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(54) VERSATILE ELECTRIFIED BACK FOR FURNITURE

(57) The present invention relates to a particularly versatile and functional electrified back (4) for furniture, equipped with measures that simplify both the assembly

of a piece of furniture and its production and storage. The invention also relates to a piece of furniture comprising such a back (4).

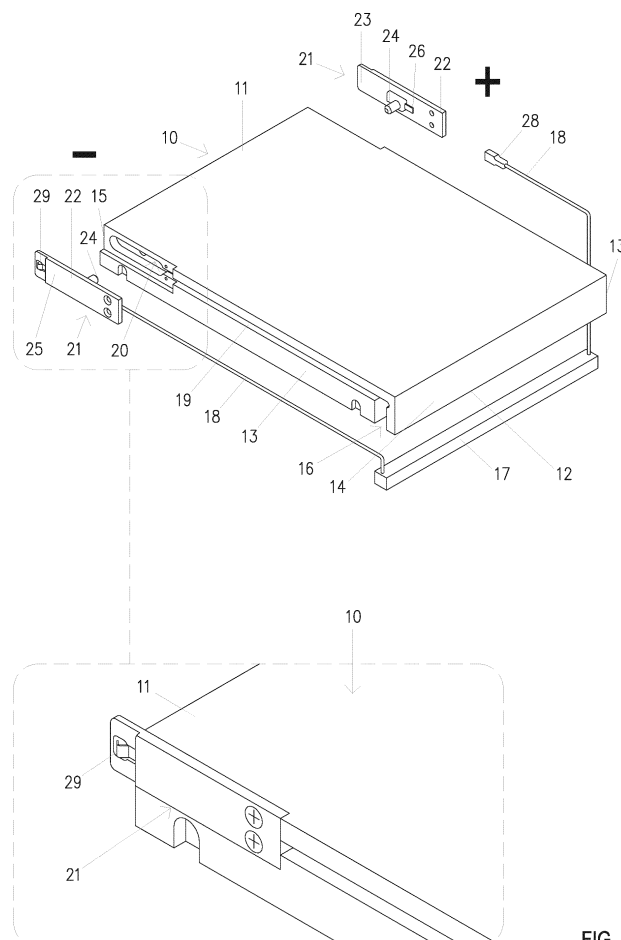


FIG. 4

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Description

TECHNICAL FIELD OF THE INVENTION

[0001] The present invention relates to a particularly versatile and functional electrified back for furniture, equipped with measures that simplify both the assembly of a piece of furniture and its production and storage. The invention also relates to a piece of furniture comprising such a back.

PRIOR ART

[0002] In the furniture sector, various structures and forms of furniture have long been known, such as bedroom, bathroom or kitchen furniture, comprising backs adapted to close the rear part of the compartment(s) and consisting of a panel usually of low thickness that also acts as a supporting structural element.

[0003] The back is therefore an independent component which is normally constrained to the structure through the interlocking of the perimeter edges thereof within suitable grooves obtained on the sides, base and top of the piece of furniture.

[0004] If an electrified structure is to be provided to equip the piece of furniture with an electrical network capable of powering electric devices, such as lighting systems, significant changes must be made to the sides, base, top and back. In particular, suitable seats or safety paths must be created for the electrical cables in the thickness of the panels that form the back, sides, base and/or top. All this also involves the differentiation of the production of said panels from non-electric panels and the consequent increase of components in the warehouse. Therefore, it is clear that the processing costs and the complication in warehouse management are serious drawbacks.

SUMMARY OF THE INVENTION

[0005] Therefore, the technical problem underlying the present invention is to design a back that allows the internal electrification of a piece of furniture without requiring modifying the other components, in order to considerably reduce processing and warehouse management.

[0006] This problem is solved by an electrified back provided with a simple structure able to adapt to the standard components of the sides, base and top of a piece of furniture.

[0007] Therefore, a first object of the present invention is an electric back comprising this structure.

[0008] A second object is a back comprising means for supporting the shelves and equipment inside the piece of furniture such as to simultaneously allow the electrification of the piece of furniture in a simple and reliable manner.

[0009] A third object is to create a back that allows the installation of an aesthetic backdrop in fabric, opaline

glass, transparent glass or other material, which is easily removable and/or can be backlit.

[0010] A further object is a piece of furniture or furnishing complement comprising a back according to the invention.

BRIEF DESCRIPTION OF THE FIGURES

[0011] Further features and advantages of the back of the invention will become more apparent from the following description of some embodiments given by way of nonlimiting example with reference to the following figures, in which:

- figure 1 shows a schematic, axonometric and partial exploded view of a compartment for furniture, according to the known art;
- figure 2 shows a schematic rear and axonometric view of an electric back according to the invention, partially assembled in the compartment of figure 1;
- figure 3 shows a partial split front schematic and axonometric view of the compartment of figure 1 with the back of figure 2 assembled, and an enlarged sectional detail;
- figure 4 shows schematic, axonometric and partial exploded view of a shelf for a compartment of figure 1 with a lighting system connectable to the electric back of figure 2, and an enlarged detail thereof;
- figure 5A shows a schematic and split view of the compartment of figure 1 with the back of figure 2 and a shelf of figure 4 mounted;
- figure 5B shows a schematic sectional view of a detail of figure 5A;
- figure 6 shows an axonometric schematic view of a partial split detail of a first embodiment of the back of the invention;
- figure 7 shows an axonometric schematic view of an electric shelf for the first embodiment of the back of figure 6 with a lighting system in exploded view;
- figure 8 shows an axonometric schematic view of the detail of figure 6 with the shelf of figure 7 assembled;
- figure 9 shows a schematic sectional view of a second embodiment of the back of the invention;
- figure 10 shows an axonometric schematic and exploded view of a third embodiment of the back of the invention;
- figure 11 shows an axonometric schematic and partial exploded view of the back of figure 10 assembled in the compartment of figure 1 with a cover, and a sectional detail;
- figure 12A shows an axonometric schematic view of the back of figure 11 with a shelf of figure 4 mounted;
- figure 12B shows a schematic sectional view of a detail of figure 12A;
- figure 13 shows an axonometric schematic view of a detail of the back according to a fourth embodiment of the invention, assembled with a shelf of figure 7;

- figure 14 shows a schematic sectional view of a detail of a fifth embodiment according to the invention;
- figure 15 shows a schematic sectional view of a detail of a sixth embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0012] With reference to figure 1, a compartment of a piece of furniture - in partially exploded view - according to the known art, whether for a kitchen, bedroom, living room, bathroom or other domestic, industrial, commercial or other environment is generally indicated with reference number 1. In particular, the compartment 1 in use comprises two parallel and vertical sides 2, a base 3 or bottom, a top (not shown) and a back 4. The sides 2 and base 3, as well as the top, are provided with channels or longitudinal grooves 5 obtained at the rear perimeter edges to allow the insertion of the back 4, in a completely conventional manner. In addition, as is known, the compartment 1 may be closed in front by hinged or sliding doors (not shown).

[0013] In figure 2, a compartment 1 is shown without a top and with a partially mounted back 4. Advantageously, the back 4 according to the present invention comprises a panel 6 and two bars 7 associated with two side edges of said panel.

[0014] An electrical power supply 9 may be applied on a face of said back with two electrical cables 8 that project separately and each terminate with an end 80 provided with connectors 81 to obtain an electrical contact with said bars. The power supply 9 can be applied outside the compartment, as shown in the figure, and provided with a power cable with its plug. Alternatively, it can be placed away from the compartment and connected thereto with a conventional double wire cable. In any case, the two electrical cables 8 exiting the power supply are each connected to one of the two bars 7 by means of said connectors 81 so as to form a positive + and a negative - contact on said bars.

[0015] The panel 6 is a conventional flat element generally rectangular in shape, for example made of wooden or synthetic or glass material, having an upper edge 60 or an edge for engagement with the top, a lower edge 61 or an edge for engaging with the base 3 and two opposite side edges 62 or edges for engagement with the sides 2 of the compartment 1. Preferably, the side edges 62 are provided with a longitudinal groove 63 for engaging with said bars 7 (detail of figure 3).

[0016] Preferably, as also shown in figure 3, the bars 7 extend straight along the side edges 62 of the panel 6 and are associated therewith by gluing, fixing with known mechanical means such as screws or nails, or as better shown in the detail of figure 3, through means for interlocking or shape coupling with said groove 63.

[0017] In particular, the bars 7 comprise at least one seat 70 for inserting the connector 81 of the power cables 8. Preferably, said seat is obtained at the end of the bars in contact with the top (figure 2). Furthermore, the bars

preferably comprise a portion 71 engaging with the groove 5 of the sides 2 of the compartment 1, a second portion 72 engaging with the side edges 62 of the panel 6 and a seat 73 between said first portion 71 and second portion 72, opened towards the side inside the compartment, when the panels with the bars are mounted in the compartment, to receive a conductive element of a shelf, as explained below. The second portion 72 is preferably a protrusion 76 adapted to engage said groove 63 of the side edge of the panel 6.

[0018] Advantageously, said seat 73 in turn comprises a conductive element 74 which extends along the entire length of the bar, preferably in the form of a belt, and - on the one side - it makes an electrical contact with the connector 81 of an electrical cable 8 and - on the other side - it makes an electrical contact with the conductive element of the shelf, as described below. Preferably, the portion 71 engaging with the groove 5 of the sides 2 comprises a seat for housing an insulating element 75 carrying the conductive element 74 which extends along the entire bar 7 and it faces the seat 73.

[0019] In accordance with the present invention, the electrified back 4 described above cooperates with shelves 10 of the compartment 1 to deliver the electrical current for example to lighting systems mounted on said shelves. Preferably, the shelf 10 shown in figure 4 consists of a generally flat rectangular table made of wood, synthetic or mixed material or glass, having a first supporting face 11, a second face 12 opposite said first face, two side edges 13, a front edge 14 facing the opening of the compartment and a rear edge 15 opposite that of the front. In addition, the shelf 10 is provided with conventional seats for engaging with shelf support elements (not indicated with a reference number).

[0020] Preferably, near the front edge 14 and on the second face 12 of the shelf, a seat 16 is obtained for receiving a light source 17, such as a LED. Two electrical cables 18 run from the source 17 along the respective side edges 13 of the shelf and are housed in corresponding grooves 19 (only one shown in figure 4) up to a seat 20 for a connector 21 of the shelves.

[0021] The connector 21 comprises a support 22 made of insulating material formed as an elongated plate with a first face 23 engaging said side edge 13, provided with reversible coupling means 24 with the edge, such as for example a pin that fits into a corresponding hole obtained in said seat 20, and a second face 25 opposite the first. Preferably, a first end 26 of a conductive element 27 projects from the first face 23 as a metal tab, partially incorporated in said support 22, to obtain an electrical contact with a corresponding plug 28 (such as a standard Faston socket) of said electrical cable 18 of the source 17 (figure 5B). From the second face 25, a second end 29 of the tab 27 projects at one end of the support, preferably protruding with respect to the rear edge 15 of the shelf 10 when the connector is mounted on the same shelf. Said second end 29 is preferably folded with a curve protruding away from the side edge 13, thus form-

ing an elastic portion.

[0022] As shown in figures 5A and 5B, when a shelf 10 is mounted inside the compartment 1, the second ends 29 of the tab 27, protruding from the rear edge 15, are inserted within the seat 73 of the bars 7 so as to make an electrical contact with the conductive element 74 of the bar due to the elastic nature of the metal tab.

[0023] With reference to figures 6-8, the reference number 700 indicates a lateral bar of a back 400 according to a first embodiment variant of the invention.

[0024] In particular, the bar 700 is generally identical to the bar 7 described above, thus it will not be described further below and reference numbers identical to those of the bar 7 indicate the same elements or portions. In addition, it comprises a plurality of openings 701 obtained within the seat 73 for receiving the conductive element 27 of the shelf (figure 6). It should be noted that the plurality of openings 701 is preferably present along the entire extension of the seat 73 so as to form a sort of rack where the shelves can be coupled.

[0025] In fact, as shown in figure 7, the shelf 100 is substantially identical to the shelf 10 described above, thus identical reference numbers indicate identical elements. The shelf 100 differs in that the support 200 of the connector 201 comprises at least one hook element 101 extending from the end thereof which carries the second end 29 of the metal tab 27. Preferably, the connector comprises a plurality of hook elements 101 stacked longitudinally with respect to the bar 700.

[0026] Thus, as shown in figure 8, when the shelf 100 is mounted within the compartment 1, the support 200, previously fixed in the seat 20 thereof obtained on the side edge 13 of the shelf 100, is inserted into the bar 700 of the back 400 by engaging at least one hook element 101 with at least one of the holes 701. At the same time, the second end 29 of the metal tab 27 of the support 200 touches the conductive element 74 of the bar 700.

[0027] According to a second embodiment variant, as shown in figure 9, the bar 707 of the back 401 comprises a first portion 710 engaging with the channel 5 of the side 2, a second portion 720 engaging with the groove 63 of the panel 6, and a seat 730 between said portions 710 and 720 opened towards the inner side of the compartment, when the back 401 is mounted in the compartment, to receive the conductive element of the shelf. In particular, a conductive element 74 identical to that described above is leaning on or housed in the second portion 720 engaging with the groove 63 of the panel 6, rather than in the first portion 710. Thus, the second portion 29 of the metal tab 27 of the conductive element of the shelf 10 (not shown) will face the second face 23 of the corresponding support 22 so as to make due contact with the conductive element 74 of the bar 707.

[0028] A third embodiment variant of the back of the present invention is shown in figure 10. The back 404 comprises a panel 600 substantially identical to the panel described above and perimetrically enclosed by a frame comprising two electric bars 770 which connect with two

preferably non-electric bars 740. Preferably, the electric bars are mounted vertically while the non-electric bars are mounted horizontally on the panel, when the panel is in turn mounted in the compartment in conditions of use.

[0029] As better shown in figure 11, the electric bars 770 comprise a first portion 771 engaging with the groove 5 of the sides 2 of the compartment 1 and a second portion 772 engaging with said panel 600 and with a panel cover 39. Between these two first 771 and second 772 portions there is a seat 773 adapted to receive the second end 29 of the conductive element 27 of a shelf, as explained below, and facing inside which is a conductive element 74 identical to that described above.

[0030] Preferably, the first portion 771 is identical to the first portion 71 of the bar 7 described above. The second portion 772 comprises a seat 774 for interlocking with an edge of the panel 600 and a seat 775 for engaging with a cover element 39 of the panel 600. Also said seat 775 preferably extends along the entire bar 770 for the reversible engagement with the cover element. In addition, the ends of the bar 770 may each be provided with a hole 776 for engaging with an L-shaped connecting element 777 (figure 10) between the electric bars 770 and the non-electric bars 740. Said ends will preferably be cut at 45° to form a continuous frame with the non-electric bars.

[0031] The non-electric bar 740 (figure 10) comprises a first portion 741 engaging with the groove 5 of the base 3 or top, and a second portion 742 engaging with the panel 600 and the cover element 39. In particular, the second portion 742 comprises a first seat 743 engaging with an edge of the panel 600 and a second seat 744 engaging with said cover element. In addition, the ends may each be provided with a hole 745 for engaging with the aforementioned connecting element 777.

[0032] As shown in figures 10 and 11, in fact, the preparation of the back 404 in accordance with the present embodiment is simple, as it is sufficient to first mount, for example, the electric bars 770 on the respective edges of the panel 600 by engaging with the aforementioned first seat 774. Subsequently, the connectors 81 of the power supply cables 8 and the L-shaped connecting elements 777 are applied to the ends of each of the non-electric bars, each in the corresponding holes (not indicated). Next, the non-electric bars 740 are mounted on the respective edges of the panel so as to also engage with the electric bars, thus forming the frame of the back 404.

[0033] At this point, the back 404 can in turn be mounted in the compartment 1 in a completely conventional manner by inserting the electric and non-electric bars in the corresponding grooves 5 of the sides 2 and the base 3.

[0034] A cover element 39 may be applied to the back 404 before or after mounting the same back in the compartment. Preferably, the cover 39 may comprise a frame 38 adapted to engage the second seat 775 of the electric

bar 770 and the second seat 744 of the non-electric bar 740.

[0035] The engagement with an electric shelf 10 as described above occurs in the same manner. The only precaution will be to use a connector 21 with the support 22 thereof which protrudes more than the rear edge 15 of the shelf, since the thickness of the back 404 will be greater for the presence of the cover. In any case, as shown in figures 12A and 12B, the electrical contact will be made with the same elements in the same arrangement and therefore will not be described herein.

[0036] The "rack" bar exemplified above can also be adopted in the bar in accordance with the present embodiment of the back 402 (see figure 13), keeping the above shelf structure unchanged. In practice, the back 402 is provided with a bar 750 comprising a seat 753 for obtaining an electrical contact between the conductive element 74 of the bar and the second end 29 of the tab 27 of the shelf contact. This seat 753 is provided with holes 711 engageable by corresponding hook elements 111 to reversibly lock the shelf 100 to the back while simultaneously obtaining the aforementioned electrical contact to activate a lighting system.

[0037] With reference to figure 14, the number 50 indicates a back according to a fifth embodiment, comprising an electric bar 51 engaging with the grooves 5 obtained on the sides 2. The bar 51 comprises a first portion 52 engaging with said channels, a second portion 53 engaging with a side edge of a back panel, and a seat 54 between said first and second portions. The first portion 52 and seat 54 are identical to those described above. The second portion 53 comprises a longitudinal seat 55 adapted to house a glass pane 56, preferably through the interposition of a rubber gasket 57.

[0038] With reference to figure 15, in accordance with a sixth embodiment, the back 90 comprises an electric bar 91 engaging with the channels 5 obtained on the sides 2. The bar 91 comprises a first portion 92 engaging with said channels, a second portion 93 engaging with a side edge of a back panel 600, and a seat 94 between said first and second portions. The first portion 92 and seat 94 are identical to those described above. The second portion 93 is substantially identical to the second portion 772 described with reference to figures 10 and 11. In particular, this second portion 93 comprises a longitudinal seat 95 for engaging with a perimeter edge of a panel 600, a hole (not indicated) for receiving a connector of an electrical current supply cable, as described above.

[0039] The back 90 further comprises a further non-electric bar 96 provided with a seat 97 engaging with a perimeter edge of a glass pane 98. The electric bar 91 and the non-electric bar 96 can be coupled one above the other through fixing means 99 such as Velcro, interlocking means, magnets, snap buttons. In this way, advantageously, the panel 600 may carry lighting elements (not shown) that back light the glass pane 98 mounted in front of the same panel.

[0040] From what has been explained so far, it is clear that the disadvantages related to the electrification of furniture according to the known technique have been overcome.

[0041] In fact, first of all, it is not necessary to modify the standard structure of the sides, bases and tops of any compartment of a piece of furniture.

[0042] Furthermore, it is not even necessary to provide a specific wiring to electrify the compartment.

[0043] Consequently, many different types of sides, bases, tops and wirings can be avoided for different warehouse needs, with the evident reduction of production and management costs of such a complex warehouse.

[0044] With the preparation of the aforementioned special bars applied to the backs it is possible to provide a warehouse with only two types of product, namely electrified backs and non-electrified backs.

[0045] In addition, the structure of the electrified backs appears advantageously simple, without complex connections or housed cables and to be accommodated and fixed in an uncomfortable and risky manner.

[0046] The backs are also particularly versatile because, as shown, they can allow to deliver the electrical current to lighting systems mounted on shelves, drawers, trolleys, removable baskets.

[0047] The advantageous arrangement of an electrical contact along the entire electric bar of the back allows to move the shelf inside the compartment at any desired height according to specific needs or preferences, without being forced to resort to the complicated assembly and disassembly of components. In other words, it is not necessary to shorten or lengthen cables thanks to the electrical contacts obtained as described above.

[0048] The possibility of covering the inner surface of the back compartment is then an additional aesthetic, valuable and functional advantage, as it can protect the same back against shock or other inadvertent damage, especially if the power supply is housed on the outer face of the back.

[0049] The back according to the present invention is also subject to variations and modifications all within the reach of the person skilled in the art, although without leaving the scope of protection of the appended claims.

[0050] For example, the shapes of the bars described and shown may vary according to particular needs, while maintaining a portion engaging with the standard grooves of the sides, base and top of a compartment. Thus, also the first embodiment that provides a bar having a portion engaging with the back panel adapted to fit into a groove of the edge of the same panel can be replaced by a seat that engages the edge of the panel without grooves.

[0051] The back panel can carry lighting systems such as point or bar LEDs, OLEDs or LECs, even moulded directly on supports or on the panel. This type of lighting can advantageously be used to back-light a decorative cover element, such as a fabric or a panel designed or coloured in such a way as to easily obtain a particularly precious aesthetic effect, or even opaline glass or trans-

parent glass. This type of light source can also be used on shelves.

[0052] The conventional shelves can be associated with the aforementioned racks and corresponding hooks to increase the load strength of shelves or drawers.

Claims

1. Electrified back (4;400;401;402;404;50;90) for furniture comprising a generally flat panel (6;56;600) and at least a pair of rectilinear and electric bars (7;700;707;770;51;91) reversibly mounted onto two opposite edges of said panel, wherein said bars (7;700;707;770;51;91) comprise a first portion (71;710;771;52;92) adapted to engage with corresponding channels (5) of sides (2) of furniture, a second portion (72;720;772;53;93) adapted to engage with a side edge of said panel, and a seat (73;730;773;753;54;94) positioned between said first and second portions and open on at least one side towards one of the two faces of the panel, said seat comprising an electrically conductive element (74) longitudinally extending inside said seat, and said bar comprising a further seat (70) adapted to receive a connector (81) of a power supply (9) to make an electrical contact with said electrically conductive element (74). 10
2. Back (400) according to claim 1, wherein said bar (700) comprises a plurality of apertures (701) obtained within said seat (73). 15
3. Back (401) according to claim 1 or 2, wherein said electrically conductive element (74) is leaned against or housed within said second portion (720) engaging with said side edge of the panel (6). 20
4. Back (404) according to claim 1 or 2, wherein said panel (600) comprises two electric bars (770) joining with two preferably non-electric bars (740), the electric bars comprising a first portion (771) engaging with the channel (5) of the sides (2), a second portion (772) engaging with said panel and a panel cover (39), and a seat (773) between said first and second portions, said non-electric bars (740) comprising a first portion (741) to engage the channel (5) of the bottom (3) or top of a piece of furniture and a second portion (742) engaging with the panel (600) and the panel cover (39). 25
5. Back (4;400;401) according to any one of claims 1 to 3, wherein said second portion (72;720) of the bar (7;707) comprises a protrusion (76) adapted to engage a groove (63) on said side edge of said panel (6). 30
6. Back (404;402;50;90) according to any one of claims 1 to 3, wherein said second portion (72;53;93) of said electric bar (770;750;51;91) comprises a longitudinal seat (774;55;95) adapted to house an edge of said panel (600;56) eventually through the interposition of a rubber gasket (57). 35
7. Back (90) according to any one of claims 1 to 3 and 6, comprising a further non-electric bar (96) provided with a seat (97) engaging with a perimeter edge of a glass pane (98), the electric bar (91) and the non-electric bar (96) being joinable through fixing means (99). 40
8. Electric shelf (10;100) for furniture comprising a seat (16) obtained on a second face (12) to house a light source (17), grooves (19) at side edges to house electric wires, said grooves reaching a seat (20) for a connector (21;201) protruding from a rear edge (15) of the shelf adapted to electrically contact a conductor element (74) of an electric back according to any one of claims 1 to 7. 45
9. Electric shelf (100) for furniture according to claim 8, wherein the connector (201) comprises a support (200) provided with at least one hook (101) extending from the end thereof and adapted to engage at least one of said apertures (701) of said bar (700) of said back (400). 50
10. Furniture comprising a back (4;400;401;402;404;50;90) according to any one of claims 1 to 7, and an electric shelf (10;100) according to claim 8 or 9. 55

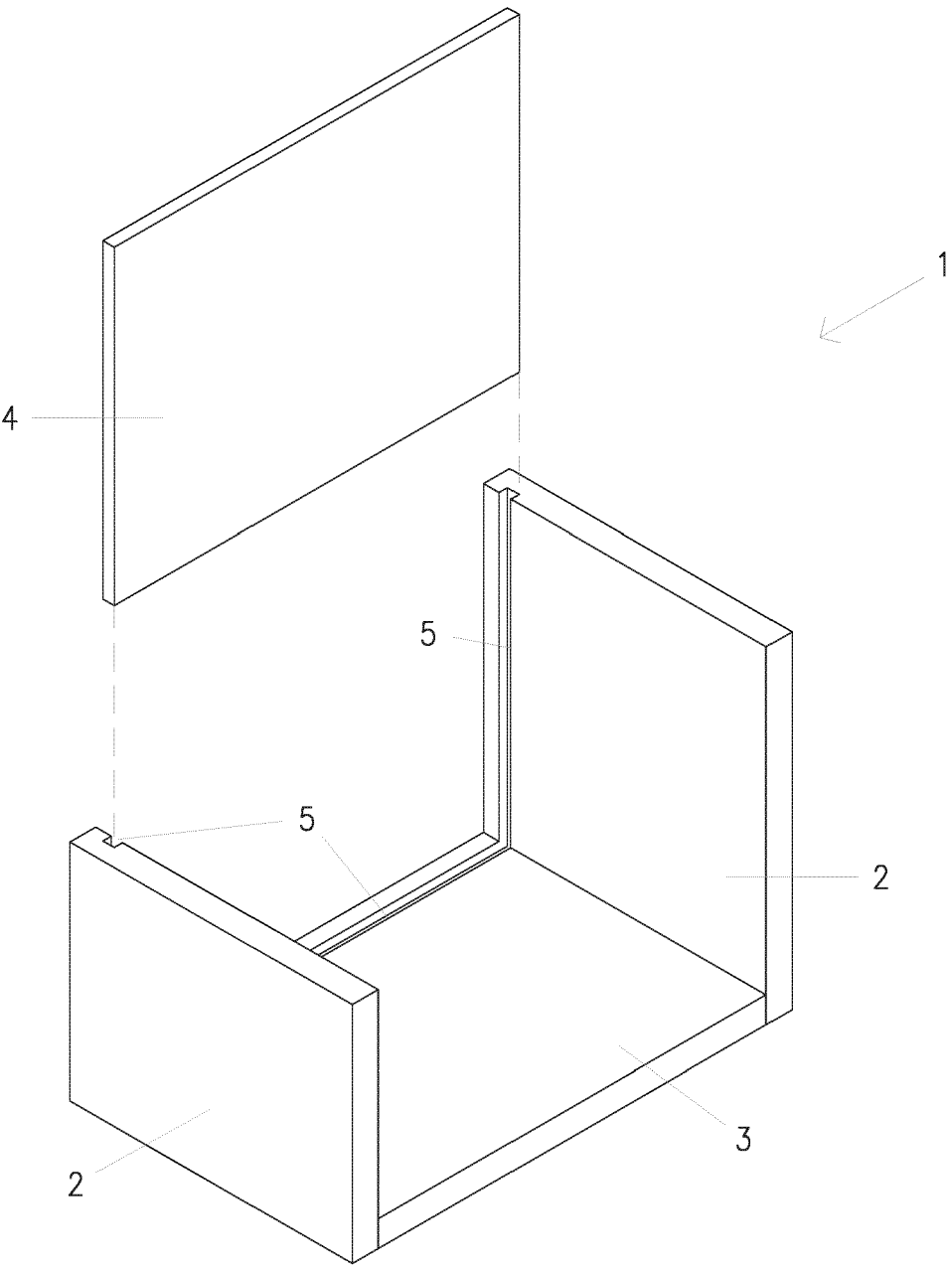


FIG. 1

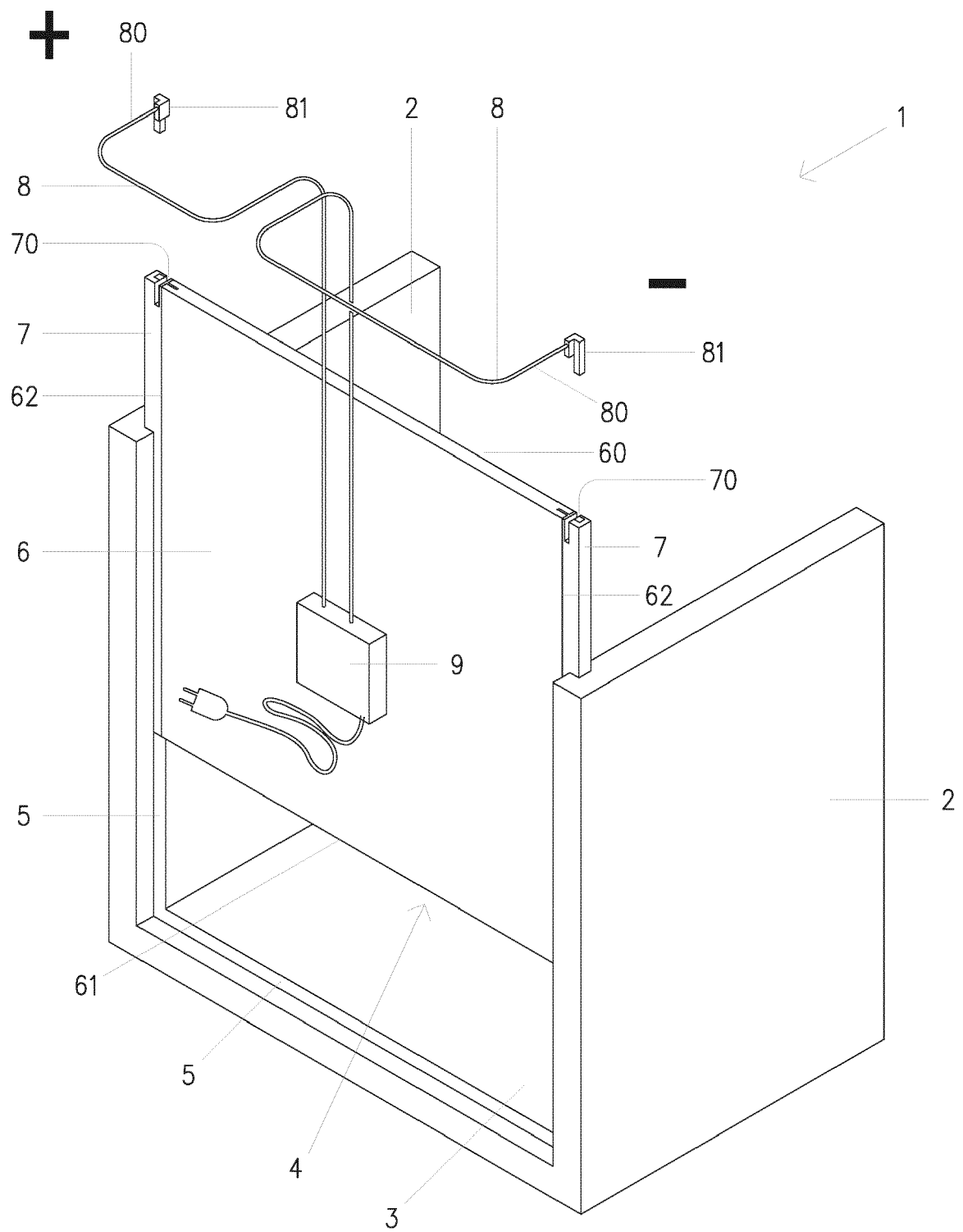


FIG. 2

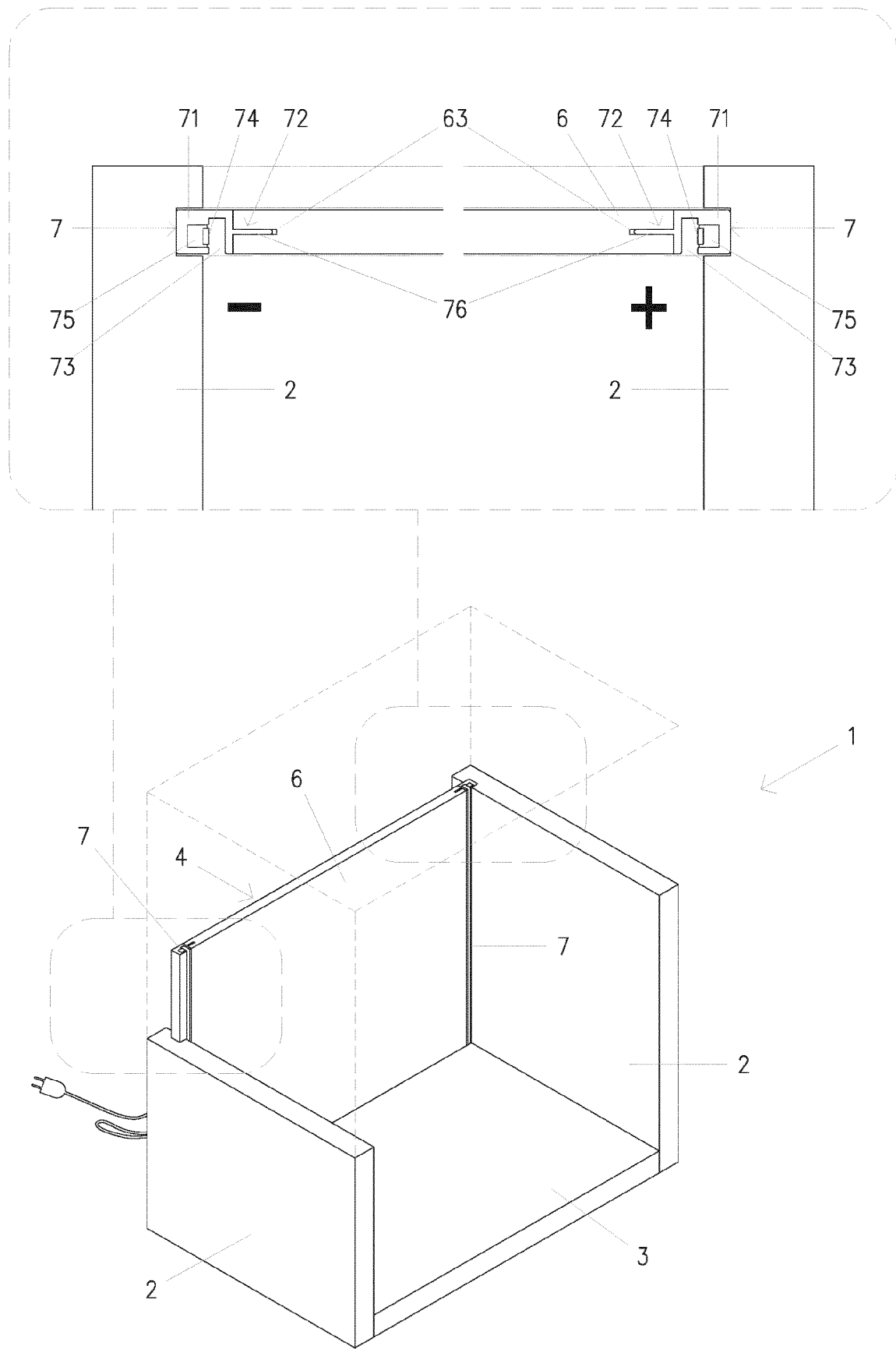


FIG. 3

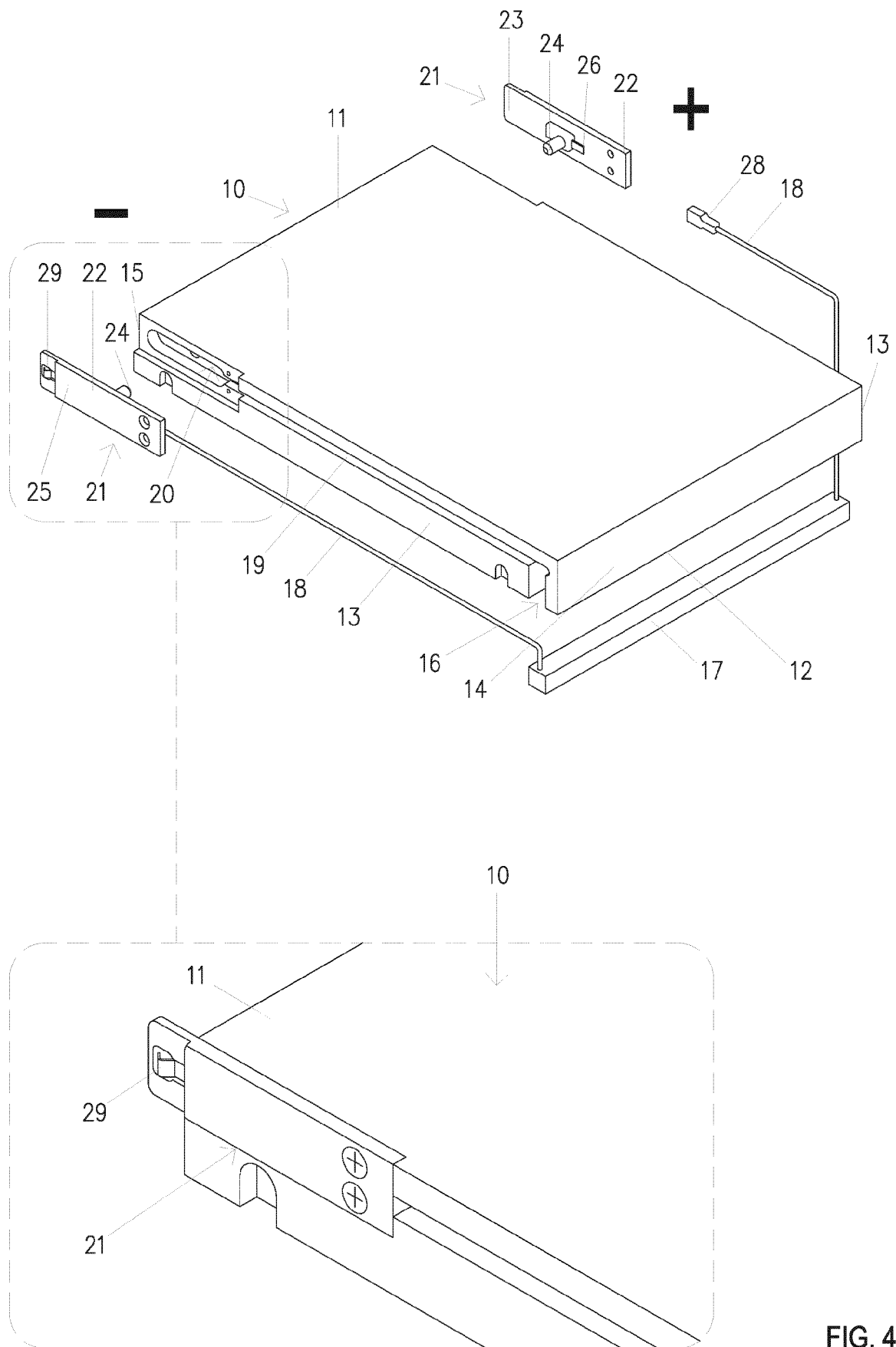


FIG. 4

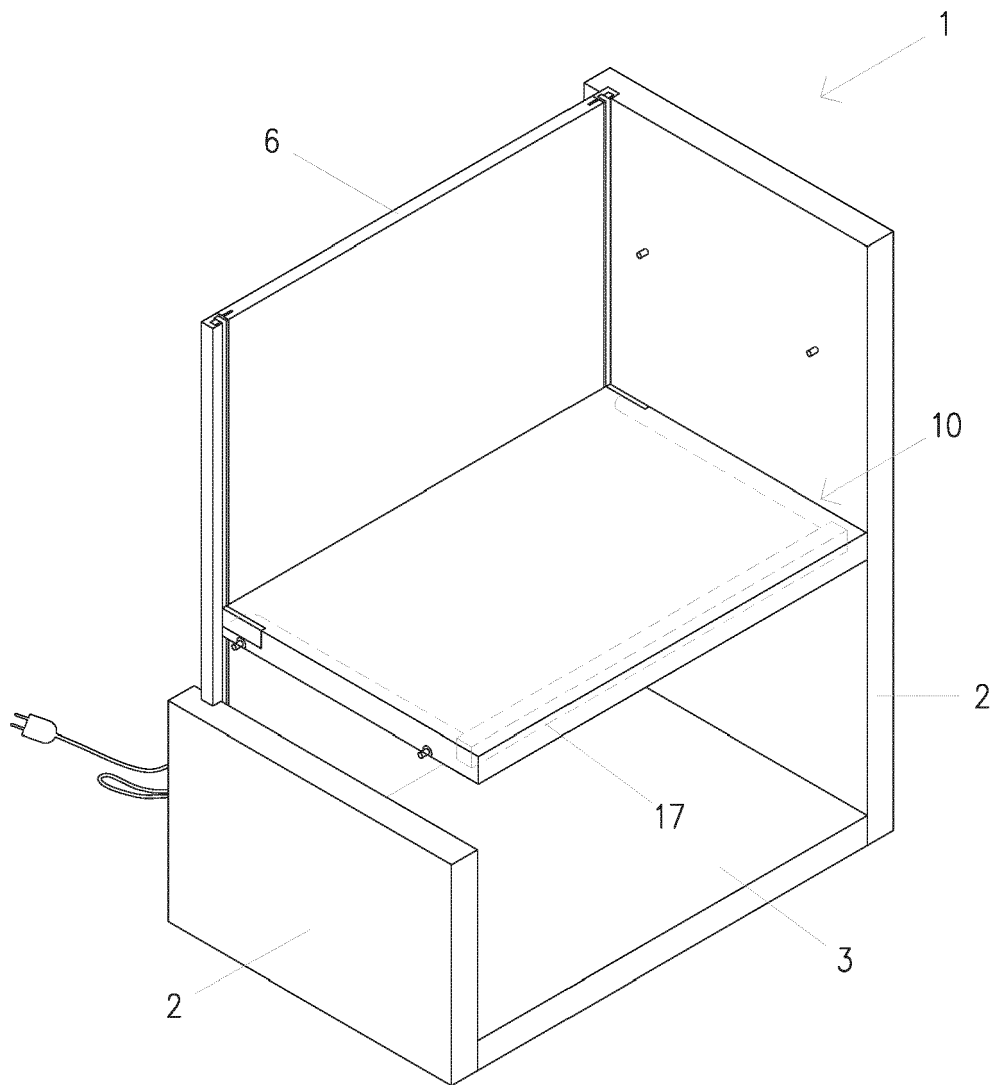


FIG. 5A

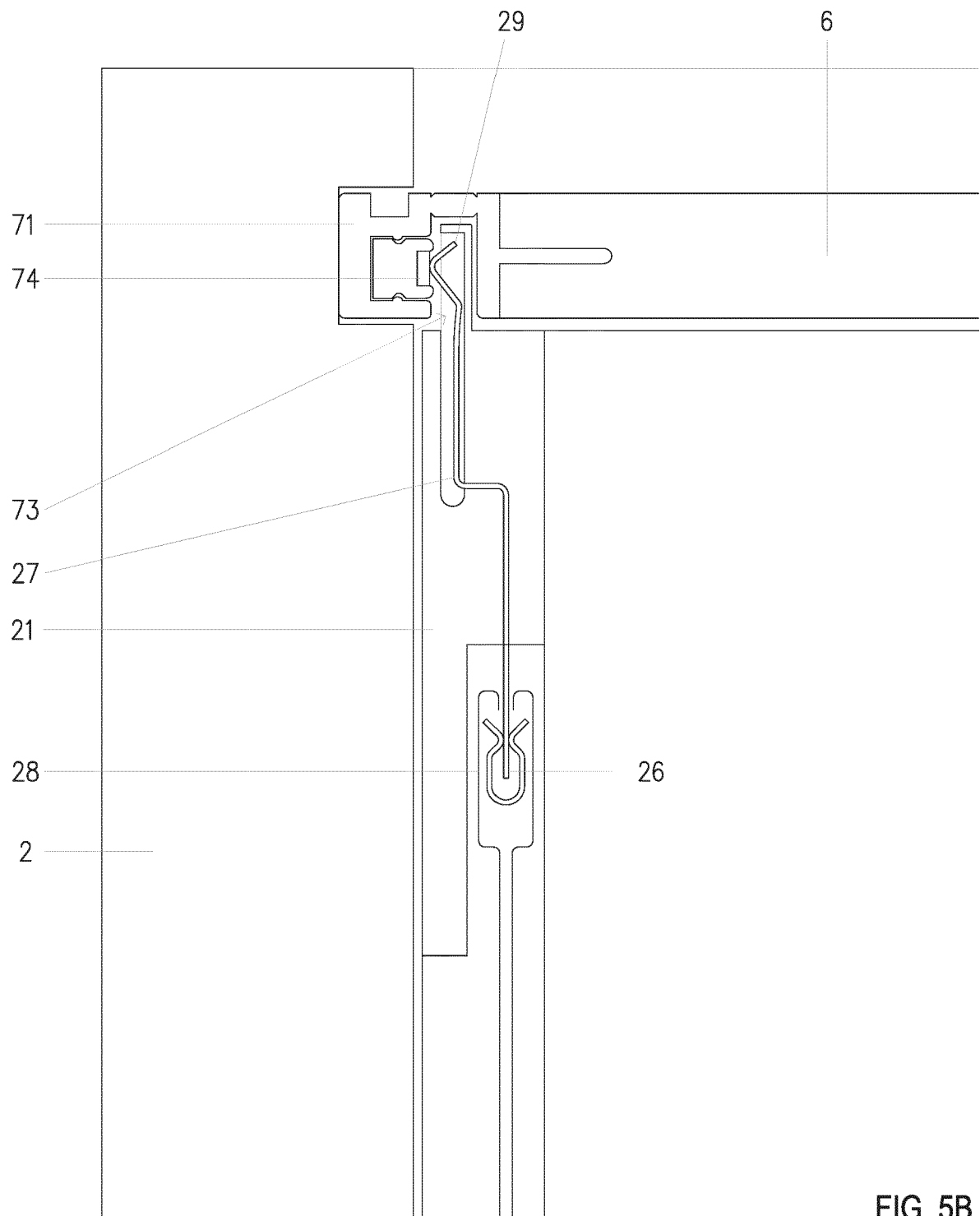


FIG. 5B

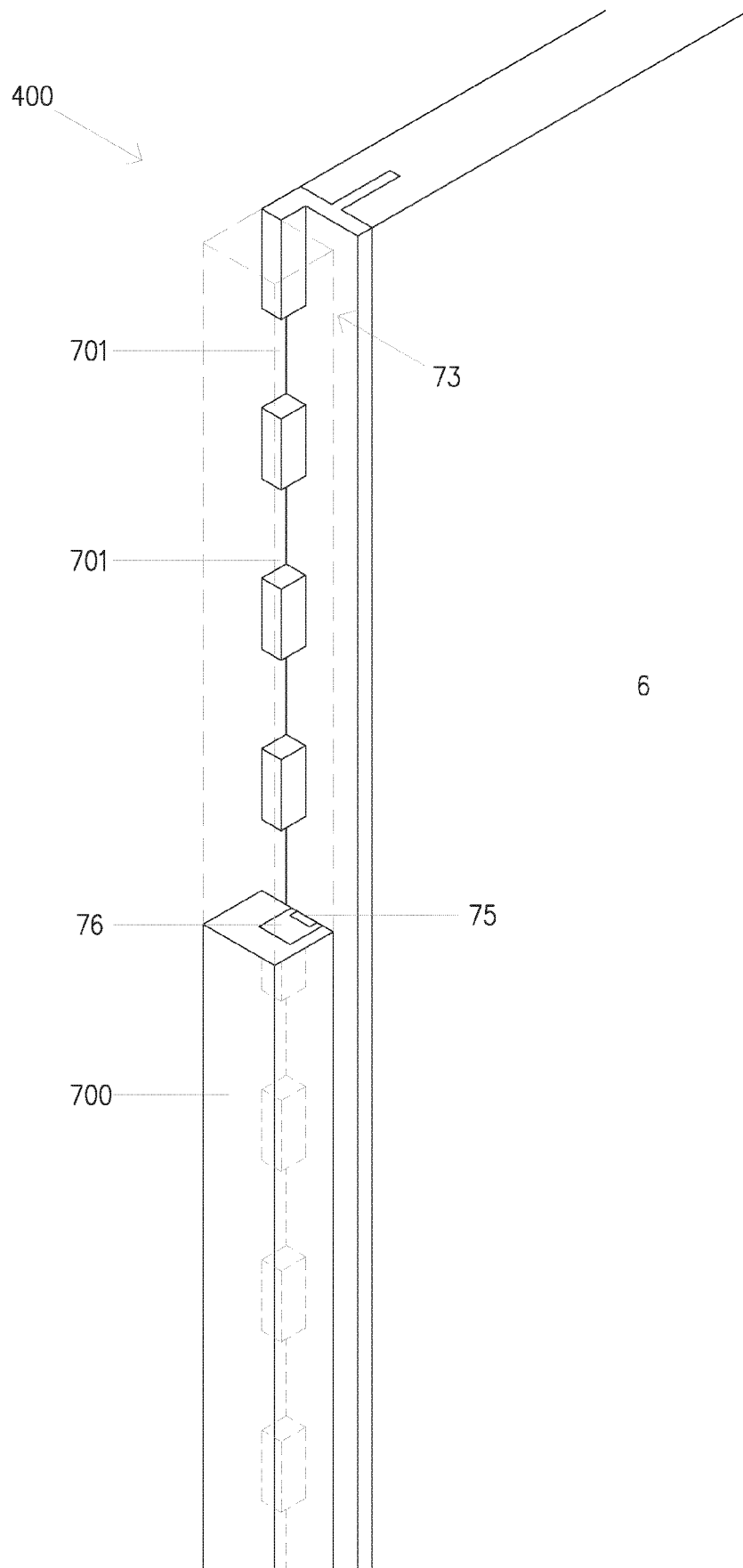


FIG. 6

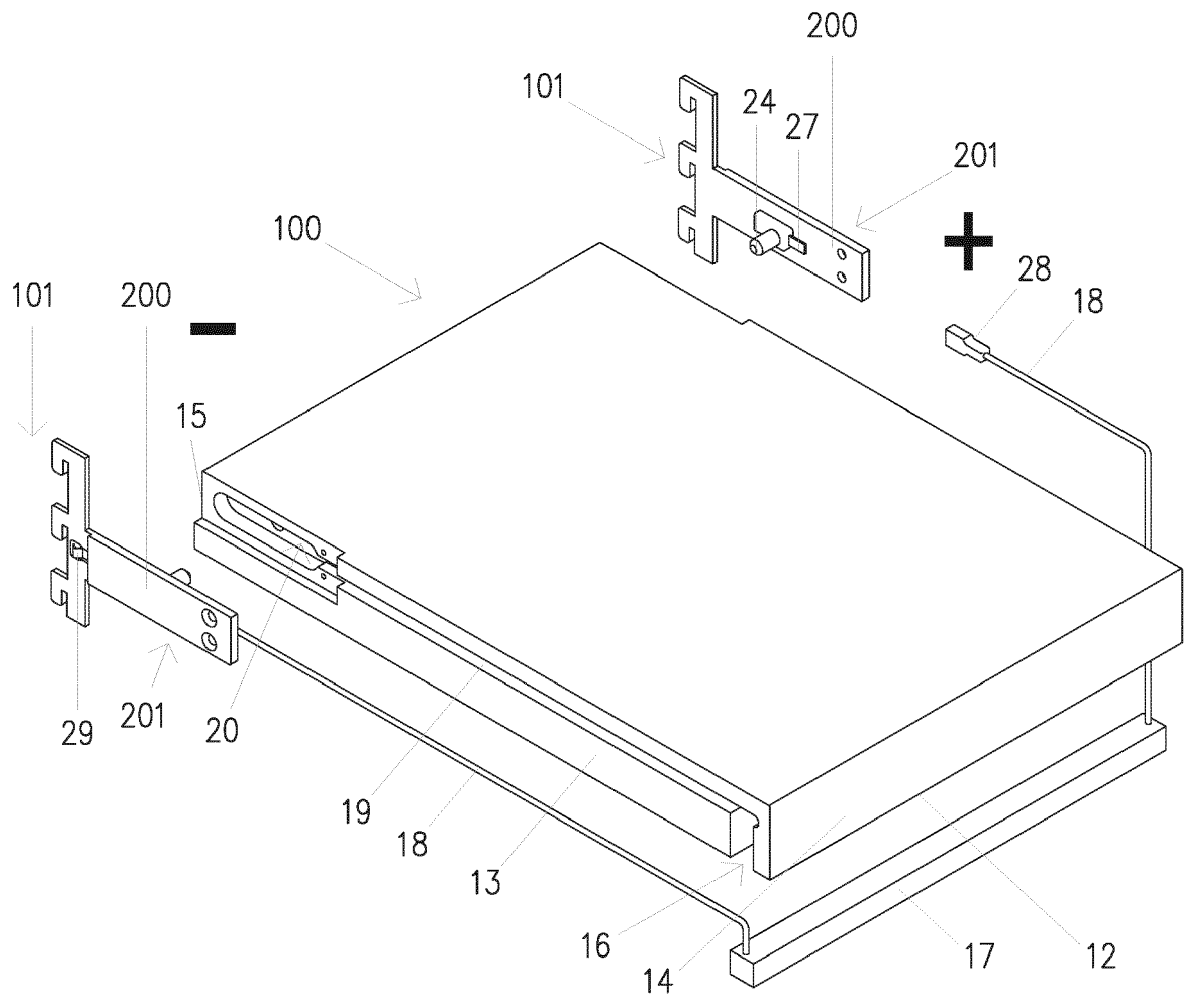
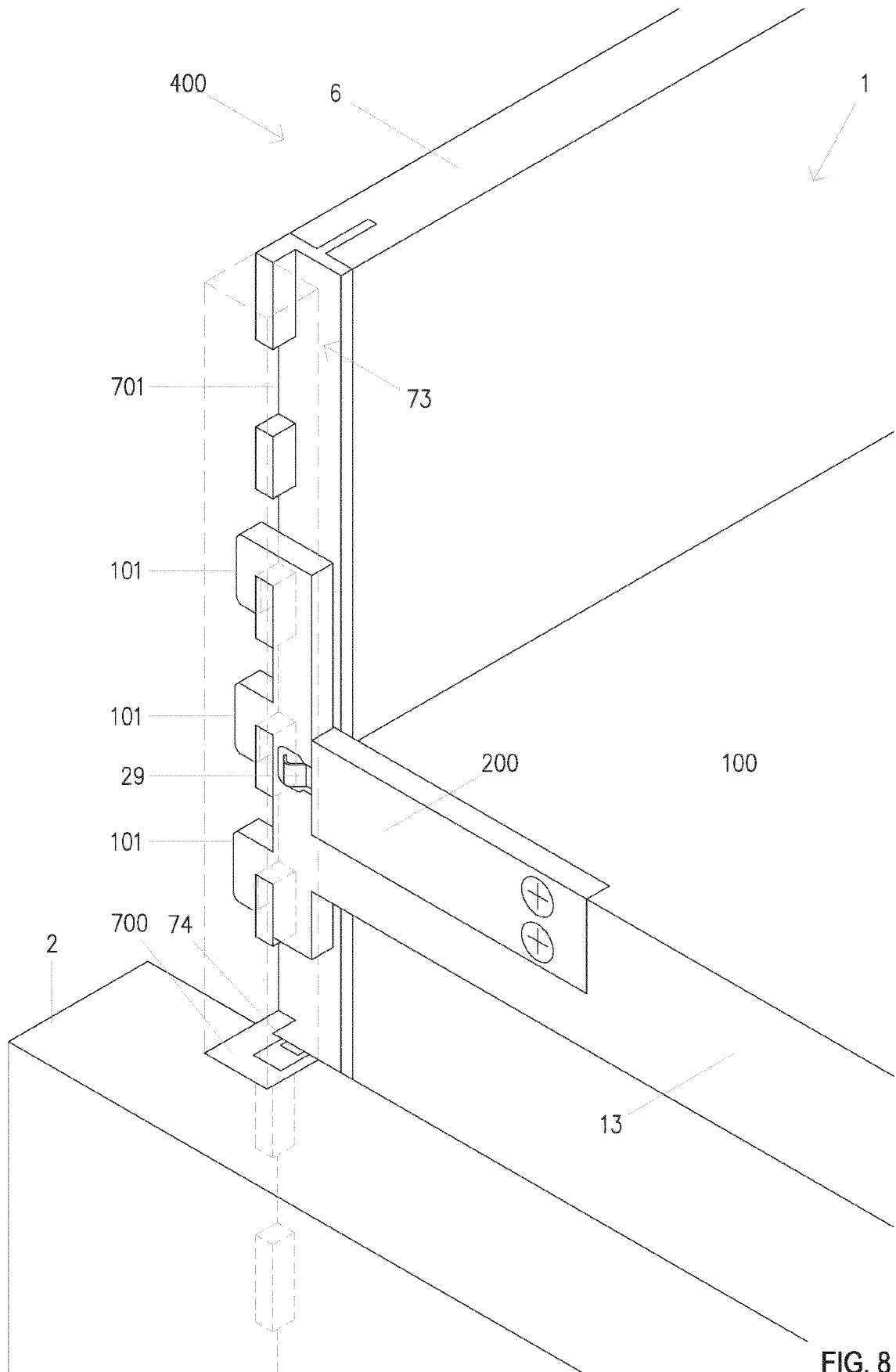


FIG. 7



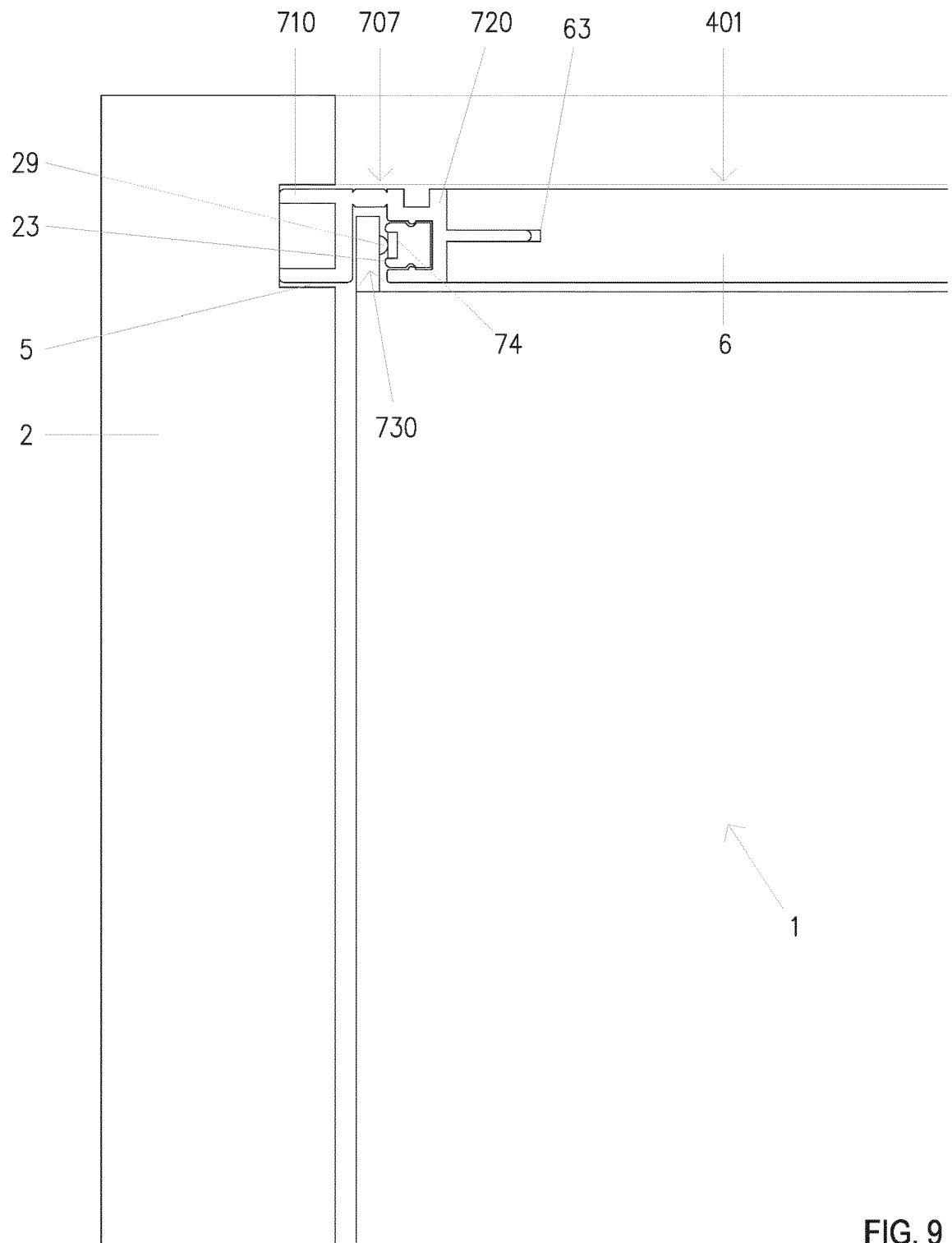


FIG. 9

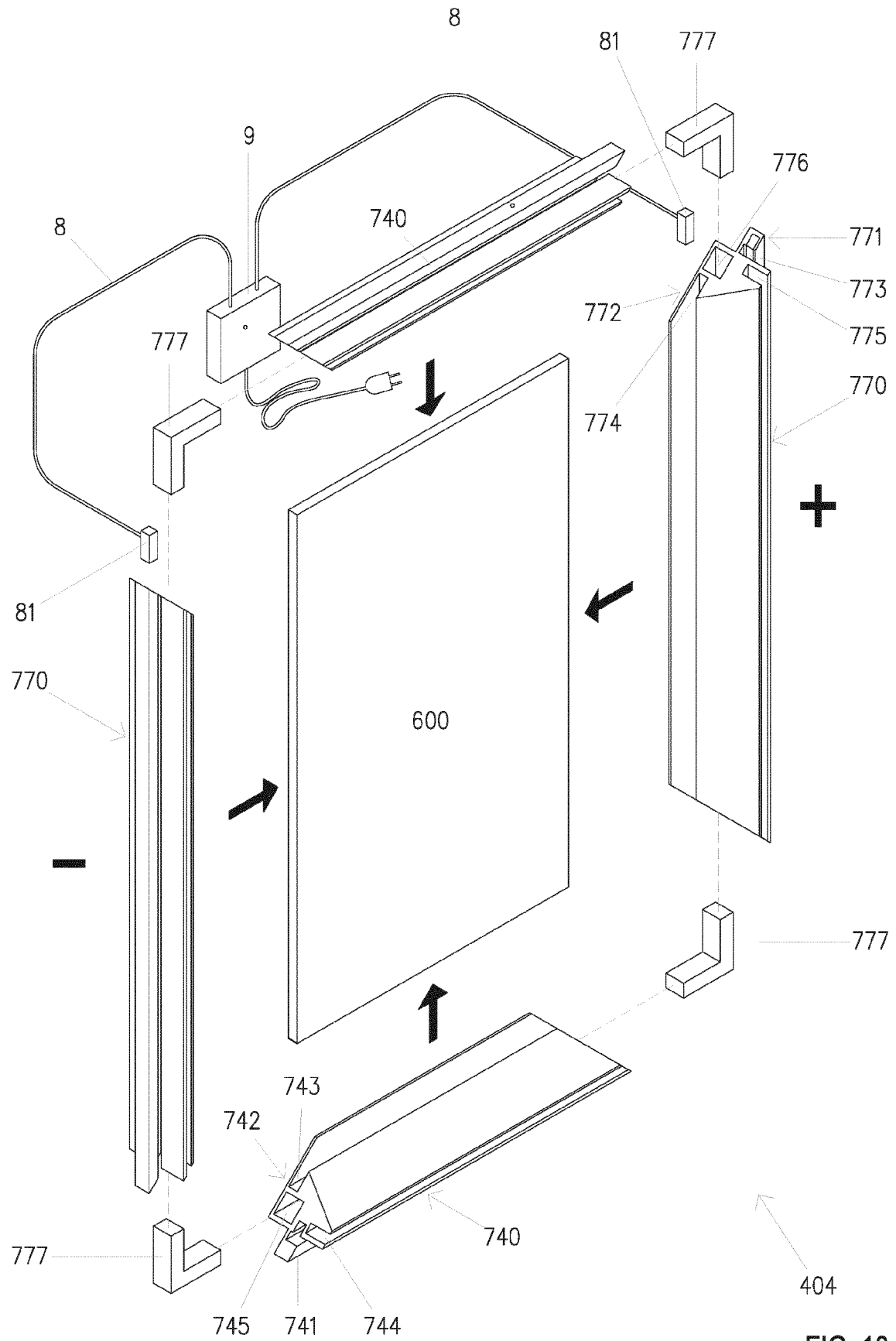


FIG. 10

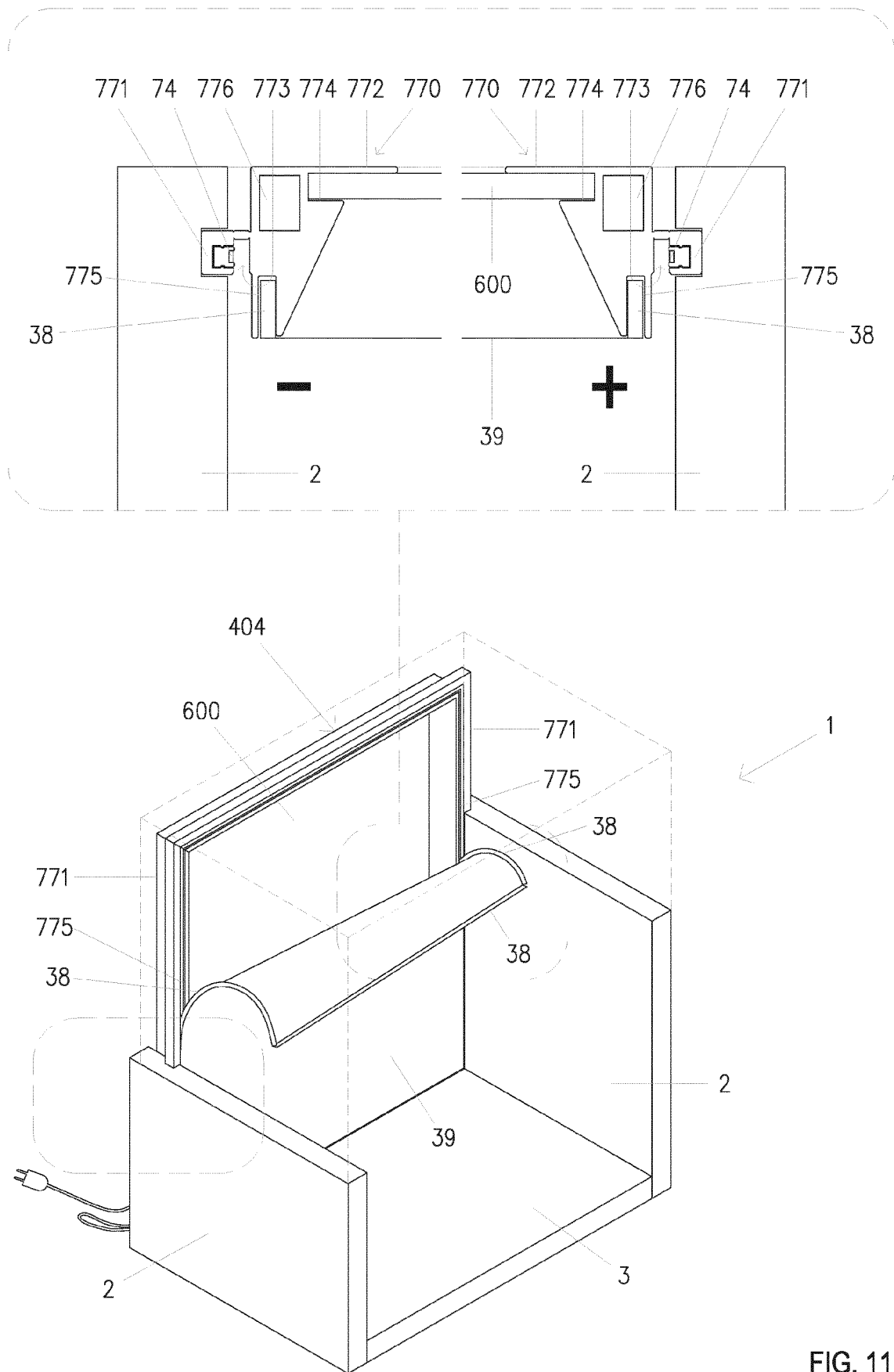


FIG. 11

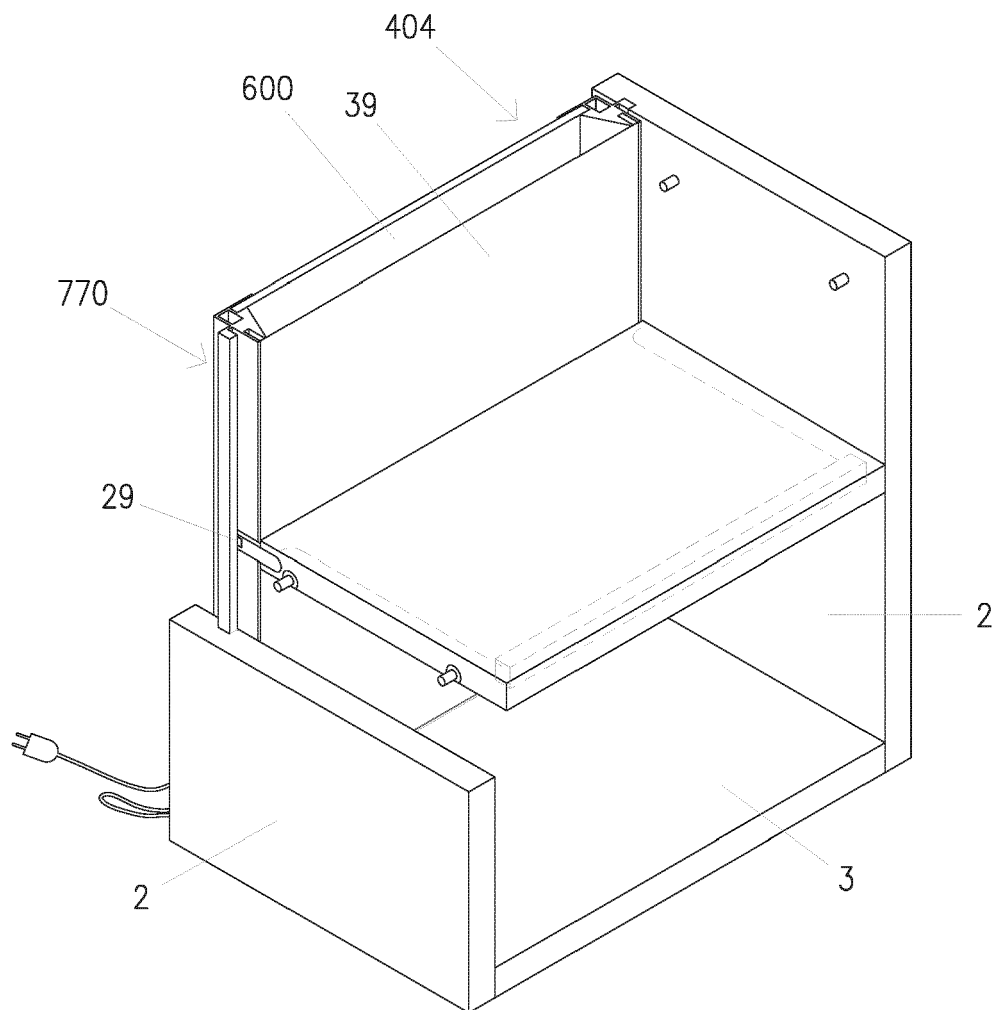


FIG. 12A

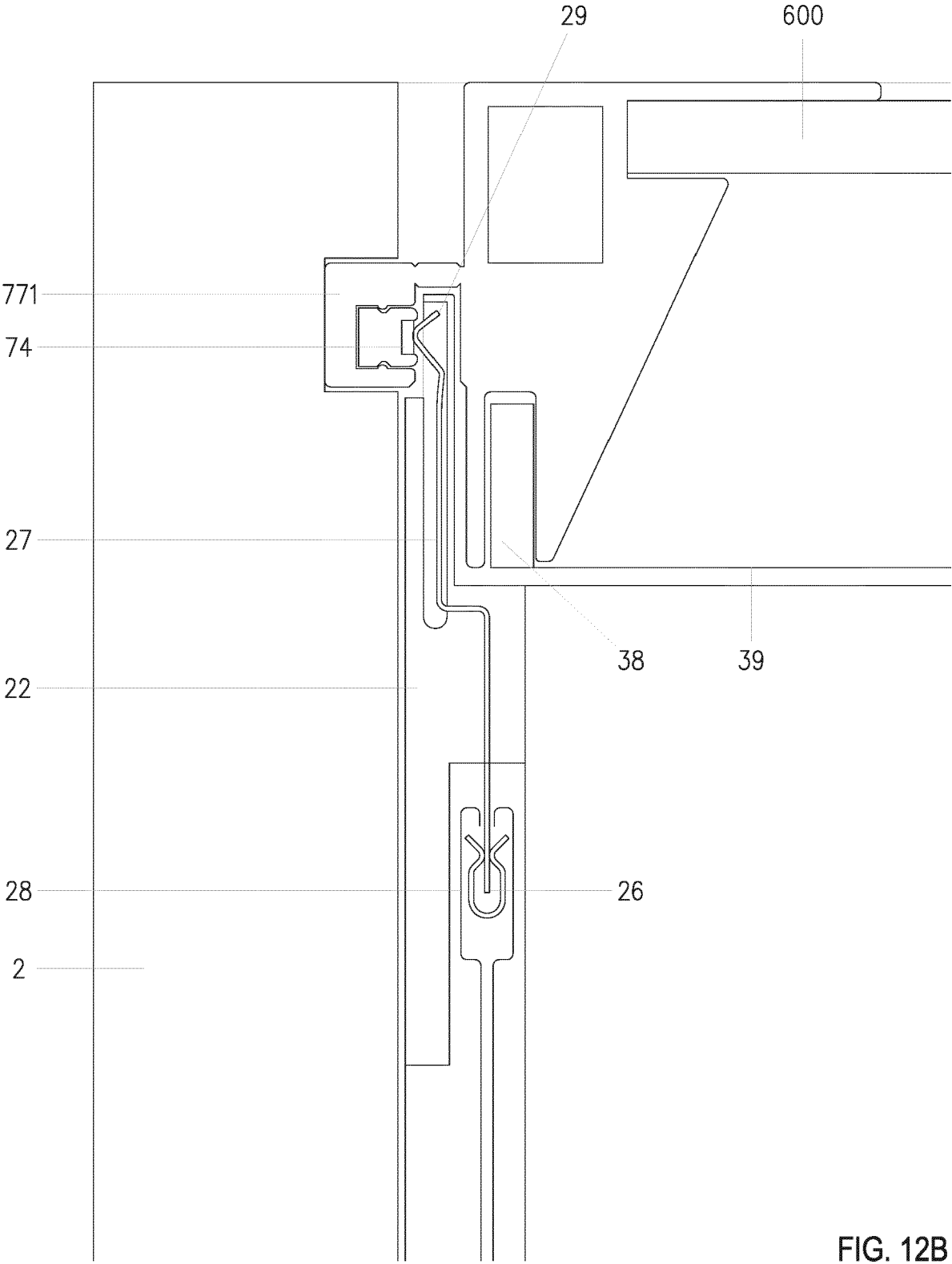
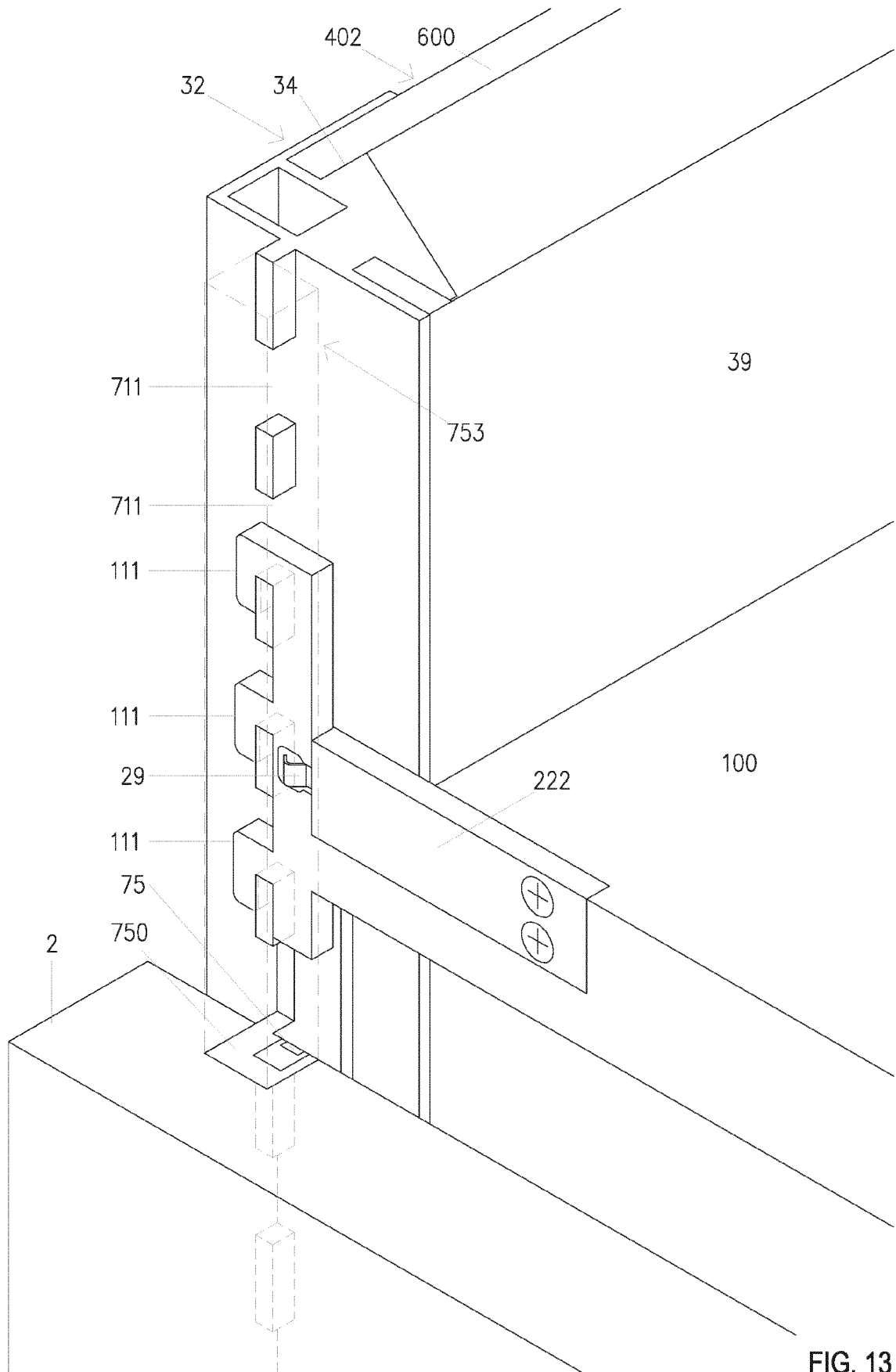


FIG. 12B



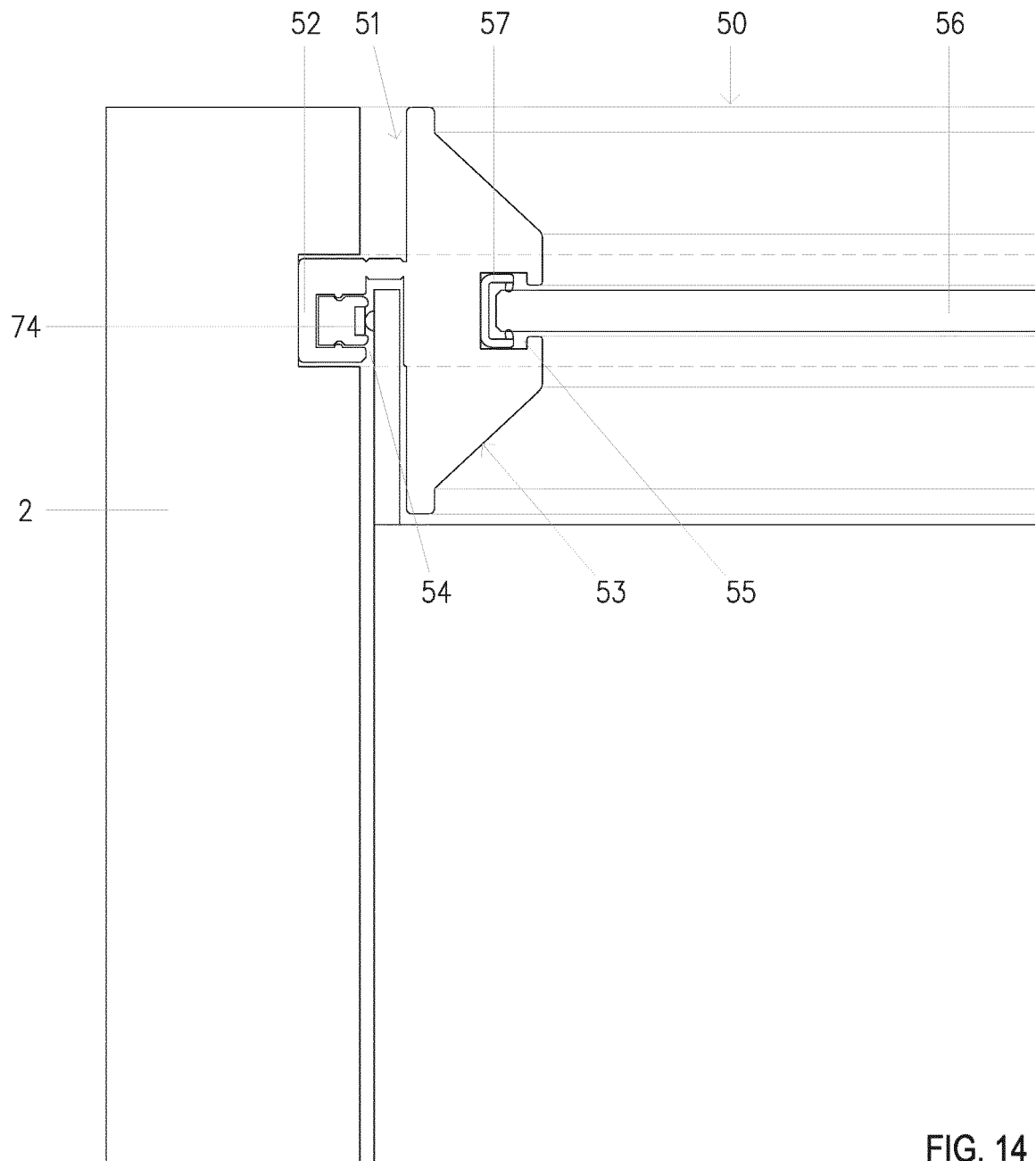


FIG. 14

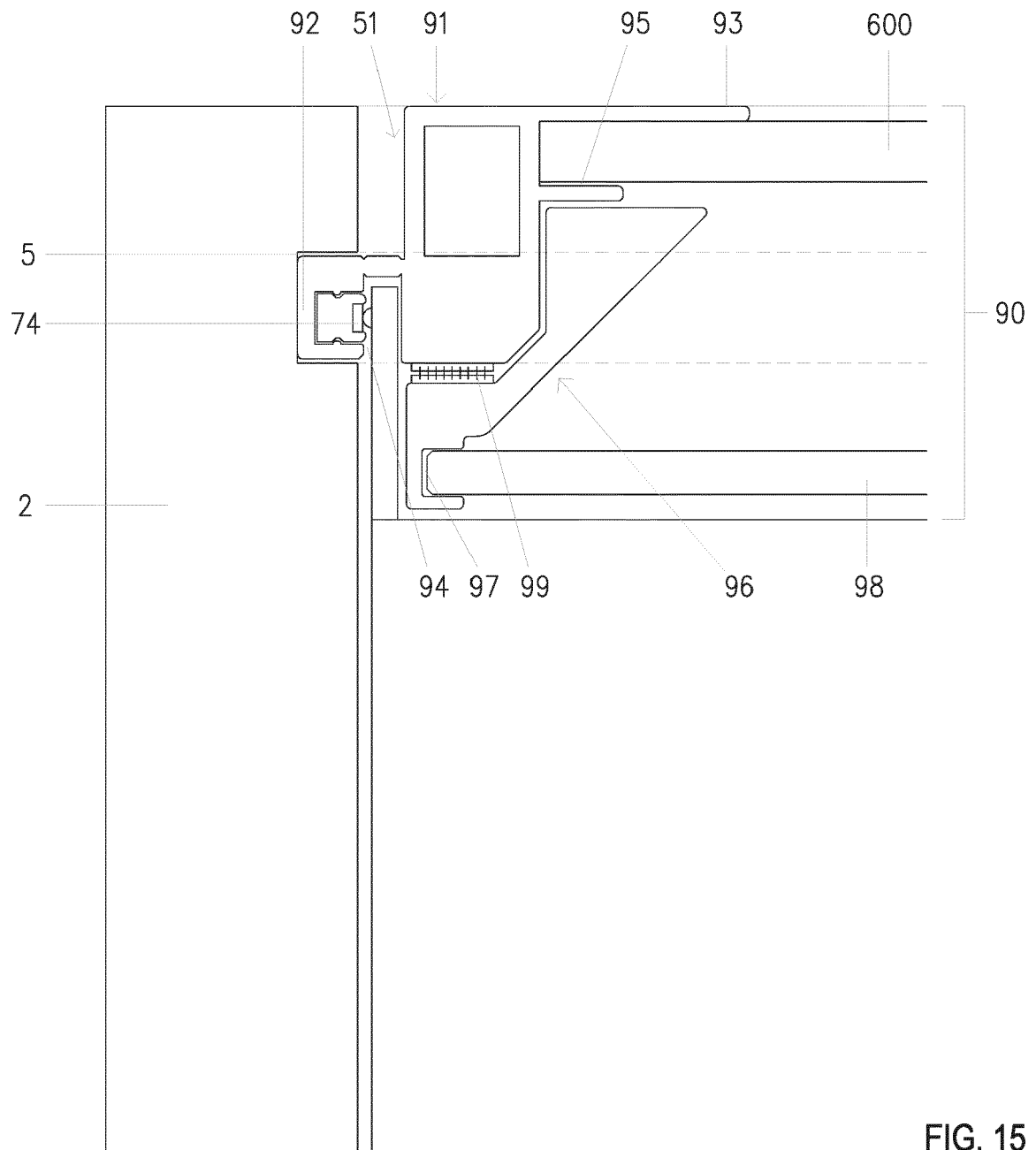


FIG. 15



EUROPEAN SEARCH REPORT

 Application Number
EP 20 17 3671

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EPO FORM 1503 03.82 (P04C01)

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	WO 03/070060 A1 (VISPLAY INT AG) 28 August 2003 (2003-08-28)	1,3-5,7	INV. A47B57/20 A47B57/34
Y	* figures 1B, 2A *	10	

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