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(54) **LOCK FOR PORTABLE GENERATORS**

(57) A lock (1), suitable to be used in the field of portable generators, comprising a locking lever (3) whose depth can be changed and that allows to place the en-

gaging portion (3a) of the locking lever also beyond the free end of the sleeve (5) on which said lever (3) can slide.

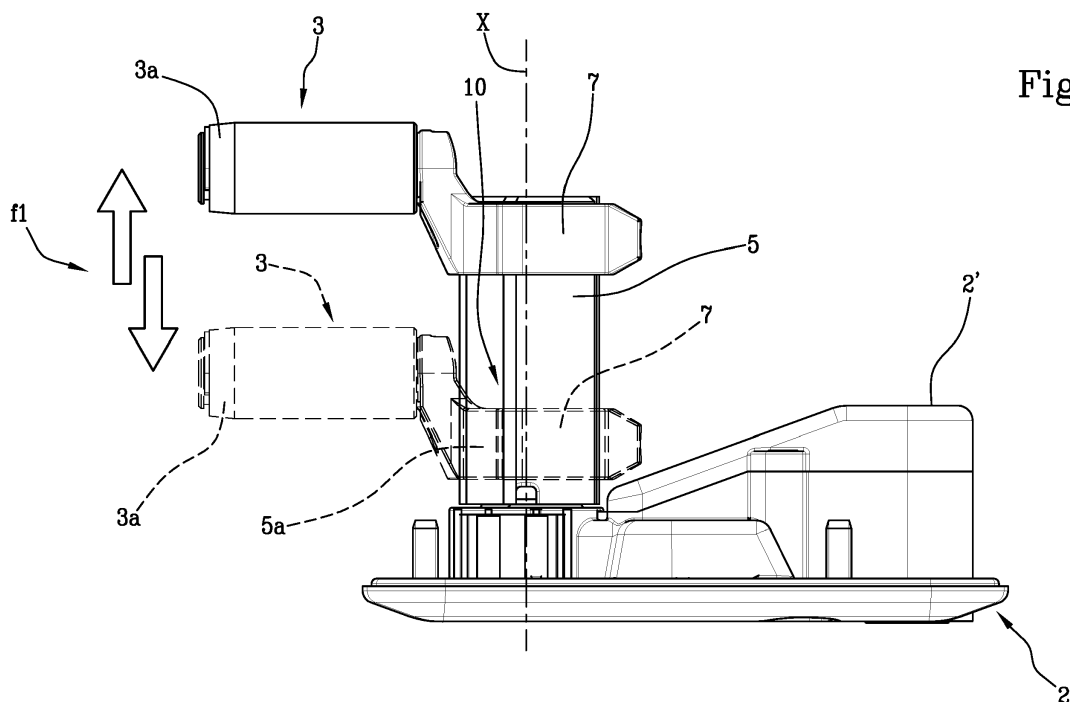


Fig.3a

Description

[0001] The present invention relates to a lock suitable to be used in the field of portable generators.

[0002] Currently, the locks for the closing of access panels for installations used in particular in the field of portable generators, or parts of such installations, have a lever that can rotate in a direction substantially orthogonal to the surface of arrangement of a first panel on which the lock is mounted. This lever preferably extends in a direction perpendicular to said axis of rotation, so that it can engage an engagement seat integral with a second panel to which this first panel is to be secured.

[0003] In such locks, the positioning of the lever along said axis of rotation of the lock can be adapted with varying of the depth of the engagement seat of the lever itself, in particular as compared with the first panel on which the lock is mounted. Considering that the extending axis of the lever is transverse to the axis of rotation of the same, in order to change its depth a sleeve extending along said axis of rotation is used, and with respect to which said lever can be shifted.

[0004] In the currently known systems, the translational motion of the latter is performed via a bearing structure of the lever, which moves into a groove integral with said sleeve, and can be placed near a coupling portion of the sleeve along the extending axis thereof.

[0005] Furthermore, as the extending axis of the lever substantially lies on a plane including the average section of the coupling portion, the maximum depth of the engagement seat of said lever is limited more or less tightly by the depth or length of the sleeve. Object of the present invention is to provide a lock suitable to be used in containment structures of installations preferably related to portable generators, such that the user is allowed to adjust the depth of the locking lever along the axis around which the rotation of the same for the closing of the lock takes place, and by which this lever can engage engagement seats located deeper than the free end of the sliding sleeve of the lever itself.

[0006] This object is achieved by means of a lock suitable to be used in at least one containment structure of installations preferably related to portable generators, said lock comprising a base structure, a locking lever integral with a bearing structure, a sleeve, a handle, and fastening means located between said bearing structure and the sleeve,

wherein the sleeve is constrained to the base structure and to the handle by constraining means such that the sleeve can be rotated around a first axis parallel to an extending axis of the sleeve and with respect to the base structure;

in which the rotation about the first axis of the sleeve can be performed by rotating the handle about the first axis and with respect to the base structure;

in which the bearing structure is constrained to the sleeve to be translatable rigidly with respect thereto along the first axis, and to be able to position itself near at least a

coupling portion of the sleeve;

in which the fastening means are suitable to ensure that the lever follows the rotation of the sleeve around said first axis and with respect to the base structure; wherein the handle is rigidly rotatable by means of the constraining means and with regard to the sleeve and to the base structure, around a second axis (Y) perpendicular to said first axis;

in which the handle can take at least a first closing position and a second operating position corresponding to at least two angular positions of the handle, respectively, about the second axis and with respect to the base structure; characterized in that the lever comprises an engagement portion suitable to engage an engagement seat of such a containment structure, said bearing structure being configured to arrange said engagement portion in a staggered manner along said first axis with respect to said coupling portion of said sleeve.

[0007] In this way a lock comprising a locking lever with variable depth is obtained, and that allows to place the engaging portion of the locking lever also beyond the free end of the sleeve on which it can slide.

[0008] A possible embodiment of the present invention may comprise at least one of the following technical aspects.

[0009] Preferably, the bearing structure is removable with respect to the sleeve. In this way it is possible to release such a bearing structure, along with the lever itself, from such sleeve to arrange the engagement portion of the lever so that the lever can be placed both on the side of the bearing structure facing towards the base structure, and on the other side. This feature allows the lever, although it may be placed along the first axis beyond the free end of the sleeve, to reach depths very close to the base structure.

[0010] Preferably, the sleeve and the handle are placed respectively on opposite sides of the base structure. In this way, the opening of the lock can take place from the outside, when the closing lever is placed from the inside with respect to the panel on which the lock is mounted. Preferably, the bearing structure is suitable to be placed at least partially about the coupling portion.

[0011] In this way, the bearing structure of the lever is easily removable, along with the lever itself, from the sleeve, and advantageously is re-inserted on the sleeve so as to guide the engagement portion according to offsets in two possible opposite half planes with respect to the bearing structure itself.

[0012] Preferably, the fastening means are suitable to tighten the bearing structure about the coupling portion and/or to hold the bearing structure with regard to the sleeve and along the first axis near the coupling portion. Preferably, the handle comprises an arm and a grip. Preferably, the constraining means are suitable to ensure that the handle can freely rotate with regard to the sleeve and about the second axis, at least between the closing position and the operating position. Preferably, the constraining means comprise an elongated connecting ele-

ment constrained to rotate together with the sleeve about the first axis, and a pin suitable to be inserted in at least an opening formed in the elongated element and in at least an opening formed in the arm of the handle, such that said pin is suitable to be inserted in these openings with an own extending axis coincident with the second axis.

[0013] Preferably, the base structure and the constraining means are suitable to ensure that a rotation of the handle about the second axis and with respect to the base structure produces a translational motion of the sleeve itself along the first axis and with respect to the base structure, by means of at least interaction means between the handle and the base structure. Preferably, the interaction means are configured so that the handle pushes against the base structure as it rotates about the second axis and with respect to the base structure itself.

[0014] Preferably, the base structure comprises a protrusion to which the sleeve is constrained in a translatable manner along the first axis.

[0015] Preferably, the lock comprises guide means interposed between the protrusion and the sleeve, and suitable to guide the sleeve during the translational motion thereof with respect to the protrusion.

[0016] Preferably, the guide means comprise at least a part of the protrusion or sleeve suitable to slide into at least one cavity provided in the sleeve or in the protrusion, respectively.

[0017] Preferably, the lock comprises stopping means configured so that, at least when the handle is in a third intermediate position between the closing position and the operating position, the rotation of the sleeve about the first axis and with respect to the base structure is more limited compared to at least when the handle is in the operating position.

[0018] Preferably, the stopping means comprise at least a surface integral with the sleeve, and at least one surface associated to the base structure, preferably disposed parallel to each other, and both inclined with respect to the normal of the first axis.

[0019] In this way, in order to rotate the lever about the first axis by an angle sufficient to open the lock, firstly it is necessary to rotate the handle about the second axis up to the operating position. In fact, the stopping means and the constraining means are preferably configured so that, when the handle has reached the operating position about the second axis, the stopping means are in a condition such that they can no longer limit the rotation of the sleeve, and therefore also of the lever, about the first axis and with respect to the base structure, at least up to the point where the lock is fully open.

[0020] Preferably, the lock comprises stabilizing means suitable to stabilize the angular position of the handle about the first axis, and in particular with respect to the base structure.

[0021] In this way, the rotation of the handle about the first axis with respect to the base structure can be controlled by such stabilizing means, which allow to stop the

rotation of the handle about the first axis, for example when the handle is in an opening angular position of the lever and/or when it is in a closing angular position of the lever itself.

5 **[0022]** Preferably, the stabilizing means comprise at least a spring and ball system.

[0023] Preferably, the lock comprises first locking means suitable to make sure that the handle, when in the closing position, remains locked to the base structure and cannot rotate about the second axis, with respect to the base structure.

10 **[0024]** Preferably, the lock comprises second locking means that are suitable to make sure that the handle, when in the closing position, cannot rotate about the first axis, with respect to the base structure.

15 **[0025]** Preferably, the first locking means comprise at least one slot integral with the handle and at least one slot integral with the base structure, said slots being respectively integral with the handle and to the base structure being suitable to align with each other when the handle is in the closing position, and said slot, integral with the base structure, being at least partially formed in a removable portion of the base structure.

20 **[0026]** In this way, it is possible to lock the handle to the base structure with a padlock passing through at least both slots.

25 **[0027]** Being the slot integral with the base structure located in a removable portion of the base structure itself, the production of the lock is therefore easier, since the slot is created in a component that can be independent with respect to the portion of the base structure affected by the movements of the handle and the sleeve. Preferably, the first locking means comprise a locking surface that can be placed so as to interfere with the rotation of the handle about the second axis and with respect to the base structure.

30 **[0028]** Preferably, the locking surface can be activated by means of a key suitable to be inserted into a cylinder, which is removable from the base structure and replaceable.

35 **[0029]** Given that the cylinder is replaceable, the same can be moved from a lock to another one belonging to the same installation, and in this manner, the repair operations of the cylinder itself should be easier to perform.

40 **[0030]** Preferably, the second locking means comprise at least a part of the side surfaces of a housing at least partially located in the base structure and suitable to accommodate the handle when the same is in the closing position.

45 **[0031]** The presence of the side surfaces of the housing formed in the base structure prevents the handle itself from rotating about the first axis when in the closing position.

50 **[0032]** The features of the present invention will be clarified from the following detailed description provided by way of illustration, and not limitation, of the more general claimed concepts.

55 **[0032]** The following detailed description refers to the accompanying drawings, in which

- Figure 1 is a perspective view of the preferred embodiment of the present invention, with the handle in the operating position;
- Figure 2a is a perspective view of this embodiment with the handle in the closing position;
- Figure 2b is a perspective, partially sectioned view of this embodiment, and with the lever in sequence rotated around two axes, with respect to the position of Figure 2a;
- Figures 3a and 3b are side views showing two different mounting modes of the locking lever on the sleeve;
- Figure 4 shows a front view of this embodiment with the handle in the operating position;
- Figure 4a shows the section C-C of Figure 4;
- Figure 5 shows a front view of this embodiment with the handle in the closing position;
- Figures 5a and 5b show the section A-A and the section B-B of Figure 5, respectively;
- Figure 6 shows a partially sectioned view of such an embodiment, in which the lock is locked by means of a padlock;
- Figure 7 is a perspective view of the preferred embodiment of the present invention, with the handle not shown in the closing position and without sleeve and lever.

[0033] With reference to the accompanying drawings, there is shown a lock 1 having a base structure 2, a closing lever 3, and a handle 4.

[0034] The closing lever 3 comprises a third engagement portion suitable to engage an engagement seat of the containment structure (not shown) on which the lock 1 is mounted.

[0035] A sleeve 5 is constrained to the base structure 2 and the handle 4 by constraining means 6, shown in Figure 2b and shown in more detail in Figures 4a, 5a and 5b. Such constraining means 6 allow the sleeve 5 to be rotate with respect to the base structure 2, as shown by the arrow r1 of Figure 1, due to a corresponding rotation of the handle 4 about the first axis X itself.

[0036] Such rotation, as shown by the arrow r1, takes place around a first axis X, parallel to an extending axis of the sleeve 5, and shown in Figures 1, 2b, 3a, 3b, 5, 5a, 5b and 6. Figures 1, 2a, 3a, 3b, 4, 4a, 5, 5a, 5b, and 6 show the handle 4 in an angular position about the axis X, such that the closing lever 3 is placed in the engagement seat of the containment structure, which is not shown in the attached figures.

[0037] Such constraining means 6 are suitable to make sure that the handle 4 is also rigidly rotatable with regard to the sleeve 5 and the base structure 2, as shown by the arrow r2 of Figure 1. With reference also to Figures 2b and 5b, such rotation, as shown by the arrow r2 of Figure 1, is around a second axis Y, which can be considered ideally integral with the handle and perpendicular to the first axis X.

[0038] In particular, the handle 4 can take at least a

first closing position and a second operating position, which are respectively associated to at least two angular positions of the handle 4 about the second axis Y. The handle 4 is in the closing position in Figures 2a, 3a, 3b, 5, 5a, 5b and 6. In the other figures, the handle 4 is in the operating position.

[0039] The constraining means 6 between the sleeve 5 and the handle 4 are suitable to ensure that the handle 4 can freely rotate with regard to the sleeve and about the second axis Y, at least between the closing position and the operating position. In particular, these constraining means 6 are shown in Figures 4a and 5a, which show the section C-C of Figure 4 and the section A-A of Figure 5, respectively.

[0040] In addition, the handle 4 advantageously comprises a handle 4a and an arm 4b, which are shown in Figures 1, 2a, 2b, 4, 4a, 5, 5a, 5b, 6 and 7.

[0041] In this embodiment, the sleeve 5 and the handle 3 are placed respectively on opposite sides of the base structure 2, so that the opening of the lock 1 can take place from the outside when the closing lever 3 is placed from the inside with respect to the panel on which the lock 1 is mounted.

[0042] The closing lever 3 is integral with a bearing structure 7, which is constrained to the sleeve 5 so as to be translatable rigidly along the first axis X to a position near at least a coupling portion 5a of the sleeve 5 itself, as shown in Figures 1, 3a, 3b, 4a, 5a and 5b.

[0043] In this way, the lever 3 follows the rotation of the sleeve 5 about the first axis X, as shown by the arrow r1 of Figure 1, preferably by virtue of the constraining means 8. The lever 3 itself can translate with respect to the sleeve 5 along the first axis X, as shown by the arrows f1 of Figures 3a and 3b, when the constraining means 8 are not in operation.

[0044] The bearing structure 7 is configured to have the engaging portion 3a in a staggered manner along said first axis X with respect to the coupling portion 5a of the sleeve 5, as clearly shown in Figures 3a and 3b.

[0045] In this embodiment, the bearing structure 7 is removable with respect to the sleeve 5, to allow the lever 3 to be arranged as shown in Figure 3a or as shown in Figure 3b, according to whether the user desires to use the engaging portion 3a of the lever 3 up to beyond the free end of the sleeve 5, or in the immediate proximity of the base structure 2. It is noted, however, that this engaging portion 3a may be placed in an intermediate zone, with both mounting configurations of the lever 3 shown in Figures 3a and 3b, respectively.

[0046] In other words, according to the present invention, the lever 3 is removable/separable and re-insertable (or re-fittable as a result of disassembly/separation) on the sleeve 5, in order to guide the engaging portion 3a according offsets in two possible opposite half planes with respect to the bearing structure 7 itself.

[0047] As stated above, preferably the bearing structure 7 is associated with constraining means, which allow the bearing structure 7 to be attached to the coupling

portion 5a of the sleeve 5, so that it remains at a depth set by the user. Moreover, this bearing structure 7 is advantageously suitable to be placed at least partially about the coupling portion 5a, as shown in Figures 1, 3a and 3b, so that it is easily removable from the sleeve 5 while remaining firmly with respect to it.

[0048] In the embodiment shown, the bearing structure 7 is at least partially shaped like a ring. The constraining means 8, shown only in Figure 5a, preferably comprise a threaded grub screw 8a that fits in the bearing structure 7 and allows to tighten it, about the coupling portion 5a selected by the user.

[0049] Regardless of the angular position of the handle with regard to the axis Y, the handle 4 itself, and thus also the sleeve 5, could theoretically take any angular position about the first axis X, because, in case of absence of impediments, can rotate together around to such first axis X thanks to the configuration of the constraining means 6.

[0050] In order that the lock 1 can only be opened once it is located in the operating position, mainly to limit wear and prevent accidental opening, the embodiment shown advantageously comprises stopping means configured so that, at least when the handle 4 is in a third intermediate position between the closing position and the operating position, the rotation of the sleeve 5 about the first axis X, with respect to the base structure 2, is more limited compared to at least when the handle 4 is in the operating position.

[0051] With reference to Figure 7, which shows the base structure 2 without either the sleeve nor the closing lever, the stopping means are at least partly located on a protrusion 9 of the base structure 2, to which the sleeve is constrained in a translatable manner along the first axis X.

[0052] With reference also to Figure 1, in order to facilitate the translational motion of the sleeve 5 along the protrusion 9, the lock 1 comprises guide means 10 interposed between the protrusion 9 and the sleeve 5, and suitable to guide the sleeve 5 during the translational motion of the same with respect to the protrusion 9, and along the first axis X. Preferably, the guide means 10, which are shown in Figures 1, 3a and 3b, comprise at least a part of the protrusion 9 or of the sleeve 5, suitable to slide in at least one cavity formed in the sleeve 5 or in the protrusion 9, respectively. The protrusion 9 in Figures 3a, 3b and 6 is not visible because covered by the sleeve 5.

[0053] In the preferred embodiment, the stopping means comprise at least one surface integral with the sleeve 5, which is not visible in the figures since it is placed inside of the same, and at least one surface 9a associated to the base structure 2 and shown in Figure 7. These surfaces are preferably parallel and both inclined with respect to the normal of the first axis X, in order that their mutual contact can at least partially limit the rotation of the sleeve and the handle about the first axis X. The term "inclined" refers also the possibility of

an inclination of ninety degrees.

[0054] The orientation of these surfaces is such that, in the event that they meet with each other while the sleeve 5 tends to rotate with respect to the protrusion 9 about the first axis X, and the handle 4 is not still in the operating position, the same surfaces can mutually slide to limit the rotation itself.

[0055] To this end, in fact, the stopping means and the constraining means 6 are preferably configured in such a way that the position of the sleeve 5 along the first axis X and with respect to the protrusion 9, such that the stopping means can no longer limit the relative rotation of the same about the axis X, is associated to the operating position of the handle 4 about the second axis Y, shown for example in Figure 4a.

[0056] To this end, with reference to Figures 4a and 5a, the base structure 2 and the constraining means 6 between the sleeve 5 and the handle 4 are such that a rotation of the handle 4 around said second axis and with regard to the structure of the base 2 produces a translational motion of the sleeve 5 along the first axis X and with respect to the base structure 2. Such translational motion of the sleeve along the first axis X takes place by means of at least interaction means between the handle 4 and the base structure 2.

[0057] It is noted that the second axis is not shown in the Figures 4a and 5a, because it is orthogonal to the plane of figures.

[0058] Preferably, the interaction means are configured so that the handle 4 pushes against the base structure 2 itself as it rotates about the second axis. In the case shown, the interaction means comprise, at the end of the arm 4b of the handle 4, a cam 4c that, during the rotation of the handle 4 to move from the closing position of Figure 5a to the operating position of Figure 4a, it remains in contact with, and pushes against a surface S, being integral, at least as regards the translational motion along the first axis X, with the base structure 2.

[0059] In this embodiment, such surface S refers to a bush 11, which is also rotatable about the first axis X with respect to the base structure 2. The section of the bush 11 is shown in Figures 4a, 5a and 5b, while the same bush 11 is also shown partially sectioned in Figure 2b. Starting from the closing position of the handle 4, shown in Figure 2a or 5a, by rotating first the handle 4 about the second axis Y up to the operating position we obtain the situation of Figure 1 or 4a. By the further rotation of the same handle 4 about the first axis X, in order to rotate the closing lever and disengage it from its engagement seat, we obtain the situation of Figure 2b, in which the lever is not shown.

[0060] In the latter figure, the base structure 2, the sleeve 5 and the handle 4 are partially sectioned to show further components which will be described later.

[0061] Figures 4a and 5a show in more detail the constraining means 6 partially sectioned, when the handle 3 is arranged in the operating position and in the closing position, respectively.

[0062] Preferably, the constraining means 6 between the sleeve 5 and the handle 4 comprise an elongated connecting element 6a constrained to rotate together with the sleeve 5 about the first axis X, and a pin 6b suitable to be inserted in at least a first opening 6c formed in the elongated element 6a and in at least a second opening 6d formed in the handle 4. These openings 6c and 6d, distinguishable and indicated in Figures 2b and 5b, are arranged in such a way that the pin 6b is suitable to remain inserted in the openings with its extending axis coincident with the second axis Y, as can be seen clearly in Figure 5b.

[0063] Advantageously, the constraining means 6 comprise also a spring K suitable to push the sleeve 5 towards the outside with respect to the base structure 2, so as to hold the handle 4, in particular at the cam 6c, abutted to the surface S integral with the base structure 2. Such spring K, when the handle 4 is in the closing position, is compressed with respect to its equilibrium condition.

[0064] With reference to Figures 2b, 4a and 5a, in this embodiment the lock 1 comprises stabilizing means 12 suitable to stabilize the angular position of the handle 4 about the first axis X, and in particular with respect to the base structure 2.

[0065] In particular, in Figure 5b it is noted that the stabilizing means 12 preferably comprise at least a spring 12a and ball 12b system, in which the spring 12a in this embodiment is within the bush 11 and may snap fit in at least a suitable cavity 12c formed in the base structure 2. Preferably, at least two cavities 12c are formed in the base structure 2, near at least the two angular positions of the handle 4 about the axis X, which are associated with the opening and the closing of the lock 1, respectively.

[0066] Note that the bush 11 can be considered as integral with the base structure 2, with respect to the translational motion along the axis X, which gives rise to the pushing effect of the cam 4c against the surface S, while the handle 4 rotates about the second axis Y. This bush 11 is not integral with the base structure 2 with respect to the rotation about the first axis X, to allow the handle 4, the sleeve 5, and thus the lever 3 to be rotated about the first axis X with respect to the base structure 2.

[0067] Preferably, the lock comprises first locking means suitable to make sure that the handle 4, when in the closing position, remains locked to the base structure 2 and cannot rotate about the second axis, with respect to the base structure 2.

[0068] Preferably, the lock comprises second locking means that are suitable to make sure that the handle 4, when in the closing position, cannot rotate about the first axis X. With reference to Figures 1, 2a, 2b, 4a, 5a and 6, the first locking means advantageously comprise at least one slot 13a integral with the handle 4 and at least one slot 13b integral with the base structure 2.

[0069] Preferably, the slots 13a and 13b, respectively integral with the handle 4 and with the base structure 2,

are suitable to be mutually aligned when the handle 4 is in the closing position.

[0070] In this way, the handle 4 may be locked to the base structure 2 by means of a padlock L passing through at least both of the slots 13a and 13b, as shown in Figure 6.

[0071] Preferably, the slot 13b, being integral with the base structure 2, is formed at least partially in a removable portion 2' of the base structure 2, also indicated in figure 7.

[0072] In Figure 2b, it is clearly visible that, in the embodiment shown, there are two slots 13a integral with the handle 4. Said slots, as seen in Figure 2a, are adapted to be aligned with the slot 13b, integral with the base structure 2, on opposite sides of this slot 13b, and when the handle 4 is in the closing position.

[0073] In this embodiment, the first locking means also comprise a locking surface 14 that can be placed to interfere with the rotation of the handle 4 with respect to the sleeve 5 and about the second axis, when the handle 4 itself is in the closing position. This effect of the locking surface 14 can be seen in Figure 5a.

[0074] With reference to Figures 4, 5, 5a and 6, preferably, the locking surface 14 can be activated by means of a key C, shown only in Figure 3b and suitable to be inserted into a cylinder 15, which is advantageously removable from the base structure 2 and replaceable. In this embodiment, the cylinder 15 is located at the removable portion 2' of the base structure 2.

[0075] With reference to Figures 2a, 2b, 5a and 6, the second locking means advantageously comprise at least a part of the side surfaces of a housing 16 at least partly located in the base structure 2, and suitable to accommodate the handle 4 in the closing position. The presence of the side surfaces of the housing 16 formed in the base structure 2 prevents the handle 4 itself from rotating about the first axis X when in the closing position.

40 Claims

1. A lock (1) suitable to be used in at least one containment structure of installations preferably related to portable generators, said lock comprising a base structure (2), a locking lever (3) integral with a bearing structure (7), a sleeve (5), a handle (4), and fastening means (8) located between said bearing structure (7) and the sleeve (5), wherein said sleeve is constrained to said base structure (2) and to said handle (4) by constraining means (6) such that said sleeve (5) can be rotated around a first axis (X) parallel to an extending axis of said sleeve (5) and with respect to said base structure (2); in which said rotation about the first axis (X) of the sleeve (5) can be performed by rotating such handle (3) about said first axis (X) and with respect to said base structure (2);

in which said bearing structure (7) is constrained to said sleeve (5) so as to be translatable rigidly with respect thereto along said first axis (X), and to be able to position itself near at least a coupling portion (5a) of the sleeve (5);

in which said fastening means (8) are suitable to ensure that said lever (3) follows the rotation of said sleeve (5) around such first axis (X) and with respect to said base structure (2);

wherein said handle (4) is rigidly rotatable by means of the constraining means (6) and with regard to said sleeve (5) and to said base structure (2), around a second axis (Y) perpendicular to said first axis (X); in which said handle (4) can take at least a first closing position and a second operating position corresponding to at least two angular positions of said handle (4), respectively, about said second axis (Y) and with respect to said base structure (2);

characterized in that said lever (3) comprises an engagement portion (3a) suitable to engage an engagement seat of such a containment structure, said bearing structure (7) being configured to arrange said engagement portion (3a) in a staggered manner along said first axis (X) with respect to said coupling portion (5a) of said sleeve (5).

2. Lock (1) according to claim 1, wherein said bearing structure (7) is removable with respect to said sleeve (5) and is preferably re-inserted on the sleeve (5) to guide the engaging portion (3a) according to offsets in two possible opposite half planes with respect to the bearing structure (7).
3. Lock according to claim 1 or 2, wherein said sleeve (5) and said handle (4) are placed respectively on opposite sides of said base structure (2).
4. Lock (1) according to one or more of the preceding claims, wherein said bearing structure (7) is suitable to be placed at least partially around said coupling portion (5a).
5. Lock (1) according to one or more of the preceding claims, wherein said fastening means (8) are suitable to tighten said bearing structure (7) around said coupling portion (5a) and/or to maintain said bearing structure (7) stationary with respect to said sleeve (5) and along said first axis (X) near said coupling portion (5a).
6. Lock (1) according to one or more of the preceding claims, wherein said handle (4) comprises an arm (4b) and a grip (4a).
7. Lock (1) according to one or more of the preceding claims, wherein said constraining means (6) are suitable to allow said handle (4) to freely rotate with respect to said sleeve (5) and around said second axis

(Y), at least between said closing position and said operating position.

8. Lock (1) according to claim 7, wherein said constraining means (6) comprise an elongated connecting element (6a) constrained to rotate along with said sleeve (5) around said first axis (X), and a pin (6b) suitable to be inserted in at least one opening (6c) formed in said elongated element (6a) and in at least one opening (6d) formed in said arm (6b) of said handle (4), such that said pin (6b) is suitable to be inserted in these openings (6c, 6d) with an own extending axis coincident with said second axis (Y).
9. Lock (1) according to one or more of the preceding claims, wherein said base structure (2) and said constraining means (6) are suitable to ensure that a rotation of said handle (4) about the second axis (Y) and with respect to said base structure (2) produces a translational motion of the sleeve (5) itself along said first axis (X) and with respect to said base structure (2), by means of at least interaction means (4c, S) between said handle (4) and said base structure (2).
10. Lock (1) according to one or more of the preceding claims, wherein said interaction means (4c, S) are configured so that said handle (4) exerts a push against said base structure (2) as it rotates about said second axis (X) and with respect to said base structure (2) itself.
11. Lock (1) according to one or more of the preceding claims, wherein said base structure (2) comprises a protrusion (9) to which said sleeve (5) is constrained, in a translatable manner along said first axis (X).
12. Lock (1) according to one or more of the preceding claims, comprising guide means (10) interposed between said protrusion (9) and said sleeve (5), and suitable to guide said sleeve (5) during the translational motion thereof with respect to said projection (9).
13. Lock (1) according to claim 12, wherein said guide means (10) comprise at least a part of said protrusion (9) or said sleeve (5), suitable to slide in at least one cavity formed in said sleeve (5) or in said protrusion (9), respectively.
14. Lock (1) according to one or more of the preceding claims, comprising stopping means configured so that, at least when said handle (4) is in a third intermediate position between said closing position and said operating position, the rotation of said sleeve (5) about the first axis (X) and with respect to said base structure (2) is more limited compared to at least when said handle (4) is in this operating position.

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in said base structure (2) and suitable to accommodate said handle (4) when the same is in the closing position.

15. Lock (1) according to claim 14, wherein said stopping means comprise at least a surface integral with said sleeve (5), and at least one surface (9a) associated to said base structure (2), preferably disposed parallel to each other, and both inclined with respect to the normal of said first axis (X). 5
16. Lock (1) according to one or more of the preceding claims, comprising stabilizing means (12) suitable to stabilize the angular position of said handle (4) around said first axis (X), and in particular with respect to said base structure (2). 10
17. Lock (1) according to claim 16, wherein said stabilizing means (12) comprise at least a spring and ball system (12a, 12b, 12c). 15
18. Lock (1) according to one or more of the preceding claims, comprising first locking means suitable to make sure that said handle (4), when in said closing position, remains locked to said base structure (2) and cannot rotate about said second axis (Y), with respect to said base structure (2). 20
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19. Lock (1) according to claim 18, wherein said first locking means comprise at least one slot (13a) integral with said handle (4) and at least one slot (13b) integral with said base structure (2), said slots (13a, 13b) being respectively integral with said handle (4) and to said base structure (2), being suitable to align with each other when said handle (4) is in said closing position, and said slot (13b), integral with said base structure (2), being at least partially formed in a removable portion (2') of said base structure (2). 30
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20. Lock (1) according to claim 18 or 19, wherein said first locking means comprise a locking surface (14) that can be placed so as to interfere with the rotation of said handle (4) about said second axis (Y) and with respect to said base structure (2). 40
21. Lock according to the preceding claim 20, wherein said locking surface (14) can be activated by means of a key suitable to be inserted into a cylinder (15), which is removable from said base structure (2) and replaceable. 45
22. Lock (1) according to one or more of the preceding claims, comprising second locking means that are suitable to make sure that said handle (4), when in said closing position, cannot rotate about said first axis (X), with respect to said base structure (2). 50
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23. Lock (1) according to claim 22, wherein said second locking means comprise at least a part of the side surfaces of a housing (16) at least partially located

Fig.1

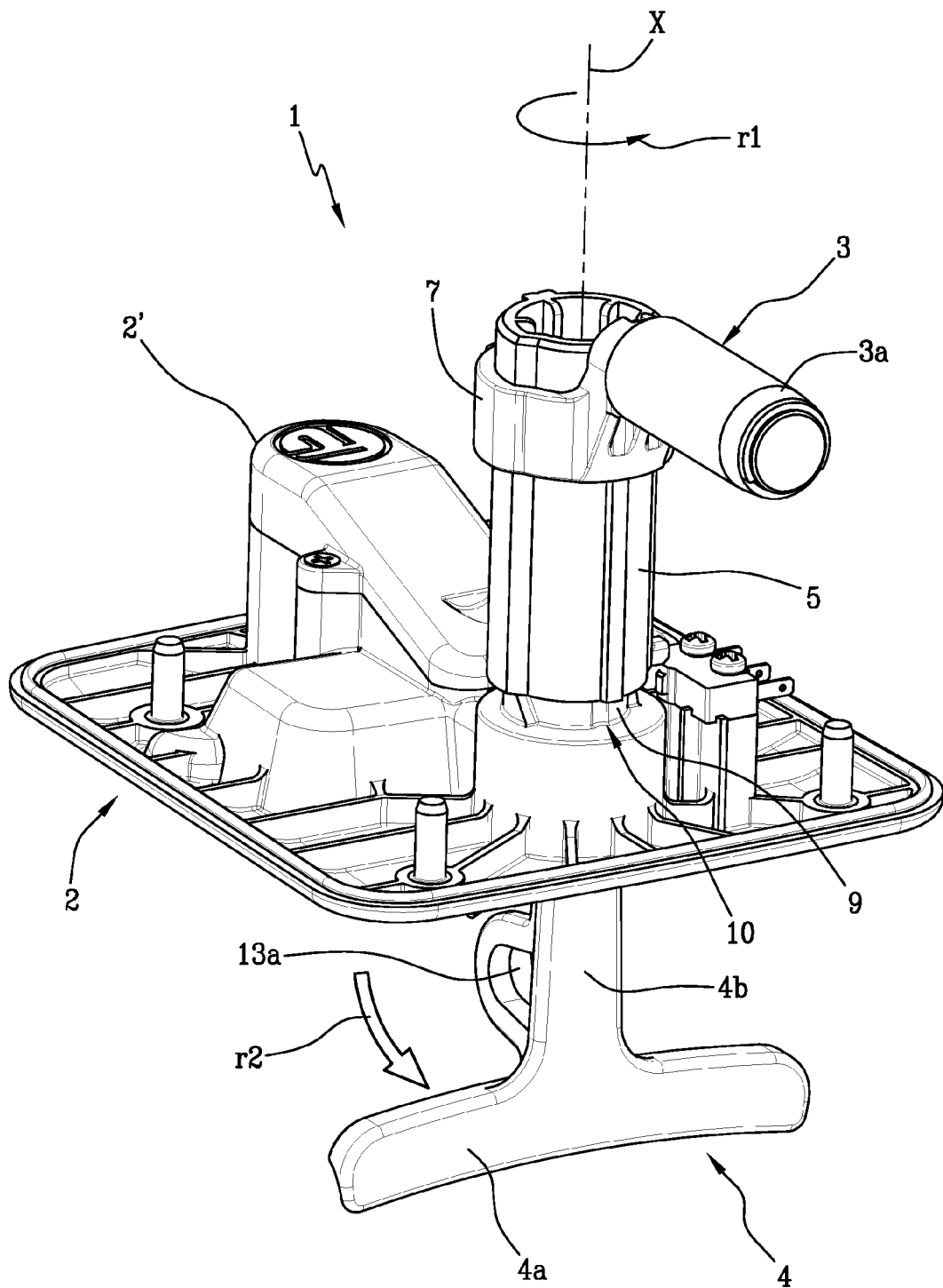


Fig. 2a

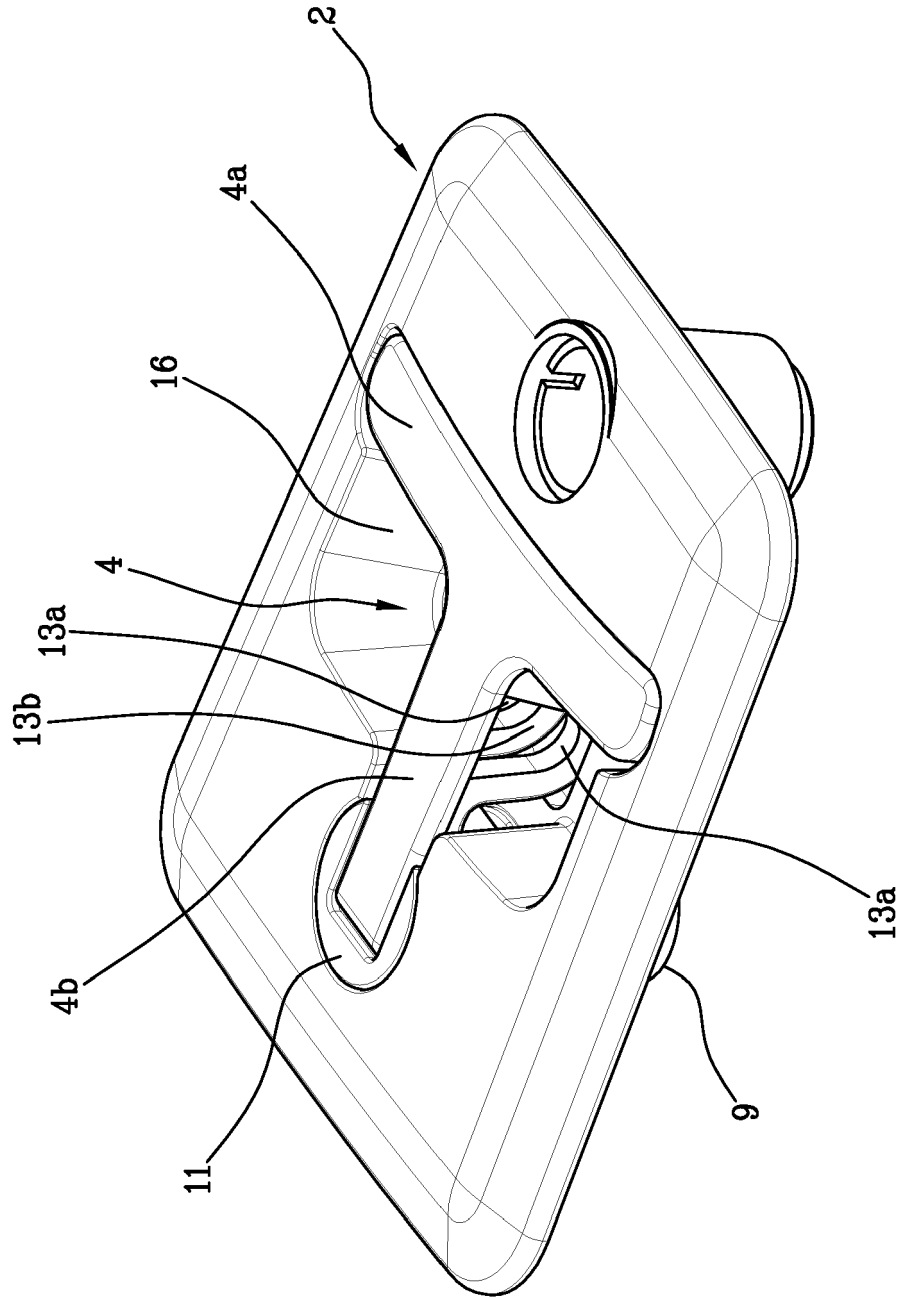


Fig. 2b

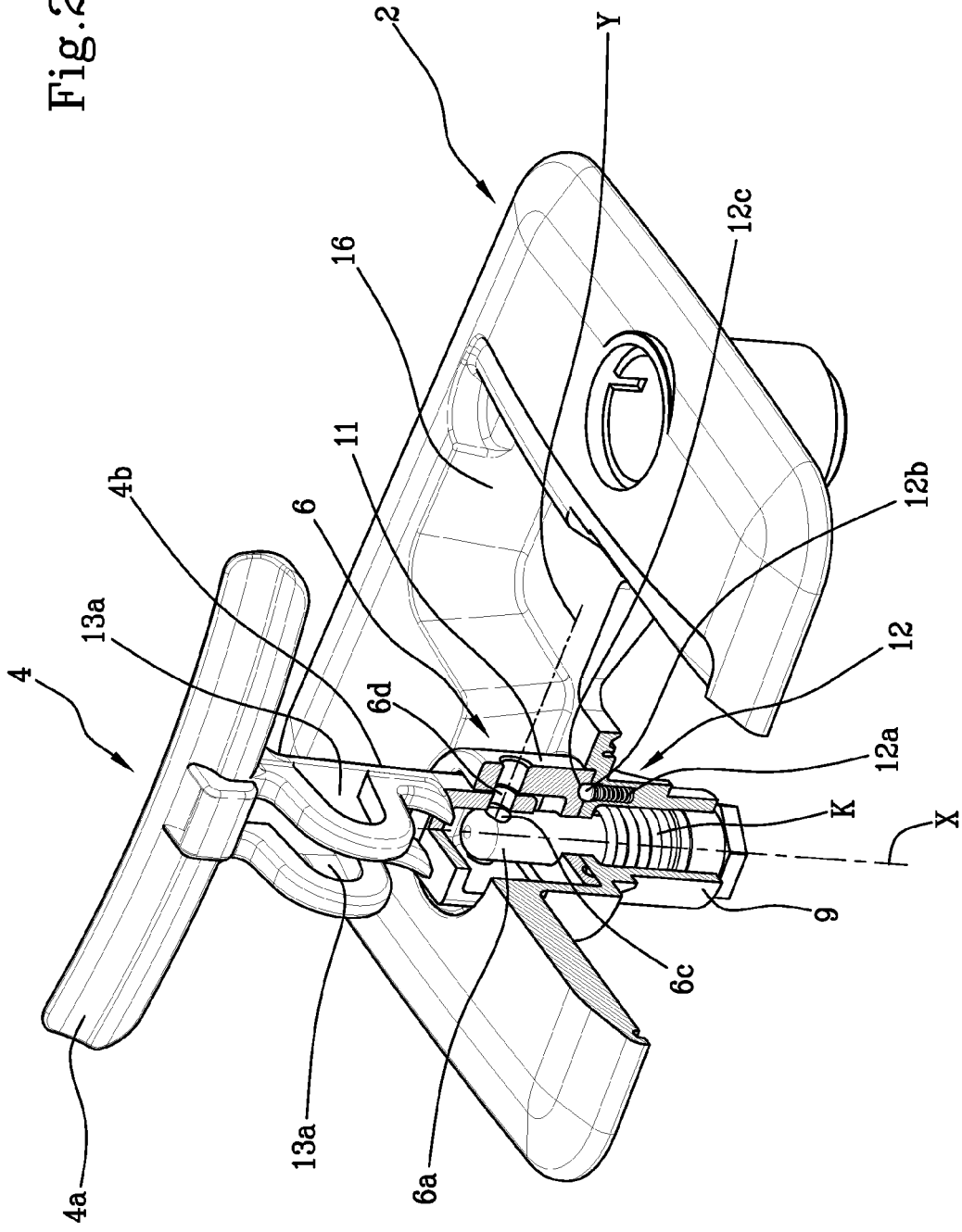
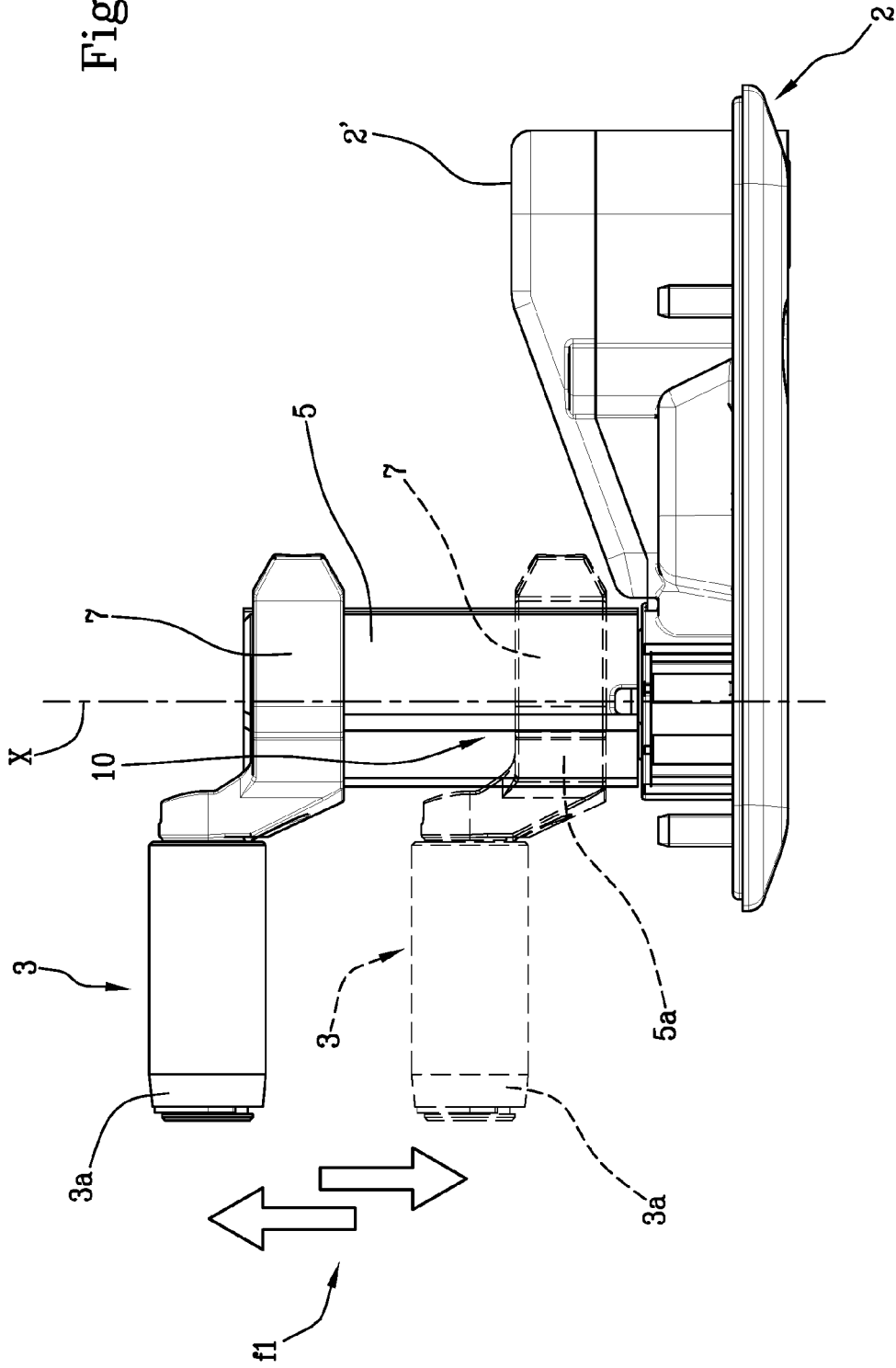


Fig. 3a



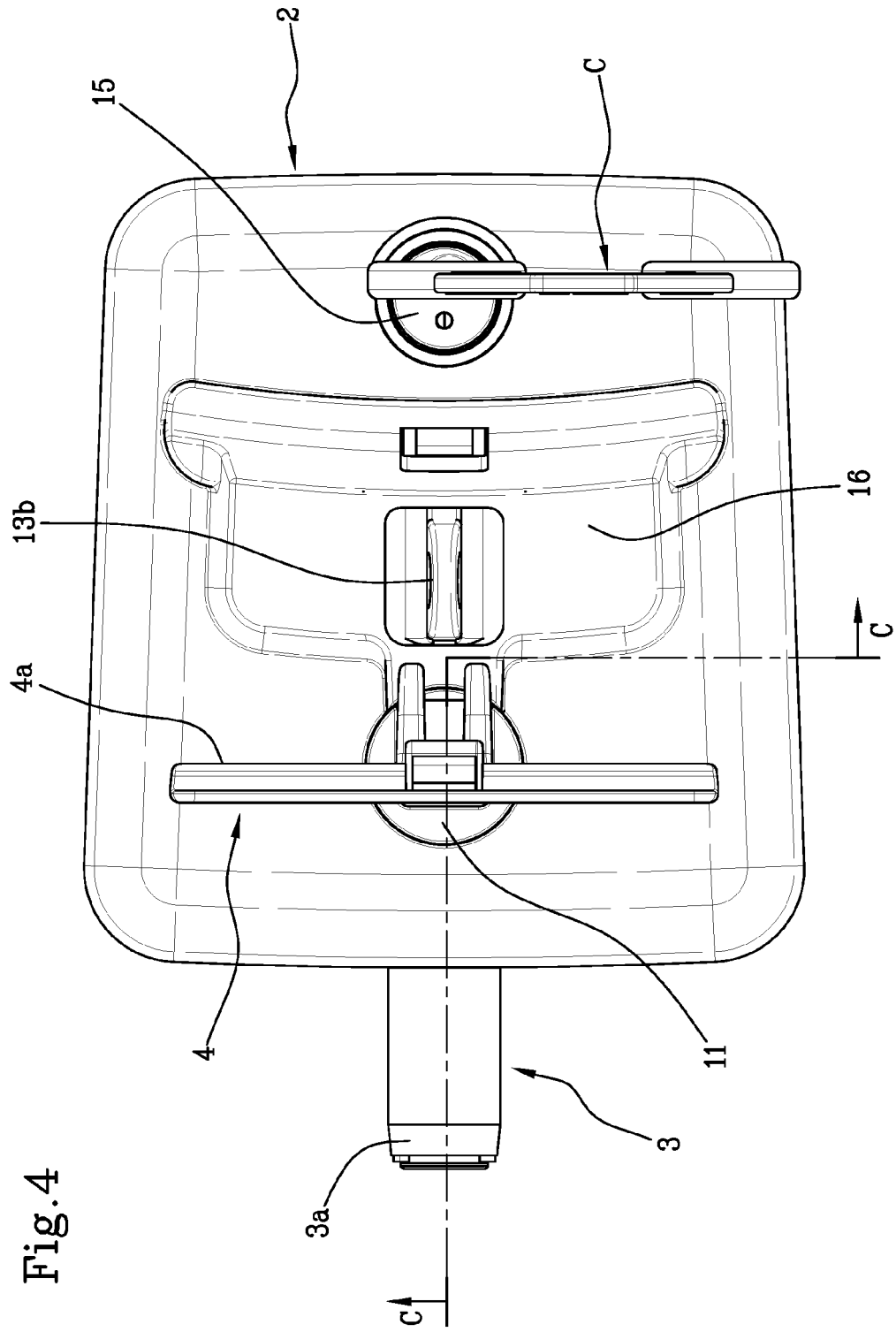
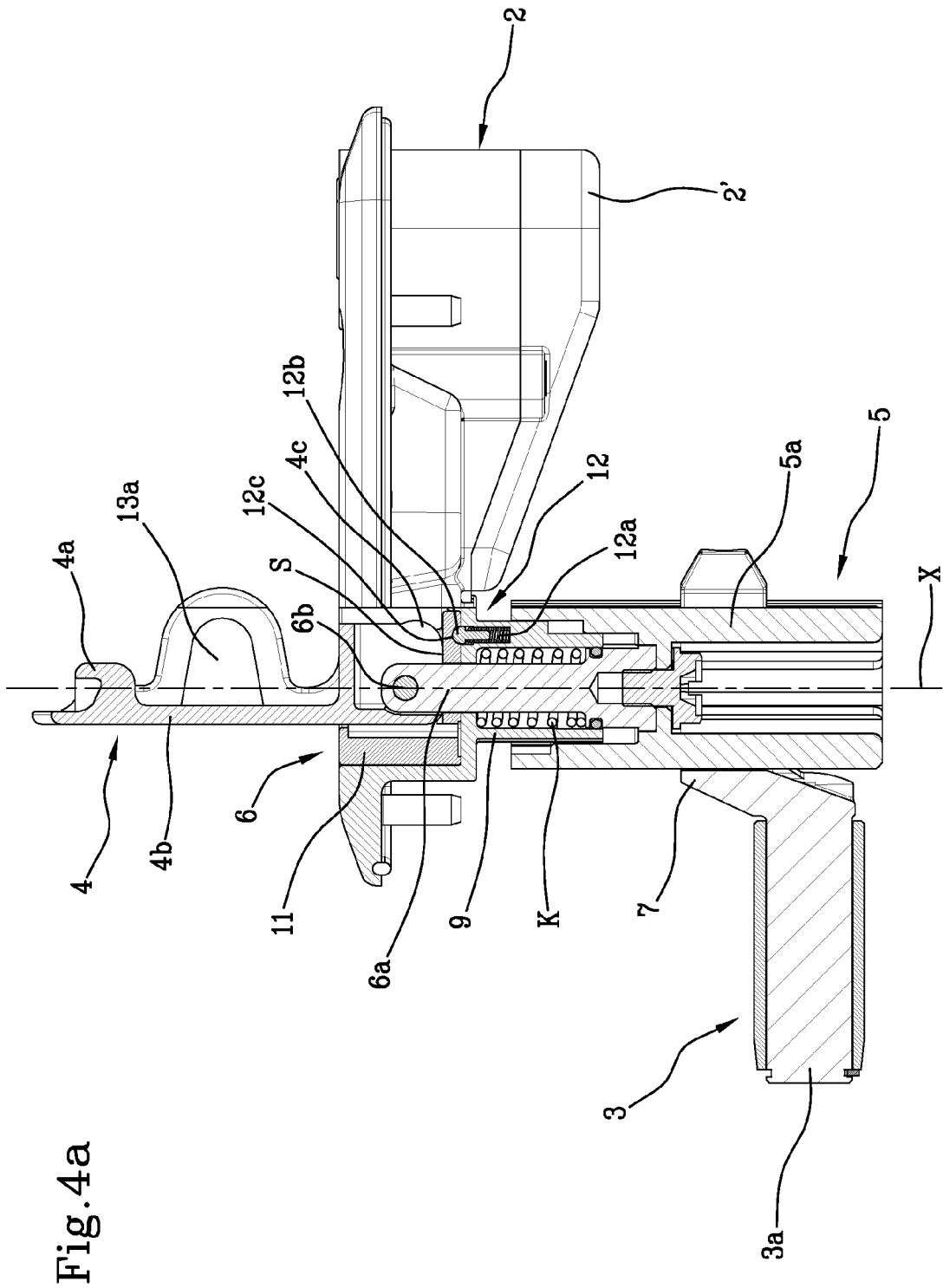


Fig. 4



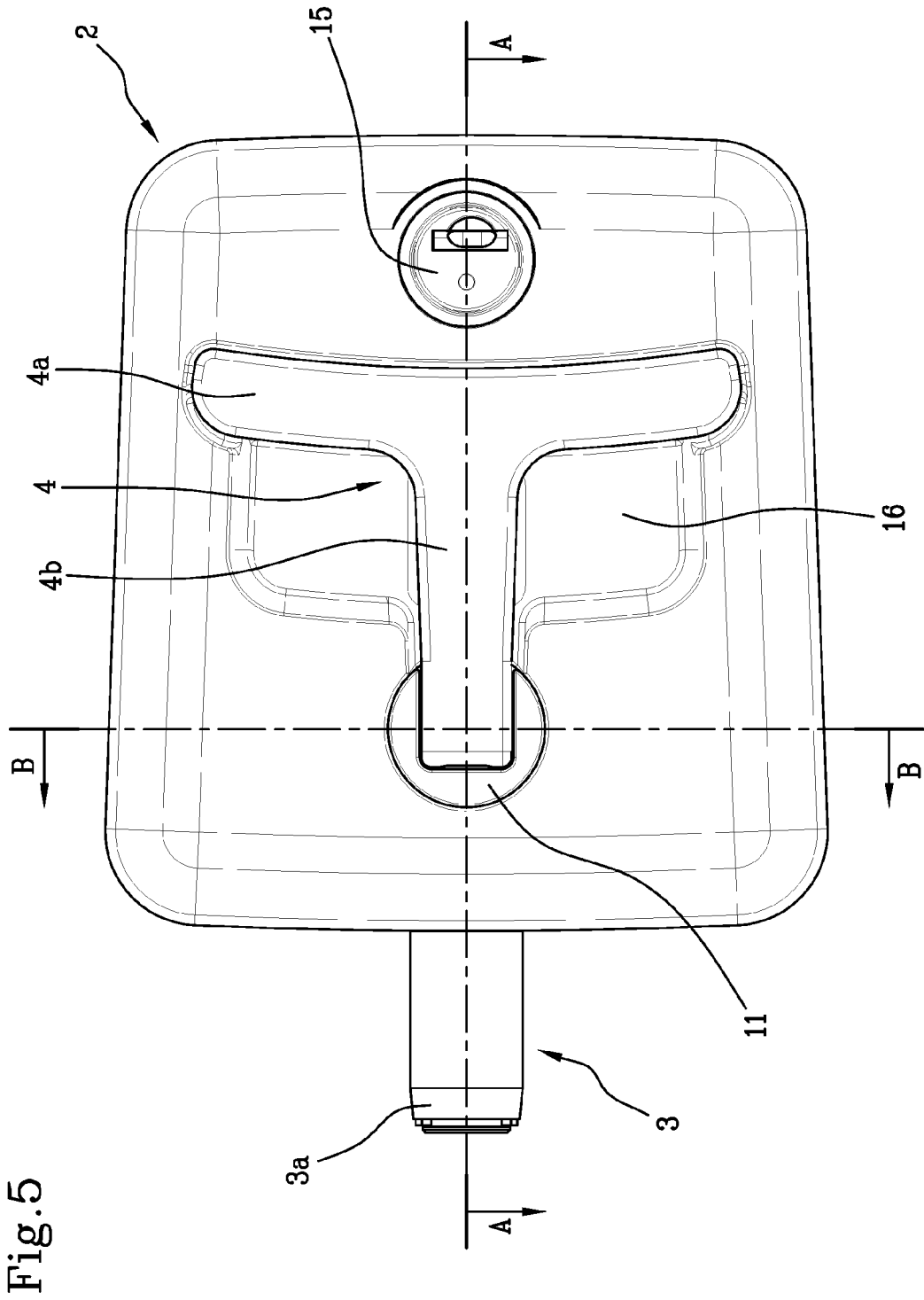


Fig. 5

Fig. 5a

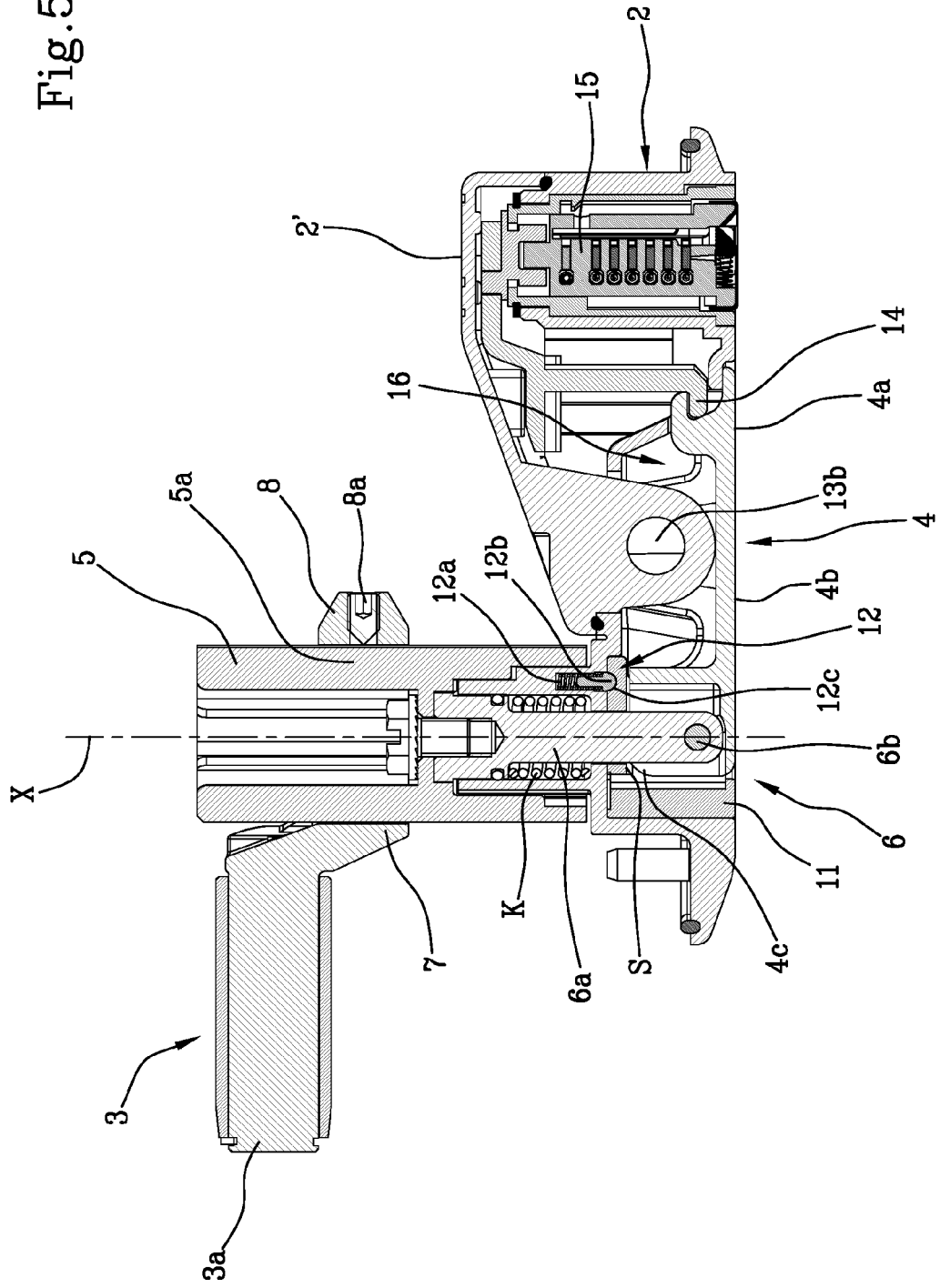
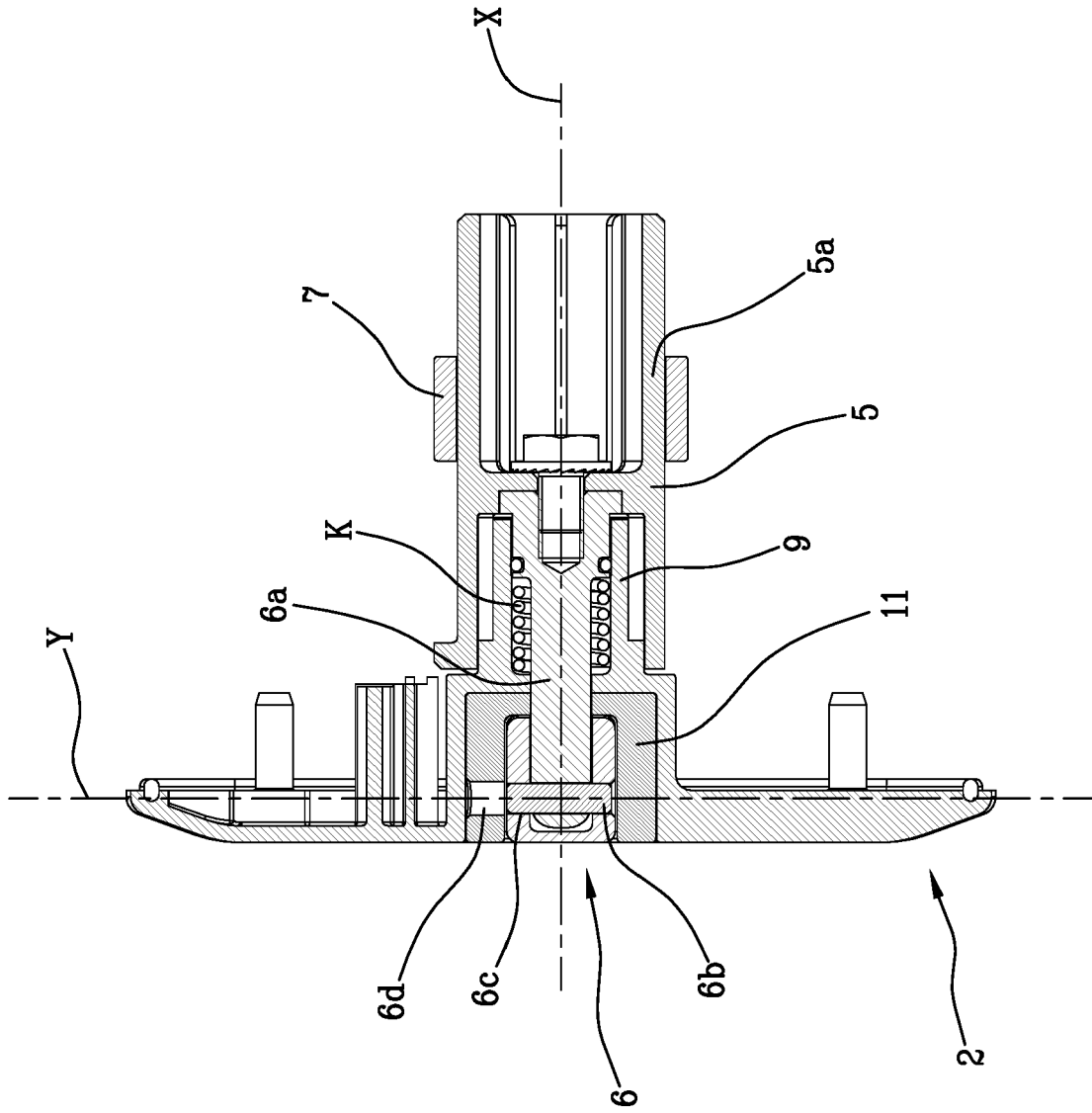


Fig. 5b



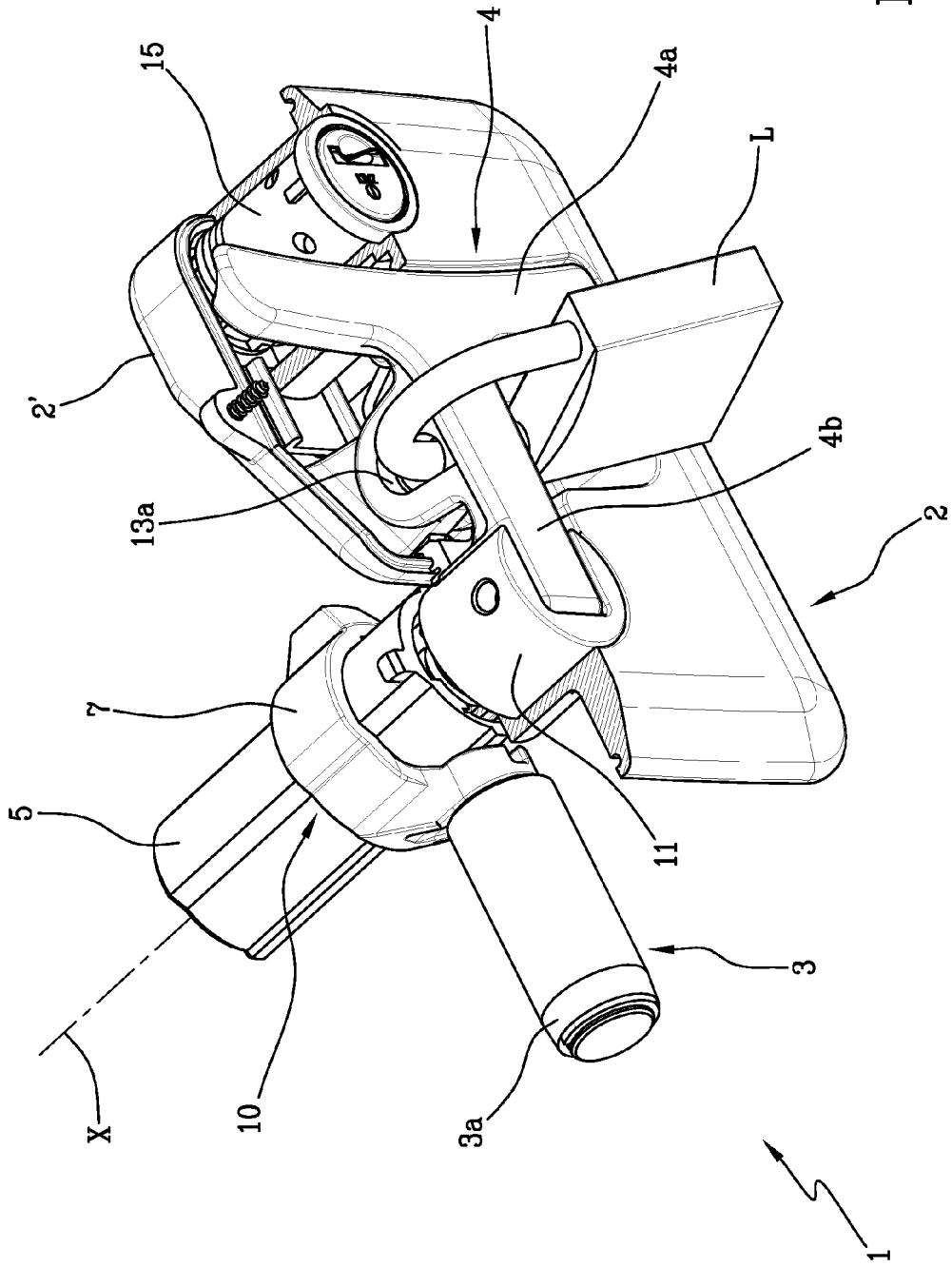
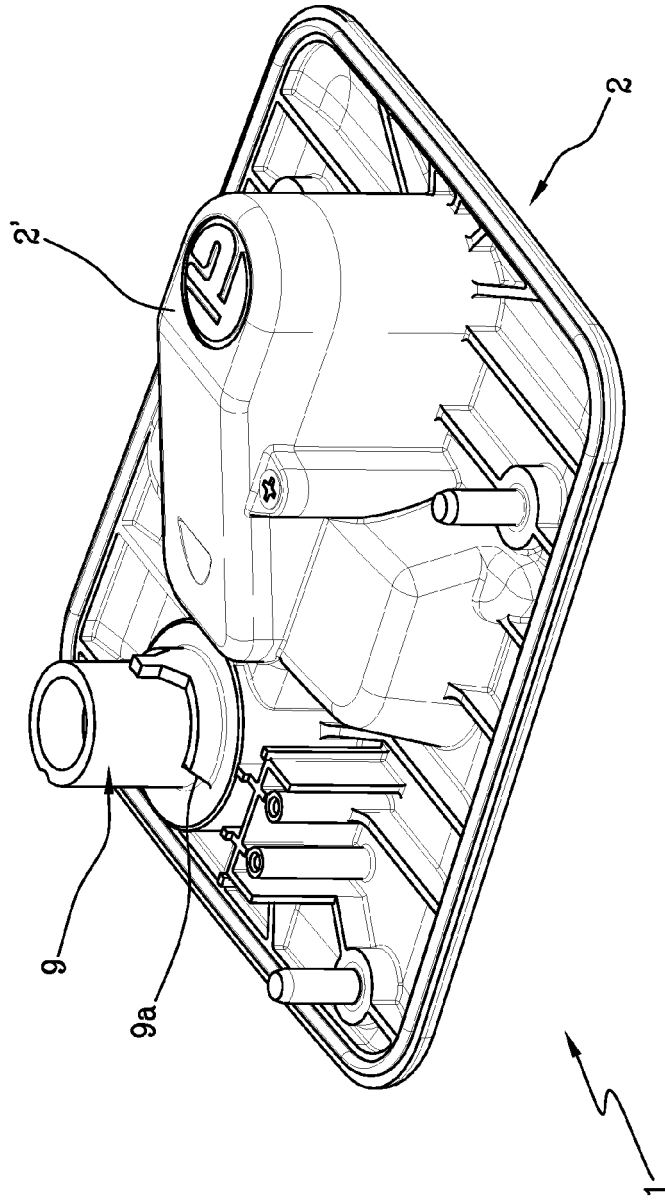


Fig.6

Fig. 7





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Application Number
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Place of search The Hague		Date of completion of the search 19 November 2015	Examiner Pérez Méndez, José F
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