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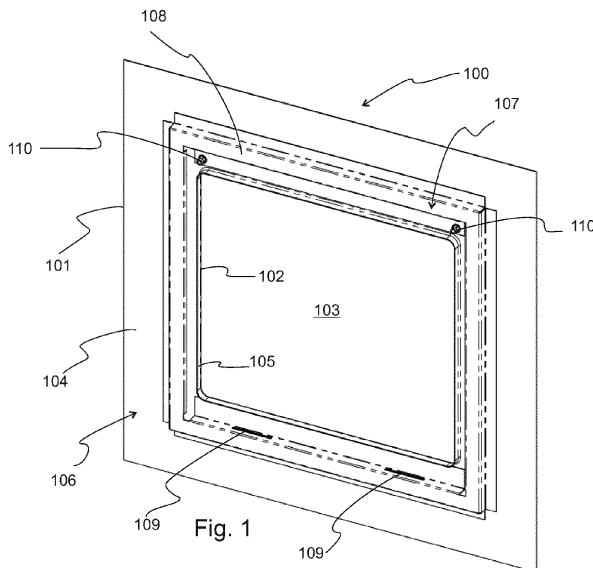
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(54) **DOOR ARRANGEMENT FOR WET AREAS**

(57) A door arrangement for wet areas, comprising a frame (100) and a door (200), wherein the frame (100) is annular component having an outer rim (101) and an inner rim (102), wherein the inner rim (102) forms an opening (103), and the outer rim (101) comprises a top surface (104) for receiving a sealing membrane foil for forming a waterproof connection between the door arrangement and a wet area surface and the door (200) comprises an inner surface (201) and an outer surface so that when the door is closed, the outer surface is ex-

posed to the environment and the inner surface (201) is against the frame (100) and the opening (103; the arrangement comprises a sealing strip (202) and a circumferential protrusion (105), which protrusion forms an inner area having the same or greater area as the opening (103), and the sealing strip (202) is configured to correspond the form of the protrusion so that the protrusion is arranged to be against the sealing strip (202) for forming a watertight connection between the door (200) and the frame (100) when the door is closed.



Description

TECHNICAL FIELD

[0001] The present invention relates to door arrangements for wet areas, such as bathrooms or other spaces exposed to great moisture.

BACKGROUND OF THE ART

[0002] Wet areas or spaces, such as bathrooms, toilets etc., often comprise some kind of means for water supply, e.g. tap, shower etc., plumbing or they are some other way exposed to great humidity and/or moisture. There is always a risk of spillage or leak and, therefore, modern wet areas have water insulation to prevent the humidity and moisture, e.g. from water, to be absorbed to the structures of the area causing e.g. mildew growth and health risks. Typically, the water insulation is a layer, e.g. vapor barrier, arranged between the inner surface (e.g. tiles), that is exposed to the area, and other structures of the building.

[0003] In most modern wet areas, piping is installed inside the wall structures and, thus, it is not visible to the area. The piping may include manifold(s) and other components, such as water meter etc., which may require maintenance and inspection time to time. Therefore, the user must have access to these components without breaking the water insulation of the area while meeting all requirements of water safety.

OBJECTIVE OF THE INVENTION

[0004] An objective of the present arrangement is to provide a watertight maintenance door for wet areas.

SUMMARY

[0005] According to a first aspect, the present invention provides a door arrangement for wet areas, comprising a frame and a door, wherein the frame is annular component having an outer rim and an inner rim, wherein the inner rim forms an opening, and the outer rim comprises a top surface for receiving a sealing membrane foil for forming a waterproof connection between the door arrangement and a wet area surface; and the door comprises an inner surface and an outer surface so that when the door is closed, the outer surface is exposed to the environment and the inner surface is against the frame and the opening. The arrangement comprises a sealing strip and a circumferential protrusion, which protrusion forms an inner area having the same or greater area as the opening, and the sealing strip is configured to correspond the form of the protrusion so that the protrusion is arranged to be against the sealing strip for forming a watertight connection between the door and the frame when the door is closed.

[0006] The advantage of the arrangement is that it pro-

vides an easy maintenance access inside the water insulated wall structures without breaking the water insulation.

[0007] In an embodiment of the arrangement, the protrusion is arranged on the frame surrounding the opening, and the sealing strip is arranged on the inner surface of the door so that the protrusion is extending from the frame against the sealing strip on the door when the door is closed.

[0008] In an embodiment of the arrangement, the protrusion is arranged on the inner rim of the frame.

[0009] In an embodiment of the arrangement, the protrusion is a flange around the opening, which flange is bended from the frame towards the door.

[0010] In an embodiment of the arrangement, the protrusion is arranged on the inner surface of the door and the sealing strip is arranged on the frame so that the protrusion is extending from the inner surface against the sealing strip on the frame when the door is closed.

[0011] In an embodiment of the arrangement, the door comprises at least one projection arranged on one edge of the door, which projection is in parallel direction as the inner surface of the door.

[0012] In an embodiment of the arrangement, the frame comprises at least one slot arranged to receive the projection of the door for fastening the door to the frame.

[0013] In an embodiment of the arrangement, door comprises more than one projection and the frame comprises the same number of slots arranged to receive each projection.

[0014] In an embodiment of the arrangement, the door comprises at least one opening, wherein the opening is at the proximity of the opposite edge to the projection(s).

[0015] In an embodiment of the arrangement, the door comprises more than one opening, wherein the openings are at the proximity of the opposite edge to the projection(s).

[0016] In an embodiment of the arrangement, the frame comprises a threaded hole or holes which are located so that the opening or openings of the door are aligned with the hole or holes when the door is closed.

[0017] In an embodiment of the arrangement, the door is fastened to the frame with captive panel screws, which are fastened to the threaded hole(s) through the opening(s) of the door.

[0018] In an embodiment of the arrangement, the frame comprises two components,

- an annular membrane for attaching the door arrangement to a surface of the wet area, wherein the annular membrane comprises the inner rim and the top surface
- a frame component attached to top surface of the annular membrane and between the inner rim and the outer rim for attaching the door to the frame.

[0019] In an embodiment of the arrangement, the frame component comprises a bended section arranged

to surround the door, when the door is closed.

[0020] In an embodiment of the arrangement, a slot or the slots are arranged at the frame component.

[0021] It is to be understood that the aspects and embodiments of the invention described above may be used in any combination with each other. Several of the aspects and embodiments may be combined together to form a further embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] The accompanying drawings, which are included to provide a further understanding of the invention and constitute a part of this specification, illustrate embodiments of the invention and together with the description help to explain the principles of the invention. In the drawings:

Fig. 1 shows the frame of the arrangement, and

Fig. 2 shows the door of the arrangement.

DETAILED DESCRIPTION

[0023] The door arrangement for wet areas comprises a frame 100 and a door 200 attachable to the frame, which are presented separately in figures 1 and 2 respectively to illustrate the features of the components more clearly. Figures 1 and 2, illustrate one possible embodiments of the frame and the door, and other embodiments and optional and/or additional features are described herein.

[0024] Figure 1 shows the frame 100, which is an annular component arranged to be installed to a wall of the wet area for maintenance opening for example for manifold or piping. The frame may have a shape of square, rectangular, or circular. The frame comprises an outer rim 101 and an inner rim 102. The inner rim 102 of the frame 100 defines an opening 103, which provides an access to piping and/or other components installed inside the wall structure, when the frame is fastened to the wall of the wet area and the door is removed. In figure 1, the opening 103 is a square but it may have different shapes. It may be for example circular or rectangular. The outer rim 101 comprises a top surface 104 for receiving a sealing membrane foil for forming a waterproof connection between the door arrangement and the wet area surface. The top surface 104 extends from the outer edge of the frame 100 towards the inner rim 102. The frame may be fastened to the wall of the wet area, for example bathroom wall, with construction glue and/or with mechanical attachment, e.g. screws. Then, the sealing membrane foil is applied over the top surface 104 and to the wall to form a watertight connection between the wall and the frame.

[0025] In figure 1, the frame 100 comprises a circumferential protrusion 105 around the opening 103, which protrusion is extending from the frame towards the door, when the door is fastened to the frame, i.e. the protrusion

is perpendicular to the top surface 106 of the frame. The protrusion 105 forms an inner area having the same or greater area than the opening 103, i.e. the protrusion is at the inner rim 102 or between the inner rim 102 and the outer rim 101. The form of the protrusion 105 corresponds the form of a sealing strip arranged on the door, and the protrusion is pushed against the sealing strip on the door, when the door is closed, for forming a watertight connection between the frame and the door.

[0026] The circumferential protrusion 105 may be arranged on the inner rim 102 of the frame 100. The protrusion 105 may be for example a flange around the opening 103, which flange is bended from the frame 100 in perpendicular direction, i.e. towards the door 200 when the door is closed. Optionally, the circumferential protrusion may be separate rigid component fastened to the frame around the opening 103.

[0027] The frame may comprise an annular bended section 108 arranged to surround the door, when the door is closed, i.e. the bended section 108 is arranged around the opening 103 and between the inner rim 102 and the outer rim 101, and the door 200 is placed at the center of the bended section 108 to close the opening 103. The axial cross-section of the bended section 108 at one side of the opening may have a certain shape. It may be for example arched or angular. The shape of the bended section 108, in front view, may be rectangular or circular and it may correspond to the shape of the door 200 and/or the frame 100.

[0028] The frame 100 may be formed of one piece or it may be formed of several pieces. For example, the frame may comprise two components, an annular membrane 106 for attaching the door arrangement to the surface, e.g. a wall, of the wet area, and a frame component 107 for fastening the door to the frame. The annular membrane 106 comprises the inner rim 101 and the top surface 104 for receiving the sealing membrane foil as described earlier. The annular membrane may be made of steel, such as deep formed stainless steel. The frame component 107 is attached to the top surface 104 of the annular membrane 106 for example by welding or gluing. For example, the frame component 107 may be fastened to the annular membrane 106 by spot welding. The inner rim 102 of the frame may be part of the annular membrane 106 or the frame component 107. The bended section 108 may be part of the frame component 107.

[0029] The frame may comprise at least one slot 109 for fastening the door to the frame. Optionally, the frame may comprise more than one slot for fastening the door to the frame. The slot or slots may be arranged on one side of the opening 103 so that they may receive a projection or projections of the door and, thus, fasten one side of the door to the frame pivotably. The slot or slots 109 may be arranged on the bended section 108 of the frame 100 or frame component 107.

[0030] The frame 100 may comprise a threaded hole or holes 110 so that the axis of the hole(s) is perpendicular to the top surface 104 of the frame 100. The threaded

hole(s) may be arranged on the frame so that they are inside the area defined by the bended section 108, i.e. between the inner rim 102 and the bended section 108.

[0031] Figure 2 shows the door 200 of the door arrangement. The door 200 comprises an inner surface and an outer surface so that when the door is closed, the outer surface is exposed to the environment and the inner surface 201 is against the frame 100 and the opening 103. In figure 2, the door comprises a sealing strip 202, which is configured to correspond the form of the protrusion in the frame so that the protrusion 105 is against the sealing strip 202, when the door is closed, for forming a watertight connection between the frame and the door.

[0032] The door 200 may have at least one projection 203 arranged on one edge of the door so that the projection is in parallel direction to the inner surface of the door. The projection 203 may be inserted to the slot 109 of the frame to fasten the door to the frame. The door may comprise more than one projection 203, which may be inserted to the slots 109 of the frame to fasten the door to the frame. The projections may be on one edge of the door.

[0033] The door 200 may comprise at least one opening 204 at the proximity of the opposite edge of the projection or projections 203. Optionally, the door may comprise more than one opening 204 at the proximity of the opposite edge of the projection or projections 203. For example, two openings may be located at the proximity of the side opposite to the projection(s) 203 so that the openings 204 are at the corners of the door 200, as seen in figure 2. The opening (s) may be used for fastening the door to the frame. For example, the door 200 may be fastened to the frame by using screws, such as captive panel screws, which are screwed to the threaded hole(s) of the frame. Thus, the opening(s) 204 may be located so that each opening is aligned with one threaded hole of the frame, when the door is closed.

[0034] In figures 1 and 2 the frame comprises the protrusion and the door comprises the sealing strip for forming a watertight connection between the frame and the door. However, optionally, the frame 100 may comprise the sealing strip around the opening and the door comprises the circumferential protrusion extending from the inner surface 201 against the sealing strip when the door is fastened to frame. The protrusion has the form corresponding the sealing strip on the frame for forming a watertight connection between the frame and the door when the door is closed.

[0035] The door 200 may be fastened to the frame 100 by inserting the projection or projections 203 extending from one edge of the door into the slot or slots 109 of the frame, arranged in corresponding locations, and pivoting the door against the frame. The screw (s) are inserted to the threaded hole(s) through the openings 204 in the door, whereby the door is pressed against the frame. The sealing strip, either in the frame or in the door, is squeezed against the protrusion, in the other component, configured in corresponding shape for forming a water-

tight connection between the door and the frame.

[0036] Optionally, the door 200 may be fastened to the frame 100 by other attachment means such as screws (with or without the openings on the door), magnets, camlocks or latches or by any combination of mentioned fastening means. The attachment means may be provided on any side or all side of the opening in the frame and/or corresponding locations in the door.

[0037] Although the invention has been the described in conjunction with a certain type of arrangement, it should be understood that the invention is not limited to any certain type of device. While the present inventions have been described in connection with a number of exemplary embodiments, and implementations, the present inventions are not so limited, but rather cover various modifications, and equivalent arrangements, which fall within the purview of prospective claims.

Claims

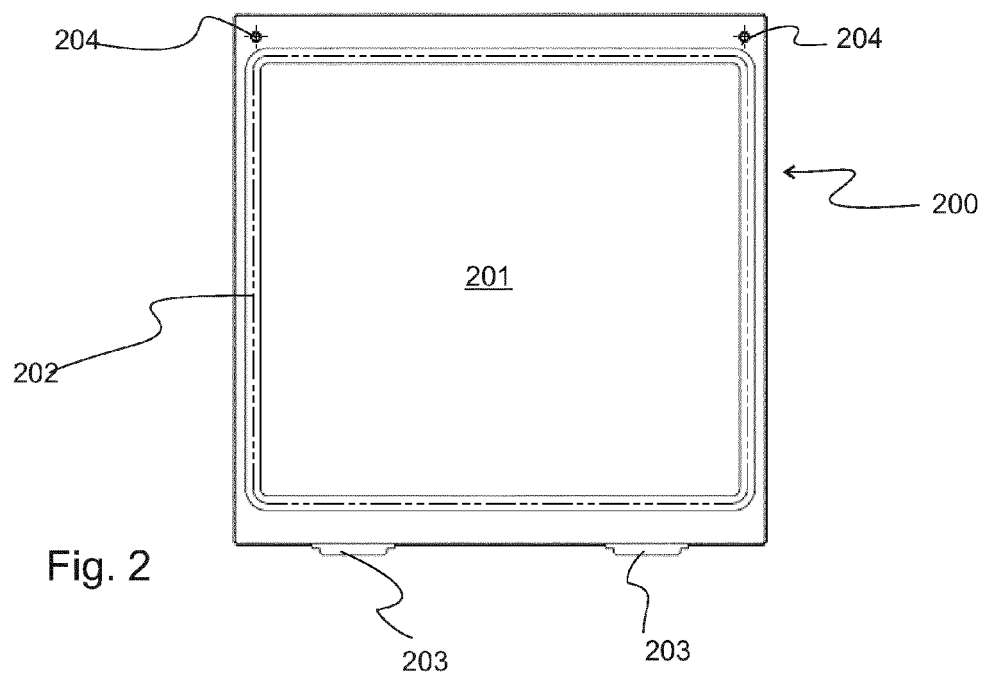
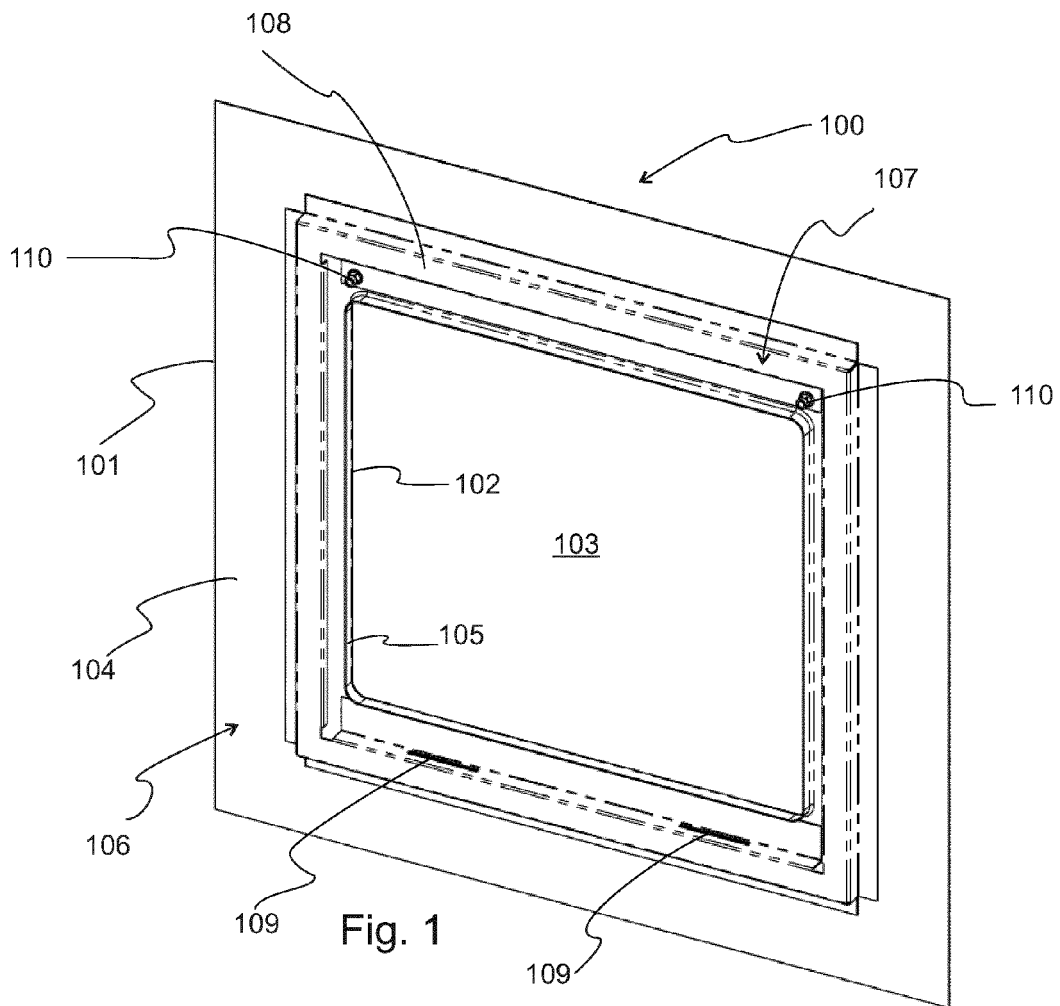
1. A door arrangement for wet areas, comprising a frame (100) and a door (200), wherein

- the frame (100) is annular component having an outer rim (101) and an inner rim (102), wherein the inner rim (102) forms an opening (103), and the outer rim (101) comprises a top surface (104) for receiving a sealing membrane foil for forming a waterproof connection between the door arrangement and a wet area surface, and
- the door (200) comprises an inner surface (201) and an outer surface so that when the door is closed, the outer surface is exposed to the environment and the inner surface (201) is against the frame (100) and the opening (103),

the arrangement comprises a sealing strip (202) and a circumferential protrusion (105), which protrusion forms an inner area having the same or greater area as the opening (103), and the sealing strip (202) is configured to correspond the form of the protrusion so that the protrusion is arranged to be against the sealing strip (202) for forming a watertight connection between the door (200) and the frame (100) when the door is closed.

2. The door arrangement according to claim 1, wherein the protrusion is arranged on the frame (100) surrounding the opening (103), and the sealing strip (202) is arranged on the inner surface (201) of the door (200) so that the protrusion is extending from the frame (100) against the sealing strip (202) on the door (200) when the door is closed.
3. The door arrangement according to claim 1 or 2, wherein the protrusion (105) is arranged on the inner rim (102) of the frame (100).

4. The door arrangement according to any one of claims 1 to 3, wherein the protrusion (105) is a flange around the opening (103), which flange is bended from the frame (100) towards the door (200). 5
5. The door arrangement according to claim 1, wherein the protrusion is arranged on the inner surface (201) of the door (200) and the sealing strip (202) is arranged on the frame (100) so that the protrusion is extending from the inner surface against the sealing strip (202) on the frame (200) when the door is closed. 10
6. The door arrangement according to any one of the preceding claims, wherein the door (200) comprises at least one projection (203) arranged on one edge of the door (200), which projection is in parallel direction as the inner surface (201) of the door (200). 15
7. The door arrangement according to any one of the preceding claims, wherein the frame comprises at least one slot (109) arranged to receive the projection (203) of the door for fastening the door (200) to the frame (100). 20
8. The door arrangement according to any one of the preceding claims, wherein door (200) comprises more than one projection (203) and the frame (100) comprises the same number of slots (109) arranged to receive each projection (203). 25
9. The door arrangement according to any one of claims 6 to 8, wherein the door (100) comprises at least one opening (204), wherein the opening is at the proximity of the opposite edge to the projection(s) (203). 30
10. The door arrangement according to any one of claims 6 to 9, wherein the door (200) comprises more than one opening (204), wherein the openings are at the proximity of the opposite edge to the projection (s) (203) . 35
11. The door arrangement according to claim 9 or 10, wherein the frame (100) comprises a threaded hole or holes (110) which are located so that the opening or openings (204) of the door (200) are aligned with the hole or holes (110) when the door (200) is closed. 40
12. The door arrangement according to claim 11, wherein the door (200) is fastened to the frame (100) with captive panel screws, which are fastened to the threaded hole(s) (110) through the opening(s) (204) of the door (200). 45
13. The door arrangement according to any one of the preceding claims, wherein the frame (100) comprises two components, 50
 - an annular membrane (106) for attaching the door arrangement to a surface of the wet area, wherein the annular membrane comprises the inner rim (102) and the top surface (104)
 - a frame component (107) attached to top surface (104) of the annular membrane (106) and between the inner rim and the outer rim for attaching the door (200) to the frame (100).
14. The door arrangement according to claim 13, wherein the frame component (107) comprises a bended section (108) arranged to surround the door (200), when the door is closed. 55
15. The door arrangement according to claim 13 or 14, wherein a slot or the slots (109) are arranged at the frame component (107).





EUROPEAN SEARCH REPORT

Application Number

EP 21 20 4813

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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Y		7-9	
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			TECHNICAL FIELDS SEARCHED (IPC)
			E04F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 25 March 2022	Examiner Fournier, Thomas
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 21 20 4813

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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25-03-2022

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