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(71) Applicant: **Manusa Gest, SL**
08174 Sant Cugat del Valles (Barcelona) (ES)

(72) Inventor: **Guilera Viladomiu, Jose Maria**
08005 Barcelona (Barcelona) (ES)

(74) Representative: **Juncosa Miro, Jaime et al**
Torner, Juncosa i Associates, S.L.
Gran Via de les Corts
Catalanes, 669 bis, 1º, 2ª
08013 Barcelona (ES)

(54) Door system for a platform screen

(57) The door system comprises a moving leaf (30a) movable between a closed position and an open position relative to a fixed screen wall panel (1) adjacent to an access opening (2a). The moving leaf (30a) comprises a front sliding leaf section (31a) and a foldable leaf section (32a) connected through a vertical hinge (4a). Support and linear guide elements are connected to the sliding leaf section (31a) so as to guide the movements thereof in parallel to the fixed screen wall panel (1), and folding guide elements are connected to the foldable leaf section (32a) so as to guide the movements of the foldable leaf section (32a) between an extended position, which is co-planar with the sliding leaf section (31a) in the closed position, and a folded position subtending an angle with the sliding leaf section (31a) in the open position.

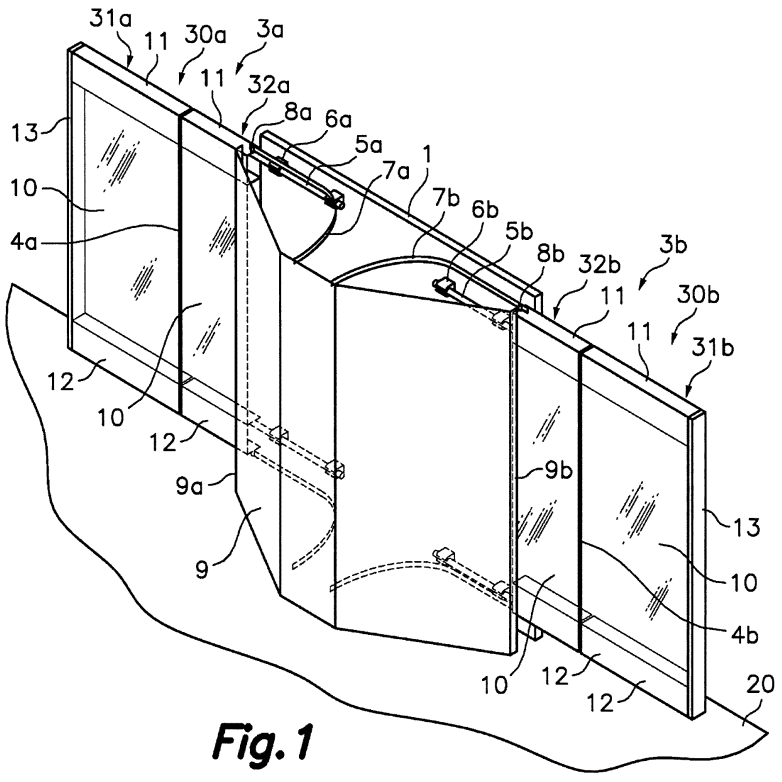

Fig. 1

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Description

Field of the art

[0001] The present invention relates generally to a door system for a platform screen wall and, more particularly, to a door system comprising at least one moving leaf that combines a sliding leaf section and a foldable leaf section so as to optimise the space occupied by the door moving leaf in an open position.

Background of the invention

[0002] Platform screen walls are known that extend along a platform in parallel to the track of a public transport vehicle in order to impede access to the track except through doors provided in the screen wall. These screen wall doors, when a public transport vehicle is present on the track, are opposite and match the vehicle doors so as to allow access thereto through the opposing doors.

[0003] A "public transport vehicle" is herein intended to mean any type of vehicle transporting people, including both those moving on rails, such as a conventional railway, a metropolitan railway, trams, etc., and those not using rails, such as buses, trolleybuses, etc. Likewise, a "track" is herein intended to mean the course along which the public transport vehicle moves, whether it includes rails or does not.

[0004] Typically, platform screen walls comprise a plurality of fixed screen wall panels between which access openings are defined, and each of the platform screen wall doors comprises two moving leaves that are simultaneously movable in opposite directions parallel to the fixed screen wall panels and which, in an open position, are arranged overlapping the fixed screen wall panels located on the opposite sides of the access opening so as not to interfere with the access opening.

[0005] Documents US 5295441, JP 5236987 and EP 1964747 describe different sliding door systems for platform screen walls.

[0006] A problem arises when the public transport vehicle has two doors very close to one another and the corresponding access openings of the screen wall have two respective doors associated provided with two sliding leaves each, the separation distance between the two access openings of the screen wall being smaller than the joint width of the two contiguous sliding leaves of the two screen wall doors, since, in such a case, the sliding leaves, which move simultaneously in opposite closing directions, do not have enough room to overlap the narrow fixed screen wall panel located between the two access openings in the open position without colliding with each other if they move on the same plane.

[0007] A prior-art solution that has been proposed for this problem is locating the opening and closing trajectory of one of the moving leaves farther away from the platform edge than the other, so that both moving leaves overlap each other, at least in part, without colliding with each other in the open position. In these case, however, the moving leaf farther away from the platform edge leaves a relatively large space between the moving leaf and the platform edge, which represents potential danger, since, when the doors are closed, a child or a slim adult might be trapped between the moving leaf of the screen wall door and the public transport vehicle, with the consequent threat to life or physical integrity when the vehicle resumes its motion.

Disclosure of the invention

[0008] The present invention contributes to solve the above and other drawbacks by providing a door system for a platform screen wall comprising a moving leaf supported by support and guide means relative to a fixed screen wall panel that has a side edge adjacent to an access opening. Said moving leaf is movable between a closed position, wherein the moving leaf blocks the passage through at least part of said access opening, and an open position, wherein the moving leaf is substantially overlapping the fixed screen wall panel and allows the passage through at least part of the access openings.

[0009] The present invention is characterised in that the moving leaf comprises a sliding leaf section and a foldable leaf section connected to each other through a vertical hinge, where said sliding leaf section is located in a leading position relative to a closing direction, and said foldable leaf section is located in a trailing position relative to said closing direction, and in that said support and guide means comprise support and linear guide elements connected to the sliding leaf section so as to guide the movements of the sliding leaf section in a straight direction, parallel to the fixed screen wall panel, and folding guide elements connected to the foldable leaf section so as to guide the movements of the foldable leaf section between an extended position, wherein the foldable leaf section is coplanar with the sliding leaf section when the moving leaf is in said closed position, and a folded position, wherein the foldable leaf section subtends an angle with the sliding leaf section when the moving leaf is in said open position.

[0010] This arrangement has the advantage of allowing the door to be opened in those cases wherein the space adjacent to the passage opening provided by the fixed screen wall panel to house the moving leaf in the open position is insufficient to house a conventional moving leaf made up by one single sliding section, which may happen at the ends of the platform screen wall o when the screen wall has two access openings mutually separated by a distance smaller than the joint width of two corresponding moving leaves that move simultaneously on the same plane in opposite closing directions. Obviously, a person skilled in the art of sliding doors will understand that the door system of the present invention is also applicable to other fields in addition to platform screen walls.

[0011] In case the platform screen wall has two access

openings very close to one another, that is, first and second access openings adjacent to first and second edges of the fixed screen wall panel separated by a distance smaller than the joint width of the two moving leaves associated with the same fixed screen wall panel, the door of the present invention comprises one first moving leaf similar to the one described above associated with the fixed screen wall panel and to the first passage opening and one second moving leaf associated with the same fixed screen wall panel and to the second passage opening, where said first and second moving leaves are located on the same plane when they are in the closed position and have respective opposite first and second closing directions.

[0012] This second moving leaf is supported by second support and guide means relative to said fixed screen wall panel, and it comprises a second sliding leaf section and a second foldable leaf section connected to each other through a second vertical hinge, where said second sliding section is located in a leading position relative to said second closing direction and said second foldable leaf section is located in a trailing position relative to said second closing direction.

[0013] Said second support and guide means comprise second support and linear guide elements connected to the second sliding leaf section so as to guide the movements of the second sliding leaf section in parallel to the fixed screen wall panel, and at least second folding guide elements connected to the second foldable leaf section so as to guide the movements of the second foldable leaf section between an extended position, wherein the second foldable leaf section is coplanar with the second sliding leaf section when the second moving leaf is in said closed position, and a folded position, wherein the second foldable leaf section subtends an angle with the second sliding leaf section when the second moving leaf is in said open position. In addition, the second foldable leaf section is opposite and adjacent to the first foldable leaf section when the first and second moving leaves are in their open positions.

[0014] This arrangement is especially advantageous when the screen wall has a first double-leaf door for opening and closing the first passage opening and a second double-leaf door for opening and closing the second passage opening located on the same plane, since it allows the first moving leaf of the first door and the second moving leaf of the second door to be simultaneously moved towards their open positions without both colliding with each other when the first and second passage openings are very close to one another according to the positions of the doors in the public transport vehicle and, more specifically, when the first and second passage openings are separated by a distance smaller than the joint width of the first and second moving leaves.

[0015] In one embodiment, the above-mentioned first and second support and linear guide elements comprise first and second guide bars affixed to the first and second sliding leaf sections, respectively, and first and second sliding blocks affixed to the fixed screen wall panel and slidingly engaged to said first and second guide bars, respectively.

[0016] Optionally, each of the first and second sliding leaf sections and each of the first and second foldable leaf sections has a transparent panel affixed to a top structural profile and to a bottom structural profile, and each of said first and second top and bottom structural profiles defines a channel having an opening opposite the fixed screen wall panel. The top structural profiles of the first and second sliding leaf sections and of the first and second foldable leaf sections are mutually aligned, and the bottom structural profiles of the first and second sliding leaf sections and of the first and second foldable leaf sections are mutually aligned. Said first and second guide bars are affixed only to said top and bottom structural profiles of the first and second sliding leaf sections and, more in particular, within the channels formed by the top and bottom structural profiles of the first and second sliding leaf sections.

[0017] This way, the first and second guide bars are housed within the channels formed by the top and bottom structural profiles of the first and second foldable leaf sections when the latter are arranged in the closed position. In addition, the first guide bars affixed to the top and bottom structural profiles of the first sliding leaf section are at different level than the second guide bars affixed to the top and bottom structural profiles of the second sliding leaf section, and the top and bottom structural profiles of the first and second sliding leaf sections and of the first and second foldable leaf sections of each of the first and second moving leaves define additional space sized to receive the first and second guide bars affixed to the top and bottom structural profiles of the first and second sliding leaf sections of the other of the first and second moving leaves when the latter are arranged in the open position.

[0018] As for the above-mentioned first and second folding guide elements, these comprise at least first and second folding guide rails affixed relative to the fixed screen wall panel and which cooperate with guide followers installed in the first and second foldable leaf sections. Said first and second folding guide rails define folding trajectories to be followed by the respective first and second guide followers. These folding trajectories gradually approach one side of the fixed screen wall panel corresponding to the platform as they come closer to the corresponding first and second side edges of the fixed screen wall panel in relation to the respective opposite closing directions. Preferably, said folding trajectories of the first and second folding guide rails are curved and the first and second guide followers are installed on a trailing end of said first and second foldable leaf sections relative to the respective first and second closing directions.

[0019] Preferably, the door system of the present invention further comprises a protection panel covering at least a portion of the fixed screen wall panel and defining

a gap between said protection panel and the fixed screen wall panel sized to house the first and second moving leaves in their open positions, including the respective foldable leaf sections in their folded positions and to allow the movements of the first and second moving leaves between their open and closed positions.

[0020] The first and second moving leaves are preferably symmetrical and the protection panel also has a preferably prominent symmetrical shape towards a side thereof corresponding to the platform. It is not necessary for the sliding leaf section and foldable leaf section to have the same width, so that, by providing the essential minimum width to the foldable leaf section, the prominence of the protection panel towards the platform side may be minimised.

[0021] One important feature of the door system of the present invention is that the folding movement of the first and second foldable leaf sections of the first and second moving leaves is carried out entirely within said space between the protection panel and the fixed screen wall panel, thereby preventing any risks for the people standing on the platform.

[0022] To that end, the protection panel has first and second side edges adjacent to the respectively first and second side edges of the fixed screen wall panel, and between said first side edge of the protection panel and an initial end of the folding trajectory defined by the first folding guide rail there is a distance equal to or larger than a distance between the first vertical hinge and the first guide follower. Likewise, between said second side edge of the protection panel and an initial end of the folding trajectory defined by the second folding guide rail there is a distance equal to or larger than a distance between the second vertical hinge and the second guide follower.

[0023] In case the fixed screen wall panel is associated with one single moving leaf according to the door system for a platform screen wall of the present invention, said support and linear guide elements comprise guide bars affixed to the sliding leaf section and sliding blocks affixed to the fixed screen wall panel and slidingly engaged to said guide bars, whereas said folding guide elements comprise at least one folding guide rail affixed relative to the fixed screen wall panel and one guide follower that cooperates with said folding guide rail. The folding guide rail defines a folding trajectory for the guide follower that gradually approaches one side of the fixed screen wall panel corresponding to the platform as it comes closer to the corresponding side edge of the fixed screen wall panel in the closing direction. Preferably, said folding trajectory of the folding guide rail is curved and the guide follower is installed on a trailing end of the foldable leaf section relative to the closing direction.

[0024] When the fixed screen wall panel has one single moving leaf associated, the door system also comprises only one protection panel covering at least a portion of the fixed screen wall panel defining a gap between said protection panel and the fixed screen wall panel sized to house the moving leaf in the open position with the foldable leaf section in its folded position and to allow the movements of the moving leaf between its open and closed positions, even though in this case the protection panel may not be symmetrical.

[0025] The opening and closing movements of the moving leaves are carried out by conventional actuation means that do not form part of the present invention under the control of control means that do not form part of the present invention either.

Brief description of the drawings

[0026] The above features and advantages will be more fully understood from the following detailed description of one merely illustrative, non-limiting embodiment with reference to the accompanying drawings, in which:

Fig. 1 is a partial perspective view of a door system for a platform screen wall according to one embodiment of the present invention in a closed position;
Fig. 2 is a partial perspective view of the door system of Fig. 1 in an intermediate position between the closed position and an open position;
Fig. 3 is a partial perspective view of the door system of Fig. 1 in a fully open position;
Fig. 4 is an elevation view of the platform side of a platform screen wall including the door system of Figs. 1 to 3 in a closed position;
Fig. 5 is a partial plan view of the platform screen wall of Fig. 4 in the closed position;
Fig. 6 is a partial plan view of the platform screen wall of Fig. 4 in an intermediate position between the closed position and an open position;
Fig. 7 is a partial plan view of the platform screen wall of Fig. 4 in a fully open position;
Fig. 8 is an elevation view of a part of the screen wall of Fig. 4, where the protection panel has been omitted in order to show the arrangement of support and guide means;
Fig. 9 is a cross-sectional view taken along the plane IX-IX of Fig. 4;
Fig. 10 is an enlarged view of detail X in Fig. 9; and
Fig. 11 is an enlarged view of detail XI in Fig. 9.

Detailed description of one embodiment

[0027] Referring first to Figs. 4 to 8, there is shown one portion of a platform screen wall that includes a door system according to one embodiment of the present invention.

[0028] Said portion of the platform screen wall comprises several fixed screen wall panels 1 placed along a platform 20, and access openings 2a, 2b defined by separations between said fixed screen wall panels 1. The fixed screen wall panel 1 shown in a central position in Figs. 4 to 8 has a first side edge 1a adjacent to a first access opening 2a having a first door 3a associated

thereto and a second opposite side edge 1b adjacent to a second access opening 2b having a corresponding second door 3b associated thereto. The fixed screen wall panel 1 shown on the left in Figs. 4 to 7 has a side edge 1c adjacent to said first access opening 2a on a side thereof opposite the first side edge 1a of the central fixed screen wall panel 1, and the fixed screen wall panel 1 shown on the right in Figs. 4 to 7 has a side edge 1d adjacent to said second access opening 2b on a side thereof opposite the second side edge 1b of the central fixed screen wall panel 1.

[0029] The first door 3a has two moving leaves 30a, 30c, one of which is a left-hand moving leaf 30c supported by support and guide means relative to the fixed screen wall panel 1 shown on the left and the other is a first moving leaf 30c supported by support and guide means relative to the fixed screen wall panel 1 shown in the central position, and the second door 3b has other two moving leaves 30b, 30d, one of which is a second moving leaf 30b supported by support and guide means relative to the fixed screen wall panel 1 shown in the central position and the other is a right-hand moving leaf 30d supported by support and guide means relative to the fixed screen wall panel 1 shown on the right.

[0030] Said left-hand moving leaf 30c and said first moving leaf 30a are simultaneously movable in opposite directions between a closed position (Figs. 4, 5 and 8), wherein they block the passage through said first access opening 2a, and an open position (Fig. 7), wherein they are substantially overlapping the respective fixed screen wall panels 1 and allow the passage through the first access opening 2a. Similarly, said second moving leaf 30b and said right-hand moving leaf 30d are simultaneously movable in opposite directions between a closed position (Figs. 4, 5 and 8), wherein they block the passage through said second access opening 2b, and an open position (Fig. 7), wherein they are substantially overlapping the respective fixed screen wall panels 1 and allow the passage through the second access opening 2b.

[0031] The left-hand moving leaf 30c, the first and second moving leaves 30a, 30b and the right-hand moving leaf 30d are located on the same plane when they are in the closed position. The first and second moving leaves 30a, 30b associated with the central fixed screen wall panel 1 carry out simultaneous opening and closing movements and the central fixed screen wall panel 1 has a width smaller than the sum of the widths of the first and second moving leaves 30a, 30b. Said opening and closing movements are carried out by conventional actuation means that do not form part of the present invention under control of control means that do not form part of the present invention either.

[0032] The first moving leaf 30a comprises a first sliding leaf section 31a and a first foldable leaf section 32a connected to each other through a first vertical hinge 4a. Said first sliding leaf section 31a is arranged in a leading position relative to a closing direction, whereas said first foldable leaf section 32a is arranged in a trailing position relative to said closing direction. Similarly, the second moving leaf 30b comprises a second sliding leaf section 31b and a second foldable leaf section 32b connected to each other through a second vertical hinge 4b. Said second sliding leaf section 31b is arranged in a leading position relative to a closing direction whereas said second foldable leaf section 32b is arranged in a trailing position relative to said closing direction.

[0033] Figures 1, 2 and 3 further illustrate the assembly and the movements of the first and second moving leaves 30a, 30b relative to the central fixed screen wall panel 1. Said support and guide means comprise first and second support and linear guide elements connected to the first and second sliding leaf sections 31a, 31b so as to guide the movements thereof in a direction parallel to the fixed screen wall panel 1, and folding guide elements connected to the first and second foldable leaf sections 32a, 32b so as to guide the movements thereof between an extended position (Figs. 1, 4, 5 and 8), wherein the first and second foldable leaf sections 32a, 32b are coplanar with the respective first and second sliding leaf sections 31a, 31b when the first and second moving leaves 30a, 30b are in said closed position, and a folded position, wherein the first and second foldable leaf sections 32a, 32b subtend an angle, preferably a straight angle, with the first and second sliding leaf sections 31a, 31b when the first and second moving leaves 30a, 30b are in said open position.

[0034] Figures 9, 10 and 11 illustrate with greater detail the configuration of the sections making up the first and second moving leaves 30a, 30b and of said support and linear guide elements and folding guide elements. Although in Figs. 9, 10 and 11 the reference signs correspond to the second sliding leaf section 31b of the second moving leaf 30b, the same illustrations may be applied to the first sliding leaf section 31a and to the first and second foldable leaf sections 32a, 32b.

[0035] Each of the first and second sliding leaf sections 31a, 31b and each of the first and second foldable leaf sections 32a, 32b comprise a transparent panel 10, made, for instance, of glass or methacrylate, affixed at its top end to a top structural profile 11 and at its bottom end to a bottom structural profile 12. Each of the top and bottom structural profiles 11, 12 defines a channel with a longitudinal opening opposite the fixed screen wall panel 1 and a support surface on a side opposite said channel to which said transparent panel 10 is attached, for instance by means of an adhesive. All the top structural profiles 11 are identical and are mutually aligned, and all the bottom structural profiles 12 are identical and are mutually aligned. Advantageously, the top structural profiles 11 are identical to the bottom structural profiles 12.

[0036] In addition, the first and second sliding leaf sections 31a, 31b have respective vertical profiles 13 (Figs. 1 to 3) that cover leading edges thereof relative to their corresponding closing directions. Said top and bottom structural profiles 11, 12 and the vertical profiles 13 can

be made, for instance, of extruded aluminium or thermoplastics.

[0037] The first and second support and linear guide elements comprise first and second guide bars 5a, 5b and first and second sliding blocks 6a, 6b. Said first and second guide bars 5a, 5b are attached by means of support arms 14 to the interior of the channels formed in the top and bottom structural profiles 11, 12 of the first and second sliding leaf sections 31a, 31b, respectively, whereas said first and second sliding blocks 6a, 6b are affixed to the fixed screen wall panel 1 and slidingly engaged to said first and second guide bars 5a, 5b, respectively. The first and second sliding blocks 6a, 6b have enveloping arms 15 that clasp the first and second guide bars 5a, 5b without interfering with said support arms 14 during the sliding motion (Figs. 10 and 11).

[0038] The first and second folding guide elements comprise first and second folding guide rails 7a, 7b affixed relative to the fixed screen wall panel 1 and corresponding guide followers 8a, 8b installed in the first and second foldable leaf sections 32a, 32b, respectively, where said first and second guide followers 8a, 8b cooperate with said first and second folding guide rails 7a, 7b so as to move the first and second foldable leaf sections 32a, 32b from said extended position to said folded position when the first and second moving leaves 30a, 30b move from the closed position to the open position, and from the folded position to the extended position when the first and second moving leaves 30a, 30b move in the opposite direction.

[0039] In the illustrated embodiment, the first and second folding guide rails 7a, 7b define curved folding trajectories that gradually approach one side of the fixed screen wall panel 1 corresponding to the platform as they come closer to the corresponding first and second side edges 1a, 1b of the fixed screen wall panel 1 in the respective opposite closing directions, and the first and second guide followers 8a, 8b include rollers installed on trailing ends of said first and second foldable leaf sections 32a, 32b relative to the respective first and second closing directions and arranged to run along the corresponding first and second folding guide rails 7a, 7b.

[0040] Although in the embodiment shown two folding guide rails 7a, 7b, a top one and a bottom one, are shown for each foldable leaf section 32a, 32b, it is to be noted that one single folding guide rail 7a, 7b would be sufficient for each foldable leaf section 32a, 32b. Although in the embodiment shown the folding guide rails 7a, 7b are shown defining a curved folding trajectory, it is to be noted that, alternatively, they could have an oblique straight folding trajectory.

[0041] Since the top structural profiles 11 are mutually aligned and the bottom structural profiles 12 are also mutually aligned, the first and second guide bars 5a, 5b are received and are housed within the channels of the top and bottom structural profiles 11, 12 of the first and second foldable leaf sections 32a, 32b when they are moved to the extended position corresponding to the closed position, and they come out of the channels of the top and bottom structural profiles 11, 12 of the first and second foldable leaf sections 32a, 32b when they are moved to the folded position corresponding to the open position.

[0042] The first guide bars 5a affixed to the top and bottom structural profiles 11, 12 of the first sliding leaf section 31a are at different level, for instance an upper level, than the second guide bars 5b affixed to the top and bottom structural profiles 11, 12 of the second sliding leaf section 31b (Figs. 8, 9, 10 and 11). In addition, the top and bottom structural profiles 11, 12 of the first and second sliding leaf sections 31a, 31b and of the first and second foldable leaf sections 32a, 32b of each of the first and second moving leaves 30a, 30b provide additional space sized to receive the first and second guide bars 5a, 5b affixed to the top and bottom structural profiles 11, 12 of the first and second sliding leaf sections 31a, 31b of the other of the first and second moving leaves 30a, 30b in the open position.

[0043] Since the first and second foldable leaf sections 32a, 32b of the first and second moving leaves 30a, 30b adopt prominent positions from the fixed screen wall panel 1 towards a side thereof corresponding to the platform, the door system comprises a convex-shaped protection panel 9 covering the fixed screen wall panel 1 or, at least, a portion of the fixed screen wall panel 1 occupied by the first and second moving leaves 30a, 30b of the first and second doors 3a, 3b. Between said protection panel 9 and the fixed screen wall panel 1 a gap is defined which is sized to house the first and second moving leaves 30a, 30b in their open positions with the respective first and second foldable leaf sections 32a, 32b in their folded positions and to allow the movements of the first and second moving leaves 30a, 30b between their open and closed positions.

[0044] The protection panel 9 has first and second side edges 9a, 9b respectively adjacent to the first and second side edges 1a, 1b of the fixed screen wall panel 1. Between said first side edge 9a of the protection panel 9 and an initial end of the folding trajectory defined by the first folding guide rail 7a there is a distance equal to or larger than a distance between the first vertical hinge 4a and the first guide follower 8a. Similarly, between the second side edge 9a of the protection panel 9 and an initial end of the folding trajectory defined by the second folding guide rail 7b there is a distance equal to or larger than a distance between the second vertical hinge 4b and the second guide follower 8b.

[0045] This way, during the opening movements, when the first and second guide followers engage said initial ends of the folding trajectories defined by the respective first and second folding guide rails 7a, 7b, the first and second vertical hinges 4a, 4b have already surpassed the first and second side edges 9a, 9b of the protection panel 9 and they are out of reach for the people standing on the platform 20. Thus, the folding movement of the first and second foldable leaf sections 32a, 32b of the first and second moving leaves 30a, 30b is carried out

entirely within said space between the protection panel 9 and the fixed screen wall panel 1, thereby preventing any risks for the people standing on the platform.

[0046] In Figs. 4 to 7, the left-hand moving leaf 30c of the first door 3a and the right-hand moving leaf 30d of the second door 3b do not need to be folded, since the respective fixed screen wall panels 1 located on the left and the right of the central fixed screen wall panel 1 provide sufficient room to house the respective left and right moving leaves 30c, 30d in the open position (Fig. 7) even if they were made up by one single fixed leaf section. However, for aesthetic reasons, it is preferred that each of them be made up by two leaf sections 31c, 32c; 31d, 32d rigidly connected to each other by respective rigid links 4c, 4d. Here too, the door system for a platform screen wall includes protection panels 9c, 9d that cover a portion of the respective left and right fixed screen wall panels 1 and provide gaps sized to house the respective left-hand and right-hand moving leaves 30c, 30d.

[0047] In some cases (not shown) it might be enough that only one of the moving leaves associated with a fixed screen wall panel 1 should be foldable. In such a case, said foldable moving leaf would be similar, for instance, to the first moving leaf 30a of the first door 3a associated with the central fixed screen wall panel 1, as shown in the Figures. That is, when there is one single foldable moving leaf 30a, this is movable between open and closed positions and it comprises a sliding leaf section 31a and a foldable leaf section 32a connected to one another by a vertical hinge 4a. Said sliding leaf section 31a is in a leading position relative to a closing direction, and said foldable leaf section 32a is in a trailing position relative to said closing direction.

[0048] Also in this case, the platform door system includes support and guide means that comprise support and linear guide elements connected to the sliding leaf section 31a so as to guide the movements of the sliding leaf section 31a in parallel to the fixed screen wall panel 1 and folding guide elements connected to the foldable leaf section 32a so as to guide the movements of the foldable leaf section 32a between an extended position, wherein the foldable leaf section 32a is coplanar with the sliding leaf section 31a when the moving leaf 30a is in said closed position, and a folded position, wherein the foldable leaf section 32a subtends an angle with the sliding leaf section 31a when the moving leaf 30a is in said open position.

[0049] Said support and linear guide elements and folding guide elements may be similar to those described above in connection with the first moving leaf 30a of the first door 3a associated with the central fixed screen wall panel 1 in Figs. 4 to 7, and the system further comprises a protection panel 9 that covers at least a portion of the fixed screen wall panel 1 and which defines a gap sized to house the moving leaf 30a in the open position with the foldable leaf section 32a in its folded position and to allow the movements of the moving leaf 30a between its open and closed positions. In this case, the protection panel 9 is configured as described above to ensure that the folding movement of the first foldable leaf section 32a of the first moving leaf 30a is carried out entirely within the gap between the protection panel 9 and the fixed screen wall panel 1.

[0050] The scope of the present invention is defined by the attached claims.

Claims

1. A door system for a platform screen wall comprising a moving leaf (30a) that is supported by supporting and linear guide means relative to a fixed screen wall panel (1) that has a side edge (1a) adjacent to an access opening (2a), said moving leaf (30a) being movable between a closed position, wherein passage through at least part of said access opening (2a) is impeded, and an open position, wherein it is substantially overlapping the fixed screen wall panel (1) and allows the passage through at least part of said access opening (2a), **characterised in that** the moving leaf (30a) comprises a sliding leaf section (31a) in a leading position relative to a closing direction and a foldable leaf section (32a) in a trailing position relative to a closing direction, said sliding and foldable leaf sections (31a, 31b) being connected to each other through a vertical hinge (4a), and said support and guide means comprise support and linear guide elements connected to the sliding leaf section (31a) and which guide the movements of the sliding leaf section (31a) in parallel to the fixed screen wall panel (1), and folding guide elements connected to the foldable leaf section (32a) and which guide the movements of the foldable leaf section (32a) between an extended position, wherein it is coplanar with the sliding leaf section (31 a) when the moving leaf (30a) is in said closed position, and a folded position, wherein it subtends an angle with the sliding leaf section (31a) when the moving leaf (30a) is in said open position.

2. A door system for a platform screen wall according to claim 1 **characterised by** comprising a second moving leaf (30b) supported by second supporting and linear guide means relative to said fixed screen wall panel (1), which has a second side edge (1b) adjacent to a second access opening (2b), where said second moving leaf (30b) comprises a second sliding leaf section (31b), leading relative to a second closing direction opposite to said first closing direction, and a second foldable leaf section (32b), trailing relative to said second closing direction, said second sliding and foldable leaf sections (31b, 32b) being connected to each other through a second vertical hinge (4b), and said second support and guide means comprise second support and linear guide elements connected to the second sliding leaf sec-

tion (31b) so as to guide the movements of the second sliding leaf section (31b) in parallel to the fixed screen wall panel (1), and second folding guide elements connected to the second foldable leaf section (32b) so as to guide the movements of the second foldable leaf section (32b) between an extended position, wherein it is coplanar with the second sliding leaf section (31b) when the second moving leaf (30b) is in said closed position, and a folded position, wherein it subtends an angle with the second sliding leaf section (31b) when the second moving leaf (30b) is in said open position and it is adjacent to the first sliding leaf section (31 a) when the first moving leaf (30a) is in its open position.

3. A door system for a platform screen wall according to claim 2 **characterised by** further comprising one protection panel (9) covering at least a portion of the fixed screen wall panel (1) and defining a gap between said protection panel (9) and the fixed screen wall panel (1), said gap being sized to house the first and second moving leaves (30a, 30b) in their open positions with the respective foldable leaf sections (32a, 32b) in their folded positions and to allow the movements of the first and second moving leaves (30a, 30b) between open and closed positions.

4. A door system for a platform screen wall according to claims 2 or 3 **characterised in that** said first and second support and linear guide elements comprise first and second guide bars (5a, 5b) affixed to the first and second sliding leaf sections (31a, 31b), respectively, and first and second sliding blocks (6a, 6b) affixed to the fixed screen wall panel (1) and slidingly engaged to said first and second guide bars (5a, 5b), respectively, and said first and second folding guide elements comprise at least first and second folding guide rails (7a, 7b) affixed relative to the fixed screen wall panel (1) and corresponding first and second guide followers (8a, 8b) installed in the first and second foldable leaf sections (32a, 32b), respectively, which cooperate with said first and second folding guide rails (7a, 7b).

5. A door system for a platform screen wall according to claim 4 **characterised in that** said protection panel (9) has first and second side edges (9a, 9b) respectively adjacent to said first and second side edges (1a, 1b) of the fixed screen wall panel (1), where a distance between said first side edge (9a) of the protection panel (9) and an initial end of the folding trajectory to be followed by said first guide follower (8a) defined by the first folding guide rail (7a) is equal to or larger than a distance between the first vertical hinge (4a) and the first guide follower (8a), and where a distance between said second side edge (9b) of the protection panel (9) and an initial end of the folding trajectory to be followed by said second guide follower (8b) defined by the second folding guide rail (7b) is equal to or larger than a distance between the second vertical hinge (4b) and the second guide follower (8b).

6. A door system for a platform screen wall according to claims 4 or 5 **characterised in that** each of the first and second sliding leaf sections (31 a, 31b) and each of the first and second foldable leaf sections (32a, 32b) has a transparent panel (10) affixed to a top structural profile (11) and to a bottom structural profile (12), and said first and second guide bars (5a, 5b) are affixed to said top and bottom structural profiles (11, 12) of the first and second sliding leaf sections (31a, 31b).

7. A door system for a platform screen wall according to claim 6 **characterised in that** the top and bottom structural profiles (11, 12) define a channel with an opening opposite said fixed screen wall panel (1) and the first and second guide bars (5a, 5b) are affixed within said channel of said top and bottom structural profiles (11, 12) of the first and second sliding leaf sections (31a, 31b) and are housed within the top and bottom structural profiles (11, 12) of the first and second foldable leaf sections (32a, 32b) in the closed position.

8. A door system for a platform screen wall according to claim 7 **characterised in that** the first guide bars (5a) affixed to the top and bottom structural profiles (11, 12) of the first sliding leaf section (31a) are at different level than the second guide bars (5b) affixed to the top and bottom structural profiles (11, 12) of the second sliding leaf section (31b), and the top and bottom structural profiles (11, 12) of the first and second sliding leaf sections (31a, 31b) and of the first and second foldable leaf sections (32a, 32b) of each of the first and second moving leaves (30a, 30b) provide additional space sized to receive the first and second guide bars (5a, 5b) affixed to the top and bottom structural profiles (11, 12) of the first and second sliding leaf sections (31a, 31b) of the other of the first and second moving leaves (30a, 30b) in the open position.

9. A door system for a platform screen wall according to any one of claims 4 to 8 **characterised in that** said folding trajectories defined by the first and second folding guide rails (7a, 7b) gradually approach the fixed screen wall panel (1) from a side thereof corresponding to the platform as the folding trajectories come closer to the corresponding first and second side edges (1a, 1b) of the fixed screen wall panel (1) in the respective opposite closing directions.

10. A door system for a platform screen wall according to claim 9 **characterised in that** the folding trajec-

tories defined by the first and second folding guide rails (7a, 7b) are curved and the first and second guide followers (8a, 8b) are installed on a trailing end of said first and second foldable leaf sections (32a, 32b) relative to the respective first and second closing directions.

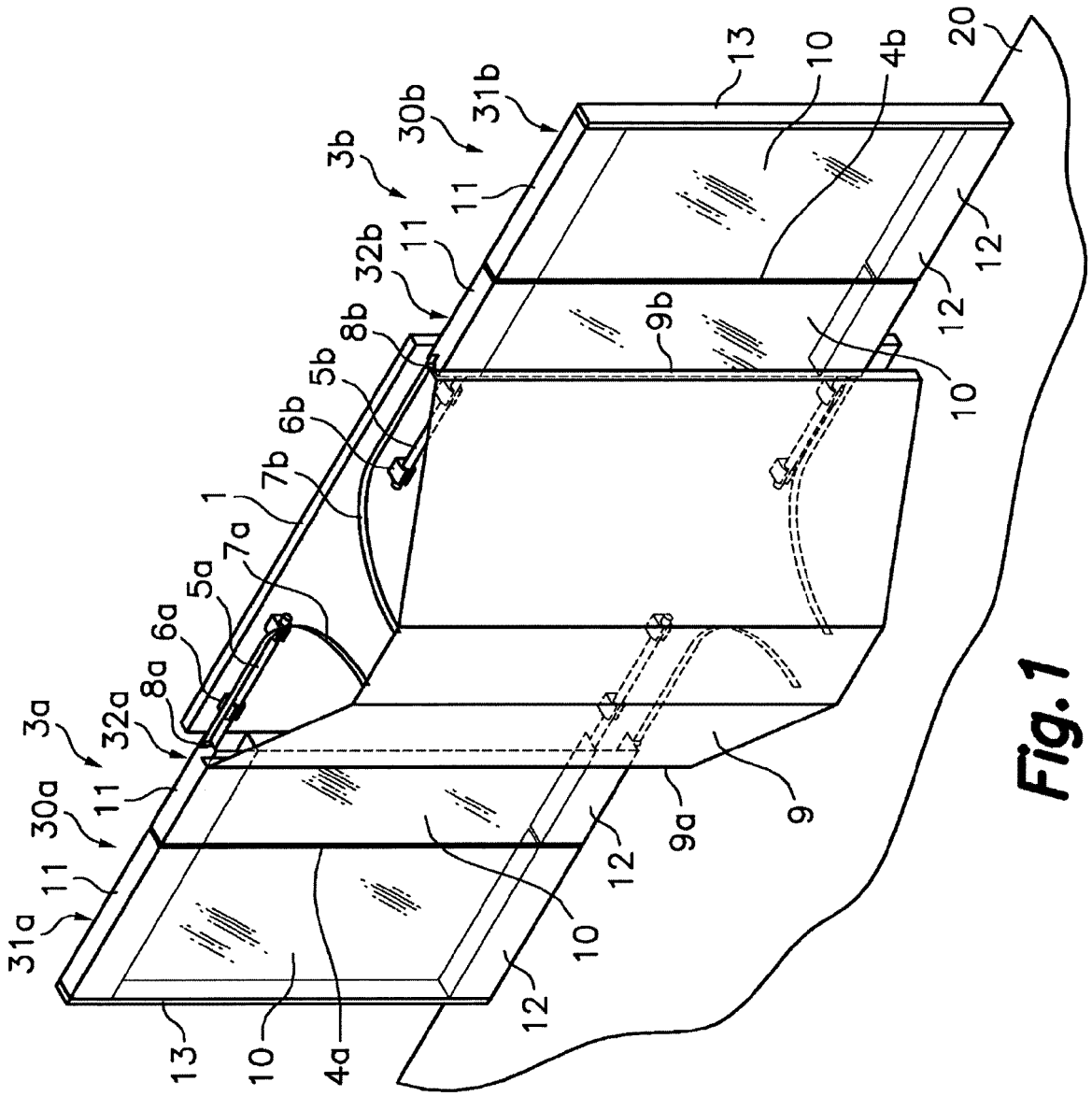
11. A door system for a platform screen wall according to claim 1 **characterised by** further comprising a protection panel (9) covering at least a portion of the fixed screen wall panel (1) and defining a gap between said protection panel (9) and the fixed screen wall panel (1) sized to house the moving leaf (30a) in the open position with the foldable leaf section (32a) in its folded position and to allow the movements of the moving leaf (30a) between its open and closed positions.

12. A door system for a platform screen wall according to claims 1 or 11 **characterised in that** said support and linear guide elements comprise guide bars (5a) affixed to the sliding leaf section (31a) and sliding blocks (6a) affixed to the fixed screen wall panel (1) and slidingly attached to said guide bars (5a), and said folding guide elements comprise at least one folding guide rail (7a) affixed relative to the fixed screen wall panel (1), which cooperate with a corresponding guide follower (8a) installed in the foldable leaf section (32a, 32b).

13. A door system for a platform screen wall according to claim 12 **characterised in that** said protection panel (9) has a side edge (9a) adjacent to said side edge (1a) of the fixed screen wall panel (1), where a distance between said side edge (9a) of the protection panel (9) and an initial end of the folding trajectory to be followed by said guide follower (8a) defined by said folding guide rail (7a) is equal to or larger than a distance between the vertical hinge (4a) and the guide follower (8a).

14. A door system for a platform screen wall according to claims 12 or 13 **characterised in that** said folding trajectory defined by the folding guide rail (7a) gradually approaches the fixed screen wall panel (1) from a side thereof corresponding to the platform as the folding trajectory comes closer to the corresponding side edge (1a) of the fixed screen wall panel (1) in the closing direction.

15. A door system for a platform screen wall according to claim 14 **characterised in that** said folding trajectory defined by the folding guide rail (7a) is curved and the guide follower (8a) is installed on a trailing end of the foldable leaf section (32a) relative to the closing direction.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8a
32a
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9
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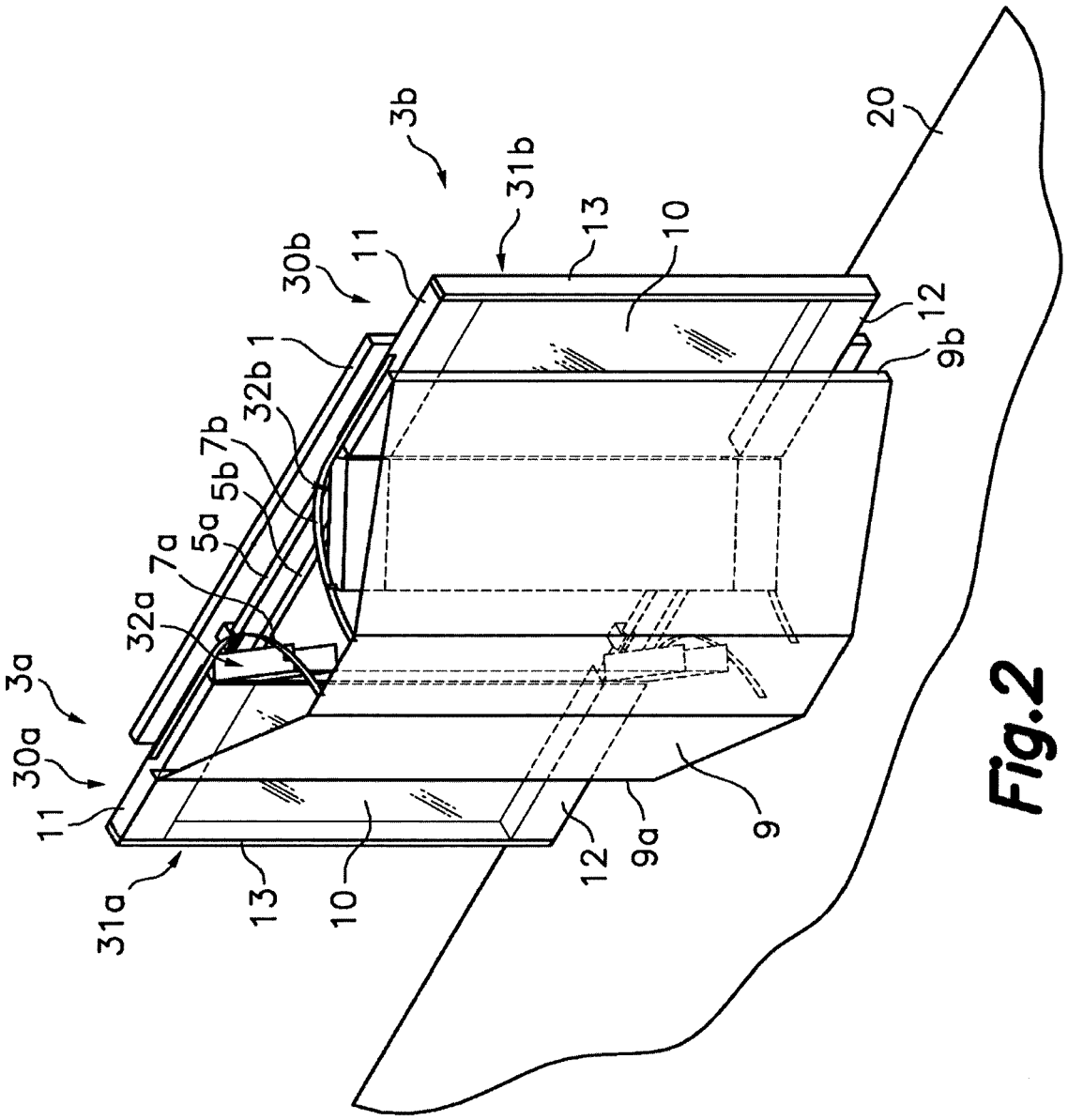
12
10
9b

Fig. 1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9a
9

Fig.2

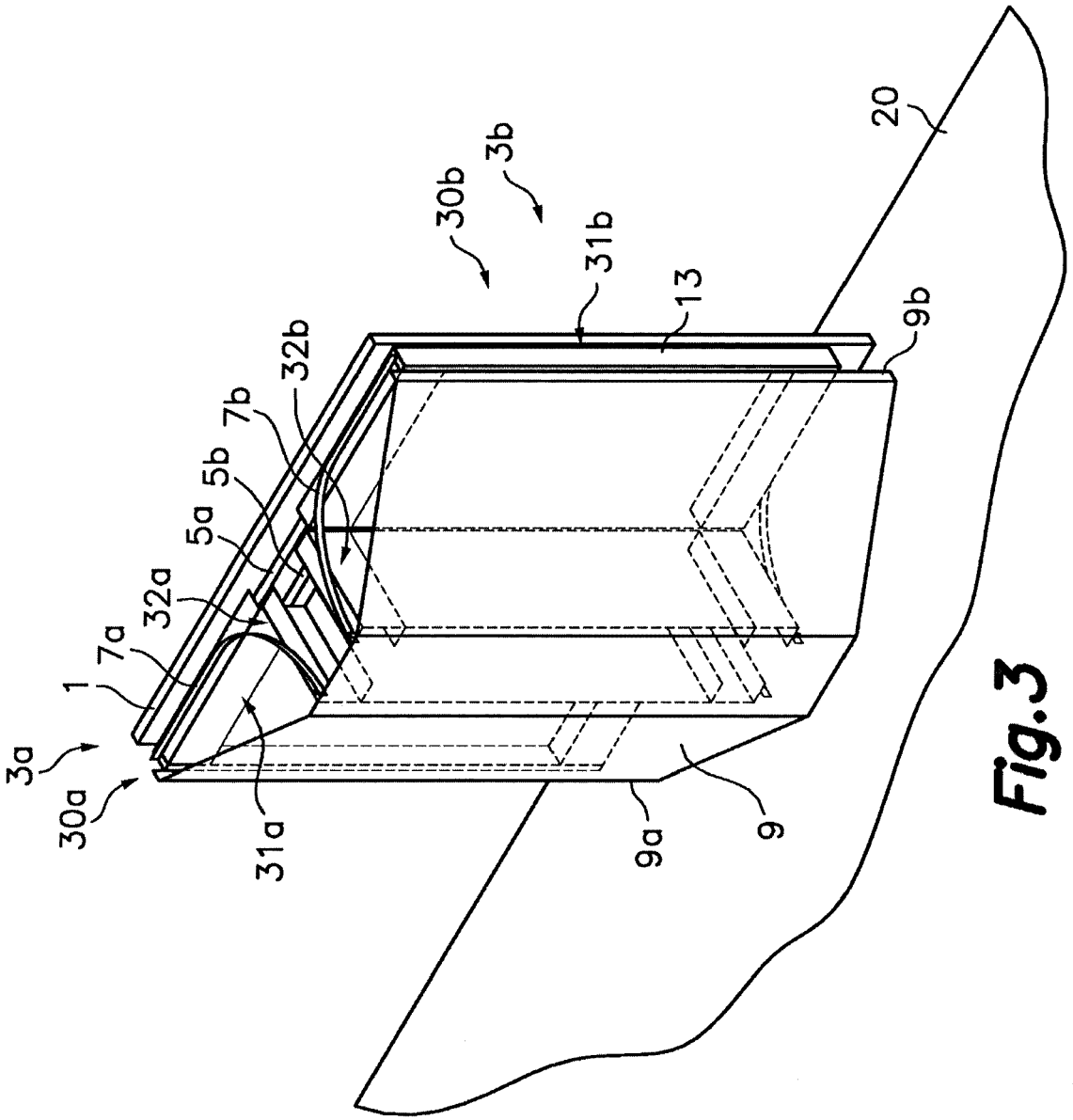
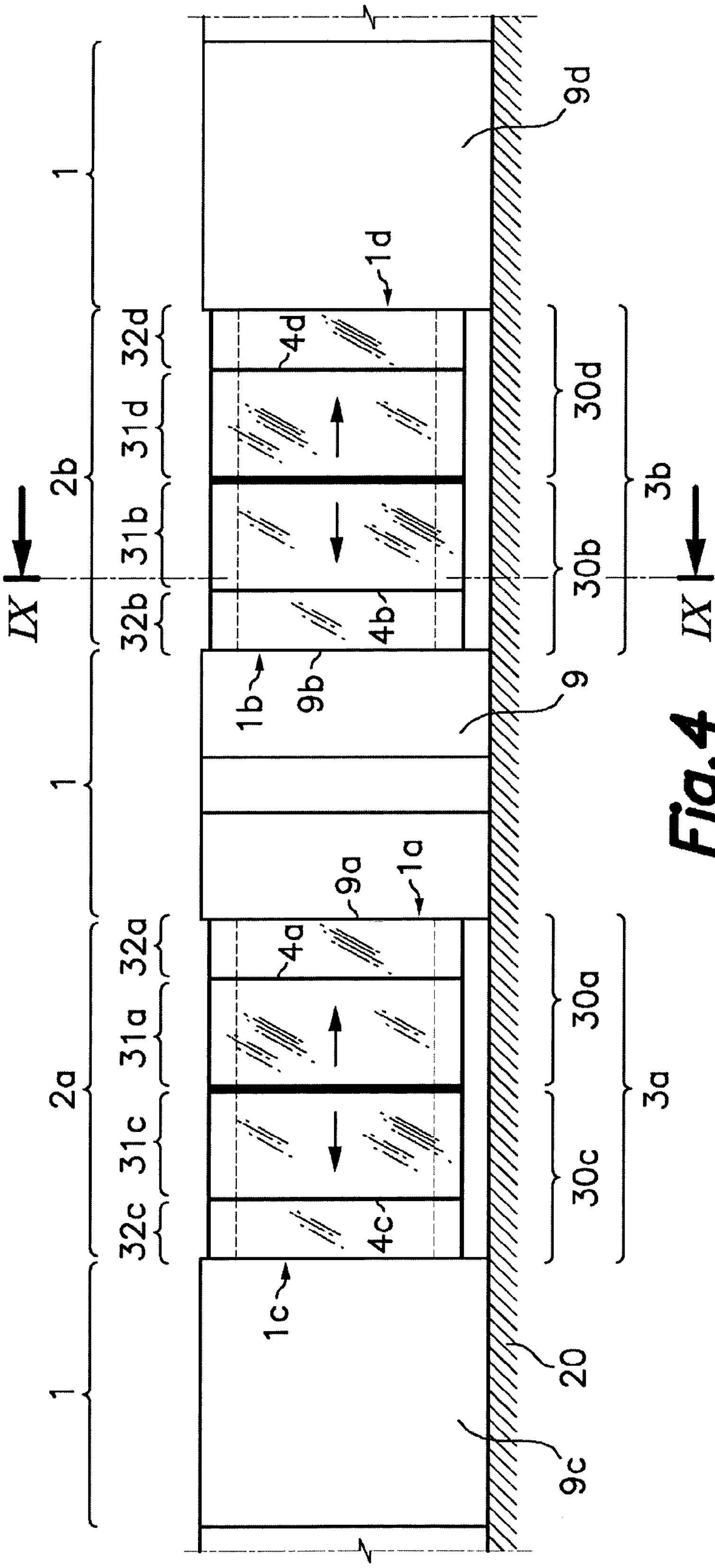


Fig.3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32d
IX
IX

Fig.4

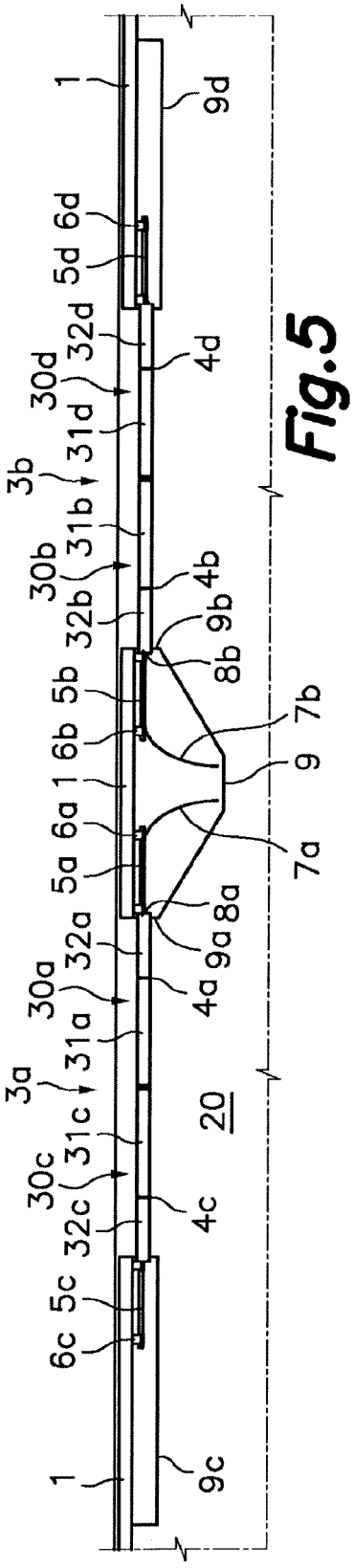

Fig.5

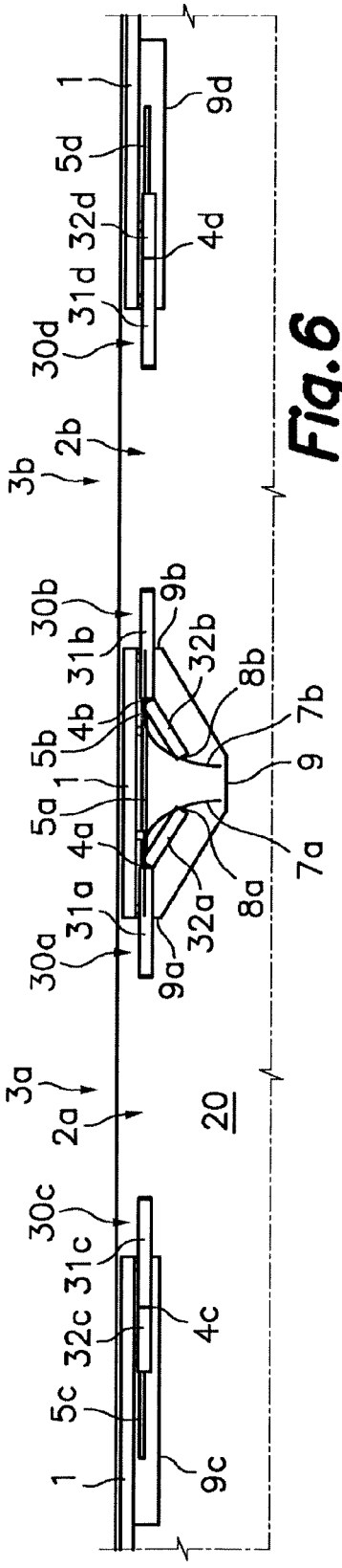

Fig.6

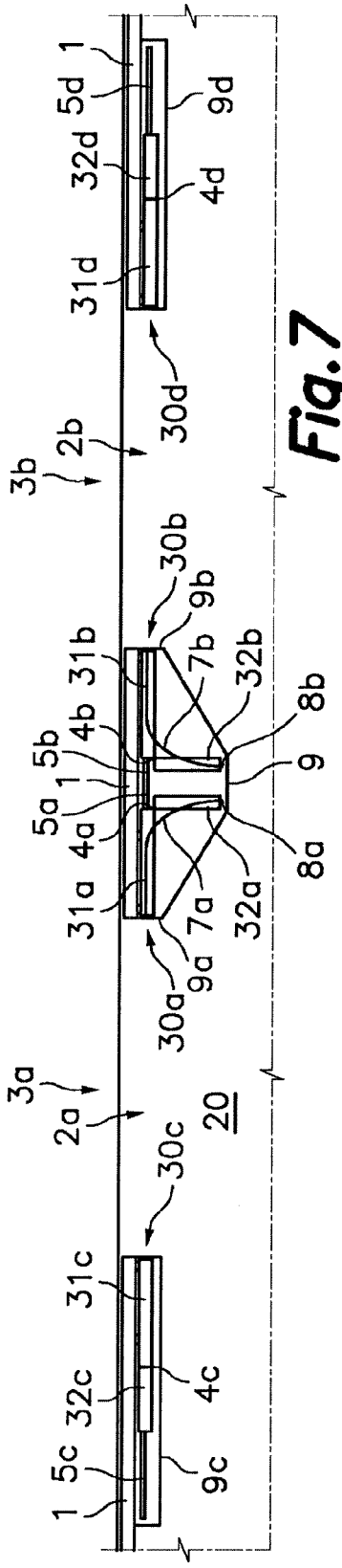

Fig.7

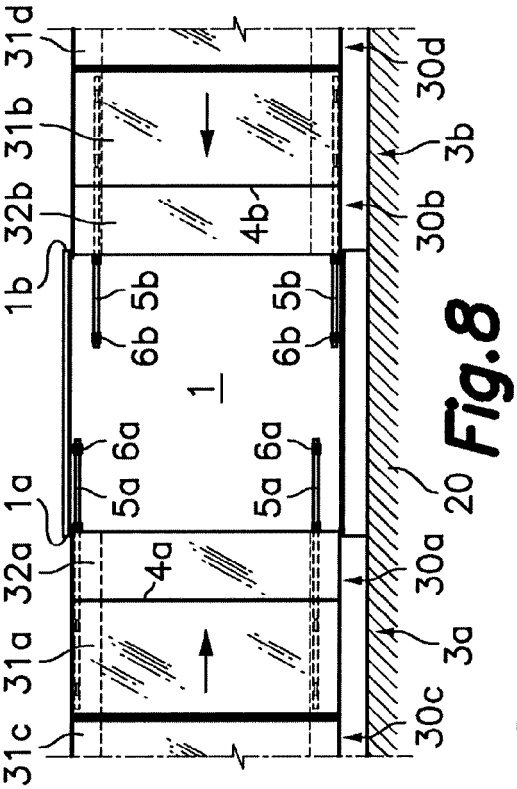

Fig.8

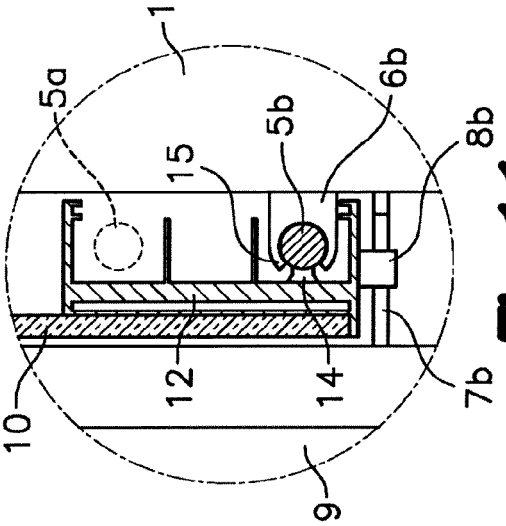

Fig.11

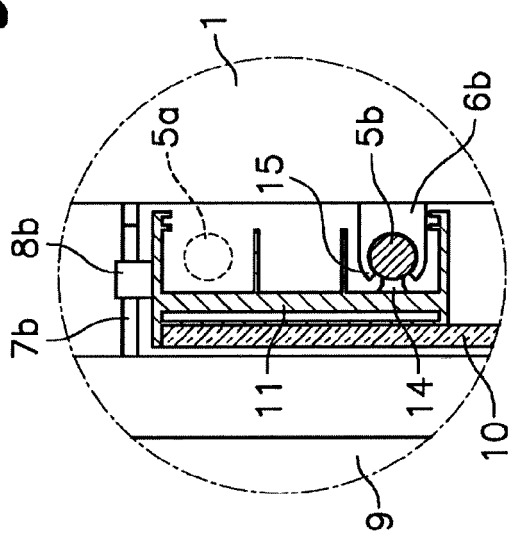

Fig.10

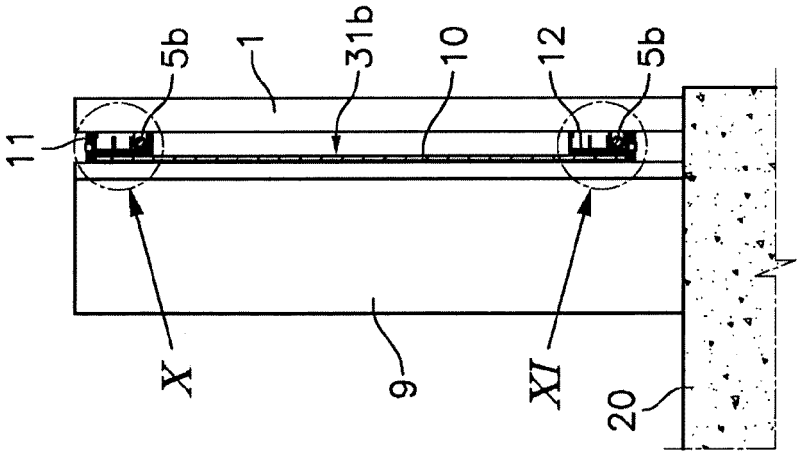

Fig.9

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EUROPEAN SEARCH REPORT

Application Number
EP 14 38 0005

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	US 5 295 441 A (KAWANISHI ISAMU [JP] ET AL) 22 March 1994 (1994-03-22) * figures 13,14 *	1	INV. B61B1/02 E05D15/36
A,D	EP 1 964 747 A1 (KABA GILGEN AG [CH]) 3 September 2008 (2008-09-03) * the whole document *	1	
A,D	JP 2009 262628 A (NABTESCO CORP; WEST JAPAN RAILWAY TECHNOS COR; NISHINIPPON RYOKAKU TET) 12 November 2009 (2009-11-12) * the whole document *	1	
A	JP 2010 007456 A (NIPPON SIGNAL CO LTD) 14 January 2010 (2010-01-14) * figures 1-8 *	1	
A	JP 2012 214196 A (MIKAMI KAKOZAI KK) 8 November 2012 (2012-11-08) * figures *	1	
A	JP H10 252348 A (UOZUMI YUKIO) 22 September 1998 (1998-09-22) * figures *	1	TECHNICAL FIELDS SEARCHED (IPC) B61B E05D
A	US 2006/011312 A1 (DIAZ CAROLS L [US] ET AL) 19 January 2006 (2006-01-19) * the whole document *	1	
A	DE 19 08 978 A1 (MODERNFOLD GMBH) 10 September 1970 (1970-09-10) * the whole document *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 May 2014	Schultze, Yves

CATEGORY OF CITED DOCUMENTS

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16-05-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5295441 A	22-03-1994	DE 69205097 D1	02-11-1995
		DE 69205097 T2	29-02-1996
		EP 0525738 A1	03-02-1993
		US 5295441 A	22-03-1994
EP 1964747 A1	03-09-2008	AT 469804 T	15-06-2010
		CN 101218139 A	09-07-2008
		DK 1964747 T3	20-09-2010
		EP 1901951 A1	26-03-2008
		EP 1964747 A1	03-09-2008
		EP 2213542 A2	04-08-2010
		ES 2345465 T3	23-09-2010
		HK 1118772 A1	05-10-2012
		HK 1123591 A1	30-09-2010
		TW I335952 B	11-01-2011
		US 2008190031 A1	14-08-2008
		WO 2006131018 A1	14-12-2006
JP 2009262628 A	12-11-2009	JP 5236987 B2	17-07-2013
		JP 2009262628 A	12-11-2009
JP 2010007456 A	14-01-2010	NONE	
JP 2012214196 A	08-11-2012	NONE	
JP H10252348 A	22-09-1998	NONE	
US 2006011312 A1	19-01-2006	US 2006011312 A1	19-01-2006
		US 2008029228 A1	07-02-2008
		WO 2006017366 A2	16-02-2006
DE 1908978 A1	10-09-1970	NONE	

EPO FORM P0459

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 5295441 A **[0005]**
- JP 5236987 B **[0005]**
- EP 1964747 A **[0005]**