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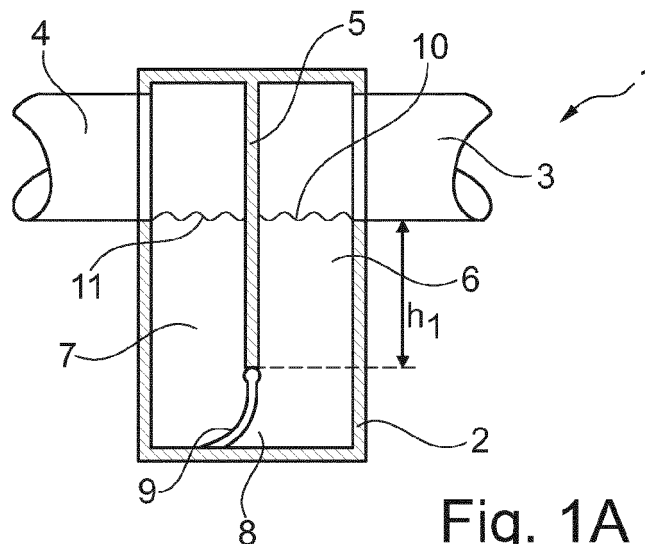
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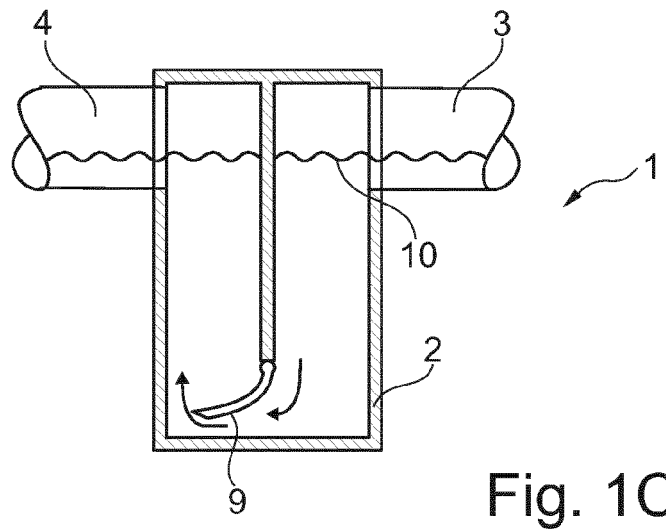
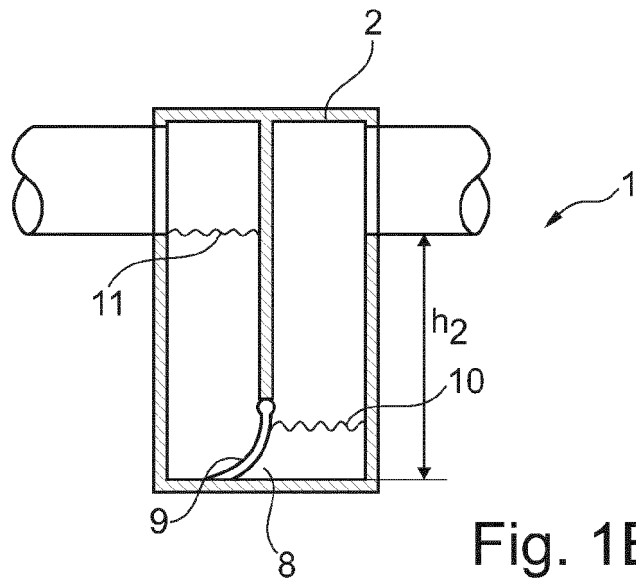
(54) **Siphon with enlarged water seal**

(57) The invention relates to a siphon for closing an outlet pipe, the siphon comprising a housing with an inflow opening arranged in a housing wall, an outflow opening arranged in a housing wall and a separating wall directed downward from above between the inflow opening

and the outflow opening and having a passage opening, wherein the passage opening lies in a lower position than both the inflow opening and the outflow opening, wherein a flexible wall part is provided adjacently of at least one opening.



**Fig. 1A**



## Description

**[0001]** The invention relates to a siphon for closing an outlet pipe, the siphon comprising a housing with an inflow opening arranged in a housing wall, an outflow opening arranged in a housing wall and a separating wall directed downward from above between the inflow opening and the outflow opening and having a passage opening, wherein the passage opening lies in a lower position than both the inflow opening and the outflow opening.

**[0002]** The separating wall forms two chambers in the housing which connect to each other via the passage opening in a low position. When water enters the housing via the inflow opening, it will flow via these chambers to the outflow opening. When water is no longer being supplied, water will remain standing in the two chambers, whereby the passage between the inflow opening and the outflow opening is closed. This creates a water seal.

**[0003]** The level in the housing can however fall due to evaporation and eventually fall below the level of the passage opening, whereby an open connection once again occurs. In accordance with norms this height of the water seal must be 5 centimetres. Because the height of the passage opening, the inflow opening and the outflow opening is easily 1 to 2 centimetres, the minimal height of a siphon will be a minimum of 7 centimetres.

**[0004]** It is the object to reduce the height of the siphon while the height of the water seal remains the same.

**[0005]** This object is achieved according to the invention with a siphon according to the preamble, characterized in that a flexible wall part is provided adjacently of at least one opening.

**[0006]** The flexible wall part lengthens the wall parts of the siphon, such as the separating wall and the walls with the inflow opening and outflow opening. A greater water seal height is hereby obtained in the siphon. When water flows through the siphon the flexible wall part will bend aside, whereby the water can flow through unimpeded and the capacity of the siphon is not limited. When the water comes to rest, the flexible wall part will once again move to the rest position and thereby lengthen the associated wall.

**[0007]** It is thus possible with the flexible wall part to reduce the height of the housing while maintaining the same water seal height.

**[0008]** In a preferred embodiment of the invention the flexible wall part comprises a flexible flap arranged with an end on a first housing wall and lying with a free end against an opposite second housing wall. The flexible flap provides an additional barrier to unobstructed passage between the inflow opening and the outflow opening. When all the water has evaporated or has otherwise disappeared from the chambers, the unidirectional seal still provides a closure which prevents stench flowing from the outflow opening via the housing to the inflow opening.

**[0009]** The flexible flap further ensures that part of the water evaporates less quickly, since a direct connection

to the often warmer outside environment is closed.

**[0010]** The flexible flap also prevents unpleasant odours entering a user space, such as a bathroom, via the siphon when there is overpressure in the sewer.

5 **[0011]** A flexible flap, such as a silicone flap, shapes itself easily to the wall against which the flap lies. If fouling were to adhere to the wall, the flexible flap will then still provide for a good seal. Nor will hairs get caught behind such a flexible flap, whereby blockage at this point is prevented. Leakage caused by hairs being left behind is also prevented.

10 **[0012]** In a further preferred embodiment of the siphon according to the invention a unidirectional seal is arranged in the passage opening. The unidirectional seal is formed here by the flexible wall. When the water now evaporates on the side of the inflow opening, the water in the chamber connected to the outflow opening will press against the unidirectional seal and press it more firmly closed. A good stench trap is also maintained when there is the same quantity of water on either side of the unidirectional seal, as long as the contact surface between the free end of the seal and the bottom lies under water.

20 **[0013]** Even if all the water in the chamber with the inflow opening has evaporated, a good stench trap will nevertheless be obtained. The effective height of the water seal, which is usually defined by the height between the outflow opening and the passage opening, is thus greater as a result. This is because the height of the water seal is determined in the invention by the height between the outflow opening and the passage opening, including the height of the passage opening, i.e. the unidirectional seal.

25 **[0014]** In the case the unidirectional seal is a flexible flap, it is then recommended that the free end of the flexible flap is oriented in flow direction in the channel. Should water attempt to flow back, it will be prevented from doing so by the flexible flap. In addition, the water flowing back will press the free end oriented in flow direction against the wall of the channel, whereby a better seal is created.

30 **[0015]** In another embodiment of the siphon according to the invention the separating wall is formed at least partially by the unidirectional seal in the channel.

35 **[0016]** The flexible wall part can be arranged on a fixed wall, such as for instance the separating wall, although the flexible wall part can also form the whole wall in the siphon.

40 **[0017]** The unidirectional seal can further be arranged in the outflow opening and/or the inflow opening.

45 **[0018]** These and other features of the invention will be further elucidated with reference to the accompanying drawings.

50 **[0019]** Figures 1A-1C show cross-sectional views of a first embodiment of a siphon according to the invention in different situations.

55 **[0020]** Figure 2 shows a cross-sectional view of a second embodiment of a siphon according to the invention.

Figure 3 shows a cross-sectional view of a third embodiment according to the invention.

Figure 4 shows a variant of the embodiment according to figure 3.

**[0019]** Figure 1A shows a cross-sectional view of a first embodiment 1 of a siphon according to the invention. Siphon 1 has a housing 2 with an inflow opening 3 and an outflow opening 4. A separating wall 5 is directed downward in the housing from the upper side, thereby creating a first chamber 6 and a second chamber 7. Situated under separating wall 5 is a passage opening 8 in which a flexible flap 9 is arranged as flexible wall and unidirectional seal.

**[0020]** In figure 1A the water levels 10, 11 in the two chambers 6, 7 are the same. In the case of a conventional siphon without flexible flap 9 the height of the water seal is  $h_1$ . This is because, as soon as the water level in chambers 6, 7 falls to the level of passage opening 8, an open connection will once again occur between inflow opening 3 and outflow opening 4. By arranging a flexible wall part 9 according to the invention the height of the water seal can be increased to  $h_2$  (see figure 1B).

**[0021]** In figure 1B the water level 10 has fallen below passage opening 8 due to for instance evaporation. Because a water column 11 is still present in second chamber 7, this will press flap 9 closed against the bottom of housing 2.

**[0022]** Figure 1C shows the situation where water flows via inflow opening 3 into housing 2. Flap 9 will be pressed open by the initially larger water column 10, whereby the water can flow away via outlet opening 4.

**[0023]** Figure 2 shows a second embodiment 20 of the siphon according to the invention. Siphon 20 has a housing 21 with an inflow opening 22 and an outflow opening 23. An outlet pipe 29, which is provided with a sleeve, is connected to outflow opening 23. A separating wall 24 is directed downward from the upper side, thereby forming a first chamber 25 and a second chamber 26.

**[0024]** In this siphon 20 a first flexible flap 27 is arranged in inflow opening 22 in the channel formed by first and second chambers 25, 26, and a second flexible flap 28 on the housing wall adjacently of outflow opening 23.

**[0025]** First flap 27 reduces the evaporation of water in first chamber 25, while second flap 28 increases the height of the water seal in that the length of the housing wall is hereby increased. Only when there is sufficient water pressure will flexible flap 28 be pressed open and the water can flow away.

**[0026]** In this embodiment the flexible flaps 27 and 28 ensure that the water in both chambers 25, 26 is closed off relative to outlet pipe 29 and the outside environment, whereby evaporation of the water in these two chambers 25, 26 is prevented to a considerable extent.

**[0027]** Figure 3 shows a cross-sectional view of a third embodiment 70 of a siphon according to the invention.

**[0028]** Siphon 70 has a housing 71 with an inflow opening 72, a passage opening 73 and an outflow opening

74. A flexible closing flap 75 is arranged adjacently of passage opening 73 on separating wall 76.

**[0029]** An annular upright wall 77 forming an additional barrier in the water seal is arranged around the downward directed wall 76 and passage opening 73. It is here also the case that the height of siphon 70 can be smaller owing to the flexible closing flap 75.

**[0030]** Figure 4 shows a variant of the embodiment according to figure 3. In this variant a second flexible flap 78 is provided on the annular upright wall 77. The water seal height is hereby increased further, or the overall height of housing 71 can be reduced while the water seal height remains the same.

## Claims

1. Siphon for closing an outlet pipe, the siphon comprising a housing with an inflow opening arranged in a housing wall, an outflow opening arranged in a housing wall and a separating wall directed downward from above between the inflow opening and the outflow opening and having a passage opening, wherein the passage opening lies in a lower position than both the inflow opening and the outflow opening, **characterized in that** a flexible wall part is provided adjacently of at least one opening.
2. Siphon as claimed in claim 1, wherein the flexible wall part comprises a flexible flap arranged with an end on a first housing wall and lying with a free end against an opposite second housing wall.
3. Siphon as claimed in claim 2, wherein a unidirectional seal is arranged in the passage opening.
4. Siphon as claimed in claim 3, wherein the free end of the flexible flap is oriented in flow direction in the channel.
5. Siphon as claimed in any of the foregoing claims, wherein a unidirectional seal is arranged in the outflow opening and/or the inflow opening.

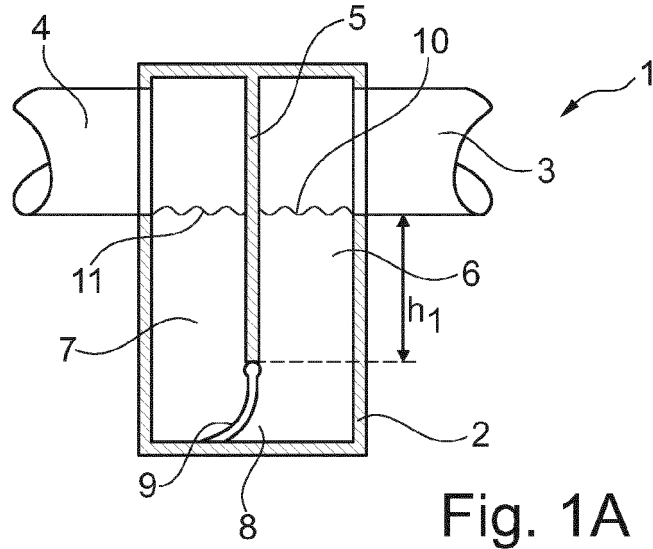


Fig. 1A

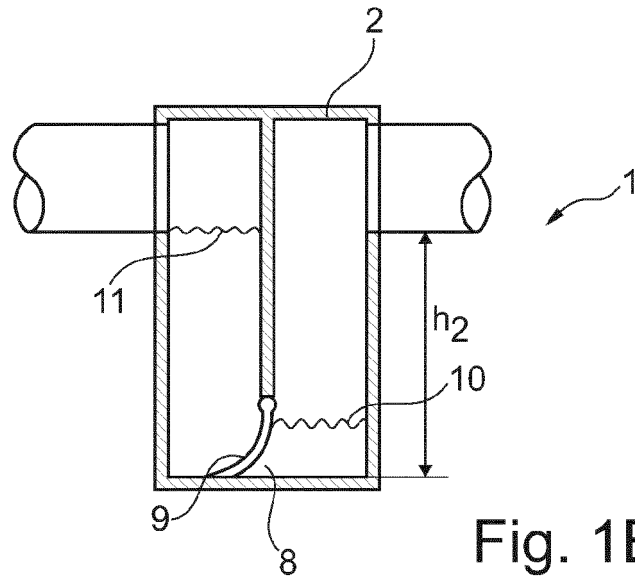


Fig. 1B

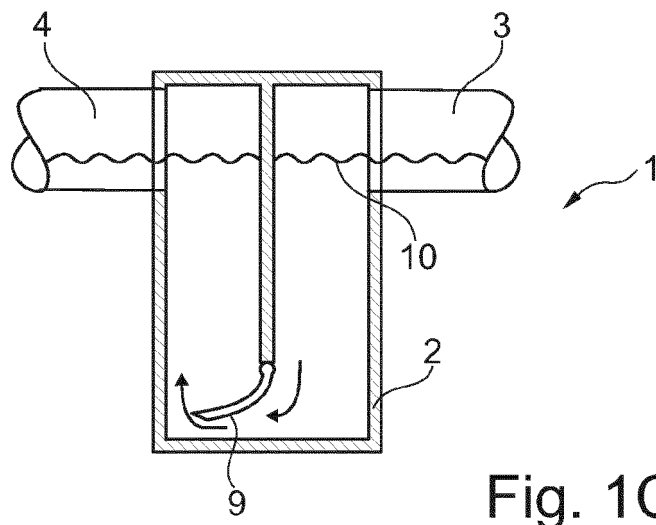


Fig. 1C

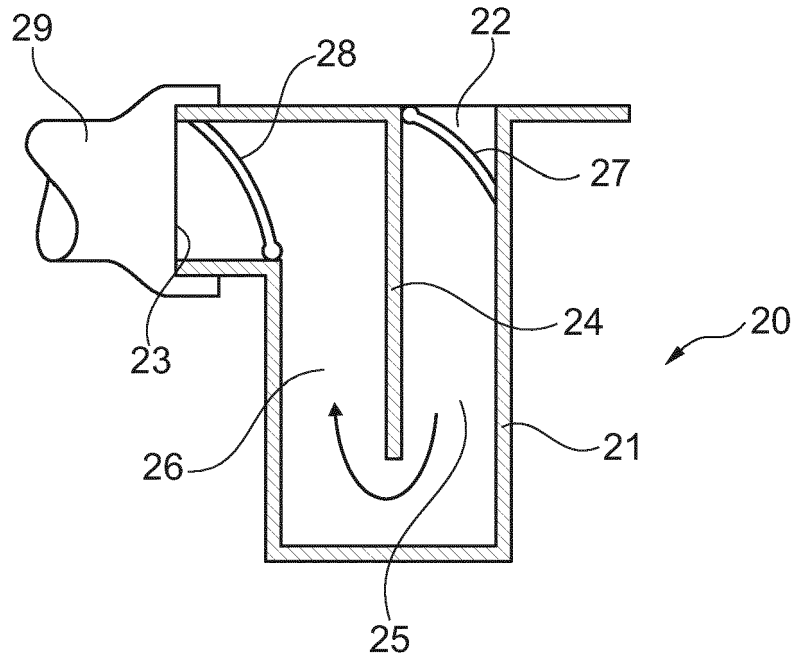


Fig. 2

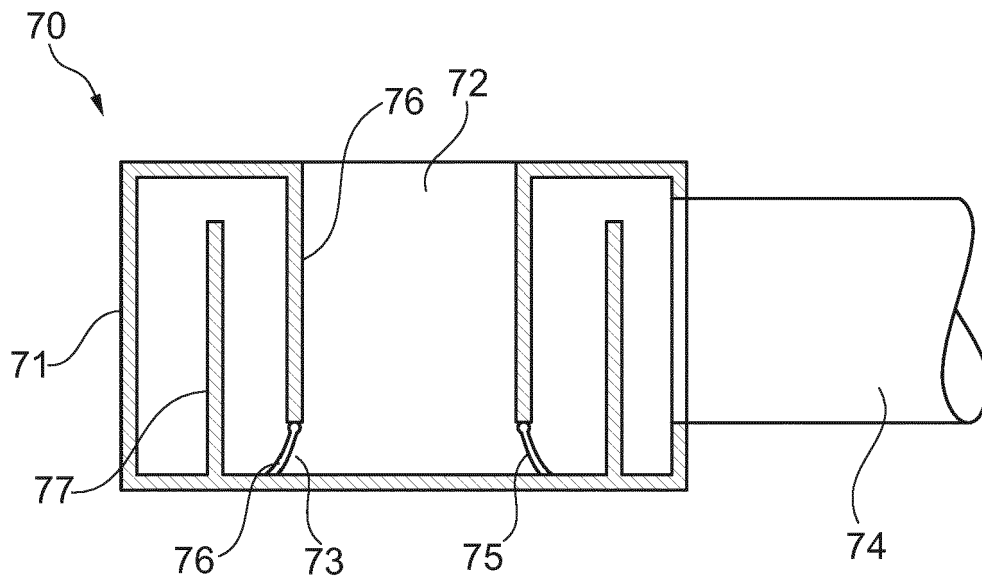


Fig. 3

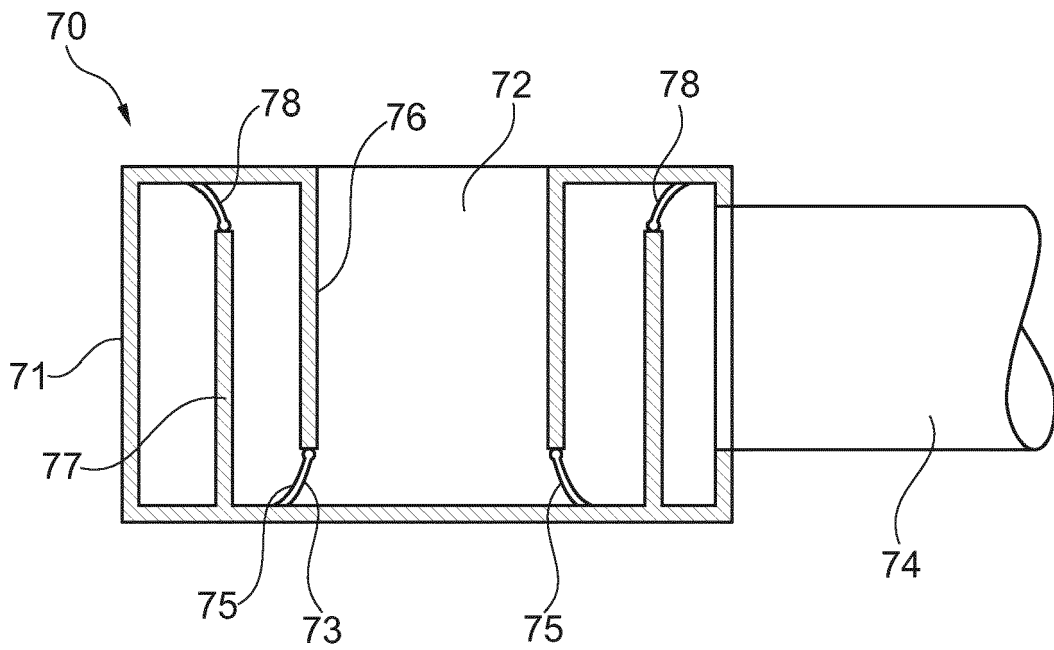


Fig. 4



EUROPEAN SEARCH REPORT

Application Number  
EP 14 15 1267

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			TECHNICAL FIELDS SEARCHED (IPC)
			E03C E03D E03F
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		11 March 2014	De Coene, Petrus
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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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