



(43) International Publication Date
23 November 2006 (23.11.2006)

PCT

(10) International Publication Number
WO 2006/123383 A1

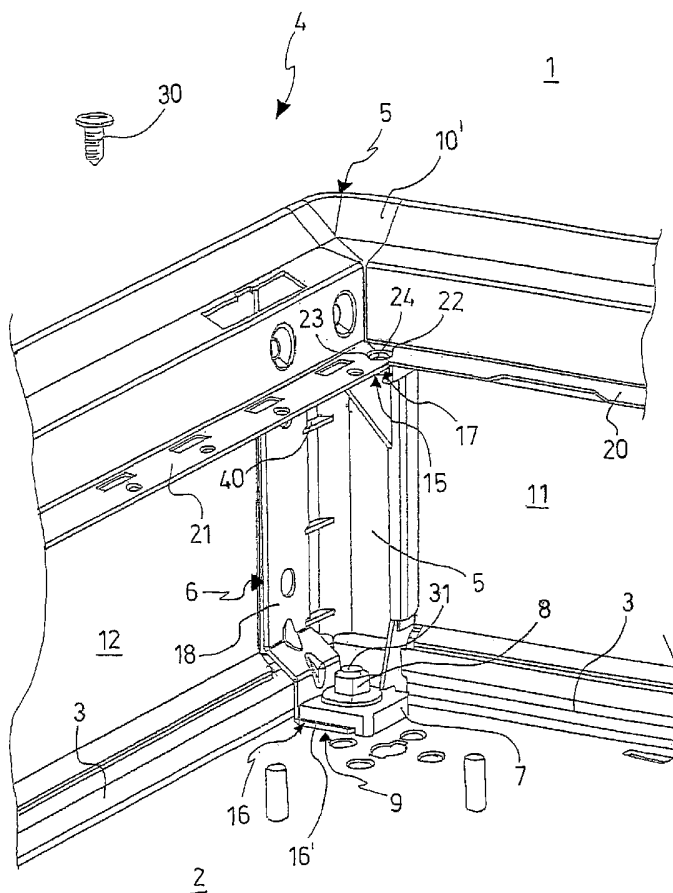
- (51) International Patent Classification:
H02B 1/30 (2006.01)
- (21) International Application Number:
PCT/IT2006/000322
- (22) International Filing Date: 8 May 2006 (08.05.2006)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
MI2005A000898 17 May 2005 (17.05.2005) IT
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- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— with international search report

[Continued on next page]

(54) Title: CABINET FOR ELECTRICAL SWITCHBOARD



(57) Abstract: A cabinet for electrical switchboard (1) for electrical devices is described constituted by a rear wall (2), two side walls a bottom and a top wall, all made of electrically conductive material and four angular elements (5) made of electrically insulating material, each angular element joining said rear wall (2) to said side and bottom/ top walls. The cabinet for electrical switchboard further comprises brackets (6) made of electrically conductive material, which are housed within angular elements (5) having a first end (16) in electrical contact with the rear wall (2) and a second end (17) in electrical contact with said side wall and bottom/ top wall.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

DESCRIPTION**"CABINET FOR ELECTRICAL SWITCHBOARD"**

The present invention relates to cabinets for electrical switchboards.

5 Typically, an electrical switchboard comprises a cabinet or box in which there are arranged support frameworks (for example, support frames) with electrical devices being mounted thereon, such as switches. In greater detail, a conventional cabinet for electrical
10 switchboard comprises a rear wall or panel, side walls or flanks and a front wall or panel. The electrical devices are connected, either directly or by means of suitable support structures, to the rear panel of the cabinet, which normally has a quadrangular shape. The front panel
15 is an access door to the electrical switchboard for a user or a maintenance operator.

An important feature of an electrical switchboard is that all the metallic parts, usually the rear panel and the flanks, have to be equipotential and connected to the
20 earth terminal, or according to the terminology of the field, "grounded or earthed".

In order to meet this requirement, cabinets of the so-called monobloc type made of metallic material are currently manufactured and installed. With these
25 cabinets, the rear panel and the flanks are made as one

piece and are earthed, such as with a respective electrical lead. This monobloc structure has a drawback in that it is not very versatile.

Furthermore, modular cabinets are known in which the rear panel and the flanks made of metallic material are joined to each other by means of angular uprights made of plastic materials. In this case, the grounding is not convenient for the installer, since one or more leads are required to be used in order to contact the two flanks, which are separated by a respective plastic upright, and the rear panel.

The object of the present invention is to provide a cabinet for electrical switchboard alternative to prior art cabinets, which particularly facilitates the grounding operation.

This object is achieved by the cabinet for electrical switchboard as defined and characterized in claim 1.

The invention will be better understood from the following detailed description of an embodiment thereof, which is given by way of example with reference to the annexed figures, in which:

Fig. 1-3 sequentially illustrate partial perspective views of assembly steps of a cabinet for electrical switchboard according to an example of the invention, and

Fig. 4 shows an overall view of said cabinet with four uprights and two side walls being assembled to the rear wall.

With reference to Fig. 1, a cabinet for electrical switchboard being globally designated with numeral 1, comprises, in a first construction step, a rear wall or panel 2 having a quadrangular shape, rectangular in the example, having a frame in relief 3, and four uprights 4 on each vertex of the panel.

An upright 4 is comprised of an outer angular element 5 and an inner element 6. The angular element 5 is made of an electrically insulating material, such as plastic, and externally has a substantially rounded connecting surface. The angular element 5 has a plurality of coupling means therein, which are suitable to cooperate, generally, with cabinet walls and the inner element 6. In greater detail, by cabinet walls is meant both the rear wall 2, as mentioned above, and suitable to house electrical devices and/or switches, and side walls or flanks 11 and 12, such as schematically represented in Fig. 2 and 3. The rear wall 2 and the side walls 11 and 12 are made of electrically conductive material, such as metal.

The angular element 5 has a foot 7 suitable to abut against the rear wall 2 and may have an outer profile,

which at least in the end tract proximate to the foot 7, is counter-shaped relative to the frame 3 of the rear wall 2. The foot 7 has a first through hole that is preferably defined in the center thereof, not seen in the
5 figures, which is suitable to house a fixing pin 31, such as a stud being welded to the rear wall 2. This fixing pin 31 being suitable to cooperate with a first nut 8 to fix the foot to the rear wall. The foot 7 partially contacts the rear wall 2 thus defining a fixing seat 9
10 for the inner element 6.

The angular element 2 further comprises, opposite to the foot 7, a head 10 that is worked as having a first portion 10' and a second portion 10" suitable to be fittingly engaged with portions of the first side wall 11
15 and second side wall of the cabinet, respectively, such as depicted in Fig. 2 and 3.

The head 10 is further provided with two ribs 13 defining a guide 14 suitable to house the inner element 6. The guide 14 further comprises an opening 15 to allow
20 a second screw 30, schematically illustrated on top of Fig. 3, to pass therethrough, in order to fix the first 11 and second 12 side walls to the angular element 5, which is intended to be screwed within a suitably threaded hole of wall 11.

25 The angular element 5 is further provided with

distributed fixing means, such as indentations 40 suitable to cooperate with the inner element 6.

The inner element 6 is made of electrically conductive material, such as metal, and preferably consists of a bracket structurally associated with the angular element 5 such as to be arranged within the cabinet 1 and extend in a substantially orthogonal direction to the rear wall 2.

The bracket 6 is substantially bent in the shape of a "C", such as to comprise, for example, a main plate-like bar 18 extending between a first end 16 and a second end 17, opposite to the first one, which are suitable to contact the rear wall 2 and, when the assembly of the cabinet has been finished, the side walls 11 and 12, respectively.

The first end 16 of the bracket 6 comprises a first drilled plate 16' extending transversally to the main bar 18. This first plate 16' is suitable to be slidingly coupled with the fixing seat 9 being defined by the foot 7 with the rear wall 2 and is provided with a third hole, not seen in the figures, which can be associated to the first hole being defined in the foot, in which the fixing stud 31 can be inserted.

The second end 17 comprises a second plate 17' provided with a further through hole 19 suitable to house

the second screw 30, and is suitable to be slidingly engaged with the guide 14 of the head 10. The further through hole 19 is engaged with the opening 15. The main bar 18 may provide eventually an end tract joined to the first plate and having a profile suitable to substantially follow the frame 3 of the rear wall 2.

With reference to Fig. 2, the first side wall 11 can be fittingly coupled with the first portion 10' of the head 10 of the angular element 5 and is provided with a first laminar projection 20 which partially rests on the guide 14 and having a first notch 22 on a first contact edge. This first laminar projection 20 is shaped as to have the first contact edge inclined by such an angle that the first notch 22 substantially follows a part of the contour of the further through hole 19 of the second plate 17' of the bracket 6.

With reference to Fig. 3, similar to the first side wall 11, the second side wall 12 can be fittingly coupled with the second portion 10" of the head 10 and is provided with a second side projection 21 suitable to be partially rested on the guide 14 and having a second notch 23 on a second contact edge, suitable to be placed beside the first contact edge. This second laminar projection 21 is shaped as to have the second contact edge inclined by an angle complementary to the

inclination of the first contact edge and such that the second notch 23 and the first notch 22 define a single opening 24 that can be overlapped to the through hole 19 suitable to house the second screw 30.

5 The installer, in the assembly step, couples the bracket 6 to the angular element 5 and couples the thus-obtained upright within the fixing pin 31 welded to the rear wall 2 by screwing the first nut 8 to the fixing pin 31 such that the bracket 6 and the rear wall 2 are placed
10 in contact with each other.

The first 11 and second 12 side walls are fittingly coupled with the head 10 of the angular element 5. Subsequently, the screw 30 is inserted within the single opening 24 overlapped to the respective further through
15 hole 19 of the second plate 17 of the bracket 6. The screw 30 is tightened such that both side walls of the cabinet are placed in contact with the bracket 6.

The bracket 6 thus allows the side walls and rear wall of a cabinet to be placed in contact with each
20 other. The bracket has a negligible electrical resistance such that the equipotentiality between the cabinet walls can be obtained by means of the cabinet according to the invention. The operations are repeated with the uprights being provided for the cabinet.

25 As may be observed, the object of the invention is

fully achieved in that all the metallic walls of a cabinet for electrical switchboard can be placed in electrical contact with each other, the electrical switchboard being then capable of being "grounded" with
5 an electrical wire connected, for example, to the rear wall of the cabinet.

A cabinet for electrical switchboard thus provided has the aesthetic advantage that the bracket is placed inside the cabinet, hence it is not visible.

10 Furthermore, the use of plastic angular elements allows obtaining a lightweight structure, while the brackets provide the cabinet with a greater solidity.

CLAIMS

1. A cabinet for electrical switchboard (1) comprising:

- a rear wall (2) and side walls (11, 12) made of
5 electrically conductive material;

- at least one angular element (5) made of electrically insulating material suitable to join the rear wall (2) and two of said side walls (11, 12) to each other;

10 characterized in that it further comprises a bracket (6) made of electrically conductive material which is structurally associated with said at least one angular element (5) and having a first end (16) in contact with the rear wall (2) and a second end (17) in contact with
15 said side walls (11, 12).

2. The cabinet for electrical switchboard (1) according to claim 1, wherein the bracket (6) is structurally associated with the angular element (5) such as to be arranged within the cabinet and extend in a
20 direction substantially orthogonal to the rear wall.

3. The cabinet for electrical switchboard (1) according to claim 1, wherein the bracket comprises a substantially plate-like main bar (18) which extends between the first (16) and second (17) ends.

25 4. The cabinet for electrical switchboard (1)

according to claim 3, wherein said first end (16) comprises a first drilled plate extending transversally to the bar.

5 5. The cabinet for electrical switchboard (1) according to claim 4, wherein the second end (17) of the bracket (6) comprises a second plate being provided with a through hole (19).

6. The cabinet for electrical switchboard (1) according to claim 4, wherein the bar (18) comprises an
10 end tract joined to said first plate and having a profile suitable to substantially follow a frame (3) of the rear wall (2).

7. The cabinet for electrical switchboard (1) according to claim 4, wherein said at least one angular
15 element (5) comprises a foot (7) suitable to partially contact the rear wall (2) and defining therewith a fixing seat (9) for the first plate (16); the cabinet comprising first fixing means (8) of the first plate and foot to the rear wall (2).

20 8. The cabinet for electrical switchboard (1) according to claim 7, wherein said at least one angular element (5) further comprises a head (10) opposite to the foot (7), which is provided with two ribs (13) defining, respectively, a guide (14) suitable to house the second
25 plate (17), the guide further comprising second fixing

means of the second plate (17), the two side walls to the at least one angular element (2).

9. The cabinet for electrical switchboard (1) according to claim 3, wherein the head (10) of the angular element (5) has a first portion (10') and a second portion (10'') suitable to be fittingly engaged with first (11) and second (12) side walls of the cabinet, respectively.

10. The cabinet for electrical switchboard (1) according to claim 7, wherein said first fixing means comprise a fixing pin (31) and a first nut (8); the foot (7) of the angular element (5), the first plate (16) being provided with respective through holes for housing the fixing pin (31) of the foot to the rear wall.

15 11. The cabinet for electrical switchboard (1) according to claim 8, wherein the second fixing means include at least one second fixing screw (30) and wherein the first side wall (11) and the second side wall (12) comprise first (20) and second (21) side projections, 20 respectively, which rest on the guide; the guide, the second drilled plate, the first and second projections being provided with respective openings (15, 19, 22, 23) to house the fixing screw.

12. The cabinet for electrical switchboard (1) 25 according to claim 11, wherein the openings of the first

12

and second projections are notches formed on respective contact edges and wherein said projections are placed side by side such that the corresponding notches (22, 23) define a single opening (24).

5 13. The cabinet for electrical switchboard (1) according to claim 3, wherein the angular element (5) is provided with distributed fixing means suitable to cooperate with the main bar (18).

10 14. The cabinet for electrical switchboard (1) according to claim 1, wherein the rear wall (2), the side walls (11, 12) and the bracket (6) are made of metal and the angular element (5) is made of plastic.

15 15. The cabinet for electrical switchboard (1) according to claim 1, wherein the rear wall (2), the side walls (11, 12) and the bracket (6) are made of metal and the angular element (5) is made of plastic; the bracket making the rear wall and side wall substantially equipotential and giving solidity to the angular element.

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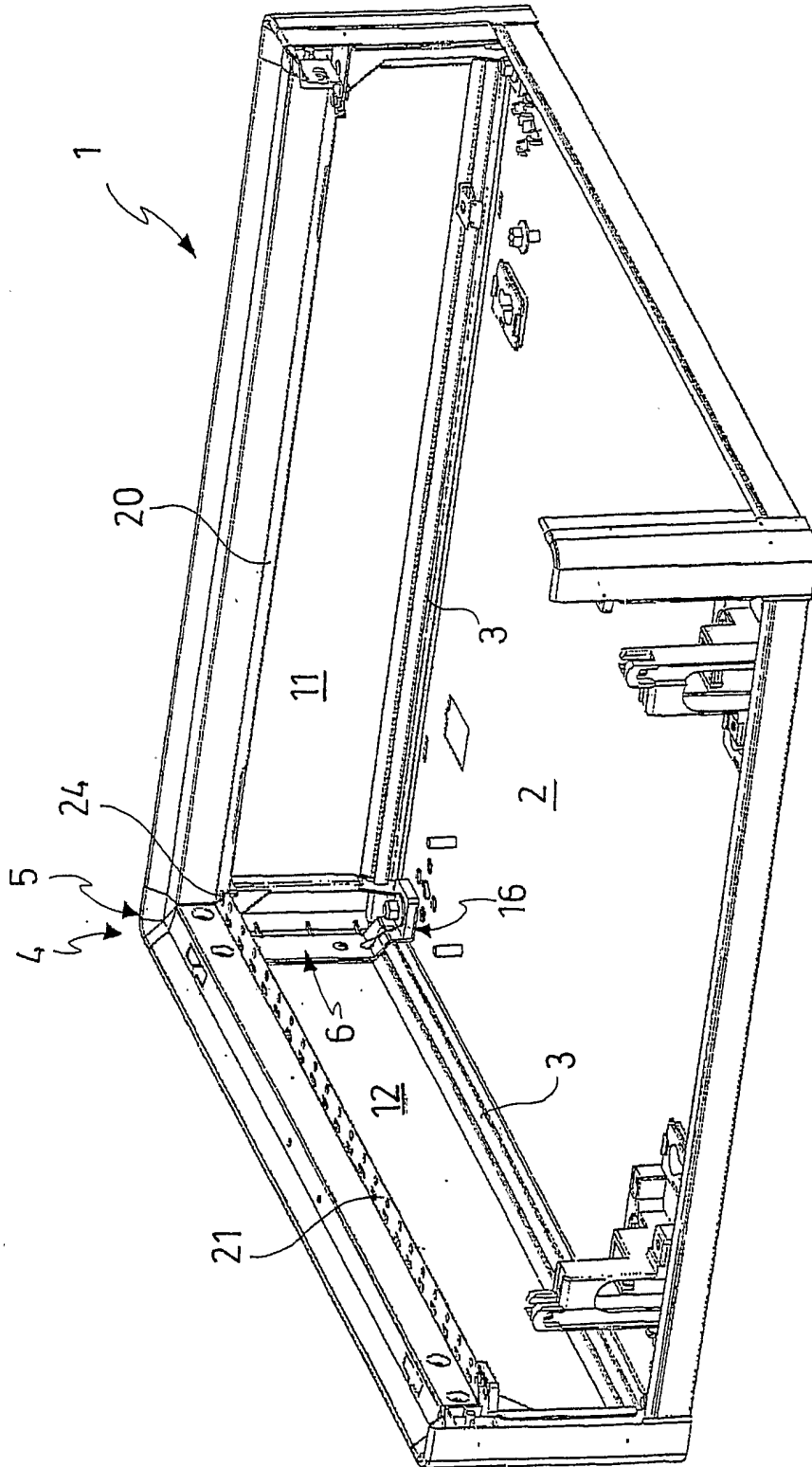


FIG.4

INTERNATIONAL SEARCH REPORT

International application No
PCT/IT2006/000322

A. CLASSIFICATION OF SUBJECT MATTER
INV. H02B1/30

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)
H02B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 02/073761 A (ABB SERVICE SRL; CAGLIANI, CRISTIAN) 19 September 2002 (2002-09-19) page 6, line 9 - page 10, line 1; figures	1
A	US 5 944 439 A (ELLSWORTH ET AL) 31 August 1999 (1999-08-31) column 1, lines 21-25; figures 1,2	1

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

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- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

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- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
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Date of the actual completion of the international search

11 August 2006

Date of mailing of the international search report

21/08/2006

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IT2006/000322

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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