Sept. 27, 1966 D. M. VENISON ETAL 3,274,622

HOUSEHOLD AND OTHER REFUSE STORAGE AND DISPOSAL APPARATUS

Filed Nov. 21, 1963 5 Sheets-Sheet 1

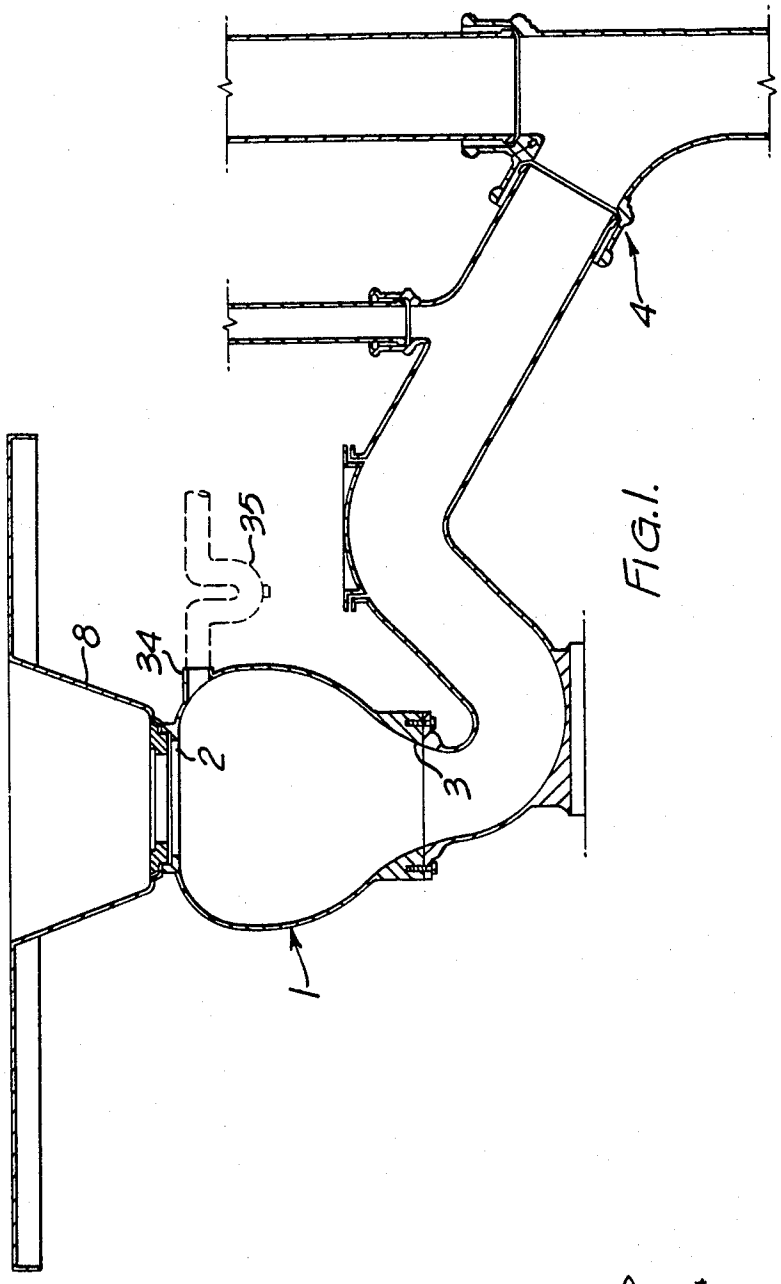


FIG. 1.

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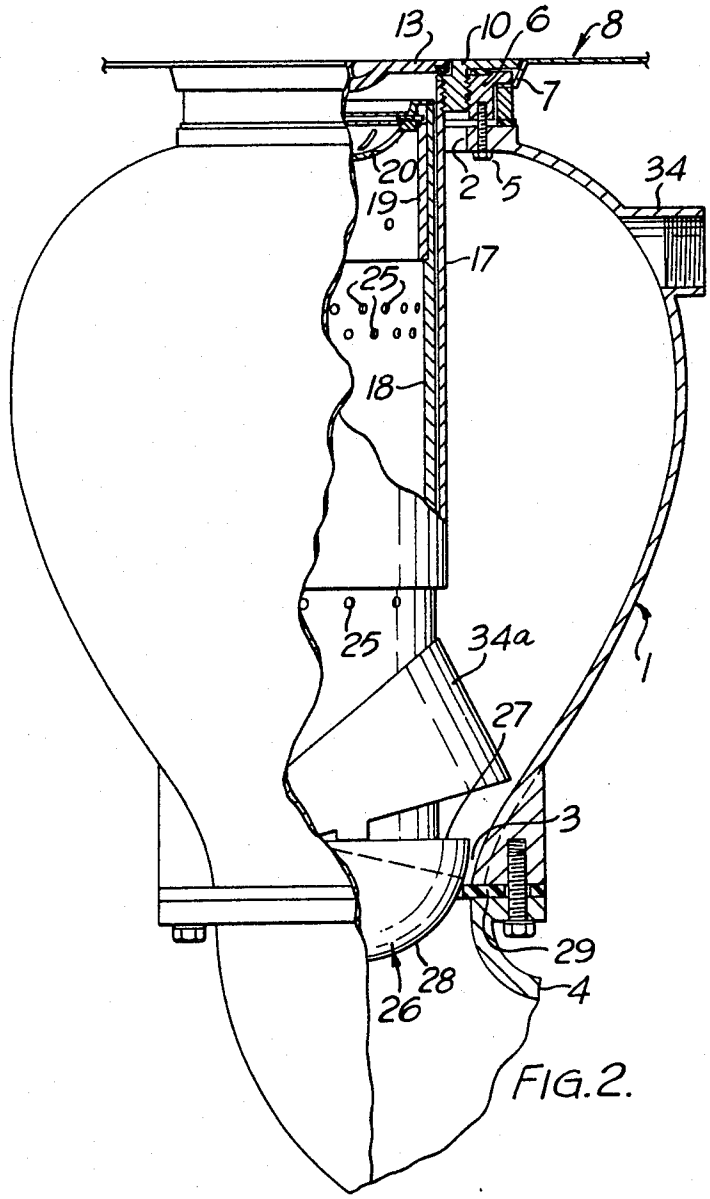


FIG. 2.

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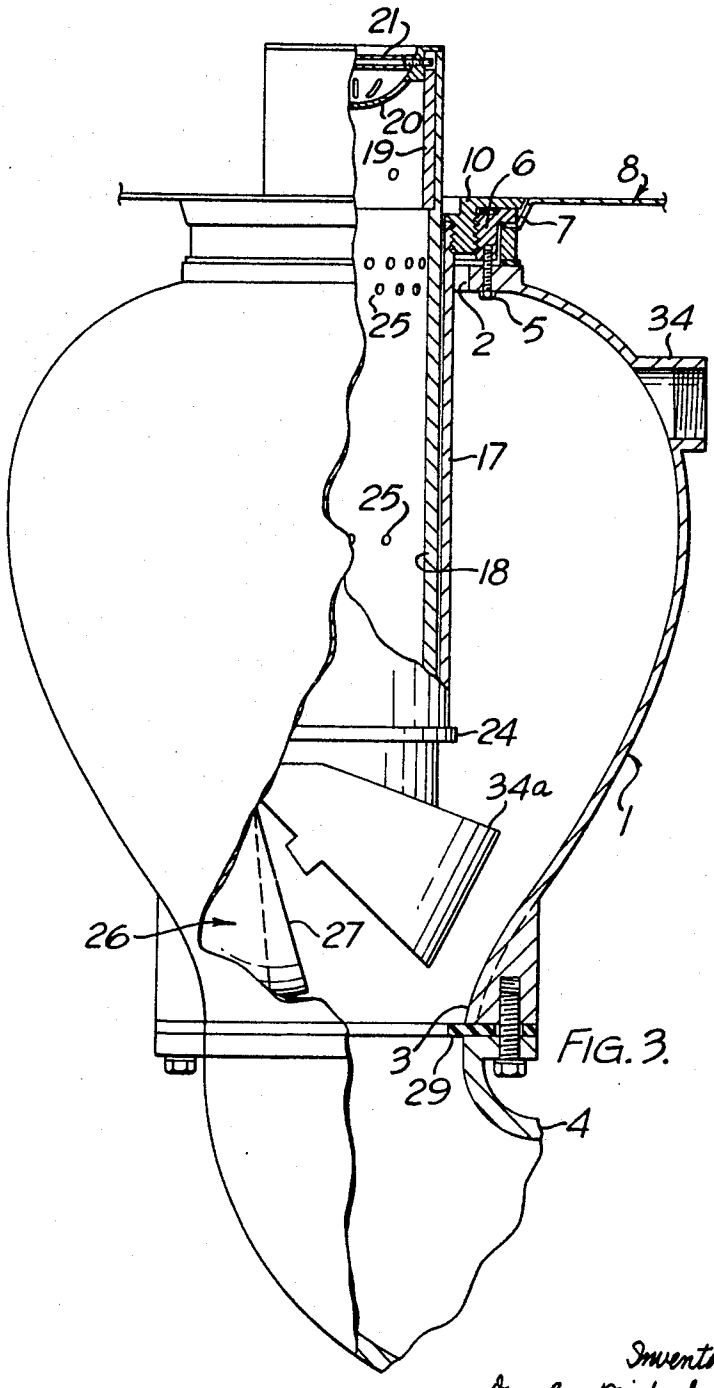


FIG. 3.

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HOUSEHOLD AND OTHER REFUSE STORAGE AND DISPOSAL APPARATUS

Filed Nov. 21, 1963 5 Sheets-Sheet 4

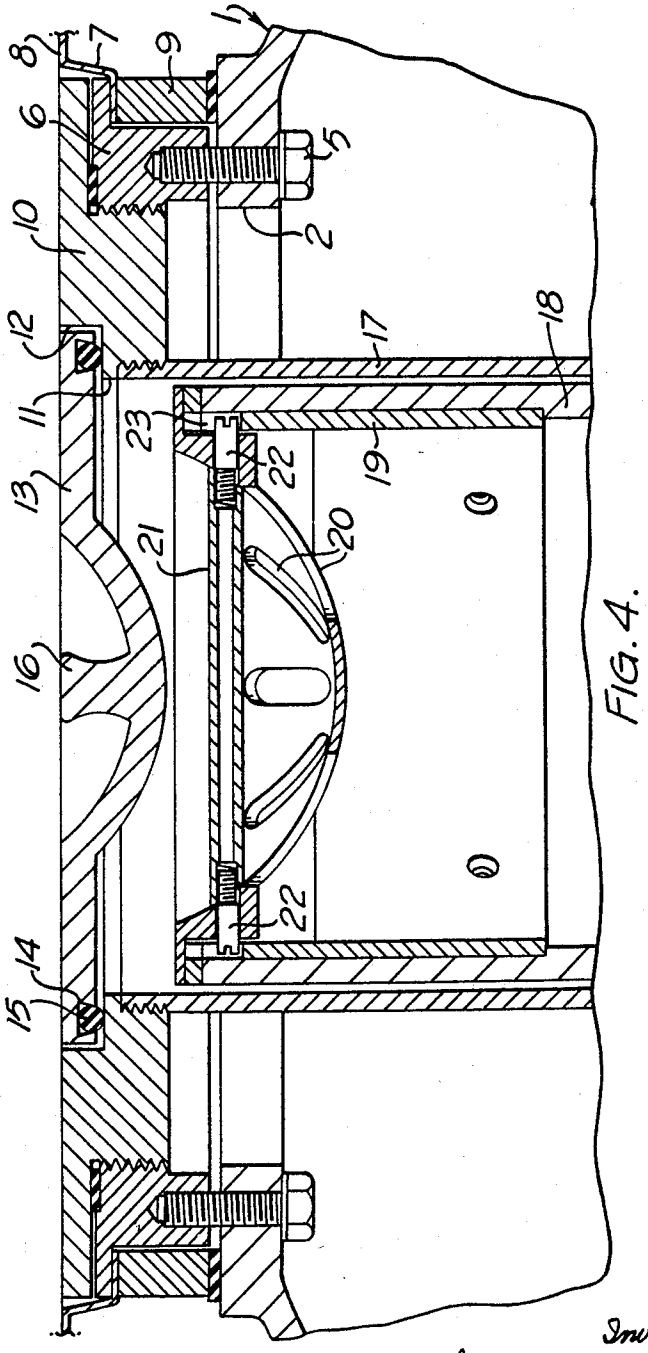


FIG. 4.

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HOUSEHOLD AND OTHER REFUSE STORAGE AND DISPOSAL APPARATUS

Filed Nov. 21, 1963 5 Sheets-Sheet 5

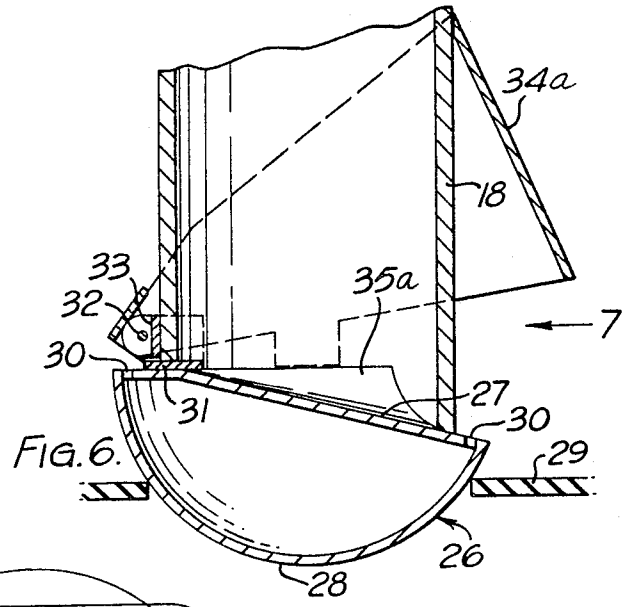


FIG. 6.

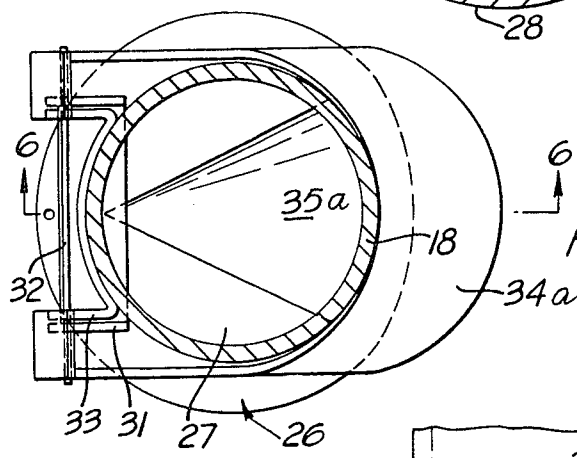


FIG. 5.

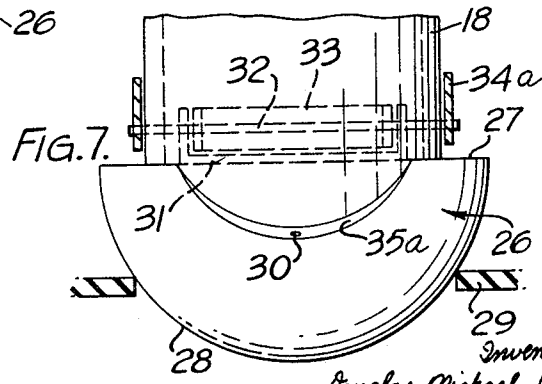


FIG. 7.

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HOUSEHOLD AND OTHER REFUSE STORAGE AND DISPOSAL APPARATUS

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Filed Nov. 21, 1963, Ser. No. 325,311

11 Claims. (Cl. 4—287)

This invention relates to household and other refuse storage and disposal apparatus of the kind which are adapted to be fitted to a kitchen sink or other fixture and operated by flushing water or other liquid.

Such apparatus is generally installed in buildings, particularly blocks of flats, or on housing estates and is connected through a pipework system to a central collecting, treating and disposal plant usually arranged remote from the building or buildings.

Known apparatus of this kind, among other things, suffer from the disadvantage that the size of the refuse placed therein by the user cannot be properly controlled, with the result that the outlet of the container and/or the pipework tends to become blocked. Although in known apparatus of this kind means are generally provided to limit the size of the refuse, such means can be misused since it is possible for the user to remove them without undue trouble.

A further disadvantage of known apparatus is that, due to its construction and operation, it is not possible to control the ratio of refuse to water with the result that, where the precentage of refuse is too great, blockages are liable to occur since there is insufficient water to carry the refuse away.

A still further disadvantage is that known apparatus of this kind usually employ, as the closure means for the outlet of the apparatus, a plunger having a peripheral rubber sealing ring which is forced into the outlet. Such closure means suffer from the disadvantage that the plunger is liable to stick in the outlet or becomes worn with the result that it does not provide a proper seal. Furthermore, as the plunger is liable to stick in the outlet, should back pressure occur in the pipework of the disposal plant, it is likely that the plunger and other parts of the apparatus could be blown out of the sink and thus become a danger to the user.

It is among the objects of the present invention to avoid, or substantially reduce, these and other disadvantages of known apparatus of this kind, and to provide a simple and efficient apparatus which is far less troublesome to the user.

According to the present invention, there is provided a refuse storage and disposal unit of the kind adapted to be fitted to a kitchen sink or other fixture, comprising an outer chamber for receiving waste liquid and having an inlet opening for connection to the sink outlet and an outlet opening for connection to the pipework of a disposal plant, valve means for normally preventing the escape of liquid through the outlet opening and for retaining a quantity of liquid in the chamber, an open ended cylinder arranged for communication with the sink outlet to receive both waste liquid and solid refuse, said cylinder being provided with aperture so that the bulk of the waste liquid can pass therethrough into the chamber and with closure means associated with its lower end so that solid refuse is normally retained therein, and means for actuating the valve means and the closure means to release the solid refuse simultaneously with the waste liquid to effect disposal thereof.

The invention is illustrated by way of example in the accompanying drawings in which,

FIGURE 1 is a schematic section showing a refuse storage and disposal unit according to the present invention in position in a refuse disposal system.

FIGURE 2 is a section, partly in elevation, of the unit according to the invention in which the parts thereof are in their normal position of use,

FIGURE 3 is a view corresponding to that of FIGURE 2 showing the position of the parts of the unit when effecting disposal of the stored refuse,

FIGURE 4 is a detail section, on an enlarged scale, of the upper part of the unit,

FIGURE 5 is a plan view of the lower part of the unit incorporating the sealing valve,

FIGURE 6 is a section on the line **6—6** of FIGURE 5, and

FIGURE 7 is an elevation in the direction of the arrow **7** of FIGURE 6 with the visor cut away for clarity.

Referring to the drawings, the storage and disposal unit comprises an outer bowl or container **1** having a central inlet opening **2** at its upper end and an outlet opening **3** at its lower end, which opening **3** is adapted to communicate with the pipework **4** of a refuse collecting, treating and disposal plant situated in a position remote from the apparatus.

The bowl **1** is secured, as by bolts **5**, to a flanged supporting ring **6** adapted to be received in a recessed drainage outlet **7** of a sink or other fixture **8**. As can be seen from FIGURE 4, the flange of the member **6** bears on the upper surface of the drainage outlet **7** and a ring **9** extends between the under-surface of the drainage outlet **7** and the bowl **1** so that when the bolts **5** are tightened the sink **8** and the bowl **1** are securely fixed together. An annular supporting frame **10** is fixed, as by screw-threading in the ring **6** and is provided with a central bore **11** and a counterbore **12**.

The counterbore **12** is arranged to receive a plug member **13** which is provided on its under-surface, near its outer periphery, with a groove **14** of dovetailed cross-section in which groove is secured an O ring **15**. The O ring **15** is arranged to bear on the flat surface of the counterbore **12** and effects a seal by virtue of its own weight. The effectiveness of the seal is increased as the amount of water in the sink increases. The plug member **13** is further provided with a dished upper surface in which is arranged a finger bar **16** so that it may be removed when required. Alternatively or additionally the plug member **13** may have attached thereto a chain which can be secured in any convenient position on or in the sink **8**.

A tubular guide sleeve **17** is fixed, as by screw-threading, in the bore **11** of the annular supporting frame **10** to extend a predetermined distance into the bowl or container **1** and is adapted to receive with sliding fit a refuse receiving tube **18** which is of a length to extend between a position adjacent the bore **11** and a position adjacent the outlet opening **3** of the bowl **1**.

The refuse tube **18**, which is preferably of a synthetic plastics material, is provided at its upper end with a counterbore to receive a metal insert **19** which is adapted to receive and support a removable sink grid **20** which is formed with a diametrically disposed cross bar **21** serving as a handle. The grid **20** can be locked in relation to

the insert **19** by means of a bayonet type fitting formed by grub screws **22** the heads of which engage in shaped slots **23** in the insert **19**.

The refuse tube **18** is provided, at a position intermediate of its ends with stop means which cooperate with the lower end of the guide sleeve **17** to limit the extent of its movement in an upward direction. The stop means are preferably in the form of an annular projection **24**, or in the form of two opposite disposed crescent-shaped projections formed on the periphery of the refuse tube, and may also be in the form of weights which assist in urging the refuse tube **18** into an operative position.

Both the guide sleeve **17** and the refuse tube **18** are formed with radially spaced holes or slots **25** to allow the passage of air and water therethrough.

A closure member in the form of a hollow semi-spherical valve member **26** is hingedly mounted adjacent the lower edge of the refuse tube **18** where its flat surface **27** provides a closure for the refuse tube **18** and its arcuate surface **28** provides a valve for effecting closure for the outlet opening **3** of the bowl **1**. For this latter purpose the outlet opening **3** is provided with a sealing gland **29** of a resilient material which has a central hole in which the valve member **26** rests to provide a seal. In this respect it will be understood that the diameter of the valve member **26** is greater than that of the hole in the sealing gland **29** and, should any wear occur, this is automatically taken up. It will further be understood that the contact between the valve member **26** and the gland **29** is such that no other force apart from the weight of the refuse tube **18** and the valve member **26** is required to provide an effective seal.

As stated the valve member **26** is hollow and is formed with at least two apertures **30** so that, in use, water can flow into it and out of it as required.

For the purpose of hingedly mounting the valve member **26** on the refuse tube **18**, the valve member is provided with a U-shaped hinge plate **31** which is pivotally mounted on a hinge pin **32** supported on a U-shaped bracket **33** fixed to the refuse tube **18**.

The bowl or container **1** is provided with an over flow connection **34** which communicates with a U-trap **35** connected either to the pipework **4** of the disposal plant or to the normal plumbing system. Connection to the plumbing system has the advantage that, should the disposal plant be out of use for any reason, it does not prevent the use of the sink for normal purposes. In addition, the overflow connection **34** is arranged in a position which is level with the lower end of the insert **19** in the refuse tube **18** and determines the quantity of water required to effect efficient flushing.

In use, the refuse tube **18** is in its lower limiting position where the lower end thereof, and the bowl outlet opening **3** are closed, and the sink grid **20** is in position in the refuse tube **18**. The plug member **13** is used in the normal manner to close the drainage outlet of the sink **8**.

The water used in the sink for normal purposes, such as for washing-up etc., passes into the refuse tube **18** and subsequently through the holes **25** therein into the bowl or container **1** until it reaches the level of the overflow **34** when it will pass through the U-trap **35** to the plumbing system, or to the pipework **4** of the disposal plant.

When it is required to dispose of refuse, the sink grid **20** is removed and the refuse is passed into the refuse tube **18**, the internal diameter of the insert **19** determining the maximum size of the refuse which can be passed into the tube, after which the sink grid **20** is replaced.

When the refuse tube **18** is full, or when it is desired to dispose of the refuse in the tube, the sink grid **20** is locked in the tube by turning it slightly to engage the bayonet fitting **22, 23** and, using the handle **21** on the grid, the refuse tube **18** is pulled upwards so that the stop means **24** engage the end of the guide sleeve **17** and so that the valve member **26** moves away from the sealing

gland **29** and simultaneously swings downwards away from the end of the refuse tube **18** with the result that the water in the bowl **1**, and the refuse in the tube **18**, fall through the bowl outlet **3** into the pipework **4**. In addition, the water contained in the valve member **26** also flows out and thereby increases the quantity of water for the flushing operation.

In the raised position of the refuse tube **18**, the valve member **26** forms a continuation of the tube **18** for part of its circumference and provides a guide for the refuse. It has however been found that there is tendency for the flow of water from the bowl to force the refuse away from the outlet opening **3** at a position opposite the valve member **26** and to avoid this a visor or guide member **34***a* is arranged to surround the lower end of the tube. The visor **34***a* is hingedly mounted on the hinge pin **32** and is arranged to pivot between an inoperative position and an operative position, where it forms an extension of the refuse tube **18**, according to the movement of the valve member.

In addition, due to the manner of mounting the valve member **26**, it has been found that, in its inoperative position, it lies in a plane which is at a slight angle to the central axis of the refuse tube **18** and tends to interfere with the movement of refuse into the outlet. In order to avoid this, the flat surface **27** of the valve member is formed with a flared recess **35***a* which coincides with the circumference of the refuse tube **18** and thereby provides a true continuation of the wall of the tube. In this respect it will be understood, as shown in FIGURES 6 and 7, that the lower end of the refuse tube **18** is shaped accordingly.

When the refuse and the water have passed through the bowl outlet **3**, the refuse tube **18** is released and will move downwardly, by virtue of its own weight, into a position where the valve member **26** seals the tube **18** and the bowl opening **3** and the apparatus is again ready for use. It will be understood that, as the valve member **26** is hollow, and is therefore comparatively light, friction is reduced to a minimum and no difficulty is encountered in causing it to pivot into its operative position.

In a modified arrangement, not illustrated, the visor or guide member **34** can be dispensed with and the tubular guide sleeve **17** on the side opposite to that of the hinge **32** of the valve member **26**, extended downwardly to provide, in effect, a continuation of the refuse tube **18** at a position around that part of the circumference of the tube not enclosed by the valve member **26**. In this case it will be understood that the lower end of the guide sleeve **17** will have to be shaped to allow the necessary amount of vertical movement of the refuse tube **18** to take place.

It will be seen that the manner of sealing of the bowl or container is such that it reduces, or avoids, any likelihood of the apparatus being fired by back pressure in the pipework, since if this does occur, the increase in pressure will merely lift the valve member slightly and the pressure will be equalized in the bowl or container.

It will also be understood that, in the system according to the present invention, refuse falls through the outlet **3** together with the water and not after the water as is the tendency with known apparatus of this kind. Apart from the fact that the refuse drops directly into the outlet, the movement of the water has the effect of setting up suction in the refuse tube **18** and draws the refuse downwardly.

In order to effect efficient flushing, it is necessary that the bowl should be filled with water to the desired level and, as mentioned, this level is that of the overflow which is in alignment with the lower end of the insert **19**. Thus, before flushing, it is only necessary for the user to observe whether or not the water level is up to the lower end of the insert which is easily visable. If it is not, then it will be necessary to bring it to that level before effecting the flushing operation.

It will be clear from the above description that the system, according to the present invention, of placing the refuse in the central tube, and not in the bowl, which is the usual practice, has numerous advantages among which is the fact that the ratio of water to refuse can be more effectively controlled and the fact that the size of the refuse is limited to the size of the refuse tube or to the insert mounted therein.

We claim:

1. A refuse storage and disposal unit of the kind adapted to be fitted to a kitchen sink, comprising an outer chamber for receiving waste liquid, said outer chamber having an inlet opening for connection to said sink outlet and an outlet opening for connection to the pipework of a disposal plant, valve means for normally preventing the escape of liquid through said outlet opening and for retaining a quantity of liquid in said outer chamber, an open ended cylinder arranged for communication with said inlet opening to receive both waste liquid and solid refuse, apertures formed in said cylinder to allow the bulk of said waste liquid to pass therethrough into said outer chamber, closure means associated with the lower end of said cylinder for normally retaining said solid refuse therein, and means for actuating said valve means and said closure means so as to release said solid refuse simultaneously with said waste liquid so that it falls through said outlet opening to effect disposal thereof.

2. A refuse storage and disposal unit of the kind adapted to be fitted to a kitchen sink, comprising an outer chamber for receiving waste liquid, said outer chamber having an inlet opening for connection to said sink outlet and an outlet opening for connection to the pipework of a disposal plant, an open ended cylinder mounted for lengthwise axial movement in said outer chamber and arranged for communication with said inlet opening to receive both waste liquid and solid refuse, apertures formed in said cylinder to allow the bulk of said waste liquid to pass therethrough into said outer chamber, combination valve and closure means operatively associated with said cylinder for normally preventing the escape of liquid through said outlet opening, for retaining a quantity of liquid in said outer chamber and for normally retaining said solid refuse in said cylinder, and means for actuating said combination valve and closure means so as to allow said solid refuse and said waste liquid to drop simultaneously through said outlet opening to effect disposal thereof.

3. A refuse storage and disposal unit of the kind adapted to be fitted to a kitchen sink, comprising an outer chamber for receiving waste liquid, said outer chamber having an inlet opening for connection to said sink outlet and an outlet opening for connection to the pipework of a disposal plant, a tubular guide sleeve one end of which is fixed in said inlet opening and the other end of which extends into said outer chamber, an open ended cylinder mounted in said guide sleeve for lengthwise axial movement relative thereto and for receiving both waste liquid and solid refuse via said inlet opening, apertures formed in said cylinder to allow the bulk of said waste liquid to pass therethrough into said outer chamber, combination valve and closure means operatively associated with said cylinder for normally preventing the escape of liquid through said outlet opening, for retaining a quantity of liquid in said outer chamber and for normally retaining said solid refuse in said cylinder, and means for actuating said combination valve and closure means so as to allow said solid refuse and said waste liquid to drop simultaneously through said outlet opening to effect disposal thereof.

4. A refuse storage and disposal unit of the kind adapted to be fitted to a kitchen sink, comprising an outer chamber for receiving waste liquid, said outer chamber having an inlet opening for connection to said sink outlet and an outlet opening for connection to the pipework of a disposal plant, a tubular guide sleeve one end of which is fixed in said inlet opening and the other end of which extends into said outer chamber, an open ended cylinder mounted in said guide sleeve for lengthwise axial movement relative thereto and for receiving both waste liquid and solid refuse via said inlet opening, apertures formed in said cylinder to allow the bulk of said waste liquid to pass therethrough into said outer chamber, combination valve and closure means hingedly connected to the lower end of said cylinder, said combination means being arranged normally to close said outlet opening to prevent the escape of liquid from said outer chamber and to retain a quantity of said liquid in said chamber, said combination means also being arranged so as normally to close said lower end of said cylinder for retaining said solid refuse in said cylinder, and means for raising said cylinder to cause said combination means to pivot relative to said cylinder end in such manner as to cause said combination means to move away from said outlet opening and said cylinder end, whereby said waste liquid and said solid refuse will fall simultaneously through said outlet opening to effect disposal thereof.

5. A refuse storage and disposal unit of the kind adapted to be fitted to a kitchen sink, comprising an outer chamber for receiving waste liquid, said outer chamber having an inlet opening for connection to said sink outlet and an outlet opening for connection to the pipework of a disposal plant, a tubular guide sleeve one end of which is fixed in said inlet opening and the other end of which extends into said outer chamber, an open ended cylinder mounted in said guide sleeve for lengthwise axial movement relative thereto and for receiving both waste liquid and solid refuse via said inlet opening, apertures formed in said cylinder to allow the bulk of said waste liquid to pass therethrough into said outer chamber, a semi-spherical valve and closure member hingedly connected to the lower end of said cylinder for normally closing said outlet opening to prevent the escape of liquid from said outer chamber to retain a quantity of said liquid therein, and to close said lower end of said cylinder to retain said solid refuse therein, and a sink grid removably attached to the upper end of said cylinder said sink grid being formed with gripping means for raising said cylinder to cause said semi-spherical member to pivot relative to said cylinder end in such manner as to cause said semi-spherical member to move away from said outlet opening and said cylinder end, whereby said waste liquid and said solid refuse will fall simultaneously through said outlet opening to effect disposal thereof.

6. A unit as claimed in claim 5, in which said semi-spherical valve and closure member is hollow and is provided with apertures to allow liquid to flow into and out of its interior.

7. A unit as claimed in claim 6, which includes a visor hingedly connected to said lower end of said cylinder to provide a continuation, with said semi-spherical member, of said cylinder when said cylinder is raised to effect disposal of said waste liquid and said solid refuse.

8. A unit as claimed in claim 7, including stop means for limiting the extent of upward movement of said cylinder, said stop means consisting of a projection on said cylinder to engage with said tubular guide sleeve.

9. A unit as claimed in claim 8, in which said stop means are in the form of weights which serve to bias said cylinder in a downward direction where said semi-spherical member is in its operative position to close said outlet opening and said lower end of said cylinder.

10. A unit as claimed in claim 9, which includes a metal insert arranged adjacent said inlet opening, said insert having an inner diameter which is less than that of said cylinder and serving to provide a gauge for determining the maximum size of the refuse which can be inserted in said cylinder.

11. A unit as claimed in claim **10**, in which said cylinder and said semi-spherical member are of a synthetic plastics material.

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