Jan. 16, 1968 C. G. JOA 3,363,847

WASTE DISPOSER

Filed Nov. 12, 1964

Fig. 1

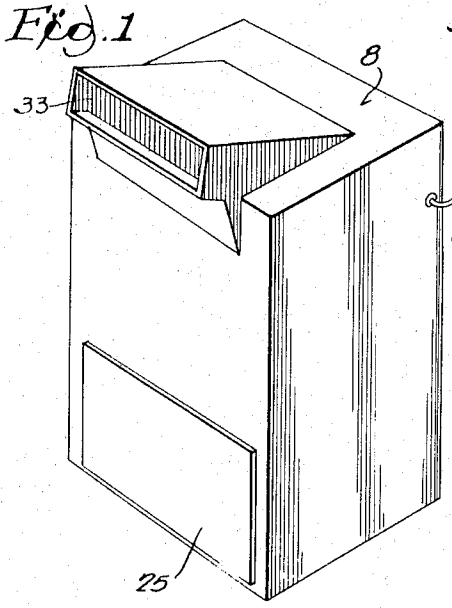
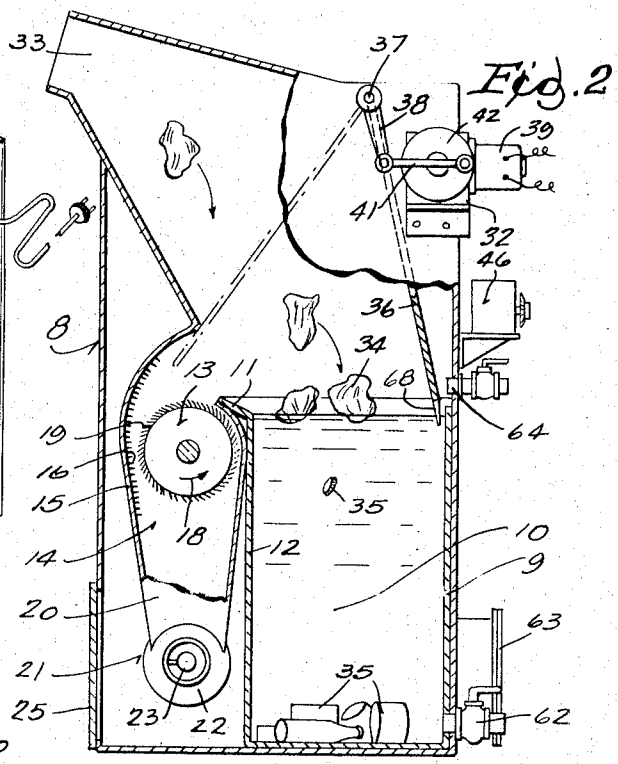


Fig. 2



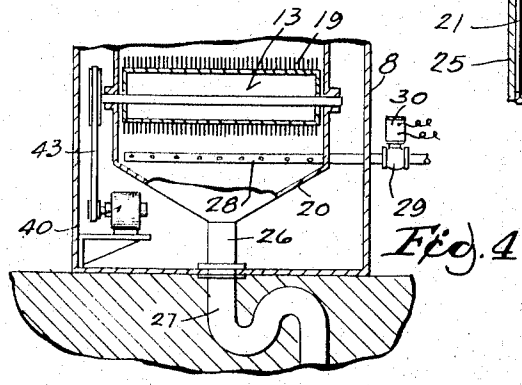


Fig. 4

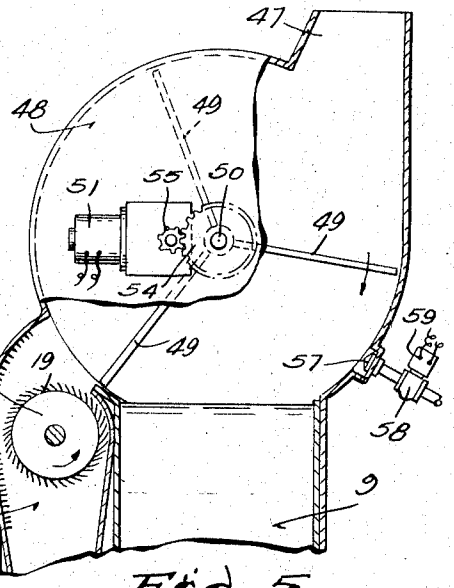


Fig. 5

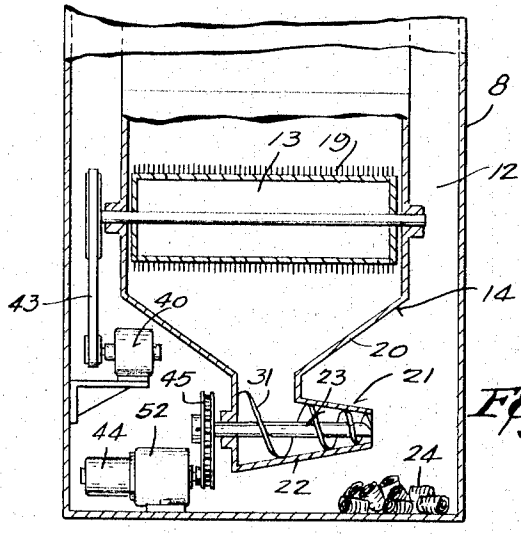


Fig. 3

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WASTE DISPOSER

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This invention relates to a waste disposer and particularly to a disposer for paper waste such as paper towels, baby diapers, sanitary napkins, paper cups, etc.

The increasing use of paper products for sanitary purposes, wrapping material, etc. has created a disposal problem for which no adequate solution has yet been contrived. This problem is particularly acute in public wash rooms and lavatories where used hand towels, paper cups, paper diapers and napkins, etc. accumulate in great quantities in waste baskets and require frequent janitorial services to maintain sanitary and neat conditions. Most of this material cannot be disposed of through the sanitary sewer system unless it is first comminuted, lest the sewer line be plugged. The disposal problem is also acute in supermarkets where incoming goods are packaged in paper containers which must be removed and disposed of in the course of displaying merchandise for sale. Even a single domestic household now must dispose of over two tons of paper waste per annum. A multi-family dwelling presents proportionately greater disposal problems.

According to the present invention, the paper waste is disintegrated. In one embodiment of the invention, the resultant fibers are simply flushed down the sanitary sewer system for ready disposal without requiring janitorial services in connection therewith. This requires a plumbing connection. Alternatively, the disintegrated paper waste may be compacted for salvage, if desired. In the latter instance, no plumbing connection would be required.

An important feature of all embodiments of the present invention is provision for separating disintegrable waste material from non-disintegrable waste materials such as tin cans, glass bottles, pieces of metal such as hairpins, etc. All categories of waste are usually commingled by the public. A commercially practical waste disposer should accept all waste, of whatever nature. For this reason the waste disposer of the present invention incorporates a flotation chamber in which lightweight disintegrable material such as paper will float on the surface of liquid in the chamber, and heavy non-disintegrable material will sink to the bottom of the chamber for periodic removal independently of disposition of the disintegrable material.

In preferred embodiments of the invention, an automatic mechanism is provided which will periodically convey floatable material at the surface of the liquid in the flotation chamber to the disintegrator. The disintegrator and disposer will be concurrently operated to dispose of disintegrated material.

Other objects, features and advantages of the present invention will appear from the following disclosure in which:

FIGURE 1 is a perspective view of a waste disposer embodying the present invention.

FIGURE 2 is a vertical cross section taken through the disposer of FIGURE 1.

FIGURE 3 is a transverse vertical cross section taken through the disposer of FIGURE 2.

FIGURE 4 is a fragmentary cross section taken through a modified embodiment of the invention.

FIGURE 5 is a fragmentary cross section taken through another modified embodiment of the invention.

Although the disclosure hereof is detailed and exact to enable those skilled in the art to practice the invention, the physical embodiments herein disclosed merely exemplify the invention which may be embodied in other specific structure. The scope of the invention is defined in the claims appended hereto.

The apparatus of the present invention is desirably contained within an attractive outer casing **8** which can be placed in public lavatories, supermarkets or any other place having a paper waste disposal potential. In the embodiment shown in FIGURES 1, 2 and 3, no plumbing connection is required and the unit may be positioned at any location convenient to an electrical service outlet to power the electric motors and timer within the unit. The embodiments of FIGURES 4 and 5 require plumbing connections.

The cabinet **8** of all embodiments is partitioned off interiorly into a flotation chamber **9** which is desirably kept filled with a liquid such as water **10**. A deodorizer and disinfectant may be added to the water. Adjacent a lip **11** on wall **12** of the flotation chamber **9** is disposed the picker drum **13** of a paper waste disintegrator **14**. Disintegrator **14** is further provided with a picker wall **15** on which are provided compementary stationary picker pins **16** which cooperate with the pins **19** on drum **13** to shred and defiberize paper waste which is periodicaliy fed to the disintegrator **14**. The picker drum **13** is rotated at high speed in the direction of arrow **18**. Its pins **19** have slight clearance (less than $\frac{1}{32}$ inch) from pins **16**, thus to tear the waste into tiny fragments.

The disintegrator **14** further includes downwardly extending discharge hopper **20**. In the embodiment shown in FIGURES 2 and 3, hopper **20** terminates in a compactor **21** which may consist of a conically shaped throat **22** within which a compacting screw auger **23** is disposed. Helical flight **31** is of decreasing pitch and diameter from its input end to its discharge end. Paper fragments which have been disintegrated by the picker drum **13** are compacted in the compactor **21** to form slugs **24** of salvage paper waste which can be removed periodically through the cabinet door **25** for sale to paper mills, etc.

In the embodiment shown in FIGURE 4, the chute **20** terminates in a connection **26** to the drain **27** of the sanitary sewer system. The disintegrated fragments may be flushed down the chute **20** and into the drain **27** by a water spray eminating from a spray head **28** under pressure from the city water system through a valve **29** which can be controlled by a solenoid operator **30**.

Waste material may be deposited in the disposer through a chute **33**. Floatable paper waste material **34** will float on the surface of the liquid in the flotation chamber **9**, and sinkable material **35** will drop to the bottom of the flotation chamber. In some embodiments of the invention, as shown in FIGURES 2 and 3, there is a conveyor or sweep paddle **36** pivotally mounted on the cabinet on the rock shaft **37** which is actuated by crank **38** and pitman **41** connected through disk **42** and gear reducer **32** to electric motor **39**. Motor **39** will be periodically energized to sweep paddle **36** from its full to broken line position shown in FIGURE 2. In the course of this movement, the paddle **36** will convey or push the floating material **34** laterally across the top of the flotation chamber **9** and into the disintegrator **14**.

Picker drum **13** of the disintegrator **14** is also provided with an electric motor **40** which drives the drum **13** through belt **43**. Where the compactor **21** is used, it is also provided with an electric motor **44** coupled to the shaft of the auger **23** through gear reducer **52** and chain drive **45**.

All electric motors which comprise the power means for the various parts above described are desirably controlled by a conventional electric timer **46** which will concurrently actuate all motors so that as the disintegrable material is swept into the disintegrator, the picker wheel **13** thereof will be actuated. In compactor embodiments,

motor 44 will also be actuated. In the embodiment shown in FIGURE 4, the valve 29 will be concurrently opened by the solenoid 30 to flush disintegrated material down the sewer. When the timer times out, all motors will be de-energized and valve 29 will close.

An alternative mode of loading the disposer is shown in FIGURE 5 in which the disposer is provided with a loading spout 47 and with a cylindrical metering vane housing 48 containing three metering vanes 49 arcuately spaced 120° and mounted on an axle 50 powered by motor 51 connected to a sprocket 54 on the axle 50 through a pinion 55 and gear reduction drive unit. In this embodiment, motor 51 is controlled by the timer 46. The rest position of the vanes is shown in FIGURE 5 in which one vane blocks the passage to the flotation chamber 9.

In the embodiment of FIGURE 5, a spray nozzle 57 may also be provided under control of a valve 58 having a solenoid actuator 59 controlled by timer 46. In this embodiment, the materials to be disposed of are merely dropped into the spout 47. The material will accumulate in the space above the blocking vane which spans across the housing 48. Accordingly, paper, etc. that might sink if soaked is kept dry for a period after being deposited in the disposer.

Periodically, under control of timer 46, shaft 50 will be rotated through 120°. Blocking vane 49 will sweep floatable material previously admitted to the flotation chamber into the disintegrator 14 and will deposit the next charge of material in the flotation chamber 9 for separation as aforesaid. The metering device shown in FIGURE 5 positively precludes deposit of non-disintegrable material into disintegrator 14 and deposits all such material in the flotation chamber. The spray nozzle 57 may be actuated concurrently to clean the underside of the vane 49 which has just swept over the flotation chamber 9 and flush any paper into the chamber which might otherwise stick to the vane. The embodiment of FIGURE 5 requires a plumbing connection.

Other non-disintegrable material 35 may be periodically removed by draining chamber 9 through drain cock 62. A water-tight access door 63 may be provided through which the material 35 is physically removed. Water is then restored to the tank 9 through filling spout 64.

In "plumbed in" embodiments, the paddle 36 or vanes 49 desirably dip into the water in tank 9 to convey some water with the material 34 into the disintegrator and aid in its comminution and flushing to the sewer 27 through the disintegrator 14.

In portable units, the lower margin of paddle 36 is desirably composed of tines 68 (FIGURE 2) which pick the material 34 out of the water in tank 9 without conveying the water into the disintegrator 14 and compactor 21.

The disposer may be made of any appropriate size, ranging from small sizes for domestic home use to medium size for apartment house use to large size for supermarket use.

I claim:

1. A waste disposer comprising:
a flotation chamber into which waste material is deposited for separation of sinkable material from floatable material,
a lip on the flotation chamber over which floatable material is discharged therefrom,
conveyor means for conveying floatable material in the flotation chamber over said lip,

a picker drum adjacent said lip and onto which the floatable material is fed by the conveyor means,
a picker wall adjacent the picker drum and with which the picker drum coacts to disintegrate the floatable material,
and means for disposing of disintegrated material.

2. A waste disposer comprising a flotation chamber into which waste material is deposited for separation of sinkable material from floatable material, a disintegrator adjacent said flotation chamber, conveyor means for conveying floatable material in the flotation chamber to the disintegrator and comprising a paddle and means mounting said paddle to sweep across the surface of liquid in the flotation chamber to move floatable material to the disintegrator, and means for disposing of disintegrated material.

3. The waste disposer of claim 1 in which the means for disposing of the disintegrated material comprises a compactor.

4. The waste disposer of claim 1 in which the means for disposing of the disintegrated material comprises a sewer line connection.

5. A waste disposer comprising a flotation chamber into which waste material is deposited for separation of sinkable material from floatable material, a disintegrator adjacent said flotation chamber, conveyor means for conveying floatable material in the flotation chamber to the disintegrator, and means for disposing of disintegrated material, said flotation chamber being provided with a charging door, said door having metering vanes which sweep across the surface of liquid in the flotation chamber to move floatable material to the disintegrator.

6. A waste disposer comprising a flotation chamber into which waste material is deposited for separation of sinkable material from floatable material, a disintegrator adjacent said flotation chamber, conveyor means for conveying floatable material in the flotation chamber to the disintegrator, and means for disposing of disintegrated material, and power means for the disintegrator and the conveyor means and a timer for periodically actuating said power means.

7. A waste disposer comprising:
a flotation chamber into which waste material is deposited for separation of sinkable material from floatable material,
a disintegrator adjacent said flotation chamber,
a sweep paddle,
means mounting said paddle to sweep over the surface of the liquid in the flotation chamber,
power means for said disintegrator and sweep paddle,
a timer to periodically actuate said power means for concurrent action of the sweep paddle and disintegrator,
and means for disposing of disintegrated material.

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