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(71) Applicant: **Schneider Electric España, S.A.**
08019 Barcelona (ES)

(72) Inventors:
- **SANTESTEBAN INSAUSTI, Patxi**
  08019 Barcelona (ES)
- **REBOLÉ OLLETA, Jose Antonio**
  08019 Barcelona (ES)
- **GONZÁLEZ IRIBAS, Aitor**
  08019 Barcelona (ES)

(74) Representative: **Plasseraud IP**
104 Rue de Richelieu
CS92104
75080 Paris Cedex 02 (FR)

(54) **MULTIPURPOSE ELECTRICAL SWITCH**

(57) The present invention relates to a multipurpose electrical switch with a T-shaped actuation rocker arm (1) assembled in a base box (2) in a swiveling manner between positions for the connection and disconnection of the switch, said base box (2) being assembled on a frame (3) that can be fixed to the wall, and comprising a push plate (4, 5) that can be fixed to said actuation rocker arm (1), wherein the actuation rocker arm (1) comprises first fixing means for the detachable fixing of a first standard actuation push plate (4), and second fixing means for the detachable fixing of a second actuation push plate (5) for actuation by means of a lever.

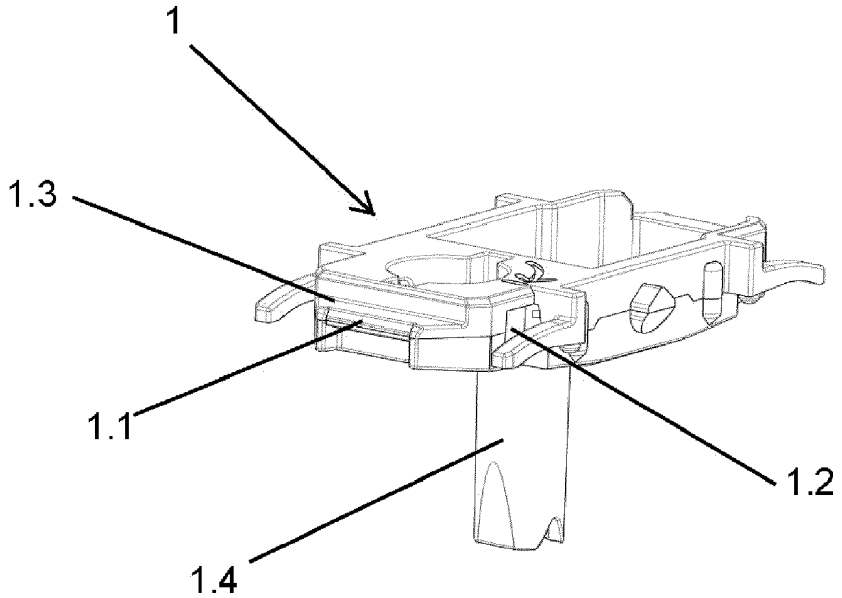


FIG. 2

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Description

Technical field

[0001] The present invention relates to electrical switches which are arranged on walls for activating and deactivating functions, such as for switching light sources on and off, said switches comprising different actuation plates or buttons and a swiveling mechanism which is actuated by means of the button to change between positions for the electrical activation and deactivation of the function controlled with the switch, with there being different actuation alternatives.

State of the art

[0002] At present there are switches with different ways of actuation on the swiveling mechanism or rocker arm which is actuated by means of an actuation button. Said actuation button normally has a flat rectangular or circular shape that acts directly on the rocker arm when pushed, being the most commonly used configuration for wall-mounted electrical switches, and on which there is finally arranged the aesthetic framework fixed to the frame of the electrical switch. Another alternative to said actuation button is a lever that protrudes from the switch, which was formerly the most widespread design and is currently regaining relevance, in which the pivoting movement of the lever acts on the rocker arm for connection or disconnection, and the aesthetic framework is also arranged on said lever button.

[0003] Another alternative of the actuation button is the one described in European patent application EP23382566.0, which comprises a mechanism for reducing the angle of inclination of the button, with the actuation button occupying the entire contour of the frame and therefore dispensing with the aesthetic framework, such that it has a coupling panel for coupling the button to the frame for pivoting, and which acts on the rocker arm by means of lever parts.

[0004] The problem that arises is that every time when the type of button is to be exchanged, it is necessary to change the entire switch box, since each button has its own associated system of mechanisms, which increases both production costs and the end user's expenses if he/she wants to exchange one actuation button for another for aesthetic reasons.

[0005] In view of the described disadvantage or limitation of the solutions existing today, there is a need for a solution which allows versatility in exchanging the aesthetics of the switch without the need to change the entire switch box, providing a versatile and lower cost solution for the end user.

Object of the invention

[0006] To achieve this objective and to solve the technical problems set forth up until now, as well as to provide additional advantages which can be derived below, the present invention provides a multipurpose electrical switch with a T-shaped actuation rocker arm assembled in a base box in a swiveling manner between positions for the connection and disconnection of the switch, said base box being assembled on a frame that can be fixed to the wall, and comprising a push plate that can be fixed to said actuation rocker arm, wherein the actuation rocker arm comprises first fixing means for the detachable fixing of a first standard actuation push plate, and second fixing means for the detachable fixing of a second actuation push plate for actuation by means of a lever.

[0007] A standard actuation push plate is understood to be a plate having normally square or circular flat geometry which, when pushed, acts directly on the actuation rocker arm for the connection and disconnection of the switch. An actuation push plate for actuation by means of a lever is understood to be the lever button or plate which, when pivoted, causes the lever to move the actuation rocker arm for the connection and disconnection of the switch.

[0008] In that sense, with one and the same switch assembly, the aesthetics thereof can be modified for two different actuation modes without having to change the entire switch box, simply by changing the standard plate or button, which comprises fixing means in correspondence with the actuation rocker arm, changing it for the lever plate which comprises other fixing means in correspondence with the actuation rocker arm.

[0009] In this way, production costs are reduced, and a versatile solution that can be used as a standard plate and as a lever plate by simply releasing one and fixing the other is made available to the end customer, which also translates into a lower cost for the end user to perform aesthetic exchange.

[0010] Preferably, the first fixing means are at least one projection at each end of the actuation rocker arm for the snap-fitted fixing of the first push plate which in turn comprises corresponding fitting pins, and the second fixing means being at least one recess on each side of the rocker arm for the snap-fitted fixing of the second push plate which in turn comprises corresponding fitting pins.

[0011] As a result of this configuration, it is possible to fix the first push plate or standard plate in one part of the rocker arm, and the second push plate or lever plate in another part of the rocker arm, being adapted to the usual dimensions and location of the fitting pins of each of them. Furthermore, the risk of breakage of the projection for snap-fitted fixing is reduced as it is fixed in different areas, or even if one of the two fixing means were to break, the switch could still be used with the other plate in the other fixing means, preventing it from becoming unusable.

[0012] According to another feature of the invention, it is envisaged that the electrical switch object of the invention also serves for operation with a button or plate as described in European patent application EP23382566.0, such that the rocker arm comprises at

each of the ends a step with a geometry in correspondence with the actuation end of the corresponding push levers of a third push plate of those which comprise a coupling panel for fixing to the frame on which the third push plate is secured in a swiveling assembly and with respective levers secured in rotary attachment on said coupling panel. The actuation rocker arm is adapted with said step for a correct transmission of the movement from the plate to the actuation rocker arm.

[0013] Therefore, with the frame of the electrical switch being adapted for the fixing of the coupling panel, simply by removing any of the two aforementioned plate options and fixing the third push plate, an additional aesthetics will be obtained, maintaining the push performance. As a result of this configuration, a multipurpose electrical switch is available for three different types of actuation plates, these models being the most commonly used commercially, having a single switch adapted to receive the three different types of actuation plates without the need to change the switch box or base box completely.

[0014] According to another aspect of the invention, the electrical switch comprises a set of terminals which comprises at the upper contact end thereof a fixed contact arranged on an inclined plane, and the electrical switch comprising a contact rocker arm, preferably in the form of a flat, which is supported for pivoting on a support element (9) arranged in the lower portion of said set of terminals (7), and the contact rocker arm (8) swiveling between the positions for connection and disconnection by means of the action of a contact spring (10) of the actuation rocker arm (1), the contact spring (10) being supported on the contact rocker arm (8) according to an intermediate height of the set of terminals (7).

[0015] The contact rocker arm, having a recess for the support of the contact spring arranged at an intermediate height of the terminal assembly, being understood as a height lower than that reached by the set of terminals in the arrangement thereof in the base box.

[0016] The support element will preferably have a V shape to facilitate swiveling between the positions for connection and disconnection.

[0017] As a result of this configuration, the depth of the base box or switch box is reduced, being compatible with any of the exchangeable actuation plate options. In addition, the impact noise on connection/disconnection contact is reduced, having a lateral rocking which reduces the rocking angle and impact speed with respect to the known set of terminals in which the contact rocker arm is arranged parallel to the frame arrangement. In the present invention, the contact rocker arm is arranged vertically as a prolongation of the actuation rocker arm, i.e., substantially perpendicular to the frame arrangement, such that the transmission of forces reduces the impact sound, with the fixed and movable connection contacts therefore also lasting longer.

[0018] Being a smaller product, the required plastic material and packaging material is reduced.

[0019] Additionally, in the case of the third actuation plate, it contributes to reducing the pivoting angle of the push plate since the contact rocker arm and accordingly the actuation rocker arm have a lower degree of rocking.

[0020] Likewise, it allows eliminating the plunger which usually covers the contact spring and which in the state of the art is necessary to cause the rocking movement between the positions for connection and disconnection. In contrast, in the present invention, the contact spring is arranged directly on the contact rocker arm, being housed only in the housing of the actuation rocker arm to prevent it from coming out.

[0021] Preferably, the actuation rocker arm comprises a housing covering the spring along the entire length thereof, such that it acts to house and guide the spring, preventing it from coming out in the pivoting movement for connection and disconnection.

[0022] With these features a more robust base box assembly is achieved, which extends its service life contributing to its reuse for any of the mentioned types of plate.

[0023] According to another feature of the invention, it comprises disengagement levers arranged in a disengagement block which can be removably fixed on the set of terminals, and with a window for accessing the contact spring of the actuation rocker arm.

[0024] As a result of this configuration, if necessary, it is possible to replace the disengagement levers which in the state of the art were pivotably arranged on the base box but which, in the embodiments in which the terminals are overmolded in a block made of an electrically insulating material, do not allow the replacement of said lever, which sometimes, in the event of breakage, rendered the switch unusable as engagement is not allowed. In contrast, in the present invention, the disengagement block is fixed on the set of terminals, by means of a fitting having dimensions in correspondence with the set of terminals, and having the window which allows access to the contact rocker arm, which was not possible in the state of the art in accordance with the horizontal arrangement of the contact rocker arm.

[0025] A multipurpose electrical switch for different type of actuation plates with one and the same block of switch base box and with robustness that allows extending its service life is therefore obtained.

Description of the Figures

[0026]

Figures 1A, 1B, and 1C show an exploded view of the electrical switch of the invention with the options of exchanging a first push plate, a second push plate, and a third push plate in a corresponding manner.

Figure 2 shows a perspective view of the actuation rocker arm of the electrical switch object of the invention.

Figure 3 shows a section view of the electrical switch of the invention with the first plate assembled.

Figure 4 shows a perspective cross-section view of the electrical switch of the invention with the second plate assembled.

Figure 5 shows a bottom perspective view of the second plate in the form of a lever for viewing the pins thereof for fixing to the actuation rocker arm.

Figure 6 shows a section view of the electrical switch of the invention with the third plate assembled.

Figure 7 shows a section view of a set of terminals of the electrical switch of the invention.

Figure 8 shows a perspective view of a disengagement assembly for the disengagement of the terminals of the set of terminals of the electrical switch object of the invention.

Detailed description of the invention

[0027] In view of the mentioned figures and in accordance with the adopted numbering, a preferred exemplary embodiment of the invention may be observed therein, which comprises the parts and elements that are indicated and described in detail below.

[0028] As can be seen in Figures 1A, 1B, and 1C, the electrical switch object of the invention is configured so that three different models of push plates (4, 5, 6) can be exchangeable, with the designs being the most widely available on the market.

[0029] The first button design depicted in Figure 1A with the first actuation plate (4) refers to standard buttons for an electrical connection/disconnection switch. The second button design depicted in Figure 1B with the second actuation plate (5) refers to electrical switches that can be actuated by means of a lever. Furthermore, the third button design depicted in Figure 1C with the third actuation plate (6) refers to buttons that completely cover the switch, combining the aesthetic framework and the button in a single element, and seek to achieve the smallest possible swiveling angle of the button for improved aesthetic.

[0030] Therefore, the novelty of the electrical switch object of the invention is the arrangement of a multipurpose electrical switch, which allows aesthetic and functional exchange simply by exchanging the actuation plate, such that a user can perform said change without having to disassemble the electrical switch. The risk of the user having to possibly exchange the actuation plate if he/she had to change the base box (2) or the entire switch box like in the state of the art is thereby prevented, since in this case the entire switch box would have to be disconnected with the associated push plate by disconnecting the wiring from the mains. Likewise, the cost to perform said change is reduced, given that fewer elements are required for the exchange. Likewise, production cost savings is achieved for the same reason, manufacturing only an electrical switch model configured for exchange with different push plates (4, 5, 6).

[0031] To that end, the multipurpose electrical switch comprises an actuation rocker arm (1) configured for fixing and interaction with the different push plates (4, 5, 6).

[0032] In that sense, as can be seen in Figure 3, the base box (2) with its actuation rocker arm (1) is fixed to the frame (3), said actuation rocker arm (1) acting between a position for connection and another position for disconnection. The first push plate (4) is fixed in this actuation rocker arm (1), to that end, the actuation rocker arm (1) comprises at each of the longitudinal ends thereof at least one projection (1.1), said projection being configured for the snap-fitted fixing of a corresponding pin (4.1) of the first push plate (4). The aesthetic framework (13) will then be fixed as is performed usually. Said ends are understood to mean those located in the end positions of the swiveling actuation rocker arm (1), corresponding with the larger dimension of the actuation rocker arm (1) and therefore being understood as the longitudinal direction thereof.

[0033] The first push plate (4) therefore being able to be fixed in a detachable manner for possible exchange.

[0034] The design corresponding to a second push plate (5) can be seen in Figure 4, in this case being of in the form of a lever with which the actuation rocker arm (1) is swiveled between the positions for connection and disconnection.

[0035] In that sense, like with the first push plate (4), once the assembly of the base box (2) with the actuation rocker arm (1) and frame (3) is assembled, the second push plate (5) is fixed in the actuation rocker arm (1). For said detachable fixing, the rocker arm comprises at least one recess (1.2) and preferably two recesses (1.2) on each side of the actuation rocker arm (1) for the snap-fitted fixing of the fitting pins (5.1) in correspondence with the recesses (1.2), such that the pins are introduced by clipping into said recesses (1.2), with the second push plate (5) thus being fixed. Sides of the actuation rocker arm (1) are understood to mean the end surfaces thereof in the direction perpendicular to the longitudinal direction thereof.

[0036] Preferably, the recesses (1.2) will be positioned as close as possible to the ends of the actuation rocker arm (1) in order to achieve an optimum lever effect. There can be seen in the lower part of Figure 5 the second push plate (5), where the fitting pins (5.1) can be seen in greater detail arranged in end positions of the second push plate (5) and oriented towards the inside to better protect the fixing. Furthermore, it is contemplated that the second push plate (5) comprises a side edge which reinforces the protection of said fitting pins (5.1). Said recesses (1.2) of the actuation rocker arm (1) can be better seen in Figure 2.

[0037] Preferably, as can be seen in the example of Figures 1B and 4, after fixing the second push plate (5), an aesthetic plate (5') with a hole for the passage of the lever will be fixed to the frame (3), proceeding subsequently to fix the aesthetic framework (13) to the frame (3), for complete installation.

[0038] As can be seen in Figure 6 of another option of an exchangeable push plate for the multipurpose electrical switch of the invention, in this case a third actuation plate (6) such as the one described in European patent application EP23382566.0, in which once the assembly of the base box (2) with the actuation rocker arm (1) and the frame (3) is assembled, a coupling panel (6.2) is fixed to the frame (3), with the third push plate (6) which has two lever parts (6.1) secured in rotary attachment on said coupling panel (6.2) being fixed in a swiveling assembly on said coupling panel (6.2).

[0039] In that sense, the actuation rocker arm (1) comprises a step (1.3) at each end configured for the contact of the end of the lever part (6.1), such that said step (1.3) has a shape in correspondence with the end of the lever part (6.1) and furthermore has a width dimension which allows the support of the lever part (6.1) to perform swiveling contact of the actuation rocker arm (1) without said lever part (6.1) jamming up. As can be seen in Figure 6, on the right side it remains in the pressed position to perform connection, with the end of the lever part (6.1) being in contact with the wall of the step (1.3) that acts as a stop. Furthermore, on the left side of Figure 6, the third push plate (6) before being pushed can be seen, at which time the end of the lever part (6.1) is arranged on the surface of the step (1.3), being supported thereon, without coming out of same.

[0040] An interchangeable electric switch for different push plates is therefore obtained with one and the same set of base box (2), actuation rocker arm (1), and frame (3), without having to disassemble this set for exchanging the push plates (4, 5, 6).

[0041] Preferably, the actuation rocker arm (1) comprises a housing (1.4) covering the spring along the entire length thereof in the form of a sheath, such that it acts to house and guide the spring (10), preventing it from coming out in the pivoting movement of the actuation rocker arm (1) for connection and disconnection.

[0042] According to an alternative embodiment, as can be seen in the detail of the section of Figure 7, the electrical switch of the invention comprises a set of terminals (7) which comprises in the upper contact end thereof a fixed contact (7.1) arranged on an inclined plane, and with a contact rocker arm (8) with movable contacts (8.1) swivels between the positions for connection and disconnection by means of the action of a contact spring (10) of the actuation rocker arm (1), such that the contact spring (10) is supported on the contact rocker arm (8) according to an intermediate height of the set of terminals (7), with the actuation rocker arm (1) being partially introduced in the set of terminals (7), and therefore reducing the height of the electrical switch. Said contact rocker arm (8) is supported for pivoting in a support element (9) arranged in the lower portion of said set of terminals (7), and with a preferred V-shaped configuration. A more robust base box (2) with the use thereof reinforced for a longer service life for interchangeability with different push plates (4, 5, 6) is thereby achieved.

[0043] Additionally, as a result of the preceding configuration of the set of terminals (7), given that the contact rocker arm is not arranged on the set of terminals (7) like in the known solutions, the inclusion of a disengagement block (12) which can be removably fixed on the set of terminals (7) is possible. Said disengagement block (12) comprises a flat upper surface for contact with the upper surface of the set of terminals (7) and with a window (12.1) for accessing the contact spring (10) of the actuation rocker arm, and the disengagement levers (11) being positioned once the disengagement block (12) is fitted. In this way, the disengagement levers (11) are part of the block (12), being able to be removed in the event of breakage or malfunction, unlike known solutions in which the disengagement levers (11) were fixed without possibility of access to same and therefore the removal or exchange thereof is not possible.

[0044] This configuration reinforces the robustness of the assembly of the base box (2) for use with exchangeable push plates.

Claims

1. A multipurpose electrical switch with a T-shaped actuation rocker arm (1) assembled in a base box (2) in a swiveling manner between positions for the connection and disconnection of the switch, said base box (2) being assembled on a frame (3) that can be fixed to the wall, and comprising a push plate (4, 5) that can be fixed to said actuation rocker arm (1), **characterized in that** the actuation rocker arm (1) comprises first fixing means for the detachable fixing of a first standard actuation push plate (4), and second fixing means for the detachable fixing of a second actuation push plate (5) for actuation by means of a lever.

2. The multipurpose electrical switch according to claim 1, wherein the first fixing means are at least one projection (1.1) at each end of the actuation rocker arm (1) for the snap-fitted fixing of the first push plate (4) which in turn comprises corresponding fitting pins (4.1), and the second fixing means being at least one recess (1.2) on each side of the actuation rocker arm (1) for the snap-fitted fixing of the second push plate (5) which in turn comprises corresponding fitting pins (5.1).

3. The multipurpose electrical switch according to any one of the preceding claims, wherein the actuation rocker arm (1) comprises at each of the ends a step

(1.3) with a geometry in correspondence with the actuation end of corresponding pressing lever parts (6.1) of a third push plate (6) of those which comprise a coupling panel (6.2) for fixing to the frame (3) on which the third push plate (6) is secured in a swiveling assembly and with respective lever parts (6.1) secured in rotary attachment on said coupling panel (6.2).

4. The multipurpose electrical switch according to any one of the preceding claims, comprising a set of terminals (7) which comprises at the upper contact end thereof a fixed contact (7.1) arranged on an inclined plane, and with a contact rocker arm (8) which is supported for pivoting on a support element (9) arranged in the lower portion of said set of terminals (7) and the contact rocker arm (8) swiveling between the positions for connection and disconnection by means of the action of a contact spring (10) of the actuation rocker arm (1), the contact spring (10) being supported on the contact rocker arm (8) according to an intermediate height of the set of terminals (7).

5. The multipurpose electrical switch according to the preceding claim, comprising disengagement levers (11) arranged in a disengagement block (12) which can be removably fixed on the set of terminals (7), and with a window (12.1) for accessing the contact spring (10) of the actuation rocker arm (1).

6. The multipurpose electrical switch according to claim 4 or 5, wherein the actuation rocker arm (1) comprises a housing (1.4) covering the contact spring (10) along the entire length thereof.

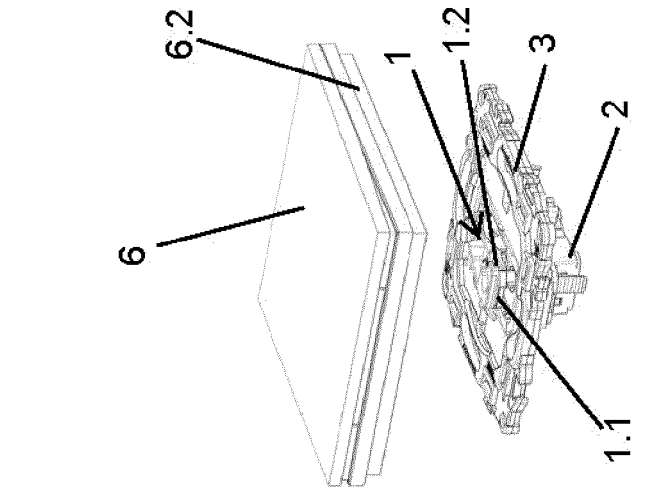


FIG. 1C

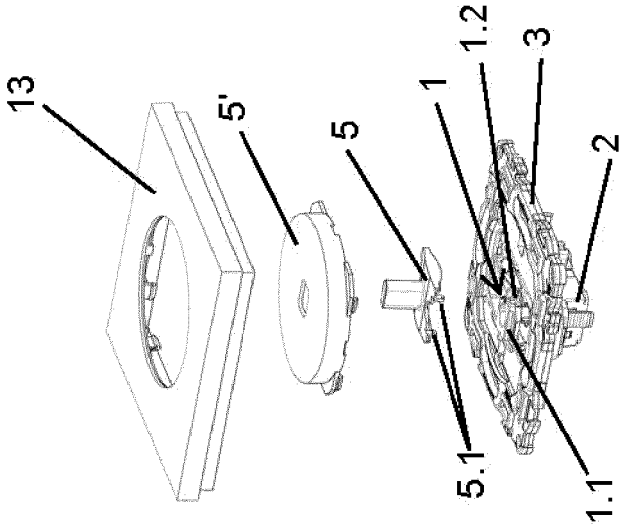


FIG. 1B

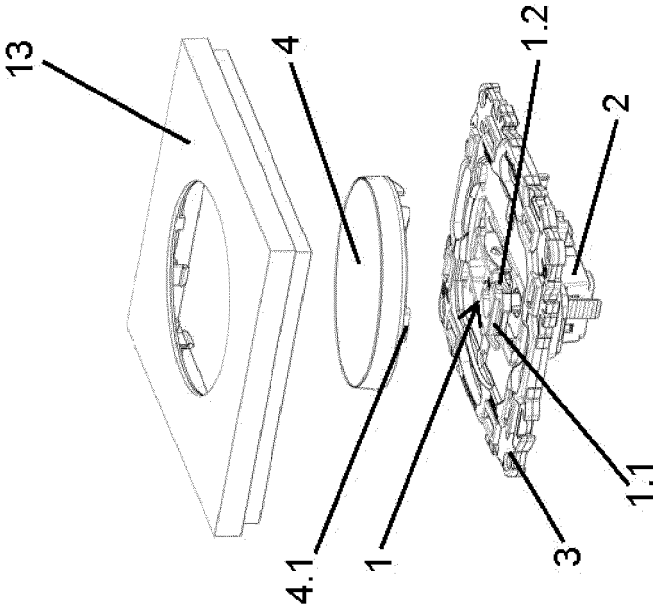


FIG. 1A

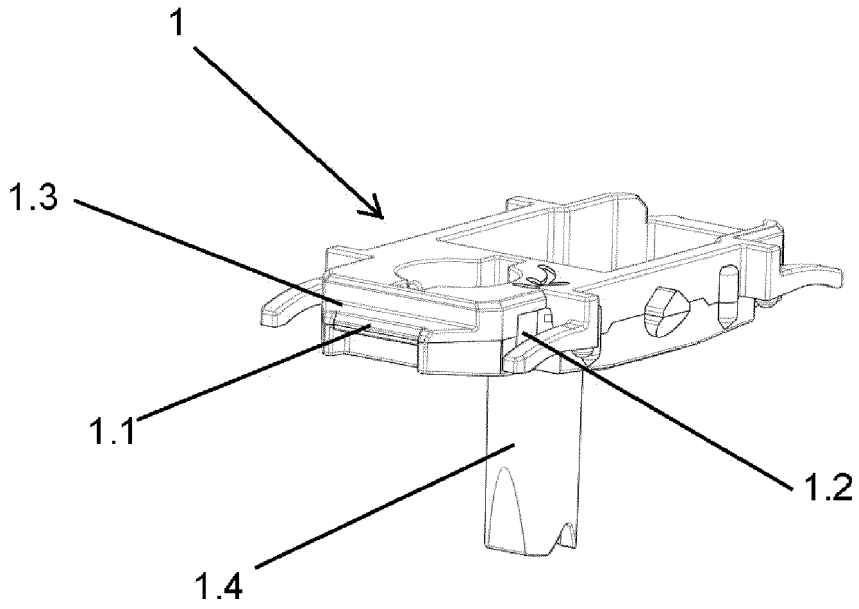


FIG. 2

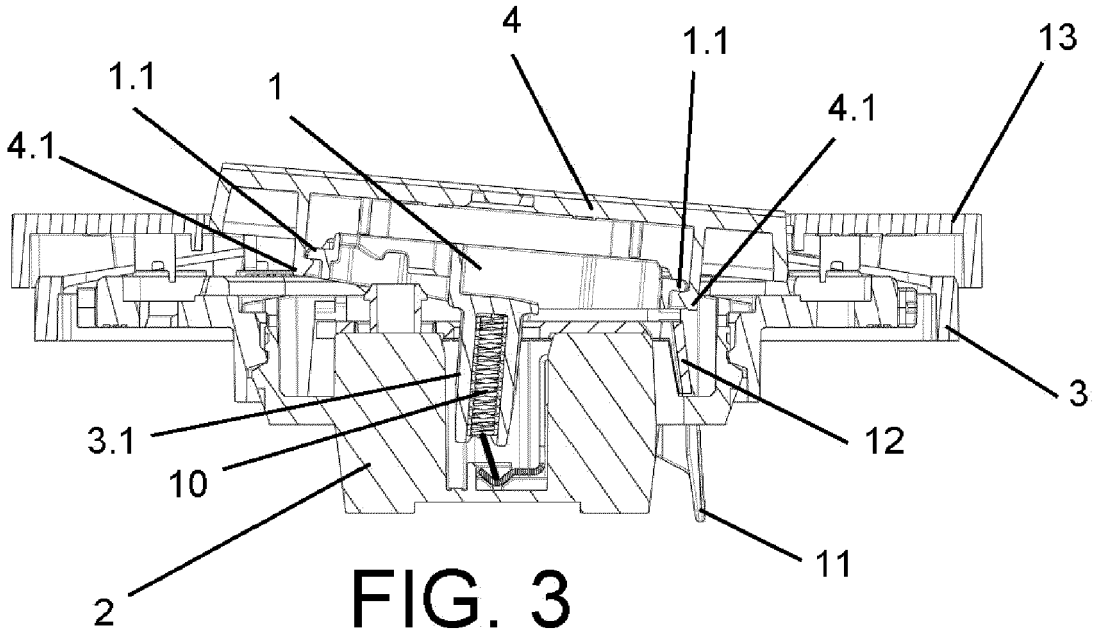


FIG. 3

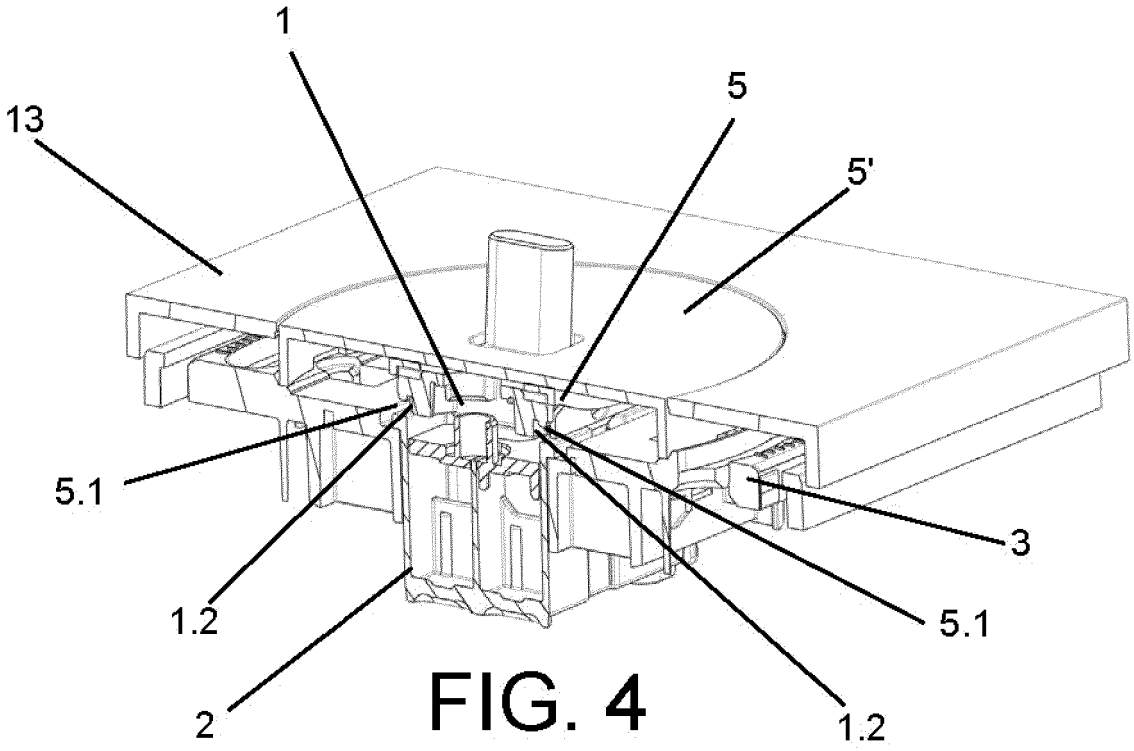


FIG. 4

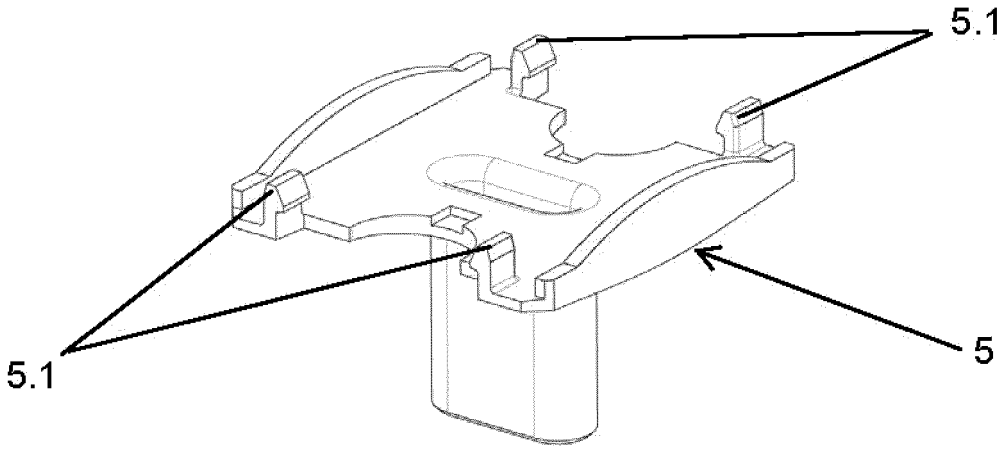


FIG. 5

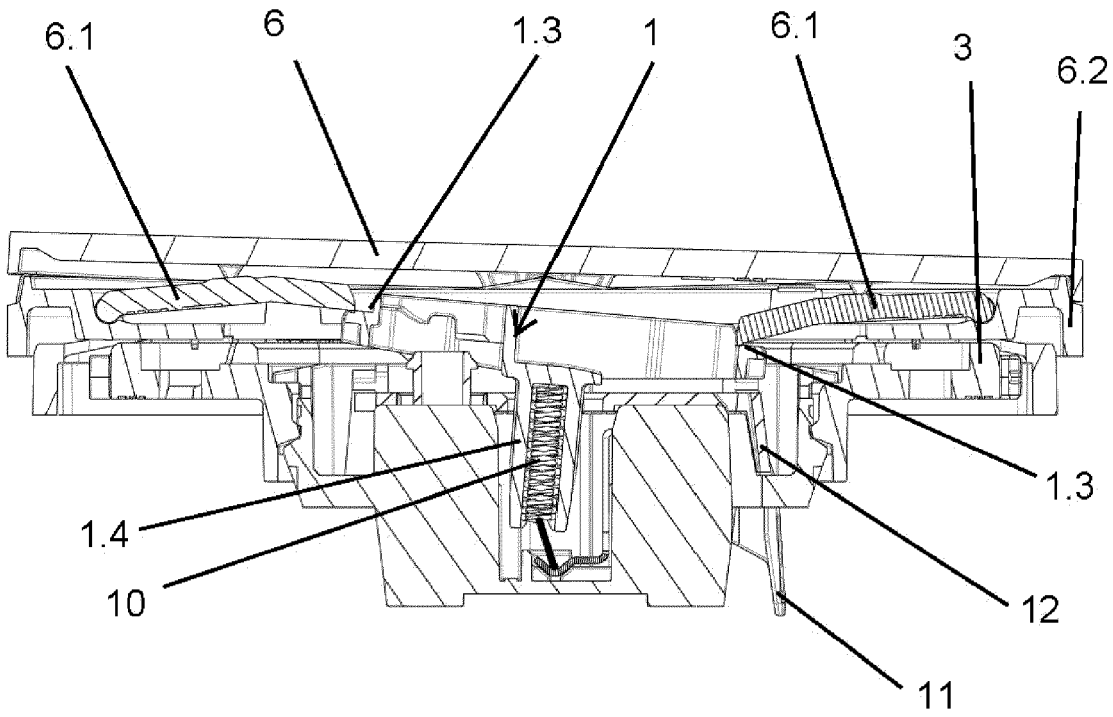


FIG. 6

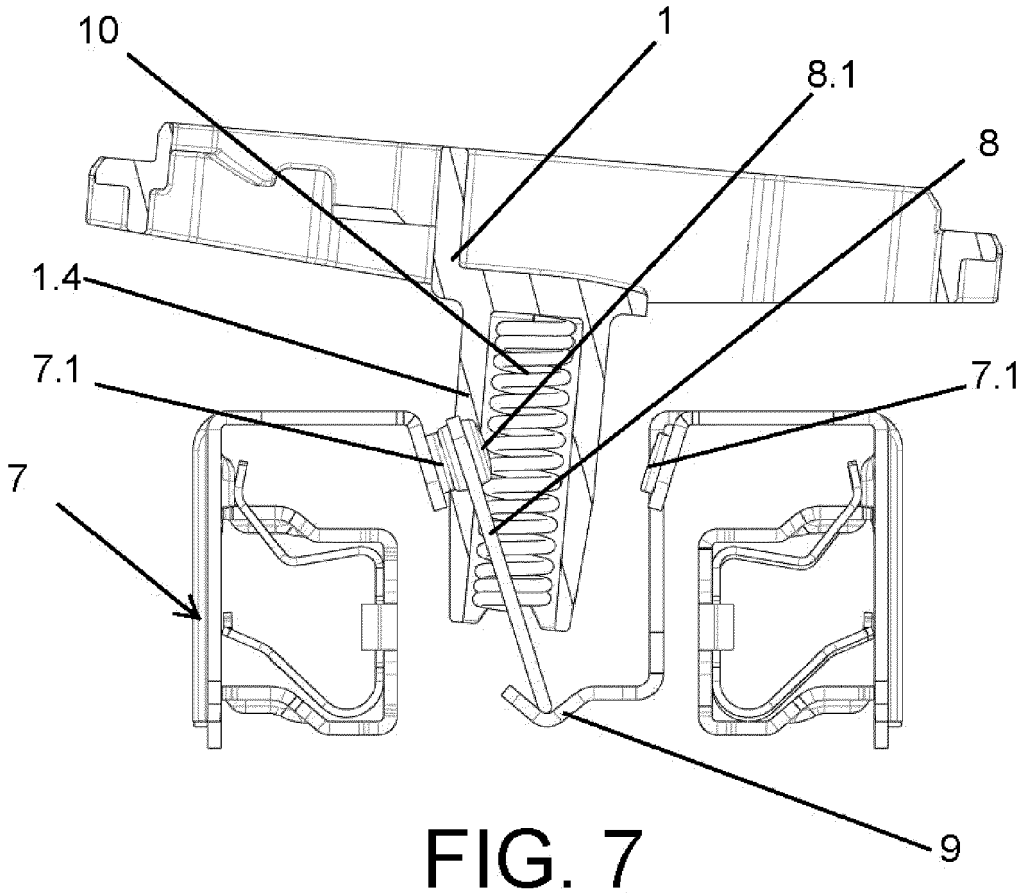


FIG. 7

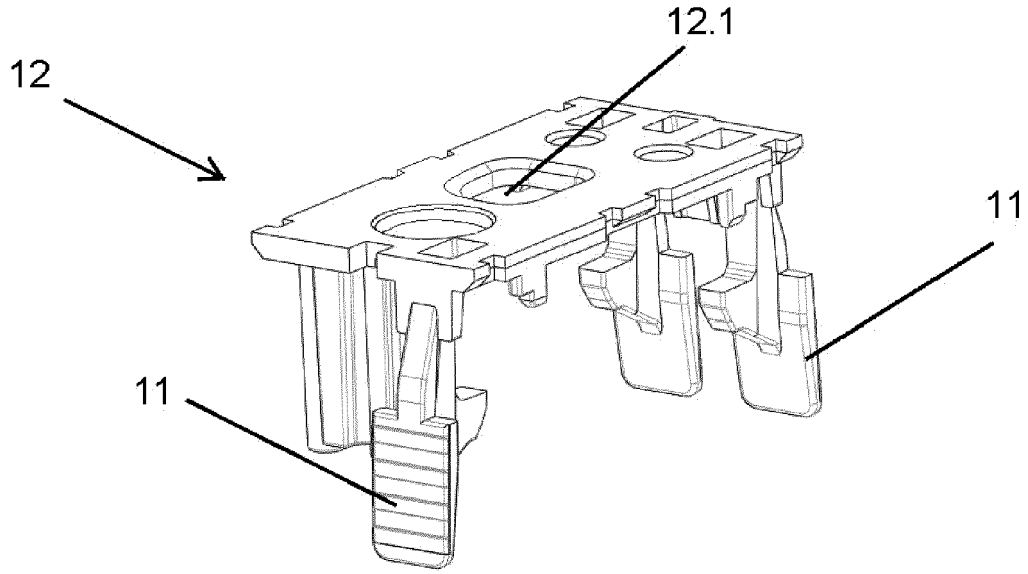


FIG. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 23 38 2675

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2016/225553 A1 (GUIBERT JEAN-SEBASTIEN [FR]) 4 August 2016 (2016-08-04)	1-3	INV. H01H11/00
Y	* page 2, paragraph 0048 - page 6, paragraph 0164; figures 2-14 *	4-6	H01H23/14
	-----		ADD.
X	EP 1 376 631 A1 (ABB PATENT GMBH [DE]) 2 January 2004 (2004-01-02)	1-3	H01H23/02 H01H23/24
Y	* page 2, paragraph 0012 - page 3, paragraph 0019; figures 1-3 *	4-6	

Y	US 2007/125635 A1 (CAPELLA JOAQUIN A [ES]) 7 June 2007 (2007-06-07)	4-6	
A	* page 4, paragraph 0126 - page 5, paragraph 0145; figures 27-38 *	1-3	

Y	EP 2 423 937 A2 (SCHNEIDER ELECTRIC ESPANA SA [ES]) 29 February 2012 (2012-02-29)	4-6	
A	* page 3, paragraph 0019 - page 4, paragraph 0028; figures 8-14 *	1-3	

TECHNICAL FIELDS SEARCHED (IPC)
H01H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 November 2023	Pavlov, Valeri

CATEGORY OF CITED DOCUMENTS

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16-11-2023

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2016225553 A1	04-08-2016	BR 102016002212 A2	13-09-2016
		CN 105845470 A	10-08-2016
		EP 3054470 A1	10-08-2016
		FR 3032303 A1	05-08-2016
		US 2016225553 A1	04-08-2016
EP 1376631 A1	02-01-2004	DE 10227400 A1	15-01-2004
		EP 1376631 A1	02-01-2004
US 2007125635 A1	07-06-2007	AR 057192 A1	21-11-2007
		BE 1017378 A3	01-07-2008
		BR PI0604982 A	09-10-2007
		DE 102006055838 A1	06-06-2007
		FR 2894723 A1	15-06-2007
		MA 28719 B1	02-07-2007
		NL 1032960 C2	25-04-2008
		PL 208866 B1	30-06-2011
		PT 103609 A	29-06-2007
		TR 200606841 A2	22-10-2007
		US 2007125635 A1	07-06-2007
EP 2423937 A2	29-02-2012	EP 2423937 A2	29-02-2012
		ES 2400108 A1	05-04-2013

EPO FORM P0459

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

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 23382566 **[0003] [0012] [0038]**