April 25, 1967 R. L. VERNON 3,315,903

PORTABLE WASTE FOOD GRINDER

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Fig. 1

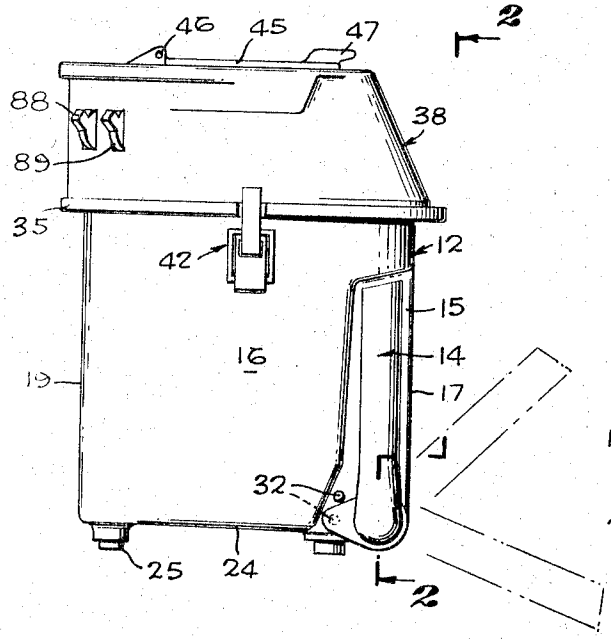


Fig. 4

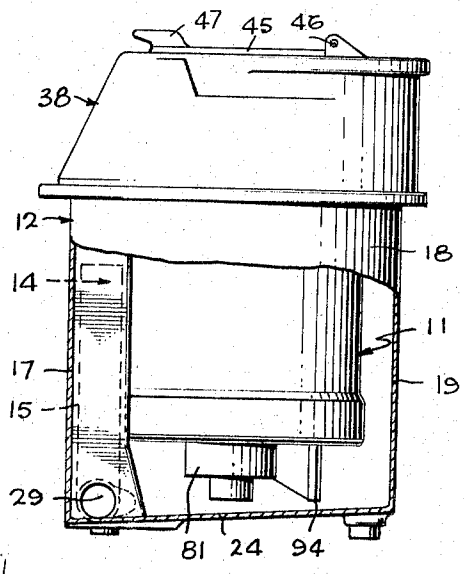


Fig. 2

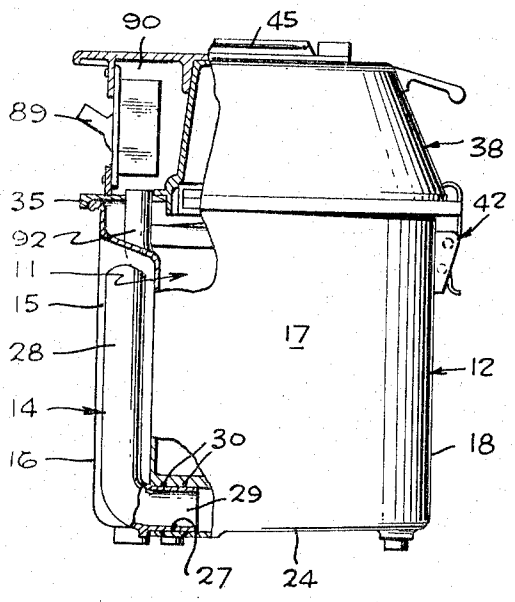
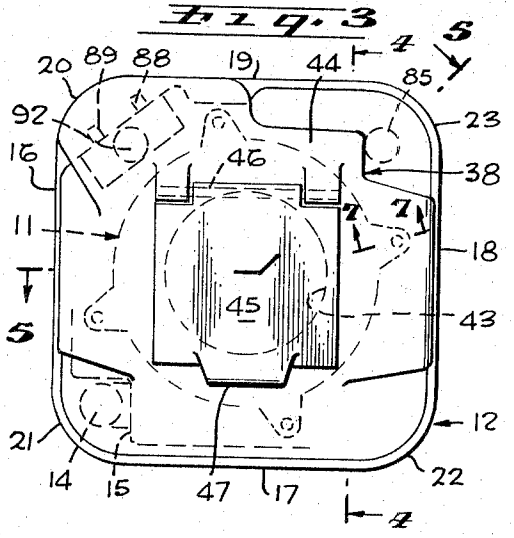


Fig. 3



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Fig. 5

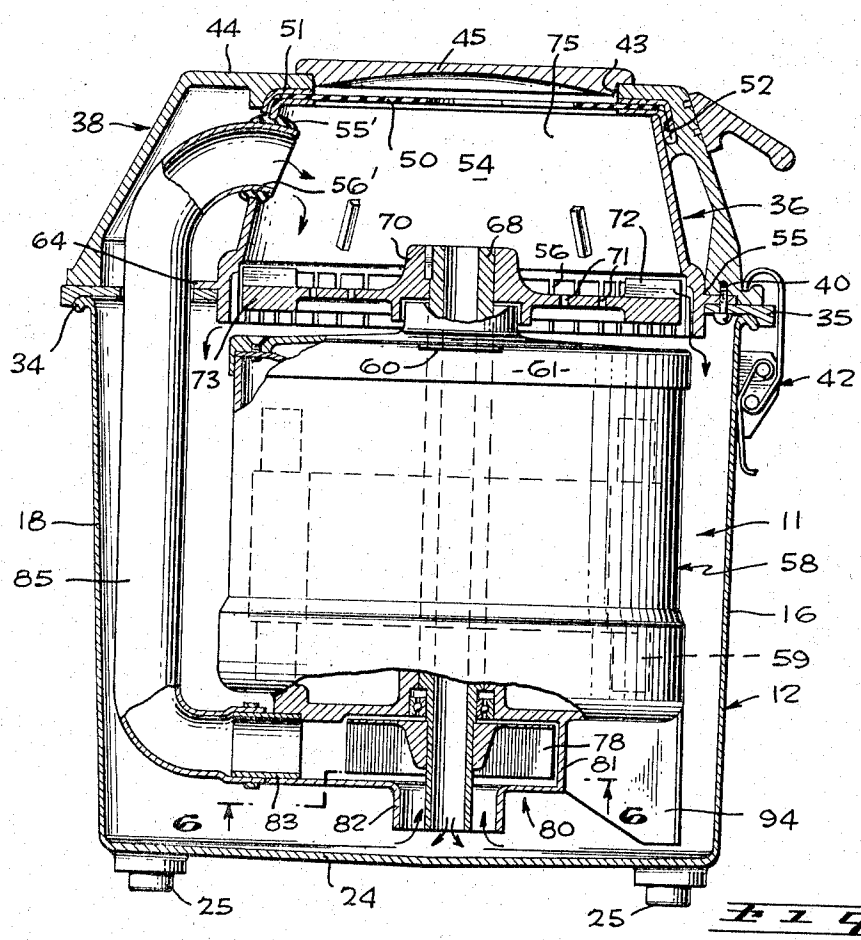


Fig. 7

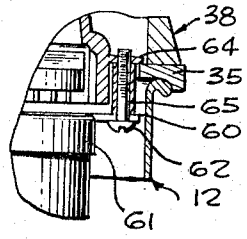
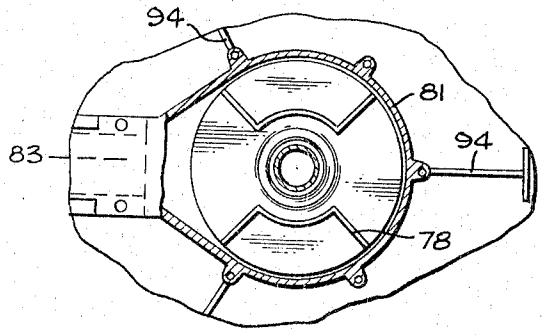


Fig. 6



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PORTABLE WASTE FOOD GRINDER

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8 Claims. (Cl. 241—285)

This invention has to do generally with waste food grinders such as are commonly installed in the drainpipe beneath a kitchen sink for the purpose of grinding food passing down the drainpipe into fine enough particles that it forms a slurry with water and can be flushed through the plumbing drainpipes. More particularly the invention has to do with portable devices of this nature such as the one shown in my Patent No. 3,048,340.

An object of the invention is to provide a new and improved portable waste food grinding and shredding device which can be conveniently used in or adjacent to a kitchen sink.

Another object is to provide such a device which is completely self-contained out so designed that it can readily be filled with a charge or water and, after the grinding operation has been completed readily emptied of the water and refuse or finely ground waste food particles.

Another object is to provide a self-contained waste food grinder embodying a pump which serves to circulate water through the grinding chamber of the device irrespective of the direction of rotation of the motor, and a reversible motor for cleaning and removing obstructions from the grinding or shredding components.

Still another object is to provide a device of the type indicated which includes means for cooling the motor by diverting a portion of the fluid through the motor shaft.

Another object is to provide a device of the type described embodying a construction in which there is relatively low starting torque required of the motor as compared to conventional waste food disposers, thereby enabling the use of a relatively small motor which will operate well on the conventional house circuits without heavy duty wiring or switches.

A further object is to provide a device of the type indicated having a drain pipe serving multiple functions: (1) lower position to drain the contents of the container after the grinding operation, (2) a median position to indicate when the initial water charge introduced through the top aperture is at the predetermined level by overflow or standing means, (3) erected to the vertical position for the grinding operation without overflow and (4) to erect to the vertical position for minimum space in the storage position.

Still another object is to provide a device wherein the major components are removable as a unit from the casing so that the device can be cleaned periodically as required.

A further object is to provide a waste food grinder which provides exceptionally fine grinding of the waste food by recirculation and the possible addition of a small quantity of detergent to create an emulsion thereby holding the fatty particles in solution that will pass freely through the drainage system when discharged.

Still another object is to provide a device that will allow complete draining of the unit by gravity flow since there are no valves, traps or areas in the liquid system that will allow accumulation of waste foods or liquid.

These and other objects will be apparent from the drawings and the following description. Referring to the drawings:

FIG. 1 is a side elevational view of a device embodying the invention;

FIG. 2 is an elevational view of the right side of the device of FIG. 1 partially broken away in section along line 2—2 of FIG. 1;

FIG. 3 is a plan view oriented as in FIG. 2;

FIG. 4 is a sectional view on line 4—4 of FIG. 3;

FIG. 5 is an enlarged sectional elevational view on line 5—5 of FIG. 3;

FIG. 6 is a fragmentary sectional view on line 6—6 of FIG. 5; and

FIG. 7 is a fragmentary sectional detail view on line 7—7 of FIG. 3, but on a larger scale.

More particularly describing the invention, in general the device includes a shredder-grinder unit designated generally by numeral **11** and a main housing or casing **12**. As will later appear, the unit **11** is mounted so that it can be readily removed from the housing **12** to permit cleaning at periodic intervals. However, normally the parts are used several times in assembled condition and there is no necessity for taking the device apart for a normal waste food grinding and disposal operation.

The main housing or casing **12** is provided with a combined fill and drain pipe designated **14**. This is located in a recessed corner portion **15** of the housing which is generally rectangular, having flat side walls **16, 17, 18** and **19** connected by curved corner wall sections **20, 21, 22** and **23** and a bottom wall **24**. Foot pads **25** are provided on the latter. The casing is formed to provide a cylindrical opening **27** in which the tube **14** is mounted for limited rotation, the tube being generally L-shaped with a long section **28** and a short section **29**, the latter being received in the opening **27**. Suitable seal rings such as O-rings **30** may be provided. Additionally a detent means **32** is provided so that the pipe can be releasably conveniently placed in any of the three positions shown in FIG. 1. When the pipe is upright, as shown in full lines in the figures, it is in the running position; when it is in the intermediate or approximately 45° position, shown by broken lines in FIG. 1, it is in the fill position; and when in the lower position shown in broken lines in FIG. 1, it is in the drain position.

Since the pipe **14** acts as a drainpipe in one of its intended functions, the bottom wall **24** of the casing is inclined to drain toward the opening **27**.

The unit **11** is suspended on the upper rim **34** of the housing by a mounting ring **35** which follows the contour of the housing. Secured to the upper face of this ring is a shredder ring member **36** and outwardly of this an upper housing member **38**. These parts are secured together by screws **40**. The upper housing member and the parts attached to it are releasably mounted upon and secured to the main housing by a plurality of manually operable clamps **42**.

The upper housing member is centrally apertured at **43** in its upper wall portion **44** and provided with a lid or cover **45** which is hinged at **46** and has a suitable handle portion **47**. Just beneath the cover is provided an apertured and radially slit rubber or plastic diaphragm **50** to form the conventional antisplash guard necessary when charging the unit with waste foods, which is mounted in a retainer **51** received in a channel **52** formed between an interior surface of the upper housing member and the outer surface of the upper end portion of the shredder ring member.

The shredder ring member is formed to provide a frusto-conical wall section **54** and a shredder ring portion **55**, the latter having an annular serrated or grooved internal surface **56** of conventional construction.

The shredder-grinder unit **11** also includes a motor casing **58** which houses an electric motor **59**. The motor casing is suspended from the mounting ring by means of a plurality of aperatured ears **60** (FIG. 7) formed on the upper end section **61** of the motor casing and screws **62** extending through the respective ears and threaded into a flange **64** formed on the shredder-grinder member.

Spacer sleeves **65** are employed to locate the motor housing at the proper elevation.

As a part of the motor or motor assembly, I provide a hollow motor shaft **68** which extends both above and below the motor casing. A rotary head **70** is keyed to the upper end of the shaft and this may be of conventional construction being provided with openings **71** therein and various abutments or teeth **72** on its upper surface at its periphery, and an enlarged peripheral section **73** for the purpose of effectively shredding and grinding the waste food products in conjunction with the shredder ring portion **55–56** of the shredder ring member as is well known in the art. It will be apparent that the rotary head forms the bottom wall of a waste food receiving chamber **75**, the lateral limits of which are defined by the shredder ring member **36** and the upper limits of which are defined by the diaphragm **50** and cover **45**.

The lower end of the motor shaft carries an impeller **78** of a pump **80** having a casing **81**. The inlet of the pump is defined by a casing portion **82** and the outlet is shown at **83**. A tube **85** leads from the outlet of the pump upwardly to and into chamber **54**, the upper end of the tube being received in a grommet **55'** within a hole **56'** in the wall of member **36**.

The electrical motor is preferably of the reversible type and I show controlling switches **88** and **89**, located in a cavity completely isolated from liquids, one of which may be an on-off switch and the other a motor reversing switch. These switches are located in a space **90** in the upper housing member **38** outwardly of member **36**. An electrical conduit **92** for the wiring extends from this space into the motor casing and this conduit also acts as a breather or vent tube for the motor casing. The electrical system may also include a thremal switch to guard against overloading of the motor and, since the wiring may be conventional, it has not been illustrated.

To operate the device, assuming that the parts are secured together as shown in the drawing, the combined fill and drain tube **14** is lowered to the intermediate or fill position shown in broken lines in FIG. 1 and water is introduced into the upper chamber until it stands at the top of or overflows the drain tube **14**. The tube is then raised to the full-line position of FIG. 1 and, if the device is connected to a suitable source of electricity, it can be operated. The waste food or refuse is placed in the upper chamber through the cover **45** and preferably this is done with the motor running. When the motor is operating the rotary head **70** rotates causing a grinding and shredding action in conjunction with the shredder ring member **36** and the flow of liquid. The liquid is pumped through inlet **82** and tube **85** to the chamber **54** from which it falls by gravity back into the lower part of the main casing. During this operation some of the liquid passes down through the tubular shaft **68** of the motor, serving to assist in cooling the motor and prevent overheating thereof. Also the liquid flows over the sides of the motor casing for the same purpose. The device should preferably be left running for a long-enough time to finely shred or grind the waste food products by recirculation thereof. Afterwards the motor is stopped and the drainpipe lowered over a sink outlet to the lowest position shown in broken lines in FIG. 1 to empty the contents. If desired, a new charge of water can then be introduced into the device and the motor operated to clear and clean the head and shredder ring member. In this connection, should it at any time be necessary to clear material from the teeth of the rotary head of the grinder, this can be done by reversing the motor. When the motor is reversed, there is full flow of liquid to the chamber **54** since the pump works equally well in either direction of rotation.

Periodically the unit **11** can be removed from housing **12** for cleaning by unfastening the clamps **42**. When so removed the unit can be stood on legs **94**.

Although I have shown and described preferred forms

of my invention, I contemplate that various changes and modifications can be made therein without departing from the invention, the scope of which is indicated by the following claims.

I claim:

1. A portable, self-contained waste food shredding and grinding device, comprising a housing means, a motor supported in the housing means, a shredding and grinding means operated by the motor and located in the upper end portion of the housing means, said housing means and said motor defining an annular space around the motor, said shredding and grinding means having an annular opening in open communication with the upper end of said space for discharge of liquid and comminuted particles into said space, a pump operated by the motor, and fluid delivery means associated with the pump and extending around the motor and the shredding and grinding means for delivering fluid from the bottom of the housing means to the upper end portion thereof above the shredding and grinding means, said motor having a hollow drive shaft extending from the region of the upper end of the housing to the lower end portion thereof for the circulation of excess fluid downwardly therethrough.

2. A portable, self-contained waste food shredding and grinding device adapted to be initially charged with water before operation, comprising a housing, a waste food shredding and grinding means within the housing, a motor for operating the last-mentioned means, and a combined fill and drain pipe mounted on the housing and having its inner end in communication with the lower end of the interior of the housing, said pipe being mounted for limited rotation from a normal upright position to a lower drain position and to an intermediate fill position.

3. A portable, self-contained waste food shredding and grinding device adapted to be initially charged with water before operation, comprising a housing, a waste food shredding and grinding means within the housing, a motor for operating the last-mentioned means, said housing having a laterally extending cylindrical opening adjacent its bottom, an L-shaped combined fill and drain pipe having a long portion normally upright and adjacent to the exterior of the housing and a short portion substantially normal to the long portion journaled in said opening, said pipe being rotatable in said opening to lower the long portion thereof to a low drain position or to an intermediate fill position to indicate proper fill level.

4. In a portable, self-contained waste food shredding and grinding device, an open-topped, bucket-like housing, a motor supported in said housing and having a vertical drive shaft, a rotary head mounted on the upper end of said drive shaft, a shredder ring member around said head and extending upwardly therefrom to define therewith a waste food receiving chamber, a pump having an inlet and an outlet mounted beneath said motor and operated by the lower end of said drive shaft, and a tube leading from the outlet of said pump upwardly around the motor and into said chamber.

5. The device set forth in claim **4** in which the drive shaft of said motor is tubular and open from end to end and extends from the space above said head to a region below said motor for downward circulation of fluid therethrough.

6. In a portable, self-contained waste food shredding and grinding device, an open-topped main housing member, a mounting ring resting on the upper end of said main housing member, an upper housing member mounted on said mounting ring, a shredder ring mounted on said mounting ring inside said upper housing, an electric motor in said main housing suspended from said mounting ring, a pump mounted on said motor and operated thereby, a rotary shredding head within said shredder ring operated by said motor, said head, said

shredder ring member and said upper housing member defining a waste food receiving chamber, conduit means for conveying water from said pump around the motor to said waste food receiving chamber, means detachably securing said mounting ring to said main housing member, and a combined fill and drain pipe having its inner end journaled in the lower portion of said main housing member whereby the same can be pivoted from an upright position to a lowered position.

7. The device set forth in claim 6 in which said motor has a tubular drive shaft establishing open communication for downward flow of fluid from said chamber to the bottom of the main housing member.

8. A portable, self-contained waste food shredding and grinding device, comprising a housing, a reversible electric motor in said housing, a shredder-grinder means

in the upper part of the housing operated by the motor, a rotary pump operated by the motor, conduit means for delivering fluid from the pump to the region of the shredder-grinder means, means for reversing said motor, said pump being operable, in conjunction with said conduit means to deliver fluid to the region of the shredder-grinder means irrespective of the direction of rotation of the motor.

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