

(19)



(11)

EP 2 493 785 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
23.01.2019 Bulletin 2019/04

(51) Int Cl.:
B65F 1/00 (2006.01) **B65F 1/06** (2006.01)
B65F 7/00 (2006.01) **B65F 1/16** (2006.01)

(21) Application number: **10827354.1**

(86) International application number:
PCT/US2010/053769

(22) Date of filing: **22.10.2010**

(87) International publication number:
WO 2011/053531 (05.05.2011 Gazette 2011/18)

(54) **POWDER DISPENSING ASSEMBLY FOR A WASTE CONTAINER**

PULVERSPENDEVORRICHTUNG FÜR EINEN ABFALLBEHÄLTER

ENSEMBLE DE DISTRIBUTION DE POUDRE POUR CONTENANT À DÉCHETS

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(30) Priority: **30.10.2009 US 609136**
30.10.2009 US 609140

(43) Date of publication of application:
05.09.2012 Bulletin 2012/36

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EP 2 493 785 B1

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] This invention relates generally to waste disposal systems, such as trash cans and diaper pails, for household and institutional use. More specifically, this invention pertains to an improved waste disposal system and a powder dispensing assembly for dispensing a deodorizing or odor-absorbing powder such as sodium bicarbonate into a targeted area of a waste disposal system.

2. Description of the Related Technology

[0002] Conventional deodorizing techniques for waste disposal systems such as trash cans and diaper pails include periodically spraying the inside of the container with an aerosol deodorant, or using a liner or disposable bag that has been treated or impregnated with a substance that is intended to suppress or mask odors.

[0003] U.S. Patent 7,086,569 to Stravitz describes an odor control assembly for such systems in which a deodorizing powder is provided in a cartridge that is secured to an underside of a hinged lid of a trash container. The cartridge is provided with a plurality of dispensing openings in the bottom of the cartridge that are oriented to disperse the powder downwardly and substantially evenly in all directions when the lid is in the closed position.

[0004] Unfortunately, the present inventors have found that such a dispensing orientation does not optimally disperse the powder into the desired areas of the waste container when the lid is open and closed. Instead, powder that falls from the container when the lid is open will tend to fall disproportionately on the side of the container that bears the hinge. When the lid is open to the extent that it is close to being perpendicular to the closed position, powder will even tend to fall directly on the hinge or the rim of the trash container. This wastes the powder, can cause malfunction of mechanical components of the waste container and can also create a mess on the surrounding floor or carpet.

[0005] In addition, conventional powder dispensers for waste disposal systems typically did not provide precise metering of the powder material that would ensure that an efficacious amount of powder material is dispensed each time a lid of the waste container is opened and closed, and that would conserve the powder material to ensure an optimal number of lid opening and closing cycles can be accommodated before the powder dispenser needs to be replaced or refilled.

[0006] A need exists for an improved system and method for dispensing a deodorizing or odor-absorbing powder in a waste disposal system that optimally disperses the powder to the desired portions of the waste disposal system whether the lid is open or closed, and that effica-

ciously meters the powder material into the waste disposal system.

[0007] US3214065 (A) relates to a powder dispensing device for dispensing disinfecting or deodorising material, in particular disinfecting or deodorising powder. There is provided a container for powdered disinfecting and/or deodorising material having a neck portion with dispensing means whereby powder from the container is allowed to escape and become sprinkled when the container is in inverted attitude and is subjected to mechanical disturbance, and means for attaching the container in inverted attitude to the underside of a lid of a garbage or like receptacle. The container may be for use with a receptacle having a hinged lid. The container is secured to the inside of the lid so that when the lid is on the garbage container the device is in vertical inverted attitude. The container body is charged with powdered disinfectant and/or deodorising material. Powder discharging openings are distributed circumferentially in a cylindrical side wall of a closure cap fitted to a neck portion of the dispensing device. When the lid is raised for access to the garbage container the body of the device becomes tilted and allows the escape of the powdered material through the apertures in the cap. The container can have its cap forming a permanent closure around three sides of the orifice and being capable of opening an outlet on the fourth side and being formed with a ledge thereat. This fourth side would be lowermost when the container is fitted to a lid and the lid is canted upwardly about its hinge.

SUMMARY OF THE INVENTION

[0008] Accordingly, it is an object of the invention to provide an improved system and method for dispensing a deodorizing or odor-absorbing powder in a waste disposal system that optimally disperses the powder to the desired portions of the waste disposal system whether the lid is open or closed, and that efficaciously meters the powder material into the waste disposal system.

[0009] In order to achieve the above and other objects of the invention, a waste disposal system according to claim 1 is provided

[0010] These and various other advantages and features of novelty that characterize the invention are pointed out with particularity in the claims annexed hereto and forming a part hereof. However, for a better understanding of the invention, its advantages, and the objects obtained by its use, reference should be made to the drawings which form a further part hereof, and to the accompanying descriptive matter, in which there is illustrated and described a preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011]

FIGURE 1 is a perspective view of a waste disposal system that is constructed according to a preferred

embodiment of the invention;

FIGURE 2 is a bottom plan view of a powder dispensing unit that is constructed according to the preferred embodiment of the invention;

FIGURE 3 is a side elevational view taken along lines 3-3 in FIGURE 2;

FIGURE 4 is a side elevational view of the powder dispensing unit that is shown in FIGURE 2;

FIGURE 5 is a rear elevational view of the powder dispensing unit that is shown in FIGURE 2;

FIGURE 6 is a diagrammatical depiction of the powder dispensing unit that is shown in FIGURE 2 in use;

FIGURE 7 is a perspective exploded view of the powder dispensing unit that is shown in FIGURE 2;

FIGURE 8 is a fragmentary perspective view of a mounting receptacle that is part of the waste disposal system shown in FIGURE 1; and

FIGURE 9 is a diagrammatical depiction depicting venting of the waste disposal system shown in FIGURE 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

[0012] Referring now to the drawings, wherein like reference numerals designate corresponding structure throughout the views, and referring in particular to FIGURE 1, a waste disposal system 10 includes a housing 12 defining an internal storage space that may be accessed by a parent or a caregiver through a hinged door 14. In the preferred embodiment, waste disposal system 10 is constructed as a diaper pail assembly that uses a modular bag assembly having a flexible, liquid and air impervious pleated bag having an attached foldable frame.

[0013] Waste disposal system 10 preferably includes a mechanism 16 for holding and twisting an intermediate portion of the flexible bag while the bag frame is held fixed by the housing. A lower portion of the flexible bag is positioned within the internal storage space for holding waste articles such as used disposable diapers, hi alternative embodiments, the waste disposal system could be any type of waste container for residential, institutional or industrial use.

[0014] Referring again to FIGURE 1, waste disposal system 10 further includes a lid member 18 that is movably mounted with respect to the housing 12 by a hinge mechanism 20. Lid member 18 defines a longitudinal axis 22 that is preferably oriented substantially vertically when the lid 18 is in the closed position. In the preferred em-

bodiment, a releasable locking mechanism including a laterally expandable plunger 19 that is provided on the lid member 18 and a mating recess 21 that is defined within the housing 12 permits the lid member to be releasably locked in the closed position.

[0015] In order to open the waste disposal system 10 by lifting the lid member 18, the plunger 19 is moved and laterally contracted by an actuator button in order to disengage a latch portion 19 thereof from the mating recess 21. When the lid member 18 is pressed downwardly by a parent or caregiver in order to close the waste disposal system 10, the releasable locking mechanism engages with a slight hesitation and click as the laterally expandable latch portion 19 passes over the restriction of the recess 21 and temporarily laterally contracts against a spring bias, which is advantageous for facilitating powder distribution for reasons that are described in greater detail below.

[0016] Waste disposal system 10 further includes a powder dispensing unit 24 that is preferably releasably secured to an underside 26 of the lid member 18. Specifically, powder dispensing unit 24 is releasably secured to a mounting receptacle 60, described in further detail below, which in turn is mounted to the underside 26 of the lid member 18.

[0017] Referring briefly to FIGURE 3, it will be seen that the powder dispensing unit 24 preferably includes a container 28 that defines an interior space 30 in which a powder material 32 such as sodium bicarbonate may be stored. For purposes of this document, the term powder material includes any type of powdered or granular substance without regard to the degree of granularity. Any alternative odor-absorbing, odor masking or sanitizing powder could be used, as could a composite powder that has more than one of such properties. A sanitizing powder is a powder that has antibacterial or antiviral properties. Other powders such as talcum powder or baby powder could alternatively be used in the powder dispensing unit 24.

[0018] The powder material 32 preferably has a granularity that is expressed as a mean particle size maximum dimension that is substantially within a range of about 40 microns to about 140 microns, more preferably within a range of about 60 microns to about 120 microns and most preferably within a range of about 80 microns to about 100 microns. The material 32 also preferably has a bulk density that is substantially within a range of about 48 lb/ft³ to about 78 lb/ft³, more preferably within a range of about 53 lb/ft³ to about 73 lb/ft³ and most preferably within a range of about 58 lb/ft³ to about 68 lb/ft³.

[0019] Container 28 is preferably fabricated from a substantially rigid plastic material, which is preferably translucent, and more preferably transparent. In the preferred embodiment, container 28 includes an integral upper mounting flange 34 having external helical threading 36.

[0020] The container 28 also includes a directional dispensing portion 38 for dispensing powder material 32

from the container 28 into a targeted portion of the waste disposal unit 10. In the preferred embodiment, the targeted portion is a central portion 33 of the waste disposal system 10 that is substantially radially inward of the hinge mechanism 20 and that is substantially above a portion of the mechanism 16 for holding and twisting an intermediate portion of the flexible bag. More preferably, the targeted portion is above a portion of the flexible bag itself when it is positioned within the mechanism 16. The targeted portion preferably does not overlie any upper horizontal portion of the outer housing 12. The targeted portion is preferably positioned radially inward of the hinge mechanism by a distance D_t that is at least substantially about 3 cm, more preferably at least substantially about 5 cm and most preferably at least substantially about 9 cm.

[0021] The directional dispensing portion 38 is constructed and arranged to concentrate and more preferably limit the initial dispersal of the powder material 32 as originating from a single side of the container 28, which is preferably a side of the container 28 that is away from the hinge mechanism 20. More preferably, the directional dispensing unit 38 is constructed and arranged to concentrate and limit the initial dispersal of the powder material 32 to a side of the container 28 that is substantially diametrically opposed to the hinge mechanism 20.

[0022] According to one embodiment of the invention, the directional dispensing portion 38 is constructed and arranged to limit initial dispersal of the powder material 32 as it leaves the container 28 within an angular range α_1 that is 40° to 80° with respect to the longitudinal axis 40 of the container 28. In the preferred embodiment, the longitudinal axis 40 of the container 28 is substantially coincident with the longitudinal axis 22 of the lid member 18 when the lid member 18 is in the closed position. Accordingly, the directional dispensing portion 38 is also constructed and arranged to limit initial dispersal of the powder material 32 within an angular range α_1 that is 40° to 80° with respect to the longitudinal axis 22 of the lid member 18 when the lid member 18 is in the closed position.

[0023] More preferably, the angular range α_1 is substantially about 45° to about 75° , and most preferably it is substantially about 50° to about 70° .

[0024] In the preferred embodiment, the directional dispensing portion 38 has a single dispensing orifice 44 that is defined in a substantially flat surface portion 42 that is located on one side of the container 28. Alternatively, multiple dispensing orifices could be provided on the substantially flat surface portion 42.

[0025] Orifice 44 preferably is substantially circular in cross-section, but it could alternatively be constructed to have a polygonal or oval shape. Dispensing orifice 44 preferably has a maximum diameter $D_{\max}$ that is substantially within a range of about 0.5 mm to about 5.0 mm, that is more preferably within a range of substantially about 0.75 mm to about 3.5 mm and that is most preferably within a range of substantially about 1.0 mm to about

2.5 mm.

[0026] The substantially flat surface portion 42 is oriented so as to define an angle α_2 with respect to the longitudinal axis 40 of the container 28. Angle α_2 is preferably substantially within a range of substantially about 5.0° to about 60.0° degrees. More preferably, angle α_2 is substantially within a range of about 15.0° to about 45.0° degrees, and is most preferably substantially within a range of about 20.0° to about 40.0° degrees.

[0027] The dispensing orifice 44 is also preferably positioned at a first longitudinal distance L_1 , measured axially in a direction that is parallel to the longitudinal axis 22 of the lid member 18, from the underside 26 of the lid member 18. Distance L_1 is preferably substantially within a range of about 3.0 cm to about 15.0 cm. More preferably, the first distance L_1 is substantially within a range of about 4.5 cm to about 8.5 cm, and most preferably it is substantially within a range of about 5.0 cm to about 7.0 cm.

[0028] Container 28 is moreover preferably constructed so that the dispensing orifice 44 is spaced a second lateral distance L_2 from the longitudinal axis 40 of the container 28. Second lateral distance L_2 is preferably substantially within a range of about 0.25 cm to about 6.0 cm. More preferably, distance L_2 is substantially within a range of about 0.5 cm to about 4.0 cm and most preferably it is substantially within a range of about 1.0 cm to about 2.5 cm.

[0029] Referring briefly to FIGURE 4, which is a side elevational view of the powder dispensing unit 24, it will be seen that the container 28 is preferably provided with first indicia 46 for indicating a recommended minimum fill level and second indicia 48 for indicating a recommended maximum fill level. Indicia 46, 48 provide guidance to a parent or caregiver as to the optimal fill level for the powder material 32 within the interior space 30 of the container 28. Preferably, the indicia 46, 48 are also visible from the rear side of the container 28, as is shown in FIGURE 5. The indicia 46, 48 are preferably integrally molded into the container 28 using the same transparent material from which the rest of the container 28 is fabricated. Alternatively, the indicia 46, 48 could be formed from a translucent or opaque material, or it could be printed or silkscreened onto the container 28.

[0030] Preferably, container 28 is sized and shaped so as to have a first internal volume corresponding to the recommended minimum fill level that is preferably within a range of about 5 cm^3 to about 50 cm^3 , that is more preferably within a range of about 7 cm^3 to about 40 cm^3 , and that is most preferably within a range of about 10 cm^3 to about 30 cm^3 .

[0031] Container 28 also preferably has a second internal volume corresponding to the recommended maximum fill level that is preferably within a range of about 15 cm^3 to about 120 cm^3 , that is more preferably within a range of about 20 cm^3 to about 80 cm^3 , and that is most preferably within a range of about 25 cm^3 to about 65 cm^3 .

[0032] Container 28 further defines a third internal volume V_R , shown in FIGURE 4, which is the internal space within the container 28 between the recommended minimum and maximum fill levels, that is preferably substantially within a range of about 10 cm³ to about 70 cm³, more preferably within a range of about 13 cm³ to about 40 cm³, and most preferably within a range of about 15 cm³ to about 35 cm³.

[0033] The container 28 is preferably fabricated from a material that will minimize the potential for any buildup of static electricity that could cause the powder material to clump or cling to the internal surface use of the container 28 or the dispensing orifice 44. Preferably, the internal surfaces of container 28 and the surfaces defining the dispensing orifice 44 are fabricated from a plastic material having anti-stick properties such as polypropylene. In the preferred embodiment, the entire container 28, including the internal surfaces and the surfaces defining the dispensing orifice 44, is fabricated from a polypropylene Random Copolymer such as YUNGSOX® PP 5090T, commercially available from Formosa Plastics Corporation in Taiwan.

[0034] A material that has anti-static or static dissipative properties may be used, such as a material having a resistivity that is substantially within a range of about 10⁷ to about 10¹² ohms/cm². Alternatively, a material that is conductive could be used to control potential static charges, such as a material having a resistivity that is substantially within a range of about 10³ to about 10⁶ ohms/cm².

[0035] The container 28 is further preferably constructed and arranged in such a manner that the powder material 32 within the third internal volume between the recommended minimum and maximum fill levels will be dispensed at a rate per each cycle of opening and closing of the lid member 18 that ensures that the container 28 has sufficient capacity to effectively dispense an amount of powder between refills that substantially correlates with the anticipated lifespan of the effective odor absorbing capability of the powder material 32. Container 28 is also constructed and arranged to ensure that an amount of powder material 32 is dispensed per each lid opening cycle that provides effective odor absorbing or deodorizing capability within each lid opening cycle.

[0036] Preferably, the directional dispensing system 38 is constructed so that the powder material 32 within the third internal volume is conserved to be dispensed substantially within a range of about 600 to about 2000 lid opening cycles. More preferably, directional dispensing system 38 is constructed so that the powder material 32 within the third internal volume is conserved to be dispensed substantially within a range of about 750 to about 1600 lid opening cycles, and most preferably substantially within a range of about 900 to about 1200 lid opening cycles.

[0037] One physical characteristic of the directional dispensing system 38 that is important in ensuring that the powder material 32 is conserved for the anticipated

number of lid opening cycles is the relationship between the internal volume of the container 28 and the cross-sectional area of the dispensing orifice 44. Preferably, the third internal volume divided by the cross-sectional area of the dispensing orifice 44 is substantially within a range of about 350 cm to about 5100 cm, more preferably within a range of about 500 cm to about 3000 cm, and most preferably within a range of about 700 cm to about 1500 cm.

[0038] FIGURE 6 is a diagrammatical view showing the powder dispensing unit 24 in the process of dispensing a powder material 32 into a waste disposal system that is constructed according to the preferred embodiment of the invention. It is readily apparent from viewing FIGURE 6 how the directional dispensing portion 38 helps to direct the powder material toward the center of the waste disposal system 10 when the lid member 18 is partially open.

[0039] In the preferred embodiment, the waste disposal system 10 is a diaper pail assembly in which a flexible plastic bag 70 having an upper portion 72 that is mounted to a bag frame 74 is mounted within the system 10 so that the bag frame 74 is rotationally fixed with respect to the housing 12. The bag frame 74, which has a central opening defined therein, is mounted directly beneath the powder dispensing unit 24. It is important that powder material that is dispensed from the powder dispensing unit 24 falls into the central opening of the bag frame 74 and not into other areas near the top of the housing 12. The directional dispensing portion 38 facilitates this.

[0040] In the preferred embodiment, a plurality of inwardly radially extending resilient fingers 76 engage and twist an outer surface of an intermediate portion of the flexible bag 70 in order to create a twisted intermediate portion 75 of the flexible bag 70 in order to form an odor seal while the upper portion 72 and a lower portion 78 remain substantially stationary. The lower portion 78 of the flexible bag 70 is shown in FIGURE 6 to be holding a number of waste packages 80, which may be used disposable diapers. The consumer will insert the waste packages 80 through the central opening of the bag frame 74 and downwardly through the twisted portion 75 of the bag 70 into the lower portion 78. An odor seal is maintained between the twisted portion and the outer surface of the waste package 80 as it is being pushed through the twisted portion.

[0041] Accordingly, powder material 32, after falling into the upper portion 72 of the flexible bag 70, is retained in the upper portion 72 above the twisted intermediate portion 75 of the flexible bag 70 for a period of time before a portion of it is swept by the parent or caregiver into the lower portion 78 of the flexible bag as the parent or caregiver pushes a waste package 80 downwardly through the twisted portion 75. The powder material 32 accordingly deodorizes or absorbs odor in the upper area of the diaper pail assembly 10 for a period of time when it is positioned within the upper portion 72 of the flexible bag 70, and later in the lower portion 78 of the flexible bag 70.

[0042] A bottom surface 82 of the housing 12 is concavely curved in order to center and align the flexible bag 70 in order to optimize the space and provide longitudinal alignment of the flexible bag 70 with respect to the pail and the mechanism 16.

[0043] In the preferred embodiment, the powder dispensing unit 24 is constructed and arranged to dispense a powdered deodorant or odor absorbing substance such as sodium bicarbonate directly into the interior of the waste disposal system 10. In addition, it is constructed to facilitate and permit air within the waste disposal system 10 to contact and potentially circulate past the powder material, including when the lid member 18 is closed, in order to reduce objectionable odors within the waste disposal system 10. This is achieved by means of a venting path that is defined in the powder dispensing unit 24, which is shown diagrammatically in FIGURE 9. Opening and closing of the lid member 18 further facilitates circulation of air through the venting path.

[0044] FIGURE 7 is an exploded perspective view depicting the preferred components of the powder dispensing unit 24. In addition to the container 28, the powder dispensing unit 24 includes a removable cover 54 that has at least one vent opening 56 defined therein and a porous membrane 58 that is positioned between the removable cover 54 and a container 28 so as to be interposed within the vent opening 56.

[0045] In the preferred embodiment, vent opening 56 is embodied as a plurality of substantially concentric, curved individual vent openings, each of which preferably has a substantially constant radius of curvature as view in top plan. All of the individual vent openings preferably have a common center point of curvature, which is preferably in the center of the removable cover 54 and substantially coincident with the longitudinal axis 40 of the container 28. However, the vent opening 56 could be sized and shaped in any one of a number of possible different ways.

[0046] The removable cover 54 is releasably secured during use within a recessed upper inner seating surface 61 of the container 28, best shown in FIGURE 3, by means of engagement of at least one helical thread 57 that is provided on an outer circumferential surface of the cover 54 with a mating internal thread 63 that is provided on the recessed upper inner seating surface 61. Structure 59 such as a thread stop is also preferably provided for limiting the maximum amount of rotation that is permitted between the removable cover 54 and the container 28. Alternatively, any other mechanical structure for attaching the removable cover 54 to the container 28 could be provided, including but not limited to a tab lock arrangement, a snap arrangement or a latching arrangement.

[0047] Preferably, the porous membrane 58 includes a fibrous matrix that may be bound together using a binder material such as latex, and which can include natural and/or synthetic fibers. Preferably the porous membrane has an air permeability as measured by the "Frazier Number" (also referred to in the industry as "CFM") that

is substantially within a range of about 15 to about 500, and that is more preferably within a range of about 30 to about 380 at a differential pressure of 0.5 inches of water. Most preferably, porous membrane 58 has a Frazier Number that is substantially within a range of about 40 to about 410 at a differential pressure of 0.5 inches of water. The Frazier Number/CFM rating is a measurement of air flow in cubic feet per square foot of sample area per minute at a given differential pressure.

[0048] Porous membrane 58 may also be fabricated from a material that has anti-static or static dissipative properties, such as a material having a resistivity that is substantially within a range of about 10^7 to about 10^{12} ohms/cm². Alternatively, a material that is conductive could be used to control potential static charges, such as a material having a resistivity that is substantially within a range of about 10^3 to about 10^6 ohms/cm².

[0049] In the illustrated embodiment, a mounting receptacle 60 is secured to the underside 26 of the lid member 18. The mounting receptacle 60 includes a central opening for receiving the mounting flange 34 of the container 28 and is provided with one or more internal helical threads 64 that are constructed and arranged to mate with the external helical threads 36 that are provided on the mounting flange 34 of the container 28. As is best shown in FIGURE 8, rotation limiting and alignment structure such as a thread stop 66 is provided for limiting the maximum amount of rotation that is permitted to occur between the container 28 and a mounting receptacle 60. This will prevent overtightening of the container 28 within the mounting receptacle 60 as well as ensure the alignment of the directional dispensing portion 38 in opposition to the position of the hinge mechanism 20.

[0050] The powder dispensing unit 24 may be provided to the consumer both together with the initial sale of the waste disposal system 10 and as a separate modular refill product. The unit 24 may be packaged using a shrink wrapping technology to preserve the freshness of the powder 32, or a temporary adhesive barrier may be placed over the upper surface of the container 28 with the removable cover 54 in place in order to prevent air from circulating through the vent openings 56 and reducing the odor absorbing or masking capacity of the powder 32 before the unit 24 is used by the consumer.

[0051] The consumer will remove the packaging or the adhesive barrier prior to use. The consumer will then install the powder dispensing unit into the waste disposal system 10 by grasping the container 28 and causing the external threading 36 of the mounting flange 34 to mate with the internal threading 64 of the mounting receptacle 60 that is provided on the underside 26 of the lid member 18. An adhesive label 52 that is preferably provided on the flat surface 42 in order to seal the dispensing orifice 44 during transit and storage will then be removed by the consumer.

[0052] During normal use of the waste disposal system 10, air that is internal to the waste disposal system 10 is permitted to circulate and contact the odor absorbing or

deodorizing powder 32 within the container 28 by flowing through the venting path that includes the vent openings 62 that are defined in the mounting receptacle 60 and the vent openings 56 that are defined in the removable cover 54. Because the venting path is located near the top of the waste disposal system 10, circulation of air therethrough may be aided by convection.

[0053] The outer absorbing or deodorizing powder material 32 may also be dispensed directly into the central portion 33 of the waste disposal system 10 as a result of the motion of the lid member 18 when it is opened and closed, or as a result of the parent or caregiver tapping on the lid member 18 or directly on the container 28. In addition, the latching mechanism 19, 21 of the waste disposal system 10 is constructed and arranged to create a slight hesitation that includes an initial deceleration and then a rapid acceleration into the closed position that has a tendency to cause some of the powder material 32 to be shaken out of the dispensing orifice 44 at the moment that closure of the lid member 18 is completed.

[0054] The parent or caregiver may directly access the interior space 30 of the container 28 by unscrewing the container 28 from the mounting receptacle 60 and then unscrewing the removable cover 54 from the container 28. At this point, he or she may add additional powder material into the interior space 30 of the container 28 in order to maintain the level of powder material 30 within the suggested limits that are communicated by the indicia 46, 48. The consumer may also change the odor-absorbing powder if he or she feels that its odor-absorbing capacity has been diminished.

[0055] It is to be understood, however, that even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size and arrangement of parts within the principles of the invention to the extent indicated by the appended claims.

Claims

1. A waste disposal system (10), comprising:

a housing (12);
a lid member (18) movably mounted to said housing (12) by a hinge (20), said lid member (18) having a lid longitudinal axis (22) that is substantially vertical when said lid member (18) is in a closed position; and
a powder dispensing unit (24) mounted to an underside (26) of said lid member (18), said powder dispensing unit (24) comprising a container (28) defining an interior space (30) in which a powder (32) may be stored, said container (28) having a container longitudinal axis

(40), and a directional dispensing portion (38) for dispensing the powder (32) from the container (28) into a targeted portion of the waste disposal system (10),

characterised in that said directional dispensing portion (38) is constructed and arranged to concentrate initial dispersal of the powder (32) to a single side of said container (28) and within an angular range of 40 degrees to 80 degrees with respect to the container longitudinal axis (40) or the lid longitudinal axis (22).

2. The waste disposal system (10) of claim 1, further comprising a venting path defined in said container (28), said venting path being in communication with said interior space (30) for permitting air circulating within said waste disposal system (10) to contact the powder (32) within said container (28).

3. The waste disposal system (10) of claim 1, wherein the container longitudinal axis (40) is substantially coincident with said lid longitudinal axis (22) when said lid member (18) is closed.

4. The waste disposal system (10) of claim 1, wherein said directional dispensing portion (38) comprises a dispensing orifice (44) for dispensing the powder (32) from the container (28) into the targeted portion of the waste disposal system (10).

5. The waste disposal system (10) of claim 4, wherein said container (28) further having a recommended minimum fill level and a recommended maximum fill level, wherein an internal volume of the container (28) between the recommended minimum and maximum fill levels divided by the total cross-sectional area of said at least one dispensing orifice (44) is within a range of 350 cm to 5100 cm.

6. The waste disposal system (10) of claim 5, wherein the internal volume of the container (28) between the recommended minimum and maximum fill levels is within a range of 10 cm³ to 70 cm³.

7. The waste disposal system (10) of claim 4, wherein said dispensing orifice (44) is positioned a first distance from the underside (26) of said lid member (18), measured parallel to said lid longitudinal axis (22), that is within a range of 3.0 cm to 15.0 cm.

8. The waste disposal system (10) of claim 1, wherein said directional dispensing portion (38) is constructed and arranged to concentrate said initial dispersal of the powder (32) to said single side of the container (28) within an angular range of 45 degrees to 75 degrees with respect to the lid longitudinal axis (22).

9. The waste disposal system (10) of claim 1, further

wherein the lid member (18) is removable for permitting a consumer to access said interior space (30).

10. The waste disposal system (10) of claim 1, wherein said directional dispensing portion (38) is constructed and arranged to concentrate dispersal of the powder (32) to a single side of the container (28) that is away from said hinge (20).
11. The waste disposal system (10) of claim 1, wherein said single side of the container (28) is substantially diametrically opposed to said hinge (20).
12. The waste disposal system (10) of claim 1, wherein said directional dispensing portion (38) is constructed and arranged to concentrate said initial dispersal of the powder (32) to said single side of the container (28) and within an angular range of 50 degrees to 70 degrees with respect to the lid longitudinal axis (22).

Patentansprüche

1. Abfallentsorgungssystem (10), umfassend:

ein Gehäuse (12);
ein Deckelelement (18), das über ein Gelenk (20) beweglich an dem Gehäuse (12) angebracht ist, wobei das Deckelelement (18) eine Deckel-Längsachse (22) aufweist, die weitgehend vertikal ist, wenn sich das Deckelelement (18) in einer geschlossenen Position befindet; und
eine Pulverabgabeeinheit (24), die an einer Unterseite (26) des Deckelelements (18) angebracht ist, wobei die Pulverabgabeeinheit (24) einen Behälter (28), der einen Innenraum (30) definiert, in dem ein Pulver (32) aufbewahrt werden kann, wobei der Behälter (28) eine Behälter-Längsachse (40) aufweist, und einen Teil (38) zur gerichteten Abgabe zum Abgeben des Pulvers (32) aus dem Behälter (28) in einen Zielteil des Abfallentsorgungssystems (10),
dadurch gekennzeichnet, dass der Teil (38) zur gerichteten Abgabe so konstruiert und angeordnet ist, dass die anfängliche Verstreuung des Pulvers (32) zu einer einzigen Seite des Behälters (28) hin und innerhalb eines Winkelbereichs von 40 Grad bis 80 Grad bezüglich der Behälter-Längsachse (40) oder der Deckel-Längsachse (22) konzentriert ist.

2. Abfallentsorgungssystem (10) nach Anspruch 1, ferner umfassend einen in den Behälter (28) definierten Lüftungspfad, wobei der Lüftungspfad mit dem Innenraum (30) in Verbindung steht, damit in dem Ab-

fallentsorgungssystem (10) zirkulierende Luft mit dem Pulver (32) in dem Behälter (28) in Kontakt kommen kann.

3. Abfallentsorgungssystem (10) nach Anspruch 1, wobei die Behälter-Längsachse (40) weitgehend mit der Deckel-Längsachse (22) zusammenfällt, wenn das Deckelelement (18) geschlossen ist.
4. Abfallentsorgungssystem (10) nach Anspruch 1, wobei der Teil (38) zur gerichteten Abgabe eine Abgabeöffnung (44) zum Abgeben des Pulvers (32) aus dem Behälter (28) in den Zielteil des Abfallentsorgungssystems (10) umfasst.
5. Abfallentsorgungssystem (10) nach Anspruch 4, wobei der Behälter (28) ferner eine empfohlene Mindestfüllhöhe und eine empfohlene Höchstfüllhöhe aufweist, wobei ein Innenvolumen des Behälters (28) zwischen der empfohlenen Mindest- und Höchstfüllhöhe dividiert durch die gesamte Querschnittsfläche der mindestens einen Abgabeöffnung (44) in einem Bereich von 350 cm bis 5100 cm liegt.
6. Abfallentsorgungssystem (10) nach Anspruch 5, wobei das Innenvolumen des Behälters (28) zwischen der empfohlenen Mindest- und Höchstfüllhöhe in einem Bereich von 10 cm³ bis 70 cm³ liegt.
7. Abfallentsorgungssystem (10) nach Anspruch 4, wobei die Abgabeöffnung (44) in einem ersten Abstand von der Unterseite (26) des Deckelelements (18), parallel zur Deckel-Längsachse (22) gemessen, positioniert ist, der in einem Bereich von 3,0 cm bis 15,0 cm liegt.
8. Abfallentsorgungssystem (10) nach Anspruch 1, wobei der Teil (38) zur gerichteten Abgabe so konstruiert und angeordnet ist, dass die anfängliche Verstreuung des Pulvers (32) zu der einzigen Seite des Behälters (28) hin und innerhalb eines Winkelbereichs von 45 Grad bis 75 Grad bezüglich der Deckel-Längsachse (22) konzentriert ist.
9. Abfallentsorgungssystem (10) nach Anspruch 1, ferner wobei das Deckelelement (18) abnehmbar ist, damit ein Verbraucher auf den Innenraum (30) zugreifen kann.
10. Abfallentsorgungssystem (10) nach Anspruch 1, wobei der Teil (38) zur gerichteten Abgabe so konstruiert und angeordnet ist, dass die Verstreuung des Pulvers (32) zu einer einzigen Seite des Behälters (28), die von dem Gelenk (20) entfernt ist, hin konzentriert ist.
11. Abfallentsorgungssystem (10) nach Anspruch 1, wobei die einzige Seite des Behälters (28) dem Gelenk

(20) weitgehend diametral entgegen liegt.

12. Abfallentsorgungssystem (10) nach Anspruch 1, wobei der Teil (38) zur gerichteten Abgabe so konstruiert und angeordnet ist, dass die anfängliche Ver-
5 streuung des Pulvers (32) zu der einzigen Seite des Behälters (28) hin und innerhalb eines Winkelbereichs von 50 Grad bis 70 Grad bezüglich der Deckel-Längsachse (22) konzentriert ist.

Revendications

1. Système d'élimination de déchets (10),
comprenant :

un logement (12),
un élément de couvercle (18) monté de manière
mobile sur ledit logement (12) par une charnière
(20), ledit élément de couvercle (18) ayant un
axe longitudinal de couvercle (22) qui est sen-
siblement vertical lorsque ledit élément de cou-
vercle (18) est dans une position fermée; et
une unité de distribution de poudre (24) montée
sur une face inférieure (26) dudit élément de
couvercle (18), ladite unité de distribution de
poudre (24) comprenant un conteneur (28) dé-
finissant un espace intérieur (30) dans lequel
une poudre (32) peut être stockée, ledit conte-
neur (28) ayant un axe longitudinal de conteneur
(40), et une partie de distribution directionnelle
(38) destinée à distribuer la poudre (32) du con-
teneur (28) dans une partie ciblée du système
d'élimination de déchets (10),
caractérisé en ce que ladite partie de distribu-
tion directionnelle (38) est construite et agencée
pour concentrer la dispersion initiale de la pou-
dre (32) sur un seul côté dudit conteneur (28) et
dans une plage angulaire de 40 degrés à 80
degrés par rapport à l'axe longitudinal de con-
teneur (40) ou à l'axe longitudinal de couvercle
(22).

2. Système d'élimination de déchets (10) selon la re-
vendication 1, comprenant en outre une trajectoire
d'aération définie dans ledit conteneur (28), ladite
trajectoire d'aération étant en communication avec
ledit espace intérieur (30) pour permettre à l'air cir-
culant dans ledit système d'élimination de déchets
(10) d'entrer en contact avec la poudre (32) à l'inté-
rieur dudit conteneur (28).
3. Système d'élimination de déchets (10) selon la re-
vendication 1, dans lequel l'axe longitudinal de con-
teneur (40) coïncide sensiblement avec ledit axe lon-
gitudinal de couvercle (22) lorsque ledit élément de
couvercle (18) est fermé.

4. Système d'élimination de déchets (10) selon la re-
vendication 1, dans lequel ladite partie de distribution
directionnelle (38) comprend un orifice de distribu-
tion (44) destinée à distribuer la poudre (32) du con-
teneur (28) dans la partie ciblée du système d'élimi-
nation de déchets (10).

5. Système d'élimination de déchets (10) selon la re-
vendication 4, dans lequel ledit conteneur (28) a en
outre un niveau de remplissage minimal recomman-
dé et un niveau de remplissage maximal recomman-
dé, dans lequel un volume interne du conteneur (28)
entre les niveaux de remplissage minimal et maximal
recommandés divisé par la surface totale de section
transversale dudit au moins orifice de distribution
(44) se situe dans une plage de 350 cm à 5100 cm.

6. Système d'élimination de déchets (10) selon la re-
vendication 5, dans lequel le volume interne du con-
teneur (28) entre les niveaux de remplissage minimal
et maximal recommandés est compris entre 10 cm³
et 70 cm³.

7. Système d'élimination de déchets (10) selon la re-
vendication 4, dans lequel ledit orifice de distribution
(44) est positionné à une première distance de la
face inférieure (26) dudit élément de couvercle (18),
mesurée parallèlement audit axe longitudinal de
couvercle (22), soit dans une plage de 3,0 cm à 15,0
cm.

8. Système d'élimination de déchets (10) selon la re-
vendication 1, dans lequel ladite partie de distribution
directionnelle (38) est construite et agencée pour
concentrer ladite dispersion initiale de la poudre (32)
sur ledit seul côté du conteneur (28) et dans une
plage angulaire de 45 degrés à 75 degrés par rapport
à l'axe longitudinal de couvercle (22).

9. Système d'élimination de déchets (10) selon la re-
vendication 1, dans lequel l'élément de couvercle
(18) est amovible pour permettre à un utilisateur
d'accéder audit espace intérieur (30).

10. Système d'élimination de déchets (10) selon la re-
vendication 1, dans lequel ladite partie de distribution
directionnelle (38) est construite et agencée pour
concentrer la dispersion de la poudre (32) sur un
seul côté du conteneur (28) qui est éloigné de ladite
charnière (20).

11. Système d'élimination de déchets (10) selon la re-
vendication 1, dans lequel ledit côté unique du con-
teneur (28) est sensiblement diamétralement oppo-
sé à ladite charnière (20).

12. Système d'élimination de déchets (10) selon la re-
vendication 1, dans lequel ladite partie de distribution

directionnelle (38) est construite et agencée pour concentrer ladite dispersion initiale de la poudre (32) sur ledit seul côté du conteneur (28) et dans une plage angulaire de 50 degrés à 70 degrés par rapport à l'axe longitudinal de couvercle (22).

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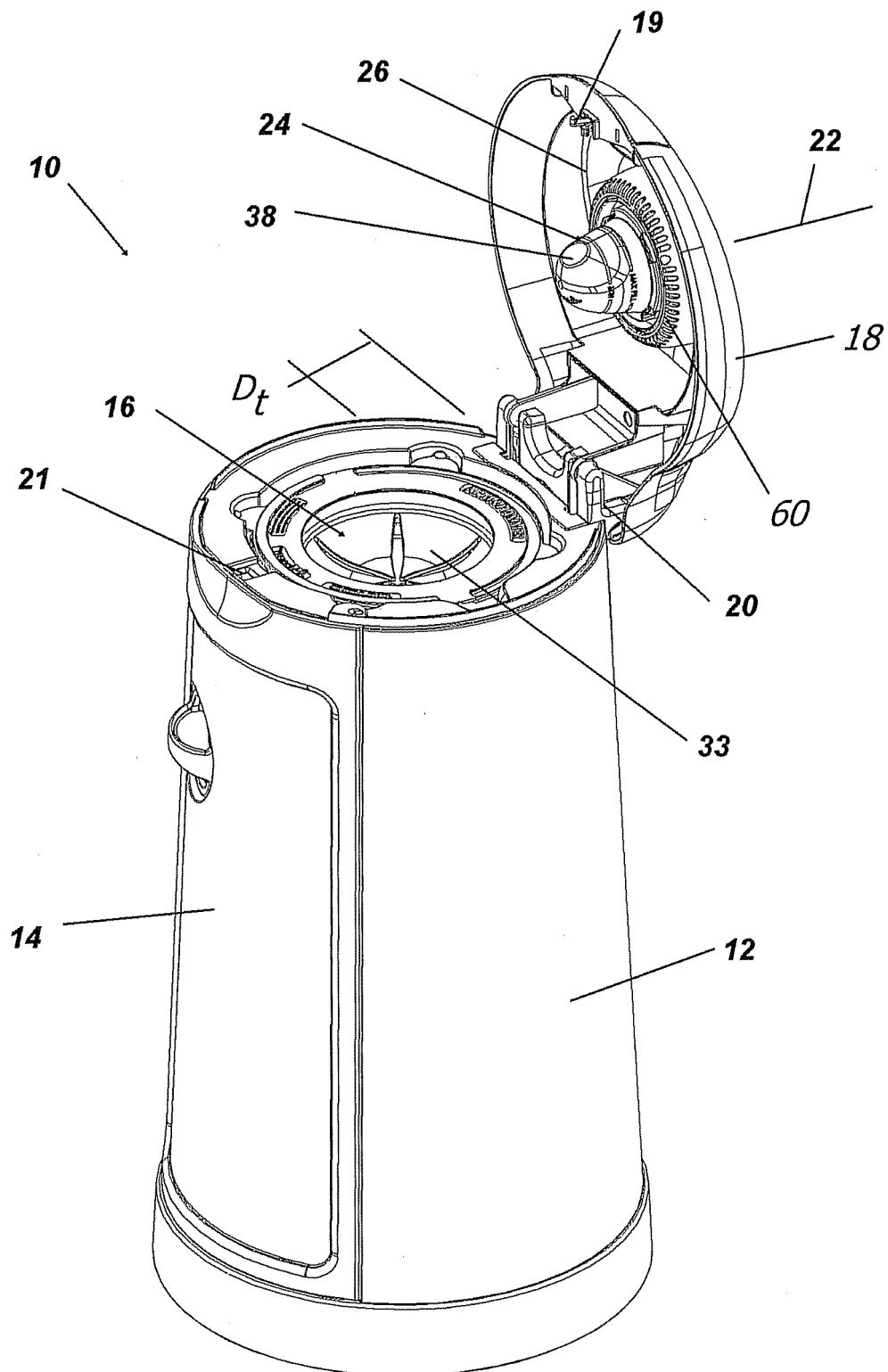
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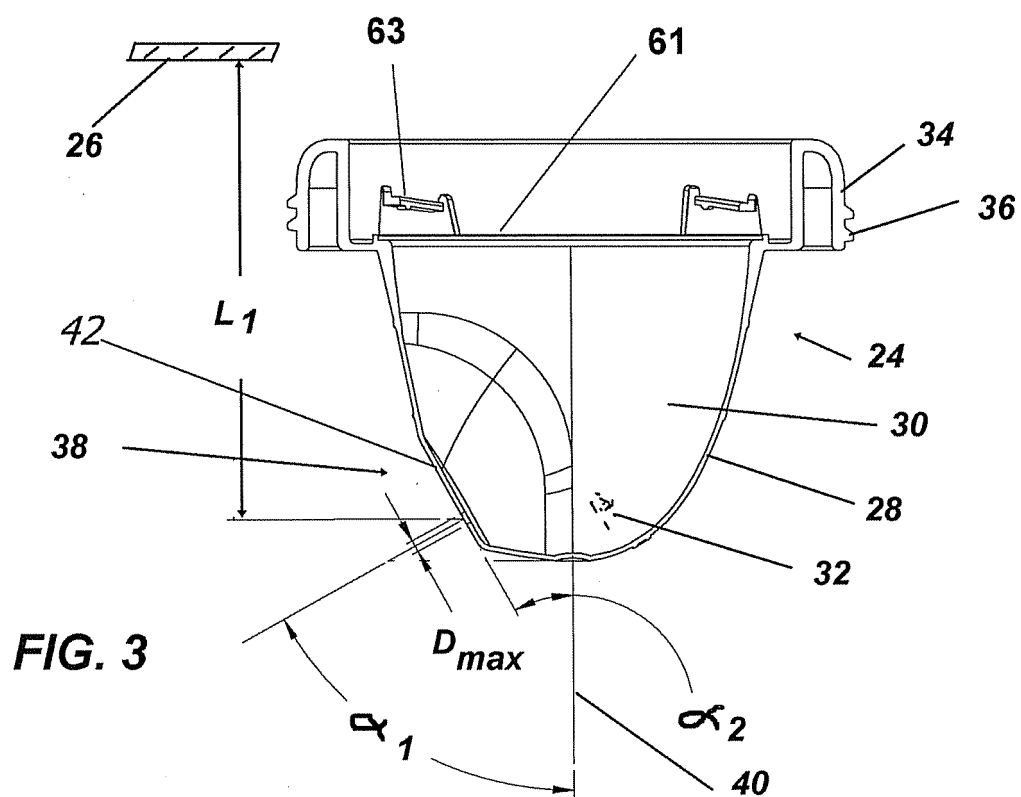
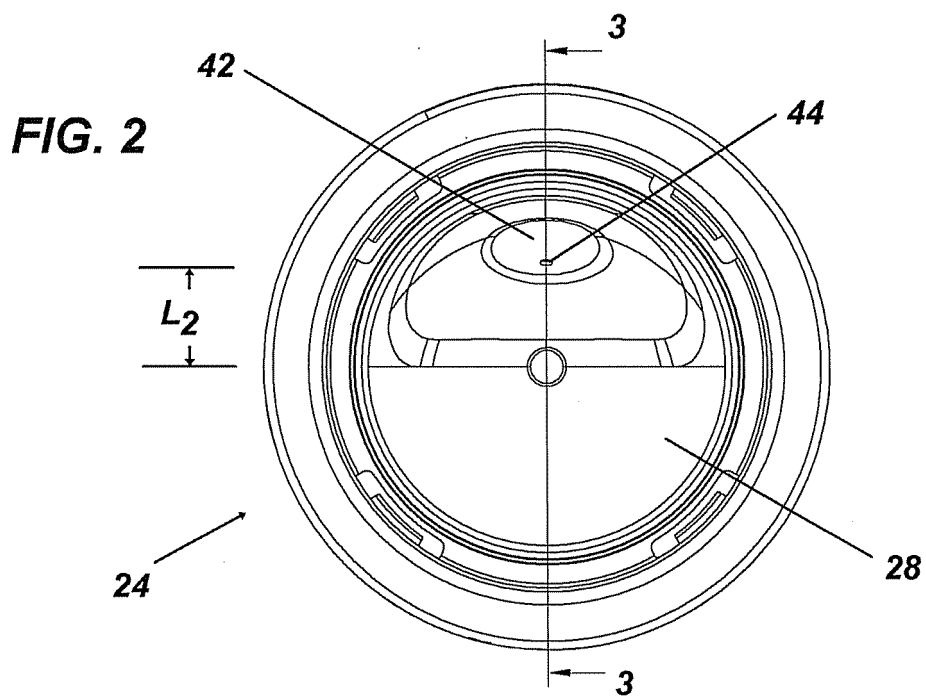
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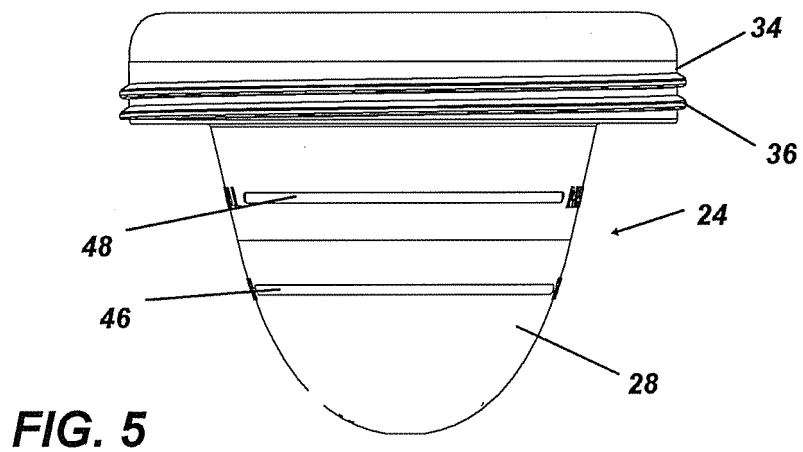
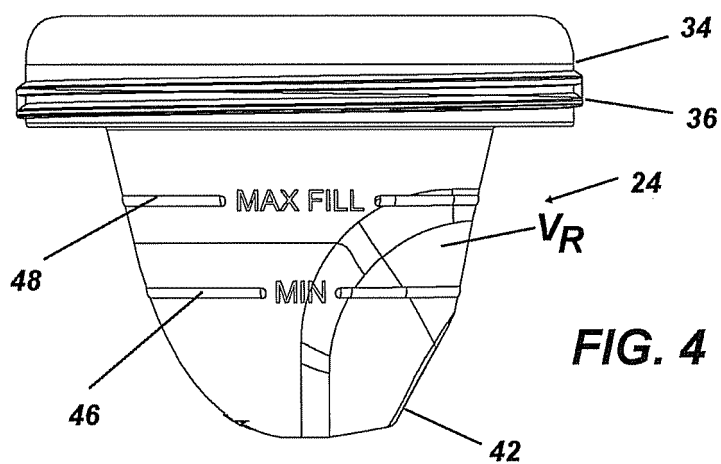
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FIG. 1







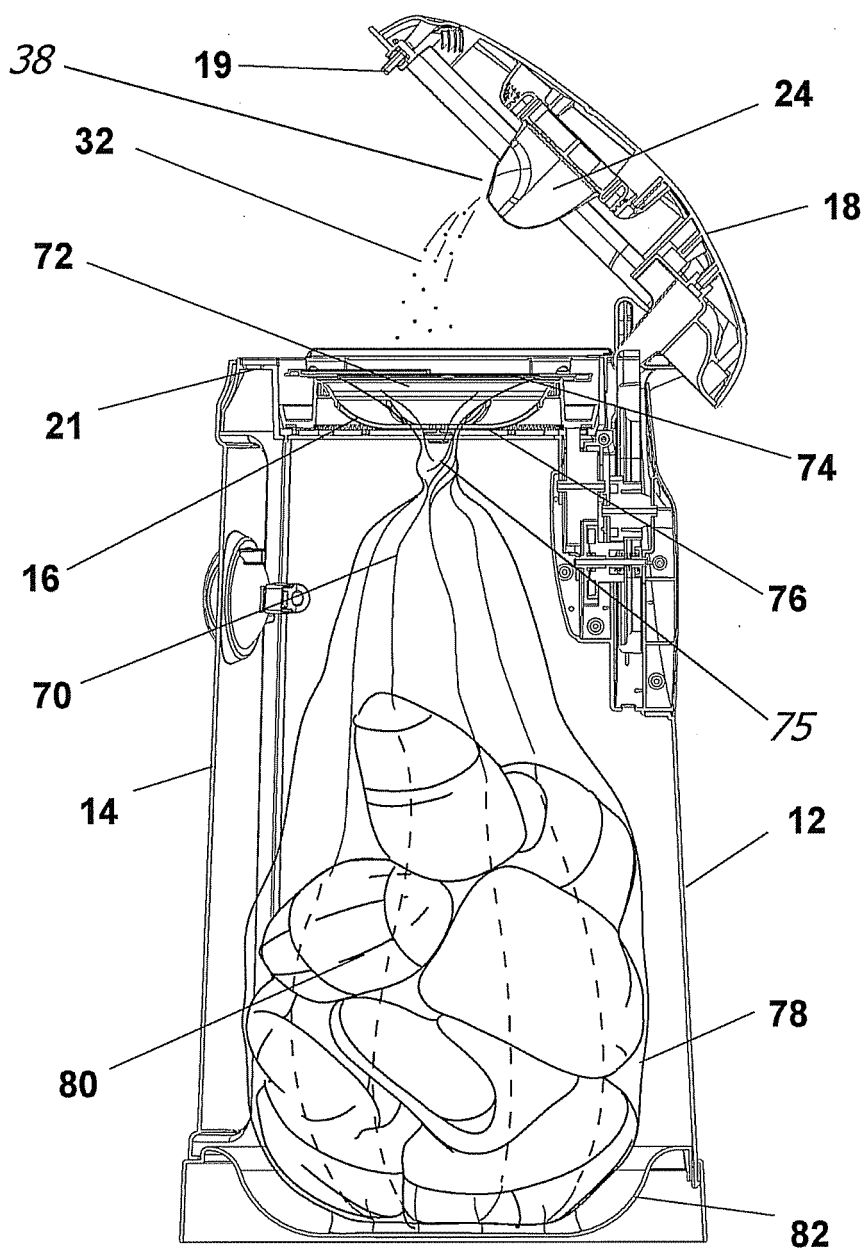


FIG. 6

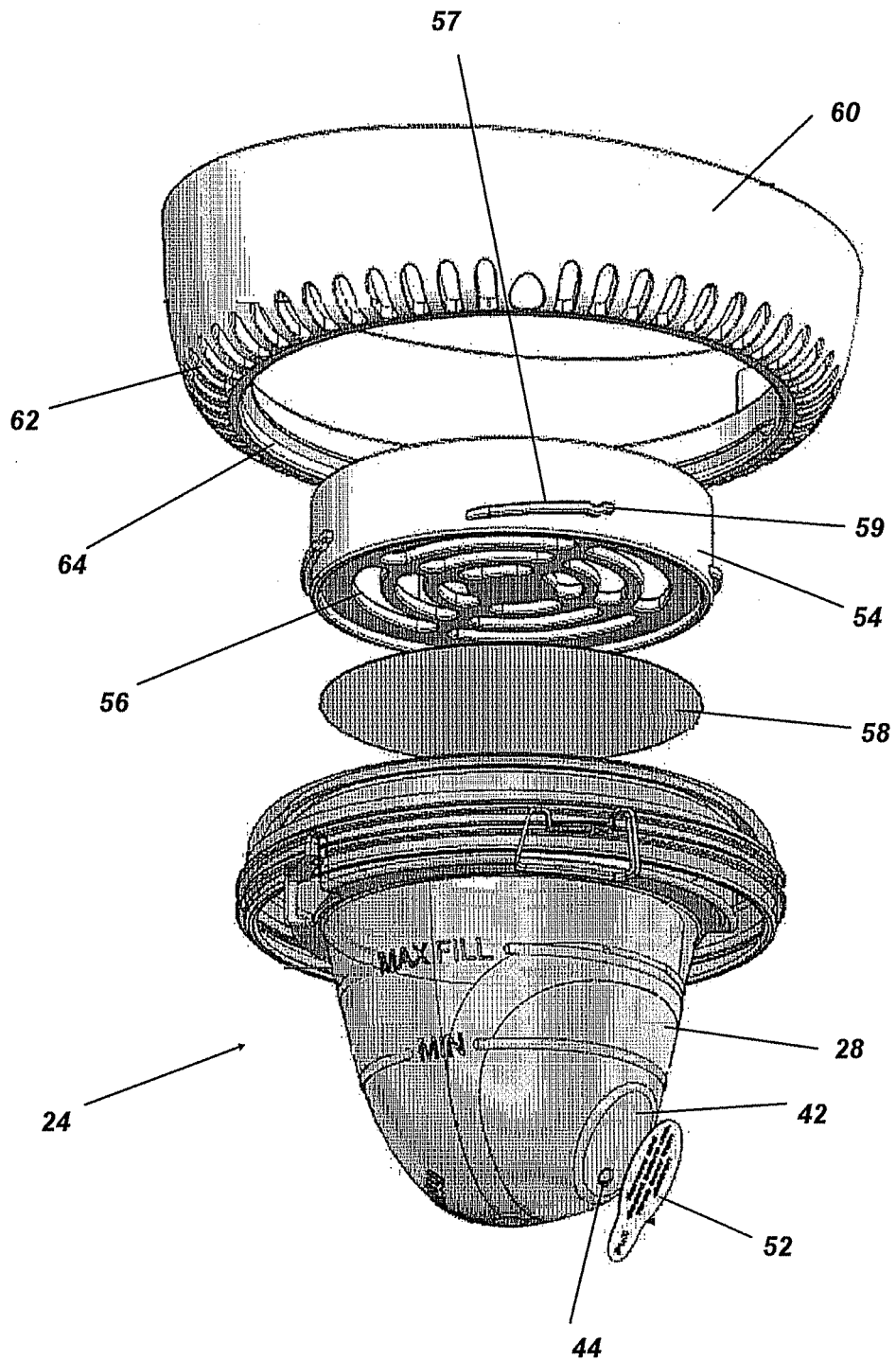


FIG. 7

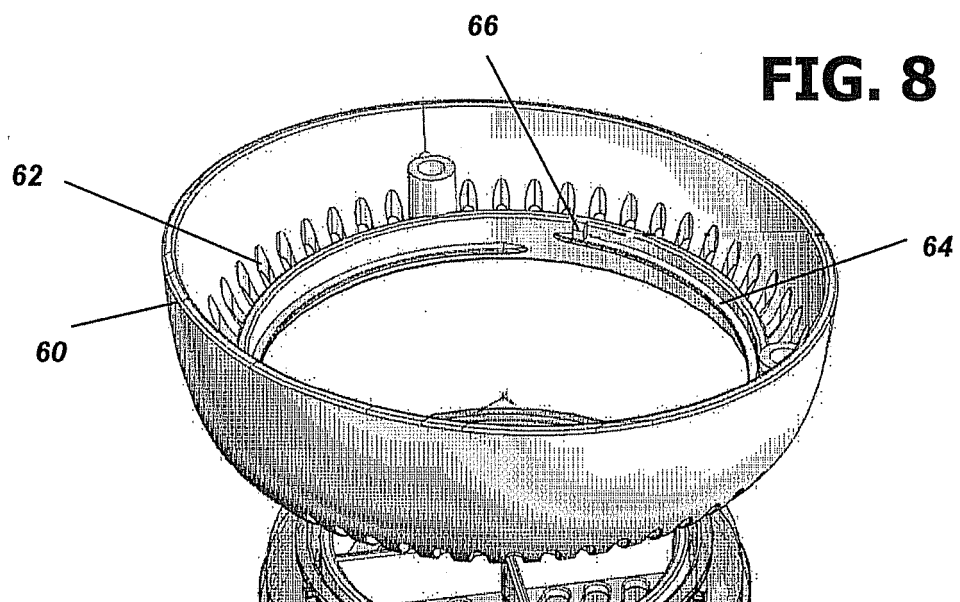
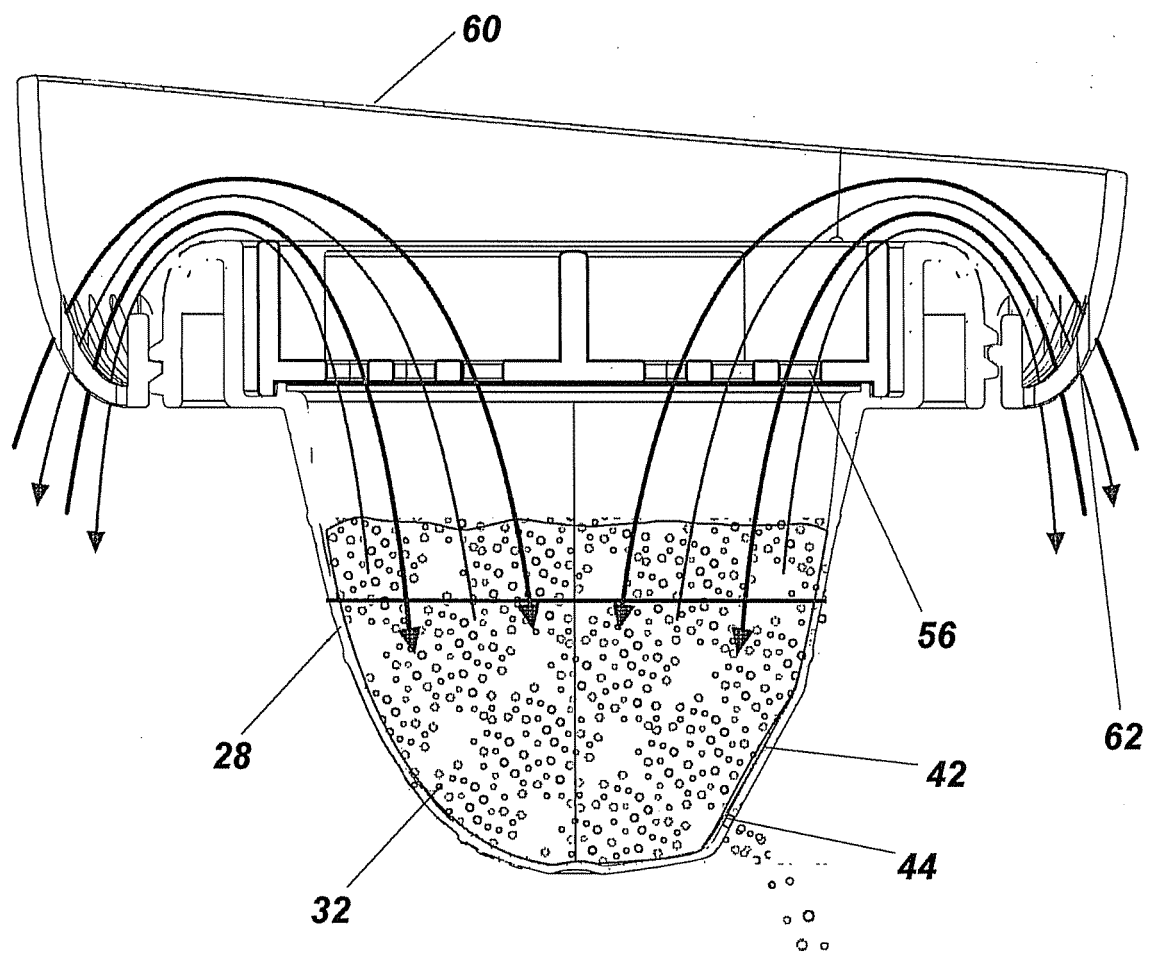


FIG. 9



REFERENCES CITED IN THE DESCRIPTION

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