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ABSTRACT

FIXING OF A BATTERY WITH VARYING SIZE IN AN ELECTRIC BOX

5 A system for fixing a battery (3) in a switch remote control interface box enables the battery (3) to be secured along its six axes without requiring any specific tools and in simple manner. The system comprises:

- an adjustable fixing strap (70);
- a bottom mounting plate (30) supporting the battery with at least one notch (74) for adjustment of the strap (70), and inserts (62) for fixing of sliding stop means (50);
- 10 - a side plate (10);
- a support bracket (40) which comprises at least one notch (72) for adjustment of the strap (70), and also acts as depthwise stop (42);
- sliding stop means (50) which can be fixed by two screws in the inserts of the
- 15 support plate (30).

The strap (70) performs securing along two axes and the adjustable stop means (50) perform securing along the third axis. The slide system provides possibilities of adjustment and adaptation to the different dimensions of batteries (3), without imposing the direction (vertical/horizontal) of fitting of the box.

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(FIGURE 5A)

25

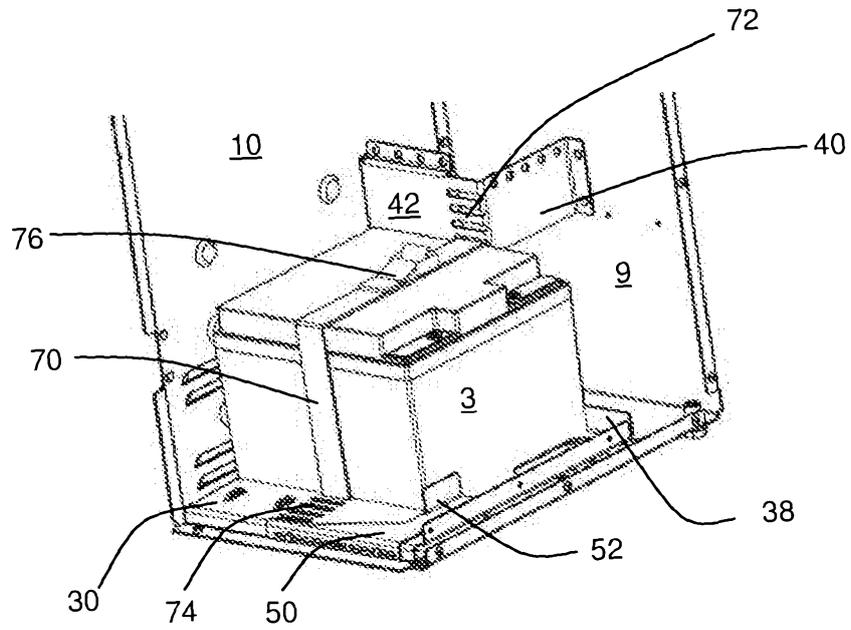


Fig. 5A

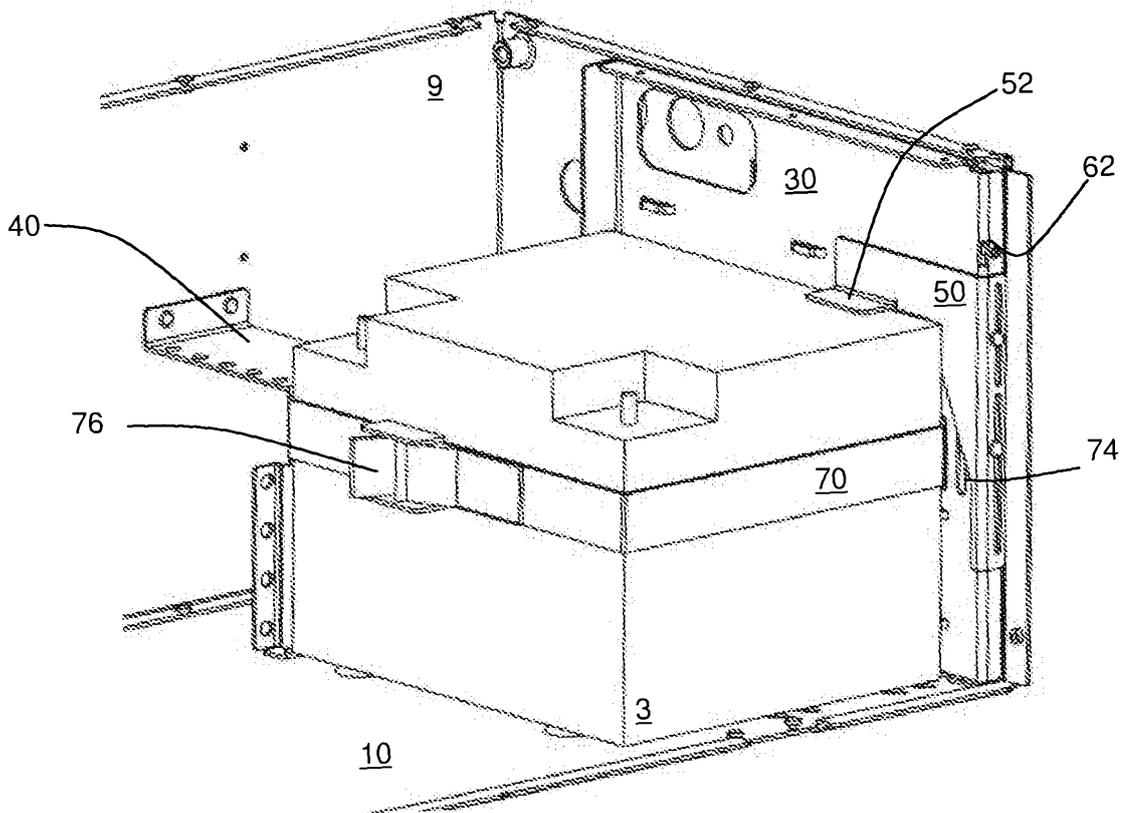


Fig. 5B

FIXING OF A BATTERY WITH VARYING SIZE IN AN ELECTRIC BOX

5 **BACKGROUND OF THE INVENTION**

The invention relates to fixing of a rectangular electric case of varying size, in particular a battery, in position in the enclosure of an electric box, in particular a switch remote control interface.

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STATE OF THE ART

Electric power systems are generally architected on several layers with a first extra-high and high voltage transportation and distribution network from the power production plants over large distances. After transformation, a HVA or MV medium voltage distribution network takes over for transportation on a smaller scale to customers of industrial type or to LV low voltage networks which supply customers with low power demands.

At the level of the distribution network usually between 1 and 35 kV, and more precisely 15 or 20 kV in France, it is usual for the HVA equipment to be able to be remote controlled from remote sub-stations. Electricité de France (EdF) thus uses 400 A switch remote control interfaces, or RCI, to control up to eight switches using the analog or digital radio network, the switched telephone network, a dedicated telephone link, or other types of computer networks.

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A RCI, supplied directly on the MV alternating current network, thus enables telecommunication with the network control station, operation of the electric controls of the switches, detection of HVA faults, automatic opening of a switch on detection of the faulty feeder, automatic switching of the power supply sources, recording of the operations and indication of the date-stamped events. The RCI also has to perform its functions in case of outage of the AC power supply source. For this purpose, it comprises an autonomous power source which takes over from the usual external AC power source. The distributors have stringent prescriptions for these batteries, which have to be able to be

replaced while being powered-on and without any specific tooling. EdF thus imposes a single sealed 12 V, C₂₀ 38 Ah at 20°C battery bank, and 1.75 V per element, the external dimensions of which must not exceed 205 × 185 × 180 mm³.

- 5 The batteries are placed inside the RCI box, in a dedicated compartment of suitable dimensions to enable housing of the battery and also ventilation performing heat dissipation. Gravity alone conventionally keeps the battery in position, possibly in a confined space with suitable dimensions, such as a sub-compartment or a rack.
- 10 Quite recently, some constraints have been added for producing RCI boxes. In particular, vibratory or seismic tests, such as for example defined in the standard IEC 255-21-3, have to be passed. Existing solutions for fixing batteries do not however enable these criteria to be met.
- 15 Furthermore, the space occupation in the sub-stations where the RCI are installed can involve fitting a box called horizontal or vertical, depending on the relative size of its base with respect to its height. Distributors would prefer to use the same box for these two orientations in order to be able to delay the choice and organise their orders and stocks. However, lead storage batteries, which are the most commonplace in the application
- 20 concerned, are preferably used flat due to the presence of an acid electrolyte (liquid or gel) which has to remain confined therein, whereas their housing in the RCI does not have the same orientation depending on the configuration. This twofold constraint increases the variability of the dimension of the battery to be fixed so as to withstand the seismic tests in the RCI box.

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SUMMARY OF THE INVENTION

- Among other advantages, the object of the invention is to comply with the vibratory and seismic resistance criteria for existing RCI boxes; the invention also makes it possible to
- 30 adapt to different battery dimensions or box orientations.

More generally, the invention relates to a system for fixing a battery, or another rectangular casing, within an enclosure, said system being suitable for a range of dimensions of the

electric casing, and advantageously for two orientations of the enclosure at 90° from one another, while at the same time complying with the criteria of the IEC 255-21-3 standard.

In particular, the invention relates to a system for fixing a rectangular electric casing in the enclosure of an electric box, in particular a switch remote control box of RCI type, using two principles, one with a strap for securing two axes, the other by mechanical stops for blocking the other two axes. The system according to the invention comprises a substantially rectangular bottom plate and side plate and a support element for the battery to lean against, provided with a bearing surface, the planes of these three elements secured to one another forming a rectangular trihedron in which the electric casing can be housed. The bearing surface and bottom plate each comprise at least one longitudinal aperture, and preferably several parallel apertures aligned in an orthogonal direction to their longitudinal axis, or a through a moving crossing bar adjustable aperture, in which the strap can pass. When it passes in the apertures, and depending on the presence or not of a casing in the trihedron, the strap forms a triangle or a quadrilateral two sides of which are pressed outside the trihedron against the plate and the bearing surface, the strap being flat on each of the sides of the polyhedron formed in this way. The strap coupled to the support element on the bottom plate and on the bearing surface therefore enables the casing to be blocked in four directions.

The bottom plate further comprises movable stop means which are in particular provided with a stopping surface the plane of which is parallel to the side plate and which can move in a direction orthogonal to this plane. The bottom plate also comprises means for guiding the movable stop device. The movable stop device preferably comprises a first flat side associated with the stopping surface and orthogonal thereto, which can slide flat on the bottom plate, and a second side designed to collaborate with the guiding means, in particular orthogonal to the first side and able to slide along the edge of the bottom plate, formed for example by an edge of said bottom plate, in the manner of a T. The bottom plate also comprises means for fixing the movable stop device in several relative positions, in particular apertures which can house screws collaborating with preferably oblong holes to enable all adjustments of the position of the movable stop device. The screws are preferably fitted in two holes on the edge of the bottom plate, with their axis parallel to the

plane of the bottom plate. The movable stop device fixed in this way onto the bottom plate and the side plate block the remaining two degrees of freedom.

Advantageously, the bottom plate is provided with fitting means, in particular edges, on its sides perpendicular to the stopping surface of the movable stop device. The bottom plate can also be provided with a flat fixed stop device on the last side, the plane of which is identical to that of the bearing surface.

The bottom plate is preferably associated with a bottom plate of the fixing system, said latter plate being secured to a side plate to form the trihedron. The bottom plate comprises openings for ventilation and passage of cables, as well as spacer elements such as lancements, defining a parallel surface towards the inside of the trihedron, to keep the pressing surface of the casing at a distance.

The side plate also comprises ventilation openings and spacer elements such as collars defining a parallel surface towards the inside of the trihedron to keep the pressing surface of the casing at a distance. The support element on which the battery leans is secured to the side plate to form the trihedron. The support element is secured to the side plate to form the trihedron. It is preferably in the form of a bracket and fixed at the other end to a back plate, also secured to the side plate and to the bottom plate if this is the case.

Each of the elements of the fixing system, apart from the strap, are preferably formed by folded metal plate.

The invention also relates to the rectangular enclosure of an electric box comprising a housing for a rectangular electric casing, with a fixing system the trihedron of which delineates three sides of said housing. The housing is preferably in a corner of the enclosure so that three panels of the enclosure form the side, bottom and back plates of said system.

The invention also relates to a remote control box, in particular a distribution switch remote control interface box, wherein a battery is secured in position by the above-mentioned fixing system.

BRIEF DESCRIPTION OF THE DRAWINGS

Other advantages and features will become more clearly apparent from the following description of particular embodiments of the invention, given for illustrative and non-restrictive example purposes only, represented in the appended figures.

Figure 1 schematically represents a RCI box in two different orientations.

Figure 2 shows panels of a box delineating a battery housing for a preferred embodiment of the invention.

Figures 3A and 3B represent a bottom plate and its sliding T on which a battery can rest in a preferred embodiment of the invention.

Figure 4 illustrates a trihedron for housing a battery in a preferred embodiment of the invention.

Figures 5A and 5B show a battery of two different dimensions in two different orientations fixed in a box by a preferred embodiment of the invention.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

By simplification of the description, the different elements will be described in relation with a position of use of the box, fitted in a substation on a vertical panel, with a battery placed on a horizontal base of the box. In addition, the usual configuration will be considered as being the vertical position of the box used in 85% of cases in practice. It is however understood that the positional terms such as “horizontal”, “lateral”, “bottom” are in no way restrictive as far as the object of the invention is concerned. Furthermore the geometric terms such as “orthogonal” etc. should be understood in their mechanical acceptance, i.e. tolerating a deviation with respect to the strict mathematical definition. For example, a “rectangle” can, according to the invention, be convex and have blunted angles differing slightly from 90°.

The preferred embodiment of the invention described hereafter enables the criteria of energy distributors to be complied with to the maximum, with fixing of a battery, whatever its dimensions as regards the constraints imposed on its power, enabling seismic and vibratory tests to be successfully passed, in two possible orientations of the box 90° with respect to one another, with the battery always flat on its base on a horizontal bottom plate of said box. In particular, in the preferred embodiment, the 12 V, C₂₀ 38 Ah at 20°C battery can have the following dimensions, said dimensions being taken in the position of use of the battery which rests on its base delineated by its length and its width:

	Minimum	Typical	Maximum
Length	166 mm	197 mm	205 mm
Width	175 mm	165 mm	185 mm
Height	125 mm	170 mm	180 mm
Weight	9 kg	14 kg	15 kg

However, the dimensions can vary, and some of the elements described can be omitted from an embodiment according to the invention.

As illustrated in figure 1, the box 1 is in the form of a rectangular parallelepiped in which a housing 2 is set aside for the battery 3. The housing 2 is preferably in a corner of the box 1 so that the three panels 5, 7, 9 of the box 1 form three panels of the dedicated housing. Advantageously, the housing 2 is located at the bottom of the box 1 whatever its orientation (horizontal or vertical) in order to ensure a good heat dissipation of the battery 3. In particular, a bottom outer panel 5 and a lateral outer panel 7 of the box 1 correspond to two plates on which the battery 3 can rest, depending on the orientation of the box 1, the third back panel 9 being located opposite access means to the inside of the box 1 of door type (not shown), and preferably designed to be secured to a vertical panel of the substation.

In a first position, the battery 3 is placed flat on the bottom panel 5 which corresponds to a box 1 placed in a vertical position, whereas in a second position, the battery 3 is placed on the side panel 7, the bottom panel 5 thus being vertical in use. The three panels 5, 7, 9 thus form a rectangular trihedron as illustrated in figure 2 in which the battery 3 is housed. In order to comply with vibration resistance criteria, the six degrees of freedom of the battery are blocked by different means.

A first degree of freedom is blocked by pressing of the battery 3 on the side panel 7, which is formed by a substantially rectangular plate 10 provided with ventilation recesses or openings 12 enabling an air flow and ventilation of the battery 3. It is moreover desirable for the battery 3 not to rest directly against said plate 10, and spacers 14 are incorporated, in particular by stamping of the plate 10. The battery 3 presses on said spacers 14 in order to release a space, for example with a thickness of more than 3 mm, between the plate 10 and the major part of the side of the battery 3 which is pressing against the latter.

A second degree of liberty is blocked by gravity pressing of the battery 3 on its base. The bottom panel is also formed by a substantially rectangular plate 20 provided with recesses 22 enabling an air flow and ventilation of the battery, and with apertures 24 for passage of the connection cables of the battery 3. In order to fit additional means of the fixing system of the battery 3, a mounting plate 30 is here inserted between the plate 20 forming the bottom panel 5 and the base of the battery 3. The mounting plate 30 itself, illustrated in figure 3A, is secured to the side plate 10 by fixing means 32 at the level of the internal edge which it forms with said plate, for fixed positioning with respect to said plate 10 (see figure 4). The mounting plate 30 also comprises fitting means 34 opposite these fixing means 32 and parallel to the latter, which enable the housing 2 of the battery 3 to be delineated but which are not solicited by it. These fitting means 34 are located at the level of the internal edge which the mounting plate 30 forms with an opposite panel to the side plate 10 (not shown in figure 4). The bottom plate 20 being itself secured to the side plate 10 (and to the opposite side panel) by suitable means, the mounting plate 30 is indirectly coupled to the bottom plate 20 being separated therefrom by means which are formed by folds of the two elements, namely plate 20 and mounting plate 30. As previously, it is desirable for the battery 3 not to rest directly on said mounting plate 30 and spacers 35 are fitted, in particular by lancing of the mounting plate 30. The battery 3 presses on said spacers 35 in order to release a space, for example with a thickness of more than 3 mm, between the mounting plate 30 and the major part of the battery side that is pressing on the latter. The mounting plate 30 is finally provided with apertures 36 necessary to curve the cables arriving perpendicularly to the plate 20 and then redirected towards the back panel 9.

The mounting plate 30 also comprises stop means 38, preferably an edge, located on its side designed to be fitted towards the back panel 9. This edge 38 can serve the purpose of blocking a third degree of freedom of the battery 3, which presses against the latter towards the bottom of the housing 2. It is possible to complete this edge 38 with a metal plate acting as bearing surface for the battery 3 to press against (not shown). However, advantageously, the mounting plate 30 is formed by a folded metal plate, and the bottom stop means 38 have a small height, for example about one centimetre, but sufficient for the battery 3 to be stopped from moving when it is fitted in place. To prevent any rocking in particular when vibratory tests are performed, and to ensure blocking of the third degree of freedom, it is in fact preferred for the top of the battery 3 to be adjoined to suitable means. The back panel 9 is therefore provided with an element 40 against which the battery presses, a bearing surface 42 of which parallel to the back panel 9 is located towards a top part of the battery 3. The battery 3 thus rests against the stop 38 at the bottom and against the bearing surface 42 at the top, which releases a maximum passage for ventilation flow and for the cables to pass.

The support element 40 is preferably made from a folded metal plate secured to the side plate 10 for example by riveting. The bearing surface 42 might be of small size; it can form a strip parallel to the back panel 9 and passing widthwise through the housing 2 (not shown). Advantageously, the support element 40 is in the form of a bracket which is secured to the side plate 20 and to the back panel 9, the bearing surface 42 being of sufficient size for securing the battery 3, for example over one half of the smaller dimension, width or height, of a battery of maximum size. The length of the part 44 of the bracket 40 parallel to the side plate 10 is larger than or advantageously equal to the distance between the edge 38 of the mounting plate 30 and the back panel 9 when the mounting plate 30 is fitted. The bracket 40 thus forms a space 46 between its two branches 42, 44 and the panels 10, 9 of the box 1, the size of which is sufficient to enable passage of the connection cables to the inside, which thereby enables an optimised arrangement inside the box. The first and/or second branch 42, 44 of the support element 40 can further comprise apertures 48 designed for fixing of the cables by known means.

A fourth degree of freedom of the battery 3 is blocked by lateral stop means 50 a bearing surface 52 of which is orthogonal to the stop 38 / back panel 9. In order to adapt to the

variable depthwise dimensions of the battery 3 while at the same time ensuring securing complying with seismic standards, said lateral stop means 50 are adjustable in depth on the mounting plate 30, and in particular slide between a minimum position closest to the side panel 10 and a maximum position at the level of the lateral edge 34 of the mounting plate 30. The adjustable stop means 50 are in particular in the form of a T one branch 54 of which is placed against the mounting plate 30, next to the battery 3, and provided with the orthogonal bearing surface 52. A second branch of the T 56 slides along the front side of the mounting plate 30, advantageously provided with an edge 60 facilitating said sliding. The second branch 56 of the T 50 is provided with oblong recesses 58 designed to collaborate with holes 62 in the front edge 60 of the mounting plate 30 to secure the T 50 by means of screws 64 in position once the dimension of the “wedged” battery 3 has been chosen, whatever the relative position of said T 50.

It is clear that the shape of the T 50 can vary according to the available volumes, and in particular, in the embodiment illustrated in figure 3B, the first branch 54 of the T 50 is triangular, the second branch 56 being a fold at 90° of one of the edges of the triangle 54. Likewise, it is possible for guiding of the front stop means 50 to be performed by means of a rail drilled in the mounting plate 30 and not against its edge 60 (not shown).

According to the invention, the last two degrees of freedom of the battery 3, in the upwards and frontwards directions, are limited by means of different means, in this case a strap 70. This option does in fact enable precise adjustment and adaptation to several dimensions by tightening of the strap. The strap 70, for example with a width of 25 mm and a thickness of 1.5 mm, presses against the two surfaces of the battery 3 which are not solicited by any one of the other securing means (T 50 and/or plate 10 and/or mounting plate 30 and/or bracket 40). The strap 70 is thus secured to the mounting plate 30 and to the back panel 9 by suitable means.

In particular, as far as the back panel 9 is concerned, it is advantageous for the bearing surface 42 of the battery 3 to be used for the fixing means, on account of the fact that it is located in immediate proximity to the top surface of the battery 3 which is to be secured. In particular, the bearing surface 42 of the bracket 40 is provided with at least one oblong aperture 72 parallel to the mounting plate 30 in which the strap can pass. In a preferred

embodiment, several apertures 72 are drilled at different heights with respect to the mounting plate 30. Thus, the end of the part of strap 70 pressing against the top surface of the battery 3 is in immediate proximity to the edge concerned, which optimises securing. Similar securing means 74 of the strap 72 are fitted on the mounting plate 30, i.e. a plurality of apertures 74 parallel to the guiding surface 60 of the T 50, so as to apply the strap 70 right against the corresponding side of the battery 3. The strap 70 therefore only forms two strips orthogonal to one another, pressed against two sides of the battery 3, without a dead angle due to an offset in anchoring.

Alternatively, the bearing surface 42 comprises a vertical limited recess, the recess being closed by a longitudinal bar able to slide vertically in a rack so as to define an opening of variable size. The strap 70 is inserted in the aperture created in this way and folded directly onto the bar which can be fitted right next to the battery 3. Preferably, the top surface of the bar is of curved shape to prevent any possible wear of the strap 70. In the same way, a second slide can be fitted on the mounting plate 30 at the level of the recess to form the aperture 74 and the securing means of the strap 70. This embodiment reduces the number of operations by changing a battery, the strap being able to remain in place, the slide(s) just having to be moved.

Although described above in relation with a vertical position of the box 1, the same elements enable fixing of the battery 3 in the horizontal position. In fact, when a battery 3 is fitted in place, whatever the horizontal or vertical configuration of the box 1 the mounting plate 30 of which has been previously coupled to the bottom plate 20 of the box 1, the procedure is as follows:

1. unscrewing the (two) fixing screws 64 of the sliding T 50;
2. positioning the T 50 in the maximum position, farthest from the side panel 10;
3. passing the strap 70 in the notches 72, 74 chosen at the level of the fixing bracket 40 and of the mounting plate 30, or displacing the corresponding slide of the aperture 72, 74, passing underneath the mounting plate 30 and in the space 46 of the bracket 40, and keeping its two ends free in the housing 2;
4. positioning the battery 3 (either on the mounting plate 30 as illustrated in figure 5A for a battery 3 of minimum size admitted by the system in the case where

optimisation of fixing is required, or on the side plate 10 as illustrated in figure 5B for a battery 3 of larger size);

- 5 5. securing the strap 70 by pulling to the maximum, so as to press it firmly against the two surfaces of the battery 3 – advantageously, the loop 76 is not metallic to prevent any problem with the connection terminals of the battery 3; alternatively to the configuration of figure 5A, the loop 76 can be fitted along the front surface of the battery 3;
6. moving the T 50 by sliding from the maximum position until it is wedged against the battery 3;
- 10 7. tightening the two fixing screws 64 of the T 50.

Fitting or removal of the battery are therefore performed without any specific tools, in simple manner, while at the same time ensuring optimum securing, in all scheduled cases. The solution according to the invention in fact simultaneously enables the following
15 criteria to be satisfied:

- implementation in the vertical position and in the horizontal position;
- blocking on three axes of an element of variable size, performed in both positions by the same means, enabling seismic and vibratory tests to be passed; and
- securing of the battery in the box without recourse to specific tools, with ease of
20 access and fitting.

In addition to the previous elements, the problem of heat dissipation is also solved by means of free spaces around the battery whatever the chosen configuration.

To sum up, the invention describes a principle for fixing a battery 3, or more generally a
25 rectangular casing, of variable size in a box 1 able to be used in both the vertical position and horizontal position, and secured on the three axes of translation for normative earthquake resistance requirements, with:

- an adjustable fixing strap 70;
- a mounting plate 30 acting as support in the case of a vertical RCI, which
30 comprises at least one, and preferably five notches 74, for adjustment of the strap 70 (alternatively one adjustable notch thanks a slide), a metal stop 38 in the depthwise direction, and inserts 62 for fixing sliding stop means 50, and landings

35 to guarantee that the battery 3 is not pressing directly, which enables a better ventilation;

- a side plate 10 (which becomes a support in the case of a horizontal RCI), comprising ventilation openings 22 and collars 24 to guarantee that the battery 3 is not pressing directly, which enables a better ventilation;
- a support bracket 40, positioned on the back panel 9 (in the case of both a vertical and horizontal RCI), which comprises four notches 72, or a notch with a moving limiting bar, for adjustment of the strap 70, and also acts as depthwise stop 42;
- a sliding T 50 which can be fixed by two screws 64 by means of oblong recesses 58 drilled in the inserts 62 of the support plate 30, which enables lateral adjustment and securing for a vertical RCI (and therefore heightwise adjustment and securing for a horizontal RCI).

Securing along the two axes is performed by the strap 70, and by the adjustable stop means 50 along the third access. The slide system provides possibilities of adjustment and adaptation to the different dimensions of batteries 3, without imposing the direction of fitting (vertical/horizontal) of the box, as do the adjustment notches 72, 74. The design also enables ventilation on all the surfaces of the battery 3 either with an intermediate part 40 creating the offset, or by recesses acting as spacers 14 directly on the part 10, or by lancements 35 directly on the part 30. What is more, the metallic fixing parts are not in contact with the terminals situated on the top surface of the battery 3.

Although the invention has been described with reference to a bi-positional switch remote control interface box directly supporting the battery 3, it is not limited thereto. The fixing system can be used in other applications supporting equivalent stresses. Furthermore, some of the elements described above can be omitted if the associated advantages are not indispensable, such as for example a reduction of the number and/or adjustment possibilities of apertures 72, 74 of strap 70. In addition, although the preferred embodiment shows bottom and side panels 5, 7 formed by plates 10, 20 associated with the fixing device, it is possible to fit said plates 10, 20 on external panels of the box 1 by doubling them, in particular if it is desired to have a box with solid panels.

CLAIMS

- 5 1. A system for fixing a rectangular electric casing (3) in an enclosure of a box (1) comprising a substantially rectangular bottom mounting plate (30), a substantially rectangular side plate and a support element (40) comprising a bearing surface (42), the side plate (10) and mounting plate (30) being secured to one another and forming three planes orthogonal to one another which delineate a rectangular trihedron forming a housing (2) of said casing (3), characterized in that:
- 10 - the system comprises a strap (70);
 - the bearing surface (42) and mounting plate (30) comprise at least one longitudinal aperture (72, 74) for passage of the strap (70), so that, depending on the size of the casing fitted in the housing (2), the strap (70) stretched between the apertures (72, 74) forms a triangle or a quadrilateral passing outside the trihedron against the bottom plate (30) and the bearing surface (42), the strap (70) being fitted flat on
15 each of its sides;
 - the mounting plate (30) comprises removable stop means (50), said means (50) comprising a stopping surface (52) the plane of which is parallel to that of the side plate (10) and can slide in an orthogonal direction to said planes, the mounting plate (30) further comprising guide means (60) of the movable stop means (50) and
20 removable fixing means (64) of said movable stop means (50) in several relative positions with respect to the bottom mounting plate (30).
- 25 2. The system according to claim 1 wherein the support element (40) and/or the mounting plate (30) comprise apertures for passage of the strap (70), said apertures (72, 74) being parallel to one another and aligned in an orthogonal direction to their longitudinal axis.
- 30 3. The system according to claim 1 wherein the support element (40) comprises a longitudinal bar defining at least one opening for passage of the strap (70), said bar being movable in an orthogonal direction.

4. The system according to one of claims 1 to 3 wherein the bottom mounting plate (30) comprises a flat fixed stop (38) the plane of which is identical to that of the bearing surface (42).
- 5 5. The system according to one of claims 1 to 4 wherein the movable stop means (50) comprises a first flat side (54) able to slide flat on the bottom mounting plate (30) and supporting the stopping surface (52), and a second side (56) able to cooperate with the guide means (60) of said bottom mounting plate (30).
- 10 6. The system according to claim 5 wherein the guide means (60) are formed by an edge of the bottom mounting plate (30), and the second side (56) of the movable stop means (50) is formed by a folded edge of the first side (54).
- 15 7. The system according to claim 6 wherein the edge of the bottom plate (60) comprises apertures (62), the second side (56) of the movable stop means (50) comprises two oblong apertures (58), and the fixing means comprise two screws (64).
- 20 8. The system according to one of claims 1 to 7 wherein the bottom mounting plate (30) comprises edges (32, 34) for fitting on its sides parallel to the side plate (10) and spacer means (35) defining a plane parallel to said bottom plate (10) inside the trihedron.
- 25 9. The system according to one of claims 1 to 8 wherein the bottom mounting plate (30), the side plate (10), the movable stop means (50) and/or the support element (40) are folded metal sheet plates.
- 30 10. The system according to one of claims 1 to 9 further comprising a bottom plate (9) secured to the side plate (10), the support element (40) being in the form of a bracket one side (44) of which is fixed to the bottom plate (9) and the bearing surface (42) is fixed to the side plate (10).

11. The system according to one of claims 1 to 10 wherein the side plate (10) comprises ventilation openings (12) and spacer means (14) defining a plane parallel to said plate (10) inside the trihedron.
- 5 12. The system according to one of claims 1 to 11 further comprising a bottom plate (20) provided with recesses (22) secured to the side plate (10) and parallel to the mounting plate (30) outside the trihedron.
- 10 13. A remote control box enclosure with five fixed panels and one panel provided with access means, comprising a housing (2) and a fixing system according to one of claims 1 to 12 the trihedron of which delineates three sides of said housing (2).
- 15 14. The enclosure according to claim 13 wherein the fixing system is according to claim 12 and two fixed panels of the enclosure form the side and bottom plates (10, 20) of said system.
- 15 15. The enclosure according to claim 14 wherein the fixing system is according to claim 10, said bottom plate (9) being formed by a third panel of the enclosure.
- 20 16. A switch remote control interface box (1) comprising an enclosure according to one of claims 13 to 15 wherein a battery (3) is fitted in the housing (2) and secured by the fixing system.
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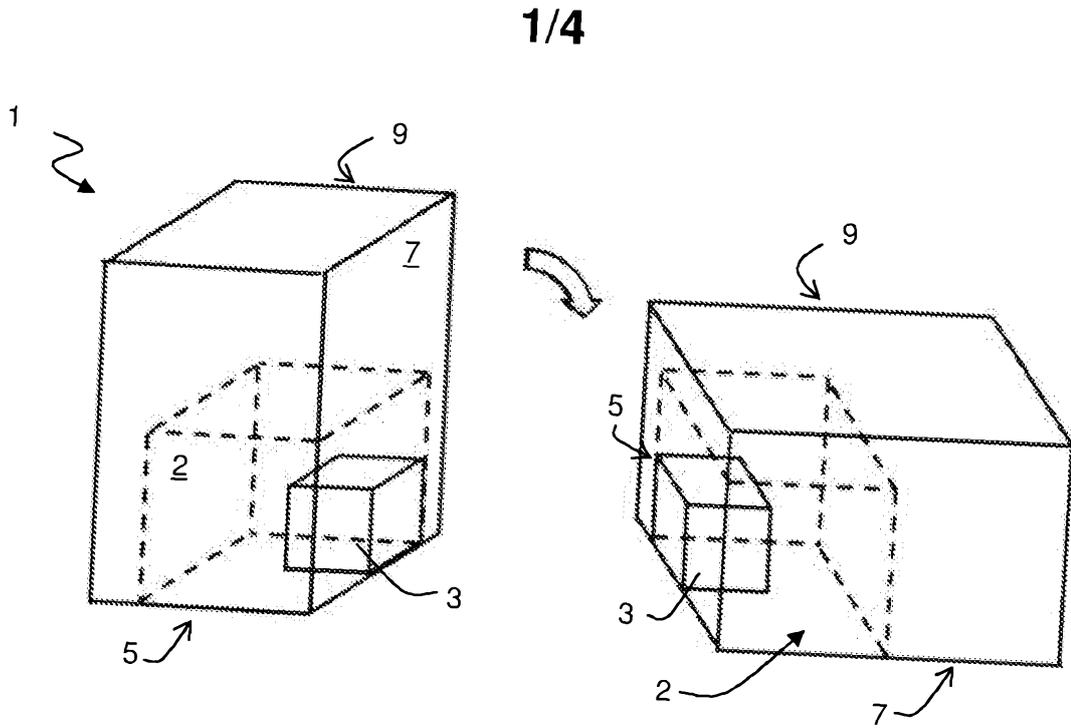


Fig. 1

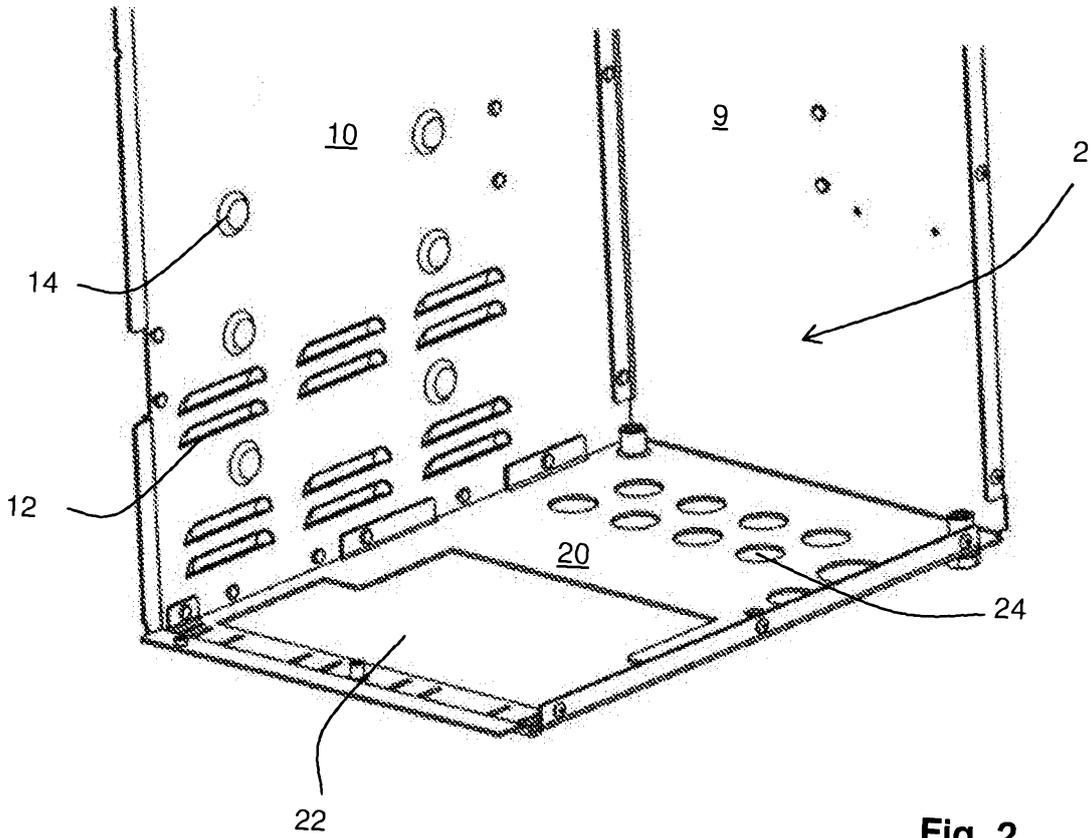


Fig. 2

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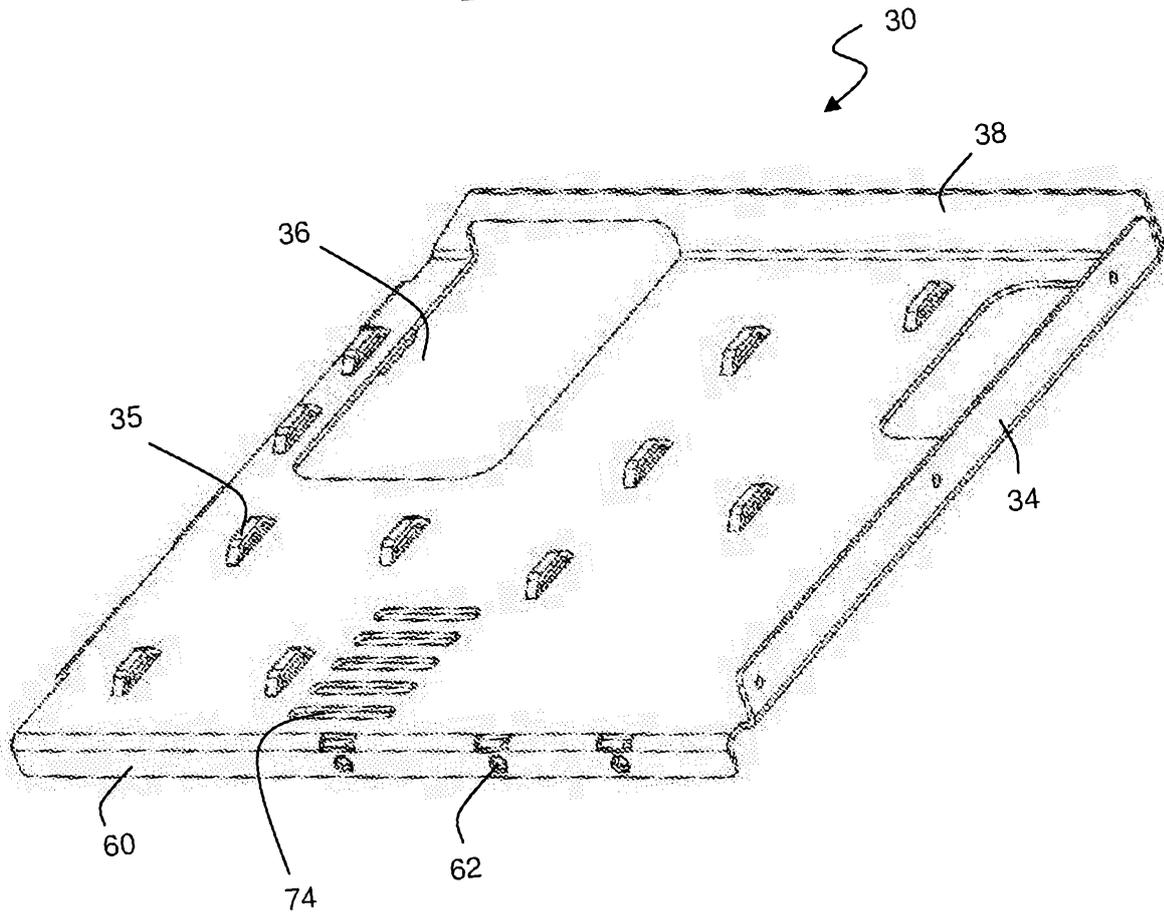


Fig. 3A

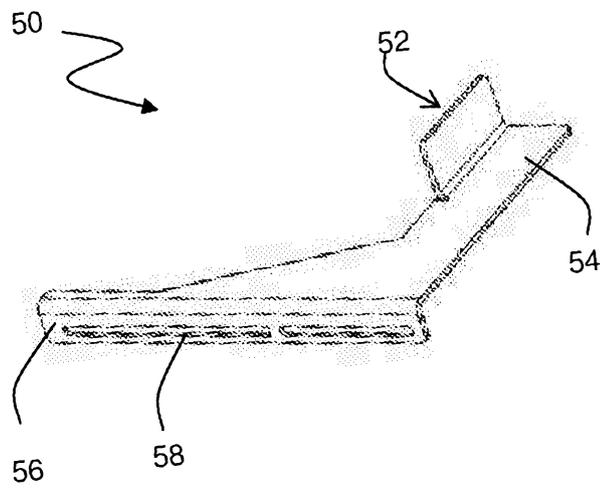


Fig. 3B

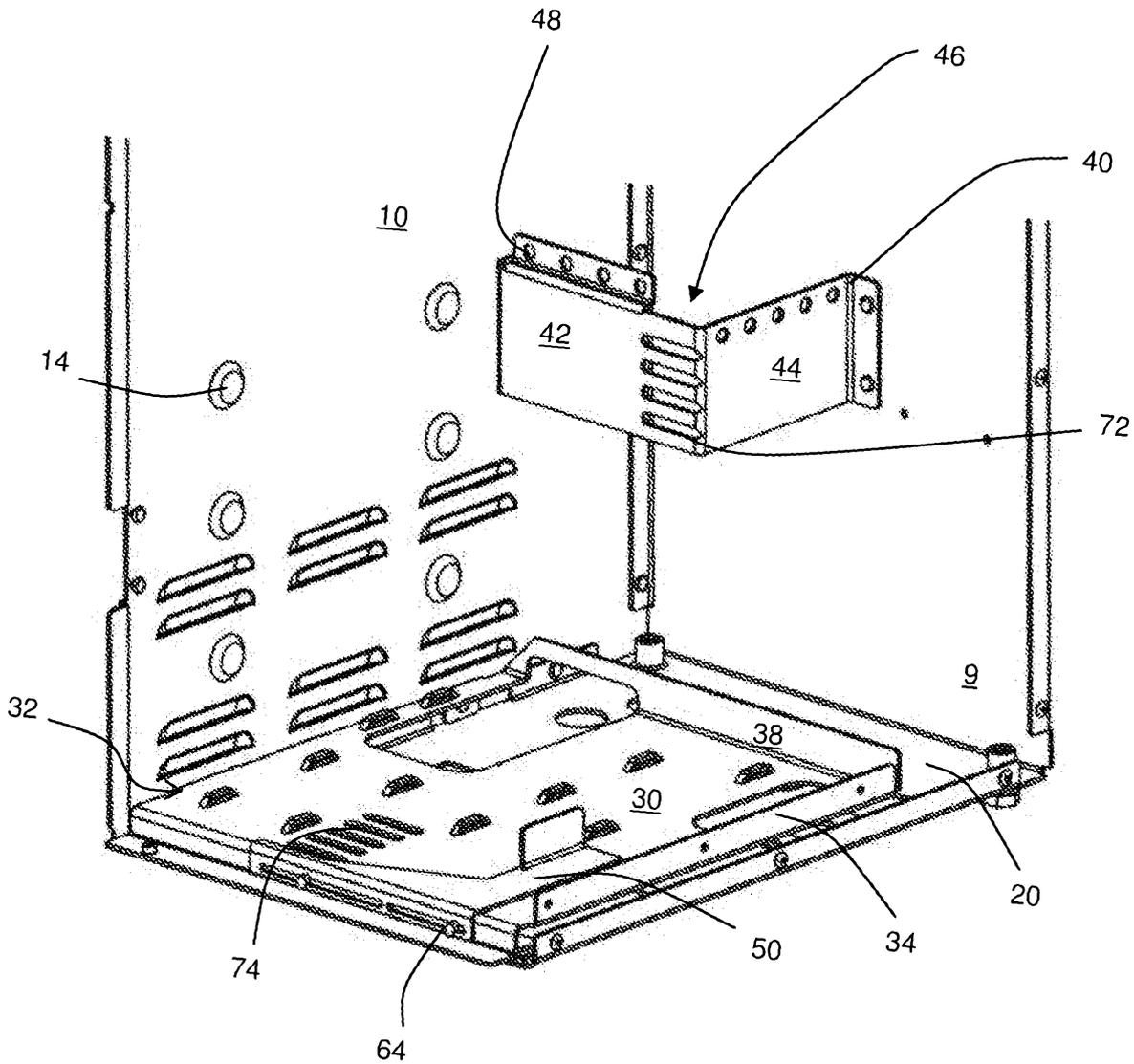


Fig.4

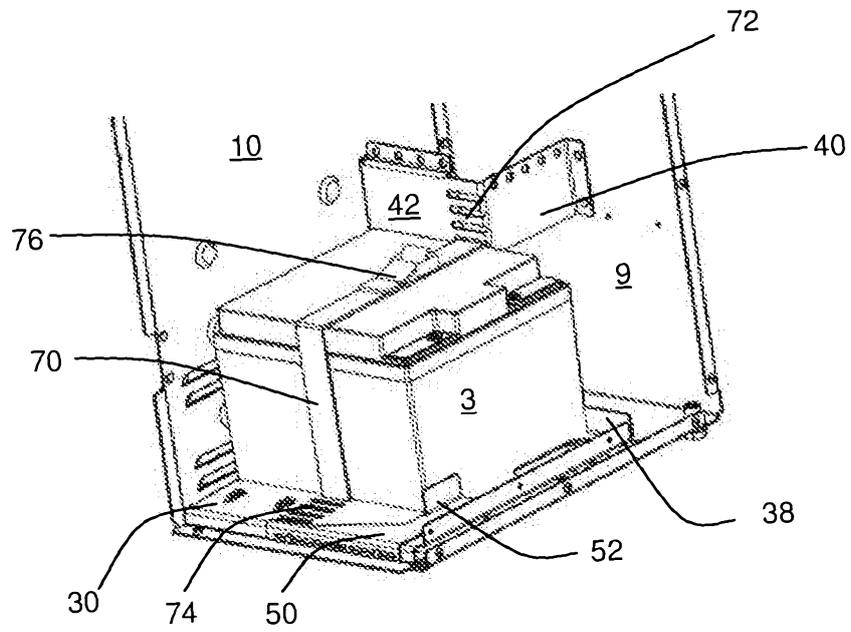


Fig. 5A

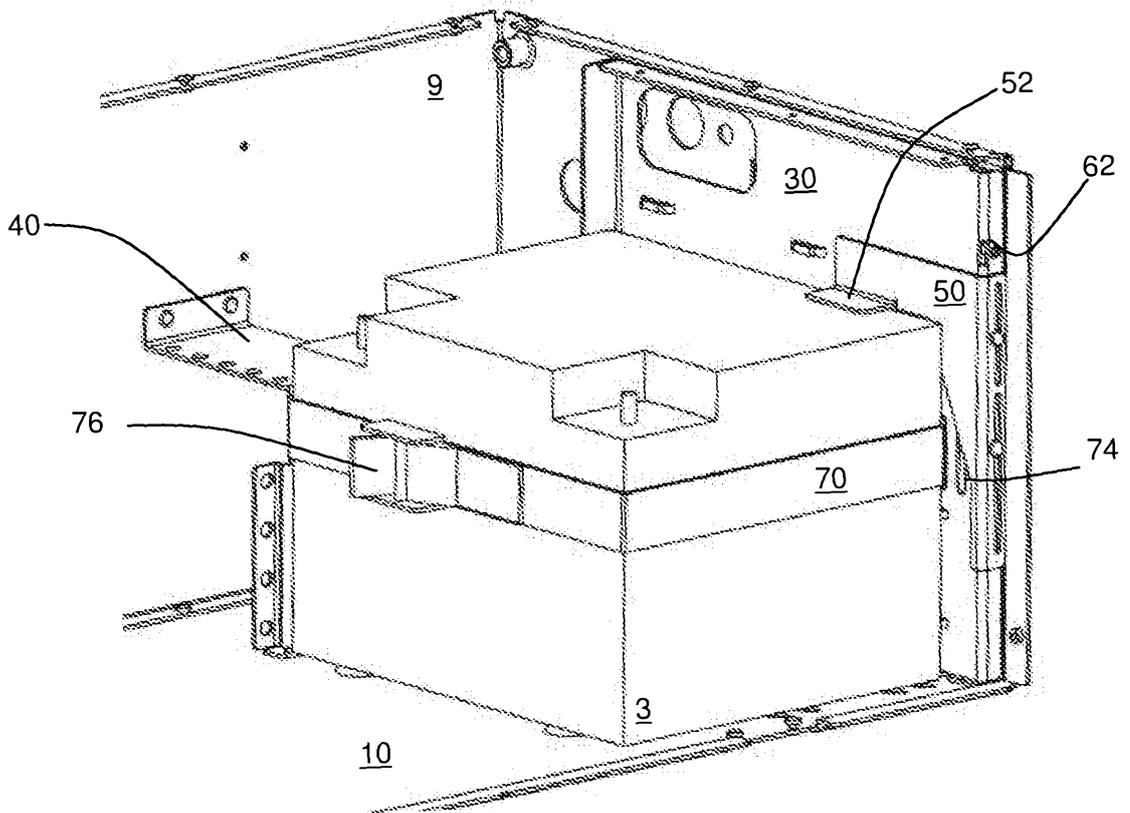


Fig. 5B