

COMMONWEALTH of AUSTRALIA
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APPLICATION FOR A STANDARD PATENT

017888

I/We

Hansa Metallwerke AG

of

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hereby apply for the grant of a Standard Patent for an invention entitled:

~~Pipe interruptor~~ A sanitary Filtering

which is described in the accompanying complete specification.

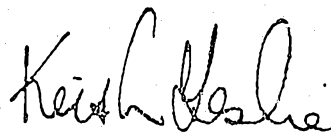
Details of basic application(s):-

<u>Number</u>	<u>Convention Country</u>	<u>Date</u>
P 38 37 032.8	Federal Republic of Germany	31 October 1988

The address for service is care of DAVIES & COLLISON, Patent Attorneys, of 1 Little Collins Street, Melbourne, in the State of Victoria, Commonwealth of Australia.

DATED this TWENTY FIFTH day of OCTOBER 1989

To: THE COMMISSIONER OF PATENTS



.....
a member of the firm of
DAVIES & COLLISON for
and on behalf of the
applicant(s)

Davies & Collison, Melbourne



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NOTICE OF ENTITLEMENT

We, **Hansa Metallwerke AG** the applicant in respect of Application No. 43716/89, state the following:-

Hans Oberdörfer of Kolbäckerstrasse 16, 7000 Stuttgart 80, Germany, is the inventor of the invention.

The Nominated person is entitled to the grant of the patent because the Nominated person would, on the grant of a patent for the invention, be entitled to have the patent assigned to him.

The Nominated person is entitled to claim priority from the basic application listed on the patent request because the Nominated person made the basic application.

The basic application is the first application made in a Convention country in respect of the invention.

Dated this 30th day of August 1991



(A member of the firm of Davies & Collison for
and on behalf of the applicant)

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(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 617886

(54) Title
A SANITARY FITTING

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(56) Prior Art Documents
US 2877789
US 2302150
US 2302151

(57) Claim

5. A sanitary fitting comprising:
- a) a housing;
 - b) a chamber in the housing, and opening into said chamber an inlet pipe for water, an outlet pipe for water and a ventilating passage;
 - c) a closing flap mounted in the chamber which, in the event of a reduced pressure in the inlet pipe, both closes the inlet pipe and opens the ventilation passage, said closing flap being formed from a single piece of resilient elastic material that includes
 - ca) an attachment section that is secured in a fixed position within said housing;
 - cb) a closing section joined to and extending outwardly from said attachment section which closing section is movable in the manner of a hinge through an angle extending between
 - a first position in which it bears against and can close off said ventilation passage solely by virtue of its elastic resilience when there is no reduced pressure in said inlet pipe, and
 - a second position in which said elastic

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resiliency of the closing section that holds it against said ventilation passage is overcome by reduced pressure in the inlet pipe and the closing section moves to a position where it closes off said inlet pipe.

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COMPLETE SPECIFICATION

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COMPLETE SPECIFICATION FOR THE INVENTION ENTITLED:

~~Pipe interrupter~~
A sanitary fitting

The following statement is a full description of this invention, including the best method of performing it known to me/us:-



The invention relates to a sanitary fitting.

Some sanitary fittings can endanger the quality of drinking water because contaminated water can be sucked
5 back by them. Such fittings include bath/shower head sets with flexible hose showerheads or handbasin and sink fittings with a shower head flexible hose which can be pulled out. Fittings of this type must therefore comprising safety devices, by which the sucking-back of
10 contaminated water into the drinking water can be reliably prevented. Safety devices of this type normally comprise a pipe interrupter or ventilator.

A pipe interrupter of the type described above is known from German Industry Standard (DIN) 2266, July
15 1966, Figure 2. In this case, provided coaxially to the water inlet pipe in the chamber of the housing is a connection through which radial flow openings for the water are guided. Provided coaxially to the wall of this connection is an outer wall, which contains the openings
20 for the admission of air. The resilient closing member is constructed as a hollow, cylindrical part, which without any throughflow of water bears against the inner connection and closes off the water flow openings, and in this case simultaneously clears the air openings. As
25 soon as water at excess pressure is present in the inlet pipe, the water presses the hollow, cylindrical closing member radially outwards, so that on the one hand the water passage into the chamber is released and on the other hand the air supply through the radial ventilation
30 openings is closed. However, the dimensions of this pipe interrupter are so great that it is poorly suited for installation in a sanitary fitting. Furthermore it has a relative complicated construction.

According to a first aspect of the present invention
35 there is provided a sanitary fitting comprising:

- a) a fitting body having a base part;



- b) an outlet mouthpiece which can be pulled out and which is connected by way of a flexible hose to an outlet pipe fastened in said base part, said flexible hose being arranged in a loop which is guided partly inside said fitting body;
- 5 c) control elements inside said fitting body for controlling the water flow through said fitting;
- d) a chamber provided in said base part and opening into said chamber an inlet pipe for water coming from said control elements, said outlet pipe and a ventilating passage;
- 10 e) a hollow, cylindrical insert inserted into said chamber from the side and sealed against the wall of said chamber;
- 15 f) a closing flap mounted in said chamber which, in the event of a reduced pressure in the inlet pipe, both closes the inlet pipe and opens the ventilation passage, said closing flap being formed from a single piece of resilient elastic material that includes
- 20 1) an attachment section that is secured by said insert in a fixed position at the wall of said chamber;
- 2) a single planar closing section joined to and extending outwardly in a single plane from said attachment section, which closing section is movable in the manner of a hinge through an angle extending between
- 25 - a first position in which it bears against and by itself covers and closes off said ventilation passage solely by virtue of its elastic resilience when there is no reduced pressure in said inlet pipe, and
- 30 - a second position in which said elastic resiliency of the single planar closing section that biases it against said ventilation passage is overcome by reduced pressure in the inlet pipe and the single planar closing section
- 35



moves through a single arc to a position where it by itself covers and closes off said inlet pipe.

5 According to a second aspect of the present invention there is provided a sanitary fitting comprising:

- a) a housing;
- b) a chamber in the housing, and opening into said chamber an inlet pipe for water, an outlet pipe for water and a ventilating passage;
- 10 c) a closing flap mounted in the chamber which, in the event of a reduced pressure in the inlet pipe, both closes the inlet pipe and opens the ventilation passage, said closing flap being formed from a single piece of resilient elastic material that includes
 - 15 ca) an attachment section that is secured in a fixed position within said housing;
 - cb) a closing section joined to and extending outwardly from said attachment section which closing section is movable in the manner of a hinge through an angle extending between
 - 20 - a first position in which it bears against and can close off said ventilation passage solely by virtue of its elastic resilience when there is no reduced pressure in said inlet pipe, and
 - 25 - a second position in which said elastic resiliency of the closing section that holds it against said ventilation passage is overcome by reduced pressure in the inlet pipe and the closing section moves to a position where it closes off said inlet pipe.

35 Preferably, the chamber inside the housing may be provided geometrically, with smooth walls. The sensitivity of the response of the closing section is high, since only low hinge forces are necessary for its tilting and an elastic expansion must not occur.



If, when there is not a reduced pressure in the inlet pipe, the closing section bears in an elastic resilient manner against the opening aperture of the ventilation passage into the chamber, when raising a shower head flexible hose connected to the outlet pipe, water contained there is prevented from emerging from the ventilation aperture.

In a particular embodiment of the invention a groove is disposed on the transition line between the attachment section and the tiltable closing section of the closing flap. Due to this, the axis about which the tilting movement of the closing section should take place, is defined precisely and the tilting movement itself is facilitated.

The closing flap may be produced as a whole from resilient material; this elasticity then serves both for the formation of the hinge as well as of the seal.

As an alternative, the closing section of the closing flap may also be produced from a hard core, which comprises resilient overlays on both sides. The resilient overlays than takes care of sealing, whereas the hinge to be produced separately facilitates the tilting capacity.

The closing section may also be made as a whole from hard material, if the opening points of the ventilation passage and of the inlet pipe into the chamber are surrounded by resilient seals.



Embodiments of the invention are described in detail hereafter with reference to the drawings, in which:

Figure 1 is a side view of a sanitary fitting with installed pipe interrupter, partly in section;

Figure 2a is a side view of the closing flap in the pipe interrupter of Figure 1;

Figure 2b is an underneath view of the closing flap of the pipe interrupter of Figure 1;

Figure 3 is a second embodiment of a pipe interrupter for installation in the sanitary fitting illustrated in Figure 1.

The sanitary fitting illustrated in Figure 1 comprises in known manner a fitting body 1, an operating lever 2 which is able to rotate and tilt as well as an outlet mouthpiece 3 which can be pulled out. The latter is connected by way of a shower head flexible hose 4 arranged in a loop, which is guided partly inside the fitting body 1 and partly through the hole of the washbasin to be imagined below the sanitary fitting, to an outlet pipe 5. The outlet pipe 5 is fastened in a base part 6, which rests on an inner step of the fitting body 1. The base part 6 supports a control cartridge 7, which can be constructed in known manner and in which the control elements necessary for controlling the water stream or streams are combined. These control elements are moved in a suitable manner by means of the handle 2. Two inlet pipes 8 for cold or hot water likewise extend through the hole in the basin and from below into the fitting body 1. They pass through the base part 6 and communicate in known manner with the control cartridge 7.

The mixed water delivered by the control cartridge 7 according to the relative position of the control elements



passes by way of a short pipe 9 into a somewhat enlarged chamber 10 and from there by way of a pipe 11, which coaxially continues the pipe 9, to the outlet pipe 5 and from there to the outlet mouthpiece 3 which can be pulled out.

Inserted from the side in the chamber 10 is a pipe interrupter, which bears the general reference numeral 12. It comprises a hollow, cylindrical insert 13, which is sealed by means of O-ring seals against the side wall of the chamber 10 in the base part 6 and against the inner wall of the fitting body 1. The interior 14 of the hollow, cylindrical insert 13 is connected by way of a bore 15 to the outside atmosphere.

Under normal conditions, i.e. as long as no reduced pressure prevails in the pipe system connected to the inlet pipes 8, the interior 14 of the insert 13 is closed with respect to the internal region of the chamber 10 by a closing flap 16. The latter is shown to an enlarged scale in Figure 2a in side view and in Figure 2b in underneath plan view. It consists of resilient material, preferably rubber or a comparable synthetic material. It comprises an attachment section 18 formed on a lateral lug 17 (see Figure 2b) and which is bent substantially at an angle of 90° as well as a closing section 19 having a circular shape in the underneath plan view. A groove 20 extends at the boundary line between the attachment section 18 and the lateral lug 17, which groove at this point forms a type of hinge between the two sections 18 and 19.

As can be seen in Figure 1, the attachment section 18 of the closing flap 16 is clamped between the outer wall of the insert 13 and the inner wall of the chamber 10, whereas the closing section 19 of the closing flap 16 may tilt about the hinge formed by the groove 20,

between the position illustrated in full line and the position illustrated in dot-dash line.

The method of operation of the pipe interrupter described within the illustrated sanitary fitting is as follows:

Normal operation means a condition of the sanitary fitting in which no reduced pressure prevails in the pipe system enclosing the inlet pipes 8. Under these conditions, the closing section 19 of the closing flap 16 bears with slight resilient pressure against the right-hand front face of the insert 13 in Figure 1 and in this case prevents both the inlet of air from the external atmosphere into the inner region of the chamber 10 as well as the escape of water from the inner region of the chamber 10 through the ventilation bore 15 in the fitting housing 1. The latter is particularly important if, when the loop of the shower head flexible hose 4 is still filled with water, the mouthpiece 3 is removed and raised. Without the closing flap 16 bearing against the insert 13, the water still contained in the loop of the shower head flexible hose 14 would flow out of the ventilation bore 15.

If, in exceptional circumstances in the pipe system, which is connected to the intake pipes 8, reduced pressure occurred, then the closing section 19 of the closing flap 16 tilts through approximately 90°, until it closes off the pipe 9 - as shown in dot-dash lines in Figure 1 -. Due to this, water is first of all prevented from flowing back into the control cartridge and from there possibly even into the inlet pipes 8 and the connected pipe system. At the same time, the inlet of air through the ventilation bore 15 of the fitting housing 1 and the interior 14 of the insert 13 into the right-hand region of the chamber 10 in the drawing is released,

so that thus, this region of the chamber 10 and the subsequent flow paths (outlet pipe 5, shower head flexible hose 4, outlet mouthpiece 3) are ventilated.

As soon as the pressure in the water inlet pipe 8 once more returns to its normal value, on account of its inherent elasticity, the closing section 19 of the closing flap 16 once more returns to its normal position, which is shown in full line in Figure 1.

Figure 3 shows a second embodiment of a pipe interrupter, the construction of which corresponds largely to that described above. Corresponding components are therefore characterised by the same reference numerals plus 100.

The pipe interrupter 112 illustrated in Figure 3 comprises an insert 113, which with the incorporation of corresponding seals can be inserted in a similar manner in a base part of a sanitary fitting, as was the case in the embodiment of Figure 1. In this case, the insert 113 of the pipe interrupter of Figure 3 comprises a pipe 109, to which the mixed water emerging from the control cartridge is supplied. The pipe 109 opens into an inner chamber 110 of the insert 113, into which a pipe 111 also opens in an axis parallel manner and at an obtuse angle with respect to the pipe 109 a ventilation passage 114.

Once again a closing flap 116 is provided, which comprises an attachment section 118 as well as a closing section 119. According to the different geometry of the pipes 109, 114 in the insert 113, the sections 118 and 119 of the closing flap 116 however enclose an obtuse angle. A groove 120 is again located at the transition region between the attachment section 118 and the closing section 119, which groove assists the hinge action of this region.

The method of operation of the pipe interrupter illustrated in Figure 3 corresponds to that of the embodiment of Figure 1 completely, if one disregards the fact that the tilting region of the closing section 119 in the embodiment of Figure 3 is smaller than in the embodiment of Figure 1.

In one embodiment not shown in the drawing, the closing section of the closing flap is produced from hard material. On both sides it supports resilient overlays, which ensure the seal with respect to the opening apertures of the ventilation passage and of the inlet pipe. As an alternative to these resilient overlays, the opening apertures can also be surrounded by resilient seals. In both cases, the hinge then only needs to be resilient and/or flexible, due to a corresponding spring device, care having to be taken that under normal circumstances the closing section bears against the opening point of the ventilation passage into the chamber.

~~The reference numerals in the following claims do not
in any way limit the scope of the respective claims.~~



THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. Sanitary fitting comprising:
 - a) a fitting body having a base part;
 - b) an outlet mouthpiece which can be pulled out and which is connected by way of a flexible hose to an outlet pipe fastened in said base part, said flexible hose being arranged in a loop which is guided partly inside said fitting body;
 - c) control elements inside said fitting body for controlling the water flow through said fitting;
 - d) a chamber provided in said base part and opening into said chamber an inlet pipe for water coming from said control elements, said outlet pipe and a ventilating passage;
 - e) a hollow, cylindrical insert inserted into said chamber from the side and sealed against the wall of said chamber;
 - f) a closing flap mounted in said chamber which, in the event of a reduced pressure in the inlet pipe, both closes the inlet pipe and opens the ventilation passage, said closing flap being formed from a single piece of resilient elastic material that includes
 - 1) an attachment section that is secured by said insert in a fixed position at the wall of said chamber;
 - 2) a single planar closing section joined to and extending outwardly in a single plane from said attachment section, which closing section is movable in the manner of a hinge through an angle extending between
 - a first position in which it bears against and by itself covers and closes off said ventilation passage solely by virtue of its elastic resilience when there is no reduced pressure in said inlet pipe, and
 - a second position in which said elastic



resiliency of the single planar closing section that biases it against said ventilation passage is overcome by reduced pressure in the inlet pipe and the single planar closing section moves through a single arc to a position where it by itself covers and closes off said inlet pipe.

2. A sanitary fitting according to Claim 1 wherein said closing flap includes a groove at the transition line between the attachment section and the closing section.

3. A sanitary fitting according to Claim 1 wherein said closing flap is formed so that the attachment section is at a right angle relative to said closing section.

4. A sanitary fitting substantially as hereinbefore described with reference to the accompanying drawings.

5. A sanitary fitting comprising:

- a) a housing;
- b) a chamber in the housing, and opening into said chamber an inlet pipe for water, an outlet pipe for water and a ventilating passage;
- c) a closing flap mounted in the chamber which, in the event of a reduced pressure in the inlet pipe, both closes the inlet pipe and opens the ventilation passage, said closing flap being formed from a single piece of resilient elastic material that includes
 - ca) an attachment section that is secured in a fixed position within said housing;
 - cb) a closing section joined to and extending outwardly from said attachment section which closing section is movable in the manner of a hinge through an angle extending between
 - a first position in which it bears against and



can close off said ventilation passage solely by virtue of its elastic resilience when there is no reduced pressure in said inlet pipe, and a second position in which said elastic resiliency of the closing section that holds it against said ventilation passage is overcome by reduced pressure in the inlet pipe and the closing section moves to a position where it closes off said inlet pipe.

6. A device according to Claim 5 wherein said closing flap includes a groove at the transition line between the attachment section and the closing section.

7. A device according to Claim 5 wherein said closing flap is formed so that the attachment section is at a right angle relative to said closing section.

DATED this 30th day of August 1991

Hansa Metallwerke AG

By Its Patent Attorneys

DAVIES & COLLISON



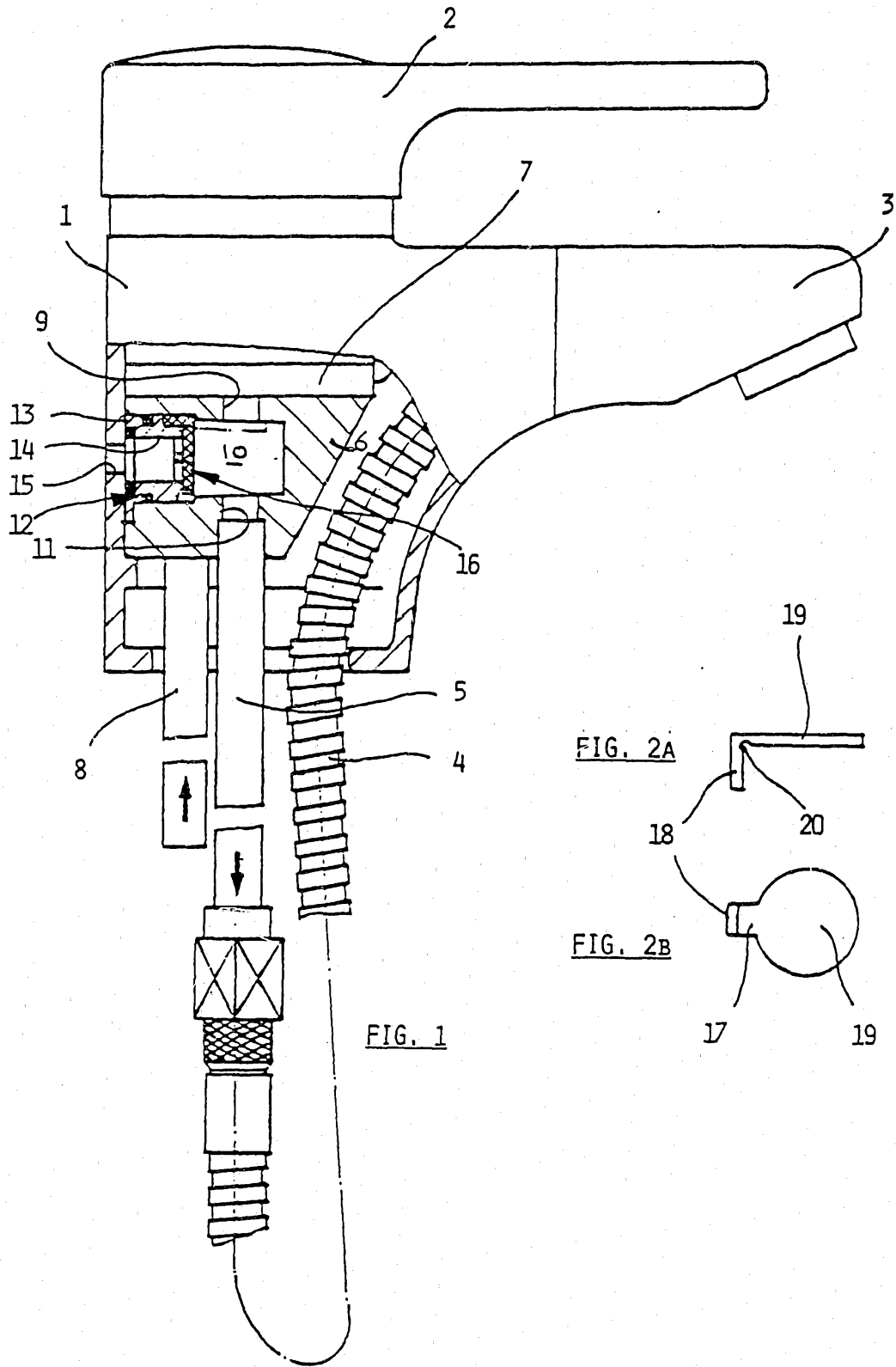


FIG. 1
FIG. 2A
FIG. 2B

