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(54) **GARMENT STEAMER WITH AN IRONING BOARD AND A MECHANISM FOR SETTING THE ROTATION ANGLE OF THE IRONING BOARD**

(57) The invention relates to a garment steamer for treating a garment. The garment steamer comprises a base, a pole assembly extending along a substantially vertical axis (YY). The pole assembly comprises a first pole and a second pole (102b). The garment steamer also comprises an ironing board (103) for supporting the garment during treatment, a coupling element (104) for coupling the ironing board (103) and the pole assembly. The coupling element (104) is adapted to allow a rotation of the ironing board (103) compared to the pole assembly (102) around a first axis (AI) being substantially perpendicular to said vertical axis (YY). The garment steamer (100) also comprises a mechanism for setting the rotation angle (AA) of the ironing board (103) around the first axis (AI). The mechanism comprises a lever (106) coupled to the ironing board (103) via a pivot coupling (107) rotating around a second axis (A2) parallel to said first axis (AI). The lever (106) comprises a plurality of grooves (GI, G2) adapted to cooperate with a stud element (109) protruding from anyone of said first pole and said second pole (102b).

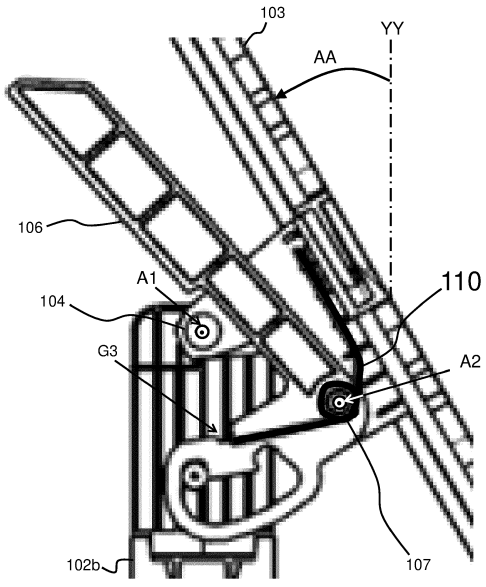

FIG.4B

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Description

FIELD OF THE INVENTION

[0001] The invention relates to a garment steamer with an ironing board and a mechanism for setting the rotation angle of the ironing board.

[0002] The invention may be used in the field of garment care.

BACKGROUND OF THE INVENTION

[0003] It is known from the state of the art some stand garment steamers with a pole assembly to which an ironing board is attached. The ironing board is used to create a back support for the garments being steamed.

[0004] However, in those known devices, the ironing board is attached vertically, which may create some inconveniences when using is steaming a garment against the ironing board.

OBJECT AND SUMMARY OF THE INVENTION

[0005] It is an object of the invention to propose an improved garment steamer for treating a garment that avoids or mitigates above-mentioned problems.

[0006] The invention is defined by the independent claims. The dependent claims define advantageous embodiments.

[0007] To this end, the garment steamer according to the invention comprises:

- a base,
- a pole assembly extending along a substantially vertical axis from the base, the pole assembly comprising a first pole and a second pole,
- an ironing board for supporting the garment during treatment,
- a coupling element for coupling the ironing board and the pole assembly, the coupling element being adapted to allow a rotation of the ironing board compared to the pole assembly around a first axis being substantially perpendicular to the vertical axis,
- a mechanism for setting the rotation angle of the ironing board around the first axis, the mechanism comprising a lever coupled to the ironing board via a pivot coupling rotating around a second axis parallel to the first axis, the lever comprising a plurality of grooves adapted to cooperate with a stud element protruding from anyone of the first pole and the second pole.

[0008] With this tilting mechanism, user just needs to actuate the lever with one hand to unlock the board, and rotates the board with the same hand to the tilted position, then releases the lever to lock the board in position.

[0009] This solution provides a one-hand operation board tilting mechanism where user can conveniently adjust the board angle with a single hand, with a firm locking mechanism.

[0010] Also, the advantage of having the grooves arranged in the lever is that the pole assembly can be more compact because the mechanism can be kept within the small width of the pole assembly.

[0011] Detailed explanations and other aspects of the invention will be given below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Particular aspects of the invention will now be explained with reference to the embodiments described hereinafter and considered in connection with the accompanying drawings, in which identical parts or sub-steps are designated in the same manner.

Fig.1A depicts a front view of a garment steamer according to the invention,
Fig.1B depicts a side view of Fig.1A,
Fig.2A depicts a partial rear view of a garment steamer according to the invention,
Fig.2B depicts a zoomed-in view of Fig.2A,
Fig.3A depicts a first embodiment of a lever used in a garment steamer according to the invention,
Fig.3B depicts a second embodiment of a lever used in a garment steamer according to the invention,
Fig.3C depicts a third embodiment of a lever used in a garment steamer according to the invention,
Fig.4A depicts a partial view of a garment steamer according to the invention, with an ironing board extending vertically,
Fig.4B depicts a partial view of a garment steamer according to the invention, with an ironing board being inclined compared to a vertical direction,
Fig.5 depicts a partial view of a garment steamer according to the invention, with a focus on some specific parameters,
Fig.6A and Fig.6B depict partial views of a lever used in a garment steamer according to the invention, with a focus on some specific parameters,
Fig.7A depicts schematically a garment steamer according to the invention, with an ironing board extending vertically, with a lever in a locked position,
Fig.7B depicts schematically a garment steamer according to the invention, with an ironing board extending vertically, with a lever in an unlocked position,
Fig.7C depicts schematically a garment steamer according to the invention, with an ironing board during rotation, with a lever in an unlocked position,
Fig.7D depicts schematically a garment steamer according to the invention, with an ironing board being inclined compared to a vertical direction, with a lever in a locked position,
Fig.8A1 depicts a two-dimensional view of a garment steamer according to the invention, with an ironing board extending vertically, with a lever in a locked

position, Fig.8A2 depicts a zoomed-in view of Fig.8A1,

Fig.8B1 depicts a two-dimensional view of a garment steamer according to the invention, with an ironing board extending vertically, with a lever in an unlocked position, Fig.8B2 depicts a zoomed-in view of Fig.8B1,

Fig.8C1 depicts a two-dimensional view of a garment steamer according to the invention, with an ironing board during rotation, with a lever in an unlocked position, Fig.8C2 depicts a zoomed-in view of Fig.8C1,

Fig.8D1 depicts a two-dimensional view of a garment steamer according to the invention, with an ironing board being inclined compared to a vertical direction, with a lever in a locked position,

Fig.8D2 depicts a zoomed-in view of Fig.8D1,

Fig.9A depicts a three-dimensional view of a garment steamer according to the invention, with an ironing board extending vertically, with a lever in a locked position,

Fig.9B depicts a three-dimensional view of a garment steamer according to the invention, with an ironing board extending vertically, with a lever in an unlocked position,

Fig.9C depicts a three-dimensional view of a garment steamer according to the invention, with an ironing board during rotation, with a lever in an unlocked position,

Fig.9D depicts a three-dimensional view of a garment steamer according to the invention, with an ironing board being inclined compared to a vertical direction, with a lever in a locked position.

DETAILED DESCRIPTION OF THE INVENTION

[0013] Fig.1A depicts a front view of a garment steamer 100 according to the invention for treating a garment. Fig.1B depicts a side view of Fig.1A.

[0014] The garment steamer 100 comprises a base 101.

[0015] The garment steamer 100 also comprises a pole assembly 102 extending along a substantially vertical axis YY from the base 101. The pole assembly 102 comprises a first pole 102a and a second pole 102b.

[0016] The garment steamer 100 also comprises an ironing board 103 for supporting the garment during treatment.

[0017] The garment steamer 100 also comprises a coupling element 104 for coupling the ironing board 103 and the pole assembly 102. The coupling element 104 is adapted to allow a rotation of the ironing board 103 compared to the pole assembly 102 around a first axis A1 being substantially perpendicular to the vertical axis YY.

[0018] By "substantially perpendicular", it is meant a difference up to +/- 10 degrees compared to the vertical axis YY.

[0019] The garment steamer 100 also comprises a mechanism 105 for setting the rotation angle AA of the ironing board 103 around the first axis A1. The mechanism 105 comprises a lever 106 coupled to the ironing board 103 via a pivot coupling 107 rotating around a second axis A2 parallel to the first axis A1.

[0020] The lever 106 comprises a plurality of grooves 108 adapted to cooperate with a stud element 109 protruding from anyone of the first pole 102a and the second pole 102b.

[0021] The base 101 preferably contains a steam generator (not shown) and/or a water tank. The steam generator receives water from the water tank to generate steam. A hose cord 111 is connected to the base 101 to carry steam or water to a steamer head 112. The steamer head 112 is intended to apply steam over the garment being treated, using the ironing board 103 as a back support. A support 113 for the steamer head 112 is preferably arranged at an extremity of the ironing board 103.

[0022] For sake of clarity, the hose cord 111 and the steamer head 112 are only represented on Fig.1A.

[0023] In Fig.1A, the ironing board 103 extends vertically. In other words, the ironing board extends parallel to the substantially vertical axis YY.

[0024] The ironing board 103 is intended to be used as a back support for a garment during treatment with the steamer head 116.

[0025] Fig.2A depicts a partial rear view of a garment steamer according to the invention, while Fig.2B depicts a zoomed-in view of Fig.2A.

[0026] The stud element is fixed compared to the pole, attached to anyone of the two poles 102a/102b, as long as the lever 106 is arranged on the same side as the stud element.

[0027] The stub element is preferably cylindrically-shaped, and is for example fixed by screw (not whown) to the pole assembly.

[0028] The cooperation of the stud element 109 with one of the grooves, results in that the ironing board 103 takes different inclination angles AA around the first axis A1.

[0029] The lever 106 may take different shapes.

[0030] In the various drawings, the lever 106 which is represented comprises two grooves G1 and G2, meaning that the ironing board can take two different angular orientation around axis A1. However, a higher number of grooves could be considered similarly.

[0031] Fig.3A depicts a first embodiment of a lever 106 used in a garment steamer according to the invention. The lever 106 is overall rectangular. The grooves G1 and G2 are arranged in a bottom part of this rectangular shape.

[0032] Fig.3B depicts a second embodiment of a lever used in a garment steamer according to the invention. Fig.3B only differs from Fig.3A in that the lever 106 is shaped differently. The gorooves G1 and G2 are arranged are the same location as in Fig.3A compared to second axis A2. The lever 106 comprises an extended

arm (bended portion) where the grooves G1 and G2 are arranged. Compared to Fig.3A, this shape for the lever 106 is less bulky and is cost-saving.

[0033] Fig.3C depicts a third embodiment of a lever 106 used in a garment steamer according to the invention. The lever 106 comprises a hollow area HH. The plurality of grooves 108 are arranged along an inner periphery PP of the hollow area HH. Preferably, as illustrated, the hollow area is completely closed.

[0034] Preferably, as illustared, the inner periphery PP comprises a curved portion facing the plurality of grooves.

[0035] By "curved", it is meant a portion without angular portions to avoid the stud element bumping against some protruding parts inside the hollow area.
For example, the curved portion is a portion of a circle, an arch, or any curved portion.

[0036] In the embodiments previously depicted along with Fig.3A-3B-3C, the length of the lever 106 between the second axis A2 and the extremity of the lever held by user, is such as to create a sufficient momentum around the second axis A2 to easily rotating the ironing board. For example, this length of lever 106 is in the range [7;20] cm.

[0037] Fig.4A depicts a partial view of a garment steamer according to the invention, with an ironing board extending vertically.

[0038] Fig.4B depicts a partial view of a garment steamer according to the invention, with an ironing board being inclined compared to a vertical direction. In this example, the angle AA is 30 degrees.

[0039] In the embodiments previously depicted along with Fig.3A-3B-3C, the first groove G1 is arranged such that when the stud element 109 cooperates with the first groove G1, the ironing board 103 is substantially parallel to the vertical axis YY, as illustrated in Fig.4A.

[0040] In the embodiments previously depicted along with Fig.3A-3B-3C, the second groove G2 is arranged such that when the stud element 109 cooperates with the second groove G2, the ironing board 103 is rotated with an angle AA being in the range [10;90] degrees compared to the vertical axis YY, as illustrated in Fig.4B.

[0041] Seen from a projected vertical plan, the angle between segment A1-G1 and segment A1-G2 corresponds to the rotation angle of the ironing board between two successive positions, when the stud element matches successively with two successive grooves, such as G1 and G2.

[0042] Preferably, as illustrated in Fig.4B, the lever 106 is spring-loaded by a spring 110 arranged around the second axis A2.

[0043] The spring 110 creates a force momentum such that the grooves are exerting a force onto the stud element.

[0044] This spring 110 enhances the lock/unlock feeling before each change of angular position of the ironing board via user action on the lever 106.

[0045] Preferably, one extremity of the spring 110 cooperates with a third groove G3 arranged in the lever 106, so that the spring is better kept in position. Another extremity of the spring 110 is in contact with ironing board 103.

[0046] Fig.5 depicts a partial view of a garment steamer according to the invention, with a focus on some specific parameters.

[0047] Preferably, as illustrated in Fig.5, the projected distance d1 between the first axis A1 and the stud element 109, and the projected distance d2 between the first axis A1 and the second axis A2, have substantially the same value.

[0048] This enables a simple and more compact implementation.

[0049] By "substantially the same value", it is meant a difference up to +/- 10 % between those distances.

[0050] For example, d1=56 mm, and d2 = 60 mm
Preferably, the groves 108 are arranged along the perimeter of a circle with the first axis A1 as the center of the circle.

[0051] Preferably, as illustrated in Fig.5, the coupling element 104, the pivot coupling 107 and the stud element 109 are positioned relatively to each other such that the angle BB between:

- the projected segment between as first axis A1 and the stud element 109,
- the projected segment between the first axis A1 and the second axis A2, is in the range [15;55] degrees, when the ironing board extends parallel to the substantially vertical axis YY.

[0052] This angle BB is the consideration to place the pivot coupling 107 and the stud element 109, with the ironing board 103 in vertical position. In other words, the angle BB determines the size of the product.

[0053] If the angle BB is smaller than 15 degrees, the pivot coupling 107 and the stud element will clash each other, or they will be too small to have sufficient strength. If the angle is larger than 55 degrees, the pivot coupling 107 will be too much protruding towards the board, or the stud element will be shifted too far away beyond the boundary of the pole assembly opposite to ironing board direction, resulting in unreasonably bulky product.

[0054] Having angle BB in the range [15;55] degrees provides an optimal compromise.

[0055] Fig.6A and Fig.6B depicts partial views of a lever 106 used in a garment steamer according to the invention, with a focus on some specific parameters.

[0056] Preferably, at least one groove taken among the plurality of grooves 108 defines a concave area comprising two opposite walls W1/W2 intended to come into contact with the periphery of the stud element 109.

[0057] The principle of locking applies to both the first groove G1 and the second groove G2.

[0058] For sake of clarity, only the first groove G1 is represented.

[0059] Line A3 is defined as the line connecting the

center of pivot coupling 107, and the center of the stud element 109. The locking is characterized in:
The groove G1 (or G2) is having two opposing walls W1/W2 that come into contact with the circumference of the stud element 109. The contact points are the intersection points of line A3 and the circumference of the stud element 109.

[0060] This lock ensures that the ironing board cannot rotate about the first axis A1, unless the grooves and the stud element 109 are disengaged by rotating the lever about the second axis A2.

[0061] Preferably, the two opposite walls (W1, W2) extend parallel to each other. In other words, the walls W1/W2 are perpendicular to line A3 at those contact points.

[0062] Preferably, the walls W1/W2 extend beyond the contact points towards the lead in part of the lock (open end) at a length of > 0.1mm as illustrated in Fig.6A.

[0063] Preferably, as illustrated in Fig.6B, in order to facilitate the entry/exit of the stud element 109 into the groove G1/G2, each wall W1/W2 comprises a tapered angle of less than 10 degrees flaring out towards the open end, preferably in the range [5;10] degrees.

[0064] Preferably, as illustrated in Fig.6B, the depth of the groove to the point where its width is equal to the diameter of the stud element is larger than the radius of the stud such that the close end of the groove is having a gap preferably larger than 0.1mm with the circumference of the stud element, when the groove is fully engaged with the stud element. This help to ensure that a tight locking.

[0065] Fig.7A-7B-7C-7D depict schematically the main phases for tilting the ironing board from a vertical position to tilted position.

[0066] Fig.7A depicts schematically a garment steamer according to the invention, with an ironing board 103 extending vertically along vertical axis YY, with a lever 106 in a locked position. The first groove G1 engages with the stud element 109.

[0067] Fig.7B depicts schematically a garment steamer according to the invention, with an ironing board 103 extending vertically, with the lever 106 in an unlocked position. The lever 106 is pressed by user toward the ironing board 103 direction. The lever 106 is held in its pressed position.

[0068] Fig.7C depicts schematically a garment steamer according to the invention, with an ironing board 103 during rotation, with a lever in an unlocked position. User tilts the ironing board 103 together with the lever 106 forward, in order to adjust the tilt angle.

[0069] Fig.7D depicts schematically a garment steamer according to the invention, with an ironing board being inclined compared to a vertical direction, with a lever in a locked position. 4. The lever 106 is released, resulting in that the second groove G2 engages with the stud element 109.

[0070] The ironing board 103 is in the tilted position.

[0071] In order to return the ironing board from a tilted position to a vertical position, the reverse of above steps should be performed.

[0072] Fig.8A1-8B1-8C1-8D1 depicts successive two-dimensional views of a garment steamer according to the invention, and correspond to the views of Fig.7A-7B-7C-7D, respectively. The lever 106 which is implemented corresponds to the lever 106 as depicted in Fig.3C.

[0073] Fig.8A2-8B2-8C2-8D2 are zoomed-in views of Fig.8A1-8B1-8C1-8D1, respectively.

[0074] Fig.9A-9B-9C-9D depict successive three-dimensional views of a garment steamer according to the invention, and correspond to the views of Fig. Fig.8A1-8B1-8C1-8D1.

[0075] The above embodiments as described are only illustrative, and not intended to limit the technique approaches of the present invention. Although the present invention is described in details referring to the preferable embodiments, those skilled in the art will understand that the technique approaches of the present invention can be modified or equally displaced without departing from the protective scope of the claims of the present invention. In the claims, the word "comprising" does not exclude other elements or steps, and the indefinite article "a" or "an" does not exclude a plurality. Any reference signs in the claims should not be construed as limiting the scope.

Claims

1. A garment steamer (100) for treating a garment, the garment steamer (100) comprising:

   - a base (101),
   - a pole assembly (102) extending along a substantially vertical axis (YY) from the base (101), the pole assembly (102) comprising a first pole (102a) and a second pole (102b),
   - an ironing board (103) for supporting the garment during treatment,
   - a coupling element (104) for coupling the ironing board (103) and the pole assembly (102), the coupling element (104) being adapted to allow a rotation of the ironing board (103) compared to the pole assembly (102) around a first axis (A1) being substantially perpendicular to said vertical axis (YY),
   - a mechanism (105) for setting the rotation angle (AA) of the ironing board (103) around said first axis (A1), said mechanism (105) comprising a lever (106) coupled to the ironing board (103) via a pivot coupling (107) rotating around a second axis (A2) parallel to said first axis (A1), said lever (106) comprising a plurality of grooves (108) adapted to cooperate with a stud element (109) protruding from anyone of said first pole (102a) and said second pole (102b).

2. The garment steamer according to claim 1, wherein said plurality of grooves (108) comprises a first groove (G1) arranged such that when said stud element (109) cooperates with said first groove (G1), the ironing board (103) is substantially parallel to said vertical axis (YY).

3. The garment steamer according to claim 1 or 2, wherein said plurality of grooves (108) comprises a second groove (G2) arranged such that when said stud element (109) cooperates with said second groove (G2), the ironing board (103) is rotated with an angle (AA) being in the range [10;90] degrees compared to said vertical axis (YY).

4. The garment steamer according to any one of the preceding claims, wherein said lever (106) is spring-loaded by a spring (110) arranged around said second axis (A2).

5. The garment steamer according to any one of the preceding claims, wherein: the projected distance (d1) between the first axis (A1) and the stud element (109), and the projected distance (d2) between the first axis (A1) and the second axis (A2), have substantially the same value.

6. The garment steamer according to any one of the preceding claims, wherein the coupling element (104), the pivot coupling (107) and the stud element (109) are positioned relatively to each other such that the angle (BB) between:

- the projected segment between as first axis (A1) and the stud element (109),
- the projected segment between the first axis (A1) and the second axis (A2), is in the range [15;55] degrees, when the ironing board extends parallel to said substantially vertical axis (YY).

7. The garment steamer according to claim 1, wherein said lever (106) comprises a hollow area (HH), said plurality of grooves (108) being arranged along an inner periphery (PP) of said hollow area (HH).

8. The garment steamer according to claim 7, wherein said inner periphery (PP) comprises a curved portion facing said plurality of grooves.

9. The garment steamer according to any one of the preceding claims, wherein said stud element (109) is cylindrically-shaped.

10. The garment steamer according to claim 9, wherein at least one groove taken among said plurality of grooves (108) defines a concave area comprising two opposite walls (W1, W2) intended to come into contact with the periphery of said stud element (109).

11. The garment steamer according to claim 10, wherein said two opposite walls (W1, W2) extend parallel to each other.

12. The garment steamer according to claim 11, wherein said two opposite walls (W1, W2) are tapered with an angle of less than 10 degrees.

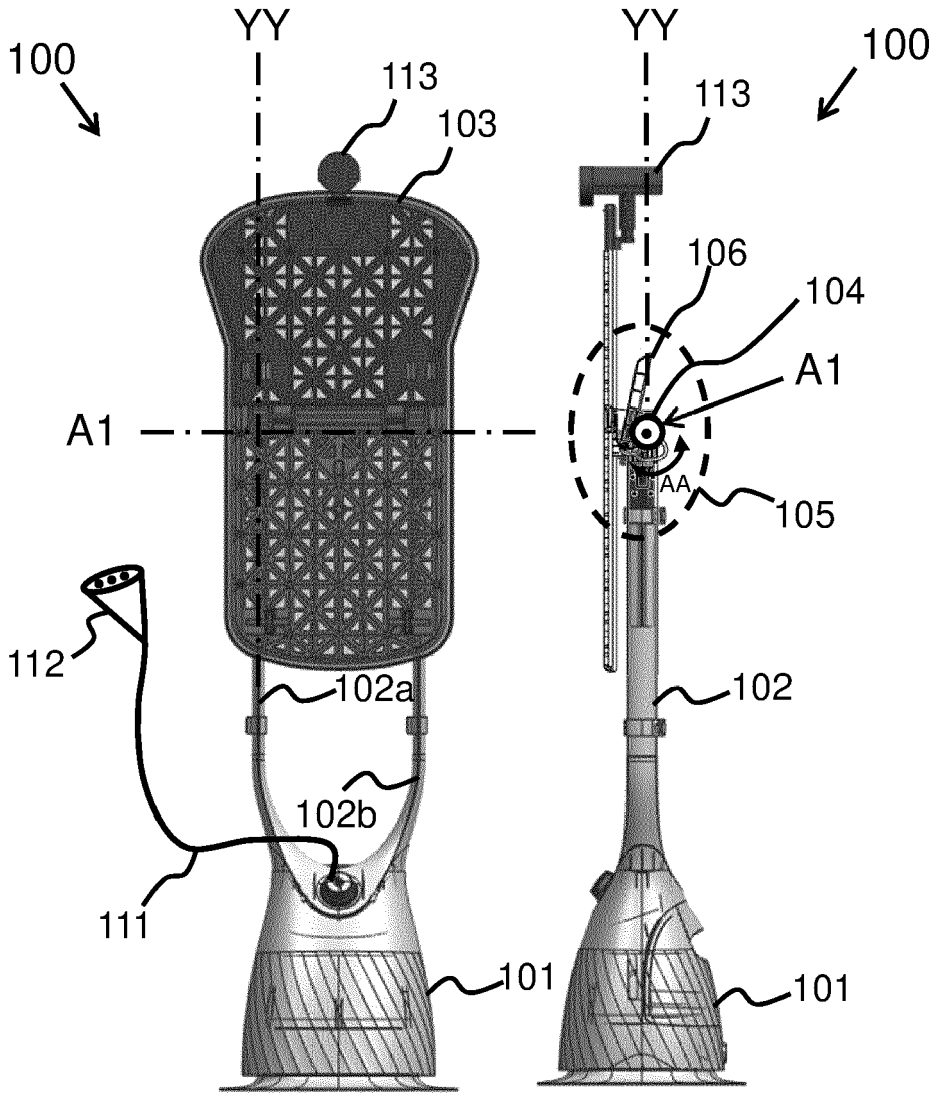
100
YY
113
103
A1
112
102a
102b
111
101
YY
113
100
106
104
A1
AA
105
102
101

FIG.1A FIG.1B

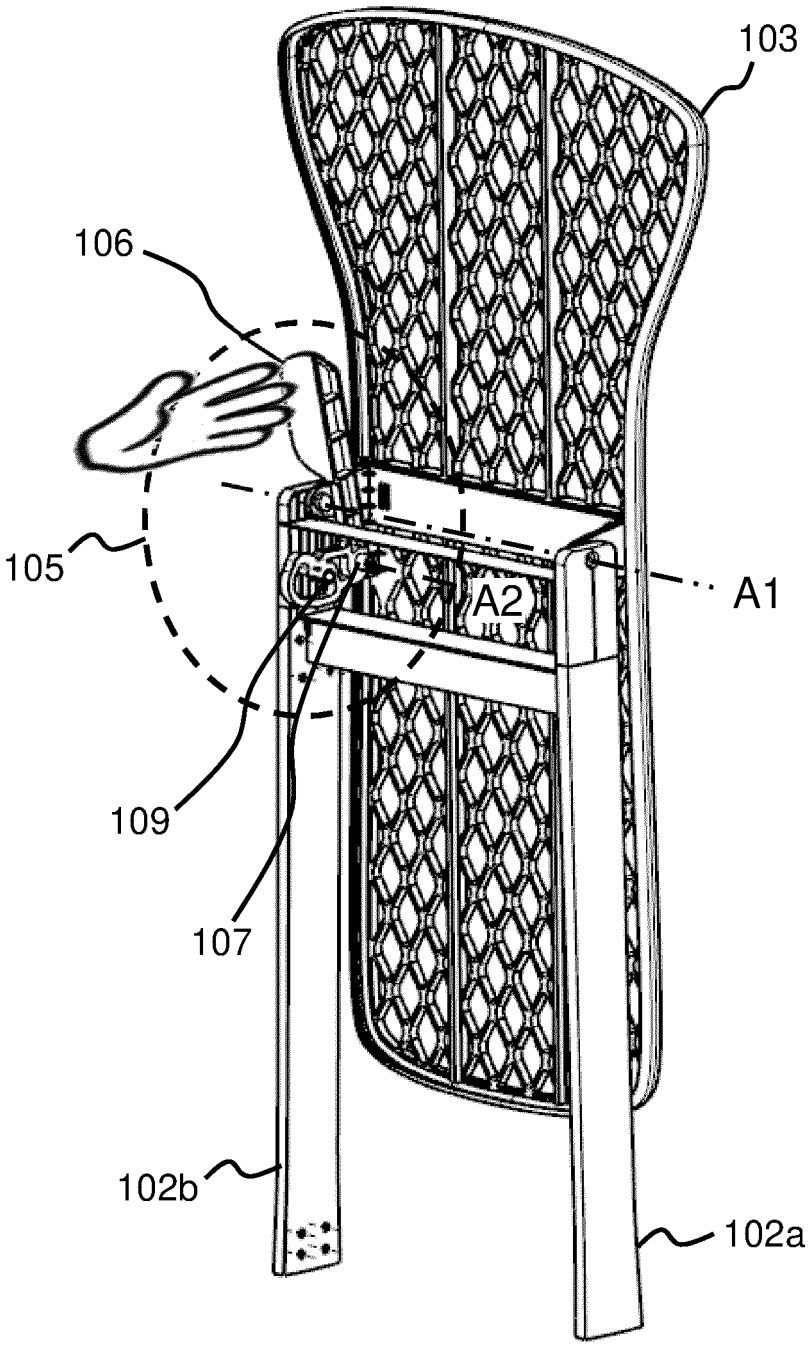

FIG.2A

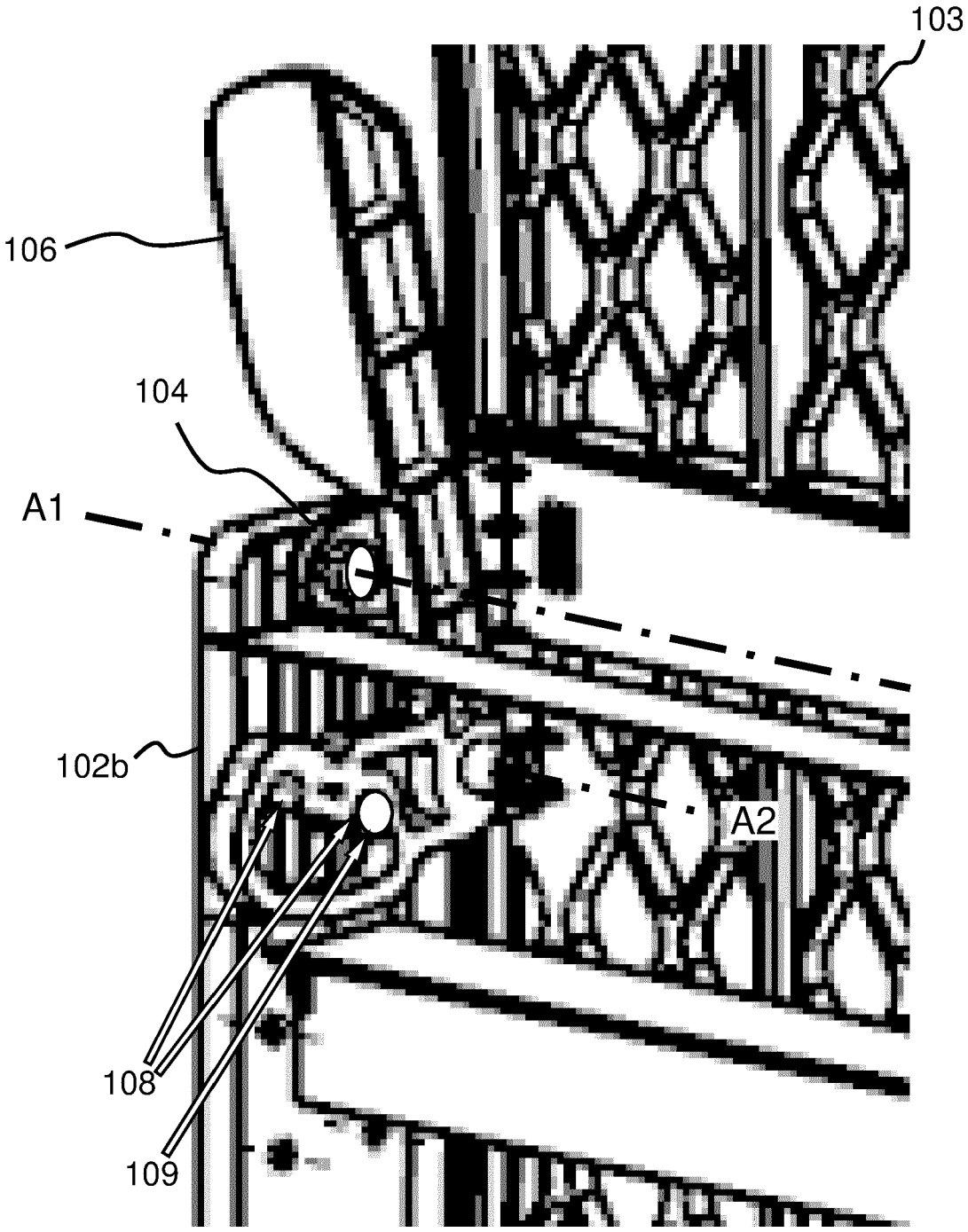

FIG.2B

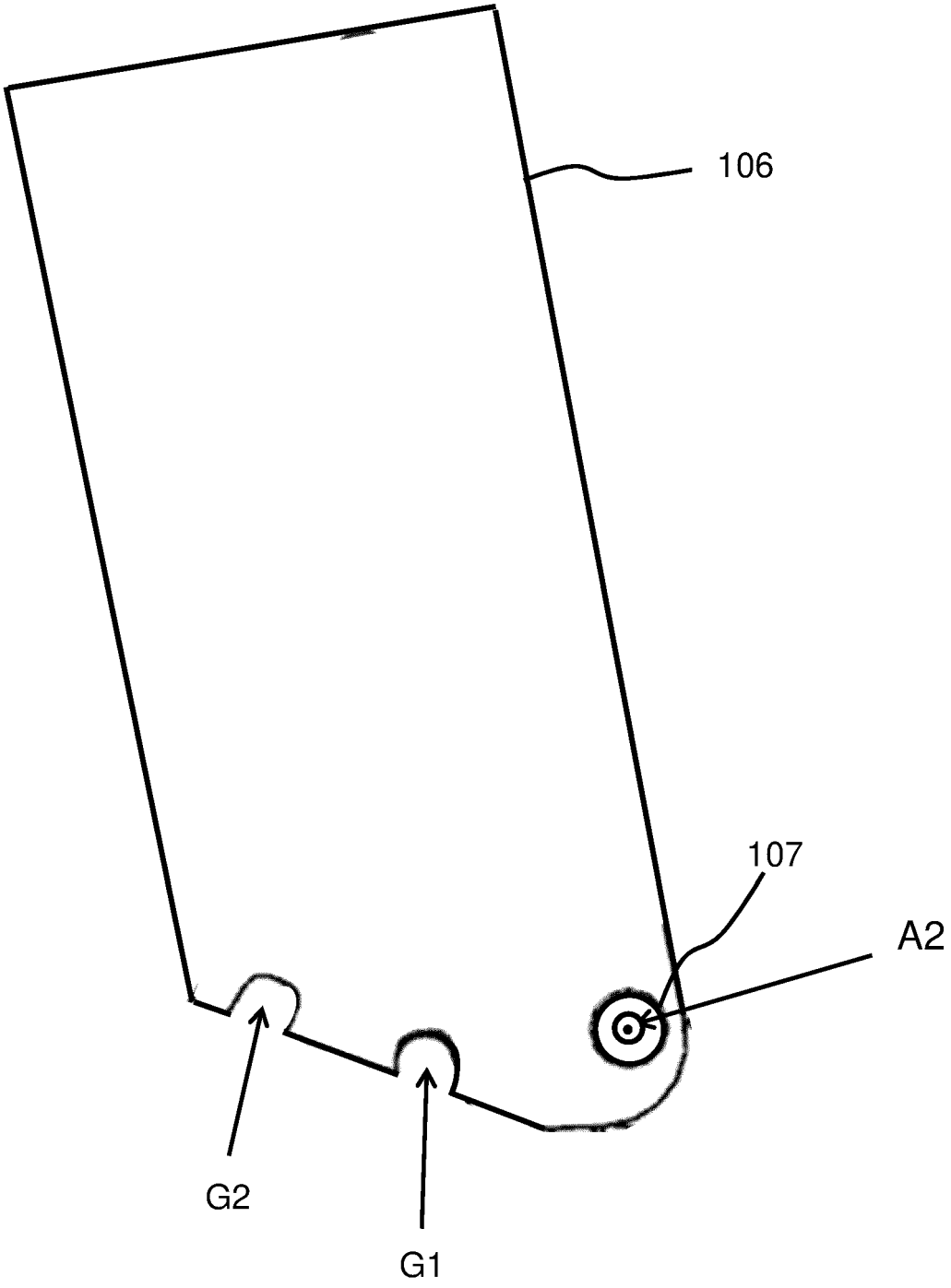

FIG.3A

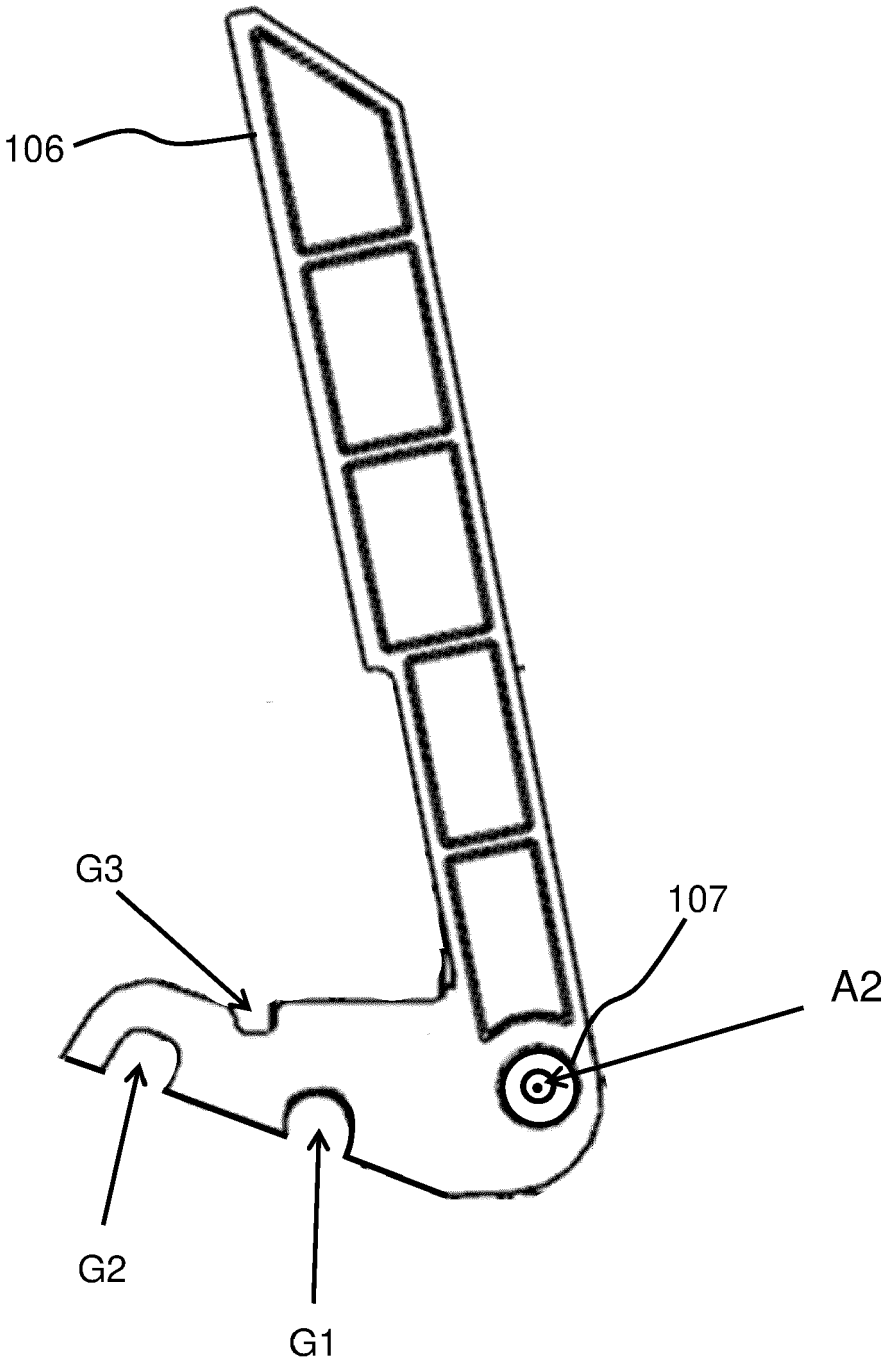

FIG.3B

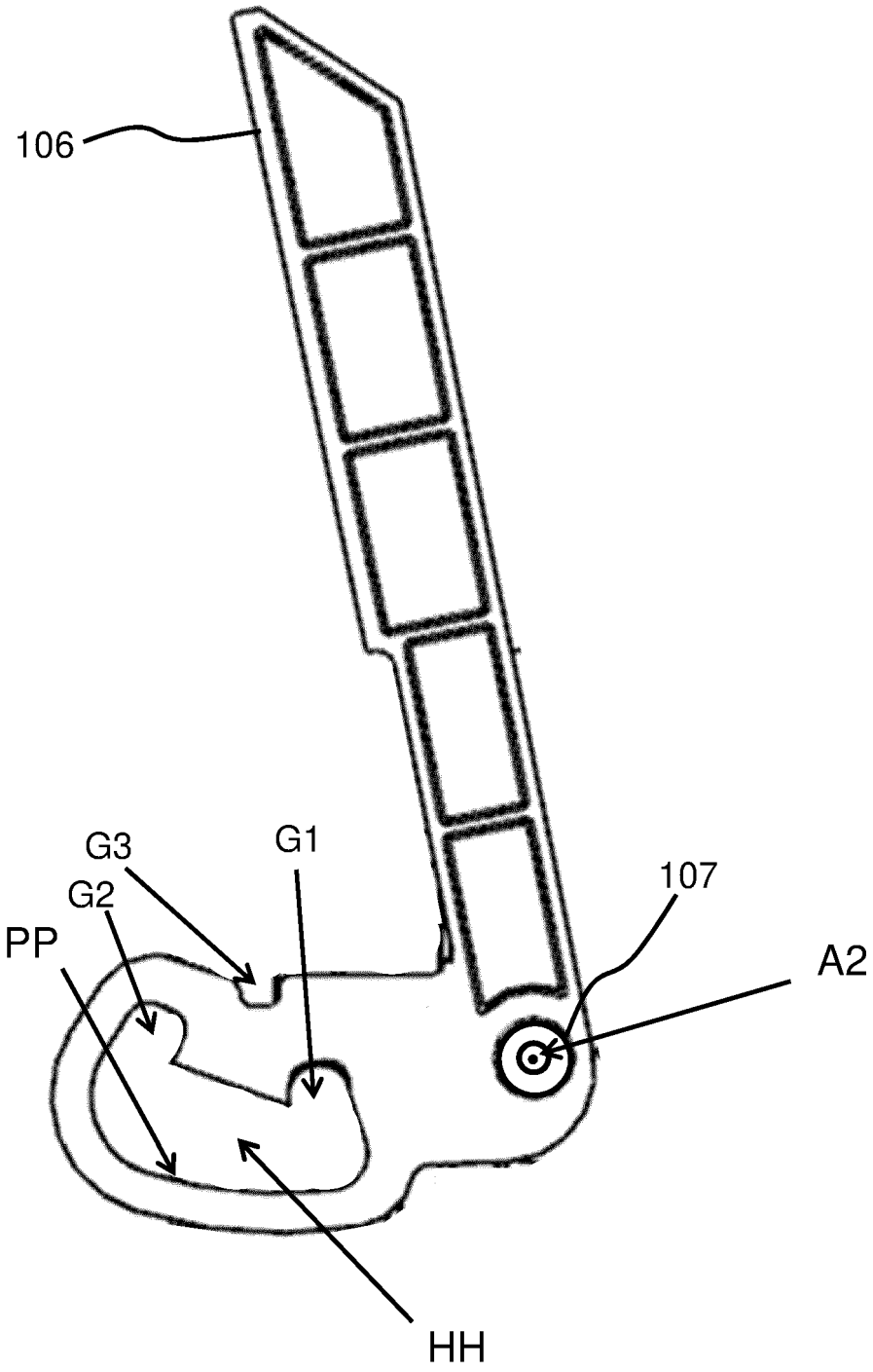

FIG.3C

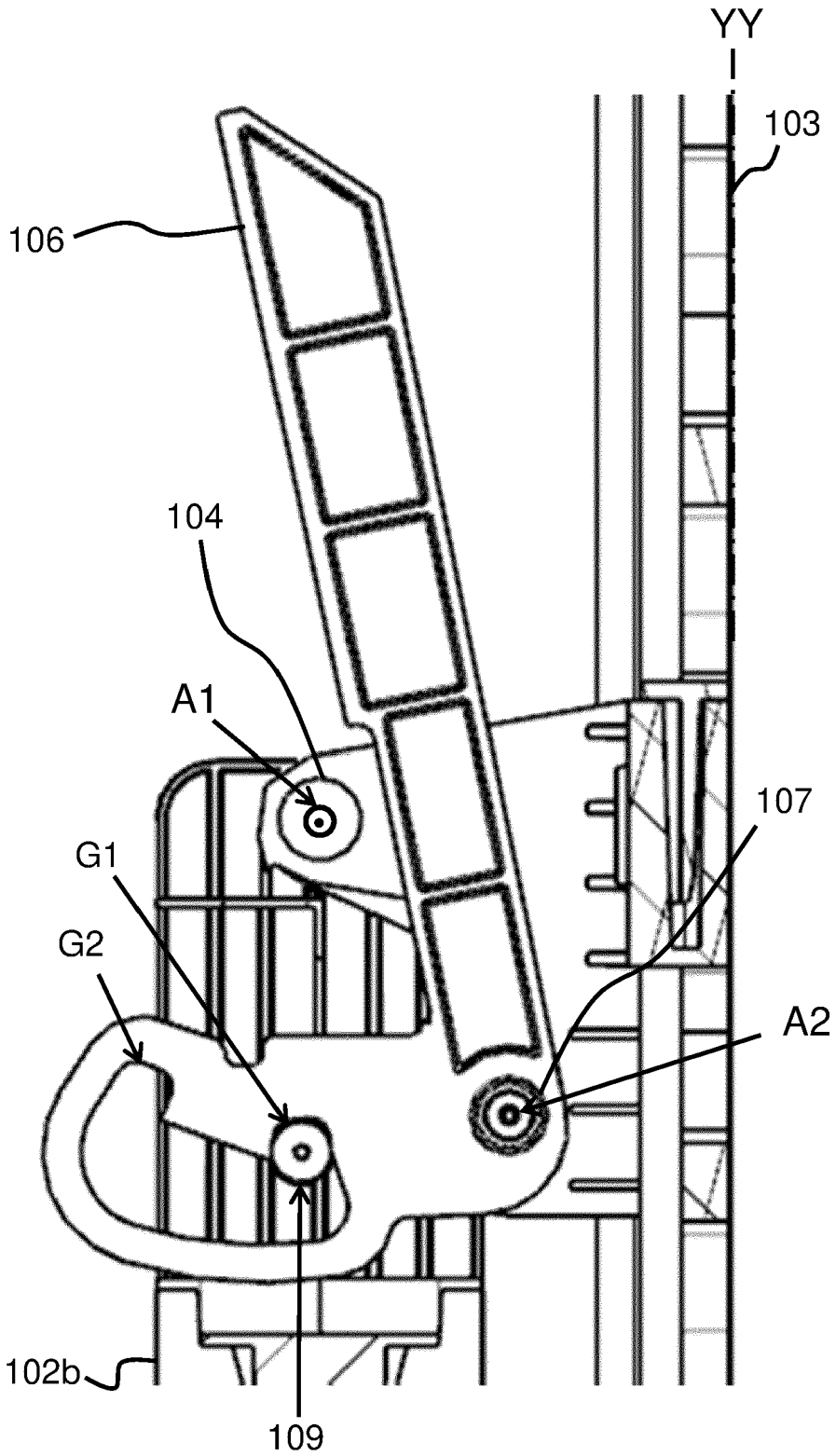

FIG.4A

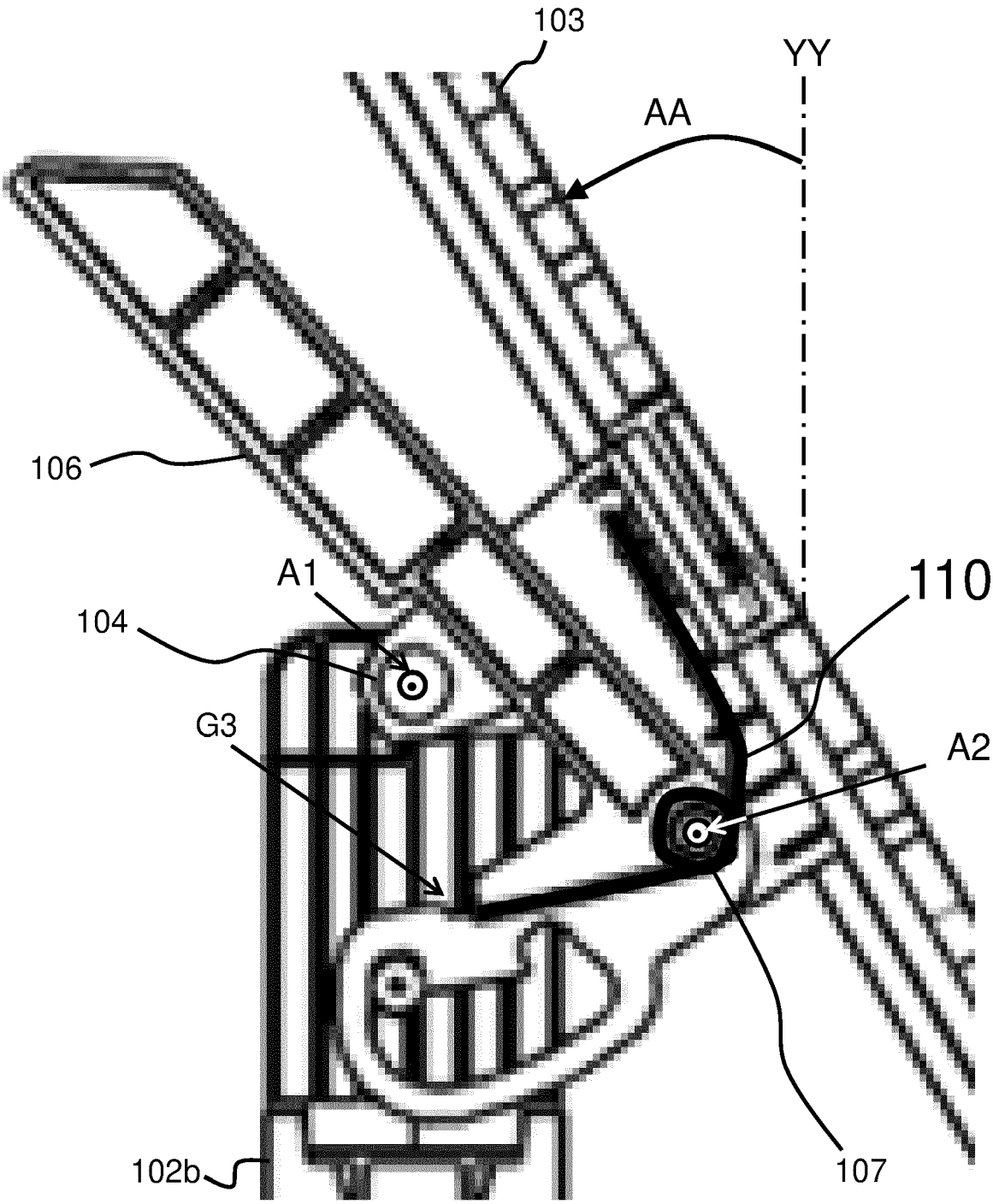

FIG.4B

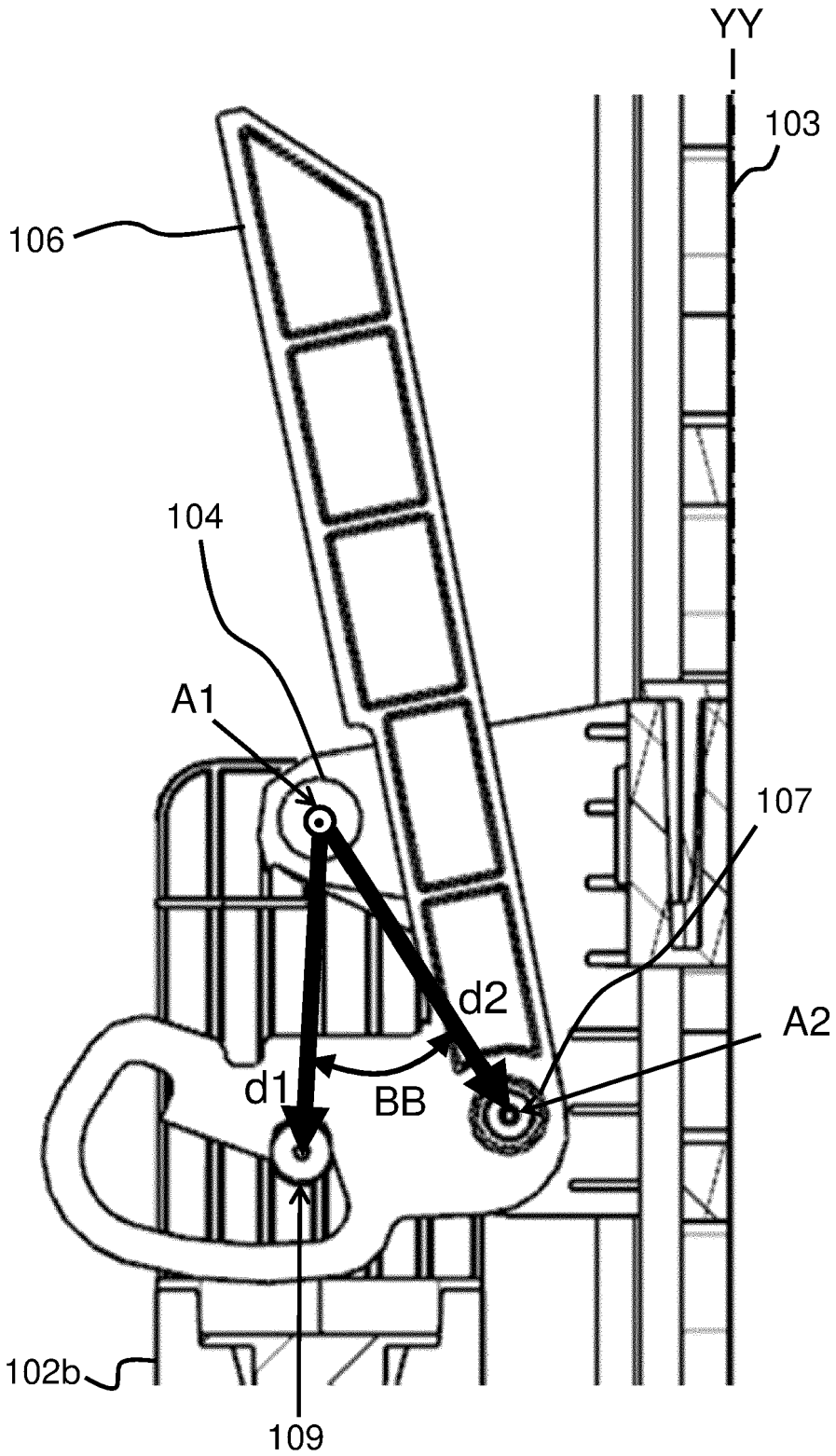

FIG.5

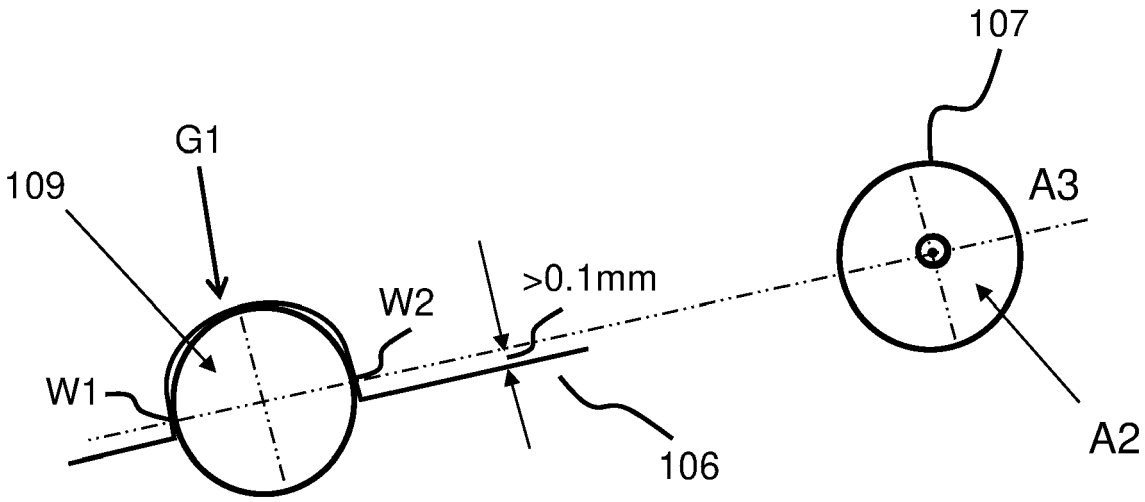
107
G1
109
A3
>0.1mm
W2
W1
A2
106

FIG.6A

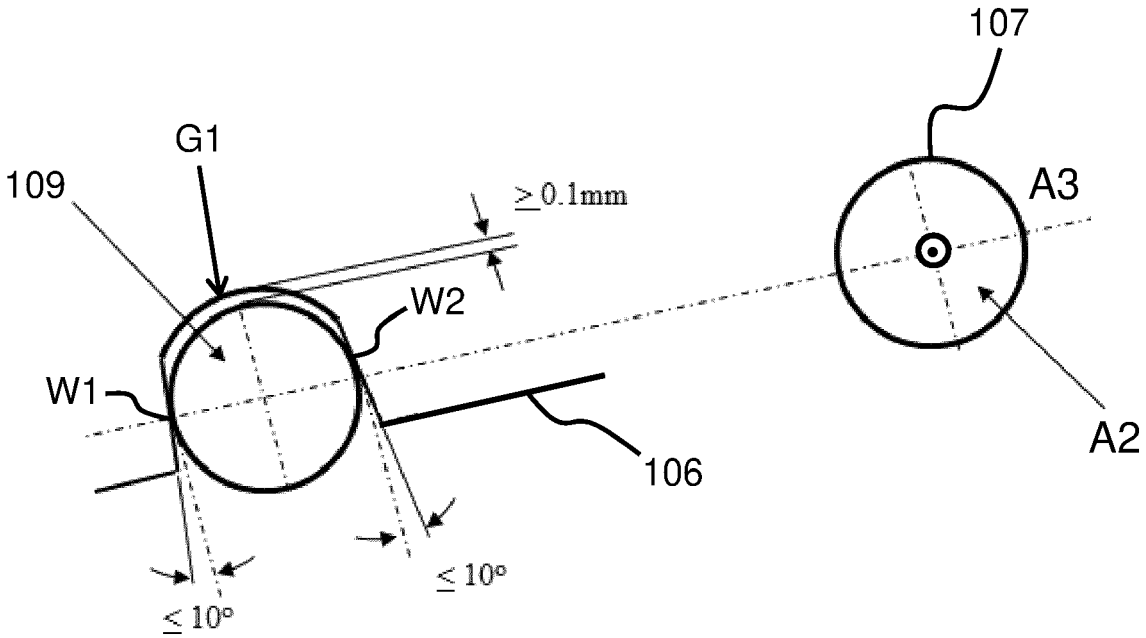
107
G1
109
A3
≥0.1mm
W2
W1
A2
106
≤10°
≤10°

FIG.6B

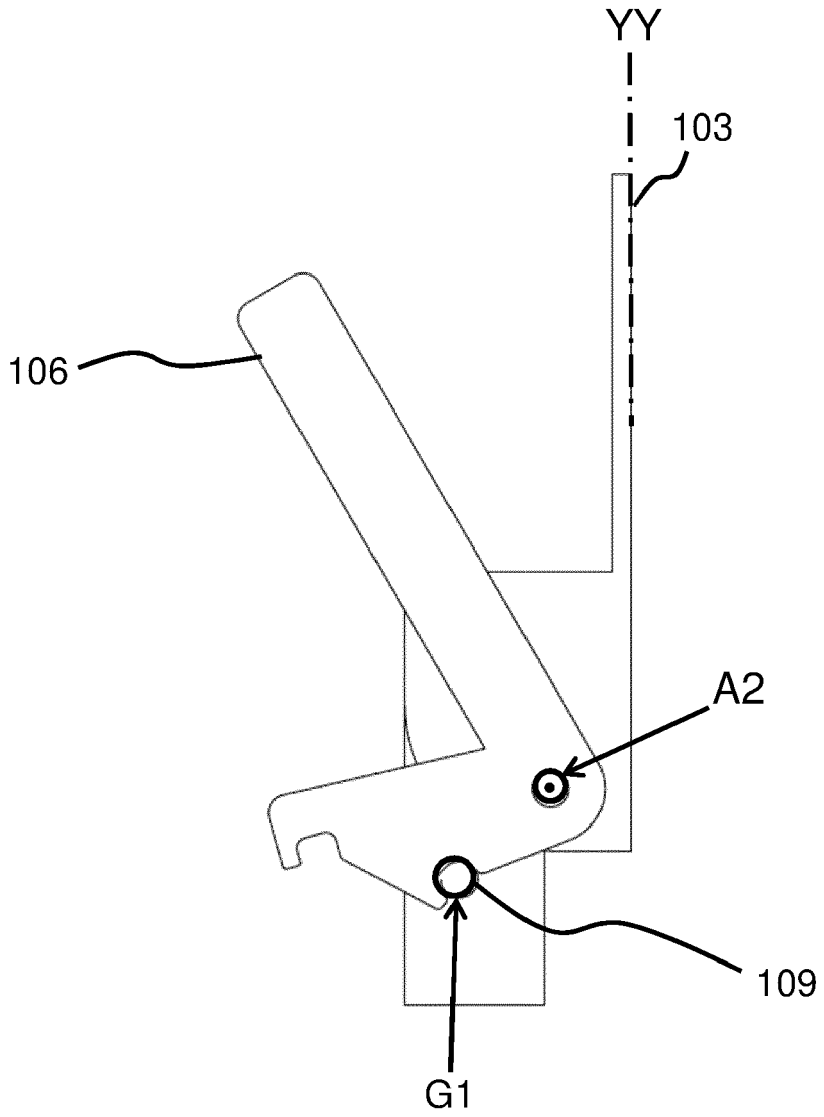

FIG.7A

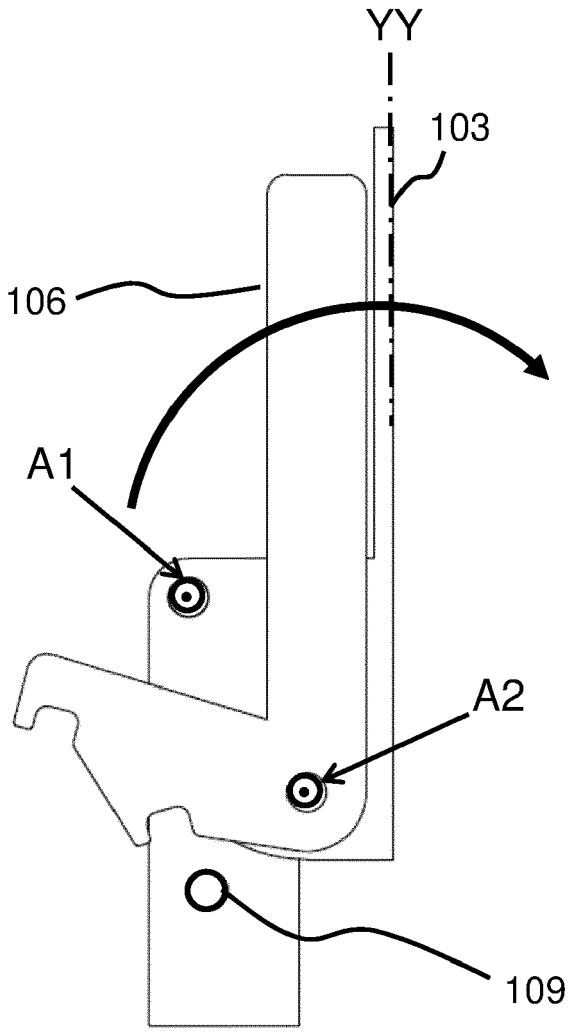

FIG.7B

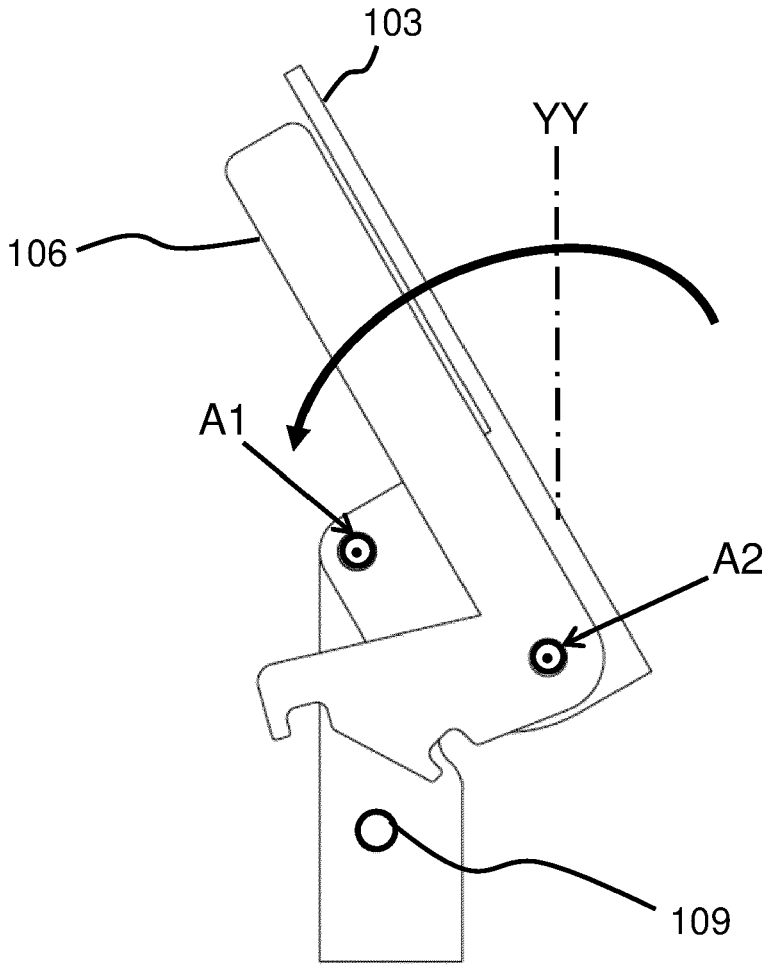

FIG.7C

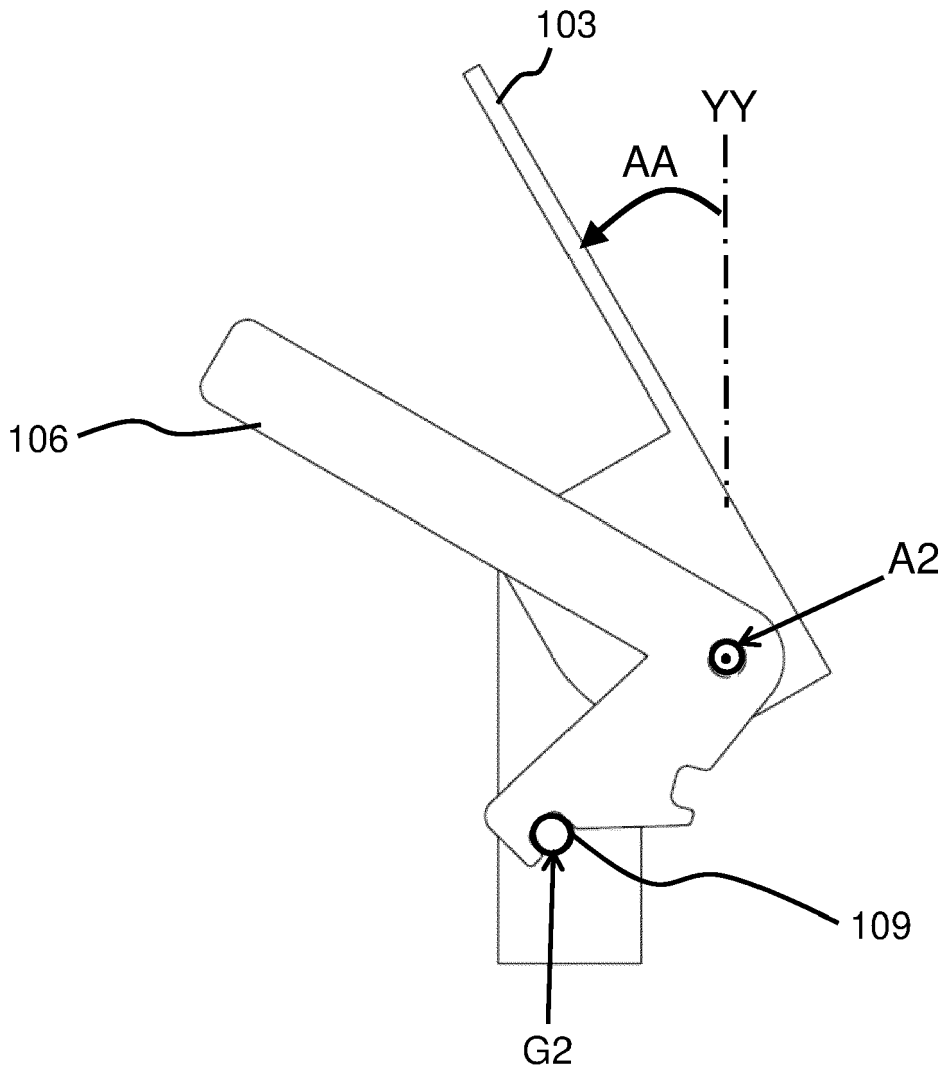

FIG.7D

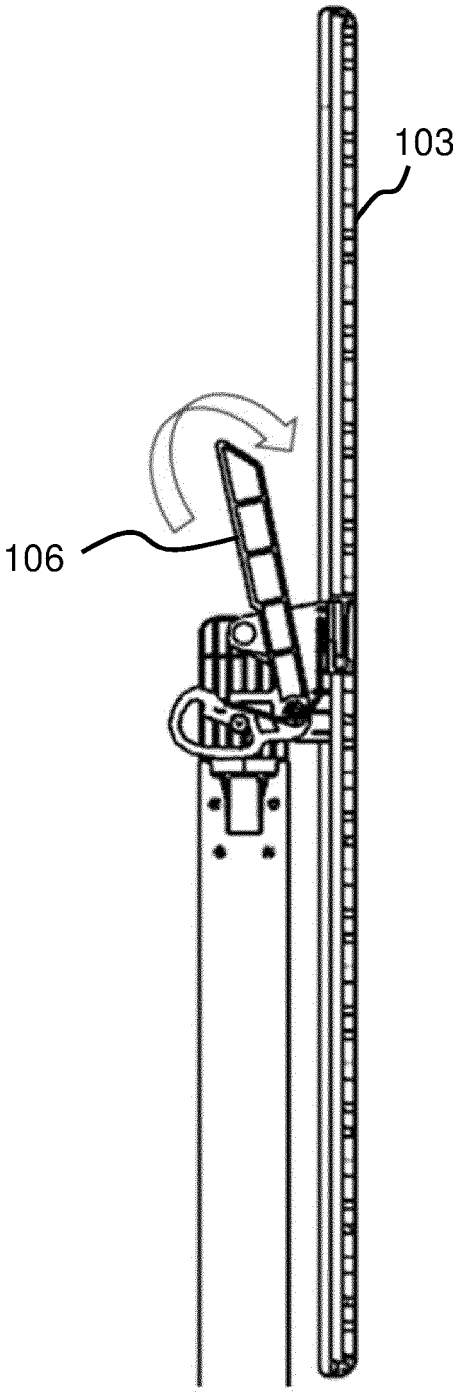

FIG.8A1

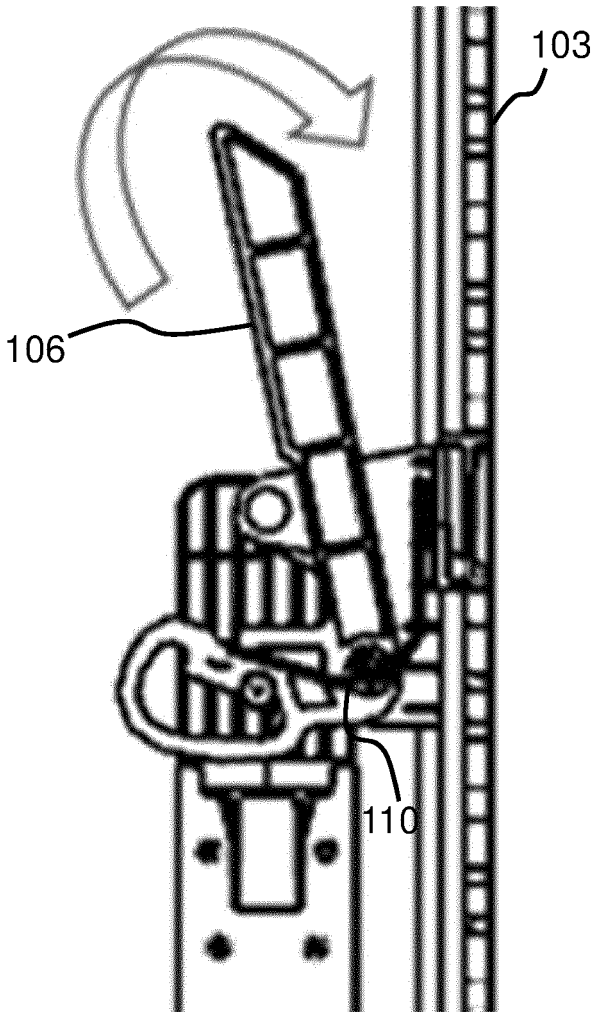

FIG.8A2

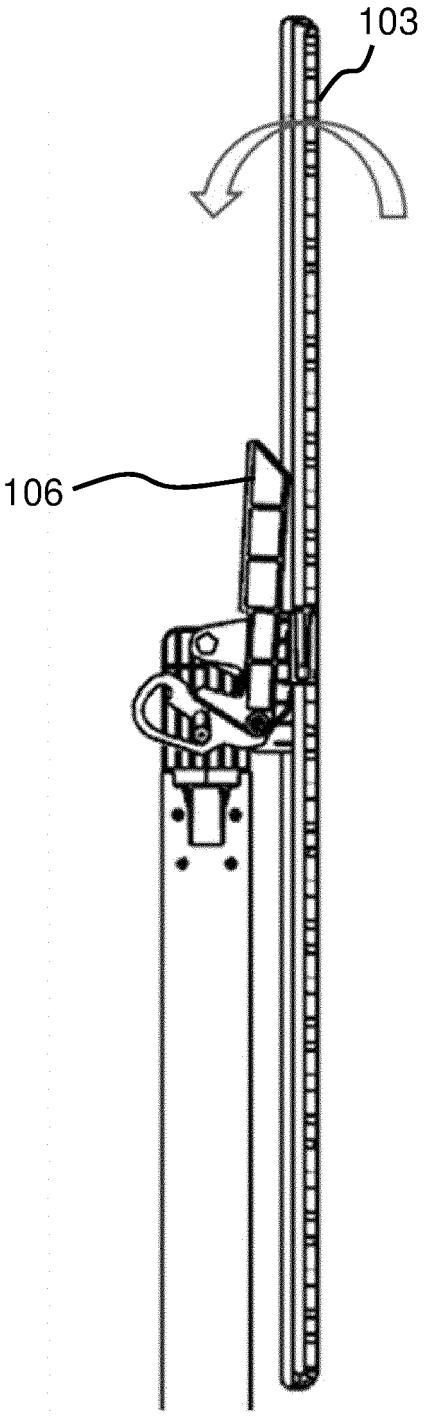

FIG.8B1

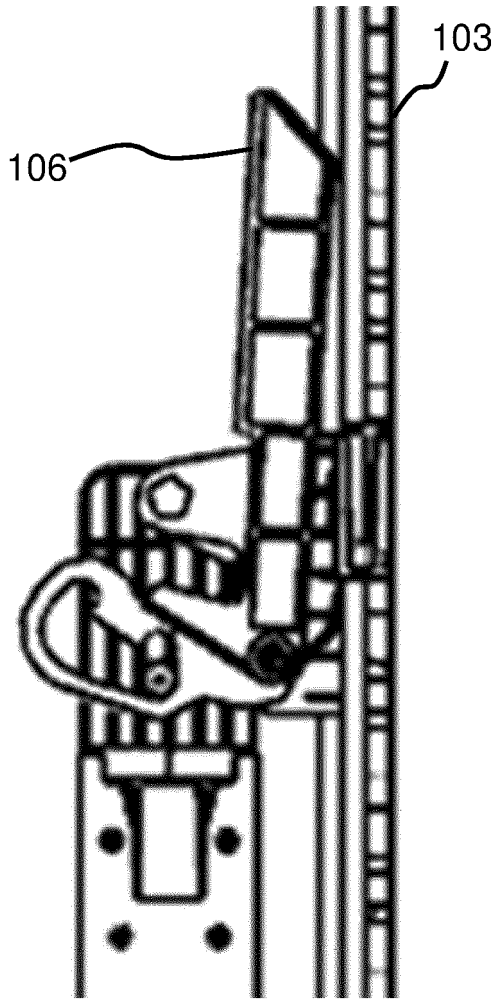

FIG.8B2

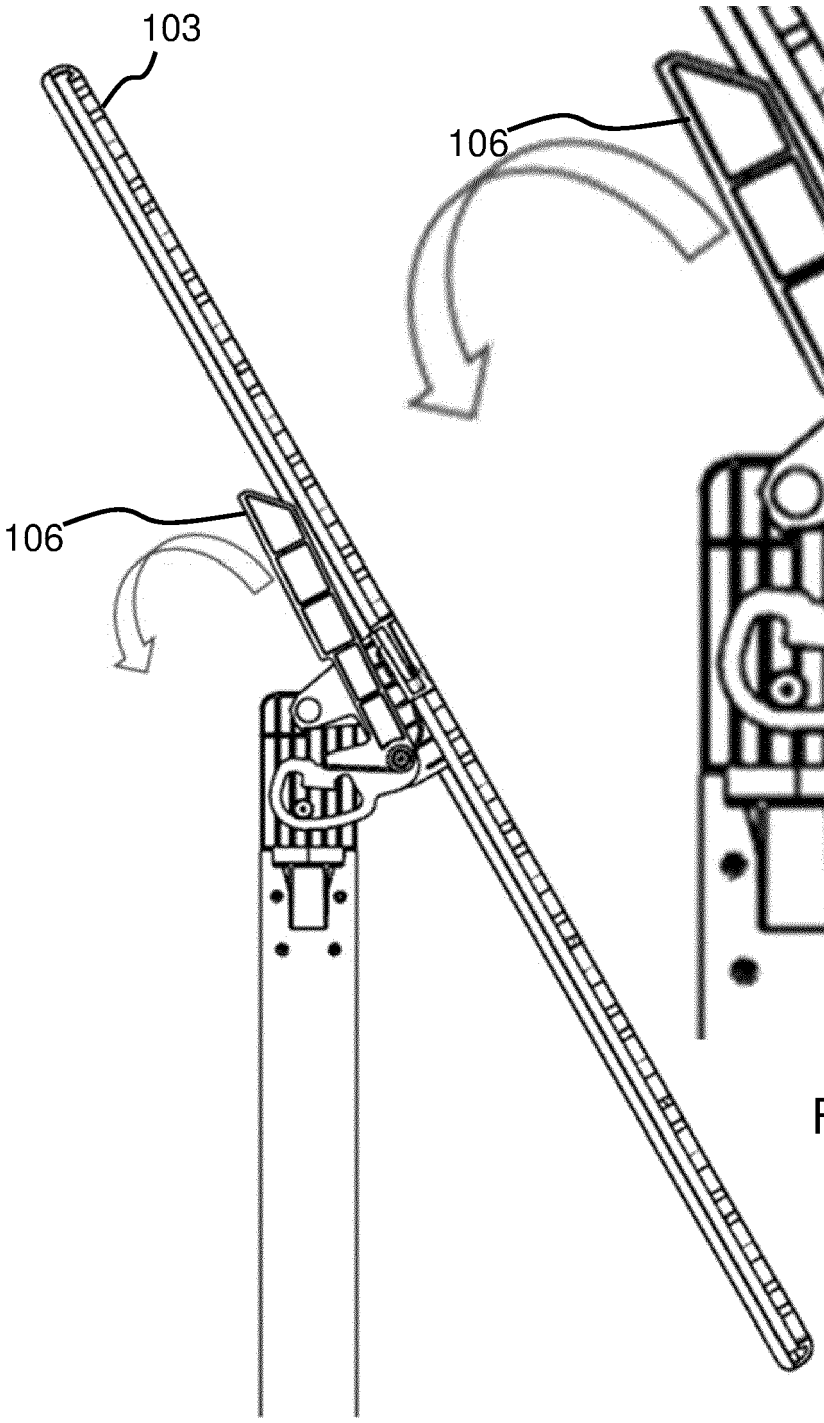

FIG.8C1

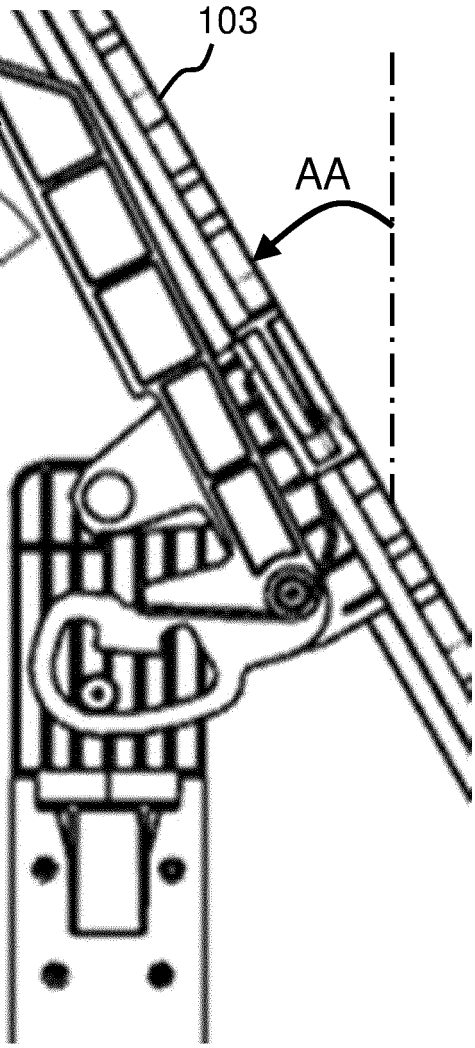

FIG.8C2

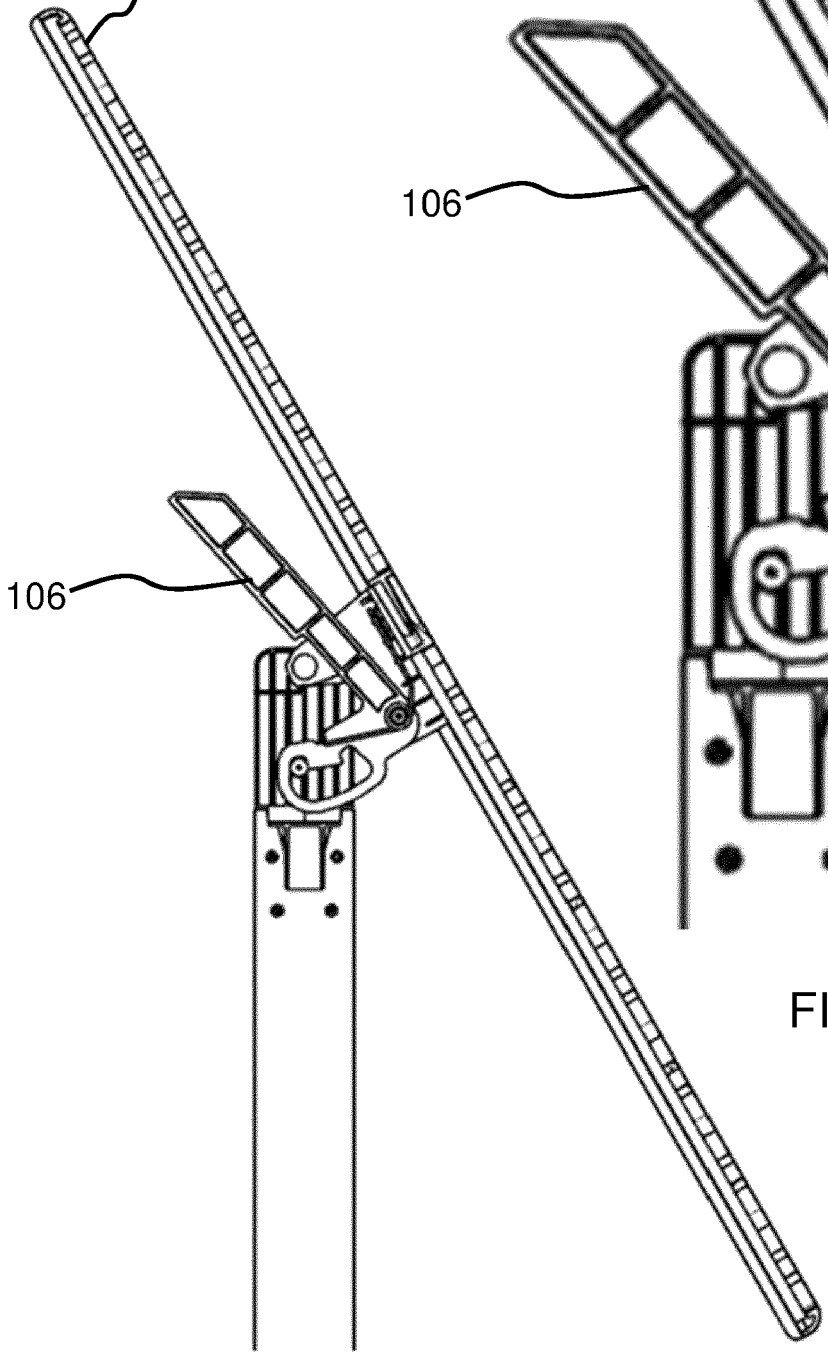

FIG.8D1

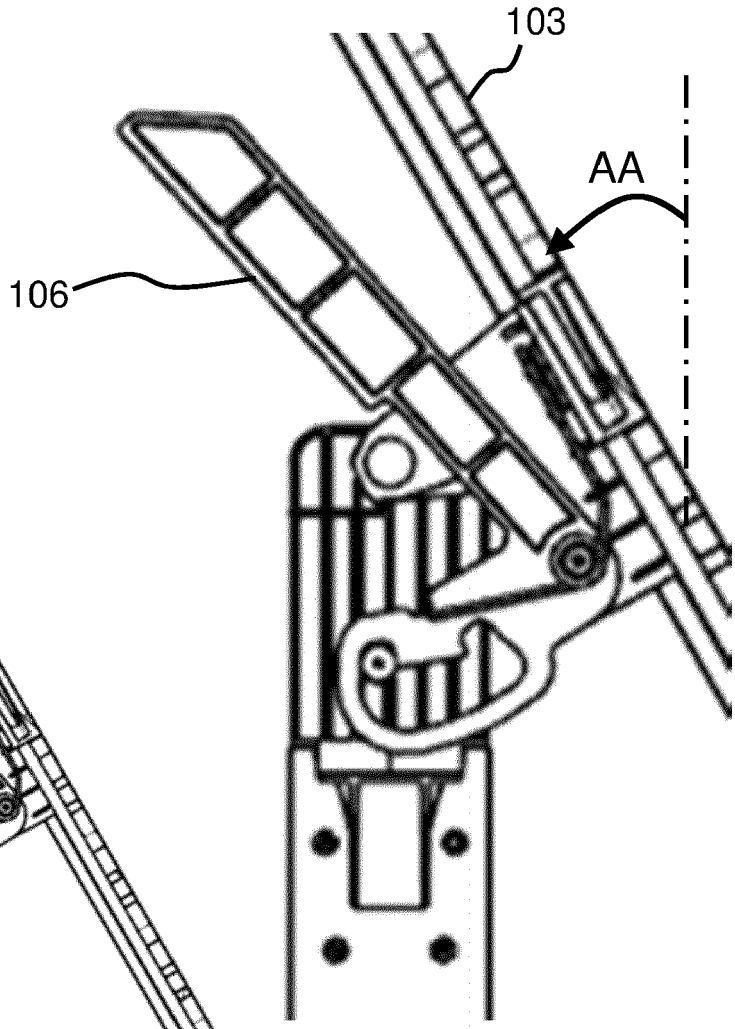

FIG.8D2

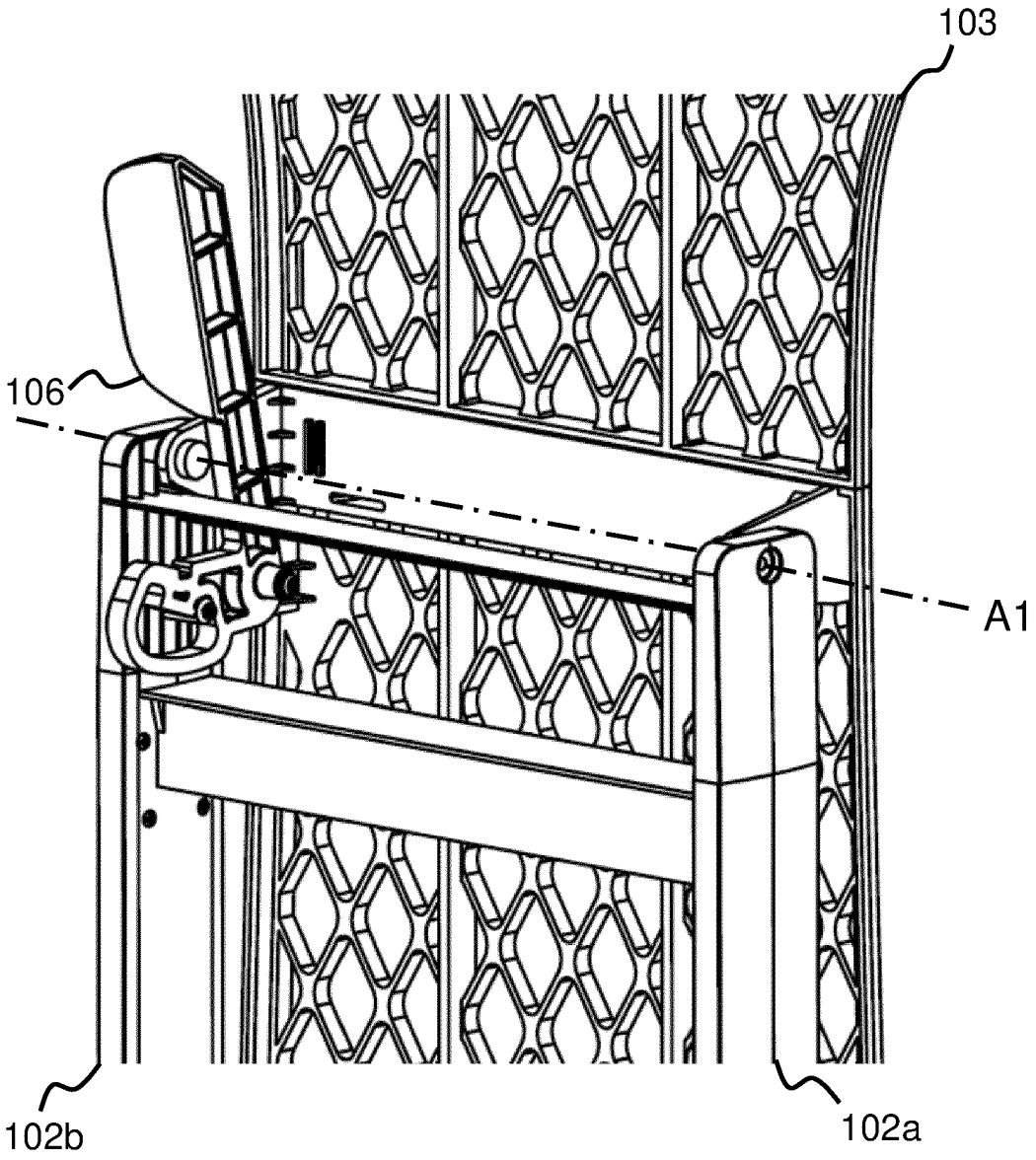

FIG.9A

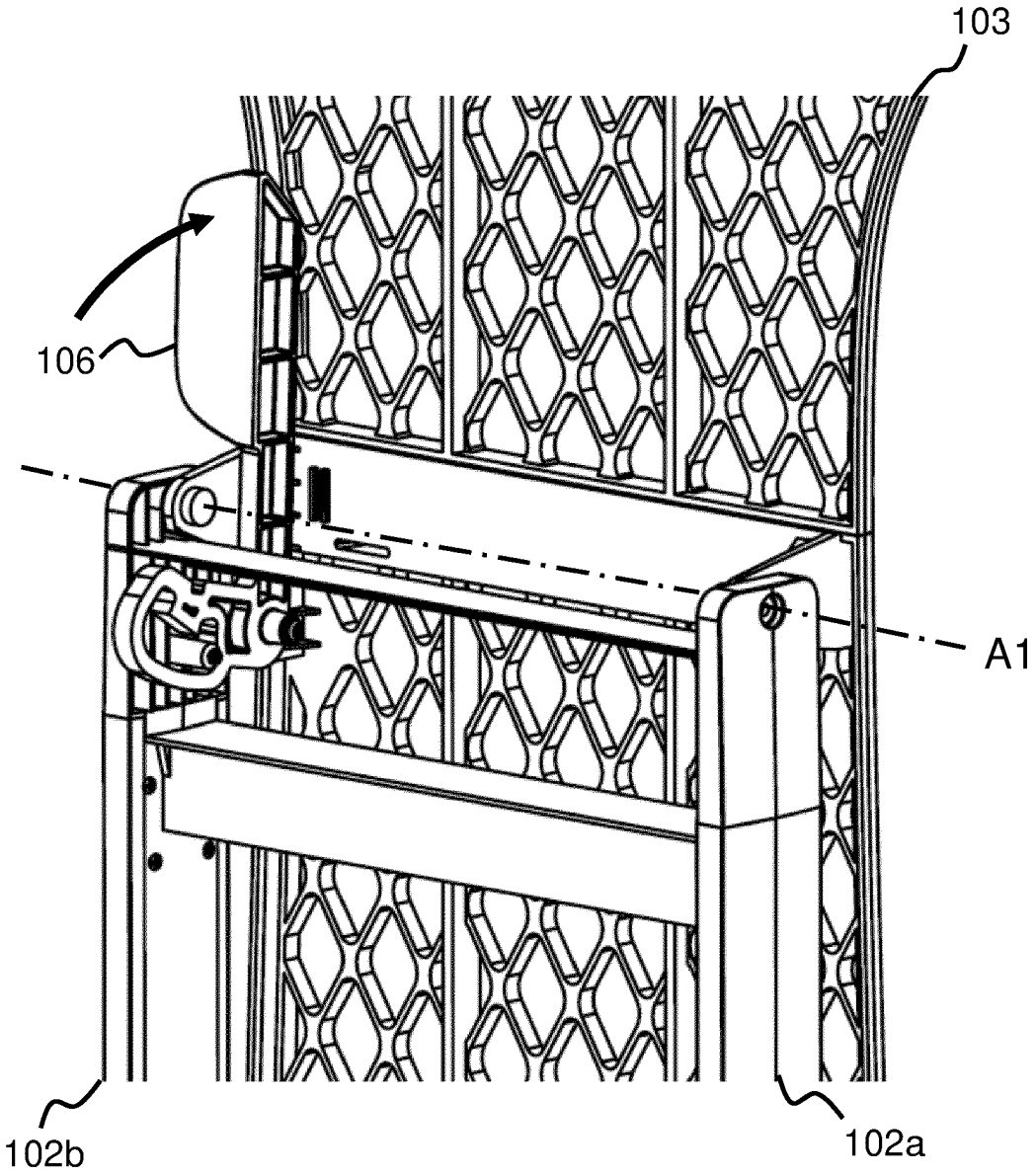

FIG.9B

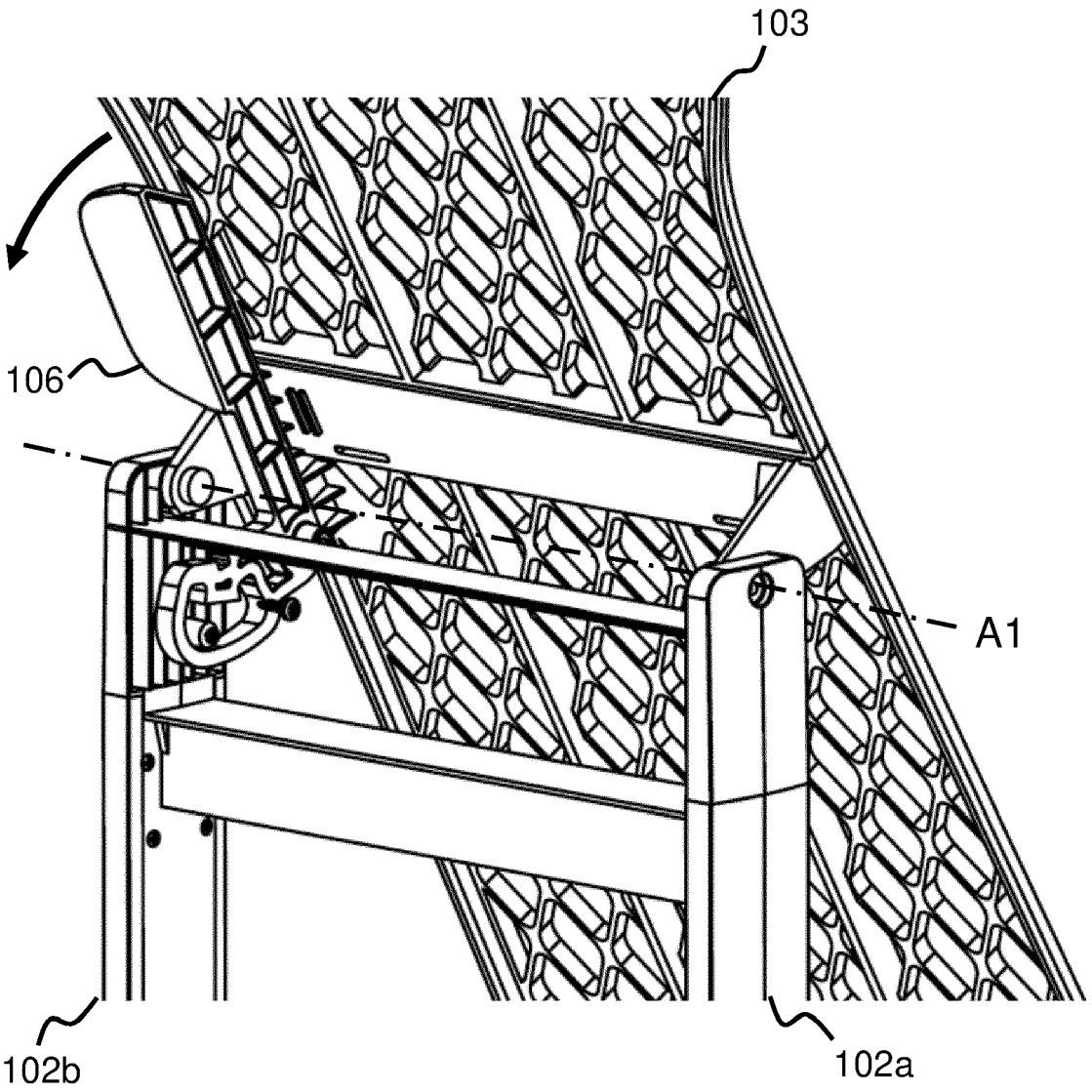

FIG.9C

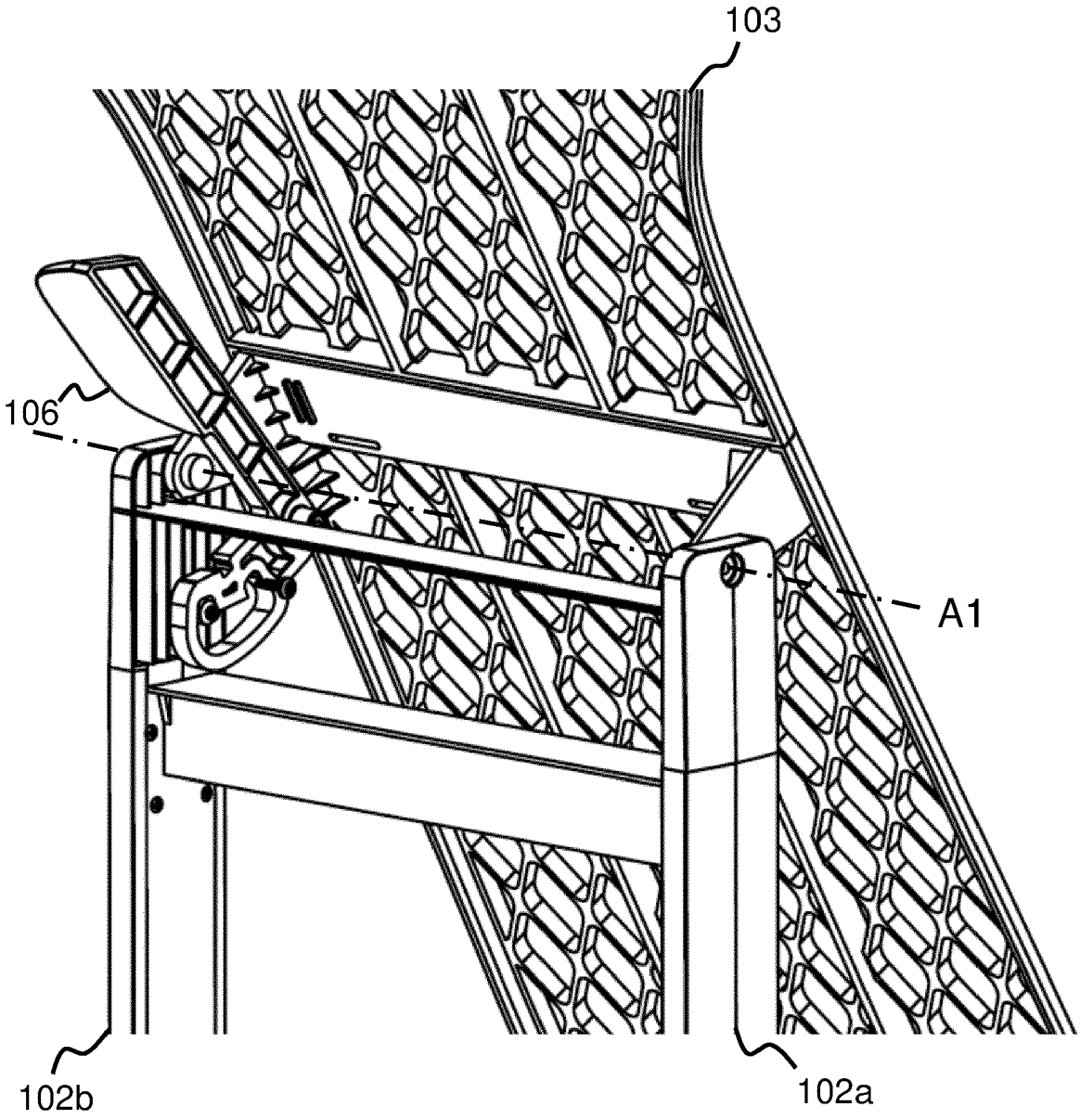

FIG.9D

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EUROPEAN SEARCH REPORT

Application Number
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A	CN 108 166 230 A (SUZHOU GEMEINA ELECTRIC APPLIANCE CO LTD) 15 June 2018 (2018-06-15) * claims 1, 5; figures *	1-12	

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D06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	1 April 2020	Diaz y Diaz-Caneja

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