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WASTE DISPOSAL APPARATUS

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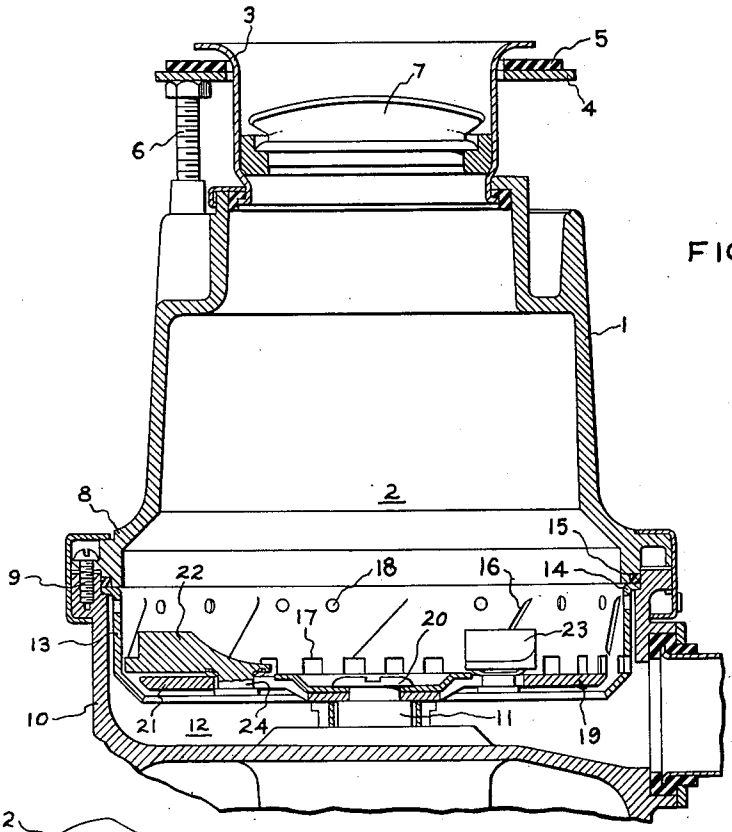


FIG. 1

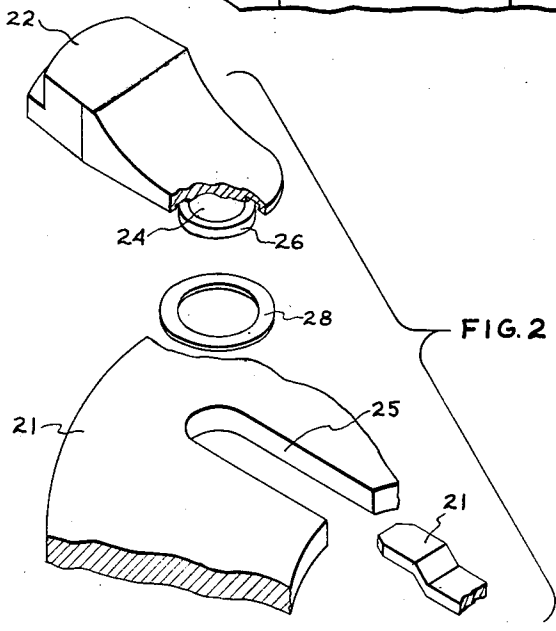


FIG. 2

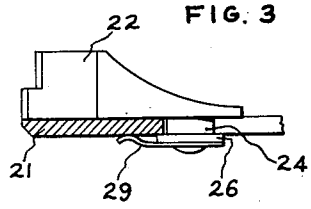


FIG. 3

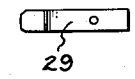


FIG. 4

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WASTE DISPOSAL APPARATUS

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4 Claims. (Cl. 241—46)

This invention relates to waste disposal apparatus of the type adapted to be connected to the drain opening of a sink, and has as its principal object the provision of an improved grinding mechanism for such apparatus.

Another object of this invention is to provide waste disposal apparatus with movable grinding mechanism impellers so arranged that jamming of the mechanism is minimized.

Further objects and advantages of the invention will become apparent as the following description proceeds, and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

Briefly stated, in accordance with one aspect of this invention there is provided a waste disposer including a generally cylindrical grinding chamber, a rotary grinding member including an impeller mounted for pivotal movement thereon about an axis generally parallel to the axis of the rotary member, and spring means associated with the impeller for imposing a frictional force restraining pivotal movement of the impeller sufficient to maintain it in a radially extending position when the rotatable member coasts to a stop after a grinding operation.

For a better understanding of the invention, reference may be made to the following description and the accompanying drawing in which:

Fig. 1 is a fragmentary elevation view, in section, illustrating a waste disposal device incorporating this invention.

Fig. 2 is an exploded fragmentary view of a portion of the device shown in Fig. 1.

Fig. 3 is a fragmentary elevation view, partially in section, showing a modified form of the invention.

Fig. 4 shows one element of the arrangement of Fig. 3.

Referring to the drawing, there is shown a waste disposal device having a generally cylindrical casing or hopper 1 enclosing a grinding chamber 2 at the bottom of which the grinding and shredding of waste material takes place. The upper end of hopper 1 is provided with means suitable for supporting the device in the drain opening of a sink or the like, the supporting means including, for example, a flanged drain sleeve 3, a clamping ring 4, a sealing washer 5, and clamping bolts 6, all arranged so that the open top of hopper 1 may be supported in alignment with a sink drain opening. Preferably, the drain opening is equipped with a suitable drain stopper 7, which may be of the type disclosed in application Serial No. 549,744 filed November 29, 1955 by Fred W. Moore, now Patent No. 2,787,423, April 2, 1957, and assigned to the assignee of the present application.

The lower end of hopper 1 is provided with a flange 8 which carries mounting screws 9 for securing a motor housing 10 to the hopper so as to form an integral structure. Mounted within motor housing 10 is an electric motor (not shown) provided with a vertically extending shaft 11 projecting into the chamber 12 defined by the upper walls of housing 10. Secured to the bottom of

tubular hopper 1 is a generally cylindrical shredding ring 13 provided with a flange 14 at the top thereof which is clamped between flange 8 of the hopper and the upper end of motor housing 10 so that the shredding ring is stationary with respect to the hopper, the joint being sealed by a gasket 15. Shredding ring 13 is provided with a plurality of shredding projections 16 on its inner surface, a plurality of openings 17 through which comminuted material is expelled during grinding operation, and a row of apertures 18 arranged to drain excess water from the comminuting zone. Projections 16, openings 17 and apertures 18 may be conveniently formed by lancing or stamping operations, or by any other suitable means. The arrangement and functions of shredding ring 13 are more fully described and claimed in application Serial No. 553,119 filed December 14, 1955 by Herbert J. Macemon and assigned to the assignee of the present application.

In accordance with the present invention I provide a rotary grinding member, generally designated by the numeral 19, fixedly secured to the upper end of motor shaft 11, by means of a fastening screw 20, for example, and provided with novel impelling means arranged to cooperate with shredding ring 13. Rotary grinding member 19 includes a generally cylindrical flywheel or table 21 having a running clearance with the lower edge portion of shredding ring 13 and a pair of impellers 22 and 23 pivotally mounted on flywheel 21 for movement about an axis generally parallel to the axis of rotation of motor shaft 11. Impellers 22 and 23 are oppositely mounted along a diameter of flywheel 21 and are preferably identical, only impeller 22 being described in detail herein.

Impeller 22 is provided with an integrally formed pivot pin 24 located in a generally radial slot 25 in flywheel 21 and retained therein by a collar 26 on the lower end thereof and a retaining member 27 clamped by screw 20. Thus during rotation of flywheel 21 when the grinding chamber is unobstructed by waste material, impeller 22 is held in the generally radial position shown in Fig. 1 by centrifugal force, but is free to pivot about the axis of pin 24 to a trailing position upon meeting an obstruction, as illustrated by the position of impeller 23 in Fig. 1.

While impeller 22 is free to pivot to the last mentioned position from a radial position upon meeting an obstruction, it sometimes happens that the obstruction (such as a bone fragment or a fruit pit) becomes wedged between the free end of impeller 22 and shredding ring 13 while flywheel 21 is stationary, and impelller 22 is pivoted forwardly with respect to the direction of rotation of the flywheel. Under these conditions, when the flywheel begins to rotate the jamming force is transmitted through the impeller and along a line through the axis of pin 24, and consequently impeller 22 cannot pivot to a trailing position with respect to the direction of flywheel rotation. It has been discovered that the impeller sometimes comes to rest in forwardly extending positions as described above after the completion of a grinding operation. In accordance with the present invention impeller 22 is maintained in a radially extending position upon completion of each grinding operation by spring means which impose a frictional force restraining pivotal movement of the impeller sufficient to maintain it in a radially extending position as flywheel 21 coasts to a stop after a completed comminuting operation. As best illustrated in Fig. 2, the spring means may be a bowed spring washer 28 encircling pivot pin 24 and bearing against the top surface of flywheel 21 and the bottom surface of impeller 22. Thus impeller 22 is not free to assume a random position as impeller 21 coasts to a stop but instead is maintained by the frictional force imposed by spring washer 28 in a radially extending position. Nevertheless impeller 22 may, of course, pivot to a trailing posi-

tion whenever it contacts an obstructing object. The frictional force applied by spring washer **28** should be great enough to hold impeller **22** against the inertia force on the impeller tending to rotate it to a forward position as flywheel **21** stops.

Referring to Figs. 3 and 4 which show a modified form of the invention and in which identical numerals are used for those parts which are common to both modifications, a leaf spring **29** is utilized in place of the bowed spring washer **28**. Leaf spring **29** is secured by means of riveting, for example, to the lower end of retaining collar **26** and extends into frictional engagement with the bottom surface of flywheel **21**. An advantage of this modifications is that the impeller is held in rubbing contact with the top surface of flywheel **21**, which may be desirable under certain conditions. The operation of the arrangement shown in Fig. 3 is essentially the same as that described above.

While I have shown and described a specific embodiment of this invention, I do not desire the invention to be limited to the particular construction shown and described, and I intend by the appended claims to cover all modifications within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. Waste disposal apparatus for use with a sink having a drain outlet comprising a housing providing a grinding chamber and having at its upper end an inlet opening for water and waste material, mounting means for securing said housing to the sink with said inlet opening in alignment with said drain outlet, projecting shredding members fixedly secured within said chamber, a rotatable grinding member within said grinding chamber, an impeller pivotally mounted on said rotatable member for movement about an axis generally parallel to the axis of rotation of said rotatable member, and spring means associated with said impeller for imposing a frictional force restraining pivotal movement of said impeller sufficient to maintain said impeller in a radially

extended position when said rotatable member coasts to a stop after a completed comminuting operation.

2. Waste disposal apparatus as defined in claim 1 in which said impeller includes a pivot pin extending through said rotary member provided with a retaining collar engaging said rotary member, and said spring means is a bowed spring washer on said pin.

3. Waste disposal apparatus as defined in claim 1 in which said impeller includes a pivot pin extending through said rotary member, and said spring means is a leaf spring secured to said pin and in frictional engagement with said rotary member.

4. Waste disposal apparatus for use with a sink having a drain outlet comprising a housing providing a generally cylindrical grinding chamber and having at its upper end an inlet opening for water and waste material, mounting means for securing said housing to the sink with said inlet opening in alignment with said drain outlet, fixed shredding members adjacent the inner wall of said chamber, a rotatable circular grinding flywheel mounted at the bottom of said chamber for rotation about an axis aligned with the axis of said chamber, an impeller mounted on said flywheel for pivotal movement about an axis spaced from said flywheel axis, said impeller including a pivot pin extending through said flywheel, a retaining collar on said pin engageable with the lower surface of said flywheel, and a bowed spring washer on said pin between the lower surface of said impeller and the upper surface of said flywheel, said spring imposing a frictional force restraining pivotal movement of said impeller sufficient to maintain said impeller in a radially extended position when said rotatable member coasts to a stop after a completed comminuting operation.

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