. As a result, when recliner 100 is transitioned into its reclined position, bracket 120 slides along the length of arm 114 in a direction towards spring 402 and surface 400.

[0048] As recliner 100 is reclined and approaches its fully reclined position (causing bracket 120 to slide along arm 114), surface 406 of bracket 120 contacts spring 402 and compresses spring 402 between surface 406 and surface 404. Spring 402 is configured to resist the compressive force. When recliner 100 is in its fully reclined position, therefore, spring 402 is compressed between surfaces 406 and 404.

[0049] To transition recliner 100 out of its fully reclined positioned, a user must cause bracket 120 to slide backwards along arm 114 away from surface 404. The user can accomplish this by pushing down upon foot rest 112, pulling upwards on back 108 of recliner 100, and/or applying pressure on arms 114 to cause arms 114 to slide forward with respect to bracket 120. In any of these cases, in implementations of recliner 100 containing spring 402, the compressed spring facilitates these actions by

applying a force backwards against surface 404 of bracket 120, thereby pushing bracket 120 backwards along arm 114. Accordingly, spring 402 facilitates transition of recliner 100 out of a fully reclined position.

[0050] Although the present invention has been described with respect to preferred embodiment(s), any person skilled in the art will recognize that changes may be made in form and detail, and equivalents may be substituted for elements of the invention without departing from the spirit and scope of the invention. Therefore, it is intended that the invention not be limited to the particular embodiments disclosed for carrying out this invention, but will include all embodiments falling within the scope of the appended claims.

Claims

1. A chair, comprising:

a support frame;
a seat connected to the support frame, the seat being configured to support a user and move with respect to the support frame;
a back portion connected to the seat, the back portion being configured to move with respect to the seat;
a foot rest connected to the seat, the foot rest being configured to move with respect to the seat; and
a lower strut connected between the back portion and the foot rest, the lower strut being configured to move with respect to the back portion, the lower strut being configured to move with respect to the seat.

2. The chair of claim 1 wherein

the back portion is connected to the seat at a first connection;
the foot rest is connected to the seat at a second connection;
the strut is connected to the back portion at a third connection; and
to the foot rest at a fourth connection
wherein the third connection is between the second connection and the bottom of the back portion and the fourth connection is between the second connection and the bottom of the foot rest.

3. A chair, comprising:

a support frame;
a seat connected to the support frame;
a back portion connected to the seat at a first connection, the back portion being configured to move with respect to the seat and having a top and a bottom;
a foot rest connected to the seat at a second

connection, the foot rest being configured to move with respect to the seat and having a top and a bottom; and

a strut connected to the back portion at a third connection and the foot rest at a fourth connection, wherein the third connection is between the first connection and the bottom of the back portion and the fourth connection is between the second connection and the bottom of the foot rest.

4. The chair of claim 1 or of claim 2 or of claim 3, including at least one arm rest, the at least one arm rest being pivotally connected to the back portion and being slidably connected to the support frame.

5. The chair of claim 4, including a locking mechanism configured to selectively fix a position of the at least one arm rest to prevent the at least one arm rest from sliding with respect to the support frame.

6. The chair of claim 1 or of claim 3 or of any preceding claim, wherein the lower strut has a bend of between 10 and 15 degrees.

7. The chair of claim 1 or of claim 3 or of any preceding claim, where a length of the seat is approximately equal to a length of the lower strut.

8. The chair of claim 1 or of claim 3 or of any preceding claim, including a cup holder releasably connected to at least one of the back portion and the foot rest.

9. The chair of claim 8, wherein the cup holder includes a mounting post and the mounting post is configured to releasably engage a cup holder mount connected to the at least one of the back portion and the foot rest.

10. The chair of claim 9, wherein the cup holder is configured to engage the cup holder mount using a friction coupling.

11. The chair of claim 1 or claim 2 or claim 3, including at least one arm rest, the at least one arm rest being connected to the back portion and being slidably connected to the support frame.

12. The chair of claim 9 or of claim 11, wherein the strut has a bend of between 10 and 15 degrees; and/or where a length of the seat is approximately equal to a length of the strut.

13. The chair of claim 3 or of claim 11 or of claim 12, including a cup holder releasably connected to at least one of the back portion and the foot rest.

14. The chair of claim 13, wherein the cup holder in-

cludes a mounting post and the mounting post is configured to releasably engage a cup holder mount connected to the at least one of the back portion and the foot rest.

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15. The chair of claim 14, wherein the cup holder is configured to engage the cup holder mount using a friction coupling.

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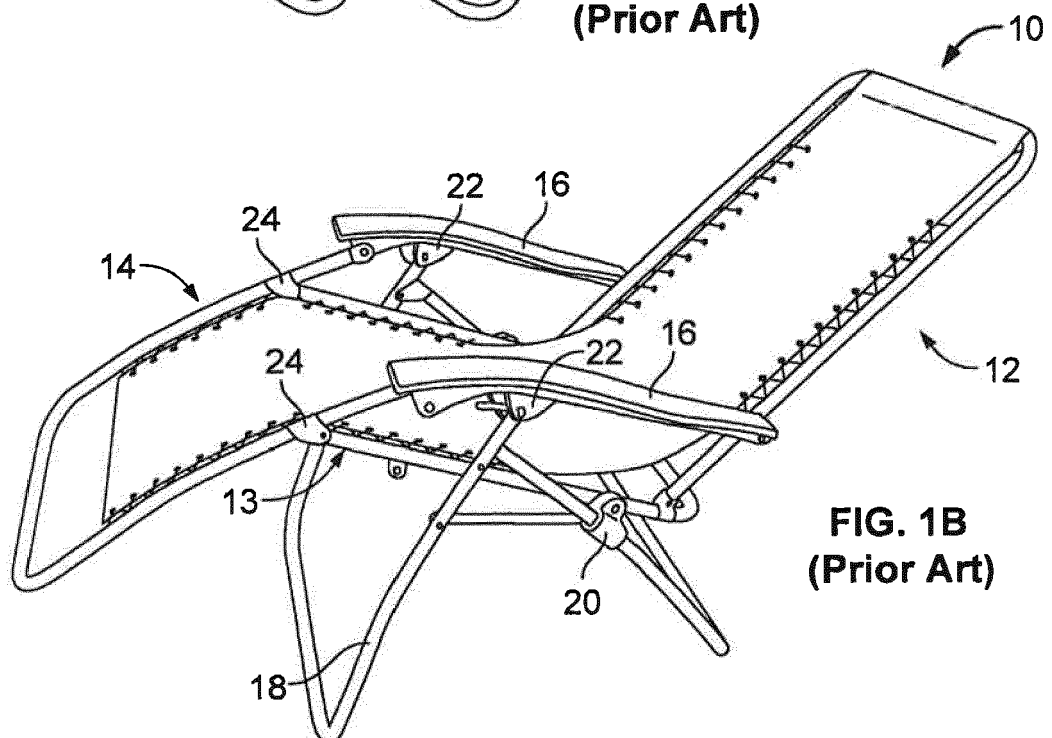
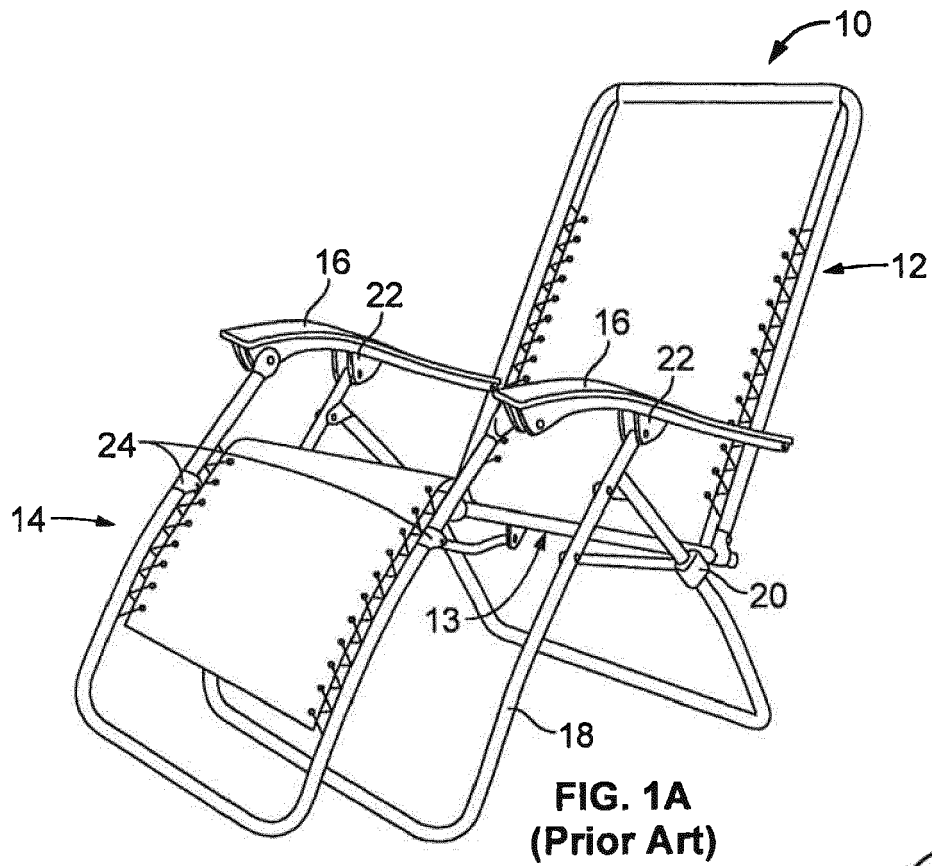
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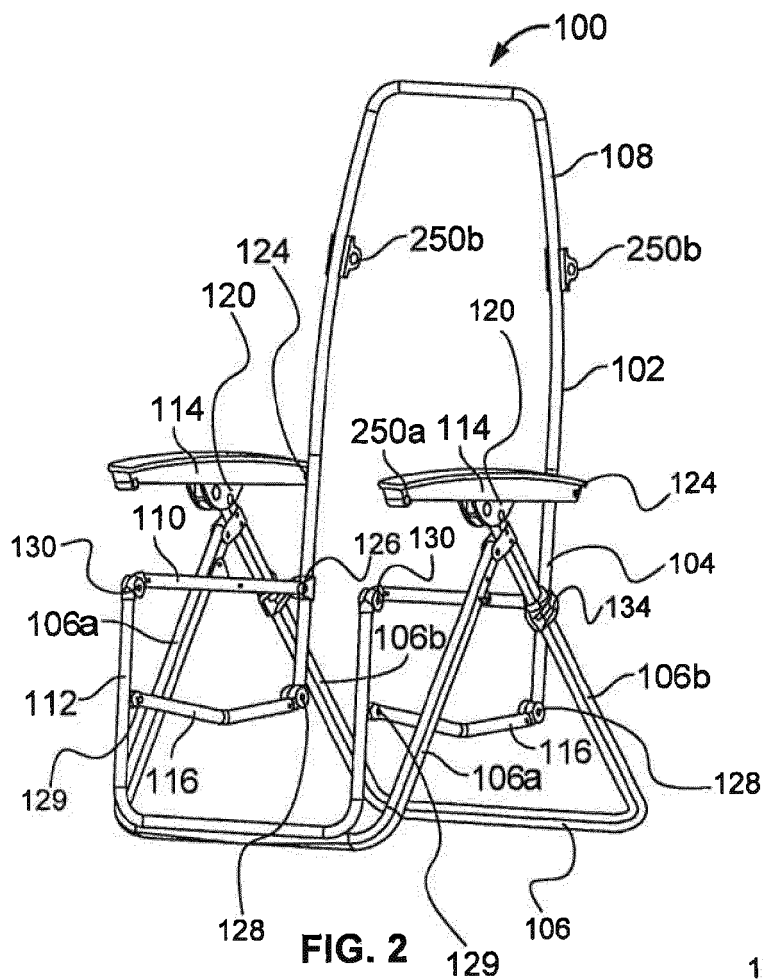


FIG. 2

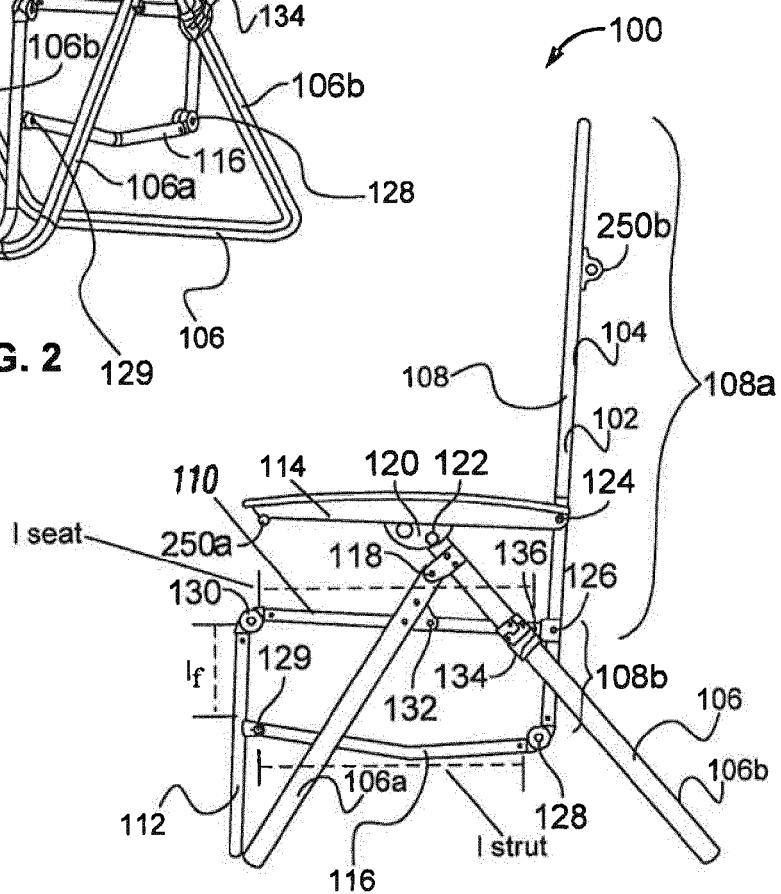


FIG. 3

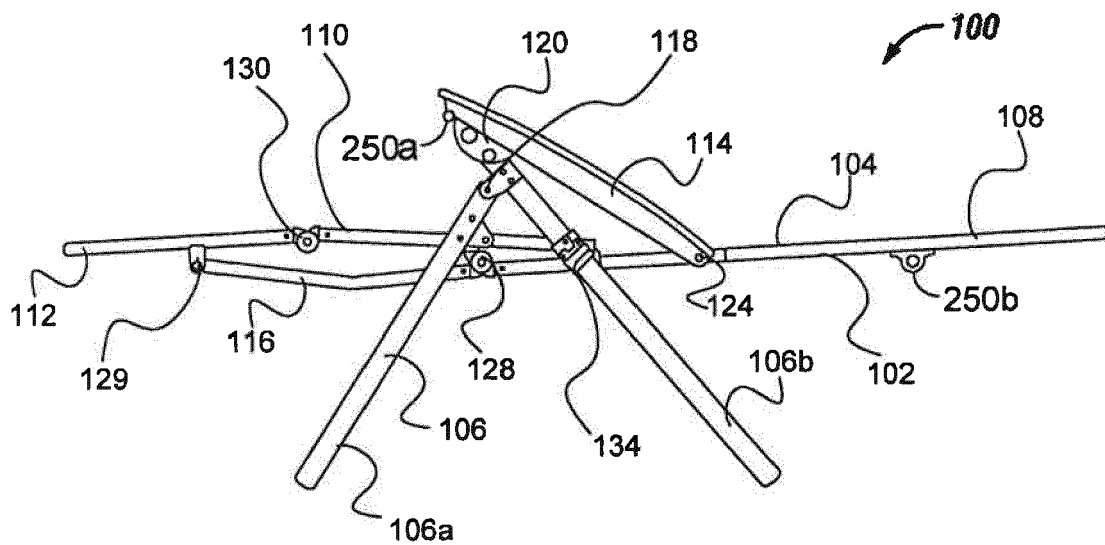


FIG. 4

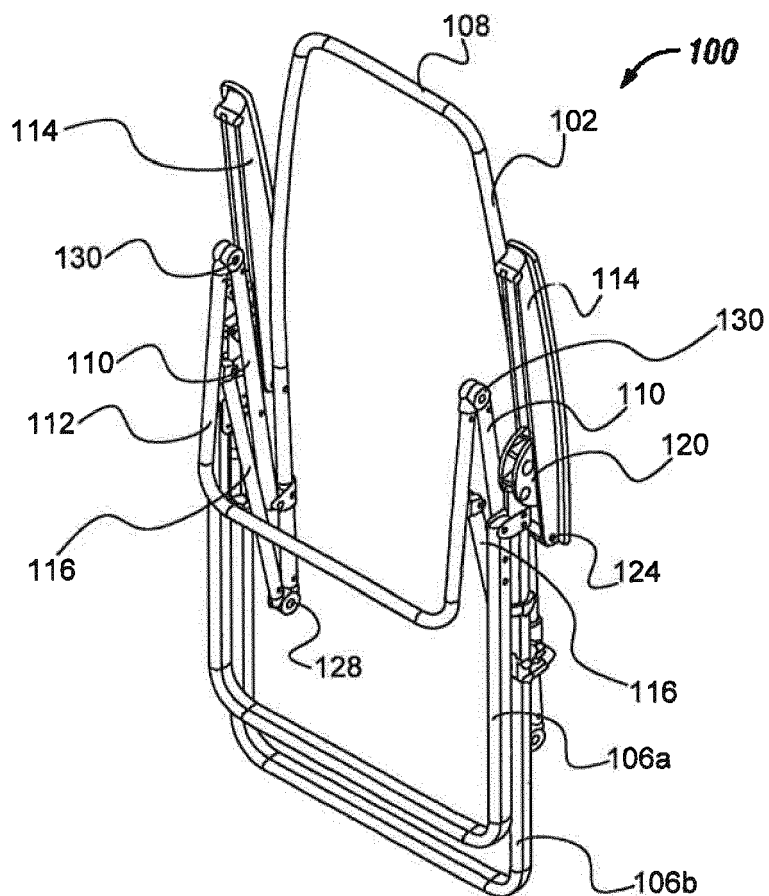


FIG. 5

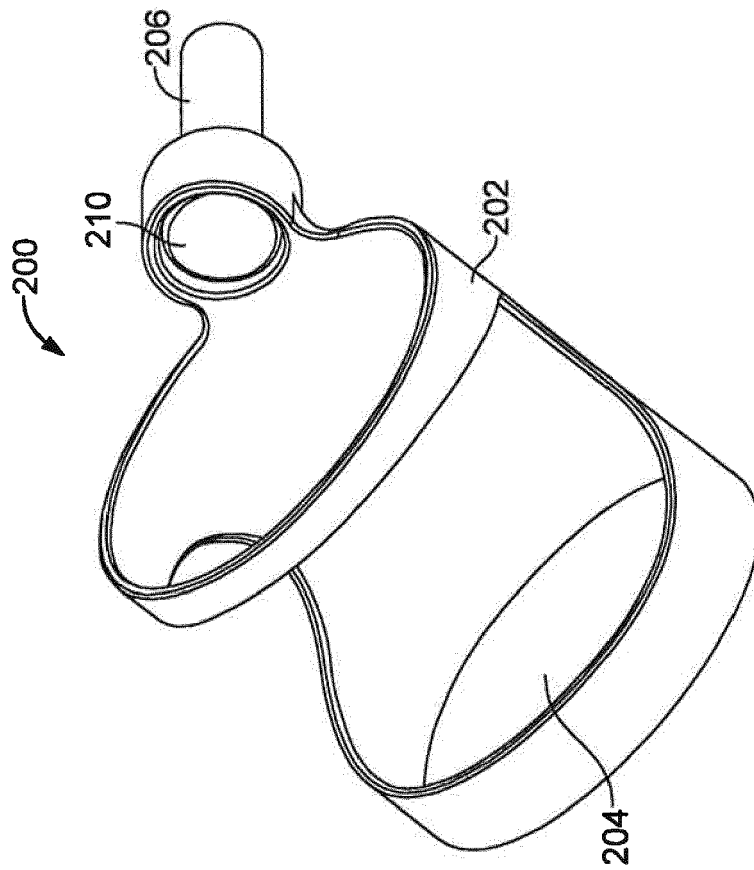


FIG. 6B

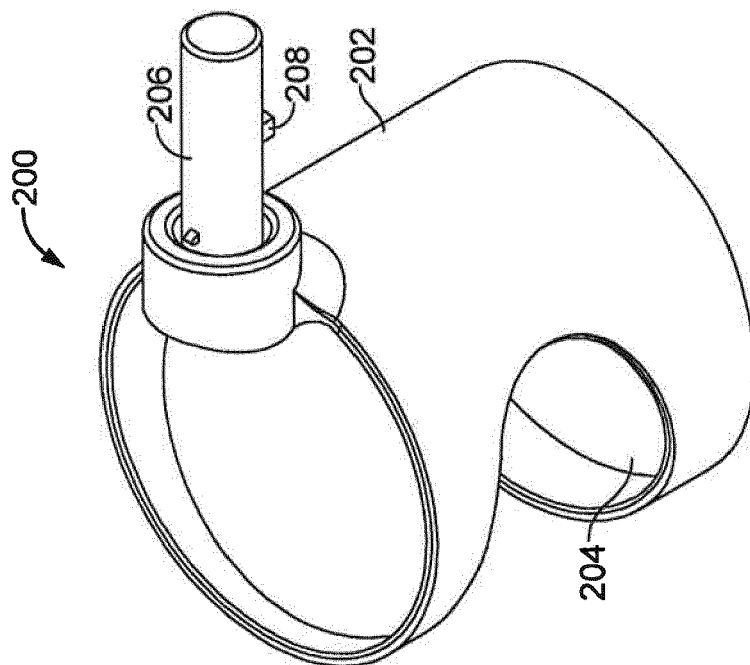


FIG. 6A

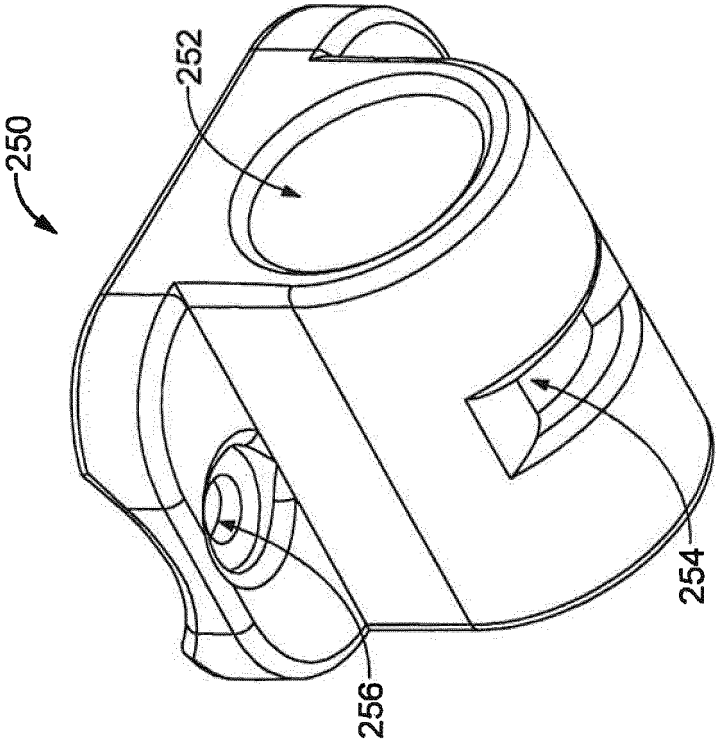


FIG. 7A

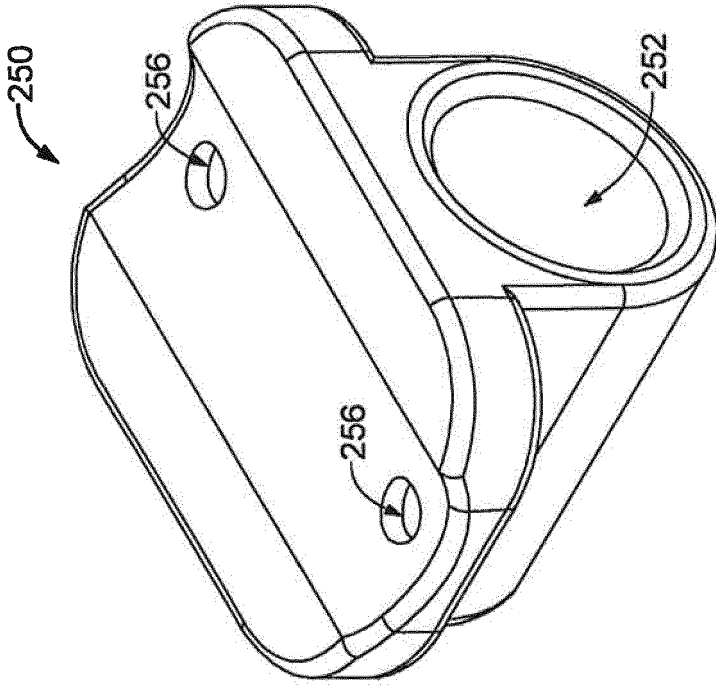


FIG. 7B

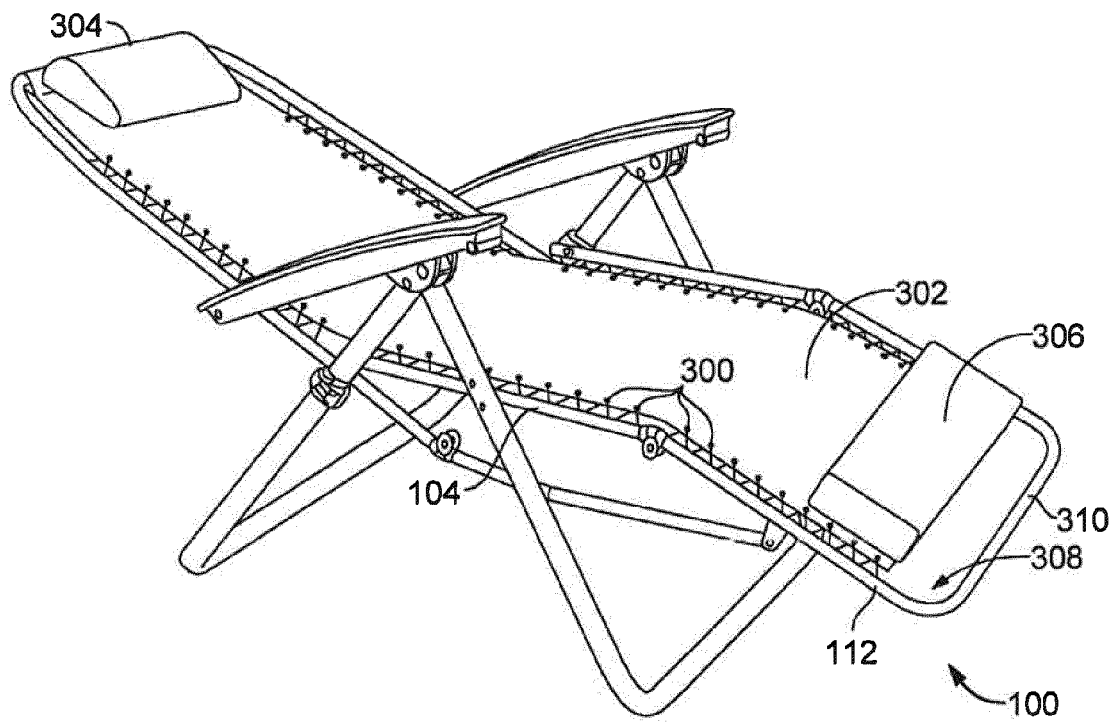
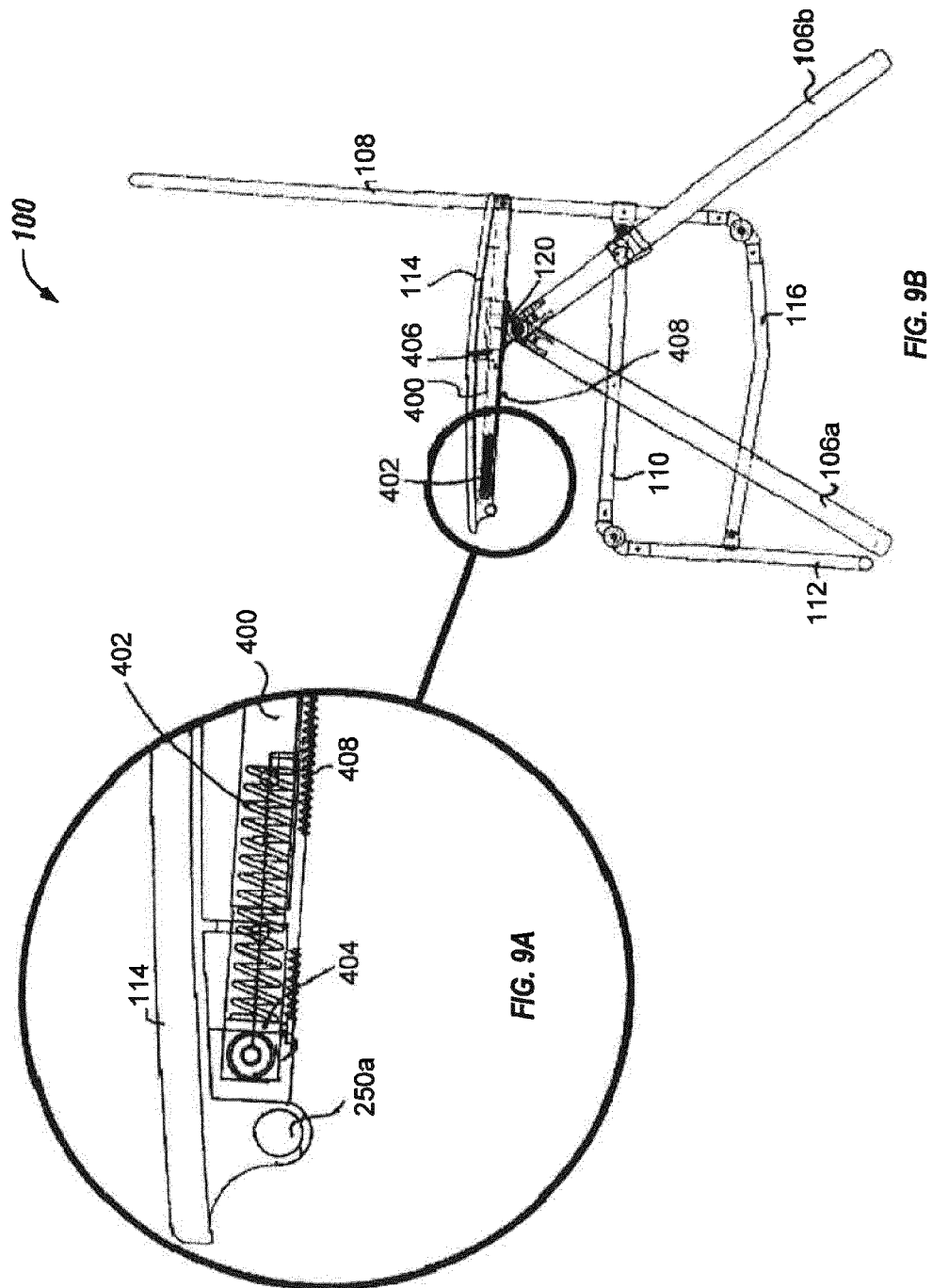


FIG. 8





EUROPEAN SEARCH REPORT

Application Number
EP 13 19 5173

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 5 082 324 A (HARADA HIDENARI [JP] ET AL) 21 January 1992 (1992-01-21) * figures 1,3,4 * * abstract *	1-15	INV. A47C1/032 A47C1/035
X	JP S58 428 A (IKEDA BUSSAN CO) 5 January 1983 (1983-01-05) * figures 1,2,4 * * abstract *	1-15	
X	CN 201 094 410 Y (HANGZHOU JURI ELECTRIC APPLIAN [CN]) 6 August 2008 (2008-08-06) * figures 1-3 * * abstract *	1-15	
A	US 2002/125745 A1 (LEE MENG-FENG [TW]) 12 September 2002 (2002-09-12) * figure 6a * * pages 21,22,28 *	4,5,11	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47C
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 13 February 2014	Examiner Sainz Martínez, M
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ON EUROPEAN PATENT APPLICATION NO.**

EP 13 19 5173

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The members are as contained in the European Patent Office EDP file on
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13-02-2014

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5082324	A	21-01-1992	NONE	

JP S58428	A	05-01-1983	JP S58428 A	05-01-1983
			JP S6030209 B2	15-07-1985

CN 201094410	Y	06-08-2008	NONE	

US 2002125745	A1	12-09-2002	NONE	

EPO FORM P0459

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