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- **Dal Canton, Mario**
31044 Montebelluna (TV) (IT)
- **Dal Canton, Tiziano**
31040 Trevignano (TV) (IT)
- **Dalto, Dino**
31020 Vidor (TV) (IT)

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(74) Representative: **Modiano, Micaela Nadia et al**
Dr. Modiano & Associati SpA
Via Meravigli 16
20123 Milano (IT)

(71) Applicant: **GO S.R.L.**
33097 Spilimbergo (PN) (IT)

(72) Inventors:
• **Ceotto, Roberto**
33090 Sequals (PN) (IT)

(54) **Protective device particularly for guides of sectional doors**

(57) A protective device, particularly for guides of sectional doors (1) which comprise a frame provided with flat vertical and horizontal regions (8,9) which are covered by a curved region (10) for supporting at least one wheel (6) which is freely pivoted to a shaft (5) which is rigidly coupled to the sectional door and protrudes later-

ally thereto. The device is constituted by at least one shell (37,43,44), which can be associated detachably by means of a first perimetric edge (50a) with the vertical, horizontal and curved regions of the guide, the other perimetric edge (51a) of the shell can be arranged adjacent to the shaft (5).

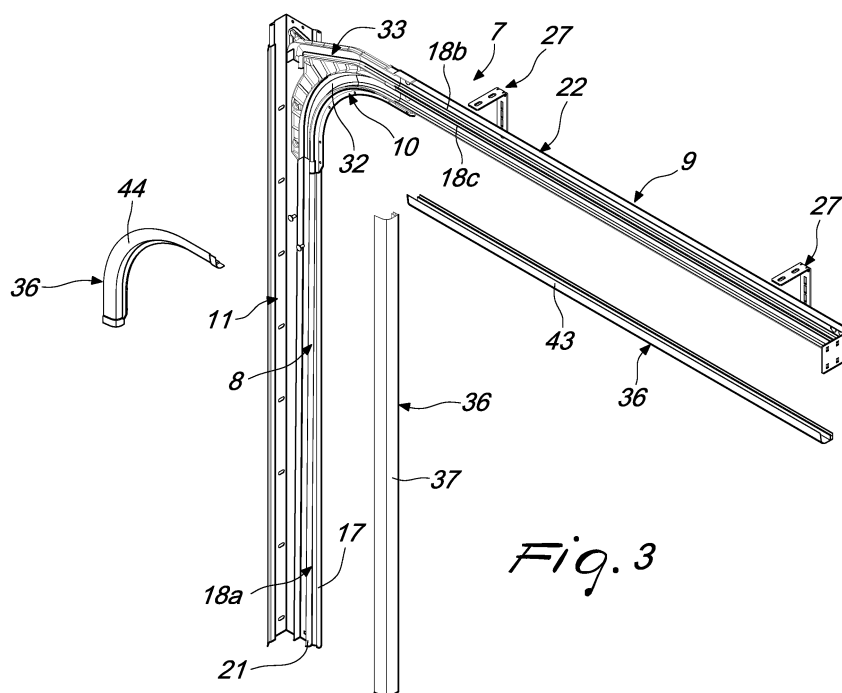


Fig. 3

Description

[0001] The present invention relates to a protective device particularly for guides of sectional doors.

[0002] Sectional doors are currently used which are constituted by a plurality of panels which have a typically rectangular plan shape and are rotatably connected to each other in pairs at a longitudinal end of said panels.

[0003] Shafts protrude approximately at right angles from the two transverse ends of the panels, and wheels are pivoted to the shafts; such wheels can slide in appropriately provided guides which are approximately shaped like an inverted letter L, so as to form a vertical flat region and a horizontal flat region blended by a curved region.

[0004] The three regions of the guide each comprise a support of a known type (shown in Figure 1), which has an approximately inverted L-shaped cross-section so as to form a first wing 201, which is substantially flat and arranged, during use, approximately parallel to the sectional door 202, and a second wing 203, which during use is arranged laterally to the door and approximately at right angles to the plane of arrangement of the door.

[0005] A profiled element 204 is fixed proximate to the free end of the second wing 203 and has an approximately J-shaped transverse cross-section; a head 205 is formed in said profiled element, is approximately flat and is arranged approximately at right angles to the second wing 203; a substantially flat stem 206 protrudes approximately at right angles from the end of the second wing which is contiguous to the second wing and is fixed to the second wing; said stem ends with an arc-shaped foot 207, which forms a rolling surface for the wheels 208 associated with the door.

[0006] By way of the sliding of the wheels 208 in the guides, the door can move from a closed position, in which all the panels are arranged vertically, at the vertical regions of the guides, to an open position, in which the panels are arranged horizontally at the horizontal region of the guides.

[0007] In order to reduce the risk that someone might accidentally insert his/her hands in the guides during the passage of the wheels, with the consequent danger of injury, it is known to fix to the transverse ends of the panels that constitute the door, at least proximate to the wheels, walls 209 which are made of flexible material, are arc-shaped, cover the wheel and partly the shaft that supports said wheel, being arranged so that their free end is adjacent to the foot of the profiled element.

[0008] However, these walls have a drawback; by being fixed to the panels of the door, during the opening and closure of the doors they are subjected to intense mechanical stresses both due to their friction against the guide and due to the fact that they are subjected to flexing during the passage of the respective panel along the curved portion of the guide.

[0009] These walls therefore tend to deteriorate with use, forcing their frequent replacement.

[0010] Another drawback of known types is that the application of the walls to the door is rather complicated and requires a long execution time.

[0011] The aim of the present invention is to solve the above mentioned problems, eliminating the drawbacks of the cited background art, by providing a protective device, particularly for guides of sectional doors, which allows to open and close the door in full safety for the people who are proximate to it.

[0012] Within this aim, an object of the invention is to provide a protective device particularly for guides of sectional doors which can be installed and removed very easily and quickly.

[0013] Another object is to provide a protective device which has a long lifespan.

[0014] Another object is to provide a protective device which is structurally simple and has low manufacturing costs.

[0015] This aim and these and other objects, which will become better apparent hereinafter, are achieved by a protective device, particularly for guides of sectional doors which comprise a frame provided with flat vertical and horizontal regions which are blended by a curved region for supporting at least one wheel which is freely pivoted to a shaft which is rigidly coupled to said sectional door and protrudes laterally thereto, characterized in that it is constituted by at least one shell, which can be associated detachably at a first perimetric edge with said vertical, horizontal and curved regions of said guide, the other perimetric edge being arrangeable adjacent to said shaft.

[0016] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a particular but not exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a partially sectional view of a known type of guide described earlier;

Figure 2 is a perspective view of a sectional door supported by two guides to which a device according to the invention is applied;

Figure 3 is an exploded perspective view of the device according to the invention;

Figure 4 is an exploded perspective view of the curved region of the guide and of the device according to the invention;

Figure 5 is a front view of one of the guides of Figure 2;

Figure 6 is a side view of the guide of Figure 5;

Figure 7 is a side view of the curved region of a guide to which the device according to the invention is applied;

Figure 8 is a sectional view, taken along the line VIII-VIII of Figure 5;

Figure 9 is a sectional view, taken along the line IX-IX of Figure 6;

Figure 10 is a sectional view, taken along the line X-

X of Figure 7;

Figure 11 is a view, taken along a transverse sectional plane, of the flat vertical region of a guide and of a device according to the invention before their mutual connection;

Figure 12 is a view, similar to Figure 11, of the flat horizontal region of the guide and of the device according to the invention.

[0017] In the exemplary embodiments that follow, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

[0018] Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0019] With reference to Figures 2 to 12, the reference numeral 1 designates a sectional door which is constituted by a plurality of panels 2 which have a substantially rectangular plan shape and are rotatably connected in pairs at a longitudinal end, for example by means of appropriately provided hinges of a known type, not shown in the accompanying figures.

[0020] Appropriately provided supporting elements 4 of a known type are associated with the transverse ends 3 of the panels 2, and at least one and preferably a plurality of shafts 5 protrude from said supporting elements approximately at right angles to the transverse ends 3; at least one and preferably a plurality of wheels 6 are pivoted to said shafts so that they can rotate freely and are supported slidingly in appropriately provided guides 7.

[0021] The guides 7 comprise a frame with vertical flat regions 8 and horizontal flat regions 9, blended by a curved region 10, so as to form for such frame an approximately inverted L-shaped configuration.

[0022] Advantageously, the vertical flat regions 8 comprise a first support 11, which in transverse cross-section is approximately inverted L-shaped, so as to form a first wing 12, which is substantially flat and arranged, during use, approximately parallel to the sectional door 1 and can be fixed, by way of known fixing means such as for example screws or wall plugs not shown in the accompanying figures, to a wall, also not shown, at the perimeter rim of an opening to be closed with the sectional door 1.

[0023] One end 13 of the first wing 12 is appropriately folded approximately into a U-shape so as to form a means for engagement with an appropriately provided gasket 14 of a known type, which is suitable to abut against the outer surface of the sectional door 1.

[0024] The first support 11 further comprises a second wing 15, which is approximately perpendicular to the first wing 12 and is arranged during use laterally to the sectional door 1; a first inclined portion 16, which ends with a first preferably U-shaped free end 17, protrudes externally from the lower end of the second wing 15.

[0025] A profiled element 18a is associated for example by welding with the lateral surface of the second wing 15 which is directed toward the wheel 6; in a transverse cross-section, the profiled element 18a is approximately J-shaped and has a head 19, which is approximately flat and arranged approximately at right angles to the second wing 15; a substantially flat stem 20 protrudes approximately at right angles from the end of said head which is contiguous to the second wing 15; the stem 20 is fixed to the second wing 15 and ends with an arc-like foot 21 which forms a rolling surface for the wheels 6 which are associated with the sectional door 1.

[0026] The horizontal flat regions 9 of the guide 7 comprise advantageously a second support 22, which is similar to the first support 11 and therefore has an approximately inverted L-shaped transverse cross-section, so as to form a third wing 23, which is substantially flat and arranged, during use, approximately horizontally; a fourth wing 24 protrudes approximately at right angles from the third wing 23, and a second inclined portion 25, preferably similar to the first inclined portion 16, protrudes externally from the end of the fourth wing 24; said second inclined portion ends with a second free end 26, which is advantageously approximately U-shaped and is identical to the first free end 17 of the vertical flat regions 8.

[0027] Advantageously, a plurality of brackets 27, for example shaped like an inverted letter L, are associated with the fourth wing 24, for example by bolting, and are adapted to fix the guide 1 for example to a wall or ceiling, not shown in the accompanying figures.

[0028] Two other profiled elements 18b and 18c are associated with the second support 22, are arranged one above the other and form, with the respective feet 21, two rolling surfaces for the wheels 6 which are substantially mutually parallel; the wheel 6 arranged at the upper end of the panel of the sectional door 1 arranged in the upper position, designated by the reference numeral 2a, is associated with the profiled element 18b of the horizontal flat region 9 which is arranged upward.

[0029] The vertical flat region 8 and the horizontal flat region 9 are blended by a curved region 10, which is constituted preferably by a half-shell 28 which is approximately inverted L-shaped in plan view so as to form a first substantially vertical arm 29, which can be blended to the vertical flat region 8, and a second arm 30, which is approximately horizontal and can be blended with the horizontal flat region 9; the first and second arms are blended by a curved portion 31.

[0030] A first seat 32 is formed on the internal surface of the half-shell 28 along the entire length of the half-shell 28, and has a transverse cross-section which is substantially similar to the profiled elements 18a and 18c; the first seat 32 is in fact arranged so as to be contiguous, at the first arm 29, to the profiled element 18a of the vertical flat region 8 and, at the second arm 30, to the profiled element 18c of the horizontal flat region 9, so as to achieve continuity for the sliding of the wheel 6.

[0031] The first seat 32 therefore is extended so as to

also affect the curved portion 31.

[0032] Advantageously, only on the second arm 30 of the half-shell 28 there is a second seat 33 which has a transverse cross-section which is substantially similar to the profiled element 18b: the second seat is arranged so as to be contiguous to the profiled element 18b of the horizontal flat region 9 and lies, at the curved region 10, preferably along an axis which is inclined and curved downward toward the first arm 29.

[0033] Advantageously, a plurality of through holes 35 are formed proximate to one end 34 of the half-shell 28.

[0034] A protective device 36 is associated with the guide 7 and is constituted by at least one shell, which can be associated at a first perimetric edge detachably to said vertical, horizontal and curved regions of the guide 7, its other perimetric edge being arrangeable adjacent to the shaft 5.

[0035] The protective device 36 further comprises advantageously at least one first shell 37, which is extended longitudinally along a substantially rectilinear axis and can be associated with the vertical flat region 8; the first shell 37 has an approximately inverted L-shaped transverse cross-section, so as to form a first approximately flat branch 38a, which can be associated detachably, at a first perimetric edge 50a thereof, with the first free end 17 of the first support 11 by way of first removable fixing means.

[0036] Advantageously, the first removable fixing means comprise two tabs, designated respectively by the reference numerals 39a and 49a, which protrude approximately at right angles from the first branch 38a and between which there is a seat 40a which can accommodate, preferably by snap action, the first free end 17 of the vertical flat region 8.

[0037] A tooth 41a protrudes approximately at right angles and toward the tab 39a from the end of the tab 49a and is suitable to abut against the first free end 17 of the first inclined portion 16 which protrudes from the second wing 15.

[0038] The first shell 37 further comprises a second arc-like branch 42a, whose other perimetric edge 51a is arranged adjacent to the shaft 5 which supports the wheel 6 which can engage in the guide 7.

[0039] The protective device 36 further comprises at least one second shell 43, which can be associated with the horizontal flat region 9, is shaped like the first shell 37 and therefore has a first approximately flat branch 38b, which can be associated detachably, at a first perimetric edge 50b thereof, with the second free end 26 of the second support 22 by way of first removable fixing means.

[0040] Advantageously, the first removable fixing means comprise two tabs, respectively designated by the reference numerals 39b and 49b, which protrude approximately at right angles from the first branch 38b and between which there is a seat 40b in which it is possible to accommodate, preferably by snap action, the second free end 26 of the horizontal flat region 9.

[0041] A tooth 41b, suitable to abut against the second free end 26, protrudes approximately at right angles and at the tab 39b from the end of the tab 49b.

[0042] The second shell 43 further comprises a second arc-like branch 42b, whose other perimetric edge 51b is arranged adjacent to the shaft 5 which supports the wheel 6 which can engage in the guide 7.

[0043] Advantageously, the protective device 36 further comprises at least one third shell 44, which has an arc-like profile which follows the shape of the end 34 of the curved region 10.

[0044] The third shell 44 has an approximately L-shaped transverse cross-section, so as to form a third branch 45 which can be associated with the half-shell 28 proximate to the end 34 thereof by way of second removable fixing means, which preferably comprise pins 46 which can be fixed detachably within the holes 35.

[0045] The third shell 44 has a fourth arc-like branch 47 which is arranged, during use, so that its first perimetric edge 51c is adjacent to the shaft 5 which supports the wheel 6 which can engage in the guide 7.

[0046] Advantageously, the ends of the third shell 44, designated by the reference numerals 48a and 48b, have a fin-like shape which must be arranged so as to surround partially and externally the contiguous ends of the first shell 37 and of the second shell 43 respectively.

[0047] Operation is therefore as follows: with reference to Figures 2 to 12, it is possible to associate with the horizontal and vertical flat regions of a guide 7 for a sectional door 1 respectively the first shell 37 and the second shell 43, fixing the first free end 17 and the second free end 26 of the horizontal and vertical flat regions in the seats 40a, 40b formed by the tabs which protrude from the first branches 38a, 38b of the first and second shells.

[0048] It is therefore possible to associate the third shell 44 with the curved region 10 by inserting the pins 46 in the holes 35; the ends 48a and 48b of the third shell 44 are arranged above and adjacent to the contiguous ends respectively of the first shell 37 and of the second shell 43.

[0049] Likewise, it is then possible to separate the various shells from the guide 7.

[0050] The wheels 6 and the shafts 5 which support them are therefore almost completely concealed by the first, second and third shells of the protective device 36, thus allowing to move the sectional door 1 without the danger that someone might insert for example a hand in the guide 7.

[0051] It has thus been found that the invention has achieved the intended aim and objects, a protective device particularly for guides of sectional doors having been provided which, by concealing the shafts and the wheels associated with the door, allows to open and close said door in conditions of full safety for the people who are in the vicinity of said door.

[0052] Further, the protective device according to the invention, by way of the first and second removable fixing means described earlier, can be installed and removed

from the guide very easily and rapidly.

[0053] Moreover, the device according to the invention, by not being subject to movements or friction during use, has a long lifespan.

[0054] Further, the production costs of the device according to the invention remain low, since it is provided exclusively by means of components which are easy to manufacture and/or assemble.

[0055] The invention is of course susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0056] The materials used, as well as the dimensions that constitute the individual components of the invention, may of course be more pertinent according to specific requirements.

[0057] The various means for performing certain different functions need not certainly coexist only in the illustrated embodiment but can be present per se in many embodiments, including ones that are not illustrated.

[0058] The characteristics indicated as advantageously, convenient or the like can also be omitted or be replaced with equivalents.

[0059] The disclosures in Italian Utility Model Application No. TV2006U000012 from which this application claims priority are incorporated herein by reference.

[0060] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A protective device, particularly for guides of sectional doors comprising a frame provided with flat vertical and horizontal regions which are blended by a curved region for supporting at least one wheel which is freely pivoted to a shaft which is rigidly coupled to said sectional door and protrudes laterally thereto, **characterized in that** it is constituted by at least one shell, which can be associated detachably at a first perimetric edge with said vertical, horizontal and curved regions of said guide, the other perimetric edge being arrangeable adjacent to said shaft.
2. The device according to claim 1, **characterized in that** said vertical flat regions comprise a first support, which has an approximately inverted L-shaped transverse cross-section so as to form a first substantially flat wing and a second wing which is approximately perpendicular to said first wing, a first inclined portion protruding outward from the lower end of said second wing and ending with a first free end which is preferably approximately U-shaped.

3. The device according to claims 1 and 2, **characterized in that** said at least one shell, which can be associated with said vertical flat region, lies longitudinally along a substantially rectilinear axis and has an approximately inverted L-shaped transverse cross-section, so as to form a first approximately flat branch, which can be associated with a first perimetric edge thereof detachably and at said first free end of said first support by way of first removable fixing means.
4. The device according to claims 1 and 3, **characterized in that** said first removable fixing means are constituted by two tabs which protrude approximately at right angles from said first perimetric edge and between which a seat is formed in which said first free end of said first support can be accommodated preferably by snap action.
5. The device according to claims 1 and 4, **characterized in that** a tooth protrudes approximately at right angles from the end of one of said tabs toward the other of said tabs and is suitable to abut against said first free end of said first inclined portion which protrudes from said second wing.
6. The device according to one or more of the preceding claims, **characterized in that** said shell comprises a second arc-like branch which is arranged during use so that the other perimetric edge is adjacent to said shaft which supports said wheel.
7. The device according to one or more of the preceding claims, **characterized in that** said horizontal flat regions comprise a second support, which is similar to said first support and therefore has an approximately inverted L-shaped transverse cross-section, so as to form a third substantially flat wing from which a fourth wing protrudes approximately at right angles, a second inclined portion protruding externally from the end of said fourth wing and ending with a second free end which is shaped like an inverted letter U.
8. The device according to claims 1 and 7, **characterized in that** it comprises at least one further shell, which can be associated with said horizontal flat region, is shaped like said shell and has a first approximately flat arm, which can be associated detachably and at a first perimetric edge thereof with said second free end of said second support by way of first removable fixing means.
9. The device according to claims 1 and 8, **characterized in that** said first removable fixing means are constituted by two tabs which protrude approximately at right angles from said first perimetric edge and between which there is a seat which can accommodate said second free end of said second support.

10. The device according to claims 1 and 9, **characterized in that** a tooth protrudes from the end of one of said tabs approximately at right angles and toward the other of said tabs and is adapted to abut against said second free end of said second inclined portion which protrudes from said fourth wing. 5
11. The device according to one or more of the preceding claims, **characterized in that** said second shell comprises a second arc-like branch, which is arranged during use so that the other perimetric edge is adjacent to said shaft which supports said wheel. 10
12. The device according to one or more of the preceding claims, **characterized in that** said curved region is constituted by a half-shell which is approximately inverted L-shaped in plan view so as to form a first substantially vertical arm, which can be blended with said first vertical flat region, and a second approximately horizontal arm, which can be blended with said horizontal flat region, said first and second arms being blended by a curved portion, a plurality of through holes being provided proximate to the end of said half-shell. 15
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13. The device according to claims 1 and 12, **characterized in that** it comprises at least one still further shell, which has an arc-like profile which follows the shape of said end of said curved region. 30
14. The device according to claims 1 and 13, **characterized in that** said third shell has an approximately L-shaped transverse cross-section so as to form a third branch which can be associated with said half-shell proximate to said end thereof by way of second removable fixing means. 35
15. The device according to claims 1 and 14, **characterized in that** said second removable fixing means comprise pins which can be fixed detachably in said holes formed in said end of said half-shell. 40
16. The device according to one or more of the preceding claims, **characterized in that** said still further shell has a fourth arc-like branch which is arranged during use so that its first perimetric edge is adjacent to said shaft which supports said wheel. 45
17. The device according to one or more of the preceding claims, **characterized in that** the ends of said still further shell have a fin-like shape, which is to be arranged so as to partially and externally surround the contiguous ends of said shell and said further shell respectively. 50
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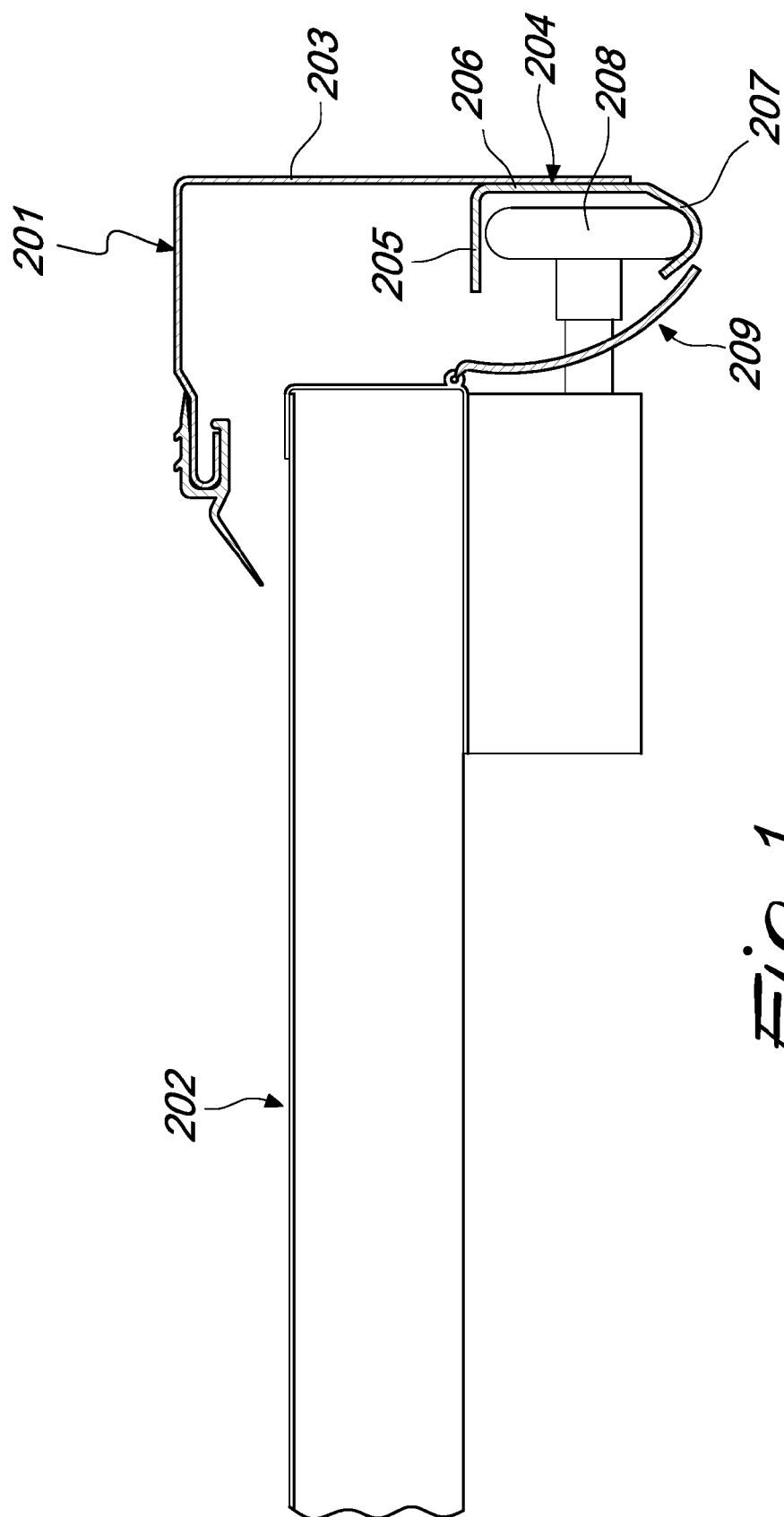


Fig. 1

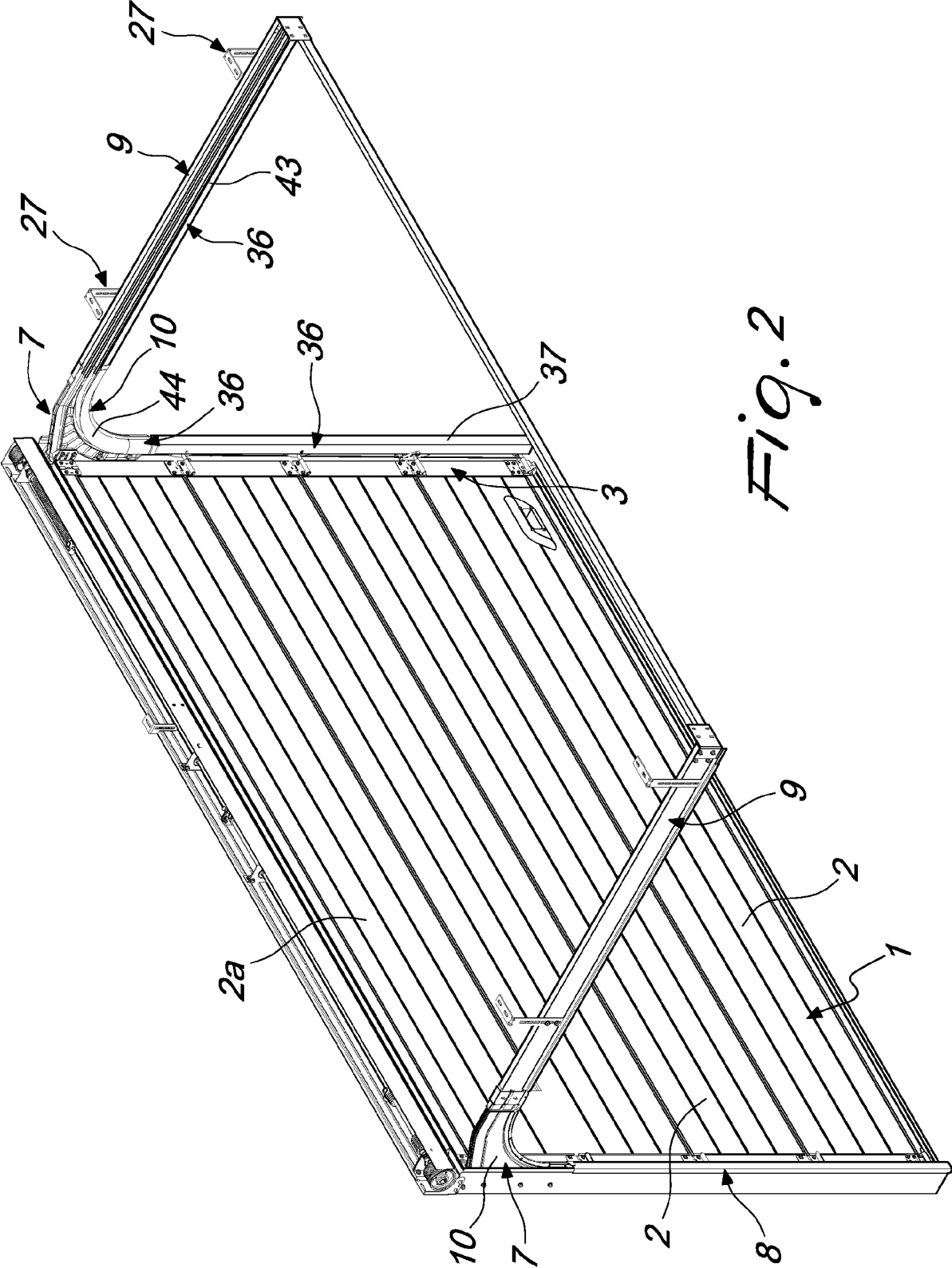
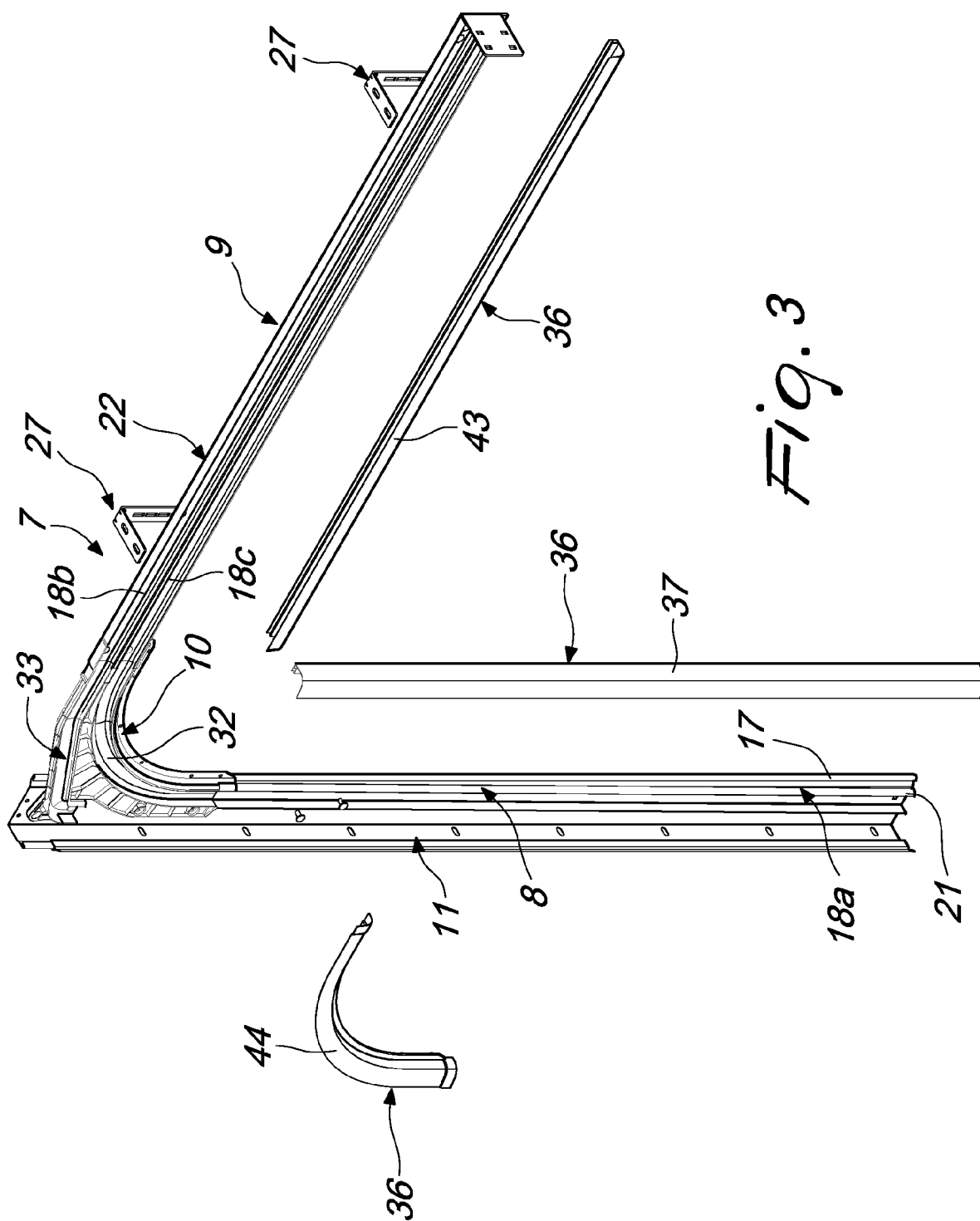


Fig. 2



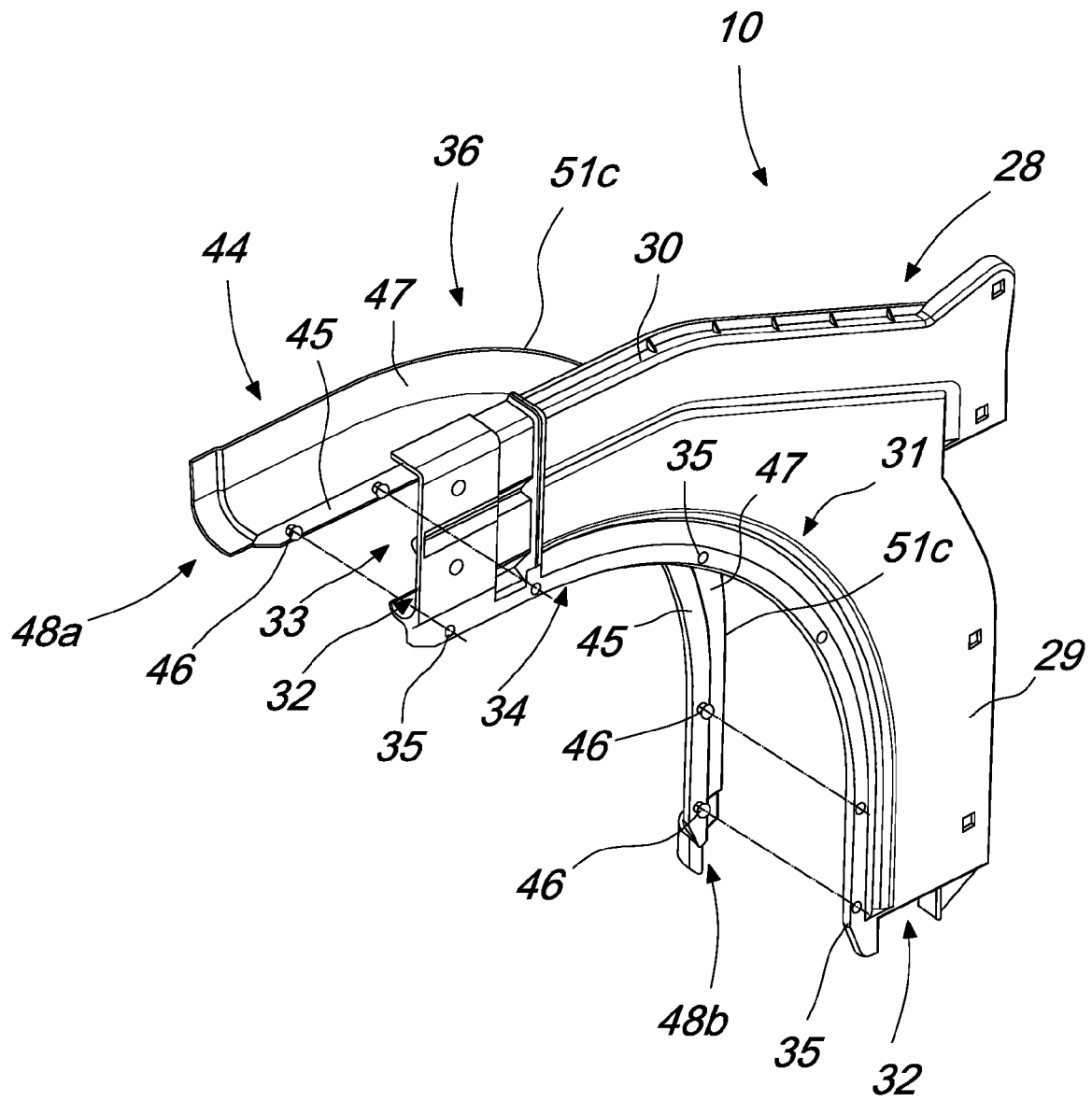
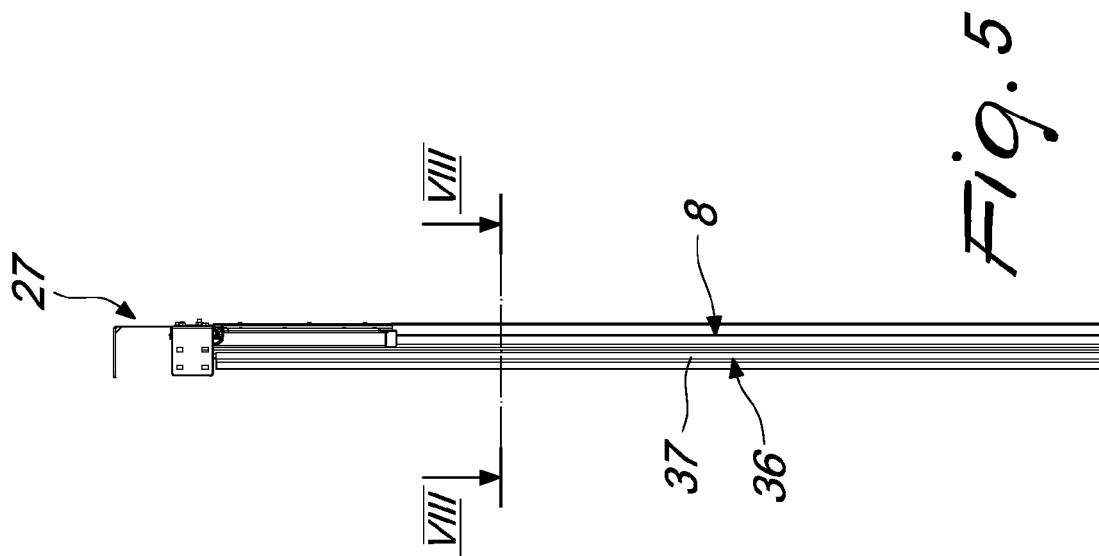
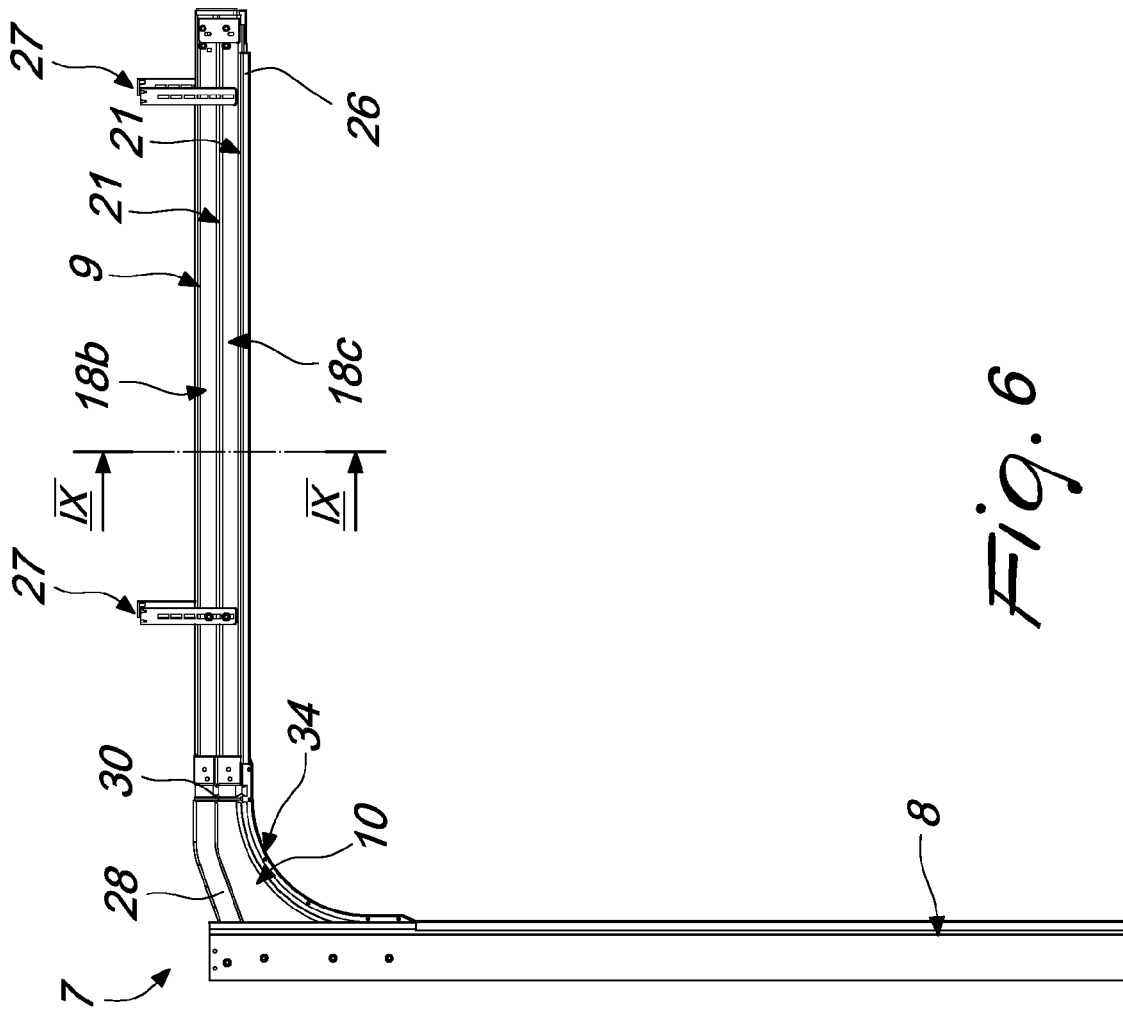
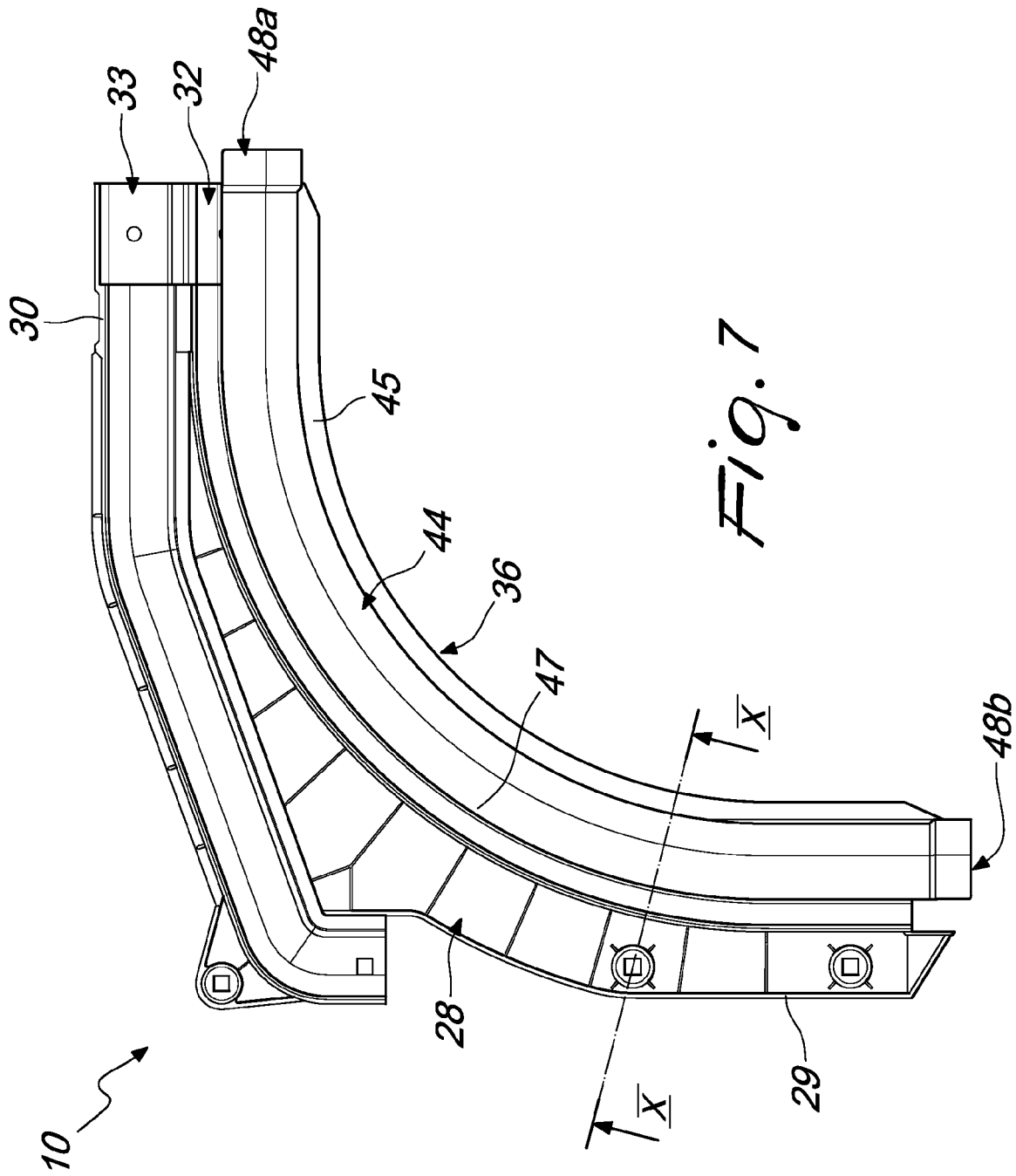


Fig. 4





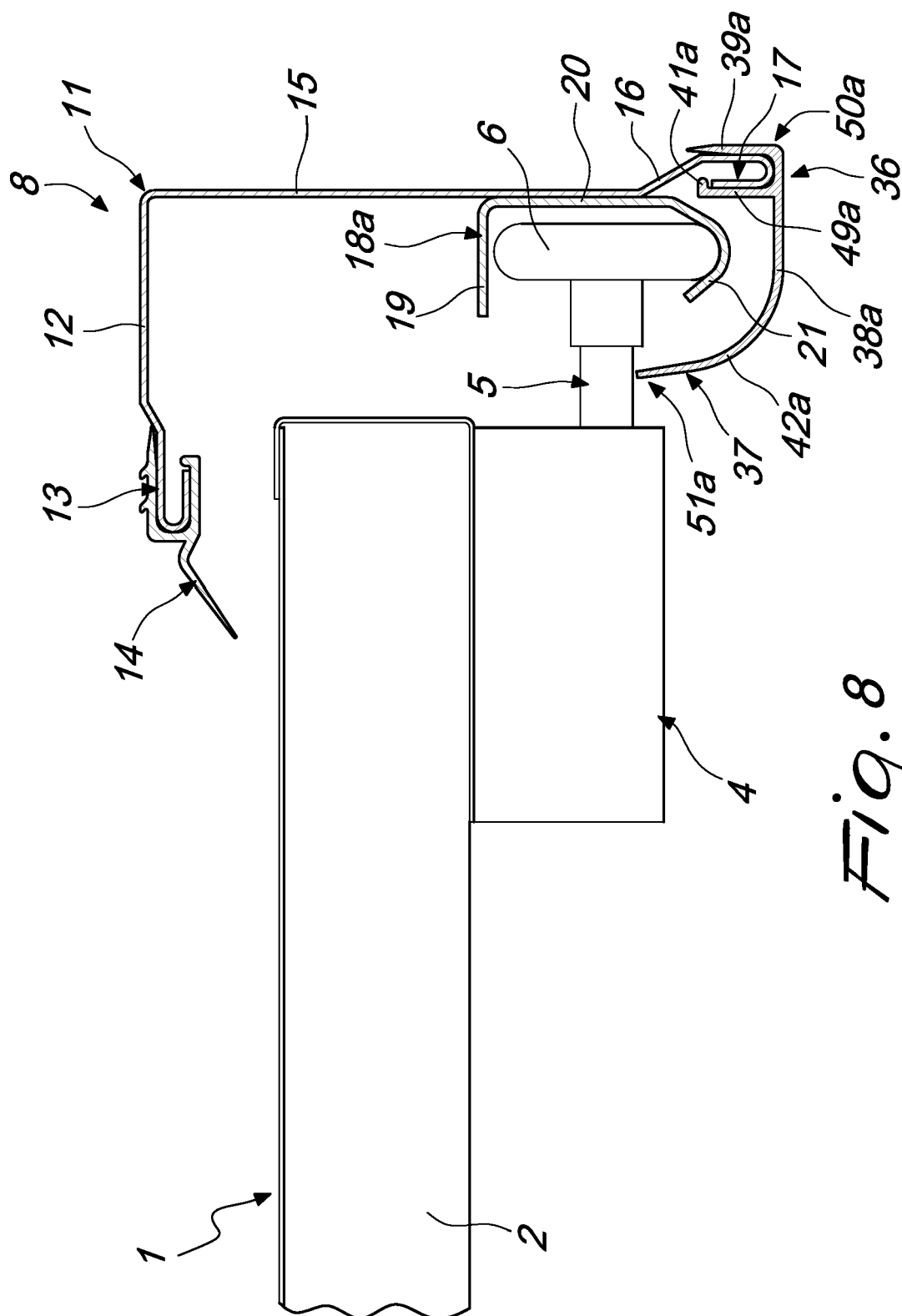
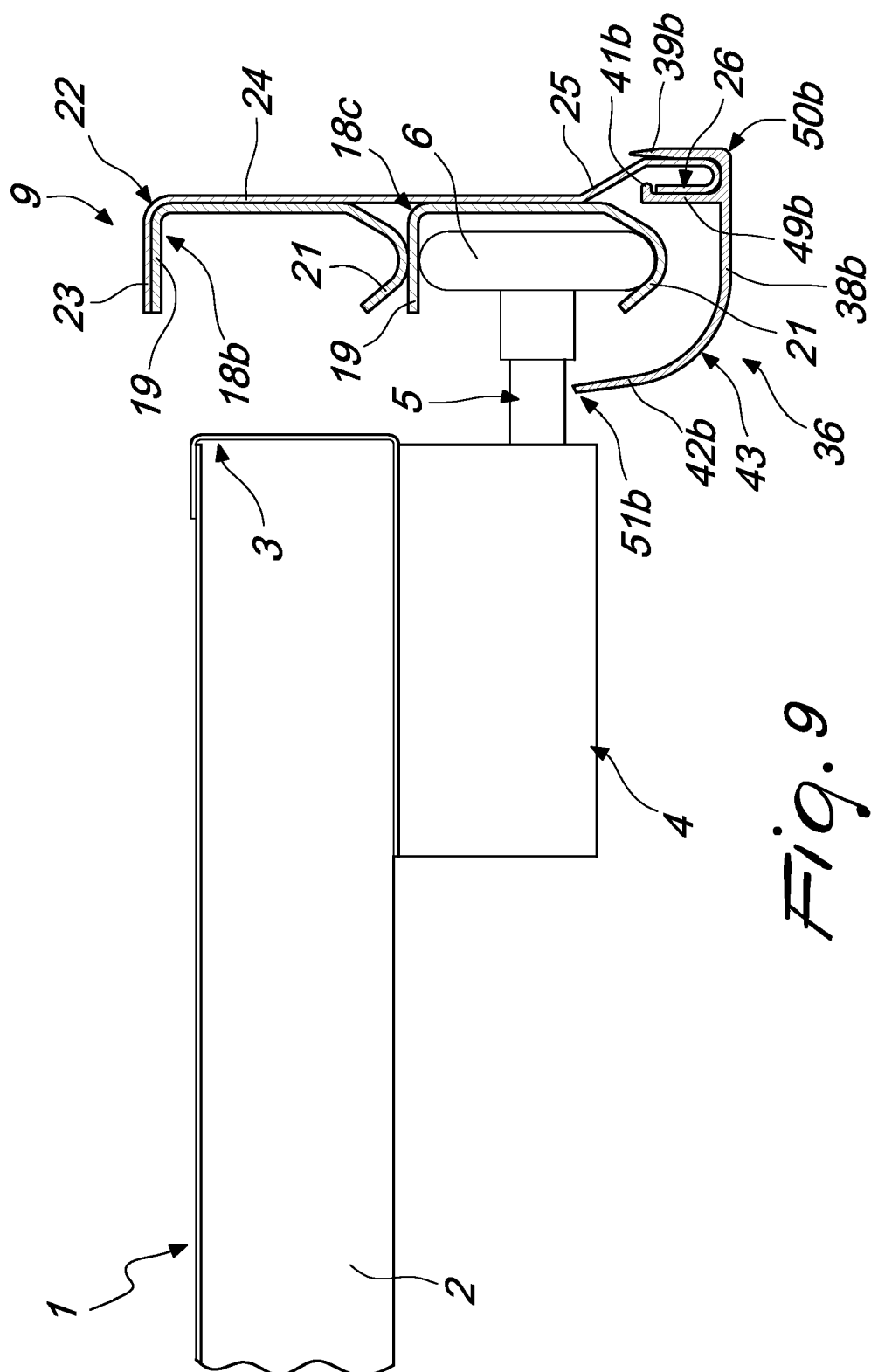


Fig. 8



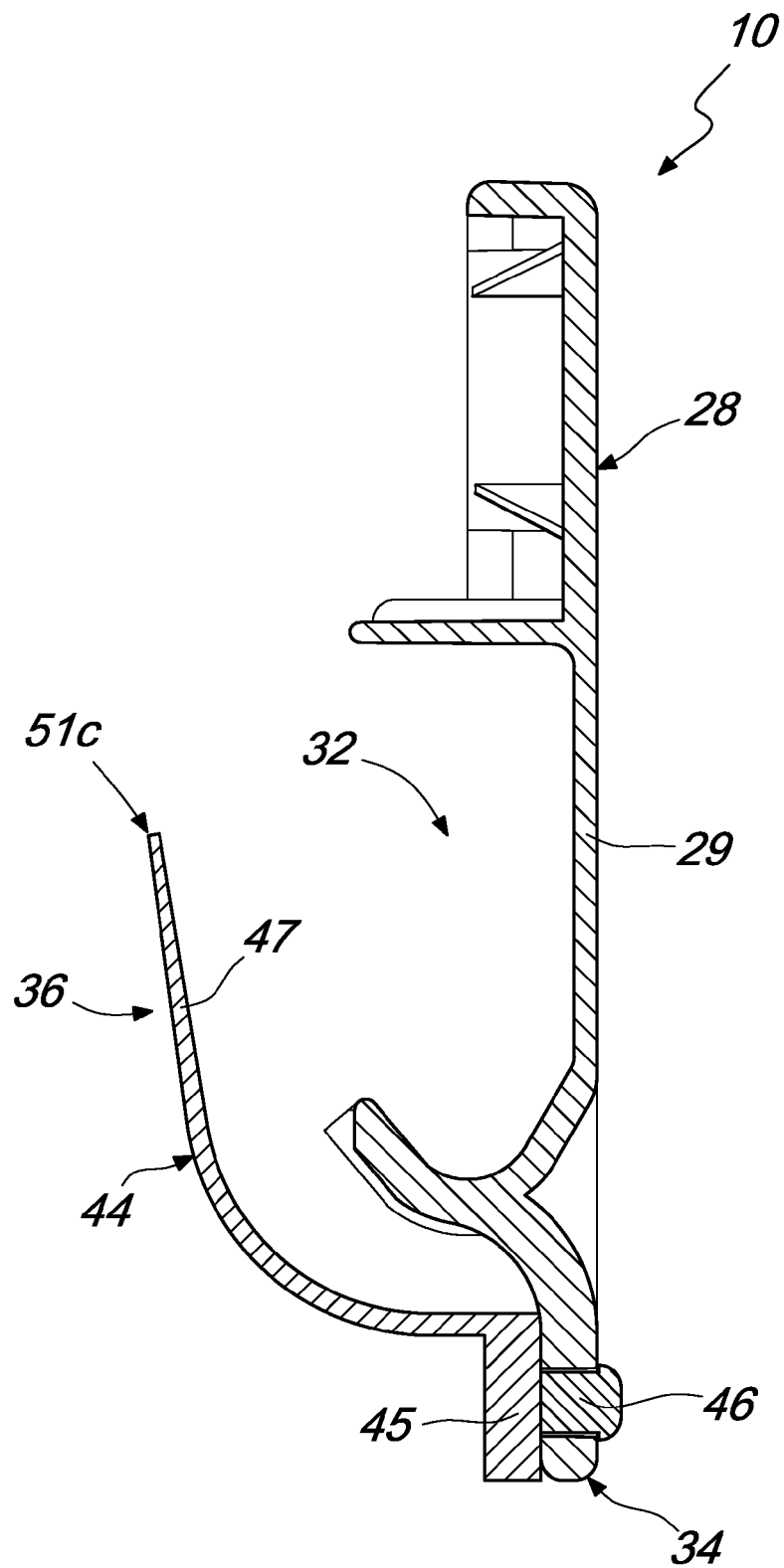
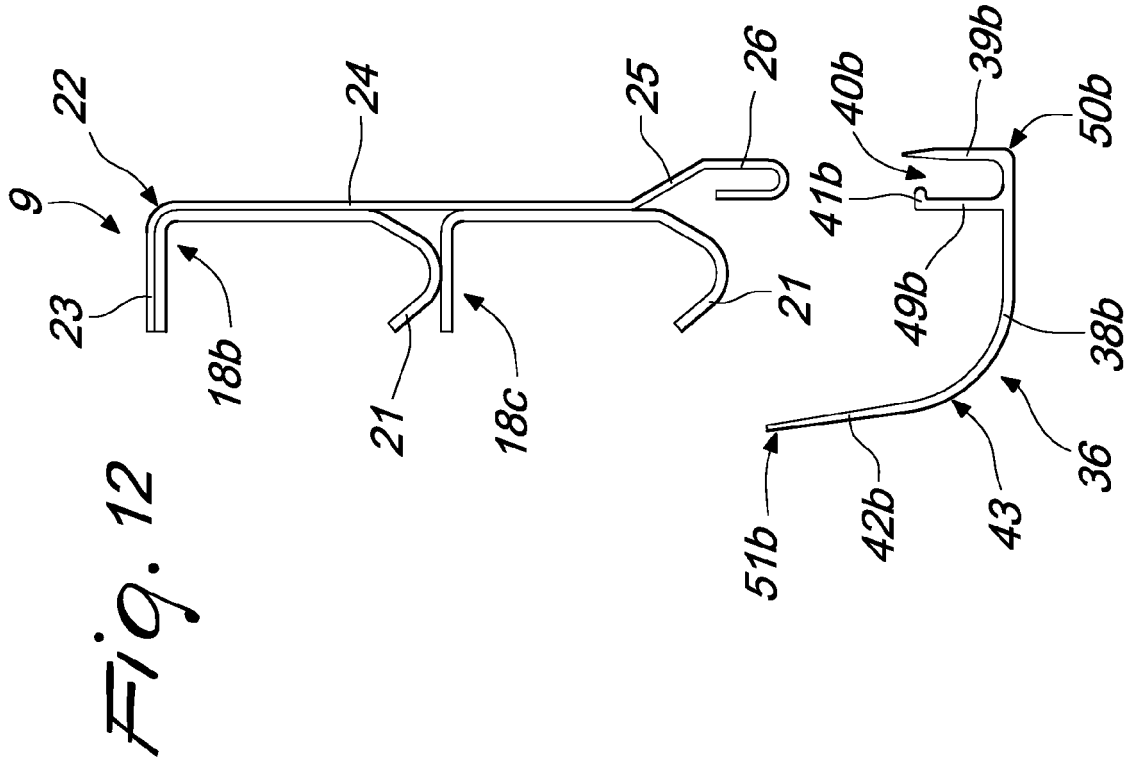
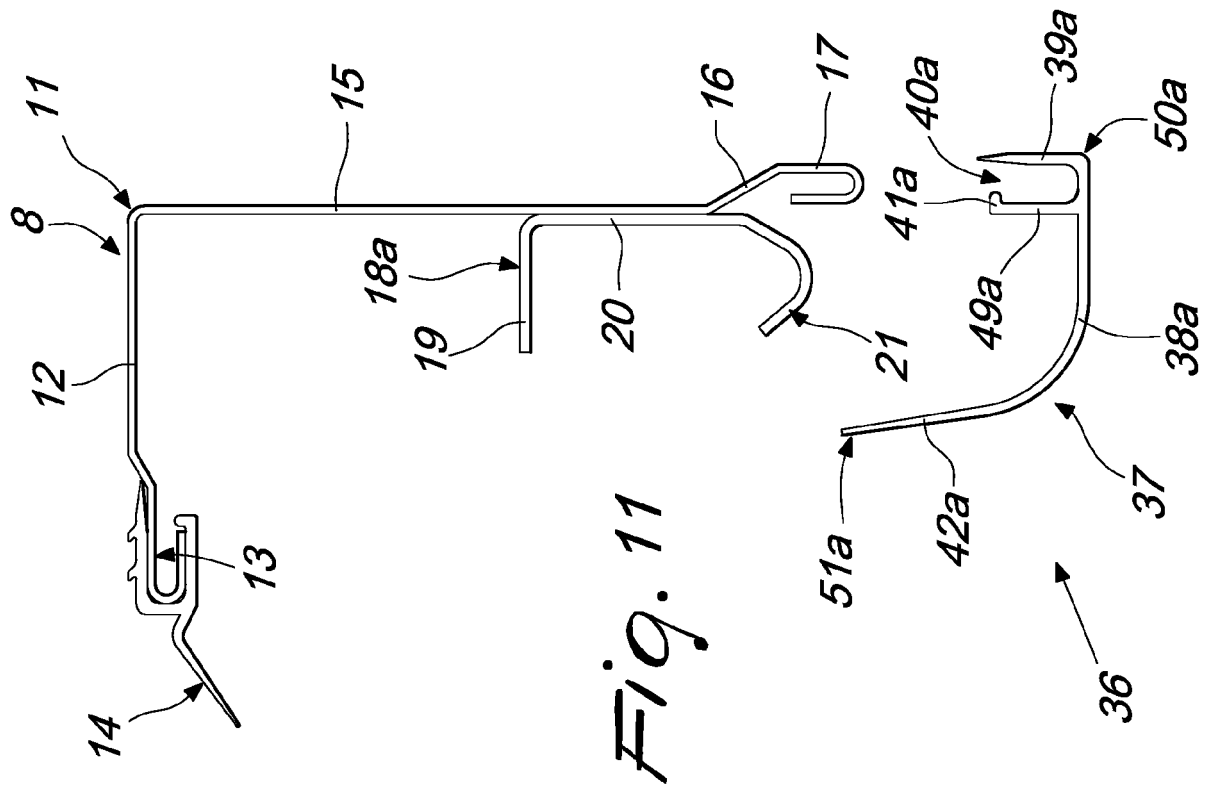


Fig. 10



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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