



(11) **EP 1 956 154 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
13.08.2008 Bulletin 2008/33

(51) Int Cl.:
E03F 5/04 (2006.01) **E03C 1/29** (2006.01)

(21) Application number: **08075031.8**

(22) Date of filing: **11.01.2008**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT
RO SE SI SK TR**
Designated Extension States:
AL BA MK RS

(30) Priority: **07.02.2007 NL 1033352**

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(54) **Narrow siphon**

(57) The invention relates to a siphon comprising:
- a first chamber with an elongate inflow opening; and
- a second chamber connected to the first chamber via a passage opening, wherein the passage opening lies below the inflow opening during use, wherein the second chamber extends substantially in longitudinal direction of the elongate inflow opening, and wherein the second chamber comprises an outflow opening which lies above the passage opening during use.

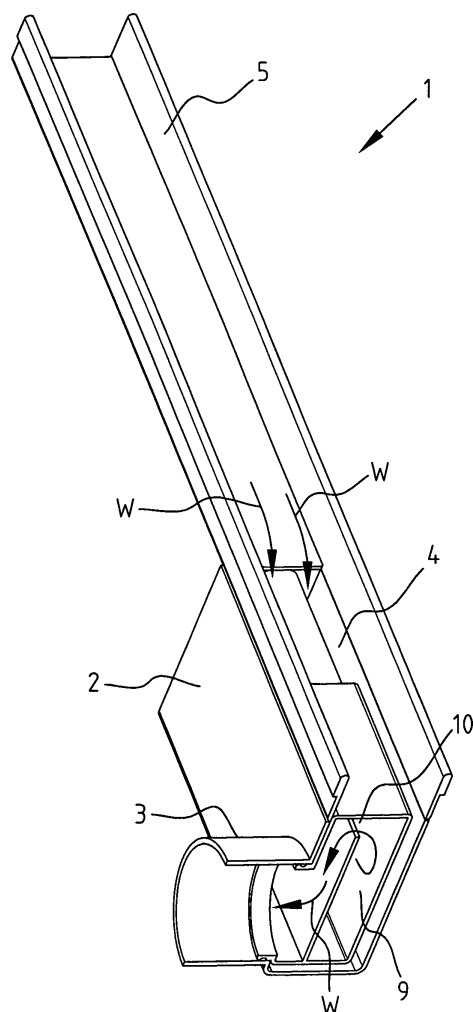


FIG. 1

Description

[0001] The invention relates to a siphon. A siphon is used as stench-trap in drains of for instance washbasins, baths and showers. A siphon seals the entrance to the sewer pipe by providing a layer of water.

[0002] Numerous siphons are known in many forms and variations. The best known form is the so-called swan-neck. This is a normally round tube, which has a first downward directed part which then bends into an upward directed part and subsequently bends once again into a downward directed part. Due to this shape water will always remain in the first downward directed part and the upward directed part, whereby the connection to the sewer remains sealed. Such swan-necks are still frequently applied beneath washbasins.

[0003] A different variant of a siphon is known for showers. This is due particularly to the limited overall depth as a result of the thickness of a floor. Such a siphon consists of a cylindrical receptacle in which an outlet pipe protrudes centrally. An inverted receptacle is then placed over this outlet pipe. A seal is also realized here by providing a quantity of water.

[0004] It is important in all siphons that a sufficient quantity of water can be drained by the siphon. The throughflow surface must therefore have a minimum area in order to bring about good and rapid discharge of water.

[0005] The existing siphons either have the drawback that the overall depth is considerable, such as a swan-neck, or that the width-length ratio of a siphon is substantially equal to 1, whereby a considerable amount of space is taken up.

[0006] It is now an object of the invention to provide a siphon which can be given a narrow form, wherein the overall depth remains limited.

[0007] This object is achieved with a siphon according to the invention, which siphon comprises:

- a first chamber with an elongate inflow opening; and
- a second chamber connected to the first chamber via a passage opening, wherein the passage opening lies below the inflow opening during use, wherein the second chamber extends substantially in longitudinal direction of the elongate inflow opening, and wherein the second chamber comprises an outflow opening which lies above the passage opening during use.

[0008] By providing an elongate inflow opening and arranging the second chamber substantially in longitudinal direction of the elongate inflow opening, a narrow, elongate siphon is obtained. It is hereby possible to keep the visible part of a drain narrow, whereby the drain disrupts the floor in which it is arranged as little as possible.

[0009] In an embodiment of the siphon according to the invention the throughflow area of the passage opening and the outflow opening is at least substantially equal to the throughflow area of the inflow opening. This en-

sures that the water flowing in via the inflow opening is not blocked or slowed down and a rapid discharge of the water is possible.

[0010] In another embodiment of the siphon according to the invention the outflow opening is arranged in longitudinal direction of the elongate inflow opening adjacently of this inflow opening. The narrowest possible siphon hereby also becomes possible.

[0011] In yet another embodiment the second chamber has a cross-section, at least over the distance between the passage opening and the outflow opening, which is at least substantially equal to the throughflow area of the inflow opening.

[0012] In a further embodiment of the siphon according to the invention the ratio between the main dimensions of the elongate inflow opening is at least 1:2, preferably 1:6.

[0013] The invention further comprises a drain, comprising:

- a housing with an inflow opening on the upper side and a discharge opening on the underside or side, and
- a siphon according to the invention arranged in the housing, wherein the inflow opening of the housing is connected to the inflow opening of the siphon, and wherein the outflow opening of the siphon is connected to the discharge opening.

[0014] The first chamber of the siphon is preferably formed by at least a part of the housing such that the discharge opening is connected to the first chamber only via the second chamber.

[0015] In another embodiment of the drain according to the invention the outflow opening of the siphon is connected via a channel to the discharge opening of the housing.

[0016] A further preferred embodiment of the drain according to the invention comprises a gutter which guides liquid for draining to the inflow opening of the housing. Owing to the narrow embodiment of the siphon it is also possible to give the drain a narrow form, and an elongate gutter having a minimum width can be arranged. In the light of aesthetic considerations this is highly recommended.

[0017] The invention further comprises another drain, comprising:

- a tubular housing;
- a first baffle placed obliquely in longitudinal direction in the housing, wherein on the underside, between the first baffle and the tubular housing, there is provided a passage opening with a throughflow area substantially equal to the throughflow area of the tubular housing;
- second and third baffles placed obliquely in longitudinal direction in the housing on either side of the first baffle, wherein on the upper side, between the

second and third baffles and the tubular housing, there is provided a passage opening with a through-flow area substantially equal to the throughflow area of the tubular housing.

[0018] In this drain according to the invention the siphon is provided by placing three baffles in the tubular housing. Elongate openings are provided by placing the different baffles obliquely in the housing, so that a narrow siphon is provided which is accommodated in the tubular housing. It is thus possible to arrange a siphon in an existing outlet pipe. Because the baffles are positioned in oblique direction and thus provide elongate passage openings, the flow rate through the outlet pipe is in at least very large measure maintained.

[0019] These and other characteristics of the invention are further elucidated with reference to the accompanying drawings.

Figure 1 shows a perspective view of a first embodiment of a drain according to the invention.

Figure 2 shows the drain according to figure 1 in another perspective view.

Figure 3 shows a removable part of the siphon of the drain of figure 1.

Figure 4 shows a second embodiment of a drain according to the invention.

Figure 5 shows a third embodiment of a drain according to the invention.

[0020] Figure 1 shows a drain 1 which has a housing 2 with a discharge opening 3 arranged on the side. An inflow opening 4 is provided on the upper side of the housing. A gutter 5, which guides water W to inflow opening 4, is arranged on housing 2.

[0021] Figure 2 shows drain 1 according to figure 1 in another perspective view. It is apparent here that the water W flowing via inflow opening 4 enters a first chamber 6 formed by a part of housing 2 and an insert 7. Insert 7 is shown in more detail in figure 3. The water W flowing into chamber 6 then arrives at passage opening 8 which is arranged on the underside of insert 7. As shown in figure 1, water W enters second chamber 9 via this passage opening 8.

[0022] Second chamber 9 is provided on the upper side with an outflow opening 10 along which water W can flow out of second chamber 9 and thus enters discharge opening 3.

[0023] Because inflow opening 4 is elongate, the width of drain 1 can remain limited. Because the dimensions of passage opening 8 and outflow opening 10 are further chosen such that the throughflow area of the openings is almost the same, it is ensured that a good drainage of water W takes place.

[0024] Insert 7 with second chamber 9 is connected removably to discharge opening 3 via a flange 11. This provides the advantage that the siphon part of drain 1 can be easily cleaned.

[0025] Figures 4A and 4B show a second embodiment 20 of a drain according to the invention. This drain 20 has a tubular housing 21 in which a first baffle 22, a second baffle 23 and a third baffle 24 are arranged. First baffle 22 is arranged such that a passage opening 25 is present between tubular housing 21 and the upper side of baffle 22. Owing to the oblique placing of baffles 22, 23, 24 in longitudinal direction of tube 21, the passage opening 25 is elongate, and the throughflow area is hereby considerably enlarged. Second baffle 23 is arranged against the upper side of tube 21 so that a second passage opening 26 is arranged on the underside of baffle 23. Third baffle 24 is once again arranged such that a third passage opening 27 is arranged between the upper edge of baffle 24 and tube 21. The water flowing through tube 21 will then first pass over first baffle 22 via passage opening 25 and thus enter a first chamber 28. Water W then flows under second baffle 23 via passage opening 26 and herein enters second chamber 29. The water here passes over third baffle 24 via passage opening 27, and can further continue on its way through tube 21.

[0026] Owing to the arrangement of baffles 22, 23, 24 water will remain in first chamber 28 and second chamber 29. This provides a seal against stench.

[0027] Figures 5A and 5B show a third embodiment 30 of a drain according to the invention. For ease of explanation of the drawing, figures 5A and 5B show a square tube 31, although it will be apparent that such a tube 31 can also have a round cross-section, this in fact being more usual. A square tube is however chosen for the sake of clarity in the drawing. Figure 5A herein shows a cross-sectional view as seen from above, while figure 5B shows a cut-away side view.

[0028] Tube 31 has an inlet opening 32 along which water flows in. Arranged in tube 31 is a curved baffle 33 which lies against the upper side in fully sealing manner and leaves an opening 34 clear on the underside. The inflowing water W can enter space 35 via this opening 34.

[0029] Space 35 is bounded by the first baffle 33 and a second curved baffle 36, which lies sealingly against the underside and provides an outflow opening 37 on the upper side. The water from space 35 can continue further on its way via outflow opening 37.

[0030] Drain 30 can for instance be placed in an already existing outlet pipe and must co-act with a collecting holder placed preceding drain 30. Such a collecting holder can for instance be arranged beneath a washbasin, and the necessary water level can hereby be maintained in space 35 and the preceding space up to the collecting holder.

[0031] Owing to the placing of baffles 33 and 36 in substantially a V-shape as seen from above, the water flow W via inflow opening 34, space 35 and outflow opening 37 will display a helical flow. Due to this helical flow the water will be slowed as little as possible by the placing of baffles 33 and 36. The area of inflow opening 34 and outflow opening 37 is moreover enlarged due to the oblique placing of baffles 33, 36, whereby a higher flow rate

is possible.

opening of the siphon is connected via a channel to the discharge opening of the housing.

Claims

1. Siphon comprising:

- a first chamber with an elongate inflow opening; and
- a second chamber connected to the first chamber via a passage opening, wherein the passage opening lies below the inflow opening during use, wherein the second chamber extends substantially in longitudinal direction of the elongate inflow opening, and wherein the second chamber comprises an outflow opening which lies above the passage opening during use.

2. Siphon as claimed in claim 1, wherein the throughflow area of the passage opening and the outflow opening is at least substantially equal to the throughflow area of the inflow opening.

3. Siphon as claimed in claim 1 or 2, wherein the outflow opening is arranged in longitudinal direction of the elongate inflow opening adjacently of this inflow opening.

4. Siphon as claimed in any of the foregoing claims, wherein the second chamber has a cross-section, at least over the distance between the passage opening and the outflow opening, which is at least substantially equal to the throughflow area of the inflow opening.

5. Siphon as claimed in any of the foregoing claims, wherein the ratio between the main dimensions of the elongate inflow opening is at least 1:2, preferably 1:6.

6. Drain, comprising:

- a housing with an inflow opening on the upper side and a discharge opening on the underside or side, and
- a siphon according as claimed in any of the foregoing claims arranged in the housing, wherein the inflow opening of the housing is connected to the inflow opening of the siphon, and wherein the outflow opening of the siphon is connected to the discharge opening.

7. Drain as claimed in claim 6, wherein the first chamber of the siphon is formed by at least a part of the housing such that the discharge opening is connected to the first chamber only via the second chamber.

8. Drain as claimed in claim 7, wherein the outflow

9. Drain as claimed in any of the claims 6-8, comprising a gutter which guides liquid for draining to the inflow opening of the housing.

10. Drain, comprising:

- a tubular housing;
- a first baffle placed obliquely in longitudinal direction in the housing, wherein on the underside, between the first baffle and the tubular housing, there is provided a passage opening with a throughflow area substantially equal to the throughflow area of the tubular housing;
- second and third baffles placed obliquely in longitudinal direction in the housing on either side of the first baffle, wherein on the upper side, between the second and third baffles and the tubular housing, there is provided a passage opening with a throughflow area substantially equal to the throughflow area of the tubular housing.

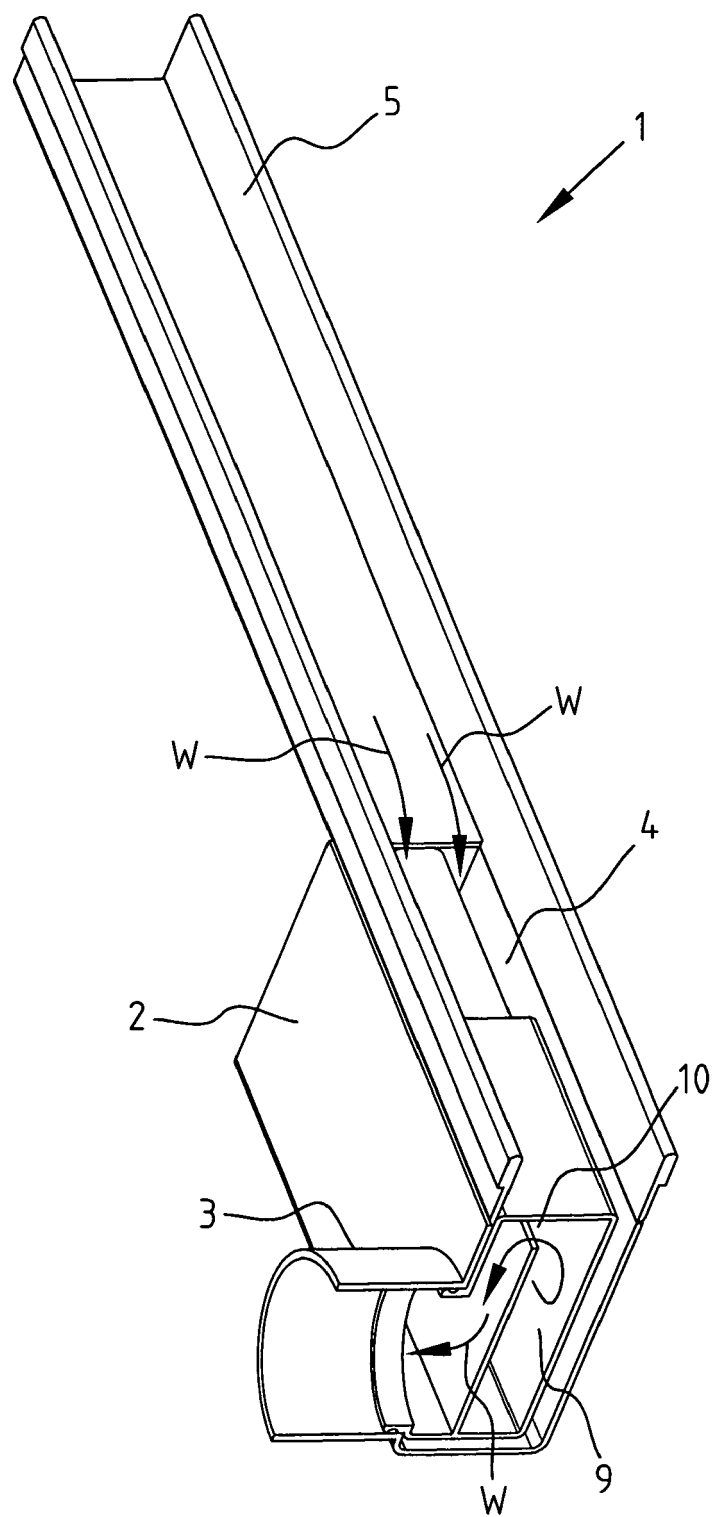


FIG. 1

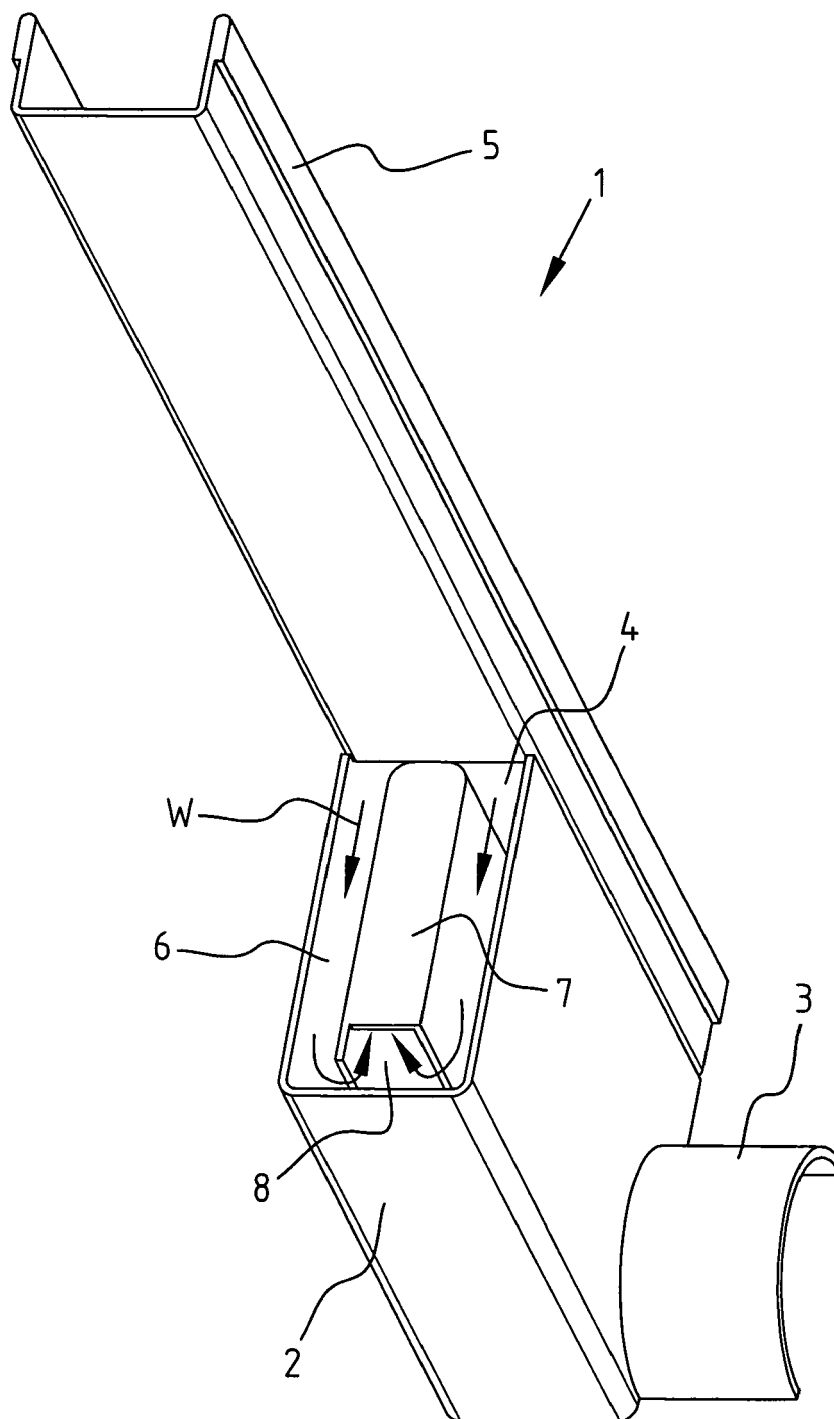


FIG. 2

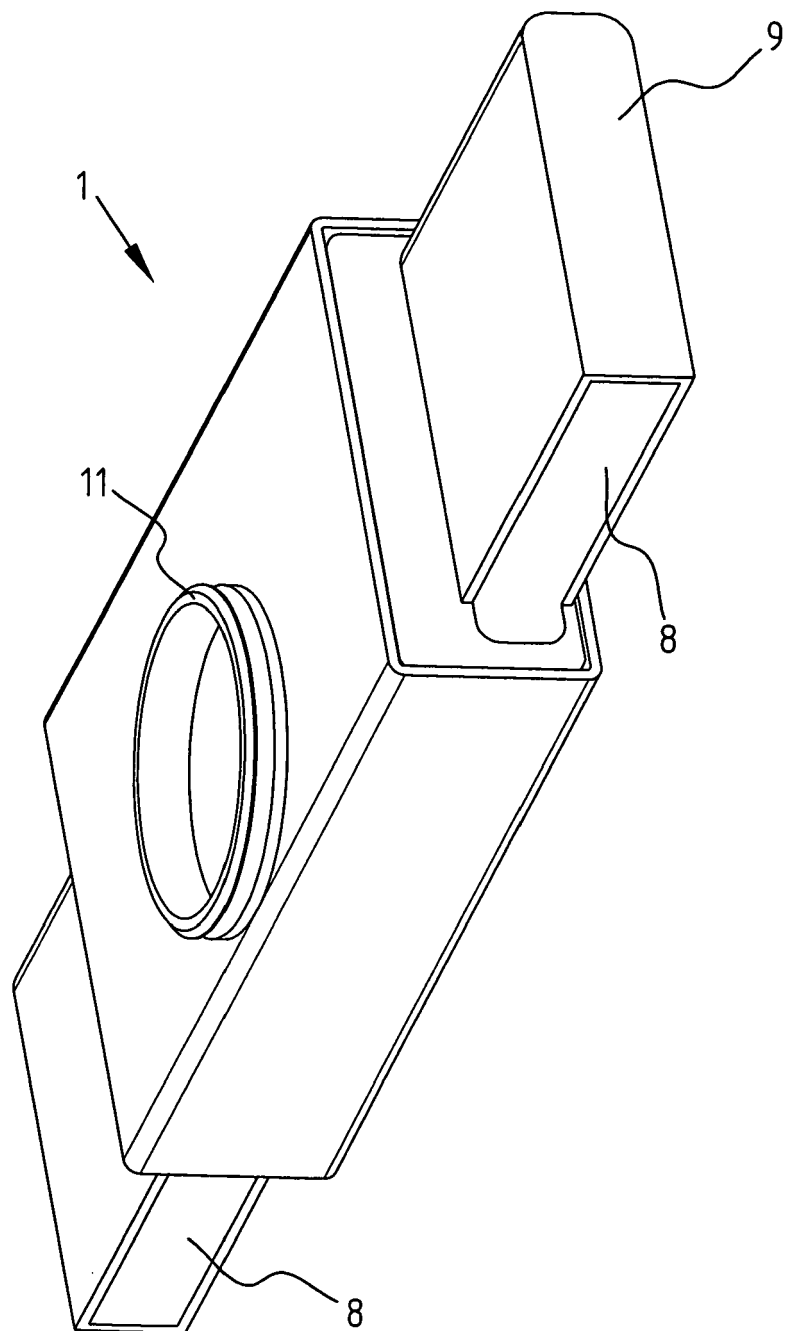
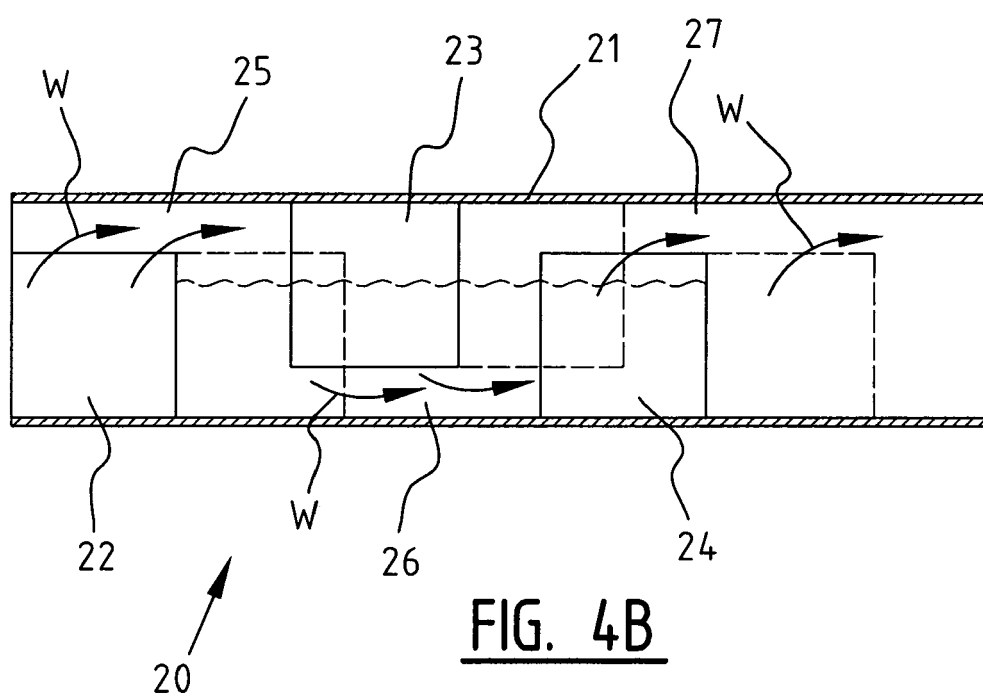
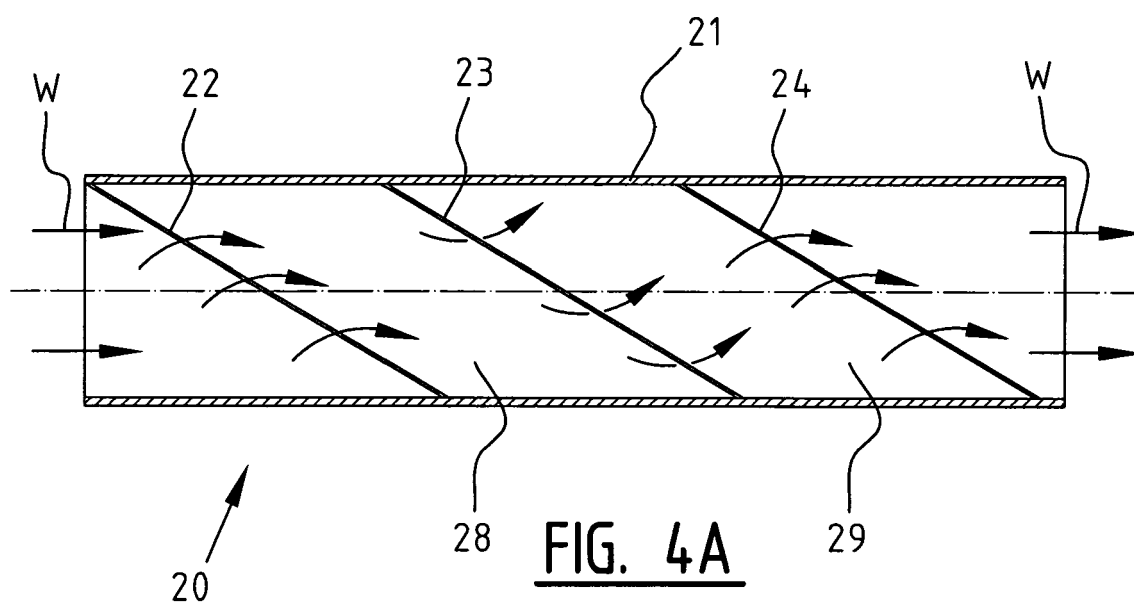
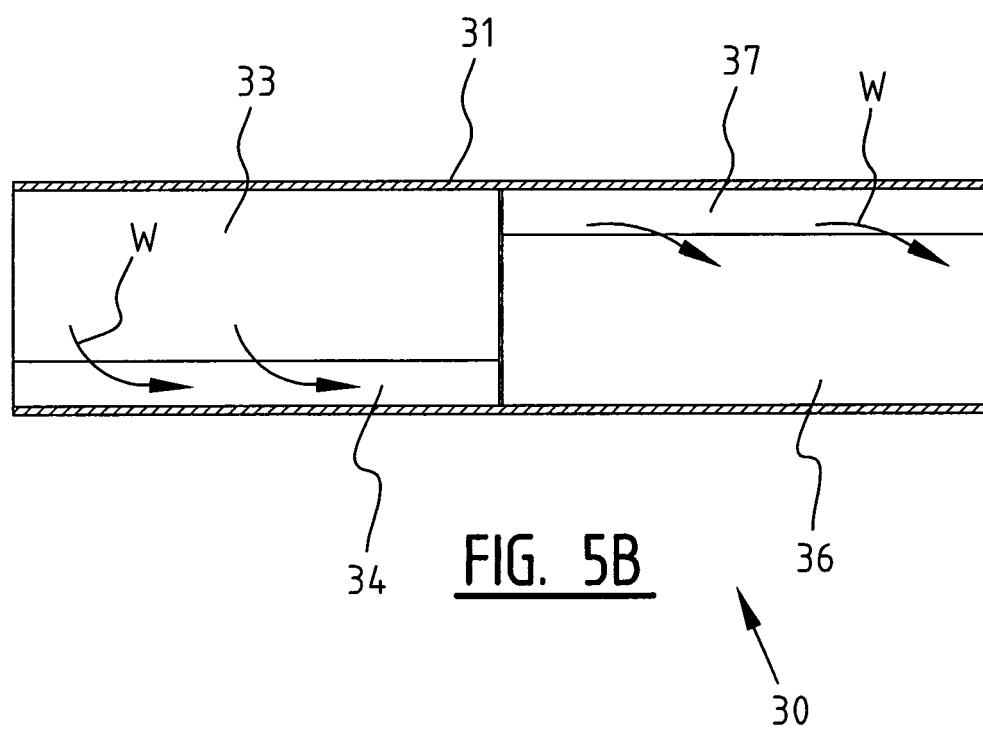
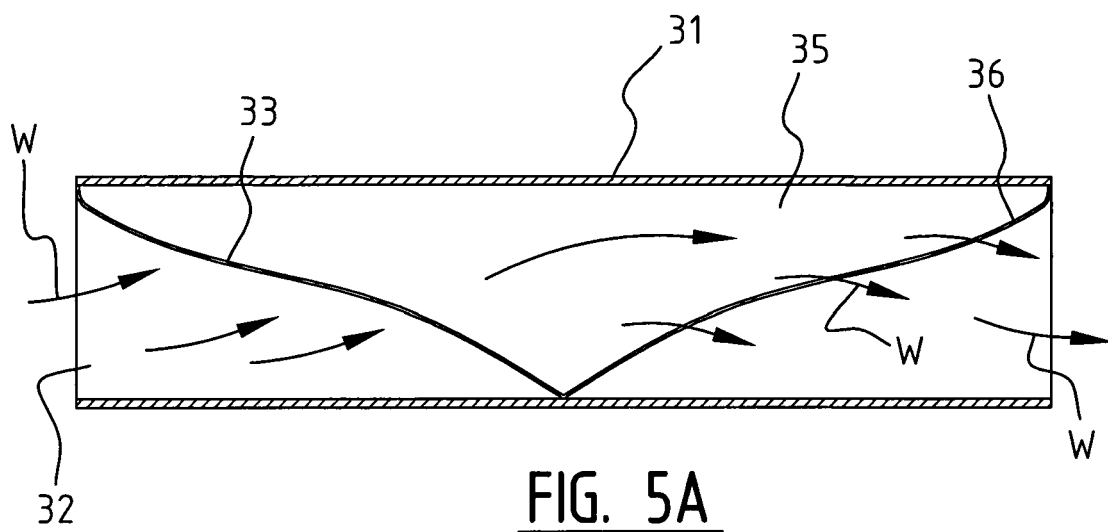


FIG. 3







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EUROPEAN SEARCH REPORT

Application Number
EP 08 07 5031

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	WO 01/73231 A (NIELSEN CLAUS DYRE [DK]) 4 October 2001 (2001-10-04) * page 8, line 8 - line 34; figures 2b,2c,2d *	1-9	INV. E03F5/04 E03C1/29
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X	WO 2005/111326 A (MANDAU KURT [DE]) 24 November 2005 (2005-11-24) * page 7, line 26 - page 11, line 27; figures *	10	
			TECHNICAL FIELDS SEARCHED (IPC)
			E03C E03F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 16 May 2008	Examiner Van Bost, Sonia
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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EPO FORM 1503 03.82 (P04001)



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Application Number
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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☒ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:
- ☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



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**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 08 07 5031

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-9

Siphon (claims 1-5) with a first chamber and a second chamber, and drain (claims 6-9) with a housing and a siphon according to any of the claims 1-5.

2. claim: 10

Drain comprising tubular housing and three baffles.

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

EP 08 07 5031

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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16-05-2008

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