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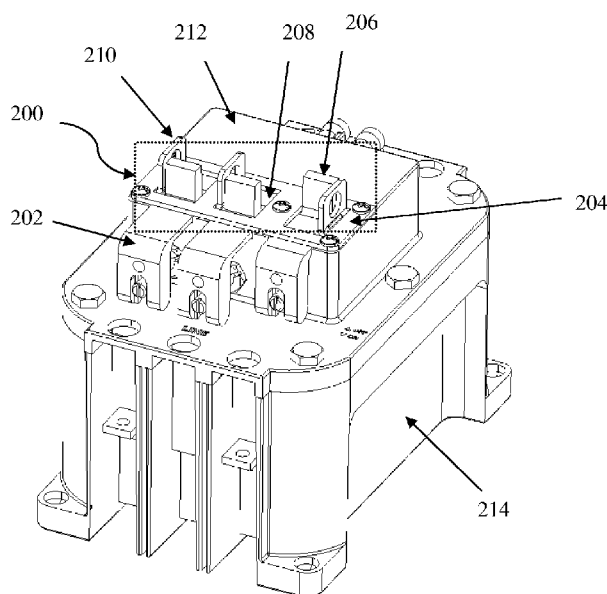


Figure 2a

(57) Abstract: The present disclosure relates to a locking arrangement for a plurality of toggle switches. The locking arrangement facilitates independent locking and independent actuation of the toggle switches. The locking arrangement restricts the movement of a lever associated with a toggle switch of the plurality of toggle switches so as to maintain the lever of the toggle switch in at least one predetermined position. The locking arrangement is adapted to receive a locking device. The locking device restricts the movement of the lever in at least one predetermined position defined by the periphery of a locking plate or a base plate of the locking arrangement.



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A LOCKING ARRANGEMENT FOR A PLURALITY OF TOGGLE SWITCHES

FIELD

The present disclosure relates to the field of mechanical engineering, particularly to the field of locking arrangements for toggle switches.

BACKGROUND

- 5 Electrically powered machines are isolated from a power supply before performing adjustments, maintenance, or repair work of the machine by a human operator. Such isolation is required in order to prevent any accidental connection of the machine with the power supply unit. Similarly, the electrically powered machines are also required to always stay operational under normal working conditions. A down time of as low as a few minutes can
- 10 have severe effects on other dependent processes and machines. Therefore, it is necessary to have a locking mechanism associated with circuit breakers in order to avoid unauthorized start and stop of the electrically powered machines.

- Conventionally, a single common locking arrangement is used to provide lock to the levers of the toggle switches. The toggle switches are configured to control the ON and OFF operation
- 15 of the circuit breakers. Therefore, locking or restricting the movement of the toggle switches, locks the circuit breaker in a predetermined position that is either ON or OFF. The disadvantage of such conventional locking arrangement is that it provides unwanted access to the switches, other than those toggle switches which need to be accessed, thereby increasing the chances of an accidental ON or OFF of the other toggle switches.

- 20 Therefore, there is felt a need for a locking apparatus for toggle switches that can facilitate independent locking and independent actuation of each toggle switch from a plurality of toggle switches.

DEFINITIONS

- Enclosure: The term “enclosure” hereinafter in the complete specification refers to an
- 25 electrical housing body.

Panel: The term “panel” hereinafter in the complete specification refers to an electrical housing cover that is disposed on the top portion of the electrical housing body.

OBJECTS

Some of the objects of the present invention, which at least one embodiment herein satisfies, are as follows.

5 It is an object of the present invention to mitigate one or more problems of the prior art or to at least provide a useful alternative.

An object of the present invention is to provide a locking arrangement for a plurality of toggle switches that provides individual actuation of each of the plurality of toggle switches.

Another object of the present invention is to provide a locking arrangement for a plurality of toggle switches that provides individual locking of each of the plurality of toggle switches.

10 Yet another object of the present invention is to provide a locking arrangement for a plurality of toggle switches that is easy to assemble.

Still another object of the present invention is to provide a locking arrangement for a plurality of toggle switches that is light in weight.

15 Still another object of the present invention is to provide a locking arrangement for a plurality of toggle switches that is cost effective.

Other objects and advantages of the present invention will be more apparent from the following description, which is not intended to limit the scope of the present invention.

SUMMARY

20 The present invention envisages a locking arrangement for a plurality of toggle switches. The locking arrangement is configured to facilitate independent locking and independent actuation of each toggle switch of the plurality of toggle switches.

25 In an embodiment, the locking arrangement includes, a locking plate and a panel. The locking plate is mountable on the panel. The locking plate includes, at least one opening configured on the locking plate for receiving a lever of at least one toggle switch of the plurality of toggle switches to facilitate the movement of the lever within predetermined positions as defined by the periphery of the at least one opening. At least one flange extending from the periphery of the at least one opening. The at least one flange having a hole configured

thereon for receiving a locking device and limiting the movement of the lever of the at least one toggle switch, thereby maintaining the lever of the at least one toggle switch in at least one of the predetermined positions.

In another embodiment, the locking arrangement includes a panel, a base plate, and at least one locking plate. The base plate is mounted on the panel. The base plate includes at least one slot that is configured for receiving a lever of at least one toggle switch of the plurality of toggle switches. The at least one slot facilitates the movement of the lever of the at least one toggle switch within predetermined positions as defined by the periphery of the at least one slot. The base plate further includes a projection. The projection extends from the periphery of the base plate having at least one aperture configured thereon. Further, the at least one locking plate is hingeably mounted on the base plate. The locking plate includes, at least two openings configured on the at least one locking plate for receiving the lever of the at least one toggle switch. The at least two openings limit the movement of the lever of the at least one toggle switch within at least one opening of the at least two openings so as to maintain the lever of the at least one toggle switch in at least one of the predetermined positions. At least one flange extends from the periphery of the at least one opening. The at least one flange of the locking plate has a hole configured thereon. The hole configured on the flange registers with the at least one aperture of the projection of the base plate when the locking plate abuts with the base plate. Further, the hole of the locking plate and the at least one aperture of the base plate is adapted to receive a locking device.

In yet another embodiment, the locking arrangement includes a panel and a locking plate. The locking plate is mounted on the panel. The locking plate includes, at least one opening configured on the locking plate. The at least one opening on the locking plate is adapted to receive a lever of at least one toggle switch of the plurality of toggle switches. The at least one opening facilitates the movement of the lever within predetermined positions as defined by the periphery of the at least one opening. The lever of at least one toggle switch further includes a through-hole formed thereon. At least two flanges extend from opposite sides of the at least one opening. The at least two flanges have a hole configured thereon. The hole registers with the through-hole of the lever when the lever abuts the at least one flange for receiving a locking device and limiting the movement of the lever of the at least one toggle switch so as to maintain the lever in at least one of the predetermined positions.

In still another embodiment, the locking arrangement includes a panel, a base plate and a locking plate. The base plate is mounted on the panel. At least one slot is configured on the base plate for receiving a lever of the at least one toggle switch. The at least one slot facilitates the movement of the lever of the at least one toggle switch within predetermined
5 positions as defined by the periphery of the at least one slot. The lever of the at least one toggle switch includes a through-hole formed thereon. A projection extends from the periphery of the base plate. The projection has at least two apertures configured thereon. Further, the locking plate includes at least one hole configured thereon. The at least one hole registers with the through-hole of the lever when the lever abuts the locking plate for
10 receiving a locking device. The locking plate has a protrusion that snap fits with at least one aperture of the at least two apertures of the base plate.

In still another embodiment, the locking plate is made from a single sheet metal.

In still another embodiment, the locking device includes a lockout hasp and an at least one lock.

15 In still another embodiment, the locking plate is secured to the panel by means of fasteners, screws, or nuts and bolts.

In still another embodiment, the hole of the at least one flange has a shape selected from a group consisting of a circle, a square, a triangle, or a rectangle.

BRIEF DESCRIPTION OF ACCOMPANYING DRAWINGS

20 A locking arrangement for a plurality of toggle switches of the present invention will now be described with the help of the accompanying drawing, in which:

Figure 1a illustrates an isometric view of a conventional locking arrangement;

Figure 1b illustrates a top view of the conventional locking arrangement of Figure 1a;

Figure 1c illustrates a schematic view of a locking rod of the conventional locking
25 arrangement of Figure 1a;

Figure 1d illustrates a schematic view of a locking plate of the conventional locking arrangement of Figure 1a;

Figure 2a illustrates an isometric view of a locking arrangement for toggle switches, in accordance with an embodiment of the present disclosure;

Figure 2b and 2c illustrates a different view of the locking arrangement of Figure 2a;

Figure 2d and 2e illustrates isometric views of a locking plate of the locking arrangements of
5 Figure 2a-2c;

Figure 3a illustrates an isometric view of a locking arrangement for toggle switches, in accordance with another embodiment of the present disclosure;

Figure 3b illustrates an isometric view of a locking plate of the locking arrangement of Figure 3a;

10 Figure 3c illustrates an isometric view of a base plate of the locking arrangement of Figure 3a;

Figure 4a illustrates an isometric view of a locking arrangement for toggle switches, in accordance with still another embodiment of the present disclosure;

Figure 4b illustrates an isometric view of a locking plate of the locking arrangement of Figure
15 4a;

Figure 5a illustrates a schematic view of a locking arrangement for toggle switches, in yet another accordance with an embodiment of the present disclosure;

Figure 5b illustrates a top view of the locking arrangement for toggle switches of the Figure 5a;

20 Figure 5c illustrated an isometric view of a locking plate of the locking arrangement of the Figure 5a and 5b; and

Figure 5d illustrated an isometric view of a base plate of the locking arrangement of the Figure 5a and 5b.

LIST OF REFERENCE NUMERALS

25 100 – conventional locking arrangement

102 – plurality of toggle switches

- 104 – locking rod
- 106 – panel
- 108 – conventional locking plate
- 110 – plurality of flanges
- 5 112 – plurality of openings
- 114 – lever
- 116 – enclosure
- 118 – through-hole
- 120 – hole
- 10 122 – aperture
- 124 – recess
- 200 – locking arrangement
- 202 – at least one toggle switch
- 204 – locking plate
- 15 206 - lever
- 208 – at least one opening
- 210 – at least one flange
- 212 – panel
- 214 – enclosure
- 20 216 – hole
- 300 – locking arrangement
- 302 – panel
- 304 – at least one locking plate

- 306 – base plate
- 308 – hole
- 310 – lever
- 312 – at least one toggle switch
- 5 314 – at least one aperture
- 316 – at least two openings
- 318 – at least one slot
- 320 – at least one flange
- 322 – projection
- 10 400 – locking arrangement
- 402 – locking plate
- 404 – at least two flanges
- 406 – lever
- 408 – at least one toggle switch
- 15 410 – hole
- 412 – at least one opening
- 414 – panel
- 416 – though-hole
- 500 – locking arrangement
- 20 502 – base plate
- 504 – lever
- 506 – panel
- 508 – projection

510 – locking plate

512 – through-hole

514 – at least two apertures

516 – at least one hole

5 518 – at least one toggle switch

520 – at least one slot

522 - protrusion

DETAILED DESCRIPTION

Conventionally, a single common locking arrangement is being used to lock the levers of
 10 toggle switches. The common locking arrangement locks all the levers simultaneously with a
 single locking device. The disadvantage of such conventional locking arrangement is that it
 provides unwanted access to the toggle switches, other than those toggle switches which
 needs to be accessed, thereby, increasing the chances of an accidental ON or OFF of the other
 toggle switches.

15 Figure 1a illustrates an isometric view of a conventional locking arrangement. Figure 1b
 illustrates a top view of the conventional locking arrangement of the Figure 1a. Figure 1c
 illustrates a schematic view of a locking rod of the conventional locking arrangement of the
 Figure 1a. Figure 1d illustrates a schematic view of a locking plate of the conventional
 locking arrangement of Figure 1a.

20 The conventional locking arrangement 100 comprises a lever 114 associated with one of a
 toggle switch of a plurality of toggle switches 102, a locking rod 104, a panel 106, a
 conventional locking plate 108, a plurality of flanges 110, a plurality of openings 112, and an
 enclosure 116. The enclosure 116 is a sealed electrical enclosure for use in hazardous
 locations for enclosing circuit breakers. The sealed enclosure comprises a top housing (not
 25 exclusively labelled in the figures 1a – 1d), a bottom housing (not exclusively labelled in the
 figures 1a – 1d). The panel 106 is disposed on top of the enclosure 116. The conventional
 locking plate 108 is mounted on the panel 106. The plurality of openings 112 is configured
 on the conventional locking plate 108 that is configured for receiving the lever 114 of at least

one toggle switch of the plurality of toggle switches 102. The plurality of openings 112 facilitates the movement of the lever 114 of the plurality of toggle switches 102. The plurality of flanges 110 extends from the opposite edges of the conventional locking plate 108. A hole 120 is configured on at least one flange of the plurality of flanges 110 and an aperture 122 is
5 configured on a flange opposite to the at least one flange that contains the hole 120. The locking rod 104 comprises two ends. A recess 124 is configured on one end of the locking rod 104 and a through-hole 118 is configured on a free end of the locking rod 104. The recess 124 facilitates the engagement of the one end of the locking rod 104 with the aperture 122 of the locking plate 104. The engagement and disengagement of the locking rod 104 divides the
10 plurality of openings 112 into two equal parts, thereby restricting the movement of the lever 114 of the plurality of toggle switches 102 within predetermined positions. The through-hole 118 of the locking rod 104 registers with the hole 120 of the flange when the locking rod 104 abuts with the flange containing the hole 120, thereby receiving a locking device for locking the locking rod 104 with the conventional locking plate 108.

15 The present invention envisages a locking arrangement for a plurality of toggle switches. The locking arrangement is configured to facilitate independent locking and independent actuation of each toggle switch of the plurality of toggle switches.

Figure 2a illustrates an isometric view of a locking arrangement 200 for a plurality of toggle switches, in accordance with an embodiment of the present disclosure. Figures 2b and 2c
20 illustrates different views of the locking arrangement 200 for a plurality of toggle switches. Figure 2d and 2e illustrates isometric views of a locking plate 204 of the locking arrangement 200.

The locking arrangement 200 includes, the locking plate 204 and a panel 212 of the enclosure 214. In an embodiment, the enclosure is a sealed electrical enclosure for enclosing circuit
25 breakers. The enclosure includes a bottom housing (not exclusively labelled in the figures 2a-2e) and a top housing (not exclusively labelled in the figures 2a-2e). The panel 212 is mounted on an operative top surface of the top housing. The locking plate 204 is mounted on the panel 212. In an embodiment, the locking plate 204 is mounted on the panel 212 by means of fasteners, screws, or nuts and bolts. The locking plate 204 includes, at least one
30 opening 208. The at least one opening 208 is configured for receiving a lever 206 of at least one toggle switch 202 of the plurality of toggle switches. The at least one opening 208 facilitates the movement of the lever 206 within predetermined positions as defined by the

periphery of the at least one opening 208. At least one flange 210 extends from the periphery of the at least one opening 208. The at least one flange 210 has a hole 216 configured thereon for receiving a locking device (not shown in the figures). The locking device limits the movement of the lever 206 of the at least one toggle switch 202, thereby maintaining the lever 206 of the at least one toggle switch 202 in one of the predetermined positions. In an embodiment, the locking device includes a lockout hasp and at least one lock. In yet another embodiment, the locking plate 204 is made from a single sheet of metal. In still another embodiment, the hole 216 of the at least one flange 210 has a shape selected from the group consisting of a circle, a square, a triangle, and a rectangle.

- 10 Figure 3a illustrates an isometric view of a locking arrangement 300 for a plurality of toggle switches, in accordance with another embodiment of the present disclosure. Figure 3b illustrates an isometric view of at least one locking plate 304 of the locking arrangement 300. Figure 3c illustrates an isometric view of a base plate 306 of the locking arrangement 300.

The locking arrangement 300 includes a panel 302, the base plate 306, and the at least one locking plate 304. The base plate 306 is mounted on the panel 302. In an embodiment, the base plate 306 is mounted on the panel 302 by means of fasteners, screws, or nuts and bolts. The base plate 306 includes at least one slot 318 configured for receiving a lever 310 of at least one toggle switch 312 of the plurality of toggle switches. The at least one slot 318 facilitates the movement of the lever 310 of the at least one toggle switch 312 within predetermined positions defined by the periphery of the at least one slot 318. The base plate further includes, a projection 322. The projection 322 extends from the periphery of the base plate 306 and has at least one slot 318 configured thereon. A pair of through-holes is configured on the one end of the base plate 306. Still further, the at least one locking plate 304 is hingeably mounted on the base plate 306. In an embodiment, a pair of protrusions is configured on one end of the locking plate. The pair of through-holes are adapted to receive a pair of protrusions, thereby providing a hinging mechanism between the at least one locking plate 304 and the base plate 306. The at least one locking plate 304 also includes, at least two openings 316 configured on the at least one locking plate 304 for receiving the lever 310 of the at least one toggle switch 312. The at least two openings 316 configured on the at least one locking plate 304 limit the movement of the lever 310 of the at least one toggle switch 312 within at least one opening of the at least two openings 316 so as to maintain the lever 310 of the at least one toggle switch 312 in one of the predetermined positions. Further, at

least one flange 320 of the at least one locking plate 304 extends from the periphery of the at least one openings. The at least one flange 320 of the at least one locking plate 304 has a hole 308 configured thereon. The hole 308 configured on the at least one flange 320 registers with the at least one aperture 314 of the projection 322 of the base plate 306 when the at least one locking plate 304 abuts with the base plate 306. The hole 308 of the at least one locking plate 304 and the at least one aperture 314 of the base plate 306 is adapted to receive a locking device (not shown in the figure). In an embodiment, the locking device includes a lockout hasp and at least one lock. In another embodiment, the locking plate is made from a single sheet of metal. In still another embodiment, the hole 308 of the at least one flange 320 has a shape selected from the group consisting of a circle, a square, a triangle, and a rectangle.

Figure 4a illustrates an isometric view of a locking arrangement 400 for a plurality of toggle switches, in accordance with still another embodiment of the present disclosure. Figure 4b illustrates an isometric view of a locking plate of the locking arrangement of Figure 4a.

The locking arrangement 400 includes a panel 414 and a locking plate 402. The locking plate 402 is mounted on the panel 414. In an embodiment, the locking plate 402 is mounted on the panel 414 by means of fasteners, screws, or nuts and bolts. The locking plate 402 includes, at least one opening 412 configured on the locking plate 402. The at least one opening 412 on the locking plate 402 is adapted to receive a lever 406 of at least one toggle switch 408 of the plurality of toggle switches. The at least one opening 412 facilitates the movement of the lever 406 within predetermined positions as defined by the periphery of the at least one opening 412. The lever 406 of the at least one toggle switch 408 further includes a through-hole 416 formed thereon. At least two flanges 404 extend from opposite sides of the at least one opening 412. The at least two flanges 404 have a hole 410 configured thereon. The hole 410 registers with the through-hole 416 of the lever 406, when the lever 406 abuts the one flange of the at least two flanges 404 for receiving a locking device (not shown in the figures), thereby limiting the movement of the lever 406 of the at least one toggle switch 408 so as to maintain the lever 406 in at least one of the predetermined positions. In an embodiment, the locking plate is made from a single sheet of metal. In still another embodiment, the hole 410 of the at least two flanges 404 has a shape selected from the group consisting of a circle, a square, a triangle, and a rectangle.

Figure 5a illustrates a schematic view of a locking arrangement 500 for a plurality of toggle switches 518, in accordance with an embodiment of the present disclosure. Figure 5b

illustrates a top view of the locking arrangement 500 for the plurality of toggle switches 518 of the Figure 5a. Figure 5c illustrates an isometric view of a locking plate 510 of the locking arrangement 500 of the Figure 5a and 5b. Figure 5d illustrates an isometric view of a base plate 502 of the locking arrangement 500 of the Figure 5a and 5b.

- 5 The locking arrangement 500 includes a panel 506, the base plate 502 and the locking plate 510. The base plate 502 is mounted on the panel. In an embodiment, the base plate 502 is mounted on the panel 506 by means of fasteners, screws, or nuts and bolts. At least one slot 520 is configured on the base plate 502 for receiving a lever 504 of the at least one toggle switch 518. The at least one slot 520 facilitates the movement of the lever 504 of the at least one toggle switch 518 within predetermined positions as defined by the periphery of the at least one slot 520. The lever 504 of the at least one toggle switch includes a through-hole 512 formed thereon. A projection 508 extends from the periphery of the base plate 502. The projection 508 has at least two apertures 514 configured thereon. Further, the locking plate 510 includes at least one hole 516 configured thereon. The locking plate 510 has a protrusion 522 that snap fits with at least one aperture of the at least two apertures 514 of the base plate 502, thereby restricting the movement of the lever 504 of the at least one toggle switch 518. The at least one hole 516 registers with the through-hole 512 of the lever 504 when the lever 504 abuts the locking plate 510 for receiving a locking device (not shown in the figures). In another embodiment, the locking device includes a lockout hasp and at least one lock. In still another embodiment, the at least one hole 516 of the locking plate 510 has a shape selected from the group consisting of a circle, a square, a triangle, and a rectangle.

TECHNICAL ADVANCES AND ECONOMICAL SIGNIFICANCE

The present disclosure described herein above has several technical advantages including, but not limited to, the realization of a locking arrangement for a plurality of toggle switches that:

- 25
- provides individual actuation of the toggle switches;
 - individual locking of the toggle switches;
 - is easy to assemble;
 - is light in weight; and
 - is cost effective.

The foregoing description of the specific embodiments will so fully reveal the general nature of the embodiments herein that others can, by applying current knowledge, readily modify and/or adapt for various applications such specific embodiments without departing from the generic concept, and, therefore, such adaptations and modifications should and are intended to be comprehended within the meaning and range of equivalents of the disclosed
5 embodiments. It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation. Therefore, while the embodiments herein have been described in terms of preferred embodiments, those skilled in the art will recognize that the embodiments herein can be practiced with modification within the spirit and scope of
10 the embodiments as described herein.

Throughout this specification the word “comprise”, or variations such as “comprises” or “comprising”, will be understood to imply the inclusion of a stated element, integer or step, or group of elements, integers or steps, but not the exclusion of any other element, integer or step, or group of elements, integers or steps.

15 The use of the expression “at least” or “at least one” suggests the use of one or more elements or ingredients or quantities, as the use may be in the embodiment of the invention to achieve one or more of the desired objects or results.

Any discussion of documents, acts, materials, devices, articles or the like that has been included in this specification is solely for the purpose of providing a context for the
20 invention. It is not to be taken as an admission that any or all of these matters form a part of the prior art base or were common general knowledge in the field relevant to the invention as it existed anywhere before the priority date of this application.

The numerical values mentioned for the various physical parameters, dimensions or quantities are only approximations and it is envisaged that the values higher/lower than the
25 numerical values assigned to the parameters, dimensions or quantities fall within the scope of the invention, unless there is a statement in the specification specific to the contrary.

While considerable emphasis has been placed herein on the components and component parts of the preferred embodiments, it will be appreciated that many embodiments can be made and that many changes can be made in the preferred embodiments without departing from the
30 principles of the invention. These and other changes in the preferred embodiment as well as other embodiments of the invention will be apparent to those skilled in the art from the

invention herein, whereby it is to be distinctly understood that the foregoing descriptive matter is to be interpreted merely as illustrative of the invention and not as a limitation.

CLAIMS:

1. A locking arrangement for a plurality of toggle switches, said locking arrangement being configured to facilitate independent locking and independent actuation of each toggle switch of said plurality of toggle switches.
- 5 2. The locking arrangement as claimed in claim 1, which includes:
 - a locking plate, comprising:
 - 10 i. at least one opening configured on said locking plate for receiving a lever of at least one toggle switch of said plurality of toggle switches to facilitate the movement of said lever within predetermined positions as defined by the periphery of said at least one opening, and
 - 15 ii. at least one flange extending from the periphery of said at least one opening, said at least one flange having a hole configured thereon for receiving a locking device and limiting the movement of said lever of said at least one toggle switch so as to maintain said lever of said at least one toggle switch in at least one of said predetermined positions, and
 - a panel, wherein said locking plate is mountable on said panel.
3. The locking arrangement as claimed in claim 1, which includes:
 - a panel;
 - 20 • a base plate, said base plate being mountable on said panel, said base plate comprising:
 - 25 i. at least one slot configured on said base plate for receiving a lever of at least one toggle switch of said plurality of toggle switches to facilitate the movement of said lever of said at least one toggle switch within predetermined positions as defined by the periphery of said at least one slot, and

- ii. a projection extending from the periphery of said base plate, said projection having at least one aperture configured thereon, and
- at least one locking plate being hingeably mounted on said base plate, said locking plate comprising:
 - 5 i. at least two openings configured on said at least one locking plate for receiving said lever of said at least one toggle switch, and limiting the movement of said lever within at least one opening of said at least two openings so as to maintain said lever of said at least one toggle switch in at least one of said predetermined positions,
 - 10 ii. at least one flange extending from the periphery of said at least one opening, said at least one flange having a hole configured thereon, said hole being registerable with said at least one aperture of said projection when said locking plate abuts said base plate; and
 - 15 iii. a locking device being received via said hole and said at least one aperture.
- 4. The locking arrangement as claimed in claim 1, which includes:
 - a panel; and
 - a locking plate mountable on said panel, said locking plate comprising:
 - 20 i. at least one opening configured on said locking plate for receiving a lever of at least one toggle switch of said plurality of toggle switches to facilitate the movement of said lever within predetermined positions as defined by the periphery of said at least one opening, wherein said lever includes a through-hole formed thereon, and
 - 25 ii. at least two flanges extending from opposite sides of said at least one opening, said at least two flanges having a hole configured thereon, wherein said hole registers with said through-hole of said lever when said lever abuts said at least one flange for receiving a locking device and limiting the movement of said lever of said at least one toggle

switch so as to maintain said lever in at least one of said predetermined positions.

- 5 5. The locking apparatus as claimed in any one of the preceding claims, wherein said hole of said at least one flange has a shape selected from a group consisting of a circle, a square, a triangle, a rectangle.
6. The locking arrangement as claimed in claim 1, which includes:
- a panel;
 - a base plate being mountable on said panel, said base plate comprising:
 - 10 i. at least one slot configured on said base plate for receiving a lever of said at least one toggle switch, and facilitate the movement of said lever of said at least one toggle switch within predetermined positions as defined by the periphery of said at least one slot, wherein said lever includes a through-hole formed thereon; and
 - 15 ii. a projection extending from the periphery of said base plate, said projection having at least two apertures configured thereon;
 - a locking plate including at least one hole configured thereon which registers with said through-hole when said lever abuts said locking plate for receiving a locking device, said locking plate having a protrusion that snap fits with at least one aperture of said at least two apertures of said base plate.
- 20 7. The locking apparatus as claimed in any one of the preceding claims, wherein said locking plate is made from a single sheet of metal.
8. The locking apparatus as claimed in any one of the preceding claims, wherein said locking device includes a lockout hasp and at least one lock.
- 25 9. The locking apparatus as claimed in any one of the preceding claims, wherein said locking plate is secured with said panel by means of fasteners, screws, or nuts and bolts.

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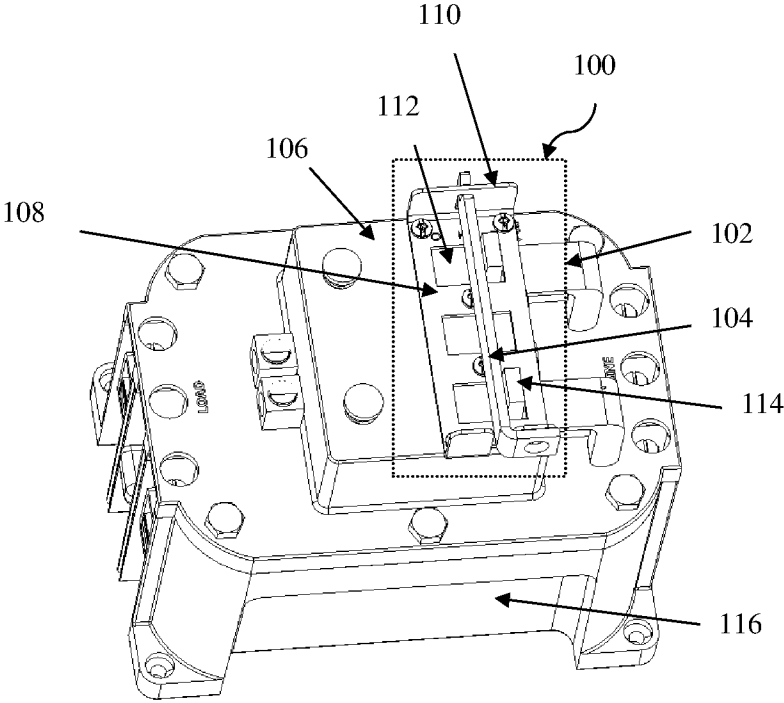


Figure 1a

PRIOR ART

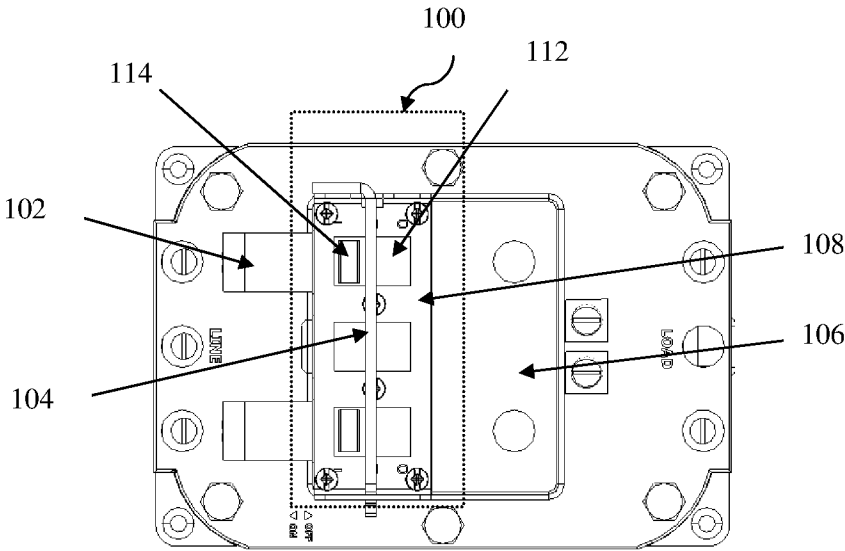


Figure 1b
PRIOR ART

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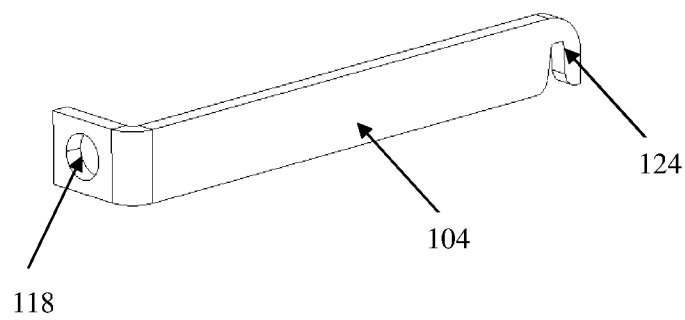


Figure 1c

PRIOR ART

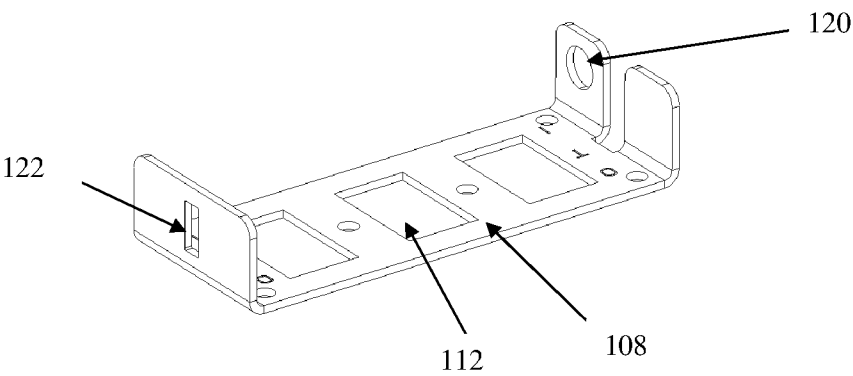


Figure 1d

PRIOR ART

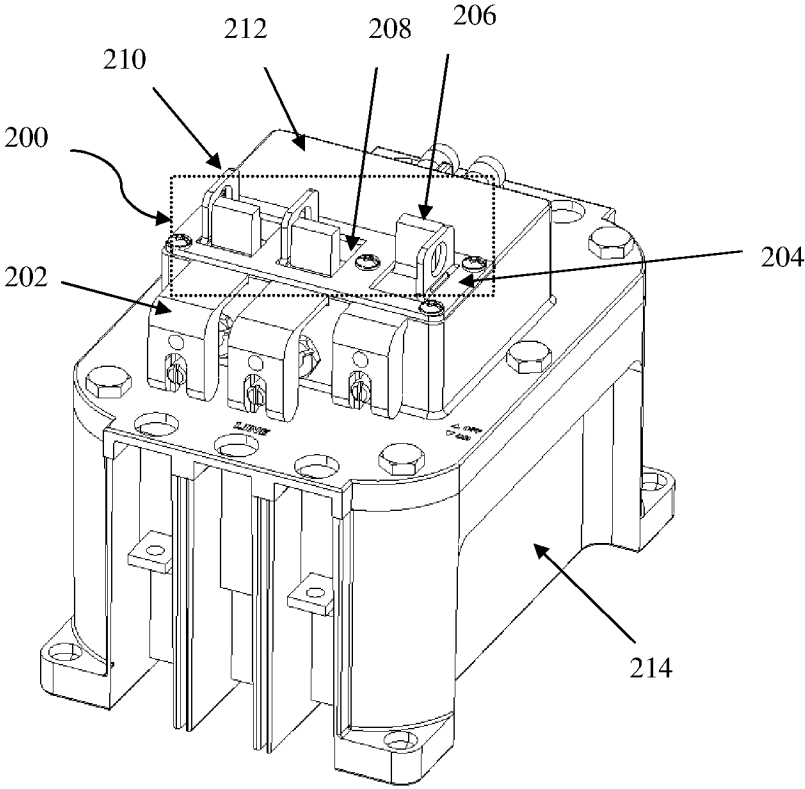


Figure 2a

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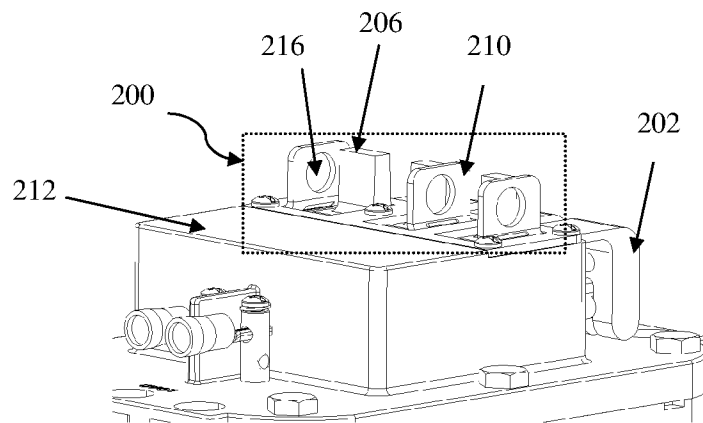


Figure 2b

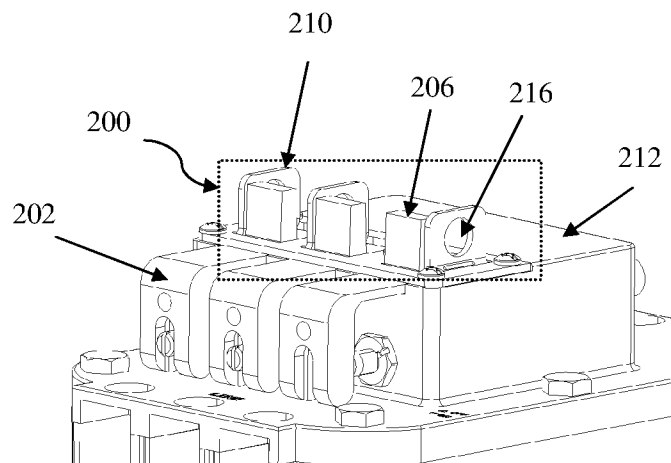


Figure 2c

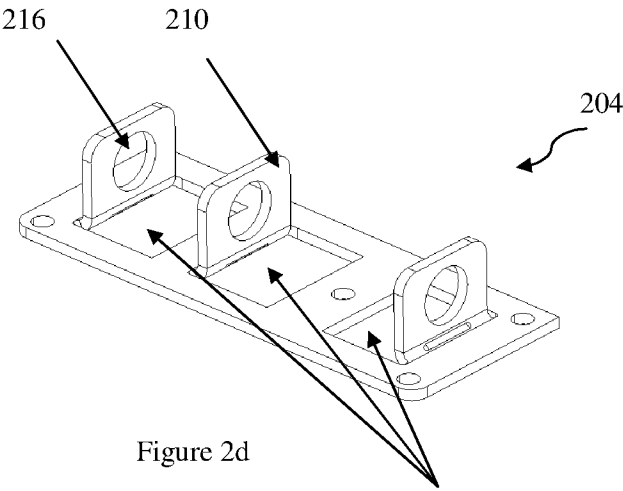


Figure 2d

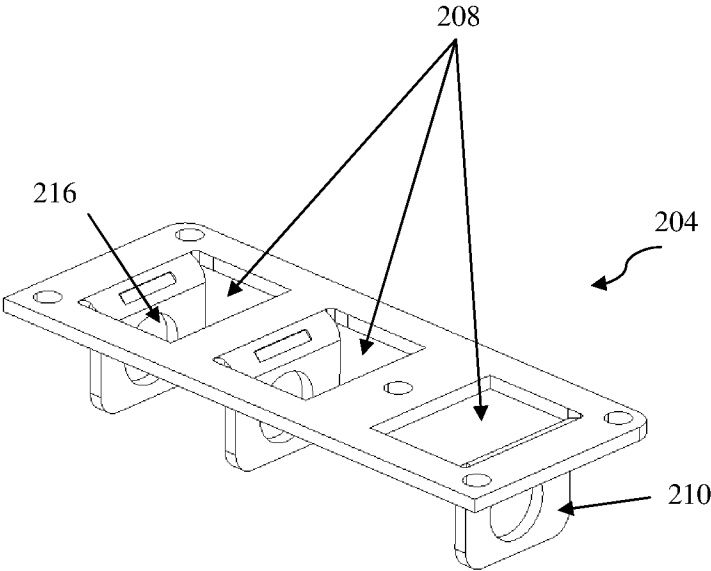


Figure 2e

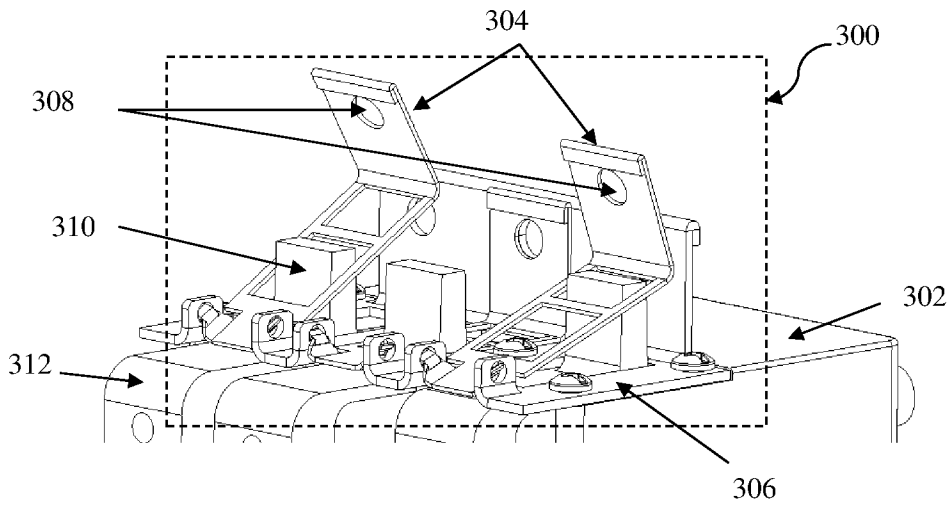


Figure 3a

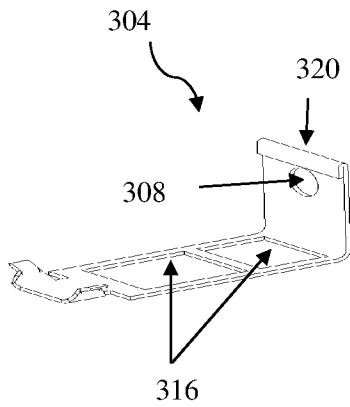


Figure 3b

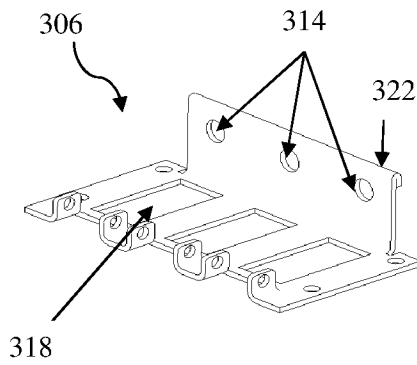


Figure 3c

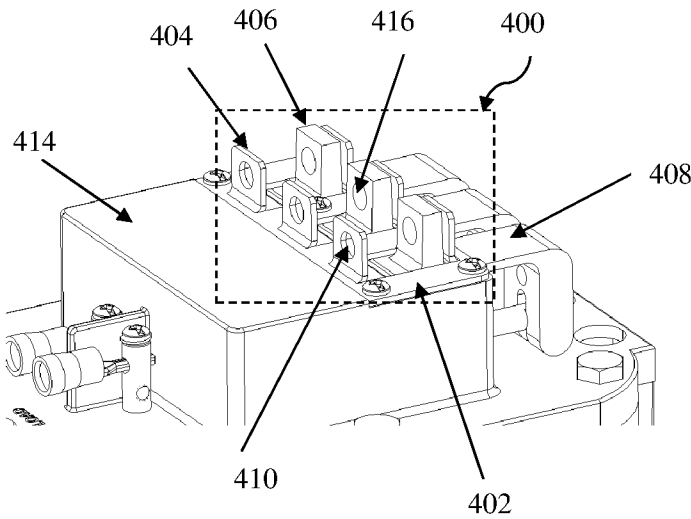


Figure 4a

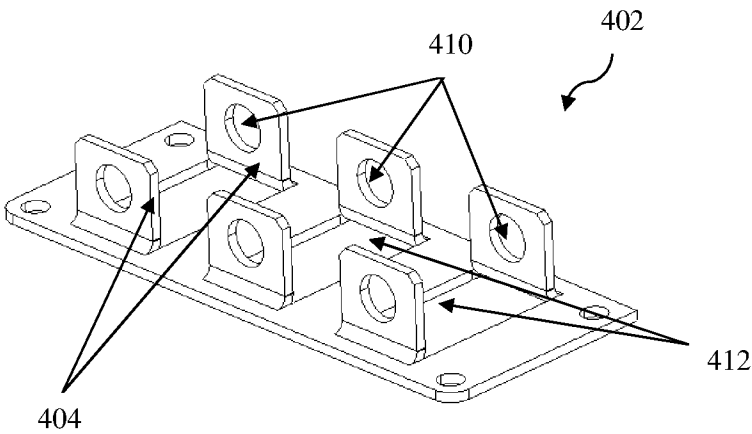


Figure 4b

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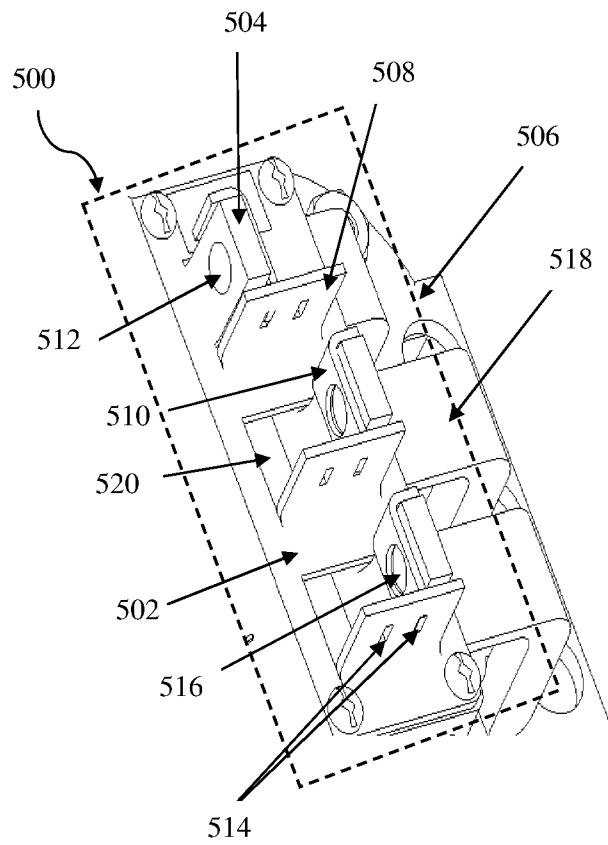


Figure 5a

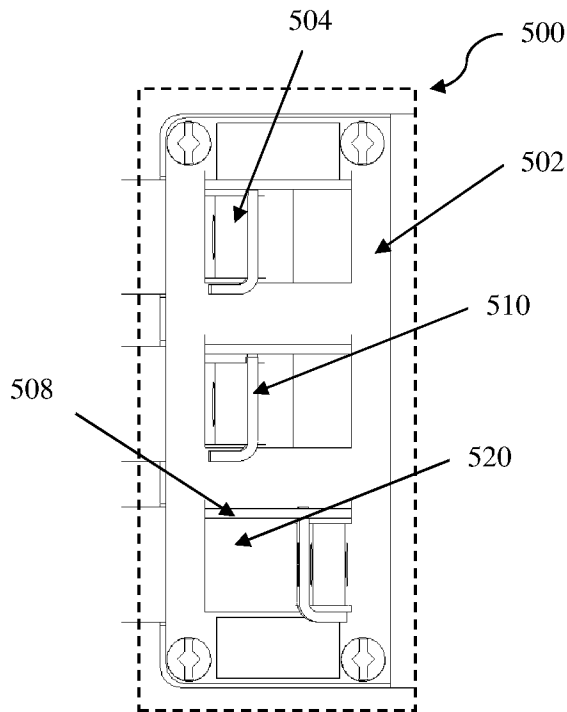


Figure 5b

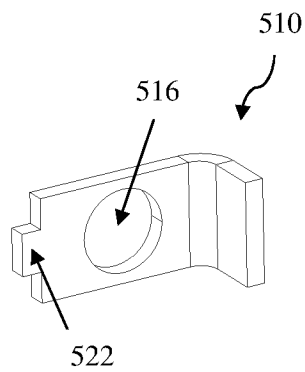


Figure 5c

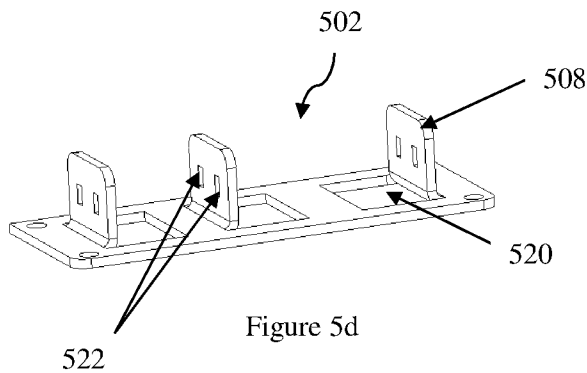


Figure 5d

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2017/051195

A. CLASSIFICATION OF SUBJECT MATTER
H01H9/28, H01H9/20, H01H71/10, F16B1/00 Version=2017.01

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H01H, F16B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Patseer, IPO Internal Database

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	WO2011097690 A1 (BORTOLINI, Aldo Luiz) 18 August 2011 (18.08.2011) Page 3; line 21 - Page 4; line 16, Figure 1-5	1-2, 7 3-6, 8-9
X A	US2349631 A (WESTINGHOUSE ELECTRIC & MFG CO) 23 May 1944 (23.05.1944) Page 4; Right column; line 24-34	1-2 3-9
A	US6160227 A (AIRPAX CORPORATION LLC) 12 December 2000 (12.12.2000) Example 1-2, Figure 3A-3D	1-9

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search
29-06-2017

Date of mailing of the international search report
29-06-2017

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