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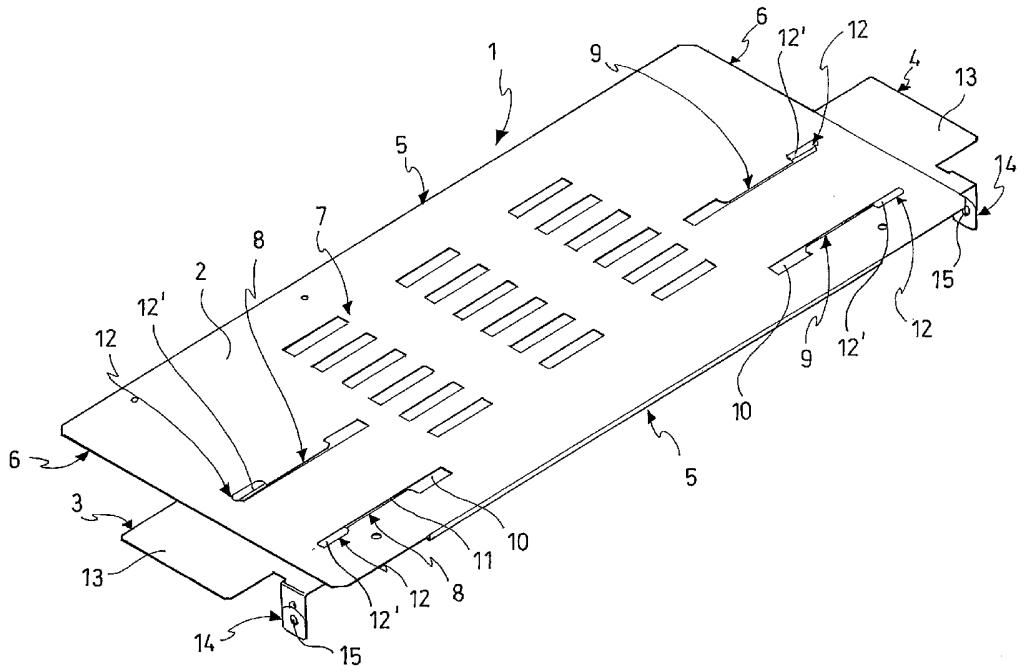
(54) **Title:** EXPANDABLE SHELF ASSEMBLY FOR AN ELECTRICAL CABINET



(57) **Abstract:** An expandable shelf assembly (1) of a cabinet (100) for electrical devices is described comprising a shelf (2) having a first dimension (5) to be inserted within the cabinet and means for attaching the plate (2) to the cabinet. The attaching means comprise an adjusting element (3) to be coupled to the plate (2) in different operating positions along the first dimension such that the partition wall can be adapted to the cabinet.

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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

EXPANDABLE SHELF ASSEMBLY FOR AN ELECTRICAL CABINET

The present invention relates to a partition wall of a cabinet for electrical devices.

A cabinet for electrical devices is known to house a plurality of these devices in a suitable room such as to form what is technically called an electric switchboard.

These electrical devices being housed within the room are usually attached to a bottom wall of the cabinet or inner support structures. As is known by those skilled in the art, the arrangement of these electrical devices inside the room is established according to installation requirements and further depends on the size of the individual devices. For example, for boards for industrial use, comprising large-sized devices, the devices are vertically housed such as to be stacked on each other. Furthermore, these devices are separated from each other by a safety distance that is directly indicated to the user by the manufacturer of the devices.

To ensure this separation, the room in the cabinet is usually divided by means of partition walls. For example, a known partition wall comprises a plate, preferably fabricated of metallic material, having a rectangular shape and capable of being inserted within the cabinet.

It should be observed that, in order to be inserted

within the cabinet, the plate is bent (either upwards or downwards) such as to easily pass through a front access opening of the cabinet. When the plate is within the room, it is released to return to its original shape and extend between opposite side walls of the cabinet. Subsequently, the plate is fixed to said side walls by means of screws. In fact, the plate is provided, for example, with drilled tabs for fixing to the cabinet walls.

Conventional metallic plates for cabinets have a drawback in that, when they are inserted within the room, they can maintain a bent position (either upwards or downwards). Therefore, when the thus deformed plates are fixed to the cabinet side walls may apply a pressure against said walls thereby causing the loosening, unfastening or breakage of the fixing screws. In addition, these bent plates may deform the side walls of the cabinet. Furthermore, based on the types of electrical devices that can be housed within the room and according to the minimum safety distance at which the electrical devices require to be positioned, the provision of curved plates or partition walls is an obstacle to the observance of these distances.

On the other hand, metallic plates having a high rigidity may require tiring mechanical actions by the installer to be bent and inserted within the cabinet.

The object of the present invention is to provide a

partition wall capable of overcoming the drawbacks as described above.

This object is achieved by the partition wall such as defined and characterized in claim 1. Alternative embodiments of the partition wall are as defined in the dependent claims 2-10. An object of the present invention is also a cabinet such as defined in claim 11.

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

Fig. 1 shows a perspective view of a partition wall in accordance with an example of the invention;

Fig. 2 is a perspective view of a portion of a cabinet for electrical switchboards comprising the partition walls of Fig. 1, and

Fig. 3 is an enlargement of a detail of the cabinet from Fig. 2.

With reference to Fig. 1 and 2, a partition wall, generally designated with numeral 1, comprises a plate 2 to which a first adjusting element 3, and preferably a second adjusting element 4, is mechanically coupled.

With reference to Fig. 2, the wall 1 can be inserted within a cabinet 100 having an outer bearing frame 101, and an inner frame supporting one or more of said walls

including a first upright 103, a second upright 104, a third upright 104', and a fourth upright not seen in the figures.

The adjusting elements 3 and 4 can be coupled to respective portions of the plate 2 such as to be capable of assuming several operating positions and thus adapting the wall 1 to the cabinet 100. Particularly, each of the adjusting elements 3 and 4 can be slidingly coupled to the plate 2.

The plate 2, preferably, has a rectangular shape, having a first dimension 5 and a second dimension 6, the second dimension being lower than the first one. The plate 2 is, for example, made of metallic material.

The plate 2 is further provided with first openings 8 to be coupled with the first adjusting element 3 and second openings 9 to be coupled with the second adjusting element 4. The first 8 and second 9 openings are preferably defined parallel to the first dimension 5 of the plate. Each of the openings 8 and 9 has the shape of an elongated "L" and comprises, from the inside of the plate 2 to the outside, a hole 10 (for example, rectangular) having a widened shape and a slot or channel 11 being joined to the hole. The hole 10 and the slot 11 of the openings 8 and 9 are the insertion seat and the sliding seat for respective projecting elements 12, respectively, as one piece with the

adjusting elements 3 and 4.

Referring back to the description of the adjusting elements, these are preferably metal sheets provided with the projecting elements 12. The projecting elements 12 vertically extend relative to the surface of the plate 2 and substantially have the shape of a reversed "L" and comprise a first tract of a width substantially equal to the width of the slot 11 and fastening means 12' such as, for example, a folded tongue joined to the first tract.

This fastening tongue 12' is suitable to pass through the hole 10 of one of the openings 8 and 9. When the projecting element 12 is slidingly engaged with the slot 11, the fastening tongue 12' rests on the upper surface of the plate 2 thereby restraining the movement of the adjusting element 3 and 4 parallel to the plate 2 and preventing that the adjusting element may be detached in the vertical direction relative to the main plane of the plate 2.

The adjusting elements 3 and 4 further comprise an extension 13 and a side tab 14, which is obtained, for example, by bending downwards a portion of the metal sheet placed beside the extension 13. The side tab 14 of the first adjusting element 3 is suitable to contact the first support upright 103 of the cabinet 100. The extension 13 is suitable to occupy a space 105 being defined by the two

uprights 103 and 104, such as depicted in Fig. 2, which have a quadrangular plan and support the cabinet.

The side tab 14 is provided, for example, with a through hole 15 suitable to receive a fixing screw to engage a respective hole of the support upright of the cabinet 100 to definitely attach the partition wall to the cabinet.

The plate 2 has, in the middle of its surface, a plurality of openings 7. In the example illustrated in Fig. 1, the openings 7 have a rectangular shape and are substantially distributed in the middle of the plate 2 and allow the plate to be lighter.

During the step of assembling the cabinet, the installer couples the adjusting elements 3 and 4 to the plate 2 by passing each fastening tongue 12' through the respective hole 10 and subsequently causing each adjusting element to slide towards the outside by means of the projecting elements 12 engaging the respective slots 11. The adjusting elements 3 and 4 are, at this point, movable relative to the plate 2 along the first dimension 5, thereby making the length of the partition wall 1 adjustable.

Subsequently, the installer reduces this length of the partition wall 1 such that the wall can be housed within the cabinet without being obliged to bend or flex the wall.

At this point, the two adjusting elements 3 and 4 are slidingly moved such as to adjust the length of the wall 1 to obtain the abutment of the side tabs 14 against the first support upright 103 and the fourth support upright of the cabinet.

As may be observed, the object of the invention is fully achieved since the partition wall 1 has an adjustable length such as to be easily introduced within a cabinet and be used for electrical switchboard cabinets having different lengths. In the assembly and installation steps, the wall does not require to be bent or flexed, and upon fixing the cabinet, the side tabs are in the ideal position for the fixing screws to be properly tightened.

There is advantageously also provided the filling of the space defined by the support uprights associated with the same side wall of the cabinet, which, in the case of the prior art conventional walls, were not covered.

Obviously, to the wall and cabinet according to the present invention, those skilled in the art, aiming at satisfying contingent and specific requirements, may carry out a number of modifications and variations, all being however contemplated within the scope of protection of the invention, such as defined in the annexed claims.

CLAIMS

1. A partition wall (1) for a cabinet (100) for electrical devices comprising:

- a plate (2) having a first dimension (5) to be inserted within the cabinet,
- means for attaching the plate (2) to the cabinet,

characterized in that the attaching means comprise an adjusting element (3) to be coupled to the plate (2) in different operating positions along the first dimension such that the partition wall can be adapted to the cabinet.

2. The partition wall (1) according to claim 1, wherein the attaching means comprise a further adjusting element (4) to be coupled to the plate (2) in different operating positions along the first dimension or along a second dimension of the plate.

3. The partition wall (1) according to claim 1, wherein the adjusting element (3) is provided with slide means for coupling to the plate.

4. The partition wall (1) according to claim 3, wherein the slide coupling means comprise projecting elements (12) being as one piece with said one adjusting element (3, 4) suitable to engage respective openings (8,9) defined on the plate (2).

5. The partition wall (1) according to claim 4,

wherein the projecting elements (12) comprise a fastening means (12') suitable to allow the adjusting element to slide along the first dimension laying on a main plane of the plate and avoiding that the adjusting element may be detached along a dimension orthogonal to the main plane.

6. The partition wall (1) according to claim 4, wherein the two openings (8,9) comprise a first insertion seat (10) and a second sliding seat (11) for said projecting elements (12).

7. The partition wall (1) according to claim 1, wherein said adjusting element (3, 4) further comprises at least one side tab (14) suitable to contact a first support upright (103) of the cabinet (100).

8. The partition wall (1) according to claim 7, wherein said at least one side tab (14) has a through hole (15) suitable to receive means for fixing said adjusting element (3,4) to the cabinet (100).

9. The partition wall (1) according to claim 7, wherein said adjusting element (3, 4) further comprises an extension (13) suitable to occupy a space being defined by the first (103) and a second (104) support uprights of the cabinet (100).

10. The partition wall (1) according to claim 1, wherein said plate (2) and said at least one attachment element (3,4) are made of metallic material.

11. A cabinet for electric devices, comprising a first (103, 104) and a second (104') support framework, a plate (2) having a first dimension (5) to be inserted within the cabinet, means for attaching the plate (2) to the first and second support structures, characterized in that the attachment means are made according to at least one of the preceding claims.

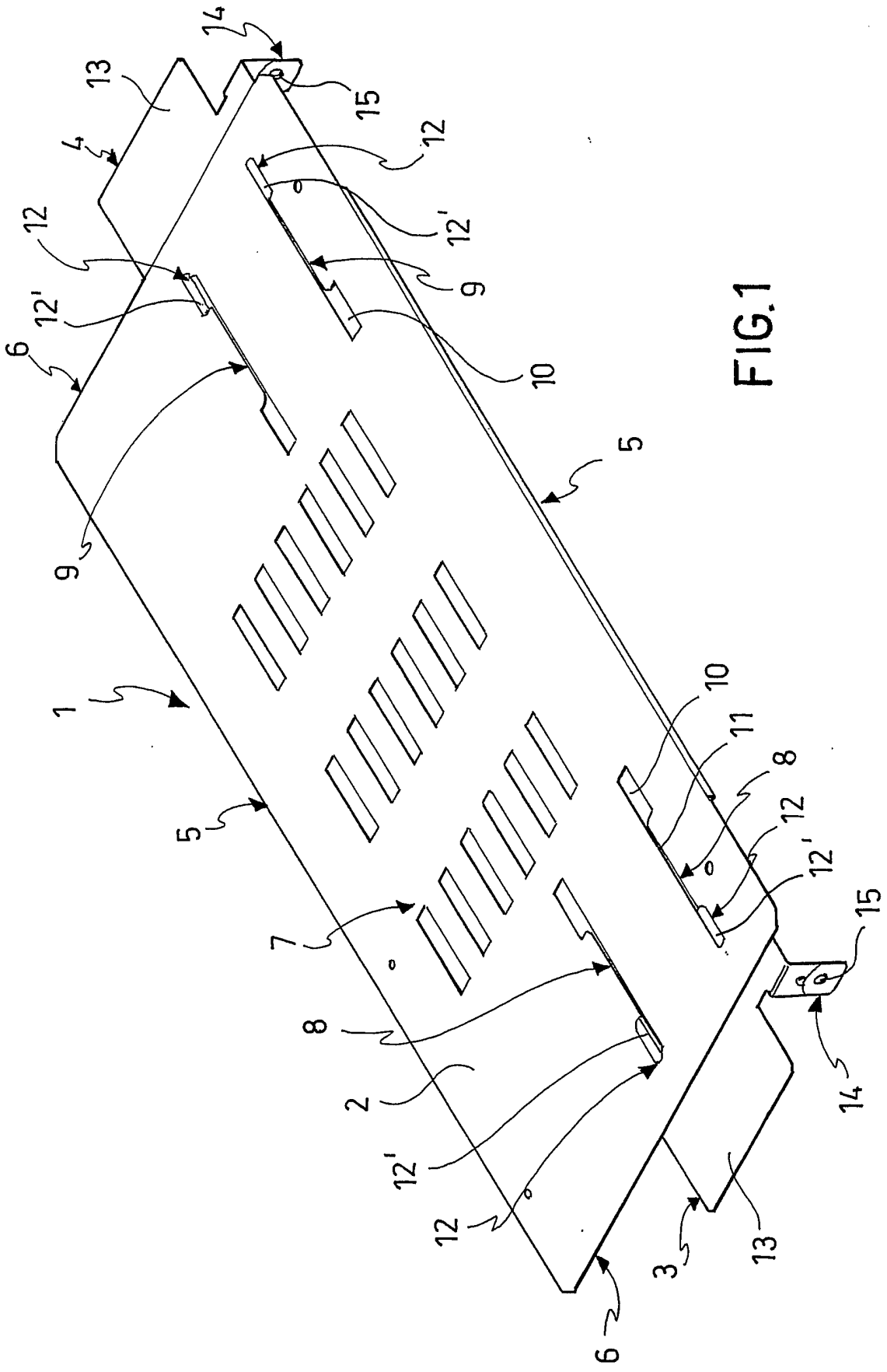

FIG.1

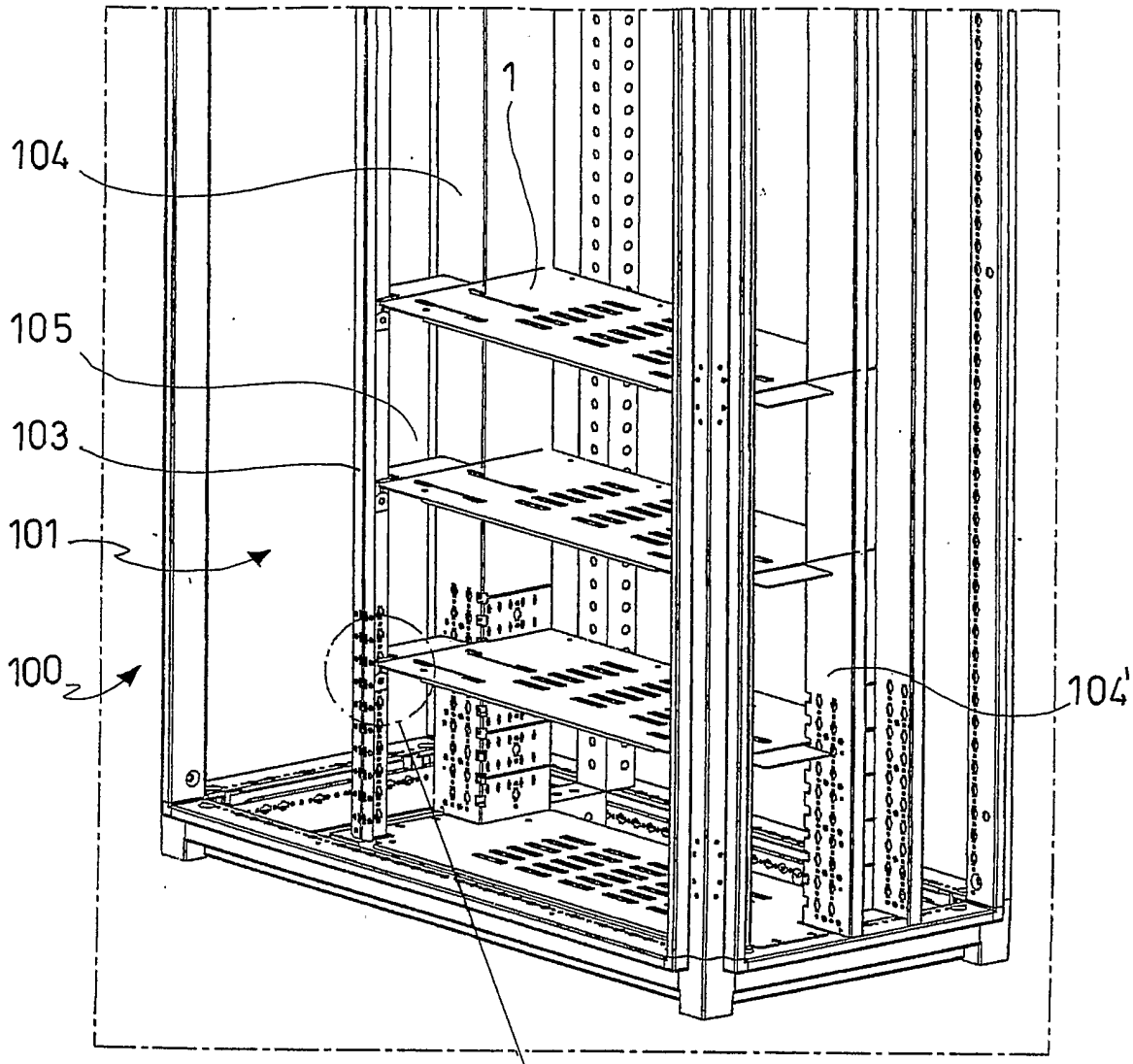

FIG. 2

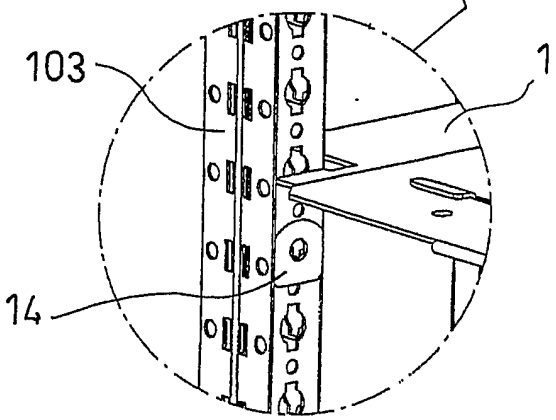

FIG. 3

INTERNATIONAL SEARCH REPORT

International application No
PCT/IT2006/000323

A. CLASSIFICATION OF SUBJECT MATTER
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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 H05K A47B

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.
X	EP 0 858 254 A (REDDICLIFFE, EDWARD A) 12 August 1998 (1998-08-12) column 1, lines 3-49 column 2, lines 41-45; figures 1,2	1-5,7-11
X	US 6 017 104 A (FOSCHINO CARMINE) 25 January 2000 (2000-01-25) column 4, line 49 - column 5, line 4; figures 1,3,8,10,16	1,3,4
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A	US 2004/080244 A1 (LOWTHER ROBERT J ET AL) 29 April 2004 (2004-04-29) abstract; figures 3-5	1

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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