April 9, 1963 J. E. BEBINGER 3,084,877

WASTE DISPOSER

Filed Oct. 10, 1960 2 Sheets-Sheet 1

FIG. 1

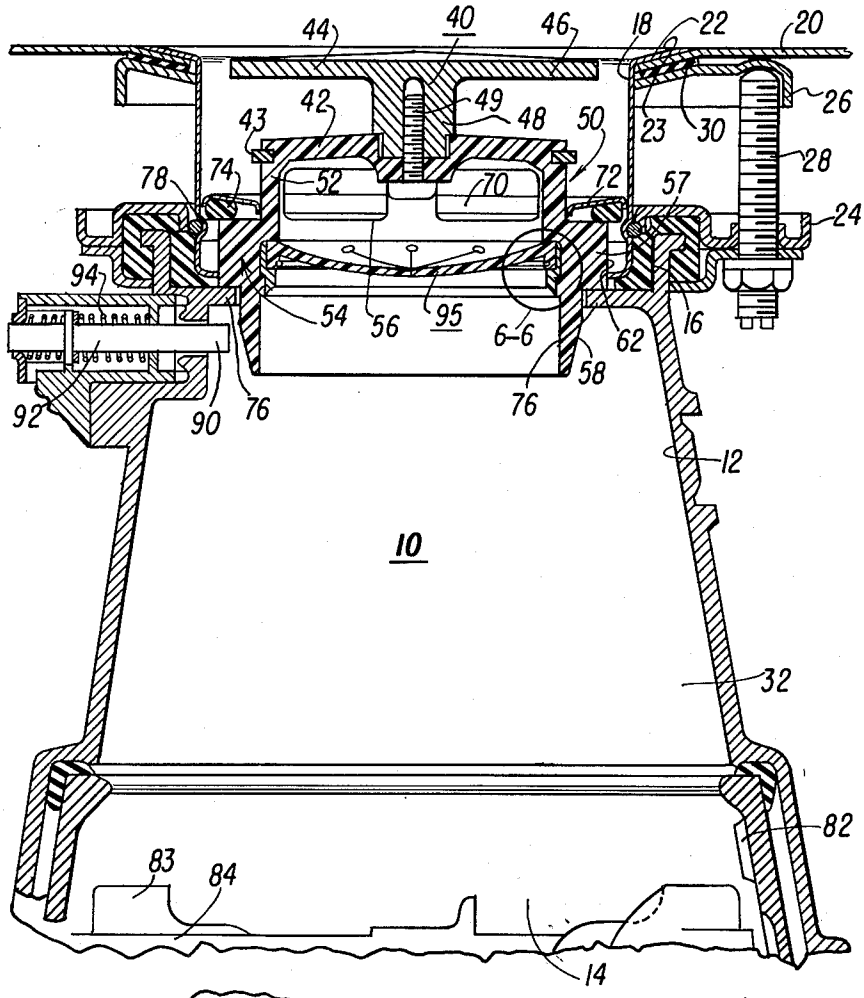
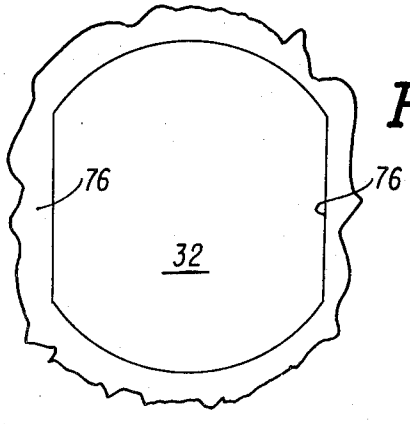


FIG. 8



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WASTE DISPOSER

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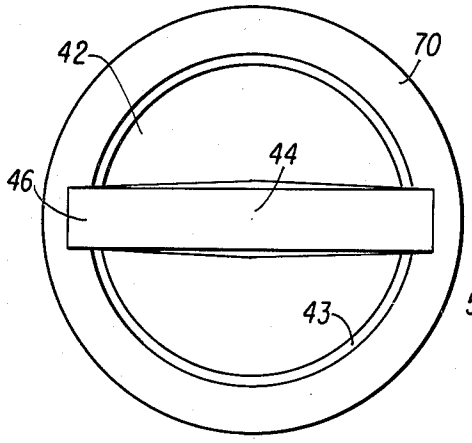


FIG. 2

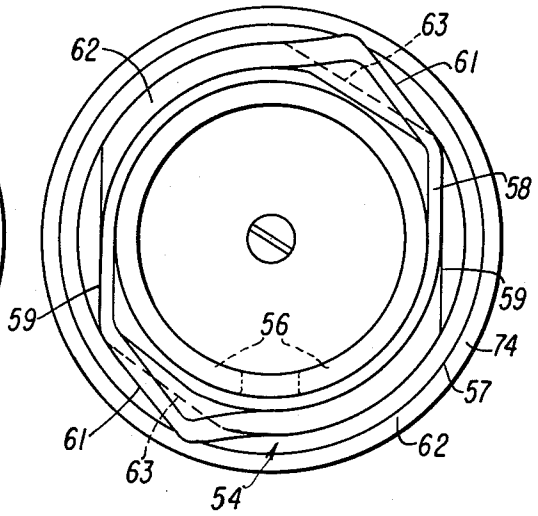


FIG. 3

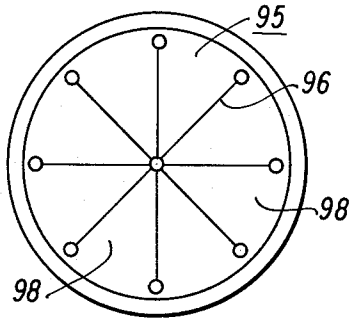


FIG. 4

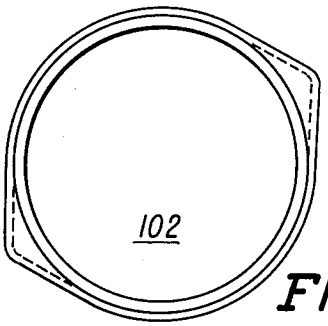


FIG. 5

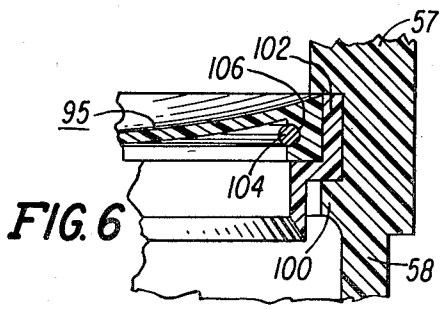


FIG. 6

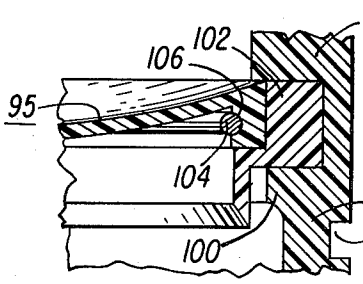


FIG. 7

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WASTE DISPOSER

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2 Claims. (Cl. 241—46)

This invention relates to food waste disposers and more particularly to the switch-actuated, locking cover type.

All food waste disposers are equipped with a sink drainage fitting by means of which the disposer is mounted in registry with the drainage opening of the sink; and in disposers of the above-noted type, it is customary to provide a stopper-like device for the drainage fitting. By manipulating the handle of the device to a first position, the disc-shaped stopper may close the drain opening. For a second position, the handle may be raised and turned to adjust the stopper to allow water to flow through the drainage fitting into the disposer mouth to permit normal sink drainage; and while in this raised position, the stopper may be further manipulated to initiate the operation of the disposer motor. To accomplish these latter results, the stopper may have a sidewall or body depending from the upper stopper surface, with water flow openings in the sidewall. Below these openings, the sidewall may be provided with a switch actuating cam for engagement with a suitable actuating element of a switch in the motor circuit.

In the area above the sidewall openings, an annular rubber gasket is positioned to extend outwardly from the sidewall beneath the stopper disc to serve as a water seal when the stopper is in its locked position. An annular stopper plate is fitted loosely about the sidewall and has at its lower and outer extremity a sealing gasket. This plate is freely movable within the apertured sidewall area of the stopper. When the stopper disc is in the first-named position, the stopper plate gasket seals tightly against the wall of the drainage fitting and the stopper disc gasket seals tightly against the annular stopper plate. Thus the combination of the two gaskets, the stopper disc and the stopper plate seal the drainage opening against entry of liquid.

When the stopper is in either of its other positions, the stopper plate comes to rest below the sidewall openings to permit flow of liquid therethrough. This stopper plate has its upper surface tapered slightly downwardly toward its inward edge so that water cascading vertically from above is deflected inwardly and downwardly through the sidewall openings in a generally horizontal manner. The water striking this plate will be deflected into the body of the device in such a manner that the water will form an eddying layer or water barrier within the body in an area directly below the sidewall openings. In order to maintain this water barrier once formed, the present invention employs a substantially imperforate, flexible basin member extending across the sidewall in the area below the sidewall openings. In a preferred form, the basin member is radially slitted to provide a plurality of triangular elements which yield in a downward direction, the basic shape of the basin being concave upward to partially entrap the water barrier for a finite length of time in an eddying flow until the water has been relieved of its kinetic energy and then falls through the yielding triangular elements in the basin member, into the disposer. During disposer operation, this eddying flow of water within the body of the stopper will provide a sound barrier such that a major portion of the sound emitted by the disposer will be deadened.

It is therefore the primary object of the invention to provide in a food waste disposer, an inlet fitting device

having means for forming and retaining a sonic barrier at the open inlet to the disposer.

It is another object of the invention to provide within the switch actuator mechanism of a food waste disposer, means for causing an eddying flow of water within the inlet fitting of the disposer and for maintaining said eddying flow to constitute a sound-deadening, water barrier.

Other objects and features of the present invention will become obvious from the detailed description of the presently described embodiment of the invention taken in connection with the accompanying drawings of which:

FIG. 1 is a side sectional view of a disposer in which the stopper and control mechanism embodying the present invention are in a position permitting sink drainage without disposer operation;

FIG. 2 is a top plan view of the combination stopper and control means;

FIG. 3 is a plan view looking upwardly from the bottom of the control means of FIG. 2;

FIG. 4 is a top plan view of the water accumulator used in the present invention;

FIG. 5 is a top plan view of the mounting device for the water accumulator;

FIG. 6 is an enlarged sectional view of the area 6—6 of FIG. 1;

FIG. 7 is an enlarged sectional view as FIG. 6 but showing the diverter assembly at a section disposed 30° from the section of FIG. 6, and

FIG. 8 is a fragmentary plan view of the entrance to the disposer chamber.

Referring now to FIG. 1, the disposer **10** may be of the general type disclosed in Stoynich Patent 2,843,328, granted July 15, 1958. Essentially, the disposer comprises an upstanding substantially tubular casing, including upper and lower sections **12** and **14** which cooperate to provide a waste-receiving and comminuting chamber. The upper casing section **12** terminates in an upstanding tubular throat **16** to which is resiliently attached the assembly by means of which the disposer is secured beneath the drain opening of a sink. This assembly includes a tubular drainage fitting **18** having an outwardly directed annular flange **22** overlying the adjacent marginal edge of the sink drain opening **23**. The disposer **10** is secured in place to the bottom wall of the sink by an arrangement including an annular clamping ring **24** encircling the tubular throat **16**, and an intervening surrounding clamping collar **26** arranged above the clamping ring **24** and below the marginal edge of the sink drain opening. More particularly, three substantially equally angularly spaced-apart set screws **28** are carried by the clamping ring **24**. These screws project upwardly into engagement with the clamping collar **26** so as to urge the clamping collar **26** toward the marginal edge of the sink surrounding the drain opening. A suitable gasket **30** is disposed between the upper surface of the clamping collar **26** and the lower marginal edge of the drain opening of the sink. Accordingly, a food waste receiving chamber **32** is defined by the casing section **12** and communicates through the tubular throat **16** with the interior of the sink; and removably arranged within fitting **18** for cooperation therewith and with the tubular throat **16** is the combination stopper and control mechanism **40**; whereby the interior of the chamber **32** is accessible through the fitting **18** for the insertion of waste when the stopper **40** is removed, and water is permitted entry into the chamber **32** or is blocked therefrom according to other adjustments of the stopper mechanism. About the drain opening, suitable indicia may be provided to show the various rotative positions of the stopper mechanism for desired functions.

More particularly the mechanism **40** comprises a horizontally disposed disc-shaped stopper **42** from which ex-

tends upwardly a manually actuatable handle 44. A sealing gasket 43 is removably secured within a peripheral groove in the stopper. Handle 44 has two outwardly flared arms 46 extending from the shaft 48 connecting it to the center of the disc 42. By manipulation of this handle the stopper may be lowered or raised, and rotated while in the raised position.

The mechanism 40 further includes a hollow body 50 depending from the stopper. The handle, stopper disc and body section are assembled in obvious fashion by the use of mounting screw 49. Directly below the stopper disc, the hollow body includes a cylindrical sidewall 52 of short axial length, rising from a lower structure 54 which incorporates the disposer-actuating components of the device. The cylindrical sidewall section 52 is apertured about much of its periphery. These apertures 56 provide an almost unrestricted water-flow passage from the sink into the hollow body.

The structure 54 comprises an upper support portion 57 and a lower cam portion 58 integral thereinto. The upper portion is cylindrical except for the diametrically opposite flat wall portions 59 and is in all results of larger radius than the apertured cylinder 52. The cam portion 58 projects downward from the portion 57. It is of a generally oval shape in which the diametrically opposite cam lobes 61 commence at one end of the flats 59 and extend as arcs of radius substantially equal to that of portion 57 and then merge with wall portions of smaller radius as appears in FIG. 3. This construction provides flat bases 62 at opposite sides of the support member 57. It will also be noted in FIG. 3 that the construction of the cam portion provides a groove 63 between each cam lobe and the overlying wall of the upper portion 57.

Fitted loosely about the cylindrical sidewall 52 of the stopper 40 is an annular baffle plate 70 which may also be called the stopper plate 70. This baffle plate has an inwardly and downwardly tapered upper surface 72 which is substantially inversely frusto-conical by this definition. The baffle plate is of greater inner diameter than the outer diameter of the adjacent cylindrical section and therefore may readily be moved vertically along the cylindrical section 52. The travel of this baffle plate is limited by the stopper disc above and the upper surface of the support portion 57, both of which extend into the area which is traversed by the baffle in its vertical movement. Secured about the periphery of the baffle plate along its lower surface is a water sealing gasket 74.

It has previously been noted that the stopper and control device may be manipulated to provide any of three functions: as a sink stopper; as a partial stopper which provides adequately for normal sink drainage while guarding against a loss of articles into the sink opening; and as a means of operating the food waste disposer while permitting the necessary flow of water from the sink into the disposer for proper operation thereof. In this latter function, this invention contributes very substantially to the reduction of the noise of the disposer operation as later more fully described.

The three positions which may be assumed by the stopper and control device result from the shape of the portion 54 with respect to the configuration of the actual entrance opening of the chamber 32. FIG. 8 is a representation of that opening with all extraneous attachments removed. It is seen that there are two diametrically operated chord-shaped ledges 76 which give to the opening a shape which admits the free passage of the controller portion 54, including both the cam portions and the support portion thereof. In this position the gasket 74 will rest upon embossed ledge 78 in the lower portion of the entrance fitting 18 and the stoper gasket 43 will seat against the surface of baffle 70, whereupon the sink drainage opening is completely sealed against escape of liquid.

The second position, represented by FIG. 1, is attained by lifting the stopper and rotating it relative to the ledges 76 until the portions 62 of the support member 57 register above the ledges. The stopper will then be supported on the ledges as shown. In this position the cam lobes are below the edges in view of the spacing provided by the grooves 63.

In the third position, the stopper is rotated from its second position until one of the cam lobes engages and actuates a motor starting switch as presently described. In this latter position, the ledges 76 enter the respective grooves 63 and secure the device against vertical displacement.

Referring now to the construction of the disposer: in the lower portion of the chamber 32, there is secured a shredding or comminuting ring 82 that co-operates with a number of hammers 83 carried by a flywheel 84 arranged in the bottom of the chamber 32; which flywheel 84 is carried by the operating shaft of an electric drive motor (not shown) housed in the lower casing section 14. Below the flywheel there is a discharge chamber (not shown) which communicates with the house drainage system. This discharge chamber is in communication with the comminution chamber 32 by way of a plurality of passages (not shown) disposed about the base of the shredding ring, as is well known in the art.

In view of the foregoing, it will be understood that when the disposer motor is operated, the flywheel 84 is rotated, causing the hammers 83 to move outwardly closely adjacent to the shredding ring 82 for the purpose of shredding or comminuting any food waste that has been deposited in the chamber 32; whereby the resulting material is discharged along with any water contained in the chamber 32 to the exterior via the discharge network.

Referring again to FIG. 1, there can be seen within the disposer throat the plunger 90 which extends into the throat opening below the inwardly directed throat segments 76. This plunger 90 has a shaft 92 which protrudes through the casing to abut a motor control switch (not shown). The plunger is normally biased into the throat by means of helical spring 94 fitted about the plunger shaft, and in this normal position, the motor control switch is not actuated. When however cam lobes 61 (FIG. 3) are rotated due to manipulation in a rotary direction of handle 44, one of them contacts plunger 90 and depresses the plunger body against the motor control switch to initiate operation of the motor.

Referring now to FIGS. 1, 4, 5 and 6 there can be seen the sound deadening water basin 95, or as it may be called a water accumulator. The basin itself is formed of a yieldable plastic. The basin is substantially concave upward as seen in FIG. 1, and is in general similar to that disclosed in my Patent 2,834,554 granted May 13, 1958, which is assigned to my present assignee. The interior of the circular area of the diverter or basin 95 is slitted as shown in FIG. 4. The slits 96 extend uniformly radially from a small central opening, as shown, and each slit extends outwardly to a position just short of the peripheral shoulder of the accumulator. In this way, a number of relatively stiff fingers 98 are formed each of which extends inwardly to a point approximately near the center of the diverter. These fingers are unconnected to one another except at the circumference and cumulatively retain the closed, concave shape shown in FIGS. 1 and 4, quite readily.

The assembly of the accumulator is shown best in FIGS. 6 and 7. In these figures there can be seen the cylindrical portion 57 and the cam portion 58 of the stopper controller. The portion 57 has an inwardly directed annular emboss 100 on which is seated the annular spacer 102. This spacer, the contour of which can be seen in FIG. 5, is used to fit the circular diverter into the irregularly shaped body 54. An annular split ring 104 of spring material is fitted within a suitable groove 106 in the diverter 95 and locks the diverter firmly within the body portion 54.

In operation, the present invention may be described as follows: First the access controller is removed and whatever kitchen refuse is to be disposed of is placed in the waste receiving chamber 32. The control device 40 is placed within the throat in the raised position shown in FIG. 1. The handle 44 is then rotated until one of the camming surfaces 61 contacts the plunger 90 to actuate the disposer motor. The disposer motor will then operate and will start to comminute the waste matter placed therein. Water is then turned on at the normal sink faucets (not shown) and water cascades into the sink drain opening, as defined by the drainage fitting 18. The water falling vertically then will strike baffle plate 70 and be diverted substantially horizontally through the apertures 56 into the hollow body 50. It will be noted from FIG. 1 that the outer rim of baffle plate 70 is substantially halfway up the openings 56, whereupon the inflowing water may almost completely submerge the openings. The water strikes the interior sidewalls causing an eddying pattern which be maintained within the basin shaped accumulator 95 and will tend to increase in depth on the basin fingers 98. This eddying flow about the concave basin and the water accumulation thereon serves as a barrier noticeably cutting down the comminution noises, not only by reason of the eddying water layer on the basin, but because of the substantial restriction of the openings 56 by the water entering therethrough. The reduction in sound transmission is very substantial as compared with conventional disposers not employing the present combination of stopper and basin.

While the water is eddying, a predetermined amount will flow through the slits and the slit ends to cascade into the comminution chamber forming with the comminuted refuse a slurry which is discharged into the drain system.

As the bulk of the water continues to eddy about on the accumulator, the weight of water on the fingers, and the dynamic forces acting thereon, will increase by an amount great enough to partially depress the fingers and a greater portion of liquid will flow into the disposer casing. The greater the weight and force of the water on the upper surface of the accumulator, the greater the deflection of the fingers, and as a result more water will flow into the disposer chamber. In this way, the accumulator will maintain no more than a predetermined amount of water eddying about in its concavity and excess will depress the fingers and flow into the chamber. Thus, the accumulator cannot readily cause backups of liquid into the sink and should give virtually trouble-free operation.

While there has been described what I at present consider to be the preferred embodiment of the invention, it will be understood that it is my intention to cover in the following claims all modifications which fall within the true spirit and scope of the invention.

What I claim is:

1. An inlet valve device for a food waste disposer having a chamber within which food waste is comminuted in the presence of water flowing into said chamber, comprising:

a cylindrical sleeve adapted to be secured between said chamber and the drainage opening of a kitchen sink or the like,

means about the interior of said sleeve to provide an inwardly directed annular valve seat,

a valve structure including a first open-bottomed cylindrical portion of substantially less diameter than said sleeve, said cylindrical portion having a side wall provided with a plurality of apertures and an imperforate top wall,

a second open-bottomed cylindrical portion fixed to said first portion below said apertures and extending downwardly therefrom, said second portion being substantially larger in diameter than the first portion to provide an upper annular ledge structure extending into relatively close proximity to the inner wall surface of said sleeve,

a first annular valve element disposed about said first cylindrical portion for axial displacement thereon, said valve element extending radially outward of said annular ledge into overlying relation with said annular valve seat, said valve element sloping downwardly and inwardly toward said apertures to direct water thereinto in a first position of said valve structure within said sleeve,

resilient flow control means within said second cylindrical portion below the level of said apertures to delay escape of water from said cylindrical portion,

a second annular valve element removably encircling said first cylindrical member above the side wall apertures thereof, said valve element projecting radially outwardly into overlying relation with said first valve element,

and means adapted for cooperating with said comminution chamber for establishing said valve structure optionally in said first position or in a second position in which said first and second annular valve elements are in engagement one with the other and said first valve element is seated on said valve seat.

2. The inlet valve device according to claim 1, in which said last named means includes the ledge structure of said second cylindrical portion.

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