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

(11) **EP 1 826 355 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
29.08.2007 Bulletin 2007/35

(51) Int Cl.:
E06B 3/88 *(2006.01)*

(21) Application number: **06425128.3**

(22) Date of filing: **28.02.2006**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(71) Applicant: **La Bra Management s.a.s. di Ferrero Elio & C.**
12063 Dogliani CN (IT)

(72) Inventor: **Fringuelli, Massimo**
50066 Reggello (FI) (IT)

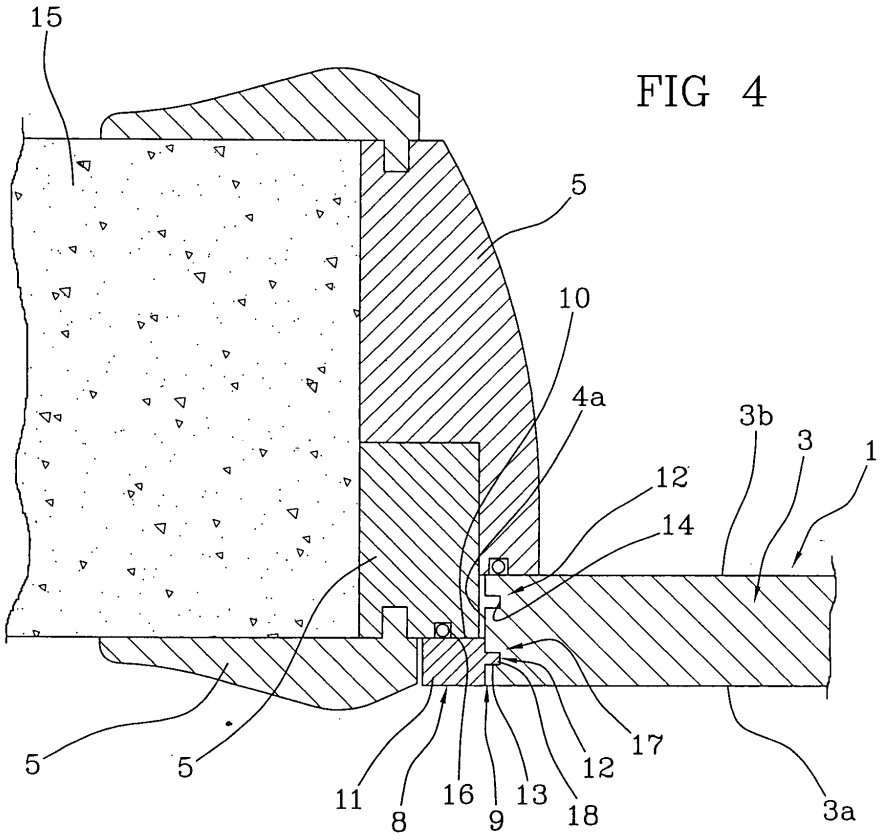
(74) Representative: **Brasca, Marco et al**
Bugnion S.p.A.
Viale Lancetti, 17
20158 Milano (IT)

Remarks:
Amended claims in accordance with Rule 86 (2) EPC.

(54) **Wing for reversible doors and process for manufacture of same**

(57) The wing (1) comprises a panel (3) with a pair of front and back vertical faces (3a, 3b, respectively) delimited by a pair of lateral vertical surfaces (4a) and by an upper (4b) and a lower (4c) surface, and an abutment edge (8) projecting from the panel (3) at the two lateral vertical surfaces (4a) and at the upper surface (4b) of the panel (3) itself and having an abutment surface parallel to the vertical faces (3a, 3b). In accordance with the invention, said abutment edge (8) is made as a separate component distinct from the panel (3) so that it can be mounted on said panel (3) depending on the selected opening side of the door.

FIG 4



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Description

[0001] The present invention relates to a wing for reversible doors and to a process for manufacture of such a wing.

[0002] The present invention preferably applies, although not exclusively, to the field concerning manufacture and installation of doors for interiors, which doors can consist of single or double doors. In any case the invention applies to all doors of the type provided with a wing, such as main entrance doors for interiors and exteriors, for example.

[0003] It is known that in the case of a single door, depending on whether the wing is hinged on the right or left side for an observer looking at the door face which rotates and opens towards himself/herself, the door is defined as right door and left door, respectively. Fig. 1 of the accompanying drawings is an elevation front view of a single door of known type having one wing 100 that, on its hinging side, is provided with a series of openings, generally three openings spaced apart the same distance from each other, for mounting of respective hinges 101 and, on its opposite side, is provided with an opening for mounting of a handle 102 and a lock 103. As viewed from Fig. 2 showing a section view of the door of known type seen in Fig. 1, the wing 100 is further usually provided with an abutment edge 104 extending along the two vertical sides and along the upper horizontal side of the wing, on that part towards which rotation of the wing occurs, and has an abutment surface 105 designed to abut against a corresponding abutment surface or rabbet 106 of a frame 107 fastened to a building wall for example, to cover the opening between the wing body 108 and the frame 107.

[0004] According to the known art (Figs. 1 and 2), the abutment edge 104 is made in an integral manner with the body 108 of the wing 100 and is disposed along the vertical wing edges and the upper horizontal wing edge, i.e. there where contact with the frame 107 occurs.

[0005] Where a door wing of a symmetric structure relative to a horizontal axis is concerned, like the one shown in Fig. 1, mounting of the door is made possible either as a right door or as a left door without change of the door wing being required, since the wing must be only rotated through 180° in its own plane, i.e. around an axis perpendicular to said plane, so as to bring the hinge openings originally arranged on the right side to the left, and the handle and lock openings originally arranged on the left side to the right.

[0006] However this reversing operation can be carried out only if also the lower horizontal edge of the wing is already provided with the abutment edge 104. But in this case, the wing is provided with a step along its lower edge, which step can be seen at least from one of the two door sides giving said door an appearance of poor finishing.

[0007] In addition, this reversing operation of the opening way of the wing is clearly impossible when the door wing has an asymmetric structure, as in the case of a typical glazed door wing having a pair of upper and lower glazed openings of different sizes from each other. In this instance therefore a door wing arranged for a right door cannot be used for a left door and vice versa.

[0008] The doors provided with a wing of known type are therefore manufactured in two distinct series suitably made to be installed on right doors and left doors, which will give rise to doubling of the management and production costs for manufacturing said doors.

[0009] Furthermore, once the type of door and opening has been selected, it is no longer possible to choose and/or modify the door configuration (opening way) in situ by means of few simple operations.

[0010] To partly solve this problem, doors have been conceived that are devoid of any ledge. Disadvantageously, the greatest accuracy is required for installation of these doors because the wing edges must be perfectly parallel to the jamb and the staff bead and, in any case, they do not allow the same finishing level as the doors provided with a ledge.

[0011] Accordingly, the present invention aims at providing a wing for reversible doors which has an abutment edge that can be easily and quickly adapted for installation as a right or left door.

[0012] In addition, it is an aim of the present invention to propose a wing for reversible doors enabling the production and storage costs to be reduced.

[0013] It is a further aim of the invention to conceive a wing for reversible doors provided with an abutment edge that can be indifferently hinged on the right side or on the left side, even if it has an asymmetric configuration with respect to a horizontal axis.

[0014] Finally, it is an aim of the present invention to offer a wing for reversible doors having a high finishing level, like the wings having a full abutment edge made for only a single type of opening (right door or left door).

[0015] The foregoing and still further aims are substantially achieved by a wing for reversible doors comprising the features set out in one or more of the appended claims 1 to 12 and by a reversible door as claimed in claim 13.

[0016] In a further aspect of the invention, said aims are achieved by means of a process for manufacturing a wing for reversible doors comprising the features recited in claims 14 to 20.

[0017] The description of a door provided with a wing for reversible doors in accordance with the present invention is now given hereinafter, by way of nonlimiting example and with reference to the accompanying drawings, in which:

- Fig. 1 is an elevation front view of a door in accordance with the known art, with a single wing of symmetric structure;
- Fig. 2 is a top view of the door of the known art seen in Fig. 1 and sectioned along line II-II;
- Fig. 3 is an elevation front view of a reversible door of the type with a single wing (single door) according

to a preferred embodiment of the present invention, the wing of which has an asymmetric configuration relative to a horizontal axis;

- Fig. 4 is a top view of a lateral portion of the door seen in Fig. 3, sectioned along line IV-IV;
- Figs. 5 and 6 are two views of the wing alone similar to the view in Fig. 4 and showing two alternative embodiments of the invention; and
- Fig. 7 is a partial section view in a vertical plane of an alternative embodiment of the wing in accordance with the invention.

[0018] With reference to Figs. 3-7, a wing for reversible doors in accordance with the invention is identified with 1. Wing 1 is part of a door 2 diagrammatically shown in Fig. 3.

[0019] The invention will be described with particular reference to a reversible door 2 with a single wing 1 hinged around a vertical axis "X" close to one of the sides thereof. It is however apparent that the invention can also apply to a reversible door 2 having a pair of wings 1 hinged around the respective vertical axes close to the opposite sides thereof.

[0020] The wing 1 comprises one panel 3 or wing body, of generally parallelepiped shape, with a pair of vertical faces 3a and 3b, a first front face 3a and a second back face 3b respectively, and a thickness-defining lateral portion 4 interposed between the opposite faces 3a, 3b. For the sake of simplicity in the present description the wing body 3 will be hereinafter defined with the term "panel". This definition however is not limited to panels of the above described type commonly referred to as "tamburato" but it comprises any type of wing body also formed with several elements and materials, such as assembled or solid wings or wings made of heartwood ("massello"). In Fig. 3 said lateral portion 4 is defined by a pair of lateral vertical sides 4a and a pair of horizontal sides, upper 4b and lower 4c sides respectively. Panel 3 of wing 1 is hinged to a frame 5 by means of hinges 6, around the vertical axis "X" located close to the right side thereof, looking at Fig. 3.

[0021] Panel 3 herein shown is of rectangular shape but the invention also applies to wings of any shape provided they have at least one symmetry axis adapted to enable rotation and installation of same both with right opening and left opening, as described in more detail in the following. In addition, the faces of this panel can be made of one or several materials, with decorations, openings, raised portions of many kings and usually known by themselves.

[0022] In the embodiment shown in Fig. 3, panel 3 of wing 1 has an asymmetric configuration relative to a horizontal axis, since it has a pair of respectively upper and lower glazed openings 7a and 7b, different from each other in size.

[0023] As viewed from Figs. 3-7, wing 1 further comprises an abutment edge 8 projecting from a peripheral edge 9 of panel 3 and having an abutment surface 10 intended for engagement against a corresponding abutment surface or rabbet of the frame 5 of door 2.

[0024] Advantageously, at least part of the abutment edge 8 is made as a separate component 11 distinct from panel 3 and can be alternately coupled with distinct regions 12 of the peripheral edge 9 of said panel 3, so as to form right or left doors.

[0025] In other words, in accordance with the invention, the abutment edge 8 is made as a distinct component 11 relative to the panel of wing 1 and is therefore assembled thereon to the desired position depending on the desired opening side of the door.

[0026] Preferably, as shown in Figs. 3-6, the whole abutment edge 8 can be applied to the desired position, i.e. towards either of the vertical faces 3a or 3b of the wing panel 3. Under this situation, the separate component 11, i.e. each portion of the abutment edge 8 made separately from panel 3, can be coupled with said panel 3 alternately in a first position close to the first face 3a to define an abutment surface 10 facing the same part as the second face 3b (Fig. 6, solid line), or in a second position close to the second face 3b to define an abutment surface 10 facing the same part as the first face 3a (Fig. 6, chain line), so as to obtain right or left doors by means of a rotation of panel 3 through 180° around a vertical axis "Z" lying in the plane of panel 3.

[0027] For the purpose, as shown in Figs. 4 and 6, panel 3 has first coupling means 13 put on the lateral portion 4 close to the first face 3a, to receive the separate component 11 in the first position, and second coupling means 14 put on the lateral portion 4 close to the second face 3b to receive the separate component 11 in the second position.

[0028] Fig. 4 shows the ledge region between the left side of wing 2 and the frame 5 fastened to a masonry wall 15.

[0029] As can be viewed from this figure, the abutment edge 8 of wing 1 projects from panel 3 along the lateral vertical sides 4a and along the upper horizontal side 4b and has the abutment surface 10 substantially parallel to the vertical faces 3a and 3b and designed to flush up against the corresponding abutment surface or rabbet 16 of frame 5.

[0030] In the embodiment shown in Fig. 4, assembling of the abutment edge 8 on panel 3 of wing 1 takes place by an interaction between the female coupling means 13, 14 provided on panel 3 and male engagement means 17 provided on the abutment edge 8.

[0031] While in the embodiment in Fig. 4 the female coupling means 13, 14 is provided on panel 3 of wing 1, and the male engagement means 17 is provided on the abutment edge 8, the reverse solution can also be assumed in which the female coupling means is provided on the abutment edge 8 and the male engagement means is provided on panel 3 of wing 1. Obviously, male and female coupling means different from the above described ones can also be contemplated.

[0032] More specifically, in the preferred embodiment

herein shown, the female coupling means 13, 14 is formed with a first and a second grooves 13, 14 extending parallel to each other on the two surfaces defining the lateral vertical sides 4a and on the two surfaces defining the horizontal sides 4b, 4c (or in any case at least on the upper horizontal surface 4b) of panel 3, while the male engagement means 17 is formed by a tailpiece 18 of the abutment edge 8 designed to engage into either one of grooves 13, 14.

[0033] In the embodiment shown in Figs. 3 and 4, in which the door 2 is configured as a right door to be opened with a pulling action, the abutment edge 8 is assembled on the side of the first front vertical face 3a and therefore the tailpiece 18 of the abutment edge 8 engages in groove 13 of the wing panel 3. If during the step of installing wing 1 it were necessary to give the door 2 a configuration as a left door to be opened by a pulling action, it would be sufficient to dismantle the abutment edge 8 from groove 13, to mount it to the other groove 14 and rotate the wing 1 around its vertical symmetry axis "X", so that the openings for hinges 6 are brought to the left and the openings for handle 19 and lock 20 are brought to the right. Should the abutment edge 8 have a non-symmetric shape in a transverse section thereof, the segment of the abutment edge 8 mounted on the upper horizontal surface 4b is to be rotated through 180° around a vertical axis before being installed into the other groove 14. Each of the two abutment edges 8 placed along the two lateral vertical surfaces 4a is either to be rotated through 180° around an axis perpendicular to its longitudinal extension and lying in the wing plane before being installed in the other groove 14, or to be rotated through 180° around its longitudinal-extension axis and installed in the other groove 14 on the opposite side of the wing, i.e. the two abutment edges 8 placed along the two lateral vertical surfaces 4a are reversed (Fig. 6). If on the contrary the abutment edge 8 has a symmetric shape with a central tailpiece 18, it will be sufficient to translate it to said other groove 14.

[0034] Therefore, it is possible to use the same wing 1 in order to indifferently mount a right door or a left door even if the wing 1 has an asymmetric configuration relative to a horizontal axis. Obviously, to enable reversal of the hinging side, the lock and hinges 6 must be housed at a central position relative to the thickness of the door wing. Alternatively, should out-of-centre hinges be required to be put in the wing thickness due to the frame geometry, these hinges are such made that they too can be mounted to two different positions, i.e. with the pin displaced towards one or the other of faces 3a, 3b, during installation of the door for example, which correspond to the two mounting configurations of the abutment edge 8.

[0035] In addition, to enable reversal of the opening way, each of the two posts of frame 5 is provided with a housing for receiving the lock and with a suitable number of housings, usually two or three in number, for receiving the hinges. The unused housings, i.e. those opposite to the selected side for actually hinging wing 1, are advantageously covered with closing plates to improve the aesthetic aspect of door 2.

[0036] According to an alternative embodiment, shown in Fig. 7, should wing 1 have a symmetric configuration relative to a horizontal axis, it would be sufficient to provide for a single groove extending on the four perimetric surfaces of the door wing (i.e. on the two lateral vertical surfaces 4a and the two upper 4b and lower 4c horizontal surfaces) and divide the abutment edge 8 into distinct portions for each perimetric surface of wing 1. In fact, in this case, passage from a right door to a left door is achieved through overturning of wing 1 in the wing plane and rotation of same around an axis perpendicular to the faces 3a, 3b; then the segment of the abutment edge 8 mounted on the upper horizontal surface 4b of panel 3 is dismantled and mounted on the lower horizontal surface 4c opposite thereto.

[0037] Therefore, to this aim, the two abutment edges 8 placed along the two lateral vertical surfaces 4a can also be made as a one-piece construction with panel 3 or in any case they can be integral with said panel as they are not to be displaced.

[0038] In this case, to enable reversal of the hinging side, the lock 19 must be positioned at mid-height of wing 1. The tailpiece 18 of the abutment edge 8 is advantageously made as a continuous portion extending over the whole abutment edge 8 and therefore grooves 13 and 14 (or the single groove) are formed as continuous grooves extending over the whole height and width of panel 3 of wing 1.

[0039] Alternatively, a series of discrete projecting elements can be provided, which are distributed along the abutment edge 8 and are intended for fitting into corresponding discrete cavities provided in panel 3. In addition, the coupling means 13, 14 that in the embodiment shown are placed on the lateral portion 4 of panel 3, could be also formed on the faces 3a, 3b close to the peripheral edge 9 of said panel 3.

[0040] When the abutment edge 8 is installed on one of said regions 12, the unused coupling means belonging to the other region 12 is preferably concealed to give the door a better aesthetic aspect. For instance, the grooves and/or discrete cavities are covered with strips and/or section members provided with lugs inserted into the grooves and/or the cavities and locked therein.

[0041] Fig. 5 shows an alternative embodiment of the wing 1 seen in Fig. 4 in which panel 3 has coupling means 13, 14 that is symmetric relative to a middle plane "P" of the wing which is parallel to faces 3a, 3b, and the separate component 11 comprises a symmetric engagement portion 21 associable with said symmetric coupling means 13, 14 and an asymmetric ledge portion 22.

[0042] In more detail, the abutment edge 8 has the same thickness as panel 3 of wing 1 and is provided, on the symmetric engagement portion 21, with a central groove 23 extending over the whole abutment edge 8 and adapted to be coupled with a protrusion 24 defining the coupling means 13, 14 and formed on the lateral por-

tion 4 of panel 3. The groove 23 and protrusion 24 in this instance have a symmetric configuration relative to a middle plane "P" of wing 1 which is parallel to faces 3a, 3b, so as to enable reversal of the mounting position of the abutment edge 8. In this case too the opposite solution can be adopted in which the protrusion is formed on the abutment edge 8 and the groove is located in panel 3 of wing 1.

[0043] Finally, in the alternative embodiment shown in Fig. 6 the abutment edge 8 forms a flap 25 that in the assembled position covers a lateral end of a vertical face 3a, 3b of panel 3 of wing 1, so as to conceal the separation line between the abutment edge 8 and panel 3 and thus improve the aesthetic aspect of wing 1. This solution is particularly preferred for lacquered doors in which said separation line would be visible.

[0044] It is apparent that within the scope of the present invention the abutment edge 8 can be assembled on panel 3 of wing 1 following any other fastening modality, both of the dismountable or removable type, and of the fixed type. In fact the abutment edge 8 can be for example engaged by forced fitting, glued, and/or screwed and/or stapled in panel 3 of wing 1.

[0045] As regards the construction material, wing 1 in accordance with the invention can be indifferently made of wood, metal material (aluminium for example), plastic material (PVC for example), glass or any other suitable material. In addition, the panel 3 and abutment edge 8 can be made of materials different from each other, such as wood for panel 3 and PVC for the abutment edge 8.

[0046] The above described wing 1 is made following a process which is part of the present invention too. This process comprises the steps of:

- preparing panel 3, making the separate component 11 provided with the engagement means 17 and designed to form at least part of the abutment edge 8 having the abutment surface 10, and making the coupling means 13, 14 for connection with the engagement means 17 of the separate component 11, on distinct regions 12 close to the peripheral edge 9 of panel 3.

[0047] At the end of these operations the pack consisting of panel 3 and the separate component or components 11 is preferably packaged and transported to the installation place where, based on the true requirements, the separate component 11 is alternately coupled with one of the distinct regions 12 of the peripheral edge 8, so as to prepare panel 3 for accomplishment of right or left doors. Therefore, the above mentioned pack can be sold as a kit still in a disassembled condition. It is to be pointed out that the panel too, intended as the wing body in accordance with the above definition, can be sold in a disassembled condition, i.e. separated into its components.

[0048] Alternatively, the panels 3 and separate components 11 can be stored while waiting for orders and subsequently assembled at the factory, based on the requested amounts of right and left doors.

[0049] In more detail, to accomplish the wing shown in Figs. 4 and 6, the coupling means 13, 14 is formed along three sides 4a, 4b of the peripheral edge 9 of panel 3 in the form of two grooves 13, 14 disposed alongside each other, each of them being close to one of the faces 3a, 3b on the lateral portion 4 of the panel 3 itself. The coupling means 13, 14 could also be made over the whole peripheral edge 9.

[0050] Alternatively, to make the wing shown in Fig. 7 and described above as an alternative solution, the first coupling means 13 is made on the upper side 4b and the second coupling means 14 is made on the lower side 4c of the lateral portion 4 of panel 3 and only close to one of the two faces.

[0051] The present invention achieves the intended purposes and reaches important advantages.

[0052] In fact, in the light of the preceding description it will be appreciated that, as compared with the known art, in the present invention the installation of reversible doors having wings provided with abutment edges can be simplified, since it is possible to choose and/or modify (where the abutment edge 8 is of the removable type) the configuration (opening way) of the door in situ by means of few and simple operations.

[0053] In addition, the present invention allows the stocks to be reduced and the door manufacturing cycle in general to be optimised, both in terms of life of the doors and in terms of earning power, since it is no longer necessary to provide door wings made expressly for installation on right or left doors. As a result, the invention enables the production to be optimised both in terms of times and costs.

Claims

1. A wing for reversible doors comprising a panel (3) having a first face (3a) and a second face (3b) opposite to the first one and a lateral portion (4) interposed between said opposite faces (3a, 3b), an abutment edge (8) projecting from a peripheral edge (9) of the panel (3) and having an abutment surface (10) intended for engagement against a corresponding abutment surface or rabbet (16) of a frame (5) of a door (2),
   characterised in that at least part of the abutment edge (8) is made as a separate component (11) distinct from said panel (3) and can be alternately coupled with distinct regions (12) of the peripheral edge (9) of said panel (3), so as to obtain right or left doors.

2. A wing as claimed in claim 1, **characterised in that** the whole abutment edge (8) is made as a separate component (11) distinct from said panel (3) and can be alternately coupled with distinct regions (12) of said panel (3), so as to obtain right or left doors.

3. A wing as claimed in claim 1, **characterised in that** the panel (3) has an upper side (4b) and a lower side (4c) and **in that** said separate component (11) can be alternately coupled with the upper side (4a) or the lower side (4b) so as to obtain right or left doors by rotating the panel (3) through 180° about an axis perpendicular to the first and second faces (3a, 3b).

4. A wing as claimed in claim 3, **characterised in that** it further comprises abutment edges (8) integral with the panel (3) and extending along vertical sides (4a) of said panel (3).

5. A wing as claimed in claim 2, **characterised in that** the separate component (11) can be alternately coupled with said panel (3) either in a first position close to the first face (3a) to define an abutment surface (3b) facing the same part as the second face (3b), or in a second position close to the second face (3b) to define an abutment surface (10) facing the same part as the first face (3a), so as to obtain right or left doors by rotating the panel (3) through 180° around a vertical axis (Z) lying in the plane of the panel (3).

6. A wing as claimed in claim 1, **characterised in that** the separate component (11) can be mounted on the panel (3) in a removable manner to enable conversion of an already installed door from a right door into a left door.

7. A wing as claimed in claim 1, **characterised in that** the separate component (11) can be coupled with the lateral portion (4) of the panel (3).

8. A wing as claimed in claim 5, **characterised in that** the panel (3) has first coupling means (13) placed on the lateral portion (4) close to the first face (3a) to receive the separate component (11) in the first position, and second coupling means (14) placed on the lateral portion (4) close to the second face (3b) to receive the separate component (11) in the second position.

9. A wing as claimed in claim 8, **characterised in that** the first and second coupling means (13, 14) of the panel (3) are defined by a first (13) and a second (14) grooves respectively, which grooves are mutually parallel and formed in the lateral portion (4), and **in that** the engagement means (17) of the separate component (11) comprises at least one tailpiece (18) alternately insertable into one of the two grooves (13, 14).

10. A wing as claimed in claim 9, **characterised in that** the tailpiece (18) continuously extends along substantially the whole groove (13; 14).

11. A wing as claimed in claim 5, **characterised in that** the panel (3) has coupling means (13, 14) that is symmetric with respect to a middle plane (P) of the panel itself which is parallel to the faces (3a, 3b), and **in that** the separate component (11) comprises a symmetric engagement portion (21) associable with said symmetric coupling means (13, 14) and an asymmetric abutment portion (22).

12. A wing as claimed in claim 1, **characterised in that** the separate component (11) further has a flap (25) susceptible of partly overlapping one of the faces (3a, 3b) of the panel (3) when the separate component (11) is coupled with the panel (3), to conceal the separation line between the abutment edge (8) and said panel (3).

13. A reversible door **characterised in that** it comprises one wing (1) according to at least one of claims 1 to 12.

14. A process for manufacturing a wing for reversible doors, comprising the steps of:

- preparing a panel (3) provided with a first face (3a) and a second face (3b) that are mutually opposite, and with a lateral portion (4) interposed between said opposite faces (3a, 3b),

characterised in that it further comprises the steps of:

- making a separate component (11) distinct from the panel (3) which is provided with engagement means (17) and is designed to form at least part of an abutment edge (8) of the wing (1) having an abutment surface (10);
- forming coupling means (13, 14) for connection with the engagement means (17) of the separate component (11), on distinct regions (12) of a peripheral edge (9) of the panel (3), which separate component (11) can be alternately coupled with the distinct regions (12) of the peripheral edge (9) so as to form right doors or left doors.

15. A process as claimed in claim 14, **characterised in that** it further comprises the step of alternately coupling the separate component (11) with one of said distinct regions (12) of the peripheral edge (9) so as to form right doors or left doors.

16. A process as claimed in claim 15, **characterised in that** the coupling means (13, 14) is formed along at least three sides (4a, 4b) of the peripheral edge (9) of the panel (3) .

17. A process as claimed in claim 14, **characterised in that** the coupling means (13, 14) is formed on the lateral portion (4) of the panel.

18. A process as claimed in claim 14, **characterised in that** the step of forming the coupling means (13, 14) consists in making at least one groove (13, 14) in the panel (3).

19. A process as claimed in claim 14, **characterised in that** the first coupling means (13) is formed close to the first face (3a) and the second coupling means (14) is formed close to the second face (3b).

20. A process as claimed in claim 14, **characterised in that** the coupling means is only formed on one upper side (4b) and one lower side (4c) of the peripheral edge (9) of the panel (3) and close to one alone of the two faces (3a, 3b).

Amended claims in accordance with Rule 86(2) EPC.

1. A wing for reversible doors comprising a panel (3) having a first face (3a) and a second face (3b) opposite to the first one and a lateral portion (4) interposed between said opposite faces (3a, 3b), an abutment edge (8) projecting from a peripheral edge (9) of the panel (3) and having an abutment surface (10) intended for engagement against a corresponding abutment surface or rabbet (16) of a frame (5) of a door (2),
wherein at least part of the abutment edge (8) is made as a separate component (11) distinct from said panel (3) and can be alternately coupled with distinct regions (12) of the peripheral edge (9) of said panel (3), so as to obtain right or left doors ;
characterized in that the whole abutment edge (8) is made as a separate component (11) distinct from said panel (3) and can be alternately coupled with distinct regions (12) of said panel (3), so as to obtain right or left doors; the separate component (11) can be alternately coupled with said panel (3) either in a first position close to the first face (3a) to define an abutment surface (3b) facing the same part as the second face (3b), or in a second position close to the second face (3b) to define an abutment surface (10) facing the same part as the first face (3a), so as to obtain right or left doors by rotating the panel (3) through 180° around a vertical axis (Z) lying in the plane of the panel (3).

2. A wing as claimed in claim 1, **characterised in that** the separate component (11) can be mounted on the panel (3) in a removable manner to enable conversion of an already installed door from a right door into a left door.

3. A wing as claimed in claim 1, **characterised in that** the separate component (11) can be coupled with the lateral portion (4) of the panel (3).

4. A wing as claimed in claim 1, **characterised in that** the panel (3) has first coupling means (13) placed on the lateral portion (4) close to the first face (3a) to receive the separate component (11) in the first position, and second coupling means (14) placed on the lateral portion (4) close to the second face (3b) to receive the separate component (11) in the second position.

5. A wing as claimed in claim 4, **characterised in that** the first and second coupling means (13, 14) of the panel (3) are defined by a first (13) and a second (14) grooves respectively, which grooves are mutually parallel and formed in the lateral portion (4), and **in that** the engagement means (17) of the separate component (11) comprises at least one tailpiece (18) alternately insertable into one of the two grooves (13, 14).

6. A wing as claimed in claim 5, **characterised in that** the tailpiece (18) continuously extends along substantially the whole groove (13; 14).

7. A wing as claimed in claim 1, **characterised in that** the panel (3) has coupling means (13, 14) that is symmetric with respect to a middle plane (P) of the panel itself which is parallel to the faces (3a, 3b), and **in that** the separate component (11) comprises a symmetric engagement portion (21) associable with said symmetric coupling means (13, 14) and an asymmetric abutment portion (22).

8. A wing as claimed in claim 1, **characterised in that** the separate component (11) further has a flap (25) susceptible of partly overlapping one of the faces (3a, 3b) of the panel (3) when the separate component (11) is coupled with the panel (3), to conceal the separation line between the abutment edge (8) and said panel (3).

9. A reversible door **characterised in that** it comprises one wing (1) according to at least one of claims 1 to 8.

10. A process for manufacturing a wing for reversible doors, comprising the steps of:

preparing a panel (3) provided with a first face (3a) and a second face (3b) that are mutually opposite, and with a lateral portion (4) interposed between said opposite faces (3a, 3b),

wherein it further comprises the steps of:

- making a separate component (11) distinct from the panel (3) which is provided with engagement means (17) and is designed to form at least part of an abutment edge (8) of the wing

(1) having an abutment surface (10);
- forming coupling means (13, 14) for connection with the engagement means (17) of the separate component (11), on distinct regions (12) of a peripheral edge (9) of the panel (3), which separate component (11) can be alternately coupled with the distinct regions (12) of the peripheral edge (9) so as to form right doors or left doors;

characterised in that first coupling means (13) is formed close to the first face (3a) and second coupling means (14) is formed close to the second face (3b).

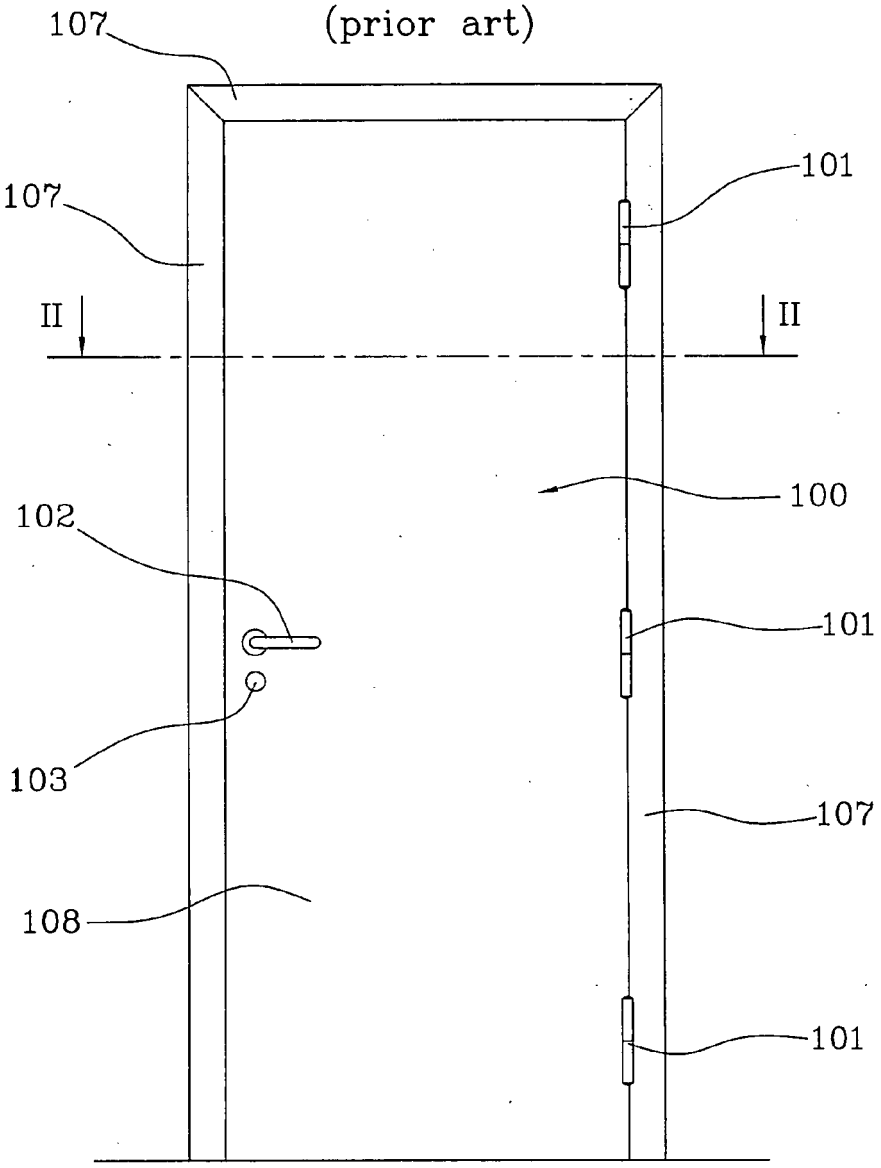
11. A process as claimed in claim 10, **characterised in that** it further comprises the step of alternately coupling the separate component (11) with one of said distinct regions (12) of the peripheral edge (9) so as to form right doors or left doors.

12. A process as claimed in claim 11, **characterised in that** the coupling means (13, 14) is formed along at least three sides (4a, 4b) of the peripheral edge (9) of the panel (3).

13. A process as claimed in claim 10, **characterised in that** the coupling means (13, 14) is formed on the lateral portion (4) of the panel.

14. A process as claimed in claim 10, **characterised in that** the step of forming the coupling means (13, 14) consists in making at least one groove (13, 14) in the panel (3).

FIG 1
(prior art)



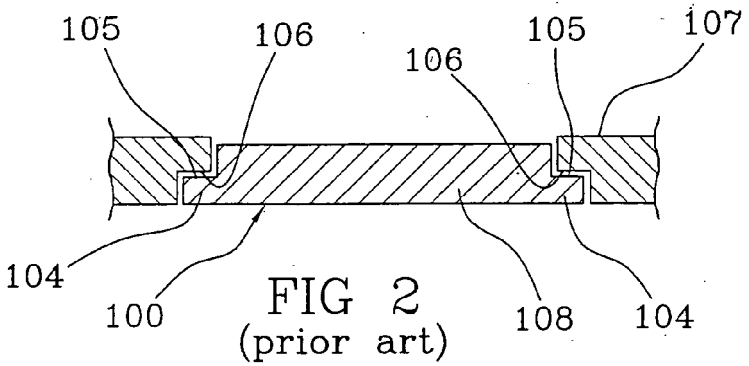


FIG 2
(prior art)

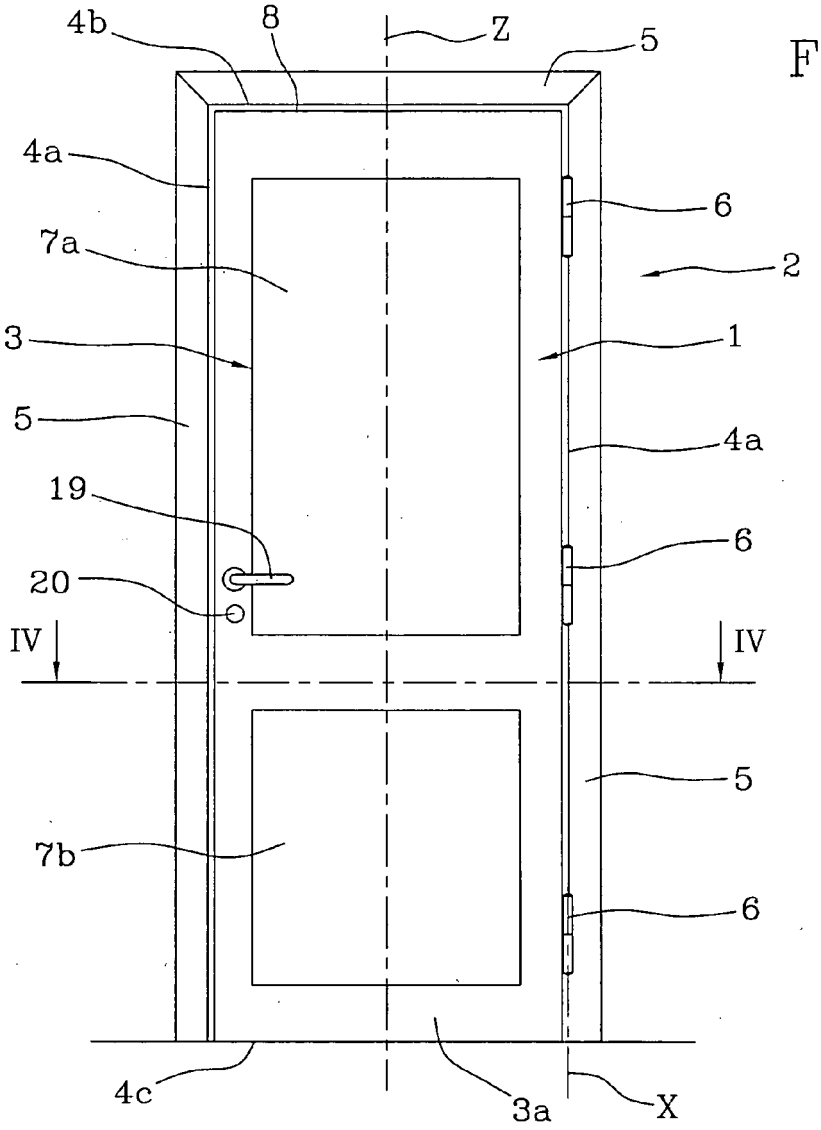


FIG 3

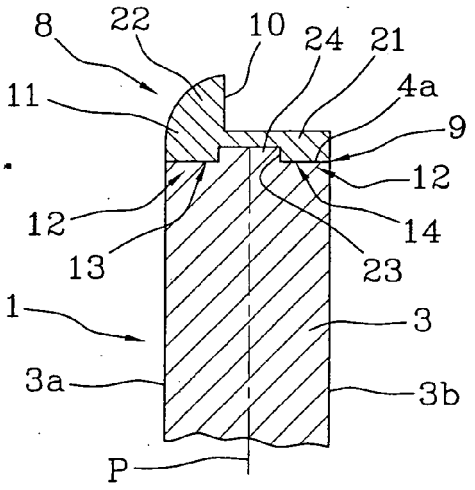


FIG 5

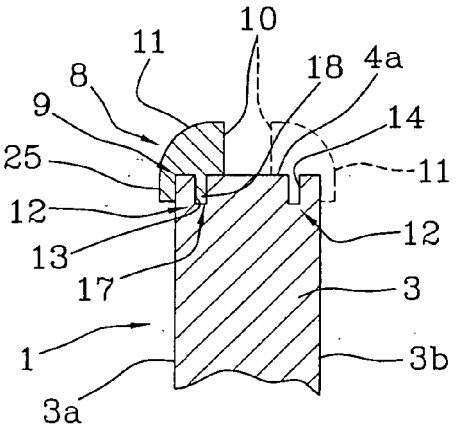
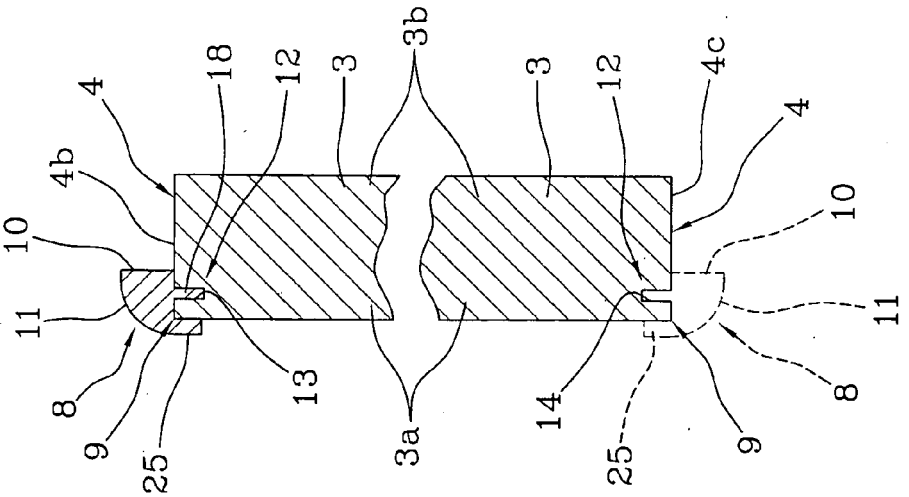


FIG 6


4
4b
10
11
8
9
25
18
12
3
3b
13
3a
14
4c
FIG 7

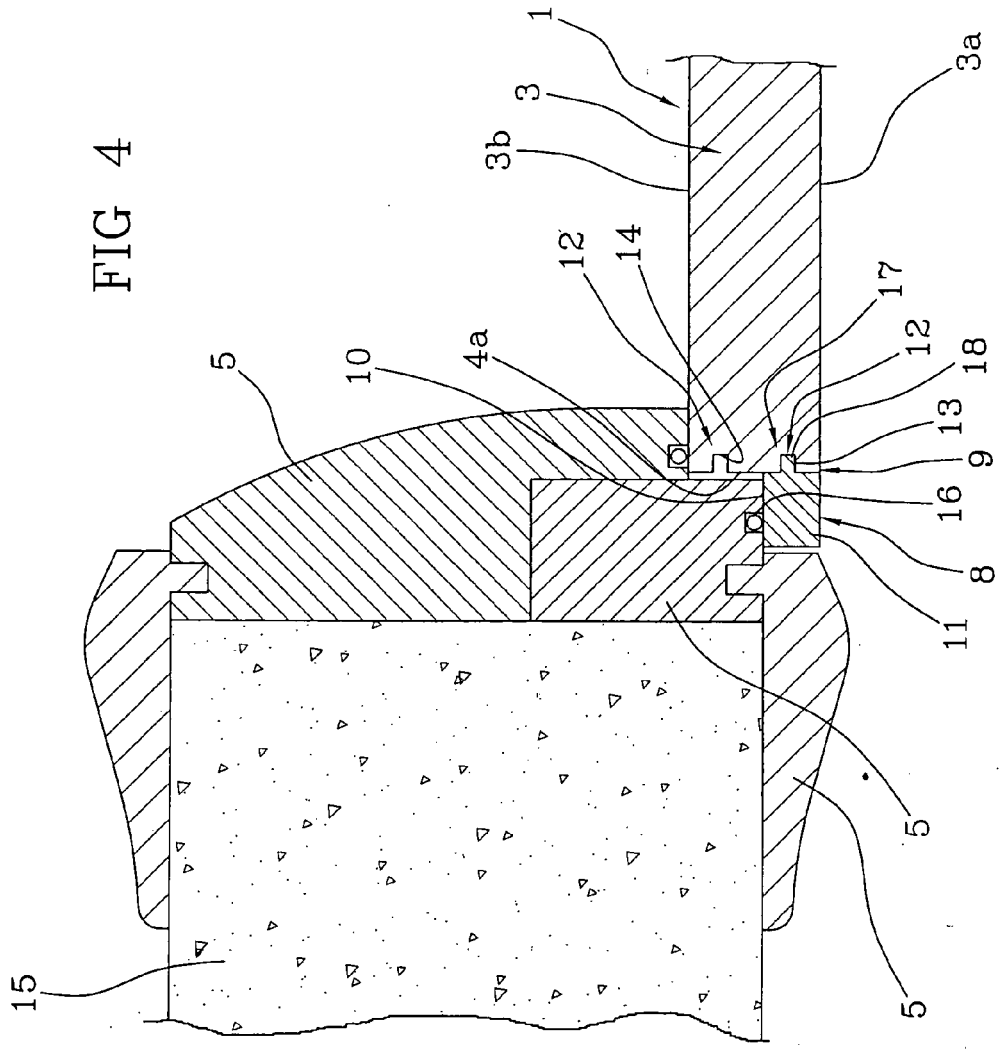


FIG 4
1
3
3b
3a
12
14
17
12
18
13
9
16
8
11
5
10
4a
15

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 42 5128

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	DE 26 28 440 A1 (WESTFAELISCHE EISEN- U. STAHLWAREN GMBH; WESTFAELISCHE EISEN- U. STAHL) 29 December 1977 (1977-12-29) * the whole document * -----	1-7,11, 13-15, 17,18,20 8,9	INV. E06B3/88
X	US 6 088 966 A (KENKEL ET AL) 18 July 2000 (2000-07-18) * column 1, lines 41-44 * * column 2, lines 30-62; figure 2 * -----	1,2,5-7, 13-15, 17,18	
X	US 2002/124470 A1 (ZACHER BRYAN P ET AL) 12 September 2002 (2002-09-12) * paragraphs [0030] - [0032], [0034] - [0040]; figures 1,3,4 * -----	1-3,5-7, 11-18	
Y	FR 2 465 862 A (FIMA) 27 March 1981 (1981-03-27) * figures 2-4 * -----	8,9	
A	EP 0 645 517 A (LIEXCO S.A) 29 March 1995 (1995-03-29) * abstract; figure 3 * -----	1-20	TECHNICAL FIELDS SEARCHED (IPC) E06B
A	US 2005/028447 A1 (SALZMAN ALLAN J) 10 February 2005 (2005-02-10) * abstract; figures 8a,8b,8c * -----	1-20	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	4 July 2006	Kofoed, P

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04-07-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 2628440 A1	29-12-1977	NONE	
US 6088966 A	18-07-2000	NONE	
US 2002124470 A1	12-09-2002	NONE	
FR 2465862 A	27-03-1981	NONE	
EP 0645517 A	29-03-1995	BE 1007460 A5	04-07-1995
		DE 69429052 D1	20-12-2001
		DE 69429052 T2	18-07-2002
		DK 645517 T3	11-03-2002
		ES 2167354 T3	16-05-2002
		US 5544456 A	13-08-1996
US 2005028447 A1	10-02-2005	US 2004107647 A1	10-06-2004

EPO FORM P0459

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