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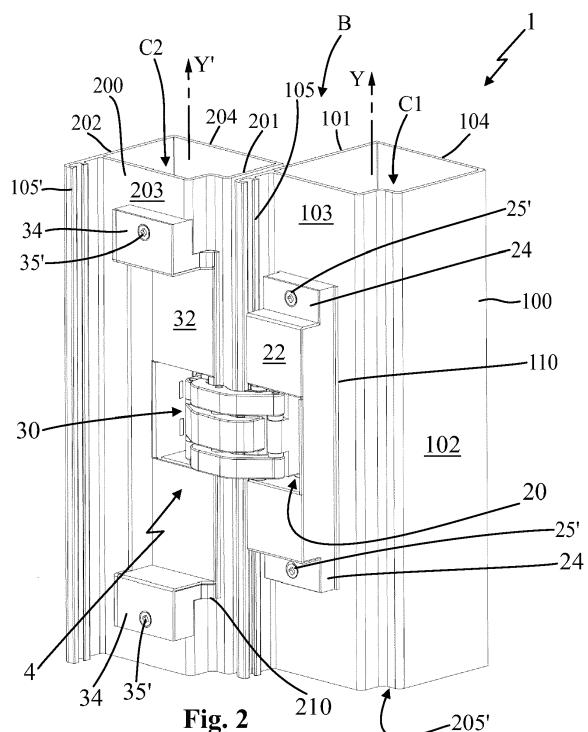
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(54) HINGING STRUCTURE FOR WINDOWS/DOORS/SHUTTERS

(57) Hinging structure for windows/doors/shutters, which comprises a first hollow metal profile (100) and a second hollow metal profile (200) respectively provided with a first appendage (105) projecting from a first hinging face (103) and with a first depression (205) receding from the second internal face (201) towards the second hinging face (203). A hidden hinge (300) is also present for rotatably connecting the two hollow metal profiles (100, 200) between a closed position (A), in which the first appendage (105) of the first hollow metal profile (100) is opposite the first depression (205) of the second hollow metal profile (200), delimiting with the second hollow metal profile (200) a first slit (305), and at least one open position (B), in which the hinging faces (103, 203) of the two hollow metal profiles (100, 200) do not face each other. The hidden hinge (300) comprises a first hinge body (2) and a second hinge body (3) mechanically fixed respectively to the first and to the second hinging face (103, 203) of the relative first and second hollow metal profile (100, 200) with the second hinge body (3) which is at least partially embedded within the second cavity (C2) of the second metal profile (200). The hidden hinge (300) also comprises articulation means (4), which rotatably connect the first hinge body (2) and the second hinge body (3) around a hinging axis (Y'') parallel to the extension directions (Y, Y') of the two hollow metal profiles (100, 200) and contained within the second cavity (C2) of the second hollow metal profile (200) when the hidden hinge (300) is in closed position (A).



DescriptionField of application

[0001] The present invention regards a hinging structure for windows/doors/shutters, such as doors and windows, according to the preamble of the main independent claim.

[0002] The present hinging structure is intended to be employed in order to radially associate a movable member, such as the panel of a door or of a furniture piece, with a fixed frame, such as the jamb of a door or the support structure of a furniture piece.

[0003] In the case of the structure for windows/doors/shutters, subject of the present invention, the windows/doors/shutters are composed of support frames, both for the movable panel part and for the fixed frame part, obtained with hollow metal sections, e.g. made of aluminum, which mount hidden hinges.

[0004] The employed hinges are of the type known in the technical jargon of the field as "hidden" or even "invisible", since they are not visible from outside once the movable member is arranged in a closed position, since all the elements that compose the hinge are situated substantially completely embedded inside the movable member and the fixed frame.

[0005] The hinge, object of the present invention, is therefore inserted in the field of windows/doors/shutters made of metal or of PVC and in the field of production of accessories for windows/doors/shutters made of metal or of PVC.

State of the art

[0006] As has been known for some time in the field of windows/doors/shutters, hinging structures consist of two profiles of a panel and of a fixed frame connected together by one or more hinges.

[0007] The profiles can be made of different materials, such as wood, plastic or metal (e.g. aluminum). In the case of the present invention, reference will be made to hollow metal profiles.

[0008] In turn, the hinges usually consist of two hinge bodies, of which one is fixed to a metal profile of a fixed frame of the window/door/shutter (such as the jamb of a door) and one is fixed to the metal profile of a movable member of the window/door/shutter, such as a panel of a door, which are mechanically connected to each other by a hinge.

[0009] In the field of windows/doors/shutters made of metal, the hinges are usually visible and consequently have the drawback of not being aesthetically pleasing, not meeting the architectural standards of the most demanding users.

[0010] Otherwise, in the field of windows/doors/shutters made of wood, hinges of hidden (or invisible) type are commonly employed, which are substantially not visible from the outside once the movable member is ar-

ranged in a closed position.

[0011] The hidden hinges are for example composed of two hinge bodies, each comprising an elongated hull embedded within a corresponding wooden profile of the movable panel or of the fixed frame, and provided with a containment seat in which they house articulation means comprising one or more articulation arms for allowing a rotation of the movable member with respect to the fixed frame, usually 180° around a hinging axis. The latter is usually positioned inside the opening defined between the opposite faces of the two wooden profiles.

[0012] Advantageously, the hidden hinges more precisely also comprise two support bodies inserted in the seats of the elongated hulls and intended to make the fulcra for the articulation means.

[0013] Recently, hinging structures have been proposed on the market that employ hidden hinges, also for windows/doors/shutters with metal profiles. One example of such hinging structures is described in the patent DE 102005039509. Nevertheless, such solution has shown that it does not lack drawbacks.

[0014] The metal profiles for windows/doors/shutters are in fact shaped with appendages that are superimposed on the opposite profile and that, in the case of use of hidden hinges provided with hinging axis interposed between the two opposite faces of the two profiles, do not allow opening the panel. In order to remedy this drawback, it is known to make hinging structures with metal profiles coupled by means of hidden hinges, leaving a considerable distance between the opposite hinging faces of the two profiles.

[0015] Also such solution has shown that it is not very aesthetically pleasing, given that it requires significant openings between the two profiles in order to prevent the appendages of the profiles from interfering with the opposite profile during the opening of the panel.

Presentation of the invention

[0016] Therefore, in this situation, the problem underlying the present invention is to overcome the drawbacks of the abovementioned prior art, by providing a hinging structure for windows/doors/shutters which is capable of employing a hinge of hidden type in order to rotatably join hollow metal profiles, maintaining a small distance between the same profiles.

[0017] A further object of the present invention is to provide a hinging structure for windows/doors/shutters which is fully aesthetically pleasing, since it does not have visible members.

[0018] A further object of the present invention is to provide a hinging structure for windows/doors/shutters which improves the insulation seal between the panel and the fixed leaf/wing.

[0019] A further object of the present invention is to provide a hinging structure for windows/doors/shutters which is inexpensive to make.

[0020] A further object of the present invention is to

provide a hinging structure for windows/doors/shutters which is safe and entirely reliable in operation.

Brief description of the drawings

[0021] The technical characteristics of the invention, according to the aforesaid objects, are clearly visible in the contents of the enclosed claims and the advantages thereof will be more evident in the following detailed description, made with reference to the enclosed drawings, which represent a merely exemplifying and non-limiting embodiment of the invention, in which:

- figure 1 shows a hinging structure for windows/doors/shutters, subject of the present invention, in a perspective view, in a closed position;
- figure 2 shows the hinging structure for windows/doors/shutters of figure 1 in an open position;
- figure 3 shows the hinging structure of figure 1 in cross section;
- figure 4 shows the hinging structure of figure 2 in cross section;
- figure 5 shows a detail of the hinging structure, subject of the present invention, relative to a hidden hinge in closed position;
- figure 6 shows a detail of the hinging structure, subject of the present invention, relative to a hidden hinge in open position;
- figure 7 shows the detail of the hinging structure of figure 5 relative to the hidden hinge in closed position in a transverse view;
- figure 8 shows the detail of the hinging structure of figure 6 relative to the hidden hinge in open position in a transverse view;
- figure 9 shows the detail of the hinging structure, subject of the present invention, already illustrated in figure 6 and relative to a hidden hinge in open position, masking plates having been separated in exploded view;
- figure 10 shows a detail of figure 9 relative to two hinge bodies and to articulation means of the hinging structure, subject of the present invention;
- figure 11 shows a first sectional view of the hinge of figure 8 carried out along a first plane transverse to the hidden hinge and passing through a first lever thereof;
- figure 12 shows a second sectional view of the hinge of figure 8 carried out along a second plane transverse to the hidden hinge and passing through a second lever thereof;
- figure 13 shows a detail of the hidden hinge mentioned in the preceding figures, relative to articulation means in a perspective view.

Detailed description

[0022] With reference to the enclosed drawings, reference number 1 indicates the hinging structure for win-

dows/doors/shutters, subject of the present invention.

[0023] The hinging structure 1 according to the invention is intended to be employed for rotatably connecting a movable member, for example the panel of a door, of a window or even of a furniture piece, with respect to a fixed frame, for example constituted by a frame of a door, of a window or by the support structure of a furniture piece.

[0024] Hereinbelow, the invention will be illustrated 10 with reference to the preferred embodiment which provides for the use of the hinging structure in the field of windows/doors/shutters for connecting the panel of a door (or of a window) to its fixed frame integral with the walling.

[0025] The hinging structure 1 comprises, in a per se 15 entirely conventional manner, a first hollow metal profile 100 and a second hollow metal profile 200 rotatably connected together by at least one hidden hinge 300. The two hollow metal profiles 100, 200 are for example obtained with extruded aluminum sections having cross sections per se known in the field of metal windows/doors/shutters.

[0026] Therefore, the first hollow metal profile 100 defines a first cavity C1 at its interior, and has a main extension in a first extension direction Y, while the second hollow metal profile 200 defines a second cavity C2 at its interior, and has main extension in a second extension direction Y' parallel to the first extension direction Y.

[0027] The two hollow metal profiles 100, 200 are part 20 of a panel and of a frame (fixed frame) of a metal window/door/shutter, e.g. advantageously as stated made of aluminum, made for example starting from extruded sections joined at the ends in order to form frames intended to make the load-bearing structure of a panel and of the relative fixed frame. The two hollow metal profiles 100, 200 illustrated in the enclosed figures are therefore advantageously segments of uprights of the frame of the panel and of the fixed frame.

[0028] Such segments of the first and of the second 25 metal profile 100, 200 are therefore extended in a complete manner, well known to the man skilled in the art, in order to form the metal window/door/shutter of the desired shape and size.

[0029] More in detail, the first hollow metal profile 100 30 is provided with a first internal face 101, with a first external face 102, substantially parallel to the first internal face 101 and with a first hinging face 103, arranged to connect the two first internal 101 and external 102 faces. Also a first anchorage face 104 is advantageously provided, opposite the first hinging face 103, and intended 35 to be anchored to the paneling of a door or window, or to the walling depending on whether such first metal profile 100 is part of the movable frame of a furniture piece or of the fixed frame.

[0030] Analogously, in turn the second hollow metal profile 200 is provided with a second internal face 201, with a second external face 202, substantially parallel to the second internal face 201, and with a second hinging

face 203, arranged to connect the two second internal 201 and external 202 faces. Also a second anchorage face 204 is advantageously provided, opposite the second hinging face 203, and intended to be anchored to the walling or to the paneling of a door or window depending on whether such second metal profile 200 is part of the fixed frame or of the movable frame of a furniture piece.

[0031] With the terms internal face and external face (respectively indicated with 101, 201 and 102, 202) of the hollow metal profiles 100, 200, it is wished to respectively indicate the side of the metal profile towards which the panel opens, and the opposite side.

[0032] Advantageously, the hinging structure 1, subject of the present invention, provides that the first internal face 101 and the first external face 102 of the first hollow metal profile 100 are coplanar, in closed position A, respectively with the second internal face 201 and with the second external face 202 of the second hollow metal profile 200.

[0033] In addition, the first hollow metal profile 100 is provided with a first appendage 105 projecting from the first hinging face 103 as a continuation of the first internal face 101. Preferably, the first appendage 105 is coplanar with the first internal face 101 and without substantial interruption with the latter.

[0034] The second hollow metal profile 200 is also provided with a first depression 205 receding from the second internal face 201 towards the second hinging face 203. Preferably, in accordance with the embodiment illustrated in the enclosed figures, the first depression 205 has the form of a step receding into the cavity of the second hollow metal profile 200 and extended along its longitudinal extension Y'.

[0035] The hidden hinge 300, to which the present invention refers, is not visible from the outside once the two metal profiles are coupled in the closed position, i.e. when the movable panel is arranged in closed position on the fixed frame, since all the elements that compose the hinge 300 are substantially embedded within the same panel and within the same fixed frame.

[0036] The hidden hinge 300 then rotatably connects the first hollow metal profile 100 to the second hollow metal profile 200 between at least one closed position A, in which the first and the second hinging face 103 and 203 are facing and parallel to each other, with the first appendage 105 that is opposite the first depression 205 so as to delimit, with the second internal face 201, a first slit 305, and at least one open position B, in which the first and the second hinging face 103, 203 are no longer directed opposite each other, one towards the other. For example, if the opening involves a rotation of 180 degrees as indicated in figures 2, 4, 6, 8 and 10, such hinging faces 103 and 203 will be oriented parallel to each other in a same common direction. Of course, the opening can also be attained with a different rotation of the panel and in that case the first and the second hinging face 103, 203 will be tilted with respect to each other.

[0037] The first appendage 105 partially surmounts the first depression 205, for the section that does not include the first slit 305; in this manner, between the first appendage 105 and the first depression 205 it is possible to mount a seal 400, as will be better described hereinbelow.

[0038] The hidden hinge 300 comprises, in a manner per se entirely conventional, two hinge bodies 2 and 3 that are rotatably mechanically connected together by means of articulation means 4.

[0039] The first hinge body 2 is mechanically fixed to the first hinging face 103 of the first hollow metal profile 100 and is provided with a first containment seat 20. In turn, the second hinge body 3 is mechanically fixed to the second hinging face 203 and is provided with a second containment seat 30. More precisely, while the first hinge body 2 can be fixed above the first hinging face 103 or at least partially embedded at its interior through a first notch 110, the second hinge body 3 is at least partially embedded within the second cavity C2 of the second metal profile 200 through a notch 210 made in the same second metal profile 200.

[0040] The hidden hinge 300 also comprises articulation means 4, which rotatably connect the first hinge body 2 and the second hinge body 3, are at least partially contained respectively within the first and second containment seat 20, 30 and are provided with a hinging axis Y" parallel to the abovementioned first and second extension direction Y, Y' of the first and of the second hollow metal profile 100, 200.

[0041] The hinging axis Y" of the articulation means 4 is contained within the second cavity C2 of the second hollow metal profile 200 when the hidden hinge 300 is in closed position A. Preferably, when the hidden hinge 300 is in open position B, the hinging axis Y" is arranged outside the second cavity C2 of the second hollow metal profile 200 and outside the first cavity C1 of the first hollow metal profile 100.

[0042] Due to this solution, it is possible to maintain quite limited the first slit 305 between the two metal profiles 100, 200, defined between the first appendage 105 of the first internal face 101 and the second internal face 201. For example, the width L of the first slit 305 can be comprised between 1 and 7 mm.

[0043] Advantageously, in accordance with the embodiment illustrated in the enclosed figures, the first hinge body 2 is preferably intended to be mechanically associated with the first hollow metal profile 100 of a movable panel while the second hinge body 3 is intended to be mechanically associated with the second metal profile 200 of a corresponding fixed frame.

[0044] In addition, in accordance with the preferred embodiment illustrated in the enclosed figures, the first hinge body 2 comprises a first elongated hull 21 mechanically fixed to the first hinging face 103, provided with a first front surface 22 from which the first containment seat 20 is extended and which is arranged outside the first cavity C1 of the first hollow profile 100.

[0045] In turn, the second hinge body 3 comprises a second elongated hull 31, mechanically fixed to the second hinging face 203, provided with a second front surface 32, from which the second containment seat 30 is extended and which is arranged inside the second cavity C2 of the second hollow profile 200.

[0046] In a per se known manner and in addition to the elongated hulls 21, 31 intended to be respectively fixed to the first and to the second hollow metal profile 100 and 200 (e.g. of the movable panel and of the fixed frame), each of the two hinge bodies 2, 3 also advantageously consists of corresponding first and second support bodies 23, 33 fixed within the respective elongated hulls 21, 31 and intended to make the fulcra for the articulation means 4.

[0047] More in detail, each elongated hull 21, 31 is preferably made of metal material, and appears as a box-like body provided with one open side defining a passage for the crossing of the articulation means 4. The latter are pivoted within the elongated hull 21, 31 to the support bodies 23 and 33 and serve for rotatably supporting the first hollow metal profile 100 (e.g. of the movable panel) with respect to the second hollow metal profile 200 (e.g. of the fixed frame 200).

[0048] The support bodies 23 and 33 are of a type well known to the man skilled in the art and are provided in accordance with the preferred embodiment of the invention illustrated in the enclosed figures and in particular in figures 9 and 10.

[0049] Advantageously, the first elongated hull 21 comprises at least two first lateral wings 24, which are externally extended from its ends, below its first front surface 22 and are mechanically fixed above the first hinging face 103 of the first metal profile 100. It is specified that in figures 2 and 6, the reference numbers are maintained for the front surfaces 22 and 32 of the two elongated hulls 21 and 31 even if these are below respective masking plates 22' and 23'.

[0050] Such first lateral wings 24 are advantageously flat, and are extended outside the first elongated hull 21 along its main extension direction (parallel to the first extension direction Y of the first hollow metal profile 100) and are provided with through holes 25 for the insertion of first retention screws aimed to fix the first elongated hull 21 respectively to the first or to the second metal profile 100, 200 of the panel or of the frame of the window/door/shutter.

[0051] The first retention screws (not illustrated) advantageously have the head embedded in seats of the through holes of the first lateral wings 24.

[0052] Advantageously, in turn the second elongated hull 31 comprises at least two second lateral wings 34, which are elevated from its ends, cross through the notch 210 made in the second metal profile 200 and are mechanically fixed above the second hinging face 203 of the same second metal profile 200.

[0053] Such second lateral wings 34 advantageously comprise stems 34', which are elevated from the two

ends of the second front surface 32 of the second elongated hull 31, passing through the notch 210, and two flat heads 34" which are extended from the ends of the stems 34' in opposite directions outside the second elongated hull 31. Such flat heads 34" are also provided with

5 through holes 35 for the insertion of second retention screws (not illustrated) aimed to fix the second elongated hull 31 respectively to the first or to the second metal profile 200 of the panel or of the frame of the window/door/shutter.

[0054] According to the embodiment of the enclosed figures, the first elongated hull 21 is at least partially embedded within the first cavity C1 of the first metal profile 100 through the further first notch 110 made in the same 10 first metal profile 100.

[0055] More in detail, preferably the first elongated hull 21 comprises an enlarged base body 21', whose longitudinal ends define the two first lateral wings 24, a central body 21", which is elevated from one side of the base 20 body 21' forming two first steps 26 therewith and a containment body 21"', which is centrally elevated from the base body 21' in a direction opposite the central body 21", forming two second steps 27 therewith.

[0056] The containment body 21''' is embedded within 25 the first cavity C1 of the first metal profile 100 through the first notch 110 made in the same first metal profile 100.

[0057] Advantageously, the two second lateral wings 34 and the second front surface 32 of the second elongated hull 31 define a chamber 36 (advantageously also by means of a lateral wall 38 on the side opposite that with the articulation means 4) which contains the first front surface 24 of the first elongated hull 21, when the hidden hinge 300 is in closed position A. Preferably, when 35 the hidden hinge 300 is in closed position A, also the central body 21" and at least partially the base body 21' of the first elongated hull 21 find housing within the aforesaid chamber 36.

[0058] In this manner, the two hinging faces 103 and 40 203 of the two hollow metal profiles 100, 200 can be placed at a reduced distance D, e.g. comprised between 8 and 16 mm.

[0059] Preferably, also the second hollow metal profile 200 is provided with a second appendage 105' projecting 45 from the second hinging face 203 as a continuation of the second external face 202. In turn, the first hollow metal profile 100 is provided with a second depression 205' receding from the first external face 102 towards the first hinging face 103. In this manner, the second appendage 50 105' is opposite the second depression 205' and delimits, with the first external face 102, a second slit 305' preferably having the same width L as the first slit 305.

[0060] The first and the second appendage 105, 105' carry, mounted thereon, in a longitudinal groove of the 55 hollow metal profiles 100, 200, a seal 400 directed towards the corresponding first and second depressions 205, 205' for an improved seal of the panel on the fixed frame, i.e. for an improved insulation of the spaces sep-

arated by the panel.

[0061] In accordance with the embodiment illustrated in the enclosed figures, the second elongated hull 31 comprises a second enlarged base body 31' from whose longitudinal ends the two second lateral wings are elevated, from one side, and a second containment body 31" is centrally elevated from the other side.

[0062] The two containment bodies 21", 31" of the two elongated hulls 21, 31 are advantageously intended to receive the support bodies 23 and 33 for pivoting the articulation means 4 illustrated in figures 9, 10 and 11.

[0063] The first front surfaces 22 and the first lateral wings 24 of the first elongated hull 21 and the second front surfaces 32 and the second lateral wings 34 of the second elongated hull 31 are covered by respective masking plates (indicated with the reference numbers 22' and 23' only in figure 9), fixed through respective screws 25', 35' (illustrated in figures 2 and 6).

[0064] The hidden hinge 300 is of known type, commonly employed for articulating wooden doors, being hidden from view when the panel is closed on the fixed frame; therefore, the hidden hinge 300 provides for articulation means 4 and support bodies 23, 33 that are per se known to the man skilled in the art.

[0065] For example, the hidden hinge 300 can be of the type described in the patent ITUD2010A000108 on page 12 line 5 to page 15 line 16, enclosed herein for reference purposes.

[0066] Hereinbelow, one possible embodiment of a hidden hinge 300 is illustrated for the sake of clarity and in accordance with figures 9, 10 and 11, of the type illustrated in the patent IT 1415397, which without departing from the protective scope of the present patent can be made with different members that are already known to the man skilled in the art.

[0067] In accordance with the latter embodiment, the hidden hinge 300 can for example provide for articulation means 4 comprising at least one panel connecting rod 7 (associated with a corresponding hinge body 2 or 3) and at least one frame connecting rod 9 (associated with the other hinge body 3, 2) pivoted at one end to the respective support bodies 23, 33 and at the other end to respective first and second levers 8, 10. The latter are in turn pivoted at the other ends thereof to the opposite support bodies 23, 33.

[0068] In accordance with the abovementioned embodiment of the enclosed figures 9, 10 and 11, the panel connecting rod 7 of the articulation means 4 of the hidden hinge 300 is contained within the first containment seat 20 of the first hinge body 2 and is pivoted at its first end 7A inside the first support body 23 and at its second end 7B to a first termination 8A of at least one first curved lever 8.

[0069] The latter is also pivoted at its second termination 8B close to a first external wall 33A of the second support body 33.

[0070] The second frame connecting rod 9 of the articulation means 4 of the hidden hinge 300 is contained

within the second containment seat 30 of the second hinge body 3 and is pivoted at a third end 9A thereof inside the second support body 33, and at its fourth end 9B to a third termination 10A of at least one second curved lever 10. The latter is also pivoted at its fourth termination 10B to a second external wall 23A of the first support body 23.

[0071] In accordance with such configuration, the first panel connecting rod 7 and the second frame connecting rod 9 rotate between the closed A and open B positions of the hinge with respect to the respective first hinge body 2 and second hinge body 3, with opposite rotation directions R1, R2.

[0072] Preferably, mainly for stability reasons, two first curved levers 8 are provided that parallel to each other, which flank the second curved lever 10 on opposite sides. More clearly, when the hinge 1 is mounted on the window/door/shutter, the three levers are arranged in succession, one on top of the other.

[0073] The two first curved levers 8 and the second curved lever 10 are advantageously pivoted, transverse to each other, by a pin 15, in particular inserted in through holes at their intermediate portions, and preferably aligned with the hinging axis Y" of the articulation means 4.

[0074] Advantageously, moreover, the first panel connecting rod 7 has T shape (see figure 13), obtained with an enlarged base 7' from which a projecting portion 7" is extended in middle position. The latter is pivoted on its opposite sides to the first terminations 8A of the two first curved levers 8, while the enlarged base 7' is pivoted at its free end to the first support body 23.

[0075] Otherwise, the two first curved levers 8 can also be pivoted to two separate first panel connecting rods 7.

[0076] The above-described hidden hinge 300 must be intended as one possible embodiment, given that the present invention leaves out of consideration the specific characteristics of the hidden hinge. The latter is available on the market with different kinematic mechanisms, all having two or more arms pivoted along a hinging axis, which due to the present invention is situated at the slit 305 defined between the first appendage 105 of the first internal face 101 of the first hollow metal profile 100 and the second internal face 201 of the second hollow metal profile 200.

[0077] The invention thus conceived therefore attains the pre-established objects.

50 Claims

1. Hinging structure (1) for windows/doors/shutters, which comprises:

55 - at least one first hollow metal profile (100) defining a first cavity (C1), having main extension in a first extension direction (Y), provided with a first internal face (101), with a first external face

(102), substantially parallel to said first internal face (101), and with a first hinging face (103) arranged to connect said first internal face (101) and said first external face (102), and with at least one first appendage (105) projecting from said first hinging face (103) as a continuation of said first internal face (101);

- at least one second hollow metal profile (200), defining a second cavity (C2), having main extension in a second extension direction (Y'), provided with a second internal face (201), with a second external face (202) substantially parallel to said second internal face (201), and with a second hinging face (203) arranged to connect said second internal face (201) and said second external face (202), and with at least one first depression (205) receding from said second internal face (201) towards said second hinging face (203);

- at least one hidden hinge (300) for rotatably connecting said first hollow metal profile (100) to said second hollow metal profile (200), between at least one closed position (A), in which said first and second hinging face (103, 203) face each other with the first appendage (105) of said first hollow metal profile (100) opposite the first depression (205) of said second hollow metal profile (200) and delimiting, with said second internal face (201), a first slit (305), and at least one open position (B), in which said first and second hinging face (103, 203) do not face each other; said hidden hinge (300) comprising:

- a first hinge body (2) mechanically fixed to the first hinging face (103) of said first metal profile (100) and provided with a first containment seat (20);
- a second hinge body (3) mechanically fixed to said second hinging face (203) of said second metal profile (200), provided with a second containment seat (30) and at least partially embedded within the second cavity (C2) of said second metal profile (200) through a notch (210) made in said second metal profile (200);
- articulation means (4), which are at least partially contained within said first and second containment seat (20, 30) and rotatably connect said first hinge body (2) and said second hinge body (3) around a hinging axis (Y") parallel to the first and second extension direction (Y, Y') of said first and second hollow metal profile (100, 200);

wherein, with said hidden hinge (300) in said closed position (A), the hinging axis (Y") of said articulation means (4) is contained within the second cavity (C2) of said second hollow metal profile (200);

said hinging structure (1) being **characterized in that**:

- said first hinge body (2) comprises a first elongated hull (21) mechanically fixed to said first hinging face (103), provided with a first front surface (22), from which said first containment seat (20) is extended and which is arranged outside the first cavity (C1) of said first hollow profile (100);

- said second hinge body (3) comprises a second elongated hull (31) mechanically fixed to said second hinging face (203), provided with a second front surface (32), from which said second containment seat (30) is extended and which is arranged inside the second cavity (C2) of said second hollow profile (200).

2. Hinging structure (1) for windows/doors/shutters according to claim 1, **characterized in that** said first elongated hull (21) comprises at least two first lateral wings (24), which are extended from the ends of said first elongated hull (21) below said first front surface (22) and are mechanically fixed on the first hinging face (103) of said first hollow metal profile (100).

3. Hinging structure (1) for windows/doors/shutters according to claim 1 or 2, **characterized in that** said second elongated hull (31) comprises at least two second lateral wings (34), which are elevated from the ends of said second elongated hull (31), cross through the notch (210) in said second hollow metal profile (200) and are mechanically fixed on the second hinging face (203) of said second hollow metal profile (200).

4. Hinging structure (1) for windows/doors/shutters according to any one of the preceding claims, **characterized in that** said first elongated hull (21) is at least partially embedded within the first cavity (C1) of said first hollow metal profile (100) through a first notch (110) made in said first hollow metal profile (100).

5. Hinging structure (1) for windows/doors/shutters according to claims 2 and 4, **characterized in that** said first elongated hull (21) comprises an enlarged base body (21'), whose longitudinal ends define said two first lateral wings (24), a central body (21''), which is elevated from one side of the base body (21'), forming with said base body (21') two first steps (26), and a containment body (21''') which is centrally elevated from the base body (21') in the direction opposite said central body (21''), forming with said base body (21') two second steps (27); said containment body (21''') being embedded within the first cavity (C1) of said first hollow metal profile (100) through the first notch (110) made in said first hollow metal profile (100).

6. Hinging structure (1) for windows/doors/shutters according to claim 3, **characterized in that** the two second lateral wings (34) and the second front surface (32) of said second elongated hull (31) define a chamber (36) which contains the first front surface (22) of said first elongated hull (21) with said hidden hinge (300) in closed position (A). 5

7. Hinging structure (1) for windows/doors/shutters according to claims 5 and 6, **characterized in that** said chamber (36) contains the central body (21") and at least partially the base body (21') of said first elongated hull (21) with said hidden hinge (300) in closed position (A). 10

8. Hinging structure (1) for windows/doors/shutters according to any one of the preceding claims, **characterized in that:** 15

- said second hollow metal profile (200) is provided with a second appendage (105') projecting from said second hinging face (203) as a continuation of said second external face (202);
 - said first hollow metal profile (100) is provided with a second depression (205') receding from said first external face (102) towards said first hinging face (103); said second appendage (105') being opposite said second depression (205') and delimiting, with said first external face (102), a second slit (305') with said hidden hinge (300) in closed position (A). 20
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9. Hinging structure (1) for windows/doors/shutters according to claim 8, **characterized in that** said first and second appendage (105, 105') carry, mounted 35 thereon, a corresponding seal (400) directed towards the corresponding first and second depression (205, 205').

10. Hinging structure (1) for windows/doors/shutters according to claims 2 and 3, **characterized in that** said second elongated hull (21) comprises a second enlarged base body (31), from whose longitudinal ends said two second lateral wings (34) are elevated, and a second containment body (31") which is centrally 45 elevated from the second enlarged base body (31) in a direction opposite said second lateral wings (34). 40
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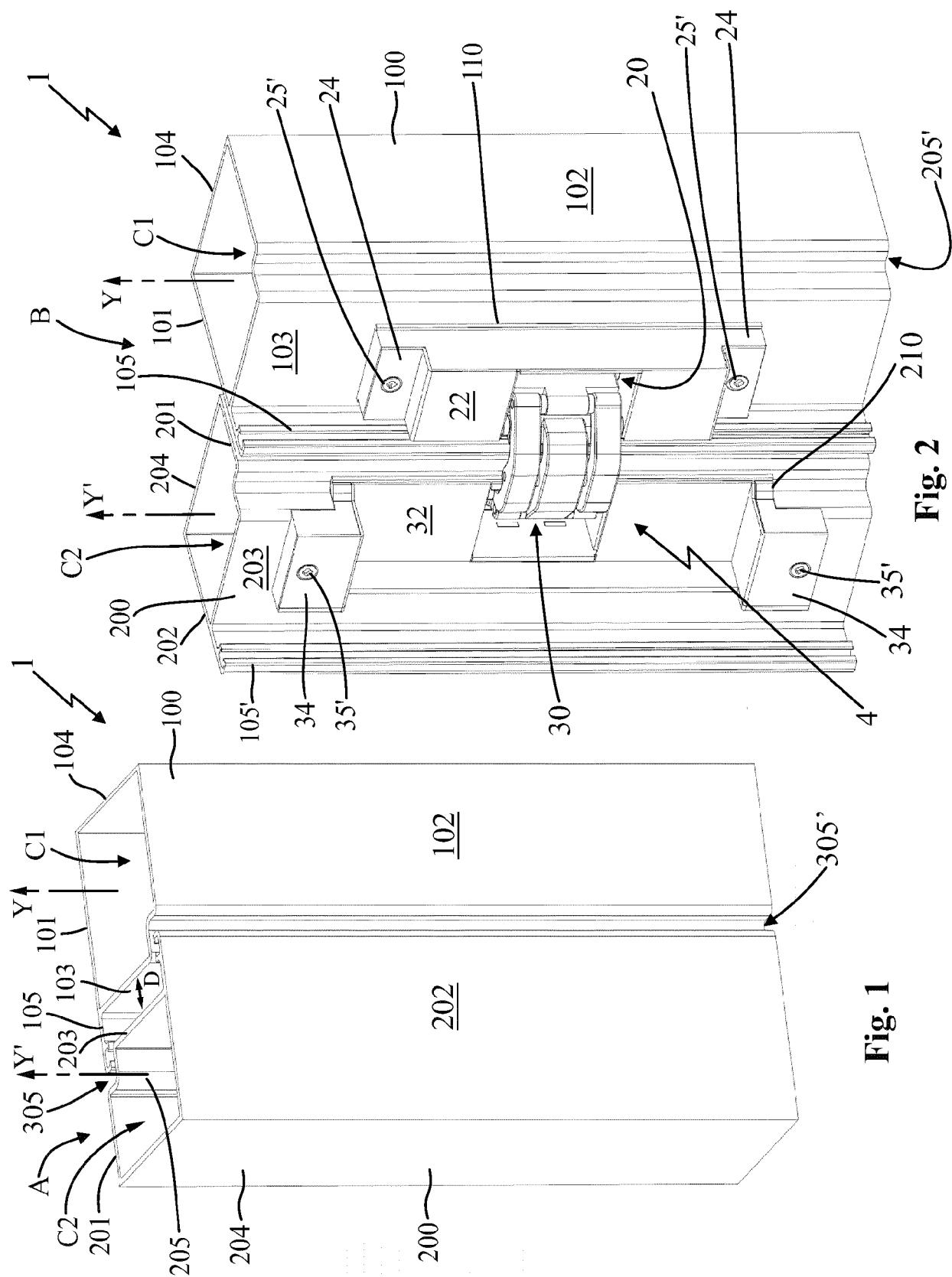
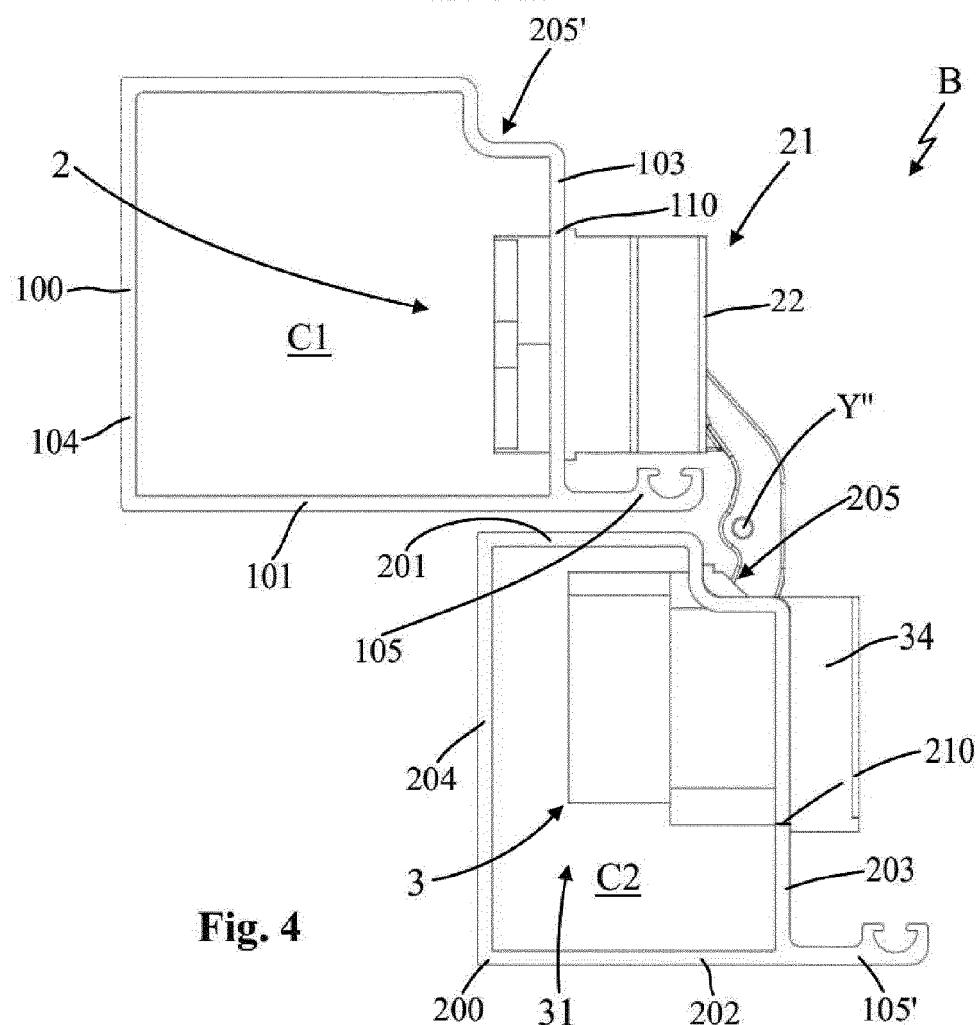
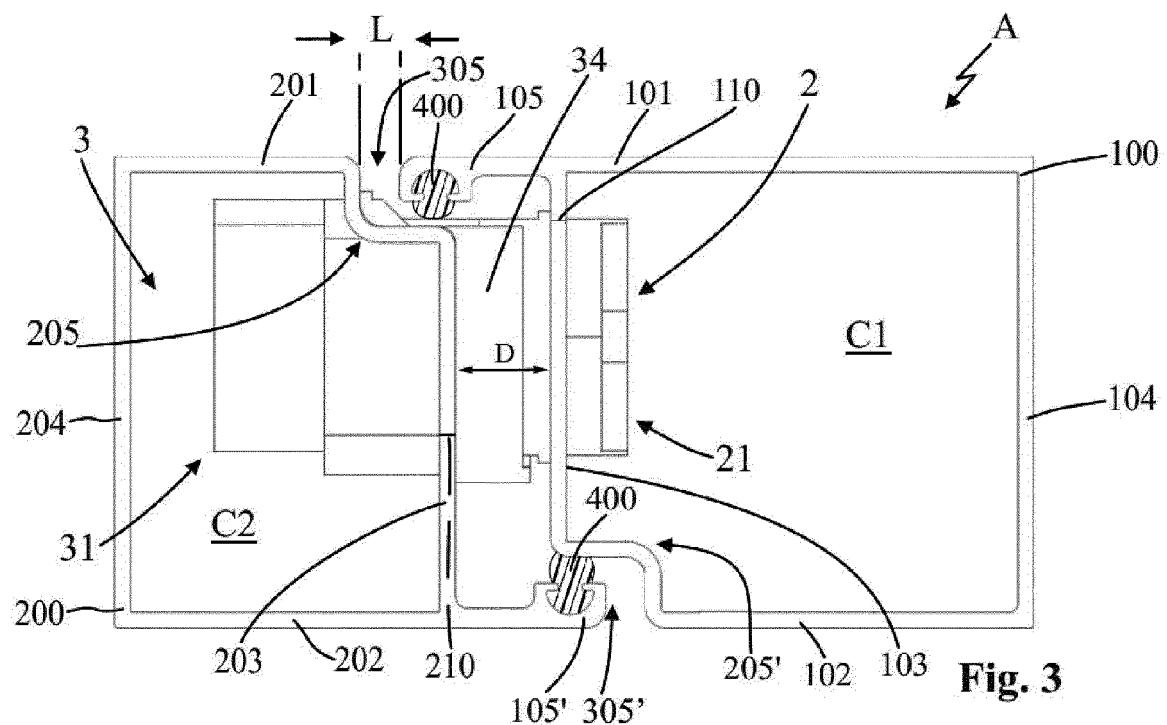


Fig. 1

Fig. 2



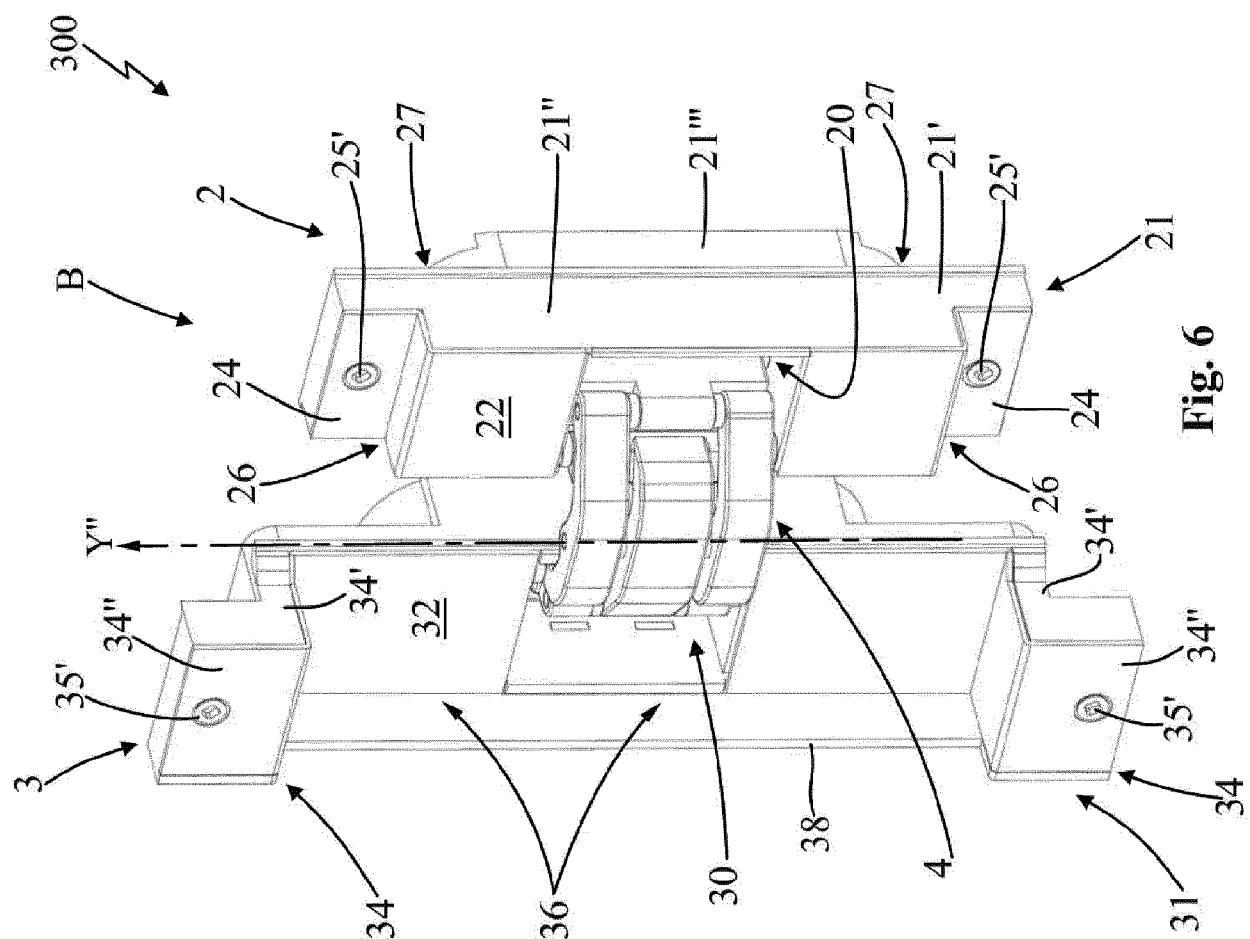
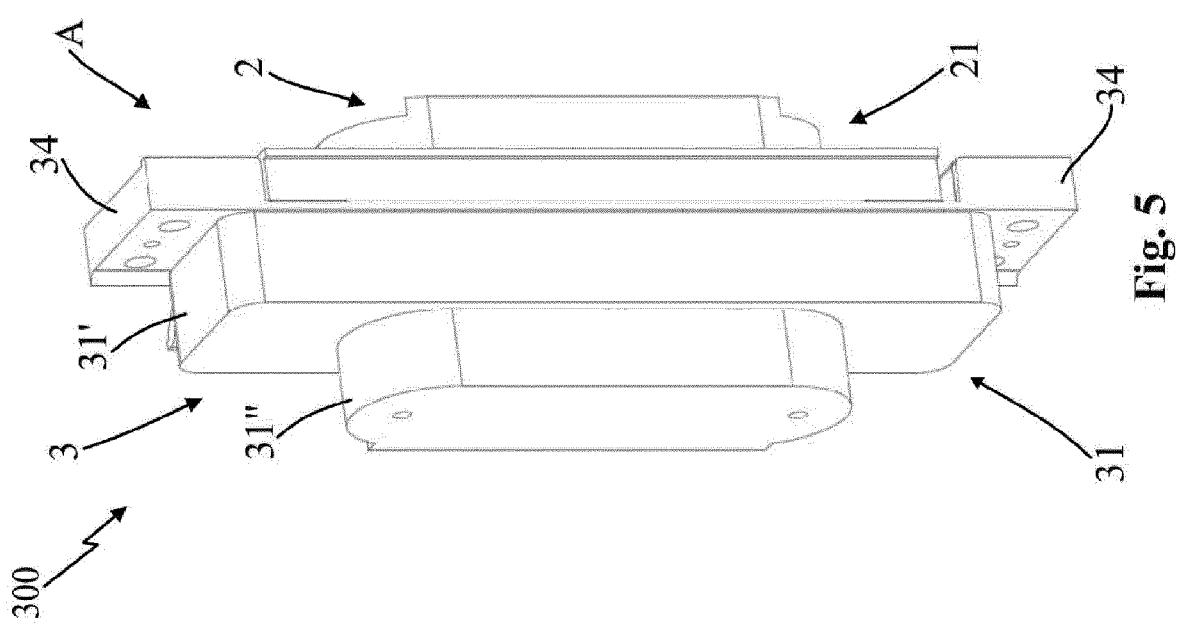
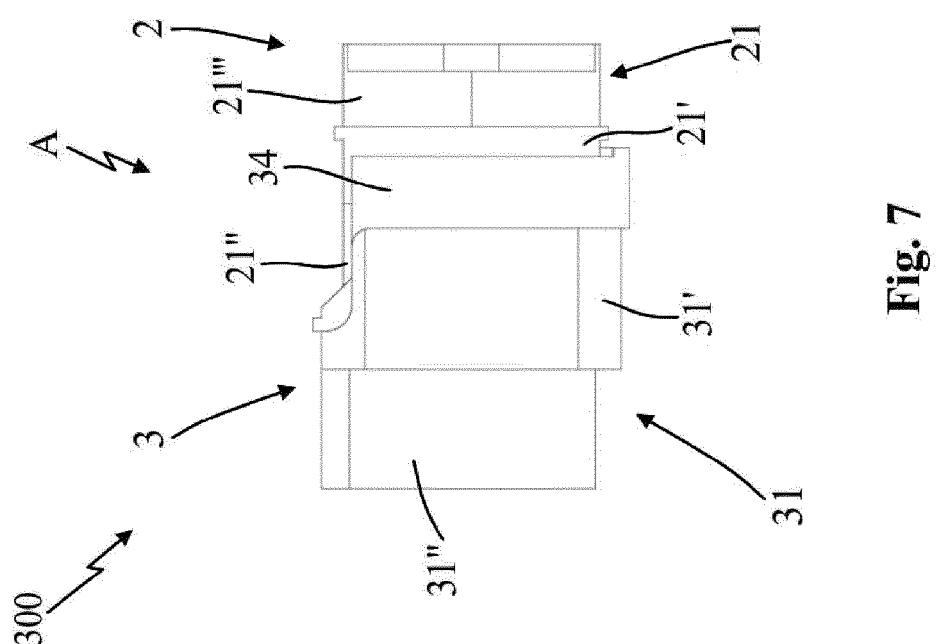
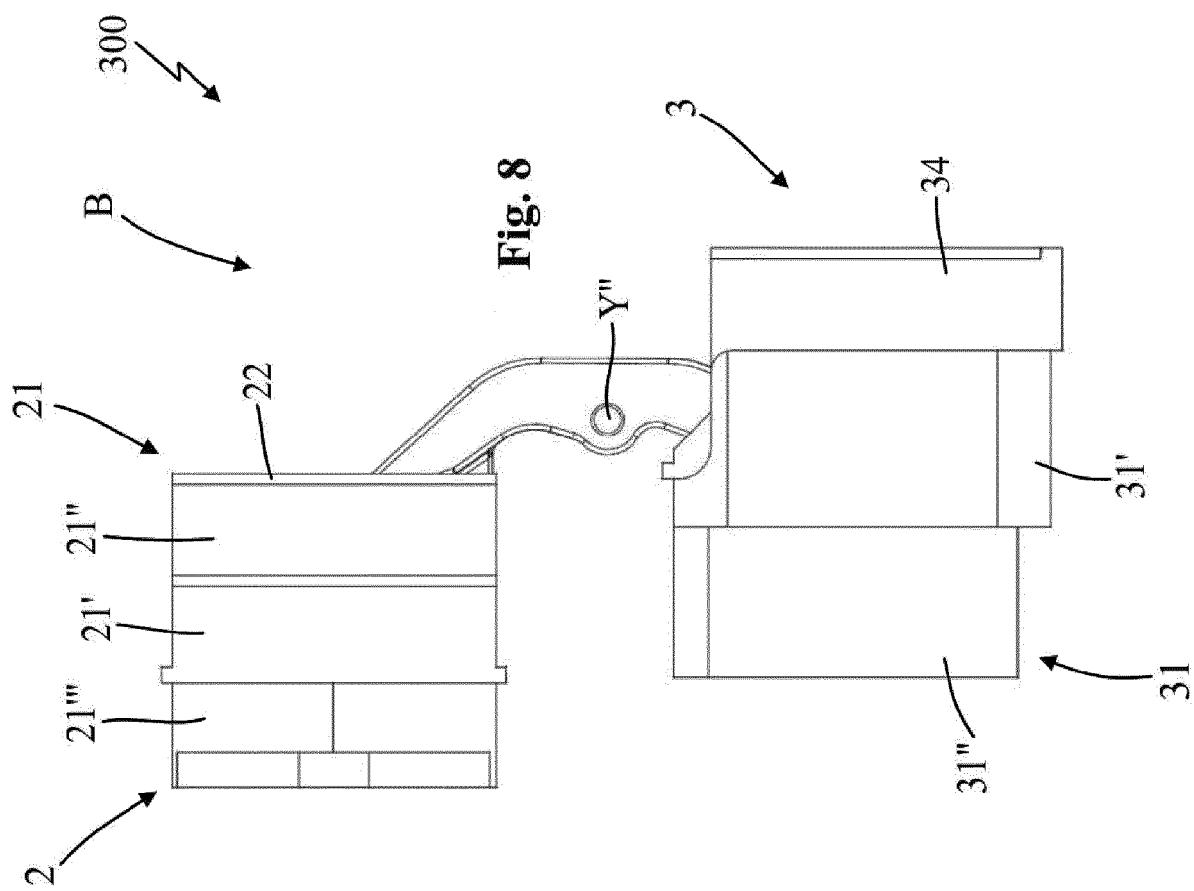


Fig. 6



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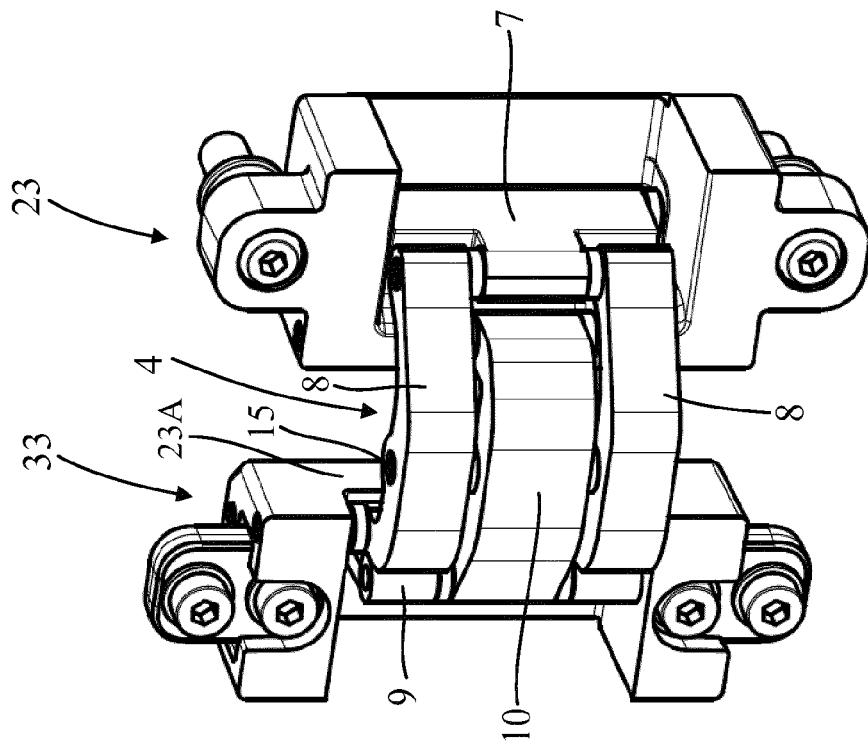


Fig. 10

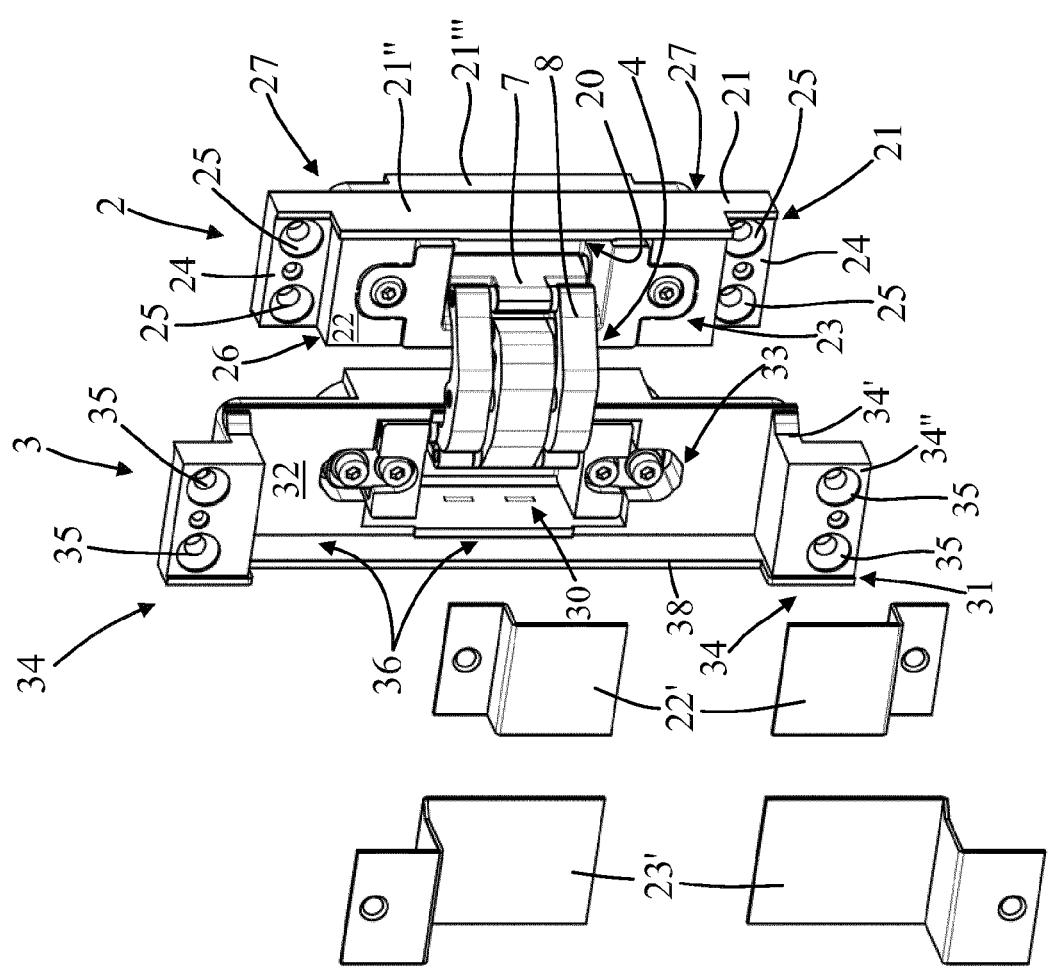
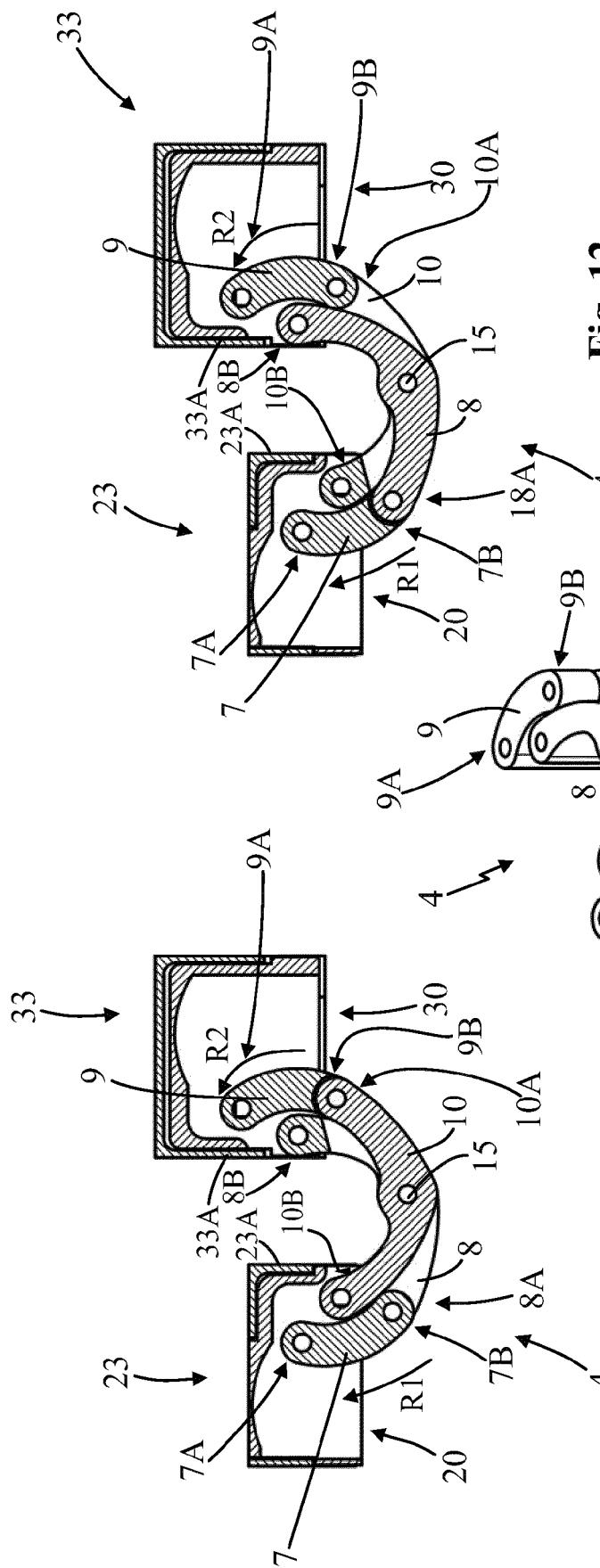


Fig. 9



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Fig. 12

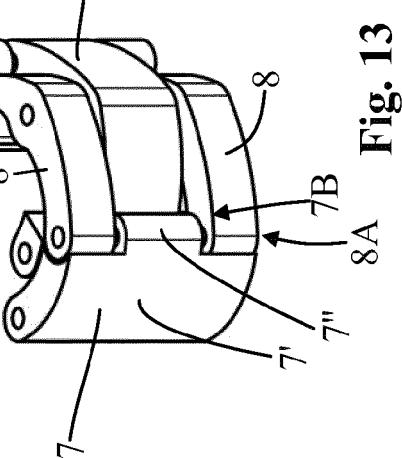


Fig. 13



EUROPEAN SEARCH REPORT

Application Number

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50 2	The present search report has been drawn up for all claims		
55	Place of search The Hague	Date of completion of the search 4 June 2019	Examiner Prieto, Daniel
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