(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 937 312 A1**

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
12.01.2022 Bulletin 2022/02

(21) Application number: **20305765.8**

(22) Date of filing: **06.07.2020**

(51) Int Cl.:
H01R 9/26 *(2006.01)* ***H01H 9/02*** *(2006.01)*
H01R 13/447 *(2006.01)*

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(71) Applicant: **Tyco Electronics France SAS**
95300 Pontoise (FR)

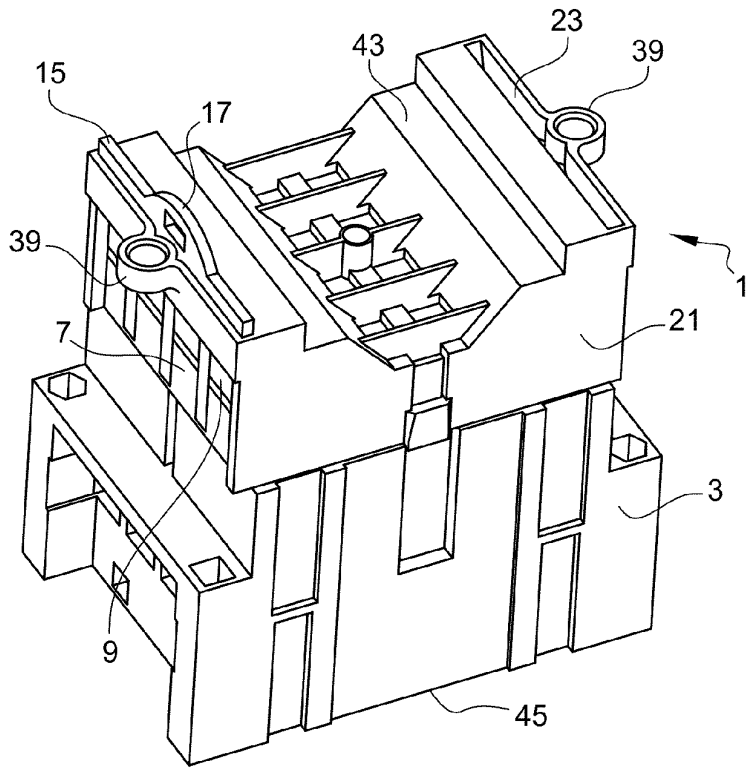
(72) Inventors:
- **GEOFFREY, Moine**
  69006 LYON (FR)
- **IMPERATO, André**
  69600 OULLINS (FR)
- **SEGUIN, Laurene**
  69100 VILLEURBANNE (FR)

(74) Representative: **Germain Maureau**
12, rue Boileau
69006 Lyon (FR)

(54) COVER ASSEMBLY FOR AN ELECTRICAL APPARATUS

(57) Cover assembly (1) for an electrical apparatus (3) configured for covering a plurality of conductor terminals of the electrical apparatus (3), the cover assembly (1) having for each conductor terminal a first separable part (7) and a second separable part (9) configured to be engender a first sized terminal opening when the first separable part (7) is removed and to engender a second sized terminal opening when the first separable part (7) and the second separable part (9) are removed.

Fig. 1



EP 3 937 312 A1

Description

Field of the invention

[0001] The present invention concerns a cover assembly for an electrical apparatus having a plurality of conductor terminals.

Prior art

[0002] It is known to use an electrical apparatus that have a plurality of conductor terminals. Such an electrical apparatus can be for example a terminal block dedicated to test an electrical installation.

[0003] This kind of electrical apparatus generally has a front face presenting testing terminals that are accessible to an operator for various controls as calibration, value measuring, etc.

[0004] The plurality of conductor terminals are generally located on a rear face opposed to the front face. The conductor terminals are linked to the electrical installation with several conductors.

[0005] Thus, only a part of the plurality of conductor terminals are plugged and another part remains disconnected. Depending on the installation, the conductors can have different diameters, which implies that the terminals are designed to receive the biggest admissible diameter.

[0006] In this context, there is a risk that a user can touch a conductive part on the rear face. It can be the extremity of a conductor or a conductor terminal. There is therefore a need to protect the rear face of the electrical apparatus.

[0007] However, as different spatial configurations related to the size or diameter of the conductors and the place of the conductors are possible, it become difficult to conceive a protection device for the rear side that prevent touching the conductive parts.

[0008] The present invention aims to solve all or some of the disadvantages mentioned above.

Summary of the invention

[0009] For this purpose, the present invention relates to a cover assembly for an electrical apparatus configured for covering a plurality of conductor terminals of the electrical apparatus, the cover assembly having for each conductor terminal a first separable part and a second separable part configured to be engender a first sized terminal opening when the first separable part is removed and to engender a second sized terminal opening when the first separable part and the second separable part are removed.

[0010] In other words, the cover assembly has a plurality of first separable parts and a plurality of second separable parts. Each first separable part is arranged to be removed from the cover assembly to create a first sized terminal opening for the insertion of a correspondingly sized conductor. When the first separable part and the associated second separable part are removed, a bigger sized conductor can be inserted.

[0011] The cover assembly enables to protect the plurality of conductor terminals of the electrical apparatus. When only some of the conductor terminals are used, the cover assembly enables to create different sized terminal openings where necessary and sized according to the plugged conductors.

[0012] The cover assembly has then a safety purpose as it protects each terminal of the electrical apparatus that are plugged or unplugged. In particular, it prevents a used to touch a conductive part.

[0013] According to an aspect of the invention, for each conductor terminal, the first separable part and the second separable part are configured to prevent access to the corresponding terminal conductor from the exterior at least according to an IP20 index.

[0014] This defines how each first separable part and second separable part are covering the corresponding conductor terminal. The cover assembly then enables to prevent a user to touch a conductive part of the electrical apparatus.

[0015] According to an aspect of the invention, the first sized terminal opening and the second sized terminal opening respect at least an IP20 index.

[0016] Then even when the separable parts are removed, the corresponding conductor terminal is protected.

[0017] According to an aspect of the invention, the cover assembly comprises at least one removable shutter on which are located the first separable parts and the second separable parts.

[0018] This provision enables to easily remove the necessary first separable parts and second separable parts from the cover assembly as the removable shutter can be removed from the cover assembly and thus from the electrical apparatus.

[0019] According to an aspect of the invention, the or each removable shutter comprises a grip. Preferably, said grip corresponds to a protrusion designed to be seized by hand. In particular, the grip presents a through hole. This provision facilitates the removal by hand or with the help of a tool.

[0020] According to an aspect of the invention, the cover assembly comprises a body configured to be clipped on the electrical apparatus, the body comprising at least one insertion slot for receiving the at least one removable shutter.

[0021] The body remains on the electrical apparatus while removing a separable part. According to an aspect of the invention, the body is provided with at least one snap-in element to cooperate with a complementary snap-in element of the at least one removable shutter. Preferably, the snap-in element corresponds to at least one hole and the complementary snap-in element corresponds to an at least one hook or vice versa.

[0022] According to an aspect of the invention, the cov-

er assembly comprises two removable shutters located on opposed faces the cover assembly.

[0023] The cover assembly is adapted to cooperate with a rear face of the electrical apparatus, the electrical apparatus being provided with two parallel rows of conductor terminals configured for plugging conductors according to two opposed directions transversally to the rows.

[0024] According to an aspect of the invention, the or each removable shutter comprises a plurality of strips, each strip comprising a corresponding first separable part and second separable part.

[0025] This facilitates the removal of each separable part, as each strip is manageable independently.

[0026] According to an aspect of the invention, for each strip, the first separable part and the second separable part are adjacent fractions of the strip, the first separable part constituting an extremity of the strip.

[0027] In other words, the removal of the first separable part reduces the length of the strip to engender a first sized terminal opening in the cover assembly. The length of the strip can be further reduced by removing the second separable part.

[0028] It appears that the removal of the first separable part and the second separable part is easy as it consists in the removal of the extremity of the strip.

[0029] According to an aspect of the invention, for each strip, the first separable part and the second separable part are pre-cut.

[0030] This provision enables a manual removal of the first separable part and/or the second separable part. Preferably, a first groove is located on the strip between the first separable part and the second separable part. A second groove is located on the strip to separate the second separable part or both separable parts from the strip.

[0031] According to an aspect of the invention, the cover assembly further has at least one eyelet configured for receiving a seal.

[0032] According to an aspect of the invention, the at least one eyelet is included in the body. According to one aspect of the invention, the or each eyelet is located in proximity to a corresponding through hole of the removable shutter so as to enable to seal together the removable shutter and the body.

[0033] According to an aspect of the invention, the cover assembly further has at least one reference orifice configured to be facing a corresponding marking of the electrical apparatus.

[0034] This provision prevents to hide the markings that are already present on the electrical apparatus. According to an aspect of the invention, the at least one reference orifice is included in the body. Preferably, the cover assembly has a plurality of reference orifices, each reference orifice corresponding to conductor terminal.

[0035] According to an aspect of the invention, the plurality of reference orifices are aligned according two lines, each line being parallel and located next to a corresponding row of conductor terminal.

[0036] According to an aspect of the invention, the at least one reference orifice and/or the at least one insertion slot are located on a rear part of the cover assembly extending transversally to the at least one removable shutter.

[0037] The eyelet is configured to enable an insertion of a cable of a seal transversally to the extension direction of the rear part of cover assembly.

[0038] The present invention also concerns an electrical testing assembly comprising the electrical apparatus and a cover assembly as detailed above, wherein the electrical apparatus has a front face presenting testing terminals and a rear face opposed to the front face and configured to receive the cover assembly.

[0039] According to an aspect of the invention, the plurality of conductor terminals are located on the rear face. Preferably, the markings are located on the rear face.

[0040] According to an aspect of the invention, the at least one removable shutter are extending transversally to the front face and the rear face.

[0041] According to an aspect of the invention, the electrical testing assembly further comprises a first sized electrical conductor plugged in a conductor terminal of the electrical apparatus, wherein the corresponding first separable part is removed and the second separable part is present, the space engendered between the first sized terminal opening and the first sized electrical conductor being defined with respect to at least an IP20 index.

[0042] According to an aspect of the invention, the electrical testing assembly further comprises a second sized electrical conductor plugged in a conductor terminal or alternatively two first sized electrical conductors plugged in said conductor terminal, wherein the corresponding first separable part and the second separable part are removed, the space engendered between the second sized terminal opening and the second sized electrical conductor or alternatively two the first sized electrical conductors being defined with respect to at least an IP20 index.

[0043] Thus, the removal the first separable part and the second separable part enable to maintain a protection for the user.

[0044] According to an aspect of the invention, the electrical apparatus is a terminal block dedicated for testing an electrical installation.

[0045] According to an aspect of the invention, the terminal block is dedicated for calibration, value measuring as current or voltage or other electrical values.

[0046] The different aspects defined above that are not incompatible can be combined.

Brief description of the figures

[0047] The invention will be better understood with the aid of the detailed description that is set out below with reference to the appended drawing in which:

- figure 1 is a perspective view of an electrical apparatus and a cover assembly mounted on the electrical apparatus;
- figure 2 is a side view of the electrical apparatus and the cover assembly;
- figure 3 is a perspective view of the electrical apparatus without cover assembly;
- figure 4 is a perspective view of the cover assembly;
- figure 5 is a front view of a removable shutter of the cover assembly;
- figure 6 is a another perspective view of the electrical apparatus and the cover assembly wherein;

Description with reference to the figures

[0048] In the following detailed description of the figures defined above, the same elements or the elements that are fulfilling identical functions may retain the same references so as to simplify the understanding of the invention.

[0049] As illustrated in figure 1 to 5 and 6, a cover assembly 1 for an electrical apparatus 3 is configured for covering a plurality of conductor terminals 5 of the electrical apparatus 3.

[0050] As illustrated in figures 1, 2 and 5, the cover assembly 1 has, for each conductor terminal 5, a first separable part 7 and a second separable part 9 configured to be engender a first sized terminal opening 11 when the first separable part 7 is removed and to engender a second sized terminal opening 13 when the first separable part 7 and the second separable part 9 are removed.

[0051] In other words, the cover assembly 1 has a plurality of first separable parts 7 and a plurality of second separable parts 9. Each first separable part 7 is arranged to be removed from the cover assembly 1 to create a first sized terminal opening 11 for the insertion of a correspondingly sized conductor. When the first separable part 7 and the associated second separable part 9 are removed, a bigger sized conductor can be inserted.

[0052] For each conductor terminal 5, the first separable part 7 and the second separable part 9 are configured to prevent access to the corresponding terminal conductor 5 from the exterior at least according to an IP20 index.

[0053] The first sized terminal opening 11 and the second sized terminal opening 13 respect at least an IP20 index.

[0054] The cover assembly 1 comprises at least one removable shutter 15 on which are located the first separable parts 7 and the second separable parts 9.

[0055] The removable shutter 15 comprises a grip 17. Said grip 17 corresponds to a protrusion designed to be seized by hand. The grip 17 presents a through hole 19.

[0056] The cover assembly 1 comprises a body 21 configured to be clipped on the electrical apparatus 3, the body 21 comprising at least one insertion slot 23 for receiving the at least one removable shutter 15.

[0057] The body 21 remains on the electrical apparatus 3 while removing a separable part. The body 21 is provided with at least one snap-in element 25 to cooperate with a complementary snap-in element 27 of the at least one removable shutter 15. The snap-in element 25 corresponds to at least one hole and the complementary snap-in element 27 corresponds to an at least one hook.

[0058] Here, the cover assembly 1 comprises two removable shutters 15 located on opposed faces the cover assembly 1.

[0059] The cover assembly 1 is adapted to cooperate with a rear face 29 of the electrical apparatus 3, the electrical apparatus 3 being provided with two parallel rows 31 of conductor terminals 4 configured for plugging conductors according to two opposed directions transversally to the rows 31.

[0060] As illustrated in figure 5, each removable shutter 15 comprises a plurality of strips 33, each strip 33 comprising a corresponding first separable part 7 and second separable part 9.

[0061] For each strip 33, the first separable part 7 and the second separable part 9 are adjacent fractions of the strip 33, the first separable part 7 constituting an extremity of the strip 33.

[0062] In other words, the removal of the first separable part 7 reduces the length of the strip 33 to engender the first sized terminal opening 11 in the cover assembly 1. The length of the strip 33 can be further reduced by removing the second separable part 9.

[0063] For each strip 33, the first separable part 7 and the second separable part 9 are pre-cut. A first groove 35 is located on the strip 33 between the first separable part 7 and the second separable part 9. A second groove 37 is located on the strip 33 to separate the second separable part 9 or both separable parts from the strip 33.

[0064] The cover assembly 1 further has at least one eyelet 39 configured for receiving a seal.

[0065] The at least one eyelet 39 is included in the body 21. Said eyelet 39 is located in proximity to a corresponding through hole 19 of a removable shutter 15 so as to enable to seal together the removable shutter 15 and the body 21.

[0066] The cover assembly 1 further has at least one reference orifice 41 configured to be facing a corresponding marking of the electrical apparatus 3.

[0067] The at least one reference orifice 41 is included in the body 21. The cover assembly 1 has a plurality of reference orifices 41, each reference orifice 41 corresponding to conductor terminal 5.

[0068] The plurality of reference orifices 39 are aligned according two lines, each line being parallel and located next to a corresponding row 31 of conductor terminal 5.

[0069] The at least one reference orifice 39 and/or the at least one insertion slot 23 are located on a rear part 43 of the cover assembly 1 extending transversally to the at least one removable shutter 15.

[0070] The eyelet 39 is configured to enable an insertion of a cable of a seal transversally to the extension direction of the rear part 43 of cover assembly 1.

[0071] An electrical testing assembly 45 comprising the electrical apparatus 3 and a cover assembly 1, wherein the electrical apparatus 3 has a front face 47 presenting testing terminals and said rear face 29 opposed to the front face 47 and configured to receive the cover assembly 1.

[0072] The plurality of conductor terminals 5 are located on the rear face 29. The markings are located on the rear face 29. The at least one removable shutter 15 are extending transversally to the front face 47 and the rear face 29.

[0073] The electrical testing assembly 45 further comprises a first sized electrical conductor 49 plugged in a conductor terminal 5 of the electrical apparatus 3 wherein the corresponding first separable part 7 is removed and the second separable part 9 is present, the space engendered between the first sized terminal opening 11 and the first sized electrical conductor 49 being defined with respect to at least an IP20 index.

[0074] The electrical testing assembly further comprising a second sized electrical conductor 51 plugged in a conductor terminal 5 or alternatively two first sized electrical conductors plugged in said conductor terminal 5, wherein the corresponding first separable part 7 and the second separable part 9 are removed, the space engendered between the second sized terminal opening 13 and the second sized electrical conductor 51 or alternatively two the first sized electrical conductors 49 being defined with respect to at least an IP20 index.

[0075] The electrical apparatus 3 is here a terminal block dedicated for testing an electrical installation. The terminal block is for example dedicated for calibration, value measuring as current or voltage or other electrical values.

[0076] The cover assembly 1 as described above enables to protect the plurality of conductor terminals 5 of the electrical apparatus 3. When only some of the conductor terminals 5 are used, the cover assembly 1 enables to create different sized terminal openings where necessary and sized according to the plugged conductors.

[0077] The cover assembly 1 has then a safety purpose as it protects each conductor terminal 5 of the electrical apparatus 3 that are plugged or unplugged. In particular, it prevents a used to touch a conductive part.

[0078] The removable shutters 15 enable to easily remove the necessary first separable parts 7 and second separable parts 9 from the cover assembly 1 as the removable shutters 15 can be removed from the cover assembly 1 and thus from the electrical apparatus 3.

[0079] As goes without saying, the invention is not limited to the sole embodiment described above by way of example, it encompasses all the variants.

Claims

1. Cover assembly (1) for an electrical apparatus (3) configured for covering a plurality of conductor terminals (5) of the electrical apparatus (3), the cover assembly (1) having for each conductor terminal (5) a first separable part (7) and a second separable part (9) configured to be engender a first sized terminal opening (11) when the first separable part (7) is removed and to engender a second sized terminal opening (13) when the first separable part (7) and the second separable part (9) are removed.

2. Cover assembly (1) according to claim 1, wherein for each conductor terminal (5), the first separable part (7) and the second separable part (9) are configured to prevent access to the corresponding terminal conductor (5) from the exterior at least according to an IP20 index.

3. Cover assembly (1) according to one of the claim 1 or 2, wherein the first sized terminal opening (11) and the second sized terminal opening (13) respect at least an IP20 index.

4. Cover assembly (1) according to one of the claims 1 to 3, comprising at least one removable shutter (15) on which are located the first separable parts (7) and the second separable parts (9).

5. Cover assembly (1) according to claim 4, comprising a body (21) configured to be clipped on the electrical apparatus (3), the body (21) comprising at least one insertion slot (23) for receiving the at least one removable shutter (15).

6. Cover assembly (1) according to one of the claims 4 or 5, comprising two removable shutters (15) located on opposed faces the cover assembly (1).

7. Cover assembly (1) according to one of the claims 4 to 6, wherein the or each removable shutter (15) comprises a plurality of strips (33), each strip (33) comprising a corresponding first separable part (7) and second separable part (9).

8. Cover assembly (1) according to claim 7, wherein for each strip (33), the first separable part (7) and the second separable part (9) are adjacent fractions of the strip (33), the first separable part (7) constituting an extremity of the strip (33).

9. Cover assembly (1) according to claim 8, wherein for each strip (33), the first separable part (7) and the second separable part (9) are pre-cut.

10. Cover assembly (1) according to one of the claims 1 to 9, further having at least one eyelet (39) configured for receiving a seal.

11. Cover assembly (1) according to one of the claims

1 to 10, further having at least one reference orifice (41) configured to be facing a corresponding marking of the electrical apparatus (3).

12. Electrical testing assembly (45) comprising the electrical apparatus (3) and a cover assembly (1) according to one of the claims 1 to 11, wherein the electrical apparatus (3) has a front face (47) presenting testing terminals and a rear face (29) opposed to the front face (47) and configured to receive the cover assembly (1).

13. Electrical testing assembly (45) according to claim 12, further comprising a first sized electrical conductor (49) plugged in a conductor terminal (5) of the electrical apparatus (3), wherein the corresponding first separable part (7) is removed and the second separable part (9) is present, the space engendered between the first sized terminal opening (11) and the first sized electrical conductor (49) being defined with respect to at least an IP20 index.

14. Electrical testing assembly (45) according one of the claims 12 or 13, further comprising a second sized electrical conductor (51) plugged in a conductor terminal (5) or alternatively two first sized electrical conductors plugged in said conductor terminal (5), wherein the corresponding first separable part (7) and the second separable part (9) are removed, the space engendered between the second sized terminal opening (13) and the second sized electrical conductor (51) or alternatively two the first sized electrical conductors (41) being defined with respect to at least an IP20 index.

15. Electrical testing assembly (45) according one of the claims 12 to 14, wherein the electrical apparatus (3) is a terminal block dedicated for testing an electrical installation.

Fig. 1

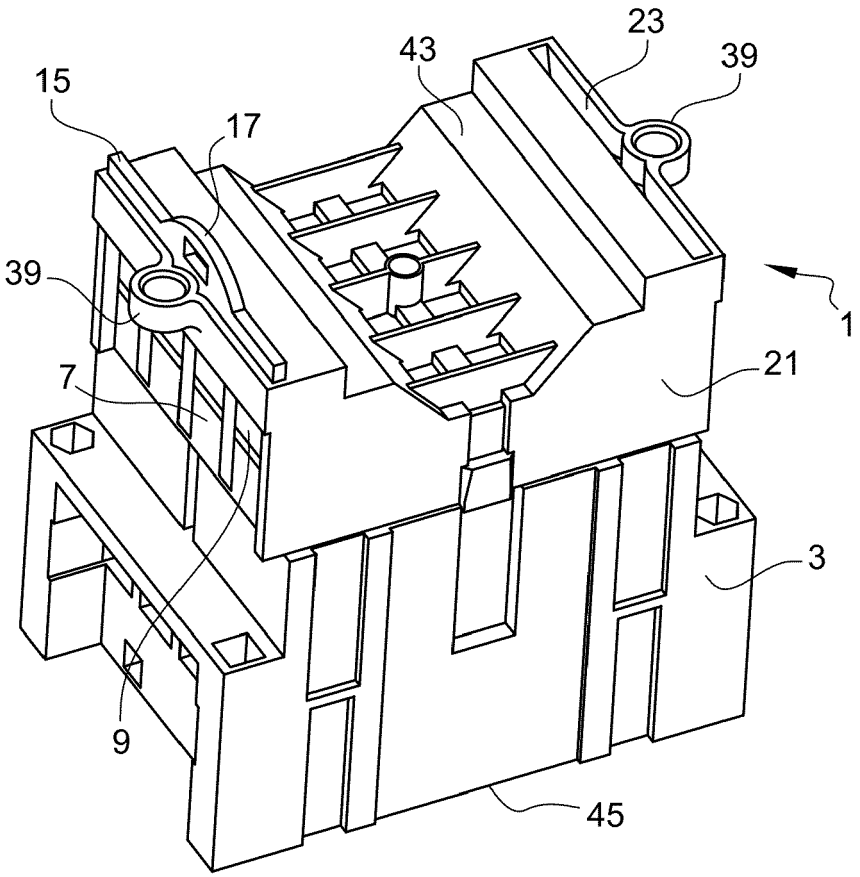


Fig. 2

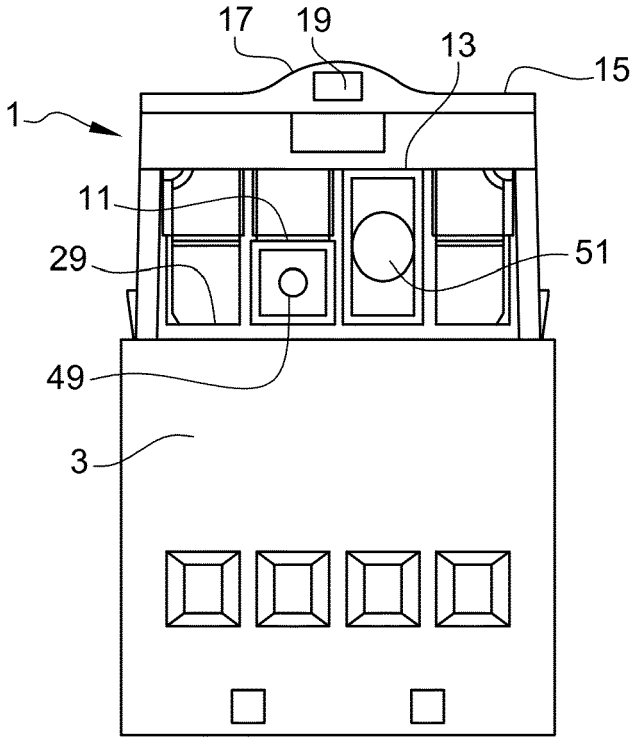


Fig. 3

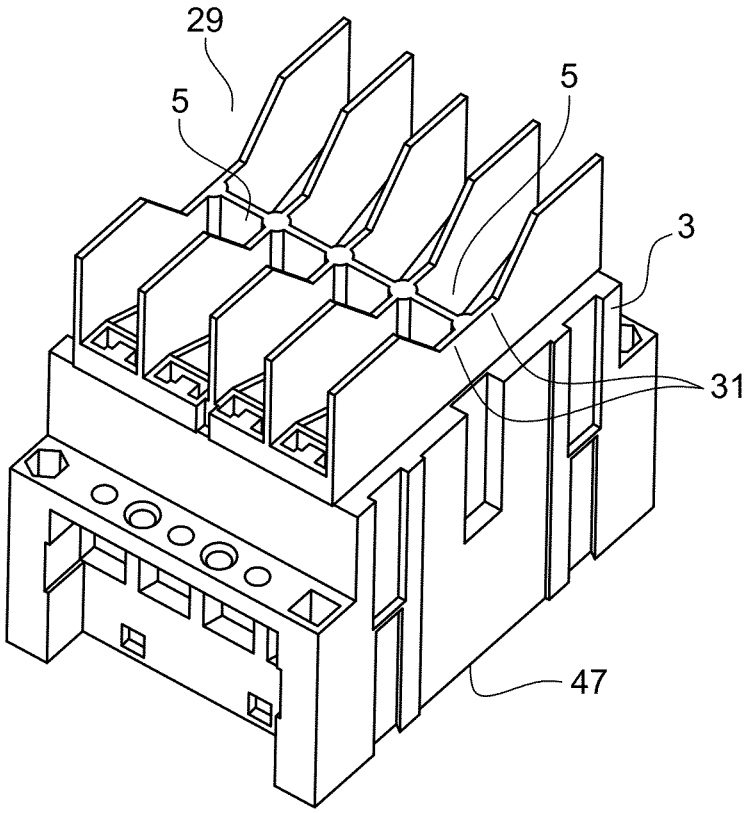


Fig. 4

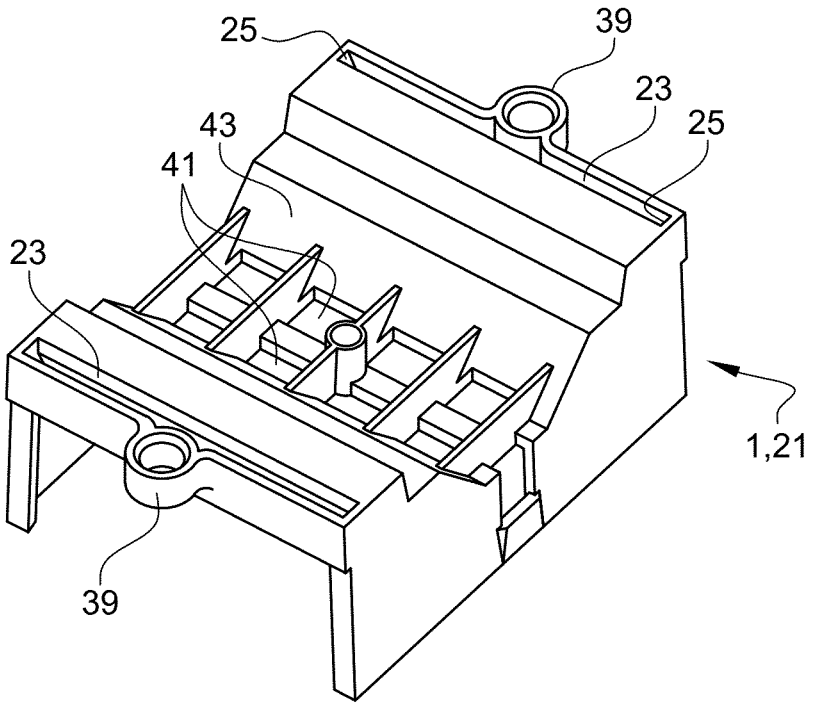


Fig. 5

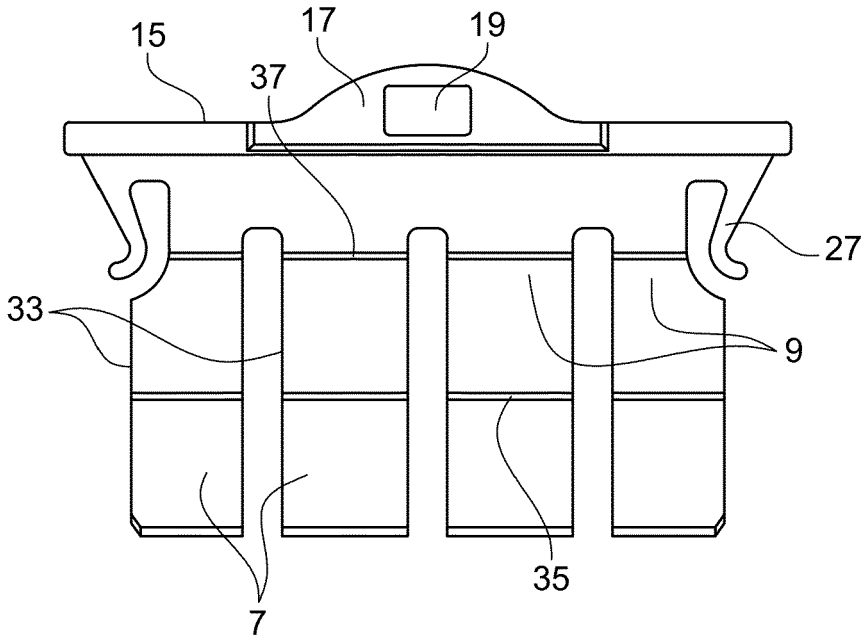
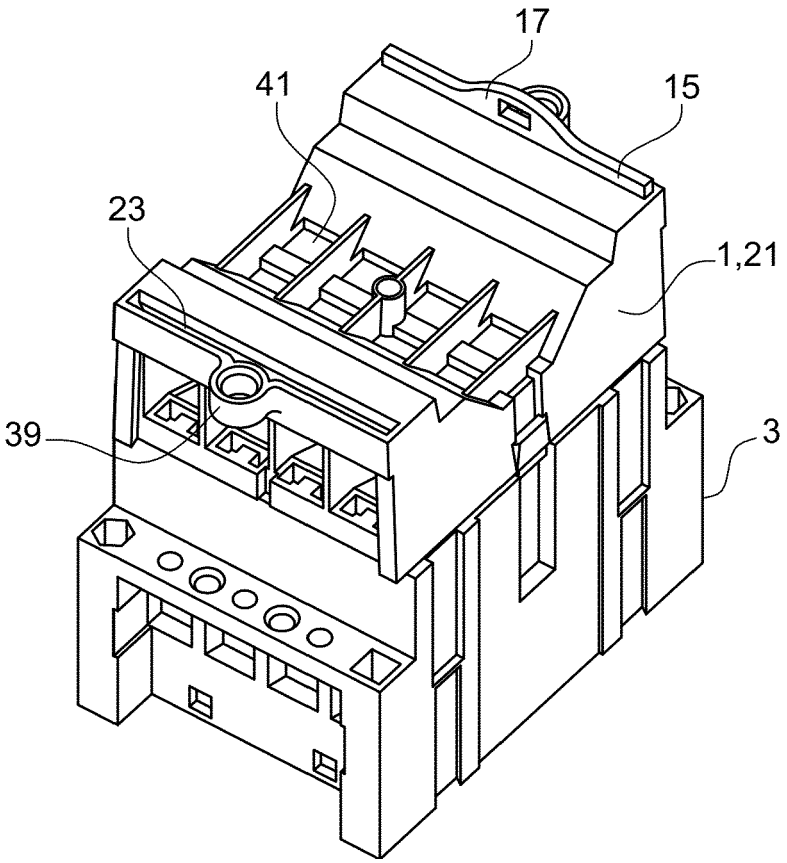


Fig. 6



Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 20 30 5765

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 Y	EP 1 069 578 A1 (POWER CONTROLS IBERICA S A [ES]) 17 January 2001 (2001-01-17) * figures 1,3b,3d,6 * * paragraph [0003] * * paragraph [0015] * -----	1-9, 11-15 10	INV. H01R9/26 H01H9/02 H01R13/447
Y A	US 8 698 023 B2 (GRÜNWALD JAN [DE]; SIEMENS AG [DE]) 15 April 2014 (2014-04-15) * abstract; figures 7-8 * -----	10 1-9, 11-15	
A	FR 2 602 948 A1 (MERLIN GERIN [FR]) 19 February 1988 (1988-02-19) * abstract; figures 1,2,3 * -----	1-15	

TECHNICAL FIELDS SEARCHED (IPC)
H01R H01H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	23 November 2020	Skaloumpakas, K

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 20 30 5765

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

23-11-2020

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1069578 A1	17-01-2001	CN 1286488 A	07-03-2001
		EP 1069578 A1	17-01-2001
		ES 2161614 A1	01-12-2001
		JP 2001068002 A	16-03-2001
US 8698023 B2	15-04-2014	BR PI1103373 A2	04-08-2015
		CN 102347172 A	08-02-2012
		DE 102010033236 A1	02-02-2012
		US 2012024680 A1	02-02-2012
FR 2602948 A1	19-02-1988	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82