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(54) **Adjustable hinge for window or door frames**

Einstellbares Scharnier für Fenster- und Türrahmen

Charnière réglable pour cadres de fenêtre ou de porte

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Description

[0001] The present invention refers to an adjustable hinge for window or door frames.

[0002] In the field of window or door frames, in particular in the field of window or door frames having substantial dimensions and weight, like, for example, security doors or "fire stop doors", it is known to use adjustable hinges which make it possible to adjust the relative position between the mobile frame and the fixed frame of the window or door frame so that, when the window or door frame is closed, the mobile frame perfectly matches the fixed frame.

[0003] Known hinges comprise at least one first wing body and a second wing body which are articulated with one another in a rotating manner around a rotation axis through a pin and of which one is fixable to the fixed frame and the other is fixable to the mobile frame of the window or door frame.

[0004] In particular, hinges are known which are equipped with adjusting means of the relative position of the first wing body and of the second wing body along three orthogonal directions, i.e.:

- along the direction parallel to the rotation axis of the hinge, known in the jargon of the field as "height adjustment";
- along the direction parallel to the plane of the window or door frame and orthogonal to the rotation axis, known in the jargon of the field as "inter-space adjustment";
- along the direction orthogonal to the plane of the window or door frame, known in the jargon of the field as "pressure adjustment".

[0005] Hinges provided with one or more of such adjusting means are for example known from IT1999TO0052 (Savio Spa), IT2008FI00180 (Euroinvest S.P.A.), EP-1455042 (Master S.r.l.), EP-1314844 (Haps+Sohn GmbH), EP-0837206 (Simonswerk GmbH), EP-0467075 (Dr. Hahn GmbH&Co.) and EP0992647-A2 (GIESSE SPA).

[0006] In particular, from EP-0467075 an adjustable hinge is known which is provided with means for adjusting the relative position of the first and of the second wing body along the direction parallel to the plane of the window or door frame and orthogonal to the rotation axis ("inter-space adjustment"), adjusting means which comprise a guide bushing inside which the hinge pin is housed with a clearance.

[0007] The guide bushing is in turn housed in a cavity that is formed in one of the two wing bodies.

[0008] Such a cavity has two faces parallel to the adjustment direction and of which one has a rectilinear toothing which extends along such an adjustment direction.

[0009] A toothing is obtained on one portion of the outer lateral surface of the bushing, toothing which engages with the rectilinear toothing on one of the two inner faces of the cavity; on the other hand, the portion of the outer lateral surface of the bushing which is opposite the toothed one is cylindrical and smooth and is defined to always be in direct contact with the opposite face of the cavity.

[0010] For every rotation of the bushing there is a corresponding relative rectilinear displacement between the first and the second wing body along the adjustment direction.

[0011] The relative position between the first and the second wing body is fixed by means of screw means.

[0012] The construction tolerances that are typical of the field, however, do not ensure the constant direct contact between the outer lateral surface of the bushing and the sides of the cavity in which it is inserted.

[0013] The purpose of the present invention is that of avoiding the drawbacks of the prior art.

[0014] Within this general purpose, the purpose of the present invention is that of providing an adjustable hinge for window or door frames which makes it possible to recover the coupling clearances between the various components thereof, in particular between those which help the adjustment along the direction parallel to the plane of the window or door frame and orthogonal to the rotation axis ("inter-space adjustment"), in a simple and effective manner.

[0015] A further purpose of the present invention is that of providing an adjustable hinge for window or door frames which makes it possible to achieve the adjustment of the mobile frame with respect to the fixed frame of a window or door frame, in particular along the direction parallel to the plane of the window or door frame and orthogonal to the rotation axis ("inter-space adjustment"), in a simple, rapid, safe manner and that is easily controllable by an operator.

[0016] Yet another purpose of the present invention is that of providing an adjustable hinge for window or door frames which visually has structural continuity for any type and amount of adjustment.

[0017] Another purpose of the present invention is that of obtaining an adjustable hinge for window or door frames that is particularly simple, functional, and has a low cost.

[0018] These purposes according to the present invention are achieved by making an adjustable hinge for window or door frames as outlined in claim 1.

[0019] Further characteristics are provided for in the dependent claims.

[0020] The characteristics and the advantages of an adjustable hinge for window or door frames according to the present invention shall become clearer from the following description, given as an example and not for limiting purposes, with reference to the attached schematic drawings, in which:

figure 1 is an overall perspective view of a hinge according to the present invention;

figure 2 is an exploded view of the hinge of figure 1, without the counter-plates and the fixing screws;
figure 3 shows in enlarged scale a detail of the hinge of figure 2;
figures 4 and 5 are two longitudinal sections, taken along planes orthogonal to one another, of the detail of figure 3 in the assembled configuration;
figure 6 is a partial schematic section view according to the plane VI-VI of figure 5;
figures 7 and 8 are two longitudinal sections taken along planes that are orthogonal to one another of the hinge of figure 1 in the assembled configuration;
figures 9a, 9b and 9c show a plan view from below of the hinge of figure 1, without the lower covering cap, in three different relative positions of the first wing body and of the second wing body along the first adjustment direction ("inter-space adjustment");
figures 10a, 10b and 10c show a plan view from above of the hinge of figure 1, without the upper covering cap, in three different relative positions of the first wing body and of the second wing body along a second adjustment direction ("pressure adjustment");
figures 11a and 11b show a front view of the hinge according to the present invention respectively in the adjustment positions corresponding to figures 9a and 9b;
figures 11c and 11d show a side view of the hinge according to the present invention respectively in the adjustment positions corresponding to figures 10a and 10b;
figures 11e and 11f show a front view of the hinge according to the present invention in two possible different relative positions of the first wing body and of the second wing body along a third adjustment direction parallel to the rotation axis ("height adjustment");
figure 12 shows an exploded view of a variant of the hinge according to the present invention;
figures 13 and 14 are two longitudinal sections taken along planes that are orthogonal to one another of the hinge of figure 12 in the assembled configuration.

[0021] With reference to the attached figures reference numeral 10 wholly indicates an adjustable hinge for window or door frames according to the present invention.

[0022] The hinge 10 is applicable to window or door frames in general comprising a fixed frame, which defines a space of a door or window, and at least one mobile frame of the type like a wing for closing such a space, which, for the sake of simplicity, are not shown.

[0023] It should be noted that in the present description adjectives such as "first", "second" and "third" or such as "upper" and "lower", are used only for the sake of clarity and must not be taken to limit the invention.

[0024] In the present description, moreover, reference is made to the "plane of the window or door frame", meaning the plane of the window or door frame considered in the closed configuration where such a plane coincides, in practice, with the plane of the mobile frame, i.e. of the door or window wing.

[0025] The hinge 10 comprises at least one first wing body 11 that is fixable to the fixed frame of a window or door frame and at least one second wing body 12 that is fixable to the mobile frame of a window or door frame, or vice versa, which are mutually articulated in a rotating manner around a rotation axis A through a pin 13.

[0026] Each one of the first body 11 and the second body 12 has a wing portion, 11a and 12a, respectively, which is joined to a hollow cylindrical portion, 11b and 12b, respectively, that is open at the opposite ends.

[0027] At the wing portions 11a and 12a holes are obtained, respectively 14 and 15, for the insertion of corresponding fixing members 16 and 17 for fixing to the fixed and mobile frame which are schematically illustrated only in some of the attached figures. Between the first body 11 and the second body 12 and respectively the fixed frame and the mobile frame of the window or door frame counter-plates and fixing springs, which are wholly indicated with reference numeral 18 and not further described since they are of the known type, can be interposed.

[0028] Each one of the first body 11 and the second body 12, moreover, is provided with a front closing lid, respectively 19 and 20, and with a lower and upper closing cap, 21 and 22 respectively, all of the removable type and also not further described since they are of the known type.

[0029] The relative position of the first body 11 and of the second body 12 is adjustable along three directions orthogonal to one another and respectively:

- along a first adjustment direction X parallel to the plane of the window or door frame and orthogonal to the rotation axis A, and that, in the jargon of the field, is indicated as "inter-space adjustment",
- along a second adjustment direction Y that is orthogonal to the plane of the window or door frame and that, in the jargon of the field, is indicated as "pressure adjustment", and
- along a third adjustment direction Z parallel to the rotation axis A and that, in the jargon of the field, is indicated as "height adjustment".

[0030] For such a purpose, the hinge 10 comprises:

- first adjusting means 23 for adjusting the relative position of the first body 11 with respect to the second body 12 along the first adjustment direction X,
- second adjusting means 24 for adjusting the relative position of the first body 11 with respect to the second body 12 along the second adjustment direction Y and
- third adjusting means 25 for adjusting the relative position of the first body 11 with respect to the second body 12 along the third adjustment direction Z.

[0031] The first adjusting means 23 comprise a first bushing 26 which supports an end portion 13a of the pin 13 and which is housed in a mobile manner inside a cavity 27 that is defined in the hollow cylindrical portion 11b of the first body 11.

[0032] The cavity 27 has two faces opposite one another and parallel to the first adjustment direction X.

[0033] A toothing 28, which extends parallel to the first adjustment direction X and with which a corresponding toothing 29, which is defined on one portion of the outer lateral surface of the first bushing 26, engages, is obtained on one of such two faces.

[0034] According to one peculiar characteristic of the present invention, the first bushing 26, on the opposite side with respect to the toothing 29, has a portion in contact with the other one of the two faces of the cavity 27, said contact portion being yielding on the plane orthogonal to the rotation axis A.

[0035] The contact portion is elastically yielding along radial planes of the first bushing 26.

[0036] In particular, the contact portion is defined by an insert element 30 which is associated with the first bushing 26.

[0037] Between the insert element 30 and the faced portion of the outer lateral surface of the first bushing 26 there is a free space S.

[0038] The insert element 30 has, in cross section, two opposite ends 30a and 30b (figures 6 and 9a) which are constrained in corresponding grooves 31a and 31b obtained on the outer lateral surface of the first bushing 26.

[0039] The insert element 30 develops in the form of a strip for a certain portion of the height of the first bushing 26, so that its two opposite ends 30a and 30b are in practice made up of two ribbings that are parallel to the rotation axis A and the corresponding grooves 31a and 31b also develop parallel to the rotation axis A.

[0040] The portion of the insert element 30 comprised between its two opposite ends 30a and 30b is yieldable along radial planes of the first bushing 26; in particular, it is capable of elastically bending.

[0041] Between the portion of the insert element 30 comprised between its two opposite ends 30a and 30b and the faced portion of the outer lateral surface of the first bushing 26 there is the free space S, which is defined by a lowered seat 32 formed in the first bushing 26. Seen in cross section, the insert element 30 has the shape of an arched-crown-sector which partially embraces the first bushing 26.

[0042] In the embodiment represented in the attached figures, the insert element 30 is in the shape of a strip or tongue which extends from a ring 33 which is anchored to the first bushing 26 by means of fixing members for example of the shape fitting type or similar, not shown in detail, since they are easy to understand for a man skilled in the art.

[0043] The ring 33 has a through opening for the first bushing 26 which is suitably shaped so as to allow, during the assembly steps, the toothing 29 to pass. The head portion of the first bushing 26 and which has a larger cross section than the latter rests and is fixed onto the ring 33.

[0044] According to a further peculiar characteristic of the present invention, the contact portion (i.e. the insert element 30) of the first bushing 26 with the face of the cavity 27 opposite the toothing 28 has a succession of alternate radial recesses and projections which are wholly indicated with reference numeral 34, which extend parallel to the rotation axis A and which engage with corresponding succession of alternate radial recesses and projections which are wholly indicated with reference numeral 35 and defined on the face of the cavity 27 opposite to the toothing 28.

[0045] The pitch between two successive projections or recesses 34 and 35 is constant and corresponds to a defined rotation angle of the first bushing 26. Advantageously, the first bushing 26 is realised in metal or metal alloy ("zama") and the deformable portion thereof, i.e. the insert element 30, is realised in polymeric material.

[0046] The lower end of the first bushing 26 has a shaped seat 36 that is accessible from the lower end of the hollow cylindrical portion 11b of the first body 11 and in which a manoeuvring member engages, for example of the Allen key type, by means of which the first bushing 26 is manoeuvrable in rotation from the outside.

[0047] The rotation of the first bushing 26 and with it of the pin 13 generates a movement between the first body 11 and the second body 12 of sole translation along a plane P parallel to the first adjustment direction X. During such a rotation, the contact portion, i.e. the insert element 30, is kept in contact with the face of the cavity 27 opposite the toothing 28 and ensures the correct engagement between the toothings 28 and 29.

[0048] At each rotation of the first bushing 26 corresponding to the pitch of the succession of alternate recesses and projections 34, moreover, thanks to the capability of yielding of the contact portion itself, a "jump" is generated with respect to the corresponding and opposite succession of alternate recesses and projections 35. Such a jump generates a "click" sound that indicates to an operator that the rotation of the first bushing 26, equal to the aforementioned pitch, and therefore, the corresponding linear displacement between the first body 11 and the second body 12, has occurred.

[0049] Moreover, first fixing means for fixing the first bushing 26 inside the cavity 27 in the position corresponding to the desired adjustment of the relative position between the first body 11 and the second body 12 along the first adjustment direction X are provided. Such first fixing means comprise a headless screw or a dowel 37 which engages in a corresponding threaded hole 37a formed along a radial direction in the wall of the cylindrical portion 11b of the first body 11 opposite the toothing 28. The end of the dowel 37 facing inside the cavity 27 rests and abuts against corresponding levelled surfaces 38 formed on the outer lateral surface of the first bushing 26 opposite the toothing 29.

[0050] The levelled surfaces 38 are defined in the axial direction by an upper tooth 55 and by a lower tooth 56, respectively, the function of which is that of avoiding a possible slipping of the first bushing 26 if subjected to loads that are greater than those allowed. Figures 9a, 9b and 9c clearly show three different limit positions, respectively "zero", of maximum and minimum distance, of the first body 11 with respect to the second body 12 along the first adjustment direction X.

[0051] In these figures 9a, 9b and 9c the contact between the contact portion, i.e. between the insert element 30, and the face of the cavity 27 opposite the toothing 28 and the succession of alternate recesses and projections 34 and 35 are clearly visible.

[0052] The second adjusting means 24 ("pressure adjustment") comprise a second bushing 39 housed in a mobile manner in a corresponding housing 40 defined in the hollow cylindrical portion 12b of the second body 12.

[0053] The second bushing 39 is provided with an eccentric cylindrical cavity 41 which houses, with the interposition of a third bushing 42 made from antifriction material, an end portion 13b of the pin 13.

[0054] The third bushing 42 is made to rotate as a unit with the second bushing 39 with a prismatic coupling 43 which, as shall become clearer in the description which follows, allows the relative free axial sliding between them.

[0055] At the upper end of the second bushing 39 there is a shaped seat 44 that is accessible from the upper open end of the hollow cylindrical portion 12b of the second body 12.

[0056] In the shaped seat 44 a manoeuvring member engages, of the type for example of an Allen key, through which the second bushing 39 is manoeuvrable in rotation from the outside.

[0057] The rotation of the second bushing 39 and with it of the pin 13 generates a relative displacement between the first body 11 and the second body 12 with a component that is parallel to the second displacement direction Y.

[0058] On the outer lateral surface of the second bushing 39 two longitudinal abutment or end stop reliefs 45 are formed which abut against corresponding abutment surfaces 46 formed in the housing 40.

[0059] The relative position of the first body 11 with respect to the second body 12 along the second adjustment direction Y is fixed by second fixing means which lock, in a temporary manner, the second bushing 39 inside the housing 40 and which are manoeuvrable from the outside. Such second fixing means also comprise a headless screw or dowel 47 which engages in a corresponding threaded hole 48 formed in the radial direction in the walls of the hollow cylindrical portion 12b of the second body 12.

[0060] The head of the dowel 47 facing inside the housing 40 rests and engages with corresponding flat facetings 49 formed on the outer lateral surface of the second bushing 39.

[0061] Figures 10a, 10b and 10c clearly show three different relative positions of the first body 11 with respect to the second body 12 along the second adjustment direction Y ("pressure adjustment").

[0062] The third adjusting means 25 ("height adjustment") comprise a threaded member 50 which engages in a corresponding through threaded hole 51 formed at an upper end portion of the second bushing 39 and having at the top a corresponding shaped seat 52 that is accessible from the outside for the engagement by a manoeuvring member of the type, for example, of an Allen key.

[0063] The lower end of the threaded member 50 rests on the bottom of the third bushing 42.

[0064] By rotating the threaded member 50 in one rotation direction or in the opposite one, the second body 12 is displaced away from or closer with respect to the first body 11 along the third adjustment direction Z, respectively.

[0065] According to a further characteristic of the present invention, the hinge 10 comprises a couple of collars 53 and 54 of which one is associated with the first bushing 26 and the other one is associated with the second bushing 39 and which are mutually coupled in a telescopic manner parallel to the rotation axis A.

[0066] In the embodiment represented, the collar 53 is associated with the first bushing 26 by means of the ring 33 with which it is formed integrally in a single body.

[0067] The collar 54, on the other hand, is fitted on the second bushing 39 and remains locked between it and the second body 12.

[0068] Thanks to the two collars 53 and 54, mutually coupled in a telescopic manner, the hinge 10 always has, in any adjustment condition of the relative position of the first and of the second body 11 and 12, structural continuity which does not alter the appearance of the window or door frame to which it is applied.

[0069] Figures from 11a to 11f clearly show the interaction between the collars 53 and 54 in visually maintaining the structural continuity of the hinge 10 in some of the possible different relative positions of the first body 11 with respect to the second body 12 respectively following an inter-space (figures 11a and 11b), in pressure (figure 11c and 11d) and in height (figures 11e and 11f) adjustment.

[0070] Figures from 12 to 14 show a possible variant of the hinge 10 according to the present invention of the so called "three wing" type in which, that is, an auxiliary body 120 is provided having a wing which is fixable to the mobile frame of the window or door frame and which is articulated to the first body 11 in a rotating manner around the rotation axis A by means of a further pin 130.

[0071] In such a case, the upper end of the pin 130 engages to the shaped seat 36 at the lower end of the first bushing 26, at the lower end of the pin a further shaped seat 360 is obtained, which is accessible from the outside and to which a manoeuvring member, for example of the Allen key type, engages, and by means

of which the first bushing 26 can be manoeuvred in rotation.

[0072] In an analogous manner to what has been described above, the pin 130 is associated with the auxiliary body 120 by means of the respective second adjusting means 24 as described above.

[0073] In figures from 12 to 14 elements that correspond to the embodiment represented in figures from 1 to 10 have been indicated with the same reference numeral.

[0074] The assembly and the adjustment in the three different possible directions of the hinge according to the present invention can be immediately understood without any effort by a man skilled in the art in light of the description and of the attached figures.

[0075] The adjustable hinge according to the present invention, thanks to the presence of an elastically yieldable insert element and as described above, has the advantage of ensuring the constant contact of the first adjustment bushing with the opposite faces of the cavity in which it is housed, recovering the coupling clearances between them in any relative position thereof.

[0076] The adjustable hinge according to the present invention, again thanks to the presence of the elastically yieldable insert element and as described above, has, moreover, the advantage of acoustically indicating the relative displacement of the first and of the second wing body along the inter-space adjustment direction instantaneously to an operator.

[0077] The adjustable hinge according to the present invention, finally, thanks to the fact that at least a couple of telescopic collars are provided as described above, has the advantage of maintaining a visual structural continuity of the hinge itself irrespective of the relative position between the first and the second wing body along one of the three adjustment directions (inter-space, pressure and height).

[0078] The adjustable hinge for window or door frames thus conceived can undergo numerous modifications and variants, all covered by the invention; moreover, all the details can be replaced by technically equivalent elements. In practice the materials used, as well as the dimensions, can be any according to the technical requirements.

Claims

1. Adjustable hinge (10) for window or door frames comprising:

   - at least one first wing body (11) fixable to the fixed frame of a window or door frame and at least a second wing body (12) fixable to the mobile frame of a window or a door frame, or vice versa, which are mutually articulated in a rotating manner around a rotation axis (A) through a pin (13),
   - first adjusting means (23) for adjusting the relative position of said first wing body (11) with respect to said second wing body (12) along a first adjustment direction (X) which is parallel to the plane of said window or door frame and orthogonal to said rotation axis (A),
   - wherein said first adjusting means (23) comprise a first bushing (26) which supports an end portion (13a) of said pin (13) and which is housed in a mobile manner inside a cavity (27) which is defined in one of said first wing body (11) and of said second wing body (12) and which has two faces opposite one another and parallel to said first adjustment direction (X),
   - wherein one of said two faces has a toothing (28) which extends parallel to said first adjustment direction (X) and with which a corresponding toothing engages (29) which is defined on one portion of the outer lateral surface of said first bushing (26), and
   - wherein said first bushing (26) is manoeuvrable in rotation from the outside and the rotation of said first bushing (26) and with it of said pin (13) generate a displacement of sole translation along said first adjustment direction (X) between said first wing body (11) and said second wing body (12),
   - said first bushing (26) has a portion in contact with the other one of said two faces of said cavity (27), said contact portion is yielding on the plane orthogonal to said rotation axis (A) **characterised in that** the contact portion is defined by an insert element (30) which is associated with said first bushing (26) and which has in the cross section an arched-crown-sector shape which partially embraces said first bushing (26), wherein between said insert element (30) and the faced portion of the outer lateral surface of said first bushing (26) there is a free space (S).

2. Hinge (10) according to claim 1, **characterised in that** said contact portion is elastically yielding along radial planes of said first bushing (26).

3. Hinge (10) according to claim 1 or 2, **characterised in that** said insert element (30) has in the cross section two opposite ends (30a, 30b) which are constrained to said first bushing (26), wherein the portion of said insert element (30) comprised between said opposite ends (30a, 30b) is yielding along radial planes of said first bushing (26).

4. Hinge (10) according to claim 3, **characterised in that** said free space (S) is defined between said portion of said insert element (30) comprised between said opposite ends thereof (30a, 30b) and the faced portion of the outer lateral surface of said first bushing (26).

5. Hinge (10) according to one or more of the preceding claims, **characterised in that** said contact portion has a succession of alternate radial recesses and projections (34) which extend parallel to said rotation axis (A) and which engage with a corresponding succession of alternate radial recesses and projections (35) defined on the face of said cavity (27) opposite to said face provided with said toothing (28).

6. Hinge (10) according to claim 5, **characterised in that** the pitch between two of said successive projections or two of said successive recesses (34, 35) of said succession is constant and corresponds to a defined rotation angle of said first bushing (26).

7. Hinge (10) according to one or more of the preceding claims, **characterised in that** it comprises first fixing means for fixing said first bushing (26) inside said cavity (27) which are associated with that of said first wing body (11) and said second wing body (12) wherein said cavity (27) is defined and which are manoeuvrable from the outside.

8. Hinge (10) according to one or more of the preceding claims, **characterised in that** it comprises second adjusting means (24) for adjusting the relative position of said first wing body (11) with respect to said second wing body (12) along a second adjustment direction (Y) orthogonal to said plane of said window or door frame and which comprise a second bushing (39) housed in a mobile manner in a corresponding housing (40) defined in the other of said first wing body (11) and said second wing body (12) and which is provided with an eccentric cylindrical cavity (41) which houses an end portion (13b) of said pin (13), wherein said second bushing (39) is manoeuvrable in rotation from the outside and wherein the rotation of said second bushing (39) and with it that of said pin (13) generates a relative displacement between said first wing body (11) and said second wing body (12) with a component parallel to said second adjustment direction (Y), being moreover provided second fixing means for fixing said second bushing (39) inside said housing (40) which are associated with that of said first wing body (11) and said second wing body (12) wherein said housing (40) is defined and which are manoeuvrable from the outside.

9. Hinge (10) according to claim 8, **characterised in that** it comprises a couple of collars (53, 54) of which one is associated with said first bushing (26) and the other with said second bushing (39) and which are mutually coupled in a telescopic manner parallel to said rotation axis (A).

10. Hinge (10) according to one or more of the preceding claims, **characterised in that** said first wing body (11) is fixable to said fixed frame of said window or door frame and said second wing body (12) is fixable to said mobile frame of said window or door frame and wherein said cavity (27) is defined in said first wing body (11).

11. Hinge (10) according to one or more of the preceding claims, **characterised in that** said first bushing (26) is realised in metal or in a metal alloy and said contact portion is realised in polymeric material.

Patentansprüche

1. Einstellbares Scharnier (10) für Fenster- oder Türrahmen, umfassend:

- mindestens einen ersten Flügelkörper (11), der an dem feststehenden Rahmen eines Fenster- oder Türrahmens befestigt werden kann, und mindestens einen zweiten Flügelkörper (12), der an dem beweglichen Rahmen eines Fenster- oder Türrahmens befestigt werden kann, oder umgekehrt, die durch einen Zapfen (13) um eine Drehachse (A) drehend aneinander angelenkt sind,
- erste Einstellmittel (23) zum Einstellen der Relativposition des ersten Flügelkörpers (11) gegenüber dem zweiten Flügelkörper (12) entlang einer ersten Einstellrichtung (X), die parallel zur Ebene des Fenster- oder Türrahmens und orthogonal zur Drehachse (A) ist,
- wobei diese ersten Einstellmittel (23) eine erste Buchse (26) umfassen, die einen Endabschnitt (13a) des Zapfens (13) trägt und beweglich in einem Hohlraum (27) untergebracht ist, der in einem von dem ersten Flügelkörper (11) und dem zweiten Flügelkörper (12) definiert ist und der zwei einander gegenüberliegende und zur ersten Einstellrichtung (X) parallele Flächen aufweist,
- wobei eine dieser zwei Flächen eine Verzahnung (28) aufweist, die sich parallel zur ersten Einstellrichtung (X) erstreckt und in die eine entsprechende Verzahnung (29) eingreift, die auf einem Abschnitt der äußeren Seitenfläche der ersten Buchse (26) definiert ist, und
- wobei die erste Buchse (26) von außen drehbeweglich ist und die Drehung dieser ersten Buchse (26) und mit ihr des Zapfens (13) eine ausschließliche Translationsverschiebung entlang der ersten Einstellrichtung (X) zwischen dem ersten Flügelkörper (11) und dem zweiten Flügelkörper (12) bewirkt,
- wobei die erste Buchse (26) einen Abschnitt aufweist, der die andere der zwei Flächen des Hohlraums (27) berührt, wobei dieser Kontaktabschnitt auf der zur Drehachse (A) orthogonalen Ebene nachgiebig ist, **dadurch gekenn-**

zeichnet, dass der Kontaktabschnitt von einem Einfügeelement (30) definiert wird, das mit der ersten Buchse (26) verbunden ist und das im Querschnitt eine Form eines gekrümmten Kronensektors hat, welche die erste Buchse (26) teilweise umfasst, wobei zwischen diesem Einfügeelement (30) und dem zugewandten Abschnitt der äußeren Seitenfläche der ersten Buchse (26) ein Freiraum (S) ist.

2. Scharnier (10) nach Anspruch 1, **dadurch gekennzeichnet, dass** der Kontaktabschnitt entlang Radialebenen der ersten Buchse (26) elastisch nachgiebig ist.

3. Scharnier (10) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** das Einfügeelement (30) im Querschnitt zwei entgegengesetzte Enden (30a, 30b) aufweist, die an der ersten Buchse (26) befestigt sind, wobei der zwischen diesen entgegengesetzten Enden (30a, 30b) eingeschlossene Abschnitt des Einfügeelements (30) entlang Radialebenen der ersten Buchse (26) nachgiebig ist.

4. Scharnier (10) nach Anspruch 3, **dadurch gekennzeichnet, dass** der Freiraum (S) zwischen dem Abschnitt des Einfügeelements (30), der zwischen den entgegengesetzten Enden (30a, 30b) desselben eingeschlossen ist, und dem zugewandten Abschnitt der äußeren Seitenfläche der ersten Buchse (26) definiert ist.

5. Scharnier (10) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Kontaktabschnitt eine Aufeinanderfolge von sich abwechselnden radialen Aussparungen und Vorsprüngen (34) aufweist, die sich parallel zur Drehachse (A) erstrecken und die mit einer entsprechenden Aufeinanderfolge von sich abwechselnden radialen Aussparungen und Vorsprüngen (35) in Eingriff sind, die auf der Fläche des Hohlraums (27) definiert sind, die der mit der Verzahnung (28) versehenen Fläche gegenüberliegt.

6. Scharnier (10) nach Anspruch 5, **dadurch gekennzeichnet, dass** der Abstand zwischen zwei der aufeinanderfolgenden Vorsprünge oder zwei der aufeinanderfolgenden Aussparungen (34, 35) der Aufeinanderfolge konstant ist und einem festgelegten Drehwinkel der ersten Buchse (26) entspricht.

7. Scharnier (10) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** es erste Befestigungsmittel zum Befestigen der ersten Buchse (26) innerhalb des Hohlraums (27) umfasst, die mit demjenigen von dem ersten Flügelkörper (11) und dem zweiten Flügelkörper (12) verbunden sind, in dem dieser Hohlraum (27) definiert ist, und die von außen bewegt werden können.

8. Scharnier (10) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** es zweite Einstellmittel (24) zum Einstellen der Relativposition des ersten Flügelkörpers (11) gegenüber dem zweiten Flügelkörper (12) entlang einer zur Ebene des Fenster- oder Türrahmens orthogonalen zweiten Einstellrichtung (Y) umfasst und die eine zweite Buchse (39) umfassen, die beweglich in einem entsprechenden Gehäuse (40) untergebracht ist, das in dem anderen von dem ersten Flügelkörper (11) und dem zweiten Flügelkörper (12) definiert ist, und die mit einem exzentrischen zylindrischen Hohlraum (41) versehen ist, der einen Endabschnitt (13b) des Zapfens (13) beherbergt, wobei diese zweite Buchse (39) von außen drehbeweglich ist und wobei die Drehung dieser zweiten Buchse (39) und mit ihr des Zapfens (13) eine Relativverschiebung zwischen dem ersten Flügelkörper (11) und dem zweiten Flügelkörper (12) mit einer zur zweiten Einstellrichtung (Y) parallelen Komponente bewirkt, wobei des Weiteren zweite Befestigungsmittel zum Befestigen dieser zweiten Buchse (39) innerhalb des Gehäuses (40) vorgesehen sind, die mit demjenigen von dem ersten Flügelkörper (11) und dem zweiten Flügelkörper (12) verbunden sind, in dem das Gehäuse (40) definiert ist, und die von außen bewegt werden können.

9. Scharnier (10) nach Anspruch 8, **dadurch gekennzeichnet, dass** es ein Paar Ringe (53, 54) umfasst, von denen einer mit der ersten Buchse (26) und der andere mit der zweiten Buchse (39) verbunden ist und die teleskopisch parallel zur Drehachse (A) miteinander verbunden sind.

10. Scharnier (10) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der erste Flügelkörper (11) an dem feststehenden Rahmen des Fenster- oder Türrahmens befestigt werden kann und der zweite Flügelkörper (12) an dem beweglichen Rahmen des Fenster- oder Türrahmens befestigt werden kann, und wobei der Hohlraum (27) im ersten Flügelkörper (11) definiert ist.

11. Scharnier (10) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die erste Buchse (26) in Metall oder in einer Metalllegierung ausgeführt ist und der Kontaktabschnitt in Polymermaterial ausgeführt ist.

Revendications

1. Charnière réglable (10) pour cadres de fenêtre ou de porte comprenant :

- au moins un premier corps de battant (11) pouvant être fixé à un cadre fixe d'un cadre de fenêtre ou de porte et au moins un deuxième corps de battant (12) pouvant être fixé au cadre mobile d'un cadre de fenêtre ou de porte, ou inversement, lesquels sont mutuellement articulés de manière pivotante autour d'un axe de rotation (A) par le biais d'une goupille (13),
- des premiers moyens de réglage (23) pour régler la position relative dudit premier corps de battant (11) par rapport audit deuxième corps de battant (12) suivant une première direction de réglage (X) qui est parallèle au plan dudit cadre de fenêtre ou de porte et orthogonal audit axe de rotation (A),
- dans laquelle lesdits premiers moyens de réglage (23) comprennent une première douille (26) qui supporte une portion d'extrémité (13a) de ladite goupille (13) et qui est logée de manière mobile à l'intérieur d'une cavité (27) qui est définie dans un dudit premier corps de battant (11) et dudit deuxième corps de battant (12) et qui a deux faces opposées entre elles et parallèles à ladite première direction de réglage (X),
- dans laquelle une desdites deux faces comporte une denture (28) qui s'étend parallèlement à ladite première direction de réglage (X) et avec laquelle s'engage une denture correspondante (29) qui est définie sur une portion de la surface latérale extérieure de ladite première douille (26), et
- dans laquelle ladite première douille (26) est manoeuvrable en rotation à partir de l'extérieur et la rotation de ladite première douille (26) et avec elle celle de ladite goupille (13) engendrent un déplacement de seule translation le long de ladite première direction de réglage (X) entre ledit premier corps de battant (11) et ledit deuxième corps de battant (12),
- ladite première douille (26) a une portion en contact avec l'autre desdites deux faces de ladite cavité (27), ladite portion de contact est souple sur le plan orthogonal audit axe de rotation (A), **caractérisée en ce que** la portion de contact est définie par un élément d'insertion (30) qui est associé à ladite première douille (26) et qui a un profil de secteur de couronne arqué en coupe transversale qui englobe partiellement ladite première douille (26), dans laquelle il existe un espace libre (S) entre ledit élément d'insertion (30) et la portion faisant face de la surface latérale extérieure de ladite première douille (26).

2. Charnière (10) selon la revendication 1, **caractérisée en ce que** ladite portion de contact est souple élastiquement le long de plans radiaux de ladite première douille (26).

3. Charnière (10) selon la revendication 1 ou 2, **caractérisée en ce que** ledit élément d'insertion (30) a, en coupe transversale, deux extrémités opposées (30a, 30b) qui sont bloquées sur ladite première douille (26), dans laquelle la portion dudit élément d'insertion (30) comprise entre lesdites extrémités opposées (30a, 30b) est souple le long de plans radiaux de ladite première douille (26).

4. Charnière (10) selon la revendication 3, **caractérisée en ce que** ledit espace libre (S) est défini entre ladite portion dudit élément d'insertion (30) comprise entre lesdites extrémités opposées (30a, 30b) de celui-ci et la portion faisant face de la surface latérale extérieure de ladite première douille (26).

5. Charnière (10) selon une ou plusieurs des revendications précédentes, **caractérisée en ce que** ladite portion de contact a une succession d'évidements et de saillies radiaux alternés (34) qui s'étendent parallèlement audit axe de rotation (A) et qui s'engagent avec une succession correspondante d'évidements et de saillies radiaux alternés (35) définis sur la face de ladite cavité (27) opposée à ladite face munie de ladite denture (28).

6. Charnière (10) selon la revendication 5, **caractérisée en ce que** le pas entre deux desdites saillies successives ou deux desdits évidements successifs (34, 35) de ladite succession est constant et correspond à un angle de rotation déterminé de ladite première douille (26).

7. Charnière (10) selon une ou plusieurs des revendications précédentes, **caractérisée en ce qu'**elle comprend des premiers moyens de fixation pour fixer ladite première douille (26) à l'intérieur de ladite cavité (27), qui sont associés à celui dudit premier corps de battant (11) et dudit deuxième corps de battant (12) dans lequel ladite cavité (27) est définie et qui sont manoeuvrables de l'extérieur.

8. Charnière (10) selon une ou plusieurs des revendications précédentes, **caractérisée en ce qu'**elle comprend des deuxièmes moyens de réglage (24) pour régler la position relative dudit premier corps de battant (11) par rapport audit deuxième corps de battant (12) suivant une deuxième direction de réglage (Y) orthogonale audit plan dudit cadre de fenêtre ou de porte et qui comprennent une deuxième douille (39) logée de manière mobile dans un logement correspondant (40) défini dans l'autre dudit premier corps de battant (11) et dudit deuxième corps de battant (12) et qui est pourvu d'une cavité cylindrique excentrique (41) qui loge une portion d'extrémité (13b) de ladite goupille (13), dans laquelle ladite deuxième douille (39) est manoeuvrable en rotation à partir de l'extérieur et dans laquelle la ro-

tation de ladite deuxième douille (39) et avec elle celle de ladite goupille (13) engendrent un déplacement relatif entre ledit premier corps de battant (11) et ledit deuxième corps de battant (12) avec une composante parallèle à ladite deuxième direction de réglage (Y), étant prévus par ailleurs des deuxièmes moyens de fixation pour fixer ladite deuxième douille (39) à l'intérieur dudit logement (40), qui sont associés à celui dudit premier corps de battant (11) et dudit deuxième corps de battant (12) dans lequel ledit logement (40) est défini et qui sont manoeuvrables de l'extérieur.

9. Charnière (10) selon la revendication 8, **caractérisée en ce qu'**elle comprend une paire de colliers (53, 54) dont un est associé à ladite première douille (26) et l'autre à ladite deuxième douille (39) et qui sont mutuellement couplés de manière télescopique parallèlement audit axe de rotation (A).

10. Charnière (10) selon une ou plusieurs des revendications précédentes, **caractérisée en ce que** ledit premier corps de battant (11) peut être fixé audit cadre fixe dudit cadre de fenêtre ou de porte et ledit deuxième corps de battant (12) peut être fixé audit cadre mobile dudit cadre de fenêtre ou de porte et dans laquelle ladite cavité (27) est définie dans ledit premier corps de battant (11).

11. Charnière (10) selon une ou plusieurs des revendications précédentes, **caractérisée en ce que** ladite première douille (26) est réalisée en métal ou en un alliage métallique et ladite portion de contact est réalisée en matériau polymère.

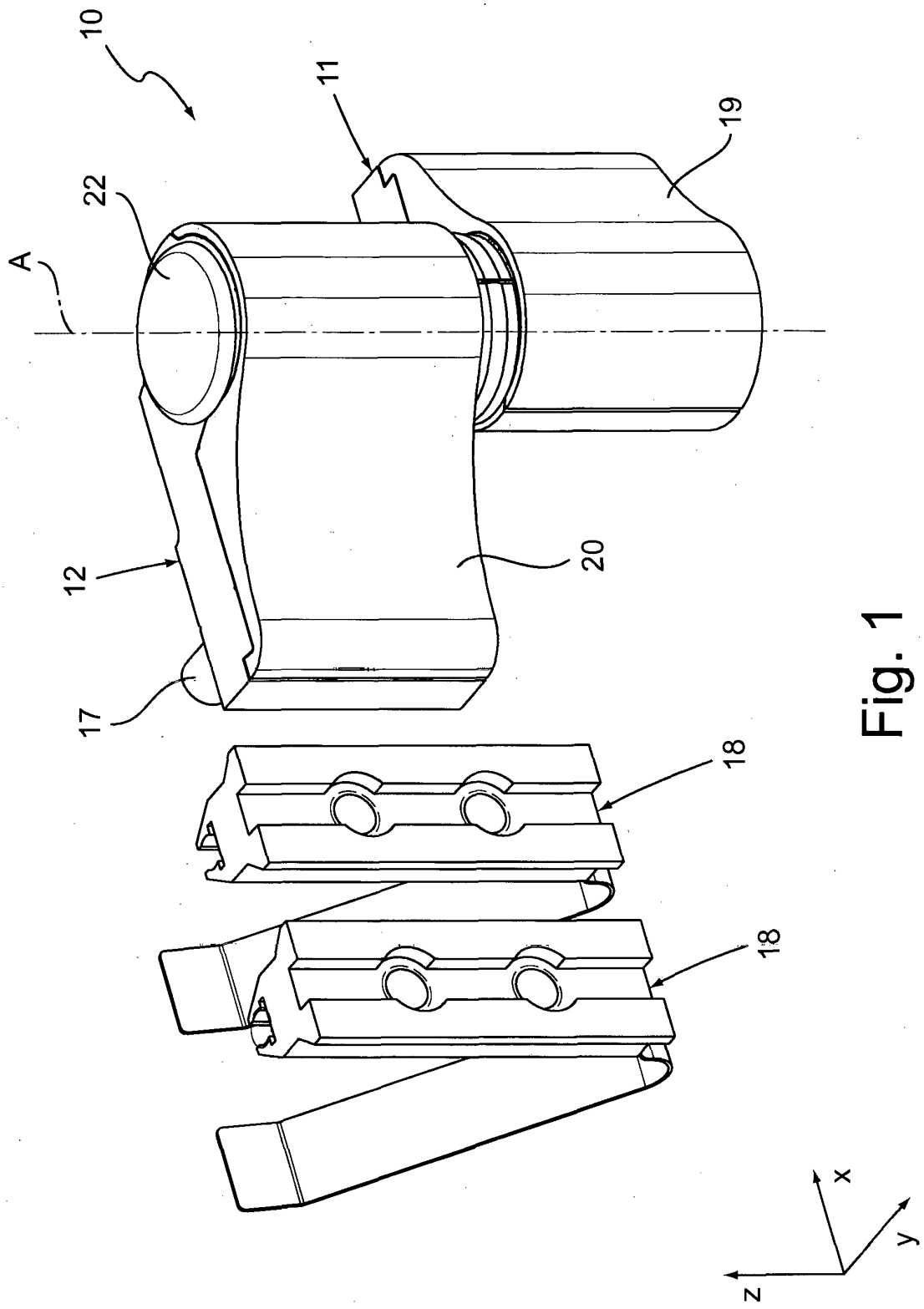


Fig. 1

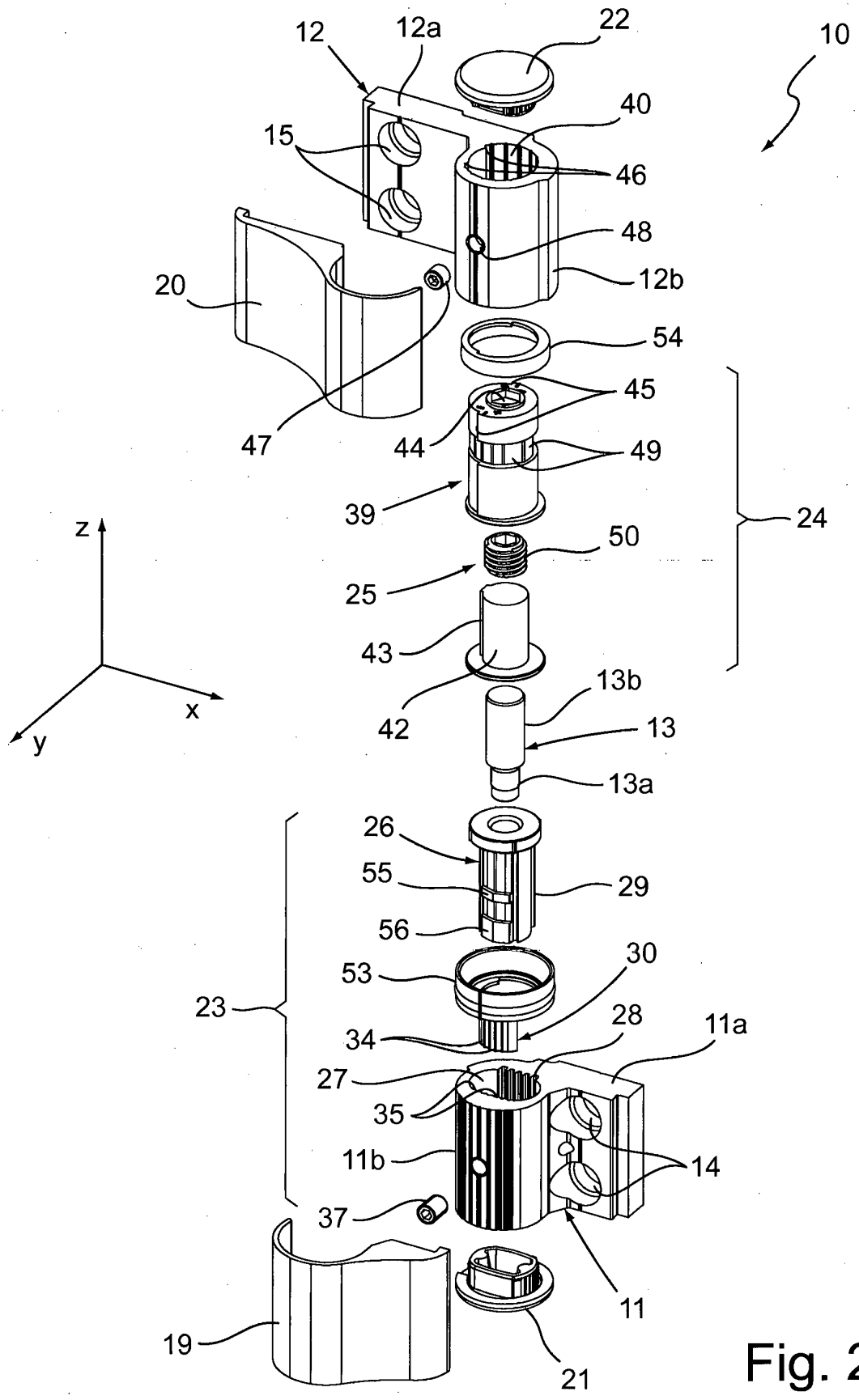

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Fig. 2

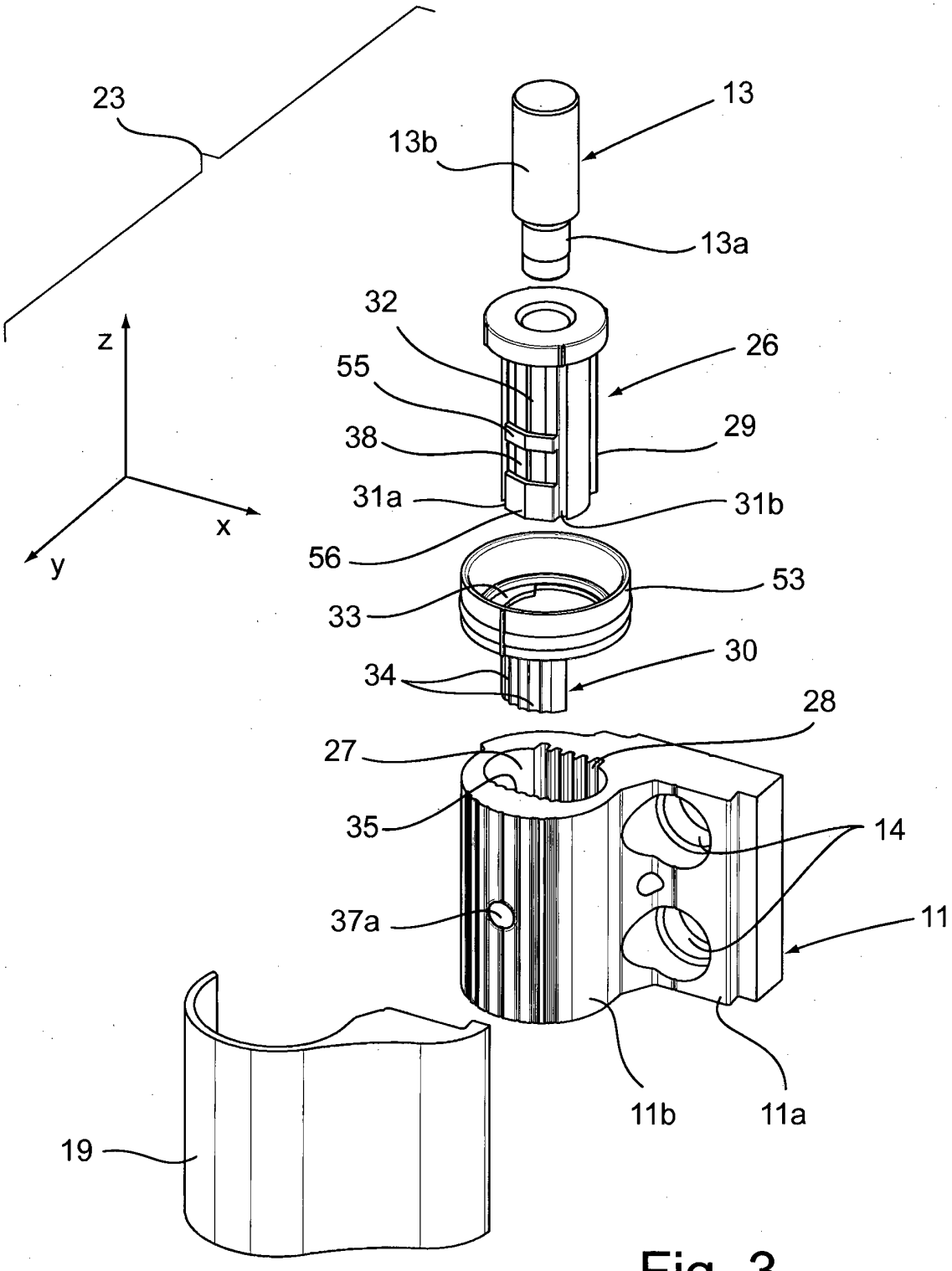

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Fig. 3

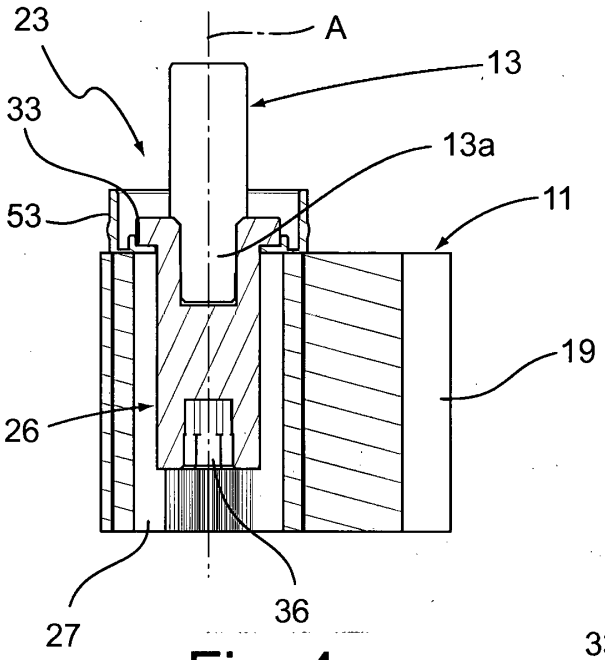


Fig. 4

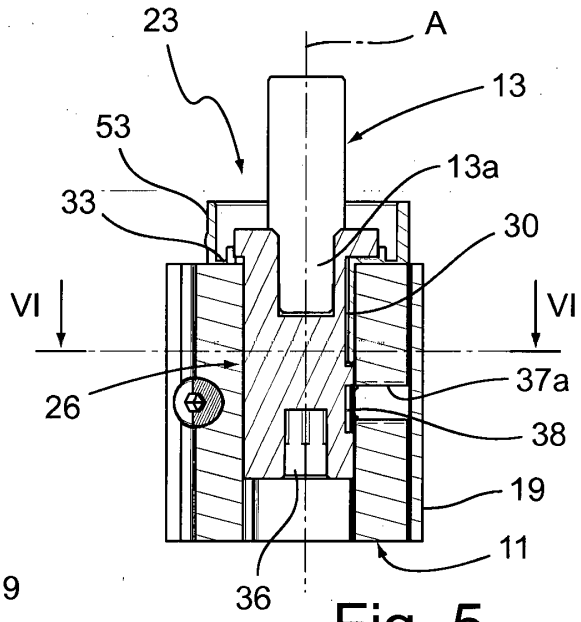


Fig. 5

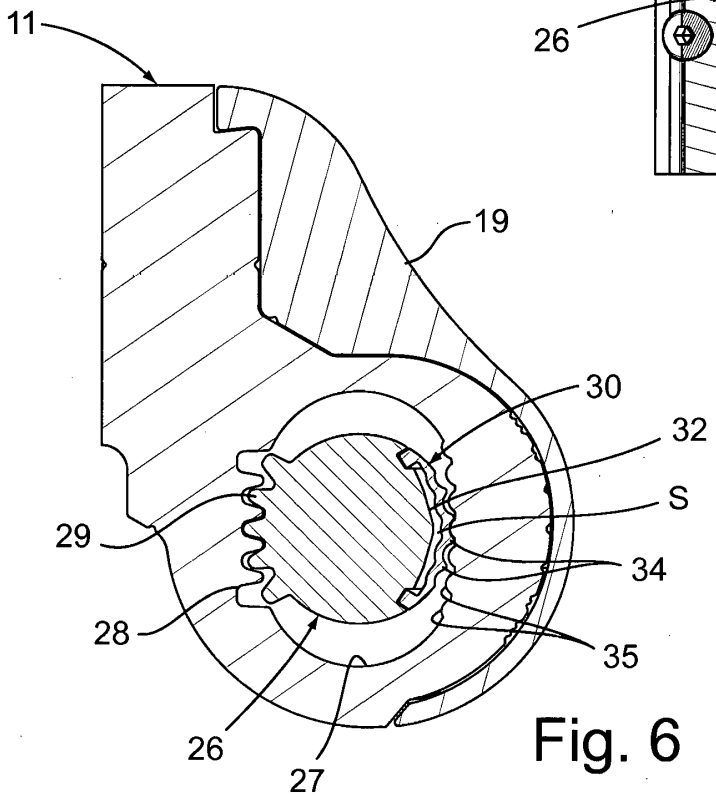


Fig. 6

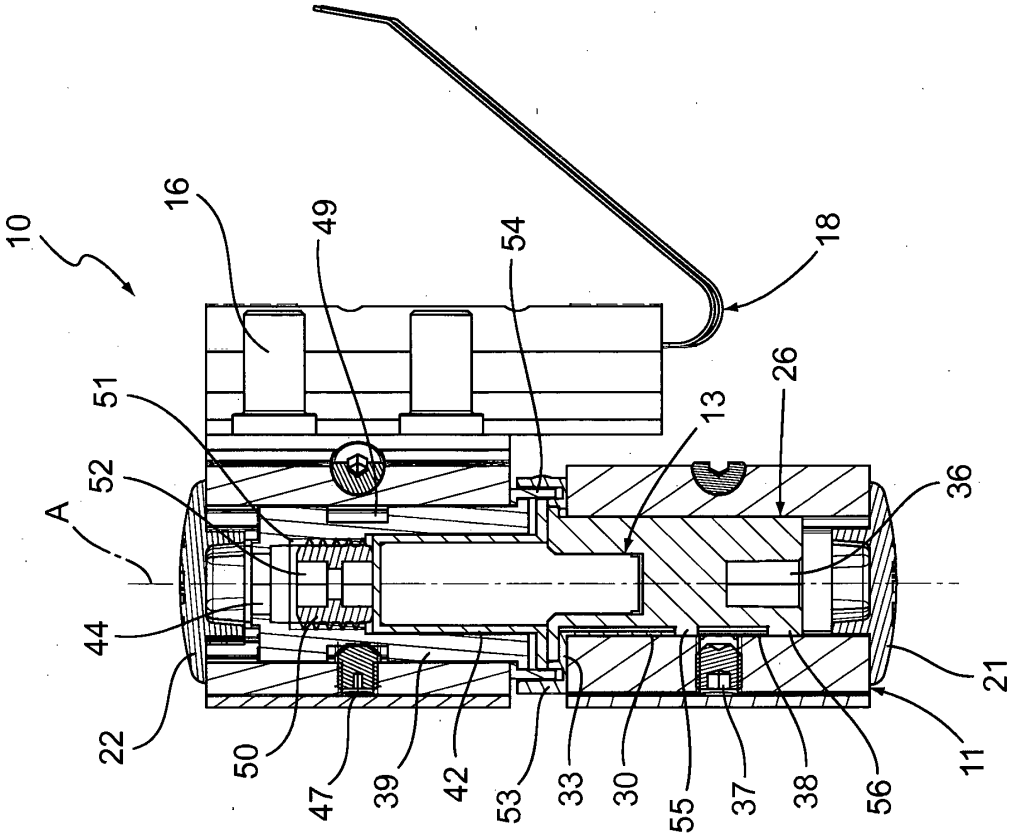

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Fig. 8

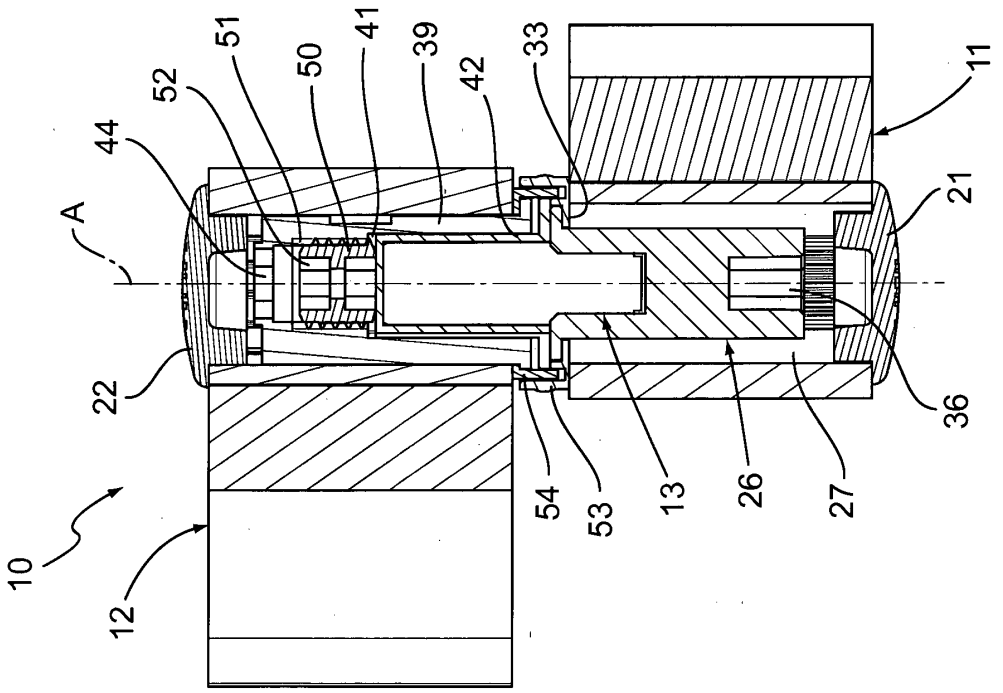

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Fig. 7

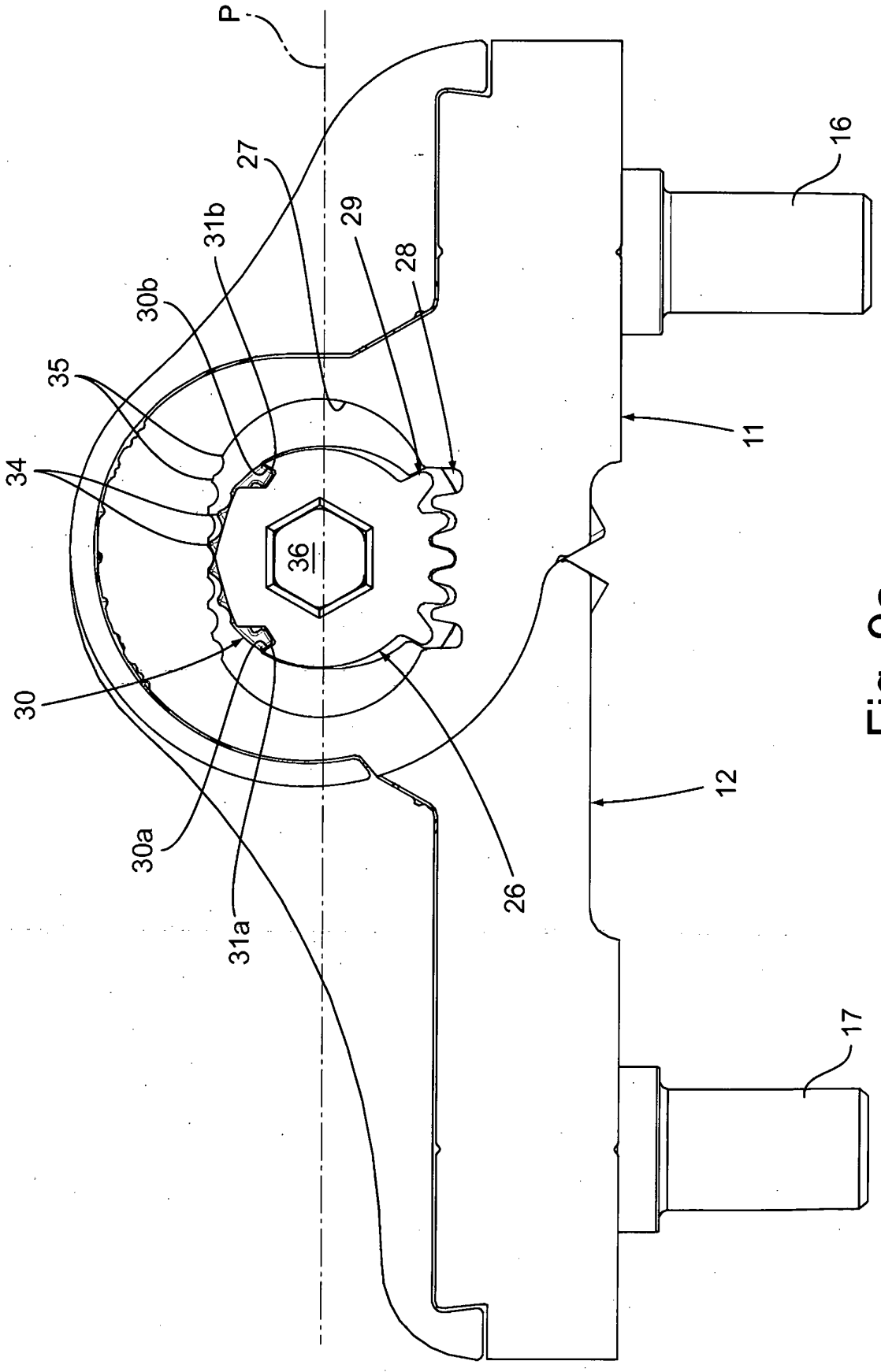


Fig. 9a

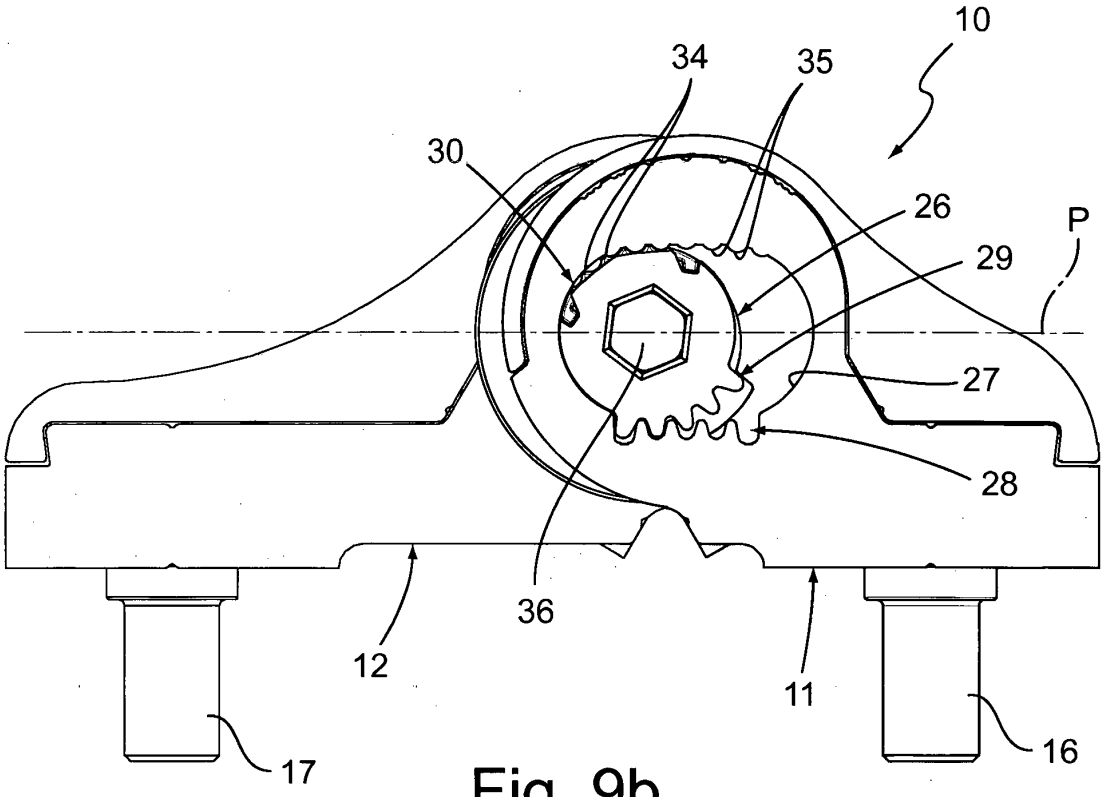

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Fig. 9b

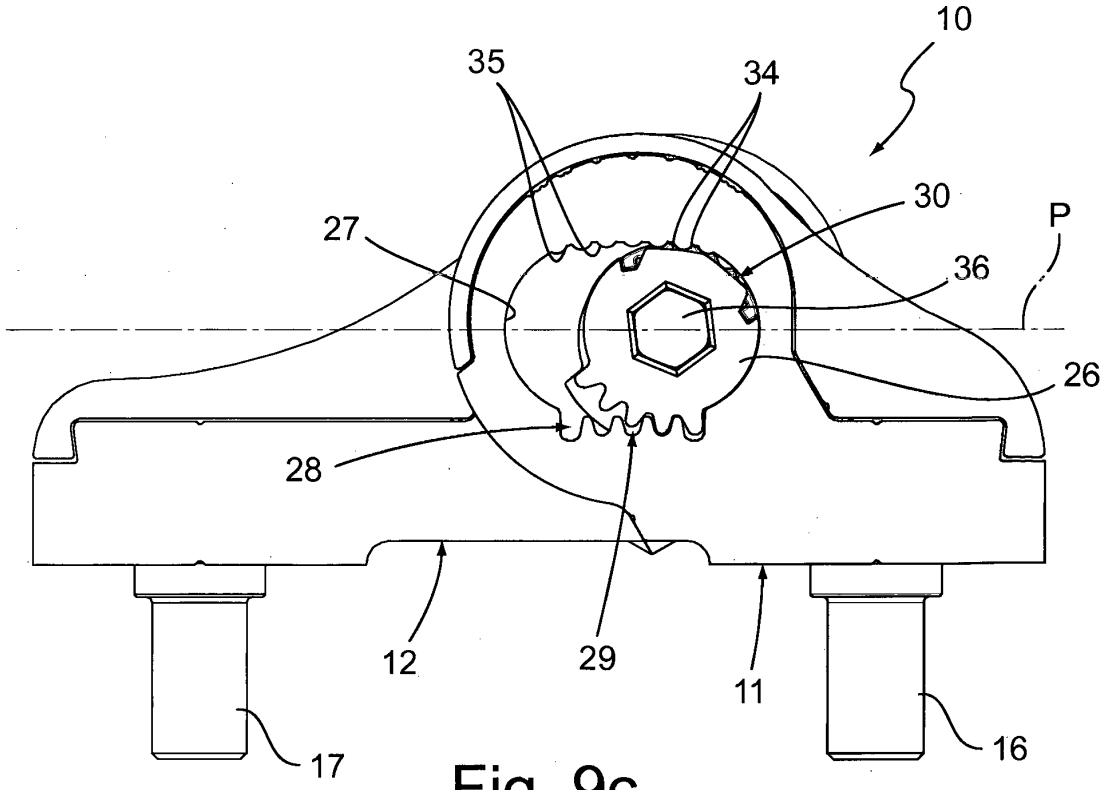

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Fig. 9c

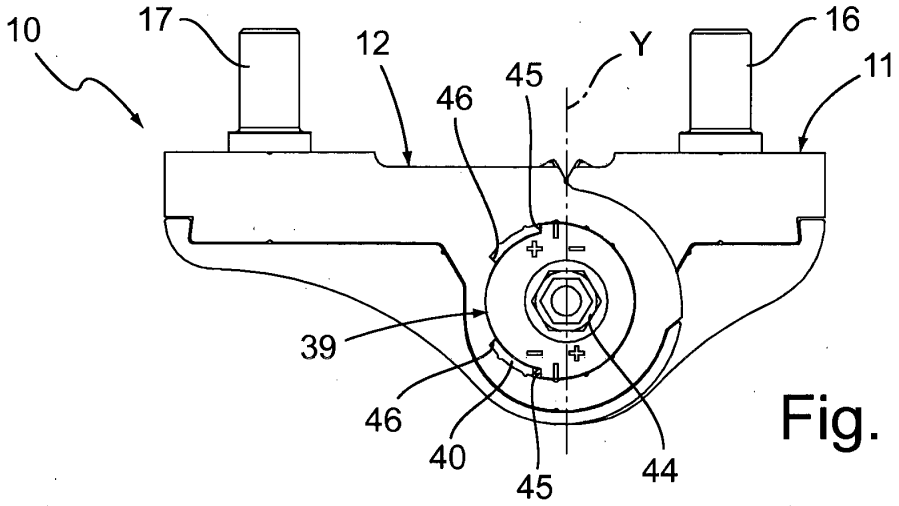


Fig. 10a

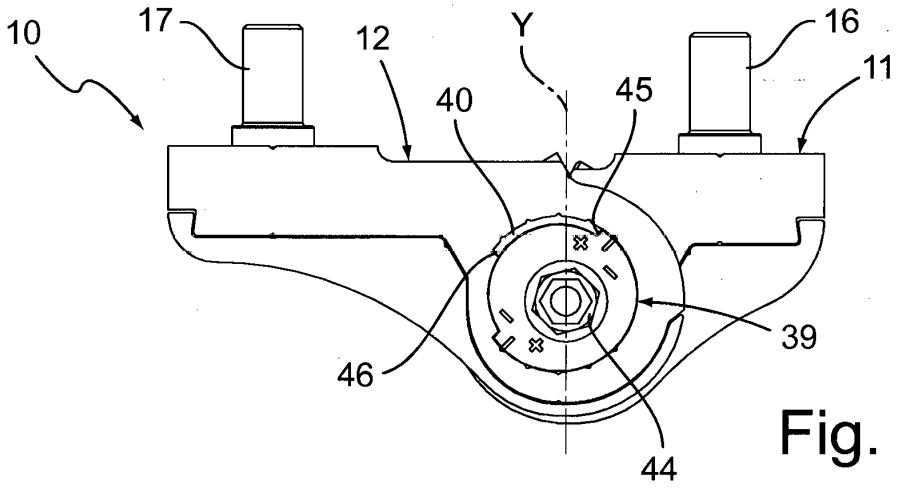


Fig. 10b

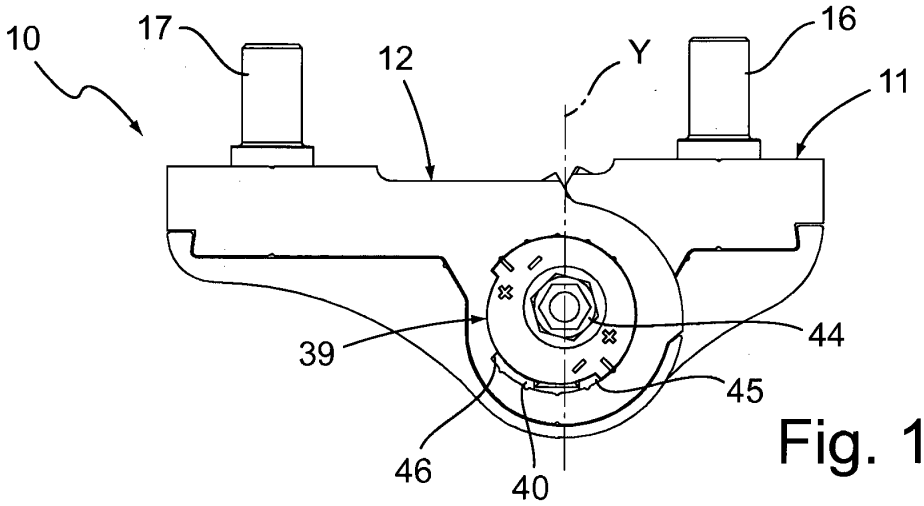


Fig. 10c

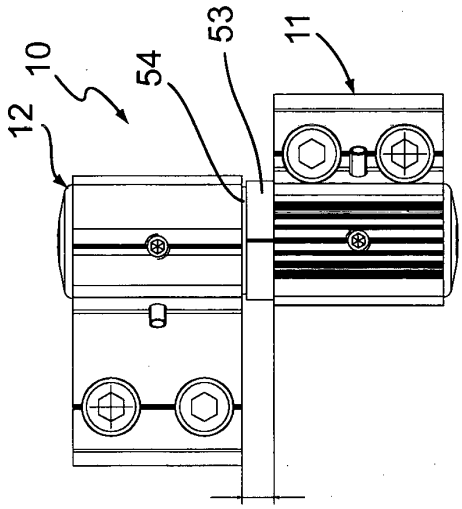


Fig. 11e

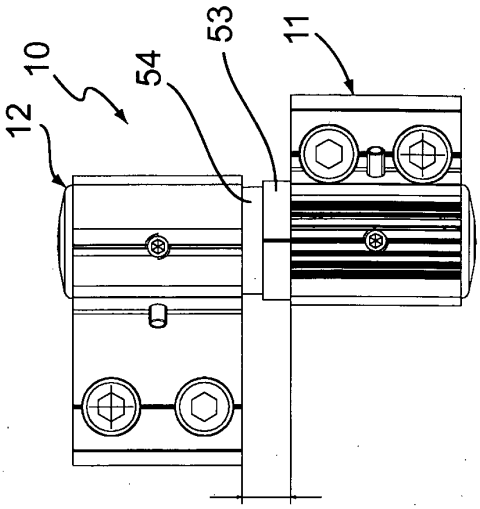


Fig. 11f

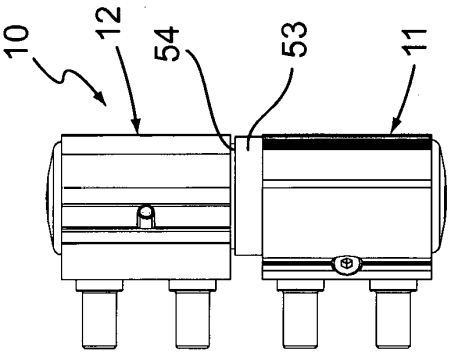


Fig. 11c

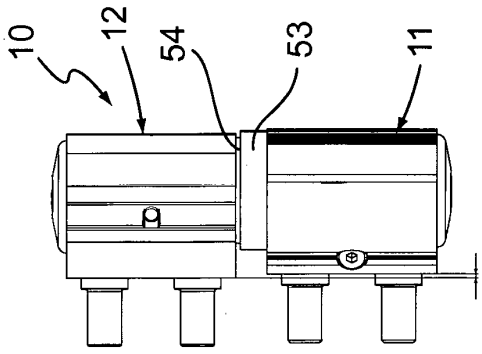


Fig. 11d

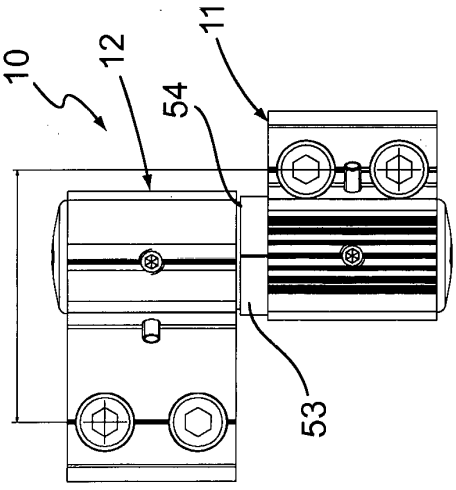


Fig. 11a

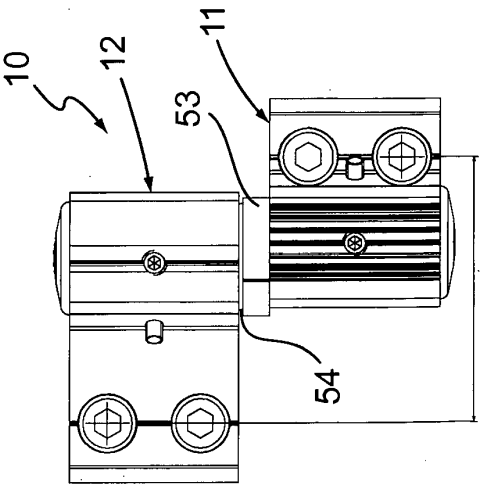


Fig. 11b

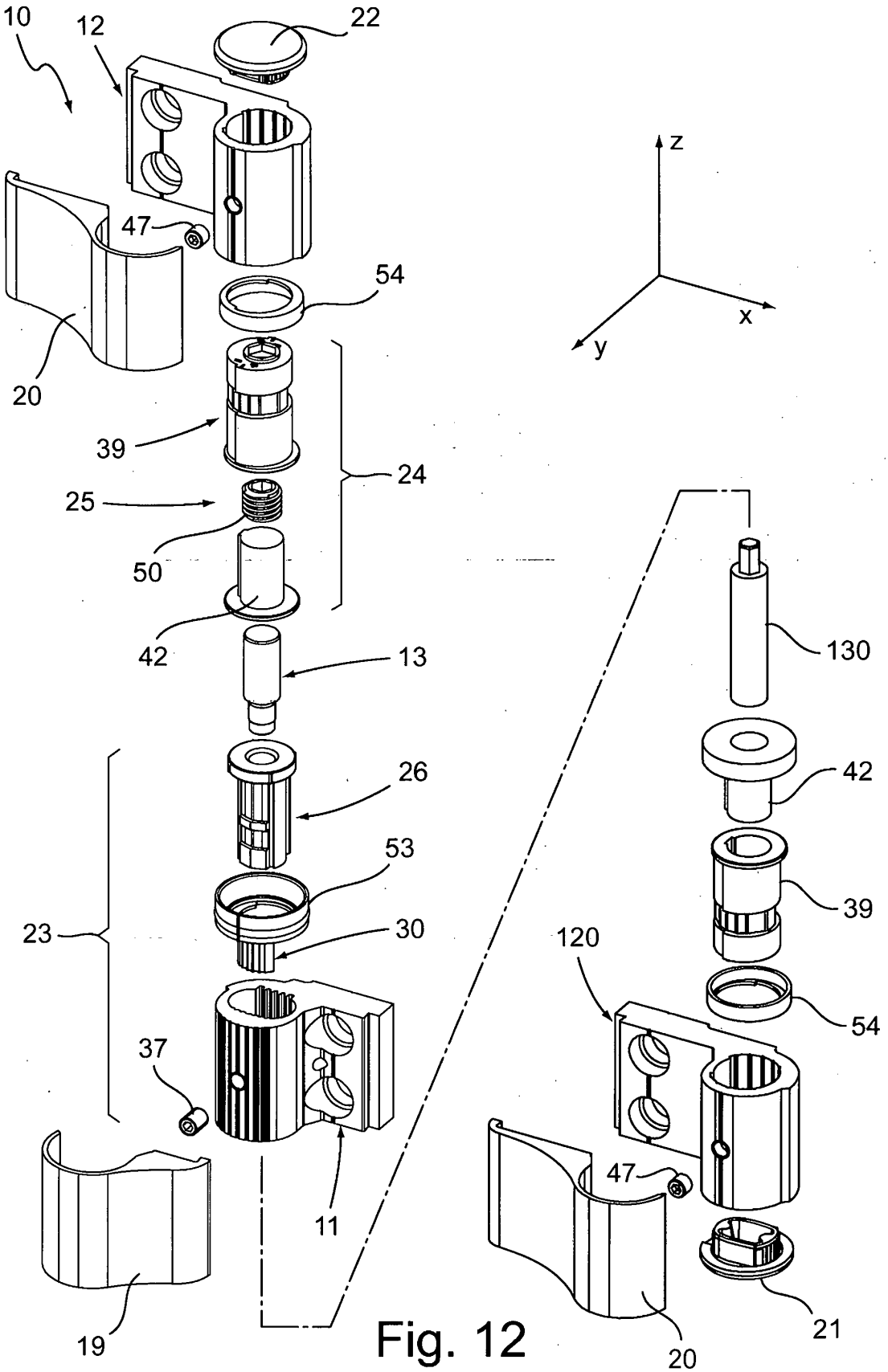

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Fig. 12

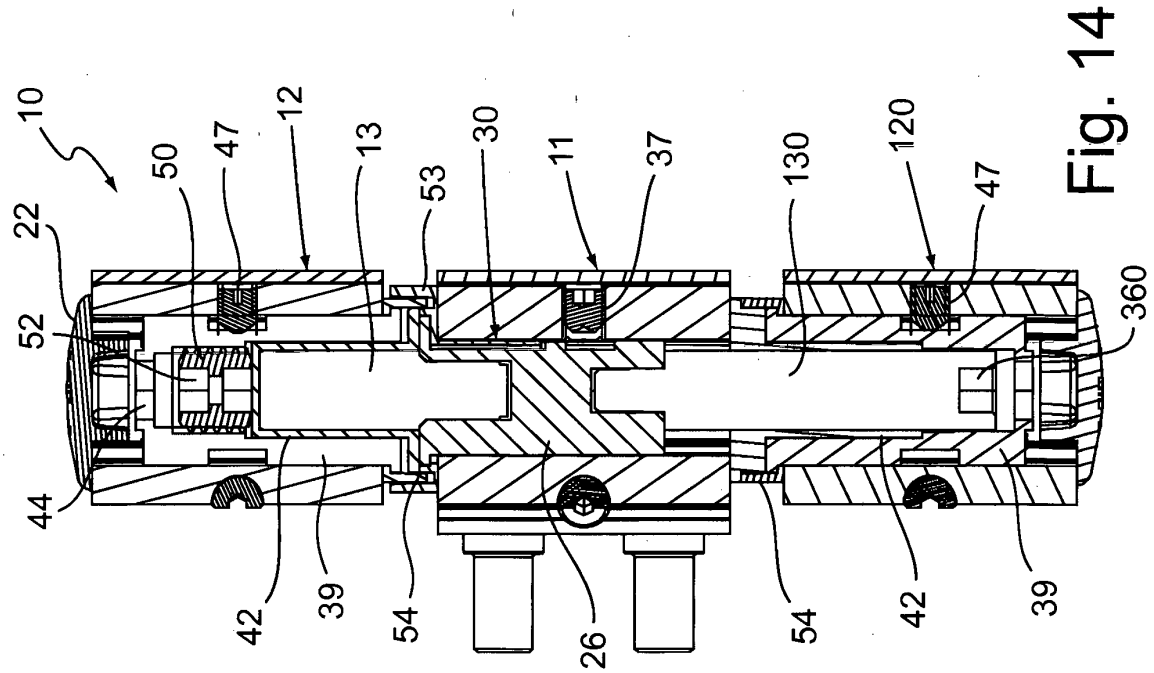

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Fig. 14

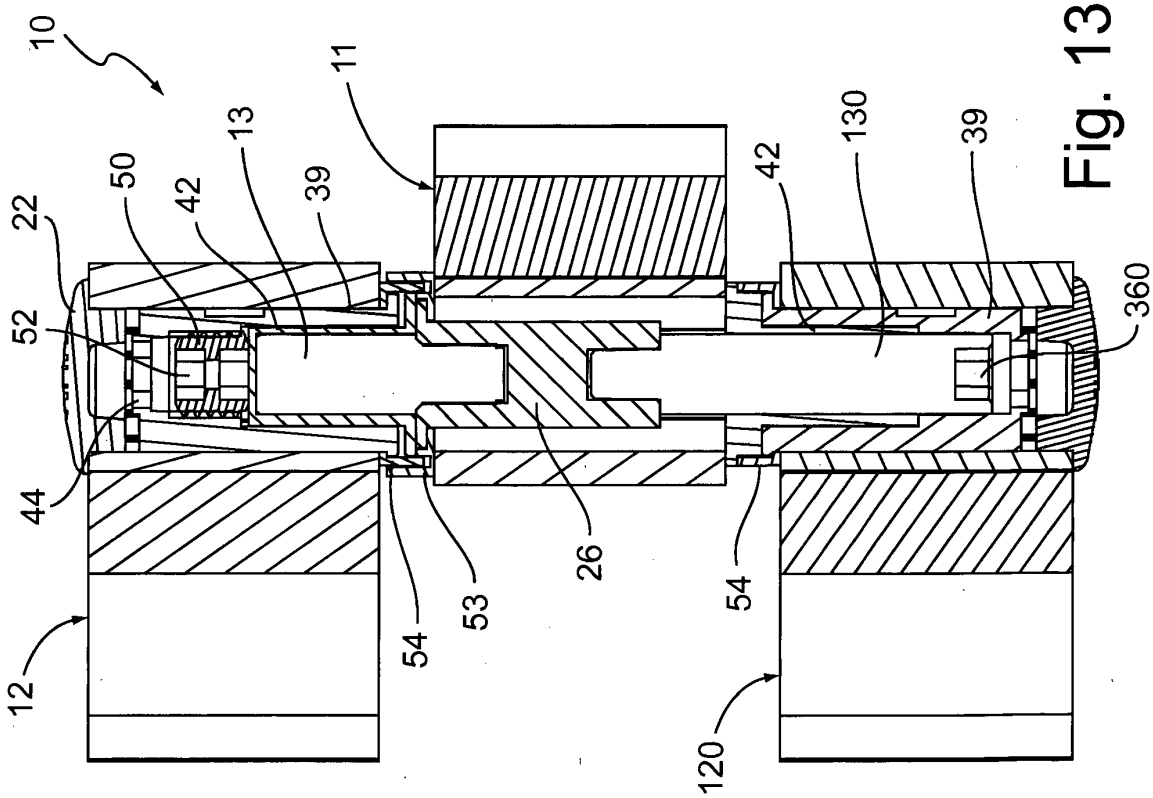

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Fig. 13