



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
25.10.2017 Bulletin 2017/43

(51) Int Cl.:
E05B 83/10 ^(2014.01)

(21) Application number: **16425033.4**

(22) Date of filing: **20.04.2016**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

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(54) **RELEASE APPARATUS FOR VEHICLE DOORS**

(57) A release apparatus for doors of vehicles, such as vans, trucks, heavy goods vehicles, articulated trucks, trailers, and the like, which comprises a base (2), which can be anchored stably to the door, and a handle assembly (3), which can be fixed to at least one rod (A) that in turn can be coupled rotatably to the door and supports respective means for anchoring to the frame of the vehicle; the handle assembly (3) is able to rotate with respect to the base (2) between at least one locking configuration, in which the anchoring means can engage even indirectly the frame of the vehicle, and at least one release configuration, in which the anchoring means are in any case disengaged from the frame of the vehicle, in order to allow the free rotation of the door; the handle assembly (3)

comprises at least one main plate (4) that has a substantially rectangular outline and defines, at a first edge (4a), a stable insertion seat for the rod (A); a locking button (6) is coupled rotatably to the base (2) and is reversibly movable between at least one first angular position, in which it is arranged so as to interfere with the movement of a second edge (4b) of the plate (4), which lies opposite the first edge (4a), and at least one second angular position, in which it is spaced from the second edge (4b); the plate (4) has at least one lug (7) that extends transversely from the second edge (4b) in order to contrast the unwanted deformation of the plate (4) and increase its mechanical strength.

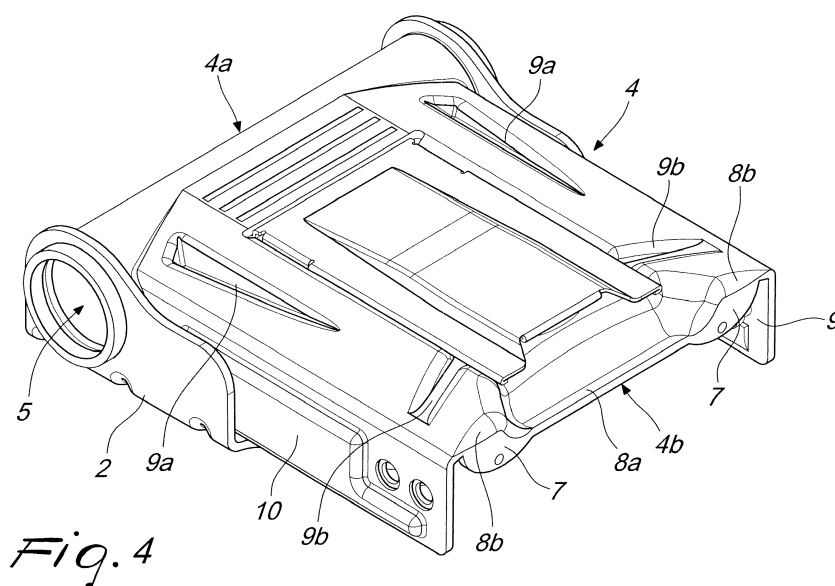


Fig. 4

Description

[0001] The present invention relates to a release apparatus for vehicle doors.

[0002] Rear (or lateral) doors usually arranged to close the loading compartment of trucks, vans, articulated trucks, heavy goods vehicles, trailers, and the like, are usually associated with particular apparatuses intended for their release, which can be operated when the user (for example the vehicle driver) wishes to gain access to the compartment.

[0003] According to methods that are by now well established, during vehicle motion the door is in fact kept in the closed arrangement by engagement elements (hooks, claws, etc.) which are fixed to the ends of a vertical rod, which is coupled rotatably to said door. In this condition, the engagement elements in fact engage respective retention elements, which are fixed to the frame of the vehicle (above and/or below the door).

[0004] Each release apparatus of the known type therefore comprises a handle, which is integral with the rod and is arranged substantially outside the door, so that it can be gripped and turned by the operator who wishes to access the compartment. The rotation of the handle causes the integral rotation of the rod and the consequent disengagement of the engagement elements from the retention elements, thus allowing the door to rotate freely.

[0005] In addition to the usual structure outlined above, there are solutions which prevent the accidental rotation of the handle, obviously to avoid the danger of unwanted openings of the door, for example during vehicle motion.

[0006] For this purpose, therefore, the free rotation of the handle is first of all handed directly or indirectly by a button.

[0007] Only as a consequence of the intentional pressing of the button on the part of the user is it possible to space such button, or an element associated therewith, from the handle rotation trajectory, in order to allow door opening.

[0008] Furthermore, as a further safety assurance (and in order to limit access to the compartment only to authorized personnel) apparatuses of the known type are also provided with key-operated devices, which again allow free rotation of the handle only to the owner of the key, their use allowing indeed to deactivate a further hindrance to the movement of said handle (or of the button).

[0009] However, this constructive solution is not devoid of drawbacks.

[0010] It should in fact be noted that release apparatuses are required to ensure high resistance to stresses and impacts, first of all to prevent violent impacts against the door from deforming the handle until its functionalities are compromised, with consequent accidental opening of the door or in any case reducing the effectiveness of the solutions cited above.

[0011] This may occur, for example, if a heavy load, accommodated in the internal compartment and incor-

rectly immobilized, strikes the door, for example in case of breaking or during uphill travel.

[0012] Furthermore, resistance to stresses is required in order to discourage break-in attempts on the part of ill-intentioned individuals, who otherwise might attempt to force the key-operated device and/or deform the components of the handle and of the release apparatus in order to achieve easy access to the compartment (and remove or damage its content).

[0013] In this context, unfortunately limitations that are by now unacceptable in solutions of the known type have become evident, since indeed commercially available release apparatuses have an inadequate resistance to stresses and deformations, which might lead to the opening of the door even without acting on the button and/or without having the key.

[0014] The aim of the present invention is to solve the problems described above, by providing a release apparatus that ensures high resistance to stresses.

[0015] Within this aim, an object of the invention is to provide a release apparatus that ensures a high mechanical resistance to impacts, deformations and shocks of any type to which such apparatus or the door on which it is mounted might be subjected.

[0016] Another object of the invention is to provide a release apparatus that ensures strength and high reliability in operation while maintaining a low cost, safe application and a general structural simplicity.

[0017] Another object of the invention is to provide a release apparatus that ensures strength and high reliability in operation while allowing to reduce the weight and thickness, and therefore the cost, of the involved components with respect to known solutions.

[0018] Another object of the invention is to provide a release apparatus that can be obtained easily starting from commonly commercially available elements and materials.

[0019] Another object of the invention is to provide an apparatus that adopts a technical and structural architecture that is alternative to those of apparatuses of the known type.

[0020] This aim and these and other objects that will become better apparent hereinafter are achieved by a release apparatus for doors of vehicles, such as vans, trucks, heavy goods vehicles, articulated trucks, trailers, and the like, which comprises a base, which can be anchored stably to the door, and a handle assembly, which can be fixed to at least one rod that can be coupled rotatably to the door and supports respective means for anchoring to the frame of the vehicle, said handle assembly being able to rotate with respect to said base between at least one locking configuration, in which the anchoring means can engage even indirectly the frame of the vehicle, and at least one release configuration, in which the anchoring means are in any case disengaged from the frame of the vehicle, in order to allow the free rotation of the door, said handle assembly comprising at least one main plate that has a substantially rectangular

outline and defines, at a first edge, a stable insertion seat for the rod, a locking button being coupled rotatably to said base and being reversibly movable between at least one first angular position, in which it is arranged so as to interfere with the movement of a second edge of said plate, which lies opposite said first edge, and at least one second angular position, in which it is spaced from said second edge, characterized in that said plate has at least one lug that extends transversely from said second edge, in order to contrast the unwanted deformation of said plate and increase its mechanical strength.

[0021] Further characteristics and advantages of the invention will become better apparent from the description of a preferred but not exclusive embodiment of the release apparatus according to the invention, illustrated by way of nonlimiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of an apparatus according to the invention;

Figure 2 is a front elevation of the apparatus of Figure 1;

Figure 3 is a bottom view of the apparatus of Figure 1;

Figure 4 is a perspective view of the plate and of the base;

Figure 5 is a perspective view of the plate, the base and the button.

[0022] With reference to the figures, the reference numeral 1 generally designates a release apparatus for doors of vehicles (typically but not exclusively for professional use).

[0023] These vehicles can be of the type of vans, heavy goods vehicles, trucks, articulated trucks, trailers, and like, and comprise therefore an internal compartment, which is closed by at least one door (usually arranged to the rear) and is intended to accommodate and transport goods of various types.

[0024] The use of the apparatus 1 for the release of doors mounted on means of transport of the type indicated above is therefore a preferred application of the invention and will be referenced constantly in the continuation of the present description. At the same time, it is useful to note that the use of the apparatus 1 according to the invention in different fields and/or for different types of vehicles, as a function of the specific requirements, is not excluded (and is in any case within the protective scope claimed herein).

[0025] The apparatus 1 comprises a base 2, which can be anchored stably to the door: for example, the base 2 can be applied rigidly to the outer face of the door, or can be arranged and fixed in a recess that is provided for this purpose in the door proper.

[0026] Furthermore, the apparatus 1 comprises a handle assembly 3, which can be fixed to at least one rod A (shown only in Figure 1 for the sake of simplicity), which in turn, according to known manners, can be coupled rotatably to the door (and typically kept in a vertical ori-

entation).

[0027] The rod A supports respective means (hooks, claws, etc.) for anchoring to the frame of the vehicle, substantially at one or both of its ends, which protrude from the space occupation of the door.

[0028] The handle assembly 3 can rotate with respect to the base 2 (about the axis B along which the rod A is arranged) between at least one locking configuration (in which it is shown in the accompanying figures) and at least one release configuration (in practice, the handle assembly 3 can oscillate about these configurations).

[0029] In the locking configuration, the rod A is rotated so that the anchoring means mentioned above can engage even indirectly the frame of the vehicle, preventing indeed the free rotation of the door (when of course the latter is already arranged so as to close the compartment).

[0030] For example, this condition can be obtained, according to known methods, by arranging adequate retention elements on the frame of the vehicle, above and below the position assumed by the door, so as to be able to indeed affect the anchoring means and engage with them detachably.

[0031] In the release configuration, which is achieved with the partial rotation of the handle assembly 3, the anchoring means are in any case disengaged from the frame of the vehicle, so as to allow the free rotation of the door and access to the internal compartment of the vehicle.

[0032] The handle assembly 3 comprises at least one main plate 4 that has a substantially rectangular contour and defines, at a first edge 4a, a stable insertion seat for the rod A.

[0033] The seat can be constituted for example by a through duct 5 that is indeed formed by the plate 4 (or is anchored thereto) at the first edge 4a.

[0034] Moreover, a locking button 6 is coupled rotatably to the base 2 and in turn can move reversibly between at least one first angular position (in which it is shown in the accompanying figures) and at least one second angular position.

[0035] In the first angular position (and especially when the handle assembly 3 is arranged in the locking configuration), the button 6 is arranged so as to interfere with the movement of a second edge 4b of the plate 4, which lies opposite the first edge 4a. As long as it is retained in said first angular position, it is thus impossible to move the handle assembly 3 from the locking configuration.

[0036] In this manner, in the first angular position the button 6 prevents any accidental releases caused for example by impacts and stresses against the door, the base 2 or the handle assembly 3, which might lead the latter to rotate in an unwanted manner (for example during vehicle motion) and therefore cause the disengagement of the rod A and of the anchoring means from the retention elements.

[0037] Vice versa, in the second angular position, the button 6 is in any case spaced from the second edge 4b

and therefore allows the free rotation of the handle assembly 3 (and the opening of the door).

[0038] According to the invention, the plate 4 has at least one lug 7 that extends transversely (and preferably at right angles) from the second edge 4b. The lug 7, preferably provided in one piece with the plate 4, contrasts any unwanted deformations of the plate 4 (which are indeed due to unexpected, accidental or fraudulent stresses), thus achieving an increase in its mechanical strength and achieving already the intended aim.

[0039] In particular, in the preferred embodiment, shown in the accompanying figures by way of nonlimiting example of the application of the invention, the button 6 is kept in interference with the rotation of a central portion 8a of the second edge 4b.

[0040] Two mutually opposite end portions 8b of the second edge 4b are therefore adjacent, on opposite sides, the central portion 8a and respective lugs 7 which protrude from them.

[0041] Usefully, the plate 4 has at least one localized planar irregularity 9a, 9b that defines a further increase in the mechanical strength of said plate 4.

[0042] This irregularity 9a, 9b can in fact be obtained by plastic deformation (or also in another manner) and causes a localized strain hardening of the material (of the fibers involved), which indeed increases the mechanical strength of the entire plate 4.

[0043] It is useful to note that the increased strength provided by the irregularities 9a, 9b and by the lugs 7 is such as to allow a general reduction of the thicknesses of material (for example metal plate) of which the plate 4 or the other involved components are made, so that indeed this does not penalize the general ability to withstand stresses, which is on the contrary assuredly increased, with respect to known solutions.

[0044] This turns out to be of extreme practical interest, since the reduction of the thicknesses causes an evident reduction of raw material costs (and more).

[0045] In particular, in a first embodiment, which corresponds to the solution shown in the accompanying figures, the irregularity 9a, 9b is constituted substantially by a localized hollow (a groove, a recess, a notch, or the like) provided along the face of the plate 4 that is opposite with respect to the base 2 (and to the door of the vehicle).

[0046] In a second embodiment, which does not exhaust the modes of an embodiment that are in any case within the protective scope claimed herein, the irregularity 9a, 9b is constituted substantially by a localized ridge (an expansion, a raised portion, a protrusion) that protrudes outward from the face of the plate 4 that lies opposite the base 2.

[0047] It should be noted that both the hollow and the ridge (or other irregularity 9a, 9b), defined as mentioned on the face of the plate 4 that lies opposite the base 2, can correspond respectively to a ridge and a hollow on the other face, if the planar extension of the latter follows that of the former.

[0048] As an alternative, the second face (the one di-

rected toward the base 2) can have a regular shape if indeed one wishes to provide the irregularity 9a, 9b only on the face that lies opposite to the base 2 (or optionally the reverse).

[0049] More particularly, and with further reference to the preferred solution, illustrated by way of nonlimiting example in the accompanying figures, the apparatus 1 comprises two irregularities 9a (two hollows) which have an elongated shape along directions that are substantially perpendicular to the edges 4a, 4b and are arranged side by side at respective peripheral regions of the plate 4.

[0050] Furthermore, the apparatus 1 comprises two irregularities 9b (two hollows) that have elongated shapes that are aligned along a direction that is substantially parallel to the edges 4a, 4b.

[0051] It is useful to specify that the protection claimed herein is to be understood as being extended to plates 4 that have one or more irregularities 9a and/or one or more irregularities 9b, and/or others even having different shape and dimensions.

[0052] In the preferred embodiment, which does not limit the application of the invention, the plate 4 has two lateral shoulders 10 that extend from respective sides substantially along the entire longitudinal extension of the plate 4, between the first edge 4a and the second edge 4b.

[0053] Furthermore, with further reference to the preferred constructive solution, the handle assembly 3 comprises a handgrip 11, which is integral with the plate 4 on the opposite side with respect to the seat (the duct 5). Although it is not excluded that such handgrip 11 might be provided with one or more degrees of freedom with respect to the plate 4, in the preferred solution the handle assembly 3 is therefore provided in one piece or in any case the plate 4 and the handgrip 11 can move integrally. The handgrip 11 can thus be gripped directly by a user in order to cause, after acting on the button 6, the rotation of the handle assembly 3 at least from the locking configuration to the release configuration.

[0054] In the preferred embodiments, the locking button 6 has an expanded head that defines an external surface 6a that is directed away from the base 2.

[0055] Preferably, at least one portion of such external surface 6a is knurled, so as to facilitate interaction with the user, but in any case it is at the outer surface 6a that the user can apply a direct pressure to actuate the button 6.

[0056] Furthermore, in this constructive solution in the first angular position an end flap 6b of the head is kept elastically rested against the second edge 4b of the plate 4, for interference with the rotation of the handle assembly 3 from the locking configuration to the release configuration.

[0057] In the second angular position, instead, the flap 6b is spaced from the second edge 4b, thus allowing the free rotation of the handle assembly 3.

[0058] Operation of the release apparatus according

to the invention is as follows.

[0059] When the door is arranged so as to close the internal compartment of the vehicle and the handle assembly 3 is in the locking configuration, the anchoring means engage directly or indirectly the frame of the vehicle and prevent the opening of the door.

[0060] In order to be able to access the compartment, the user must move the button 6 from the first angular position and at the same time move the handle assembly 3: the rotation of the latter in fact causes the rotation of the rod A and therefore the disengagement of the anchoring means. By applying further traction to the handle assembly 3 (for example on the handgrip 11) it is thus possible to move the door.

[0061] As already anticipated, the apparatus 1 ensures high strength, first of all thanks to the choice to provide one or more lugs 7.

[0062] Such lugs are in fact arranged conveniently at the region that is most stressed (the end portions 8b) and prevent (or at least limit) dangerous deformations thereof when indeed the apparatus 1 is subjected to violent blows or impacts or to break-in attempts.

[0063] Usefully, the ability to withstand stresses is further increased additionally by resorting to localized hollows or ridges (or other irregularities 9a, 9b), since these modifications in the plane shape of the plate 4 ensure an increase in mechanical strength.

[0064] It should be noted that these important results are achieved with simple and economical modifications to the plate 4 (in order to add the lugs 7 and the irregularities 9a, 9b) without having to resort to a general increase in the thicknesses of the components involved (and therefore of the material used), to welds or other complex elements.

[0065] Vice versa, it is the significant increase in strength obtained with the lugs 7 and the irregularities 9a, 9b that allows to reduce the thicknesses of the metal plate of the involved components and therefore causes a welcome cost reduction (due to the reduction in the material used), thus confirming the general low cost of the invention.

[0066] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; all the details may further be replaced with other technically equivalent elements.

[0067] In the examples of embodiment shown, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

[0068] In practice, the materials used, as well as the dimensions, may be any according to requirements and to the state of the art.

[0069] 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.

5 Claims

1. A release apparatus for doors of vehicles, such as vans, trucks, heavy goods vehicles, articulated trucks, trailers, and the like, comprising a base (2), which can be anchored stably to the door, and a handle assembly (3), which can be fixed to at least one rod (A) that can be coupled rotatably to the door and supports respective means for anchoring to the frame of the vehicle, said handle assembly (3) being able to rotate with respect to said base (2) between at least one locking configuration, in which the anchoring means can engage even indirectly the frame of the vehicle, and at least one release configuration, in which the anchoring means are in any case disengaged from the frame of the vehicle, in order to allow the free rotation of the door, said handle assembly (3) comprising at least one main plate (4) that has a substantially rectangular outline and defines, at a first edge (4a), a stable insertion seat for the rod (A), a locking button (6) being coupled rotatably to said base (2) and being reversibly movable between at least one first angular position, in which it is arranged so as to interfere with the movement of a second edge (4b) of said plate (4), which lies opposite said first edge (4a), and at least one second angular position, in which it is spaced from said second edge (4b), **characterized in that** said plate (4) has at least one lug (7) that extends transversely from said second edge (4b), in order to contrast the unwanted deformation of said plate (4) and increase its mechanical strength.
2. The apparatus according to claim 1, **characterized in that** said button (6) is kept in interference with the rotation of a central portion (8a) of said second edge (4b) said lugs (7) extending from two mutually opposite end portions (8b) of said second edge (4b) and being adjacent on opposite sides with respect to said central portion (8a).
3. The apparatus according to claim 1 or 2, **characterized in that** said plate (4) has at least one localized planar irregularity (9a, 9b), which defines a further increase in the mechanical strength of said plate (4).
4. The apparatus according to claim 3, **characterized in that** said irregularity (9a, 9b) is constituted substantially by a localized hollow provided along the face of said plate (4) that lies opposite said base (2).
5. The apparatus according to claim 3, **characterized in that** said irregularity (9a, 9b) is constituted substantially by a localized ridge, which protrudes out-

ward from the face of said plate (4) that lies opposite said base (2).

6. The apparatus according to one or more of the preceding claims, **characterized in that** it comprises two of said irregularities (9a), which have an elongated shape along directions that are substantially perpendicular to said edges (4a, 4b) and are arranged side by side in respective peripheral regions of said plate (4).

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7. The apparatus according to one or more of the preceding claims, **characterized in that** it comprises two of said irregularities (9b), which have an elongated shape and are aligned along a direction that is substantially parallel to said edges (4a, 4b).

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8. The apparatus according to one or more of the preceding claims, **characterized in that** said plate (4) is provided with two lateral shoulders (10), which extend from respective sides substantially along the entire longitudinal extension of said plate (4), between said first edge (4a) and said second edge (4b).

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9. The apparatus according to one or more of the preceding claims, **characterized in that** said handle assembly (3) comprises a handgrip (11), which is integral with said plate (4) on the opposite side with respect to said seat and can be gripped directly by a user for the rotation of said handle assembly (3) at least from said locking configuration to said release configuration.

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10. The apparatus according to one or more of the preceding claims, **characterized in that** said locking button (6) has an expanded head that defines an external surface (6a) that is directed away from said base (2), for the actuation of said locking button (6) by direct pressure, in said first angular position and end flap (6b) of said head being kept elastically rested against said second edge (4b) of said plate (4), for interference in the rotation of said handle assembly (3) from said locking configuration to said release configuration, in said second angular position said flap (6b) being spaced from said second edge (4b) for the free rotation of said handle assembly (3).

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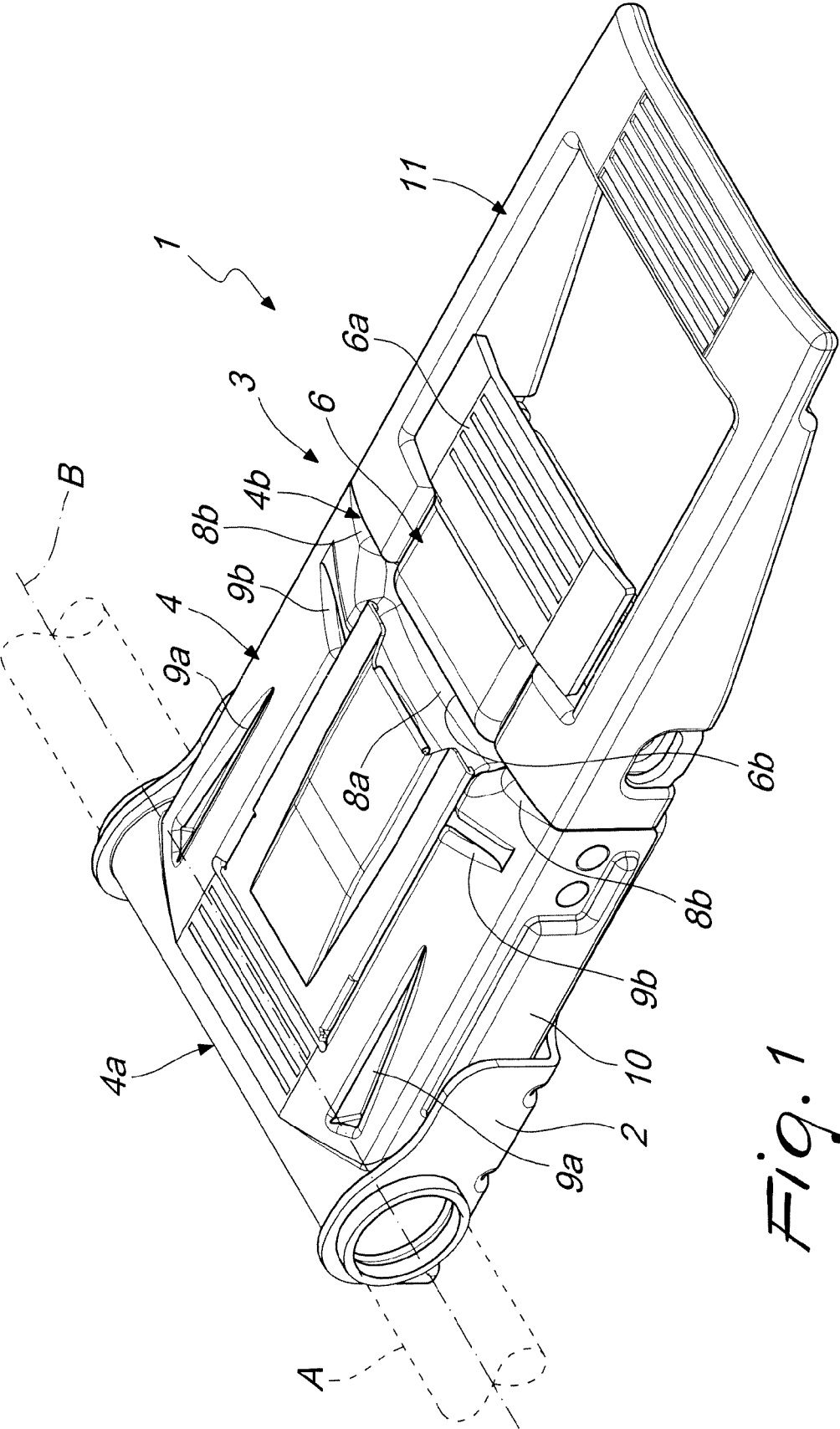


Fig. 1

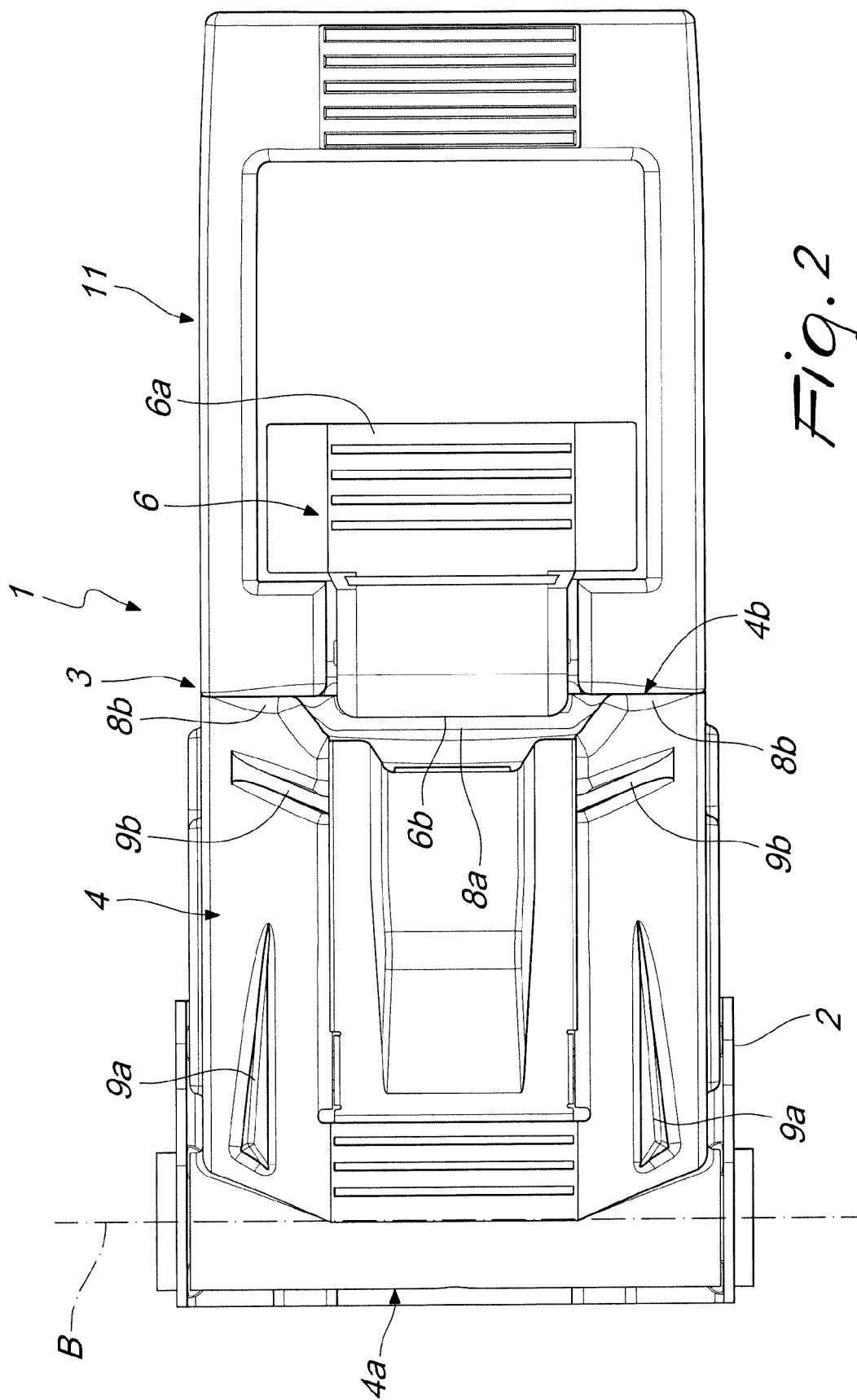
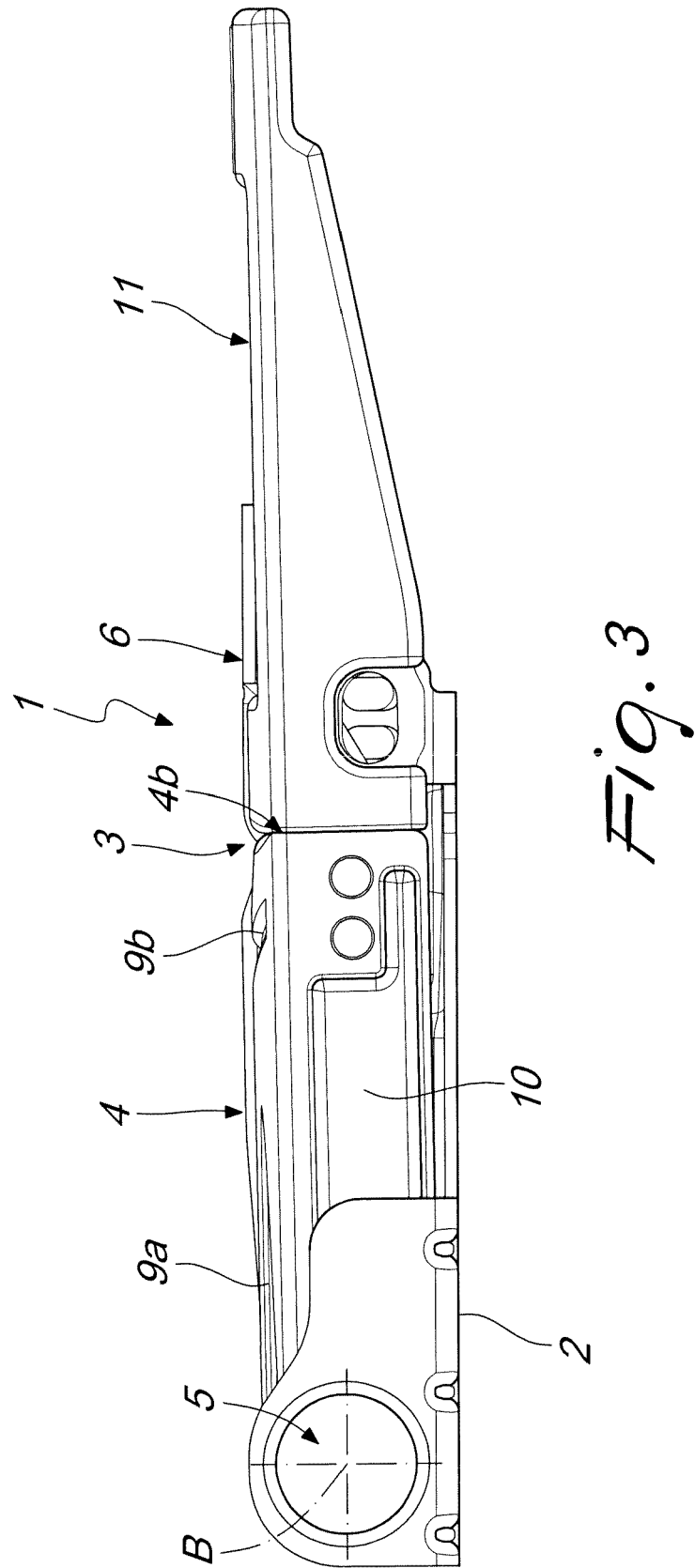


Fig. 2



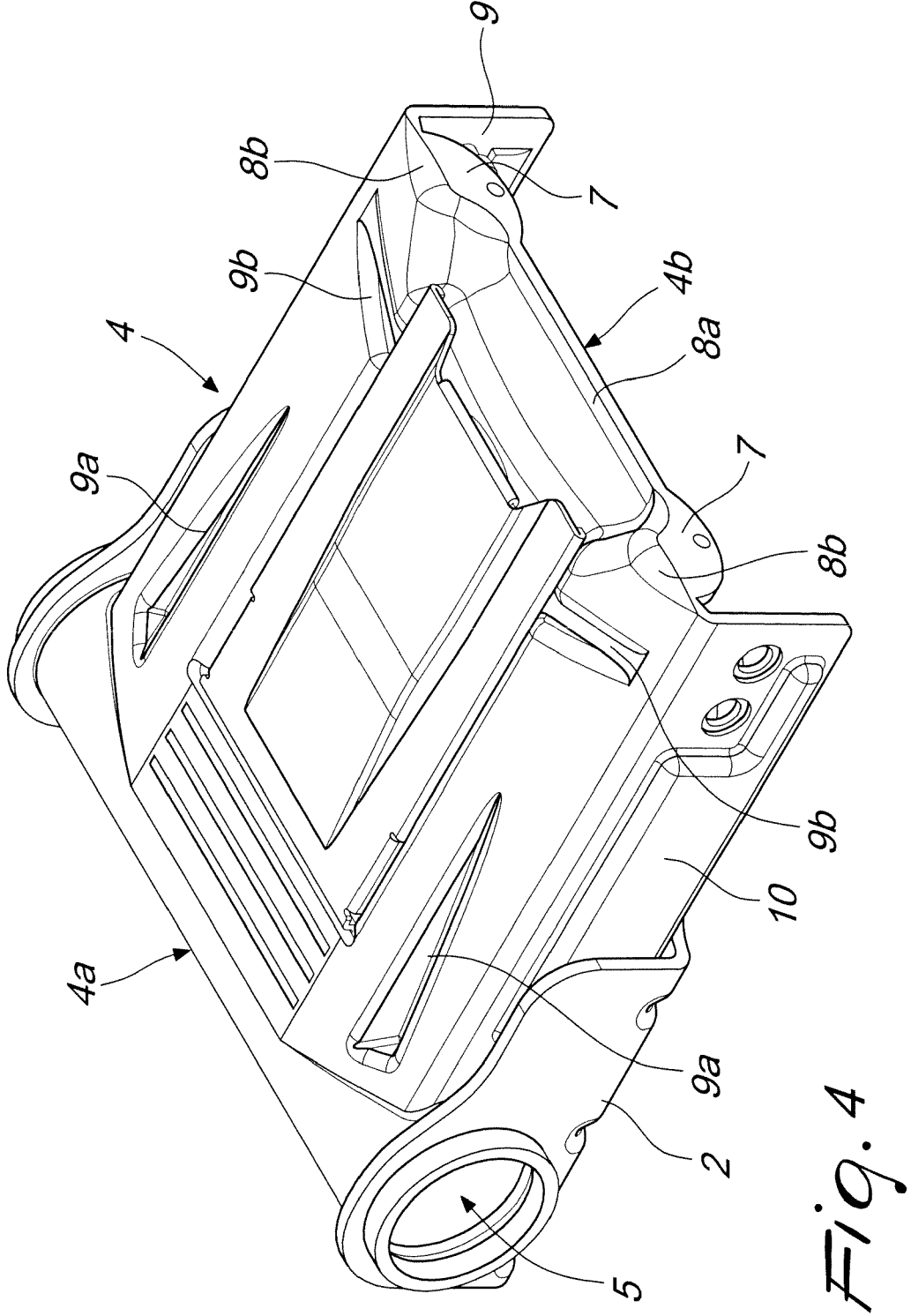
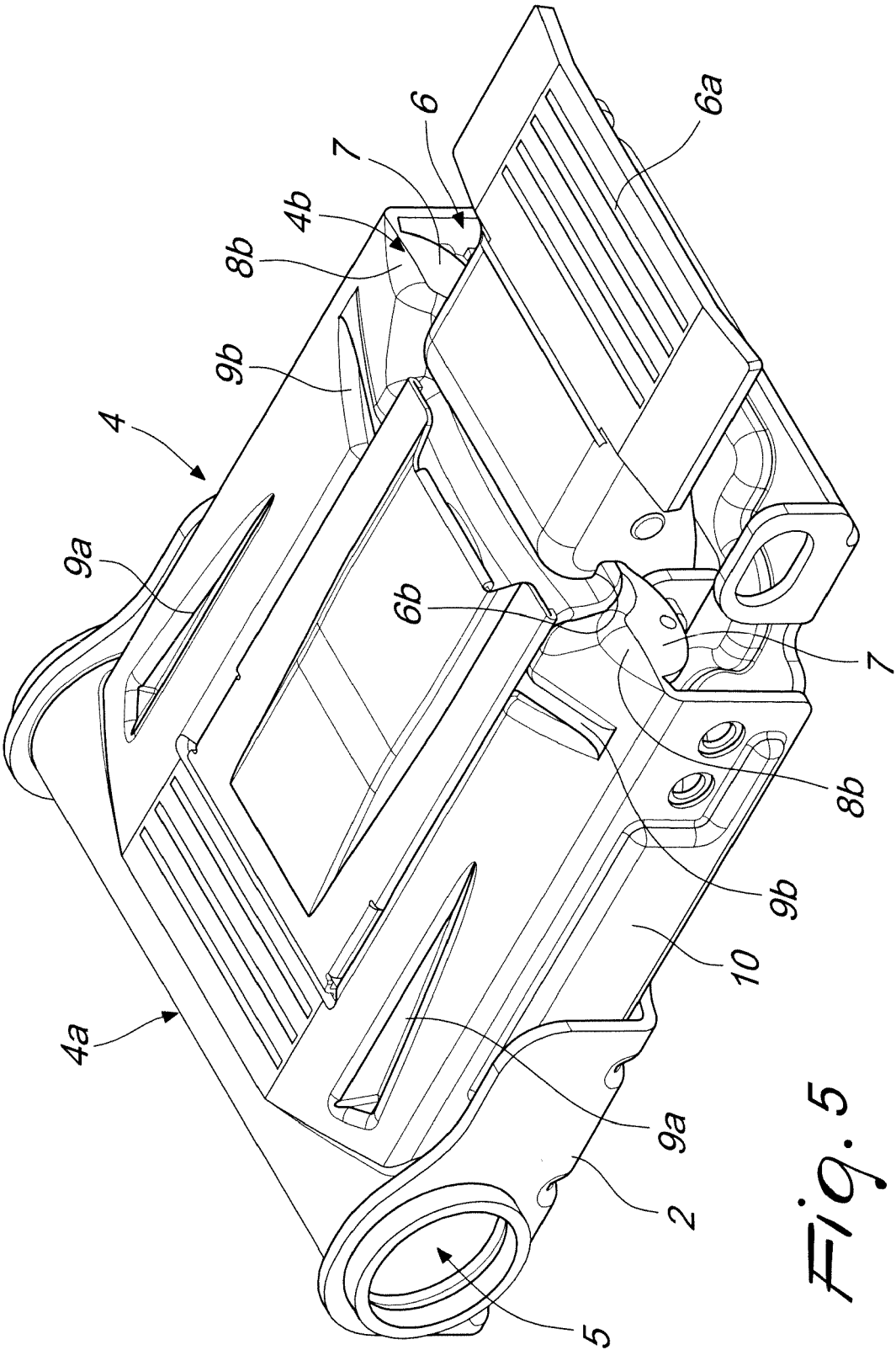


Fig. 4





EUROPEAN SEARCH REPORT

Application Number
EP 16 42 5033

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CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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