

CANDIDATE'S ANSWER

A (E/M), EQE 2016

A SIPHON

The present invention relates to a siphon, in particular a siphon that includes a compact housing.

BACKGROUND

Siphons are well-known in the art, and have been used to guide waste water from sinks or toilet bowls to sewage ducts.

A typical siphon uses a U-bend (being a U-shaped tube) to house a reservoir. The reservoir is filled to an overflow level, and the inlet and outlets of the U-bend are located above this overflow level. Thus, the liquid in the reservoir blocks unwanted smells passing from the outlet to the inlet. The walls of the U-bend block the passage of smells from the outlet to the environment external to the U-bend. However, the U-bend leads to a bulky apparatus, as the dimensions of the apparatus are determined by the dimensions of the U-bend.

It is desirable to provide a siphon that has the advantages of the U-bend but can be more compact. The present invention set out below addresses this desire.

SUMMARY OF THE INVENTION

In a first aspect of the invention, there is described a siphon according to claim 1. In this siphon, the U-bend is replaced by a wall that separates the inlet and the outlet. This still provides the advantage of blocking passage of gas from the inlet to the outlet, but the construction is much simpler and can be more compact, both in length and depth. Because the wall is located within a housing, the housing wall blocks passage of gas from the outlet to the external environment.

Some advantageous embodiments have the outlet positioned in the side wall and determining the overflow level – these embodiments allow the depth of the siphon apparatus to be reduced.

Other advantageous embodiments have a separate reservoir side wall and the outlet below the overflow level. These embodiments allow the height of the siphon to be reduced (thereby making it easier for wheelchair users).

Other advantageous embodiments utilise a valve – this blocks back flow of unpleasant smells of gas evaporating from the reservoir.

CLAIMS:

1. A siphon (200, 300, 400, 500) comprising:
 - a housing (210, 310, 410, 510);
 - a reservoir (240, 340, 440, 540) located within the housing (210, 310, 410, 510) and arranged to hold liquid up to an overflow level (250, 350, 450, 550) of the reservoir (240, 340, 440, 540); wherein
 - the housing (210, 310, 410, 510) comprises an inlet opening (220, 320, 420, 520) and an outlet opening (230, 330, 430, 530) arranged such that liquid can flow from the inlet opening (220, 320, 420, 520) to the outlet opening (230, 330, 430, 530) via the reservoir (240, 340, 440, 540); the siphon (200, 300, 400, 500) characterised by further comprising:
 - an internal wall (260, 360, 460, 560) within the housing (210, 310, 410, 510), arranged such that when the reservoir (240, 340, 440, 540) is filled with liquid to the overflow level (250, 350, 450, 550), an inner side of the internal wall (260, 360, 460, 560) is exposed to gas entering the housing (210, 310, 410, 510) from the inlet opening (220, 320, 420, 520) and the outer side of the internal wall (260, 360, 460, 560) is exposed to gas entering the housing (210, 310, 410, 510) from the outlet opening (230, 330, 430, 530), thereby blocking gas from flowing from the outlet opening (230, 330, 430, 530) to the inlet opening (220, 320, 420, 520).

2. The siphon (300, 400, 500) of claim 1, wherein the internal wall (360, 460, 560) is a tubular wall with one end of the tubular wall surrounding the inlet opening (320, 420, 520).
3. The siphon (300, 400, 500) of claim 2, wherein the tubular wall is integrally formed with an inlet tube (380, 480, 580) extending from the housing (310, 410, 520) and for connecting to a sink (80).
4. The siphon (200, 300) of any of claims 1, 2 or 3, wherein the outlet opening is provided in a side wall (211, 411) of the housing (210, 310) at a height that determines the overflow level (240, 340).
5. The siphon (400, 500) of any one of claims 1-3, further comprising an interval reservoir side wall (441, 541), wherein the height of the reservoir side wall (441, 541) determines the overflow level (450, 550); and wherein the outlet opening (430, 530) is arranged in the bottom of the housing (410, 510) or in a housing side wall (511) between the bottom of the housing (510) and the overflow level (550).
6. The siphon (200', 300', 400', 500') of any previous claim, further comprising a valve (270, 370, 470, 570) arranged to block a flow of gas from inside the housing (210, 310, 410, 510) through the inlet opening (220, 320, 420, 520).
7. The siphon (200', 300', 400', 500') of claim 6, wherein the valve comprises a buoyant valve body (271, 371, 471, 571) located in the reservoir (240, 340, 440, 540) and biased by buoyancy against a valve seat (272, 372, 472, 572) into a closed position to block the inlet opening (220, 320, 420, 520).
8. The siphon (300', 400', 500') of claim 7, when dependent on claim 2, wherein the valve seat is located at the other end of the tubular wall.
9. The siphon (200') of claim 7, when dependent from claim 1, wherein the valve seat (272) is located at the end of an inlet tube (280) extending through the inlet opening (220) into the housing.

10. The siphon (300', 400', 500') of claim 8, wherein the tubular wall extends to the overflow level (350, 450, 550).
11. The siphon (200', 300', 400', 500') of any one of claims 6-10, further comprising a valve guide (260, 373, 441, 541) arranged to guide the valve from an open position for allowing passage of liquid from the inlet opening (220, 320, 420, 520) to the reservoir, to a closed position blocking the inlet opening.
12. A waterless urinal, comprising the siphon of any one of claims 6 – 11.
13. A sink assembly, comprising a sink (50) and the siphon of any preceding claim.

Examination Committee I: Paper A - Marking Details - Candidate No

Category	Max. possible	Marks	
		Marker	Marker
Independent claim	50	50	50
Dependent claims	40	30	30
Description	10	8	7
Total		88	87

Examination Committee I agrees on 88 points and recommends the grade PASS