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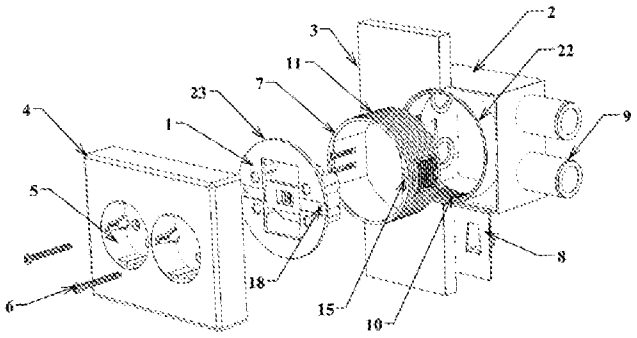
(54) Title **An electrical component assembly**

(57) Abstract

An assembly comprises a mounting unit (2), a mounting device (7), an electrical component (1), one or more fasteners (6), and an outer element (4). The mounting unit (2) is configured for receiving the mounting device (7) and the electrical component (1). The mounting unit (2) comprises a portion (22) which is shaped and configured for receiving the mounting device (7) and wherein the portion (22) comprises a connection structure (10) arranged in the inside. The electrical component (1) comprises an outward profile (23) which corresponds to the mounting device (7) outer shape. The fasteners (6) are configured for securing the outer element (4) to the mounting device. The outward profile (23), the inner shape of the portion (22), and the outer shape of the mounting device (7) have complementary shapes.



# An electrical component assembly

## Technical field of the invention

The invention relates to an electrical component assembly as defined by the preamble of claim 1.

## Background of the invention

The prior art includes US 6 166 329, which describes an electrical device assembly for mounting behind a wall surface. The assembly includes an electrical device mechanically attached to a mounting plate, and a rigid protector extending over the device to protect the device during wall construction. The hard metal protector enables an uninterrupted sheet of drywall or other wall facing material, hung in place over the device, to be cut through with a saw or router without risk of damaging the device by incidental contact with the cutting blade. To facilitate field installation of wall-mounted electrical devices, the assembly may be provided as a pre-wired assembly in which the device is mounted and wired within a standard junction box from which wires extend in a wire conduit. The assembly is mounted directly to an internal wall support prior to the installation of the wall's covering material (e.g. a drywall or panel). A shortcoming of the prior art is the inability to accommodate wall panels of different thicknesses.

## Summary of the invention

The invention is set forth and characterized in the main claim, while the dependent claims describe other characteristics of the invention.

It is thus provided an assembly, comprising a mounting unit, a mounting device, an electrical component, one or more fasteners, and an outer element, wherein the mounting unit is configured for receiving the mounting device and the electrical component, characterized in that

- the mounting unit comprises a portion which is shaped and configured for receiving the mounting device and wherein the portion comprises a connection structure arranged in the inside;
- the electrical component comprises an outward profile which corresponds to the mounting device outer shape; and

- said one or more fasteners are configured for securing the outer element to the mounting device.

In one embodiment, the mounting device comprises a plurality of connection devices that comprise locking members that are configured for releasable interlocking with corresponding potions of the connection structure in the portion. The mounting device may comprise recesses and the connection devices may be movably arranged in respective recesses.

In one embodiment, the mounting device comprises one or more receptacle for a corresponding fastener, and the one or more receptacle is arranged in the vicinity of a corresponding connection device, whereby the connection device is forced into a locking engagement with the portion when a fastener is engaged with the receptacle.

In one embodiment, the outward profile, the inner shape of the portion, and the outer shape of the mounting device, have complementary shapes.

**Brief description of the drawings**

These and other characteristics of the invention will become clear from the following description of embodiments of the invention, given as non-restrictive examples, with reference to the attached schematic drawings, wherein:

Figure 1 is a perspective exploded view of an embodiment of the electrical component assembly according to the invention;

Figure 2 is a perspective view of an embodiment of the mounting device according to the invention;

Figure 3 is a sectional-perspective view illustrating the mounting device according to the invention installed inside a mounting box;

Figure 4 is an enlarged view of the area marked “A” in figure 3;

Figure 5 is a front view (upper drawing) and a sectional view along section A-A (lower drawing) of an embodiment of the assembly according to the invention, installed in a wall of a first configuration;

Figure 6 is an enlarged view of the area marked "B" in figure 5;

Figure 7 corresponds to figure 5, but illustrates the assembly according to the invention installed in a wall of a second configuration;

Figure 8 is an enlarged view of the area marked "C" in figure 7;

Figure 9 is a sectional-perspective view illustrating the assembly according to the invention installed behind a wall element, also comprising a cover plate covering the electrical component at the hole in the wall element; and

Figure 10 is a sectional-perspective view illustrating the assembly according to the invention installed behind a wall element, and the electrical device is an electrical switch.

**Detailed description of embodiments of the invention**

The following description may use terms such as "horizontal", "vertical", "lateral", "back and forth", "up and down", "upper", "lower", "inner", "outer", "forward", "rear", etc. These terms generally refer to the views and orientations as shown in the drawings and that are associated with a normal use of the invention. The terms are used for the reader's convenience only and shall not be limiting.

The electrical component assembly according to the invention comprises a mounting unit 2, a mounting device 7, an electrical component 1, and an outer element 4. In the embodiment illustrated in figure 1, the mounting unit 2 is a housing configured for receiving the mounting device 7 and the electrical component 1. The housing 2 is configured for connection to a wall structure (e.g. a stand or beam; not shown) in a manner known in the art, for example via a bracket 8, and comprises one or more cable conduit receptacles 9. The electrical component 1 is furnished with holes 18 that are aligned with corresponding holes in the outer element 4 and with corresponding receptacles 15 in the mounting device 7. The cover 4 is connectable to the mounting device 7 by fasteners 6, in the illustrated embodiment in the form of threaded screws, in a manner which will be explained below. Connecting the outer element 4 to the mounting device 7 will therefore also connect the electrical component 1 to the mounting device 7.

In the embodiment illustrated in figure 1, the electrical component 1 is a duplex electrical outlet, and the cover 4 comprises two corresponding receptacles 5. The invention shall not be limited to the embodiment illustrated in figure 1, inasmuch as the electrical component may be any electrical component suitable for installation in the housing 2; for example a simplex electrical outlet with a cover having a single receptacle, a thermostat, or an electrical switch. The latter example is illustrated in figure 10, showing the electrical component as an electrical switch 1' installed in a housing 2, and the outer element being a switch toggle 4'.

Referring again to figure 1, the mounting unit 2 comprises a portion 22 which is shaped and configured for receiving the mounting device 7. The portion 22 comprises a connection structure 10, arranged in the inside and comprising grooves (ridges and valleys), the purpose and function of which will be described below. The electrical component 1 comprises an outward profile 23 which corresponds to the mounting device 7 outer shape. In the illustrated embodiment, the outward profile 23, the inner shape of the portion 22, and the outer shape of the mounting device 7 are circular, but the invention shall not be limited to such geometries as long as the geometries are complementary.

Referring now to figure 2, the mounting device 7 comprises a holding structure 11, here in the form of grooves (ridges and valleys) arranged on the outside of the mounting device 7 and configured for releasable interlocking connection with the connection structure (grooves) 10 in the portion 22. The holding structure 11 preferably comprises flexible ridges, allowing the mounting device 7 to be moved relative to the portion 22 in the mounting unit 2.

The mounting device 7 also comprises a plurality of connection devices 12 that in the illustrated embodiment are arranged in respective recesses 17 in the mounting device 7 outer surface. The connection devices 12 comprise locking members 13, here grooves (ridges and valleys), that are configured for releasable interlocking with corresponding portions of the connection structure (i.e. grooves) 10 in the portion 22. The connection devices 12 are movably connected to the mounting device 7 in a manner per se known in the art, for example via lugs 17 extending though corresponding slits 16 in the mounting device 7.

Referring additionally to figure 3 and figure 4, the connection devices 12 are arranged in the vicinity of the above-mentioned receptacles 15, and each comprise a spring member 19 that abuts against the connection structure 10 and thus contributes to pressing the connection device 12 into its recess 14. The mounting device 7 may thus be moved back and forth in the portion 22. However, when the above-mentioned fastener (screw) 6 is inserted into its respective receptacle 15, the spring force is overcome and the connection device 12 is forced outwards (by the fastener 6) such that the locking members (external grooves) 13 interlock with corresponding portions of the connection structure (grooves) 10 portion 22 of the mounting unit 2. The mounting device 7 is thus firmly locked to the mounting unit 2 as long as the fasteners 6 are in place. Referring again to figure 1, this implies that the electrical component 1 also is firmly locked to the mounting unit 2 when the fasteners 6 are in place as described. The electrical component 1 is being clamped between the outer element 4 and the mounting device 7 by virtue of the fasteners extending through the holes 18. The outward profile 23 of the electrical component corresponds to the mounting device 7 outer shape, and the device 7 outer shape corresponds to the inner shape of the portion 22. In the illustrated embodiment, the outward profile 23, the portion 22 inner shape and the outer shape of the mounting device 7 are circular, but the invention shall not be limited to such geometries as long as the geometries are complementary and allow an assembly as illustrated in figure 1.

When installing the invented assembly, the mounting unit 2 is initially connected to a building element (e.g. a stand in a wall structure or a beam; not shown) in a manner known in the art, for example via the bracket 8. At this stage, the electrical component 1 and the mounting device 7 may be arranged inside the mounting unit 2 and electric cables (not shown) may be connected to the electrical component 1. The cables extend through the cable conduit receptacles 9 and into cable conduits (not show) in a manner known in the art. Referring to figure 9, a temporary cover plate 21 is placed in front of the electrical component 1. The temporary cover plate 21 keeps the mounting device 7 and the electrical component 1 in place, and protects the electrical component.

A covering element 3 (e.g. panel, drywall, plasterboard) is subsequently connected to the building element and furnished with a hole that corresponds to the outer shape of the

portion 22 of the mounting unit (see also figure 1). When this covering element 3 is in place, the temporary cover plate 21 may be removed and the outer element 4 may be connected to the mounting device 7 as described above.

Figures 5 and 6 illustrate the invented assembly installed behind a covering element 3, and the portion 22 extending through the hole in the covering element. Figures 7 and 8 illustrate a similar installation configuration, but with a difference being that the covering element 3' in figures 7 and 8 is thicker than the covering element 3 in figures 5 and 6. The invented assembly can accommodate such different thicknesses because the mounting device 7 is slidably arranged in the mounting unit 2, more specifically in the portion 22, as described above. In figures 5 and 6, the mounting device 7 is at a maximum backward position, abutting against a stop member 20, whereas the mounting device 7 is at a maximum forward position in figures 7 and 8, at a distance *d* away from the stop member 20. It will be understood that the mounting device 7 may be connected to the portion 22 at any intermediate position, by means of the features described above.

## Claims

1. An assembly, comprising a mounting unit (2), a mounting device (7), an electrical component (1), one or more fasteners (6), and an outer element (4), wherein the mounting unit (2) is configured for receiving the mounting device (7) and the electrical component (1), **characterized in that**

- the mounting unit (2) comprises a portion (22) which is shaped and configured for receiving the mounting device (7) and wherein the portion (22) comprises a connection structure (10) arranged in the inside;
- the electrical component (1) comprises an outward profile (23) which corresponds to the mounting device (7) outer shape; and
- said one or more fasteners (6) are configured for securing the outer element (4) to the mounting device.

2. The assembly of claim 1, wherein the mounting device (7) comprises a plurality of connection devices (12) that comprise locking members (13) that are configured for releasable interlocking with corresponding potions of the connection structure (10) in the portion (22).

3. The assembly of claim 2, wherein the mounting device (7) comprises recesses (14) and the connection devices (12) are movably arranged in respective recesses.

4. The assembly of any one of claims 2-3, wherein the mounting device (7) comprises one or more receptacle (15) for a corresponding fastener (6), and the one or more receptacle is arranged in the vicinity of a corresponding connection device (12), whereby the connection device (12 ) is forced into a locking engagement with the portion (22) when a fastener (6) is engaged with the receptacle (15).

5. The assembly of any one of claims 1-4, wherein the outward profile (23), the inner shape of the portion (22), and the outer shape of the mounting device (7) have complementary shapes.

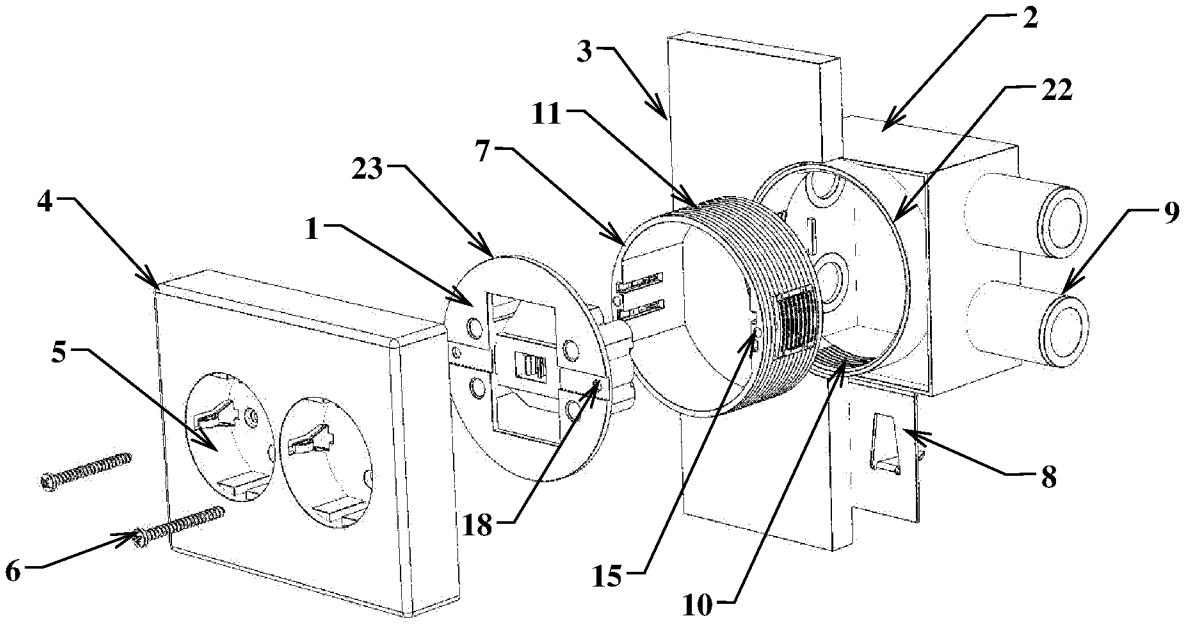



Fig. 1

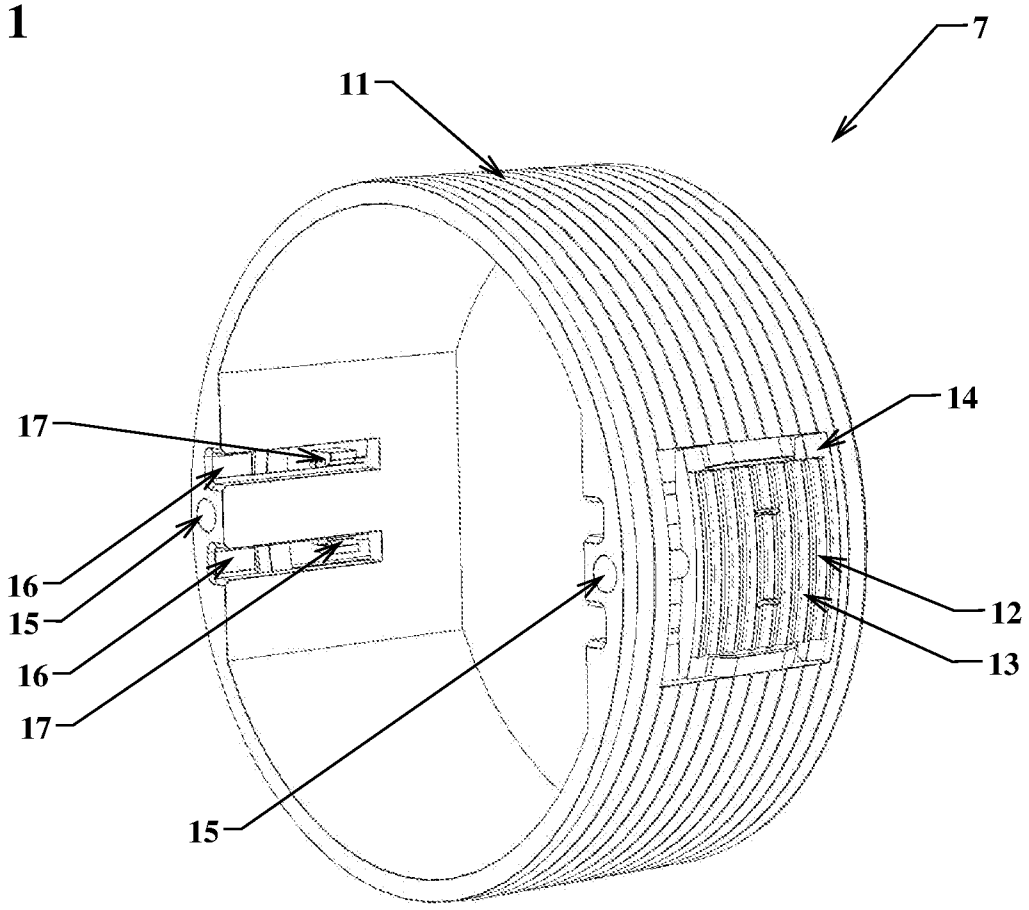



Fig. 2

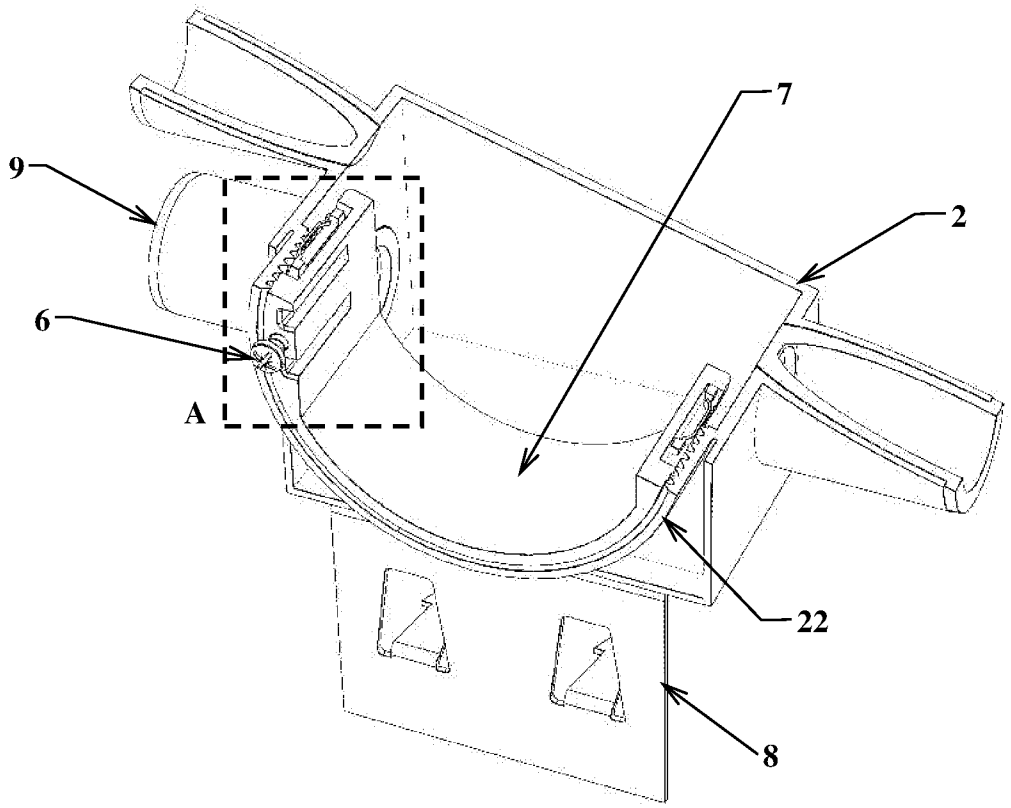



Fig. 3

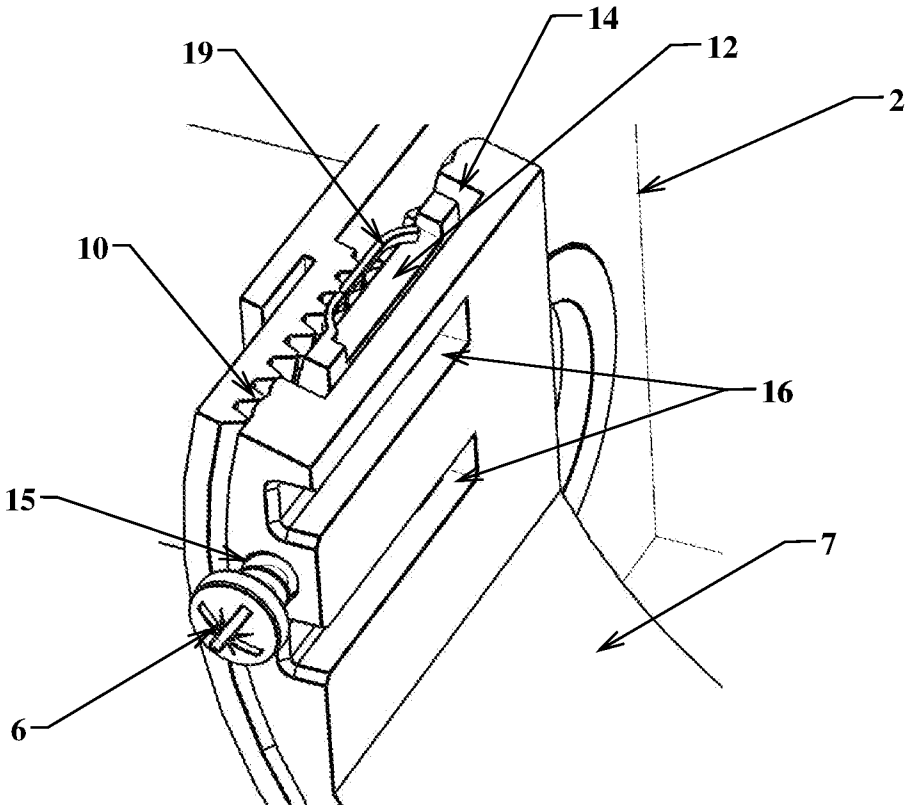



Fig. 4

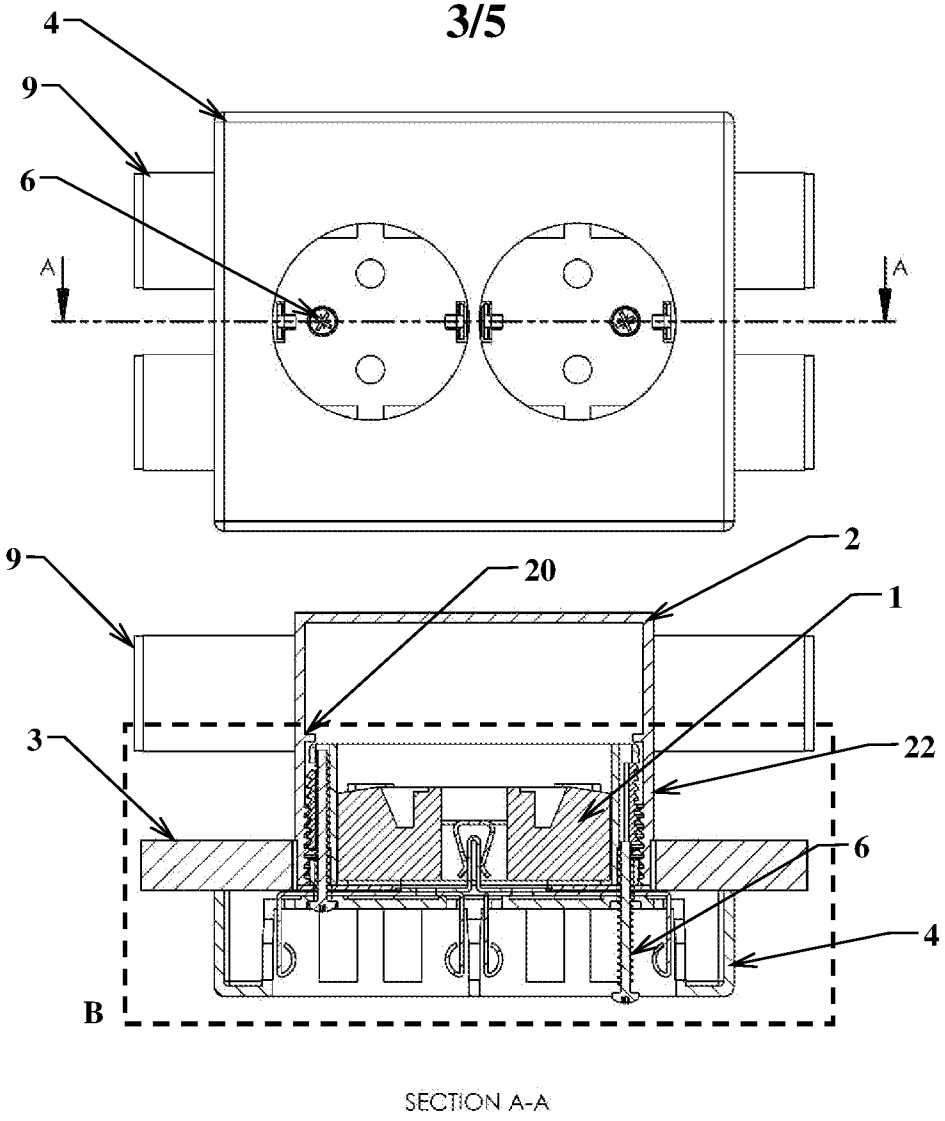



Fig. 5

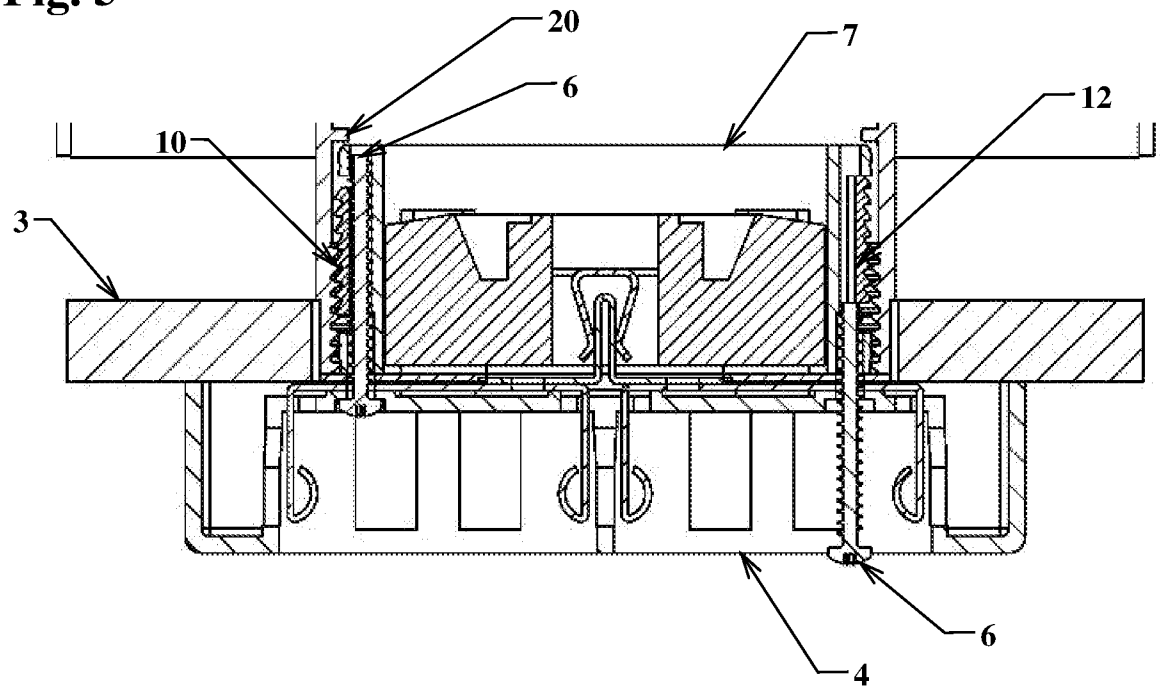



Fig. 6

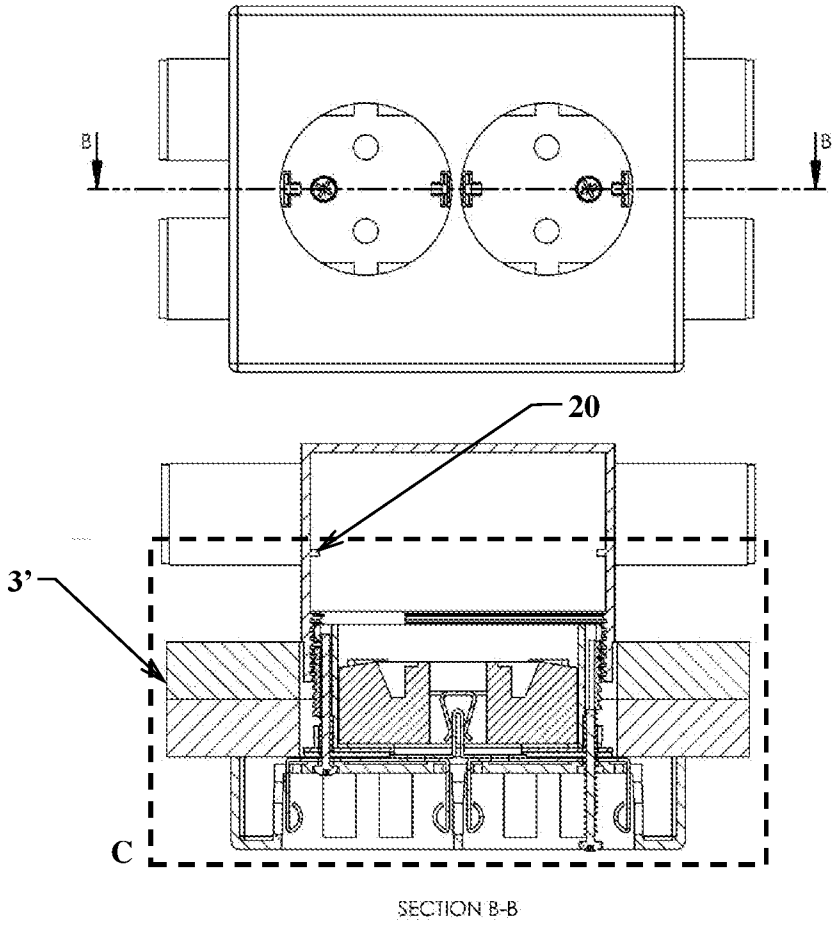



Fig. 7

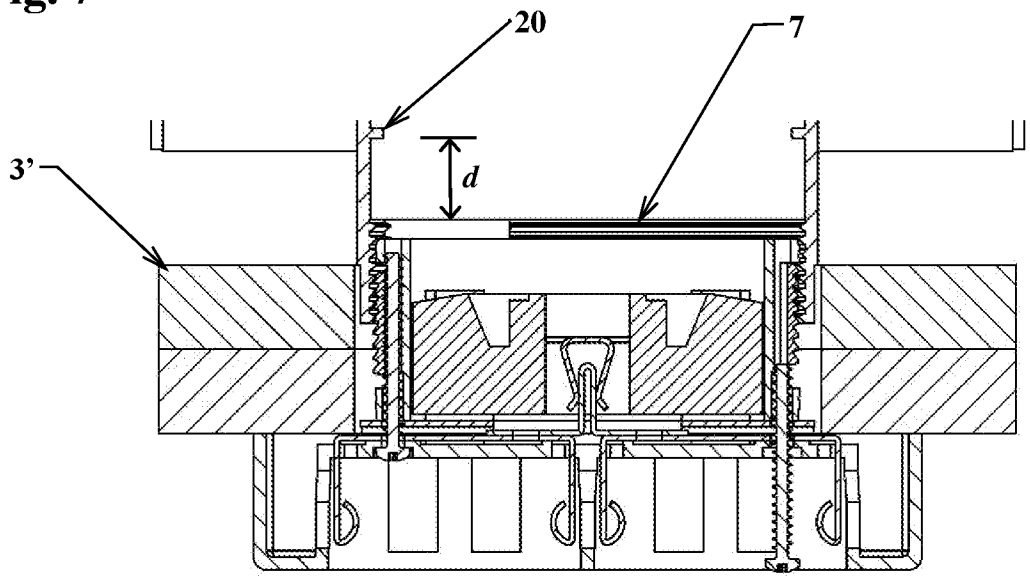



Fig. 8

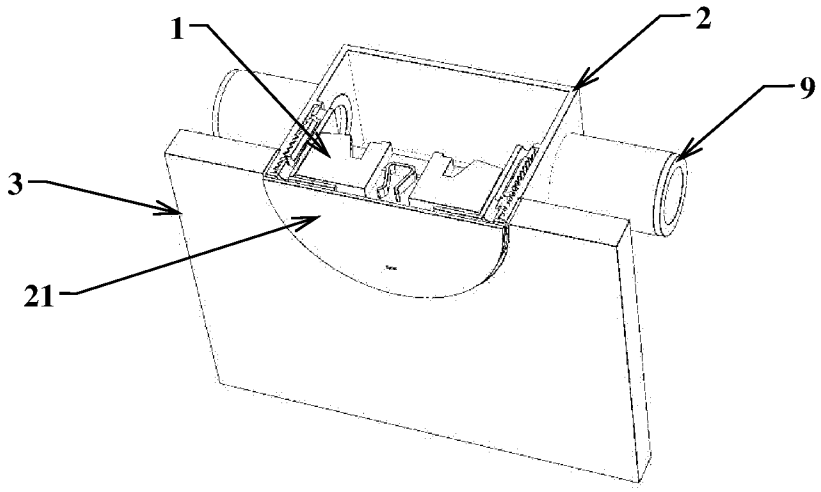



Fig. 9

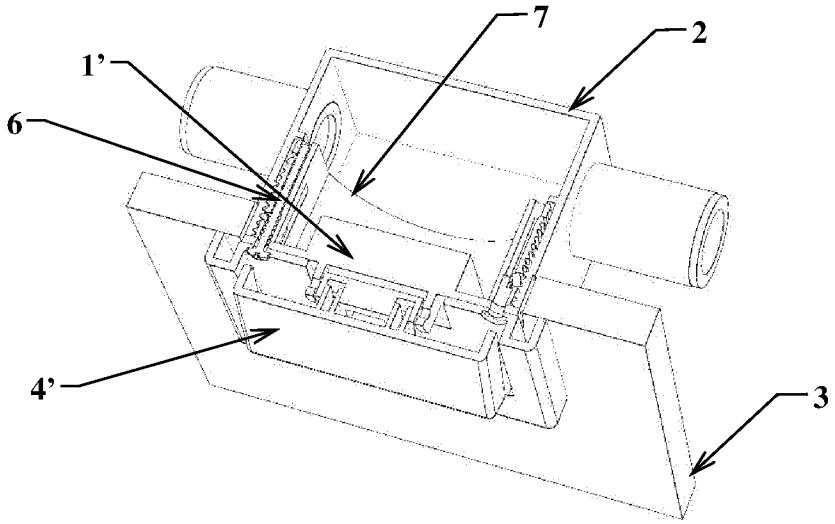



Fig. 10