July 26, 1960 M. J. GREEN 2,946,522

WASTE DISPOSAL UNIT

Filed Aug. 8, 1956

FIG. 1

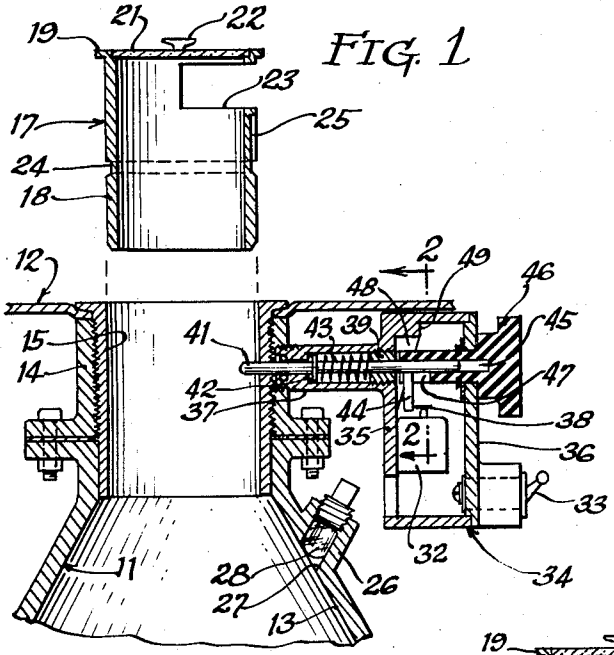



FIG. 2

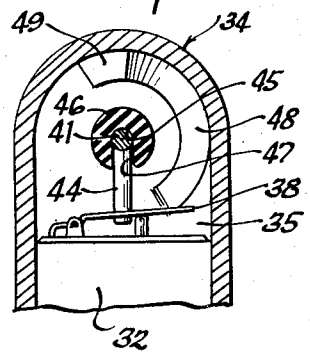



FIG. 3

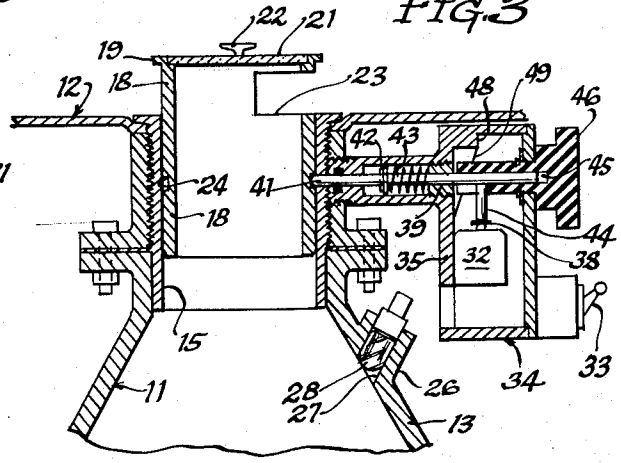



FIG. 5

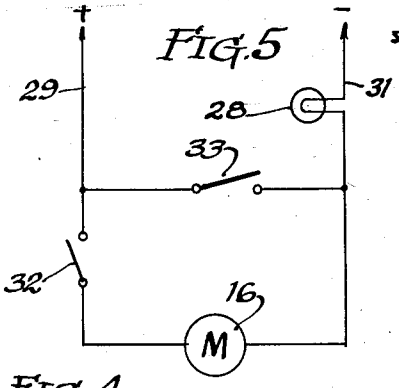
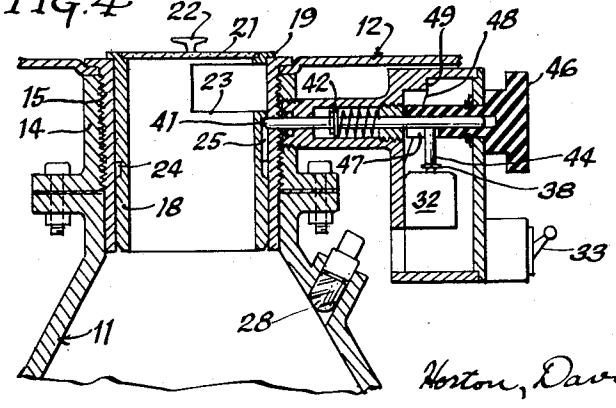



FIG. 4




INVENTOR.
Martin J. Green

BY
Horton, Davis, Brewer & Brugman
Attorneys

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# WASTE DISPOSAL UNIT

Martin J. Green, 730 Milburn St., Evanston, Ill.

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9 Claims. (Cl. 241—32.5)

This invention relates in general to waste disposal units, and more particularly to novel means for controlling the operation and use thereof.

A principal object of the invention is to prevent accidents and injuries, both to the person using such a disposal unit and to the unit itself. More specifically, in this connection, it is an object of the invention to give a visual indication that the motor of the unit is operating, whenever that is the case, and also to insure that it is automatically de-energized and prevented from being restarted accidentally whenever it is possible for a hand or long instrument to be inserted or introduced into the comminuting interior portion of the unit.

Another important object is to eliminate unnecessary running or operation of a waste disposal unit while insuring complete elimination or discharge of the waste introduced thereto to prevent any unwitting accumulation of odor generating materials.

A further important object of the invention is to enable a user of a disposal unit to see clearly into the interior of the unit at any time, either during its operation or when it may be desired to remove anything from the unit, such as a piece of metal tableware inadvertently placed therein.

In the illustrated embodiment of this invention, these objects are attained by providing a novel closure means for a disposal unit cooperable with a separate manually operable motor control to automatically break the motor circuit whenever the closure means is removed from the unit, to prevent restarting of the motor unintentionally until the closure means is reinserted into the unit, and to selectively maintain the closure means in an intermediate, charge receiving position; by providing a light for illuminating the interior of the unit, both automatically whenever the motor is operating, and optionally at any other time; and by providing in the closure means a suitable transparent portion or window means through which the interior of the unit readily may be observed.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, when taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

In the drawings:

Figure 1 is a vertical section through the upper or inlet portion of a disposal unit embodying the features of my invention, showing the closure means removed therefrom and the manually and automatically operable motor and light control means in extended, circuit opening position;

Fig. 2 is an enlarged detail vertical section taken substantially on the line 2—2 of Fig. 1;

Figs. 3 and 4 are views similar to Fig. 1 showing the motor control means in retracted, circuit closing position, and the closure means, respectively, in intermediate, charging position, and in closed or sealing position; and



Fig. 5 is a simple wiring diagram of the electrical circuit employed.

Referring more particularly to Fig. 1 of the drawings, reference numeral 11 indicates in general a waste disposal unit shown as mounted in the usual manner in the standard drain opening of a sink 12, only a portion of the bottom of which is illustrated. Since the details of construction of the operating or comminuting mechanism disposed interiorly of the waste disposal unit 11 are not essential to the instant invention, only the upper portion of the unit is herein illustrated, including the upper end of an outer casing 13. In the illustrated embodiment of this unit, the open upper end of the outer casing 13 is disclosed as secured in any suitable manner to an internally threaded mounting bushing 14, which cooperates with an externally threaded mounting sleeve 15 flanged at its upper end to clamp a marginal portion of the drain opening of the sink 12 therebetween. The sleeve 15 thus provides the inlet to the interior of the unit 11 through which waste material that it is desired to dispose of may be introduced. It will be appreciated that the disposal unit 11 thus may be supported by the sink 12, as is customary, or additional bracket supporting means therefor may be provided and supported by the floor below the sink or attached in any desired manner to an adjacent wall. As noted, the details of construction of the waste disposal unit 11 and the specific mechanism employed therein to effect comminuting of the waste material introduced through the inlet provided by the sleeve 15, together with water from one of the standard faucets that is available with the usual sink installation, are of no importance so far as the present invention is concerned, so long as the unit 11 includes an electric motor for operating the same. Such a motor is indicated in the wiring diagram of Fig. 5 by reference numeral 16.

A suitable closure means, indicated generally by reference numeral 17, is provided for the inlet to the waste disposal unit, which latter comprises the interior bore of sleeve 15 in the illustrated embodiment. This closure means 17 is made up of a sleeve 18 having an annular flange 19 at its upper end, the outer diameter of the sleeve 18 being somewhat less than the inner diameter of the mounting sleeve 15 so as to be slidably positionable therein, and the flange 19 being adapted to effect a leak proof seal with the upper end surface of the mounting sleeve 15 when the closure means 17 is fully inserted therein, as shown in Fig. 4. The upper end of the closure sleeve 18 is closed by means of a transparent disc or window means 21 of any suitable transparent material, such as clear plastic, which is secured thereto in a desired manner. To facilitate insertion into and removal from the inlet of the disposal unti 11, the closure means 17 is provided with a suitable knob or handle 22 which is shown as attached to the central portion of the window means 21. In order that the disposal unit 11 may be operated as a continuously fed unit, if desired, the sleeve 18 of the closure means 17 is provided adjacent its upper end with a slot 23 which, when the closure means 17 is disposed in an intermediate position as illustrated in Fig. 3, comprises an inlet aperture through which waste materials and/or water may be introduced into the interior of the inlet 11. An annular groove 24 is provided in the outer surface of the sleeve 18 spaced a suitable distance below the lower end of the inlet aperture 23 for a purpose that will soon be described, the lower edge of this groove 24 being rounded or chamfered, as best seen in Fig. 1. A vertical groove 25 of substantially the same width as the horizontal groove 24 also is provided in the outer surface of the sleeve 18 extending from a point shortly below the lower edge of the inlet aperture 23 downwardly into communication with the groove 24.

A light means is provided for illuminating the interior of the unit 11 so that a user may conveniently see clearly down through the sleeve 15 if it is desired to remove anything from the unit, such as a piece of metal tableware inadvertently placed therein, or into the interior of the unit during its operation through the transparent window means 21. In the illustrated embodiment of the invention, the outer casing 13 is provided adjacent the bottom edge of the mounting sleeve 15 with a suitable boss 26 that is bored to provide a downwardly extending aperture 27 preferably tapped at its outer end to receive the threaded base of an electric light bulb 28. This light 28 preferably is provided with a suitable plastic cap, such as those employed exteriorly on aircraft, and when mounted in the manner illustrated herein, will not only direct its light rays downwardly to thoroughly illuminate the interior of unit 11, but also will effectively seal the bore or aperture 27 within which it is mounted.

The wiring diagram of Fig, 5 shows the motor 16 for the unit 11 and the electric light 28 so interconnected to a suitable source of electrical energy, comprising lines 29, 31, and with two switches 32 and 33 that closing of the switch 32 will energize both the motor and the light 28, while closing of the switch 33 when the switch 32 is open will energize only the light 28. It will be appreciated, of course, that this diagram is intended only as being representative of one way in which a normally open switch, when closed, will start the motor 16 for the unit 11 and turn on the light 28, while a second normally open switch, when closed, will turn on the light 28 without energizing the motor 16.

As shown in Figs. 1, 3, and 4, a suitable switch housing 34 is mounted in any suitable manner on the exterior of the unit 11, being illustrated as having inner and outer parallel walls 35 and 36 with a boss 37 on the inner wall 35 having an outwardly threaded end adapted to be screwed into a suitable tapped aperture provided in the mounting bushing 14. The previously mentioned switch 33 comprises a manually operable switch that is mounted in any suitable manner on the exterior of the outer wall 36 of the switch housing 34. The other switch 32 previously mentioned is mounted interiorly of the housing 34 on the inner wall 35, and comprises a normally open microswitch, the usual plunger of which may be depressed to close the same by means of a lever 38 overlying the plunger and pivotally mounted in any suitable manner on the upper surface of the housing of this switch 32. The switch operating lever 38 is best illustrated in Fig. 2.

The boss 37 is bored and tapped adjacent the inner wall 35 to receive a suitable bearing sleeve 39 for a horizontally disposed rod 41. The inner end of this rod 41 extends through a suitable aperture provided in the inner mounting sleeve 15, and has a radial pin 42 secured intermediate its end for cooperation with a limiting shoulder provided by a reduced outer end portion of the bore of the boss 37 and also with the inner end of coil spring 43 which is mounted on the rod 41 and interposed between this pin 42 and the bearing sleeve 39. It will thus be seen that the spring 43 urges the rod 41 inwardly towards its extended position of Fig. 1. Intermediate the switch casing walls 35 and 36, the rod 41 is provided with a depending finger 44 which is adapted to cooperate with the switch operating lever 38 in a manner to be later described. The outer end of the rod 41 is slidably engaged within the bore 45 of a knob 46, which is preferably formed of any suitable insulating material and is rotatably mounted in an aperture provided in the outer switch casing wall 36. Any suitable means may be employed to prevent movement of the knob 46 axially of its bore 45 relative to the switch casing wall 36. The inner end of the inner extension of the knob 46 is provided with a suitable radial slot 47 for slidably accommodating the depending finger 44 of the rod 41. It will thus be seen that the rod 41 is axially slidable in limited degree relative to the knob 46 and, while the latter cannot be moved axially of the rod 41, rotation thereof will rotate the finger 44 about the axis of the rod 41. The inner surface of the inner wall 35 of the switch housing 34 is formed to provide an arcuate cam 48 inscribed from the axis of the rod 41 and spaced therefrom for cooperation with the finger 44. This cam 48 rises or extends outwardly from the wall 35 gradually from its lower end adjacent the switch operating lever 38 to a high point or dwell 49 at its upper end. The extent of this rise or the position of the dwell 49 is such that rotation of the knob 46 in a counterclockwise direction (viewing Fig. 2), when the parts are in their positions of Figs. 1 and 2, will result in engagement of the finger 44 with the cam 48 to cause axial movement of the rod 41 against the action of the spring 43 in sufficient degree to retract the inner end of the rod 41 substantially into the plane of the inner surface of the inner supporting sleeve 15.



*Operation*

When the several parts are in their positions of Fig. 1, both switches 32 and 33 are open, as shown in Fig. 5. At this time, or at any other desired time, closing of the manually operable switch 33 will light the light 28 to illuminate the interior of the unit 11. But rotation of the knob 46 cannot effect closing of the other switch 32. This is because the finger 44 is out of vertical alignment with the switch actuating lever 38 and while it will be aligned therewith by cam 48 when moved to an upper position onto the rise 49 by rotation of knob 46, continued rotation only results in spring 43 returning the finger 44 to its inactive position of Fig. 1. Also the rod 41 cannot be pulled outwardly because the latter cannot be so moved directly by by the knob 46. And, if an attempt is made to reach interiorly of the sleeve 15 to move the rod 41 axially by pressing against its protruding inner end, such movement will be blocked because the finger 44 extends below the normal horizontal plane of the switch actuating lever 38, as best seen from Fig. 2. Consequently, with the closure member 17 out of the inlet of the unit 11, the switch 32 cannot be accidently closed to effect energization of the motor 16. And it will be noted that the protruding inner end of the rod 41 will prevent effective insertion of the closure member 17 into the mounting sleeve 15.

However, rotation of the knob 46, as above described, will cause cam 48, 49 to move the depending finger 44 and the rod 41 outwardly to bring the inner end of the rod 41 substantially into the plane of the inner surface of the sleeve 15, which then will enable the user to insert the closure means 17 into the inlet of the unit. Now subsequent rotation of the rod 41 and swinging of the finger 44 by rotating arm 46 will not result in the rod 44 being moved inwardly by the spring 43 out of possible engagement with the switch actuating lever 38, as is the case when the closure member 17 is removed as in Fig. 1. Rather, the closure means 17 will maintain the rod 41 in active condition in an outer position to retain the depending finger 44 aligned with the switch actuating lever 38, so that rotation of knob 46 will cause engagement of the lower end of finger 44 with switch actuating lever 38 to depress the latter to close switch 32 and cause energization of the motor 16 and light 28. Consequently, rotation of knob 46 is effective to close switch 32 only when the closure means 17 is disposed in active position within the sleeve 15 of the unit 11.

It will be appreciated that the reason for providing the horizontal annular groove 24 in the outer surface of the cylindrical member 18 is to facilitate retention of the closure means 17 in its intermediate, waste receiving position of Fig. 3 by virtue of the coaction between that groove 24 and the inner end of the rod 41. The groove 24 is positioned relative to the lower edge of the inlet aperture 23 so that the latter will then be substantially flush with the upper surface of the bottom of the sink

12. Now a slight rotation of the closure means 17 to align the vertical groove 25 with the inner end of the rod 41 will result in the closure means dropping to its lowermost or sealing position of Fig. 4. From either this position of Fig. 4 or the intermediate position of Fig. 3, the closure means 17 may readily be removed upwardly from the inlet of the unit merely by lifting the handle 22 by virtue of the lower edge of the horizontal groove 24 being chamfered or rounded and the rounding of the inner end of the rod 41. It will be appreciated that the lower outer corner of the cylinder 18 should likewise be chamfered or rounded off to facilitate movement downwardly of the closure member to its positions of Figs. 3 or 4 after the inner end of the rod 41 has been retracted by rotation of the knob 46 to bring the depending finger 44 into engagement with a high point or dwell 49 of the cam 48. If it is desired to use the unit 11 solely as a batch unit, rather than to provide for optional continuous feeding thereof as herein disclosed, the grooves 24, 25 and the aperture 23 may be dispensed with.

The above described mechanism, in addition to preventing accidental operation of the unit 11 whenever the closure means 17 is removed therefrom, also gives visual indication of the fact of operation of the motor 16 by virtue of the energization of the light 28 whenever the motor is running. The user thus can determine visually when the waste introduced to the unit has been eliminated, so as to avoid unnecessary operation of the unit. At the same time, any unwitting accumulation of odor generating materials will be obviated because, with the motor off and with the closure means 17 either inserted or removed from the unit, the operator can readily see whether or not the interior of the unit is clean merely by closing the switch 33 to turn on the light 23. The use of the switch 33 is also of inestimable value after any completely foreign object, such as a piece of tableware, has inadvertently been dropped into the unit, since it greatly facilitates the removal thereof. The desirability or necessity of de-energizing the motor automatically when the closure means is moved to its sealing position, as sometimes heretofore effected, is completely eliminated with the present invention by the provision of the light being on whenever the motor is running and of the transparent portion or window of the closure means. Whenever the parts are in their sealing position of Fig. 4, if the motor is running, that fact will be indicated visually through the transparent cover portion 21 by the lighted interior of the unit. And if it is then desired to stop the motor, it is necessary only to turn knob 46 to disengage the depending finger 44 from the switch operating lever 38, which will also turn off the light 28 if switch 33 is open.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the forms hereinbefore described being merely preferred embodiments thereof.

I claim:

1. In a waste disposal unit having an electric motor and a waste receiving inlet, a switch for controlling operation of said motor, manually operable control means for closing said switch, closure means insertable into said inlet for cooperation with said control means to enable subsequent manual switch closing operation of said control means, and means automatically operable in response to removal of said closure means from said inlet to prevent effective manual switch closing operation of said control means.

2. In a waste disposal unit having an electric motor and a waste receiving inlet, closure means insertable into and removable from said inlet, manually operable control means for said motor maintained in active condition by said closure means whenever the latter is disposed in said inlet, and means automatically operable upon removal of said closure means from said inlet to render said control means inactive.



3. In a waste disposal unit having an electric motor, a casing having a waste receiving inlet and a wall portion with an aperture disposed therein, an electric light mounted in said aperture to direct its light rays into the interior of said unit, manually removable closure means for said inlet including transparent means through which to view the interior of the unit, and control means for said motor and said light mounted on said casing and maintained in active condition by said closure means.

4. In a waste disposal unit having an electric motor and a casing with a waste receiving inlet, a closure means insertable into and removable from said inlet, a switch mounted exteriorly of said casing for controlling operation of said motor, and control means for actuating said switch including a manually operable member and switch closing means operable thereby and extending into said inlet for cooperation with said closure means, said closure means being provided with means engageable by said switch closing means for releasably maintaining the closure means in an intermediate, waste receiving position.

5. In a waste disposal unit having an electric motor, a casing having a waste receiving inlet and a wall portion with an aperture disposed therein, an electric light mounted in said aperture to direct its light rays into the interior of said unit, manually removable closure means for said inlet including transparent means through which to view the interior of the unit, a switch mounted exteriorly of said casing for controlling said motor and said light, and control means for actuating said switch including a manually operable member and switch closing means operable thereby and extending into said inlet for cooperation with said closure means.

6. In a waste disposal unit having an electric motor, a casing having a waste receiving inlet and a wall portion with an aperture disposed therein, an electric light mounted in said aperture to direct its light rays into the interior of said unit, closure means for said inlet including transparent means through which to view the interior of the unit, a switch mounted exteriorly of said casing for controlling said motor and said light, control means for actuating said switch including a manually operable member, and switch closing means operable thereby and extending into said inlet for cooperation with said closure means when the latter is disposed in said inlet, and means operable automatically upon removal of said closure means from said inlet to render said switch closing means ineffective.

7. In a waste disposal unit having an electric motor, a casing having a waste receiving inlet and a wall portion with an aperture disposed therein, an electric light mounted in said aperture to direct its light rays into the interior of said unit, closure means for said inlet including transparent means through which to view the interior of the unit, a switch mounted exteriorly of said casing for controlling said motor and said light, control means for actuating said switch including a manually operable member, and switch closing means operable thereby and extending into said inlet for cooperation with said closure means when the latter is disposed in said inlet, means operable automatically upon removal of said closure means from said inlet to render said switch closing means ineffective by moving the same out of alignment with said switch, and means operable by said member against the action of said last recited means to realign said switch closing means with said switch.

8. In a waste disposal unit having an electric motor, a casing having a waste receiving inlet and a wall portion with an aperture disposed therein, an electric light mounted in said aperture to direct its light rays into the interior of said unit, closure means for said inlet including transparent means through which to view the interior of the

unit, a switch mounted exteriorly of said casing for controlling said motor and said light, control means for actuating said switch including a manually operable member, and switch closing means operable thereby and extending into said inlet for cooperation with said closure means when the latter is disposed in said inlet, means operable automatically upon removal of said closure means from said inlet to render said switch closing means ineffective, and a second switch mounted exteriorly of said casing and connected in parallel with said motor and operable to turn on said light without energizing said motor.

9. In a waste disposal unit having an electric motor and a casing with a waste receiving inlet, closure means insertable into and removable from said inlet, a switch mounted exteriorly of said casing for controlling operation of said motor, control means for actuating said switch including a manually operable member and switch closing means operable thereby and extending into said inlet for cooperation with said closure means, said closure means, when inserted into said inlet, maintaining



said switch closing means in an active, retracted position, means operable automatically, upon removal of said closure means from said inlet, to move said switch closing means to an extended, inactive position, said switch closing means blocking insertion of said closure means into said inlet when in such extended position, and means operable in response to actuation of said member to retract said switch closing means against the action of said automatically operable means to permit insertion of said closure means into said inlet.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 2,063,266 | Pape et al. | Dec. 8, 1936 |
| 2,281,608 | Vincent | May 5, 1942 |
| 2,484,459 | Osborn | Oct. 11, 1949 |
| 2,619,654 | Coss | Dec. 2, 1952 |
| 2,657,397 | Drew | Nov. 3, 1953 |
| 2,758,197 | Evans et al. | Aug. 7, 1956 |