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Piece of Seating Furniture Having a Backward-Tilt Stop**Description:**

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The invention relates to a piece of seating furniture comprising a backrest and a seat, wherein the seat is operatively connected to the backrest, and therefore the backrest and the seat, during the pivoting of the backrest, open one another at an opening angle, wherein a backward-tilt stop is provided, which is designed for limiting the relative

10 movement of the seat and the backrest.

Such a piece of seating furniture has been made known from WO 2013/083562 A1, for example. The known piece of seating furniture comprises a backrest and a seat surface.

The seat surface is operatively connected to the backrest. The piece of seating furniture comprises an, in particular, integrally formed connection element. The connection element
15 is connected to the backrest and the seat surface and is designed to counteract a pivoting movement of the backrest in a resilient manner.

The connection element is designed to pivot along with the seat surface in a

predetermined manner in relation to the pivoting movement of the backrest, and therefore

20 the backrest and the seat surface, during the pivoting of the backrest, open one another at an opening angle. A seat leg rests against a backward-tilt stop in the area of an end which faces away from a turning section, said backward-tilt stop being designed such that, upon deflection against a spring element which rests against a base support, the backward-tilt stop limits the spring travel of the seat leg and the backrest leg upon deflection which is
25 caused, for example, by the seat surface being sat upon by a person.

The backward-tilt stop is situated next to a vertical support of a pedestal. Unfavorable leverage ratios arise as a result.

30 US 2006/0097558 A1 discloses an office chair comprising a synchronous mechanism.

DE 37 24 605 A1 discloses a piece of seating furniture with a seat surface inclination or seat part surface inclination that can be adjusted around a transverse axis and is pretensioned in the basic position, wherein a rigid body is mounted such that it can be

pivoted between a position in which it locks the seat surface and another position in which it releases the movement of the seat surface.

DE 76 31 908 U1 discloses an armchair comprising a device for adjusting the inclination
5 of the seat.

The problem addressed by the present invention is that of refining a piece of seating furniture of the type mentioned at the outset, in such a way that the leverage ratios present during the limitation of the opening movement of the seat surface with respect to
10 the backrest are improved.

This problem is solved according to the invention by a piece of seating furniture comprising the features of claim 1.

15 Due to this measure, the backward-tilt stop is located in the center above a pedestal. Forces that act on the seat can therefore be particularly well absorbed. The design of the arrangement of the backward-tilt stop is simplified as compared to the embodiment according to WO 2013/083562 A1.

20 The backward-tilt stop can be directly or indirectly connected to the vertical support of the pedestal, e.g., via a base support. In addition, the backward-tilt stop can be indirectly or directly connected, via its other end, to the seat. For example, the backward-tilt stop can be connected via its seat-side end to a seat leg of a seat leaf spring. The seat leg, in turn, can be connected to the seat and, optionally, to a base support.

25 According to one preferred embodiment, the backward-tilt stop can be blockable. If the backward-tilt stop is blocked, no relative movement of the seat with respect to the vertical support of the pedestal is possible. This also means, however, that no relative movement of the backrest with respect to the seat is possible. Due to the blockage of the backward-
30 tilt stop, the relative movement of the seat and the backrest can therefore also be blocked.

Further advantages result when the backward-tilt stop comprises a variable-length section. Due to the variable-length section, relative movements of the seat with respect to the vertical support of the pedestal are possible. A pivoting movement between the
35 backrest and the seat is therefore also made possible.

The backward-tilt stop can comprise a stop shaft and a stop piston, wherein, in a first relative rotary position of the stop shaft and the stop piston, these are movable relative to one another in the longitudinal direction and, in a second relative rotary position, the stop shaft and the stop piston are not movable relative to one another in the longitudinal direction. The backward-tilt stop can therefore be blocked in a simple manner by way of a rotation of the stop shaft and the stop piston relative to one another. In particular, the stop piston can be guided via stems in recesses of the stop shaft. By way of a relative rotation of the stop shaft and the stop piston, the stems of the stop piston can come to rest next to the recesses, and therefore mutual guidance is no longer possible and, in particular, relative movement in the longitudinal direction is no longer possible.

An actuating mechanism can be provided for blocking and releasing the backward-tilt stop. In particular, the relative rotation of the stop shaft and the stop piston can be effectuated by means of the actuating mechanism. The actuating mechanism can comprise a release button on the underside of the seat. Said release button can be connected to the backward-tilt stop, for example, via a cable pull.

Further advantages result when the backward-tilt stop is pivotable relative to the seat, in particular is connected to the seat via a spherical or hemispherical connection element. In particular, the backward-tilt stop can be pivotable relative to the seat not only along one direction, but rather pivotable relative to the seat on all sides. As a result, it is possible to assume a plurality of seat positions. These seat positions are not restricted or prevented by the backward-tilt stop.

25

In accordance with the invention, the backward-tilt stop is situated so as to be pivotable relative to a pedestal. Therefore, one further degree of freedom results and the backward-tilt stop can follow movements of the seat.

30 The seat can be connected to a backrest leg via a seat bearing. The seat can therefore rest on a backrest leg. Given that the connection is established via a seat bearing, relative movements of the seat and the backrest leg are possible, however.

Particular advantages result when the seat bearing is designed as a spherical bearing. A plurality of positions of the seat relative to a horizontal plane is therefore possible.

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Further features and advantages of the invention result from the detailed description of one exemplary embodiment of the invention presented below with reference to the figures in the drawing, which shows the details that are essential to the present invention. Further
5 features and advantages of the present invention also result from the claims. The features described therein are not intended to be interpreted literally, and are presented in such a manner that the special features of the present invention may be presented clearly. The various features can be implemented individually, or these can be combined in any possible manner in different variants of the invention.

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Exemplary embodiments of the invention are depicted in the schematic drawing, in various stages of use, and are described in greater detail in the description that follows.

15 In the drawing:

Fig. 1 shows a side view of a piece of seating furniture according to the invention in a first relative position of the seat and the backrest;

20 Fig. 2 shows a side view of the piece of seating furniture according to the invention with pivoted backrest and seat;

Fig. 3 shows a backward-tilt stop in the released position;

25 Fig. 4 shows the backward-tilt stop in the locked or blocked position;

Fig. 5 shows an actuating mechanism;

30 Fig. 6 shows an enlarged sectional illustration of the backward-tilt stop in a home position of the piece of seating furniture;

Fig. 7 shows an illustration of the backward-tilt stop corresponding to Fig. 6, with pivoted backrest and seat;

Fig. 8 shows a sectional illustration of the seat in the area of the backward-tilt stop.

Figure 1 shows a piece of seating furniture 1 designed as an office chair, comprising a seat 2 and a backrest 3. The seat 2 is situated on a flexible seat support 4 which is essentially U-shaped in cross section and is connected to a base support 5. The backrest 3 comprises a support structure 6 which has a flexible backrest leg 7 which is likewise connected to the base support 5. The seat 2 is connected to the support structure 6, i.e., the backrest 3, via a seat bearing 8. A backward-tilt stop 11 is situated between the seat 2 and the vertical support 9 of a pedestal 10. In the position shown, the seat 2 and the backrest 3 have a home position relative to one another, which corresponds to an angle α_1 .

Figure 2, in turn, shows the piece of seating furniture 1, wherein the backrest 3 and the seat 2 have been pivoted in this case. As a result, the opening angle between the backrest 3 and the seat 2 has also increased and now corresponds to the angle α_2 . The backward-tilt stop 11, which is located in extension of the vertical support 9, has been pivoted and compressed, i.e., the length was shortened. In the position shown in Fig. 2, the backward-tilt stop 11 is completely compressed, and therefore a further pivoting of both the seat 2 and the backrest 3 is no longer possible. The backward-tilt stop 11 therefore limits the movement of the backrest 3 and the seat 2.

A detailed illustration of the backward-tilt stop 11 is shown in Fig. 3. The backward-tilt stop 11 comprises a stop piston 12 and a stop shaft 13. The stop piston 12 comprises stems 14 which, in the position shown, align with groove-like recesses 15 in the stop shaft 13. Therefore, the stop piston 12 and the stop shaft 13 can be moved relative to one another, wherein the stems 14 are guided through the groove-like recesses 15.

At the upper end, the backward-tilt stop 11 comprises a hemispherical connection piece 16, via which the backward-tilt stop 11 can be pivotably connected to the seat 2.

The backward-tilt stop 11 is shown in a released position in Fig. 3. Fig. 4 shows the blocked position, however. As compared to the position shown in Fig. 3, the stop piston 12 has been rotated so far in the clockwise direction with respect to the stop shaft 13 that

the stems 14 are located next to the groove-like recesses 15. The stems 14 therefore rest on the stop shaft 13. A relative movement, in the longitudinal direction 20, of the stop piston 12 and the stop shaft 13 is therefore not possible.

- 5 It is clear from both Fig. 3 and Fig. 4 that the backward-tilt stop 11 has a pivot axis 21 at its lower end, which enables a pivoting of the backward-tilt stop 11 relative to the pedestal 10.

Fig. 5 shows an actuating mechanism 25 comprising an actuating button 26 which can be
10 situated on the seat 2, in particular on its underside. A cable pull 27, in particular a trigger wire, extends from the actuating button 26 to an actuating tab 28 on the stop piston 12. The stop piston 12 can therefore be rotated relative to the stop shaft 13 by actuating the button 26. A base plate 29, by means of which the backward-tilt stop 11 can be fastened on the base support 5, is also apparent.

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Figure 6 shows a cut detailed illustration of the piece of seating furniture 1 in the area of the backward-tilt stop 11. In the position shown, the backward-tilt stop 11 is released, i.e., not blocked. This means that the stop piston 12 is movable relative to the stop shaft 13, in particular movable downward in the exemplary embodiment shown. The backward-tilt
20 stop 11 further comprises a stop axle 30, on the end of which the hemispherical connection piece 16 is situated. The connection piece 16 is mounted in the seat 2. The position shown in Fig. 6 corresponds to the home position. If the seat 2 is now pivoted, the situation shown in Fig. 7 results. In this case, it is apparent that the backward-tilt stop 11 has been pivoted about the axis 21. It is also apparent that the backward-tilt stop 11 has
25 been compressed, i.e., the stop piston 12 has been displaced in the stop shaft 13 and, there, assumes an end position. A further compression or change in length in the longitudinal direction of the backward-tilt stop 11 is not possible. The backward-tilt movement of both the seat 2 and of the backrest 3 is therefore limited. It is also apparent that the seat 2 has been pivoted relative to the backward-tilt stop 11 as compared to the
30 position according to Fig. 6. This is possible since the hemispherical connection piece 16 is provided.

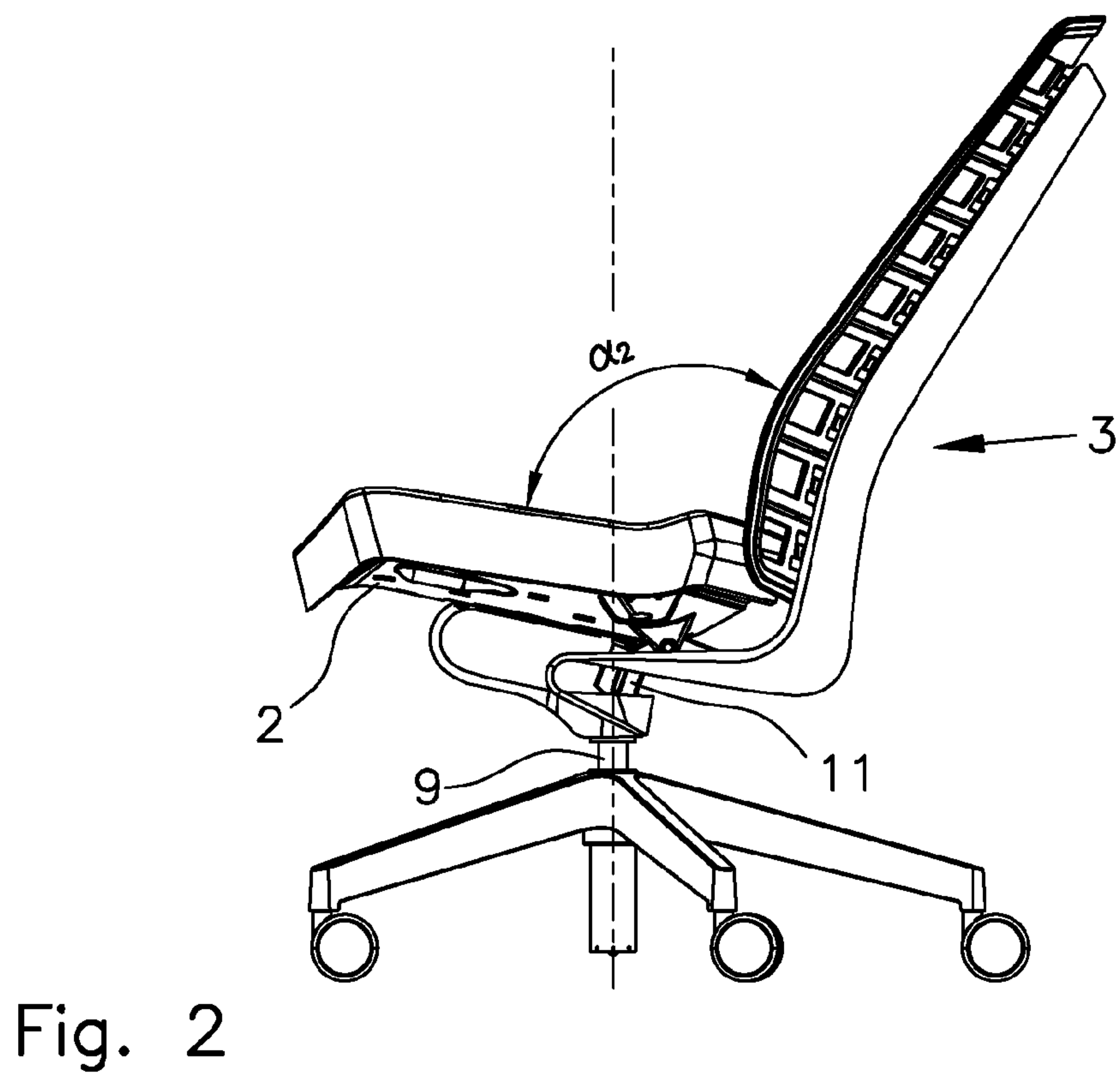
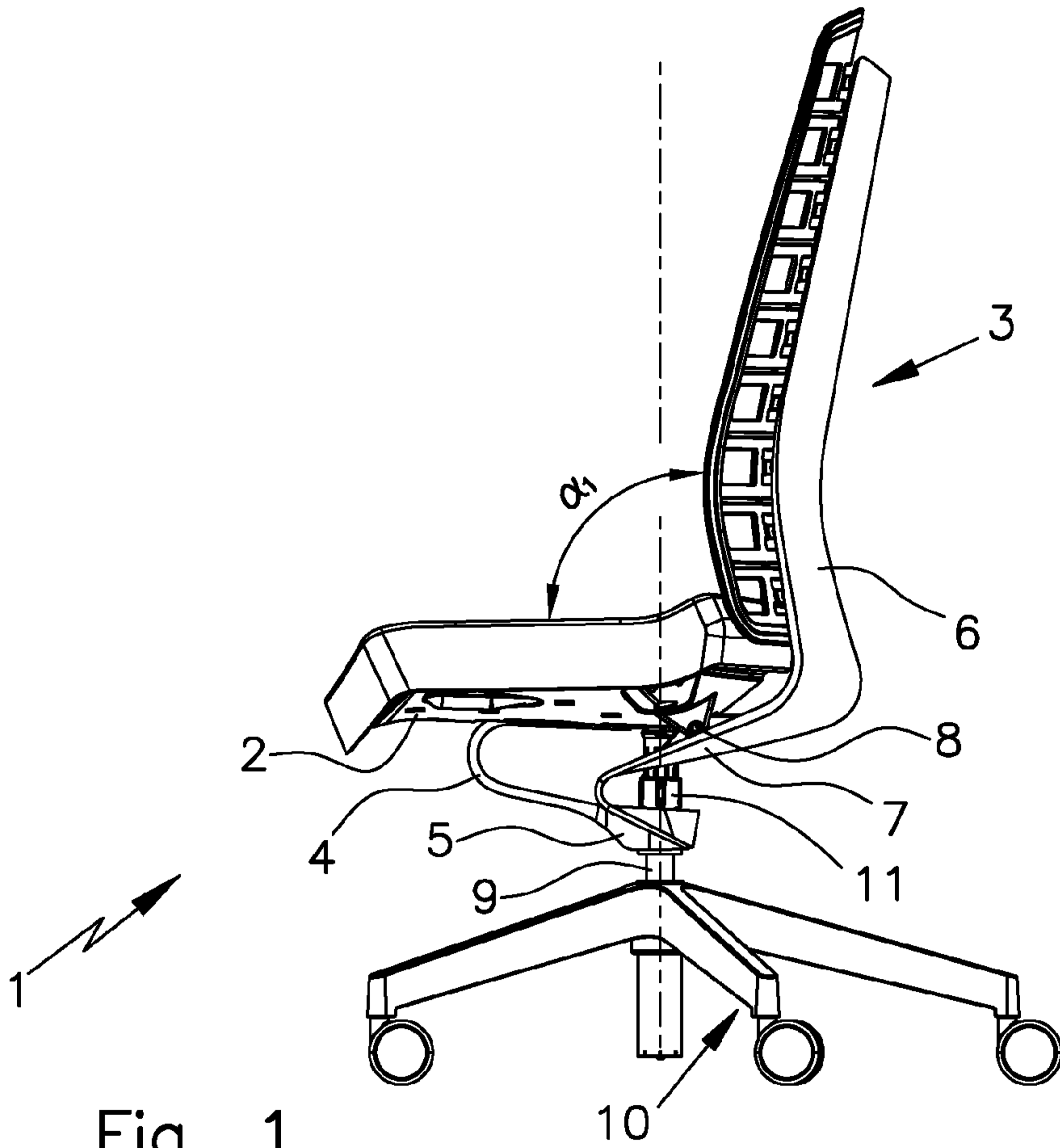
Figure 8 shows a partial sectional illustration through the seat 2. It is apparent here that the seat 2 is laterally pivotable, and therefore said seat assumes an angle $\beta \neq 90^\circ$ with
35 respect to vertical. This pivoting movement is possible, on the one hand, since the

hemispherical connection piece 16 is provided and, therefore, the backward-tilt stop 11 does not impede the movement. On the other hand, the movement is made possible by the fact that the backrest leg 7 is connected via the seat bearing 8 which is designed as a spherical bearing, and therefore the seat 2 can carry out the movement shown. A second 5 seat bearing 8.1 connects a second backrest leg 7.1 to the seat 2.

Patentkrav

1. Siddemøbel (1) med et ryglæn (3) og et sæde (2), idet sædet (2) er funktionelt forbundet med ryglænet (3), således at ryglænet (3) og sædet (2) åbner hinanden med en åbningsvinkel, når ryglænet (3) drejes, idet der er tilvejebragt
5 et ryghældningsstop (11), som er udformet til at begrænse den relative bevægelse af sædet (2) og ryglænet (3), idet ryghældningsstoppet (11) er indrettet i forlængelse af den vertikale støtte (9) på et understel (10), **kendetegnet ved, at** ryghældningsstoppet (11) er indrettet drejeligt i forhold til et understel (10).
- 10
2. Siddemøbel ifølge krav 1, **kendetegnet ved, at** ryghældningsstoppet (11) kan låses.
3. Siddemøbel ifølge et af de foregående krav, **kendetegnet ved,**
15 **at** ryghældningsstoppet (11) omfatter et længdejusterbart afsnit.
4. Siddemøbel ifølge et af de foregående krav, **kendetegnet ved,**
at ryghældningsstoppet (11) omfatter et stopskaft (13) og et stopstempel (12), idet stopskafte (13) og stopstemplet (12) er bevægelige i forhold til hinanden i
20 længderetningen i en første relativ drejehøjde, og stopskafte (13) og stopstemplet (12) ikke er bevægelige i forhold til hinanden i længderetningen i en anden relativ drejehøjde.
5. Siddemøbel ifølge et af de foregående krav, **kendetegnet ved, at** der er
25 tilvejebragt en aktiveringsmekanisme (25) til låsning og oplåsning af ryghældningsstoppet (11).
6. Siddemøbel ifølge et af de foregående krav, **kendetegnet ved,**
at ryghældningsstoppet (11) er drejeligt i forhold til sædet (2), især er forbundet
30 med sædet (2) via et kugle- eller halvkugleformet forbindelseselement (16).
7. Siddemøbel ifølge et af de foregående krav, **kendetegnet ved, at** sædet (2) er forbundet med et ryglænsben (7) via et sædeleje (8).

8. Siddemøbel ifølge krav 7, **kendetegnet ved, at** sædelejet (8) er udformet som et kuglehovedleje.



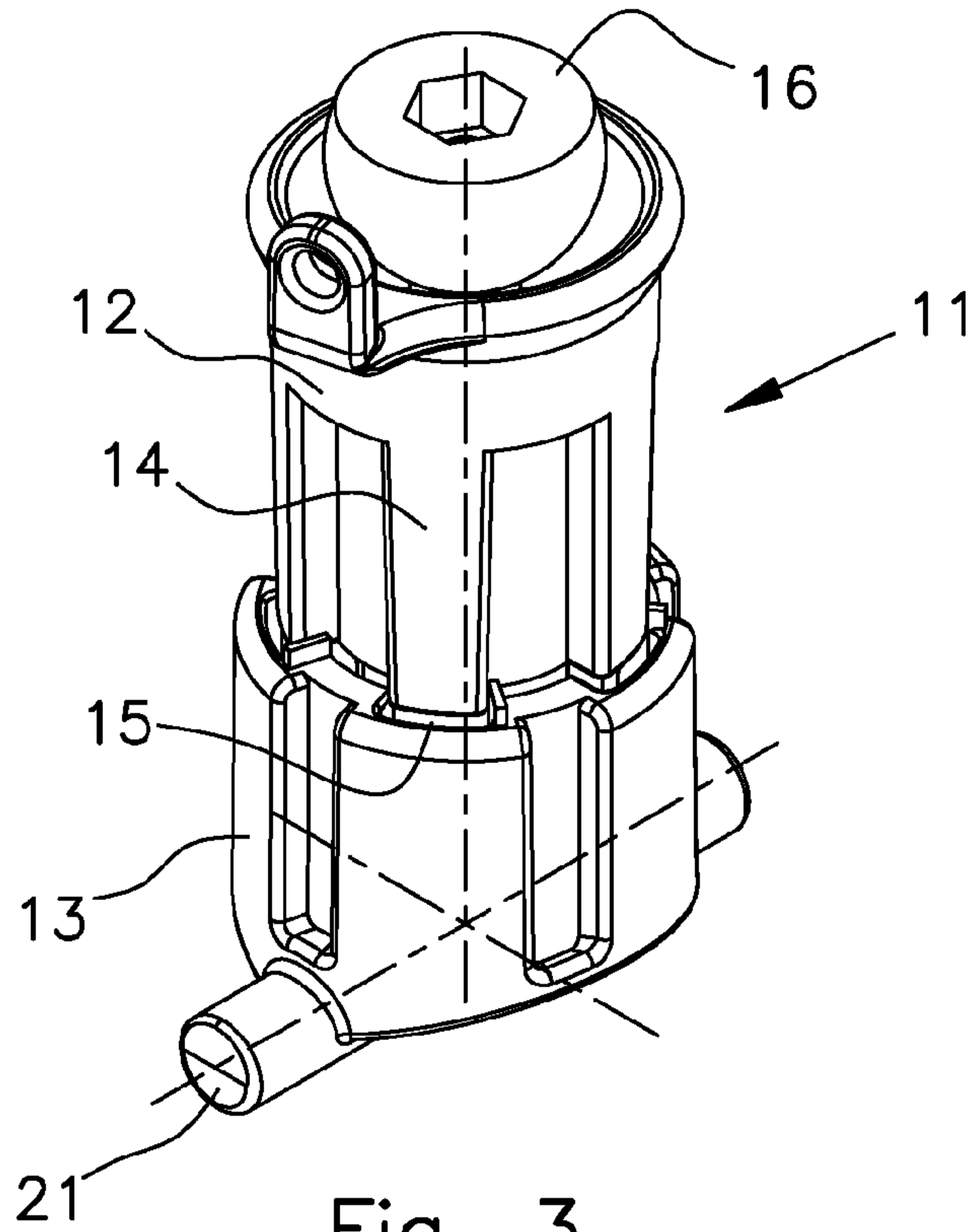


Fig. 3

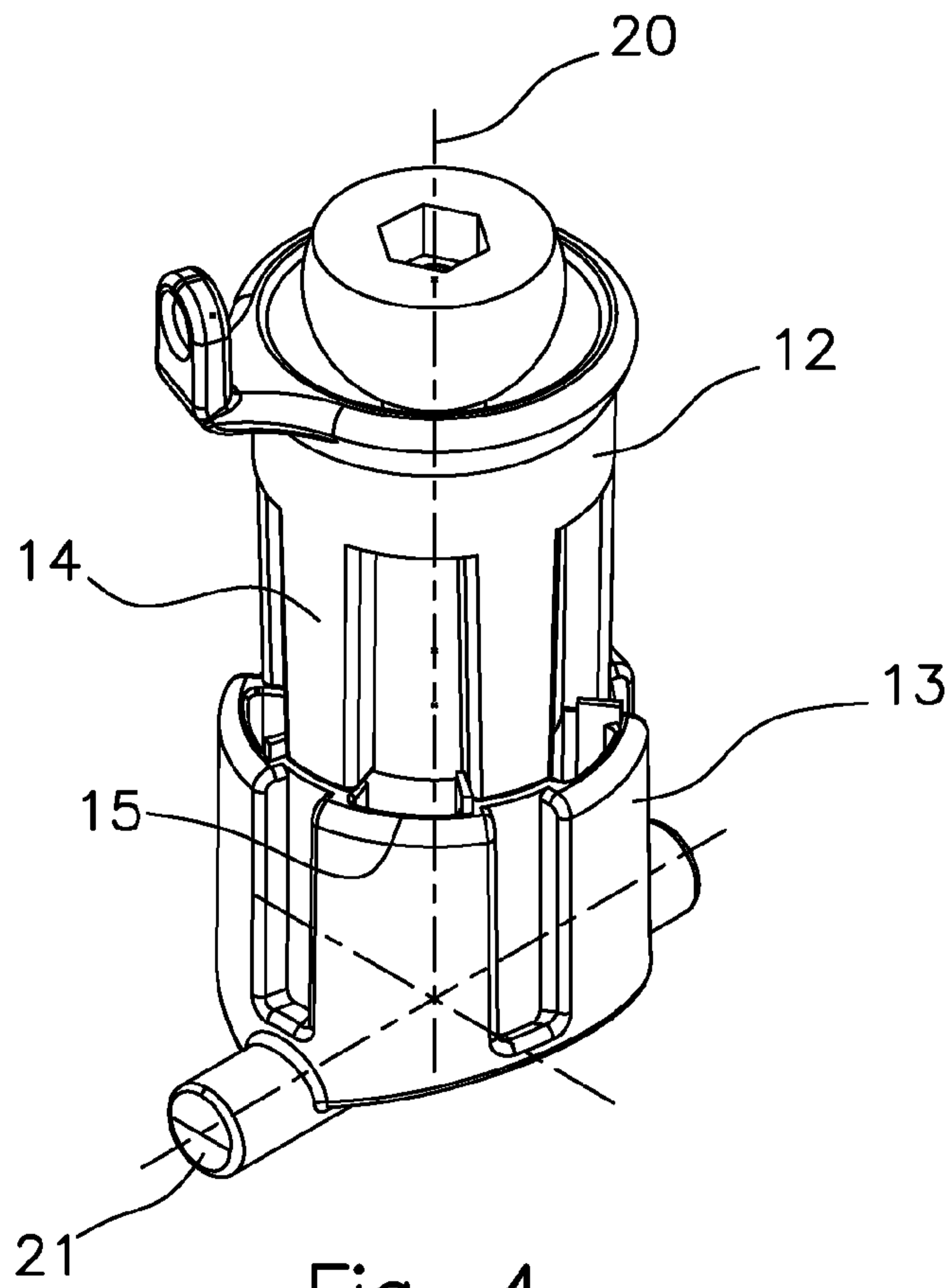


Fig. 4

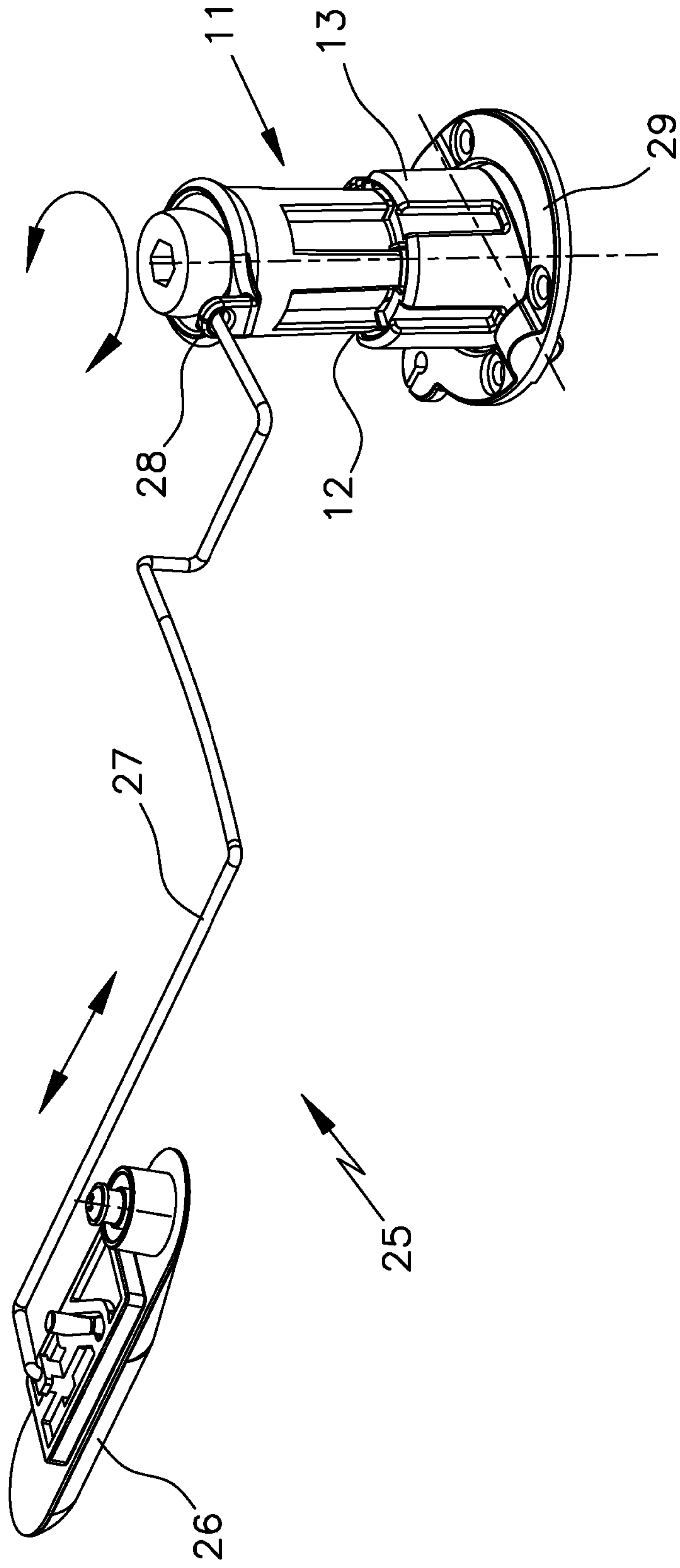


Fig. 5

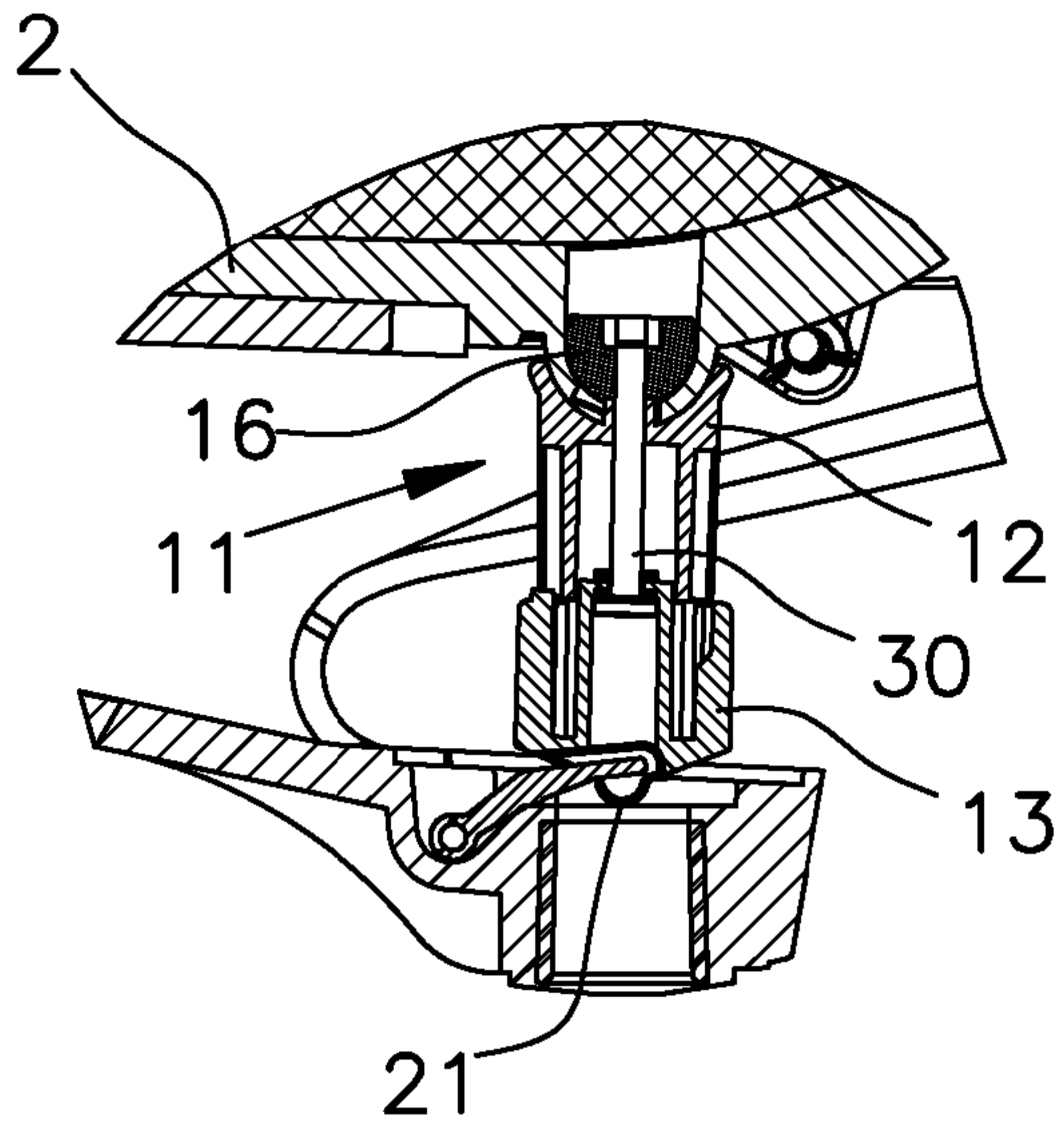


Fig. 6

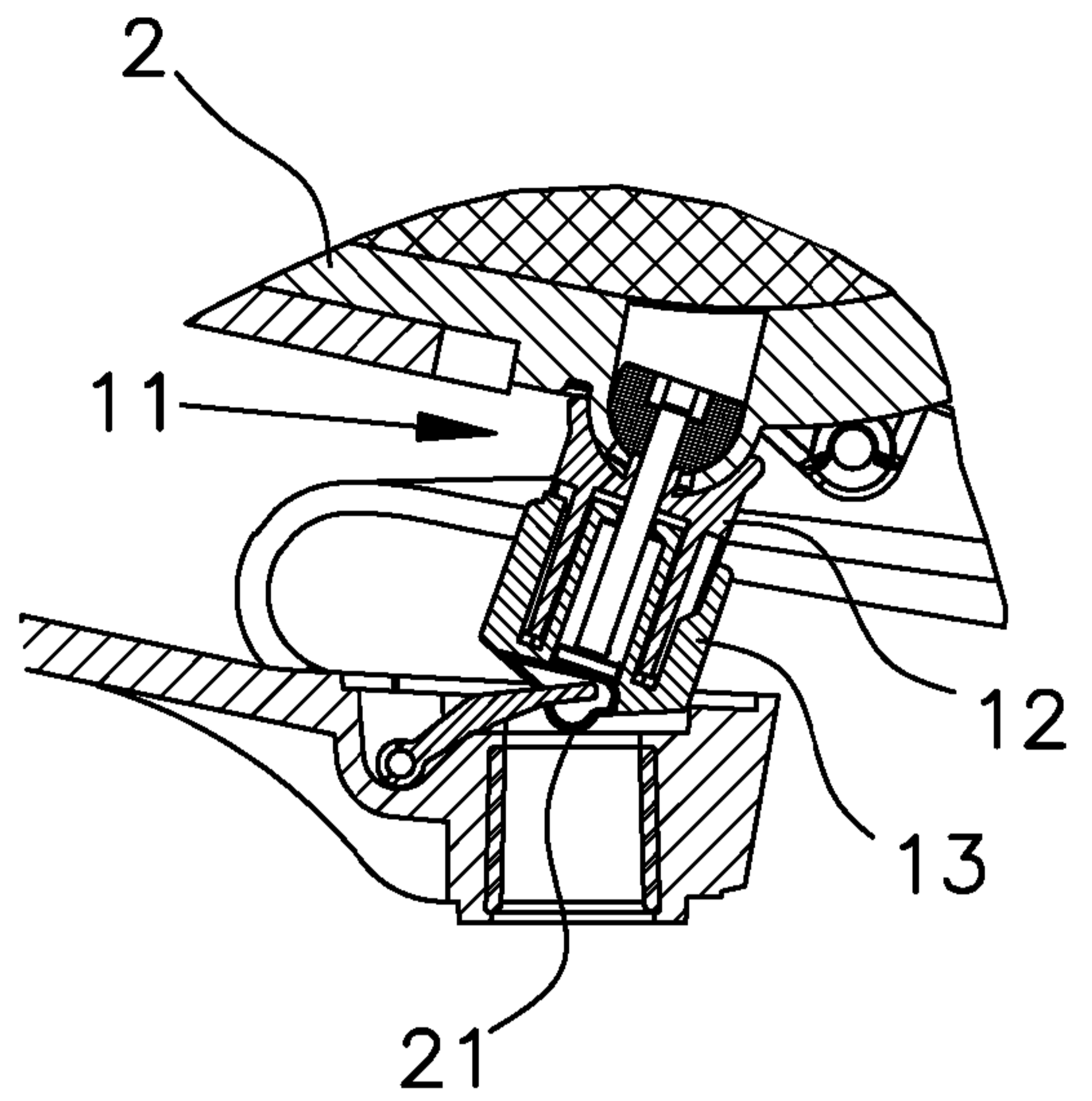


Fig. 7

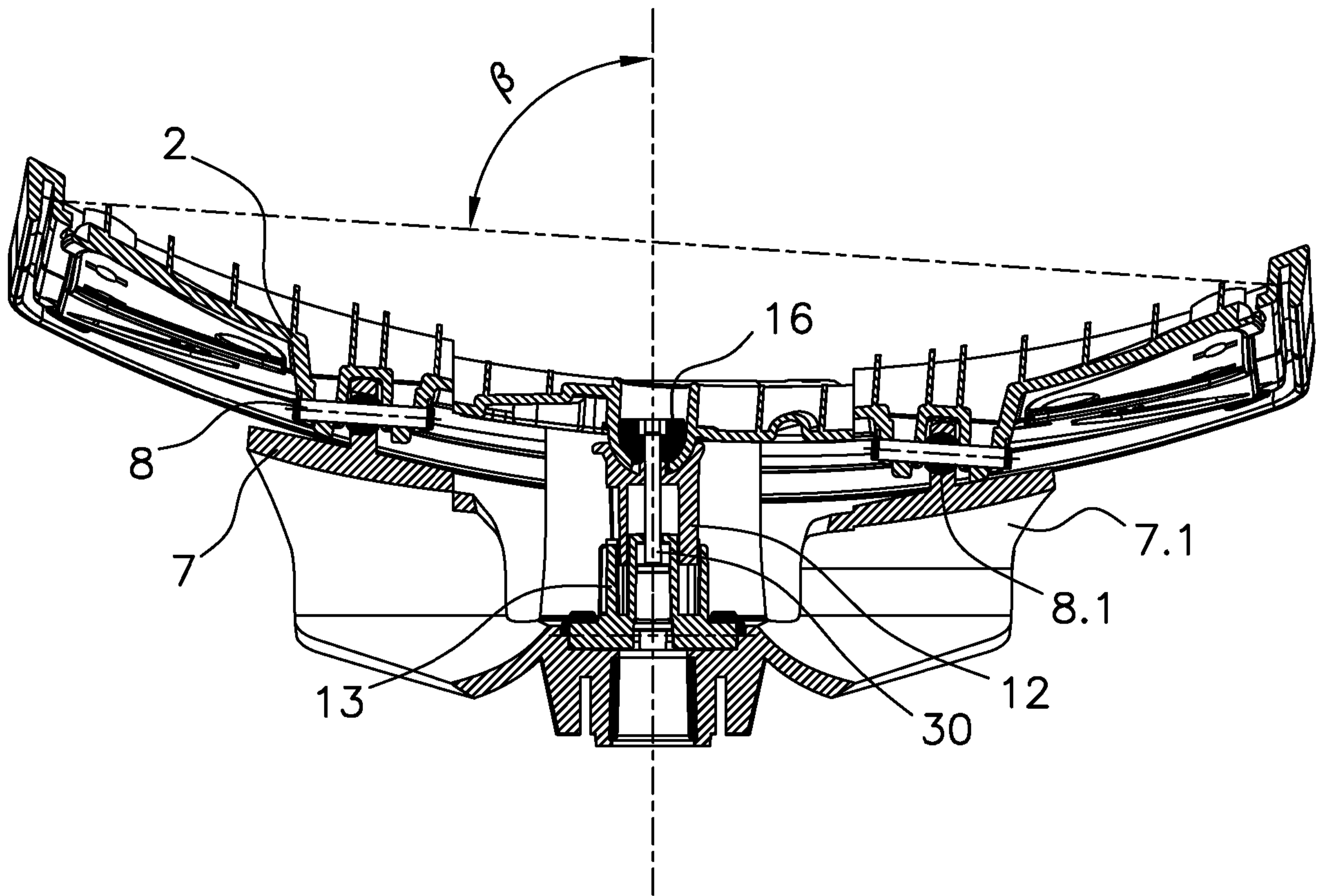


Fig. 8