My present invention is directed to improved valves for outlets of receptacles and operating mechanism therefor.

An essential of the invention resides in a valve equipped with a valve member and operating mechanism therefor, whereby the valve member is moved toward and to its closing position in a direction transversely of the direction of opening of the outlet of the receptacle. Such relationship of the movable valve member affords a self-cleaning action relative to the opening, in that the closing movement of the movable valve member insures the removal of any lint, soap residue, surface accumulation, etc., incident to use of the tub or other receptacle.

In the preferred forms of my invention, the movable valve member comprises a plate portion, which may be substantially flat, the effective faces of the outlet being substantially flat, and appurtenant elements associated with the plate portion of the movable valve member for increasing the degree of frictional engagement of the same with the effective faces of the outlet as the valve member is moved toward its closed position.

In the more preferred forms of my invention, the plate portion of the movable valve member is provided with wedge or cam-like flanges cooperating with guide means having slots or corresponding wedge or cam contour, such guide means terminating at a location anterior of the position of the valve member when in its closed position, thus affording a clearance in the guide means beyond its stated termination, thus enabling the movable valve member to project through such clearance, for compensation of wear, varied degree of friction between the movable valve member and the faces of the outlet, and other self-compensating purposes.

Fig. 1 is a detail vertical section of a tub equipped with a preferred form of my invention.

Fig. 2 is a sectional elevation on line 2—2 of Fig. 1.

Fig. 3 is a sectional elevation on line 3—3 of Fig. 1.

Fig. 4 is a detail elevation as viewed from line 4—4 of Fig. 3.

Referring to Figs. 1, 2, 3 and 4 of the drawings, the embodiment is exemplified as a control valve for a tub 10 having a bottom outtake 11 and an overflow outtake 12.

The tub indicated in the drawings is representative of other types of receptacles, particularly having an overflow discharge, such as lavatories, laundry tubs, sinks, industrial and other tanks, etc.

In the embodiment shown in Figs. 1, 2 and 3 the outtake 11 is shown disposed to have its lower edge coincident with the face of the bottom 16 of the receptacle 10, the axis of the opening 11 extending substantially horizontally, thus affording drainage to a maximum of the receptacle 10 in a horizontal direction.

A strainer plate 13 is preferably located within the receptacle 10, whereby any articles and/or foreign matter are readily accessible.

The control valve embodied in my invention, as shown in Figs. 1, 2 and 3, embodies a movable valve member 14 suitably mounted in proper guide means with respect to the effective discharge opening of the receptacle, in this instance the discharge opening of the nipple 16, suitably connected for communication with the discharge opening 11 of the receptacle 10. Such movable valve member 14 is illustrated as having an effective closure in the form of a plate and coordinated with suitable operating means, generally designated 17, provided with an accessible handle 18.

Advantageously, the nipple 16 is unitarily mounted in connection with the strainer plate 13 on opposing sides of the rim of the outtake 11, as by means of a set screw 19 the stem of which passes through a suitable opening 13a, see Fig. 4, of the strainer plate 13, and a spider element 20 having its central boss tapped to receive the thread of the set screw 19.

Preferably, the guide means, see 21, 21, Fig. 2, and the movable valve member 14 are related in wedge-like or cam-like manner to one another, whereby upon closing movement of the movable valve member 14 the effective face of the same 40 is brought in increasing frictional relation with the rim edges of the outtake 11.

The movement of the movable valve member 14 is preferably in a general vertical plane, thus enabling the nipple 16 and the effective opening 45 of the receptacle to be also located to have a horizontally directed outflow.

Specifically, the member 14 has flanges 14a, extending rearwardly at its opposite vertical edges relative to the effective face of its closure 50 plate, which flanges 14a are of wedge formation and taper downwardly, and the guide means 21, 21, for the respective flanges 14a have open-sided slots which taper downwardly.

The movable valve member 14 and its handle—
Interconnecting linkage 17 are advantageously disposed within the outflow passage means of the overflow opening 12 of the receptacle; such interconnecting linkage are located from the mouth of the overflow 12 to the trapway 25, thus serving as a common discharge for the bottom opening 11 and overflow opening 12. Such tube lengths are advantageously screw-threaded related to one another and to the nipple 16, which may also be of screw-threaded component parts, and screw-threaded related to the strainer plate 23 of the overflow opening 12; in such instance, the strainer plate may have a cylindrical flange 23a, the peripheral projecting end of which is threaded for threaded connection with the rim 14a of the receptacle, i.e., hub section 24. A gasket 25 is advantageously interposed between the rim 14a and the flange 23a jointly with the edge of the overflow opening 12. Gaskets are provided for at the respective screw threaded joints, as indicated in the drawings.

The linkage between the shaft 22 and the movable valve member 14 may be of any suitable character. Conveniently, cam actuation desirable for such form of linkage is had by bending the free end 22a of the shaft and pivotally connecting thereby to a link 25, secured by a cotter pin connection indicated at 27, and provided an eye or equivalent 26a at the lower end of the link for pivotal connection with a stud 28 secured to the back of the movable valve plate 14, secured, say, by a cotter pin connection indicated at 29. According to rotation of the handle 16 and the body of its shaft 22, its cam end 22a effects the raising of the link 26, thereby raising the movable valve member 14 in its guide members 21, 21, whereby the effective discharge opening 15 of the receptacle 10 is moved to its full open position.

The straight dash outline 17a indicates the maximum upward position of the linkage 17 and the dot and dash outline of the movable valve member 14a indicates its uppermost position, at which position the opening 15 of the receptacle 10 is wholly open, in such fully open position, the linkage, and therewith the closure member, are held automatically by the stated cam formation and bend 17a of the link 26.

The trapway 25 is connected to any suitable soil or waste piping of a plumbing system, embossing proper venting of the stated parts.

An essential advantage attained by the invention resides in the "shearing" action effected by the stated movable valve member relative to the edges of the discharge opening, thus automatically clearing the discharge opening of all obstruction.

The above or equivalent arrangement results in closure means for a receptacle wherein wear of the parts incident to use is automatically compensated. Such advantage results from the wedge-like or cam-like relationship of the movable valve member comprising a plate formation and the co-action therewith of appropriate guide means effective upon the closing movement of the movable valve member to increase the frictional engagement of the same with the edges of the discharge opening. Such relationship is enhanced by the provision of the stated tapered flange formation provided for the movable valve member and a correspondingly tapered guide therefor. Such relationship is further enhanced in the illustrated embodiment by terminating the lowest portions of the guide means at a location above the lower edge of the discharge opening.

The invention offers the further advantage that the movable valve member and its handle-interconnecting linkage are disposed in zones which are not fouled incident to the use of the receptacle, that is to say, the movable valve member 14, the linkage 17 and the operating shaft 22 are located within the passage means 24 which during the stage of open position of the movable valve member is fully sared as well as being concealed.

The particular assembly of the movable valve member, its linkage 17 and its operating shaft 22, inclusive of its cam end formation 22a, affords the mounting of the shaft 22 and therewith the handle 16 through the overflow opening 12 of the receptacle, and further moving the stated parts to be readily withdrawn through the overflow opening 12 for inspection and/or repair.

From the above, it is apparent that the movement of the movable valve member toward and to its closed position effects a shearing of the faces of the outlet by the plate portion of the movable valve member. An effective assembly is had by a substantially flat plate portion of the movable element and substantially uni-planar faces of the outlet, whereby the movement of the movable valve member provides for such shearing action over an appreciable extent of movement of the valve member toward its closed position. For simplicity of assembly and disassembly, the pivotal connection, see eye 26a, receiving the stud 28 and cotter pin connection 29, may have considerable "lost motion" and at the same time insure a full seating of the plate portion with respect to the faces of the outlet with the movable valve member when moved to its closed position, and irrespective of the wear of the stated parts.

I claim:

1. In combination with a receptacle having a lowerly disposed outlet with its lower edge coincident with the face of the bottom of the receptacle and an upwardly disposed outlet, valve means for the lowerly disposed outlet, said lowerly disposed outlet having a face about its opening of substantially uniplanar formation, said valve means including a member having a substantially uniplanar face portion for co-action with the uniplanar face portion of the lowerly disposed outlet, guide means cooperating with said movable valve member, operating linkages extending through the upwardly disposed outlet of the receptacle for member to and from its closed position, and passage means communicatively connecting the upwardly disposed outlet and the lowerly disposed outlet with a common discharge, said passage means serving to house said linkage and said movable valve member.

2. In combination with a receptacle having a lowerly disposed outlet with its lower edge coincident with the face of the bottom of the receptacle, and an upwardly disposed outlet, valve means for the lowerly disposed outlet, said lowerly disposed outlet having a face about its opening of substantially uniplanar formation, said valve means including a member having a substantially uniplanar face portion for co-action
with the uniplanar face portion of the lowerly disposed outlet, guide means cooperating with said movable valve member, operating linkage extending through the upwardly disposed outlet of the receptacle for moving said valve member to and from its closed position, passage means communicatively connecting the upwardly disposed outlet and the lowerly disposed outlet with a common discharge, said passage means serving to house said linkage and said movable valve member, and a strainer plate for said lowerly disposed outlet located within said receptacle whereby any articles of foreign matter within the said outlet are readily accessible for removal.

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