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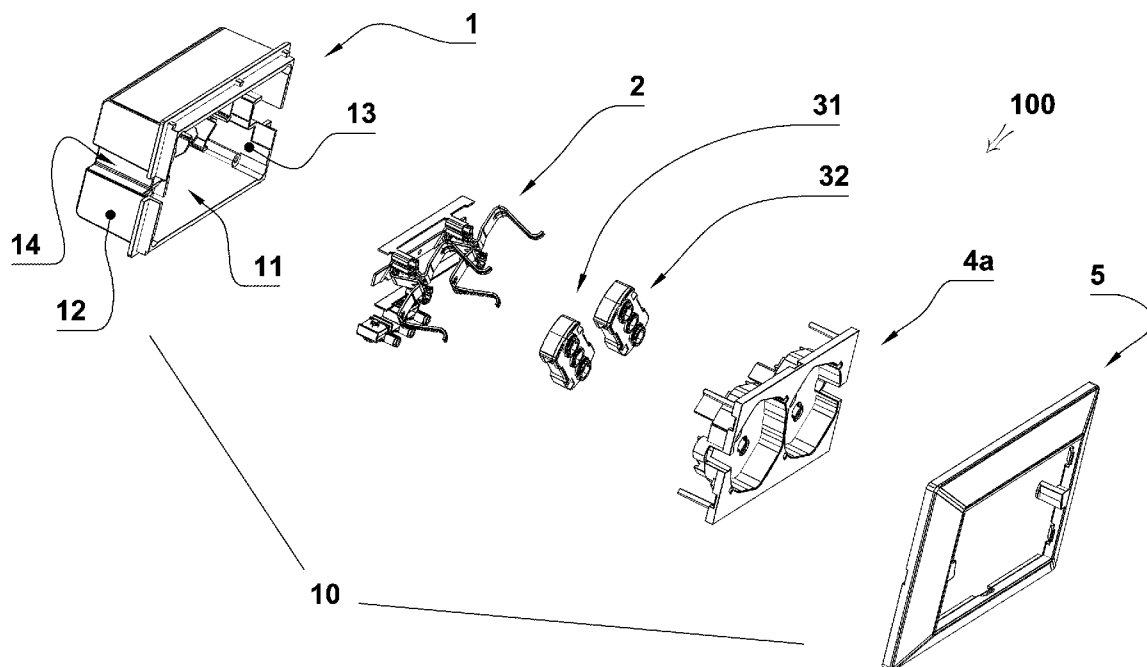


Fig. 1a

(57) Abstract: The invention is a pre-wired double socket (100), recessed or wall-mounted, comprising a containment casing (10) provided with a front plate in turn comprising a main surface with two cavities for sockets and two lateral holes for the insertion of the casing's fixing screws, and wherein the distance between the axes of said lateral holes (46) is equal to the standard distance established for standard three-module electrical boxes.

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PRE-WIRED DOUBLE SOCKET FOR THREE-MODULE ELECTRICAL BOX

DESCRIPTION

The present patent relates to electrical sockets and in particular concerns a
5 new pre-wired double socket for a three-module electrical box.

The prior art includes various types of electrical sockets for the insertion of
corresponding types of electrical plugs.

For example, the prior art comprises 10A electrical sockets, called P11,
equipped with three holes to enable the connection with the corresponding
10 plugs featuring three aligned poles.

The prior art also comprises 16A electrical sockets, called P17, having
larger holes spaced further apart than those of the P11 version and intended
for the connection with two or three-pole plugs.

The prior art also comprises 16A bivalent P17/P11 sockets, with holes and
15 shaped connections for the selective insertion of both types of plugs.

These bivalent sockets use the space of a single unit, and therefore, up to
three can be installed in one of the standard three-module boxes currently on
the market.

In addition, the prior art includes grounded sockets, known as Schuko
20 sockets or German sockets, configured for the connection to corresponding
Schuko or German plugs. Schuko sockets have a substantially circular
cavity with two circular holes on the bottom of the cavity and two
diametrically opposite clips on the two sides of the cavity, for the protective
earthing of the device to be connected through the plug.

25 Schuko sockets are bulkier than the sockets described above, so much so

that in a standard box, of the type that can contain three P17 sockets, a single Schuko socket can be currently installed.

Multipurpose sockets are also known in the prior art, also known as P40, which are a combination of a Schuko and a bivalent socket and which
5 enable the selective connection of the plugs for P11 and P17 sockets and the Schuko plugs with no need for adapters.

Like the Schuko sockets, multipurpose sockets have a large body.

The object of this patent is a new pre-wired double socket for a three-module electrical box, comprising two P40 multipurpose or Schuko type
10 sockets integrated in a containment casing which in turn can be installed in a standard three-module recessed or external box.

Another object of the present invention is to integrate two P40 multipurpose sockets in a containment casing which can in turn be installed in a standard three-module electrical box, said containment casing being configured so
15 that the distance between the axes of its fastening holes is equal to the standard distance established for standard three-module electrical boxes.

Still another object is a new pre-wired double socket for a three-module electrical box, comprising two Schuko sockets integrated in a containment casing which can in turn be installed in a standard three-module box,
20 whether recessed or external, said containment casing being configured so that the distance between the axes of its fixing holes is equal to the standard distance established for the holes of the standard three-module box.

Yet another object of the present invention is to speed up the installation and electrical connection procedures of the new pre-wired double socket.

25 These and other direct and complementary objects are achieved by the new

pre-wired double socket for three-module electrical boxes comprising in its main parts:

- a containment casing having a size suitable to be installed in a standard three-module box; suitable size is understood to mean that the containment casing can be inserted into a standard three-module box, having for example a shape corresponding substantially to the shape of said standard three-module box and having slightly smaller dimensions; said containment casing in particular comprises a substantially parallelepiped rear casing where one wall is completely absent or open so as to have a front opening for the insertion of sockets or components, and a front cover configured so as to close said front opening of the rear casing, completing the assembly of said containment casing;
- a covering frame intended to be installed as a perimeter frame of said front plate and comprising a perimeter portion with a central opening.

Said front plate is equipped with two lateral holes for the insertion of the fixing screws of the casing, and where the distance between the axes of said holes is equal to the standard distance established for standard three-module electrical boxes.

Said front plate is configured with a main surface on which there are two properly oriented recessed cavities for the multipurpose sockets.

On the bottoms of the cavities, which are recessed with respect to said main surface, there are circular holes made for the insertion of the plug pins.

Openings for the earthing clips are also present on the sides of the cavities

walls.

As noted, there are two lateral holes for inserting the screws on said front plate, where the surface of said lateral holes where the head of the screw abuts is recessed with respect to the bottom of the cavities.

- 5 Said covering frame is configured with said central opening substantially corresponding to the shape of said main surface of the front plate.

On the edge of said central opening there are protruding tabs directed towards the inside of the containment casing.

- Said tabs are configured in such a way as to serve as covering plugs of said
10 lateral holes for the screws, that is, they are configured in such a way as to close any discontinuity due to the presence of the lateral holes for the screws and present between the frame and said front plate, thus completely closing the perimeter according to the regulations in force, and preventing the accidental or voluntary introduction of a tool or a finger.

- 15 Essentially, given that P40 multi-purpose sockets and Schuko sockets have dimensions such as to partly use the space of the position used for the lateral holes intended for the screws, which are placed at a preset standard distance that cannot be changed, in the new double socket said holes for the screws are recessed with respect to the bottom of the socket cavity, by way of
20 openings on the plate. These missing parts of the plate are, in the final assembly stage, completely hidden by said covering frame, which restores a continuous and closed perimeter of the front plate.

- Said containment casing is also internally configured with partitions and seats for housing a connector unit for the electrical connection of two plugs
25 with the electrical cables that enter the box.

This solution facilitates the electrical connection and installation operations, since the new double socket is in fact prewired and does not require the installer to make any connection bridges inside the new socket during its installation.

- 5 The characteristics of the present invention will be better clarified by the following description with reference to the drawings, attached by way of a non-limiting example.

Figures 1a and 1b show a three-dimensional exploded view of the new pre-wired double socket (100), where the parts that comprise it are visible and in particular, from left to right, a rear casing (1) which makes up the
10 containment casing (10), an electrical connector unit (2), two protection modules (31, 32), a front plate (4a, 4b) which is part of said containment casing (10) together with said rear container (1), a covering frame (5).

Figures 2a and 2b only show the front plate (4a, 4b) and the covering frame
15 (5) in a three-dimensional view.

Figure 3 shows the recessed portions located on the bottom of the cavities.

Figure 4 shows the protruding tabs integral with the covering frame.

Figure 5 shows a three-dimensional view of only the rear casing (1) where the partitions and seats of the electrical components described below can be
20 seen internally.

Figure 6 shows a three-dimensional view of only the electrical connector unit (2) intended to be installed inside said rear casing (1).

Figure 7 shows said connector unit (2) installed inside said rear casing (1).

The new pre-wired double socket (100) comprises a containment casing (10)
25 which can preferably be recessed or wall mounted.

Figure 1a shows the embodiment of a recessed containment casing (10).

Said containment casing (10) comprises a substantially parallelepiped rear casing (1) where a wall is completely absent or open so as to create a front opening (11) for inserting the modules or components.

- 5 Two opposite side walls (12, 13) comprise cutouts or recesses (14) for the passage of the fixing screws.

Said containment casing (10) also comprises a front plate (4a) having a substantially rectangular shape or in any case such as to close said front opening (11) of the rear casing (1), completely closing said containment casing (10).

Said front plate (4a) comprises a substantially flat main surface (41a) on which two recessed cavities (42a, 43a) are present for the insertion of multipurpose sockets, properly shaped and oriented so as to be completely contained within said main surface (41a) of the plate (4a).

- 15 On the bottoms (421a, 431a) of the cavities (42a, 43a), which are therefore recessed with respect to said main surface (41a), circular holes (44) are present for the insertion of the plug pins.

On the side walls (422a, 432a) of the cavities (42a, 43a) there are suitable openings (45) for the earthing clips.

- 20 Two opposite side walls (12, 13) comprise cutouts or recesses (14) for the passage of the fixing screws.

Figure 1b shows said containment casing (10) with the same main characteristics as the embodiment in Figure 1a, but equipped with a front plate (4b) which includes a substantially flat main surface (41b) on which

- 25 two recessed cavities are made (42b, 43b) for Schuko sockets, properly

shaped and oriented so as to be completely contained within said main surface (41b) of the plate (4b).

On said front plate (4a, 4b) there are two lateral holes (46) for the insertion of fixing screws.

- 5 Said two lateral holes (46) are in particular made on corresponding portions (47) (Fig. 3) of said front plate (4a, 4b) present on two opposite edges (48) of the front plate (4a, 4b) itself, in correspondence with said cutouts or recesses (14) present on said rear casing (1).

- 10 Said portions (47), which substantially constitute the portion of the surface where the head of the screws abut, are recessed both with respect to said main surface (41) and with respect to the bottom (421a, 421b, 431a, 431b) of the cavities (42a, 42b, 43a, 43b) so that the heads of the screws do not hinder the proper and complete insertion of the plug pins in the cavities (42a, 42b, 43a, 43b).

- 15 Both said main surface (41) of the front plate (4a, 4b) and said bottom (421a, 421b, 421b, 431b) and said side wall (422a, 432a, 422b, 432b) of the cavities (42a, 42b, 43a, 43b) are therefore discontinuous in correspondence with said holes (46) as can be seen in Figure 3.

- 20 In the embodiment shown in Figures 2a and 2b and in the detailed representation of Figure 3, said recessed portions (47) are partly present on said bottoms (421a, 431a, 431a, 431b) of the cavities (42a, 42b, 43a, 43b) and in part protruding from the side edges (48) of the front plate (4a, 4b), so that the distance (D) between the axes of said lateral holes (46) is equal to the standard distance established for standard three-module electrical boxes.

- 25 The socket (100) also comprises a covering frame (5) to be installed as a

perimeter frame of said front plate (4) and comprising a perimeter portion (51) and an opening (52) substantially corresponding to the shape of said main surface (41) of the front plate (4).

On the edge (521) of said opening (52) of the covering frame (5) there are
5 two protruding tabs (53, 54), shown in greater detail in Figure 4.

Each of said tabs (53, 54) is substantially oriented orthogonally to the perimeter portion (51) so as to be directed towards the inside of the containment casing (10) once the covering frame (5) is correctly mounted on the front plate (4a, 4b).

10 Said tabs (53, 54) are located on said edge (521) of the opening (52) of the covering frame (5) in correspondence with said recessed lateral holes (46) present on said front plate (4) and are configured so as to serve as covers of said lateral holes (46), closing the discontinuities present on said main surface (41a, 41b), on said bottoms (421a, 431a, 421b, 431b) and on said
15 side walls (422a, 432a, 422b, 432b) of the cavities (42a, 42b, 43a, 43b).

More specifically, each of said tabs (53, 54) comprises:

- a first portion (541) substantially coplanar with said perimeter portion (51) of the covering frame (5) or in any case such as to be substantially coplanar with said main surface (41) of said front plate
20 (4), when the frame (5) is properly installed;
- a second portion (542) substantially orthogonal to said first portion (541) and intended to be directed towards the inside of the containment casing (10) and to be substantially coplanar with the wall (431, 432) of the cavities (42, 43);
- 25 - a third portion (543) or foot substantially orthogonal to said second

portion (542) and configured so as to cover said hole (46) thus being coplanar to said bottom (421, 431) of the cavities (42, 43).

Essentially, once the covering frame (5) is properly positioned on the plate (4a, 4b), the presence of said tabs (53, 54) creates a completely closed
5 perimeter around the casing.

Said containment casing (10) is also internally configured with compartments and seats for housing at least one connector unit (2), configured such that both plugs inserted in the cavities (42a, 42b, 43a, 43b) can be connected electrically with the electrical cables entering the
10 containment casing (10).

In particular, from the bottom wall (15) of said rear casing (1), that is, the wall opposite said front opening (11), there are raised partitions (16), configured to house and hold a connector unit (2) shown in Figure 6, which comprises: two pairs of housings (21, 22) for the two phases of a plug, a
15 bridge (25) for each of said pairs of housings (21, 22), two earthing connectors (23, 24) or for the third pole of a plug, a bridge (26) for connecting the earthing connectors (23, 24) and connection bridges with power supply cables, not shown in the figures, the ends of which will be inserted in the seats (7) for the insertion of the cables, suitably located on
20 the walls of said rear casing (1).

Figure 8 shows how it is possible to provide for the use of an additional outdoor electrical box (6) configured for housing said containment casing (10) and also equipped with lateral holes (61) for the insertion of fixing screws.

25 Figure 9 shows an embodiment relating to an Ip55 rated waterproof socket

for outdoor use, comprising in addition to the casing (1), the connector unit (2), the front plate (4a), the covering frame (5), with the relative tabs (53, 54), a front panel (6) with relative cover (61).

Therefore, with reference to the preceding description and the attached
5 drawings the following claims are made.

CLAIMS

1. Pre-wired double socket (100), recessed or wall-mounted, comprising a containment casing (10), wherein the dimensions of said casing (10) are suitable for installation in a standard three-module box and
5 said casing (10) in turn comprises:

- a substantially parallelepiped-shaped rear container (1), one side of which is completely absent or open in such a way as to define a front opening (11),
- a front plate (4a,4b) configured in such a way as to close said front
10 opening (11) of the rear container (1), completing said casing (10);

characterized in that said front plate (4) comprises:

- a main surface (41a, 41b) provided with two cavities (42a,42b,43a,43b) for multi- purpose sockets,
- two lateral holes (46) for the insertion of the casing's fixing screws,
15 and wherein the distance between the axes of said lateral holes (46) is equal to the standard distance established for standard three-module electrical boxes,

and wherein the portions (47) in which said lateral holes (46) are made and where the heads of the screws inserted in the holes (46) themselves abut, are
20 lowered with respect to said main surface (41a, 41b) and the bottom (421a, 431a, 421b, 423b) of said cavities (42a, 43a, 42b, 43b).

2. Pre-wired double socket (100) according to claim 1, characterized in that it comprises a covering frame (5) designed to be installed as a perimeter frame of said front plate (4a, 4b) and comprising a perimeter portion (51)
25 and an opening (52) substantially matching the shape of said main surface

(41) of the front plate (4), and wherein on the edge (521) of said opening (52) there are projecting tabs (53, 54) in positions corresponding to the position of said lateral holes (46) of said front plate (4), and wherein said tabs (53, 54) are facing towards the inside of said containment casing (10),
5 and wherein said tabs (53, 54) are configured in such a way that they serve as covering plugs of said lateral holes (46) for the insertion of the screws.

3. Pre-wired double socket (100) according to claim 1 or 2, characterized in that said lowered portions (47) with said lateral holes (46) are partially (471) created on said bottoms (421, 431) of the cavities (42, 43)
10 and partially (472) project from the side edges (48) of the front plate (4), in such a way that the distance (D) between the axes of said lateral holes (46) is equal to the standard distance established for standard three-module electrical boxes.

4. Pre-wired double socket (100) according to claims 2, 3,
15 characterized in that each of said tabs (53, 54) comprises:

- a first portion (541) substantially coplanar with said perimeter portion (51) of the frame (5) or in any case such as to be substantially coplanar with said main surface (41) of said front plate (4) when the frame (5) is correctly installed;
- 20 - a second portion (542) substantially orthogonal to said first portion (541) and intended to be directed towards the inside of the casing (10) and to be substantially coplanar with the side wall (431, 432) of the cavities (42, 43);
- a third portion (543) or foot substantially orthogonal to said second
25 portion (542) and configured in such a way as to cover said hole

(46), thus being substantially coplanar with the bottom (421, 431) of the cavities (42, 43).

5 5. Pre-wired double socket (100) according to the preceding claims, characterized in that the inside of said containment casing (10) is configured with partitions and seats for housing at least one group of connectors (2) configured in such a way that both the plugs inserted in the cavities (42, 43) can be electrically connected with the electrical wires that get into the casing (10).

10 6. Pre-wired double socket (100) according to claim 5, characterized in that partitions (16) extend from the bottom wall (15) of said rear container (1), meaning the wall opposite said front opening (11), wherein said partitions (16) are configured to house and hold a group of connectors (2), and wherein said group of connectors (2) comprises two pairs of housings (21, 22) for the two pins of a plug, a bridge (25) for each of said pairs of
15 housings (21, 22), two earthing connectors (23, 24) or connectors for the third pin of a plug, a bridge (26) for connecting the earthing connectors (23, 24), bridges for connection with the power supply cables and seats (7) for the insertion of the power supply cables.

20 7. Pre-wired double socket (100) according to the preceding claims, characterized in that said rear container (1) is externally configured for recessed installation.

25 8. Pre-wired double socket (100) according to any of the preceding claims, characterized in that it comprises a further external box (6) configured to house said containment casing (10) and provided, too, with lateral holes (61) for the insertion of the fixing screws.

9. Pre-wired double socket (100) according to any of the preceding claims, characterized in that, in addition to the casing (1), the connector unit (2), the front plate (4a) of the covering frame (5) with its relative tabs (53, 54), it comprises a front panel (6) with relative cover (61) and is suitable to
- 5 guarantee at least an Ip55 rate waterproof protection.

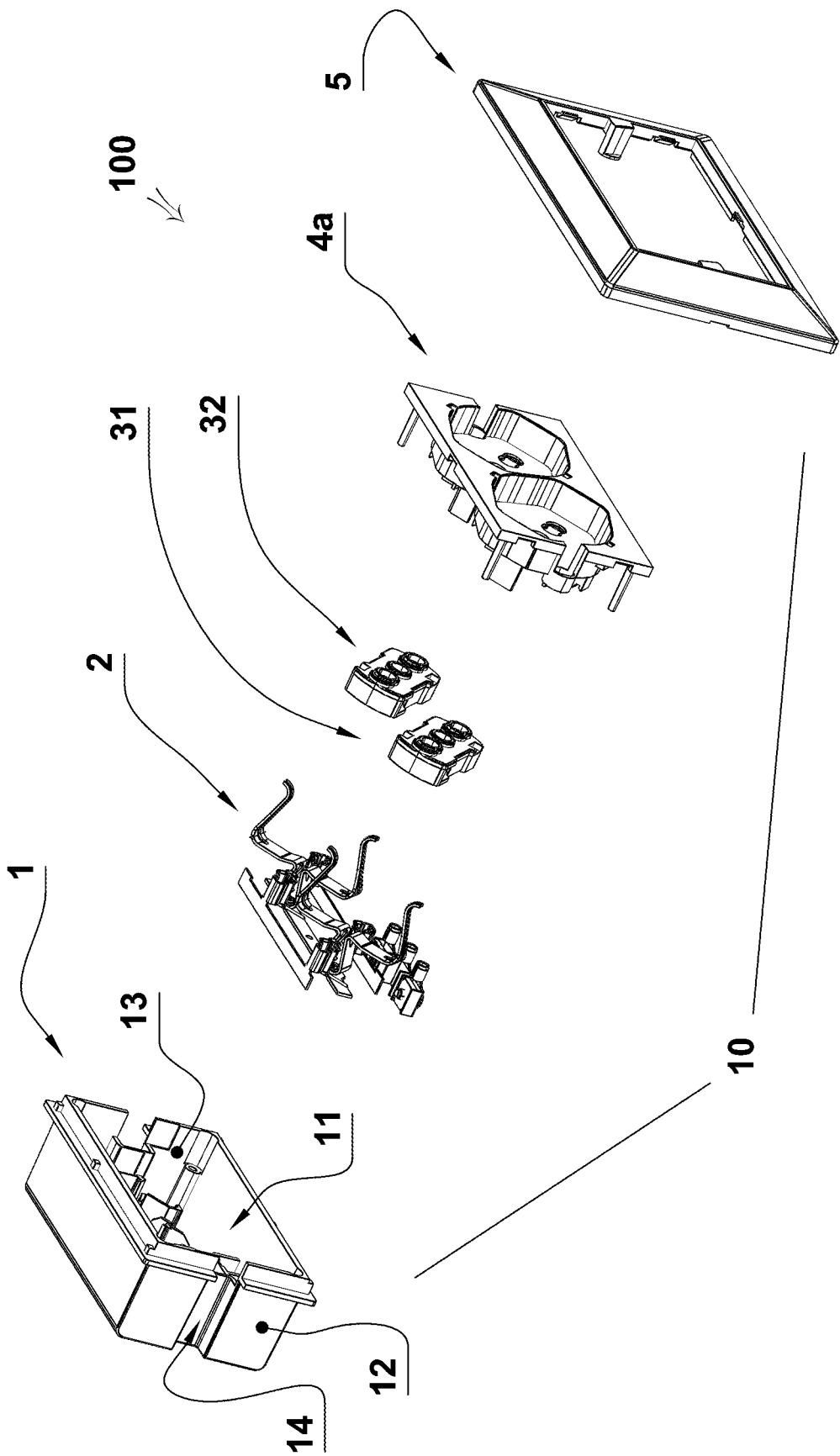


Fig. 1a

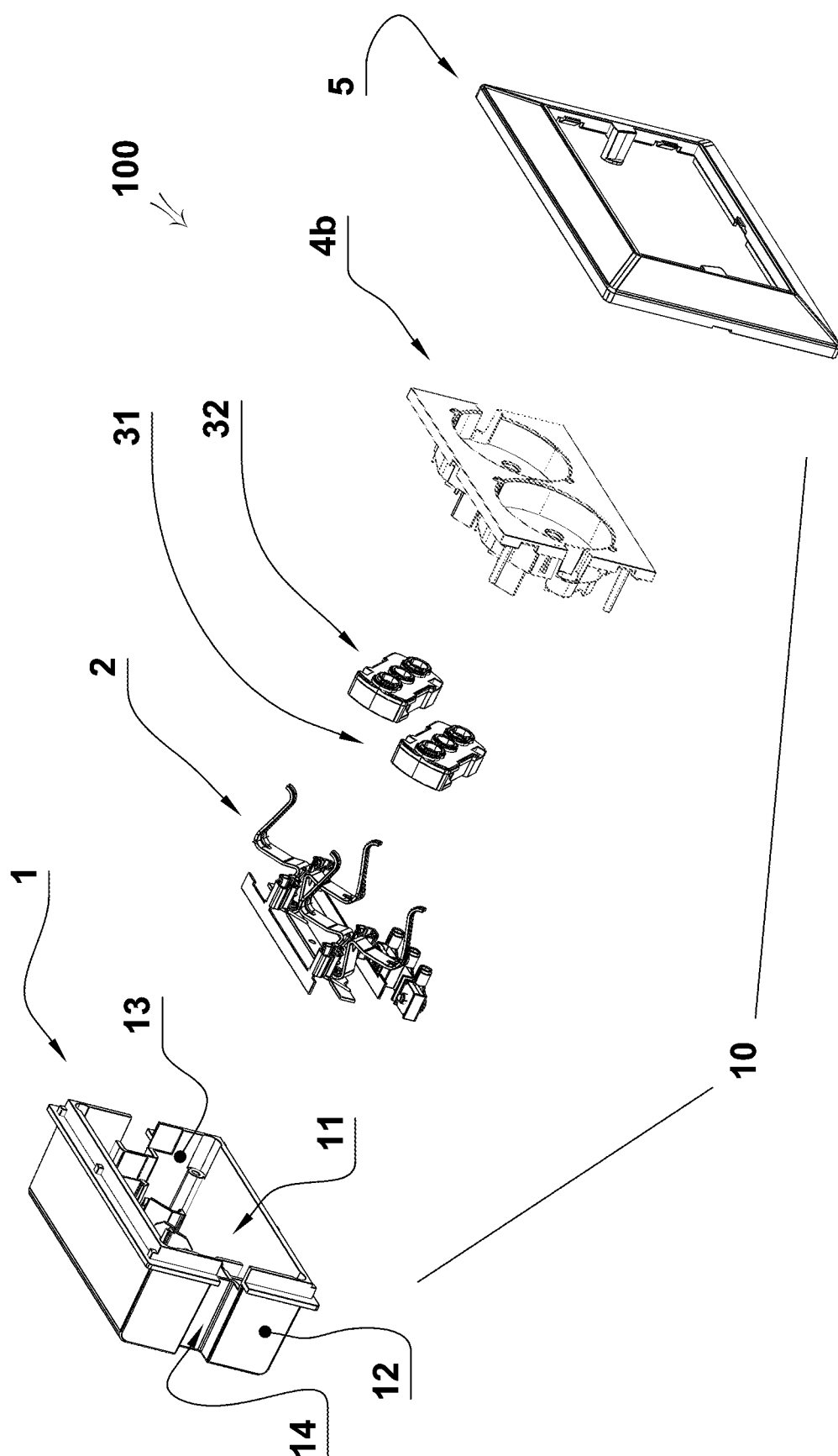


Fig. 1b

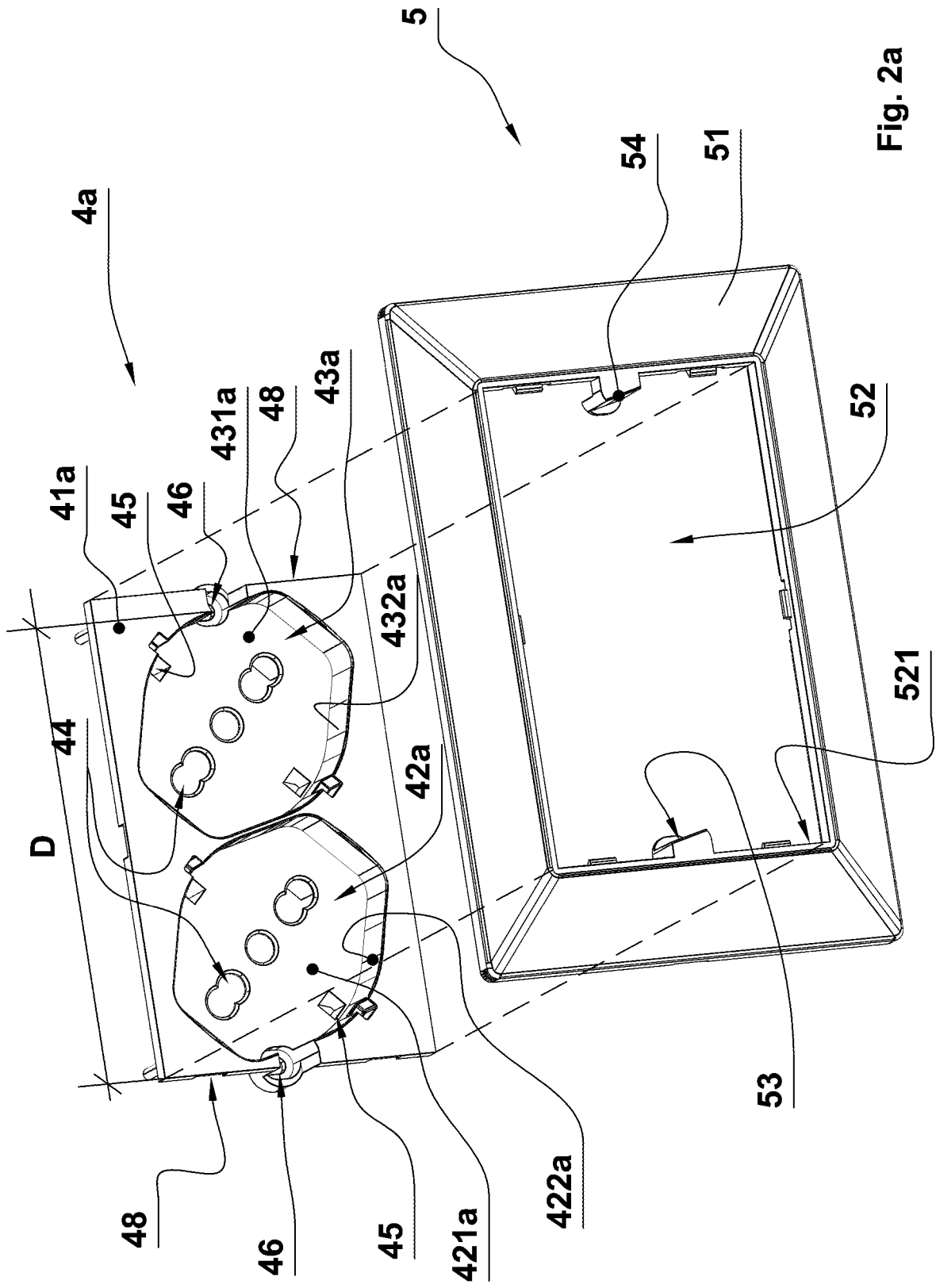


Fig. 2a

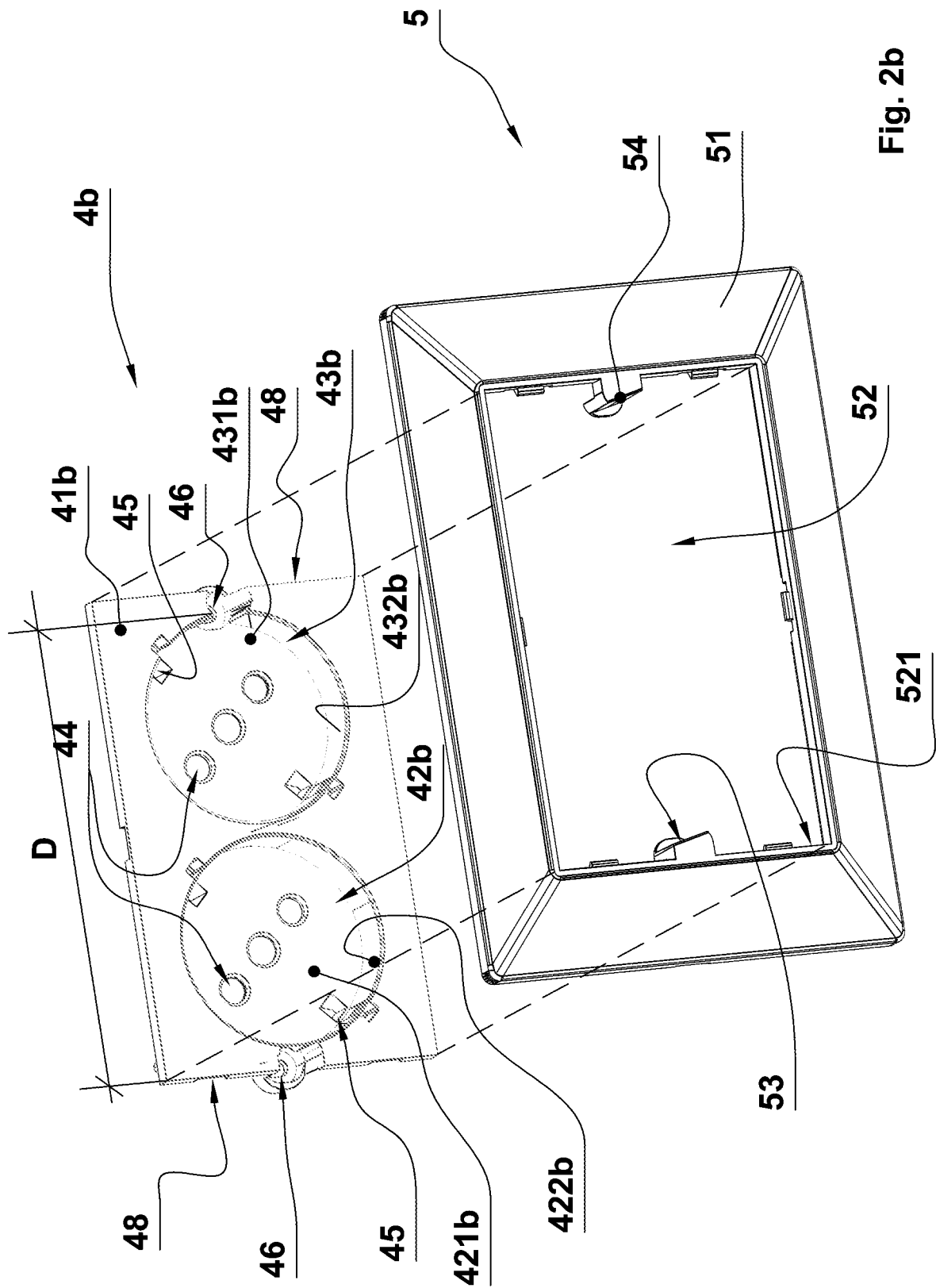
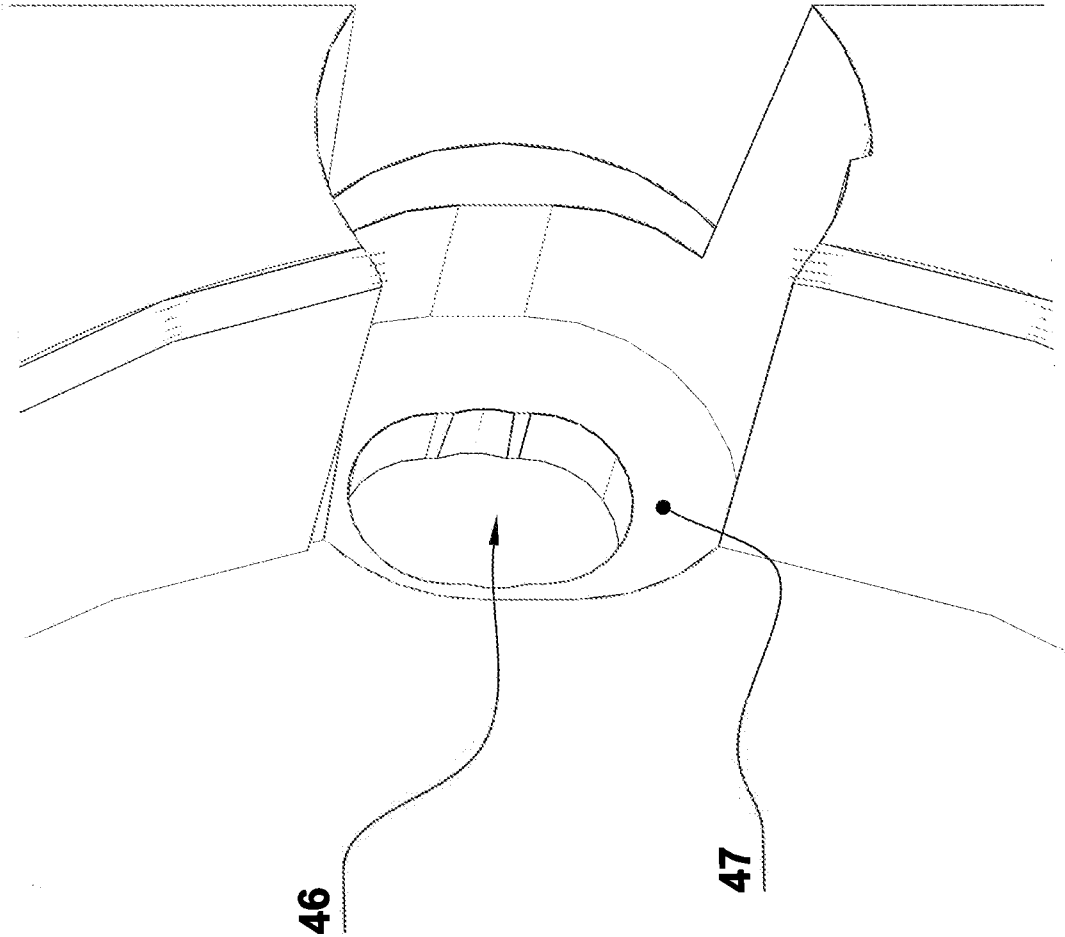


Fig. 2b

Fig. 3



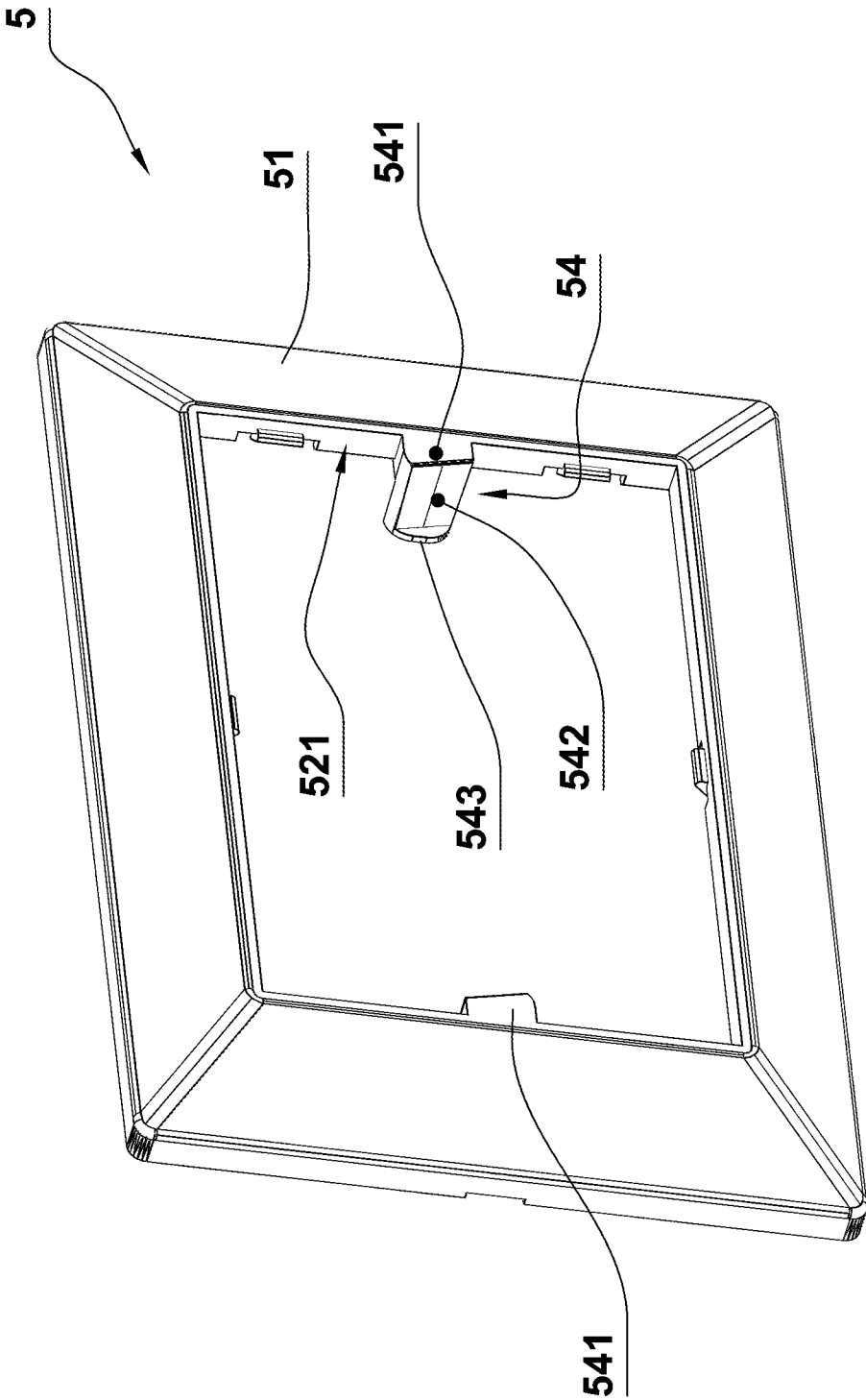


Fig. 4

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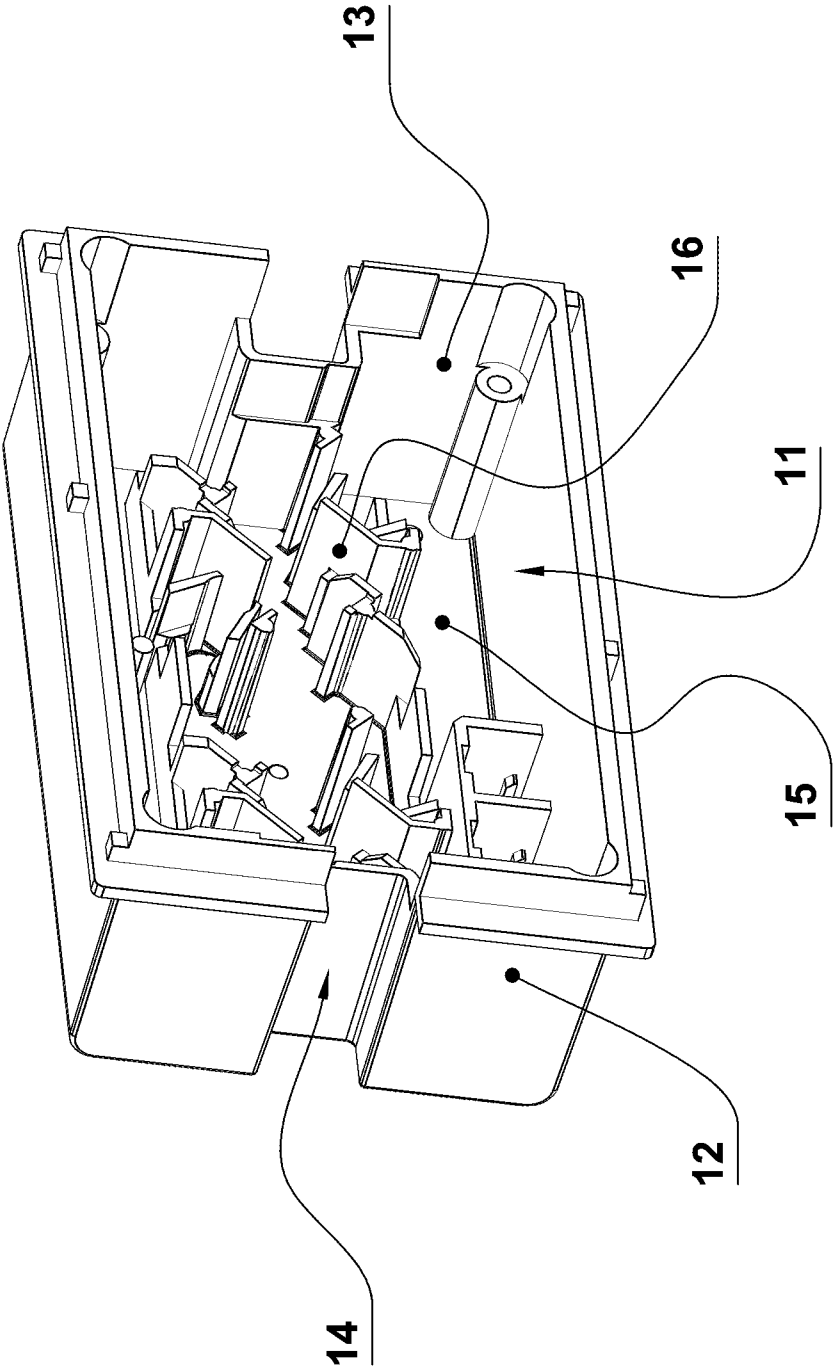


Fig. 5

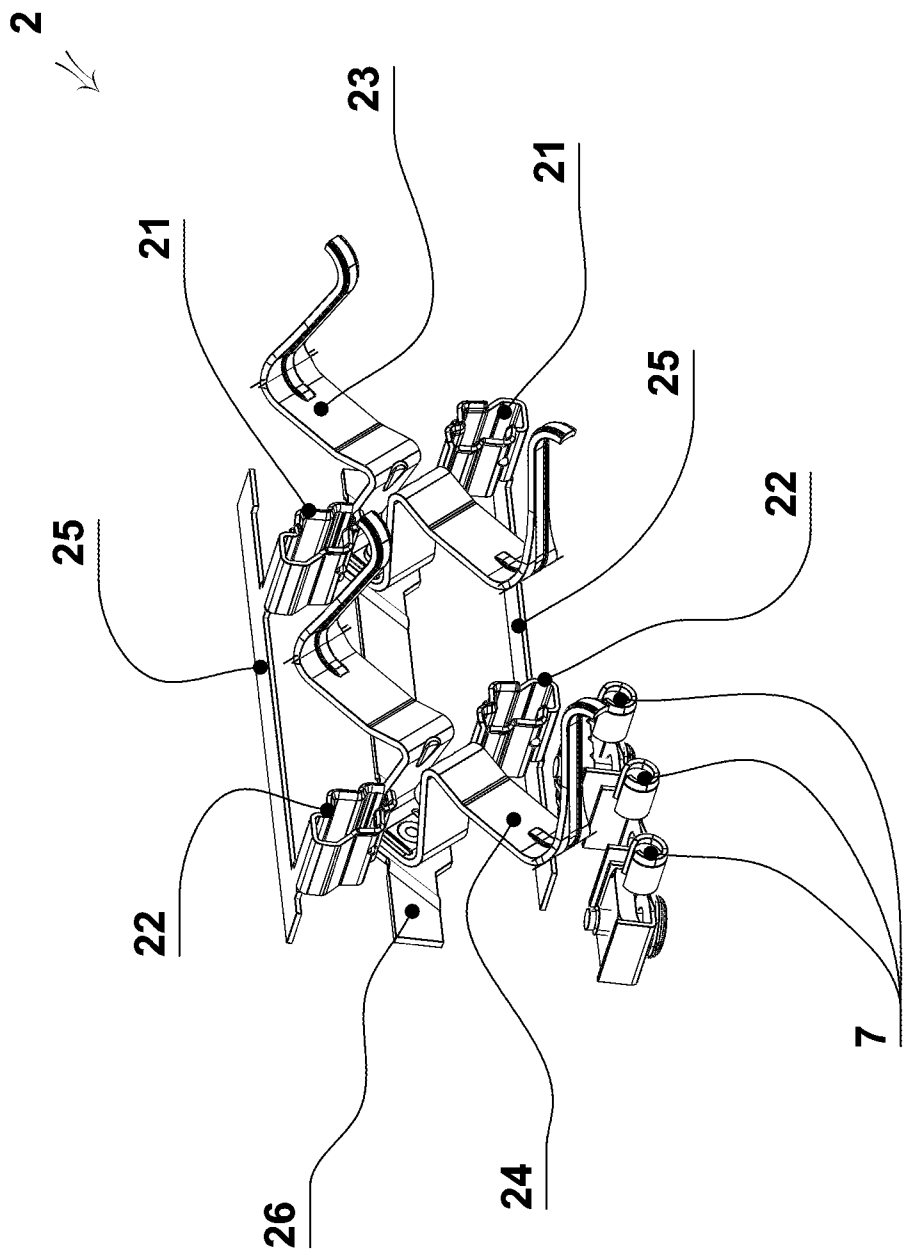


Fig. 6

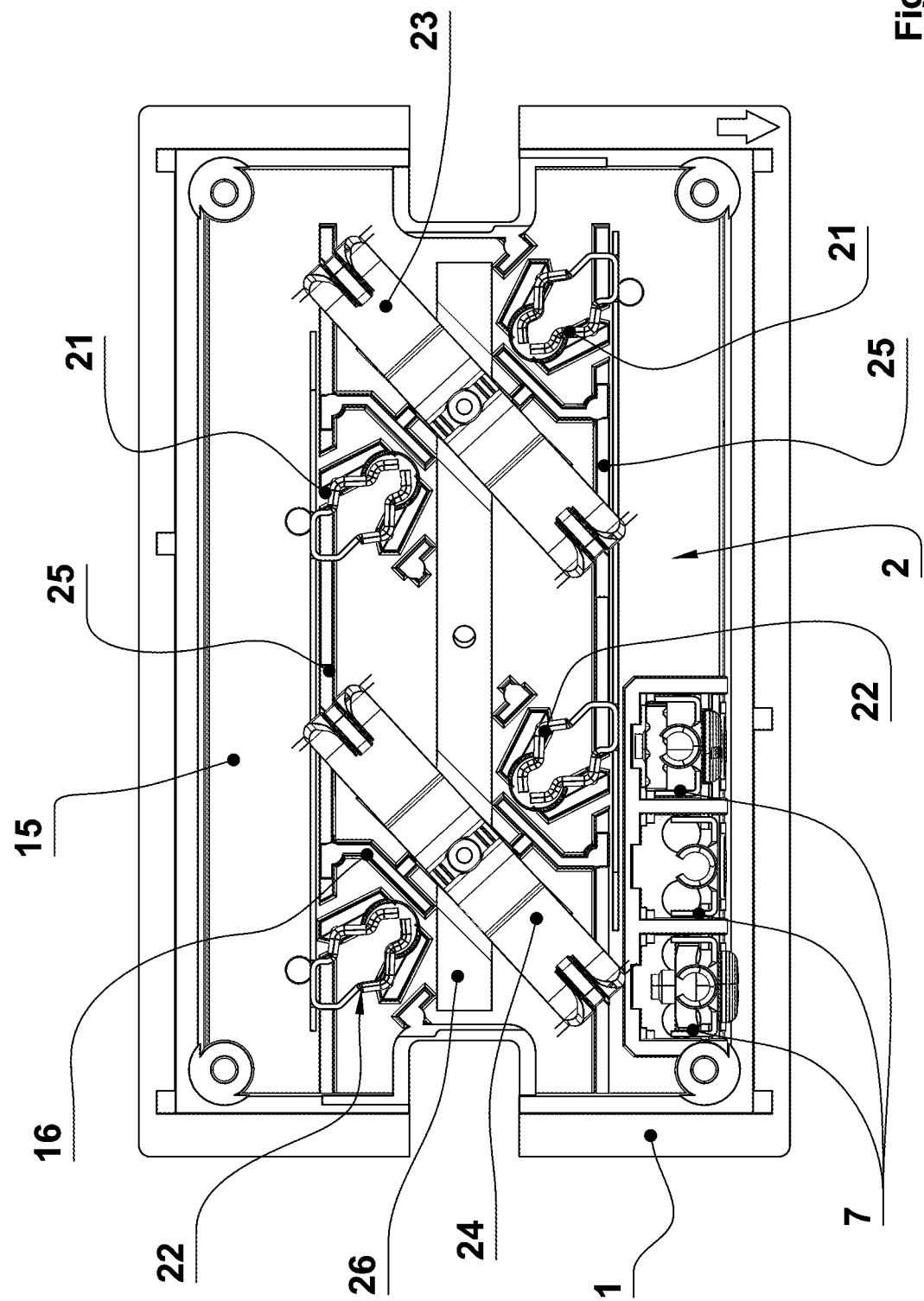


Fig. 7

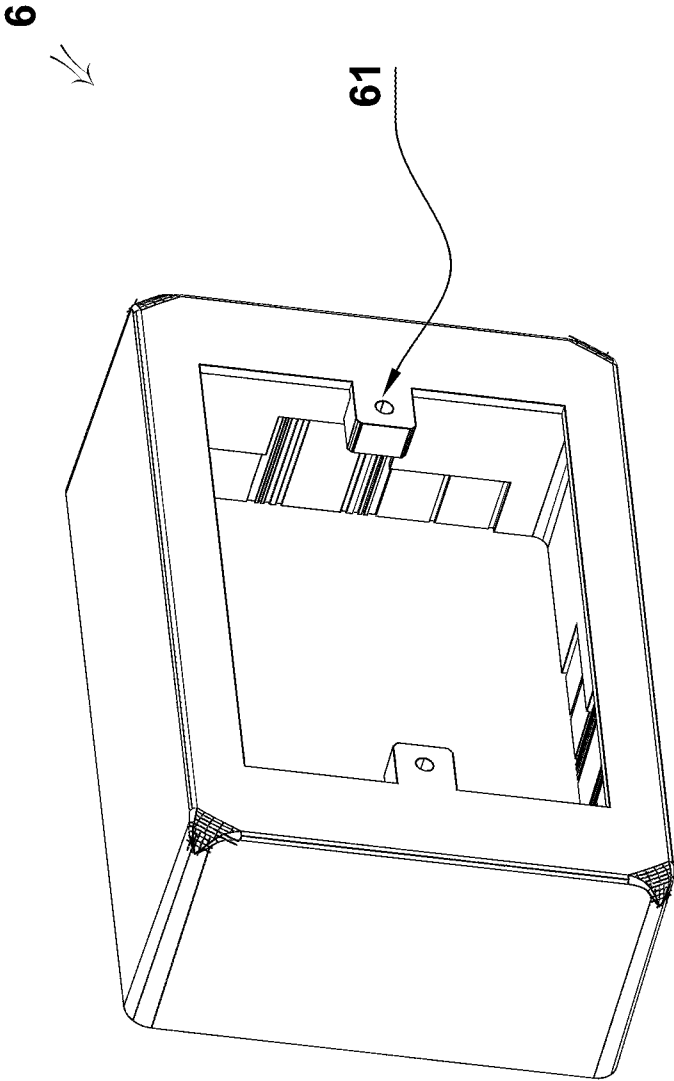


Fig. 8

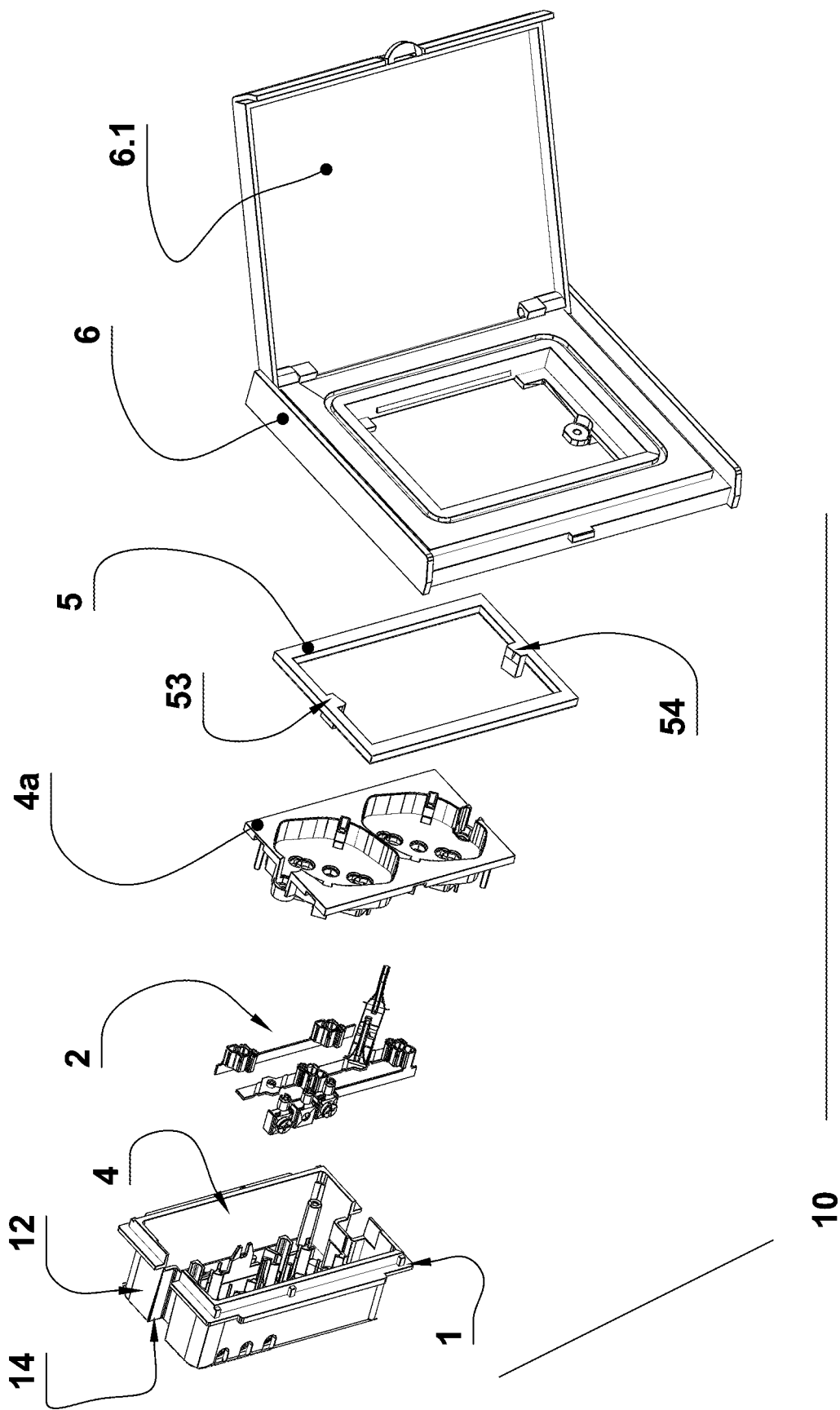


Fig. 9

INTERNATIONAL SEARCH REPORT

International application No

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A. CLASSIFICATION OF SUBJECT MATTER INV. H02G3/14 H02G3/18 H02G3/16 H02G3/03 ADD.		
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) H02G H01R		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	figures 1-5	8
A	paragraph [0009] - paragraph [0013] -----	2-4
X	EP 0 675 583 A1 (ABB PATENT GMBH [DE]) 4 October 1995 (1995-10-04)	1,5-7,9
Y	column 3, line 35 - line 41; figures 1-2	8
A	-----	2-4
Y	DE 40 03 276 A1 (KLEINHUIS HERMANN GMBH [DE]) 8 August 1991 (1991-08-08)	8
A	column 6, line 26 - column 7, line 44; figure 6	1
A	DE 12 02 375 B (BUSCH JAEGER DUERENER METALL) 7 October 1965 (1965-10-07) figures 3-4 -----	1
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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