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(71) Applicant: **A.S.A. Plastici Azienda Stampaggio Articoli Plastici S.R.L.**
20090 Trezzano Sul Maviglio, MI (IT)

(72) Inventor: **CRUCITTI, Rodolfo**
21100 VARESE (IT)

(74) Representative: **Modiano, Micaela Nadia et al Modiano & Partners**
Via Meravigli, 16
20123 Milano (IT)

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(54) **HOLDER FOR CONCEALED ELECTRICAL CONNECTIONS**

(57) Holder (1) for concealed electrical connections that comprises at least one sliding cover (4a, 4b) which is adapted to cover at least one electrical connection (5a, 5b), the cover (4a, 4b) being adapted to be superimposed on the electrical connection in a covering position and to be moved away by sliding from such covering position so as to expose the electrical connection (5a, 5b) to the outside; the cover (4a, 4b) is elastically loaded to move

away from the covering position by way of respective first elastic means (6); at least one button (7a, 7b) is provided, which can move between a raised position and a lowered position, respectively associated with the cover (4a, 4b) and adapted to release at least part of the elastic energy stored in the first elastic means (6) when the button (7a, 7b) passes from the raised position to the lowered position.

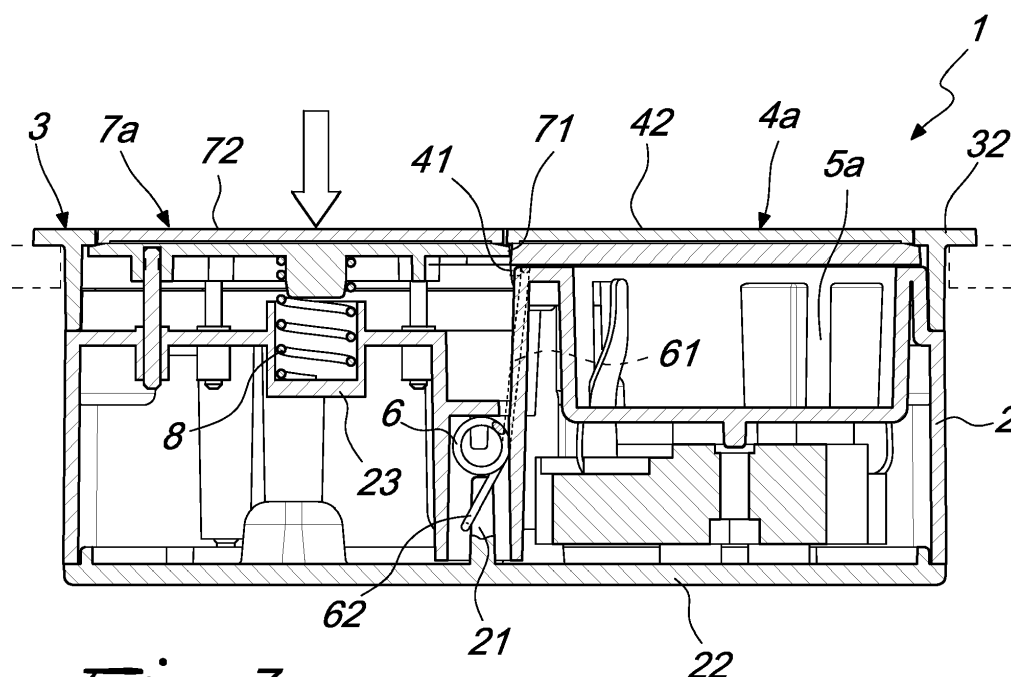


Fig. 7

Description

[0001] The present invention relates to a holder for concealed electrical connections, of the type that can be recessed in a surface such as a table or a wall.

[0002] Solutions are known that use adapted means for hiding electrical connections when they are not in use. For example, Italian utility model no. 280540 discloses a system with two covers that can slide in order to cover or expose a respective electrical connection.

[0003] This known system has the drawback of having a cover that necessarily protrudes with respect to the surface in which the electrical connection is recessed, in order to allow the user to manually grip the outer edges of the cover in order to slide it. Furthermore, the opening of the above mentioned cover is completely manual.

[0004] The aim of the present invention is to provide a holder for concealed electrical connections which is capable of improving the known art in one or more of the above mentioned aspects.

[0005] Within this aim, an object of the invention is to provide a holder for concealed electrical connections that makes it possible to automatically access the hidden electrical connection, thus reducing the manual intervention by the user.

[0006] Another object of the invention is to provide a holder for concealed electrical connections that makes it possible to keep the covers covering the electrical connections substantially flush with the surface in which the holder is recessed or with a plate of the holder proper.

[0007] Another object of the present invention is to overcome the known drawbacks in a different manner to any existing solutions.

[0008] Another object of the invention is to provide a holder for concealed electrical connections that is highly reliable, easy to implement and low cost.

[0009] This aim and these and other objects which will become better apparent hereinafter are achieved by a holder for concealed electrical connections according to claim 1. Any advantageous characteristics of the invention are recited in the dependent claims.

[0010] Further characteristics and advantages of the invention will become better apparent from the detailed description that follows of a preferred, but not exclusive, embodiment of the holder for concealed electrical connections according to the invention, which is illustrated for the purposes of non-limiting example in the accompanying drawings wherein:

Figure 1 is a perspective view of a holder for electrical connections according to the invention, wherein the covers are in the covering position of the respective electrical connection;

Figure 2 shows the automatic opening movement of one of the covers of the holder of the previous figure; Figure 3 shows the step of opening the cover of the previous figure;

Figure 4 shows the cover of the previous figure com-

pletely open;

Figure 5 is a plan view from above of the holder of Figure 1;

Figure 6 is a plan view from above of the holder of Figure 4;

Figure 7 is a cross-sectional view of the holder of Figure 5 taken along the line VII-VII;

Figure 8 is a cross-sectional view of the holder of Figure 6 taken along the line VIII-VIII.

[0011] With reference to the figures, a holder for concealed electrical connections according to the invention, generally designated by the reference numeral 1, comprises a box 2 and a plate 3.

[0012] The box 2 can be recessed in a surface, for example in a table or in a wall, and the plate 3 is fixed to the box 2 in the assembly step, so that the plate 3 is substantially flush with the surface. The box 2 can be closed on the bottom by an end face 22, which can be separated and is optionally provided with openings for the wires of the electrical connections to pass through.

[0013] The holder 1 further comprises at least one sliding cover that is adapted to cover at least one electrical connection in a covering position and to be moved away by sliding from such covering position so as to expose the electrical connection to the outside. In particular, in the embodiment shown, there are two sliding covers 4a and 4b, each one adapted to be superimposed on a respective electrical connection 5a, 5b which, in the embodiment shown, is a CEE 7/3 or "Schuko" socket.

[0014] In other embodiments of the holder according to the invention, not shown, there can be a single sliding cover adapted to cover one or more electrical connections, or more than two sliding covers, each one adapted to cover a respective electrical connection or a plurality of electrical connections.

[0015] The covers 4a, 4b are preferably able to slide within a respective rectangular opening 31a, 31b in the plate 3, in particular along the edges of such opening 31a, 31b.

[0016] The electrical connections of the holder 1 according to the invention can be of any kind. They can be identical electrical AC sockets, like the sockets 5a-5b, or different, or RJ45 data sockets, microphone or headphone jacks, HDMI ports or USB ports (for the transmission of data or 5V power for recharging batteries, in particular of cellular phones).

[0017] Each cover 4a, 4b is elastically loaded to move away from the above mentioned covering position of the electrical connection 5a, 5b shown in Figures 1 and 7, by way of respective first elastic means which, in the embodiment shown, consist of a respective torsion spring 6 for each cover 4a, 4b, which is accommodated in the box 2.

[0018] With reference only to the torsion spring 6 of the cover 4a shown in the drawings, such spring acts between a raised portion 21 protruding from the base 22 of the box 2 and an abutment element that is integral with

the respective cover 4a, for example a tooth 41 protruding from the other side with respect to the upper surface 42 of the cover 4a. In particular, one arm 61 of the torsion spring 6 is engaged from behind on the tooth 41, while the second arm 62 is engaged against a face of the raised portion 21 so that the torsion spring 6 is loaded when the cover 4a is completely superimposed on the respective electrical connection 5a, i.e. it is in the covering position. In such position, the torsion spring 6 tends to entrain the cover 4a away from the covering position of the electrical connection 5a.

[0019] The holder 1 further comprises at least one button that can move between a raised position and a lowered position. In particular, in the embodiment shown, there are two buttons 7a and 7b, which are associated with a respective cover 4a, 4b and adapted to release at least part of the elastic energy stored in the respective torsion spring 6 when the respective button 7a, 7b passes from the raised position to the lowered position, i.e. when it is pressed by the user as illustrated in Figure 2 with reference to the button 7a.

[0020] The button 7a, 7b is loaded elastically toward the raised position by way of second elastic means, for example by way of a respective compression spring 8 of the helical type, which tends to make the button 7a, 7b return to the raised position unless it is kept pressed. The compression spring 8 acts between a surface 23 of the box 2 and the lower surface of the respective button 7a, 7b.

[0021] Each button 7a, 7b comprises or is connected to a respective abutment 71 against which an edge 43 of the respective sliding cover 4a, 4b is engaged. The abutment 71 is adapted to keep the corresponding cover 4a, 4b in the covering position of the electrical connection 5a, 5b when the respective button 7a, 7b is in the raised position, i.e. in the position shown in Figures 1 or 7 with reference to the button 7a.

[0022] The same opening 31a, 31b of the plate 3 within which the respective cover 4a, 4b can slide is occupied by the corresponding button 7a, 7b when such button is in the raised position. Advantageously, the button 7a, 7b and the respective cover 4a, 4b have in plan view a substantially rectangular and substantially mutually identical shape and they have respective upper surfaces 72, 42 directed toward the outside which are substantially flat, flush and contiguous with one another, and flush and contiguous with the upper surface 32 of the plate 3.

[0023] In the preferred embodiments of the invention, the button 7a, 7b flanks the respective cover 4a, 4b so that, when a button 7a or 7b is pressed, the respective cover 4a, 4b can slide until it is superimposed on the button 7a or 7b pressed, thus keeping it in the lowered position. In the example shown, the travel of the upper surface 72 of the button 7a between the raised position and the lowered position is substantially greater than or equal to the overall thickness of the cover 4a, so that, with the sliding of the cover away from the covering position of the electrical connection 5a, the cover 4a can

be completely superimposed on the button 7a when this is in the lowered position, as illustrated in Figure 8.

[0024] The operation of the invention is evident from the description of its structure. In particular, starting from the situation in Figure 1, when the button 7a is pressed, the abutment 71 is lowered along with the button 7a and therefore it no longer prevents the sliding of the cover 4a. Considering that the torsion spring 6 was loaded when the cover was in the covering position and that now the cover 4a is no longer held by the abutment 71, the arm 61 of the torsion spring entrains the cover away from the covering position, thus releasing all or part of the energy that was stored in the spring 6 before the button 7a was pressed. At this point, the cover initially slides because it is pushed by the arm 61 of the spring 6 and, when such arm is decoupled from the position of engagement with the tooth 41, the sliding of the cover 4a continues by inertia, bringing the cover 4a to a position at least partially superimposed on the button 7a as shown in Figure 3. In this position, the arm 61 is already uncoupled from the tooth 41 and therefore, if the travel is not complete, the user can manually slide the cover 4a until it is completely superimposed on the button 7a, as shown in Figure 4. It is thus possible to access the electrical connection 5a.

[0025] To close the cover 4a, it is manually slid until it completely covers the electrical connection 5a. During the return travel of the cover 4a, the tooth 41 intercepts the arm 61 of the torsion spring 6 once again, thus loading the latter up until the covering position. Once such position is reached, since there is no longer any portion of the cover 4a superimposed on the button 7a, the latter snaps back to the raised position shown in Figure 1.

[0026] In practice it has been found that the device according to the invention fully achieves the set aim, since it makes it possible to automatically access electrical connections that are hidden from view, reducing manual intervention by the user and keeping the covers covering the electrical connections substantially flush with the surface in which the holder is recessed or with a plate of the holder proper.

[0027] The device, thus conceived, is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims. Moreover, all the details may be substituted by other, technically equivalent elements.

[0028] In practice, the materials employed, as well as the dimensions, may be any according to requirements and to the state of the art.

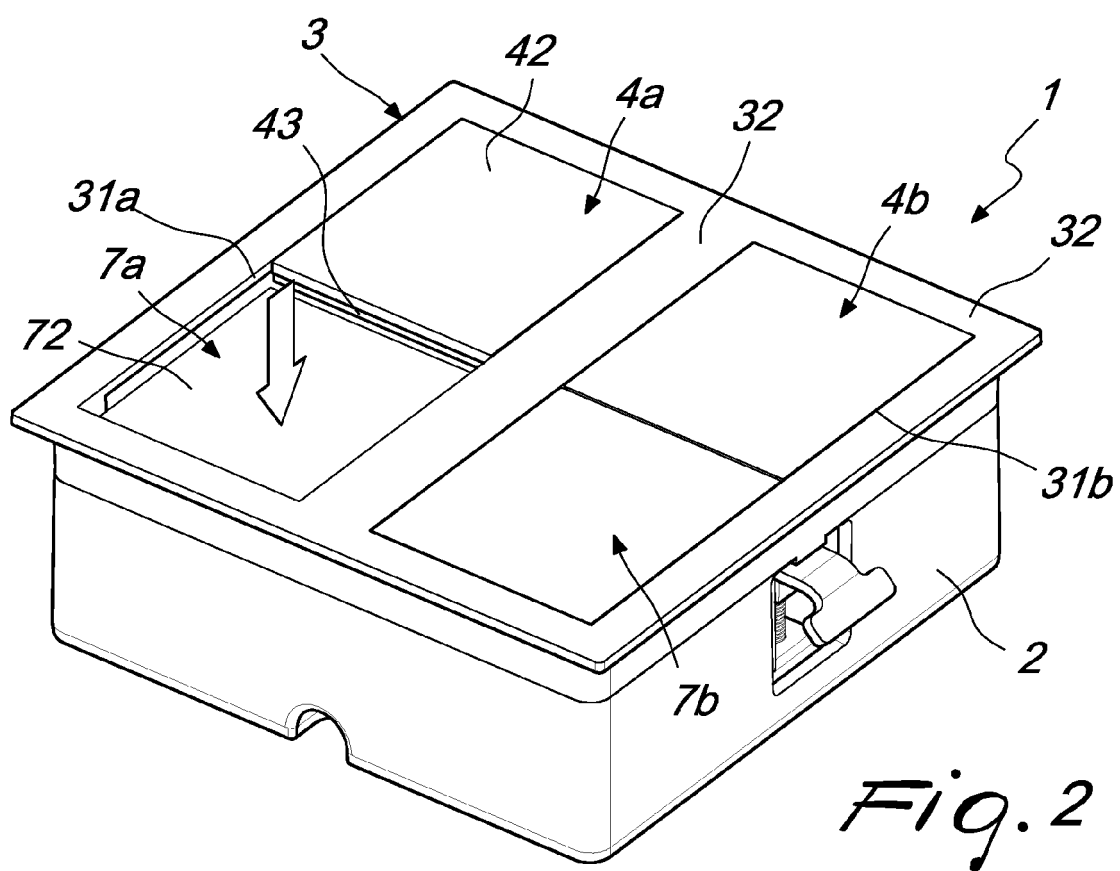
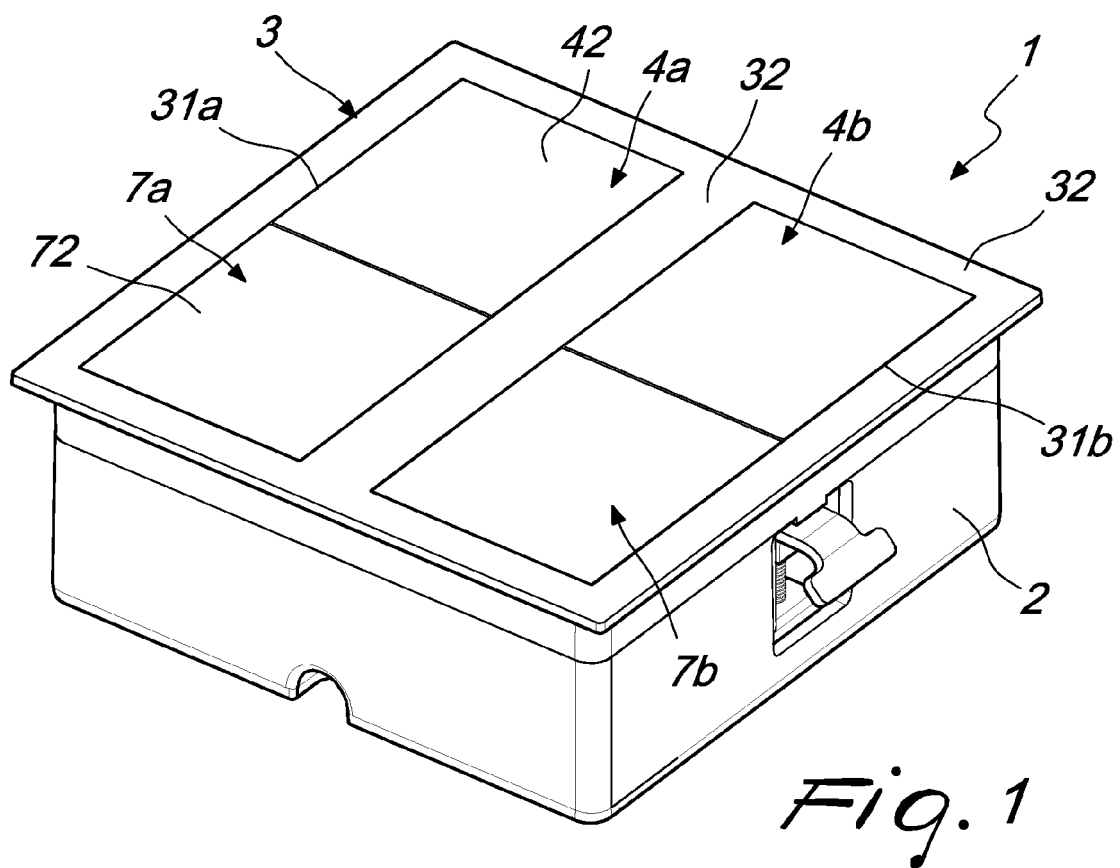
[0029] The disclosures in Italian Utility Model Application No. 202016000007889 (UB2016U013727) from which this application claims priority are incorporated herein by reference.

[0030] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the

interpretation of each element identified by way of example by such reference signs.

Claims

1. A holder (1) for concealed electrical connections that comprises at least one sliding cover (4a, 4b) which is adapted to cover at least one electrical connection (5a, 5b), said at least one cover (4a, 4b) being adapted to be superimposed on said electrical connection in a covering position and to be moved away by sliding from said covering position so as to expose said electrical connection (5a, 5b) to the outside, **characterized in that** said at least one cover (4a, 4b) is elastically loaded to move away from said covering position by way of respective first elastic means (6), said holder (1) further comprising at least one button (7a, 7b) that can move between a raised position and a lowered position, said at least one button (7a, 7b) being respectively associated with said at least one cover (4a, 4b) and adapted to release at least part of the elastic energy stored in said first elastic means (6) when said at least one button (7a, 7b) passes from the raised position to the lowered position.
2. The holder according to claim 1, wherein said at least one button (7a, 7b) comprises or is connected to an abutment (71) against which an edge (43) of said at least one cover (4a, 4b) is engaged, said abutment (71) being adapted to keep said at least one cover (4a, 4b) in the covering position when said at least one button (7a, 7b) is in the raised position.
3. The holder according to one or more of the preceding claims, wherein said at least one button (7a, 7b) is elastically loaded toward said raised position by way of second elastic means (8).
4. The holder according to one or more of the preceding claims, comprising a box (2) for supporting said at least one electrical connection (5a, 5b) which can be recessed in a surface and a plate (3) associated with said box (2), said plate (3) comprising at least one opening (31, 32) along the edges of which said at least one cover (4a, 4b) can slide.
5. The holder according to claim 4, wherein said opening in the plate (3) is occupied by said at least one button (7a, 7b) when it is in the raised position.
6. The holder according to one or more of the preceding claims, wherein said at least one button (7a, 7b) and said at least one cover (4a, 4b) have respective upper surfaces (42, 72) directed toward the outside, said upper surfaces being substantially flat and mutually flush.
7. The holder according to claim 6, wherein said upper surfaces (42, 72) have in plan view a substantially rectangular and substantially mutually identical shape.
8. The holder according to one or more of the preceding claims, wherein the travel of the upper surface (72) of said at least one button (7a, 7b) between the raised position and the lowered position is substantially greater than or equal to the thickness of said at least one cover (4a, 4b), so that, with its sliding away from the covering position, said at least one cover (4a, 4b) can be superimposed on said at least one button (7a, 7b) when said at least one button is in the lowered position.
9. The holder according to one or more of the preceding claims, wherein said first elastic means (6) act between said box (2) and an abutment element (41) that is integral with said at least one cover.
10. The holder according to claim 9, wherein said first elastic means (6) comprise a torsion spring that comprises an arm (61) engaged with said abutment element (41) of the cover (4a, 4b).
11. The holder according to claim 10, wherein said abutment element (41) protrudes below from said at least one cover (4a, 4b) and is arranged proximate to said abutment (71) of the button (7a, 7b).
12. The holder according to one or more of the preceding claims, wherein said second elastic means (8) comprise a compression spring placed below said at least one button (7a, 7b) and acting between said box (2) and said at least one button (7a, 7b).



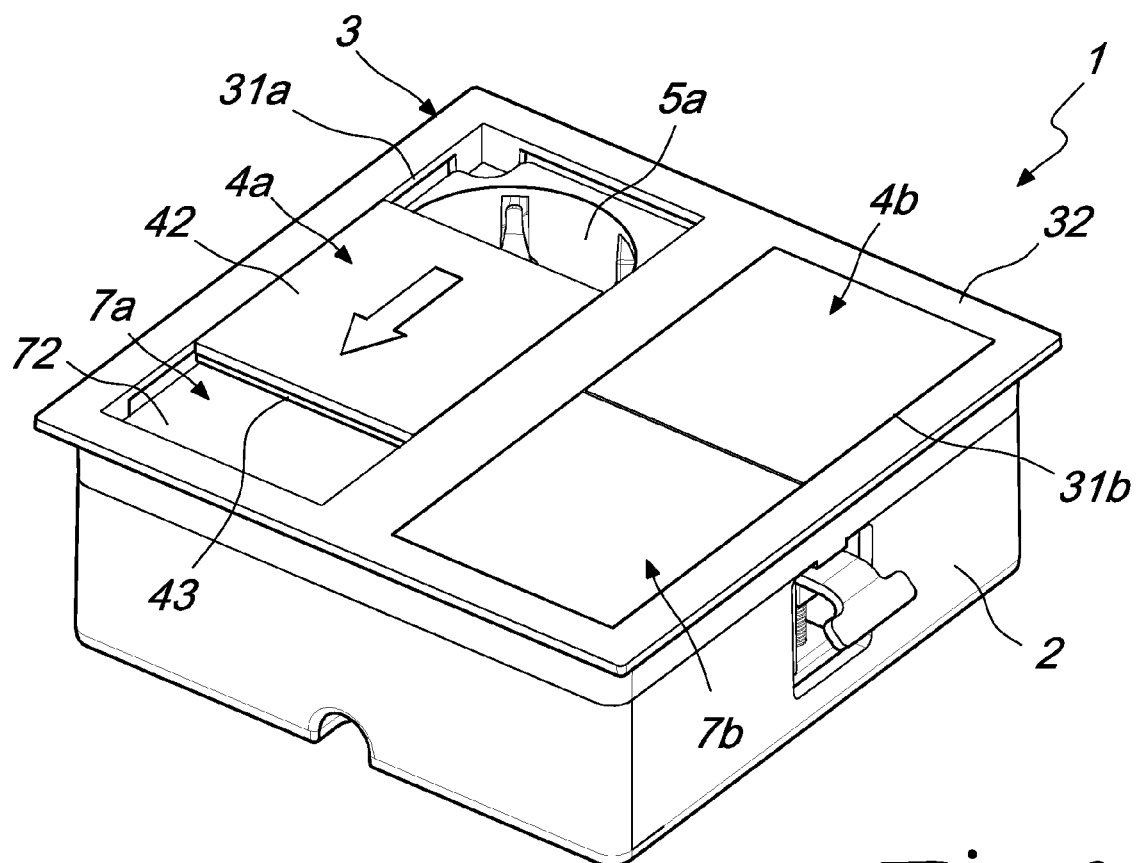


Fig. 3

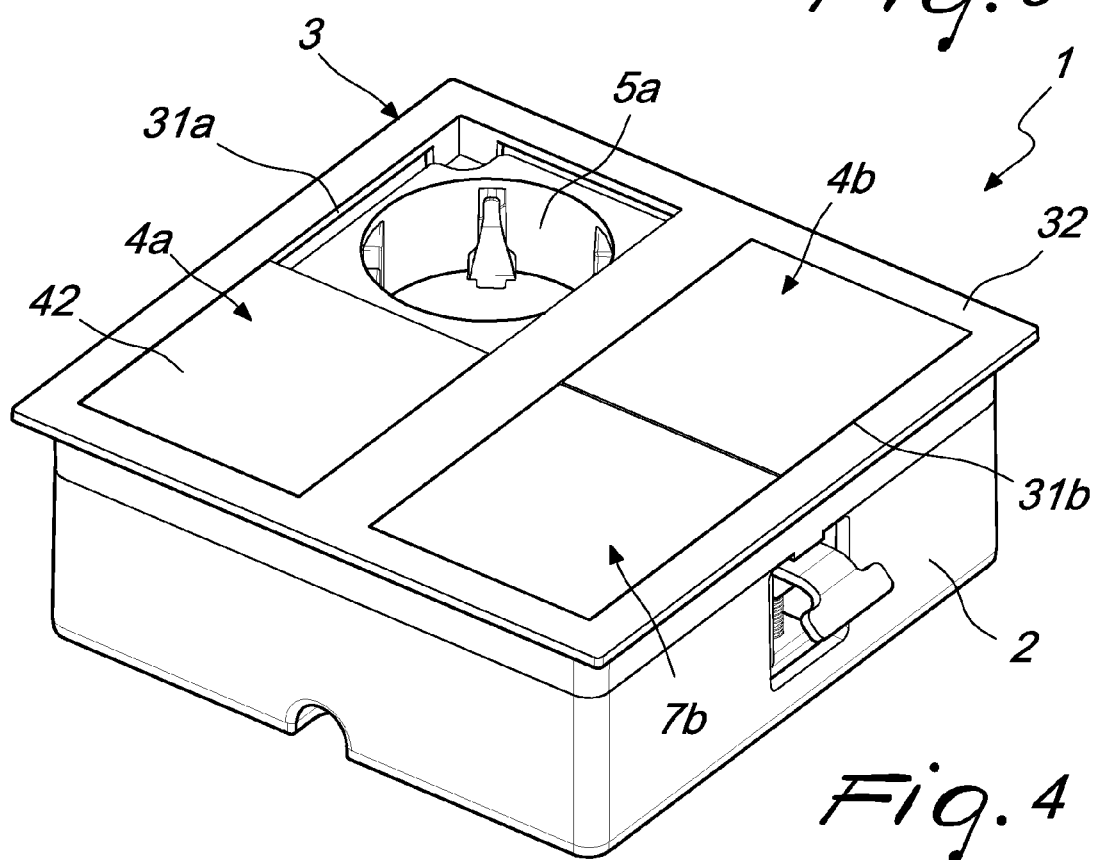
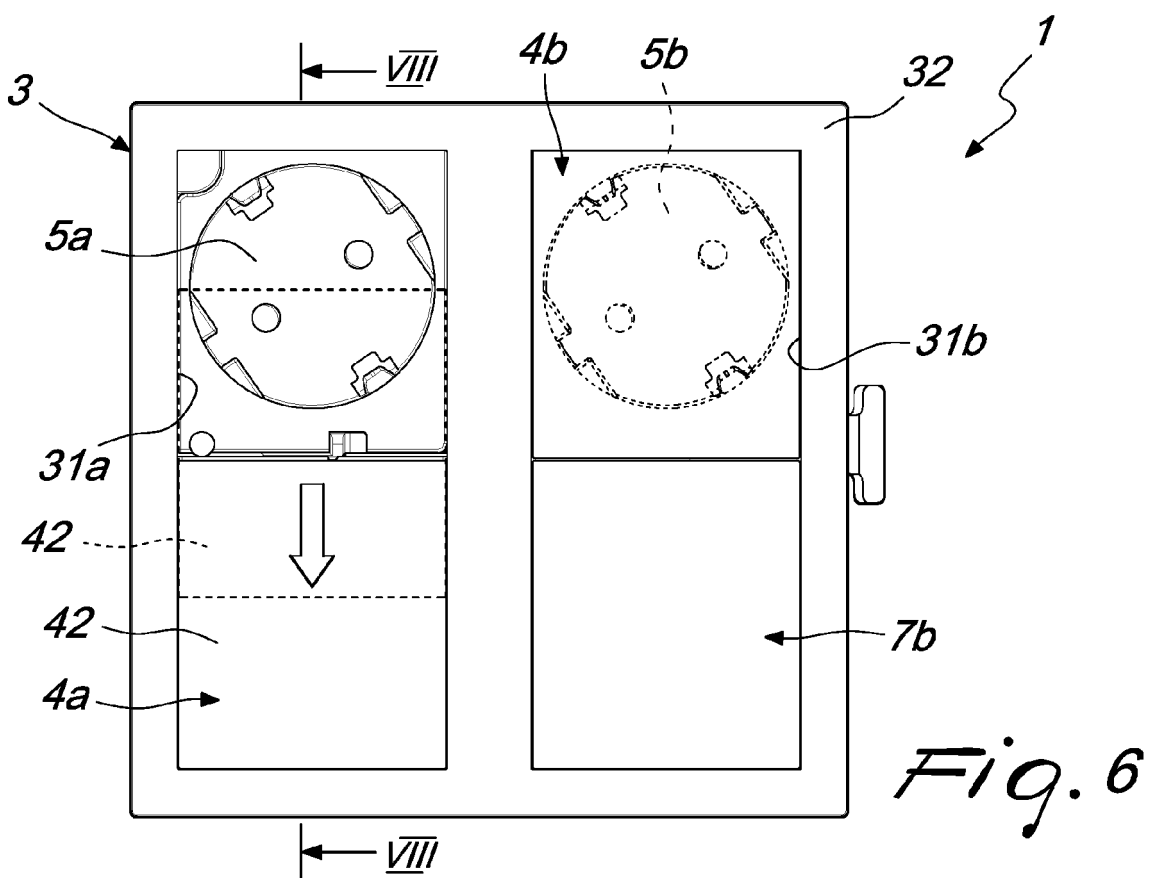
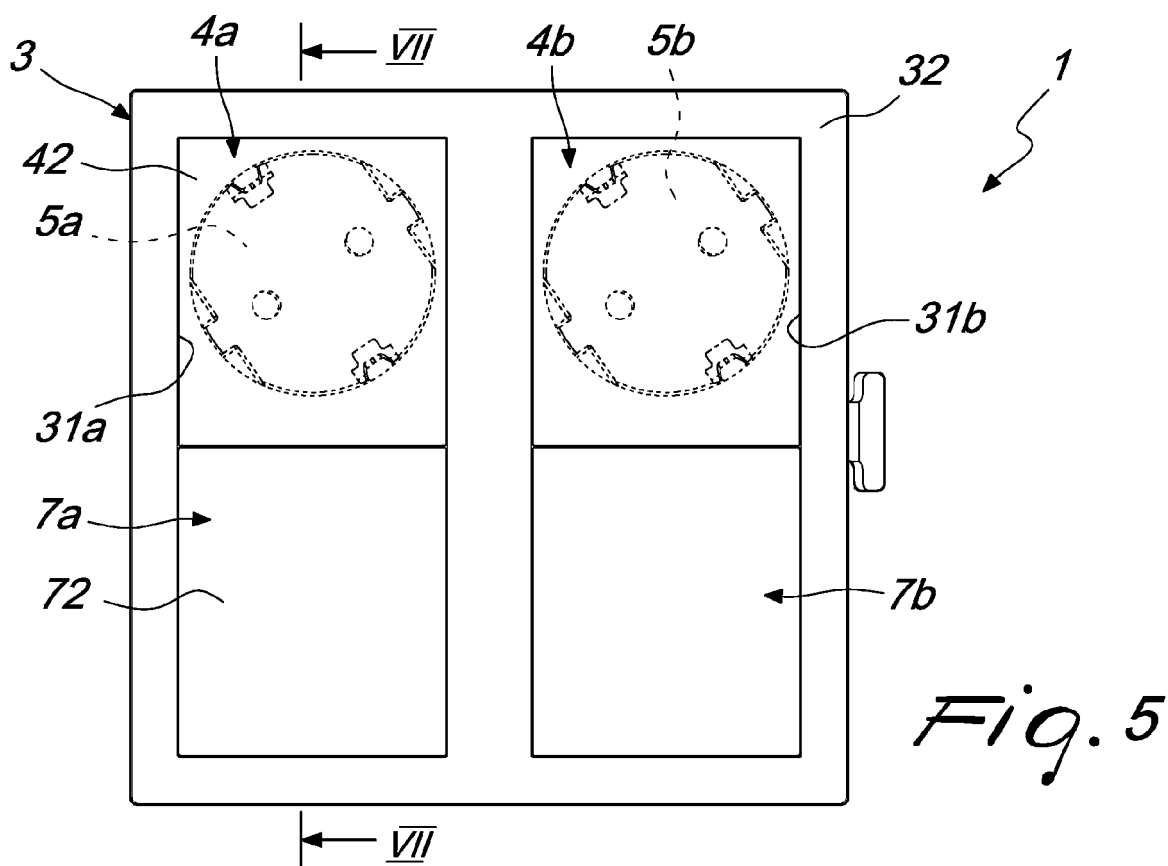


Fig. 4



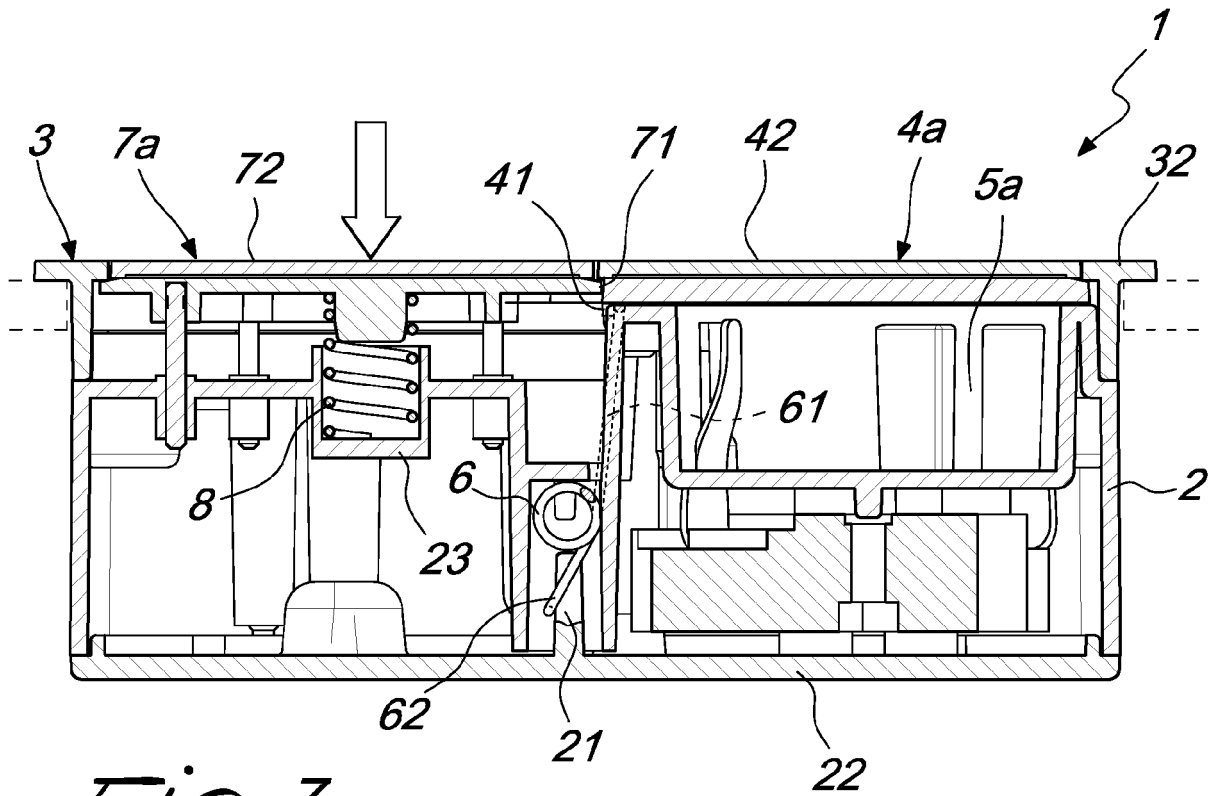


Fig. 7

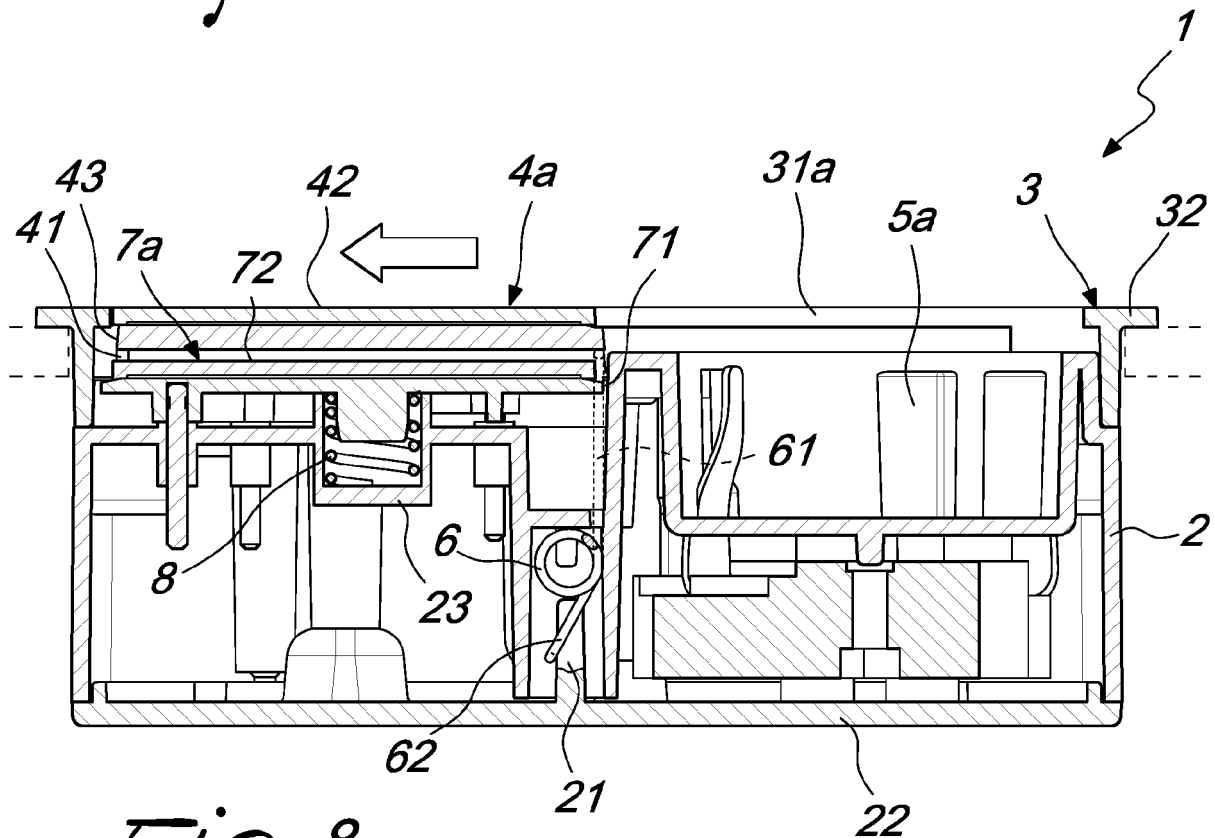


Fig. 8



EUROPEAN SEARCH REPORT

 Application Number
 EP 17 15 3239

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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 4 549 778 A (PRICE FRED D [US] ET AL) 29 October 1985 (1985-10-29) * abstract * * claim 1 * * figures 1-7 * * column 3, line 23 - line 25 * * column 3, line 63 - line 67 * * column 4, line 1 - line 3 * * paragraph [0007] * -----	1-6,8-12	INV. H01R13/453 H01R13/447 ADD. H01R24/78
X	US 4 605 270 A (ASLIZADEH NEJDEH [CA]) 12 August 1986 (1986-08-12) * abstract * * figures 1-5 * * column 1, line 5 - line 9 * * column 3, line 9 - line 34 * * column 3, line 37 - line 41 * -----	1-12	TECHNICAL FIELDS SEARCHED (IPC) H01R H02G
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 5 April 2017	Examiner Topak, Eray
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 17 15 3239

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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US 4549778	A	29-10-1985	NONE
US 4605270	A	12-08-1986	NONE

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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

- IT 280540 [0002]
- IT 202016000007889 [0029]