April 25, 1961 R. W. HYDE 2,981,488

DRAIN TROUGH FOR GARBAGE DISPOSER UNIT

Original Filed Dec. 20, 1951 2 Sheets-Sheet 1

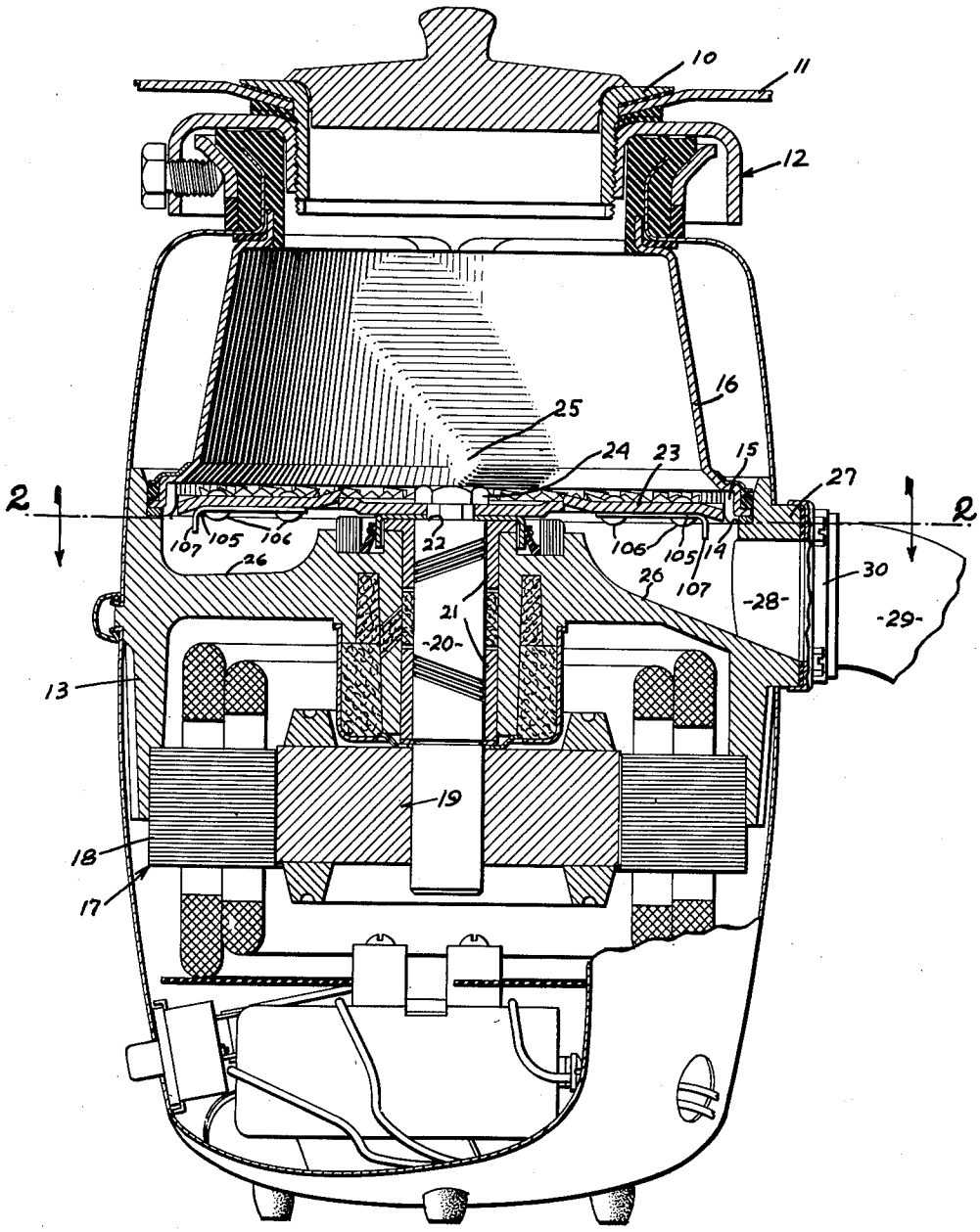


Fig. 1

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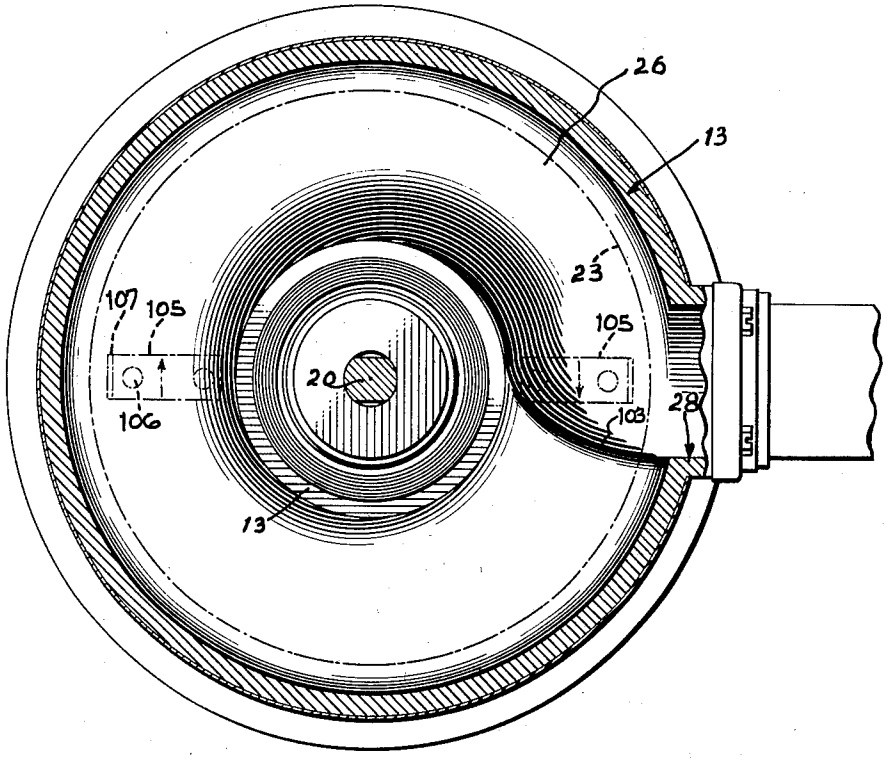


Fig. 2.

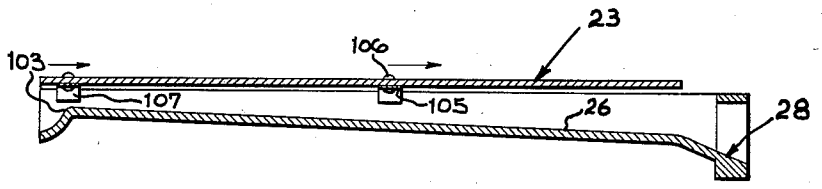


Fig. 3.

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DRAIN TROUGH FOR GARBAGE DISPOSER UNIT

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Application Nov. 18, 1953, Ser. No. 392,873, now Patent No. 2,949,246, dated Aug. 16, 1960, which is a continuation of abandoned application Ser. No. 262,626, Dec. 20, 1951. Divided and this application Sept. 4, 1959, Ser. No. 838,196

4 Claims. (Cl. 241—245)

This invention relates to waste disposers of the type which are designed for installation at the drain openings of sinks and it is particularly directed to a drain trough construction for such waste disposers.

This application is a division of U.S. patent application Serial No. 392,873, filed November 18, 1953, now Patent No. 2,949,246, for "Garbage Disposal Unit." Serial No. 392,873 is a continuation of an application which was filed December 20, 1951, Serial No. 262,626, now abandoned.

The waste disposer of the parent case comprises essentially a body casting which is the main frame of the disposer, an electric motor which is mounted below the body casting and a comminuting chamber which is disposed above the body casting. The shaft for the motor projects up through the center of the body casting and it drives a cutter which forms the floor of the comminuting chamber.

The drain trough to which this application is directed is formed in the body casting, surrounding the shaft of the motor, immediately below the cutter. The drain trough is in communication with the drain pipe of the sink installation and all comminuted waste and the flush water which is used in the operation of disposers must pass through the drain trough to reach the drain pipe. The drain troughs provided in past disposers tended to collect bits of waste and some even permitted fluids to stand. These bits of waste and fluids frequently gave rise to objectionable odors.

The primary objective of the present invention has been to provide a drain trough construction which permits no waste to collect nor fluids to stand, and further one in which the rotation of the cutter is employed to induce a flow of flush water toward the drain pipe. As a result, the drain trough of this invention remains clean and free of waste.

Other objectives and features of the invention will be readily apparent to those skilled in the art from the following detailed description of the drawings in which:

Figure 1 is a transverse cross sectional view through a waste disposer illustrating a preferred embodiment of the invention.

Figure 2 is a cross section view taken on the line 2—2 of Figure 1.

Figure 3 is a diagrammatic layout view of the drain trough, illustrating its slope.

Inasmuch as the details of the disposer are disclosed in the parent case it is believed unnecessary to describe them here, except in a general way and only as they are specifically applicable to the invention claimed herein. In general, the waste disposer is secured to a drain sleeve, designated 10, which depends through the drain opening of a sink, a portion only of which is shown at 11. A mounted ring, indicated generally at 12, secures the disposer in place. The disposer comprises a body casting 13 which is circular as viewed from above. The upper face of the body casting is configurated to provide a circular recess 14 which seats a shearing ring 15 and the

lower rim of a casing 16 which is generally in the shape of a frustum of a cone. The underside of the body casting 13 is configurated to seat an electric motor 17. The stator of the motor is indicated generally at 18 and the rotor is indicated generally at 19. The drive shaft of the motor is designated 20 and it projects up through the center of the body casting 13 through appropriate bearings 21—21. The upper end of drive shaft 20 is of reduced diameter to provide a shoulder 22. Immediately above the shoulder the shaft is configurated to key into a central opening in a cutter disk 23. A nut 24 threads onto the upper end of the motor shaft and it serves to lock the cutter disk in driving connection with shaft 20.

The cutter disk 23 and the casing 16 define the chamber into which food waste is dropped through drain sleeve 10 for comminution. As explained in the parent case, the wall of the casing 16 has a directing vane 25 which, in the preferred embodiment, is formed as an integral part of the wall of the casing. Waste on top of the rotating cutter disk is thrown outwardly by centrifugal force against vane 25 and then re-directed by the vane both downwardly toward the upper surface of the cutting disk and radially inwardly thereof. Waste is cut into bits by teeth provided on the upper surface of disk 23. In order for waste to be discharged from the comminuting chamber it must be reduced in size to an extent to pass between the outer periphery of the cutter disk and the shearing ring 15 which immediately surrounds the disk. Once the waste is reduced in size, it and the flush water, which must be used in the operation of disposers falls into a drain trough 26 which is formed in the body casting surrounding the shaft 20 of the motor underneath the cutter disk 23.

The body casting has a boss 27 at one side which projects from the unit surrounding an outlet 28. A drain pipe 29, a portion only of which is shown in Figure 1, is secured to the boss by a coupler 30.

Referring to Figures 1 and 2, it may be seen that the bottom of the drain trough is rounded and that the trough is spiral in shape. The lowest point in the trough is at the outlet 28. The highest point is immediately adjacent the outlet. This configuration, of necessity, results in a shoulder 103. The shoulder is, however, rounded off. The trough slopes downwardly from shoulder 103 in the direction of rotation of the cutter disk. Thus, flush water carrying comminuted waste is induced to flow toward the drain outlet by the rotating disk so that drainage is not a matter of gravity alone. However, since the slant is through substantially 360 degrees, going around the unit, there is no place in the trough for fluids to collect and stand, nor is there any place for bits of comminuted material to collect in the trough and thereby give rise to objectionable odors.

It has been found that stringy material, such as the strings of celery, may hang up on the shoulder 103. However, provision is made to prevent this. The centrifugal force imparted to pieces of stringy materials by the rotating disk tends to throw them against the outer portion of the shoulder. In order to avoid a build-up of a mass which could break loose as a surge load and clog the drain, two small paddles 105—105 are provided on the bottom of the cutter disk. Each paddle comprises a flat strip of metal which is riveted to the underside of the disk as at 106. Each strip has a flange 107 turned downwardly at a right angle at its outer end. As may be seen from Figure 3, the paddle flanges clear the shoulder 103 by an appreciable margin, however, it is found that they do provide enough disturbance in the flush water to keep the shoulder clean. Obviously, only one paddle could be used, but two are preferred, being mounted at diametrically opposed place to balance the disk.

The spiral of the drain trough, being in the direction of rotation of the cutter disk from shoulder **103** to drain outlet **28**, presents no obstacle to a continuous, rapid flow of flush water and at no time is the induced flow moved against the force of gravity. In other words, the flow is always down hill.

I claim:

1. In a garbage disposer unit, a body casing, a shaft journalled in said body casting for rotation about a vertical axis, a circular cutting disc disposed above said body casting and in driving connection with the upper end of said shaft, an electrical motor disposed beneath said body casting and in driving connection with the lower end of said shaft, an annular seat formed in the upper face of said body casting surrounding the edge of said cutter disc, a shearing ring seated within said seat, said ring having teeth thereon, the outer edge of said disc configurated to present shearing edges to said teeth, a frusto-conical casing, said casing seated on said shearing ring and tapering upwardly to define with the cutter disc a comminuting chamber, a spirally shaped drain trough surrounding the upper end of said shaft in the top of said body casting inwardly of said shearing ring and immediately below said disc, and said drain trough spiralling downwardly through substantially 360° to a drain opening in the direction of rotation of said cutter disc, whereby flow in said drain trough toward said drain opening is induced by said disc rotating in the comminuting chamber.

2. In a garbage disposer unit, a body casting, a shaft journalled in said body casting for rotation about a vertical axis, a horizontally disposed circular cutter disc in driving connection with the upper end of said shaft immediately above said body casting, an electrical motor disposed beneath said body casting and in driving connection with the lower end of said shaft, a casing seated on top of said body casting surrounding said cutter disc to define with the cutter disc a comminuting chamber, a spirally shaped drain trough formed in the top of said body casting beneath said cutter disc, said drain trough spiralling downwardly through substantially 360° to a drain opening in the direction of rotation of said cutter disc, whereby flow in said drain trough is induced by the cutter disc rotating within said comminuting chamber.

3. In a garbage disposal unit, a body casing, a shaft journalled in said body casting for rotation about a vertical axis, a circular cutting disc disposed above said body casting and in driving connection with the upper end of said shaft, a casting seated on top of said body casting with the central axis thereof in vertical alignment with the axis of the shaft, said casing defining with the cutter disc a comminuting chamber, a drain trough formed in the top of said body casting surrounding the upper end of said shaft and immediately beneath said cutter disc, said drain trough being spiral in shape and sloping downwardly through substantially 360° from a high point adjacent to one side of a drain opening, thence around said body casting, and thence to said drain opening in the direction of rotation of said cutter disc, whereby flow in said drain trough toward said drain opening is induced by the rotation of said cutter disc in said comminuting chamber.

4. In a garbage disposal unit having a cutter disc rotatably mounted on a body casting, a drain trough formed in the upper face of said body casting below said disc and concentric with the axis of rotation thereof, said drain trough spiralling downwardly through substantially 360° from a shoulder adjacent a drain opening to said drain opening, a paddle depending from the underside of said cutter disc into said drain trough, the lower end of said paddle clearing said shoulder during rotation of the cutter disc and disposed to move in a circular path which is sufficiently close to the outer portion of the shoulder to prevent stringy materials from piling up on said shoulder during the operation of the unit.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,981,488 April 25, 1961

Robert W. Hyde

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, line 6, for "cutting" read -- cutter --; line 8, for "casting" read -- casing --.

Signed and sealed this 3rd day of October 1961.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents

USCOMM-DC