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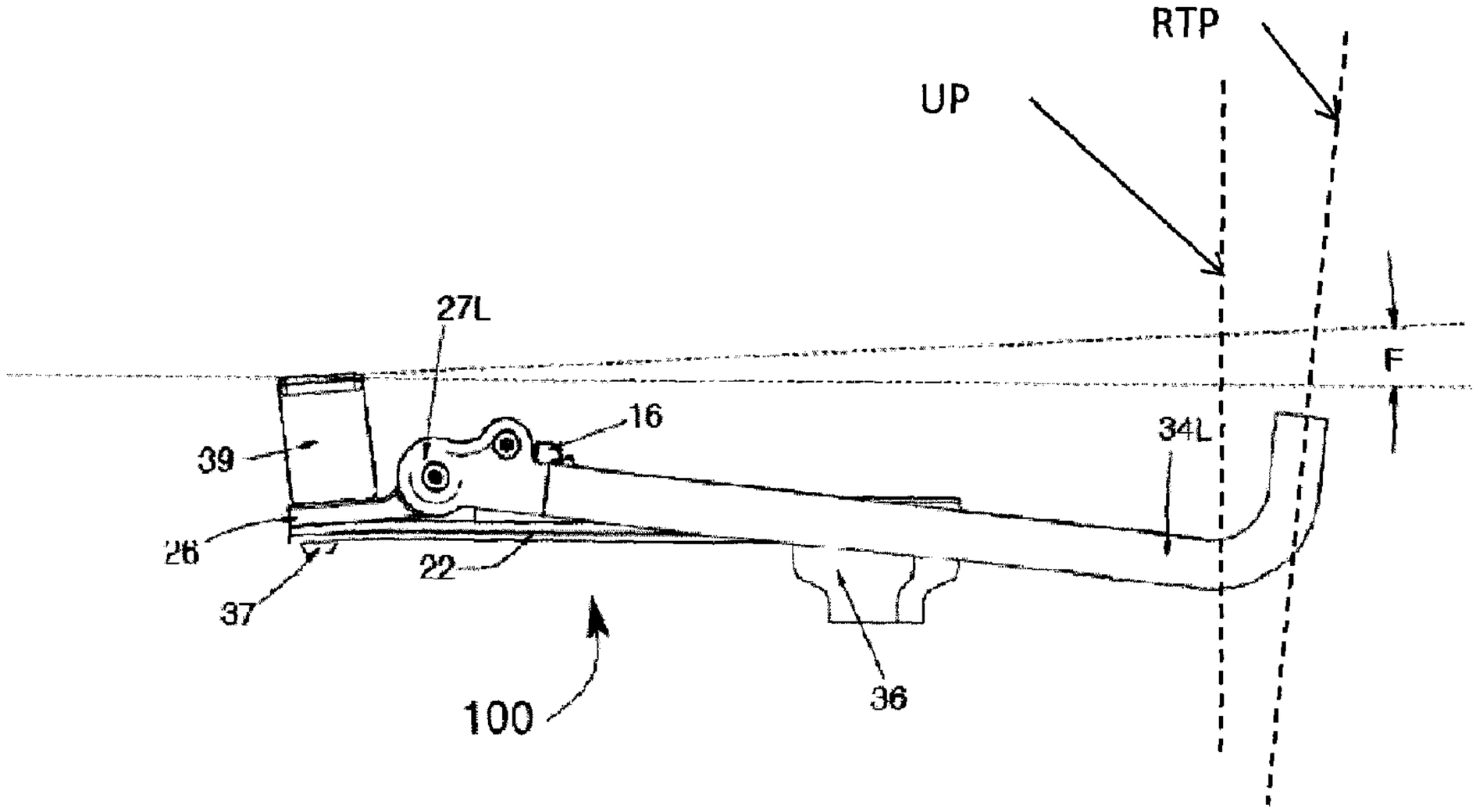
(54) **Titre : FAUTEUIL INCLINE AUTO AJUSTABLE DOTE D'UN MECANISME CANTILEVER**
(54) **Title: SELF-ADJUSTABLE TILTING CHAIR WITH CANTILEVER MECHANISM**




(57) **Abrégé/Abstract:**
An ergonomically advanced tilting chair mechanism. It is a self-adjustable, weight sensitive and substantially simplified counter-balancing mechanism. Occupants of a broad weight range can decide at which tilting point to relax and hold the position without using his/her muscle force. The occupant's weight can produce adequate tension resistance and friction.

**ABSTRACT**

An ergonomically advanced tilting chair mechanism. It is a self-adjustable, weight sensitive and substantially simplified counter-balancing mechanism. Occupants of a broad weight range can decide at which tilting point to relax and hold the position without using his/her muscle force. The occupant's weight can produce adequate tension resistance and friction.

# SELF-ADJUSTABLE TILTING CHAIR WITH CANTILEVER MECHANISM

## FIELD

**[0001]** This disclosure relates generally to chair tilt mechanisms and more particularly to weight balance mechanisms.

## BACKGROUND

**[0002]** Most people spend their working day sitting in a task chair. A good chair provides ergonomic support during long working hours. To achieve the desired comfort level, most task chairs have a high degree of adjustability. Typically task chairs have a mechanism with a tension adjustable backrest that enables the user to make proper adjustments. Increased adjustability ensures a better fit for the occupant with different weight and size requirements while providing adequate support in a range of sitting positions. A desired feature of a task chair mechanism is the rearward backrest tilting motion and its adjustability. Another desired feature of a task chair mechanism is a forward seat tilt in order to relieve pressure on the user's legs during chair tilt operation, however the ability for a task chair mechanism to provide for both rearward backrest tilt and forward seat tilt is difficult unless complicated adjustment mechanisms are used. Complicated adjustment mechanisms cause undesirable increases in mechanism manufacturing complexity, cost, reliability and general mechanism size.

**[0003]** A typical task chair has a multifunction mechanism with a variety of manual adjustments: knobs for back tilt tension, height, knee tilt/lock etc. This requires very complex, heavy, bulky, and expensive mechanisms. Current technology has shown inconsistent performance and usually may not allow users to stop, hold, and relax at a desired position during the rearward tilting motion. Every new chair's occupant is required to fine-tune their difficult adjustments with many knobs in an effort to assure ergonomic seating, thus providing for difficulty

in ease of use for chairs that are situated in multipurpose rooms like meeting rooms and the like, wherein chair users may have to continually readjust their chair because of a chair's adjustments set by the previous occupant.

**[0004]** Other task chair types have weight sensitive self-adjustable mechanisms that make use of the occupant's body weight to provide resistance to rearward tilting of the backrest. Some chairs' backrest and seat are linked in a way such that the entire seat rises against the weight of the occupant as the back is reclined. In this manner, the occupant's weight on the seat loads the recline mechanism. However, these chair tilt mechanisms also do not address simultaneous backrest rearward tilt and seat forward tilt without undue complexity with many involved spring tensioning members and adjustment controls.

## SUMMARY

**[0005]** It is an object of the present invention to provide a chair adjustment mechanism that obviates or mitigates at least some of the above-presented disadvantages in the art.

**[0006]** Provided is an ergonomically advanced tilting chair mechanism, which is self-adjustable, weight sensitive, and involves counter-balancing. The chair mechanism is provides as simple, compact, constructed with just a few main parts, and considered inexpensive, as compared to current chair mechanism available in the art.

**[0007]** Further, most existing chairs are considered comfortable only in some locations of a full rearward tilting range. Contrary to existing chairs, provided is a chair that can be comfortable at rearward tilting points as selected by the user. Chair occupants of a broad weight range can recline to a number of different tilting angles and hold the selected tilt position with minimal use of the occupant's muscles to maintain their selected comfort tilt angle. The occupant's

weight can produces adequate tension resistance. The mechanism can address the well known shirt-pulling effect as evident to a person skilled in the art.

**[0008]** A first aspect is a chair tilt mechanism for a chair having a seat and a backrest, the chair tilt mechanism comprising: a seat bracket for connecting to the seat; a backrest bracket for connecting to the backrest; a pivotal connection coupling the seat bracket to the backrest bracket; and a mounting plate for mounting the seat bracket thereto and for coupling the backrest bracket thereto, such that the seat bracket is positioned on one side of the first pivot axis and the backrest bracket is positioned on the other side of the first pivot axis.

**[0009]** A second aspect is a chair tilt mechanism such that a seat of the chair is pivotally connected to a backrest of the chair incorporating the chair tilt mechanism.

**[0010]** A seat pivot (e.g. pivotal connection) coupled to a seat is directly mounted to a backrest (e.g. via backrest arms).

## Brief Description of the Drawings

**[0011]** The foregoing and other aspects will now be described by way of example only with reference to the attached drawings, in which:

**[0012]** Fig. 1 is a perspective view of a chair mechanism mounted on a chair;

**[0013]** Fig. 1A is a perspective view of a further embodiment of the chair of Figure 1;

**[0014]** Fig. 1B is a side view of the chair mechanism of Figure 1;

**[0015]** Fig. 1C is a back view of the chair mechanism of Figure 1;

**[0016]** Fig. 1D is a top view of the chair mechanism of Figure 1;

**[0017]** Fig. 2 is a further perspective view of the chair mechanism of Figure 1;

**[0018]** Fig. 2A is a back view of the chair mechanism of Figure 2;

**[0019]** Fig. 2B is a top view of the chair mechanism of Figure 2;

**[0020]** Fig. 2C is a side view of the chair mechanism of Figure 2;

**[0021]** Fig. 3, Fig. 3A and Fig. 3B are further side views the chair mechanism of Figure 2;

**[0022]** Fig. 4 is an exploded and perspective view of the chair mechanism of Figure 1;

**[0023]** Fig. 4A is an exploded and perspective view of some parts of the chair mechanism of Figure 1;

**[0024]** Fig. 5 is an exploded and perspective view of parts of the chair mechanism of Figure 1;

**[0025]** Fig. 6 is a partial cross section view of the chair mechanism of Figure 1; and

**[0026]** Fig. 7 is a further embodiment of the chair mechanism of Figure 1.

## DETAILED DESCRIPTION

**[0027]** Referring to Fig. 1 a perspective view of a tilt mechanism 100 is shown mounted on a chair 30. The chair 30 has a seat 40 coupled to a backrest 42. The seat 40 is mounted on a seat support 51 (e.g. pillar) connected to a base 52 (e.g. a base assembly). As an example, the seat support 51 can be a pneumatic height adjustment cylinder mounted to the base 52 with or without casters. A seat support holder 36 is mounted to the seat support 51 (e.g. pneumatic height adjustment cylinder) and coupled to a mounting plate or base 25 (see Figure 2B) in order to connect the tilt mechanism 100 to the seat support holder 36. As an example, the backrest 42 can be connected via a backrest arm 34L and a backrest arm 34R to the mounting plate 25 via the tilt mechanism 100. A seat support 39 (e.g. optionally proving for cross support balancing) can be

mounted to the tilt mechanism 100 with the one or more fasteners 37 (e.g. screws, bolts, rivets, welds, etc.). Seat 40 can be mounted to the seat support 39 as shown. It is recognized that height of the seat structure 40 with respect to the base 52 can be manually adjusted via a height adjusting lever (not shown). As such, it is recognized that both the seat 40 and the backrest 42 can be connected to the seat support holder 36 via the tilt mechanism 100, as further described below. It is the ability of the tilt mechanism 100 to account for both rearward backrest 42 tilt and forward seat 40 tilt during operation that can provide for ease and comfort of chair tilt operation, such that the tilt mechanism 100 provides for mounting of both the backrest 42 and seat 40 to the base 52 (via the seat support 51 and associated seat support holder 36).

**[0028]** Referring to Fig. 1A, a perspective view from above of the tilt mechanism 100 is shown mounted on the chair 39, for example where backrest mesh 43 is mounted to the backrest 42. It is recognized that for illustrative purposes only and view of the tilt mechanism 100, mesh on the seat 40 is not shown for convenience. Figures 1B, 1C, 1D show different planar views of tilt mechanism 100 mounted on the chair 30.

**[0029]** Figures 2, 2a, 2B, 2C show different planar views of tilt mechanism 100 separated from the seat 40 and backrest 42 of the chair 30 (see Figure 1). Backrest connectors 27L and 27R (e.g. also referred to generically as a backrest bracket) attach the tilt mechanism 100 to the backrest arm 34L and backrest arm 34R respectively. A seat pivot bracket 26 is mounted to the backrest connectors 27L and 27R via a pivotal connector 21 (e.g. a pin and sleeve configuration), such that the seat pivot bracket 26 is coupled to both the seat support 39 and a seat biasing member 22 (e.g. a leaf spring). See figure 7 showing an alternative embodiment of the seat biasing member 22 as a spring 22. It is recognized that the seat biasing member 22 can also be referred to as a resilient member, such that the seat biasing member 22 is biased against forward tilt “F” (see Figure 3B) of the seat support 40 when the tilt mechanism 100 is operated. As further

described below, seat forward tilt angle provided by operation of the tilt mechanism 100 can be represented by reference “F”, which represents a change in forward tilt angle of the seat 40 between a reference position RP (e.g. when the chair 30 is absent an occupant or the chair occupant is not resting backwards in the chair 30 which causes the tilt mechanism 100 to operate) and a tilt position TP. Therefore, the seat biasing member 22 biases the tilt angle of the seat 40 towards the reference position RP during operation of the tilt mechanism 100, such that the chair occupant must provide a force to overcome the return bias force of the seat biasing member 22 when desired to move the seat 40 into the forward tilt position TP. In a preferred embodiment, the seat support 39 is coupled to both the seat biasing member 22 and the seat pivot bracket 26 via fasteners 37.

**[0030]** It is recognized that the pivotal connection 21 is what connects to the seat 40 via the seat bracket 26 to the seat support 36 and connected base assembly of the chair 30. Further, the seat 40 can also be connected to the seat support 36 and base assembly via the biasing member 22, thus demonstrating that the seat 40 can be displaced (e.g. tilted) in relation to the mounting plate 25 based on the displacement of the biasing member 22 at one end of the seat bracket 26, rotational displacement of the pivotal connection 21, and/or displacement of the seat bracket 26 away from the biasing member 22. It is also recognized that the seat 40 is coupled to the base assembly (e.g. seat support 36 and base 22) via a pair of pivotal connections 18,21 in series between the mounting plate 25 and the seat bracket 26. It is also recognized that the backrest 42 is directly attached to one of the pair of pivotal connections 18,21 of the tilt mechanism 100 and is otherwise unsupported by the tilt mechanism 100 and/or remaining chair 30 components, as the remainder of the tilt mechanism 100 component(s) is what supports the one of the pair of pivotal connections 18,21 connected to the backrest 42 (via backrest arms 34R,L) with respect to the chair 30 (e.g. via the mounting plate 25).

**[0031]** Referring again to Figures 2,2A,2B,2C, the tilt mechanism 100 is coupled to the mounting plate 25 and can include the seat biasing member 22, coupled to the seat pivot bracket 26, the backrest connectors 27L and 27R connected to the seat pivot bracket 26 via a pivotal connector 21 to define a first pivot axis 10, and a block arrangement 5 (see Figure 3B) also mounted to the mounting plate 25 and coupled to the backrest connectors 27L and 27R via a pivotal connection 18 (e.g. pin and sleeve arrangement) as further described below. The pivotal connection 18 provides a second pivot axis 11 spaced apart from the first pivot axis 10. As such, the seat pivot bracket 26 is coupled at one end 8 to the mounting plate 25 via the seat biasing member 22 and is also coupled at another end 9 (e.g. at the first pivot axis 10) to the backrest connectors 27L and 27R and thus to the mounting plate 25 again via the block arrangement 5 in cooperation with the second pivot axis 11. In turn, the seat pivot bracket 26 is coupled to the seat support 39, thus coupling the seat 40 to the tilt mechanism 100, and the backrest connectors 27L and 27R is connected to the backrest 42 via arms 34R,34L thus providing for coupling of the backrest 42 to the tilt mechanism 100. In one embodiment, the seat biasing member 22 provides for cantilevering of the seat 40 forward of the chair support 51 as connected to the mounting plate 25.

**[0032]** Further, the first pivot axis 10 can be positioned between the mounting plate 25 and the second pivot axis 11. Further or in alternative, the first pivot axis 10 can be positioned further away from the mounting plate 25 than the second pivot axis 11 is positioned with respect to the mounting plate 25. Preferably, the first pivot axis 10 can be positioned lower than the second pivot axis 11 with respect to the mounting plate 25.

**[0033]** Further, it is recognized that the seat pivot bracket 26 positions attachment of the seat 40 to the tilt mechanism 100 on one side of the first pivot axis 10 provided by the backrest connectors 27L and 27R and positions attachment of the backrest 42 to the tilt mechanism 100 on the other side of the

first pivot axis 10 provided by the backrest connectors 27L and 27R. Further, coupling of the backrest 42 to the mounting plate 25 is via the second pivot axis 11 also provided by the backrest connectors 27L and 27R, such that the first 10 and second 11 pivot axes are spaced apart from one another. By example, connection of the second pivot axis 11 to the mounting plate 25 is via the block arrangement 5 (See figure 3B).

**[0034]** Referring to Fig. 3, Fig. 3A and Fig. 3B, shown are side views of tilt mechanism 100 when the backrest 42 is in an upright position UP and in a rearward tilting position RTP. It is recognized that the seat biasing member 22 and/or the block arrangement 5 can provide for bias of the backrest 42 towards the upright position UP. For example, Fig. 3 shows a side view of the tilt mechanism 100 in the upright position UP. Mechanism 100 can be mounted on the cylinder holder 36 via mounting plate 25. Seat support 39 can be mounted to the tilt mechanism 100 with the fasteners 37 (e.g. at the point of the seat biasing member 22). Seat 40 can be mounted to the seat support 39. Fig. 3A shows a side view of the tilt mechanism 100 in the rearward tilting position RTP. As a movement result, the front portion of the seat biasing member 22 (e.g. leaf spring) bends or is otherwise worked against the bias, the seat support 39 tilts in conjunction with movement of the seat bracket 26, thus influencing back portion of the seat 40 to move up (i.e. the seat 40 moves from the reference position RP to the tilt position TP through seat tilt F as shown in figure 3B).

**[0035]** Fig. 3B shows a side view of the tilt mechanism 100 in the rearward tilting position RTP. Some parts are shown in the cross section view for illustrative purposes. Backrest 42 is connected to the backrest connector 34R. Seat structure 40 is attached to the seat support 39. Back portion of the seat 40 is lifted up as a result of a tilting action of the backrest arm 34R and the backrest 42, as the pivot connections 21,18 are operated about their pivot axes 10,11. Backrest 42 and the backrest arm 34R are shown in a tilting position. When the chair's occupant tilts (occupant pressure shown as arrow P2) movement of the

backrest 42 forces the pivot connection 18 against the mounting plate 25 via block arrangement 5, causes the backrest connector end 27L and 27R to pivot about pivot axis 11 as the block arrangement 5 is mounted on the mounting plate 25. As such, pivot of the seat bracket 26 about the first pivot axis 10 is in a rotational direction opposite to the pivot of the backrest connector end 27L and 27R about the second pivot axis 11. It is recognized that pivot of the seat bracket 26 about the first pivot axis 10 is resisted by the seat biasing member 22, as is pivot of the backrest connector end 27L and 27R about the second pivot axis 11. Consequently, pressure P2 causes rotation of the backrest connector end 27L and 27R at the seat pivot 10 axis location, thus providing for the backrest connector arms 34L,R to rotate in one rotational direction about the seat pivot 10 axis location and the seat bracket 26 to pivot in the opposite rotational direction about the seat pivot 10 axis location to effect forward seat 40 tilt along with rearward backrest 42 tilt.

**[0036]** Fig. 4 is an exploded and perspective view of the tilt mechanism 100 as an example embodiment. Mechanism base plate 25 can be mounted to the top of the leaf spring 22 (as the seat biasing member). Leaf spring 22 is connected to the seat pivot bracket 26. Backrest connector 34R and 34L are connected to the backrest connector end 27L and 27R. Fig. 4A provides an exploded and perspective view of some parts of tilt mechanism 100, as an embodiment of the pivotal connections 18,21. Exploded view shows assembly of the backrest connector 34R and 34L, the backrest connector end 27L and 27 R and the pivot members (e.g. metal cylinder, pins, etc.) 17 and 18a. Fastener (e.g. screw) 35 can provide affixing (e.g. locking) of backrest connector end 27L and 27 R to the pivot members 17 and 18a.

**[0037]** Fig. 5 shows an exploded and perspective view of most parts of tilt mechanism 100. Fastener (e.g. screw) 47 can connect the mechanism base plate 25 and the leaf spring 22 to the cylinder holder 36. Backrest connector 34R and 34L can be connected to the backrest connector end 27L and 27R. Metal

cylinder 17 and the metal cylinder 18a can be locked with fastener (e.g. screw) 35 to the backrest connector end 27L and 27R. Metal cylinder 17 and the metal cylinder 18a can be identical, as desired.

**[0038]** Referring to Fig. 6, a friction material (e.g. ½ ring) 20 can be positioned (e.g. permanently mounted) to a sliding surface element 16 (e.g. block) of the block arrangement 5. A friction material (e.g. ring) 21a can be positioned (e.g. permanently mounted) to the seat pivot bracket 26, as desired. Block 15 (for example providing an inclined or declined surface to the mounting plate 25) of the block arrangement 5 can be mounted on the mechanism base plate 25. Optionally, a material plate 28 (e.g. providing a reduced coefficient of friction between clock 15 and block 16) can be mounted to a bottom of the sliding surface element 16. Block 15 can have a slippery and/or polished top surface to facilitate a reduced friction environment and therefore facilitate movement of the material plate 28 that is mounted on the sliding surface element 16. Material ½ ring 20 can be permanently mounted to the sliding surface element 16. It is also recognized that the friction material 20,21a can be absent from the tilt mechanism 100, as desired. The friction material 20,21a (either completely or partially filling the pivotal connections 18,21) can be provided as a surface coating to one or more of the components of the pivotal connection 18,21. The friction material 20,21a can be comprised of a polymer compound (e.g. plastic, rubber, etc.).

**[0039]** It is recognized that as the occupant pushes (via pressure P) the backrest 42 further backwards and away from the front of the chair 30 towards the tilt position TP, a compressive force applied to the friction material 20,21a by adjacent pivotal connection 18,21 components (e.g. sleeve and metal cylinder) increases, thus providing for resistance to further rotation of the pivotal connection 20,21 (either further towards or further away from the current tilt position). As such, the optional friction material 20,21a can facilitate the formation of a plurality of stop or hold positions between the reference position RP and the

tilt position TP. It is recognized that the stop or hold positions could be done by more traditional mechanical detents, etc, if the friction material 20,21a is not included in the pivotal connections 18,21. It is also recognized that a friction inhibiting material (e.g. lubricating film such as oil, etc.) could be positioned between the block 15 and the block 16, thus facilitating movement of the block 16 with respect to the block 15.

**[0040]** Provided is an example embodiment of the above more generally described tilt mechanism 100 and cooperating chair 30 components. During a rearward tilting, with an occupant, the metal cylinder 17 and 18a can slightly rotate at axis locations 10,11 of the friction material ½ ring 20 and the friction material ring 21a. As a result, movement lifts the seat pivot bracket 26 away from the leaf spring 22 thus tensioning same, thus causing corresponding movement of the metal cylinder 17 in the pivot connection 21, and forward tilt of the seat support 39 and the attached seat 40. Lifting action and motion range of the seat 40 is shown by example in the Fig. 3B with a reference arrow P2. It is recognized that actuation of the seat bracket 26 via rearward tilting by pressure P2 of the occupant against the backrest 42 can also reposition the metal cylinder 18a of the pivot connection 18 with respect to the block arrangement 5, since the action can force the sliding surface element 16 to move (e.g. up) along the surface (e.g. incline, decline) of the block 15. As such, the block 16 and block 15 move relative to one another due to the simultaneous pivot of the seat bracket 26 and backrest connector end 27L and 27R about the first pivot axis 10. During the occupant's return to the starting tilting position, the sliding surface element 16 would return towards the original starting position (e.g. move forward and down for the example incline surface). Arrow H shows the movement of the sliding surface element 16 with the attached material plate 28 within the block arrangement 5, while arrow UP shows movement of the seat bracket 26 away from the biasing member 22 (see figure 3B). As a result, the movement of the seat bracket 26 under influence of the backrest support arms 34L,R can also

bend the (e.g. elastic) leaf spring 22. It is recognized that the leaf spring 22 can bend differently as a result of an occupant's weight, thus providing for variability in the performance of the force of the biasing force supplied by the biasing element 22.

**[0041]** With an action described above related to the Fig. 3B, the counter-balancing tilt mechanism 100 provides for a self-adjustable weight sensitive seating capability. During the rearward tilting, the metal cylinder 18a can produce a pressure and adequate friction on a bottom inside wall of the friction material ½ ring 20 as shown with arrow P1 on the Fig.3B. Some degree of friction and the counter-balancing structure can provide an advantage of the occupant to stop, hold, and relax at any tilting point without using his/her muscles to force stability, however it is recognized that degree of friction between various components of the tilt mechanism 100, or lack thereof, can be varied in design of the tilt mechanism 100 as desired.

**[0042]** Tilt mechanism 100 is illustrated throughout the drawings and descriptions. Alternately, the tilt mechanism 100 could function with the some changes. For instance, the metal cylinder 17 and 18a could have permanently attached friction material ring and could produce the friction on the metal inside wall of the sliding friction surface element 16 and on the seat pivot 26. Friction material could also be attached on the metal cylinder 17 and 18a, to the seat pivot bracket 26 and to the sliding surface element 16. Tilt mechanism 100 can function without friction material. Leaf spring 22 can provide balancing weight distribution and facilitate the backrest 42 to stay upright with no occupant, however it is recognized that the tilt mechanism 100 could operate with some kind of detent means (not shown), in conjunction with or in replacement of the biasing member 22, to facilitate holding of the tilt mechanism 100 in the reference position RP as shown. Leaf spring could also be positioned on the top of the mechanism base plate 25.

**[0043]** As such, leaf spring or any other spring type as the biasing member 22 (e.g. coil spring, etc. – see Figure 7) could have a different location position in the tilt mechanism 100,other than as shown, in order to hold and return the backrest 42 in the upright position with and without the occupant. Drawings show a set of two (2) leaf springs 22. Depending on the size and property of a leaf spring 22 the configuration could have one (1) or more than one leaf spring. Mechanism base plate 25 can be eliminated and replaced with the leaf spring(s) providing the support of the base plate 25 and connection of the tilt mechanism 100 to the chair components 36 and 51. Most parts of the chair 30 and tilt mechanism 100 could be made of variety of a different metal alloys, composite materials, plastic etc. Seat 40 and backrest 42 could be constructed with plastic, metal or other materials. The surface of the seat 40 and backrest 42 could be covered with foam, mash, plastic, metal, fabric, leather and etc.

**[0044]** As noted above, the seat 40 pivot (e.g. pivotal connection 21) is directly mounted to the backrest 42 via the backrest arms 34R,L. As such, it can be advantageous to have the seat 40 pivotally connected to the backrest 42 as compared to other prior art systems having backrests directly connected to the chair base.

**[0045]** As such, the tilt mechanism 100 can be provided such that the base 52 is mounted on the pneumatic height adjustment cylinder (seat support 51), which is mounted to the mechanism base plate 25. Further, the mechanism base plate 25 if present is mounted to the biasing member 22, which is directly mounted to the seat pivot bracket 26. As discussed, the seat pivot bracket 26 is directly mounted to the backrest connectors (34R,L) via pivotal connection 21. During recline/tilting motion, the seat pivot 26 moves up away from the biasing element 22 and lifts the seat 40, for example as a forward tilt motion towards the tilt position TP, thus providing for a counterbalancing action. It is also recognized that the chair tilt mechanism 100 can have friction produced with the (e.g. upper) surface of the pivot element 17 on the friction material 21a and/or other friction

produced with the (e.g. bottom) surface of the pivot element 18a on the friction material ½ 20.

**[0046]** The above summary is not intended to describe each illustrated embodiment or every possible implementation. These and other features, aspects, and advantages of the present invention will become better understood with regard to the following description, and accompanying drawings.

## CLAIMS

1. A chair tilt mechanism for a chair having a seat and a backrest, the chair tilt mechanism comprising:

a seat bracket for connecting to the seat;

a backrest bracket for connecting to the backrest;

a pivotal connection coupling the seat bracket to the backrest bracket, the pivotal connection defining a first pivot axis, such that pivoting of the seat bracket about the first pivot axis is configured in a rotational direction opposite to pivoting of the backrest bracket about the first pivot axis; and

a mounting plate for mounting the seat bracket thereto and for coupling the backrest bracket thereto, such that the seat bracket is positioned on one side of the first pivot axis and the backrest bracket is positioned on the other side of the first pivot axis;

wherein the mounting plate is configured for connecting to a base assembly of the chair.

2. The chair tilt mechanism of claim 1, wherein the mounting plate is a biasing member for biasing the seat towards a seat reference position.

3. The chair tilt mechanism of claim 1, wherein the backrest bracket further has a second pivot connection spaced apart from the first pivot connection.

4. The chair tilt mechanism of claim 1, wherein the second pivot connection is positioned on the mounting plate for providing the coupling of the backrest bracket to the mounting plate.

5. The chair tilt mechanism of claim 1, wherein a position of the second pivot connection is variable as the seat bracket and the backrest bracket pivot about the first pivot axis.

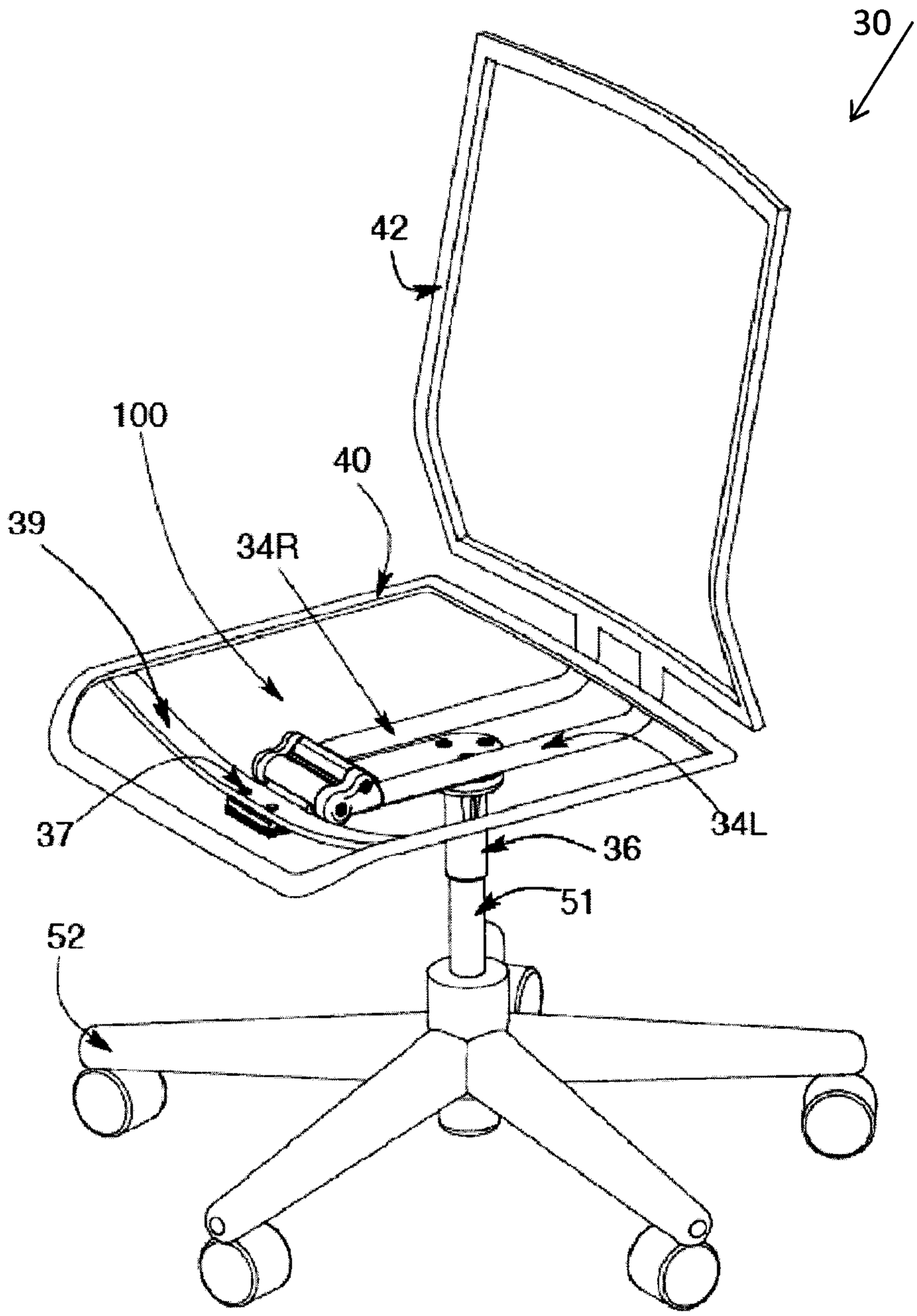



Fig. 1

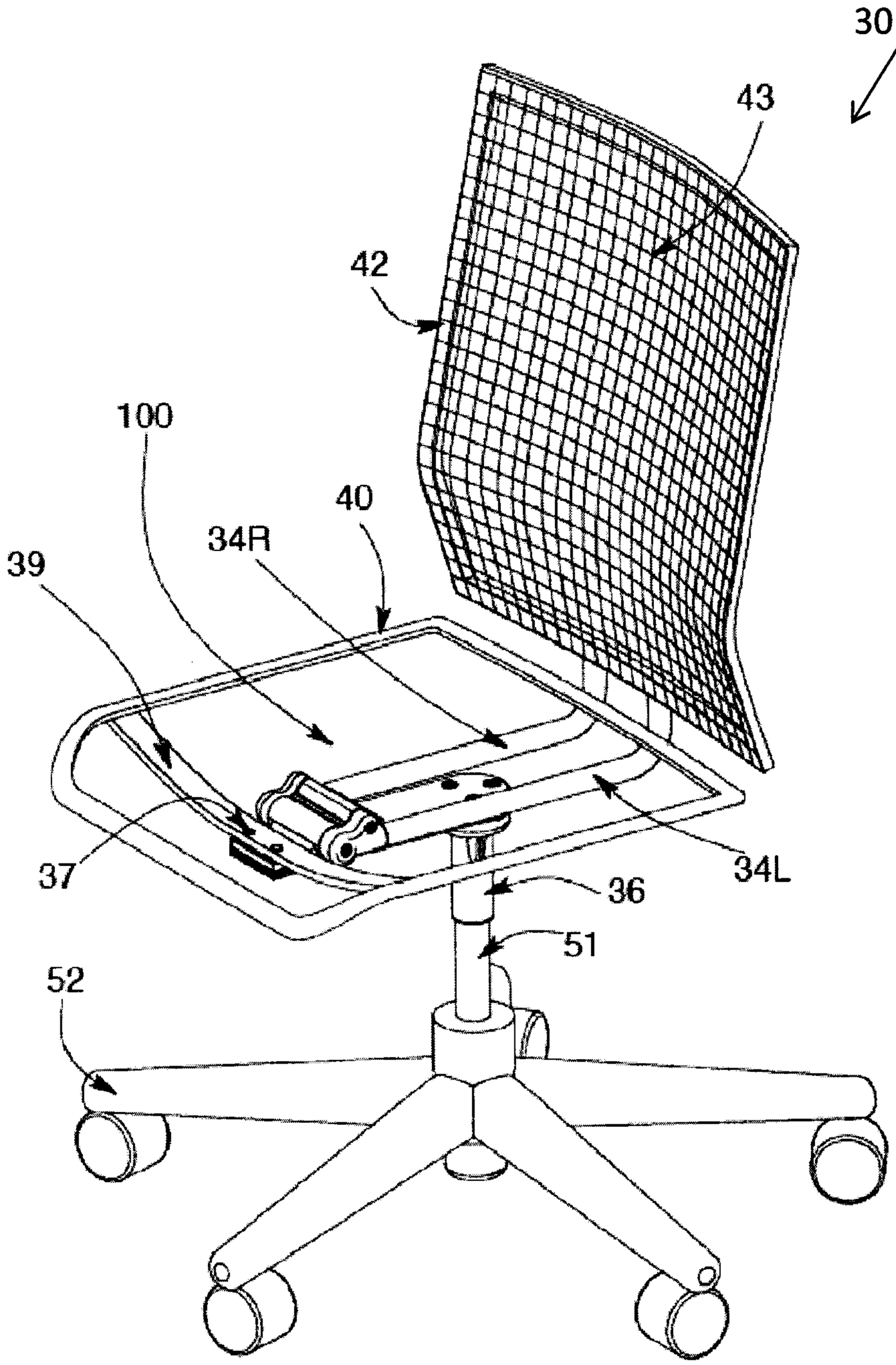



Fig. 1A

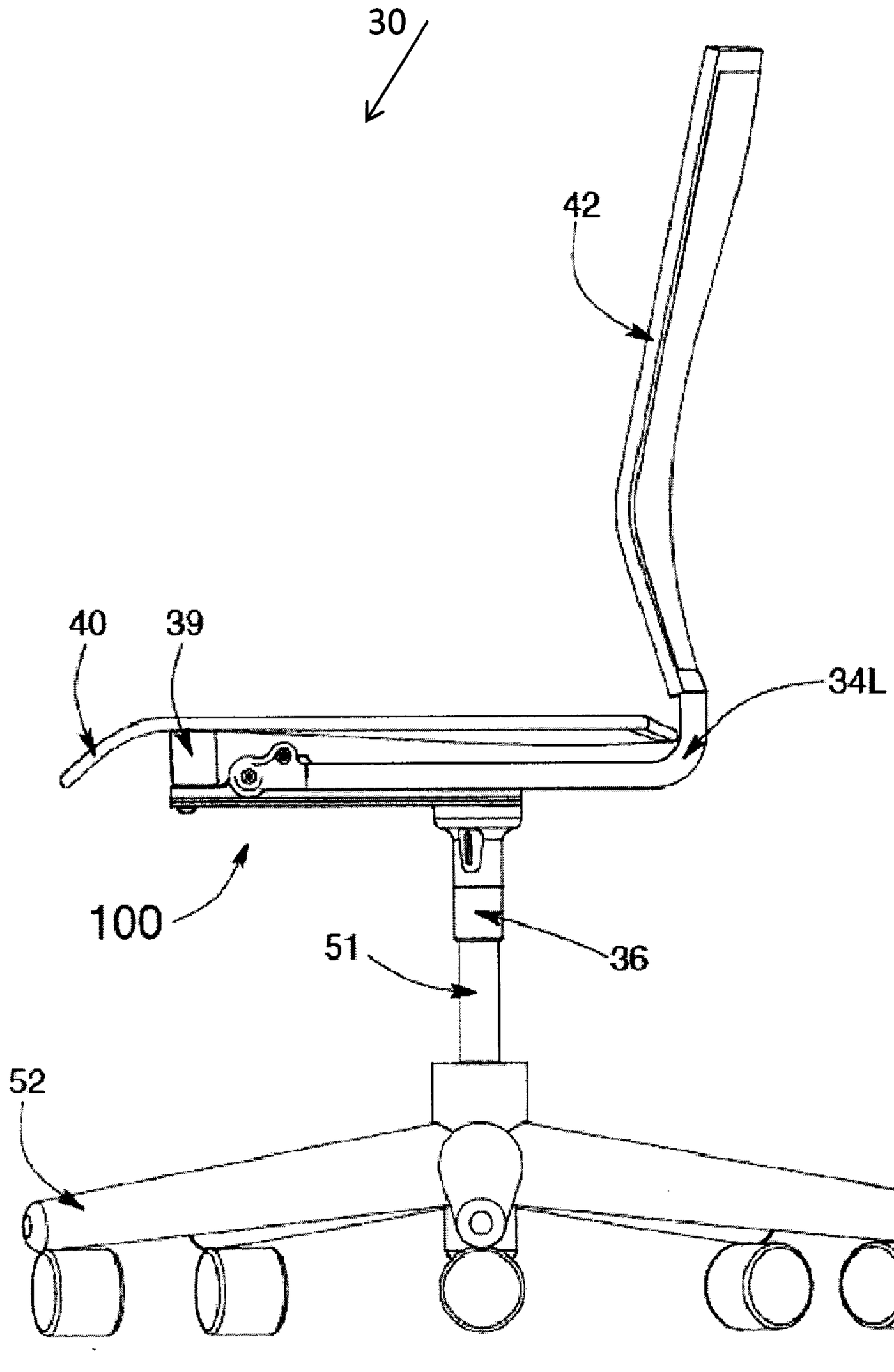



Fig. 1B

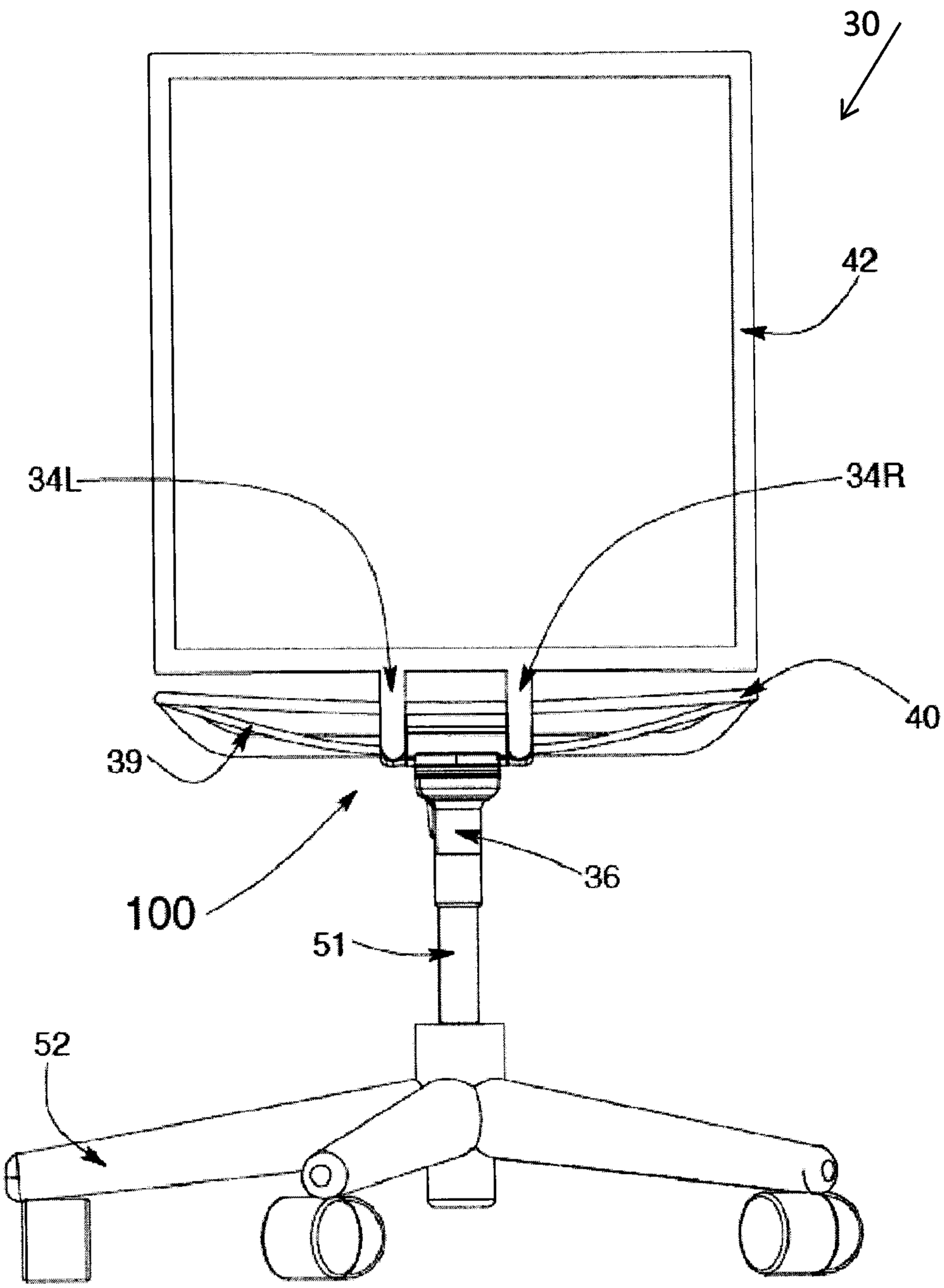



Fig. 1C

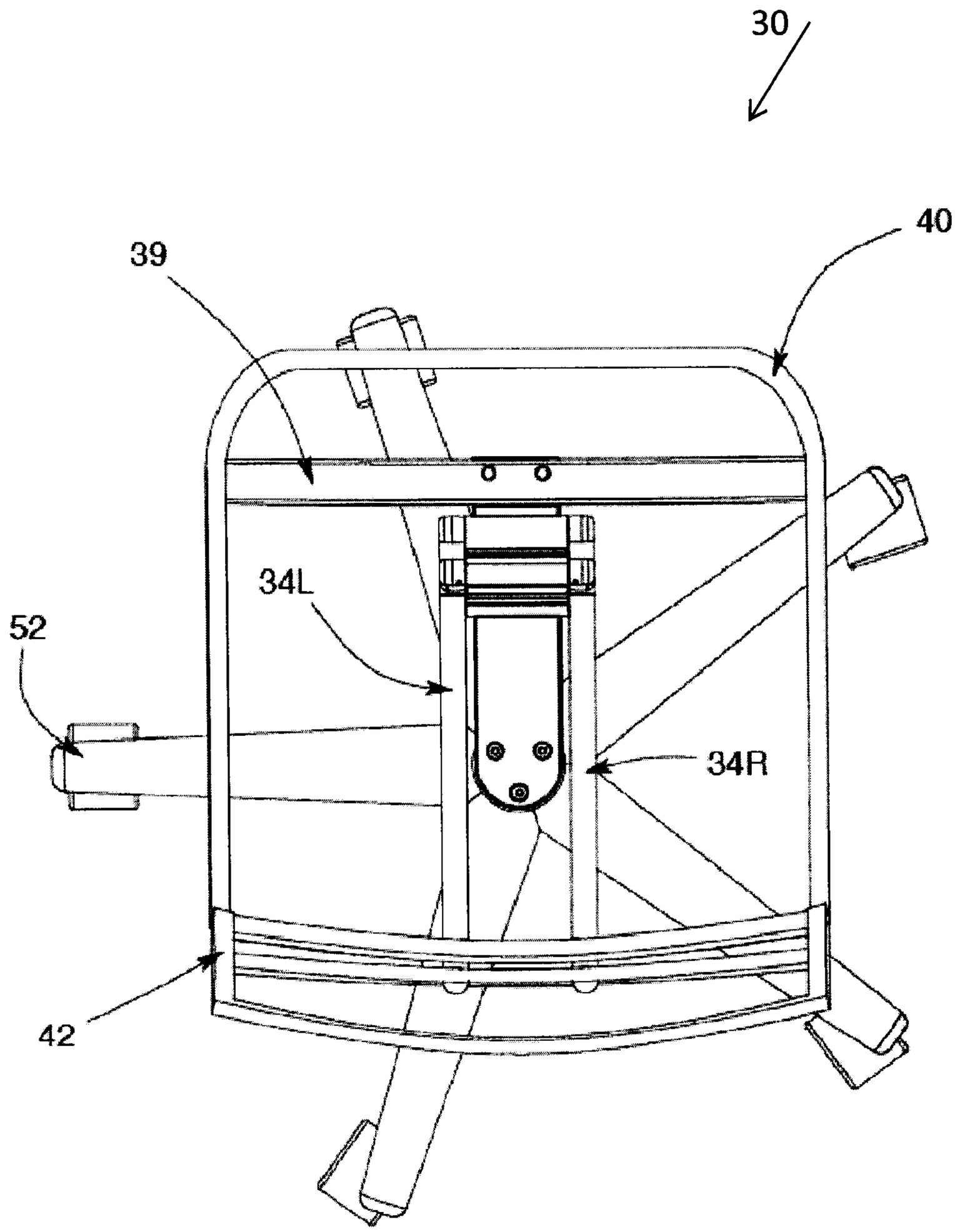



Fig. 1D

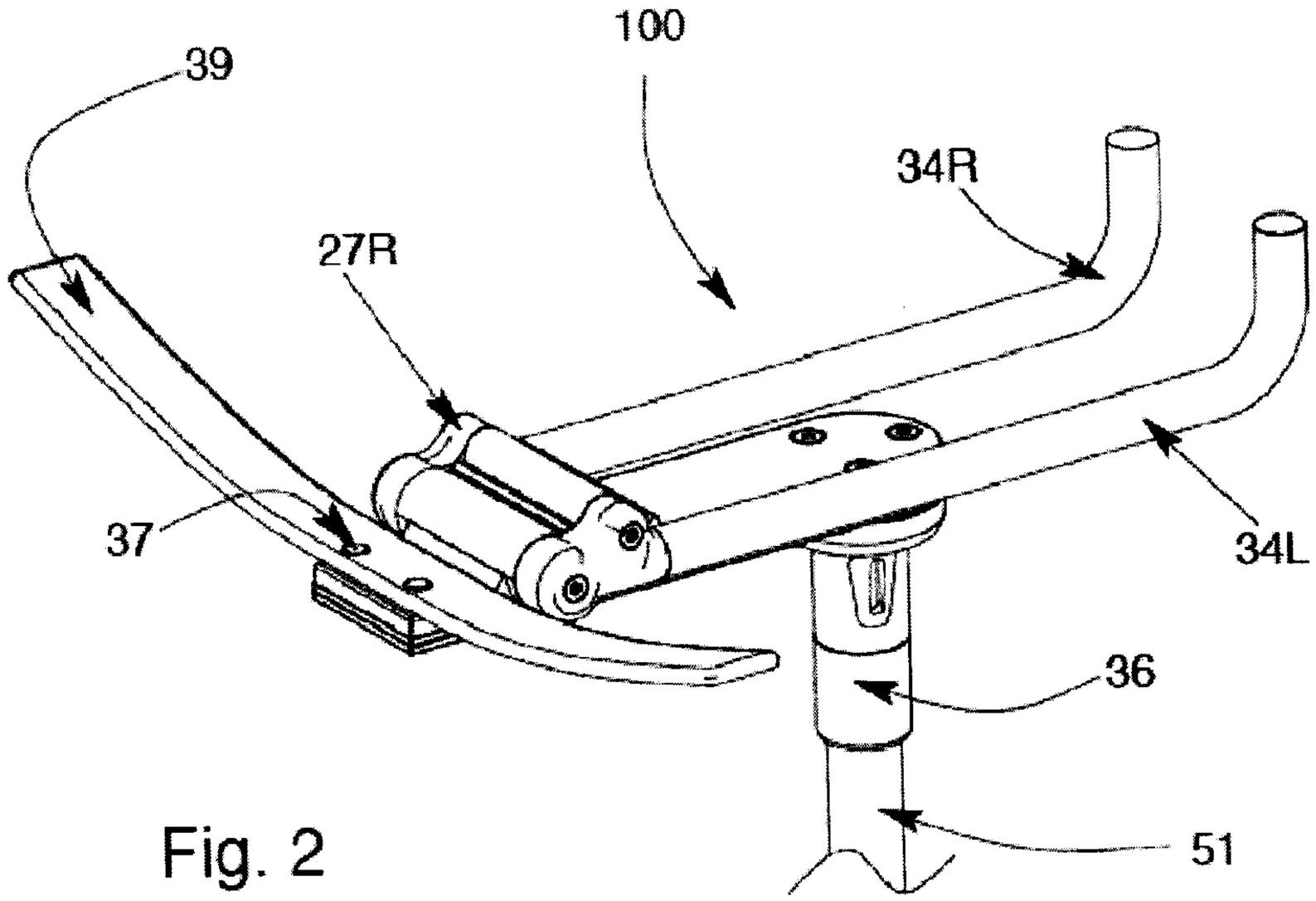



Fig. 2

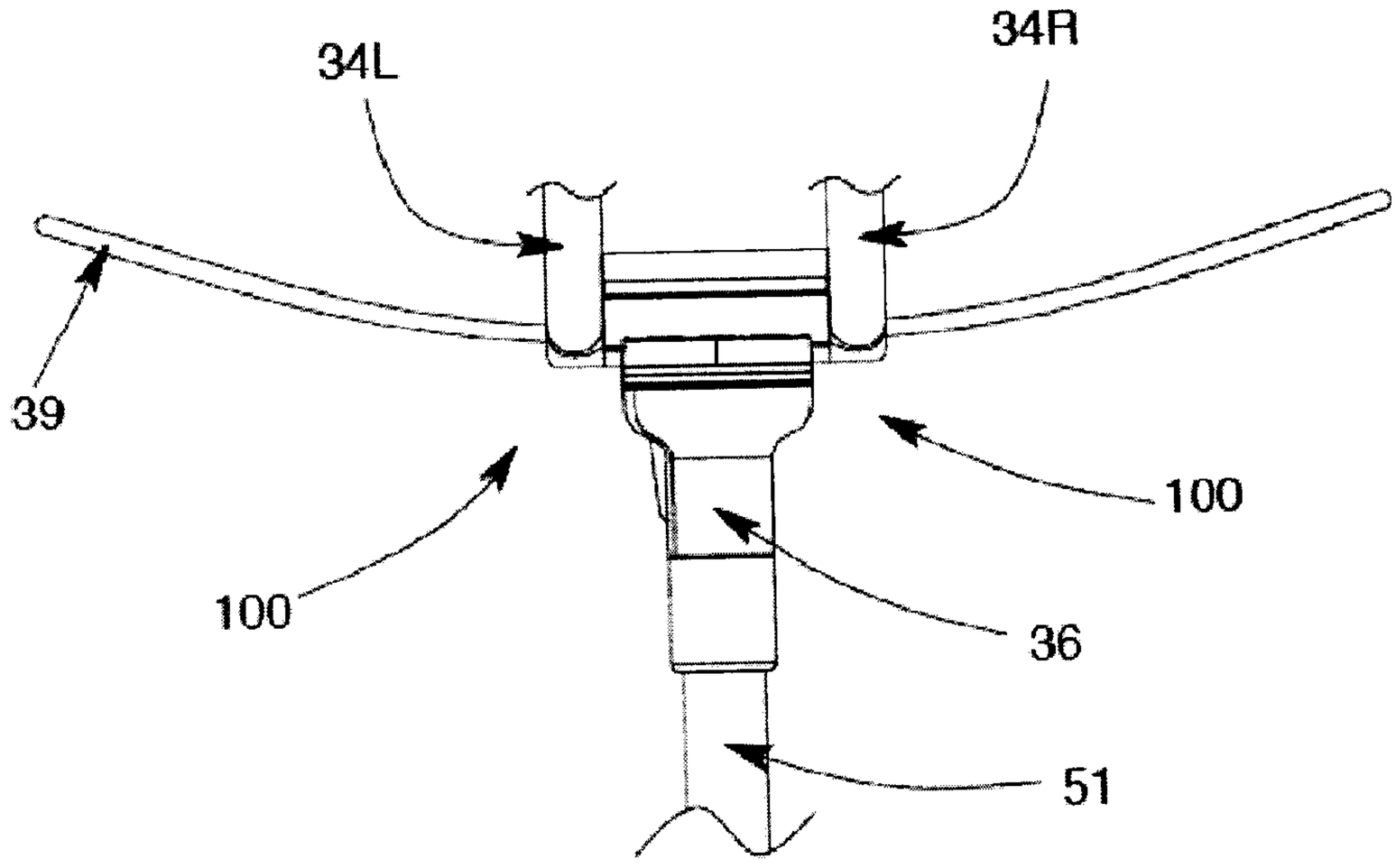



Fig. 2A

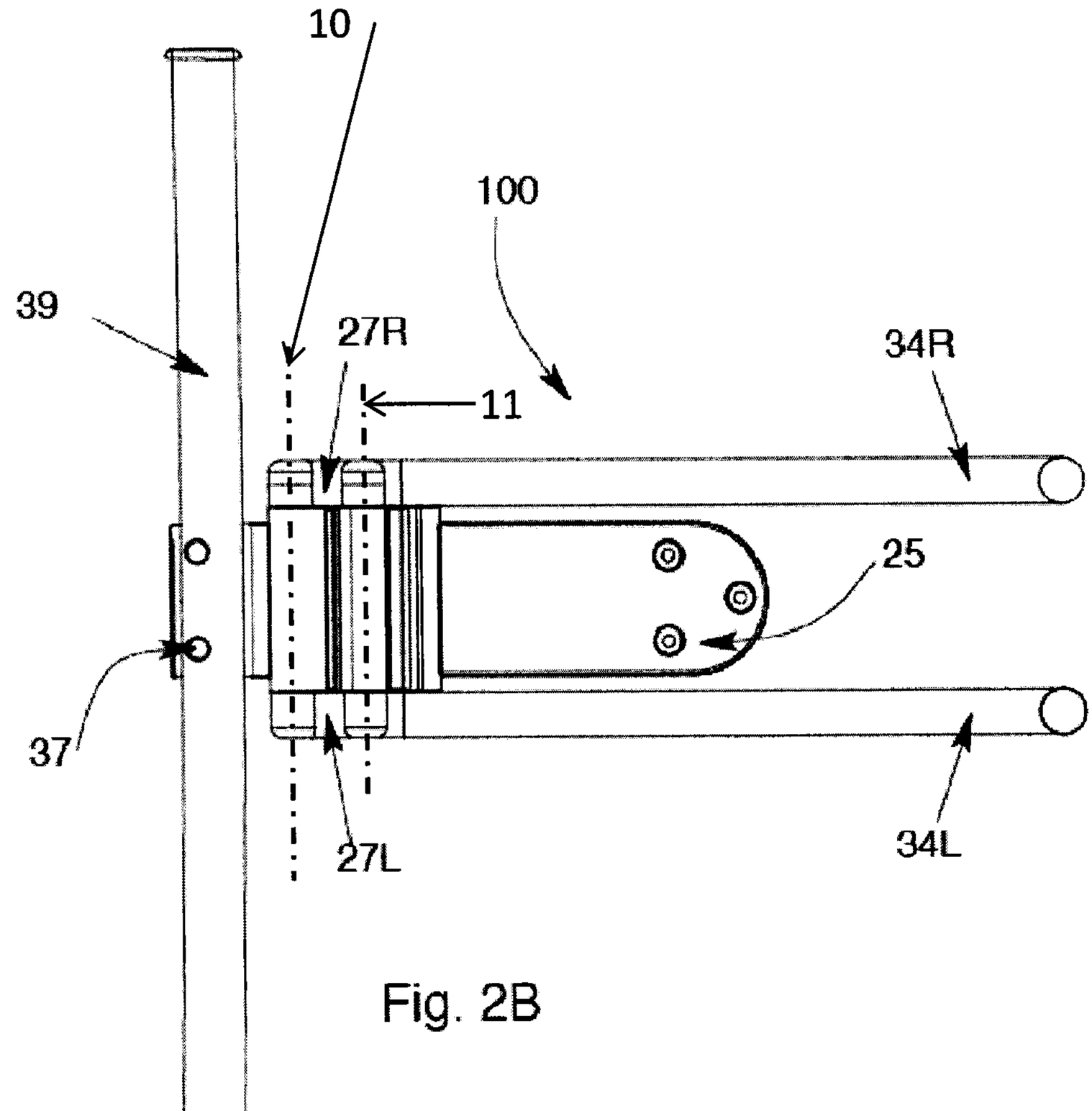



Fig. 2B

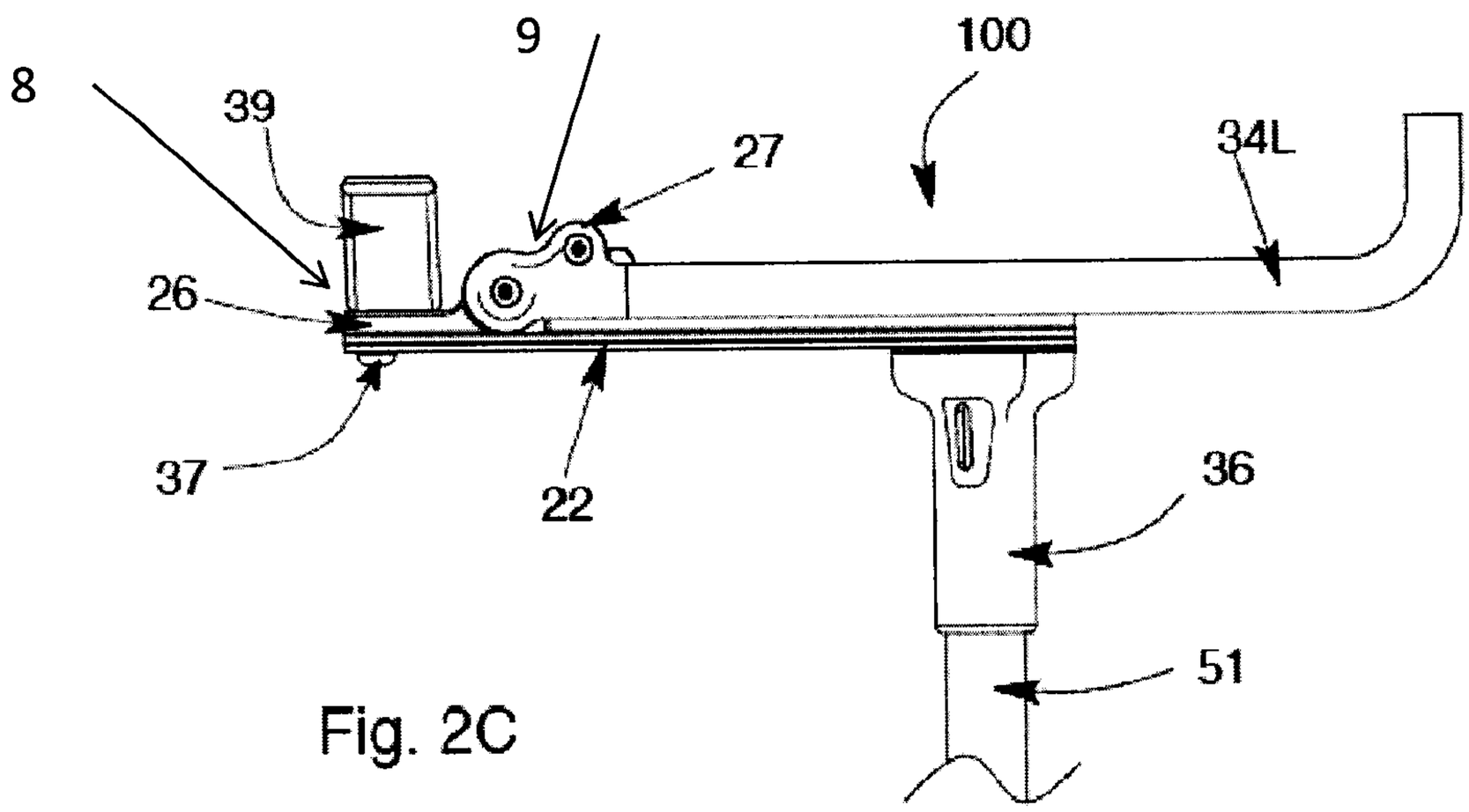



Fig. 2C

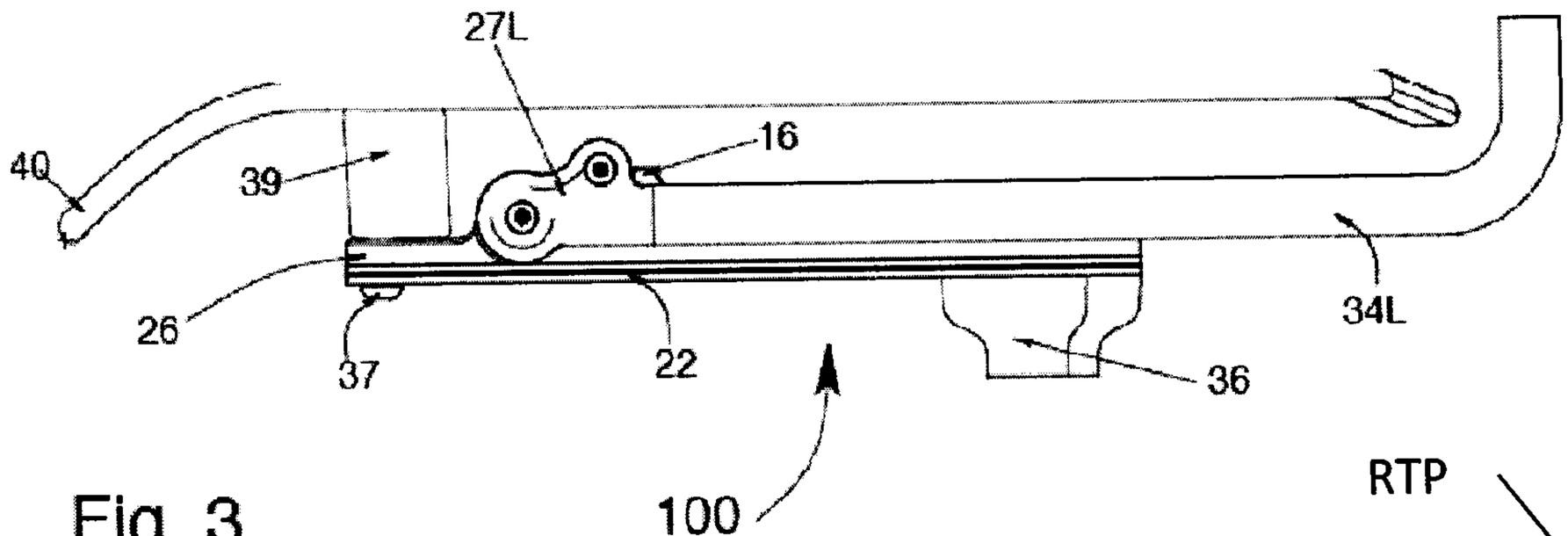

27L
16
40
39
26
37
22
34L
36
100

Fig. 3

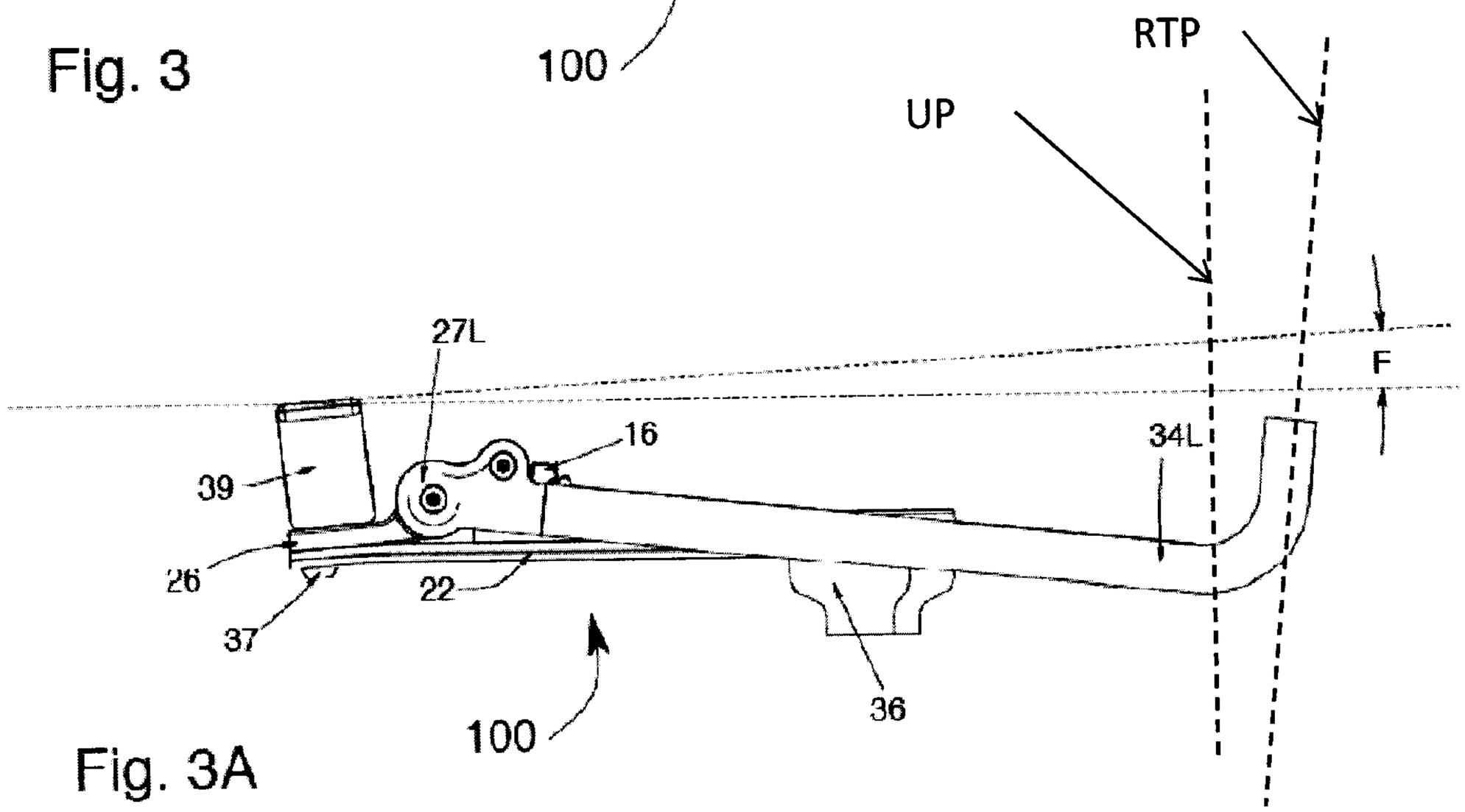

RTP
UP
F
27L
16
39
34L
26
22
37
36
100

Fig. 3A

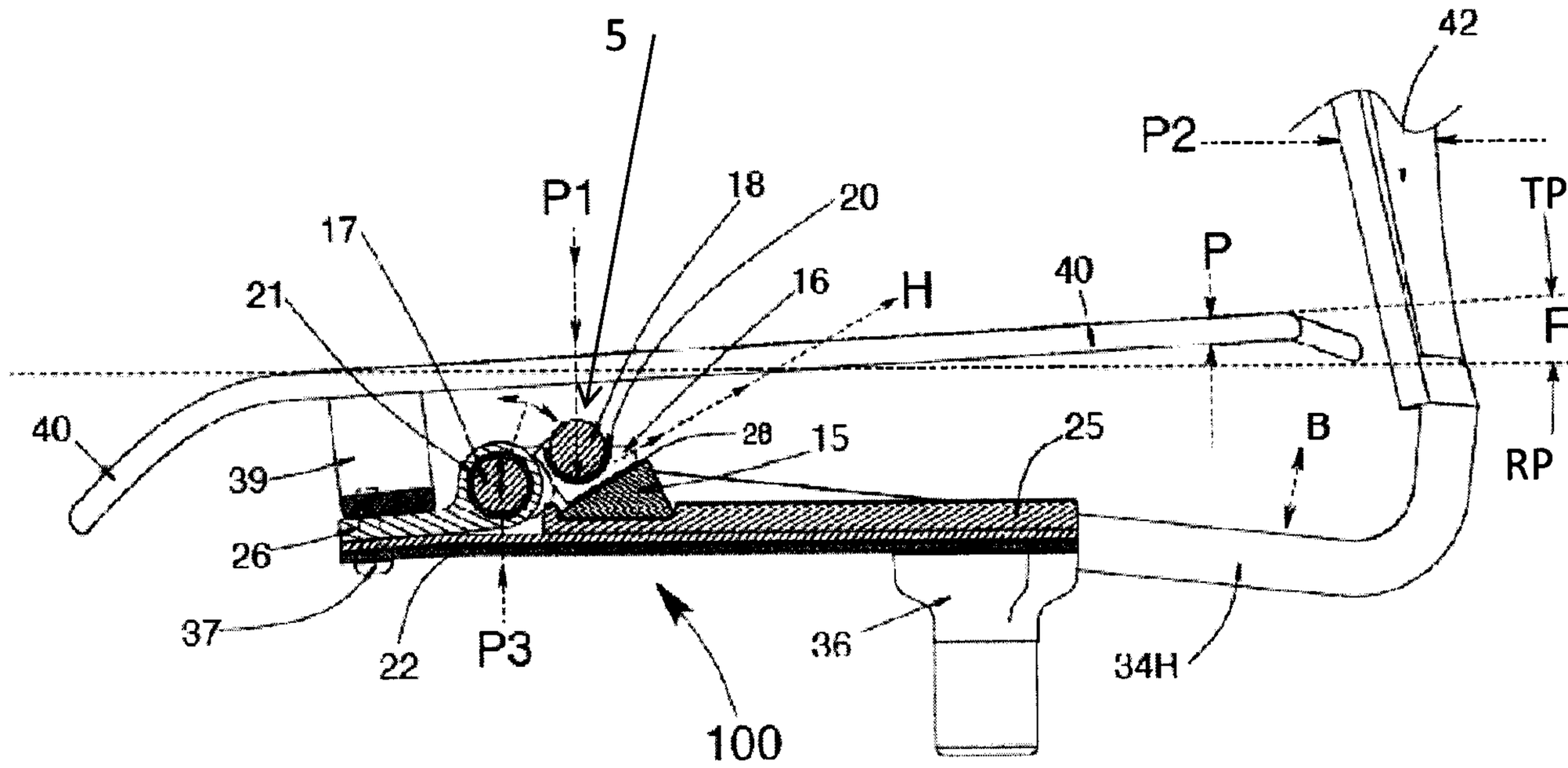

5
42
P2
P1
18
20
17
TP
P
21
16
H
40
F
40
25
B
28
15
RP
39
26
37
22
P3
36
34H
100

Fig. 3B

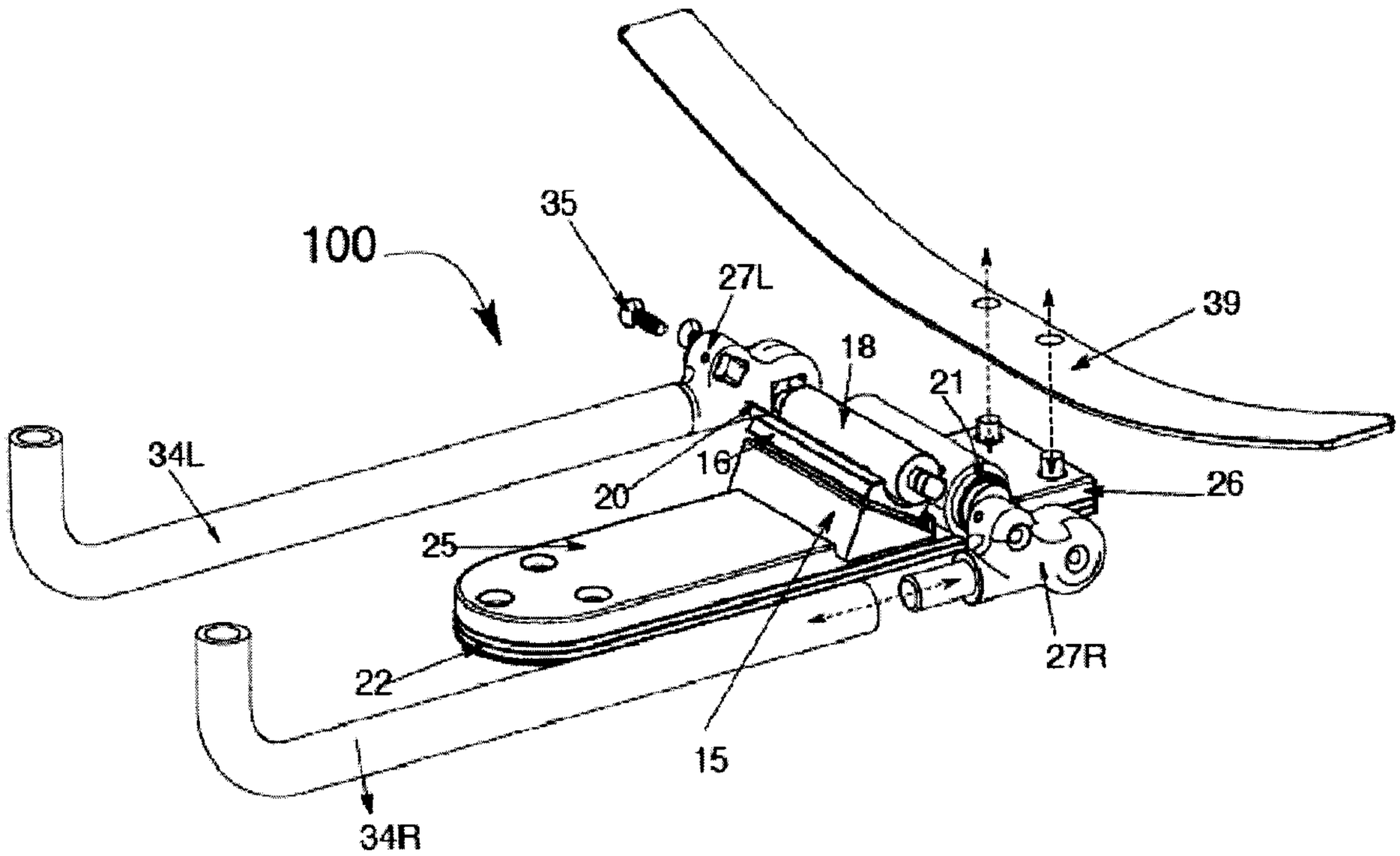

100
35
27L
39
18
21
34L
16
20
26
25
22
27R
15
34R

Fig. 4

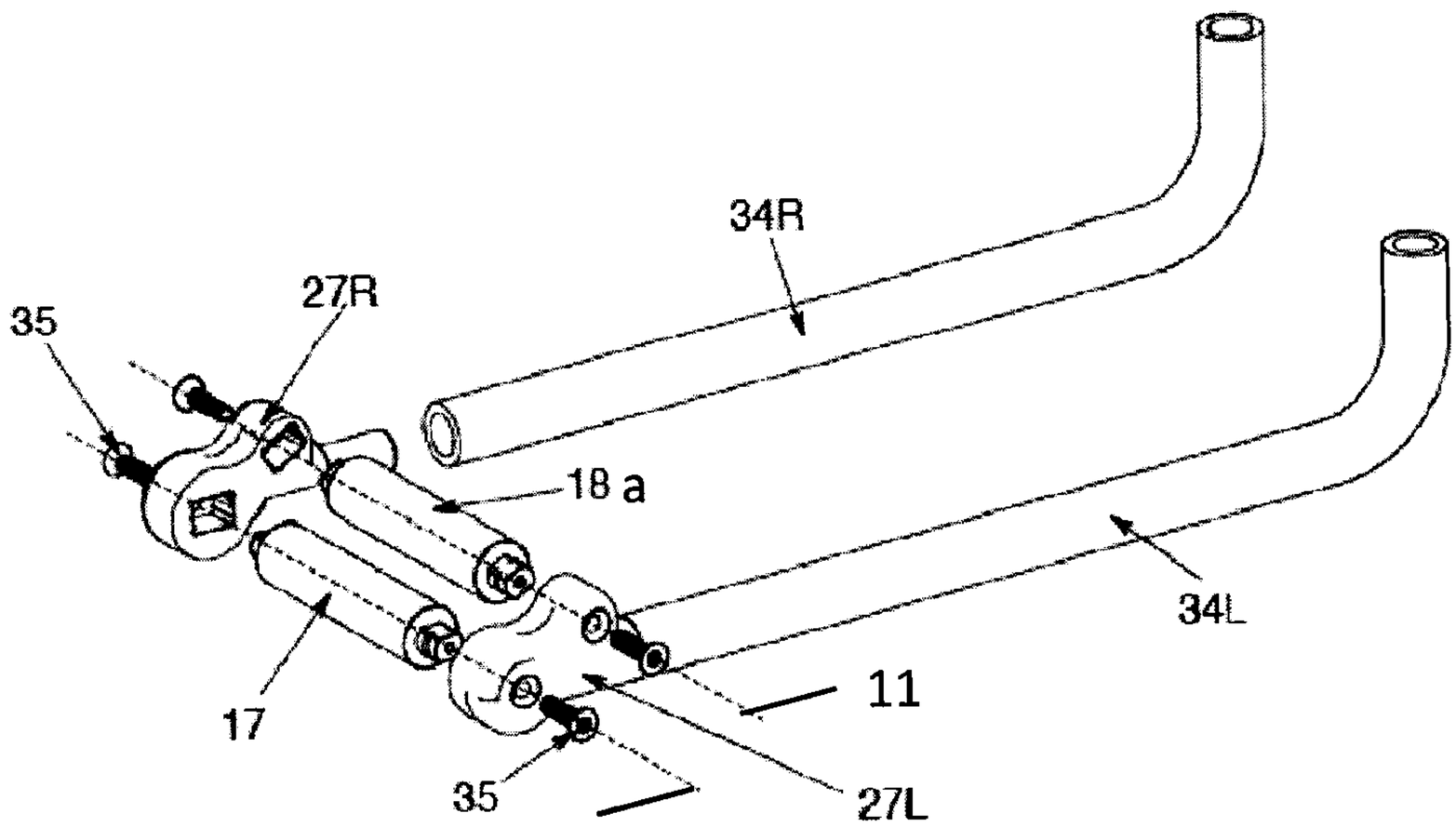

34R
27R
35
18 a
34L
11
17
35
27L

Fig. 4A

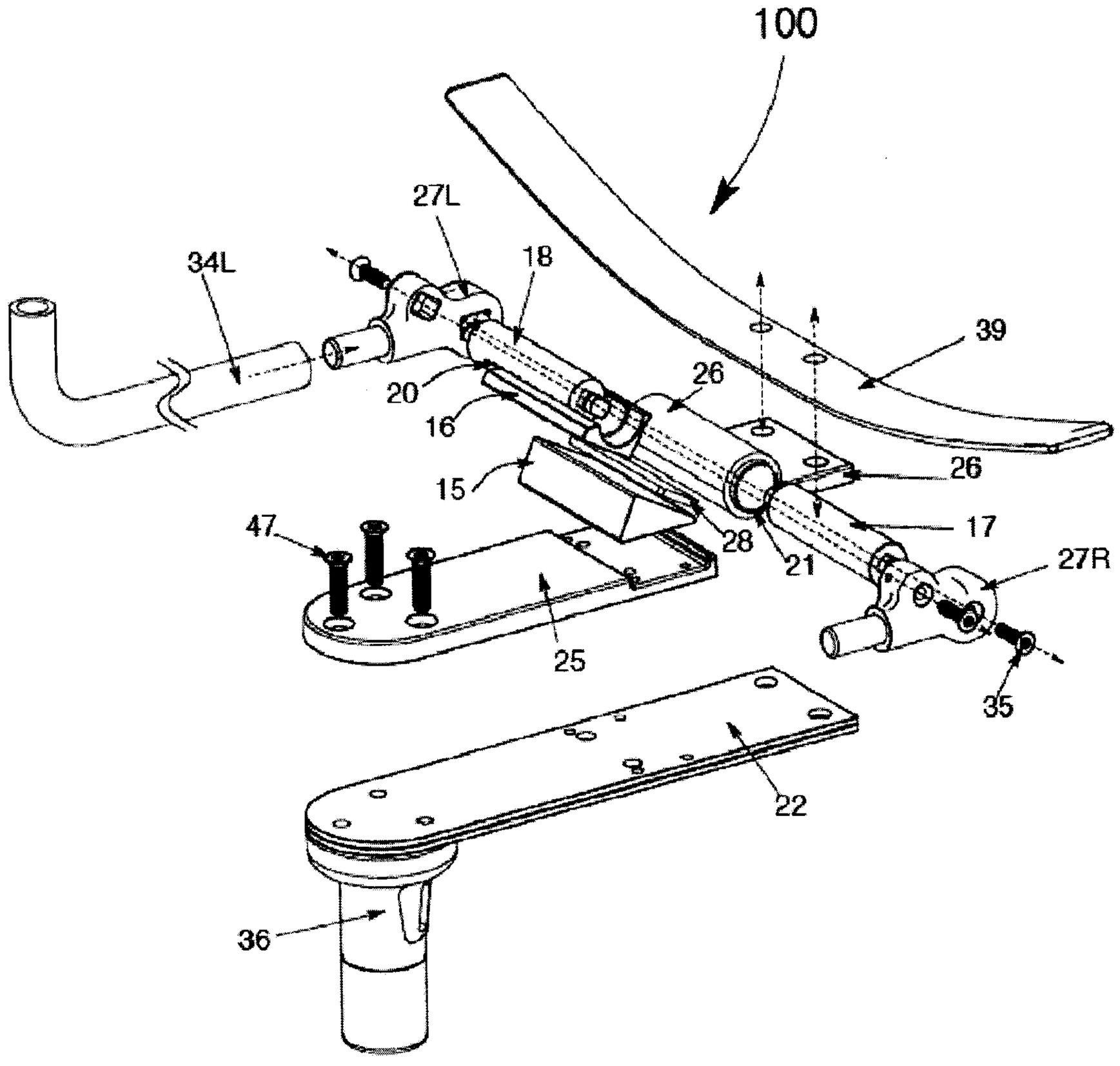



Fig. 5

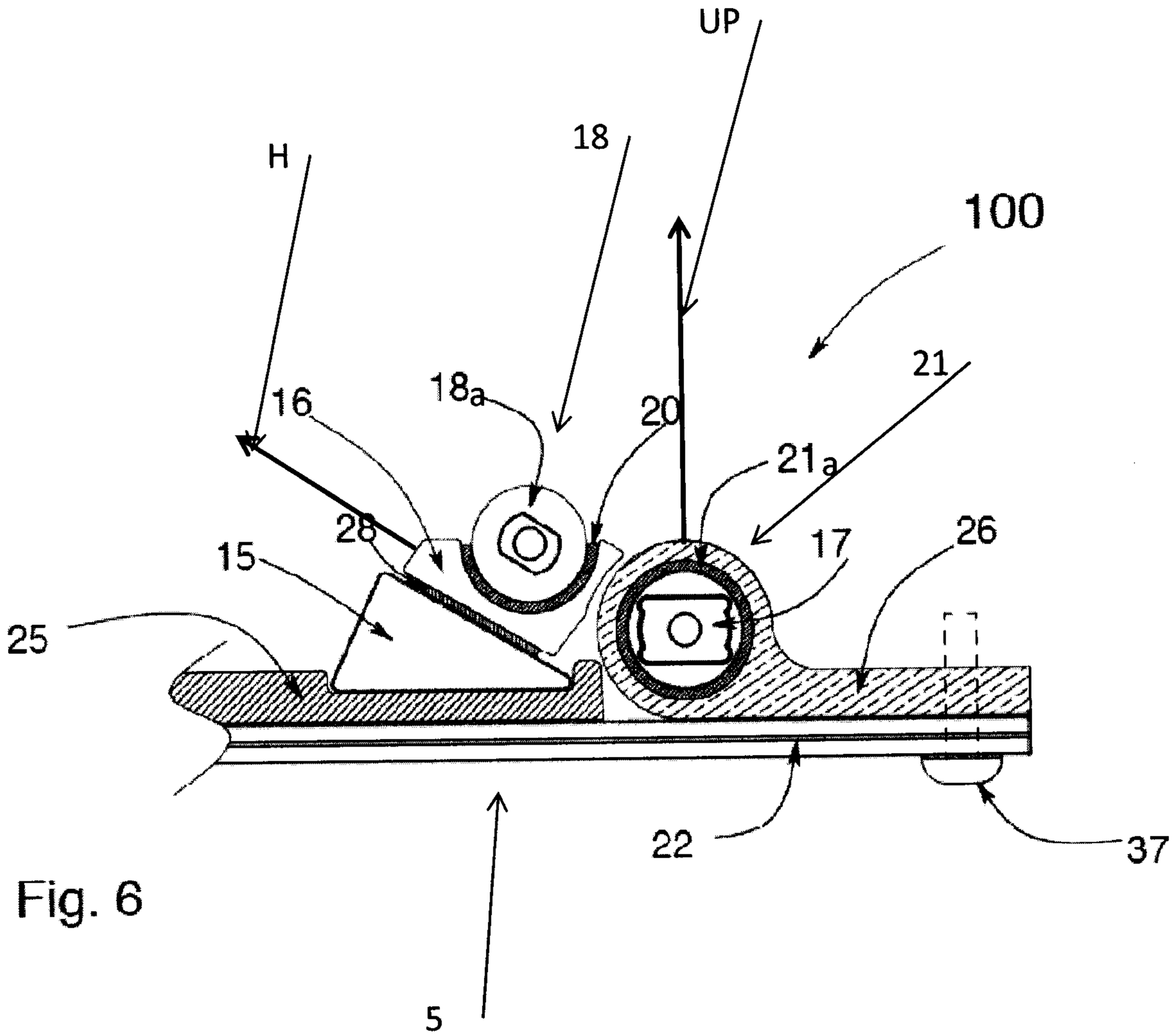



Fig. 6

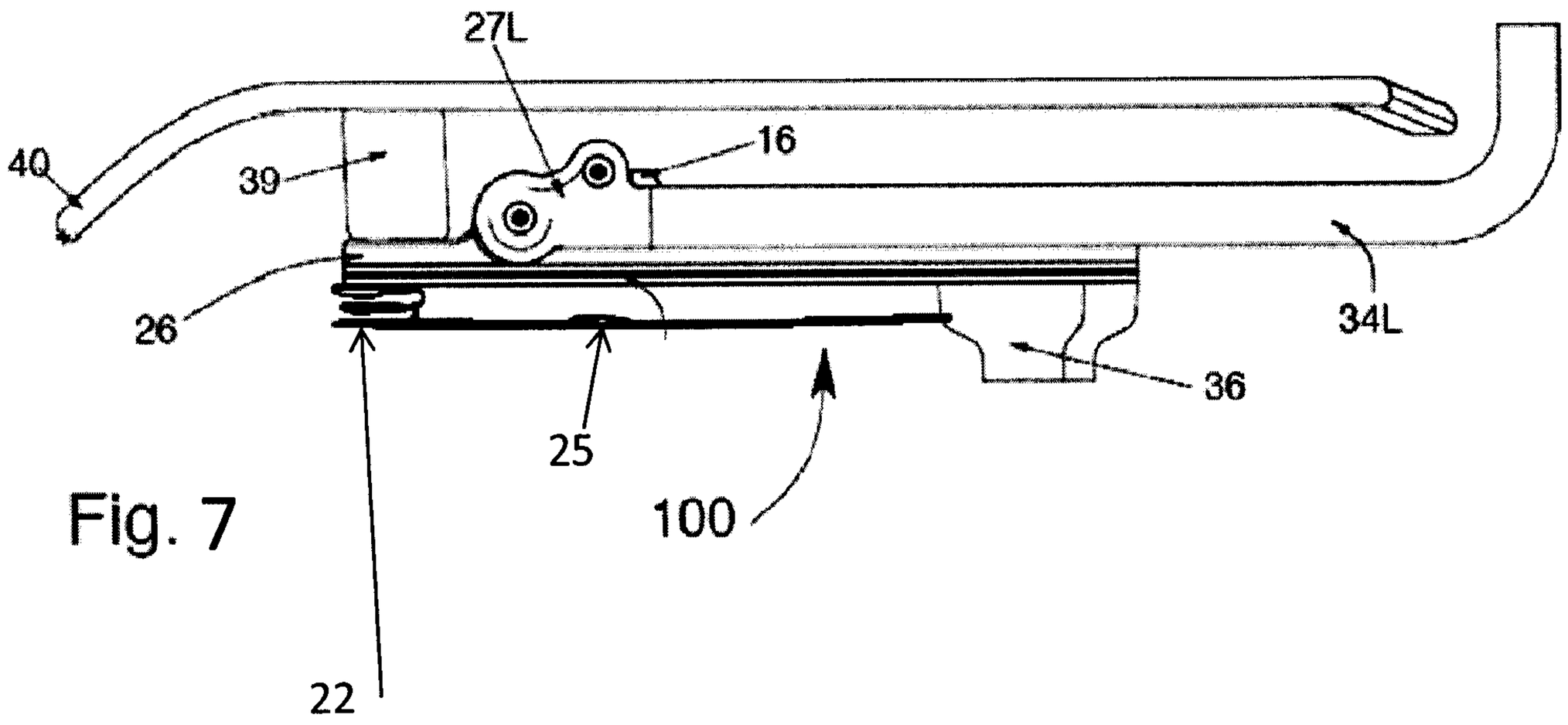
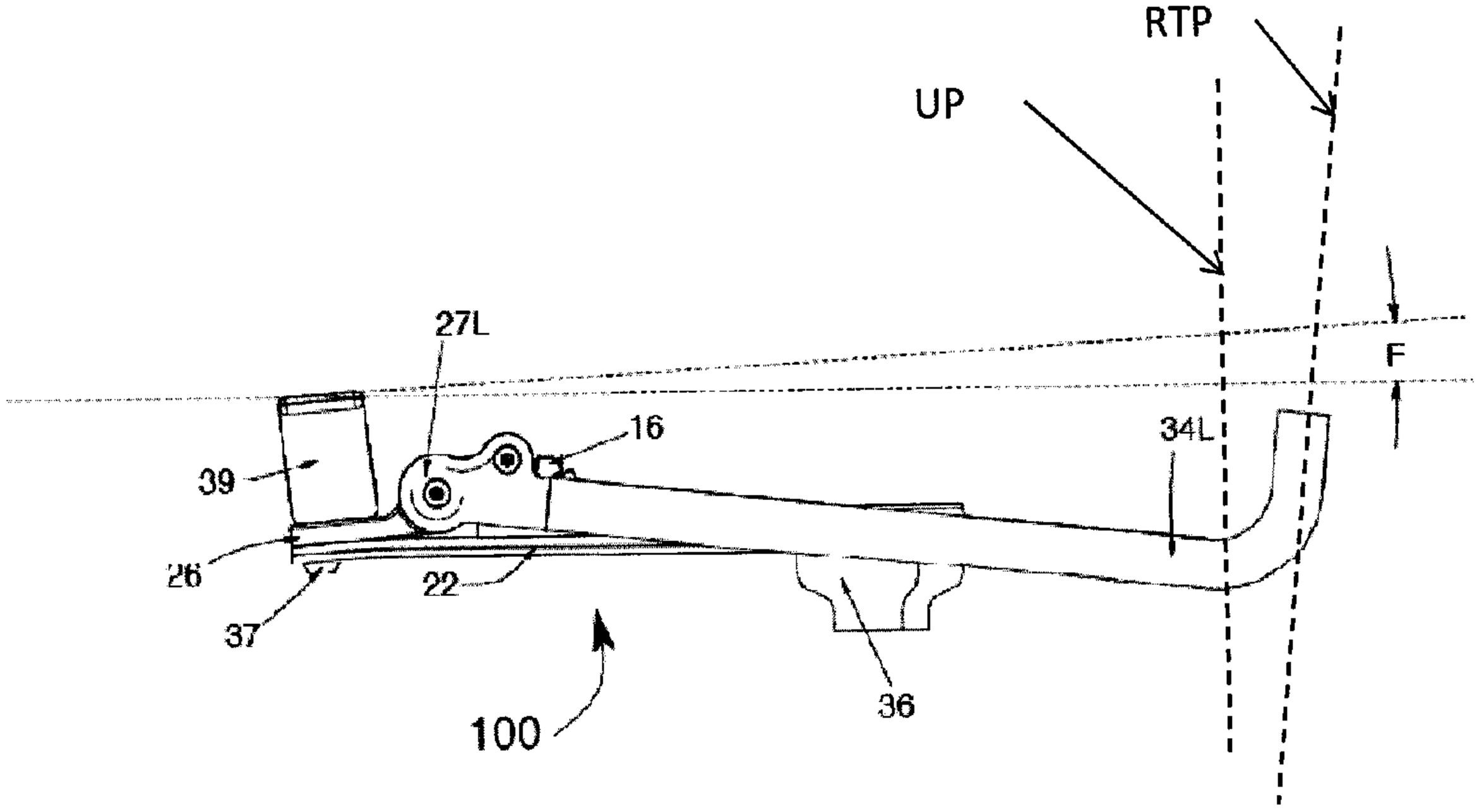



Fig. 7


RTP
UP
27L
F
16
34L
39
26
22
37
36
100