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(71) Applicant: **Brado S.p.A.**
31030 Valdobbiadene (IT)

(72) Inventor: **SERENA, Stefano**
31031 Caerano di San Marco (TV) (IT)

(74) Representative: **Modiano, Micaela Nadia et al**
Modiano & Partners
Via Meravigli, 16
20123 Milano (IT)

(54) DEVICE FOR ADJUSTING THE POSITION OF AN ARMREST OF A CHAIR

(57) A device for adjusting the position of an armrest of a chair, which comprises a clamp (11), stably associated with the chair (3), which interacts selectively with a vertical position selector (29), associated with a box-like body (4) which constitutes the armrest (2). The vertical position selector (29) is actuatable by virtue of means which can be activated by the user and comprise a slider (35) which can slide below the armrest (2) and is adapted to activate/deactivate the actuation of the vertical position selector (29).

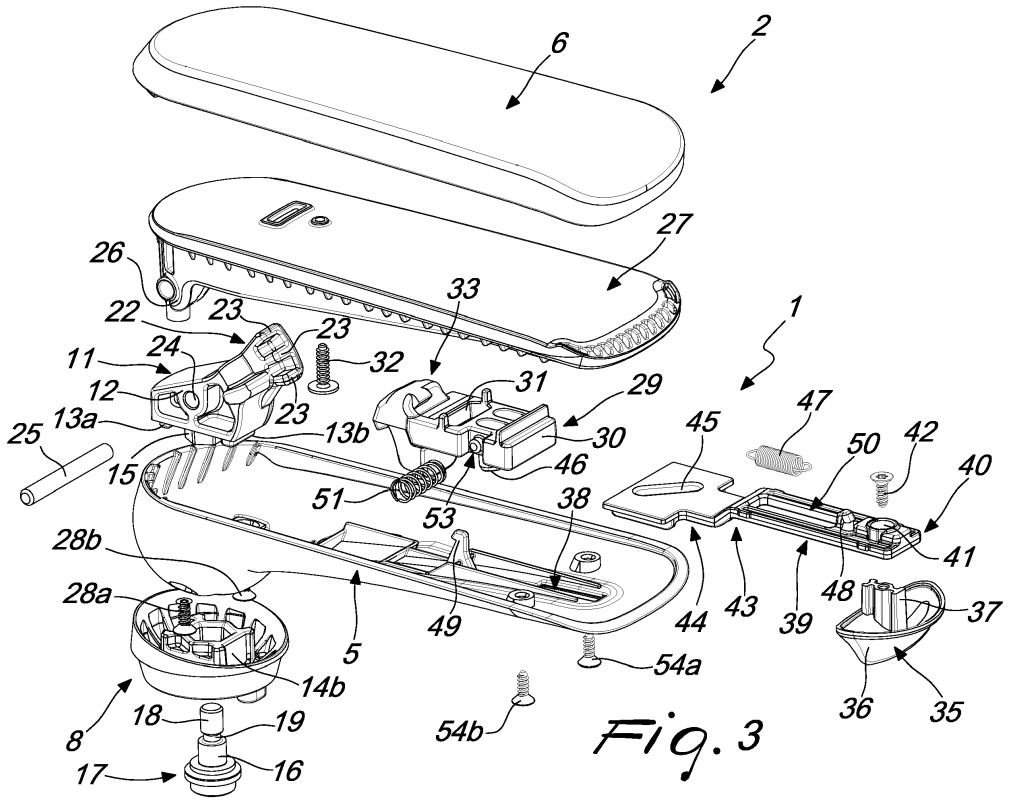

Fig. 3

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Description

[0001] The present invention relates to a device for adjusting the position of an armrest of a chair.

[0002] Currently it is known to provide chairs which comprise a seat, a back and lateral armrests on which the user can rest his forearms.

[0003] Armrests are known which can adjust their position substantially along an axis that is vertical with respect to the ground or can rotate substantially on a plane that is horizontal with respect to the ground.

[0004] However, these armrests of a known type have a drawback: since the back can oscillate and the seat can move, the user can assume a posture that causes the arms to be anatomically arranged on the armrests in a manner that creates tensions or fatigue since the arms are excessively or insufficiently flexed.

[0005] The aim of the present invention is therefore to solve the described technical problems, eliminating the drawbacks of the cited background art and thus providing a device that allows to achieve the optimum adjustment of the position of an armrest of a chair regardless of the position assumed by the back or by the seat.

[0006] Within this aim, an object of the invention is to provide a device in which this adjustment and its variation can be achieved rapidly and effectively.

[0007] Another object of the invention is to obtain a device in which this adjustment can be achieved and kept stable in a chosen position.

[0008] Another object of the invention is to obtain a device that can also be applied to chairs of a known type.

[0009] Another object of the invention is to obtain a device that is structurally simple, has low manufacturing costs and can be provided with ordinary known systems.

[0010] This aim and these objects, as well as others which will become better apparent hereinafter, are achieved by a device for adjusting the position of an armrest of a chair, characterized in that it has a clamp, stably associated with said chair, which interacts selectively with a vertical position selector, associated with a box-like body which constitutes said armrest, said vertical position selector being actuatable by virtue of means which can be activated by the user and comprise a slider which can slide below said armrest and is adapted to activate/deactivate the actuation of said vertical position selector.

[0011] Further characteristics and advantages of the invention will become better apparent from the detailed description of a particular but not exclusive embodiment, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a view of the armrest, containing the device according to the invention, associated with a chair;
Figure 2 is a bottom perspective view of the armrest containing the device according to the invention ;
Figure 3 is an exploded view of the armrest and of the device according to the invention;
Figure 4 is a bottom view, containing the device according to the invention, in the condition of use and from which the lower half-shell has been removed;
Figure 5 is a view, similar to Figure 4, of the armrest, in which the upper half-shell has been removed;
Figure 6 is a view taken along the sectional plane VI-VI of Figure 5;
Figure 7 is a view, similar to Figure 4, of the device according to the invention in the slider activation condition;
Figure 8 is a top view from which the shell 27 and the upper half-shell 6 have been removed;
Figures 9 and 10 are lateral perspective views of two different positions that can be assumed by the clamp and by the selector;
Figure 11 is a view, similar to Figure 6, of the armrest in a different position;
Figures 12 and 13 are lateral perspective views, respectively, of the clamp and of the selector.

[0012] In the embodiments that follow, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other embodiments.

[0013] With reference to the figures , the reference numeral 1 designates a device for adjusting the position of an armrest 2 associated with a chair 3.

[0014] The armrest 2 is provided with a box-like body 4 which is composed of a lower half-shell 5 and an upper half-shell 6, which can be mutually coupled detachably.

[0015] The lower half-shell 5 has, at a rear end 7, a base 8 that protrudes downward from it, said base 8 having means adapted to allow its rotatable connection to a support 9 associated with the frame 10 of the chair 3.

[0016] The device 1 comprises a clamp 11, which is arranged inside said lower half-shell 5 and is provided with a first body 12, which is substantially shaped like a parallelepiped and below which two first tabs 13a, 13b protrude which are arranged diametrically with respect to each other and are accommodated between a pair of second tabs 14a, 14b that protrude from the base 8, and a central nut 15, which acts as a seat for the stem 16 of a first pivot 17 associated rotatably with the underlying base 8.

[0017] An annular groove 19 is provided on the stem 16, proximate to its terminal end 18 that interacts with the central nut 15, and acts as a seat for a first washer 20 which is adapted to interact rotatably with the lower surface of the central nut 15 of the body 12.

[0018] A second tab 22 shaped substantially like a parallelepiped protrudes from a lateral end of the first body 12, in the direction of the seat 21 the chair 3, and is directed upward according to a chosen inclination; multiple first teeth 23 are provided at the end of the second tab, protrude radially and are arranged along a circular arc that is centered on a first hole 24 that is provided transversely to the first body 12 in a region that lies approxi-

mately above the central nut 15.

[0019] The first teeth 23 have a width that is approximately equal to half the width of the second tab 22.

[0020] Inside the first hole 24 there is a second pivot 25 for the pivoting of the wings 26 of a shell 27 which can be associated below the upper half-shell 6 and is contained therein and partially in the lower half-shell 5.

[0021] The shell 27 is connected by snap action to the upper half-shell 6 and, by means of first screws 28a, 28b, to the lower half-shell 5, which in turn is connected to the base 8.

[0022] The clamp 11 selectively interacts with a vertical position selector 29, which is associated with the boxlike body 4 that constitutes the armrest 2; in particular, the vertical position selector 29 has a second body 30 that is shaped substantially like a parallelepiped with a rectangular base on which a first slot 31 is provided transversely which acts as a seat for a second screw 32 for connection to said overlying shell 27.

[0023] A third tab 33 protrudes in the direction of said second tab 22 from the second body 30 of the vertical position selector 29, adjacent to the clamp 11, and multiple second teeth 34 are provided and protrude radially at the end of the third tab 33 that is directed toward said clamp 11 and are arranged so as to mesh selectively with the first teeth 23 of the clamp following a transverse movement that can be imparted to the vertical position selector 29 with respect to the clamp 11.

[0024] This transverse movement is actuated by a slider 35 which can slide in a lower region and longitudinally with respect to the lower half-shell 5 since it has a wing 36, which can be gripped by the user, from which a protrusion 37 protrudes which is accommodated slidingly within a seat 38 provided longitudinally to the lower half-shell 5, connected at the free end to a longitudinal bar 39 which in turn is slidingly associated longitudinally and internally with respect to the lower half-shell 5.

[0025] The longitudinal bar 39 has, at an end 40 that is directed oppositely with respect to the clamp 11, a hole 41 which acts as a seat for a third screw 42 for connection to the protrusion 37 of the slider 35.

[0026] At the end 43 of the longitudinal bar 39 that is directed toward the clamp 11 there is a fourth tab 44, which has a substantially square plan shape and lies on a plane that is lower than the plane of arrangement of the second body 30.

[0027] A second slot 45 is provided on the fourth tab 44 and is inclined, substantially along a diagonal, with respect to the fourth tab 44.

[0028] A third pivot 46 acts at the second slot 45 and protrudes below the second body 30 in a region that is adjacent to the first slot 31.

[0029] A longitudinal movement of the slider 35 is matched by a movement of the tab 44 that entrains the third pivot 46, which imposes a transverse movement to the second body 30 by such an extent as to disengage the second teeth 34 from the first teeth 23; by doing so it is possible to impose an upward or downward rotation to the armrest 2.

[0030] There is a first elastically deformable element 47, interposed between a first wing 48 which protrudes from the longitudinal bar 39 proximate to the third screw 42, and there is a second wing 49, which protrudes from the lower half-shell 5 at a third slot provided axially to the longitudinal bar 39.

[0031] There is a second elastically deformable element 51 interposed between the internal side wall 52 of the lower half-shell 5, toward which the second body 30 moves, and a pivot 53 which protrudes from the facing side of the second body 30.

[0032] The first and second elastically deformable elements 47, 51 allow the slider 35 and the second body 30, respectively, to return to their position once the actuation of the slider 35 by the user has ceased.

[0033] There is a pair of fourth screws 54a, 54b which are adapted to connect the lower half-shell 5 to the shell 27, the screws being preferably arranged to the side of the seat 38.

[0034] Operation is as follows: starting from the condition shown in Figure 6, when the user wishes to change the inclination of the armrest 2 it is sufficient for him to grip the slider 35 with his fingers, pulling it toward its free end.

[0035] By doing so, a longitudinal movement is imposed on the longitudinal bar 39, which in turn imposes a transverse movement on the second body 30 of the vertical position selector 29 until the first teeth 23 are disengaged from the second teeth 34.

[0036] It thus possible to raise or lower the armrest 2 to the desired position.

[0037] When the user releases the slider 35, the first elastically deformable element 47 and the second elastically deformable element 51 return to its position the second body 30 so that the first teeth 23 resume engaging the second teeth 34.

[0038] It has thus been found that the invention has achieved the intended aim and objects, a device having been obtained which allows to achieve the optimum adjustment of the position of an armrest of a chair regardless of the position assumed by the back or by the seat, so that the user can arrange his arms in an anatomically correct or preferred condition.

[0039] This adjustment and its variation can be achieved rapidly and effectively and can be achieved and kept stable in a chosen position.

[0040] Furthermore, the device can also be applied to chairs of a known type and is structurally simple, has low manufacturing costs, and can be provided with ordinary known systems.

[0041] The materials used, as well as the dimensions that constitute the individual components of the invention, may of course be more pertinent according to the specific requirements.

[0042] The characteristics indicated as advantageous, convenient or the like may also be omitted or be replaced with equivalents.

[0043] The disclosures in Italian Patent Application No. 102019000014490 from which this application claims priority are incorporated herein by reference.

[0044] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A device (1) for adjusting the position of an armrest (2) of a chair (3), **characterized in that** it has a clamp (11), stably associated with said chair (3), which interacts selectively with a vertical position selector (29), associated with a box-like body (4) which constitutes said armrest (2), said vertical position selector (29) being actuatable by virtue of means which can be activated by the user and comprise a slider (35) which can slide below said armrest (2) and is adapted to activate/deactivate the actuation of said vertical position selector (29).

2. The device according to claim 1, **characterized in that** said box-like body (4) is composed of a lower half-shell (5) and an upper half-shell (6), which can be mutually coupled detachably, said lower half-shell (5) having, at a rear end (7), a base (8) which protrudes downward from it, said base (8) having means adapted to allow its rotatable connection to a support (9) associated with the frame (10) of said chair (3).

3. The device according to one or more of the preceding claims, **characterized in that** said clamp (11) is arranged inside said lower half-shell (5) and has a first body (12), shaped substantially like a parallelepiped, below which two first tabs (13a, 13b) protrude which are arranged diametrically with respect to each other and are accommodated between a pair of second tabs (14a, 14b) which protrude from said base (8), and a central nut (15) which acts as a seat for the stem (16) of a first pivot (17) which is associated rotatably with said underlying base (8), an annular groove (19) being provided on said stem (16), proximate to its terminal end (18) which interacts with said central nut (15), and accommodating a first washer (20) adapted to interact rotatably with the lower surface of said central nut (15) of said body (12).

4. The device according to one or more of the preceding claims, **characterized in that** a second tab (22) substantially shaped like a parallelepiped protrudes from a lateral end of said first body (12) in the direction of the seat (21) of said chair (3) and is directed upward with a chosen inclination, multiple first teeth (23) being provided at the end of said second tab, protruding radially and being arranged along a circular arc which is centered on a first hole (24) provided transversely to said first body (12) in a region that lies approximately above said central nut (15), said first teeth (23) having a width approximately equal to half of the width of said second tab (22).

5. The device according to one or more of the preceding claims, **characterized in that** a second pivot (25) is arranged in said first hole (24) for the pivoting of the wings (26) of a shell (27) which can be associated below said upper half-shell (6) and contained therein and partially in said lower half-shell (5), said shell (27) being connected by snap action to the upper half-shell (6) and, by means of first screws (28a, 28b), to said lower half-shell (5), which in turn is connected to said base (8).

6. The device according to one or more of the preceding claims, **characterized in that** said vertical position selector (29) has a second body (30) substantially shaped like a parallelepiped with a rectangular base on which a first slot (31) is provided transversely and accommodates a second screw (32) for connection to said overlying shell (27), a third tab (33) protruding toward said second tab (22) from said second body (30) of said vertical position selector (29), which is adjacent to said clamp (11), multiple second teeth (34) being provided and protruding radially at the end of said third tab that is directed toward said clamp (11), said second teeth being arranged so as to mesh selectively with said first teeth (23) of said clamp following a transverse movement which can be imparted to said vertical position selector (29) with respect to said clamp (11).

7. The device according to one or more of the preceding claims, **characterized in that** said transverse movement is actuated by said slider (35), which can slide below and longitudinally to said lower half-shell (5) and has a wing (36), which can be gripped by the user, from which there protrudes a protrusion (37), which is slidingly accommodated within a seat (38) provided longitudinally to said lower half-shell (5) and is connected at its free end to a longitudinal bar (39), which in turn is associated slidingly longitudinally and internally to said lower half-shell (5), said longitudinal bar (39) having, at an end (40) directed oppositely with respect to said clamp (11), a hole (41) which accommodates a third screw (42) for connection to said protrusion (37) of said slider (35), at the end (43) of said longitudinal bar (39) directed toward said clamp (11) there being a fourth tab (44), which has a substantially square plan shape and lies on a plane that is lower than the plane of arrangement of said second body (30), a second slot (45) being provided

on said fourth tab (44) and being inclined, substantially along a diagonal, with respect to said fourth tab (44).

8. The device according to one or more of the preceding claims, **characterized in that** a third pivot (46) acts at said second slot (45) and protrudes below said second body (30) in a region that is adjacent to said first slot (31), a longitudinal movement of said slider (35) being matched by a movement of said tab (44) which entrains said third pivot (46), which imposes a transverse movement on said second body (30) by such an extent as to disengage said second teeth (34) from said first teeth (23) so as to allow an upward or downward rotation to said armrest (2).

9. The device according to one or more of the preceding claims, **characterized in that** it has a first elastically deformable element (47) which is interposed between a first wing (48), which protrudes from said longitudinal bar (39) proximate to said third screw (42), and a second wing (49), which protrudes from said lower half-shell (5) at a third slot (50) provided axially to said longitudinal bar (39), a second elastically deformable element (51) being interposed between the internal side wall (52) of said lower half-shell (5), toward which said second body (30) moves, and a pivot (53) which protrudes from the facing side of said second body (30), said first and second elastically deformable elements (47, 51) allowing said slider (35) and said second body (30), respectively, to return to position once the actuation of said slider (35) by the user has ceased.

10. The device according to one or more of the preceding claims, **characterized in that** there is a pair of fourth screws (54a, 54b) adapted to connect said lower half-shell (5) to said shell (27), said screws being arranged laterally to said seat (38).

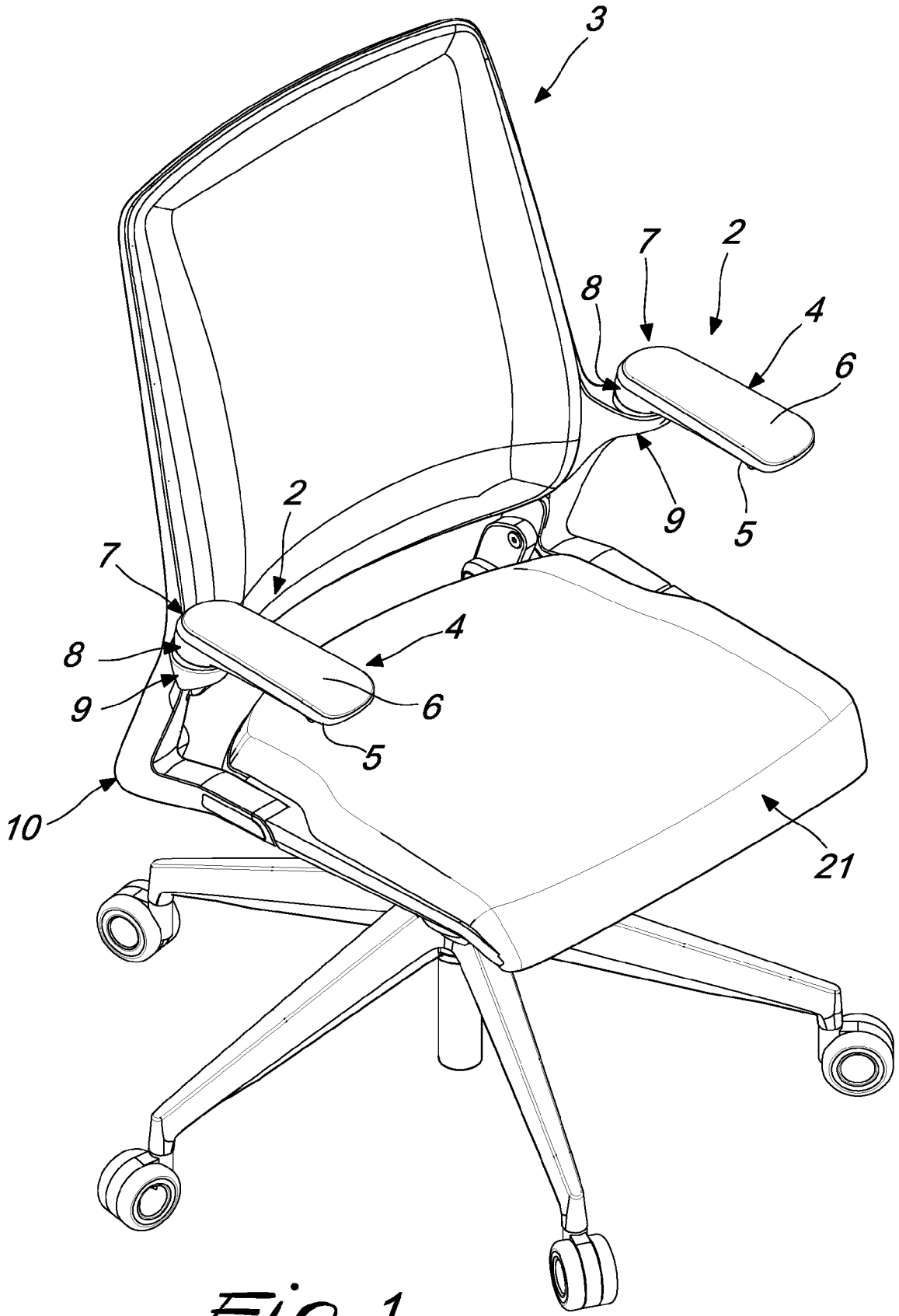

Fig. 1

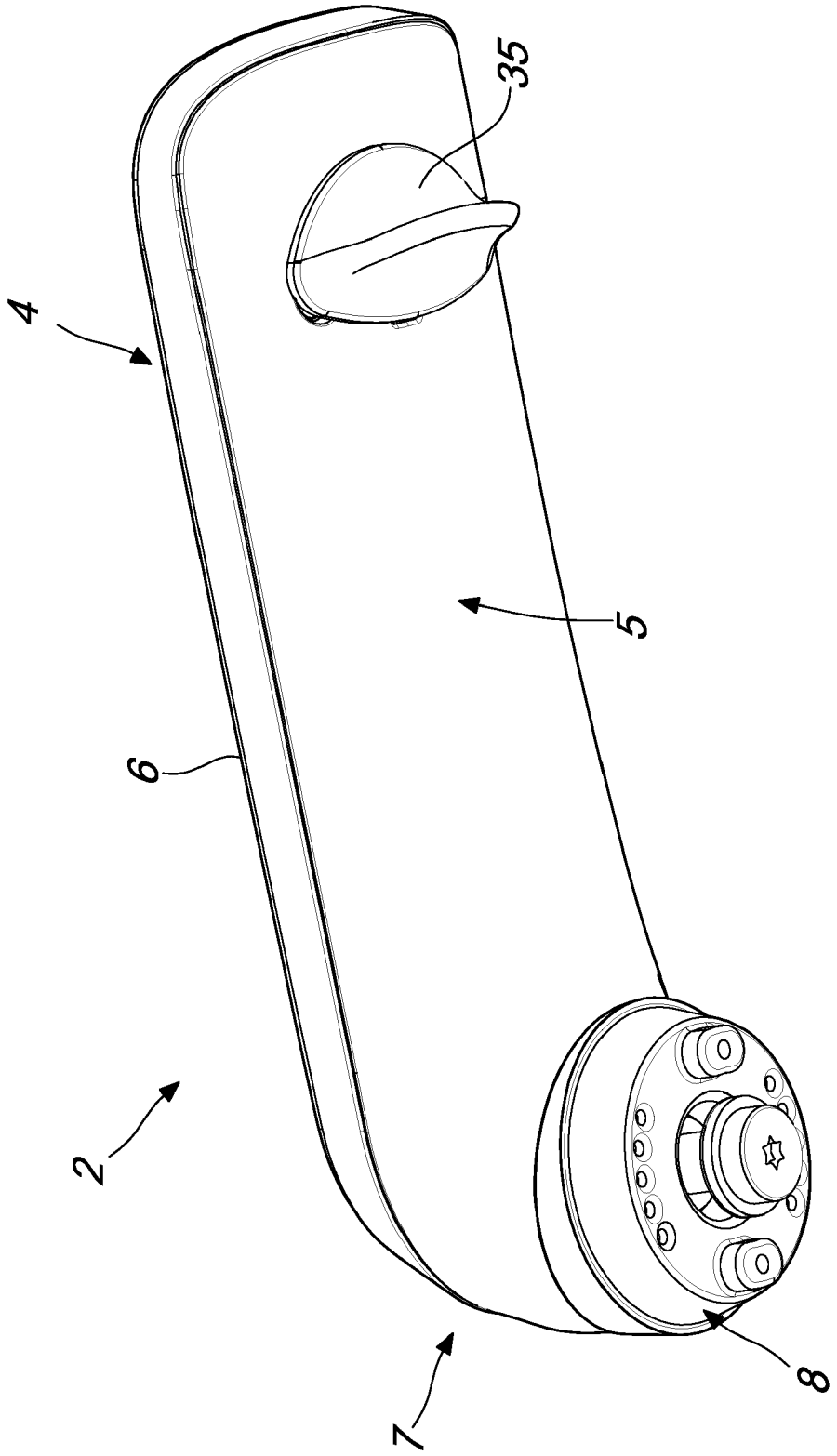

Fig. 2

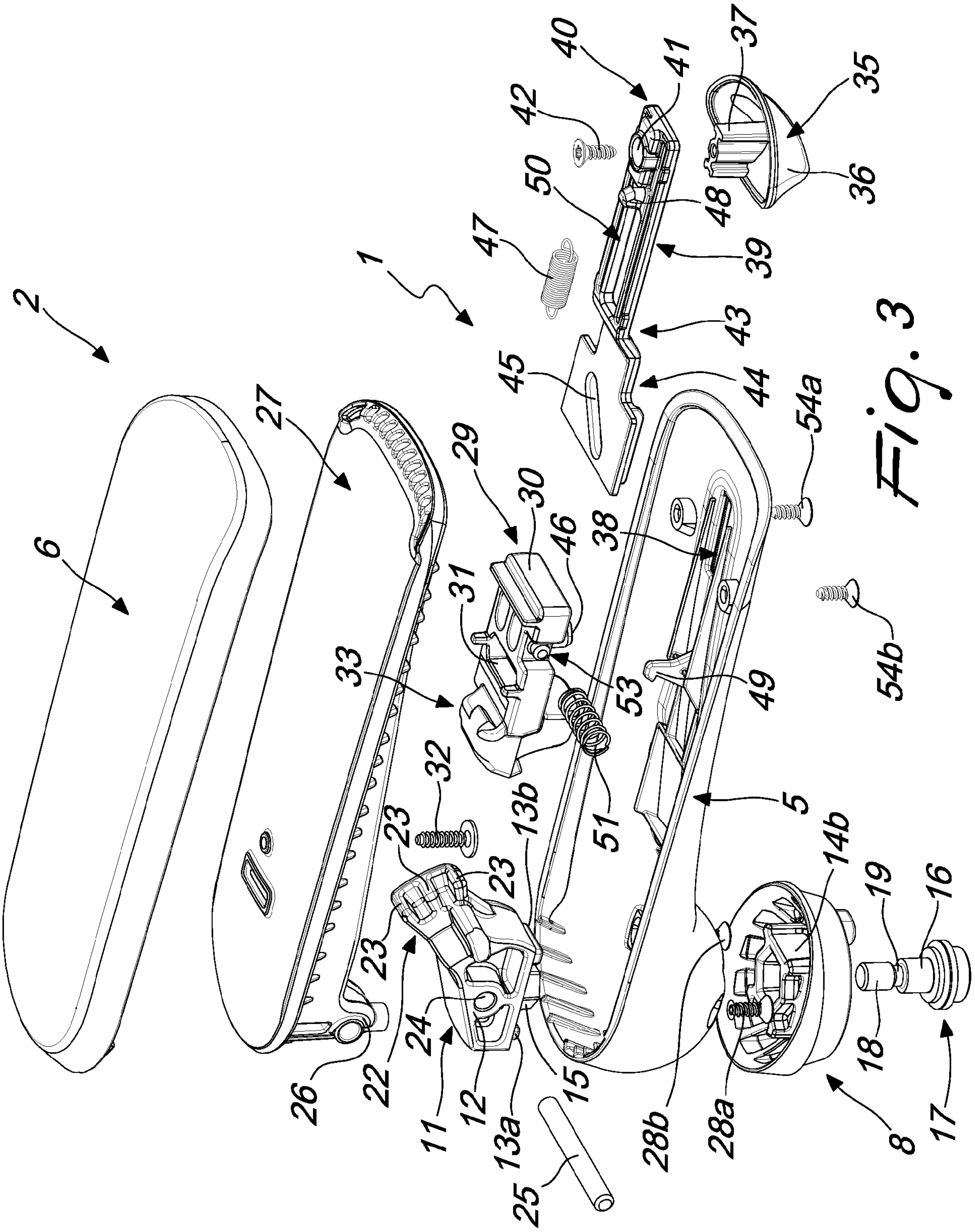
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Fig. 3

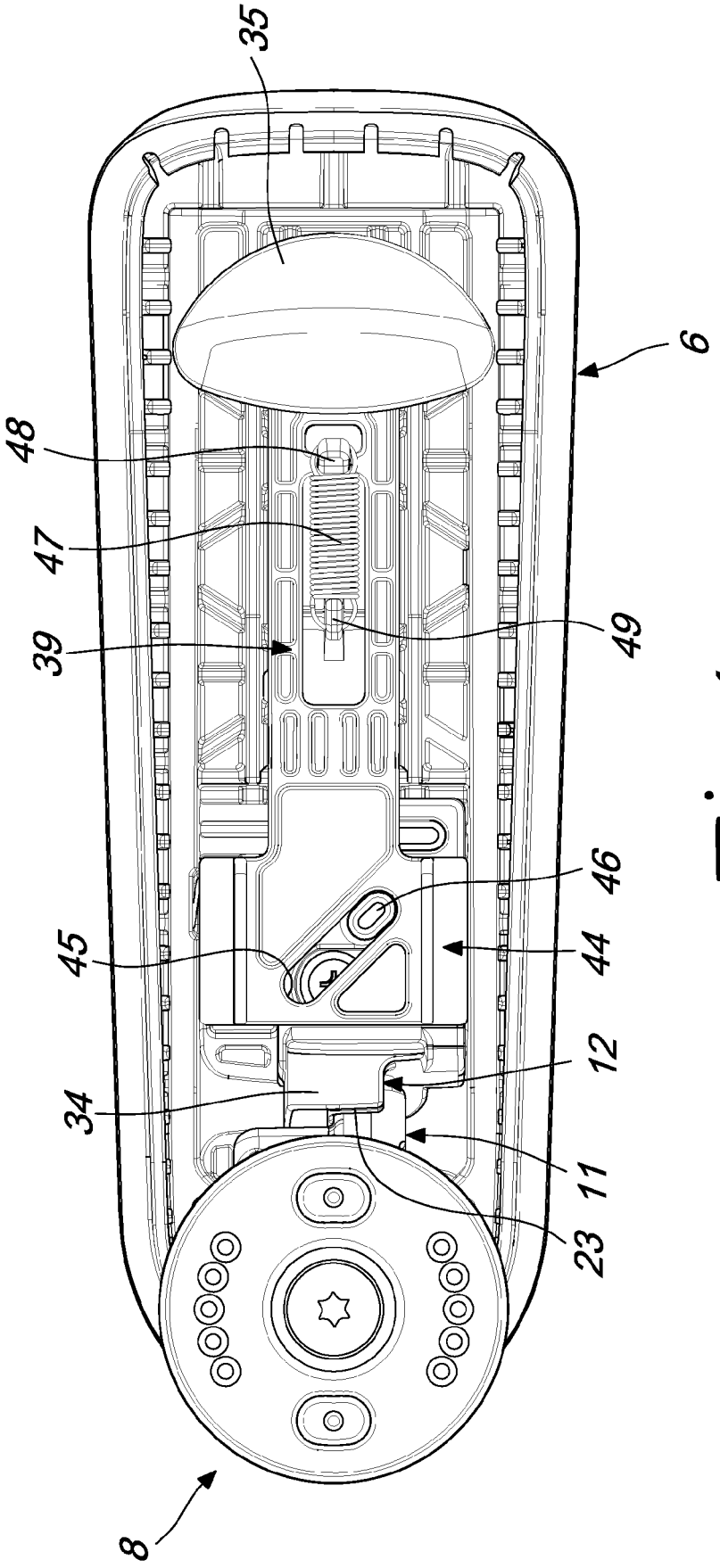

Fig. 4

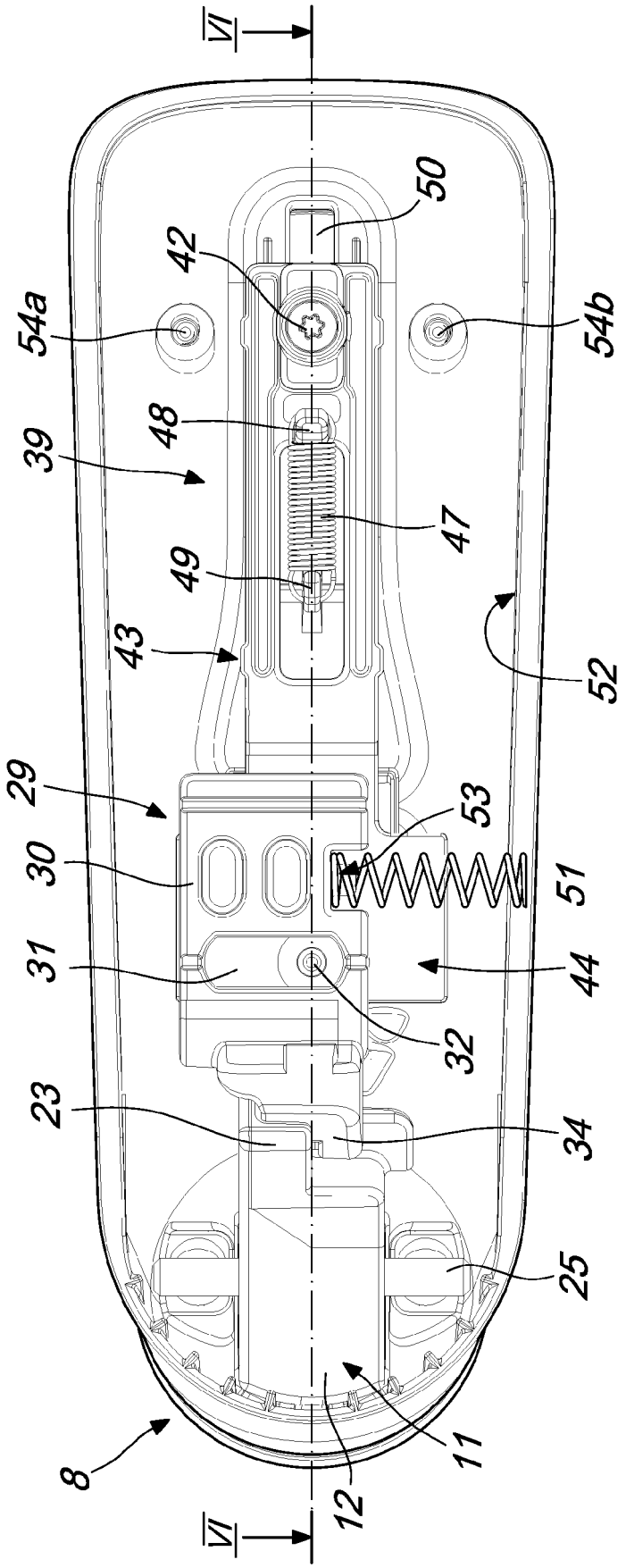
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Fig. 5

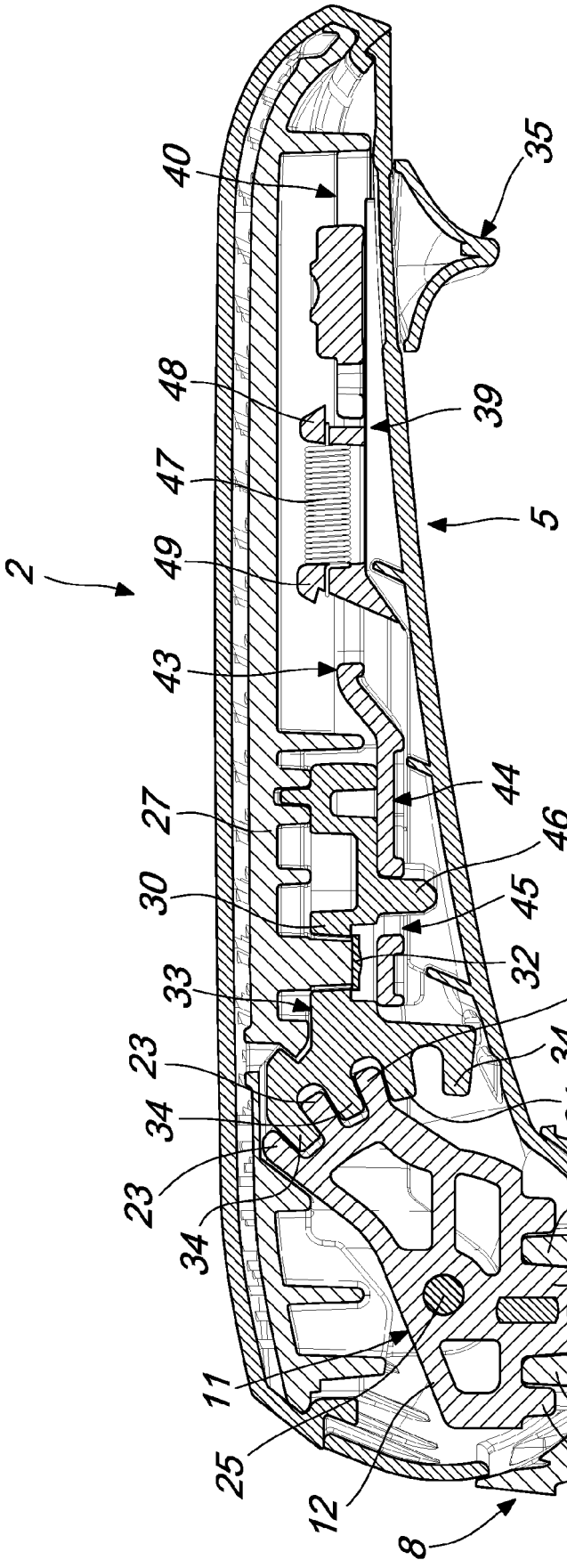
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Fig. 6

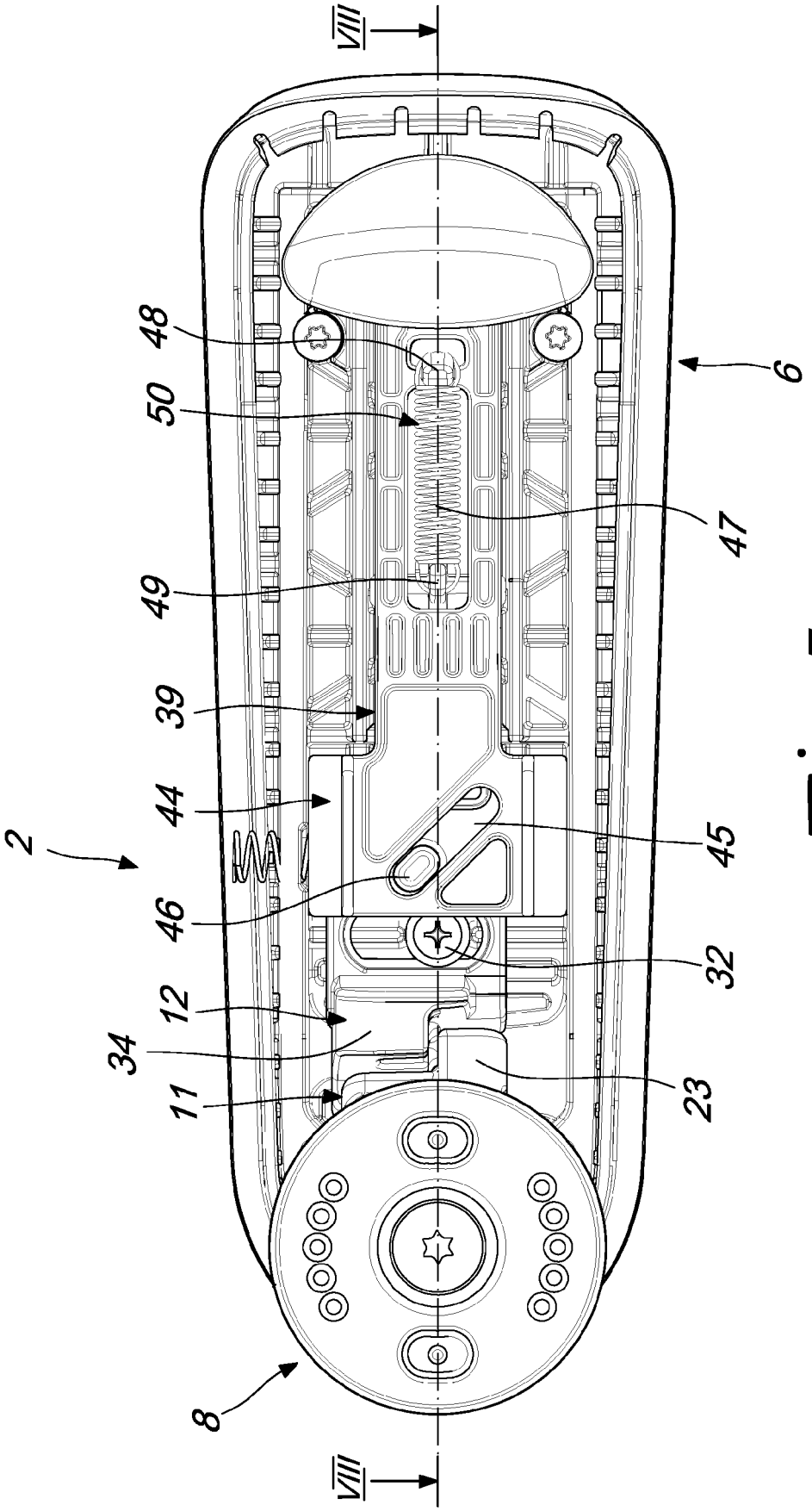

Fig. 7

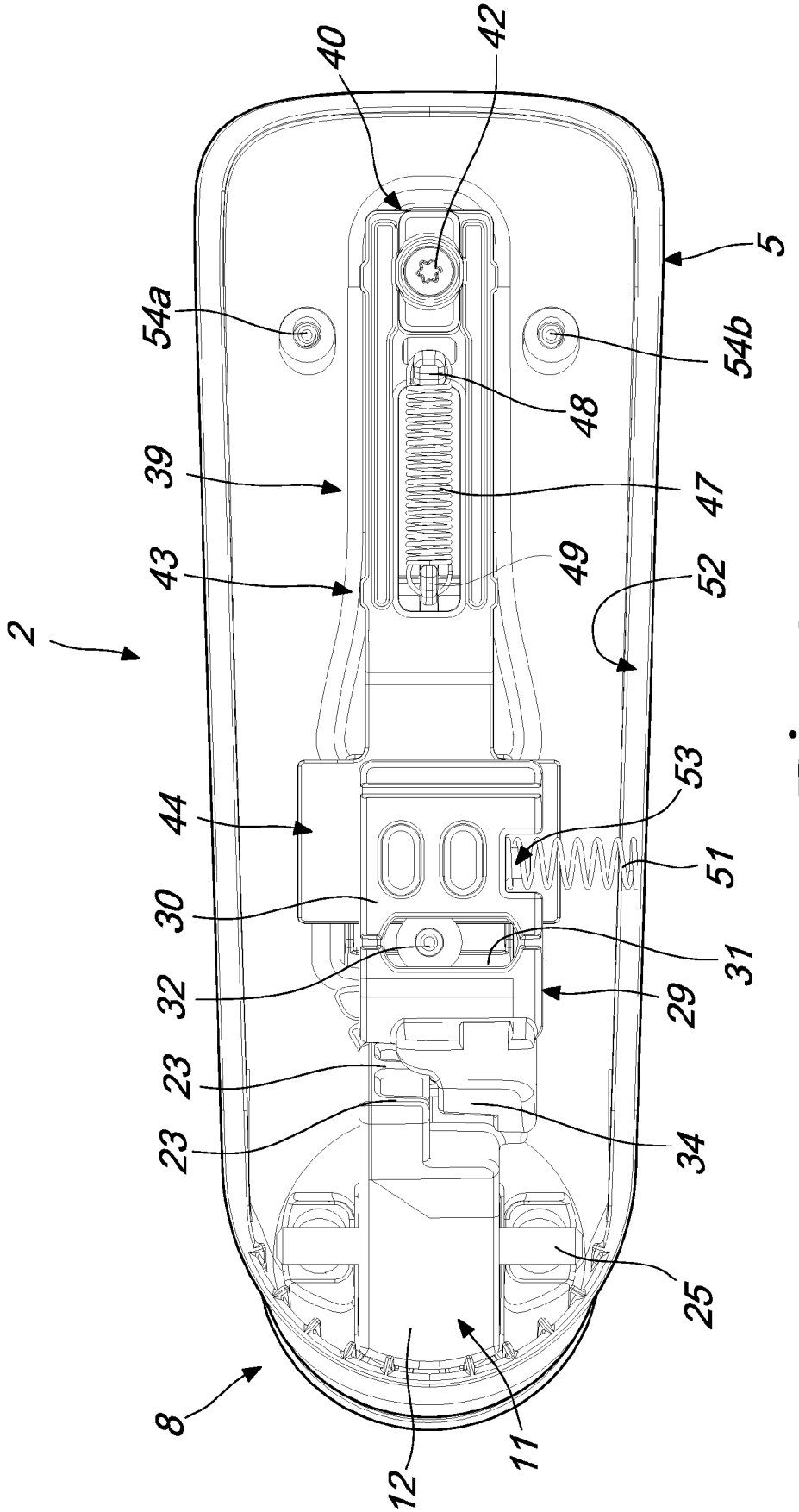
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Fig. 8

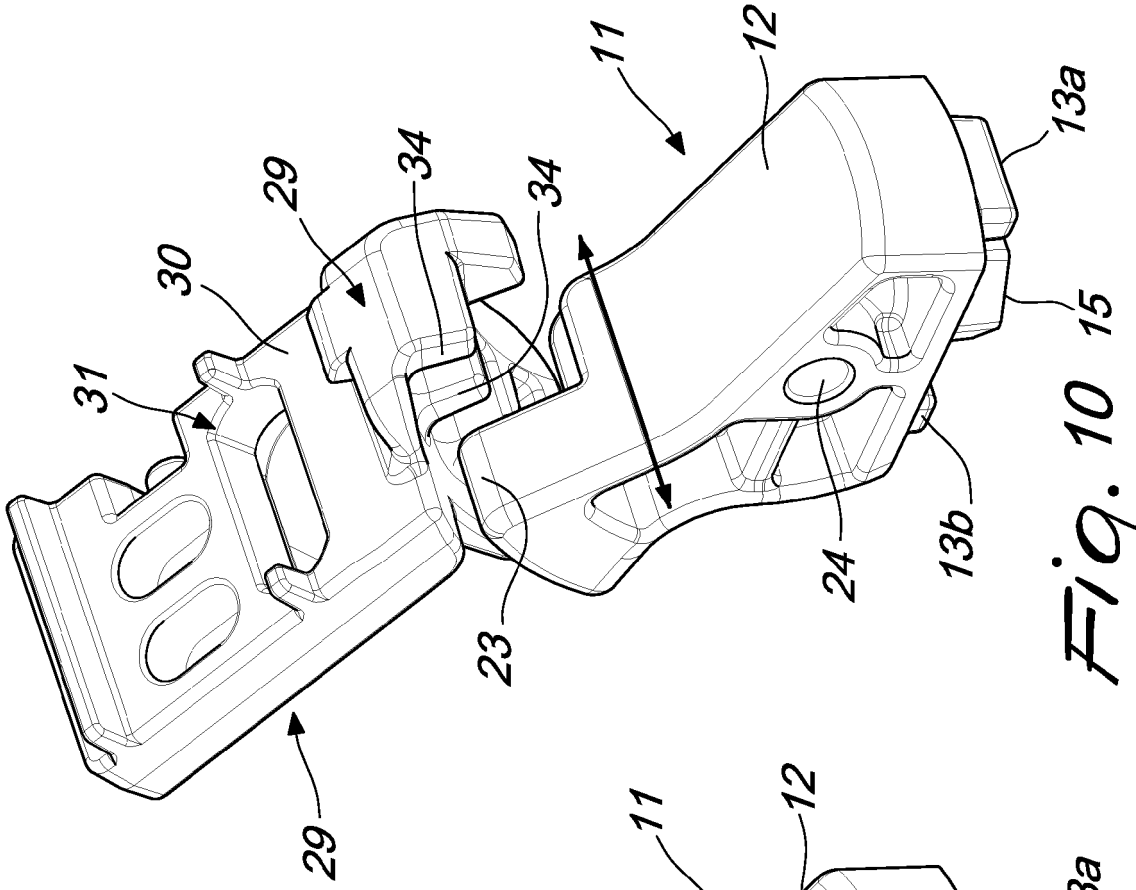
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Fig. 10

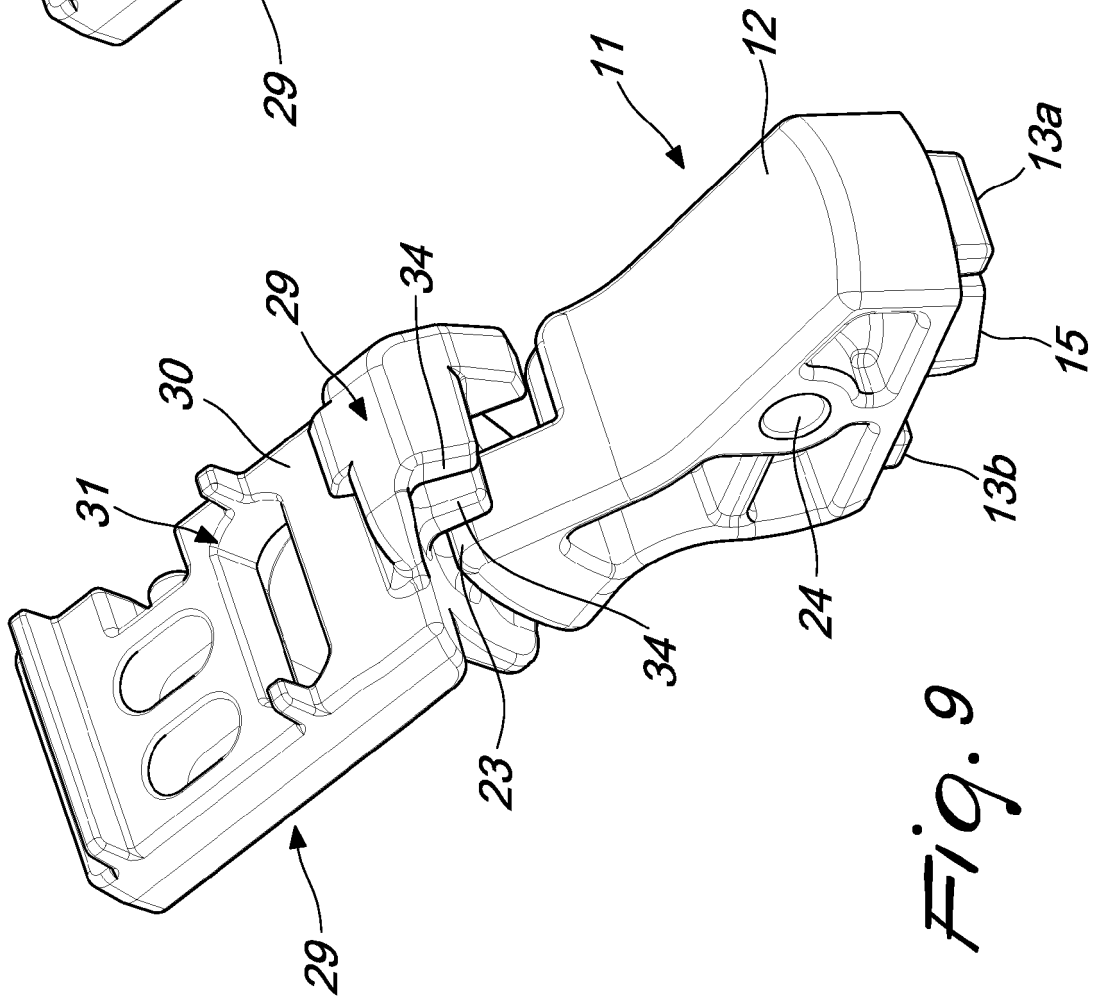
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Fig. 9

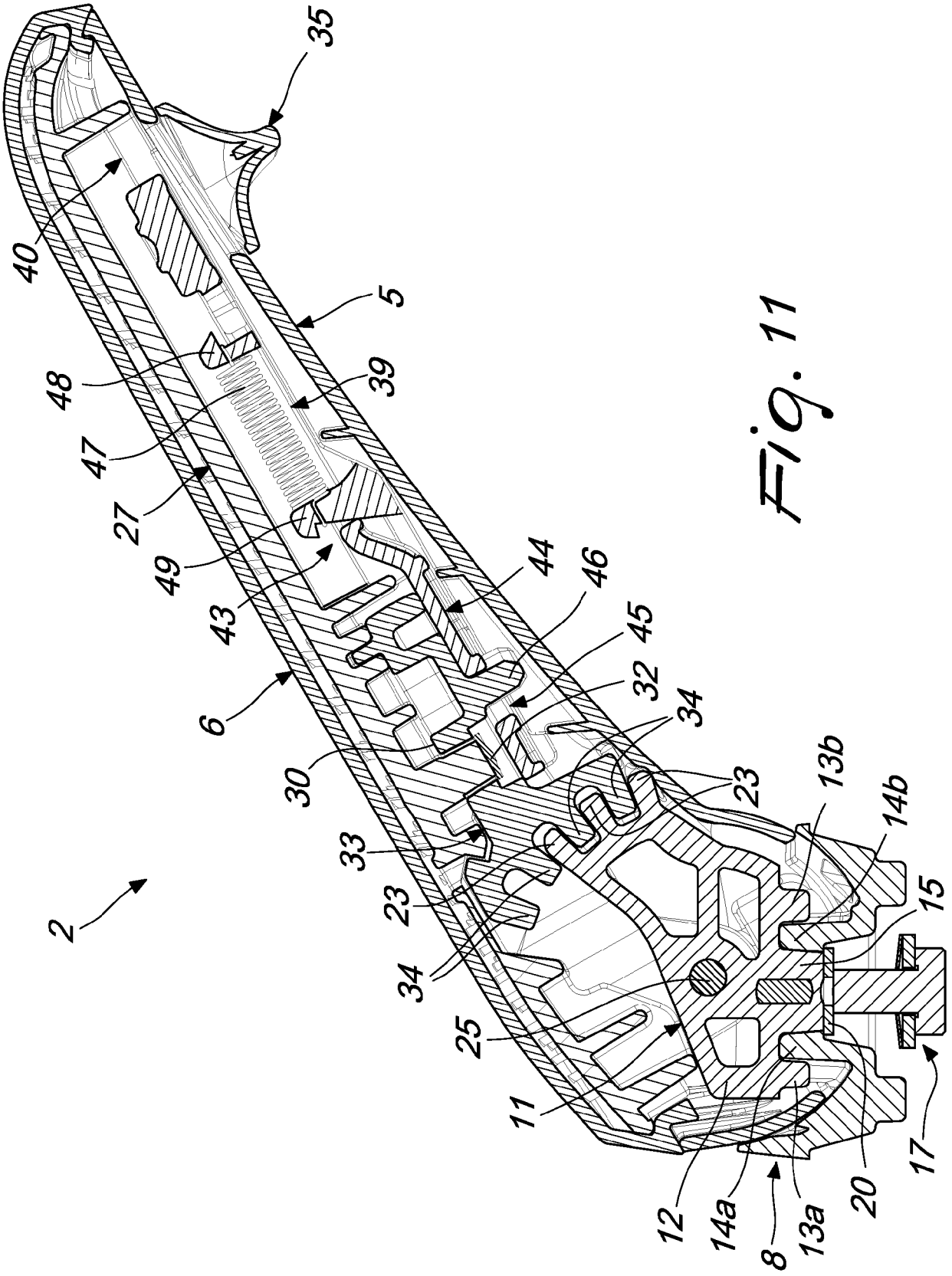
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Fig. 11

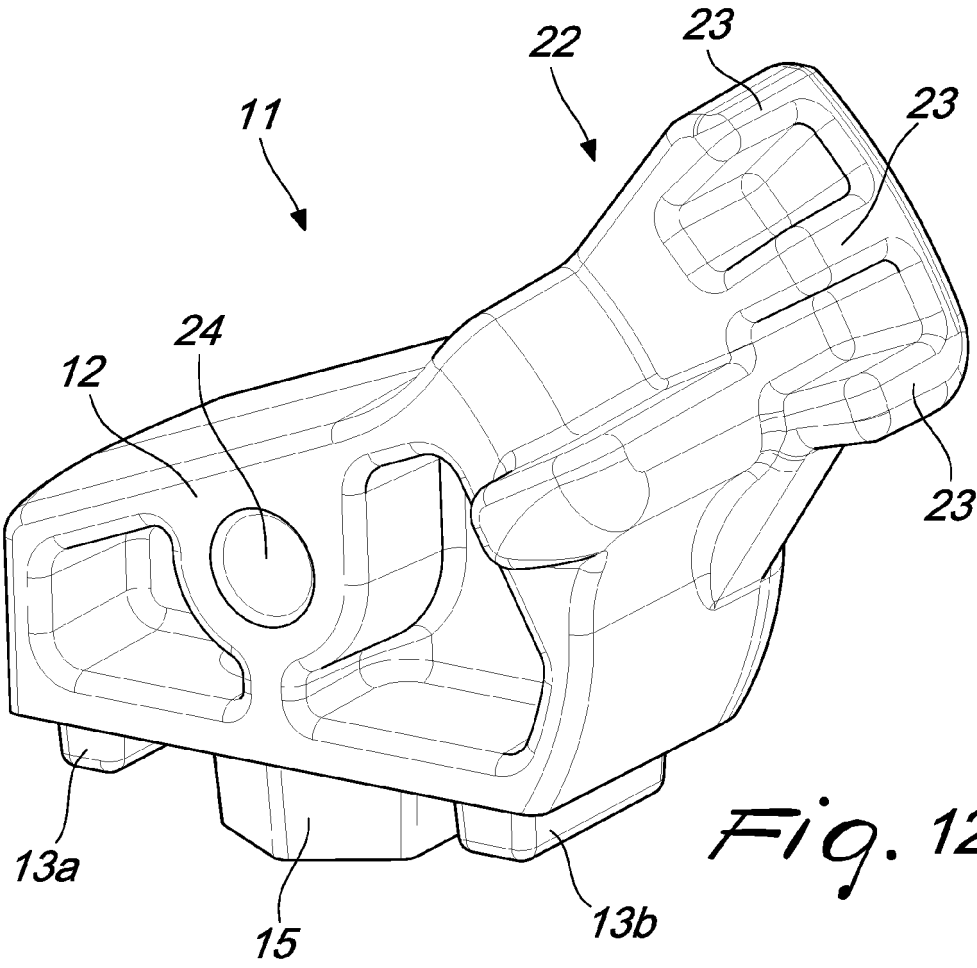

Fig. 12

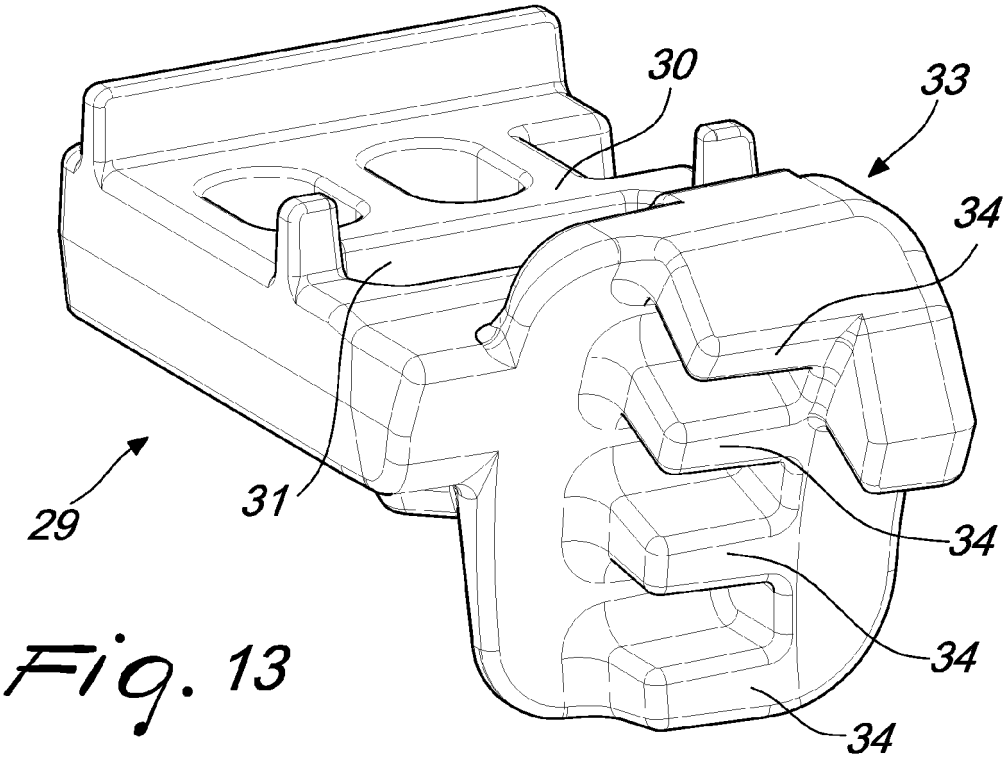

Fig. 13

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EUROPEAN SEARCH REPORT

Application Number
EP 20 18 9295

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	GB 264 669 A (ROBERT RUSSELL) 27 January 1927 (1927-01-27) * page 3, line 68 - page 4, line 105; figures 1-4 *	1-10	INV. A47C1/03
X	JP H11 276299 A (TAKANO CO LTD; KOKUYO KK) 12 October 1999 (1999-10-12) * paragraph [0014] - paragraph [0037]; figures 1-5 *	1-10	
X	JP H11 155687 A (ITOKI CREBIO CORP) 15 June 1999 (1999-06-15) * paragraph [0009] - paragraph [0016]; figures 1-7 *	1-10	
X	JP H11 155688 A (ITOKI CREBIO CORP) 15 June 1999 (1999-06-15) * paragraph [0009] - paragraph [0020]; figures 1-10 *	1-10	
X	EP 1 698 254 A1 (PROVENDA MARKETING AG [CH]) 6 September 2006 (2006-09-06) * paragraph [0025] - paragraph [0034]; figures 1-10 *	1-10	TECHNICAL FIELDS SEARCHED (IPC) A47C B60N G05G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	26 August 2020	Kus, Slawomir

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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26-08-2020

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- IT 102019000014490 **[0043]**