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(54) MOBILE DOOR PANEL FOR A CLOSURE SYSTEM OF MOBILE PANELS

(57) The present invention consists of a panel for the windbreak system that functions like a normal panel but comprises specific anchoring parts that enable it to open when all the other panels are closed. The door panel comprises a pane (7) between 6 and 12 mm thick, an upper profile (2a) with a cross-section such that it envelopes the pane (7) on one side and offers a hollow on the opposite side, a lower profile (2b) with a cross-section such that it envelopes the pane (7) on one side and offers a hollow on the opposite side, a lower rotating assembly (4) and a lower guide (6) fixed to the lower profile (2b) and finally, an upper rotating assembly (3) and an upper guide (5) fixed to the upper profile (2a).

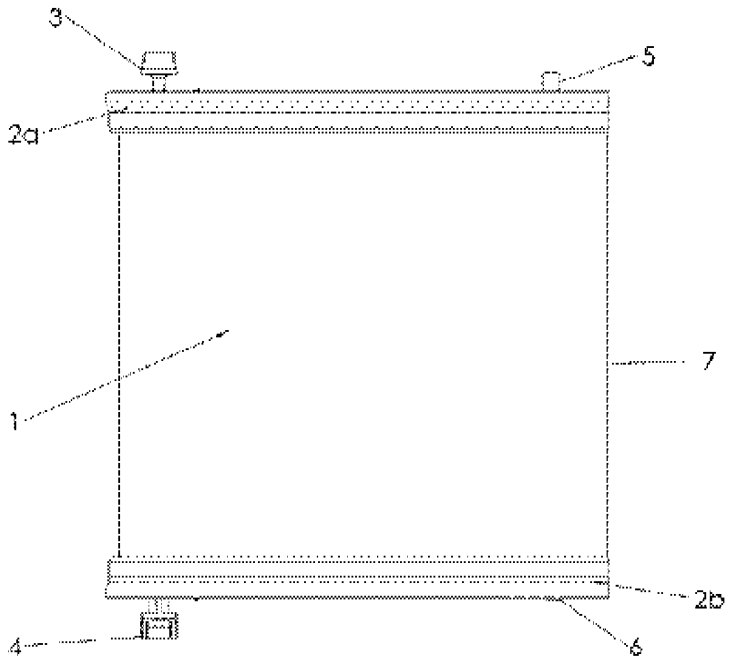

FIGURE 1

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Description

Sector of the art

[0001] The present invention consists of a mobile door panel for the windbreak system that functions like a normal panel but comprises specific anchoring parts that enable it to open when all the other panels are closed. These windbreak systems are manufactured from glass and aluminium, and are used to delimit, insulate and close spaces, both in homes and businesses.
The present invention falls under the sector of the art of construction materials.

State of the art

[0002] PCT/ES2010/000187 and PCT/ES2011/00210 disclose a windbreak system. In this type of windbreak system, the panels must be moved to the side where the door panel is located in order to be opened, since the shafts do not have any support along the guide rail to pivot. In order to pass to the other side, the door panel must be opened on one of the ends of the installation, and said opening is not possible at an intermediate point between the ends of the installation. In very long installations, this represents a problem since in public places like restaurants or shops, the door is usually located at an intermediate point of one side and not at an end, due to which, in order to create an access door in the middle of the installation, a permanent door must be installed, with the drawback that it cannot be moved to the end of the installation, thereby disrupting the aesthetics of the glazed hollow.
[0003] The system of the present invention consists of a series of elements that are added to the system disclosed in PCT/ES2010/000187 and PCT/ES/2011/00210, which makes it possible to open the mobile door panel when the other panels are closed. In order to open the system, the mobile door panel can be moved to the end of the installation and opened like the other panels, freeing the glazed hollow.

Explanation of the invention

[0004] The panel called mobile door is composed of a pane joined to two aluminium profiles, a lower profile and an upper profile. Two shafts are anchored to these profiles, a lower shaft and an upper shaft, called rotating assemblies. These shafts allow the door to pivot in the two positions in which it can do so. In order to always maintain the panel longitudinal to the guide rail when not wanting to open the panel and be able to slide it therealong, guides shall be installed on the side of the profile opposite to that of the rotating assemblies.
[0005] The object of the invention is a mobile door panel for a mobile panel closure system that moves along a lower rail and is guided by an upper rail.
[0006] The mobile door panel comprises a pane between 6 and 12 mm thick, an upper profile with a cross-section such that it envelopes the pane on one side and offers a hollow on the opposite side, a lower profile with a cross-section such that it envelopes the pane on one side and offers a hollow on the opposite side, a lower rotating assembly and a lower guide fixed to the lower profile, an upper rotating assembly and an upper guide fixed to the upper profile.
[0007] The lower rail and the upper rail have a cross-section that comprises a base, two inner faces perpendicular to the base and parallel therebetween, a side opposite the base that comprises an opening in the centre and two recesses on both sides of the opening, such that strips of a homogeneous polymer blend are located in the two recesses.
[0008] The lower rotating assembly of the mobile door panel that is the object of the invention comprises a first strip, a first shaft perpendicular to the first strip and fixed thereto, a bushing on the first shaft and a metallic rectangular block screwed to the first shaft at the end opposite that of the fixation to the first strip.
[0009] The first strip is configured at two heights, where side walls can be observed, a first level that comprises transversal protuberances that fix the lower rotating assembly to the lower profile and a second level with a width corresponding to the hollow of the lower profile.
[0010] The upper rotating assembly of the mobile door panel that is the object of the invention comprises a second strip, a second shaft perpendicular to the second strip and fixed thereto, a bushing on the second shaft and a rectangular protuberance with rounded sides that forms part of the second shaft at an end opposite that of fixation to the second strip.
[0011] The second strip of the mobile door panel that is the object of the invention has a configuration at two heights, where side faces can be observed, a first level that comprises protuberances of up to 0.5 mm that fix the upper rotating assembly to the upper profile and a second level with a width equal to the hollow of the upper profile.
[0012] The second shaft of the upper rotating assembly of the mobile door panel that is the object of the invention comprises a first section with a first diameter and a second section with a second diameter, wherein the diameter of the first section is smaller than the diameter of the second section, in order to pass through the opening of the upper rail, wherein the rectangular protuberance comprises a transversal hole to fix a circular segment-shaped part.
[0013] The lower guide comprises a base with a two-level structure and a protuberance, such that the protuberance projects from the lower profile and comes into contact with one side of the strips of homogeneous polymer blend.
[0014] The mobile door panel that is the object of the invention comprises an upper strip fixed to the internal base of the upper rail and a lower strip fixed to the base of the lower rail.

[0015] The lower strip has the same width as the interior of the lower rail and a first longitudinal groove formed by two opposing faces that comprise the following sections:

- a first section wherein the two faces disposed in straight opposition to each other are inclined therebetween,
- a second section with the two faces disposed in straight and parallel opposition to each other,
- a third section with two faces disposed in circular opposition to each other, and
- a fourth section with two faces disposed in straight and parallel opposition to each other.

[0016] The first longitudinal groove comprises a pass-through slot at its base in the first section, a drill hole in the third section and a step in the fourth section.

[0017] The upper strip comprises a second longitudinal groove formed by a first side wall and a second side wall, wherein the first side wall comprises a first straight section, followed by a first circular section until reaching a second straight section that reaches up to a second circular section oriented in the direction opposite to the first circular section, wherein the second circular section is symmetrical to the first circular section and ends in a third straight section symmetrical to the first straight section, and wherein the second side wall comprises a first straight section, followed by a first circular section that ends in a second straight section having the same dimensions as the second straight section of the first side wall, followed by a second circular section that is symmetrical to the first circular section and, finally, a third straight section that is symmetrical to the first straight section.

[0018] In the mobile door panel that is the object of the invention, the upper rotating assembly is in contact with the upper strip while the lower rotating assembly is in contact with the lower strip.

[0019] In the mobile door panel that is the object of the invention, the circular segment-shaped parts of the upper rotating assembly, when said upper rotating assembly reaches the upper strip, block a movement of the upper rotating assembly along the upper rail, whereupon the circular sections of the first wall of the upper strip come into contact with the circular segment-shaped part and because, with the upper rotating assembly in this position, the mobile door panel rotates, resting on one of the circular sections of the first wall of the upper strip.

[0020] The bushing is T-shaped, wherefrom two perpendicular arms emerge, with two flat side faces and a front face and a rounded rear face, such that the length of the two arms is identical to that of the rectangular block.

[0021] The lower rotating assembly is inserted in the lower strip until it is stopped by the step wherein the first shaft of the lower rotating assembly is located centered between the circular faces of the lower strip and the bushing rests on the parallel flat faces of the lower strip.

[0022] The lower rail comprises an exit part wherethrough the lower guide comes out of the lower rail in the opening movement of the mobile door panel.

[0023] The exit part of the mobile door panel that is the object of the invention comprises a rectangular base and two trapezoidal protuberances at the ends of the rectangular base, wherein each protuberance comprises a countersunk drill hole and have two opposing faces.

[0024] In the mobile door panel for a mobile panel closure system that is the object of the invention, the first strip of the lower rotating assembly comprises a first wedge opposite the first shaft.

[0025] The first shaft of the lower rotating assembly comprises a square cross-section at its end part with a slot in the interior wherein the rectangular block is screwed.

[0026] The second strip of the upper rotating assembly of the mobile door panel that is the object of the invention comprises a second wedge opposite the second shaft.

[0027] In the mobile door panel for a mobile panel closure system that is the object of the invention, the bushing introduced in the second section of the second shaft has a shaft with a greater diameter than the rest of the bushing to be in contact with the inner walls of the upper rail.

[0028] The bushing in the preferred embodiment of the mobile door panel for a panel closure system that is the object of the invention is made of polyamide.

[0029] The protuberance of the lower guide has a semicircular shape and comprises a flat face that interrupts the semicircular shape.

[0030] The bushing of the mobile door panel for a panel closure system that is the object of the invention comprises a smaller width than the opening of the cross-section of the lower rail.

[0031] The bushing of the mobile door panel for a panel closure system that is the object of the invention is centered with respect to the first axis and is capable of moving to maintain the parallelism between the side faces of the bushing and the lower rail.

[0032] In the mobile door panel for a panel closure system that is the object of the invention, the radius of the circular shape of the circular segment-shaped part is equal to the radius of the rounded outer sides of the protuberance of the second shaft and said radii are concentric, wherein the circular segment-shaped part together with the rounded external sides of the protuberance of the second shaft form a continuous circular surface.

Brief description of the drawings

[0033]

Figure 1 shows the mobile door panel with its elements.

Figure 2 shows the lower strip on which the lower rotating assembly of the mobile door panel pivots.

Figure 3 shows the lower rotating assembly of the mobile door panel.

Figure 4 shows the upper strip on which the upper rotating assembly of the mobile door panel pivots.
Figure 5 shows the upper rotating assembly of the mobile door panel.
Figure 6 shows the exit of the lower guide of the mobile door panel.
Figure 7 shows the lower guide of the mobile door panel.
Figure 8 shows the tongue-shaped stop of the mobile door panel.
Figure 9 shows the cross-section of the guide rail.
Figure 10 shows the arrangement of the exit of the lower guide on the guide rail.

Explanation of an embodiment of the invention

[0034] The object of the invention is a mobile door panel (1) for a glass panel closure system, which acts as a door in an intermediate position of one side which is closed by means of the aforementioned glass panel closure system. In the glass panel closure systems known to date, the doors were always positioned at the ends of the side to be closed and, once the panels were installed, there was no panel with an intermediate securing system along the length of the closure that would allow a rotation movement for opening.

[0035] A glass panel closure system is formed by a series of panels that move along a lower rail (65) and guided by an upper rail (65) with an identical cross-section. The lower rail (65) is positioned with the cross-section in a position such as that observed in figure 9 and the upper rail (65) is positioned with the cross-section rotated 180º with respect to the position of figure 9, although the cross-section of the lower and upper rails (65) is identical and comprises the same elements.

[0036] The cross-section of the rails (65) is a section that comprises:

- a base (67),
- two inner faces (68) perpendicular to the base (67) and parallel therebetween,
- a side opposite the base (67) that comprises an opening (64) in the centre and two recesses (66) on both sides of the opening (64).

Figure 1 shows the mobile door panel (1) that is the object of the invention. This mobile door panel (1) comprises:

- a pane (7) between 6 and 12 mm thick,
- an upper profile (2a),
- a lower profile (2b),
- a lower rotating assembly (4) and a lower guide (6) fixed to the lower profile (2b),
- an upper rotating assembly (3) and an upper guide (5) fixed to the upper profile (2a).

[0037] Both the upper profile (2a) and the lower profile (2b) comprise a section with a shape such that it envelopes the pane (7) on one side and leaves a free hollow to envelope another element on the opposite side. The two profiles (2a, 2b) are manufactured from aluminium.

[0038] The mobile door panel (1) performs three possible movements:

- a first longitudinal movement by sliding over strips of a homogeneous polymer blend (70), disposed in the two recesses (66) of the lower rail (65). This movement may be made provided that any of the panels are open.
- a second rotating movement in the position where the permanent door is located.
- a third opening movement, once all the panels are longitudinally disposed on the lower and upper rails (65).

[0039] In the two first movements, the mobile door panel (1) object of the invention behaves like a normal panel, while for the third movement the mobile door panel (1) requires the specific elements that allow it to perform the rotating movement in the chosen position.

[0040] The mobile door panel (1) for performing the third rotating movement in an intermediate position between the two ends of the side to be closed with a closing system requires a lower strip (8) fixed to the base (67) of the lower rail (65) disposed in the lower position and an upper strip (28) fixed to the base (67) of the upper rail (65) disposed in the upper position.

[0041] The lower strip (8) has the same width as the interior of the lower rail (65) and a first longitudinal groove (72) formed by two opposing faces that comprises the following sections:

- a first section wherein the two faces disposed in straight opposition to each other are inclined therebetween (9),
- a second section with the two faces disposed in straight and parallel opposition to each other (14a),
- a third section with the two faces disposed in circular opposition to each other (10), and
- a fourth section with the two exit faces disposed in straight and parallel opposition to each other (14b).

[0042] As regards the base of the first longitudinal groove (72), a passthrough slot (12) is disposed in the section of the flat faces inclined therebetween (9), a drill hole (13) is disposed in the third section and a step (11) is disposed in the fourth section. The lower strip (8) is fixed to the lower rail (65) by means of two screws disposed in the passthrough slot (12) and in the drill hole (13).

[0043] The lower rotating assembly (4) (observable in figure 3) comprises:

- a first strip (18),
- a first shaft (19) perpendicular to the first strip (18) and fixed thereto,

- a bushing (20) that is pressed onto the first shaft (19),
- a metallic rectangular block (23) screwed to the first shaft (19) at the end opposite that of the fixation of the first strip (18).

[0044] The first strip (18) of the lower rotating assembly (4) has a configuration at two heights, where the following can be observed:

- side walls (15) that guarantee the longitudinal position of the lower rotating assembly (4) of the mobile door panel (1) with respect to the lower profile (2b);
- a first level (16) that comprises protuberances (26) that fix the lower rotating assembly (4) to the lower profile (2b); and
- a second level (17) with a width corresponding to the hollow of the lower profile (2b), thereby guaranteeing the centering of the lower rotating assembly (4) with the lower profile (2b).

[0045] The first strip (18) of the lower rotating assembly (4) of the mobile door panel (1) is inserted in the interior of the lower profile (2b).

[0046] A first wedge (27) is disposed on the lower part of the first strip (18), on which the lower rotating assembly (4) rests and guarantees that the first shaft (19) is in a vertical position once the lower rotating assembly (4) is fixed. The first shaft (19) is mostly cylindrical and at the end of the first shaft (19) it has a square cross-section part with a slot in the interior wherein a metallic rectangular block (23) is screwed.

[0047] The bushing (20) is T-shaped, wherefrom two perpendicular arms (21) emerge, with two flat side faces (22) and a rounded front face (24a) and rear face (24b). The width of the bushing (20) is smaller than the opening of the cross-section of the lower rail (65), which enables the panels to be assembled and disassembled without need to open a hole in said lower rail (65). The bushing (20) is centered with respect to the first shaft (19) and is capable of movement to maintain the parallelism between the side faces (22) of the bushing (20) and the lower rail (65). The two arms (21) of the bushing (20) have the same length as the rectangular block (23).

[0048] The rectangular block (23) is disposed at the end of the first shaft (19), whose ends are rounded. This rectangular block (23) is fixed by means of a screw (25) to the first shaft (19), which has previously been drilled to house said screw (25). In this manner, the lower rotating assembly (4) of the mobile door panel (1) is longer than the lower rotating assemblies of the other panels. This enables the other panels to pass above the lower strip (8) without interference but the lower rotating assembly (4) of the mobile door panel (1) is stopped by the step (11) of the lower strip (8). When the mobile door panel (1) is opened, it is this rectangular block (23) which rests on the circular faces (10) of the lower strip (8) by means of its rounded faces (24a, 24b).

[0049] Upon sliding the mobile door panel (1) to a position in which a door will be established, the lower rotating assembly (4) of the mobile door panel (1) is inserted in the lower strip (8). This lower strip (8), upon having the same width as the interior of the lower rail (65), is wedged between the inner faces (68) of said lower rail (65). The lower rotating assembly (4) is guided by means of the two flat faces inclined therebetween (9) of the lower strip (8). The lower rotating assembly (4) of the mobile door panel (1) continues to move until it is stopped by the step (11). In this position, the first shaft (19) of the lower rotating assembly (4) is disposed centered between the circular faces (10) of the lower strip (88), while the arms (21) of the bushing (20) of the lower rotating assembly (4) of the mobile door panel (1) rest on the parallel flat faces (14a) of the lower strip (8).

[0050] The upper rotating assembly (3) (observable in figure 5) comes into contact with the upper strip (28) at the same time that the lower rotating assembly (4) comes into contact with the lower strip (8). The function of the upper strip (28) is the same as that of the lower strip (8): to hold the mobile door panel (1) in the opening process to prevent it from moving longitudinally along the upper rail (65).

[0051] The upper strip (28) is fixed to the internal base (67) of the upper rail (65) and is wedged between the inner faces of the rail (68). The upper strip (28) comprises a slot (31) that allows adjustment in the fixation process and a drill hole (32) for fixing to the base (67) of the upper rail (65).

[0052] The upper strip (28) comprises a second longitudinal groove (73), said second longitudinal groove (73) being symmetrical with respect to a shaft that passes through the centre of the upper strip (28) in a transversal direction to the second longitudinal groove (73). Said second longitudinal groove (73) is defined by side walls. Next, the second longitudinal groove (73) is defined along the length of each side wall. The first side wall comprises a first straight section (74), followed by a first circular section (29a) until reaching a second straight section (30a) that reaches a second circular section (29b) oriented in a direction opposite to the first circular section (29) (which is symmetrical to the first circular section (29a)) and that ends in a third straight section (75) (which is symmetrical to the first straight section (74)). The second side wall comprises a first straight section (76), followed by a first circular section (28a) that ends in a second straight section (30b) having the same dimensions as the second straight section (30a) of the first side wall, followed by a second circular section (28b) (symmetrical to the first circular section (28a)) and finally a third straight section (77) (which is symmetrical to the first straight section (76)).

[0053] The first straight section (74) of the first side wall is disposed facing the first straight section (76) of the second side wall, configuring the entrance/exit of the rotating assemblies. The first straight section (76) of the second side wall is shorter in length than the first straight section (74) of the first side wall. The first circular section

(29a) of the first side wall is shorter in length than the first circular section (28a) of the second side wall, since the end of the two first circular sections (28a, 29a) of the two walls is opposed, and the two first circular sections (28a, 29a) configure a first semicircular hollow (78), which is where the upper rotating assembly (3) of the mobile door panel (1) that is the object of the invention rests in the third rotating movement of the mobile door panel (1).

[0054] The two second straight sections (30a, 30b) of the two side walls are disposed facing each other and have identical length.

[0055] Equally symmetrical to the first semicircular hollow (78) and configured by the second circular sections (28, 29b) of the two side walls, the upper strip (28) comprises a second semicircular hollow (79).

[0056] In the centre of the upper strip (28), longitudinally, there is sufficient space between the two second straight sections (30a, 30b) of the two side walls for the upper rotating assemblies of the normal panels to pass.

[0057] The upper rotating assembly (3) observable in figure 5) of the mobile door panel (1) comprises:

- a second strip (80),
- a second shaft (38) perpendicular to the second strip (80) and fixed thereto by a rectangular protuberance (44) on the end opposite that of fixation to the second strip (80), wherein said rectangular protuberance has rounded sides (45), and
- a bushing (39) that is pressed onto the second shaft (38).

[0058] The upper rotating assembly (3) (observable in figure 5) is inserted in the interior of the upper profile (2a) and is fixed by means of a screw (37) housed in a threaded drill hole of the second strip (80).

The second strip (80) comprises a second wedge (46) which, together with the screw (37), maintains the second shaft (38) vertical with respect to the upper profile (2a).

[0059] The second strip (80) of the upper rotating assembly (3) has a configuration at two heights, wherein the following can be observed:

- side faces (34) that guarantee the longitudinal position of the upper rotating assembly (3) with respect to the upper profile (2a),
- a first level (35) that comprises protuberances (43) of up to 0.5 mm that completely fix the upper rotating assembly (3) to the upper profile (2a), and
- a second level (36) with a width equal to the upper profile (2a), thereby guaranteeing the centering of the upper rotating assembly (3) on the upper profile (2a).

[0060] The second shaft (38) has a first section (81) with a first diameter and a second section (82) with a second diameter, wherein the diameter of the first section (81) is smaller than the diameter of the second section (82), in order to pass through the openings (64) of the upper rail (65). The plastic bushing (39) is press-fitted into the second section (82). The second section (82) is followed by the rectangular protuberance (44), which comprises a transversal hole for fixing a metallic circular-shaped segment (41).

[0061] In the mobile door panel (1) opening process, the rounded sides (45) come into contact either with the first circular section (28a) or with the second circular section (28b) of the second wall of the upper strip (28).

[0062] The upper rotating assembly (3) of the mobile door panel (1) stops when it reaches the upper strip (28) by means of the circular segment-shaped part (41). The radius of the circular shape of the circular segment-shaped part (41) is equal to the radius of the rounded sides (45) of the protuberance (44) of the second shaft (38) and said radii are concentric. In this manner, the circular segment-shaped part (41) together with the rounded outer sides (45) of the protuberance (44) of the second shaft (38) forms a continuous circular surface.

[0063] The circular segment-shaped part (41) causes the width of the upper rotating assembly (3) of the mobile door panel (1) is greater than the rotating assemblies of the other panels of the closure system and, therefore, when said upper rotating assembly (3) reaches the upper strip (28) in a movement along an upper rail (65) it stops, because the circular sections (29a, 29b) of the first wall of the upper strip (28) come into contact with the circular segment-shaped part (41). With the upper rotating assembly (3) of the mobile door panel (1) in this position, said mobile door panel (1) can be rotated, resting on one of the circular sections (29a, 29b) of the first wall of the upper strip (28), thereby impeding the longitudinal movement of the mobile door panel (1) on the upper rail (65).

[0064] The bushing (39) introduced in the second section (82) of the second shaft (38) is manufactured from polyamide in order to prevent noise and vibrations in the movement of the mobile door panel (1) on the upper rail (65). The bushing (39) has a section (40) with a larger diameter than the rest of the bushing (39), such that with the bushing (39) introduced in the upper rail (65), the section with a larger diameter (40) than the bushing (39) is in contact with the inner walls (68) of the upper rail (65), which also guarantees the centering of the mobile door panel (1).

[0065] The lower guide (6) of the mobile door panel (1) serves to guide the panel along the lower rail (65).

[0066] The lower guide (6) comprises:

- a base (33) with a structure of a first level (55) and a second level (56), and
- a semicircular-shaped protuberance (57), which comprises a flat face (58) that cuts the semicircular shape.

[0067] The protuberance (57) of the lower guide (6) that projects from the lower profile (2b) and comes into contact with the side (71) of the strips of a homogeneous polymer blend (70), preventing the mobile door panel (1)

from opening in an incorrect position.

[0068] The lower guide (6) is inserted in the lower profile (2b) by means of the base (33). The first level (55) of the base prevents the lower guide (6) from coming out of the lower profile (2b), and the width of the second level (56) coincides with the hollow of the lower profile (2b), due to which the lower guide (69 is completely centered on the lower profile (2b). In order to fix the lower guide 86) to the lower profile (2b), said lower guide (6) comprises two threaded holes (59, 60), through which two headless screws are screwed.

[0069] In order for the lower guide (6) to come out from the lower rail (65) during the opening movement of the mobile door panel (1), an exit part (47) is installed on said lower rail (65).

[0070] The exit part (47) comprises:

- a rectangular base (48) that comprises two hollows (49) in its lower zone,
- two trapezoidal protuberances (50) at the ends of the rectangular base (48), each protuberance (50) comprising a drill hole (53) with countersinking (54) and having two opposing faces (52).

[0071] In order to position this exit part (47) in the lower rail (65), the rectangular base (48) is inserted in the recess (66) disposed in the upper part of the lower rail (65), which is fixed by means of two screws (69). The two hollows (49) of the rectangular base (48) allow the passage of the screws (69). Once the exit (47) of the lower guide (6) has been fixed to the lower rail (65), the two protuberances (50) leave sufficient space between their opposing faces (52) for the protuberance (57) of the lower guide (6) to pass. The trapezoidal shape helps the lower guide (6) to pass between the opposing faces (52) of the protuberances (50). The countersinking (54) of the drill holes (53) houses the head of the screws (69) so that they do not protrude.

[0072] The upper guide (5) of the mobile door panel (1) guides the mobile door panel (1) along the length of the upper rail (65). In the position in which the upper guide (5) remains when all the panels are closed, a cut is made on the side of the upper rail (65) to allow the upper guide (5) to come out from the interior of the upper rail (65).

[0073] In order to open the mobile door panel (1) on the side of the opening of the normal panels, the mobile door panel (1) is moved towards the end of the system. In order to position the mobile door panel (1) in the corresponding rotation mechanism, a tongue-shaped stop (61) that comprises a base (62) and a protuberance (63) is positioned. The protuberance (63) acts like a stop for the mobile door panel (1), coming into contact with the lower rotating assembly (4). This is necessary since the rotating assemblies (3, 4) of the mobile door panel (1) are moved towards the centre of the mobile door panel (1), creating a protuberance with respect to the rotating assembly (3, 4) that would make the panel profile (2a, 2b) of the mobile door panel (1) impact against the profile of the previous panel.

List of elements mentioned in the figures

[0074]

1.	mobile door panel,
2a.	upper profile,
2b.	lower profile,
3.	upper rotational assembly,
4.	lower rotational assembly,
5.	upper guide,
6.	lower guide,
7.	pane,
8.	lower strip,
9.	flat faces inclined therebetween,
10.	circular faces,
11.	step,
12.	passthraugh slat,
13.	drill hole,
14a.	parallel flat faces,
14b.	exit parallel flat faces,
15.	side walls of the first strip level of the first strip,
16.	first level of the first strip,
17.	second level of the first strip,
18.	first strip,
19.	first shaft,
20.	shaft,
21.	bushing arms,
22.	side faces,
23.	rectangular block,
24a.	front face,
24b.	rear face,
25.	screw,
26.	protuberances of the first level of the first strip,
27.	first wedge,
28.	upper strip,
28a.	first circular section of the second wall of the second groove,
28b.	second circular section of the second wall of the second groove,
29a.	first circular section of the first wall of the second groove,
29b.	second circular section of the first wall of the second groove,
30a.	second straight section of the first wall of the second groove,
30b.	second straight section of the second wall of the second groove,
31.	groove of the upper strip,
32.	drill hole of the upper strip,
33.	base of the upper guide,
34.	side faces of the second strip,
35.	first level of the second strip,
36.	second level of the second strip,
37.	screw,
38.	second shaft,
39.	bushing,

40. section with the largest bushing diameter,
41. circular segment-shaped part,
43. protuberances of the second level of the second strip,
44. rectangular protuberance,
45. rounded sides,
46. second wedge,
47. exit part,
48. rectangular base,
49. hollow,
50. protuberance,
52. opposing faces,
53. drill hole,
54. countersinking,
55. first level,
56. second level of the base of the lower guide,
57. protuberance of the lower guide,
58. flat face of the protuberance,
59. threaded hole of the lower guide,
60. threaded hole of the lower guide,
61. stop,
62. stop base,
63. stop protuberance,
64. rail opening,
65. lower rail,
66. recess,
67. rail base,
68. inner face,
69. screws,
70. strip of homogeneous polymer blend,
71. side of the strips of homogeneous polymer blend,
72. first longitudinal groove,
73. second longitudinal groove.
74. first straight section of the first wall of the second groove,
75. third straight section of the first wall of the second groove,
76. first straight section of the second wall of the second groove,
77. third straight section of the second wall of the second groove,
78. first semicircular hollow,
79. second semicircular hollow,
80. second strip of the upper rotating assembly,
81. first section of the second shaft,
82. second section of the second shaft.

Claims

1. A mobile door panel (1) for a closure system for mobile panels that move along a lower rail (65) and guided by an upper rail (65), wherein the mobile door panel (1) comprises:

- a pane (7) between 6 and 12 mm thick,
- an upper profile (2a) with a cross-section such that it envelopes the pane (7) on one side and offer a hollow on the opposite side,
- a lower profile (2b) with a cross-section such that it envelopes the pane (7) on one side and offers a hollow on the opposite side,
- a lower rotating assembly (4) and a lower guide (6) fixed to the lower profile (2b),
- an upper rotating assembly (3) and an upper guide (5) fixed to the upper profile (2a),

where the lower rail (65) and the upper rail (65) have a cross-section that comprises:

- a base (67),
- two inner faces (68) perpendicular to the base (67) and parallel therebetween,
- a side opposite the base (67), which comprises an opening (64) in the centre and two recesses (66) on both sides of the opening (64), such that strips of a homogeneous polymer blend (70) are located in the two recesses (66);

where the lower rotating assembly (4) comprises:

- a first strip (18),
- a first shaft (19) perpendicular to the first strip (18) and fixed thereto,
- a bushing (20) on the first shaft (19),
- a metallic rectangular block (23) screwed to the first shaft (19) on the end opposite that of fixation to the first strip (18),

where the first strip (18) has a configuration at two heights, wherein side walls (15) can be observed, a first level (16) that comprises transversal protuberances (26) that fix the lower rotating assembly (4) to the lower profile (2b) and a second level (17) having a width that corresponds to the hollow of the lower profile (2b),
and where the upper rotating assembly (3) comprises:

- a second strip (80),
- a second shaft (38) perpendicular to the second strip and fixed thereto that comprises a rectangular protuberance (44) with rounded sides (45) at an end opposite that of the fixation to the second strip,
- a bushing (39) on the second shaft (38),

where the second strip (80) has a configuration at two heights, where side faces (34), a first level (35) that comprises protuberances (43) of up to 0.5 mm that fix the upper rotating assembly (3) to the upper profile (2a), and a second level (36) with a width equal to the hollow of the upper profile (2a),
characterised in that the second shaft (38) comprises a first section (81) with a first diameter and a second section (82) with a second diameter, wherein

the diameter of the first section (81) is smaller than the diameter of the second section (82), in order to pass through the opening (64) of the upper rail (65), where the rectangular protuberance (44) comprises a transversal hole for fixing a circular segment-shaped part (41),
and the lower guide (6) comprises a base (33) having a two-level structure (55, 56) and a protuberance (57), such that the protuberance (57) of the lower guide (6) projects from the lower profile (2b) and comes into contact with one side (71) of the strips of homogeneous polymer blend (70);
and comprises an upper strip (28) fixed to the internal base (67) of the upper rail (65) and a lower strip (8) fixed to the base (67) of the lower rail (65);
and the lower strip (8) has the same width as the interior of the lower rail (65) and a first longitudinal groove (72) formed by two opposing faces that comprises the following sections:

- a first section wherein the two faces disposed in straight opposition to each other are inclined therebetween (9),
- a second section with the two faces disposed in straight and parallel opposition to each other (14a),
- a third section with the two faces disposed in circular opposition to each other (10), and
- a fourth section with the two exit faces disposed in straight and parallel opposition to each other (14b),

where the first longitudinal groove comprises, at its base, a passthrough slot (12) in the first section, a drill hole (13) in the third section and a step (11) in the fourth section.
and the upper strip (28) comprises a second longitudinal groove (73) formed by a first side wall and a second side wall, where the first side wall comprises a first straight section (74), followed by a first circular section (29a) until reaching a second straight section (30a) that reaches up to a second circular section (29b) oriented in the opposite direction to the first circular section (29a), wherein the second circular section (29b) is symmetrical to the first circular section (29a), and wherein the second side wall comprises a first straight section (76), followed by a first circular section (28a) ending in a second straight section (30b) having the same dimensions as the second straight section (30a) of the first side wall, followed by a second circular section (28b) that is symmetrical to the first circular section (28a) and finally a third straight section (77) that is symmetrical to the first straight section (76),
and the upper rotating assembly (3) comes into contact with the upper strip (28) at the same time that the lower rotating assembly (4) comes into contact with the lower strip (8),
and the circular segment-shaped part (41) of the upper rotating assembly (3) blocks a movement of the upper rotating assembly (3) along the upper rail (65) when said upper rotating assembly (3) reaches the upper strip (28), wherein the circular sections (29a, 29b) of the first wall of the upper strip (28) comes into contact with the circular segment-shaped part (41) and because, with the upper rotating assembly (3) in this position, the mobile door panel (1) rotates, resting on one of the circular sections (29a, 29b) of the first wall of the upper strip (28),
and the bushing (20) is T-shaped, wherefrom two perpendicular arms (21) emerge, with two rounded flat side walls (22) and a front face (24a) and a rear side (24b), such that the two arms (21) of the bushing (20) have the same length as the rectangular block (23),
and the lower rotating assembly (4) is inserted in the lower strip (8) until it is stopped by the step (11), wherein the first shaft (19) of the lower rotating assembly (4) is arranged centered between the circular faces (10) of the lower strip (8) and the bushing (20) rests on the parallel flat faces (14a) of the lower strip (8),
and the lower rail (65) comprises an exit part (47), through which the lower guide (6) comes out of the lower rail (65) during the opening movement of the mobile door panel (1).

2. The mobile door panel (1) for a mobile panel closure system, according to claim 1, **characterised in that** the exit part (47) comprises:

- a rectangular base (48),
- two trapezoidal protuberances (50) at the ends of the rectangular base (48).

3. The mobile door panel (1) for a mobile panel closure system, according to claim 2, **characterised in that** each protuberance (50) comprises a drill hole (53) with countersinking (54) and has two opposing faces (52).

4. The mobile door panel (1) for a mobile panel closure system, according to any of the preceding claims, **characterised in that** the first strip (18) of the lower rotating assembly (4) comprises a first wedge (27) opposite to the first shaft (19).

5. The mobile door panel (1) for a mobile panel closure system, according to any of the preceding claims, **characterised in that** the first shaft (19) comprises a square section on its final end with a slot in the interior wherein the rectangular block (23) is screwed.

6. The mobile door panel (1) for a mobile panel closure system, according to any of the preceding claims,

characterised in that the second strip (80) of the upper rotating assembly (3) comprises a second wedge (46) opposite the second shaft (38).

7. The mobile door panel (1) for a mobile panel closure system, according to the preceding claims, **characterised in that** the bushing (39) introduced in the second section (82) of the second shaft (38) has a section with a larger diameter (40) than the rest of the bushing (39) in order to be in contact with the internal walls of the upper rail (65).

8. The mobile door panel (1) for a mobile panel closure system, according to any of the preceding claims, **characterised in that** the bushing (39) is manufactured from polyamide.

9. The mobile door panel (1) for a mobile panel closure system, according to any of the preceding claims, **characterised in that** the protuberance (57) of the lower guide (6) has a semicircular shape and comprises a flat face (58) that interrupts the semicircular shape.

10. The mobile door panel (1) for a mobile panel closure system, according to any of the preceding claims, **characterised in that** the bushing (20) comprises a smaller width than the opening (64) of the cross-section of the lower rail (65).

11. The mobile door panel (1) for a mobile panel closure system, according to any of the preceding claims, **characterised in that** the bushing (20) is centered with respect to the first shaft (19) and is capable of moving to maintain the parallelism between the side faces (22) of the bushing (20) and the lower rail (65).

12. The mobile door panel (1) for a mobile panel closure system, according to any of the preceding claims, **characterised in that** the radius of the circular shape of the circular segment-shaped part (41) is equal to the radius of the rounded outer sides (45) of the protuberance (44) of the second shaft (38) and said radii are concentric, wherein the circular segment-shaped part (41), together with the rounded outer sides (45) of the protuberance (44) of the second shaft (38), forms a continuous circular surface.

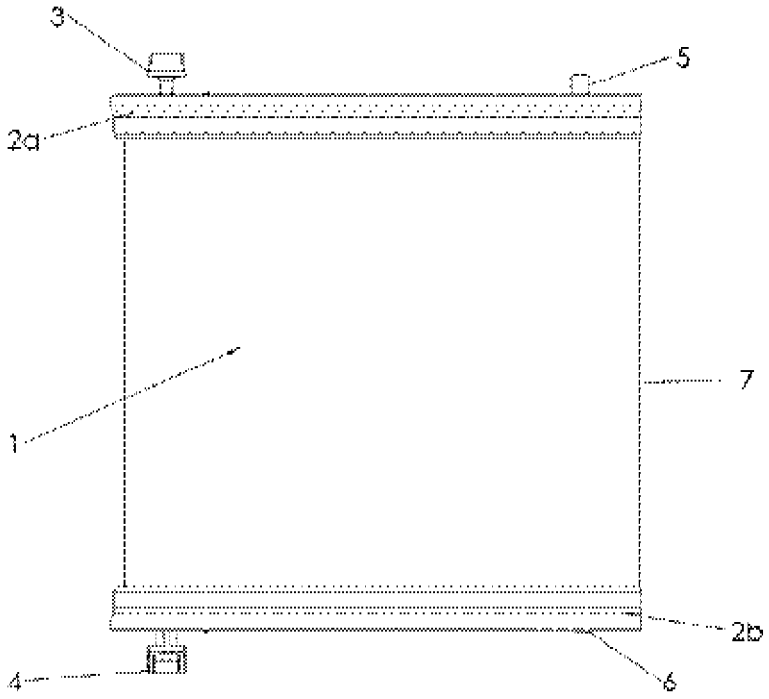

FIGURE 1

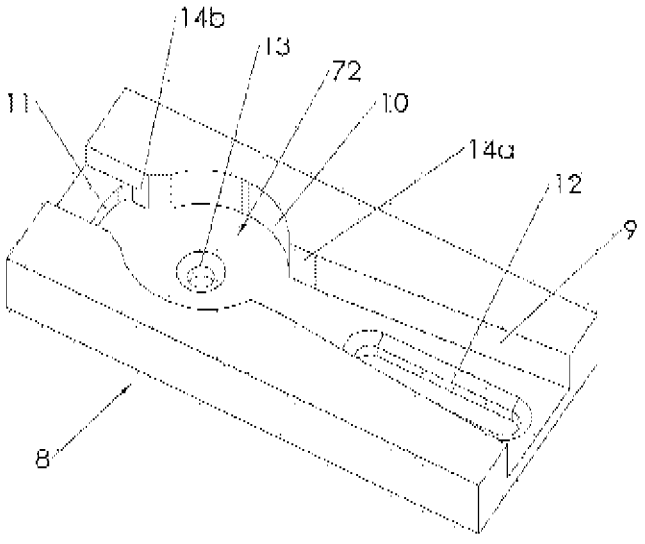

FIGURE 2

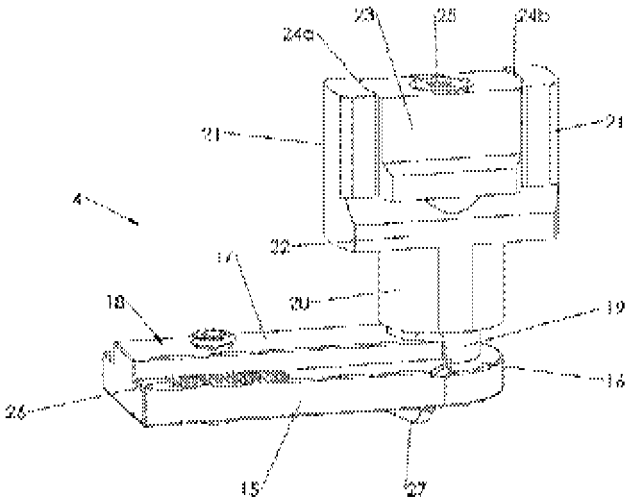

FIGURE 3

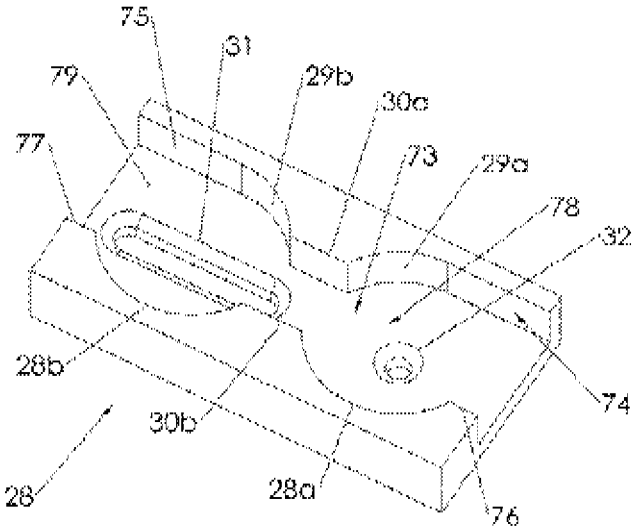

FIGURE 4

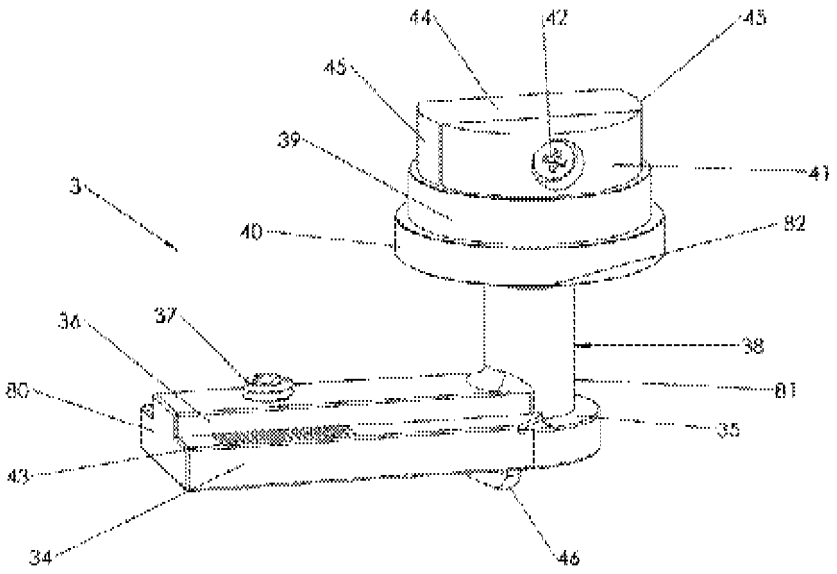

FIGURE 5

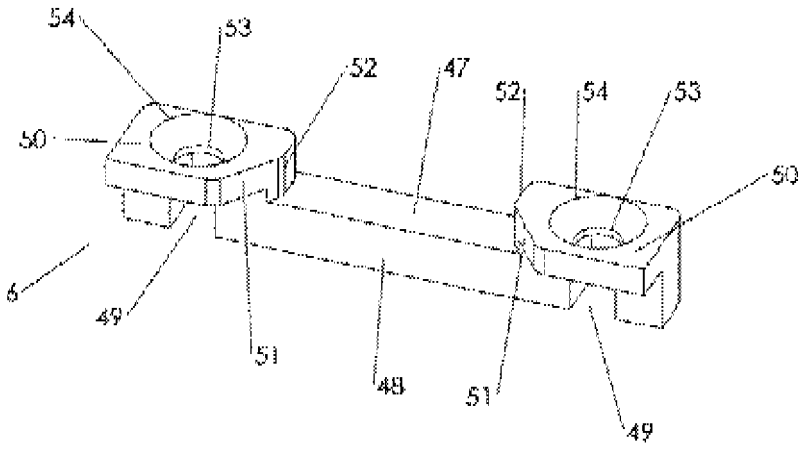

FIGURE 6

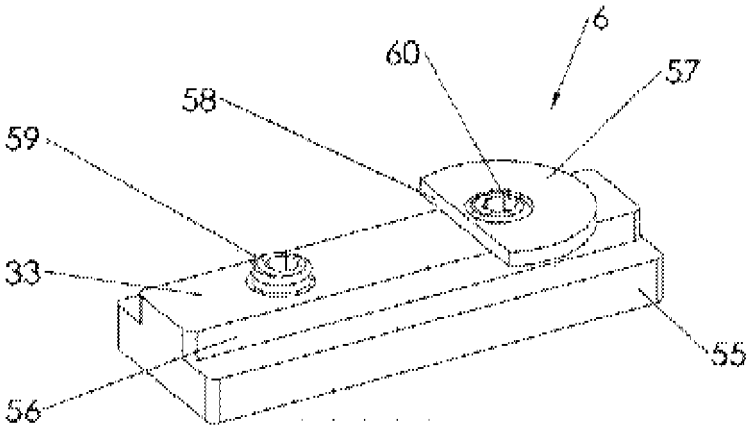

FIGURE 7

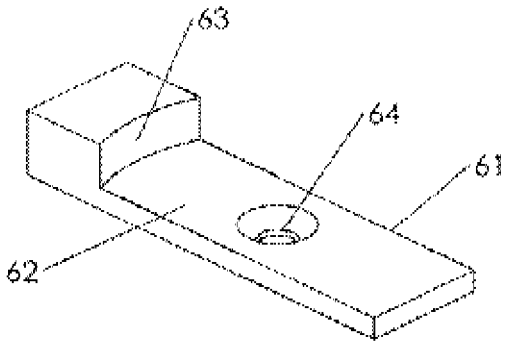

FIGURE 8

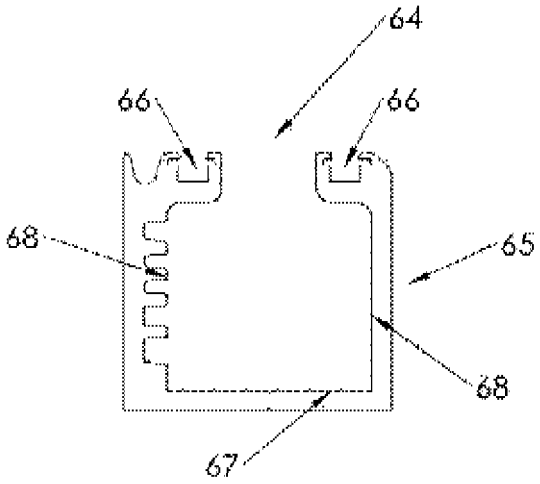

FIGURE 9

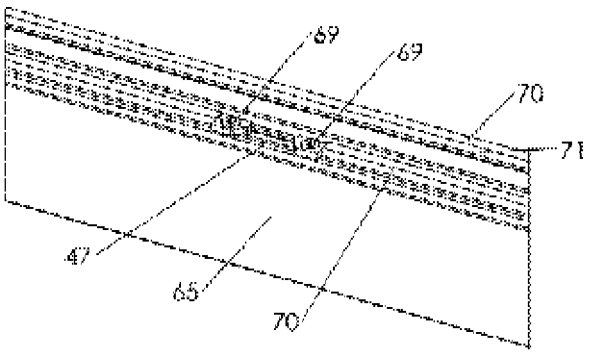

FIGURE 10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2014/000209

A. CLASSIFICATION OF SUBJECT MATTER

E05D15/06 (2006.01)
E05D15/58 (2006.01)
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)
E05D

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 practicable, search terms used)

EPODOC, INVENES, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2012175754 A1 (ALLGLASS CONFORT SYSTEMS S.L.; OÑA GONZÁLEZ, FRANCISCO; PÉREZ FALCÓN, JORGE LUIS) 27.12.2012, page 13, line 1 – page 23, line 5; figures.	1-12
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☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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"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
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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Date of the actual completion of the international search	Date of mailing of the international search report
28/08/2015	**(02.09.2015)**
Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04	Authorized officer F. Riesco Ruiz Telephone No. 91 3496869

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2014/000209

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9739215 A1 (NIKAI INNOVAATIO OY; KARHU NIILO) 23.10.1997, the whole document.	1-12
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
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Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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- ES 201100210 W **[0002] [0003]**