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# (54) AN ALARM ASSEMBLY

(57) An battery operated camera peripheral (11) for a home or small businesses alarm system, comprising a camera module and a battery compartment to receive a removable battery pack (55). When the peripheral is mounted to a mounting surface, the battery is replaceable through an opening (45) without changing the orientation of the camera with respect to the mounting surface.

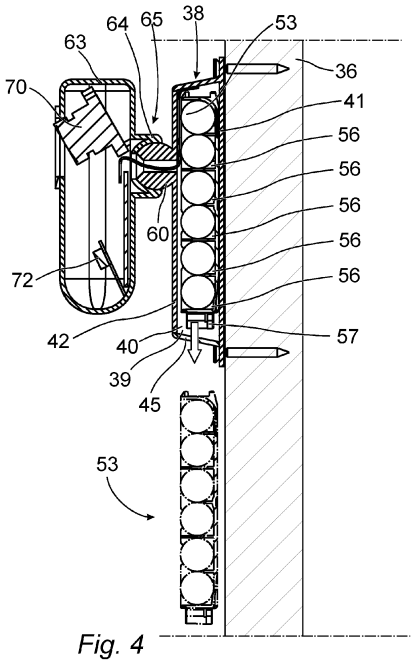


*Fig. 4*

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## Description

### TECHNICAL FIELD

**[0001]** The present invention relates to alarm systems for both indoor and outdoor use which may be used in homes or small businesses and to peripherals for use in such system.

### BACKGROUND

**[0002]** Home alarm systems and similar systems often comprise at least one battery powered alarm sensor assembly. The alarm sensor assembly normally is arranged in a desired and specific position that can be changed unintentionally when the sensor assembly is managed.

**[0003]** From the above it is understood that there is room for improvements and the invention aims to solve or at least mitigate the above problems.

### SUMMARY

**[0004]** An object of the present invention is to provide a new type of alarm sensor assembly or alarm peripheral which is improved over prior art and which eliminates or at least mitigates the drawbacks discussed above. These objects are achieved by the technique set forth in the appended independent claims with preferred embodiments defined in the dependent claims related thereto. Additional advantages will be set forth in part in the description which follows or may be learned by practice.

**[0005]** In an aspect there is provided an battery operated camera peripheral for a home or small businesses alarm system. The peripheral comprises a camera module and a battery compartment to receive a removable battery pack, the battery compartment being adapted to be mounted to a wall or other mounting surface. The battery compartment has an opening through which the battery pack may be inserted, and a hatch is provided to close the opening. The battery compartment and the camera module each comprises a coupling element, the respective coupling elements being mutually arranged to allow the camera module to be mounted on the battery compartment and further arranged to allow the orientation of the camera module with respect to the battery compartment to be adjusted so that the camera module can be orientated with respect to the mounting surface independently from the battery compartment, the arrangement being such that, after mounting the peripheral to the mounting surface, the battery is replaceable through the opening without changing the orientation of the camera with respect to the mounting surface.

### BRIEF DESCRIPTION OF THE DRAWINGS

**[0006]** The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate embodiments and together with the description, serve to explain non-limiting examples of the methods and systems of the inventive concept. In the drawings,

Fig. 1 is a schematic top view of an alarm installation in a building,

Fig. 2 is a schematic perspective view of a first embodiment of an alarm assembly with a closed hatch,

Fig. 3 is a schematic perspective view of the alarm assembly of Fig. 2 without the hatch,

Fig. 4 is a schematic side section view of the alarm assembly of Fig. 1 showing a battery pack removed from the wall bracket,

Fig. 5 is a schematic perspective view of the alarm assembly of Fig. 1 showing a battery pack removed from the wall bracket and a removed hatch,

Fig. 6 is a schematic side section view of the alarm assembly of Fig. 1 showing the wall bracket without a battery pack,

Fig. 7 is a schematic perspective view of the alarm assembly of Fig. 1 showing a battery pack removed from the wall bracket and connection means,

Fig. 8 is a schematic perspective view of a second embodiment of an alarm assembly.

### DETAILED DESCRIPTION

**[0007]** Hereinafter, certain embodiments will be described more fully with reference to the accompanying drawings. It will be apparent to those skilled in the art that various modifications and variations can be made without departing from the inventive concept. Other embodiments will be apparent to those skilled in the art from consideration of the specification and practice disclosed herein. The embodiments herein are provided by way of example so that this disclosure will be thorough and complete, and will fully convey the scope of the inventive concept, and that the claims be construed as encompassing all equivalents of the present inventive concept which are apparent to those skilled in the art to which the inventive concept pertains. If nothing else is stated, different embodiments may be combined with each other.

**[0008]** In the embodiment shown in Fig. 1 an installation comprising a home wireless system is installed in a building 10. The home wireless system is an alarm system installation and comprises a plurality of wireless peripheral nodes including wireless alarm sensor assemblies, peripheral devices, a first gateway 12 and a second gateway 12'. One alarm sensor assembly is a first infra-

red detector 14 with a camera 15 mounted in the corner of a room close to the ceiling. The first infrared detector 14 has a sensing area that covers the first gateway 12 and comprises a camera that is activated in an alarm situation. A first perimeter alarm detector 16 is mounted at a window 17 in the same room. The infrared detector operates in a conventional manner to detect presence and movements of objects emitting infrared radiation. The perimeter alarm detector also operates in a conventional manner to detect when a door or a window is opened. In various embodiments the perimeter alarm detector comprises a magnetic sensor that will detect when a magnet attached to the door or window is moved.

**[0009]** The second gateway 12' is arranged in a second room separated from the room where the first gateway 12 is arranged. A second infrared detector 14' is mounted in the same room as the second gateway 12' to cover it within its operative area and a second perimeter alarm detector 16' is mounted at a window 17' in the same room. The second infrared detector 14' can also comprise a camera 15. A keypad 19 is mounted close to a front door 20 of the building 10. The keypad 19 is used by an operator of the alarm system to arm and to disarm the alarm system. The keypad 19 also is a wireless peripheral node. The front door 20 is covered by a third perimeter alarm detector 21. Another type of wireless peripheral device is a smoke detector 23 mounted in the ceiling of building. In various embodiments a plurality of smoke detectors 23 are arranged throughout the building 10 to ensure that fire can be detected at an early stage.

**[0010]** Fig 4 shows an alarm assembly 11 mounted to a surface 36, in this case an inside wall surface 36 of a building 10. The alarm assembly includes a wall bracket 38 for mounting the alarm assembly to the wall surface 36. It also includes a sensor device 63 which is mountable to the wall bracket 38, which is described in more detail below.

**[0011]** The wall bracket 38 is designed with an inner space 39 to house a battery pack 53, which is configured to provide the alarm assembly 11 and especially the sensor device 63 with power. It is beneficial to arrange the battery pack 53 in the wall bracket 38, as close to the wall surface 36 as possible, as it decreases the lever arm effect the weight of the battery pack 53 has on the wall mounting means 37. This means that the alarm assembly 11, with the specific placement of the battery pack 53 as shown in the figures are beneficial in shock tests and real shocks situations.

**[0012]** The battery pack 53 is preferably arranged within a surrounding structure 55 as shown in Fig. 5, from now on called a sledge 55, in order to hold the batteries in their desired places. The sledge 55 has several compartments 56 in which batteries are placed. The space 39 in which the battery pack 53 is kept is defined by two side surfaces 40 and a front surface 41 facing in the direction of the wall surface 36 and a back surface 42 facing the front surface 41. The shape and size of the inner space preferrably correspond to the shape and size of the battery pack 53 and the sledge 55. The battery pack 53 is kept in place inside the space 39 preferably by means of a friction grip between the sledge 55 and the surrounding surfaces 40, 41, 42. The friction grip may preferably be increased by means of connections means 50 which provide the connection between the battery pack 53 and the sensor device 63. The connection means 50 is described in more detail below.

**[0013]** As an alternative to the friction grip, not shown in the drawings, a sliding arrangement may be provided on which the battery pack may be guided and supported. Such a sliding arrangement may include a protrusion/slot-arrangement or the like.

**[0014]** The wall bracket 38 is further provided with an opening 45 in its bottom portion 46 through which the battery pack 53 may be inserted and which leads into the space 39 in which the battery pack 53 is contained during operation of the alarm assembly. The opening 45 is closed by means of a hatch 47 which is either hinged and screwed or just screwed to the bottom portion 46 of the wall bracket 38. The hatch 47 is provided to protect the opening 45 and the inner space 39 from outer impact. In the opening 45 of the wall bracket 38 there is also provided a tampering unit 49 which engages or is connected to the hatch 47 when the hatch is closed. The tamper unit 49 is configured to send a tamper signal to a gateway 12 and/or in any other way communicate if the hatch 47 is being opened. The tamper unit 49 may also be configured to recognize a displacement of the wall bracket 38 from the wall surface 36 and then send a tamper signal to the gateway 12 and/or in any other way communicate this to a user or operator.

**[0015]** The connection means 50 as previously mentioned are configured to connect the battery pack 53 to the sensor device 63 in order to provide power to the units of the sensor device 63. The connection means 50 also connect the battery pack 53 with units within the wall bracket 38, such as the tampering unit 49. In the shown examples the connection means include contact springs 51 and contact surfaces 52. The contact springs 51 are arranged on the back surface 42 of the space 39 of the wall bracket 38 and the contact surfaces 52 are arranged on the sledge 55 carrying the battery pack 53. The contact surfaces 52 are in contact with the contact springs 51 when the battery pack 53 is inside the space 39 of the wall bracket 38. It is not necessary for the whole battery pack 53 to be located within the space 39 for the contact springs 51 and contact surfaces 52 to provide power to the alarm assembly 11, but at a part of the battery pack 53 needs to be in contact with the contact springs 51. This means that the battery pack 53 can still provide the alarm assembly 11 with power even if it is half way out of the wall bracket 38. This is a preferred feature from a tampering perspective. In order for the tampering system to work the tampering unit needs a defined amount of time to be able to send the tamper signal properly. The hatch 47 together with the contact means 51 extending down the front surface 41 gives the tampering unit 49

plenty of time to send the tampering signal.

**[0016]** The sledge 55 transporting the battery pack 53 mentioned before has several compartments 56 for holding the batteries in their desired places, thus securing the contact with the contact means 51. The sledge 55 also mitigates the handling of the battery pack 53 in case one or several batteries need to be replaced. It is easy to pull out the sledge 55 from the space 39 of the wall bracket 38 by means of two finger grips 57 which are arranged in a bottom portion 58 of the sledge 55. When the batteries have been switched the sledge 55 is easily push back up into the space 39 of the wall bracket 38 and kept in place by the friction grip.

**[0017]** The alarm assembly further includes, as mentioned above, a sensor device 63 which in one example, see Figs 1-7, may be mounted on the wall bracket 38, and in another example, see Fig. 8 may be mounted to enclose the wall bracket 38. In both examples the wall bracket 38 has a joint portion 60 which cooperates with a counter joint portion 64 of the sensor device 63. In the first example the wall bracket 38 and the sensor device 63 are joint together with a ball joint assembly 65 that preferably can be locked to a specific position by a locking means 67, such as a screw. Such an arrangement could be arranged to allow the sensor device 63 to be orientated substantially freely in relation to the wall bracket 38 in one, two or three axes of rotation about the joint. In the second example the wall bracket 38 and the sensor device 63 are joined together with a pin joint assembly 66. The first example, the ball joint assembly 65 has the benefit of being more flexible, i.e. allowing the position of the sensor unit 63 to be adapted to the specific application by tilting and rotating the sensor unit 63. Both the ball assembly and the pin assembly have the benefit of not being affected if the battery pack 53 needs to be replaced.

**[0018]** The sensor device 63 further includes, in the shown example, a camera and a motion detector in order to detect movement etc. within a defined area. It is beneficial to be able to replace the battery pack without affecting the rest of the alarm assembly, such as the position of the camera and the motion detector. This alarm assembly may be used both indoors and outdoors and due to the regulations of GDPR it is important to be sure that the detection area of the alarm assembly only covers the intended area. For example, if the alarm assembly is used outdoors, the camera are only allowed to cover a defined area and not anything outside of that area. It is therefore important to know that the position of the camera is not affected because one having to replace the batteries.

**[0019]** In various embodiments, the disclosed alarm sensor assembly will provide a possibility to change the battery pack without dismounting the alarm sensor assembly or even affect or change the positioning of the sensor. By arranging the battery pack in a separate wall bracket shock resistance of the alarm sensor assembly will be very good. It can be further improved by providing mounting of the battery pack in the wall bracket close the wall. The position and weight of the battery back will result in a lower impact of any fastening means used to mount the wall bracket to the wall. The position and weight of the battery back also will improve shock testing results for the complete assembly.

Numbered paragraphs

**[0020]** Additional independent aspects and features of the present disclosure are defined in the following numbered paragraphs:

A1. An alarm peripheral comprising a wall bracket (38) for mounting said alarm peripheral to a surface (36), a sensor device (63) mountable to said wall bracket (38), a battery pack (53) for providing power to said alarm peripheral by means of connection means (50), wherein said battery pack (53) is arranged within a space (39) of said wall bracket (38), and wherein said wall bracket (38) comprises an opening (45) to said space (39) and a hatch (47) configured to close said opening (45), though which opening (45) said battery pack (38) is inserted.

A2. The alarm peripheral according to paragraph 1, wherein said opening (45) and hatch (47) are arranged in a bottom portion (46) of said wall bracket (38).

A3. The alarm peripheral according to paragraphs 1 or 2, wherein said hatch (47) is hinged to and/or fastened my means of screws (48) to said wall bracket (38).

A4. The alarm peripheral according to any one of the preceding paragraphs, wherein said space (39) is provided with a tamper unit (49) configured to send a tamper signal to a gateway (12) and/or communicate if the hatch (47) is opened and/or if the wall bracket (38) is displaced from said surface (36).

A5. The alarm peripheral according to paragraph 4, wherein said tamper unit (49) is arranged in said opening (45) and in connection with said hatch (47).

A6. The alarm peripheral according to any one of the preceding paragraphs, wherein said connection means (50) comprises at least one contact spring (51) arranged in said space (39) of said wall bracket (38) adjacent at least one contact surface (52) arranged on said battery pack (53), wherein said contact spring (51) and said contact surface (52) are configured to create an electrical contact between the battery pack (53) and the alarm peripheral.

A7. The alarm peripheral according to paragraph 6, wherein said contact surface (52) are arranged along a surface of a sledge (55) supporting said battery

pack (53).

A8. The alarm peripheral according to any one of the preceding paragraphs, wherein said battery pack (38) is held by a friction grip in said space (39).

A9. The alarm peripheral according to any one of the preceding paragraphs, wherein said battery pack is arranged in a sledge (55) which is configured to slide in and out of said space (39) of said wall bracket (38) and through said opening (45).

A10. The alarm peripheral according to paragraph 9, wherein said sledge (55) comprises an number of compartments (56) designed to house a battery of said battery pack (53).

A11. The alarm peripheral according to any one of the preceding paragraphs, wherein said wall bracket (38) further comprises a joint portion (60), wherein said sensor device (63) further comprises a counter joint portion (64) and wherein said joint portion (60) and said counted joint portion (64) are configured to mount said sensor device (63) to said wall bracket (38).

A12. The alarm peripheral according to paragraph 11, wherein said joint portion (60) and said counter j ont portion (64) together form a ball joint peripheral (65).

A13. The alarm peripheral according to any one of the preceding paragraphs, wherein said sensor unit (63) comprises at least one camera (70).

A14. The alarm assemblu according to any one of the preceding paragraphs, wherein said sensor unit (63) comprises at least one motion detector (72).

A15. An battery operated camera peripheral for a home or small businesses alarm system, comprising a battery compartment and a camera module, the battery compartment being adapted to be mounted to a wall or other mounting surface, the battery compartment and the camera module each comprising a coupling element, the respective coupling elements being mutually arranged to allow the camera module to be mounted on the battery compartment and further arranged to allow the camera module to be orientated independently from the battery compartment.

## Claims

1. An battery operated camera peripheral (11) for a home or small businesses alarm system, comprising a camera module and a battery compartment to receive a removable battery pack (55), the battery compartment being adapted to be mounted to a wall or other mounting surface, the battery compartment having an opening (45) through which the battery pack may be inserted, a hatch (47) being provided to close the opening (45), the battery compartment and the camera module each comprising a coupling element, the respective coupling elements being mutually arranged to allow the camera module to be mounted on the battery compartment and further arranged to allow the orientation of the camera module with respect to the battery compartment to be adjusted so that the camera module can be orientated with respect to the mounting surface independently from the battery compartment, the arrangement being such that, after mounting the peripheral to the mounting surface, the battery pack is replaceable through the opening (45) without changing the orientation of the camera with respect to the mounting surface.

2. The peripheral as claimed in claim 1, wherein the battery compartment is configured for surface mounting to a wall.

3. The peripheral as claimed in claim 2, wherein the battery compartment is in the form of a wall bracket.

4. The peripheral as claimed in claim 3, wherein the camera peripheral is configured to enclose the wall bracket.

5. The peripheral as claimed in claim 4, wherein the coupling elements of the wall bracket and the camera peripheral form a pin joint assembly (66).

6. The peripheral as claimed in claim 3, wherein the battery compartment (39) is provided with a tamper unit (49) configured to send a tamper signal to a gateway (12) and/or communicate if the hatch (47) is opened and/or if the wall bracket (38) is displaced from said surface (36).

7. The peripheral according to claim 6, wherein said tamper unit (49) is arranged in said opening (45) and in connection with said hatch (47).

8. The peripheral as claimed in any one of claims 3 to 7, wherein the peripheral includes connection means by means of which the battery pack within the battery compartment provides power to the peripheral, said connection means (50) comprising at least one contact spring (51) arranged in the battery compartment (39) of said wall bracket (38) adjacent at least one contact surface (52) arranged on said battery pack (53), wherein said contact spring (51) and said contact surface (52) are configured to create an electrical contact between the battery pack (53) and the

alarm peripheral.

**9.** The peripheral according to claim 8, wherein said contact surface (52) is arranged along a surface of a sledge (55) supporting said battery pack (53).

**10.** The peripheral according to claim 8 or claim 9, wherein said battery pack is arranged in a sledge (55) which is configured to slide in and out of the battery compartment of the wall bracket (38) and through the opening (45).

**11.** The peripheral according to any one of claims 3 to 10, wherein said wall bracket (38) further comprises a joint portion (60), wherein said camera module further comprises a counter joint portion (64) and wherein said joint portion (60) and said counter joint portion (64) are configured to mount said camera module to said wall bracket (38).

**12.** The peripheral according to claim 11, wherein said joint portion (60) and said counter joint portion (64) together form a ball joint assembly (65).

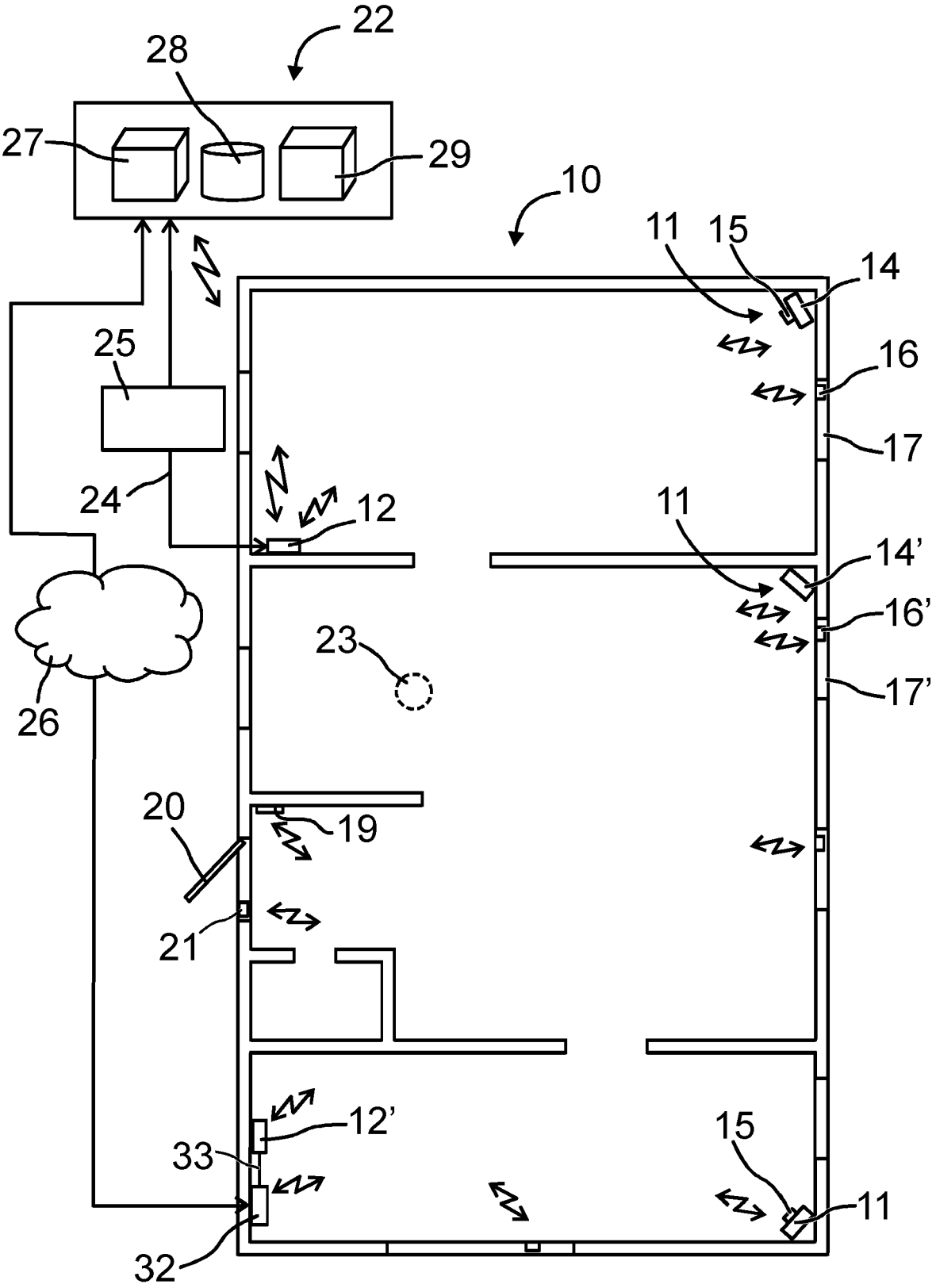
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Fig. 1

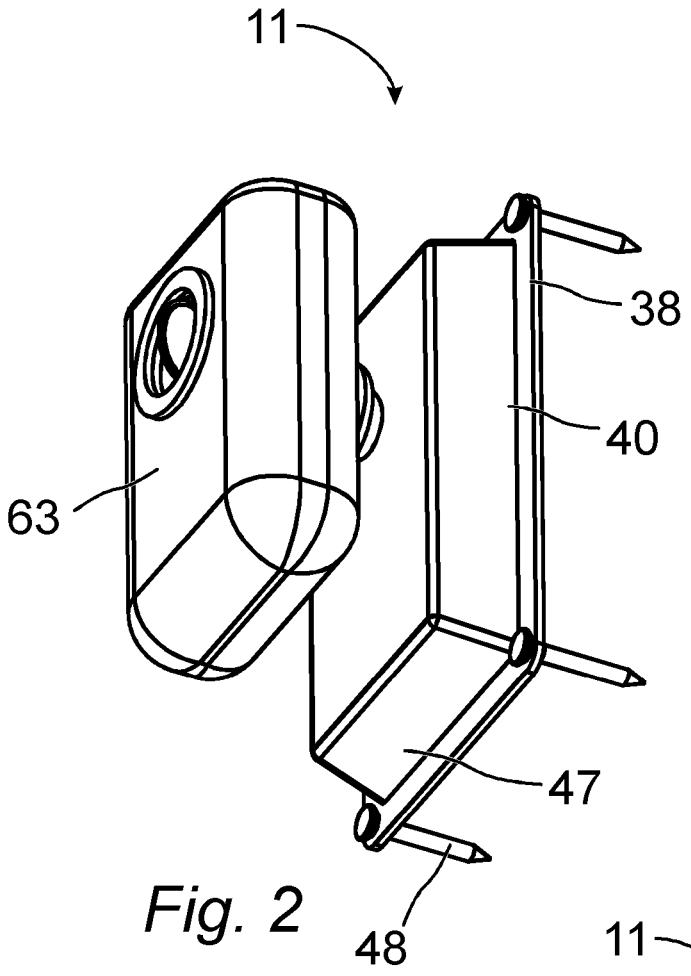


Fig. 2

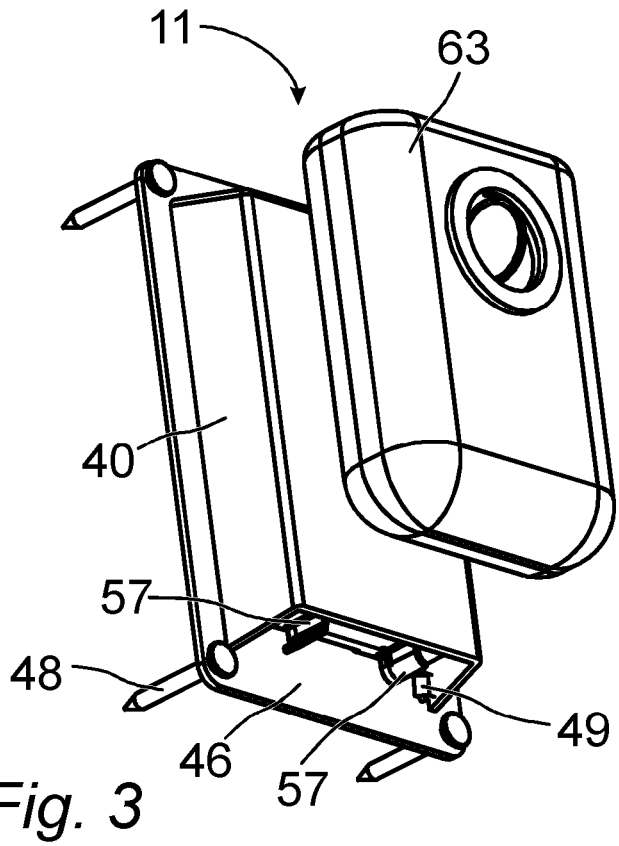


Fig. 3

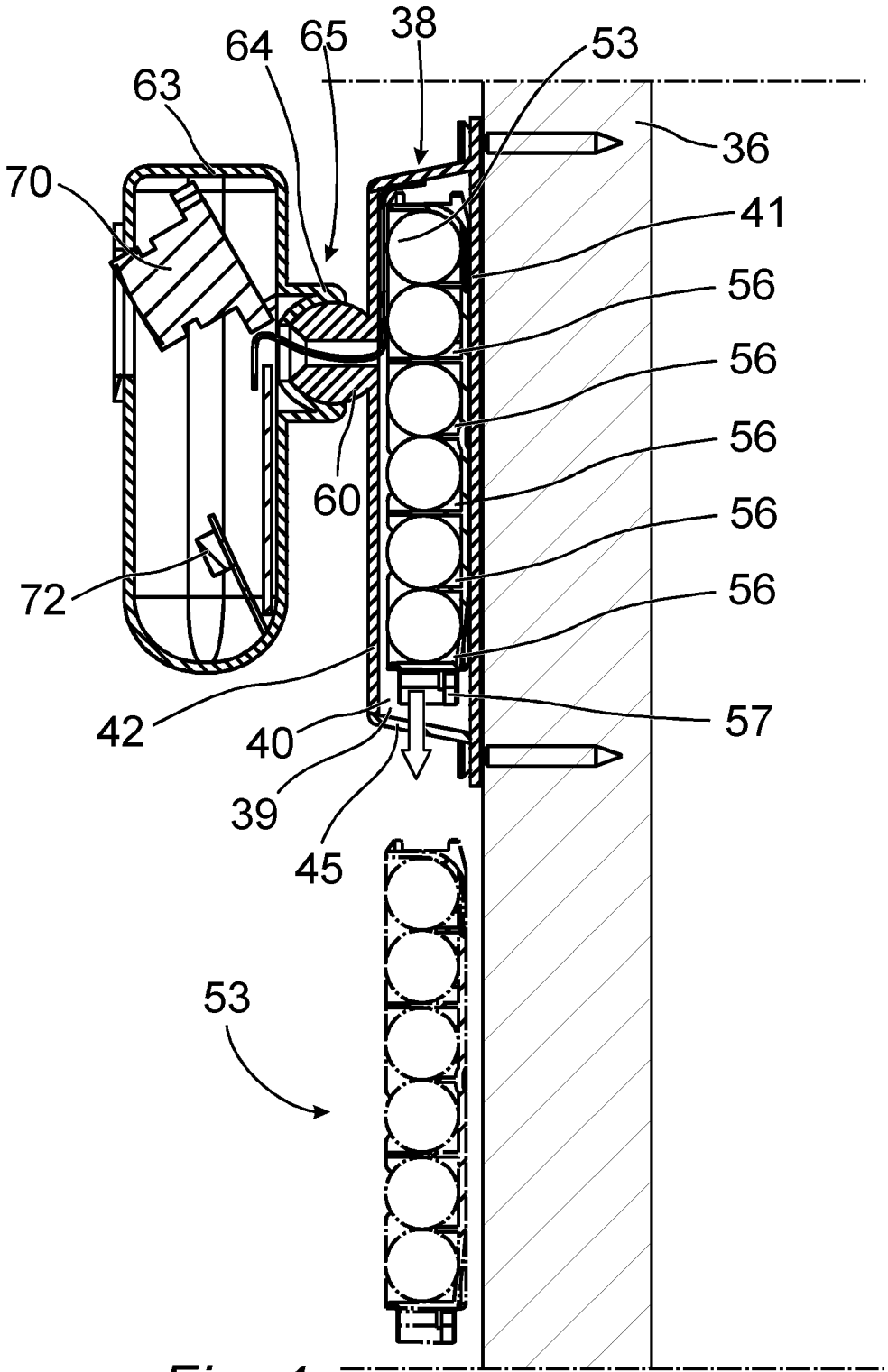


Fig. 4

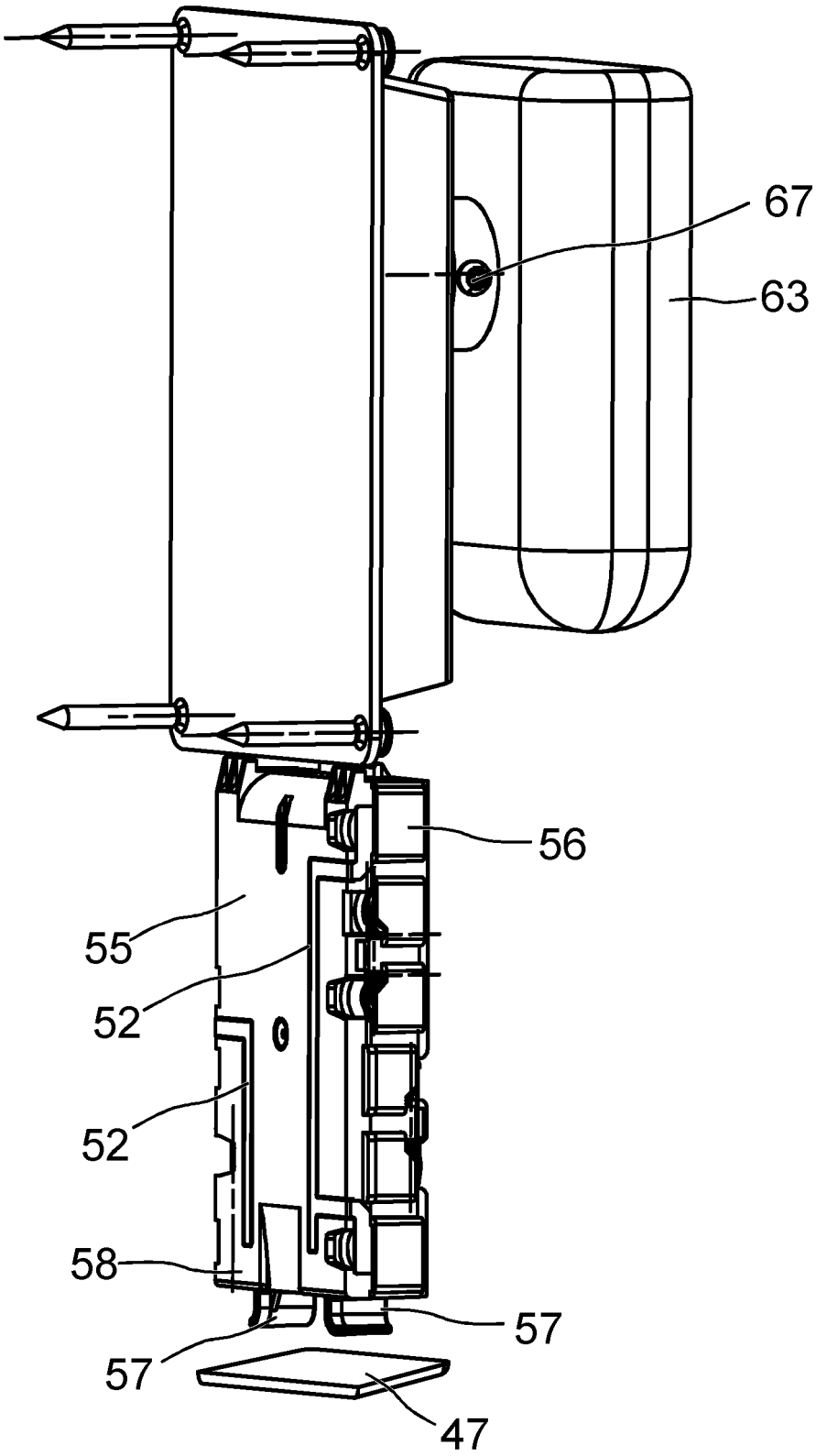


Fig. 5

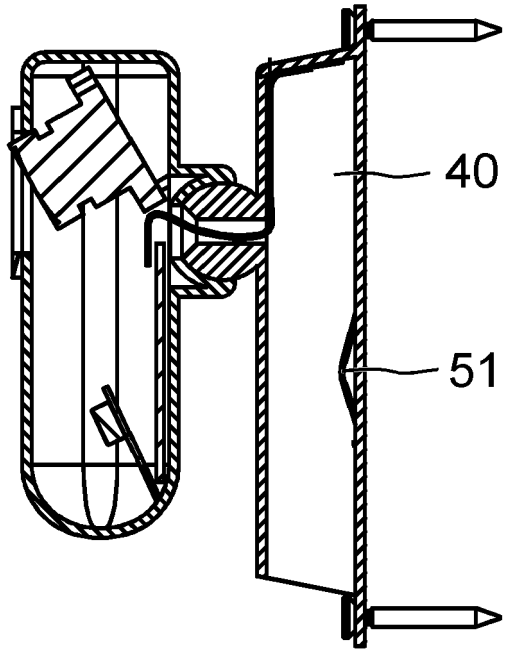


Fig. 6

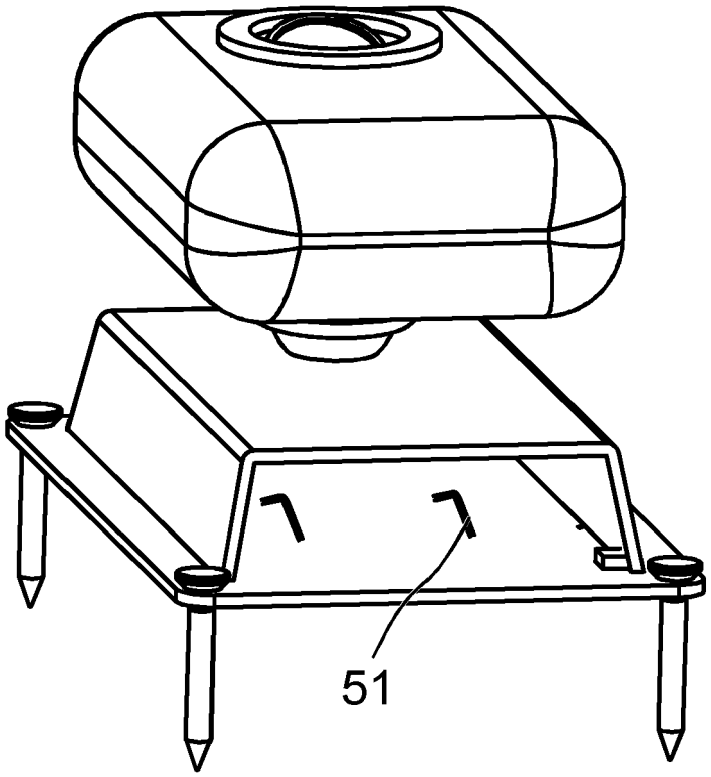


Fig. 7

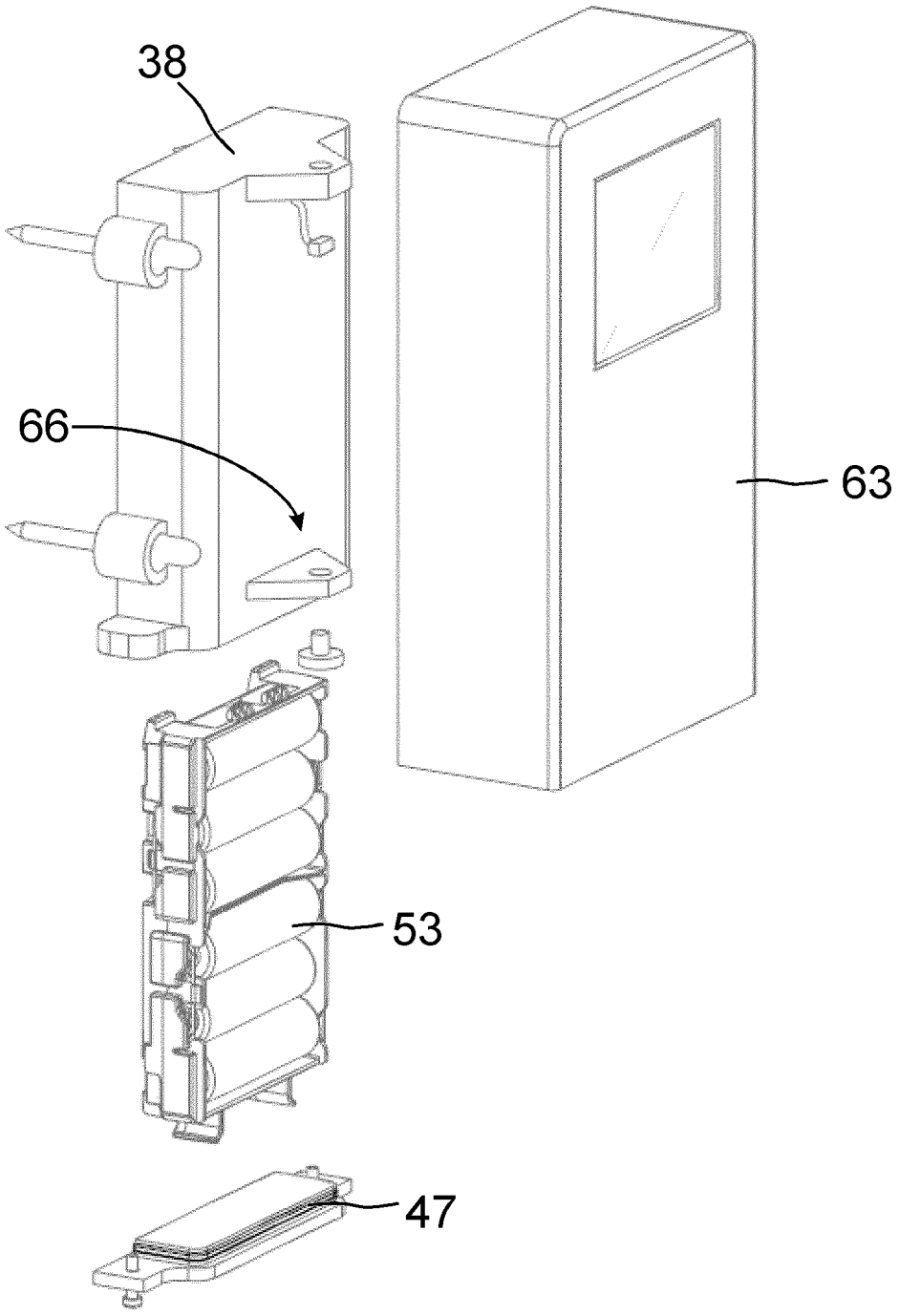


*Fig. 8*