

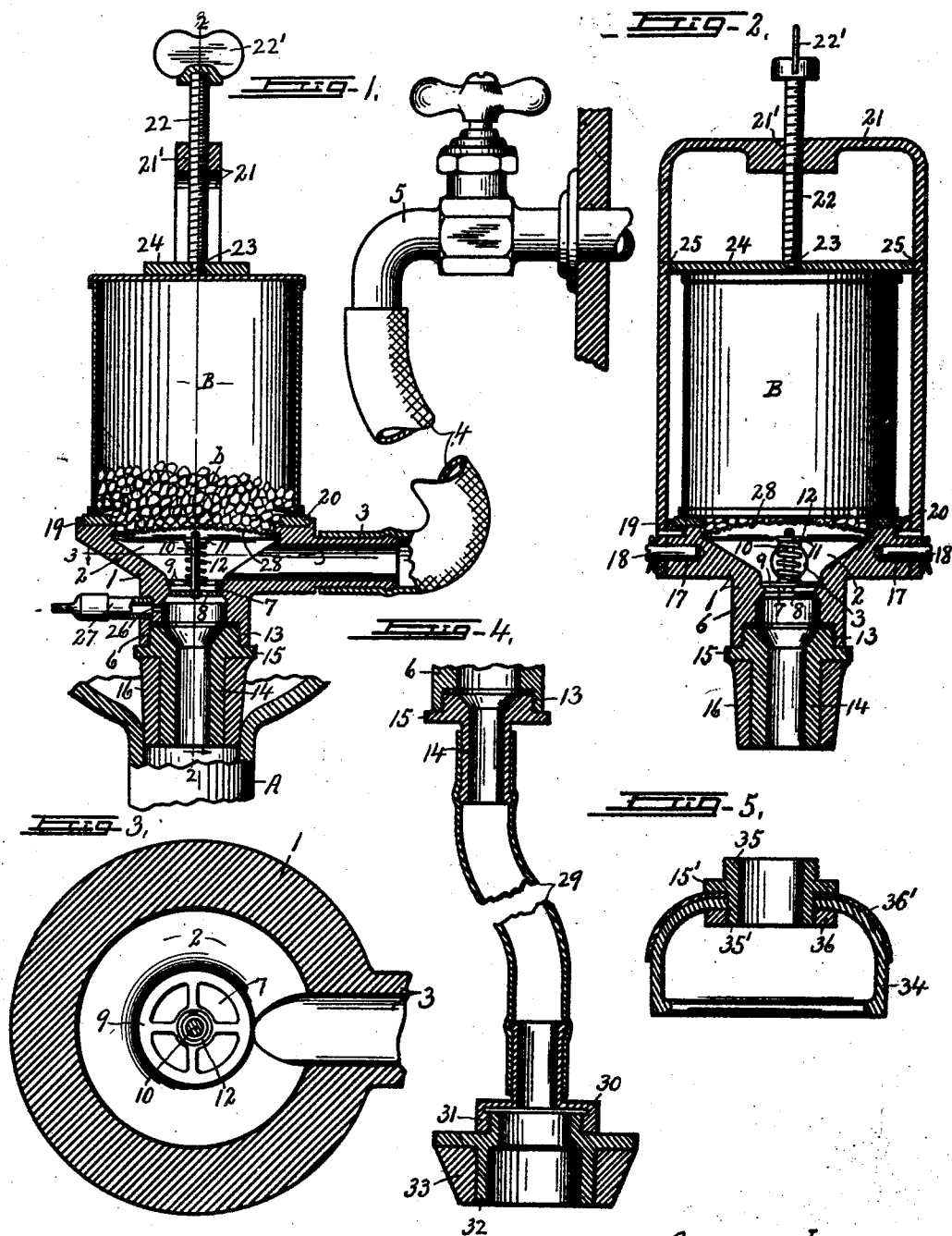
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C. J. B. BORGESON

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APPARATUS FOR CLEANING WASTE PIPES OF SINKS, ETC

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WITNESS
H. L. Meade.

INVENTOR
C. J. B. Borgeson
By
DENISON & HENNINGSON
ATTORNEYS

UNITED STATES PATENT OFFICE

CHARLES J. B. BORGESON, OF SYRACUSE, NEW YORK

APPARATUS FOR CLEANING WASTE PIPES OF SINKS, ETC.

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This invention relates to apparatus for cleaning waste pipes of sinks, closet bowls and analogous fixtures and is adapted to be connected to a water faucet or other available source of fluid supply under pressure projected through the waste pipe, together with a solvent or other detergent for removing solid matter which may tend to collect on the inner surfaces of the pipe or other fixture.

It is well-known that many of these outlets and waste pipes leading from sinks, toilet bowls and the like, frequently become more or less clogged with grease, lint, lime and other solid contents in the water or other fluid passing through the pipes, and that in many instances, powerful solvents are required to remove these solids and allow them to be flushed from the pipes by water or other fluid under pressure. Many of these powerful solvents are manufactured and sold in crystal or powdered form and are put up in hermetically sealed cans of conveniently portable size for household use to protect the same against contact with external air and moisture and also to prevent the escape of gases and other fumes which are more or less poisonous, or at least irritating when coming in contact with the skin or flesh of the user. The main object of the present invention is to provide simple and efficient means whereby the contents of these cans, together with a stream of water or other suitable fluid, may be projected simultaneously into a drainage outlet or waste pipe with a minimum consumption of time and labor and without liability of any of the fumes or poisonous gases of the solvent escaping into the room or coming in contact with any of the physical elements or clothing of the user.

Another object is to render the device applicable for use in connection with drainage outlets of various sizes and of different fixtures.

A further object is to provide the device with a mixing chamber communicating with the interior of the can and with a source of water supply, both leading to a common outlet extension which, when applied to the outlet or pipe to form a fluid-tight joint

therewith, will allow the mixture to flow directly into said outlet or pipe without liability of any part thereof or the fumes therefrom escaping into the ambient atmosphere.

Other objects and uses relating to specific parts of the apparatus, will be brought out in the following description:

In the drawings:—

Figure 1 is a vertical sectional view, partly in elevation, of an apparatus embodying the various features of my invention, and including a portion of a drainage outlet and pipe to which the apparatus is attached and also showing a water supply pipe, partly broken away, connected to an ordinary water faucet.

Figure 2 is a vertical sectional view of the same apparatus, taken in the plane of line 2—2, Figure 1.

Figure 3 is an enlarged horizontal sectional view taken in the plane of line 3—3, Figure 1.

Figure 4 is a sectional view, partly broken away, of an attachment adapted to be used with the apparatus shown in Figures 1 and 2 for supplying the solvent mixture to fixtures more or less remote from the source of supply.

Figure 5 is a detail sectional view of another attachment adapted to be used with the same apparatus for directing the mixture into the drainage outlets of toilet bowls and the like.

As illustrated, this apparatus comprises a valve case —1—, having its upper end enlarged and provided with a mixing chamber —2— which is preferably conical or hopper-shaped, one side of the enlarged upper end of the valve case being provided with a radially projecting inlet nipple —3— to which is connected one end of a flexible pipe or hose —4— having its other end connected to an ordinary water faucet —5—, or other source of fluid supply under pressure.

The lower reduced portion of the valve case —1— forms what may be termed an outlet nipple or extension —6— having an opening therethrough connected with the mixing chamber —2— through the medium of a port

—7— which is controlled by a valve —8— shown more clearly in Figures 1 and 2.

A screen or similar apertured plate —9—, is seated in a suitable annular recess in the apex of the mixing chamber —2— closely adjacent the port —7— and just above the valve —8— to allow the mixture to pass from the mixing chamber —2— through the outlet opening in the nipple —6— when the valve —8— is opened.

The valve —8— is provided with an upwardly projecting stem —10— having its upper end provided with a shoulder —11— for engaging the upper end of a spring —12— having its lower end normally resting upon the plate —9— for yieldingly holding the valve —8— in its closed position. That is, the valve —8— closes against its seat by upward movement, due to the action of the spring —12— which is of sufficient tension to overcome the weight of the valve —8— and its stem —10—, but on the other hand, is sufficiently light to allow the valve to be automatically opened by the pressure of the water and solvent in the mixing chamber —2—.

The lower end of the outlet nipple —6— is provided with an internally threaded socket —13—, some distance below the valve —8— for receiving the upper externally threaded end of a coupling —14— having an annular flange —15— adapted to abut tightly against the lower end of the outlet nipple —6— when the coupling member —14— is screwed in place upon said nipple.

This coupling member —14— is provided with a central lengthwise opening there-through, communicating with the opening in the outlet nipple —6—, said coupling having its lower end reduced in diameter for receiving a sleeve —16— of resilient material such as soft rubber, cork or equivalent substance, the outer surface of the sleeve —16— being frusto-conical or tapered from the top downwardly so as to fit snugly within the outlet opening of a drainage pipe or conduit —A— when the apparatus is applied to the drainage outlet or pipe as shown in Figure 1.

The upper enlarged end of the valve case —1— is provided with diametrically opposite radial sockets —17— for receiving a pair of anchor pins —18— projecting radially from the periphery of the valve case and upon which is mounted the lower ends of an inverted U-shaped yoke —21— which extends upwardly from the valve case a distance somewhat greater than the height of the can, as —B—, containing the solvent or other refuse-disintegrating material.

The enlarged end of the valve case —1— is provided in its upper end with a relatively shallow annular socket —19— of somewhat greater diameter than the can —B— for receiving and supporting a packing ring —20— of rubber or other suitable alkali-resisting material, said packing ring or gasket being of

sufficient thickness to project slightly above the annular flange surrounding the socket —19— to allow the adjacent end of the can to rest firmly thereon without contact with the metal valve case.

Suitable means is provided for firmly clamping the then opened inner or lower end of the can —B— against the packing ring —20—, and for this purpose, the upper cross bar of the U-shaped yoke —21— is provided with a central threaded aperture —21'— adapted to be engaged by a hand-operated screw —22— which extends some distance above and below the cross bar of the yoke and has its upper end provided with a handle —22'— by which it may be turned in the threaded socket-opening —21'—.

The lower end of the screw —22— is swiveled at —23— to the central portion of a follower plate —24— which is adapted to engage the outer or upper end of the can as shown in Figures 1 and 2.

The diametrically opposite sides of the follower plate —24— are provided with recesses —25— for receiving the adjacent arms of the yoke —21— to hold the follower against relative rotary movement while the same is being tightened upon and released from the adjacent end of the can —B—.

The outlet nipple —6— is provided with an additional inlet —26— for receiving fluid under pressure, said inlet being located between the valve —8— and coupling member —14—. A suitable valve —27— of the conventional tire-valve type is secured to the side of the outlet nipple —6— adjacent the inlet opening —26— to communicate therewith and is adapted to be connected to any conventional form of booster for projecting air or liquid into the waste pipe below the valve —8— under abnormally high pressure to assist in dislodging any solids which may tend to accumulate in said outlet.

A screen or foraminous plate —28— is placed within the mixing chamber —2— to extend across the entire area of the upper end thereof for preventing excessive precipitation of the crystals or powder from the can —B— into said chamber, but at the same time, allowing a gradual drop of said crystals or powder into the mixing chamber, particularly when partially dissolved by contact with the water or other liquid entering said chamber through the supply pipe —4—.

In Figure 4 is shown an attachment for the valve case —1— shown in Figures 1 and 2 and consisting of a flexible hose —29— having one end telescopically fitted upon the reduced end of the coupling member —14— and its other end telescopically fitted upon the reduced end of a coupling nipple —30— having an internally threaded socket —31— similar to the threaded socket —13— in the nipple —6— of the valve case —1— for receiving the reduced threaded end of a cou-

pling member —32— having a tapered packing ring or gasket —33—.

The coupling —14— on the upper end of the flexible hose —29— is quite similar to the coupling member —14— shown in Figures 1 and 2 in that it is interchangeable therewith.

The threaded connections between the coupling —30— and plug —32— is also similar to the threaded connections between the nipple —6— and coupling —14— shown in Figures 1 and 2 so that the plug —32— with its gasket —33— may be removed from the coupling —30— and applied directly to the nipple —6— if desired.

The flexible hose —29— may be of any practicable length to enable the plug —32— to be used in the outlets of sinks or toilet bowls more or less remote from the valve case —1—; that is, the coupling —14— with the gasket —16— thereon may be removed from the nipple —6— and replaced by the coupling —14— on the upper end of the flexible hose —29— carrying the parts —32— and —33— for use in cleansing larger drainage outlets.

In Figure 5 is shown what is commonly known as a vacuum cup —34— having a metallic reinforcement —36'—, both of which are secured to a coupling —35— having a reduced threaded upper end similar to the threaded upper end of the coupling —14— shown in Figures 1 and 2 so that it may be interchanged therewith. It will be observed, however, that the coupling —35— is provided with a reduced externally threaded lower end —35'— for receiving a nut —36— between which and the flange —15'— is clamped the adjacent portion of the vacuum cup —34— and reinforcement —36'—, the cup —34— being preferably made of soft rubber or equivalent material to fit snugly against the fixture around the drainage outlet.

The can —B— is preferably of a conventional type made of tin or other suitable material and has one or both ends provided with removable closures or, at least capable of being easily or quickly opened to allow the contents to be displaced therefrom, the closure of one end of the can shown in Figures 1 and 2 being shown as removed.

Operation

When it is desired to use the apparatus for cleansing a drainage outlet or pipe, the can containing the solvent is placed in an upright position upon any suitable support and its upper end is then opened by any suitable instrument leaving the marginal walls of the opening in their original smooth flat plane.

Immediately following the opening of the can the apparatus, unattached to either the faucet —5— or drainage outlet —A—, is held by hand or otherwise in an inverted position

with the gasket —20— and follower —24— in substantially horizontal parallel planes.

The follower —24— will have been preferably adjusted by the screw —22— a sufficient distance from the gasket —20— to permit the can to be placed in the intervening space with its closed lower end resting upon the follower and its open upper end facing the gasket —20— in which position the can will be substantially co-axial with the screw —22— and outlet of the valve case —1— with the rim of its open end in position to engage said gasket at all points throughout its circumference.

The screw —22— and its follower —24— are then adjusted to firmly clamp the can endwise between the follower —24— and gasket —20— to form a liquid and gas tight joint between the open end of the can and valve case —1—, it being understood that the open end of the can will then register with the mixing chamber —2—.

The apparatus with the can clamped therein is then restored to its upright position with the outlet nipple —6— at the bottom and the open end of the can facing downwardly. Under these conditions the contents as —b— of the can —B— will be temporarily held against undue downward displacement by the screen —28— or, if any of the contents of the can should pass through the screen it will be held against passing into the outlet by the valve —8— and spring —12— which is of sufficient tension to hold the valve closed until opened by the water under pressure admitted through the inlet —3—.

The hose or pipe —4— which has been previously connected to the inlet —3— is then attached to the faucet —5— or other source of water supply while the faucet still remains closed, after which the coupling —14— and its packing —16— constituting a plug is tightly fitted in the mouth of the drainage outlet —A— to form a liquid and gas tight joint therewith.

The faucet —5— may then be opened to allow the water to flow into the mixing chamber —2— to contact with the contents of the can —B— through the screen —28—, thereby causing a mixture of the water and solvent contents of the can in the mixing chamber —2—.

The water pressure admitted to the mixing chamber is sufficient to open the valve —8— against the action of its spring —12— to allow the mixture to flow under pressure from the mixing chamber —2— through the outlet of the valve case and thence into the drainage outlet —A— for effecting a thorough cleansing of any solids which may have accumulated in the drainage outlet or pipe leading therefrom.

It will be observed that during this discharge of the mixture from the mixing chamber —2— into the drainage outlet, all

joints between said outlet and open end of the can will be tightly closed to prevent the escape of any fumes or gases, resulting from the dissolution of the contents of the can —B—, into the room in which the apparatus is used.

In case the water pressure from the faucet and solvent liberated from the container into the drainage outlet is insufficient to dislodge any solids which may have accumulated within the outlet, a source of air or liquid supply under relatively higher pressure than that from the faucet may be connected to the supplemental valve —27— to act as a booster for projecting said air or liquid into the outlet to further assist the solvent in disintegrating and removing such solid, it being understood that when the booster pressure is removed from the valve, the latter will be closed automatically by the check valve (not shown) contained therein, thereby preventing the escape of gases or liquid through such supplemental inlet under normal operation of the apparatus.

The operation of liberating and projecting the solvent and water through the drainage outlet may be continued until the can is wholly or partly emptied, depending upon the effect of the mixture upon the accumulations within the drainage outlet.

When the operation is finished, the valve of the faucet —5— may be closed and the hose —4— disconnected therefrom, at which time the apparatus may be removed from the outlet and reinverted and the screw —22— and its follower —24— loosened to permit the removal of the more or less empty can —B— ready for a repetition of the cleansing operation.

What I claim is:—

1. An apparatus for cleansing the drainage outlets of sinks, toilet bowls and the like, comprising a valve case having a mixing chamber provided with a fluid inlet and an outlet, said mixing chamber being also provided with an inlet for receiving a solvent adapted to mix the fluid in the mixing chamber so that the mixture may be discharged through the outlet, means for attaching the fluid inlet to a source of fluid supply under pressure, means for attaching the outlet of the valve case to the drainage outlet to be cleansed, and a valve controlling the passage of the mixture from the mixing chamber to the outlet of the valve case.

2. An apparatus for cleansing the drainage outlets of sinks, toilet bowls and the like, comprising a valve case having a mixing chamber provided with a fluid inlet and an outlet, said mixing chamber being also provided with an inlet for receiving a solvent adapted to mix with the fluid in the mixing chamber so that the mixture may be discharged through the outlet, means for attaching the fluid inlet to a source of fluid supply

under pressure, means for attaching the outlet of the valve case to the drainage outlet to be cleansed, and a self-closing valve controlling the passage of the mixture from the mixing chamber to the outlet and adapted to be opened in the direction of said outlet by pressure of the fluid in the mixing chamber.

3. An apparatus for cleaning drainage outlets as in claim 1, in which the outlet of the valve case is provided with a supplemental inlet for connection with a source of fluid pressure relatively greater than that in the inlet leading to the mixing chamber.

4. An apparatus for cleaning drainage outlets as in claim 1, in which a conduit is releasably connected to the outlet of the valve case and provided with a resilient gasket adapted to close the drainage outlet.

5. An apparatus for cleaning drainage outlets as in claim 1, in which a screen partition is extended across the solvent inlet of the valve case.

6. An apparatus for cleansing drainage outlets as in claim 1, in which the end of the valve case having the solvent inlet is provided with a seat surrounding said solvent inlet and against which the open end of the can containing the solvent is adapted to rest.

7. An apparatus for cleansing drainage outlets as in claim 1, in which the end of the valve case having the solvent inlet is provided with a seat surrounding said solvent inlet and against which the open end of the can containing the solvent is adapted to rest, and means attached to the valve case for forcing the can against its seat.

8. In an apparatus for cleansing the drainage outlets of sinks, toilet bowls and the like, the combination with a valve case having a mixing chamber provided with a fluid inlet and an outlet, said mixing chamber having an inlet in one end for receiving a solvent to mix with the inflowing fluid, means for attaching the outlet of the valve case to the drainage outlet to form a liquid and gas tight connection therewith, means for connecting the fluid inlet of the valve case to a source of fluid supply under pressure, a gasket mounted on the first-named end of the valve case to surround the solvent inlet and to form a seat for the open end of a solvent-containing can, and means mounted on the valve case for forcing the open end of the can against the gasket to form a gas and liquid tight joint therewith.

In witness whereof I have hereunto set my hand this 26th day of February, 1931.

CHARLES J. B. BORGESON.