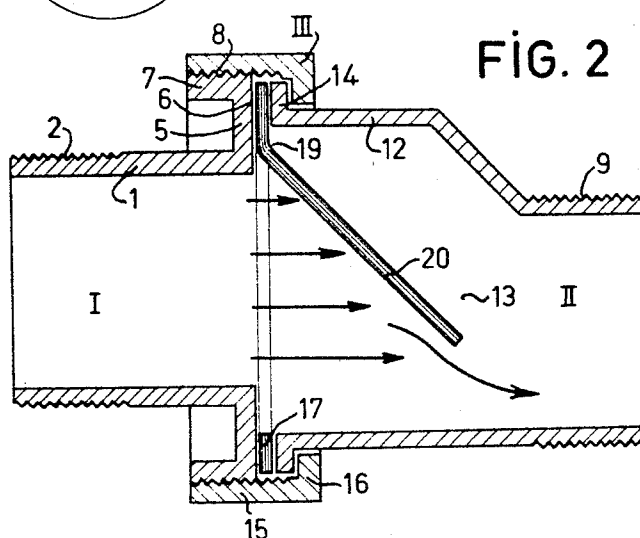
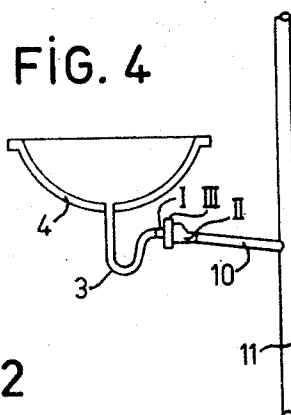
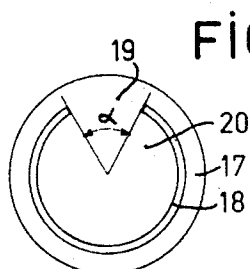
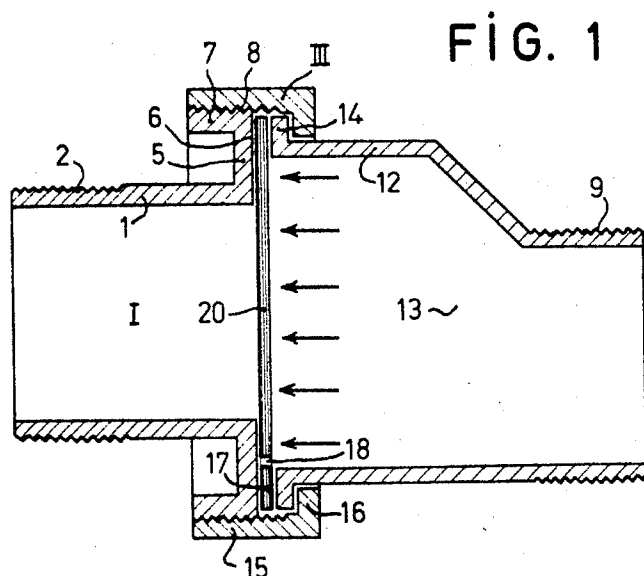


3,460,168

2 Sheets-Sheet 1



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3,460,168

DRAINAGE SYSTEM FOR SINKS, LAVATORIES AND THE LIKE

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2 Sheets-Sheet 2

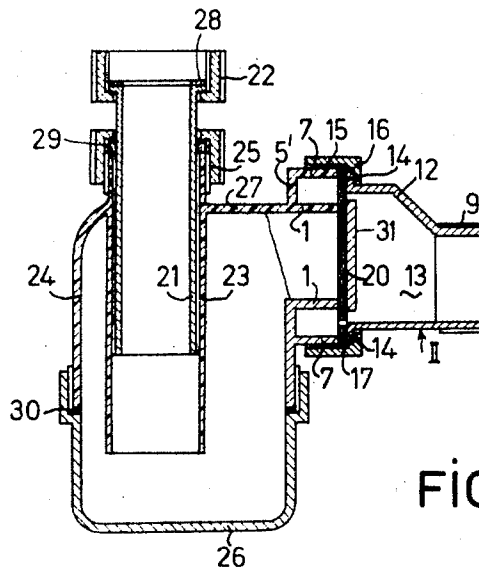


FIG. 5

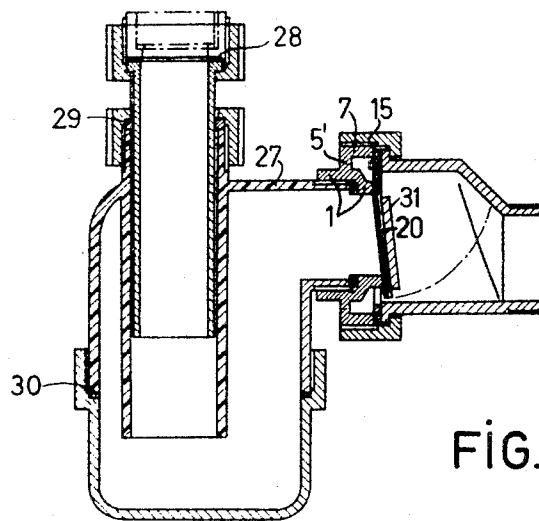


FIG. 6

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3,460,168

DRAINAGE SYSTEM FOR SINKS, LAVATORIES AND THE LIKE

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8 Claims 10

ABSTRACT OF THE DISCLOSURE

A drainage system for sinks, lavatories and the like and concerns a device for preventing the rising and backflow of foams coming from waste water.

Today the use of detergents leads to the formation of foams in the drain pipes; these foams very often rise in these drain pipes and flow back into sinks, lavatories and the like, mainly in the lower floors of modern buildings.

This defect has been remedied by building, in the cellars of these buildings, foam chambers of masonry sometimes several cubic metres in size, at the foot of each down piping; however, this arrangement is far from giving complete satisfaction and, as the use of detergents spreads, the appearance of these residual foams is unfortunately more and more frequent. The object of the device to which the invention relates is to prevent the rising and backflow of foams in sinks by cheap and simple means, and at the same time to make it possible to do without the foam chamber, which of course represents a considerable saving.

The device in accordance with the invention is characterized in that there is provided in the drain pipe an anti-foam valve member which can move only in one direction, which is constructed and acts in such a way as to be brought under the weak thrust of waste water in the open position and which can resume a vertical position and be maintained against a locking surface through the forces of gravity and elasticity.

In the practical embodiment of the invention the anti-foam valve consists of a diaphragm of flexible material, rubber for instance, in the form of a washer whose periphery is gripped, forming a joint between two components provided on the drain pipe and which has over about 300° of its circumference an annular recess interrupted over about 60° in such a way as to form a hinge and the central part forms the anti-foam valve which can only move in one direction.

Specific embodiments of the invention will now be described by way of example with reference to the accompanying drawings, in which:

FIGURE 1 is a section showing the device with the valve closed.

FIGURE 2 is a similar view with the valve open.

FIGURES 3 and 4 are detail views.

FIGURES 5 and 6 represent improved forms of the invention.

As can be seen from the drawings, the device comprises three components I-II-III of metal, plastics or other material.

The component I, an inlet component, comprises a cylindrical portion 1 provided with an external screw-thread 2 whereby it may be connected to a trap 3 on the side of the trap connected for instance to a sink 4 (FIGURE 4).

This component I terminates on the side opposite the drain pipe in a flange 5 presenting a support surface 6 which will be referred to below and which is bent back towards the pipe 3 to present a cylindrical projection 7 con-

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centric with the portion 1 and provided with a male screw-thread 8.

The component II has an externally threaded extension 9 for connection with a drain pipe 10 leading to a down-pipe 11 (FIGURE 4). The extension 9 is eccentric with respect to the component I in order to avoid deposits forming at the bottom and side of the pipe 1. The component II is widened (at 12) to present a chamber 13 permitting the movement of a diaphragm 17 which will be referred to below. The widened part 12 terminates in a radially directed flange 14.

The component III is an internally threaded connecting member 15 which screws onto the threaded projection 7 and is provided with a rim 16 which engages behind the flange 14.

According to the invention, between the components I and II there is provided a flexible diaphragm 17 in the form of a washer (FIGURE 3) of rubber, for instance, and which has its periphery gripped to form a joint between the flanges 5 and 14. A slot 18, concentric with respect to the periphery of the diaphragm extends through about 300° and is interrupted over about 60° in the upper part at 19 (angle α , FIGURE 3) in such a way as to form a hinge at this point. The central portion 20 of the diaphragm forms a valve member.

Waste water coming from the sink 4 (FIGURE 4) and flowing through the pipe 3 exerts a thrust on the valve 20 which is able to move in the chamber 13 without meeting any resistance, and by pivoting round the hinge 19 it can be brought into the position in FIGURE 2. In this way waste water can continue on its way through the pipes 10 and 11.

When the flow ends the valve 20, through its own weight and elasticity, resumes the position shown in FIGURE 1 and it is maintained in this position a fortiori under the counterpressure exerted by the foam against the blocking face 6 which prevents it from moving in the direction opposite that represented in FIGURE 2.

The advantages may be summarized as follows:

(1) Suppression of smells due to foam rising in the piping or coming from the downpipe and occurring in known appliances when the trap has been emptied of water by foam rising in the piping or through a drop in pressure due to water being poured away from the upper floors.

(2) Prevention of backflow and rising of foam in sinks.

(3) Omission of the foam chamber or duplicated pipes.

(4) Replacement of these by devices which are cheaper to buy and install.

(5) Less space required.

(6) Possibility of individual installation for each floor and appliance.

In an improved form of the invention account is taken of the fact that the device described above must always be fitted between the discharge pipe or downpipe for wastes and the trap placed beneath the lavatory, sink, etc., and usually near this trap.

The embodiment in FIGURE 5 makes it possible to considerably reduce the cost of production and installation, giving rise to an assembly comprising the trap mandatorily arranged below the lavatory in order to prevent the backrise of bad smells and the foam-checking device described above.

For this purpose the inlet component of the anti-foam device and the piece forming the outlet of the trap form a single tube with a male thread on which the threaded connection for locking the foam-checking device is screwed.

The body of the trap and the cylindrical inlet component of the anti-foam device may form a single element, generally made by moulding from a plastics material and constituting a monoblock.

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In FIGURE 5 there is shown at 1 the cylindrical portion of the inlet component which provides by means of a cylindrical projection 7 concentric to this portion and connected to it by a flange 5', a support for the flexible diaphragm 17 in the form of a washer having the characteristics mentioned above and whose central portion forms the valve member 20 moving in the chamber 13 formed by the widened portion 12 of the connecting member II connected by a screwthread 9 with the connecting pipe for the downpipe.

At 15 is shown the threaded connecting member engaging the screwthread on the projection 7 and provided with a rim 16 engaging behind the flange 14 of the widened portion 12.

The air trap comprises the telescopic waste inlet pipe 21 connected to the lavatory or sink by a locknut 22 and a joint 28 and slidingly arranged in the inlet pipe 23 which forms one piece with the body 24 of the trap provided with the trap outlet component 27; a nut 25 locks the telescopic pipe 21 on the inlet pipe 23 and fluidtightness is ensured by a joint 29.

A movable and dismountable base 26 is screwed to the base of the body 24 fluidtightly thanks to the joint 30. The inlet pipe 23 is eccentric in known manner in the body 24, so that when water flows a turbulence is created, the result of which is always to leave after this flow a water level above the lower end of the inlet pipe 23 the result of which is to prevent bad smells rising back.

In this improved embodiment the inlet component 1 of the anti-foam device and 27 constituting the trap outlet form a single pipe.

The trap body 24 and the cylindrical inlet component 1 of the anti-foam device may form a single element, generally produced by moulding from a synthetic material.

It will be easily understood that the principal advantage of this improvement is the creation of a special trap having the double faculty of stopping smells and foams coming from waste water drainpipes on the one hand, while considerably reducing expenses of manufacture and installation thanks to a monoblock assembly comprising the body 24 and the cylindrical portion 1 of the inlet component of the anti-foam device.

The valve 20 of the flexible diaphragm is formed and acts as described above without however this embodiment which may be improved constituting a restriction; the valve may for instance be reinforced by a stainless steel plate 31 so as to render it more rigid and thus able to prevent the return of waste water in addition to foams; similarly the diaphragm may be made of rubberized fabric or any other equivalent material, or again the cylindrical portion 1 may be chamfered in such a way that the valve 20 rests slightly obliquely in the closed position of the device (see FIGURE 6) because it may happen that because of the ageing of the rubber, the valve 20 losing some of its elasticity does not fall completely back into the vertical position under its own weight, thus leaving a passage for the rising of the foam.

FIGURE 6 shows an improved embodiment of the invention similar to the preceding. In this form of the invention the inlet component 1 of the anti-foam device and the component 27 forming part of the trap no longer constitute a single pipe; the inlet component 1 screws on the trap outlet pipe 27; thus the trap and the cylindrical inlet component of the anti-foam device no longer form a monoblock assembly which offers the advantage commercially of being able to sell a trap or anti-foam device

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independently of one another, or the two appliances screwed together may be sold as a unit.

All the parts of the device in their improved embodiments are preferably made of a transparent synthetic material, for instance cellulose polyanate, but may quite well be made of another material.

What I claim is:

1. In a drainage system for sinks, lavatories and the like having a drain-pipe and a down-pipe connected together, an anti-foam device situated in said drain-pipe to prevent the rising and backflow in said sinks of foam coming from waste water; said device comprising an inlet connected up-stream to said drain-pipe, an outlet connected downstream to said drain-pipe, a diaphragm having an annular slot over substantially 300° of its circumference delimiting a central disc-like portion, an annular outer portion, and a hinge between said disc-like portion and said annular portion, said central disc-like portion constituting a valve member, means for allowing movement of said valve member in one direction under the thrust of waste water from said inlet and for preventing movement of said valve member in a reverse direction against the thrust of backflow of foam from waste water in said outlet, interconnecting means for said inlet, outlet, and annular portion.

2. An anti-foam device according to claim 1 in which said diaphragm constituting said valve member is of flexible material.

3. An anti-foam device according to claim 1 in which said first-named means is a chamber in said outlet and an abutment member in said inlet against which said central disc-like portion forming the valve member is stopped and prevented from moving in said reverse direction.

4. An anti-foam device according to claim 1 in which said interconnecting means includes an outer annular member with screw threads and a flange on opposite ends, a cylindrical screw thread projection on said inlet, and a flange on said outlet.

5. A drainage system according to claim 1 in which the inlet includes a trap body and forms therewith a one-piece element.

6. A drainage system according to claim 5 in which the single element is a synthetic material.

7. A drainage system according to claim 1 in which a stainless steel plate reinforces said diaphragm in such a way as to render it more rigid and to enable it to prevent the backflow of waste water as well as foam.

8. A drainage system according to claim 5 in which said inlet and said trap body are two elements with screw-connecting means therebetween.

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