Nov. 22, 1955 R. H. TULL 2,724,560

FOOD WASTE DISPOSER CONTROL CLOSURE

Filed May 3, 1952 2 Sheets-Sheet 1

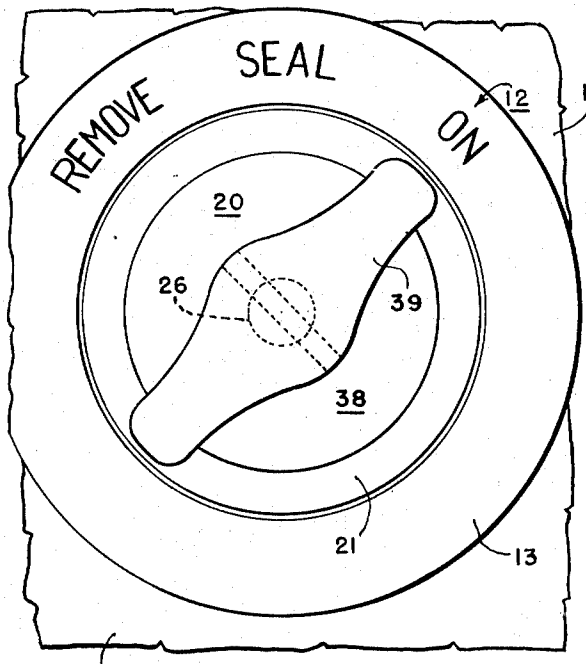


FIG.1.

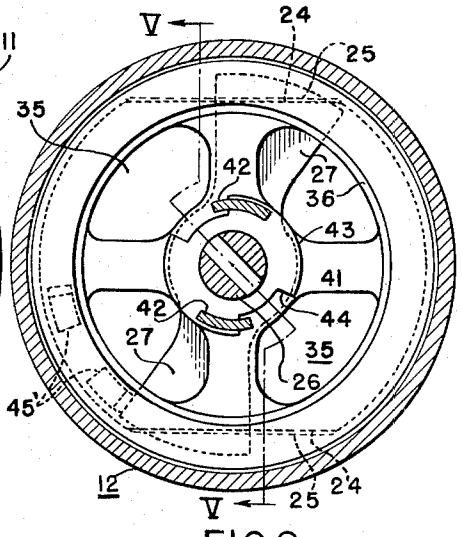


FIG.2.

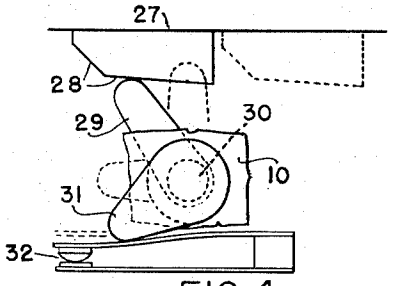


FIG.4.

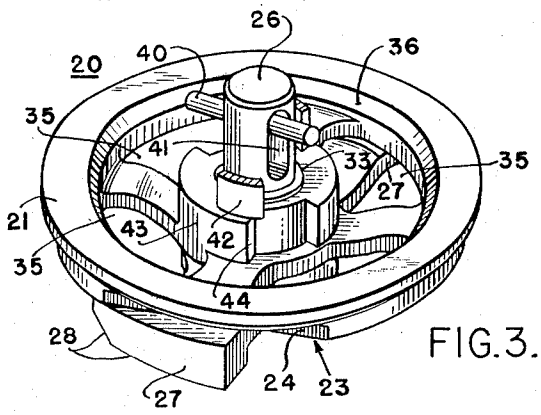


FIG.3.

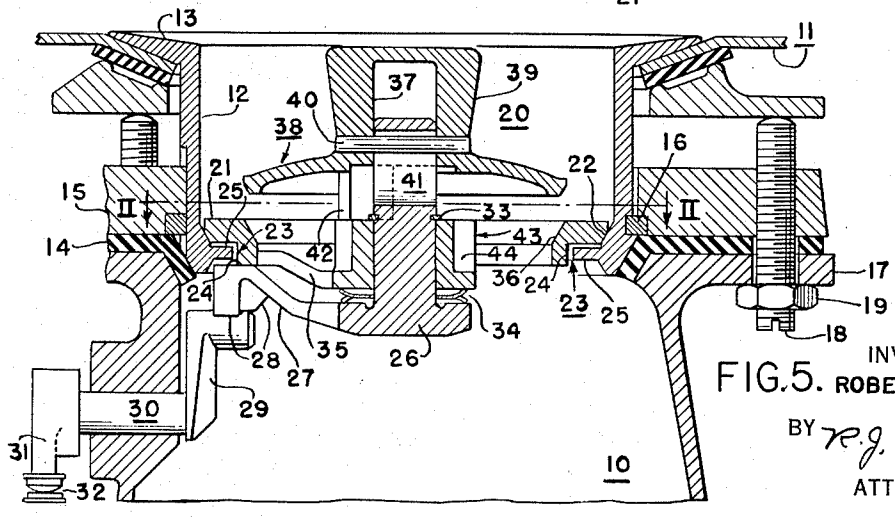


FIG.5.

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FOOD WASTE DISPOSER CONTROL CLOSURE

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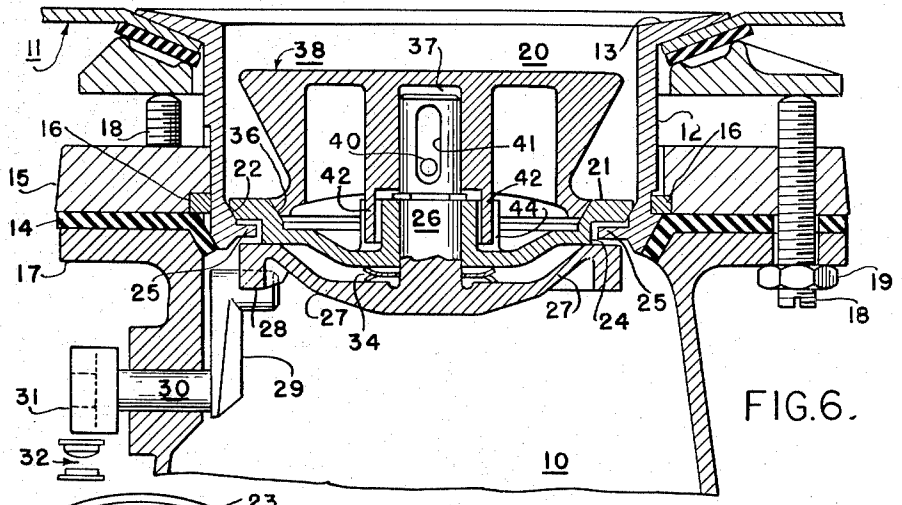


FIG.6.

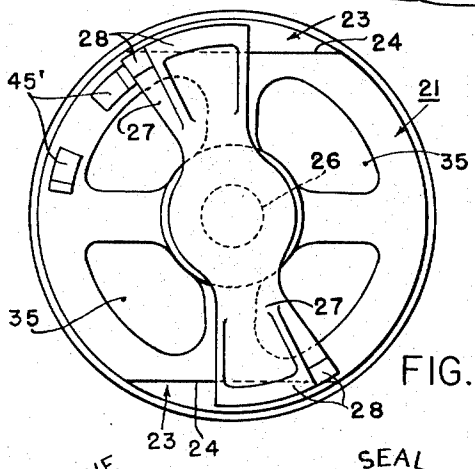


FIG.7.

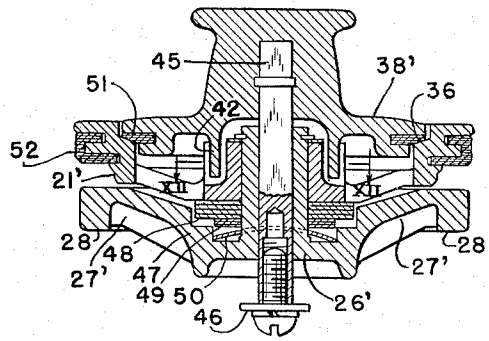


FIG.11.

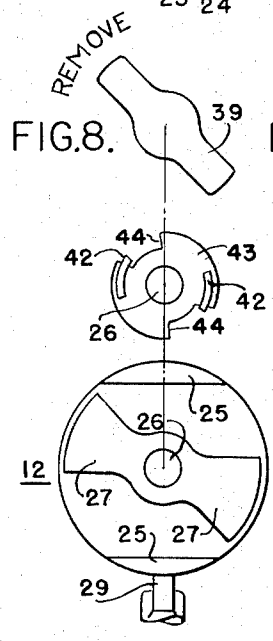


FIG.8.

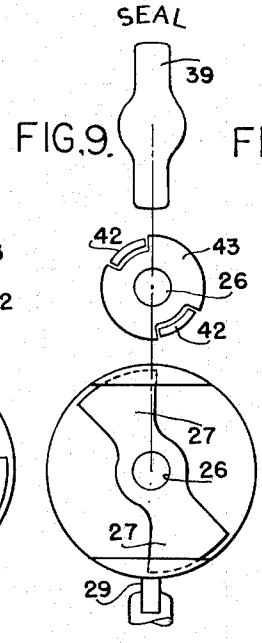


FIG.9.

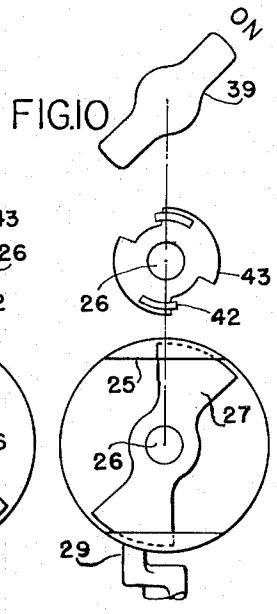


FIG.10

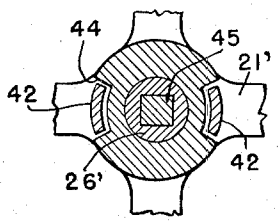


FIG.12

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2,724,560

FOOD WASTE DISPOSER CONTROL CLOSURE

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Application May 3, 1952, Serial No. 285,850

4 Claims. (Cl. 241—32.5)

My invention relates to a food waste disposer, particularly to a closure therefor which actuates a switch for operating the disposer only when the closure is in its "on" position, in which it permits flow of water into the disposer but presents substantial obstruction to access to the interior of the disposer by the user.

An object of the invention is to provide an improved closure of the character set forth.

A more particular object is to provide a closure which is relatively inexpensive to manufacture.

In accordance with my invention, I provide a closure including a main or plate member having a water flow opening therein and further including a vertically movable stopper for closing the water flow opening. A handle is attached to or integral with the stopper and serves also as a handle for the closure and further to rotate a shaft which operates a switch that controls operation of the disposer. There are also interlocking elements which prevent the stopper from dropping down to closed position when the switch operating shaft is rotated to close the switch, but which permit it to close when the shaft is rotated to another position in which the switch is open.

These and other objects are effected by my invention as will be apparent from the following description taken in connection with the accompanying drawings, forming a part of this application, in which:

Fig. 1 is a top plan view of my novel closure, together with the adapter ring in which it is positioned;

Fig. 2 is a horizontal section, taken on the line II—II of Fig. 5, showing the closure in the "on" position;

Fig. 3 is a perspective view of a portion of the closure, with some parts in the "on" position and other parts broken away;

Fig. 4 is a schematic view of the switch operating mechanism, as seen from the left in Fig. 5;

Fig. 5 is a vertical section, taken on the line V—V of Fig. 2, of the closure and of the upper portion of the food waste disposer in which it is positioned, the closure being in the "on" position;

Fig. 6 is a vertical section which is taken for the most part on the line V—V of Fig. 2, but which shows the closure in the "seal" position;

Fig. 7 is a bottom plan view of the closure, showing the same in the "on" position;

Figs. 8, 9 and 10 are schematic views showing the positions of several parts of the stopper when the handle is in the "remove," "seal" and "on" positions, respectively;

Fig. 11 is a vertical section, taken on a line represented by the section line V—V of Fig. 2, but actually showing a modified construction of my novel closure; and

Fig. 12 is a horizontal section taken on the line XII—XII of Fig. 11.

Referring to the drawings in detail, I show the upper part of the casing 10 of a food waste disposer, suspended from the sink 11 by means of an adapter ring 12. The latter includes a tubular portion extending through an

opening in the sink 11 and having a flange 13 resting on the marginal portion of the sink surrounding the opening. The flange 13 bears indicia which read "remove," "seal" and "on." The disposer can be operated ony in the "on" position. The flow of water can be shut off only in the "seal" position, in which the disposer cannot be operated. The closure can be removed only in the "remove" position.

The casing 10 is attached to and supported by the adapter ring 12, with a gasket 14 therebetween, by any suitable structure, such as that disclosed and claimed in Patent No. 2,555,583 of C. H. Ewing. Such structure includes a supporting ring 15 which encompasses the ring 12 and rests on a retaining ring 16 extending into a groove in the adapter ring 12. The casing 10 is provided with a flange 17 connected to the ring 15 by bolts 18 and nuts 19.

The closure of the present invention, indicated generally by the reference numeral 20, comprises a main or plate member 21 which seats upon an inclined or conical seat 22 formed on the inside of the ring 12 adjacent the lower end thereof. The plate 21 is provided with two diametrically opposite recesses 23, each of which has a vertical side 24 extending along a chord of the circle defined by the periphery of the plate member. The adapter ring 12 is provided with two chordal or wing extensions 25 which are complementary to the recesses 23 and which are fitted therein when the plate member is seated on the seat 22. Thus, the plate member can be positioned only in one of two diametrically opposite positions.

A rotatable switch operating shaft 26 extends through a shaft opening in the center of the plate member 21. Oppositely extending arms 27 are formed integrally with the lower end of the shaft 26 and are formed with cam surfaces 28 for actuating a switch lever 29 upon rotative movement of the cam surfaces. The switch lever 29, through a shaft 30 and an arm 31, operates a switch 32 that permits operation of the disposer only when the switch lever 29 is depressed by one of the cam surfaces 28, thereby assuring that operation will not take place unless the closure 20 is in place. The arms 27 are adapted to be rotated under the extensions 25, in which case they prevent removal of the closure.

The shaft 26 is retained against vertical movement relative to the plate member 21. A ring 33 is seated in an annular groove in the shaft 26 and abuts the upper surface of the plate member 21 to prevent downward movement of the shaft 26. An annular spring member 34 is located between the enlargement on the lower end of the shaft 26 and the lower surface of the plate 21 to provide frictional resistance against relative rotation, and to give a feeling of firmness instead of looseness.

The plate member 21 is further provided with a plurality of openings 35 to provide flow of water into the disposer when in operation. An inclined or conical seat 36 surrounds the group of openings 35. A vertically movable stopper 38 is adapted to seat against the seat 36 when it is in its lower position to close all the openings 35. A handle 39 is attached to the stopper 38, being preferably integral therewith, as in the illustrated embodiment. The handle 39 serves both as a handle for the stopper 38 and for the closure as a whole.

The shaft 26 extends upwardly into a cylindrical bore 37 in the stopper 38 and the handle 39. The stopper 38 and the shaft 26 are provided with a connection which locks the same against relative rotation but which permits limited vertical movement of the stopper member from a lower position in which it closes the openings to an upper position in which the openings are open. This connection comprises a pin 40 extending transversely through the handle 39 and through a vertical diametrical

slot 41 in the shaft 26. Thus, the handle 39 serves also for rotating the switch operating shaft 26.

The stopper 38 and the plate 21 are provided with interlocking portions which abut to hold the stopper in raised or open position when the handle is turned to the "remove" or to the "on" position, but which interleave to permit the stopper to drop down to closed position when the handle is in the "seal" position. In the illustrated embodiment, such interlocking portions comprise two tongues 42 extending downwardly from the stopper and a hub portion 43 of the plate member which is provided with recesses 44 that register with and receive the tongues 42 when the handle is in the "seal" position. While the sides of each recess 44 are shown as being vertical, it will be apparent that either or both sides of each recess may be inclined to provide a camming action for raising the stopper as it is rotated from the "seal" position.

The plate 21 is provided with stops 45' which abut the arms 27 to limit counterclockwise movement (viewed from above) beyond the "remove" position and clockwise movement beyond the "on" position.

Operation

The closure may be removed from the disposer when the handle 39 is moved counterclockwise to the position indicated by the word "remove." In this position, the tongues 42 are out of registry with the recesses 44, as shown in Fig. 8, so that the tongues rest upon the top surface of the hub portion 43 and the stopper 38 is held in the upper or open position. The arms 27 are out of registry with the projections 25, thereby permitting the closure to be moved vertically for either putting the closure in place or for removing it, and neither cam surface 28 engages the switch lever 29. Thus, the lever 29 is in the dotted line position shown in Fig. 4, to which it is biased, and the switch 32 is open. When in place on its seat 22 with the handle in this position, the disposer cannot operate, water flow is permitted, and the closure is removable.

With the closure in place resting on the seat 22 and in the "remove" position, as just mentioned, the handle 39 may be turned clockwise to the position indicated by the word "seal," as indicated in Fig. 9. In this position, the tongues 42 are in registry with the recesses 44, so that the stopper drops down into closed position to shut off flow of water through the openings 35. Thus, the sink may be used for washing dishes. The arms 27 have moved partly under the projections 25, so that the closure is not removable by direct upward movement. The cam surfaces 28 have not yet actuated the switch lever 29, so that the switch 32 is open and prevents operation of the motor. Thus, operation of the disposer cannot take place while flow of water thereto is shut off.

To move the handle to the "on" position from the "seal" position, the stopper 38 and the handle 39 must first be raised to withdraw the tongues 42 from their recesses 44, whereupon the handle may be rotated clockwise to the "on" position. The tongues 42 again rest on the upper surface of the hub portion 43, thereby holding the stopper 38 in the open position to permit flow of water through openings 35 into the interior of the disposer. The arms 27 extend under the projections 25 so that the closure cannot be removed by direct upward movement. As the cam surfaces 28 move from the "seal" to the "on" position, one of the cam surfaces 28 engages the switch arm 29 and actuates it, in counterclockwise direction as shown in Fig. 4, to the position shown in full lines, so that the arm 31 closes the switch 32 to effect operation of the motor. Thus, in the "on" position, operation of the disposer is effected, the stopper is necessarily raised to permit water flow, and the closure cannot be removed.

When the handle is in either the "seal" or the "on" position, if it is desired to remove the closure, it is necessary first to rotate the handle counterclockwise to the "remove" position, which opens the switch 32 and prevents operation of the motor, whereupon the closure may be removed.

Figs. 11 and 12

In Figs. 11 and 12, I show an embodiment of my invention incorporating a modified connection, suggested by Lawrence S. Riendeau, for locking the stopper 38' and the shaft 26' against relative rotation and for limiting the upward movement of the stopper 38'. Such modification comprises a pin or bar 45, which has a square cross section and which is cast into the stopper 38'. The bar 45 extends downwardly through an opening in the shaft 26', which opening has a square cross section and with which opening the bar has a sliding fit. A stop washer 46 is attached to the lower end of the bar and is adapted to abut the lower surface of the shaft 26' to limit the upward movement of the stopper 38'.

The shaft 26' is part of a cam member which includes an enlargement or hub 47 at the lower end of the shaft 26' and two arms 27' which extend radially outwardly from the hub 47. The arms 27' are similar to the arms 27 of the first embodiment and are provided with cam surfaces 28.

A thrust pad 48, a washer 49 and a spring washer 50 are disposed between the lower surface of the plate member 21' and the upper surface of the hub 47. They serve to provide frictional resistance against relative rotation of the cam member and the plate member, to provide firmness instead of looseness.

The stopper 38' is provided with an annular gasket 51 which engages the seat 36 in the plate member, and the latter is provided with an annular gasket 52 which engages the conical seat 22 in the adapter ring 12. Except as described specifically with reference to Figs. 11 and 12, the modified form of closure shown in these figures is the same as that of the first embodiment.

Figs. 11 and 12—Operation

It will be apparent that the square cross-sectional form of the bar 45 and the opening in the plate member 27 prevent relative rotation between the stopper 38' and the plate member 27'. The stop washer 46 limits upward movement of the stopper 38' by its engagement with the lower surface of the shaft 26'. In other respects, the operation of this embodiment is the same as that of the first embodiment.

While I have shown my invention in two forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof.

What I claim is:

1. A closure for a food waste disposer comprising a plate having an opening for flow of water therethrough and also having a shaft opening extending therethrough, a rotatable shaft extending through said shaft opening and having an arm on the lower end thereof for effecting actuation of a switch, a stopper and handle member mounted on said shaft and disposed on the upper side of said plate, a connection between said handle member and said shaft which locks the same against relative rotation but permits relative vertical or axial movement, whereby said arm may be rotated by said handle and said stopper may be moved vertically or axially to open and close said water flow opening, and interlocking portions carried by said plate and said member, respectively, which permit the stopper to drop down to closed position in one angular position of the member but which prevent the same from dropping down to closed position in another angular position.

2. A closure for a food waste disposer comprising a plate member adapted to seat in the inlet opening of

the disposer and having a shaft opening and an opening for flow of water therethrough, a rotatable shaft extending through said shaft opening and having a cam on one side of the plate member, a handle member mounted on said shaft and disposed on the opposite side of said plate member, said handle member including a stopper for the water flow opening in the plate member and a handle portion which serves as a handle for both the stopper and the closure, said handle member having limited axial movement relative to the shaft and the plate member, means for locking the handle member and the shaft against further axial movement and against relative rotation, said stopper being adapted to close said water flow opening in one axial position and to permit water flow through said opening upon axial movement away from the plate member, said plate member and said handle member having cooperating portions which abut to prevent axial movement of the stopper to closed position in at least one angular position of the shaft but which clear each other in another angular position to permit movement of the stopper to closed position.

3. A closure for a food waste disposer comprising a plate member adapted to seat in the inlet opening of the disposer and having an opening for flow of water therethrough into the disposer and also having a shaft opening therein, a rotatable shaft mounted on said plate member in said shaft opening and having a switch operating arm mounted thereon, a handle and stopper member mounted on said shaft and including a stopper for the water flow opening in the plate member and a handle portion which serves as a handle for both the stopper and the closure, said stopper being adapted to close said water flow opening in one axial position and to permit water flow through said opening upon axial movement away from the plate member, said member having limited axial movement relative to the shaft and the plate member, means for locking the handle member and the shaft against further axial movement and against relative rotation, and the plate member and the handle member having cooperating portions which abut to prevent axial movement of the stopper to closed position in at least one

angular position of the shaft but which clear each other in another angular position of the shaft to permit movement of the stopper to closed position.

4. A closure and control device for a food waste disposer comprising a plate member adapted to seat in the inlet of the disposer and having an opening for flow of water therethrough into the disposer, a switch operating arm mounted on the lower side of said plate member for movement about a vertical axis disposed centrally of the plate member, means for preventing vertical movement of the switch operating arm relative to the plate member, a handle and stopper member disposed on the upper side of said plate member and including a stopper for the water flow opening in the plate member and a handle portion which serves as a handle for both the stopper and the closure, and a connection between said handle and stopper member and said switch operating arm which permits limited vertical movement of the handle and stopper member relative to the switch operating arm but which locks the handle and stopper member against further upward movement and against rotation relative to the switch operating arm, said stopper being adapted to close said water flow opening in its lowermost portion and to permit water flow through said opening upon upward movement away from the plate member, said plate member and said handle and stopper member having cooperating portions which abut to prevent downward movement of the stopper to closed position in at least one angular position of the shaft but which clear each other in another angular position to permit movement of the stopper to closed position.

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