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(54) **Combination of a cistern for a toilet, a wall arranged in front of the cistern and a control element for controlling the cistern**

(57) The invention relates to a combination of a flush reservoir (10) for a toilet, a wall (2) arranged in front of the flush reservoir (10) and an operating element (6,7,8,9) for operating the flush reservoir, wherein the operating element is arranged on the wall outside the

projection of the flush reservoir. The wall can optionally comprise an opening, wherein the operating element comprises a frame (3), which frame is arranged at least partially in the opening and wherein the front surface of the frame lies flush with, or recessed relative to, the front surface of the wall.

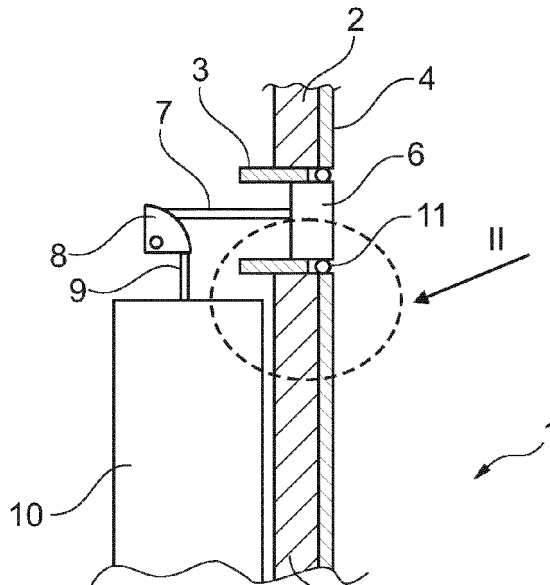


Fig. 1

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Description

[0001] The invention relates to a combination of a flush reservoir for a toilet, a wall arranged in front of the flush reservoir and an operating element for operating the flush reservoir.

[0002] Such combinations are particularly known in the case of build-in reservoirs for sanitary spaces, such as a toilet space. A build-in reservoir is arranged here against a wall, after which a wall is arranged in front of the build-in reservoir. An opening which provides access to the inspection opening in the build-in reservoir is arranged in the wall. This opening in the wall is covered by an operating plate. The operating plate comprises a push-button with which the flushing mechanism in the build-in reservoir can be operated.

[0003] A usual operating plate normally consists of a frame part arranged on the wall around the opening. This frame part is usually connected to the build-in reservoir through the opening and is not usually mounted on the wall itself. A cap in which the push-button is arranged is then placed over this frame part.

[0004] Because the frame part is not mounted on the wall itself the frame part can slide and rotate. In addition, this known structure provides a part lying on the wall, this being disadvantageous from a hygienic viewpoint.

[0005] It is further known to arrange a known push plate on the wall and to then arrange a thick finishing layer around the push plate, whereby the push plate appears to be recessed into the wall. The drawback is however that the push plate can no longer be removed in order to gain access to the inspection opening. This is because the push plate must be pushed upward so as to be released from the frame part. Because the push plate is now enclosed by the finishing layer, this pushing movement can no longer be carried out.

[0006] It is now an object of the invention to reduce, or even obviate, the above stated drawbacks.

[0007] This object is achieved with a combination according to the preamble, wherein the operating element is arranged on the wall outside the projection of the flush reservoir. No longer having the operating element coincide with the projection of the flush reservoir on the wall results in more freedom of design in respect of the way in which access is gained to the flush reservoir and the way in which the flush reservoir is operated. It is no longer necessary, as in the prior art, to combine these two functions.

[0008] In an embodiment of the combination according to the invention the wall comprises an opening and the operating element comprises a frame, which frame is arranged at least partially in the opening and wherein the front surface of the frame lies flush with, or recessed relative to, the front surface of the wall.

[0009] By arranging the frame of the operating element in the opening the operating element can lie recessed in the wall, irrespective of the wall thickness or a possible finishing layer such as a tile layer or plaster layer. In ad-

dition, the frame of the operating element can no longer slide reciprocally because it is arranged in the opening. Prior art cover plates lie on the wall and can thereby slide reciprocally, while the frame of the combination according to the invention lies in the opening and is enclosed thereby.

[0010] A finishing layer, such as a tile layer or plaster layer, is preferably arranged on the wall and the front surface of the wall is the front surface of the finishing layer. Because the frame is arranged in the opening, the frame can be arranged as desired more or less deeply in the opening, this such that the operating element has a desired position relative to the front surface.

[0011] In a preferred embodiment of the combination according to the invention an operating button is arranged in the frame of the operating element for the purpose of operating the flush reservoir. With such an embodiment the operating button can for instance be arranged wholly flush with the surrounding wall.

[0012] CH 293966 shows a toilet with a build-in reservoir hanging in a high position and arranged in a recess in a solid wall. An access hatch is mounted in front of the reservoir. Further provided at a suitable height is an operating element with which the pull cord of the build-in reservoir can be operated. The access hatch is in fact no more than a removable pre-wall through which access can be gained to the build-in reservoir in the wall.

[0013] In a preferred embodiment of the combination according to the invention the frame is a box-like part with a rear wall and side walls arranged along the periphery of the real wall. Using such a frame an alcove is created in the wall. This alcove can for instance be used as storage space. In addition, easy access can be gained through a hatch in a side wall of the alcove to the space behind the pre-wall. It thus becomes possible for instance to top up a reservoir with cleaning liquid, to refill a holder with toilet rolls or to inspect and repair the flush reservoir if necessary.

[0014] In another embodiment of the combination according to the invention the rear wall of the box-like part is situated, relative to the front surface, on the opposite side of the wall. The box-like part thus protrudes through the wall and can for instance protrude therebehind into the flush reservoir. When the box-like part is now arranged in removable manner, access can thus be gained to the inspection opening of the flush reservoir.

[0015] In a highly preferred embodiment of the combination according to the invention a light barrier is arranged between two opposite side walls for the purpose of operating the flush reservoir.

[0016] Sensors are per se already known for operating a flush reservoir. The drawback of the known sensors is that they respond to the presence of a person in the sanitary space and it is not normally possible to operate the flush reservoir as desired. By now arranging a light barrier in the box-like part the flush reservoir can be operated in contact-free manner by for instance inserting a hand in the alcove.

[0017] In yet another embodiment of the combination according to the invention the operating element comprises a sub-frame which is slidable in the frame such that an upper edge of the sub-frame can be placed flush with the front surface of the wall.

[0018] This sub-frame can be displaced in the frame, making a fine adjustment possible. The frame can thus be first arranged at a suitable depth in the wall, after which the sub-frame is mounted and can be adjusted subject to the applied finishing layer.

[0019] The sub-frame can optionally comprise an outward directed flange. This flange can then protrude as finish over the fixed frame.

[0020] It is advantageous for the frame to be arranged on the flush reservoir. The flush reservoir can thus be provided with a fixed frame in the factory. In combination with a slidable sub-frame, mounting of an operating element can thus be effected which does not depend on the thickness of the wall and a possible finishing layer.

[0021] The frame can optionally protrude at least partially into the flush reservoir.

[0022] As alternative embodiment of the combination according to the invention, the flush reservoir comprises an operating pin protruding vertically out of the top side, wherein the combination further comprises a transmission coupled to the vertical operating pin and the operating element.

[0023] With an operating pin protruding vertically from the top side the operating element can easily be arranged at any desired height above the flush reservoir merely by lengthening the operating pin. As a result of the transmission the operating element can then be arranged at a desired position on the wall.

[0024] The operating pin protruding from the top side can be coupled via a pneumatic transmission or an electric transmission to the operating element. The operating pin protruding on the top side can be covered here by a cap arranged on the flush reservoir. Here too the advantage is gained that the height of the operating element in the pre-wall does not depend on the height of the flush reservoir.

[0025] As option an alcove can be provided in the wall and the operating element lies adjacently of the alcove. At least a part of the alcove can be removable here for access to the space behind the wall.

[0026] In a preferred embodiment the alcove and the operating element are both arranged on a single mounting frame. The alcove and the operating element can hereby be mounted integrally in the wall. This mounting is independent of the flush reservoir. This embodiment can hereby also be readily applied during renovation, wherein a flush reservoir is already provided.

[0027] The transmission is preferably arranged on a wall of the alcove. The integral combination of alcove, operating element and transmission can hereby be handled and mounted in simple manner.

[0028] An additional advantage of a combined alcove and operating element is that no tiling need take place

between the operating element and the alcove when a finishing layer such as a tile layer is arranged on the wall. This avoids a great deal of cutting work.

[0029] These and other features of the invention are further elucidated with reference to the accompanying drawing.

Figure 1 shows a cross-sectional view of a first embodiment of the combination according to the invention.

Figure 2 shows a detail of the embodiment according to figure 1.

Figure 3 shows a cross-sectional view of a second embodiment.

Figure 4 shows a perspective view of a third embodiment of a combination according to the invention.

Figure 5 shows a fourth embodiment of a combination according to the invention.

Figure 6 shows a fifth embodiment of a combination according to the invention.

Figure 7 shows a cross-sectional view of a sixth embodiment of a combination according to the invention.

Figure 8 shows a perspective view of a part of the embodiment according to figure 7.

[0030] Figure 1 shows a first embodiment of a combination 1 according to the invention. Combination 1 has a wall 2 with an opening in which a frame 3 is arranged. A finishing layer 4 is arranged on wall 2. Frame 3 is arranged recessed relative to front surface 5, i.e. the visible surface of finishing layer 4. Arranged in frame 3 is an operating element 6 which is connected via a first rod 7, a lever 8 and a second rod 9 to a flush reservoir 10.

[0031] As can be seen in figure 2, due to the slightly recessed position of frame 3 a seal 11 can be provided between operating element 6 and wall 2 and finishing layer 4.

[0032] Figure 3 shows a second embodiment 20. This embodiment 20 has a wall 21 with a finishing layer 22. Placed in opening 23 is a box-like element which consists of a rear wall 24 and side walls 25. This box-like element 24, 25 is arranged recessed relative to front surface 26.

[0033] A displaceable sub-frame 27 is arranged in box-like element 24, 25. This sub-frame 27 has an outward folded edge which covers the edge of box-like element 24, 25. Because sub-frame 27 is displaceable in box-like element 24, 25 it is possible to ensure that the outward folded edge lies flush with front surface 26.

[0034] Figure 4 shows a third embodiment of a combination 30. This combination has a wall 31 with an opening 32. A flush reservoir 33 is arranged behind this wall 31. This flush reservoir 33 is connected to a toilet bowl 34.

[0035] A box-like element is arranged in opening 32. This box-like element protrudes into flush reservoir 33. Direct access can thus be gained to flush reservoir 33 by removing the box-like element from opening 32.

[0036] An operating button 35 with which flush reser-

voir 33 can be operated is further arranged in the box-like element.

[0037] Figure 5 shows a fourth embodiment 40 of a combination according to the invention. This embodiment has a wall 41 with a finishing layer 42. An opening 43 is arranged in wall 41 and finishing layer 42. A box-like element with a rear wall 44 and side walls 45 is placed in this opening 43.

[0038] Arranged in box-like element 44, 45 is a displaceable sub-frame 46, the folded edge 47 of which can be positioned such that it lies flush with the front surface of finishing layer 42.

[0039] A transmitter 48 and receiver 49 which form a light barrier 50 are arranged in side walls 45. When this light barrier 50 is interrupted a signal can be generated with which the flushing mechanism of the flush reservoir can be activated.

[0040] Figure 6 shows a fifth embodiment 60 of the invention.

[0041] Combination 60 has a flush reservoir 61 arranged behind a wall 62. A finishing layer, for instance a tile layer 63, is arranged on wall 62. Flush reservoir 61 is provided with an operating pin 64 which protrudes vertically from the top side.

[0042] A mounting frame 65 is arranged in wall 62 above flush reservoir 61. An alcove 66 and an operating button 67 are arranged on this mounting frame 65. Further arranged on mounting frame 65 is a transmission 68 which converts the horizontal movement of operating button 67 to a vertical movement of operating pin 64. Owing to this transmission 64 the position of alcove 66 does not depend on the position of flush reservoir 61.

[0043] An inspection hatch 69 is further provided in the bottom of alcove 66. Via this inspection hatch 69 access can be gained to the space behind wall 62 and also to flush reservoir 61, for instance for maintenance purposes.

[0044] Figure 7 shows a cross-sectional view of a sixth embodiment 70 according to the invention. In this embodiment 70 a flush reservoir 73 is arranged behind a pre-wall 71 with a finishing layer 72. This flush reservoir 73 has an operating pin 74 protruding on the top side.

[0045] A T-shaped adapter or construction aid 75 is placed on flush reservoir 73. Figure 8 shows a perspective view of this construction aid 75. Construction aid 75 is provided with a duct end 76 which connects to flush reservoir 73, a duct end 77 which protrudes upward and a duct end 78 which protrudes forward and through pre-wall 71.

[0046] Each duct end 76, 77, 78 is provided with peripheral ribs, whereby each duct end 76, 77, 78 can easily be sawn to length.

[0047] In this embodiment a hose of a pneumatic control or an electrical cable can protrude from the top side of flush reservoir 73 instead of operating pin 74. The hose or cable then runs to an operating button 79.

[0048] It will be apparent from figure 8 that the forward directed duct end 78, in which only an operating button

79 is arranged, has a smaller opening than the upward directed duct end 77. Operating button 79 is connected via a pin 80 and a transmission 81 to operating pin 74 of flush reservoir 73.

[0049] Easy access can be gained to flush reservoir 73 via the upward directed duct end 77. In the shelf embodiment shown in figure 7 this duct end 77 can be covered by a cap 82, although in other embodiments it can also be covered by an alcove element, as shown for instance in figure 6.

Claims

1. Combination of a flush reservoir for a toilet, a wall arranged in front of the flush reservoir and an operating element for operating the flush reservoir, wherein the operating element is arranged on the wall outside the projection of the flush reservoir.
2. Combination as claimed in claim 1, wherein the wall comprises an opening and wherein the operating element comprises a frame, which frame is arranged at least partially in the opening and wherein the front surface of the frame lies flush with, or recessed relative to, the front surface of the wall.
3. Combination as claimed in claim 1 or 2, wherein a finishing layer, such as a tile layer or plaster layer, is arranged on the wall and wherein the front surface of the wall is the front surface of the finishing layer.
4. Combination as claimed in claim 2 or 3, wherein an operating button is arranged in the frame of the operating element for the purpose of operating the flush reservoir.
5. Combination as claimed in any of the foregoing claims, wherein the frame is a box-like part with a rear wall and side walls arranged along the periphery of the rear wall.
6. Combination as claimed in claim 5, wherein the rear wall of the box-like part is situated, relative to the front surface, on the opposite side of the wall.
7. Combination as claimed in claim 5 or 6, wherein a light barrier is arranged between two opposite side walls for the purpose of operating the flush reservoir.
8. Combination as claimed in any of the foregoing claims, wherein the operating element comprises a sub-frame which is slidable in the frame such that an upper edge of the sub-frame can be placed flush with the front surface of the wall.
9. Combination as claimed in claim 8, wherein the sub-frame comprises an outward directed flange.

10. Combination as claimed in claim 9, wherein the frame is arranged on the flush reservoir.
11. Combination as claimed in claim 9 or 10, wherein the frame protrudes at least partially into the flush reservoir. 5
12. Combination as claimed in any of the foregoing claims, wherein the flush reservoir comprises an operating pin protruding vertically out of the top side, wherein the combination further comprises a transmission coupled to the vertical operating pin and the operating element. 10
13. Combination as claimed in claim 12, wherein an alcove is provided in the wall and wherein the operating element lies adjacently of the alcove. 15
14. Combination as claimed in claim 13, wherein at least a part of the alcove is removable for access to the space behind the wall. 20
15. Combination as claimed in claim 13 or 14, wherein the alcove and the operating element are both arranged on a single mounting frame. 25
16. Combination as claimed in any of the claims 13-15, wherein the transmission is arranged on a wall of the alcove. 30

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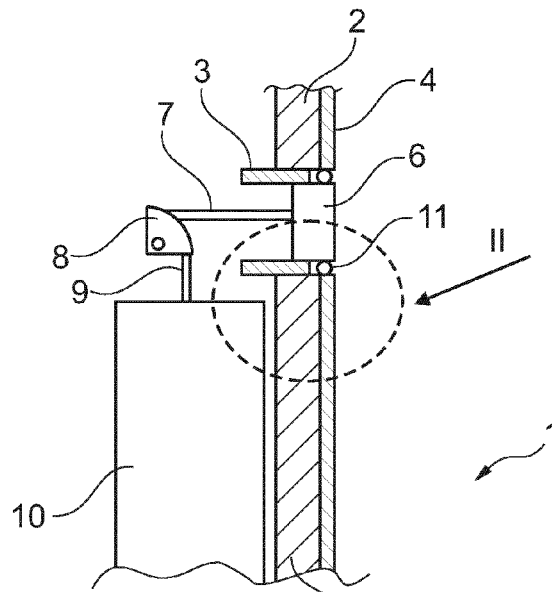


Fig. 1

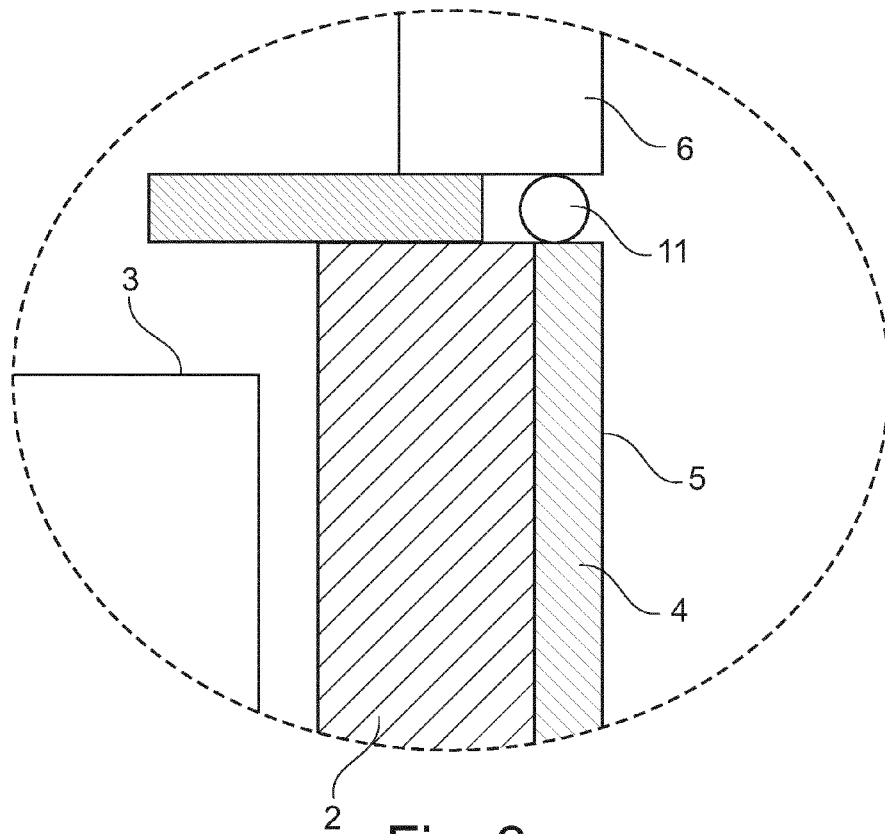


Fig. 2

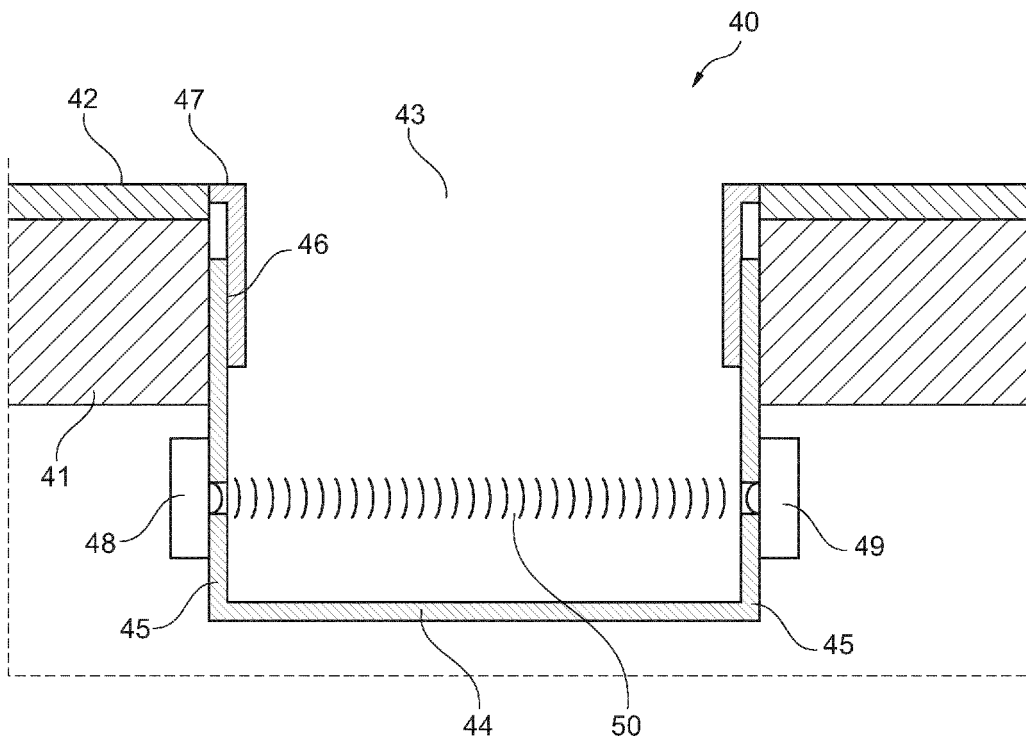


Fig. 5

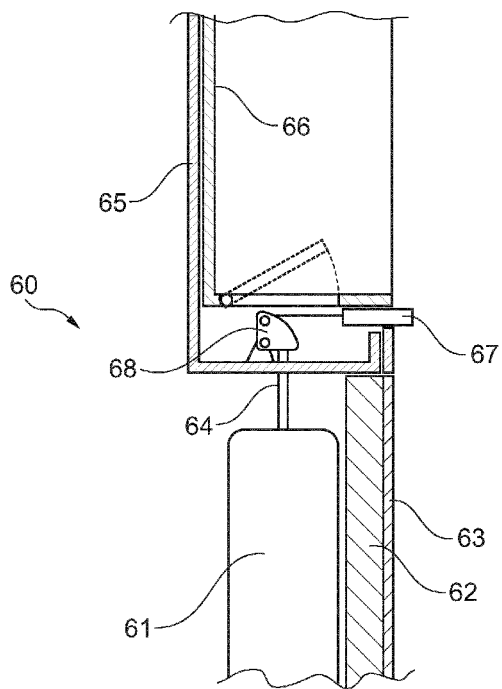


Fig. 6

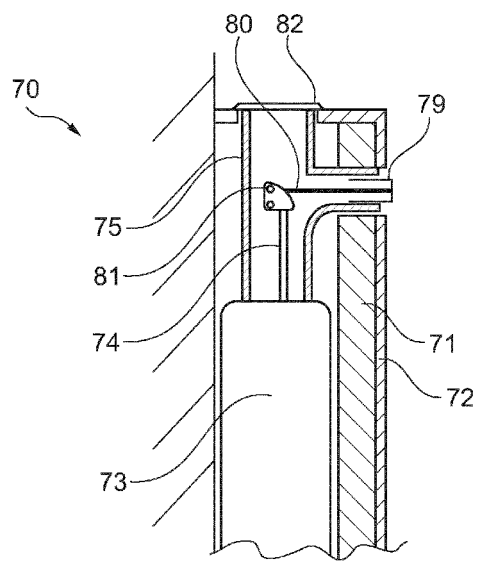


Fig. 7

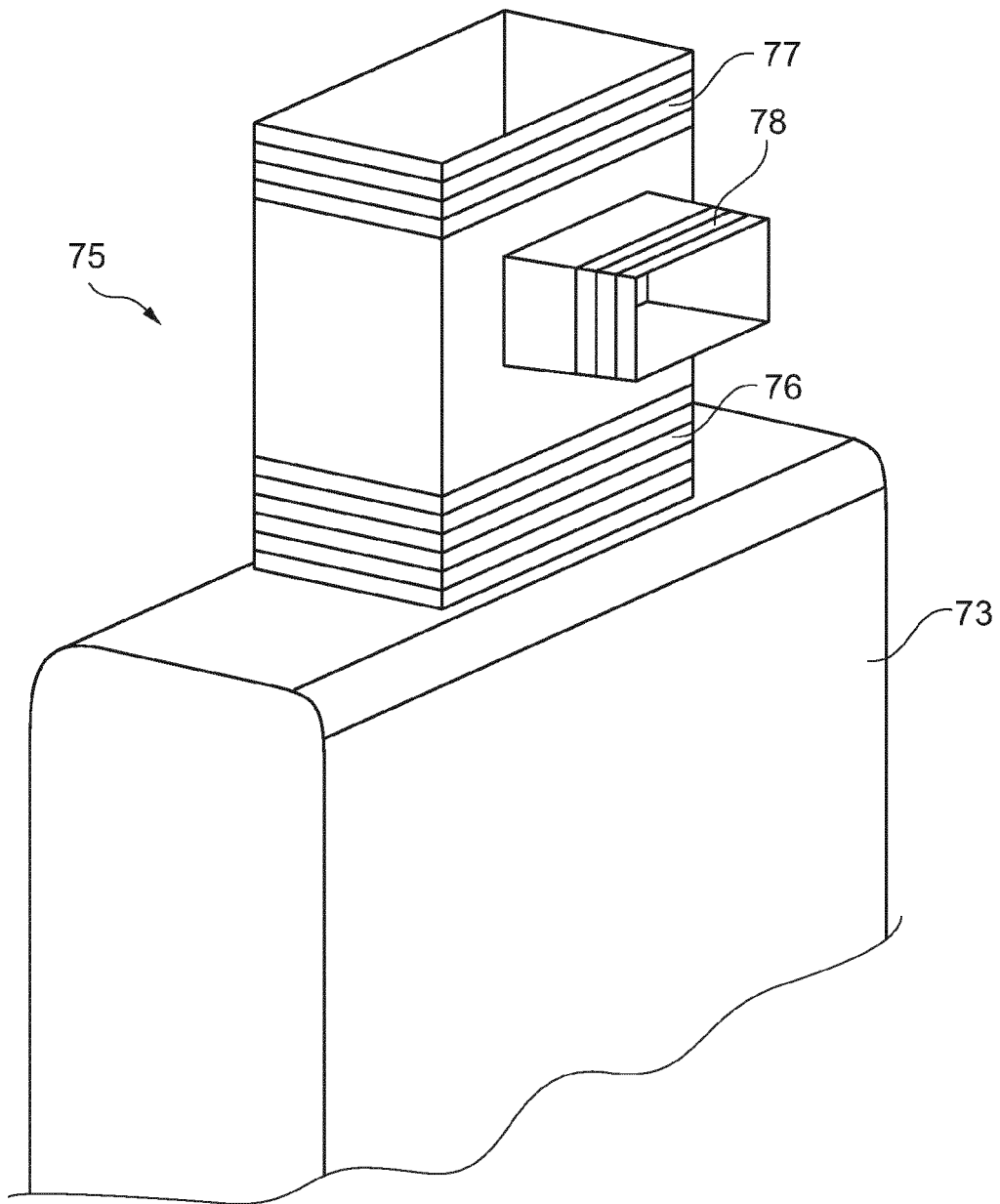


Fig. 8



EUROPEAN SEARCH REPORT

Application Number
EP 11 18 4346

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 2 226 437 A1 (GEBERIT INT AG [CH]) 8 September 2010 (2010-09-08) * abstract *	1-4	INV. E03D5/02 E03D5/10
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X	GB 1 582 429 A (CHLORIDE GROUP LTD) 7 January 1981 (1981-01-07) * figure 1 *	1-6	
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X	EP 0 754 808 A1 (FELTON SA [LU]) 22 January 1997 (1997-01-22) * figure 5 *	1	TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 2 February 2012	Examiner Flygare, Esa
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	

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

EP 11 18 4346

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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