(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 950 366 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
30.07.2008 Bulletin 2008/31

(51) Int Cl.:
E05B 65/12 *(2006.01)* ***E05B 65/20*** *(2006.01)*

(21) Application number: **07116051.9**

(22) Date of filing: **10.09.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

(30) Priority: **29.01.2007 IT BS20070009**

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(54) **Handle group with safety device for motor vehicle door**

(57) The present invention relates to a handle group (1) for a motor vehicle door comprising a grip (2), a control lever (20) associable to the closing mechanism by a Bowden cable or a tie rod, wherein the grip is normally disengaged from the control lever. The handle group further comprises a coupling lever (30) actuable by a safety lever (40) arranged along a back surface of the same grip, suitable for engaging the control lever (20), thus allowing the control of the door opening from the grip. In the event of collisions, the handle group prevents the inertial forces acting on the grip from opening the closing mechanism; this is enabled by the fact that if the safety lever (40) is not pressed, the grip is disengaged from the control lever (20).

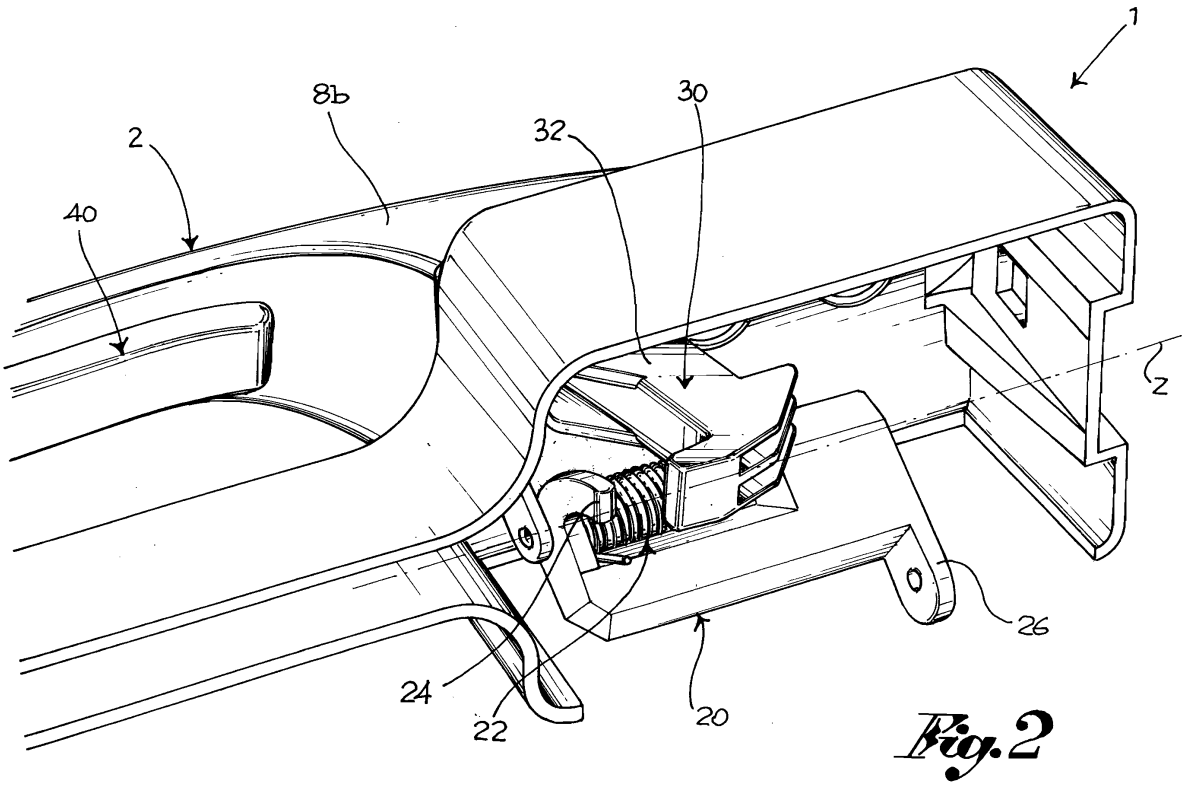

Fig. 2

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Description

[0001] The present invention relates to a handle group for a motor vehicle door provided with a safety device suitable for preventing the door opening in a collision.

[0002] In the field of motor vehicle safety, the need of providing the handle group with devices that prevent the door opening in a collision due to the inertial forces that develop in the collision has long been felt.

[0003] There are many known solutions of safety devices for handle groups especially relating to the use of inertial masses that following the inertial collision forces, lock the door opening mechanism.

[0004] However, such solutions are often disadvantageous due to the weight of the masses required for proper operation of the safety devices and to their overall dimensions.

[0005] Other known solutions based on different operating principles than those of inertial masses are described, on the other hand, in documents US 2005/0219043, EP 1538287 and WO 2004/059112.

[0006] However, the above solutions are particularly complex in their structure and imply high manufacturing and assembly costs, while the automotive field is well known to watch the production costs.

[0007] The object of the present invention is to make a handle group for a motor vehicle door provided with a safety device which should overcome the disadvantages mentioned above with reference to the prior art.

[0008] Such object is achieved by a handle group made according to the following claim 1. The dependent claims describe embodiment variations.

[0009] The features and advantages of the handle group according to the present invention will appear more clearly from the following description, made by way of an indicative and non-limiting example with reference to the annexed figures, wherein:

[0010] - figure 1 shows a view of the handle group according to the present invention, in a rest configuration.

[0011] - figure 2 shows a safety device of the handle group of figure 1 in the rest configuration;

[0012] - figure 3 shows the safety device of figure 2 in an engaged configuration and with handle at rest;

[0013] - figure 4 shows the handle group in a configuration with pulled handle;

[0014] - figure 5 shows the safety device in the engaged configuration and with pulled handle.

[0015] With reference to the annexed figures, reference numeral 1 globally denotes a handle group for a motor vehicle door.

[0016] The handle group 1 is associable to a closing mechanism suitable for switching from a closed configuration, wherein it constrains the door to the frame of the motor vehicle for preventing the opening thereof, to an open configuration, wherein the door opening is allowed.

[0017] The handle group comprises a grip 2 suitable for being grasped by a user and being moved from a rest configuration to a pulled configuration for allowing the door opening.

[0018] According to a preferred embodiment, grip 2 comprises a hinging portion 4, usually arranged into the door, suitable for hinging the grip to a fixed bar 6, inside the door as well.

[0019] Preferably, moreover, grip 2 comprises a handle 8, arranged on the outer surface of the door and connected to the hinging portion 2.

[0020] For example, handle 8 comprises a first enlargement 8a, on the end of the hinging portion 4, a second enlargement 8b, on the opposite side, and a thinned portion 8c, which connects enlargements 8a, 8b and with the outer surface of the door forms a gripping space 10 suitable for the introduction of a hand of the user.

[0021] Preferably, moreover, grip 2 exhibits a window 8d, for example obtained on the back surface of grip 2, in particular on the back surface of the thinned portion 8c, facing the door surface.

[0022] Moreover, the handle group 1 comprises a control lever 20 associable to the closing mechanism for controlling it from the closed configuration to the open configuration.

[0023] Preferably, the control lever 20 is connectable to the closing mechanism by a cable (not shown), known in the field as "Bowden cable", or by a tie rod.

[0024] The control lever 20 is hinged to a support along an axis of rotation Z, so as to be moved and in particular rotated from a rest position, wherein it does not influence the closing mechanism, to an active position wherein it influences the closing mechanism in opening.

[0025] Preferably, the handle group comprises elastic means suitable for constantly influencing the control lever 20 so as to oppose the passage of the control lever from the rest position to the active position.

[0026] For example, the elastic means comprise a spring 22, arranged about the axis of rotation Z of the control lever 20.

[0027] According to a preferred embodiment, the control lever 20 comprises a hook portion 24 for the engagement with grip 2 and a pulling portion 26 for the connection to the closing mechanism. For example, the pulling portion 26 is associated to the Bowden cable or the tie rod.

[0028] Preferably, the hook portion 24 is angularly spaced relative to the pulling portion 26, for facilitating the connection of the Bowden cable to the closing mechanism and not undergoing structural interferences between the Bowden cable and the control lever, especially ion the active position thereof.

[0029] Preferably, moreover, the hook portion 24 is proximal to the axis of rotation Z and the pulling portion 26 is distal to the axis of rotation Z, for obtaining a lever effect that facilitates the actuation of the closing mechanism in opening also in case of a weak action on the grip.

[0030] Moreover, the handle group 1 comprises a coupling lever 30 integral with grip 2, suitable for switching from a disengaged configuration to an engaged configuration wherein it engages the control lever 20, thus allowing the control of the closing mechanism in opening

moving grip 2.

[0031] Said lever, normally in the disengaged configuration, is influenced to stay in said configuration by elastic means (not shown).

[0032] Preferably, the coupling lever 30 comprises a lever body 32, partly seated in grip 2, for example in the second enlargement 8b thereof, and a projection 34, protruding from the lever body 32, suitable for engaging the coupling portion 24 of the control lever 20.

[0033] In other words, the coupling lever 30 exhibits a hammer shape.

[0034] The coupling lever 30 is actuable by the user from outside the motor vehicle, preferably at the same time as the grasping of the grip, for switching from the disengaged configuration to the engaged configuration wherein it engages the control lever 20.

[0035] Since the coupling lever 30 is integral to grip 2, moving grip 2 also leads to the movement of the coupling lever 30 and, if the latter is in engaged configuration with the control lever 20, the rotation of the control lever 20 is obtained.

[0036] Preferably, the handle group 1 comprises a safety lever 40, arranged inside grip 2 and accessible by the user through window 8d obtained in grip 2.

[0037] The safety lever 40 is operatively engageable with the coupling lever 30 so that moving the safety lever 40, the coupling lever 30 switches from the disengaged configuration to the engaged configuration with the control lever 20.

[0038] For example, the safety lever 40 protrudes from window 8d of grip 2, to be pressed by the user's hand that grasps grip 2, at the same time as grasping grip 2.

[0039] According to a preferred embodiment, the handle group comprises a multiplier device (not shown) arranged along the kinematic chain between the safety lever 40 and the coupling lever 30, suitable for multiplying the movement of the safety lever 40, that is, such as to match a slight movement of the safety lever with a movement of the coupling lever 30 sufficiently wide to engage the control lever 20.

[0040] In the standard operation of the handle group 1, in a complete rest configuration of the handle group:

[0041] - the grip is in the rest configuration, that is, is not pulled by the user;

[0042] - the safety lever 40 is not pressed by the user, widely protrudes from window 8d of grip 2 and does not influence the coupling lever 30 towards the engagement configuration thereof;

[0043] - the coupling lever 30 is in the disengaged configuration, that is, it does not engage the control lever 20;

[0044] - the control lever 20 is in the rest position, that is, it does not influence the closing mechanism to open;

[0045] - the closing mechanism is in the closed configuration, that is, it engages the vehicle frame, so as to prevent the door opening.

[0046] In the complete rest configuration, pulling grip 2, the coupling lever 30, integral to the grip, is moved but since it does not engage the control lever 20, the latter does not switch to the active position wherein it actuates the closing mechanism to open. So, the grip movement does not produce the opening of the closing mechanism and thus of the door.

[0047] The above condition occurs during a collision of the vehicle: the inertia forces that develop due to the collision tend to move the grip but unlike what happens in known handle groups, the closing mechanism is not stressed to open.

[0048] In a partial rest configuration of the handle group:

[0049] - the grip is in the rest configuration, that is, is not pulled by the user;

[0050] - the safety lever 40 is pressed by the user and influences the coupling lever 30 towards the engagement configuration thereof with the control lever 20;

[0051] - the coupling lever 30 is in the engaged configuration, that is, it engages the control lever 20;

[0052] - the control lever 20 is in the rest position, that is, it does not influence the closing mechanism to open;

[0053] - the closing mechanism is in the closed configuration, that is, it engages the vehicle frame, so as to prevent the door opening.

[0054] Such configuration takes place when a user wants to open the door to access the motor vehicle, so he/she grasps grip 2 of the handle group, moving the safety lever 40.

[0055] In an active configuration of the handle group:

[0056] - the grip is in the pulled configuration, that is, is pulled by the user;

[0057] - the safety lever 40 is pressed by the user and influences the coupling lever 30 towards the engagement configuration thereof with the control lever 20;

[0058] - the coupling lever 30 is in the engaged configuration, that is, it engages the control lever 20;

[0059] - the control lever 20 is in the active position, that is, it influences the closing mechanism to open;

[0060] - the closing mechanism is in the open configuration, that is, it does not engage the vehicle frame, so as to allow the door opening.

[0061] Such configuration is obtained, starting from the previous partial rest configuration, when the user besides grasping the grip, pulls it thus causing the rotation thereof.

[0062] Then, the closing mechanism disengages the vehicle frame and the door opening is allowed.

[0063] It should be noted that the control lever is hinged to the support body so as to be turnable about the axis of rotation Z, that the axils of rotation lays on a horizontal plane and that the movement of the grip from the rest configuration to the pulled configuration takes place on a plane coplanar to said horizontal plane.

[0064] Innovatively, the handle group according to the present invention allows preventing undesired door opening subsequent to collisions, overcoming the disadvantages mentioned with reference to the prior art, since it does not exhibit inertial masses and is structurally simple in the construction and assembly thereof.

[0065] Advantageously, moreover, the handle group

is convenient to use since the actuation of the safety lever occurs at the same time as the grip grasping.

[0066] According to a further advantageous aspect, the construction is optimised to reduce the user's effort required to actuate the safety lever and to release the closing mechanism.

[0067] It is clear that a man skilled in the art may make several changes and adjustments to the handle group described above in order to meet specific and incidental needs, all falling within the scope of protection defined in the following claims.

Claims

1. Handle group (1) for a motor vehicle door associable to a closing mechanism suitable for switching from a closed configuration, wherein it constrains the door to the frame of the motor vehicle for preventing the opening thereof, to an open configuration,
wherein said handle group comprises

- a grip (2) suitable for being grasped by a user and being moved from a rest configuration to a pulled configuration for allowing the door opening;
- a control lever (20) associable to the closing mechanism for controlling it from the closed configuration to the open configuration;

wherein the grip, in the rest configuration, is disengaged from the control lever, and
wherein the handle group comprises a coupling lever (30) integral with the grip, actuable by the user and suitable for switching, when actuated, from a disengaged configuration to an engaged configuration wherein it engages the control lever (20), thus allowing the control of the closing mechanism in opening due to the movement of the grip.

2. Handle group according to claim 1, comprising a safety lever (40) arranged insdide the grip and accessible by the user through a window (8d) obtained in said grip, operatively engaged with the coupling lever so that moving the safety lever, the coupling lever switches from the disengaged configuration to the engaged configuration with the control lever.

3. Handle group according to claim 2, wherein said safety lever protrudes from said window of the grip, to be pressed by the user's hand that grasps the grip.

4. Handle group according to claim 3, wherein said window is obtained on the back surface of the grip, facing the door surface.

5. Handle group according to any one of the previous claims, wherein

- the control lever is hinged to a support body so as to be turnable about an axis of rotation (Z), and wherein
- the axis of rotation lays on a horizontal plane, and wherein
- the grip movement from the rest configuration to the pulled configuration takes place on a plane coplanar to said horizontal plane.

6. Handle group according to claim 5, comprising elastic means (22) suitable for constantly influencing said control lever so as to oppose the action exerted by the user on the grip in the configuration of engagement with the coupling lever and with handle pulled for opening the door.

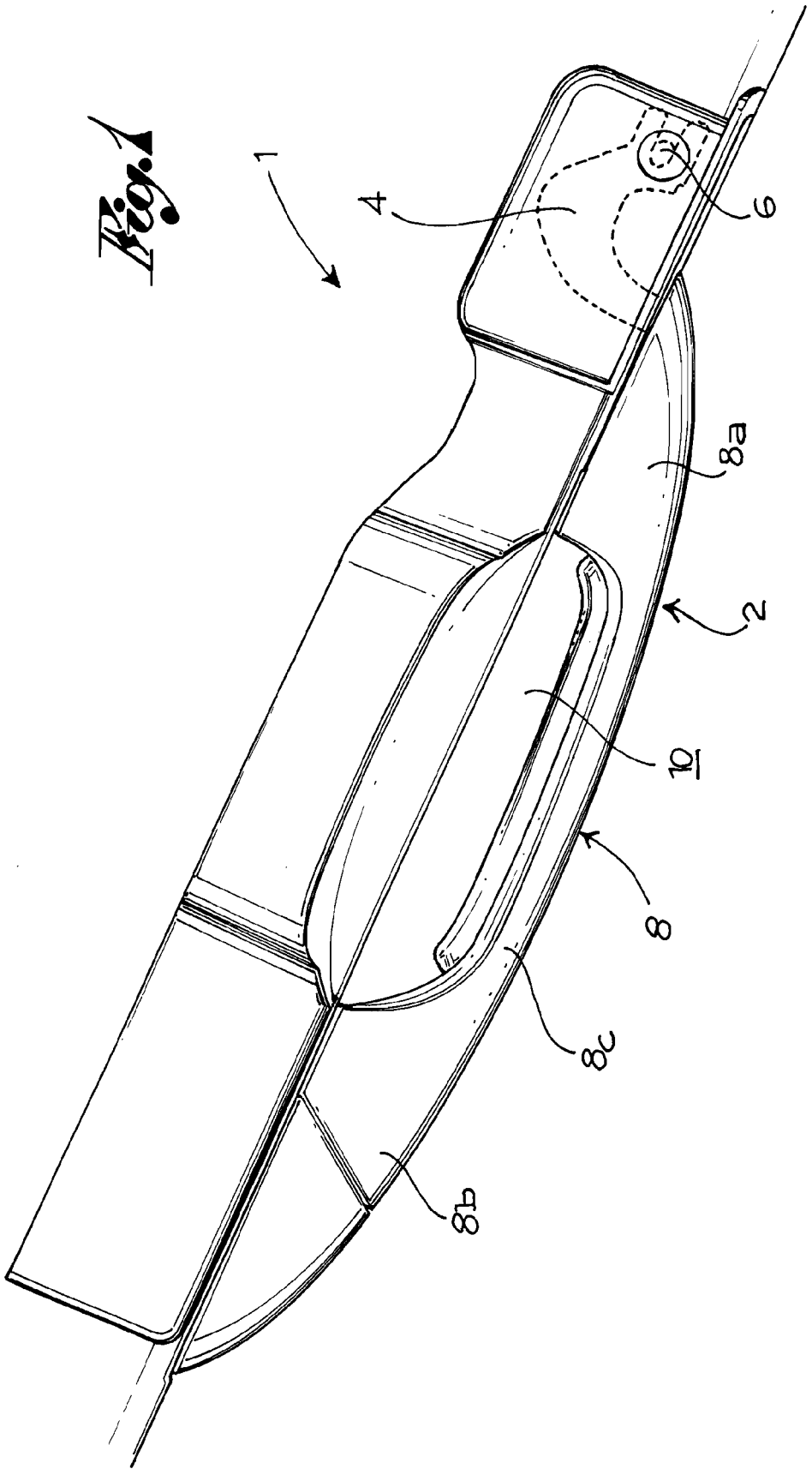
7. Handle group according to claim 5 or 6, wherein the control lever comprises a hook portion (24) for the engagement with the coupling lever (30) and a pulling portion (26) for the connection to the closing mechanism.

8. Handle group according to claim 7, wherein said hook portion is angularly spaced relative to said pulling portion.

9. Handle group according to claim 7 or 8, wherein the hook portion is proximal to the axis of rotation and the pulling portion is distal to the axis of rotation.

10. Handle group according to any one of the previous claims, wherein the coupling lever (30) comprises a lever body (32) partly seated in the grip (2), and a projection (34), protruding from the lever body (32) suitable for engaging the control lever (20).

Fig.1



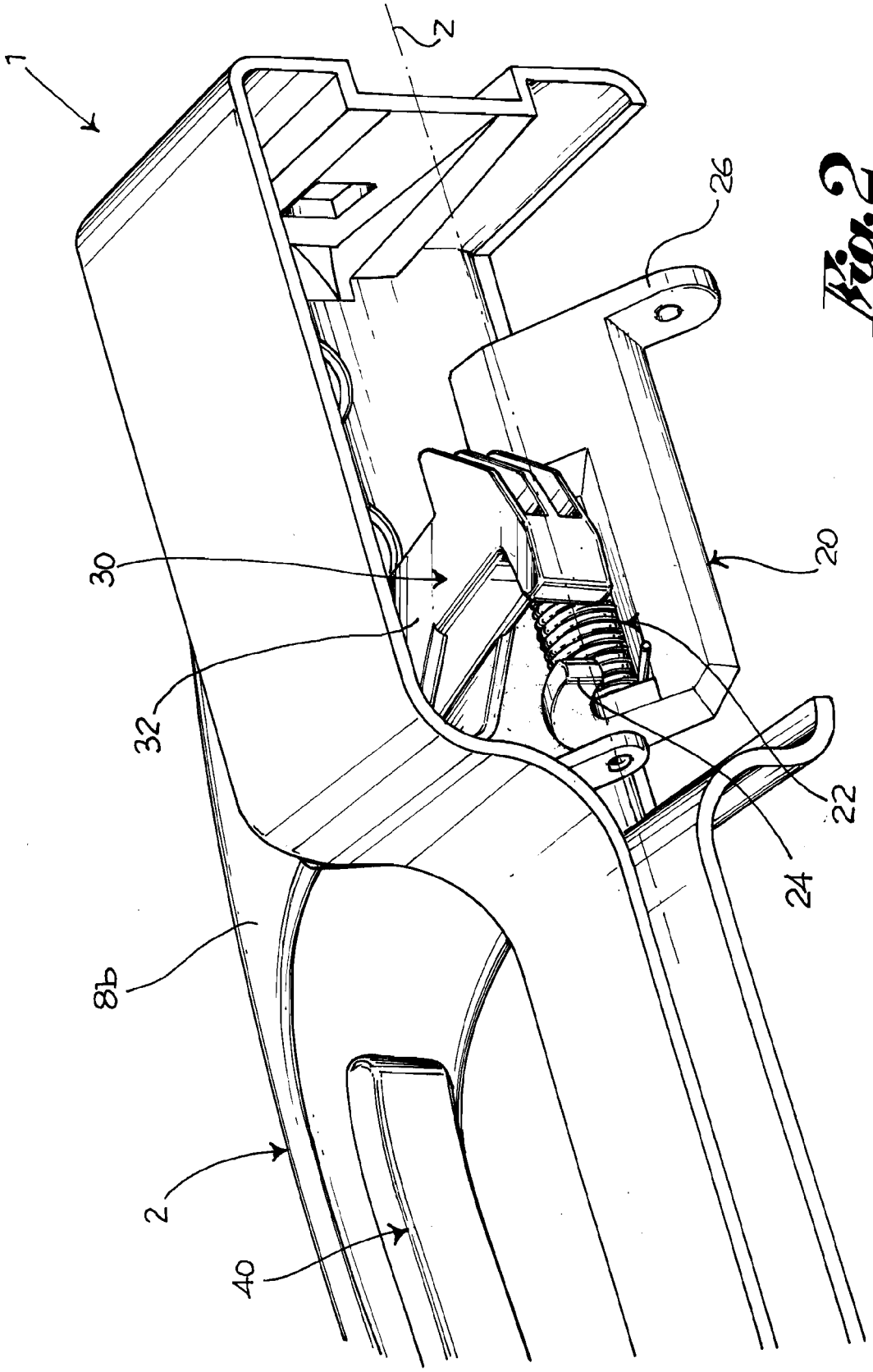


Fig. 2

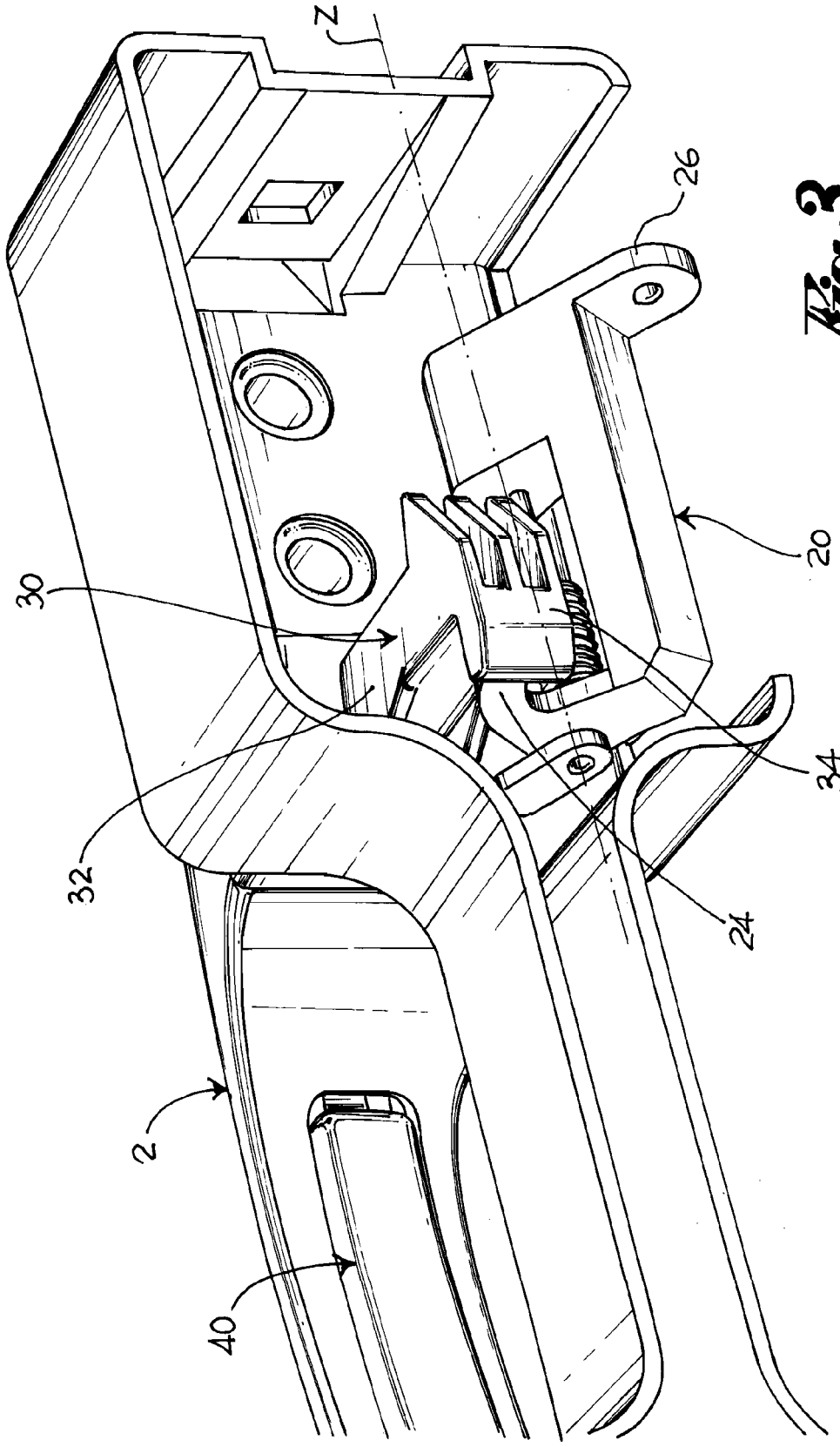
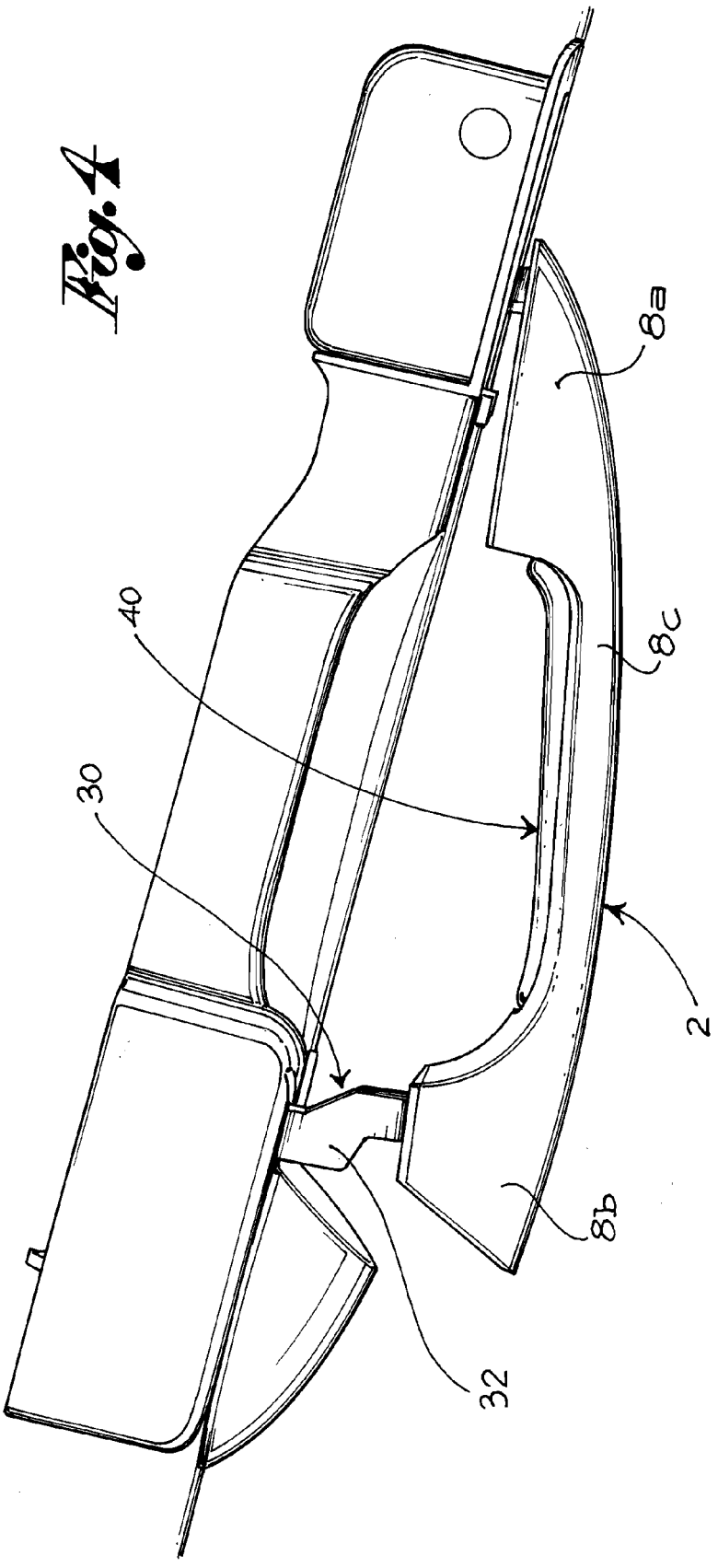


Fig.3

Fig. 4



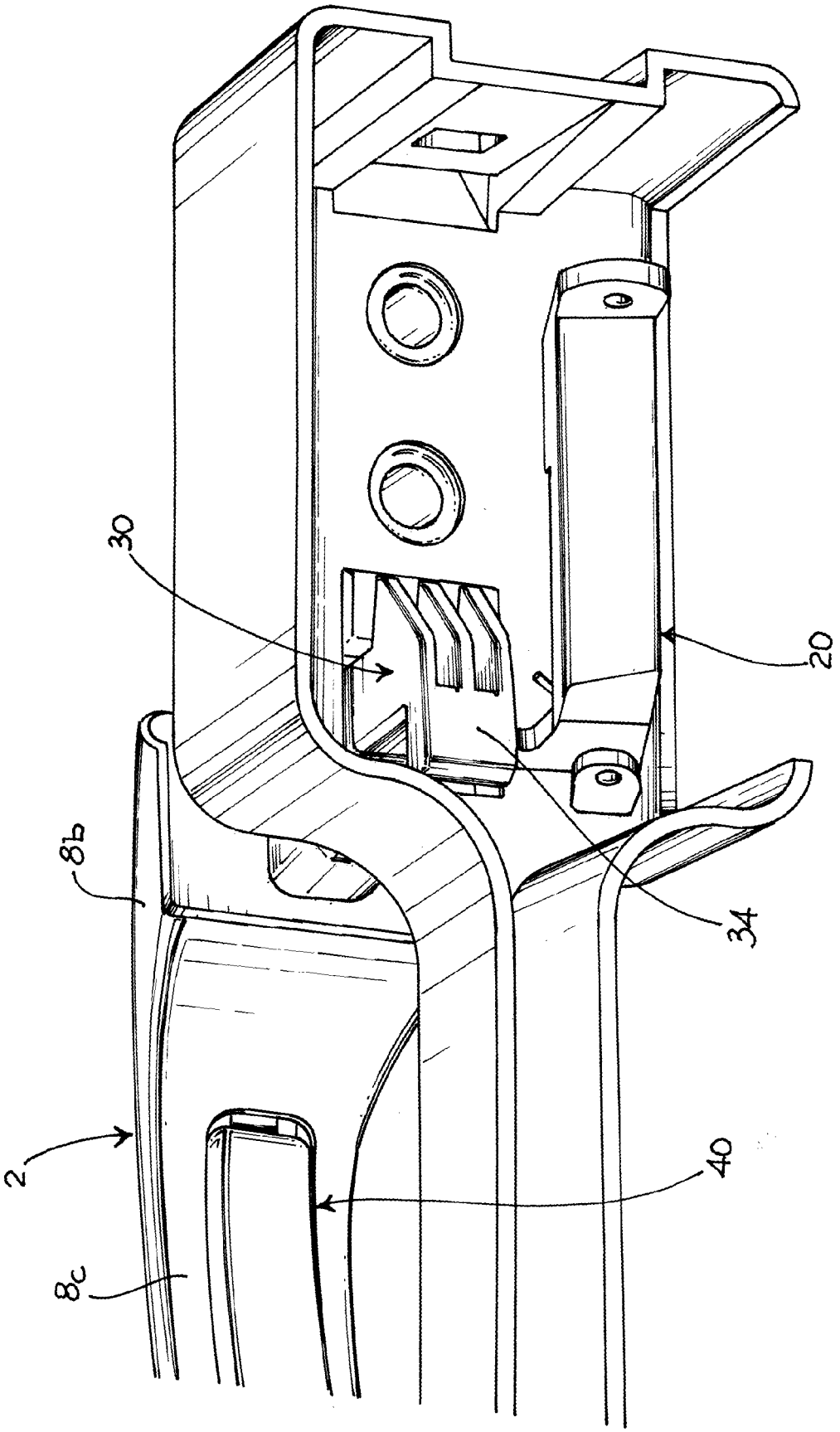


Fig.5

REFERENCES CITED IN THE DESCRIPTION

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