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(54) **RELEASE APPARATUS FOR DOORS OF VEHICLES**

(57) A release apparatus for doors of vehicles, of the type of vans, trucks, lorries, semi-trailer trucks, trailers and the like, which comprises a base structure (2) which can be stably coupled to the door and a handle assembly (3), which can in turn be associated with respective means of anchoring to the frame of the vehicle. The handle assembly (3) is rotatable with respect to the structure (2) between at least one locked configuration, in which the anchoring means can be engaged with the frame of the vehicle, and at least one released configuration, in which the anchoring means are disengaged from the frame of the vehicle, in order to allow the free rotation of the door. Furthermore, the handle assembly (3) is rotatably coupled, by way of a respective articulation device (4), to a flap (5), which rotates between a first angular

position, for covering an element to be protected, of the type of a key-operated mechanism (6), a button, and the like, and at least one second angular position, for free access to the element.

The articulation device (4) comprises two pins (7a, 7b), which are coaxially inserted, so that they can rotate, in respective mutually opposite holes (8) defined by the flap (5), and which are likewise coaxially detachably inserted by interlocking in respective mutually opposite slots (9) of matching shape, which face toward and are proximate to corresponding holes (8) and are defined in the handle assembly (3). The pins (7a, 7b) are kept inserted in the holes (8) and in the slots (9) by the elastic axial reaction developed by a helical spring (10), wound coaxially around the pins (7a, 7b).

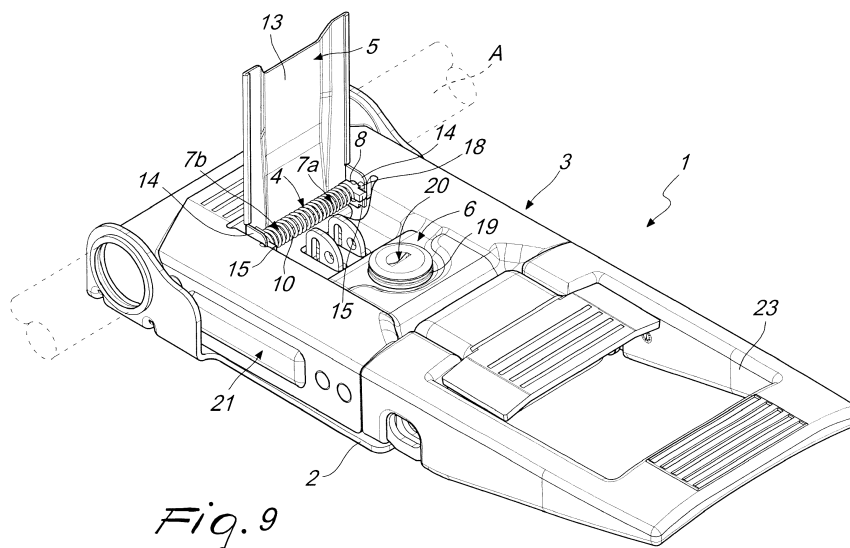


Fig. 9

Description

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

[0002] As is known, vehicles for professional use of the type of vans, trucks, lorries, semi-trailer trucks, trailers and the like are provided with a cargo compartment, which is intended for the accommodation and transport of goods of every type and is closed at the rear by one or more doors.

[0003] According to implementation methods that are now consolidated, the door, which is usually kept in the configuration for closing the internal compartment, is associated with means that ensure the locking of the door in such configuration and which can be deactivated on command, obviously in order to allow access to the compartment.

[0004] For example therefore, on the market, implementation solutions are widespread which involve locking in the closed configuration by way of a vertical rod, which is rotatably coupled to the door and can be engaged, usually at its ends, with respective retention elements anchored to the frame of the vehicle.

[0005] The release is obtained by way of a handle, which is integral with the rod and comprised in a respective release apparatus, which is installed on the outer face of the door.

[0006] When access to the compartment is needed, the user can in fact grasp the handle and make it rotate, thus causing the simultaneous rotation about its own axis of the rod, disengaging its ends from the retention elements and allowing the movement (the opening) of the door.

[0007] Usually, in order to prevent accidental releases of the door, conventional apparatuses are provided with buttons that, directly or indirectly, oppose the free rotation of the handle and therefore require the voluntary intervention of the user for their deactivation.

[0008] Furthermore, in conventional apparatuses key-operated mechanisms are usually present, which are also adapted to oppose the free rotation of the handle: evidently, such contrivances can be deactivated only by the holder of the key, to be inserted in an adapted slit defined along the outer surface of the locking apparatus (along the outer face of the door).

[0009] Typically, the slit is covered by a moveable flap, which primarily prevents dirt, dust or other impurities from accumulating in it.

[0010] More usually, the protection offered by the flap ensures a prolonged lifetime of the key-operated mechanism, by guarding against or at least reducing the risk of damage and deterioration.

[0011] In such context, therefore, in some conventional implementation solutions, two mutually opposite tabs of such flap are coupled by interlocking, rotatably, to the handle, so as to allow the controlled rotation of the flap from the protection position to the position of access to the slit. Returning to the protection position (and holding

in the protection position) is entrusted to a spring, which is coupled at one end to the handle and, at the opposite end, to the flap.

[0012] Such implementation solution is not however devoid of drawbacks: simply coupling by interlocking, as mentioned above, has been found over time not to be sufficiently reliable.

[0013] Following repeated use in fact, or in the event of stresses of various types, it sometimes happens (and with levels of frequency that nowadays are unacceptable) that the tabs of the flap disengage from the seats of matching shape that receive them.

[0014] This requires the operator to re-engage the coupling, evidently causing inconvenience or, more often, it results in the loss of the flap, evidently with greater damage.

[0015] The aim of the present invention is to solve the above mentioned problems, by providing an apparatus that ensures an adequate level of protection of the key-operated mechanisms or in any case of affected portions of the handle and/or of the release apparatus.

[0016] Within this aim, an object of the invention is to provide an apparatus that ensures an optimal resistance to the accidental removal/to the loss of the flap intended to protect the key-operated mechanism and/or other affected portions.

[0017] Another object of the invention is to provide an apparatus that enables the temporary locking of the flap in at least one configuration for free access to the key-operated mechanism or in any case to the portion that is usually protected.

[0018] Another object of the invention is to provide an apparatus that ensures, at least in determined conditions, the automatic return of the flap to the configuration for protection.

[0019] Another object of the invention is to provide an apparatus that ensures a high reliability of operation and which can be easily installed and disassembled.

[0020] Another object of the invention is to provide an apparatus that adopts an alternative technical and structural architecture to those of conventional apparatuses.

[0021] Another object of the invention is to provide an apparatus that can be easily implemented using elements and materials that are readily available on the market.

[0022] Another object of the invention is to provide an apparatus that is low cost and safely applied.

[0023] This aim and these and other objects which will become better apparent hereinafter are achieved by a release apparatus for doors of vehicles, of the type of vans, trucks, lorries, semi-trailer trucks, trailers and the like, which comprises a base structure which can be stably coupled to the door and a handle assembly which can be associated with respective means of anchoring to the frame of the vehicle, said handle assembly being rotatable with respect to said structure between at least one locked configuration, in which the anchoring means can be engaged with the frame of the vehicle, and at least

one released configuration, in which the anchoring means are disengaged from the frame of the vehicle, in order to allow the free rotation of the door, said handle assembly being rotatably coupled, by way of a respective articulation device, to a flap, which rotates between a first angular position, for covering an element to be protected, of the type of a key-operated mechanism, a button, and the like, and at least one second angular position, for free access to said element, characterized in that said articulation device comprises two pins, which are coaxially inserted, so that they can rotate, in respective mutually opposite holes defined by said flap, and are coaxially detachably inserted by interlocking in respective mutually opposite slots of matching shape, which face toward and are proximate to corresponding said holes and are defined in said handle assembly, said pins being kept inserted in said holes and in said slots by the elastic axial reaction developed by a helical spring, wound coaxially around said pins.

[0024] 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, which is illustrated by way of non-limiting example in the accompanying drawings wherein:

Figure 1 is a perspective view from the left of a release apparatus according to the invention, with the flap in the first angular position;

Figure 2 is a perspective view from the left of some components of the release apparatus in Figure 1, among which is the flap, in the first angular position; Figure 3 is a front elevation view of the components in Figure 2, in the same configuration;

Figure 4 is a cross-section of Figure 3, taken along the line IV-IV;

Figure 5 is a perspective view from the right of the components in Figure 2, among which is the flap, in an intermediate angular position;

Figure 6 is a side elevation view of the components in Figure 5, in the same configuration;

Figure 7 is a view from below of the components in Figure 5, in the same configuration;

Figure 8 is a cross-section of Figure 7, taken along the line VIII-VIII;

Figure 9 is a perspective view from the left of the release apparatus according to the invention, with the flap in the second angular position;

Figure 10 is a perspective view from the left of the components in Figure 2, among which is the flap, in the second angular position;

Figure 11 is a front elevation view of the components in Figure 10, in the same configuration;

Figure 12 is a cross-section of Figure 11, taken along the line XII-XII;

Figures 13 and 14 are respectively a rear and a side elevation view of the flap and the articulation device; Figure 15 is a perspective view of the articulation

device;

Figure 16 is a perspective view of one of the components of the release apparatus.

[0025] With reference to the figures, the reference numeral 1 generally designates a release apparatus for doors of vehicles (typically for professional use).

[0026] Such vehicles can be of the type of vans, trucks, lorries, semi-trailer trucks, trailers and the like, and therefore comprise an internal compartment, closed by at least one door (usually arranged at the rear) and intended to accommodate and transport goods of various types.

[0027] In the preferred application therefore, the apparatus 1 is adapted to release doors mounted on means of transport of the type indicated above, and reference will therefore be made to such practical context in the present discussion. Likewise, it should be noted that the possibility is not ruled out of using (while remaining within the scope of protection claimed herein) the apparatus 1 according to the invention in different environments and/or for different types of vehicles, according to specific requirements.

[0028] The apparatus 1 comprises therefore a base structure 2 which can be stably coupled to the door (usually, to its outer face) and a handle assembly 3, which can in turn be associated with respective means of anchoring to the frame of the vehicle (of which some details will be given hereinafter, for a possible embodiment).

[0029] The handle assembly 3 can rotate (oscillating) with respect to the structure 2 between at least one locked configuration (the one in which the handle assembly 3 is shown in Figures 1 and 9, and in which the handle assembly 3 substantially faces toward and is proximate to the structure 2) and at least one released configuration.

[0030] In the locked configuration, and obviously when the door is placed to close the internal compartment of the vehicle, the anchoring means can be engaged with the frame of the vehicle, so as to ensure the locking of the door and impede any access to the compartment.

[0031] In the released configuration, which is obtained by rotating and partially lifting the handle assembly 3, the anchoring means are disengaged from the frame of the vehicle, and this evidently allows the free rotation of the door and access to the compartment.

[0032] Furthermore, the handle assembly 3 is coupled rotatably, by way of a respective articulation device 4, to a flap 5.

[0033] The flap 5 can rotate (oscillate) between a first angular position (for example, the one in which the flap 5 is shown in Figures 1 to 4) and at least one second angular position (for example, the one in Figures 9 to 12).

[0034] In the first angular position the flap 5 is arranged to cover an element to be protected, of the type of a key-operated mechanism 6, a button and the like. It should be noted therefore that the scope of protection claimed herein is intended to be extended to the use of the flap 5 for covering and protecting any element, chosen according to the specific requirements; in the preferred ap-

plication however, such element is indeed a key-operated mechanism 6 (Figure 9).

[0035] Conversely, (at least) in the second angular position the flap 5 is partially rotated and spaced apart from the element, so as to allow free access to and interaction with the latter.

[0036] According to the invention, the articulation device 4 comprises two pins 7a, 7b; such pins 7a, 7b are inserted, coaxially, first of all in mutually opposite respective holes 8, which are defined by the flap 5. Furthermore, the pins 7a, 7b are detachably inserted by interlocking in respective mutually opposite slots 9 of matching shape, which face toward and are proximate to corresponding holes 8 and are defined in the handle assembly 3.

[0037] The pins 7a, 7b are kept in the holes 8 and in the slots 9 by the elastic axial reaction of a helical spring 10, which, as can be seen clearly from the figures, is wound coaxially around the pins 7a, 7b.

[0038] It should be noted therefore, first of all, that the flap 5 is free to rotate about the pins 7a, 7b, thanks to the rotatable insertion of such pins in the holes 8; at the same time, the pins 7a, 7b are usually kept rigidly coupled with the handle assembly 3, by way of the cooperation between the coupling by interlocking between the pins 7a, 7b with the slots 9 (which prevents rotation) and the action of the spring 10 (which prevents axial extraction).

[0039] The articulation device 4 therefore enables, as desired, a stable rotary coupling between the handle assembly 3 and the flap 5, which can thus rotate between the first angular position and the second angular position, at the same time ensuring the further advantages and benefits which will be made clear in the present discussion.

[0040] In the embodiment shown in the accompanying figures for the purposes of non-limiting example of the application of the invention, each pin 7a, 7b has an elongated body 11 and an end head 12 (in this regard see in particular Figures 14 and 15), which is polygonal in transverse cross-section (for example rectangular).

[0041] The head 12 is first of all inserted rotatably in the respective hole 8: in order to obtain such specific result, the hole 8 can be circular (with a conveniently chosen diameter).

[0042] Furthermore, the head 12 is detachably inserted by interlocking in the corresponding slot 9, which has a shape that complements the (rectangular for example) transverse cross-section of the head 12 (such solution is clearly visible in Figure 16) and which, as has been seen, is provided in the handle assembly 3. By defining complementary shapes and dimensions, for the transverse cross-section of the heads 12 and for the slots 9, it is therefore possible to obtain the desired coupling by interlocking (which is deactivatable by axially sliding out the pins 7a, 7b).

[0043] It should in any case be noted that the specific choices noted above, with reference to the shape structure of the pins 7a, 7b (and of their heads 12 in particular), of the holes 8 and of the slots 9, are understood to refer

to a preferred solution, but one that is certainly not limiting of the application of the invention and of the scope of protection claimed herein.

[0044] With further reference to an implementation choice of significant practical interest, but not limiting of the application of the invention, the flap 5 comprises a main strip 13 (laminar strip), which is directly adapted to cover the element to be protected, when the flap 5 is in the first angular position.

[0045] Furthermore, the flap 5 comprises two mutually opposite tabs 14, which have respective holes 8 and which extend (substantially perpendicularly) from respective mutually opposite edges of the strip 13.

[0046] The pins 7a, 7b are therefore (coaxially) arranged, with the respective bodies 11, between the tabs 14 and protrude externally with the corresponding heads 12 (inserted in the holes 8), in order to be detachably inserted by interlocking in the corresponding slots 9.

[0047] Even more specifically, the spring 10 is wound coaxially around the bodies 11 of the pins 7a, 7b and is arranged in contact with two crests 15, which extend transversely (perpendicularly to the axis of the pins 7a, 7b) from the respective base of the corresponding heads 12 of the pins 7a, 7b.

[0048] The pins 7a, 7b are therefore kept inserted in the holes 8 and in the slots 9 by the elastic axial reaction developed by the spring 10, which acts on the crests 15, it being interposed between them.

[0049] Conveniently, a first end portion 16a of the spring 10 (clearly visible in Figures 8, 13, 14 and 15) is integral with the respective pin 7a; at the opposite end, the end 17 of the second end portion 16b of the spring 10, which protrudes radially (Figure 15 for example), is pressed elastically against the flap 5.

[0050] In this manner, the spring 10 also develops an elastic torsion reaction which, firstly, ensures the flap 5 is held in the first angular position (obviously, in the absence of actions by the user).

[0051] Moreover, after the flap 5 has been rotated, to bring it from the first angular position to the second, and access is obtained to the key-operated mechanism 6, the elastic torsion reaction developed by the spring 10 favors the automatic return to the first angular position (and therefore to cover the element to be protected).

[0052] Conveniently, and partially contrary to what is said in the preceding paragraph, in the preferred (but not exclusive) embodiment, the apparatus 1 according to the invention comprises at least one contrast element, which is placed so as to interfere with the rotation of the flap 5 between the first angular position and the second angular position.

[0053] So in fact, the contrast element is capable of opposing the elastic torsion reaction developed by the spring 10 and, under certain conditions, it can prevent the (automatic) rotation of the flap 5.

[0054] In more detail, the contrast element is placed so as to interfere both with the rotation of the flap 5 from the first angular position to the second, in order to con-

tribute to holding the flap 5 in the first angular position, and with the rotation from the second angular position to the first angular position, thus defining at least one third angular position, which can coincide with the second, in which the flap 5 is kept at least partially open.

[0055] More specifically, in the embodiment shown in the accompanying figures for the purposes of non-limiting example of the application of the invention, the contrast element is constituted substantially by a boss 18 which extends inwardly from one of the tabs 14. As can be seen from the accompanying figures, the boss 18 is placed so as to interfere with the rotation of the respective crest 15 of the corresponding pin 7a, 7b.

[0056] A stress imparted to the flap 5 (typically, a rotation imparted by the user) of greater intensity than a preset value causes, during the rotation of the flap 5 and upon the contact of the crest 15 with the boss 18, the temporary compression of the spring 10, in order to allow the boss 18 to be bypassed and the rotation of the flap 5 to continue.

[0057] Therefore, in order to gain access to the key-operated mechanism 6, or in order to return the flap 5 to the first angular position, the user has to exert sufficient force to cause the temporary compression of the spring 10, thus defeating the elastic axial reaction (which is therefore correlated to the aforementioned preset value).

[0058] In the absence of a user action, it should therefore be noted that the spring 10 is chosen and dimensioned so that the elastic axial reaction, which keeps each crest 15 pressed against the corresponding tab 14, is of greater intensity than the force determined by the elastic torsion reaction, which conversely tends to rotate the flap 5 from the second angular position to the first, and therefore to compress the spring 10. Such dimensioning makes it possible to ensure the flap 5 is held in the third angular position, preventing the automatic complete closure (the automatic return to the first angular position).

[0059] Advantageously, as can be seen from the accompanying figures, the apparatus 1 comprises two bosses 18: each one of such bosses extends inwardly from a respective tab 14 and is placed so as to interfere with the rotation of the corresponding crest 15 of the corresponding pin 7a, 7b.

[0060] As already noted in the foregoing pages, in the preferred embodiment, the element to be protected is constituted substantially by a key-operated mechanism 6, which is movable between at least one first angular arrangement, for obstructing the movement of the handle assembly 3, and at least one second angular arrangement, for the free movement of the handle assembly 3.

[0061] More specifically, in such preferred embodiment the key-operated mechanism 6 comprises a main block 19 which is associated rotatably to the structure 2 (in order to be able to pass from the first angular arrangement to the second, and vice versa), and which is provided with a contoured slit 20, directed outwardly and protected by the flap 5 at least in the first angular position. A key can therefore be inserted in the slit 20, in order to

command the movement of the mechanism 6 between these angular arrangements.

[0062] With further reference to the embodiment proposed for the purposes of non-limiting example of the application of the invention, the handle assembly 3 comprises a main lever 21 (shown in Figure 16), which defines the slots 9 and which can be fixed to a rod A, which is comprised in the anchoring means and is shown schematically in dotted lines in Figures 1 and 9.

[0063] For example, the rod A can be stably and rigidly inserted in a duct 22 formed by the lever 21 (and optionally be, in turn, part of the apparatus 1 according to the invention, while remaining within the scope of protection claimed herein).

[0064] Furthermore, the rod A can be rotatably coupled to the door and can be engaged with respective retention elements, which are fixed to the frame of the vehicle.

[0065] So in fact, the aforementioned anchoring means comprise the rod A and the retention elements which are constituted for example by brackets and locators fixed to the frame of the vehicle, above and below the door, and are adapted to be engaged, in the locked configuration, with pawls, hooks or the like, which are supported rigidly by the ends of the rod A.

[0066] Therefore in order to command the rotation of the handle assembly 3 (and of the rod A) between the locked configuration and the released configuration, the main lever 21 is rotatably coupled to a grip 23, which can be grasped by a user.

[0067] It should be noted in any case that, in substitution of the main lever 21 and of the grip 23, the handle assembly 3 can have a single arm, while remaining within the scope of protection claimed herein.

[0068] Operation of the apparatus according to the invention is the following.

[0069] When the door is arranged so as to close the internal compartment of the vehicle, and the handle assembly 3 is in the locked configuration (the lever 21 and the grip 23 face toward and are proximate to the base structure 2), the anchoring means are engaged with the frame of the vehicle, and prevent the door A from being opened.

[0070] In order to be able to move the door and access the compartment, the user has to insert the key in the slit 20, in order to bring the key-operated mechanism 6 to the second angular arrangement and remove the obstacle it represents to the movement of the handle assembly 3. Furthermore, or as an alternative to the key-operated mechanism 6, there can be further buttons or security elements, which the user must take care to deactivate in order to be able to move the handle assembly 3.

[0071] In any case, in order to obtain such movement of the handle assembly 3 (and be able to access the compartment), the user has to grasp and rotate the grip 23, thus entraining in rotation the lever 21 and the rod A, thus obtaining the release of the door.

[0072] In such context, the flap 5 ensures an adequate protection of the key-operated mechanism 6 (or in any

case of other elements of the apparatus 1 to be protected).

[0073] It has been found in fact, first of all, that in the non-deformed condition of the spring, the flap 5 is in the first angular position, in which it covers and protects the slit 20 and the adjacent area, preventing the accumulation of dirt, dust or other impurities, and, more generally, ensuring a prolonged lifetime of the key-operated mechanism 6, by guarding against or at least reducing the risk of damage and deterioration.

[0074] The elastic torsion reaction developed by the spring 10, which presses with the end 17 of its second end portion 16b against the flap 5, keeps the latter in the first angular position.

[0075] At the same time, the elastic axial reaction developed by the spring 10, which acts on the crests 15 of the pins 7a, 7b, keeps such pins inserted in the holes 8 and in the slots 9, ensuring the stability of the rotary mating between flap 5 and handle assembly 3 and ensuring an excellent resistance to the accidental removal of the flap 5.

[0076] So, effectively, the same component, the spring 10, conveniently designed and dimensioned, performs the dual function of guarding against the danger of loss of the flap 5 and of ensuring the automatic protection of the key-operated mechanism 6.

[0077] When the user wishes to interact with the key-operated mechanism 6 (or with another element to be protected), he/she can impart a rotation to the flap 5, making it rotate from the first angular position to the second, or in any case sufficiently to obtain access to the slit 20. Obviously, the force exerted by the user must first of all be sufficient to defeat the elastic torsion reaction developed by the spring 10 against the flap 5, which, as has been seen, opposes the rotation.

[0078] Furthermore, the user must act with sufficient force to inhibit the action of the contrast element, and therefore (when the crests 15 meet the bosses 18 during the rotation) the force imparted must be such as to cause the temporary compression of the spring 10 (thus defeating its elastic axial reaction). This in fact causes the temporary mutual approach of the pins 7a, 7b and this allows the crests 15 and the flap 5 to continue their travel toward the second angular position, effectively bypassing the bosses 18.

[0079] Once the crests 15 have been bypassed, the elastic axial reaction restores the normal condition for the pins 7a, 7b and the spring 10.

[0080] When the user action stops, the flap 5 tends to automatically return toward the first angular position (thanks to the elastic torsion reaction), but its travel is stopped when the crests 15 come back into contact with the bosses 18, because the thrust against the tabs 14 imparted by the elastic axial reaction developed by the spring 10 prevails over the elastic torsion reaction (thanks to a suitable dimensioning of the spring 10), and therefore (without the contribution of the user) the crests 15 cannot bypass the bosses 18 again.

[0081] This makes it possible to define the aforementioned third angular position, in which the flap 5 is conveniently kept at least partially open, until further intervention by the user.

[0082] In order to be able to return the flap 5 to the first angular position, when the crests 15 meet the bosses 18 the user has to continue to push the flap 5 in rotation, with a force/torque of such intensity as to cause the temporary compression of the spring 10 (in a similar manner to what has been seen for the transition from the first position to the second position) and therefore enable the crests 15 to bypass the bosses 18 and allow the subsequent automatic return to the non-deformed condition of the spring. In fact, once the crests 15 have been bypassed, the geometry of the components and the elastic torsion reaction of the spring 10 automatically allow the return to the first angular position, with or without further contributions from the user.

[0083] It should be noted moreover that in the first angular position the bosses 18 (and the elastic axial reaction developed by the spring 10) cooperate with the elastic torsion reaction to prevent accidental rotations.

[0084] Finally, it should be noted that in addition to defining a practical and stable method of rotatable coupling between flap 5 and handle assembly 3, the release apparatus 1 according to the invention features the simple disassembly and substitution of the components of the articulation device 4 (and of the flap 5), where circumstances require it.

[0085] In fact, in the event for example of damage to or deterioration of one of the components, the user simply has to compress the spring 10 and move the pins 7a, 7b closer together, so as to be able to easily extract them from the slots 9 and thus remove them, together with the spring 10 and the flap 5. Obviously, it is further possible to further compress the spring 10 and move the pins 7a, 7b even closer together, so as to extract them from the holes 8 as well and obtain the complete disassembly.

[0086] After removing and substituting the damaged components, the user can restore the initial condition, by reinserting the pins 7a, 7b (with the spring 10 wound around them) into the holes 8 and thus into the slots 9.

[0087] Positively, it should be noted that the described activities of disassembly and subsequent re-installation can be carried out without using any tool or instrument (clamp, screwdriver etc.).

[0088] In practice it has been found that the apparatus according to the invention fully achieves the set aim and objects, in that the peculiar articulation device with which the apparatus is provided, and which enables a simple and stable rotary mating of the flap to the handle assembly, ensures an adequate protection of the key-operated mechanisms or of other elements to be protected.

[0089] The invention, thus conceived, is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims. Moreover, all the details may be substituted by other, technically equivalent elements.

[0090] In the embodiments illustrated, individual characteristics shown in relation to specific examples may in reality be substituted with other, different characteristics, existing in other embodiments.

[0091] In practice, the materials employed, as well as the dimensions, may be any according to requirements and to the state of the art.

[0092] Where the technical features mentioned in any claim are followed by reference numerals and/or signs, those reference numerals and/or signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference numerals and/or signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference numerals and/or signs.

Claims

1. A release apparatus for doors of vehicles, of the type of vans, trucks, lorries, semi-trailer trucks, trailers and the like, which comprises a base structure (2) which can be stably coupled to the door and a handle assembly (3) which can be associated with respective means of anchoring to the frame of the vehicle, said handle assembly (3) being rotatable with respect to said structure (2) between at least one locked configuration, in which the anchoring means can be engaged with the frame of the vehicle, and at least one released configuration, in which the anchoring means are disengaged from the frame of the vehicle, in order to allow the free rotation of the door, said handle assembly (3) being rotatably coupled, by way of a respective articulation device (4), to a flap (5), which rotates between a first angular position, for covering an element to be protected, of the type of a key-operated mechanism (6), a button, and the like, and at least one second angular position, for free access to said element, **characterized in that** said articulation device (4) comprises two pins (7a, 7b), which are coaxially inserted, so that they can rotate, in respective mutually opposite holes (8) defined by said flap (5), and are coaxially detachably inserted by interlocking in respective mutually opposite slots (9) of matching shape, which face toward and are proximate to corresponding said holes (8) and are defined in said handle assembly (3), said pins (7a, 7b) being kept inserted in said holes (8) and in said slots (9) by the elastic axial reaction developed by a helical spring (10), wound coaxially around said pins (7a, 7b).
2. The apparatus according to claim 1, **characterized in that** each one of said pins (7a, 7b) has an elongated body (11) and an end head (12) which is polygonal in transverse cross-section, said head (12) being inserted rotatably in the respective said hole (8) and being detachably inserted by interlocking in

the corresponding said slot (9), which has a shape that complements said transverse cross-section of said head (12).

3. The apparatus according to claim 2, **characterized in that** said flap (5) comprises a main strip (13), designed to cover said element in said first angular position, and two mutually opposite tabs (14), which have respective said holes (8) and which extend substantially perpendicularly from respective mutually opposite edges of said strip (13), said pins (7a, 7b) being arranged with the respective said bodies (11) between said tabs (14) and protruding externally with the corresponding said heads (12), for their detachable insertion by interlocking in the corresponding said slots (9).
4. The apparatus according to claim 2 or 3, **characterized in that** said spring (10) is wound coaxially around said bodies (11) of said pins (7a, 7b) and is arranged in contact with two crests (15), which extend transversely substantially from the respective base of the corresponding said heads (12) of said pins (7a, 7b), which are kept inserted in said holes (8) and in said slots (9) by the elastic axial reaction developed by said spring (10), which acts on said crests (15).
5. The apparatus according to one or more of the preceding claims, **characterized in that** a first end portion (16a) of said spring (10) is integral with the respective said pin (7a), at the opposite end the end (17) of the second end portion (16b) of said spring (10), protruding radially, being elastically pressed against said flap (5), in order to develop an elastic torsion reaction adapted to keep said flap (5) in said first angular position.
6. The apparatus according to one or more of the preceding claims, **characterized in that** it comprises at least one contrast element, placed so as to interfere with the rotation of said flap (5) from said first angular position to said second angular position, in order to contribute to keeping said flap (5) in said first angular position, and from said second angular position to said first angular position, in order to define at least one third angular position, which may coincide with said second angular position, in which said flap (5) is kept at least partially open.
7. The apparatus according to claim 6, **characterized in that** said contrast element is constituted by a boss (18) which extends inwardly from one of said tabs (14) and is placed so as to interfere with the rotation of the respective said crest (15) of the corresponding said pin (7a, 7b), a stress imparted to said flap (5) of higher intensity than a preset value causing, during the rotation of said flap (5) and upon the contact

of said crest (15) with said boss (18), the temporary compression of said spring (10) in order to bypass said boss (18) and continue the rotation of said flap (5).

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8. The apparatus according to claim 7, **characterized in that** it comprises two of said bosses (18), each one of said bosses (18) extending inwardly from a respective said tab (14) and being placed so as to interfere with the rotation of the corresponding said crest (15) of the corresponding said pin (7a, 7b). 10
9. The apparatus according to one or more of the preceding claims, **characterized in that** said element to be protected is constituted by a key-operated (6) mechanism, which is movable between at least one first angular arrangement, for obstructing the movement of said handle assembly (3), and at least one second angular arrangement, for the free movement of said handle assembly (3). 15 20
10. The apparatus according to claim 9, **characterized in that** said key-operated (6) mechanism comprises a main block (19) which is rotatably associated with said structure (2) and is provided with a contoured slit (20), which is protected by said flap (5) in said first angular position, a key being insertable in said slit (20) for commanding the movement of said mechanism (6) between said angular arrangements. 25 30
11. The apparatus according to one or more of the preceding claims, **characterized in that** said handle assembly (3) comprises a main lever (21), which defines said slots (9) and can be fixed to a rod (A) which is comprised in the anchoring means, can be rotatably coupled to the door, and can engage respective retention elements that are fixed to the frame of the vehicle, said main lever (21) being rotatably coupled to a grip (23), which can be grasped by a user in order to command the rotation of said handle assembly (3) between said locked configuration and said released configuration. 35 40 45 50 55

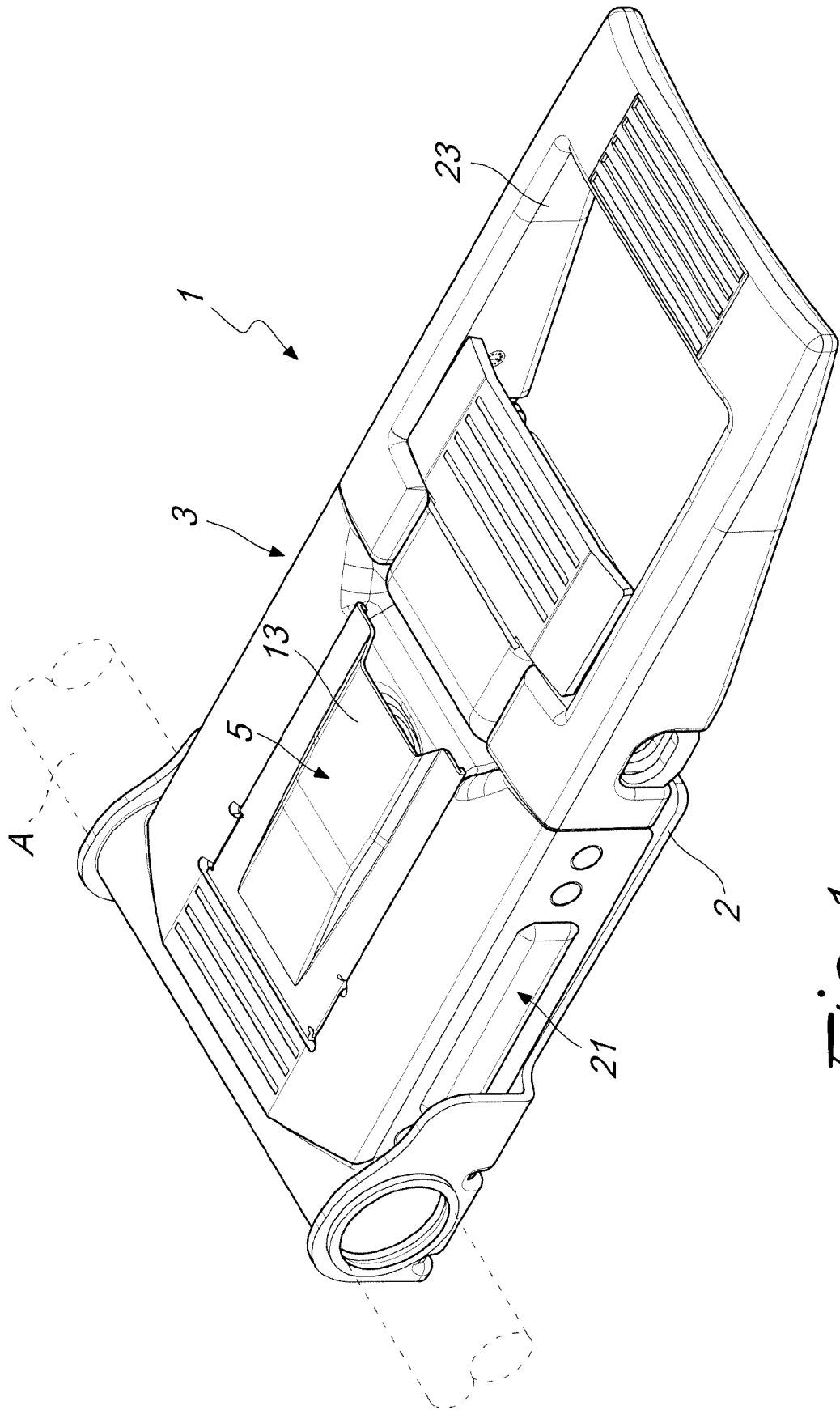
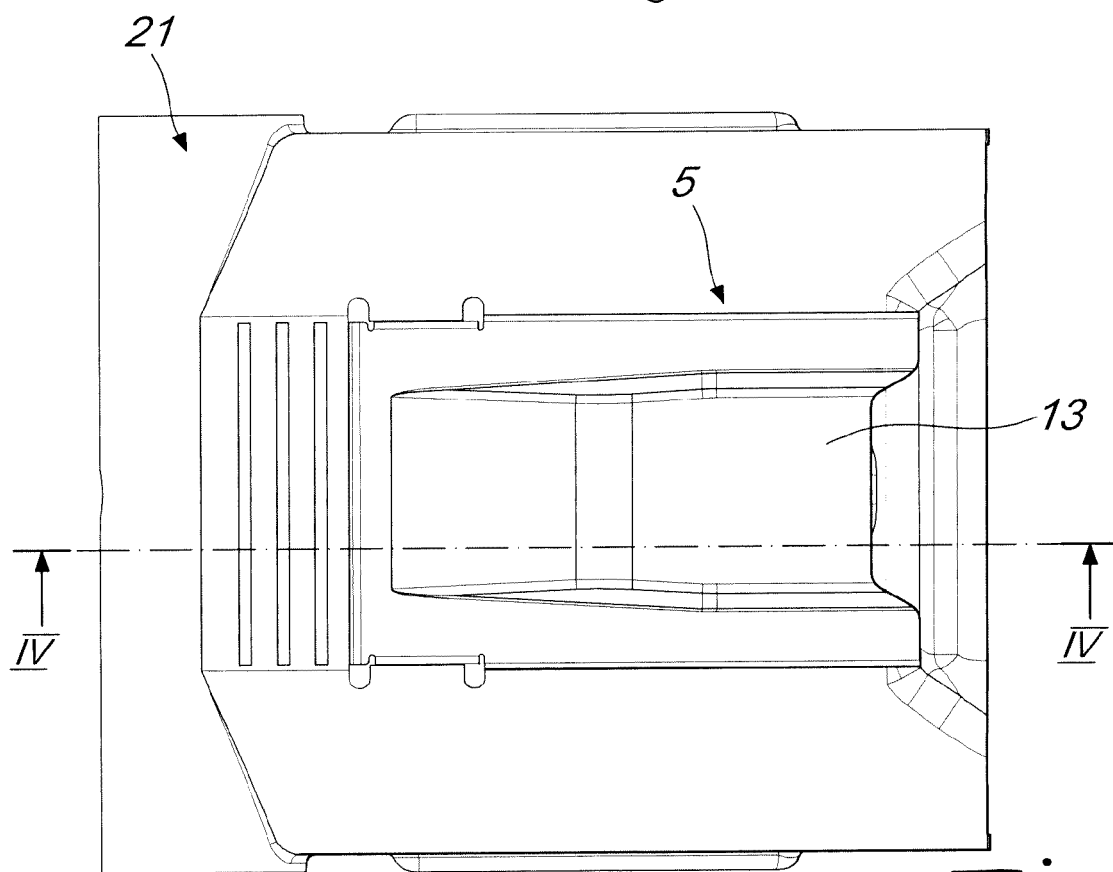
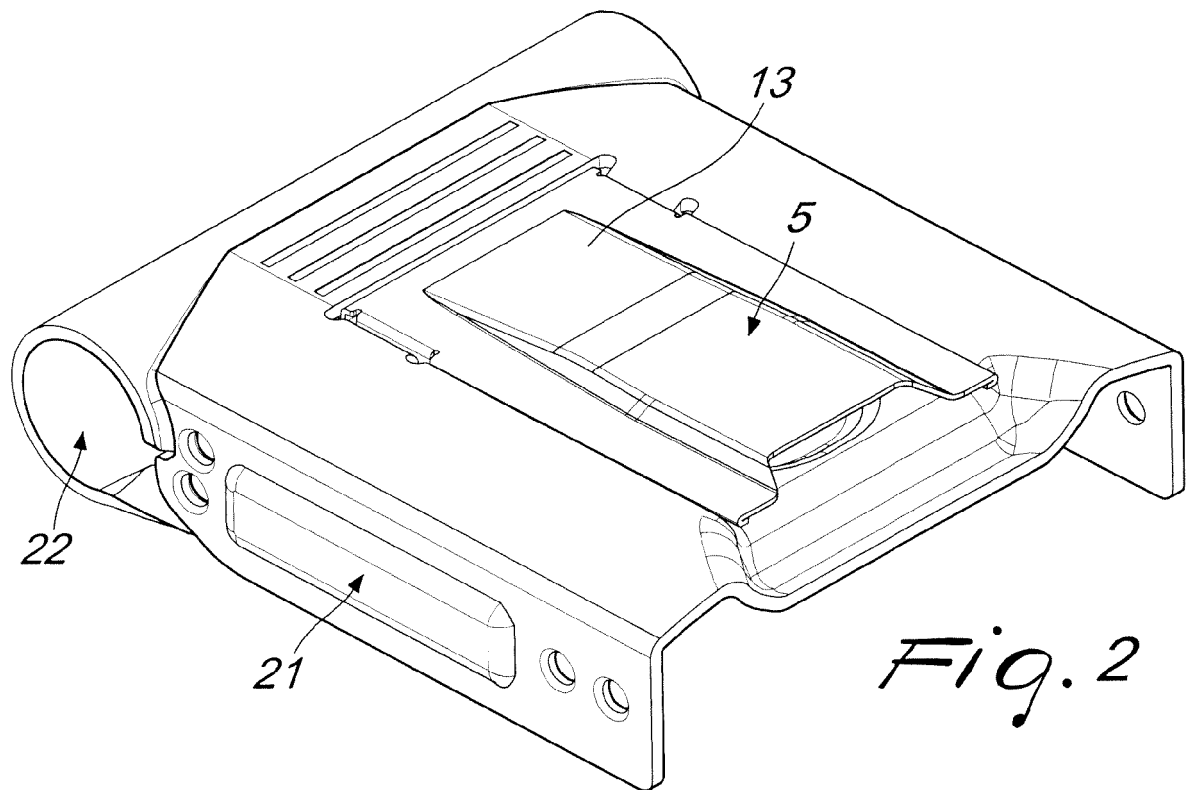


Fig. 1



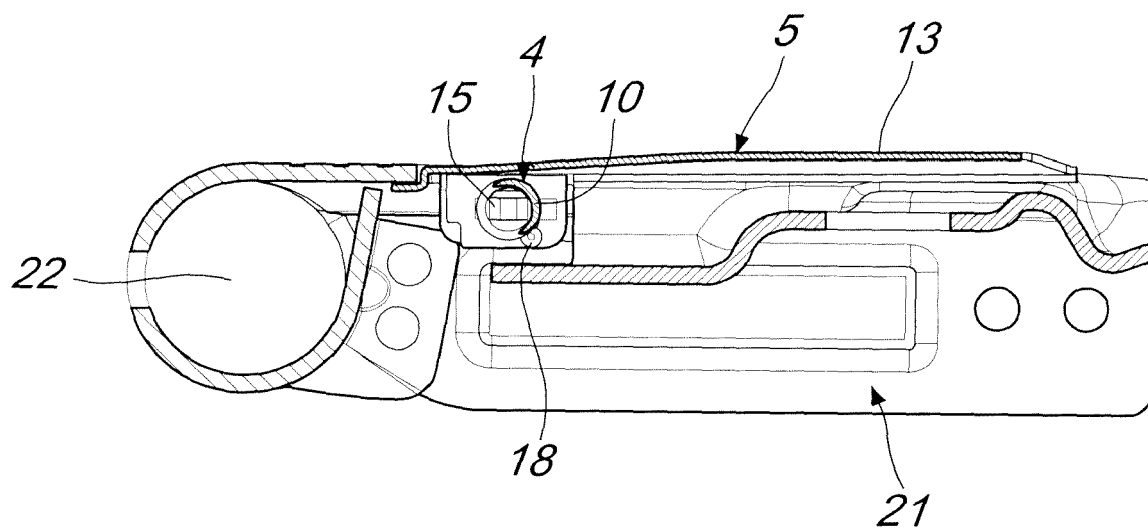


Fig. 4

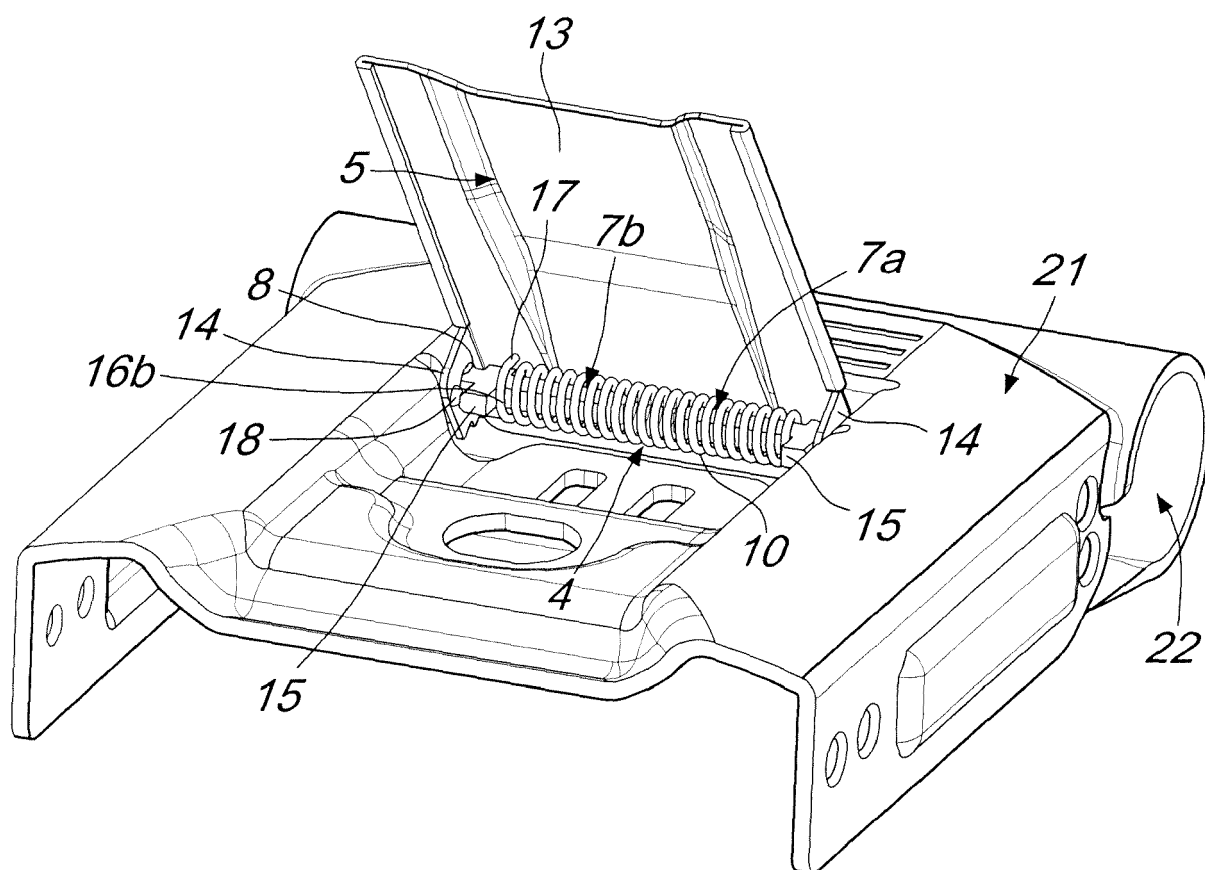
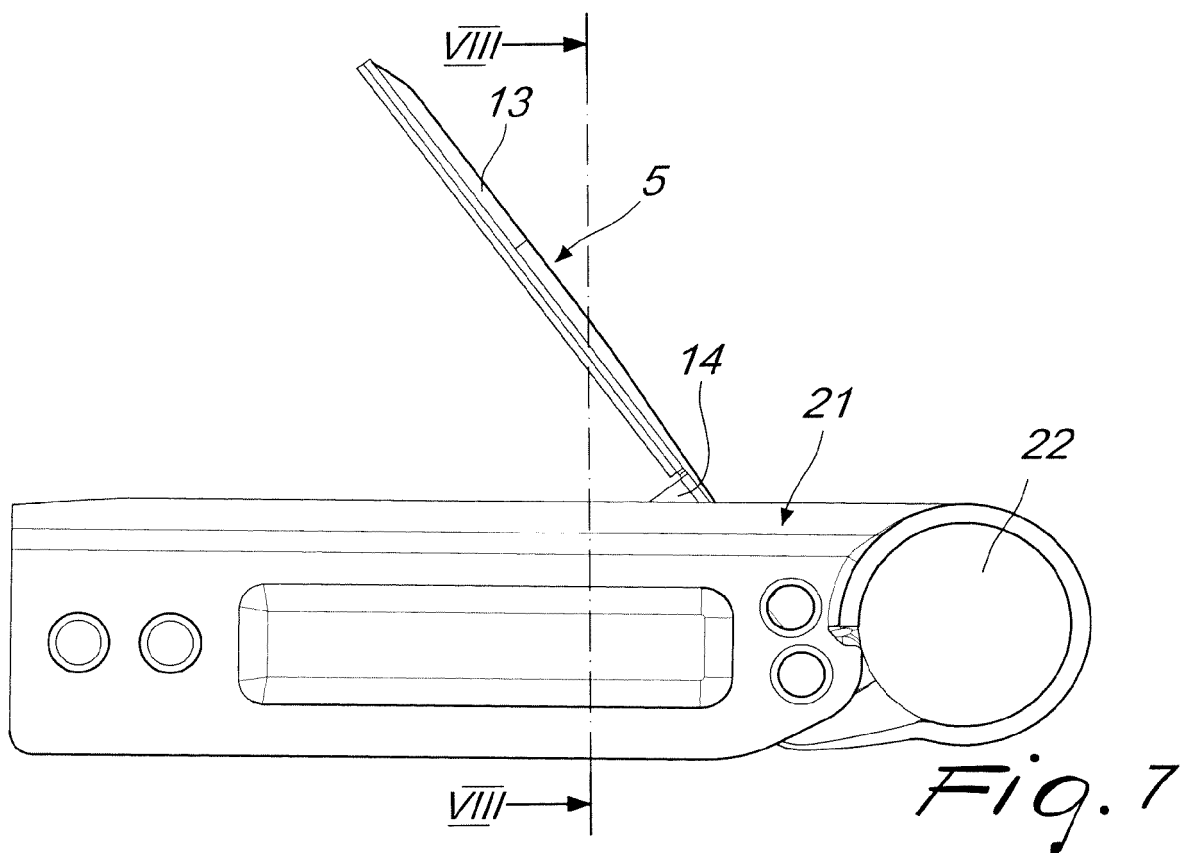
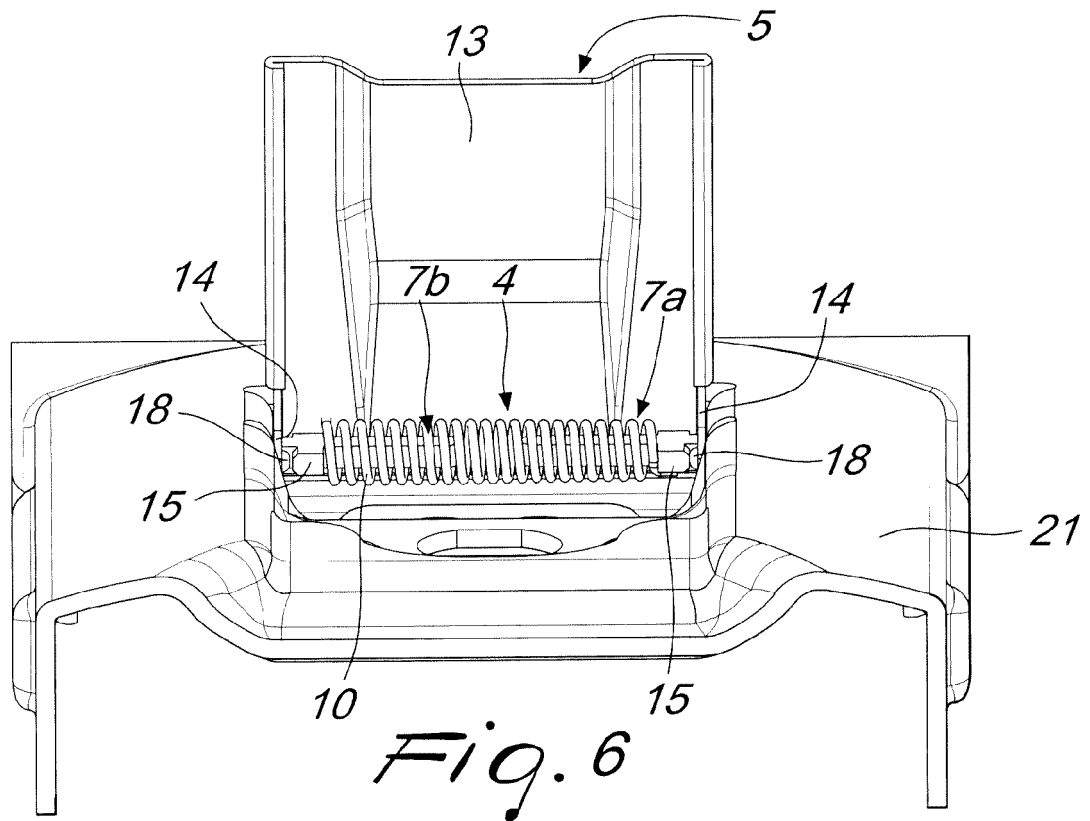


Fig. 5



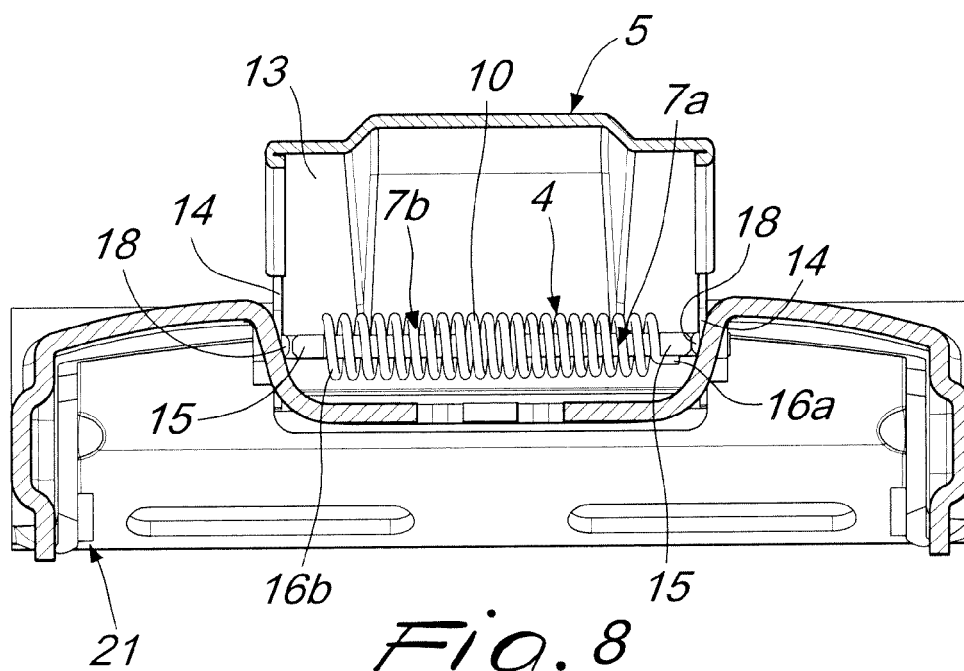


Fig. 8

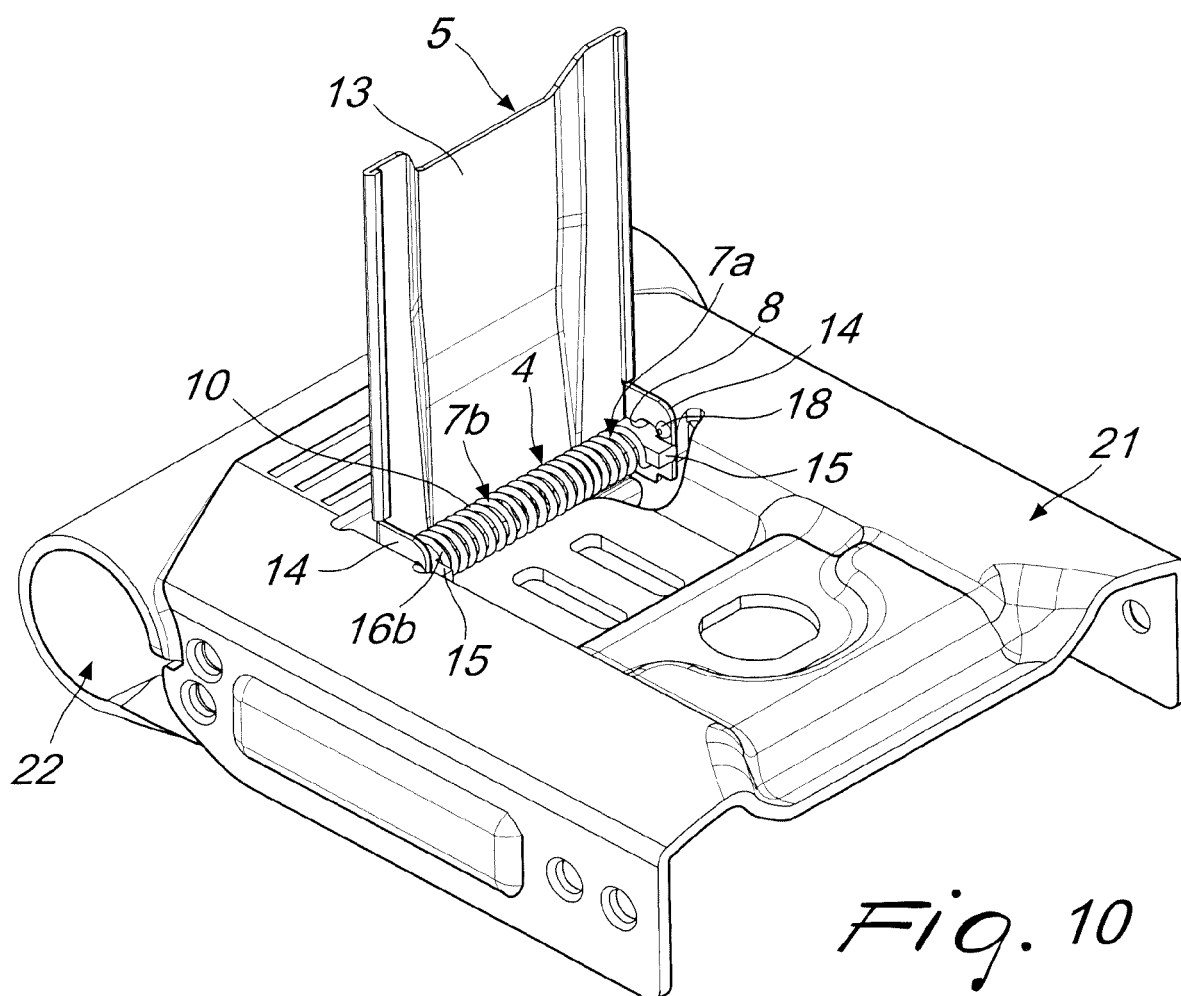


Fig. 10

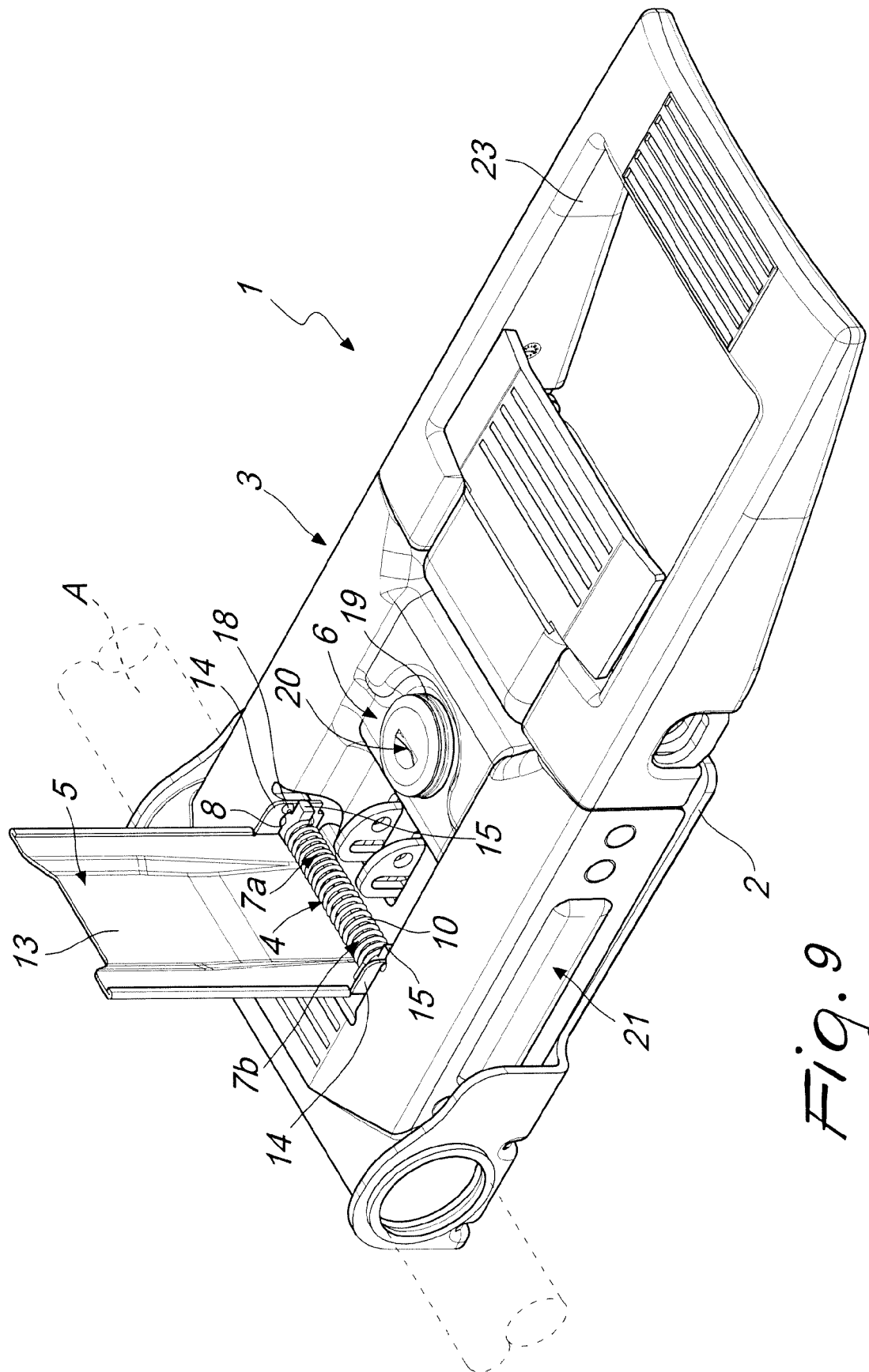


Fig. 9

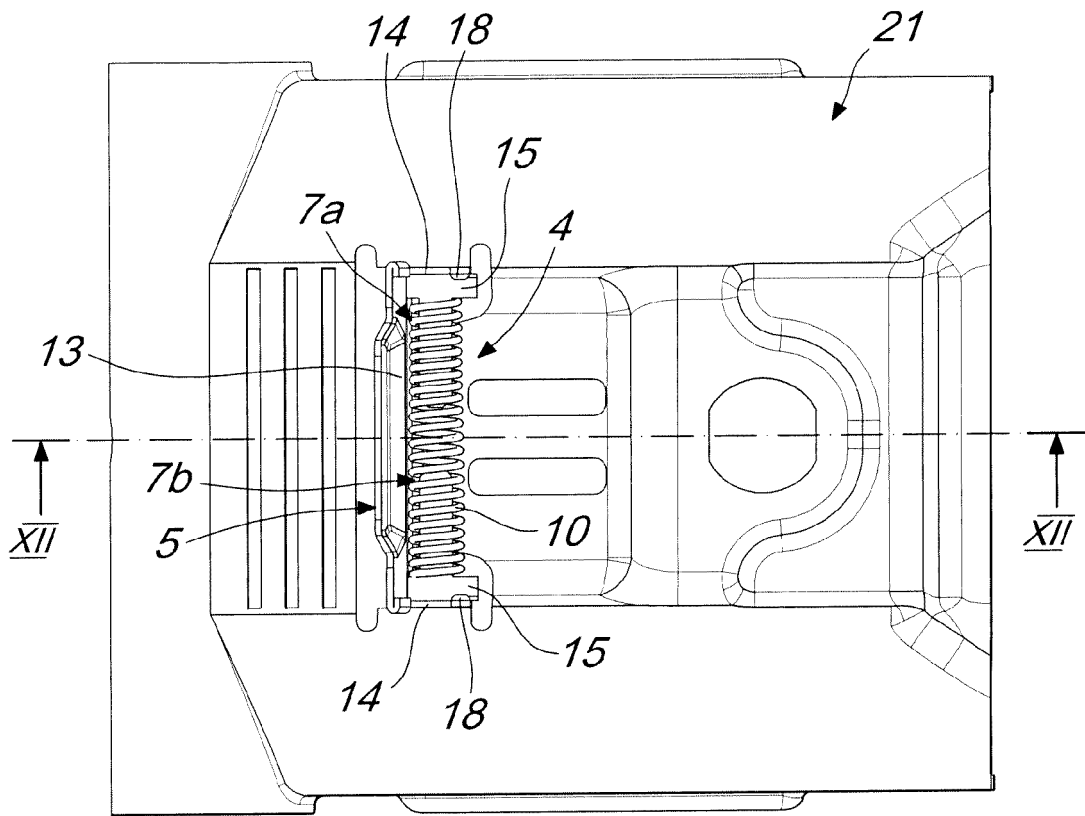


Fig. 11

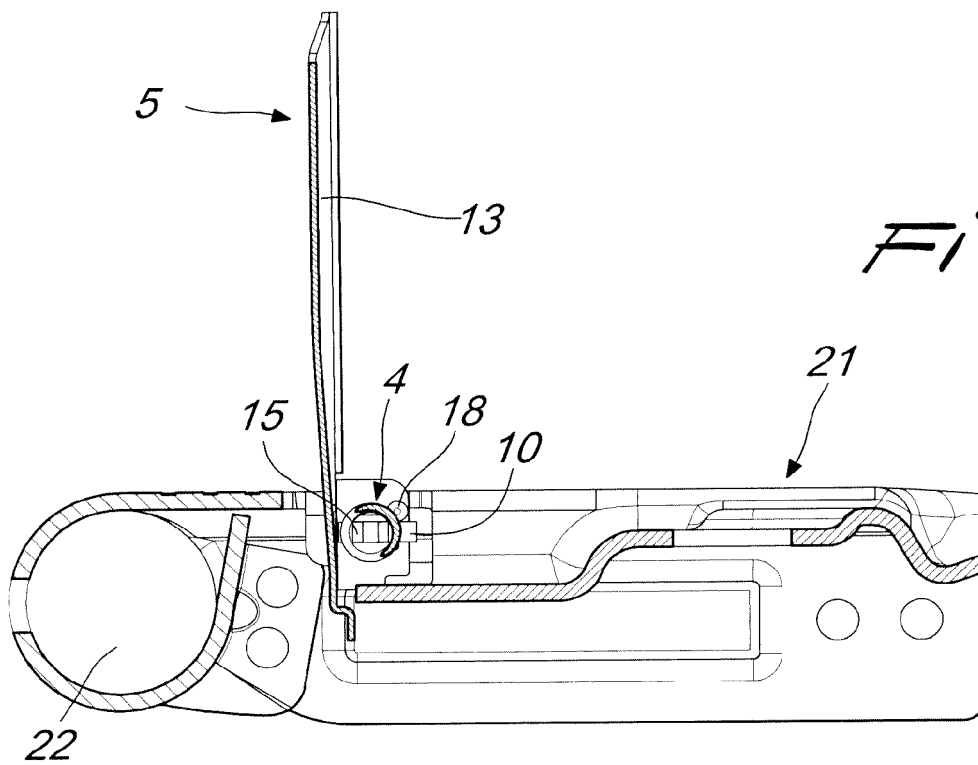
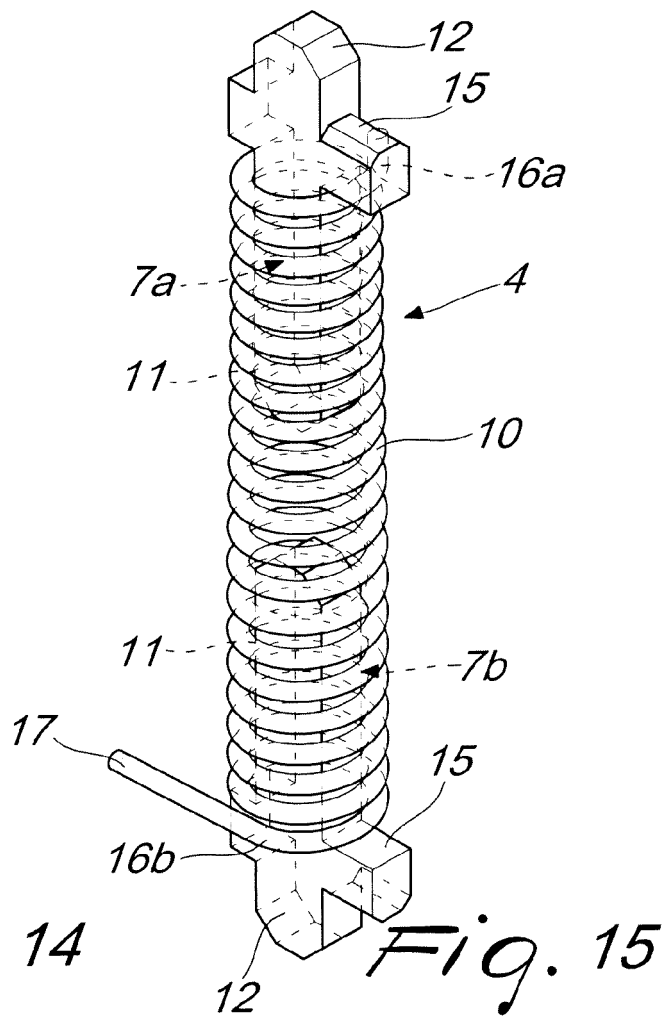
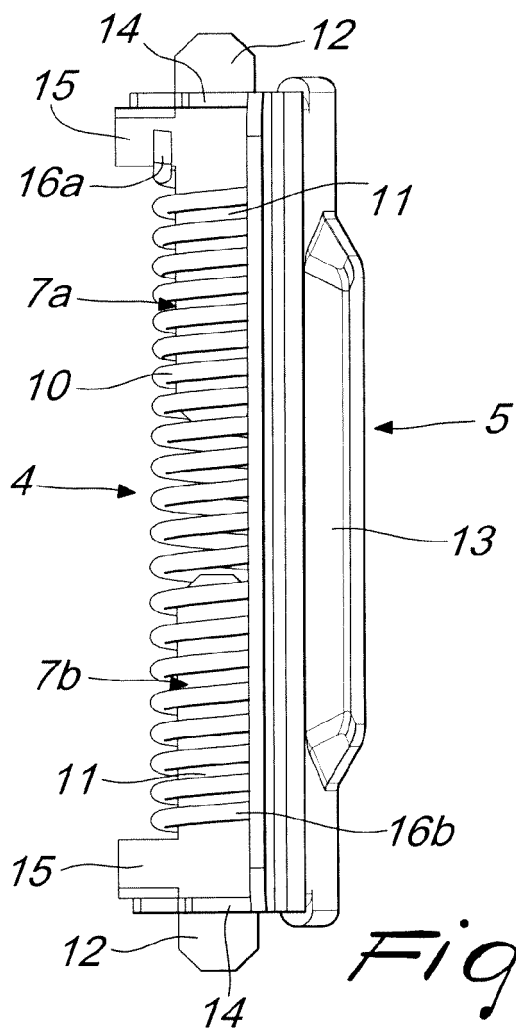
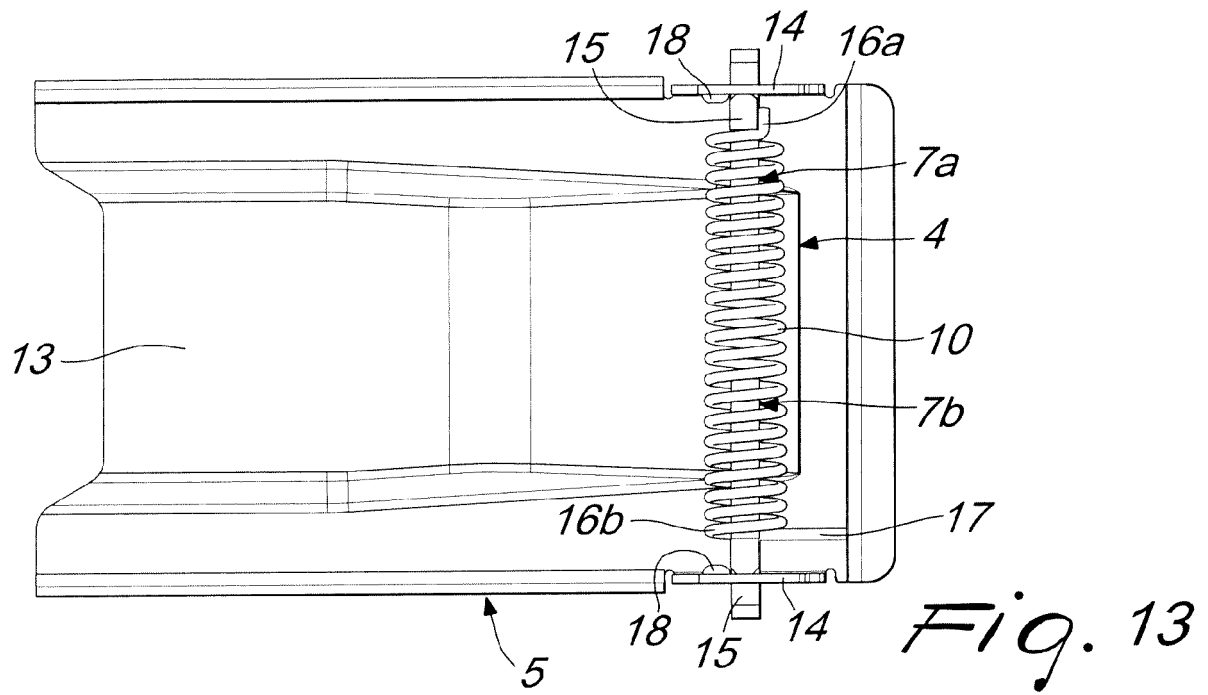
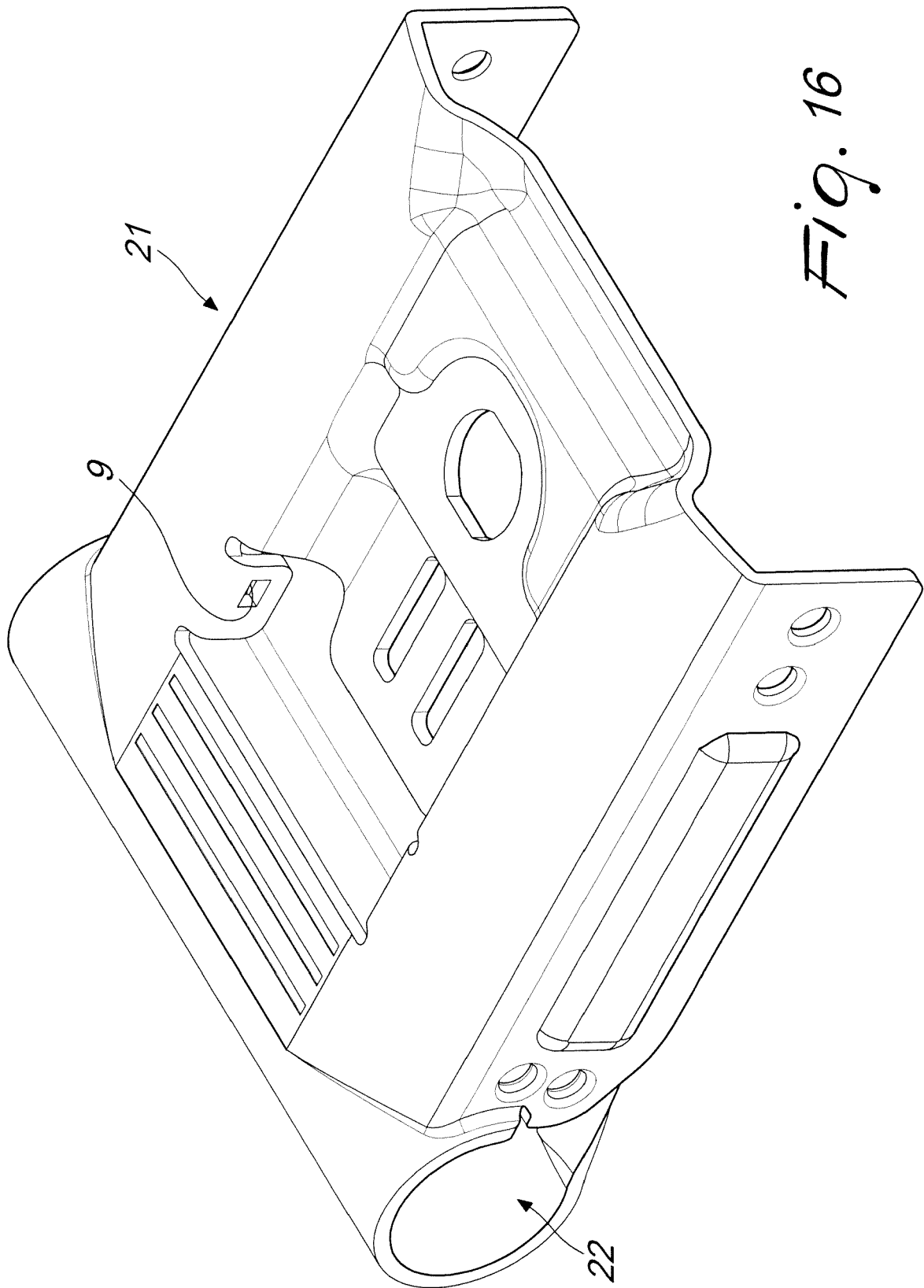


Fig. 12







EUROPEAN SEARCH REPORT

Application Number
EP 15 42 5108

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			TECHNICAL FIELDS SEARCHED (IPC)
			E05B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 24 May 2016	Examiner Westin, Kenneth
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The members are as contained in the European Patent Office EDP file on
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24-05-2016

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82