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DRAINAGE AND OVERFLOW DEVICE FOR CONNECTION TO A BASIN

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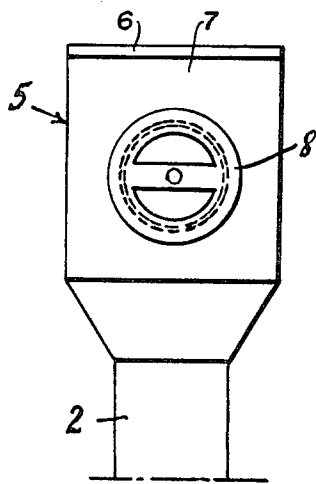


FIG. 3.

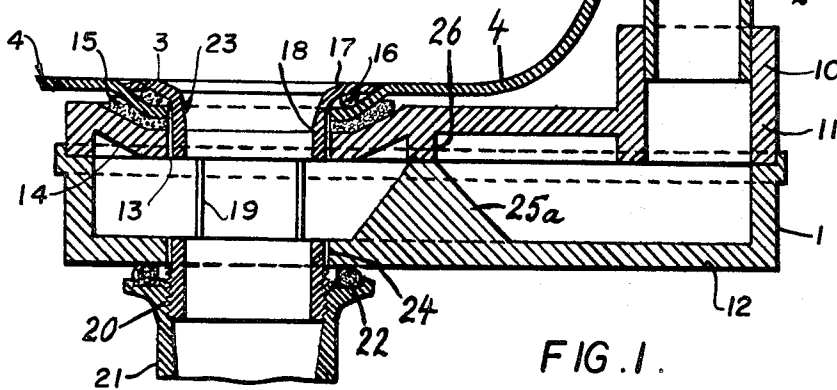
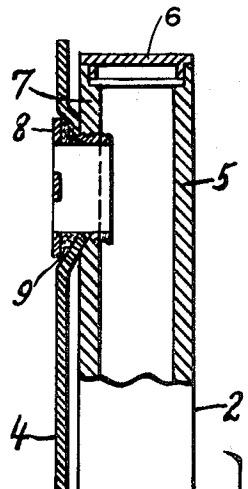


FIG. 1.

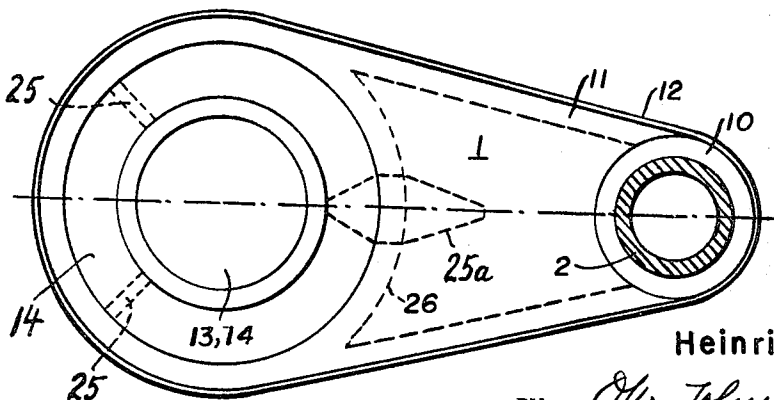


FIG. 2.

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DRAINAGE AND OVERFLOW DEVICE FOR CONNECTION TO A BASIN

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15 Claims

ABSTRACT OF THE DISCLOSURE

An overflow vessel is inserted onto a laterally slotted drainage pipe, the slots being situated within the inserted overflow vessel. The overflow vessel is of a size such that it extends for coupling with an overflow downpipe descending vertically from the overflow of the basin. The flow cross-section of the vessel increases uniformly and constantly from the cross-section of the downpipe to that of the slots in the drainage pipe.

Field of the invention

The invention relates to a drainage system for basins such as hand or laundry sinks, particularly those of high-grade steel, steel enamel, cast metal, or plastic, having an overflow downpipe and a drainage pipe.

Description of the prior art

In conventional hand and/or laundry sinks, the overflow is the source of frequent and various disadvantages. Since the drain water must be conducted through guide channels or pipelines from an opening in the region of the upper sink rim into the drain connection pipe or the discharge pipe, and these guide channels or pipes must be accommodated in most cases within a narrow space, the conduits must perforce be bent at acute angles or be constricted, resulting in narrow flow cross sections for the drain water. Under such circumstances, it cannot be avoided that the channels or pipelines clog up. Consequently, apartment floors are often flooded when an occupant using such sinks relies on the function of overflow and realizes too late that the overflow is clogged. The removal of such obstructions in the channels or pipes conducting the overflow water is connected with a substantial expenditure in time and work and is quite difficult. In many cases, the basins and pipe systems must be substantially disassembled, so that plumbers must be called in.

In case of porcelain basins or other basins made of ceramic materials, it is customary to situate the overflow channels within the wall of the sink, i.e., to make the overflow a part of the basin. The presence of this overflow cannot be perceived from the outside.

In order to drain overflow water, drainage pipes with lateral slots are positioned in the bottom of the basin. The lateral slots lie in the region of the termination of the overflow channel. This possibility of draining the overflow water and to conduct same into the drainage pipe is very simple indeed; however, this procedure exhibits the following disadvantage: The surfaces of the overflow channel in the interior of the basin wall cannot be coated with glazing mass and thus remain rough and porous even after the basin has been finished. Consequently, dirt and impurities accumulate very rapidly and cause clogging of the channel.

In case of basins made of steel, steel enamel, or plastic, the walls have a thickness of only 1 mm. or 2 mm., so that a special overflow pipe must be provided outside the wall. In order to connect the overflow pipe between

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the overflow opening in the upper region of the basin and the drain pipe, special assemblies are necessary. The connecting system for combining the drain water of the sink and the overflow water is particularly complicated in conventional sink assemblies by the need of special components having odd shapes. These can be produced only as cast parts, and the requirements of casting technology must likewise be taken into account if production costs are to be kept within reasonable limits. Additionally, only very high-quality materials can be used, particularly brass, so that the known drain assemblies for sinks made of steel, enamelled steel, or plastic are extraordinarily expensive. Additionally, the conventional assemblies, which can be used for the above-mentioned sinks, do not ensure a reliable functioning of the overflow because in these assemblies the incorporation of clog-causing bends and cross-sectional constrictions cannot be avoided. During unclogging it is also necessary to disassemble these systems.

In order to avoid these disadvantages of the conventional drainage assembly provided for high-grade steel, enamelled steel, cast metal, and plastic sinks, attempts have been made to construct an enamelled steel basin in such a manner that it can be provided with the conventional hand basin drainage pipe, which has lateral inlet slots for the overflow water. In correspondence with this feature as provided in ceramic basins, trough-shaped channels of sheet metal have been fitted onto the external surface of the basin, to serve as overflow channels. These have been mounted in such a manner that the channel terminates below the opening in the bottom of the basin, i.e., in the region of the basin draining pipe, while the other end surrounds the overflow port at the upper rim of the basin. This channel, however, cannot be successfully connected to the sinks by welding or soldering because the remaining thermal stresses lead to cracking of the enamel. Therefore, a stitch-like mounting has been performed, spot-welding the channel to the basin at a few points. A sealing connection between the channel and the basin has been attempted by applying a thick layer of enamel and filling in the seam between the trough and the basin. It is obvious that the production of such basins is very expensive and that a not insubstantial number of sinks provided with an overflow channel in this manner are of low quality, since the tight connection between the channel and the basin by the enamelling process cannot always be attained with certainty. Furthermore, the enamel has a blister structure in many cases in the region of the connection line between the channel and the basin. In this construction of the basin, the possibility is provided to enamel the interior of the overflow channel and thus to give the same a relatively smooth interior surface; however, here again there is the danger of clogging since the quality of the enamelled area in the channel and any gaps therein cannot be subsequently determined. Therefore, such sinks are frequently destroyed prematurely because of the effects of corrosion. This error can be detected in most cases only after the basin has been in use for a longer period of time and when a hole has been produced in the wall of the basin on account of corrosion. Here again, the removal of obstructions in the pipes is difficult and must be conducted gently so that the enamel will not be damaged. Similar considerations apply in basins of cast metal. The wall of such basins, being only a few millimeters thick, does not permit the embedding of an overflow channel in the wall of the sink. If the above-mentioned overflow channels are to be employed as overflow drain devices, they must be formed and cast with the sink. These overflow channels are formed, in a similar manner as in the enamelled basin, by a trough-shaped channel externally mounted to the sink. This is difficult

to do from the standpoint of manufacture. Furthermore, with respect to the possibility of controlling the enamel layer, as well as keeping the same clean, the same difficulties and disadvantages are encountered as in steel-enamel basins. If no overflow channel is cast, then it is necessary to employ the disadvantageous special assemblies for draining the overflow water.

Summary of the invention

The invention is based on the problem of avoiding the disadvantages of the conventional drainage assemblies for sinks having an overflow device.

In order to solve this problem, an assembly is provided. In accordance with the invention, this assembly comprises a closed overflow vessel of synthetic material, of a flat cross-section, having openings therein for receiving a slotted drainage pipe and having a pipe boss for the overflow down pipe; in the region of the pipe boss, the vessel is adapted in its shape substantially to the cross section of the down pipe and continues into an annular chamber around the perforations for the pipe, which chamber surrounds the slotted region of the drainage pipe in the manner of a collar. The flow cross-section of the overflow vessel, that is, that cross-section perpendicular to the laminar flow, uniformly increases in going from the pipe boss to the slots in the drainage pipe. By the word uniformly is meant that there are never any discontinuous changes in cross-section. This is a very important feature, since such discontinuities cause clogging deposits.

In a novel construction in the drainage system, an overflow vessel of plastic is used for receiving the overflow water; the substantially vertical overflow downpipe terminates in this vessel substantially at right angles. The overflow vessel furthermore encompasses the laterally slotted region of the valve tube in the manner of a collar. Thereby, an assembly having pleasing, smooth contours is created which can be employed without sight-disturbing installations.

Since the plastic material employed for producing the overflow vessel substantially repels dirt and impurities, a clogging of the overflow downpipe or the overflow vessel is hardly possible. In this connection, knees and constrictions of the cross-section along the passage from the overflow part in the sink to the drainage pipe are, in addition, substantially avoided.

In a further modification of the invention, the cross-section traversed by the overflow water increases constantly and uniformly in the direction toward the sink valve. The suction effect created by this constant, uniform increase causes even rather large impurities to be entrained by the current, i.e., there is a continuous self-cleaning action of the overflow vessel. The constancy of increase is especially advantageous when the bottom of the basin lies substantially in the horizontal plane, since the overflow vessel produces a suction effect even when snugly mounted against the bottom of the basin. This invention is furthermore advantageous in this horizontal case, because its overflow vessel extends outwardly to where a vertical overflow downpipe can be connected. The verticality of the downpipe produces a gravitationally caused suction, while the increasing cross-section of the overflow vessel creates a geometrically caused suction where esthetic and space requirements dictate that the overflow vessel should hug closely to the horizontal bottom of the vessel.

Should clogging actually, occur, contrary to expectation, in a novel drainage assembly constructed in the above-described manner, then the assembly can be taken apart very easily and quickly, and cleaning and/or unclogging can be accomplished with few manipulations, without having to call in a plumber. A special advantage of the structure of the present invention is that the junction between the overflow vessel and the drainage pipe, thus the slots of the drain pipe, can be cleaned without the necessity of dismantling.

The novel drainage assembly of the invention is also

usable for basins made of ceramic material; the overflow channels formed previously in such basins, which extend in the interior of the basin wall and are known to be disadvantageous, are eliminated, so that thinner sink walls can be employed. Thereby, not only a substantial saving in material is attained, but the manufacture is likewise extraordinarily simplified, thus lowering the costs for ceramic sinks substantially.

An advantageous construction of the novel system is characterized, according to the invention, in that the overflow vessel consists of a lower portion and a removable lid and that several reinforcing ribs are arranged on the circumference of the openings for the lower section of the drain pipe, at least one rib being provided between the drain pipe and the pipe boss for the downpipe. This rib rests on a counter rib of the lid and has a streamlined cross-section in the direction of flow of the overflow water.

By means of this construction, a very pressure-resistant structure of the overflow vessel is attained; at the same time, the vessel can be particularly simply manufactured and, if desired, can also be disassembled, on account of its two-part construction.

The invention furthermore provides that the pipe boss for the overflow downpipe is attached to and forms one component with the lid of the overflow vessel, and that the lid has a funnel-like depression around the passage opening, for receiving a conical seal placed against the top of the lid. This construction makes it possible to ensure, with a low contact pressure, a permanent, tight connection of the device with the sink, because the conical seal, in addition to having a large contact surface, is amenable to a flush, fast attachment under small wedging forces.

The invention furthermore provides that the pipe boss attached to the lid of the overflow vessel points upwardly and receives a plastic downpipe. The plastic downpipe flares at its upper end and is closed off thereat by a removable cover. It is furthermore provided with at least one planar, reinforced side wall for junction with an overflow rosette insertable in the sink wall.

This construction of the assembly aids in avoiding expensive rectangular overflow rosettes, which are disadvantageous in their functioning and in their special cast fittings. Besides, on account of the above-described construction of the novel system of the invention, particularly the overflow downpipe, the use of simple rosettes is made possible, and sealing means are substantially reduced in number. Though, as mentioned above, the occurrence of clogging is almost impossible, the construction of the overflow downpipe of the invention is distinguished by its easy disassembly and ease of cleaning.

It is suitable to make at least the overflow vessel out of chrome-coatable polypropylene plastic or a chrome-coatable ABS plastic. This construction has the advantage that it makes possible a very simple matching of the overflow vessel to the sink drainage pipe, since the latter is very often chrome-plated. The duct adhesion occurring in plastics is thereby very much reduced. The entire system, when having a chromium-plated overflow vessel, represents in the assembled condition a component which is harmonious and of unitary construction.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings in which like reference numerals designate like parts throughout the figures thereof.

Brief description of the drawing

FIGURE 1 is an elevational section through the device of the invention and a basin to which it is attached. FIGURE 2 is a top view of the overflow vessel of the invention.

FIGURE 3 is a front view of the upper part of the invention.

Description of the preferred embodiments

In FIGURE 1, it can be seen that the device of the invention comprises an overflow vessel 1, an overflow downpipe 2 and a sink drainage pipe 3. The assembly shown here is used for a sink 4 made of steel or enamelled steel. The overflow downpipe 2 is provided with a pocket-like flaring head 5 at its upper end, as shown in FIGURE 3; the wall of this head 5 is reinforced, at least one wall, namely the one on the side of the sink, being of planar construction. The upper end of the head section 5 is closed by means of a clamping lid 6 which is mounted in a detachable manner. An overflow rosette 8 is sealingly inserted in the reinforced wall 7 with rosette abutting, via a seal 9, on the edge of the sink wall 4 which has a depression in the region of the overflow port. The lower end of the overflow downpipe 2 preferably terminates in a sealed manner, if desired with the interposition of a seal, not shown, or also, in case it need not be disassembled, by means of cementing, in an intimate contact within pipe boss 10, this pipe boss being a portion of the overflow vessel 1. In the region of the pipe boss 10, the overflow vessel 1 is adapted with respect to its cross-section substantially to the cross-section of the downpipe 2, as shown in FIGURE 2.

The overflow vessel 1 is of a two-part construction and consists of a lid 11 and a lower portion 12. The pipe boss 10 is provided in the lid 11. The lid 11 is furthermore provided with a passage opening 13 for the drainage pipe 3; the passage opening 13 is surrounded by a conically depressed region 14 of the lid, so that a likewise conically shaped seal 15 can come in flush contact therewith.

A correspondingly conically formed portion of the sink 4 abuts on the seal 15. This bulging portion of the sink 4 surrounds the outlet opening for the pipe 3. The drain pipe 3 is locked to the sink via a seal 16 by means of a flanged portion 17. A tubular section 18 follows this flange-like portion 17, the section 18 being provided, within the overflow vessel 1, with lateral inlet slots 19 for the overflow water. At the lower end, the tubular section 18 has a thread 20 to which a counternut or a sleeve 21 is attached which contacts, via seal 22, the underside of the lower wall 12 of the overflow vessel 1. The clamping connection effected by tightening the tubular section 21 of a sewer pipe connection firmly holds together the two-piece overflow vessel 1 without any further measures being needed. At the same time, this connection creates the tight connection between the drainage pipe 3, the sink 4, and the overflow vessel 1. A conical inner area 23 is provided in the tubular section 18, in the zone of the flange 17, this area serving for receiving a closing stopper or sealing cone. The inlet slots 19 for the overflow water have such a large cross-section that they do not effect constriction of the current in the flow cross-section. The overflow water flowing into the downpipe 2 through the rosette 8 is not subjected to any flow inhibition, constriction or bending when entering the overflow vessel, as can clearly be seen in FIGURE 2; rather, when the water enters the overflow vessel 1, it is subjected to a continuous increase in its flow cross-section up to the overflow slots 19, so that a suction effect is encountered under whose influence entrained dirt particles, impurities, etc., can likewise be safely discharged.

It is evident that the slot area of the drain pipe is readily accessible for cleaning, for instance, by the insertion of a brush from above into the drainage pipe.

In order to absorb with certainty the pressure upon the overflow vessel 1 necessary for producing the tight connection, there are provided in the lower portion reinforcing ribs 25 around the outlet opening 13 in the lid 11, opposed to a corresponding outlet opening 24 in the lower wall 12; at least the reinforcing rib 25a of these ribs, positioned between the outlet opening 24 and the

connecting pipe 10, is provided with a streamlined cross-section and rests on counter rib 26 of the lid 11.

The material used for manufacturing the overflow vessel is plastic, preferably polypropylene, so that the overflow vessel 1 can also be chromium-plated after its manufacture, if this is desired. When chromium-plating this component, a unitary total impression is obtained, in conjunction with the drain trap which may also be chromium-plated and the chromium-plated sink valve 3. The overflow downpipe 2 is made of the same plastic material.

Novel drainage assembly of the invention can be employed for all sinks having an overflow port.

It should be understood, of course, that the foregoing disclosure relates to only preferred embodiments of the invention and that it is intended to cover all changes and modifications of the examples of the invention herein chosen for the purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention set forth in the appended claims.

I claim:

1. A drainage and overflow device for connection to the bottom drainage opening and the overflow opening of a basin for containing liquid, comprising:
 - a drainage pipe means sealable to the bottom drainage opening of the basin to project substantially vertically downwardly from the basin;
 - an overflow vessel having in an upper wall a passage opening and in a lower wall an outlet opening, said passage and outlet openings being aligned, said overflow vessel being inserted over said drainage pipe means with said drainage pipe means extending from the basin, first through said passage opening and then through said outlet opening;
 - means to seal the interfaces between said drainage pipe means and said overflow vessel at the passage and outlet openings;
 - an overflow downpipe positioned substantially vertically;
 - means to seal communicatively said overflow downpipe to the overflow opening of the basin, said overflow downpipe sealedly and communicatively connected to said overflow vessel;
 - said drainage pipe means being slotted within said overflow vessel;
 - the flow cross-section of said overflow vessel uniformly increasing from said downpipe to the slots of said drain pipe.
2. A device as claimed in claim 1, said overflow vessel being made of plastic.
3. A device as claimed in claim 2, said plastic being a chrome-coatable polypropylene plastic.
4. A device as claimed in claim 2, said plastic being a chrome-coatable ABS (acrylonitrile-butadiene-styrene) plastic.
5. A device as claimed in claim 1, the flow cross-section of said overflow vessel uniformly and constantly increasing from said downpipe to the slots of said drainpipe.
6. A device as claimed in claim 1, for connecting to the bottom drainage opening and the overflow opening of a basin having its bottom lying substantially in a horizontal plane when mounted, the overflow vessel extending substantially in the horizontal plane, with its upper wall being substantially horizontal and containing said passage opening and with its lower wall being substantially horizontal and containing said outlet opening.
7. A device as claimed in claim 6, the flow cross-section of said overflow vessel uniformly and constantly increasing from said downpipe to the slots of said drain pipe.
8. A device as claimed in claim 6, said overflow vessel having a substantially vertically extending pipe boss; said overflow downpipe being sealedly connected to said boss.
9. A device as claimed in claim 1, said overflow vessel

surrounding said drainage pipe means annularly on the side of said drainage pipe opposite to the connection of said overflow downpipe.

10. A device as claimed in claim 1, further comprising means to connect said drainage pipe means to a sewer pipe; said drainage pipe means having a flange on its upper end; said flange being of a diameter larger than the inner diameter of the bottom drainage opening of the basin; said means to connect being operable to push on said lower wall in the direction toward said basin and pull on said drain pipe in the direction away from said basin; said overflow vessel having an internal reinforcing rib extending between said upper and lower walls and situated between said drainage pipe means and the junction of said overflow downpipe with said overflow vessel, said rib being streamlined to reduce friction to fluid flow.

11. A device as claimed in claim 10, further comprising resilient annular seals insertable around said drainage pipe and between said basin and the flange of said drainage pipe and between said basin and said upper wall of said overflow vessel; said means to connect forcing said flange and said upper wall into sealing contact with said annular seals.

12. A device as claimed in claim 10, said overflow vessel comprising a lid containing said upper wall and

a lower portion containing said lower wall, said rib comprising two mutually abutting parts, one integral with the lid, the other integral with the lower portion.

13. A device as claimed in claim 1, said overflow downpipe being made of plastic.

14. A device as claimed in claim 13, said overflow downpipe being internally widened at its upper end and having an openable cover at its upper end.

15. A device as claimed in claim 13, said overflow downpipe being reinforced in the region of its communicative sealing to the overflow opening of the basin.

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