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(71) Applicant: **Pastore & Lombardi S.p.A.**
Bologna (IT)

(72) Inventor: **Hilbe, Luca**
40123 Bologna (IT)

(74) Representative: **Modiano, Micaela Nadia et al**
Modiano & Partners
Via Meravigli, 16
20123 Milano (IT)

(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 has at least one main plate (4) that is associated with means for fixing to a rod (A); in turn, the rod (A) can be coupled rotatably to the door and supports at least one respective unit 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 unit can engage even indirectly the frame of the vehicle, and at least one release configuration, in which the unit is in any case disengaged from the frame of the vehicle, in order to allow the rotation of the door; the means comprise a lip (6) that is adjacent and integral with the plate (4); the lip (6) is partially rolled up onto itself so as to define an insertion seat (7) for the rod (A); the lip (6) is further coupled to the plate (4) by means of at least one permanent connection element (9), of the type of a rivet, a nail, and the like.

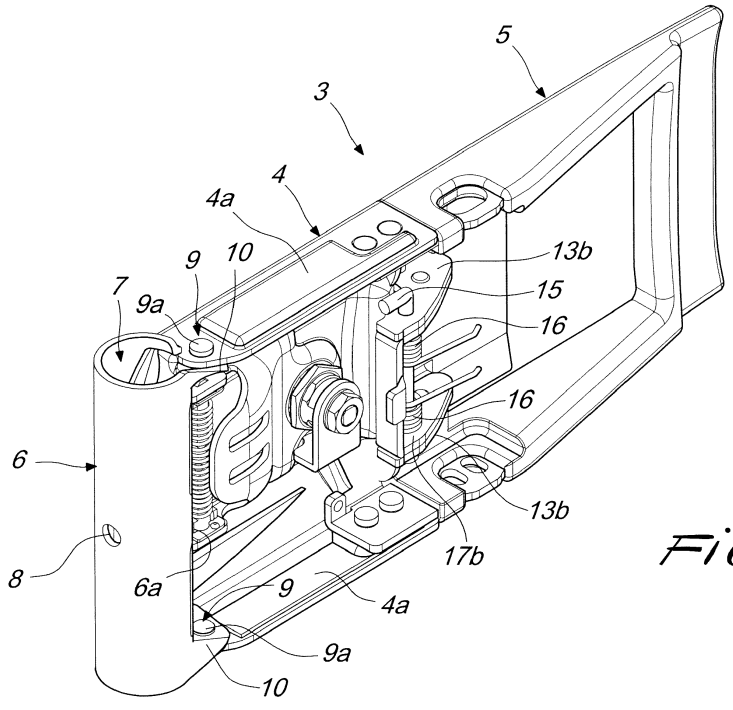

Fig. 4

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Description

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

[0002] Rear doors (and sometimes also side 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. These apparatuses are indeed actuated when one 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 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 a person wishing to access the compartment. The movement of the handle in fact 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] Moreover, known apparatuses have further solutions, which prevent the accidental rotation of the handle, since they are usually arranged directly or indirectly so as to interfere with the trajectory of said handle or of a component that is integral therewith.

[0006] This type includes buttons that must be pressed by the user, simultaneously with the traction applied to the handle, and key-operated devices that can be deactivated exclusively by the owner of said key (and therefore also allow to discourage actions by ill-intentioned individuals in addition to contrasting accidental rotations).

[0007] According to known methods, the handle, typically made of metal plate, has a flat laminar shape and is usually kept so as to face and lie proximate to the base of the apparatus (which in turn is anchored to the door).

[0008] The rigid coupling between the rod and the handle is provided at an end lip of the latter, which is bent and partially rolled up so as to form a sort of through duct, in which it is indeed possible to insert the rod, which is then anchored to said lip in various manners.

[0009] To prevent subsequent deformations of the lip, its terminal edge also is welded to the handle, thus preventing any "unrolling", as might otherwise occur due to the stresses to which said lip is subjected during normal operation.

[0010] Moreover, welds are also used in relation to other elements of known apparatuses, for example in order to compose the button, which usually has a bulkier central portion intended to be pressed directly by the user, and a respective supporting structure, which vice versa must be able to ensure coupling to other components of the release apparatus, usually in very confined spaces and therefore with the need to comply with rigid dimensional constraints.

[0011] The central portion and the supporting structure are indeed provided separately and then mutually welded.

[0012] However, these constructive solutions are not devoid of drawbacks.

[0013] The resort to welding work is by now highly unwelcome, since it increases significantly production costs and times, requiring at the same time particular attention and skills.

[0014] In greater detail, among the many drawbacks that make welds increasingly less desirable, first of all it should be noted that they require qualified personnel for their execution and entail rather long execution times for the placement of the parts, the provision of the beads and the cleaning of any slag.

[0015] Moreover, checking the quality of the weld (which further is strongly influenced by the skills of the specific operator) requires a worker qualified for visual inspection, or even the use of penetrating liquids, and in any case it is necessary to wait an appropriate time before being able to perform it, since post-welding defects (cold cracks) can occur even several hours later.

[0016] Finally, one should not forget that welding requires a specific cleaning process with chemical products, the disposal of which causes further problems.

[0017] These drawbacks become apparent therefore in the anchoring of the lip to the handle, which is indeed obtained by welding, as mentioned, and in all other points of the apparatus (such as the button) where this method is used.

[0018] The aim of the present invention is to solve the problems described above, by providing an apparatus that is capable of containing or eliminating the risk of deformations and unrolling of the lip of the handle without resorting to welds.

[0019] Within this aim, an object of the invention is to provide an apparatus that has effective methods for anchoring the lip to the handle without resorting to welds.

[0020] Another object of the invention is to provide an apparatus in which the lip is anchored to the handle rapidly, inexpensively, without requiring specific skills and without resorting to polluting materials.

[0021] Another object of the invention is to provide an apparatus in which welds are used minimally or which lacks them completely.

[0022] Another object of the invention is to provide an apparatus that ensures high reliability in operation and allows practical methods for verification and inspection.

[0023] 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.

[0024] Another object of the invention is to provide an apparatus that can be obtained easily starting from com-

monly commercially available elements and materials.

[0025] Another object of the invention is to provide an apparatus that has low costs and is safe in application.

[0026] 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 has at least one main plate that is associated with means for fixing to a rod, which can be coupled rotatably to the door and supports at least one respective unit 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 said at least one unit can engage even indirectly the frame of the vehicle, and at least one release configuration, in which said at least one unit is in any case disengaged from the frame of the vehicle, in order to allow the rotation of the door, said means comprising a lip that is adjacent and integral with said plate, said lip being partially rolled up onto itself so as to form a rod insertion seat, characterized in that said lip is further coupled to said plate by means of at least one permanent connection element, of the type of a rivet, a nail, and the like.

[0027] Further characteristics and advantages of the invention will become better apparent from the description of a preferred but not exclusive embodiment of the 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;
Figures 4 and 5 are perspective views of the handle assembly of the apparatus of Figure 1 taken at different angles;
Figure 6 is a highly enlarged-scale view of a detail of Figured 5;
Figure 7 is a rear view of the handle assembly of the apparatus of Figure 1;
Figure 8 is a bottom view of the handle assembly of the apparatus of Figure 1;
Figure 9 is a perspective view of the base and of a further component of the apparatus of Figure 1;
Figure 10 is an exploded perspective view of the additional component of Figure 9.

[0028] 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).

[0029] 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 intended to accommodate and transport goods of various types.

[0030] The use of the apparatus 1 for the release of doors mounted (to the rear or even laterally) 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).

[0031] 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 (along its external face).

[0032] Furthermore, the apparatus 1 comprises a handle assembly 3, which has at least one main plate 4 (typically but not exclusively made of metal plate), which is associated with means for fixing to a rod A (shown only in Figure 1 for the sake of simplicity).

[0033] In turn, and according to known manners, the rod A can be coupled rotatably to the door (and typically kept in a vertical orientation).

[0034] The rod A supports at least one respective unit (a hook, a claw, 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.

[0035] 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).

[0036] In the locking configuration, the rod A is rotated so that each anchoring unit 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).

[0037] 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 respective anchoring units and engage with them detachably.

[0038] In the release configuration, which is achieved with the partial rotation of the handle assembly 3, the anchoring units 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.

[0039] It should be noted that typically the handle assembly 3 also comprises a handgrip 5, which is anchored to the plate 4 on the opposite side with respect to the rod A. Although it is not excluded that such handgrip 5 might

be provided with one or more degrees of freedom with respect to the plate 4, in the preferred solution the handle assembly 3 (the plate 4 and the handgrip 5) moves integrally when it is gripped by a user (indeed preferably at the handgrip 5) to be moved from the locking configuration to the release configuration.

[0040] The already introduced fixing means comprise a lip 6 which is adjacent to and integral with the plate 4; such lip 6 is partially rolled up so as to define a seat 7 (which is substantially tubular) for the insertion of the rod A, so as to indeed allow the coupling between the latter and the handle assembly 3.

[0041] It is specified that during assembly, after inserting the rod A in the seat 7, complete fixing can be obtained in various manners, for example by welding or preferably by introducing a grub in the opening 8 provided along the lip 6 (therefore avoiding the use of welds in this step as well).

[0042] According to the invention, the lip 6 is further coupled to the plate 4 by means of at least one permanent connection element 9, of the type of a rivet, a nail, and the like, and therefore without resorting to welds, thus achieving the intended aim.

[0043] In particular, in the preferred embodiment, mentioned by way of nonlimiting example of the application of the invention, the permanent connection element 9 is indeed a rivet.

[0044] With further reference to the preferred embodiment, the lip 6 has at least one lug 10, which extends from its end edge 6a, on the opposite side with respect to the plate 4.

[0045] In order to obtain the already mentioned further coupling between the lip 6 and the plate 4, the lug 10 and a lateral ridge 4a of the plate 4 are mutually fastened by the permanent connection element 9.

[0046] More particularly, the lip 6 is provided with two lugs 10, which extend from the ends of the end edge 6a of such lip 6: each lug 10 and a respective ridge 4a are therefore mutually fastened by a corresponding permanent connection element 9.

[0047] In summary, therefore, and although different constructive choices, in any case within the protective scope claimed herein, are not excluded, in the preferred solution the plate 4 has a substantially rectangular shape, and the ridges 4a protrude from the two sides that are perpendicular to the rod A. The lip 6 in practice constitutes a sort of extension of such plate 4 and has, on the opposite side, the end edge 6a, at which (at its ends) the lugs 10 are defined.

[0048] Therefore, while in the known solutions the entire end edge is welded to the handle, in the apparatus 1 according to the invention it is sufficient to resort to one or (preferably) two connecting elements 9, to avoid in any case the danger of deformations of the lip 6.

[0049] Advantageously, the permanent connection element 9 is inserted in a hole, provided beforehand along each lug 10, and in an orifice, provided beforehand along each ridge 4a and aligned with the respective hole, in order to be able to obtain indeed subsequently the mutual fastening of the lug 10 and of the ridge 4a.

[0050] Even more particularly, after inserting the connecting element 9 in the respective hole and in the corresponding orifice, the protruding end portions 9a (or at least one of them) of said connecting element 9 are pressed against the corresponding external surfaces of the lug 10 and of the ridge 4a. In greater detail, a first protruding portion 9a can form an abutment head, which has an enlarged transverse cross-section, on the opposite side with respect to the other protruding portion 9a, the one inserted in the holes and in the orifices, after such insertion is pressed against the corresponding external surface, for example by resorting to the action of a press, obtaining the desired fastening.

[0051] Usefully, in order to prevent accidental openings of the door, the apparatus 1 comprises a locking button 11, which is coupled rotatably to the base 2, and can thus 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.

[0052] In the first angular position (and especially when the handle assembly 3 is arranged in the locking configuration), the button 11 is arranged even indirectly so as interfere with the movement of the handle assembly 3.

[0053] As long as it is kept in such first angular position, it is thus impossible to move the handle assembly 3 from the locking configuration, preventing indeed any accidental releases, due for example to impacts and stresses against the door, the base 2 or the handle assembly 3.

[0054] Vice versa, in the second angular position, the button 11 is in any case spaced from the handle assembly 3 and therefore allows the movement of the handle assembly 3 (and the opening of the door).

[0055] The button 11 (as can be deduced in particular from Figures 9 and 10) comprises a laminar main body 12, which has a central portion 13a that is substantially flat (and at the most is slightly curved at the sides), which is interposed between respective mutually opposite end flaps 13b, which are bent and articulated to the base 2 (in the manners that will be illustrated hereinafter in relation to a possible embodiment).

[0056] It should be noted, therefore, that the body 12 (which constitutes the button 11 or at least its primary component) is obtained simply by bending starting from a single component, again without resorting to any welding step. In the apparatus 1 according to the invention, the useful function of prevention against accidental releases, offered by the button 11, is therefore also implemented without resorting to welded parts.

[0057] For example, the body 12 can be constituted substantially by a metal plate, which is cold-deformed beforehand to provide indeed the bent flaps 13b (indeed without resorting to any welding step).

[0058] The desired interference with the rotation of the handle assembly 3 can be obtained for example (by way of a suitable arrangement) by keeping the body 12 in forced resting against a transverse band formed by the

plate 4.

[0059] Usefully, the flaps 13b are provided with respective mutually opposite openings 14 (Figure 10), in which it is possible to insert a respective transverse pivot 15 (Figure 9), which is coupled to the base 2, thus achieving the consequent articulation of the button 11 to said base 2.

[0060] The body 12 can be kept elastically in forced resting against the transverse band by at least one spring 16, which is indeed wound around the transverse pivot 15.

[0061] Conveniently, the laminar body 12 comprises an auxiliary platform 13c, which is extended in a substantially coplanar manner from the central portion 13a, on the opposite side with respect to the plate 4.

[0062] In this manner, the user can press directly the platform 13c, instead of on the central portion 13a, thus utilizing a longer lever arm and thus obtaining a facilitated movement of the button 11.

[0063] As already anticipated, the provision of apparatuses 1 in which the button 11 is substantially constituted exclusively by the body 12 is not excluded.

[0064] On the other hand, in the preferred constructive solution the button 11 comprises usefully a reinforcement bracket 17, which is coupled rigidly to the main body 12, in order to increase the mechanical strength of the button 11.

[0065] The bracket 17 then has a crossmember 17a and a pair of mutually parallel arms 17b, which have a center distance that is substantially complementary (slightly smaller) than the center distance of the flaps 13b.

[0066] The arms 17b are thus inserted stably between the flaps 13b, with the crossmember 17a arranged on the opposite side with respect to the central portion 13a.

[0067] It should be noted that the arms 17b are provided with holes 18 which are aligned with the openings 14 in order to allow the insertion of the pivot 15 also in said holes for rotatable coupling to the base 2.

[0068] Favorably, the arms 17b and the flaps 13b have respective slots 19 that are mutually aligned, so as to be able to insert therein corresponding mutual fixing elements 20, such as nails, rivets and the like (which are therefore similar to the permanent connection elements 9).

[0069] Therefore, no welding is required also in the embodiment that provides for an additional component for the button 11 (constituted indeed by the bracket 17), since stable coupling between the body 12 and the bracket 17 is obtained in an entirely practical and easy manner with rivets (or other mutual fixing elements 20 of a similar type).

[0070] Operation of the apparatus according to the invention is as follows.

[0071] 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 units engage directly or indirectly the frame of said vehicle and prevent the opening of the door.

[0072] In order to be able to gain access to the compartment, the user must move the button 11 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 units (by applying a further traction to the handle assembly 3 it is thus possible to move the door).

[0073] The integral movement of the handle assembly 3 and of the rod A is achieved by way of the fixing means, and therefore of the partially rolled up lip 6, which defines the seat 7 in which such rod 6 is inserted and subsequently fixed.

[0074] As shown, the lip 6 is coupled to the plate 4, since it constitutes an extension thereof (or in any case is rendered integral with it); furthermore, at the ends of its end edge 6a, which is otherwise free, with the lugs 10 it is coupled further to the ridges 4a (or to another part of the plate 4).

[0075] In this manner, the risk that any stresses that act on the handle assembly 3 might cause the deformation and/or unrolling of the lip 6 is avoided (or at least contained significantly).

[0076] Differently from what occurs in the known solutions, this result is achieved by means of rivets or other permanent connection elements 9, which mutually fasten the ridges 4a and the lugs 10 and therefore without resorting to welds and without encountering the various drawbacks associated with these processes.

[0077] In greater detail, the insertion and riveting of the connecting elements 9 (for example by means of a press) occurs rapidly and simply and can thus be performed by any operator even without specific skills.

[0078] Likewise, specific skills are not required for the subsequent inspections of the quality of the provided coupling (differently from what occurs in welded connections): it is in fact sufficient to merely measure the diameter of the protruding portion 9a that is flattened by the press.

[0079] Since it is not necessary to wait for the cooling of the parts to check for the late onset of cracks (as occur for welding processes), the simple inspections mentioned above can be performed in a timely manner and rapidly (and without resorting to polluting materials).

[0080] Furthermore, differently from what occurs in known solutions, the coupling of the lip 6 to the ridges 4a does not require the management of chemical products for cleaning, as instead is necessary when welding steps are provided.

[0081] These useful benefits, which are linked to the connection between the lip 6 and the plate 4 and arise from not resorting to welding steps, also extend to the other parts of the apparatus 1 and in particular to the button 11, which also is provided effectively without resorting to welds.

[0082] In fact, the button 11 (the laminar body 12) is provided in one piece (from metal plate), which is bent at the flaps 13b; after bending them, assembly with the base 2 is achieved in a simple manner by means of the

pivot 15, which enters the openings 14.

[0083] The embodiment that provides for the presence of the bracket 17, in order to ensure greater structural strength, in any case also ensures simplicity and low cost of execution, since said bracket 17 can be fixed easily to the body 12 by means of rivets (or similar fixing elements 20) and therefore again without welds or similar labor-intensive processes.

[0084] In practice it has been found that the apparatus according to the invention achieves fully the intended aim, since the use of a permanent connection element, such as a rivet, a nail, and the like, for further coupling between the lip and the plate allows to provide an apparatus that is capable of containing or eliminating the risk of deformations and unrollings of such lip without resorting to welds.

[0085] 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.

[0086] 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.

[0087] In practice, the materials used, as well as the dimensions, may be any according to requirements and to the state of the art.

[0088] 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 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 has at least one main plate (4) that is associated with means for fixing to a rod (A), which can be coupled rotatably to the door and supports at least one respective unit 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 said at least one unit can engage even indirectly the frame of the vehicle, and at least one release configuration, in which said at least one unit is in any case disengaged from the frame of the vehicle, in order to allow the rotation of the door, said means comprising a lip (6) that is adjacent and integral with said plate (4), said lip (6) being partially rolled up onto itself so as to define an insertion seat (7) for the rod (A), **characterized in that** said lip (6) is further coupled to said plate (4) by means of at least one permanent connection element (9), of the type of a rivet, a nail, and the like.

2. The apparatus according to claim 1, **characterized in that** said at least one permanent connection element (9) is a rivet.

3. The apparatus according to claim 1 or 2, **characterized in that** said lip (6) has at least one lug (10), which extends from its end edge (6a), which lies opposite said plate (4), said lug (10) and a lateral ridge (4a) of said plate (4) being mutually fastened by said at least one permanent connection element (9).

4. The apparatus according to claim 3, **characterized in that** said lip (6) has two of said lugs (10), which extend from the ends of said end edge (6a) of said lip (6), each one of said lugs (10) and a respective said ridge (4a) being mutually fastened by a corresponding said permanent connection element (9).

5. The apparatus according to claim 3 or 4, **characterized in that** said at least one permanent collection element (9) is inserted in a hole, provided beforehand along said lug (10), and in an orifice provided beforehand along said ridge (4a) and aligned with said hole, for the mutual fastening of said lug (10) and of said ridge (4a).

6. The apparatus according to claim 5, **characterized in that** the protruding end portions (9a) of said at least one connection element (9), inserted in said hole and in said orifice, are pressed against the corresponding external surfaces of said lug (10) and of said ridge (4a).

7. The apparatus according to one or more of the preceding claims, **characterized in that** it comprises a locking button (11), which is coupled rotatably to said base (2) and can move reversibly between at least one first angular position, in which it is arranged even indirectly in interference in the movement of said handle assembly (3), and at least one second angular position, in which it is spaced from said handle assembly (3), in order to allow the movement of said handle assembly (3), said button (11) comprising a laminar main body (12), which has a substantially flat central portion (13a) that is interposed between respective mutually opposite end flaps (13b), which are bent and articulated to said base (2).

8. The apparatus according to claim 7, **characterized in that** said flaps (13b) have respective mutually opposite openings (14) for the insertion of a respective transverse pivot (15), which is coupled to said base (2) and for the consequent articulation of said button

(11) to said base (2).

9. The apparatus according to claim 7 or 8, **characterized in that** said laminar body (12) comprises an auxiliary platform (13c), which extends in a substantially coplanar manner from said central portion (13a), on the opposite side with respect to said plate (4), for the facilitated movement of said button (11).

10. The apparatus according to one or more of claims 7 to 9, **characterized in that** said button (11) comprises a reinforcement bracket (17), which is coupled rigidly to said main body (12), for an increase in mechanical strength, said bracket (17) having a crossmember (17a) and a pair of mutually parallel arms (17b), said arms (17b) having a center distance that is substantially complementary to the center distance of said flaps (13b) and being inserted stably between said flaps (13b), with said crossmember (17a) arranged on the opposite side with respect to said central portion (13a).

11. The apparatus according to claim 10, **characterized in that** said arms (17b) and said flaps (13b) are provided with respective slots (19) which are mutually aligned for the insertion of respective mutual permanent fixing elements (20) such as nails, rivets and the like.

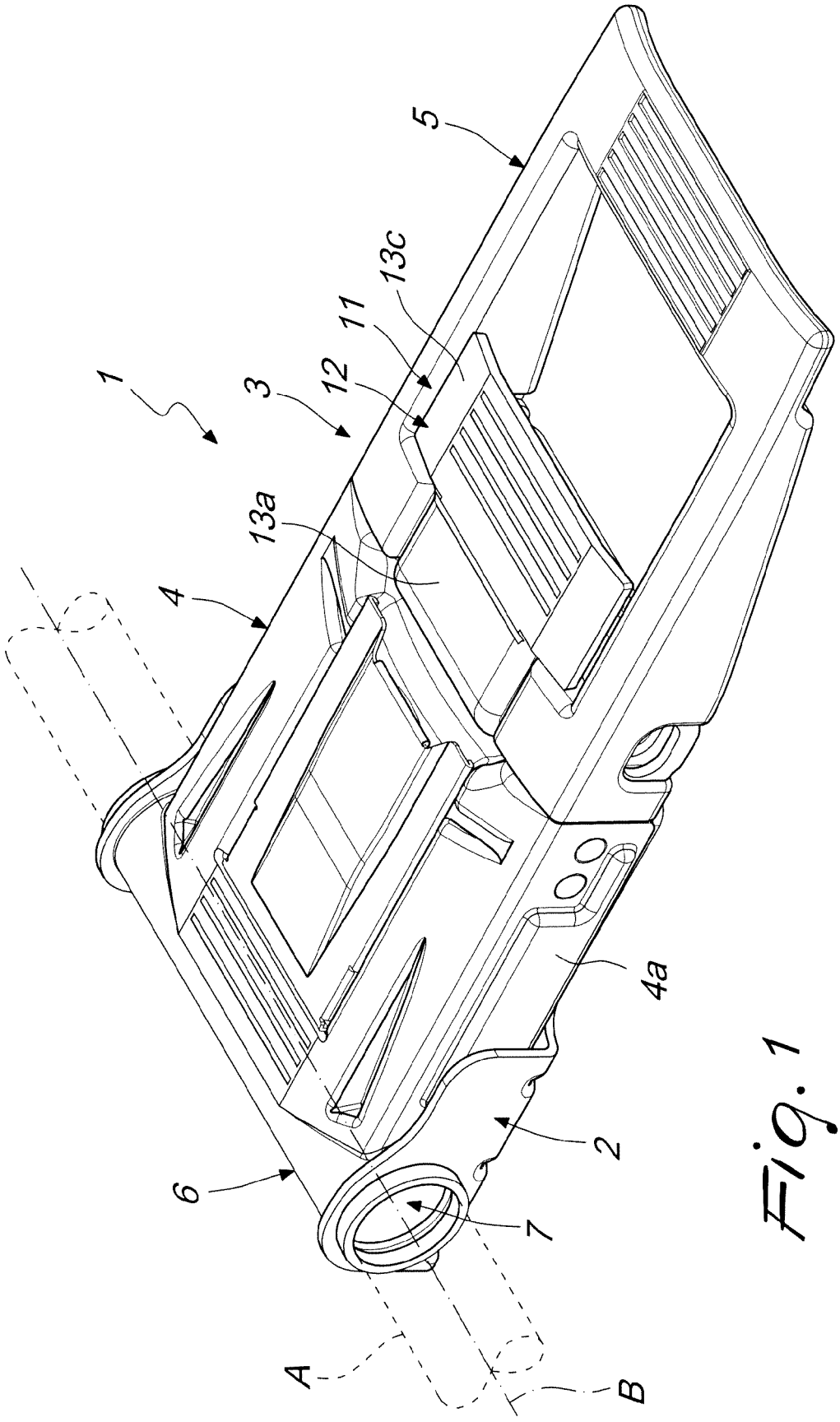


Fig. 1

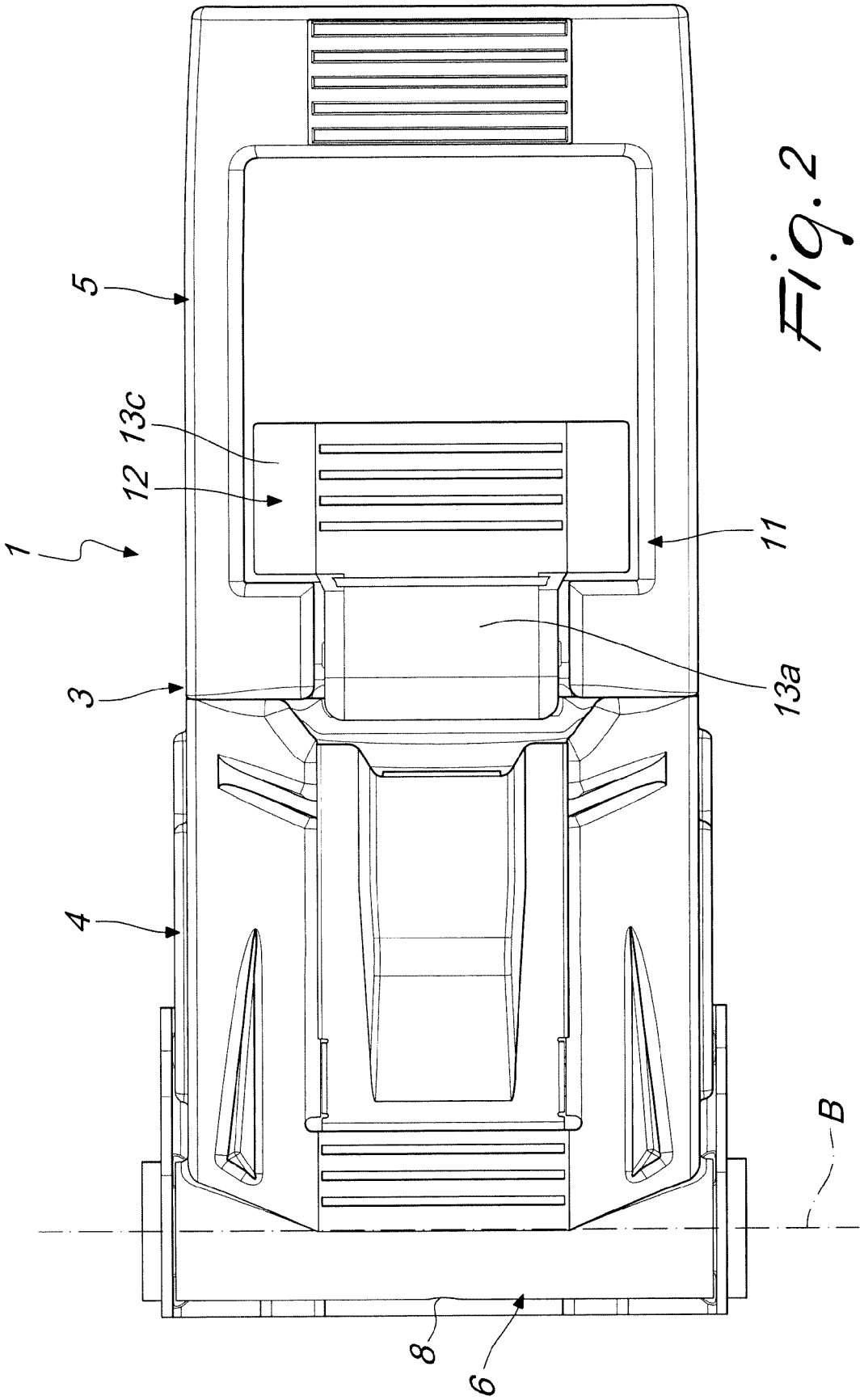


Fig. 2

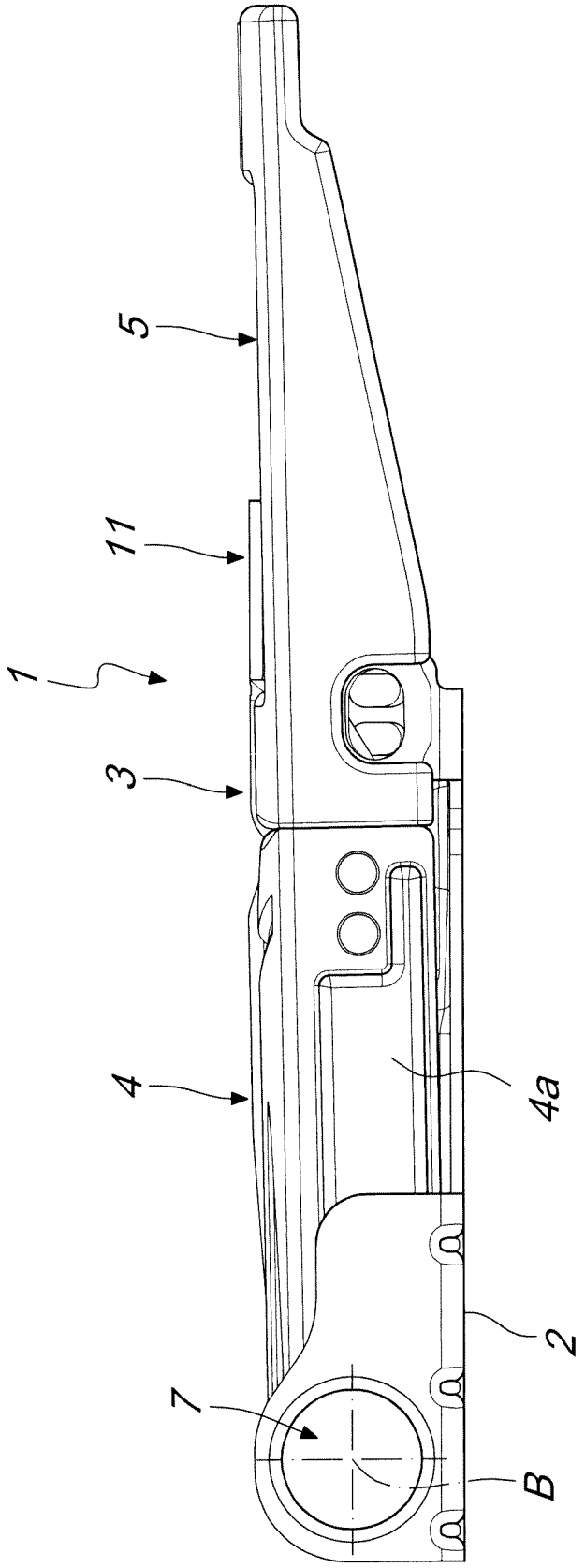


Fig. 3

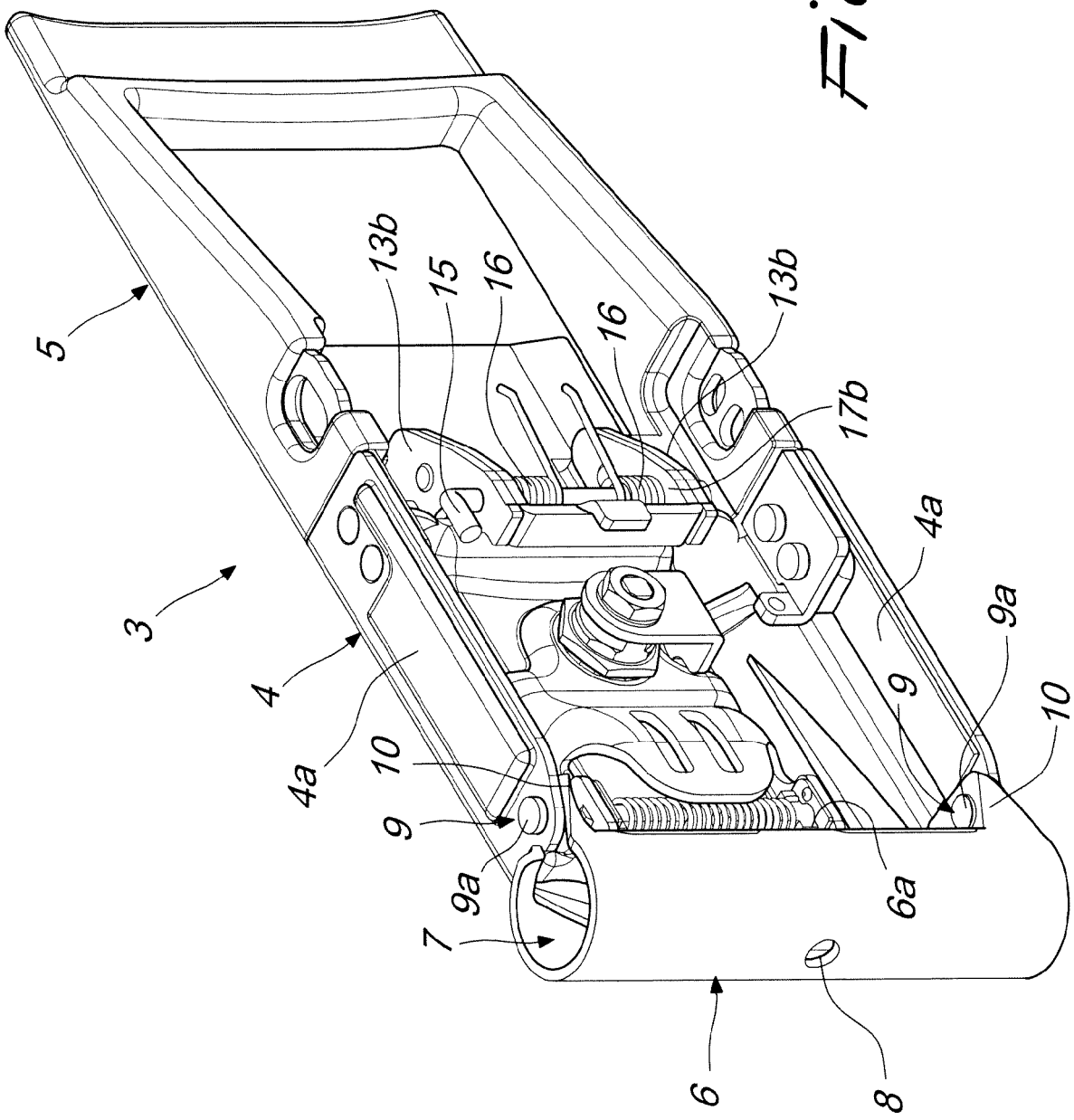


Fig. 4

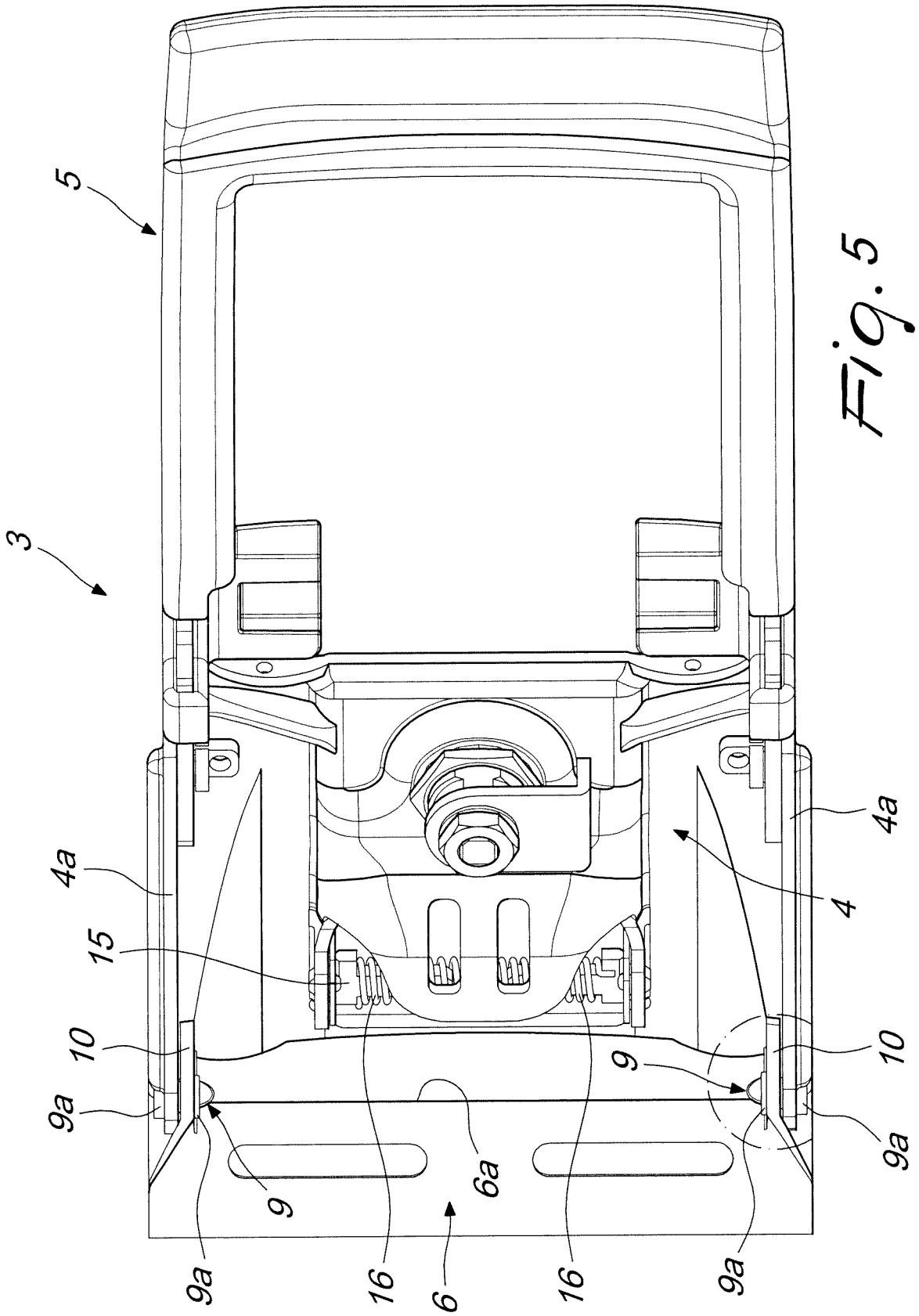


Fig. 5

Fig. 6

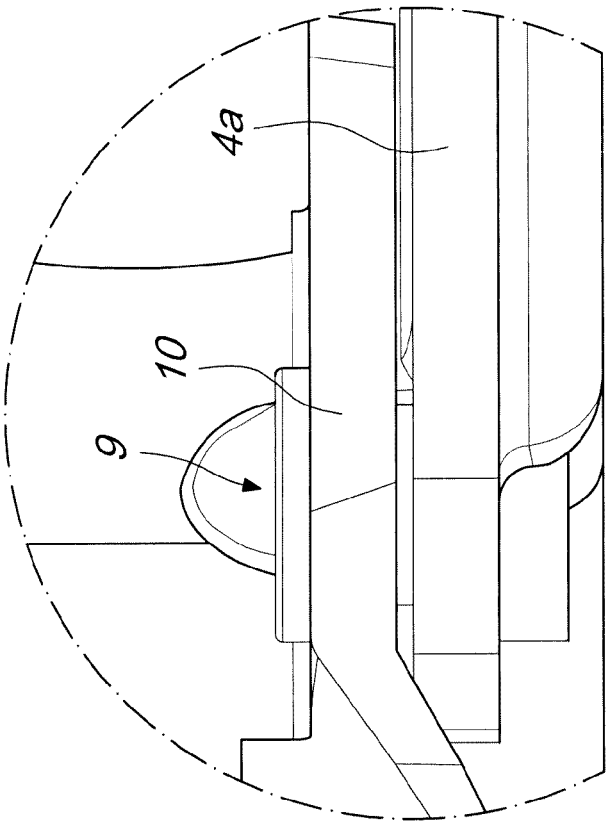
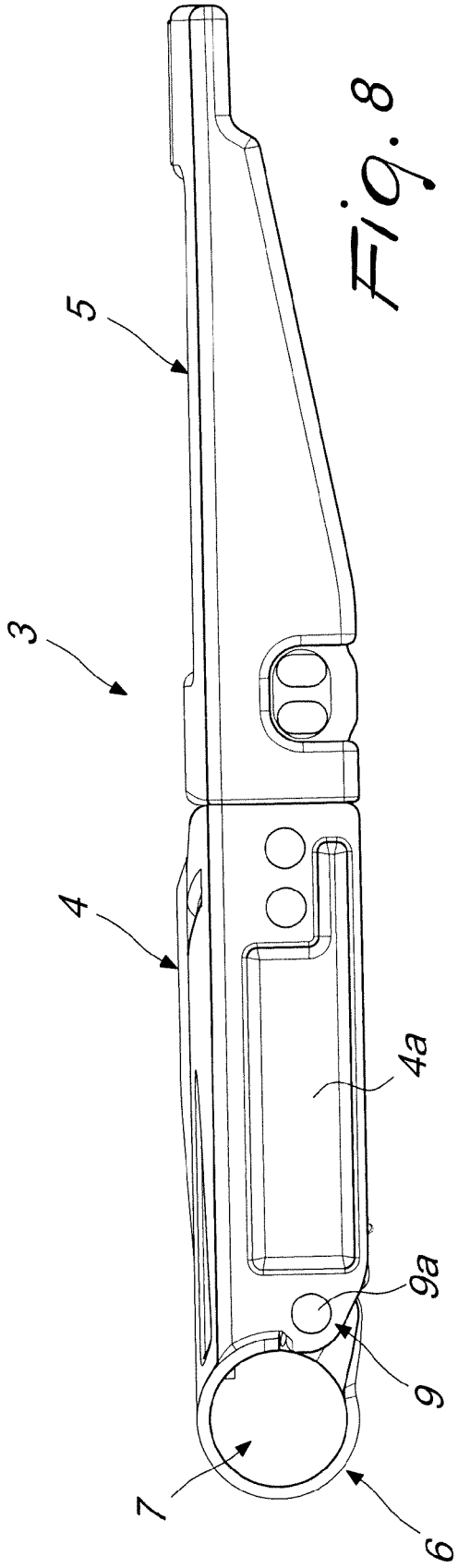


Fig. 8



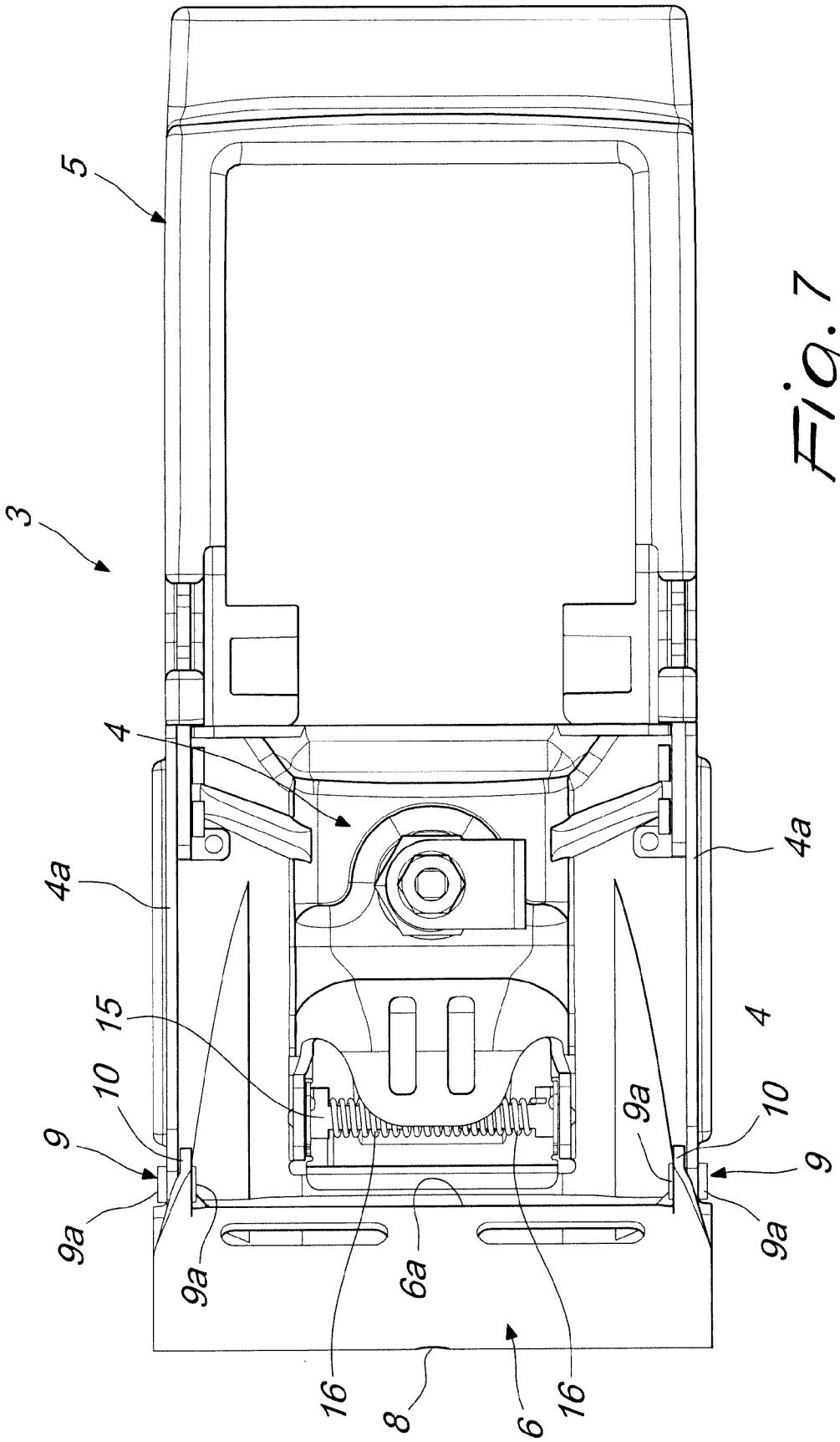


Fig. 7

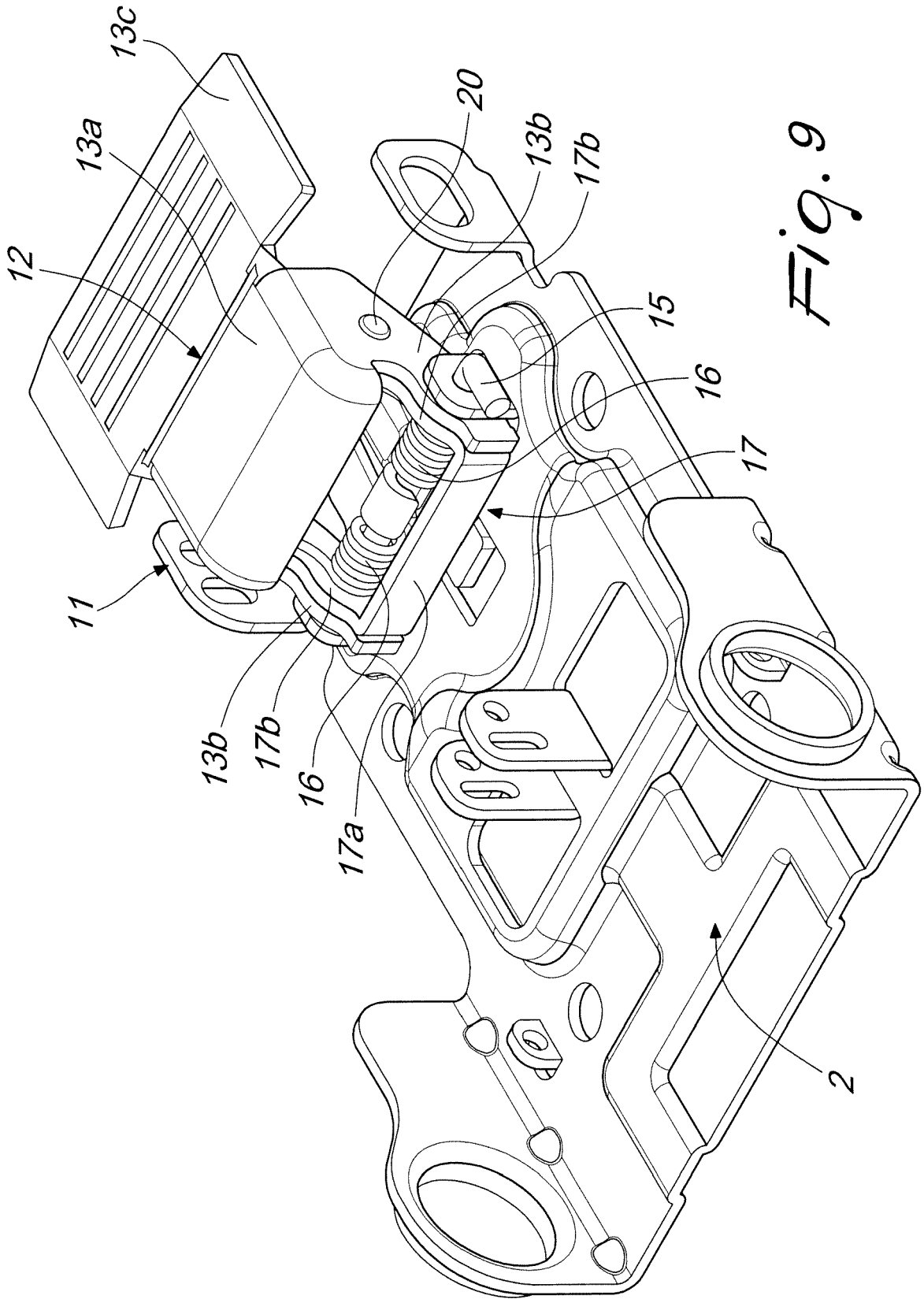


Fig. 9

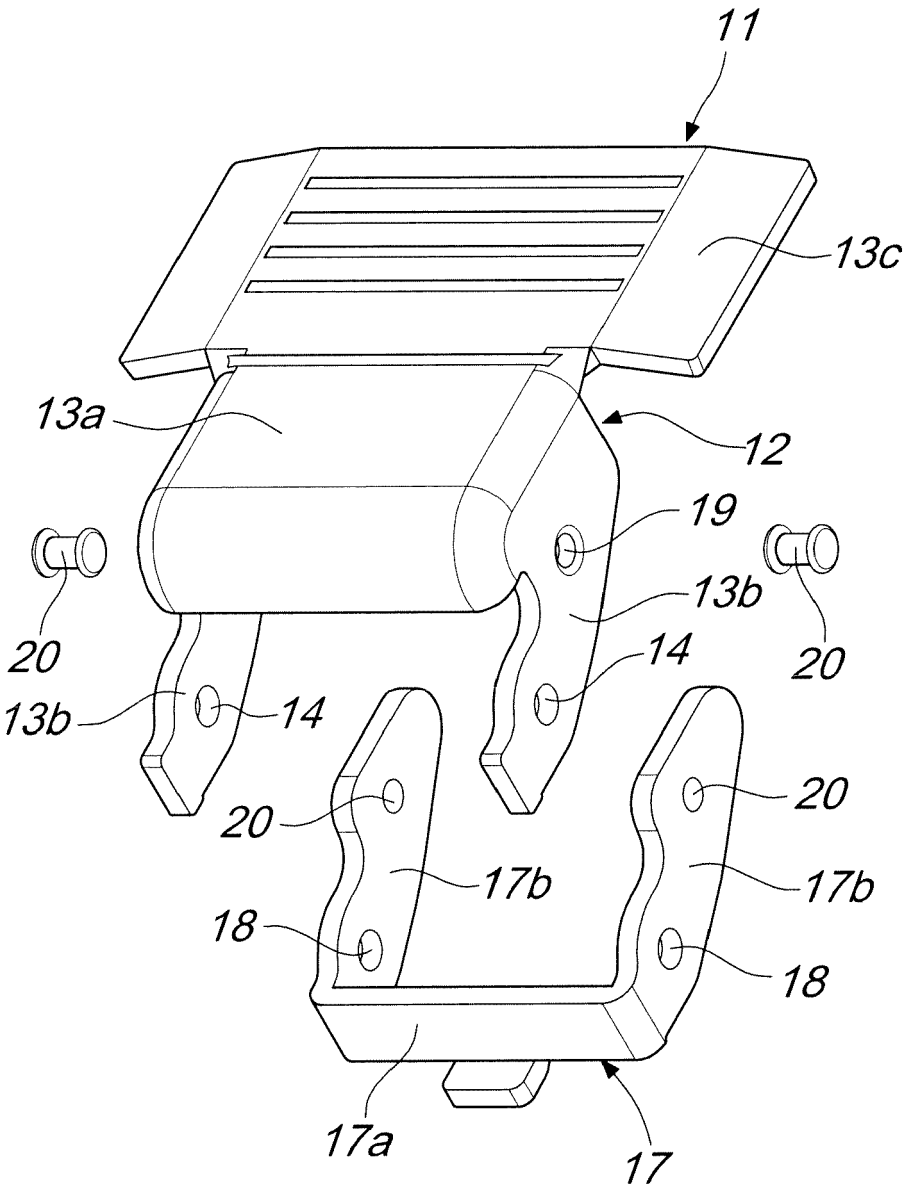


Fig. 10

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EUROPEAN SEARCH REPORT

Application Number
EP 16 42 5035

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	27 September 2016	Geerts, Arnold

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