

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2005/001274

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN, Y, 2576664 (LUO Zhiyue) 1.OCT.2003 (01.10.03) , See the whole Document	1-11
A	CN, Y, 2486510 (JINDUN CLAMP CO LTD ZIXI CITY) 17.APR.2002 (17.04.02) , See the whole Document	1-11
A	CN, Y, 2606082 (ZHANG Zhemin) 10.MAR.2004 (10.03.04) See the Whole Document	1-11

Form PCT/ISA /210 (continuation of second sheet) (April 2005)

International application No.
PCT/CN2005/001274

Form PCT/ISA /210 (patent family annex) (April 2005)

国际检索报告

国际申请号

PCT/CN2005/001274

A. 主题的分类

IPC⁷ B65F 1/16

按照国际专利分类表(IPC)或者同时按照国家分类和 IPC 两种分类

B. 检索领域

检索的最低限度文献(标明分类系统和分类号)

IPC⁷ B65F 1/16, 1/14, 1/10; B65D43/26, 43/00

包含在检索领域中的除最低限度文献以外的检索文献

中国发明专利(1985-2005.10), 中国实用新型专利(1985-2005.10)

在国际检索时查阅的电子数据库(数据库的名称, 和使用的检索词(如使用))

EPOQUE, CNPAT, WPI, PAJ; 垃圾箱, 盖, 自动, 开, 关, 闭, 传感, 感应, 电机, 驱动

C. 相关文件

类 型*	引用文件, 必要时, 指明相关段落	相关的权利要求
A	CN, Y, 2432167 (王昕 等) 2001 年 5 月 30 日 (30.05.01), 参见全文	1-11
A	CN, Y, 2613460 (杨空军) 2004 年 4 月 28 日 (28.04.04), 参见全文	1-11
A	US, B1, 6774586 (SHIH TSUNG-HWAN) 2004 年 8 月 10 日 (10.08.04) 说明书摘要, 附图 9-12	1-11
A	US, A1, 2003205979 (PAPARI JOANNE. ETAL) 2003 年 11 月 6 日 (06.11.03) 说明书摘要, 附图 1, 5-6	1-11
A	US, A, 4996467 (DAY JONG YIH) 1991 年 2 月 26 日 (26.02.91), 参见全文	1-11
A	CN, Y, 2576664 (罗志岳) 2003 年 10 月 1 日 (01.10.03), 参见全文	1-11
A	CN, Y, 2486510 (慈溪市金盾夹具有限公司) 2002 年 4 月 17 日 (17.04.02), 参见全文	1-11
A	CN, Y, 2606082 (张哲民) 2004 年 3 月 10 日 (10.03.04), 参见全文	1-11

☐ 其余文件在 C 栏的续页中列出。☒ 见同族专利附件。

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“&” 同族专利的文件

国际检索实际完成的日期

17.10 月 2005(17.10.2005)

国际检索报告邮寄日期 2005 (24.11.2005)

中华人民共和国国家知识产权局(ISA/CN)

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传真号: (86-10)62019451

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电话号码: (86-10) 62085422



国际检索报告
关于同族专利的信息

国际申请号
PCT/CN2005/001274

检索报告中引用的 专利文件	公布日期	同族专利	公布日期
CN, Y, 2432167	30.5 月 2001	US, B1, 6812655 EP, A1, 1279614 WO, A1, 0162617 CA, A1, 2401124 AU, A, 4740500	02.11 月 2004 29.1 月 2003 30.8 月 2001 30.8 月 2001 03.9 月 2001
CN, Y, 2613460	28.4 月 2004	无	
US, B1, 6774586	10.8 月 2004	无	
US, A1, 2003205979	6.11 月 2003	CA, A1, 2384483	1.11 月 2003
US, A, 4996467	26.2 月 1991	无	
CN, Y, 2486510	17.4 月 2002	无	
CN, Y, 2576664	1.10 月 2003	无	
CN, Y, 2606082	10.3 月 2004	无	

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
6 December 2007 (06.12.2007)

PCT

(10) International Publication Number
WO 2007/139570 A2

(51) International Patent Classification:
B65D 55/00 (2006.01)

(21) International Application Number:
PCT/US2006/034282

(22) International Filing Date:
1 September 2006 (01.09.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/438,839 23 May 2006 (23.05.2006) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

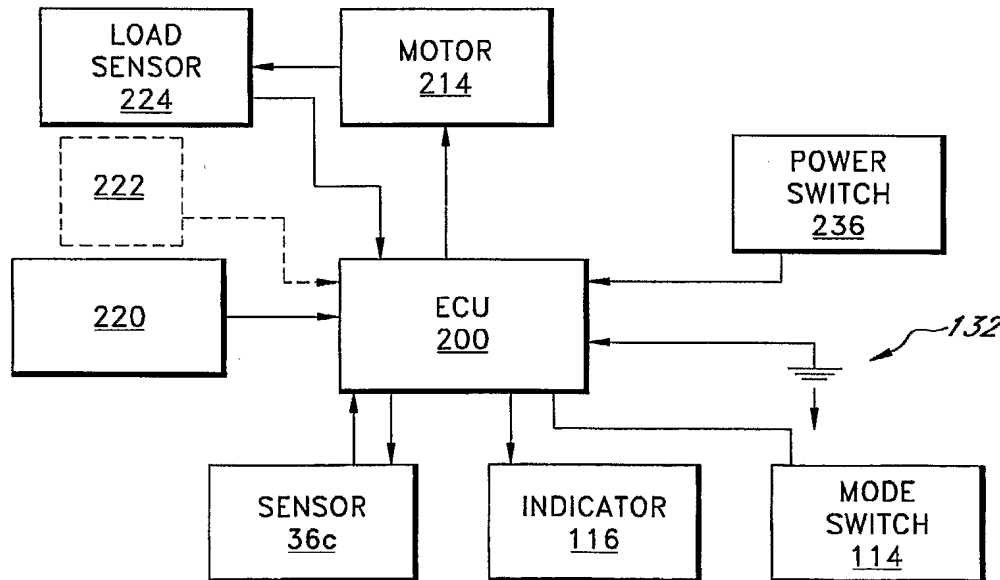
— of inventorship (Rule 4.17(iv))

Published:

— without international search report and to be republished upon receipt of that report

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(54) Title: TRASH CAN WITH POWER OPERATED LID



(57) Abstract: A trash can can include a sensor for detecting the presence of an object near a lower portion of the trash can. The detection of the object can be used to signal the trash can to open its lid. The trash can can include an electric drive unit for opening and closing the lid.

WO 2007/139570 A2

PRIORITY INFORMATION

BACKGROUND OF THE INVENTIONS

[0006] If such a sensor is calibrated to detect the movement of any user's hand or body part within twelve inches of the sensor, the sensor may also be triggered accidentally. If the sensor is triggered accidentally too often, the batteries powering such a device can be worn out too quickly, energy can be wasted, and/or the motor can be over used. However, if the sensors are calibrated to be less sensitive, it may be difficult for some users, depending on their clothing and/or skin color combination, to activate the sensor conveniently.

SUMMARY OF THE INVENTIONS

[0007] An aspect of at least one of the embodiments disclosed herein includes the realization that the problems associated with motion sensors mounted on a trash receptacle to detect movement of a user's hand can be avoided by mounting such a sensor on a lower portion of the trash receptacle. For example, but without limitation, the sensor can be disposed in a position appropriate for detecting movement of a user's foot. Such a motion sensor can be oriented to detect movement in a limited area near the floor upon which the receptacle sits. Thus, the sensor is less susceptible to false detections caused by movement of other bodies in the room. Further, such a sensor can be mounted in a recess defined by the housing of the receptacle, such that a user can move their foot into or near the recess to trigger the motion sensor. This provides even greater reliability that the sensor will issue a detection signal only when the user intends to open the receptacle.

[0008] Another aspect of at least one of the embodiments disclosed herein includes the realization that by configuring a sensor arrangement to detect movement of a lower extremity of a user, a more simple, less expensive sensor can be used. For example, in some embodiments, a simple interrupt-type sensor, such as an optical sensor, can be used to detect the presence of a non-transparent body. Such an interrupt or optical sensor can be disposed on a lower portion of a trash receptacle. As such, when a user intends to trigger the trash can to, for example, open its lid, the user can place their foot in a position to trip the optical sensor. As such, the sensor more reliably issues a detection signal only when the user intends to activate the sensor. Additionally, it is not necessary for the user to bend down to activate the sensor.

[0009] Thus, in accordance with at least one embodiment disclosed herein, an enclosed receptacle can comprise a receptacle portion defining a reservoir, and a door

mounted relative to the receptacle and configured to move between open and closed positions. A sensor can be mounted in the vicinity of a lower portion of the receptacle and configured to output a detection signal and a control mechanism can be configured to move the door between the open and closed positions, the sensor being connected to the control mechanism, the controller being configured to move the door to the open position when the sensor outputs a detection signal.

[0010] Another aspect of at least one of the inventions disclosed herein includes the realization that occasionally, a user of a trash can having a power operated lid may desire to have the lid held open for an indefinite period of time. Thus, such a trash can with a power operated lid can be provided with a mode selector button configured to allow a user to select at least one mode of operation of the lid in which the lid is held open for an extended or an indefinite period of time.

[0011] Thus, in accordance with at least one embodiment, an enclosed receptacle can comprising a receptacle portion defining a reservoir, a door mounted relative to the receptacle and configured to move between open and closed positions, and a first user input device configured to output a signal. A second user input device can be disposed apart from the first user input device and a control mechanism connected to both the first and second user input devices, the control device being configured to move the door toward the open position based on a signal from the first user input device, the control mechanism being further configured to hold the door in the open position based on a signal from the second user input device.

[0012] Yet another aspect of at least one of the inventions disclosed herein includes the realization that, occasionally, when using a receptacle with a power operated lid or door, a user may interfere with movement of the lid while it is being moved by a powered actuator. As such, the actuator can be damaged by excessive loads applied by an external body. Thus, such a receptacle with a powered lid or door can include features for avoiding damage that can be caused by forces applied to the lid or door. For example, a powered actuator for opening such a lid or door can include a load sensor configured to stop or close the lid if resistance is detected during opening. Additionally, in at least one embodiment, such a receptacle can include a linkage between the actuator and the lid or door which allows

the lid or door to be opened to any extent beyond that position corresponding to the position of the powered actuator at any moment.

[0013] Thus, in accordance with at least one embodiment disclosed herein, an enclosed receptacle can comprise a receptacle portion defining a reservoir, a door mounted relative to the receptacle and configured to move between open and closed positions, and a user input device configured to output a signal. A control mechanism can be mechanically connected to the user input device and interfaced with the door such that the control mechanism can operate to push the door toward the open position and the door can be manually moved toward the open position without the control mechanism operating.

[0014] In accordance with yet another embodiment, an enclosed receptacle can comprise a receptacle portion defining a reservoir, a door mounted relative to the receptacle and configured to move between opened and closed positions, and a power supply. A motor can be configured to move the door between the opened and closed positions, and a controller can be configured to control operation of the door. The controller can comprise a door movement trigger module configured to allow a user to issue a command to the controller to open the door and a power supply voltage monitor module configured to detect a voltage of the power supply only once each time the command has been detected by the door movement trigger module. A door position monitor module can have at least one sensor configured to monitor a position of the door. A door position sensor control module can be configured to supply power to the at least one sensor only when the door is being moved by the motor. A motor drive module can be configured to vary the power output of the motor to compensate for variations in a voltage of the power supply detected by the power supply voltage monitor and for variations in a force required to move the door at a substantially constant speed based on the position of the door detected by the door position monitor module. A braking module can be configured to slow the movement of the door as it approaches a stop position by reversing the power output of the motor for a predetermined braking time beginning at a predetermined position before the opened and closed positions of the door. Additionally, a fault detection module can be configured to stop operation of the motor and to provide an indication of a fault if the motor has been operating for more than a predetermined time period.

[0015] In accordance with the further embodiment, an enclosed receptacle can comprise a receptacle portion defining a reservoir, a door mounted relative to the receptacle and configured to move between opened and closed positions, and a power supply. A motor can be configured to move the door between the opened and closed positions and a controller configured to control operation of the door. The controller can comprise a door movement trigger module configured to allow a user to issue a command to the controller to open the door and a power supply voltage monitor module configured to detect a voltage of the power supply when the command has been detected by the door movement trigger module.

[0016] In accordance with yet another embodiment, an enclosed receptacle can comprise a receptacle portion defining a reservoir, a door mounted relative to the receptacle and configured to move between opened and closed positions, and a power supply. A motor can be configured to move the door between the opened and closed positions and a controller can be configured to control operation of the door. The controller can comprise a door movement trigger module configured to allow a user to issue a command to the controller to open the door. A door position monitor module can have at least one sensor configured to monitor a position of the door and a door position sensor control module can be configured to selectively supply power to the at least one sensor when the door is being moved by the motor.

[0017] In accordance with an embodiment, an enclosed receptacle can comprise a receptacle portion defining a reservoir, a door mounted relative to the receptacle and configured to move between opened and closed positions, a power supply and a motor configured to move the door between the opened and closed positions. A controller can be configured to control operation of the door. The controller can comprise a power supply voltage monitor module configured to detect a voltage of the power supply and a motor drive module configured to vary the power output of the motor to compensate for variations in a voltage of the power supply detected by the power supply voltage monitor.

[0018] In accordance with yet another embodiment, an enclosed receptacle can comprise a receptacle portion defining a reservoir, a door mounted relative to the receptacle and configured to move between opened and closed positions, and a power supply. A motor can be configured to move the door between the opened and closed positions and a controller

configured to control operation of the door. The controller can comprise a braking module configured to slow the movement of the door as it approaches a stop position by reversing the power output of the motor for a predetermined braking time beginning at a predetermined position before the opened and closed positions of the door.

[0019] In accordance with an additional embodiment, an enclosed receptacle can comprise a receptacle portion defining a reservoir, a door mounted relative to the receptacle and configured to move between opened and closed positions, and a power supply. A motor can be configured to move the door between the opened and closed positions and a controller can be configured to control operation of the door. The controller can comprise a fault detection module configured to stop operation of the motor and to provide an indication of a fault if the motor has been operating for more than a predetermined time period.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] The above-mentioned and other features of the inventions disclosed herein are described below with reference to the drawings of preferred embodiments. The illustrated embodiments are intended to illustrate, but not to limit the inventions. The drawings contain the following Figures:

[0021] Figure 1 is a front perspective view of a trash can assembly according to one embodiment, shown with the lid opened.

[0022] Figure 1A is an enlarged perspective view of the mechanisms used to connect the lid of the trash can assembly of Figure 1 with connecting rods.

[0023] Figure 2 is a front perspective view of a trash can assembly according to another embodiment, shown with the lid opened.

[0024] Figures 3A-3C are side plan views illustrating the operation of the assembly of Figure 1.

[0025] Figure 4 is a front plan view of a trash can assembly according to another embodiment.

[0026] Figure 5 is a side plan view of the trash can assembly of Figure 4.

[0027] Figure 6 is an enlarged perspective view of an upper portion of a modification of the trash can assemblies illustrated in Figures 1-5.

[0028] Figure 7 is an enlarged perspective and partial cut-away view of a lower portion of the trash can shown in Figure 6, illustrating an actuator for controlling the movement of the lid.

[0029] Figure 8 is an enlarged perspective view of a drive train of the actuator shown in Figure 7.

[0030] Figure 9 is an exploded and perspective view of the drive train illustrated in Figure 8.

[0031] Figure 10 is a front, bottom, and left side perspective view of the drive train unit of Figures 8 and 9.

[0032] Figure 11 is a rear, top, and right side perspective view of a controller unit of the actuator of Figure 7.

[0033] Figure 12 is a bottom, rear, and left side perspective view of the control unit of Figure 11 with a bottom cover member removed showing internal components, including an electronic controller and an electric drive motor.

[0034] Figure 13 is a rear elevational view of a lower portion of the trash can of Figures 6-12 illustrating a battery compartment, a power switch, and an AC electric power supply port.

[0035] Figure 14 is a schematic diagram of an electronic drive unit for opening the lid of the trash can of Figures 6 and 7.

[0036] Figure 15 is a flow chart illustrating a control routine for controlling the actuation of sensors and which can be used with the electronic drive unit of Figure 14.

[0037] Figure 16 is another control routine for controlling the detection of battery voltages and activation of sensors that can also be used with the electronic drive unit illustrated in Figure 14.

[0038] Figure 17 is a flow chart illustrating a control routine for controlling the actuation of an electric motor of the electronic drive unit of Figure 14.

[0039] Figure 18 is a graph illustrating predetermine electric motor drive data that can be used for operating the electric motor of the electronic drive unit of Figure 14.

[0040] Figure 19 is another graph illustrating other data that can be used for controlling the electric motor of the electronic drive unit of Figure 14.

[0041] Figure 20 is a flow chart illustrating a control routine that can be used for controlling the operation of the electronic drive unit of Figure 14.

[0042] Figure 21 is a flow chart illustrating a control routine for fault detection that can be used for controlling the electronic drive unit of Figure 14.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0043] The embodiments of a powered system for opening and closing a lid or door of a receptacle or other device is disclosed in the context of a trash can. The inventions disclosed herein are described in the context of a trash can because they have particular utility in this context. However, the inventions disclosed herein can be used in other contexts as well, including, for example, but without limitation, large commercial trash cans, doors, windows, security gates, and other larger doors or lids, as well as doors or lids for smaller devices such as high precision scales, computer drives, etc.

[0044] With reference to Figure 1, a trash can assembly 20 can include an outer shell 22 and an inner liner (not shown) configured to be retained within the outer shell. For example, an upper peripheral edge of the outer shell 22 can be configured to support an upper peripheral edge of a liner, such that the liner is suspended by its upper peripheral edge within the shell 22. However, other designs can also be used.

[0045] The outer shell 22 can assume any configuration. The non-limiting embodiment of Figure 1 illustrates an outer shell 22 having a generally four-sided rectangular configuration with a rear wall 24 and a front wall 26. The inner liner can have the same general configuration, or a different configuration from the outer shell 22. The outer shell 22 can be made from plastic, steel, stainless steel, aluminum or any other material.

[0046] The upper portion of the outer shell 22 is defined by an upper peripheral member 23. The upper peripheral member 23 can be made from plastic, steel, stainless steel, aluminum or any other material. Additionally, it is not necessary that the upper peripheral member 23 be made separate from the shell 22. For example, the upper peripheral member 23 can be made integrally or monolithically with the outer shell 22. However, in some embodiments, the outer shell 22, including the walls 24, 26, are made from a stainless steel. In such embodiments, the upper peripheral member 23 can also be formed from stainless

steel, either integrally or monolithically or separate from the shell 22. However, in some embodiments, the upper peripheral member 23 can be made from a plastic material.

[0047] A lid 28 is pivotally connected to an upper portion of the upper peripheral member 23. The pivotal connection can be defined by any type of connection allowing for pivotal movement, such as, for example, but without limitation, a hinge.

[0048] The trash can 20 can also include a foot recess 30 positioned at a lower portion of the trash can 20. For example, in some embodiments, the foot recess 30 can be defined by a portion of the outer shell 22 adjacent a bottom 32 of the outer shell 22.

[0049] Similarly to the upper peripheral member 23, the bottom 32 of the trash can 20 can be made integrally, monolithically, or separate from the shell 22. Thus, the base 32 can be made from any material including plastic, steel, stainless steel, aluminum or any other material. Additionally, in some embodiments, such as those in which the shell 22 is stainless steel, the base 32 can be a plastic material.

[0050] The recess 30 can be formed from a shaped portion of the shell 22 or can be made integrally with the bottom 32. Thus, the recess 30 can be made from plastic, steel, stainless steel, aluminum or any other material.

[0051] The recess 30 can extend inwardly into the general outer periphery defined by the shell 22. Additionally, the recess 30 can extend upwardly from the bottom 32. A foot plate can be optionally provided at a bottom of the recess 30, and can extend from the bottom 32.

[0052] In some embodiments, a sensor 36 is provided adjacent an upper portion of the recess 30 in a position where the sensor 36 can be directed downwardly toward the ground upon which the trash can 20 rests or the foot plate 34.

[0053] The sensor 36 can be any type of sensor. For example, in some embodiments, the sensor 36 is configured to detect movement or the presence of an object disposed in the recess 30. For example, the sensor 36 can be configured to emit a detection signal when a foot is disposed in the recess 30. The sensor can be considered a “user input device” because a user can use the sensor 36 to issue a command to the trash can 20.

[0054] The sensor 36 can be coupled to a lid control system configured to control the opening and closing of the lid 28. In the illustrated embodiment, the lid control system

includes wiring 38 provided inside the outer shell 22 connecting the sensor 36 to a circuit board 40. The circuit board 40, in turn, is coupled via wiring 45 to a motor gear 46 that drives a rotary lifting bar 48.

[0055] Batteries 44 can be coupled to the circuit board 40 and the motor gear 46. The lid control system can further include a pair of link rods 50 which extend generally vertically adjacent and along the rear wall 24.

[0056] Each rod 50 can have a first end coupled to the lifting bar 48 and an opposite second end that is coupled to the lid 28. Figure 1A illustrates an optional configuration for connecting the link rods 50 to the lid 28.

[0057] As illustrated in Figure 1A, the link rods 50 are connected to an inner side of the lid 28 via bracket assemblies 51. In the illustrated embodiment, the bracket assemblies 51 include a mounting portion 51A connecting to the inner surface of the lid 28. The mounting portions 51A can be attached to the lid 28 with any type of connector, fastener, or through bonding, welding, etc. In the illustrated embodiment, the mounting portions 51A are connected to the lid 28 with rivets.

[0058] The bracket assemblies 51 also include arm members 51B extending from the mounting portions 51A toward an interior of the trash can 20. The arms 51B can also include apertures 51C at an end of the arm 51B distal from the mounting portion 51A.

[0059] The upper ends of the link rods 50 extend through the apertures 51C. Although not shown, the ends of the link rods 50 can also include retainer members configured to retain the ends of the link rods 50 in a position extending through the apertures 51C.

[0060] In this configuration, the arms 51B maintain the ends of the link rods 50 at a position spaced from the inner surface of the lid 28. As such, the link rods 50 obtain an improved moment of torque for lifting the lid 28 from a closed position to an open position. Thus, any arrangement can be used to connect the upper ends of the link rods to the lid 28.

[0061] With continued reference to Figure 1, the circuit board 40, batteries 44, motor gear 46, and lifting bar 48 are illustrated as being positioned adjacent the bottom 32 and inside the outer shell 22. However, these elements can be positioned anywhere inside or outside the outer shell 22.

[0062] The circuit board 40 can include a control circuit that is configured to control the operation of the motor gear 46 and the opening and closing motions of the lid 28. The control circuit can be implemented using circuit designs that are well known to those skilled in the art. For example, although indicated as a "circuit," the control circuit can comprise a processor and memory storing a control program. As such, the control program can be written to cause the processor to perform various functions for controlling the motor gear 46 in accordance with input from the sensors, such as the sensor 36 and/or other devices.

[0063] In some embodiments, the motor gear 46 can be driven in two directions so that the motor gear 46 can turn the lifting bar 48 in two directions. For example, when the lifting bar 48 rotates in a first direction, the link rods 50 are pushed upwardly to push the lid 28 open. When the lifting bar 48 rotates in an opposite second direction, the link rods will move downwardly to pull the lid 28 towards the closed position.

[0064] Figures 3A-3C illustrate an exemplary operation of the opening and closing of the lid 28 of the trash can assembly 20. With the lid 28 in the closed position, the sensor 36 can be actuated when a user inserts a foot (or other object) into the recess 30 into the path of the sensor 36. The actuation of the sensor 36 will cause the control circuit in the circuit board 40 to drive the motor gear 46 in the required direction to rotate the lifting bar 48 in the first direction to open the lid 28.

[0065] If the user immediately removes the foot (or other object) from the recess 30 (see Figure 3A), then the lid 28 will remain opened for a specific period of time (e.g., two seconds), and then the control circuit in the circuit board 40 will drive the motor gear 46 in the opposite direction to rotate the lifting bar 48 in the second direction to close the lid 28. However, if the user's foot (or other object) remains in the recess 30 (see Figure 3B) for more than a predetermined period of time (e.g., two seconds), then the control circuit in the control board 48 will maintain the lid 28 in the opened position indefinitely or for a greater predetermined period of time.

[0066] In the situation shown in Figure 3B, the user will eventually remove the foot (or other object). After the foot has been removed in the Figure 3B situation, if the foot (or other object) is then re-inserted into the recess 30 into the path of the sensor 36 (see

Figure 3C), then the control circuit in the circuit board 40 will drive the motor gear 46 in the opposite direction to rotate the lifting bar 48 in the second direction to close the lid 28.

[0067] Figure 2 illustrates another embodiment of a trash can assembly 20a. The assembly 20a is similar to the assembly 20 of Figure 1, so the same elements in Figures 1 and 2 have the same numeral designations except that an “a” is added to the designations in Figure 2.

[0068] The difference between the assemblies 20 and 20a is that the assembly 20a has a different lid control system that is used to open and close the lid 28a after the sensor 36a has been actuated. For example, the motor gear 46 and rods 50 in the assembly 20 are replaced by a motor hinge 60 and wiring 62 that couples the circuit board 40a to the motor hinge 60. The motor hinge 60 functions to open and close the lid 28a by turning the hinged connection of the lid 28a in the requisite direction.

[0069] The motor hinge 60 can be embodied in the form of any motor hinge that is well-known in the art. The operations described in connection with Figures 3A-3C can also be performed by the assembly 20a, with the control circuit in the control board 40a programmed to control the motor hinge 60 in the same manner as for the motor gear 46.

[0070] By positioning the sensor 36, 36a inside a recess 30, 30a, the sensors 36, 36a are less likely to be accidentally actuated. To actuate the sensors 36, 36a, the user can deliberately insert a foot (or other object) or other object into a recesses 30, 30a which are located close to the ground. While this will not eliminate accidental actuation of the sensors 36, 36a, it allows for a highly sensitive sensor to be used while significantly minimizing accidental actuation of the sensors 36, 36a and the subsequent opening of the lids 28, 28a.

[0071] Notwithstanding the above, it is also possible to omit the recesses 30, 30a. For example, Figures 4 and 5 illustrate a trash can assembly 20b that can be identical to the trash can assembly 20a except that the front wall 26b does not have a recess. Instead, a canopy 30b extends from the periphery of the front wall 26b to define a covered region 37b.

[0072] In some embodiments, a plurality of sensors 36b can be provided in spaced-apart manner on the underside of the canopy 30b. In other words, any number (e.g., one or more) of sensors 36b can be provided, depending on the length of the canopy 30b and the desired use.

[0073] Providing a greater number of sensors 36b can allow the user to actuate one of the sensors 36b more easily because the user only needs to place the foot (or other object) in the direct path of any of the sensors 36b, while providing a single sensor 36b requires that the user place the foot (or other object) in the direct path of the single sensor 36b. The plurality of sensors 36b can be coupled via wiring (not shown, but can be the same as 38a) to a circuit board (not shown, but can be the same as 40a).

[0074] Thus, the embodiment illustrated in Figures 4 and 5 provides a covered region 37b adjacent the bottom of the outer shell 22b where the user can actuate one or more sensors 36b. The embodiment illustrated in Figures 4 and 5 also illustrates the provision of more than one sensor 36b, and the same principle can be applied to Figures 1 and 2, where a plurality of sensors 36, 36a can be provided in the respective recess 30, 30a. As an alternative, the canopy 30b can be provided along a side wall (e.g., 35b) of the outer shell 22b instead of along the front wall 26b.

[0075] Figures 6-13 illustrate another embodiment of the trash can 20, identified generally by the reference numeral 20c. Some of the components of the trash can 20c are the same as the corresponding components of the trash cans 20, 20a, 20b described above. These corresponding components are identified with the same reference numerals, except that a "c" has been added thereto. Additionally, it is to be understood that the features described with regard to the trash can 20c can also be used with the trash cans 20, 20a, and 20b.

[0076] With continued reference to Figure 6, the trash can 20c can include an upper peripheral surface 100 configured to provide a substantially flat surface against which the inner surface of the lid 28c can rest when the lid 28c is in a closed position. The phantom line 102 extending along the upper surface 100 illustrates the general position of the lid 28c when the lid 28c is in a closed position.

[0077] Further, as shown in Figure 6, the upper portion 23c of the trash can 20c can include a recess 104. The recess 104 can be formed from a portion of the upper surface 100 that is recessed downwardly from the remainder of the surface 100. The majority of the surface 100 can be configured to generally follow along the surface of the lid 28c when the lid 28c is closed. However, the recess 104 is sized so as to allow a human to insert at least

one or more fingers beneath the forward edge 106 of the lid 28c when the lid 28c is closed. As such, a user can lift the lid 28c manually, if desired.

[0078] The upper portion 23c can also include a ledge 108 configured to provide support for a liner of the trash can 20c. For example, a liner can have a shape that is generally complimentary to the shell 22c. Additionally, an upper peripheral edge of such a liner (not shown) can have a radially outward protruding portion provided with sufficient strength that the entire weight of the liner and the maximum weight for which the liner is designed to contain can be supported therefrom.

[0079] The upper portion 23c can include a ledge 108 configured to engage with the radially outward protruding portion of the liner so as to support the liner within the shell 22c. Thus, when the liner is inserted into the shell 22c, the entire weight of the liner is supported by the ledge 108. However, the trash can 20c can also include further supports within the shell 22c to support the weight thereof.

[0080] The upper portion 23c can also include additional recesses, for example, recesses 110, 112. The recesses 110, 112 can be configured to allow a human user to insert their fingers within the recess and below the outwardly protruding portion of the liner. This provides additional convenience in that it is easier for a user to lift the liner out of the shell 22c, for example, when a user desires to empty the trash out of the liner.

[0081] In some embodiments, the trash can 20c can include the user operable button 114. The button 114 can be configured to allow a user of the trash can 20c to, for example, change a mode of operation of the trash can 20c. As such, the button 114 can be considered to be a “user input device” because it allows a user to issue a command to the trash can 20c. Examples of the modes of operation are described below.

[0082] Additionally, the trash can 20c can include an indicator device 116 configured to provide a user with an indication of a mode in which the trash can 20c operates. Examples of such modes are described in greater detail below. In some embodiments, the indicator 116 is a light, such as, for example, but without limitation, an LED.

[0083] Figure 7 illustrates a perspective and partial cut-away view of a lower portion of the trash can 20c. In some embodiments, the sensor 36c can be a “trip light” or “interrupt” sensor. For example, as illustrated in Figure 7, the sensor 36c comprises a light

emitting portion 120 and a light receiving portion 122. As such, a beam of light 124 is emitted from the light emitting portion 120 and is received by the light receiving portion 122.

[0084] This sensor 36c can be configured to emit a trigger signal when the light beam 124 is blocked. For example, if the sensor 36c is activated, and the light emitting portion 120 is activated, but the light receiving portion 122 does not receive the light emitted from the light emitting portion 120, then the sensor 36c can emit a trigger signal. This trigger signal can be used for controlling operation of the lid 28c, described in greater detail below.

[0085] This type of sensor provides further advantages. For example, because the sensor 36c is merely an interrupt-type sensor, it is only triggered when a body is disposed in the path of the light beam 124. Thus, the sensor 36c is not triggered by movement of a body in the vicinity of the beam 124. Rather, the sensor 36c is triggered only if the light beam 124 is interrupted. To provide further prevention of unintentional triggering of the sensor 36c, the sensor 36c, including the light emitting portion 120 and the light receiving portion 122, can be further recessed into the recess 30c.

[0086] This type of sensor 36c provides additional advantages. For example, the sensor only requires enough power to generate a low power beam of light 124, which may or may not be visible to the human eye, and to power the light receiving portion 122. These types of sensors require far less power than infrared or motion-type sensors. Additionally, the sensor 36c can be operated in a pulsating mode. For example, the light emitting portion 120 can be powered on and off in a cycle such as, for example, but without limitation, for short bursts lasting for any desired period of time (e.g., .01 second, .1 second, 1 second) at any desired frequency (e.g., once per half second, once per second, once per ten seconds). As such, this type of cycling can greatly reduce the power demand for powering the sensor 36c. In operation, such cycling does not produce unacceptable results because as long as the user maintains their foot or other appendage or device in the path of the light beam 124 long enough for a detection signal to be generated, the lid 28c can be actuated.

[0087] The sensor 36c can be connected to the circuit board 40 of the trash cans 20, 20a, or it can be connected to the lid control mechanism 130 illustrated in Figure 7. The lid control mechanism 130 can include a power supply 132, a controller 134, a drive unit 136, and a link arrangement 138. However, other arrangements and components can also be used.

[0088] The power supply 132 can comprise a battery pack 44c, an alternating current (AC) power supply, a direct current (DC) power supply, or any combination of these or other power supplies. In the illustrated embodiment, the power supply 132 includes both a battery storage portion for operating the lid control system 130 on battery power and a DC power supply port for allowing the trash can 20c to be plugged into household or other power supplies, with an appropriate AC to DC converter. However, any power supply 132 can be used.

[0089] The controller 134 can include the circuit board 40 or it can include any other type of controller. In the illustrated embodiment, the controller 134 includes a processor and a memory for storing a control program. Those of ordinary skill in the art can readily develop a control routine for providing the functionality described below.

[0090] The drive unit 136 can be controlled by the controller 134 to raise and lower the link arrangement 138. The link arrangement 138 can comprise the link members 50c or any other arrangement of mechanisms for connecting the drive unit 136 with the lid 28c.

[0091] With reference to Figure 8, the drive unit 136 can be configured to operate in accordance with the principle of operation of a jack screw. In some embodiments, the lifting function of the jack screw within the drive unit 136 is used to move a lifting arm 140.

[0092] As shown in Figure 7, the lifting arm 140 can be connected to the link arms 50c. In some embodiments, the lifting arm 140 is not directly attached to the mechanism within the drive unit 136. Rather, the lifting arm 140 can be configured to be freely movable in the up and down direction and merely be pushed upwardly by the internal mechanism of the drive unit 136. As such, when the drive unit 136 is in the closed position, the lid 28c can be freely opened manually by a user.

[0093] For example, the user can insert their fingers in the recess 104 (Figure 6) and lift the lid 28c upwardly, which would cause the lifting arm 140 to rise with the link arms 50c. This provides a further advantage in that, if there is an interruption in power from the power supply 132, for example, if the batteries are no longer operable, the lid 28c can be manually opened freely without interference from the drive mechanism 136.

[0094] In the illustrated embodiment, the drive unit 136 includes an outer housing 142 mounted to a base member 144. With reference to Figure 9, the drive unit 136 can include a follower 150 and a screw 152. The screw 152 can include threads 154 on its outer surface. The follower 150 can include internal threads (not shown) configured to mesh with the threads 154. Optionally, Teflon® lubricant can be used to lubricate the threads 154 and the internal threads on the follower 150.

[0095] In some embodiments, the screw 152 can include a shaft connector 156 configured to engage a shaft of an actuator. Such an actuator can be any type of actuator including, for example, but without limitation, an electric motor/gear reduction unit.

[0096] In some embodiments, the follower 150 can include keys 158 configured to slide within generally vertical grooves (not shown) disposed on an interior surface of the housing 142. Thus, as the follower 150 moves upwardly and downwardly within the housing 142, the follower 150 does not rotate with the screw 152. Rather, the keys 158 follow the grooves within the housing 142 so as to maintain the angular position of the follower 150. As such, the engagement of the threads 154 with the internal threads of the follower 150 cause the follower 150 to move only vertically within the housing 142.

[0097] The upper end 160 of the follower 150 can be configured to push on the lower end 162 of the lifting arm 140. In the illustrated embodiment, the lower end 162 of the lifting arm 140 includes a hemispherical protrusion. However, other configurations can also be used.

[0098] In some embodiments, the upper end 160 of the follower 150 can include a generally hemispherical recess 164 having a shape that is generally complimentary to the hemispherical projection on the lower end 162 of the lifting arm 140. As such, the upper end 160 of the follower 150 maintains good contact with the lower end 162 of the lifting arm 140 during operation.

[0099] Optionally, the lifting mechanism 136 can include a spring 166. The spring 166 can be disposed such that an upper end of the spring 166 remains in contact with a lower end of the follower 150. As such, the spring 166 can be configured to provide a desired amount of upward bias to the lifting mechanism 136. Thus, a motor used to turn the screw 152 can use less power at least, in the initial upward movement, of the follower 150

and thus the lid 28c. Those of ordinary skill in the art can choose the size and strength of the spring 166 to provide the desired performance.

[0100] With continued reference to Figure 9, the base can include a recess 170 configured to receive a portion of the spring 166. As such, the spring 166 can remain aligned with the lower portion of the follower 150.

[0101] The drive unit 136 optionally can include a bearing 172 configured to provide a generally frictionless support for the screw 152. In the illustrated embodiment, the bearing 172 is configured to mate with the lower end 156 of the screw 152.

[0102] In some embodiments, the lower end 156 of the screw 152 can include a snap ring groove 174 configured to receive a snap ring 176 so as to retain the screw 152 in a proper position within the housing 142.

[0103] For example, with reference to Figure 10, the snap ring 176, when received within the snap ring groove 174, maintains the lower end 156 in a desired orientation protruding from a lower end of the base 144 of the housing 142.

[0104] As noted above, the lower end 156 of the screw 152 can be configured for attachment to a drive shaft of an electric actuator. In the illustrated embodiment, the lower end 156 of the screw 150 includes a cylindrical recess 180 having one flat side, the construction of which is well known in the art.

[0105] With reference to Figure 11, the control unit 134, in the illustrated embodiment, includes a drive shaft 182 configured to be received within the recess 180 (Figure 10) of the drive unit 136. The control unit 134, in some embodiments, can include a position sensor arrangement 190 configured to detect a predetermined position of the lid 28c. In the illustrated embodiment, the arrangement 190, further details of which are described below with reference to Figure 12, is configured to detect when the lid 28c is in a closed position.

[0106] In the illustrated embodiment, the sensor arrangement 190 includes a plunger 192 extending upwardly from the control unit 134. The plunger 192 is aligned relative to the drive shaft 182 to extend through an aperture 194 (Figure 9) in the base 144. The aperture 144 is positioned so as to be aligned with one of the keys 158 of the follower 150. In some embodiments, one of the keys 158 can be enlarged so as to ensure contact with

the plunger 192 when the follower 150 is in a position corresponding to a closed position of the lid 28c (i.e., a lowermost position of the follower 150).

[0107] Thus, during operation, when the key 158 contacts and depresses the plunger 192, the control unit 134 can determine that the lid 28c is closed or at least that the follower 150 is in a position corresponding to a closed position of the lid 28c.

[0108] Figure 12 illustrates further detail within the control unit 134. In the illustrated embodiment, an electronic control unit (ECU) 200 is mounted within the control unit 134. The ECU 200 can include connectors allowing the ECU 200 to be connected to various devices, for example, but without limitation, a power supply, an electric motor, various sensors, and user inputs. In the illustrated embodiment, the ECU 200 includes a power input port 202, a motor control port 204, a lid position sensor input port 206, a user interface port 208, as well as a port 210 for other sensors. However, other ports and arrangements can also be used.

[0109] In the illustrated embodiment, the control unit 134 also includes a combined electric motor and gear reducer set 212. The motor and gear reducer set 212 can comprise an electric motor 214 and a gear reduction device 216. However, other configurations can also be used. These types of motor and gear reducer units 212 are widely commercially available. Thus, the power of the motor 214 and the ratio of the gear reduction device 216 can be chosen by the designer to provide the desired performance.

[0110] The control unit 134 can also include an encoder wheel 218 attached to the output shaft 182 of the unit 212. The encoder wheel 218 can include a plurality of teeth disposed around its periphery so as to provide a reference for rotation of the shaft 182.

[0111] The control unit 134 can also include a sensor 220 configured to detect movement of the encoder wheel 218. For example, but without limitation, the sensor 220 can comprise a pair of devices, including a light emitter and a light receiver, arranged such that the teeth of the encoder wheel 218 intermittently block the reception of the light from the light emitter to the light receptor as the encoder wheel 218 turns. This type of sensor and encoder wheel arrangement is well known in the art.

[0112] In the control unit 134, the encoder wheel 218 and sensor 220 arrangement provides a reference for the control unit 134 to determine the location of the lid 28c. For

example, the ECU 200 can receive a signal from the sensor arrangement 220 to determine the number of rotations of the shaft 182. The number of rotations of the shaft 182 can be correlated directly to vertical movement of the follower 150 because the pitch of the teeth of the threads 154 can be known in advance, and thus be used as a basis for correlating rotation of the shaft 182 to vertical movement of the follower 150. As such, the ECU 200 can be configured to determine the position of the lid 28c based on the signal from the sensor arrangement 220.

[0113] The control unit 134 can also include a sensor 222 configured to detect when the plunger 192 (Figure 11) is depressed by one of the keys 158. For example, the sensor 222 can be in the form of a simple limit switch configured to output a detection signal when the plunger 192 is depressed. As such, the ECU 200 can receive a signal from the sensor 222 so that the ECU 200 can confirm when the lid 28c is closed or at least when the position of the follower 150 corresponds to a closed position of the lid 28c.

[0114] As noted above with reference to the circuit board 40, the ECU 200 can comprise a hard wired circuit to perform the functionality described below. In some embodiments, the ECU 200 can comprise a processor and a memory for storing a control routine for performing the functionality described below. Additionally, it is to be noted that the illustrated arrangement of the control unit 134 is merely exemplary. Any other arrangement can also be used.

[0115] Figure 13 illustrates an exemplary arrangement of the power supply 132. As shown in Figure 13, the power supply 132 can include a door 230 configured to provide access to an interior battery compartment 232. In this arrangement, the door 230 can be designed to be as small as possible, providing at least enough clearance to allow batteries to be inserted into the interior battery compartment 232. This provides a more aesthetic appearance. In some embodiments, the battery compartment 232 is configured to receive four (4) "D" batteries. However, other numbers and sizes of batteries can also be used.

[0116] Additionally, the power supply 132 can include a power input port 234. As such, the power supply 132 can be provided with electrical power from household power supply. In some embodiments, the power input port 234 is a direct current (DC) input port

configured to receive a direct current from an AC to DC converter device. Such devices are well known in the art.

[0117] Additionally, the power supply 132 can include a main power switch 236 configured to allow the power supply 132 to be turned on or off as desired by a user.

[0118] Figure 14 schematically illustrates connections between the ECU 200 and the various devices described above. During operation, the ECU 200, as noted above, can be powered by the power supply 132.

[0119] Additionally, the ECU 200 can provide power to the sensor 36c (Figure 7) for powering the light emitting portion 120 of the sensor 36c to create a light beam 124 which is received by the light receiving portion 122. Additionally, as noted above, the ECU 200 can be configured to periodically power the sensor 36c so as to reduce the amount of energy used for powering the sensor 36c.

[0120] Further, as noted above, the sensor 36c can be configured to emit a detection signal to the ECU 200 when it is determined that the beam of light 124 has been blocked. For example, the beam of light 124 can be blocked when a user inserts their foot or other non-transparent body into the recess 30c, thereby preventing the beam of light 124 from striking the light receiving portion 122 of the sensor 36c. In some modes of operation, the ECU 200 can be configured to drive the motor 214 when a detection signal from the sensor 36c is received. When the motor 214 is driven, the shaft 182 (Figures 11 and 12) is rotated. The shaft 182, being received within the recess 180 (Figure 10) of the screw 152 (Figure 9) thereby rotates the screw 152.

[0121] With continued reference to Figure 9, as the screw 152 rotates, it is supported by the bearing 172 and due to the snap ring 176, the screw 152 is maintained in its vertical position within the housing 142. However, because the follower 150 includes internal threads meshed with the external threads 154 of the screw 152, the follower 150 is pushed upwardly (as viewed in Figures 9 and 7). Additionally, because the keys 158 are received within grooves (not shown) on the interior of the housing 142, the follower 150 does not rotate in the direction of rotation of the screw 152. Rather, the angular position of the follower 150 is maintained by the keys 158 and thus, the follower 150 rises within the housing 142.

[0122] As the follower 150 rises within the housing 142, it pushes upwardly against the lifting arm 140. As shown in Figure 7, the upper end of the lifting arm 140 is connected to the connecting links 50c, and thus the lifting arm 140 pushes the links 50c upwardly. With reference to Figure 6, as the link rods 50c are pushed upwardly, the upper ends of the link rods 50c push against the bracket assemblies 51c, and thereby rotate the lid 28c toward an open position.

[0123] With reference again to Figures 12 and 14, as the shaft 182 rotates, the teeth of the encoder wheel 218 pass through the sensor arrangement 220. As shown in Figure 14, the signal from the sensor 220 is transmitted to the ECU 200.

[0124] In some embodiments, the ECU 200 can be configured to determine when the lid 28c reaches its maximum open position based on the signal from the sensor 220. For example, but without limitation, the ECU 200 can be configured to count the number of pulses it receives from the sensor 220, each pulse representing one tooth of the encoder wheel 218 passing the sensor 220, to determine the number of rotations of the shaft 182 from the beginning of the actuation of the electric motor 214. The number of pulses generated by the movement of the lid 28c from the closed position to the open position can be determined and stored within the ECU 200 as a reference value. Thus, the ECU 200 can count the pulses from the beginning of the actuation of the motor 214 and then stop the motor 214 when the ECU 200 receives the stored number of pulses from the sensor 220.

[0125] The ECU 200 can be configured to perform in a number of different ways. For example, firstly, the ECU 200 can be configured to open and close the lid 28c in accordance with the description set forth above with reference to Figures 3A, 3B, and 3C. However, the ECU 200 can be programmed to open the lid 28c in other manners.

[0126] In some embodiments, the ECU 200 can be configured to activate the indicator 116 while the lid 28c is in motion. For example, the ECU 200 can be configured to cause the indicator light 116 to blink whenever the motor 214 is turning. However, the ECU 200 can be configured to actuate the indicator light 116 in any other time for any other reason.

[0127] The ECU 200 can also be configured to operate in other modes, according to the actuation of the mode switch 114. For example, the ECU 200 can be configured to

maintain the lid 28c in an open position indefinitely if the mode switch 114 is depressed. For example, if a user causes the ECU 200 to raise the lid 28c, for example, by inserting their foot into the recess 30c (Figure 7), and then the user actuates the mode switch 114 (Figure 6), then the ECU 200 can enter an open mode in which the ECU 200 does not operate the motor 214 to close the lid 28c. Rather, the motor is not actuated until the mode switch 114 is actuated again.

[0128] While the ECU 200 is in this mode, the ECU 200 can also cause the indicator 116 to flash, change color, or provide another indication so that the user can be advised that the trash can 20c is in a mode in which the lid 28c will remain open indefinitely. Thus, in some embodiments, the indicator light 116 can comprise a multicolored LED that can change colors, remain on in any one of the various colors indefinitely, blink, or turn off. Such LED lights are widely commercially available.

[0129] When closing the lid 28c, the ECU 200 can also rely on the output of the sensor 220 to determine when the lid 28c has reached its closed position. However, the ECU 200 can optionally be configured to detect an output from the sensor 222 for determining when the lid 28c is closed. Thus, for example, when the ECU 200 drives the motor 214 to close the lid 28c, the ECU 200 can continue to provide power to the motor 214 until a detection signal is received from the sensor 222. At that time, the ECU 200 can stop directing power to the motor 214 because the signal from the sensor 222 indicates the lid 28c is closed.

[0130] This provides a further recalibration of the ECU 200 each time the lid 28c is closed. For example, because the ECU 200 is not relying solely on the output of the sensor 220 and the proper rotation of the encoder wheel 218, errors associated with the encoder wheel 218 can be avoided.

[0131] The trash can 20c can also include a load sensor 224 configured to detect the voltage applied to the motor 214. The load sensor 224 can be configured to output a signal that is continuous and proportional to the voltage applied to the motor 214. In some embodiments, the load sensor 224 can be configured to output a signal only when the voltage applied to the motor 214 exceeds a predetermined value. In either configuration, whether the ECU 200 is configured to determine whether or not the output of the load sensor 224 is above

a predetermined value, or whether the load sensor 224 is configured to output a signal only when the voltage applied to the motor 214 exceeds a predetermined value, the ECU 200 can be configured to stop operation of the motor 214 if such a signal or state is detected.

[0132] This arrangement provides a further advantage in that the ECU 200 can determine if the motor 214 is overloaded. This can happen when, for example, a user has left a heavy object on top of the lid 28c. If this happens, and the ECU 200 energizes the motor 214 so as to raise the lid 28c, the motor 214 can be overloaded. Thus, by providing a load sensor 224, or any other sensor that can provide a similar functionality, the ECU 200 can terminate operation of the motor 214 to prevent damaging the motor 214.

[0133] As noted above, the power switch 236 can be used to terminate the supply of power to the control unit 134 and thus the ECU 200. This can be useful in households with small children who may attempt to play with the trash can 20c and thus waste energy. Thus, an owner of the trash can 20c may decide to occasionally turn off the control unit 134 by activating the power switch 236. With the power switch 236 disposed on a back side (Figure 13) of the trash can 20c, small children are less likely to discover the location of the power switch.

[0134] The electronic drive unit of Figure 14 can include a motor 214. The motor 214 can be a simple brush series DC motor nominally rated for 6 volt operation. The motor 214 can be driven by an "H" bridge transistor / MOSFET hardware configuration which allows for bi-directional drive. The motor drive signals can be issued from a microcontroller (model # PIC 16F685), which can be incorporated into the ECU 200. As such speed control can be achieved by varying the duty-cycle to the motor. Motor voltage is the raw-battery voltage as switched through the transistors.

[0135] To achieve precision control of the motor 214 for purposes of positioning the lid 28c, encoder wheel 218 rotates through an optical interrupt sensor pair 220. Another interrupter 222 can be used to detect when the lid is in the home or bottom position.

[0136] The ECU 200 can also include SuperCap technology to allow the microcontroller to ride out supply dips and transients during low battery voltage. This allows for better utilization of available battery energy. The SuperCap devices are well known in the art and are not further described herein.

[0137] In the non-limiting exemplary embodiments where the PIC 16F685 microprocessor is used, the following functions can be supported, although other controllers can also be used for supporting the following functions: (1) Motor bi-directional drive, (2) Interaction with the user (detecting switches, pulse LEDs, detecting IR beam interruption), (3) Logic for driving the lid 28c up or down, (4) preventing the lid from exceeding the maximum up position, (5) homing the lid for establishing position reference.

[0138] As noted above, the ECU 200 can include modules for controlling various aspects of the operation of the electronic drive unit. The modules described below with reference to Figures 15-21 are described in the format of flow charts representing control routines that can be executed by the ECU 200. However, as noted above, these control routines can also be incorporated into hard-wired modules or a hybrid module including some hard-wired components and some functions performed by a microprocessor.

[0139] With reference to Figure 15, the control routine 310 can be used to control the actuation of the sensor 36 (Figure 1), 36c (Figure 14), or any other sensor. The control routine 310 is configured to periodically activate the sensor 36, 36c so as to reduce power consumption. Although only sensor 36c is referenced below, it is to be understood that any sensor or combination of sensors can be controlled to reduce power consumption.

[0140] For example, the control routine 310 can begin operation at an operation block 312. For example, in the operation block 312, the control routine 310 can be started when batteries are inserted into the battery compartment 232, when the power switch 236 is moved to an on position, or at any other time. After the operation block 312, the routine 310 moves on to a decision block 314.

[0141] In the decision block 314, it can be determined whether a timer has reached a predetermine time interval. For example, the ECU 200 can include a timer and, initially setting a timer counter value to zero, determine whether the timer has reached a predetermined time interval, such as, for example, one quarter of one second. However, other time intervals can also be used.

[0142] If, in the decision block 314, the timer has not reached the predetermined time interval, the routine 300 returns and repeats. On the other hand, if in the decision block

314, the timer has reached the predetermined time interval, the routine 310 moves on to an operation block 316.

[0143] In the operation block 316, a sensor can be activated. For example, the ECU 200 can activate the sensor 36c.

[0144] In some embodiments, a further advantage can be achieved by activating the sensor 36c for a period of time shorter than the predetermined time interval used in the decision block 314. For example, in some embodiments, the sensor 36c is activated for a predetermined time of about 50 microseconds. However, other time periods can also be used.

[0145] With the activation time period of the operation block 316 being shorter than the predetermined time interval, the sensor 36c is not continuously operating. Thus, the power consumption of the sensor 36c can be reduced. In the exemplary embodiment in which the predetermined time interval of decision block 314 is about one-quarter of a second and the activation time period of activation block 316 is 50 microseconds, the sensor 36c is only operating about .02 percent of the time, and a user will only have to wait about one-quarter of a second, at the most, before the ECU 200 will detect the activation of the sensor 36c.

[0146] After the operation block 316, the routine 310 moves on to a decision block 318.

[0147] In the decision block 318, it can be determined whether a pulse is detected by the sensor 36c. For example, the ECU 200 can be configured to observe the output from the sensor 36c for any interruption of the signal. More specifically, the sensor 36c, as described above, can include a light-emitting portion 120 and a light-receiving portion 122 (Figure 7). The ECU 200 can be configured to compare the actuation of the emitter 120 with the signal output from the receiver 122. If there is an interruption, the ECU 200 can determine that a pulse, or an interruption of the light beam 124, has been detected.

[0148] If, in the decision block 318, a pulse has not been detected, the routine 310 can return and repeat. Optionally, in some embodiments, the routine can return to decision block 314 to repeat, although this return is not illustrated in Figure 15. On the other hand, if

it is determined that a pulse has been detected in decision block 318, the routine 310 can move on to operation block 320.

[0149] In the operation block 320, the ECU 200 can be triggered to begin operation of the motor 214 to open or close the lid. For example, if the lid 28c is in the down position, the motor 214 can be operated to open the lid. If, on the other hand, the lid 28c is in the open position, the motor 214 can be operated to close the lid 28c.

[0150] With reference to Figure 16, a control routine 330 can be configured to activate certain components of the electronic drive unit of Figure 14. For example, the routine 330 can begin at operation block 332 at any time. In some embodiments, the operation block 332 can begin the control routine 330 when the ECU 200 detects an interruption of the light beam 124. For example, but without limitation, the routine 330 can begin an operation in the operation block 332 if the routine 310 of Figure 15 reaches the operation block 320. After the operation block 332, the routine 330 moves on to an operation block 334.

[0151] In the operation block 334, an analog-to-digital converter (not shown) can be activated. For example, the electronic drive unit of Figure 14 can include an analog-to-digital converter disposed across the power supply 132. This analog-to-digital converter can convert the voltage of the power source 132 to a digital signal so that it can be read by the ECU 200. After the operation block 334, the routine 330 can move on to an operation block 336.

[0152] In the operation block 336, the battery voltage signal generated in operation block 334 can be stored in a memory device. For example, the ECU 200 can detect the signal generated by the analog-to-digital converter which is indicative of the voltage of the power supply 132 and store that voltage in a memory device as VBat. After the operation block 336, the routine 330 can move on to an operation block 338.

[0153] In the operation block 338, the analog-to-digital converter can be powered off. After the operation block 338, the routine 330 can move on to an operation block 340.

[0154] In the operation block 340, the sensors 220, 222 (Figure 12) can be activated. The sensors 220, 222, as noted above, are configured to detect pulses generated by rotation of the encoder wheel 218 and movement of the plunger 192, respectively.

[0155] After the operation block 340, the routine 330 can move on to an operation block 342.

[0156] In the operation block 342, the output of the sensors 220, 222 can be used for control of the electronic drive unit of Figure 14. For example, the ECU 200 can detect the output of the sensors 220, 222 for use in controlling the motor 214, described in greater detail below with reference to Figures 17-19. After the operation block 342, the routine 330 can move on to a decision block 344.

[0157] In the decision block 344, it can be determined whether the lid 28c is opened or closed. For example, the ECU 200 can be configured to count pulses from the sensor 220, during an opening movement of the lid 28c, to determine if the lid 28c has reached the open position. On the other hand, the ECU 200 can also be configured to detect actuation of the sensor 222. When the sensor 222 is activated, the ECU 200 can determine that the lid is closed. If the determination in decision block 344 is that the lid 28c is not open or closed, the routine 330 returns and repeats.

[0158] However, if the determination in decision block 344 is that the lid is open or closed, the routine 330 moves on to operation block 346. In the operation block 346, the sensors 220, 222 can be turned off.

[0159] The routine 330 can provide additional advantages. For example, because the analog-to-digital converter is only operated briefly to take a battery voltage reading, the analog-to-digital converter does not consume excessive amounts of power unnecessarily. Similarly, because the sensors 220, 222 are only activated when the lid 28c is being moved, and then turned off when the lid is opened or closed, the sensors 220, 222 also consume less power.

[0160] With reference to Figure 17, a control routine 350 can also be used to control operation of the electronic drive unit of Figure 14. The control routine 350 can be configured to vary the operation of the motor 214 to achieve a desired movement characteristic of the lid 28c. For example, the routine 350 can be used to vary the drive signal, e.g., duty cycle of the power signal to the motor 214, to achieve a desired motion characteristic of the lid 28c. However, other techniques can also be used to vary the operation of the motor 214. In some embodiments, the routine 350 is designed to achieve a

substantially constant speed movement of the lid 28c in at least one of the opening movement and closing movement of the lid 28c. However, other movement characteristics can also be achieved.

[0161] The control routine 350 can begin in an operation block 352. For example, the operation block 352 can allow the routine 352 to continue when the routine 310 (Figure 15) reaches the operation block 320. After the operation block 352, the routine 350 can move on to an operation block 354.

[0162] In the operation block 354, the position of the lid 28c can be determined. For example, the ECU 200, as noted above with reference to the routine 330, can monitor the output of the sensor 220 to determine a position of the lid 28c. For example, but without limitation, the ECU 200 can count the pulses from the sensor 220. As noted above, the sensor 220 creates an interrupt signal as the teeth on the encoder wheel 218 pass by the sensor 220. Additionally, the position of the lid 28c can be correlated to the number of pulses output by the sensor 220.

[0163] For example, the number of pulses generated by the sensor 220 can be correlated to an angular position of the lid 28c. Thus, the position of the lid 28c during either an upward opening movement or closing movement can be determined by counting the pulses from the sensor 220. However, other techniques for determining the position of the lid 28c can also be used. After the operation block 354, the routine 350 can move on to an operation block 356.

[0164] In the operation block 356, a drive value for operating the motor 214 can be determined. For example, the ECU 200 can determine the desired output of the motor 214 based on the position of the lid 28c determined in operation block 354. In some embodiments, the desired power output of the motor 214 as a function of the position of the lid 28c can be determined beforehand and stored in a data table or map.

[0165] Figure 18 illustrates a sample data table that correlates the target output or target drive signal of the motor 214 to a position of the lid 28c. In the illustrated embodiment of the table of Figure 18, the vertical axis represents a percentage of the maximum power output of the motor 214. The horizontal axis represents the position of the lid 28c in terms of

counts or pulses issued from the sensor 220. However, this is merely one type of data table that can be used.

[0166] The data table of Figure 18 represents an exemplary but non-limiting embodiment of motor drive data that can be used when the lid is moved toward an opening position.

[0167] Similarly, Figure 19 illustrates data that can be used to operate the motor 214 when the lid 28c is being moved from an open to a closed position. The determination of the desired output of the motor 214 for moving the lid 28c in each of the opening and closing movements depends on various factors. For example, these factors can include the geometry of the lid 28c, the weight of the lid 28c, the geometry of the rods 50c, the characteristics of the gear reduction device 216, the resistance and gear reduction ratio achieved by the unit 136 (Figure 9) and the strength of the spring 166.

[0168] Additionally, the motor drive values represented in Figures 18 and 19 can be adjusted to achieve the desired opening or closing characteristics of the lid. For example, as noted above, the values of Figures 18 and 19 are designed to achieve a generally constant angular velocity of the lid 28c during both opening and closing movements. Additionally, these values are designed to achieve about the same velocity of the lid 28c during both opening and closing movements of the lid 28c. However, other movement characteristics can also be achieved.

[0169] With reference again to Figure 17, after the operation block 356, the routine 350 can move on to an operation block 358.

[0170] In the operation block 358, the voltage of the power supply 132 can be determined. For example, the ECU 200 can read the voltage detected in operation block 336 of routine 330 (Figure 16). However, optionally, the ECU 200 could reactivate the analog-to-digital converter and take a new reading of the voltage of the power supply 132. Other techniques can also be used.

[0171] After the operation block 358, the routine 350 can move on to a decision block 360.

[0172] In the decision block 360, it can be determined whether the voltage of the power supply 132 is greater than a first predetermined voltage threshold V1. The predetermined voltage V1 can be any voltage.

[0173] In some embodiments, the voltage V1 is set at a voltage that corresponds to a substantially fully charged state of the power supply 132, for example, where the power supply 132 is a disposable or rechargeable battery. Thus, for example, if the power supply 132 comprises six D cell batteries, each rated at 1.5 volts, the fully-charged state of the power supply 132 would be about 9.0 volts. However, as is well known in the art, fully charged D cell batteries often carry a voltage of about 1.6 volts when they are fully charged and brand new.

[0174] Thus, the voltage V1 can be 9 or 9.6 volts depending on the level of accuracy desired. In other words, as described below, the voltage VBat of the power supply 132 can be compared to several additional voltage thresholds. The more voltage thresholds that are used, the more accurately the electronic drive unit of Figure 14 will maintain a uniform angular velocity of the opening and closing of the lid 28c.

[0175] With continued reference to the decision block 360, if it is determined that the voltage VBat of the power supply 132 is greater than the first predetermined voltage threshold V1, the routine 360 can move on to an operation block 362.

[0176] In the operation block 362, an offset value can be determined. For example, the offset value Offset 1 can be predetermined to achieve a desired opening or closing speed of the lid 28c. In some embodiments, the magnitude of the value Offset 1 can be the largest of all the offset values.

[0177] For example, in some embodiments, the value of Offset 1 can be -30%. As such, when the voltage VBat of the power supply 132 is at its greatest value, the largest (negative) offset is applied. As such, as the voltage VBat of the power supply 132 drops over time, smaller (negative) offset values can be applied to thereby achieve a substantially uniform opening and closing speed of the lid 28c, as voltage of the power supply 132 discharges over time. After the operation block 362, the routine 350 can move on to operation block 364.

[0178] In the operation block 364, the drive value determined in operation block 356 is added with the offset value, and at this point of the operation of the routine 350, the offset value is Offset 1. Thus, in an exemplary embodiment, where the value of Offset 1 is (-30%), the drive value determined in operation block 356 is reduced by 30%. Thus, in the operation block 364, the motor 214 is driven at this resulting drive value.

[0179] With regard to the drive value applied to the motor 214, the power output from the motor 214 can be varied in any known way. For example, where the drive signal applied to the motor 214 is a duty cycle, characteristics of the duty cycle can be varied to achieve a varying power output of the motor 214. For example, but without limitation, the pulse width of the duty cycle applied to the motor 214 can be increased to increase the output of the motor 214 and can be decreased to decrease the power output from the motor 214. However, there is a maximum point of adjustment for an electric motor, such as the motor 214. Thus, the maximum adjustment allowed by the technique used to adjust the power output of the motor 214, would be considered a 100% drive value.

[0180] Finally, in the operation block 364, the drive value is determined by adding the offset value, in this case Offset 1, with the drive value determined in operation block 356, and this drive value is supplied to the motor 214. After the operation block 364, the routine 350 returns to operation block 354 and repeats.

[0181] Returning to decision block 360, if it is determined that the voltage VBat of the power supply 132 is not greater than the voltage V1, the routine moves on to a decision block 366.

[0182] In the decision block 366, it can be determined whether the voltage VBat is less than the voltage V1 and greater than another predetermined voltage threshold V2. As noted above, with regard to the description of the voltage V1, the voltage V2 can be set at a voltage indicative of a voltage normally reached by a power supply formed with a set of battery cells as a discharge but are still useful. If, it is determined in the decision block 366, that the voltage VBat is less than voltage V1 but greater than voltage V2, the routine can move on to an operation block 368.

[0183] In the operation block 368, another offset value can be determined. For example, in the operation block 368, the offset can be determined as Offset 2. In an

exemplary but nonlimiting embodiment, the magnitude of Offset 2 can be -20%. As such, as noted above, as the voltage of the power supply 132 drops, the magnitude of the offset value drops (to a smaller negative value) thereby compensating for the decreasing voltage of the power supply 132. After the operation block 368, the routine 350 can move to the operation block 364 and continue as described above.

[0184] With reference again to the decision block 366, if the determination therein is negative, the routine can move on to other decision blocks. There can be any number of decision blocks similar to the decision blocks 360, 366, depending on how many steps or stages of the discharge state of the power supply 132 are contemplated.

[0185] Decision block 370 represents an exemplary final decision block that can be used in this series. In the decision block 370, it can be determined whether the voltage V_{Bat} of the power supply 132 is below a final reference voltage V₄. The final reference voltage V₄ can be a voltage below which there is very little useful power left in the power supply 132, and shut down of the ECU 200 is imminent. However, other reference voltages can also be used. If, in the decision block 370, it is determined that the voltage V_{Bat} is less than the reference voltage V₄, the routine moves on to an operation block 372.

[0186] In the operation block 372, a final offset value Offset 4 can be determined. In some exemplary, but nonlimiting embodiments, the offset value Offset 4 is 0%. Thus, for example, the full value of the drive value determined in the operation block 356 is applied to the motor 214, in the operation block 364. However, in some embodiments, the value of Offset 4 can be a value that would result in a 100% value for the drive value.

[0187] For example, with reference to Figure 19, the maximum drive value applied is 70%. Thus, in some embodiments, the value of Offset 4 in operation block 372 can be +30%. Thus, when the maximum value of 70% from the table of Figure 19 is added to this exemplary value of 30% being the value of Offset 4, the resulting drive value is 100%. Again, as noted above, the values of the various offsets used in the operation block 362, 368, 372, can be set so as to achieve a substantially constant closing and opening speed of the lid 28c, regardless of the voltage of the power supply 132.

[0188] Eventually, as the voltage of the power supply 132 continues to drop, the ECU 200 will eventually shut down, despite the use of a SuperCap device described above.

[0189] Figure 20 illustrates a control routine 380 that can also be used to control the operation of the electronic drive unit of Figure 14. The routine 380 can be used for braking or slowing the movement of the lid 28c as it nears a point at which it is desired to stop the lid 28c.

[0190] The routine 380 can begin in operation block 382. The operation block 382 can be configured to allow the control routine 380 to continue at any time. In some embodiments, the operation block 382 can be configured to allow the routine 380 to continue if it is determined that the lid 28c or the motor 214 is already in motion. However, other determinations can also be used. After the operation block 382, the routine 380 can move on to a decision block 384.

[0191] In the decision block 384, it can be determined whether or not the lid 28c is in with a predetermined number of counts X of a stopped position. For example, as noted above, the encoder wheel 218 (Figure 12) causes the sensor 220 to issue pulses as the encoder wheel 218 rotates. The number of pulses required to move the lid 28c between open and closed positions can be determined beforehand. Thus, the number of counts X can be any number. In some nonlimiting exemplary embodiments, the value X can be 3 or 4. However, any number of counts can be used.

[0192] If, in the decision block 384 it is determined that the lid 28c is not within X counts of a stop position, the routine 380 returns to operation block 382 and repeats. On the other hand, if it is determined that the lid 28c is within X counts of a stop position, the routine 380 can move on to a decision block 386.

[0193] In the decision block 386, it can be determined whether or not the lid 28c is being moved upwardly or downwardly. For example, the ECU 200 can determine whether the motor 214 is currently being operated in the opening or closing direction. If, it is determined that the motor 214 is in an opening mode, the routine 380 can move to an operation block 388.

[0194] In the operation block 388, the motor 214 can be reversed for a time period of T1. The time period T1 can be a predetermined amount of time of a magnitude designed to cause the lid 28c to stop smoothly when the lid is being moved in the opening direction. For example, in an exemplary but nonlimiting embodiment, the time T1 can be .2 seconds.

Additionally, in some embodiments, when the motor is reversed, it is driven with the same drive value applied in the routine 350, but in reverse polarity. Additionally, the time T1 can be any amount of time. After the operation block 388, the routine can move on to operation block 390.

[0195] In the operation block 390, the routine 380 can stop. For example, the ECU 200 can cause the motor 214 to stop operating. However, other operations can also be carried out.

[0196] With reference again to decision block 386, if it is determined that the lid 28c is not moving toward an open position, the routine 380 can move to a decision block 392.

[0197] In the decision block 392, it can be determined whether or not the lid 28c is moving toward a closed position, or if the motor 214 is operating in a direction to close the lid. For example, the ECU 200 can determine whether or not the motor 214 is being driven in a closing direction. If it is determined that the lid 28c is moving in a closing direction, the routine 380 can move to an operation block 394.

[0198] In the operation block 394, the motor 214 can be reversed for a predetermined time period T2. The time period T2 can be an amount of time sufficient to cause the lid 28c to slow gradually and/or smoothly to a stop. The value of the time T2 can be any amount of time, and it can be the same or different from the time T1. In an exemplary but nonlimiting embodiment, the value of T2 is .2 seconds. However, any amount of time can also be used.

[0199] After the operation block 394, the routine 380 can move to operation block 390.

[0200] If, however, in the decision block 392, it is determined that the lid 214 is not moving downwardly, the routine 380 can return to operation block 382, operation block 390, or a fault can be triggered.

[0201] With reference to Figure 21, a control routine 400 can also be used to control the operation of the electronic drive unit 314. The control routine 400 can be designed to determine if a fault has occurred. For example, the routine 400 can be designed to determine if the motor 214 has been operated for an amount of time more than sufficient for closing or opening the lid 28c.

[0202] The routine 400 can begin in an operation block 402. The operation block 402 can allow the routine 400 to continue for any reason. For example, the operation block 402 can be configured to allow the routine 400 to continue if the operation block 320 (Figure 15) of the routine 310 has been reached. After the operation block 402, the routine 400 can move on to a decision block 404.

[0203] In the decision block 404, it can be determined whether or not the lid 28c is currently in motion. If it is determined that the lid 28c is not in motion, the routine 400 can move to an operation block 406 and end.

[0204] If, however, in the decision block 404, it is determined that the lid 28c is in motion, the routine 400 can move on to a decision block 408.

[0205] In the decision block 408, it can be determined whether or not a timer has reached a predetermined time value T_f . For example, the ECU 200 can be configured to monitor a timer and determine if a timer has reached the value of T_f . Optionally, the operation block 402 can also include a function of resetting this timer to zero. If, in the decision block 408, it is determined that the timer has not reached the value T_f , the routine 400 can return to the decision block 404 and repeat.

[0206] However, if it is determined, in the decision block 408, that the timer has reached or exceeded the time T_f , the routine 400 can move to operation block 410.

[0207] In the operation block 410, the motor 214 can be stopped and/or a fault can be indicated. For example, the ECU 200 can cause the motor 214 to stop, regardless of what operation is being carried out at that time. Additionally, the ECU 200 can cause the LED 116 to change color to red, or otherwise change in appearance. This change in appearance can be interpreted by a user that a fault has occurred.

[0208] Additionally, optionally, the ECU 200 can be configured to lock out any further operation of the motor 214 until the electronic drive unit of Figure 14 has been reset. For example, the ECU 200 can lock out any further operation of the motor 214 until the main power switch 236 (Figure 13) has been moved to an off position and then returned to an on position. However, other methods can also be used for resetting the operation of the electronic drive unit of Figure 14.

[0209] The magnitude of the value T_f can be any value. For example, in some embodiments, the value T_f is an amount of time more than sufficient to drive the lid from between the open and closed positions. For example, in an exemplary but nonlimiting embodiment, the electronic drive unit 14 is configured to move the lid 28c between the open and closed positions in about 1 second regardless of the state of discharge of the power supply 132. In some non-limiting embodiments, the value T_f is set to 3 seconds. This magnitude of time, i.e., 3 seconds, is substantially more time than what is required to move the lid 28c between the open and closed positions, in the exemplary nonlimiting embodiment described above. Thus, if it is determined, through the routine 400, that the motor 214 has been activated for 3 seconds or more, then it is likely or possible that the lid 28c has hit an obstruction or some other fault has occurred. Thus, in order to prevent overheating of any parts, or unnecessary discharge of the power supply 132, the motor 214 is shut down and a fault is indicated.

[0210] Although these inventions have been disclosed in the context of certain preferred embodiments and examples, it will be understood by those skilled in the art that the present inventions extend beyond the specifically disclosed embodiments to other alternative embodiments and/or uses of the inventions and obvious modifications and equivalents thereof. In addition, while several variations of the inventions have been shown and described in detail, other modifications, which are within the scope of these inventions, will be readily apparent to those of skill in the art based upon this disclosure. It is also contemplated that various combination or sub-combinations of the specific features and aspects of the embodiments may be made and still fall within the scope of the inventions. It should be understood that various features and aspects of the disclosed embodiments can be combined with or substituted for one another in order to form varying modes of the disclosed inventions. Thus, it is intended that the scope of at least some of the present inventions herein disclosed should not be limited by the particular disclosed embodiments described above.

WHAT IS CLAIMED IS:

1. An enclosed receptacle comprising:
a receptacle portion defining a reservoir;
a door mounted relative to the receptacle and configured to move between open and closed positions;
a sensor mounted in the vicinity of a lower portion of the receptacle and configured to output a detection signal;
a control mechanism configured to move the door between the open and closed positions, the sensor being connected to the control mechanism, the controller being configured to move the door to the open position when the sensor outputs a detection signal.
2. The receptacle according to Claim 1, wherein the sensor is configured to detect the presence of an object within the vicinity of the sensor.
3. The receptacle according to Claim 1, wherein the sensor is an interrupt type sensor.
4. The receptacle according to Claim 1, wherein the sensor comprises a light emitting portion and a light receiving portion, and the sensor is configured to output the detection signal if the light emitting portion emits a beam of light but the beam of light is not received by the light receiving portion.
5. The receptacle according to Claim 1, wherein the door is not directly coupled to the control mechanism.
6. The receptacle according to Claim 1, wherein the door is mechanically interfaced with the control mechanism such that the control mechanism can operate to push the door toward the open position and the door can be manually moved toward the open position without the control mechanism operating.
7. The receptacle according to Claim 1, wherein the control mechanism comprises a jack screw assembly.
8. The receptacle according to Claim 7, wherein the jack screw assembly includes a spring configured to bias the jack screw assembly toward a position corresponding to the open position of the door.

9. The receptacle according to Claim 1, wherein the control mechanism is configured to determine if the door encounters an obstruction and to stop operation of the control mechanism if the door encounters an obstruction.

10. The receptacle according to Claim 1, wherein the control mechanism comprises a proportional door position sensor configured to output a signal indicative of the movement of the door and a closed position sensor configured to output a signal indicative of the door being in the closed position.

11. The receptacle according to Claim 1, wherein the receptacle is a trash can.

12. The receptacle according to Claim 1 additionally comprising a mode switch connected to the control mechanism, the control mechanism configured to hold the door open for an indefinite amount of time if the mode switch is activated.

13. An enclosed receptacle comprising:

a receptacle portion defining a reservoir;

a door mounted relative to the receptacle and configured to move between open and closed positions;

a user input device configured to output a signal;

a control mechanism mechanically connected to the user input device and interfaced with the door such that the control mechanism can operate to push the door toward the open position and the door can be manually moved toward the open position without the control mechanism operating.

14. The receptacle according to Claim 13, wherein the user input device is an interrupt-type sensor configured to detect the presence of an object in the vicinity of the sensor and to output the signal if the presence of an object is detected.

15. The receptacle according to Claim 13, wherein the control mechanism is configured to apply a pushing force to open the door, and wherein the door can be pulled open when the control mechanism is not operating.

16. The receptacle according to Claim 13, wherein the control mechanism comprises a jack screw assembly having a follower and a columnar member arranged to be pushed toward an opening position by the follower, the columnar member and the follower not being joined together such that they can be freely moved apart from each other.

17. The receptacle according to Claim 13, wherein the receptacle portion includes a peripheral surface against which the door presses when the door is in the closed position, the peripheral surface including a recess configured to allow a human to insert at least one finger between the door and the peripheral surface.

18. An enclosed receptacle comprising:

a receptacle portion defining a reservoir;

a door mounted relative to the receptacle and configured to move between open and closed positions;

a first user input device configured to output a signal;

a second user input device disposed apart from the first user input device;

a control mechanism connected to both the first and second user input devices, the control device being configured to move the door toward the open position based on a signal from the first user input device, the control mechanism being further configured to hold the door in the open position based on a signal from the second user input device.

19. The receptacle according to Claim 18, wherein the first user input device comprises a sensor configured to detect the presence of an object and to output a detection signal to the control mechanism if the presence of an object is detected.

20. The receptacle according to Claim 19, wherein the second user input device is a button disposed on an upper portion of the receptacle.

21. The receptacle according to Claim 18 additionally comprising a main power switch disposed on a lower rear portion of the receptacle.

22. An enclosed receptacle comprising:

a receptacle portion defining a reservoir;

a door mounted relative to the receptacle and configured to move between opened and closed positions;

a power supply;

a motor configured to move the door between the opened and closed positions;

a controller configured to control operation of the door, the controller comprising:

a door movement trigger module configured to allow a user to issue a command to the controller to open the door;

a power supply voltage monitor module configured to detect a voltage of the power supply only once each time the command has been detected by the door movement trigger module;

a door position monitor module having at least one sensor configured to monitor a position of the door;

a door position sensor control module configured to supply power to the at least one sensor only when the door is being moved by the motor;

a motor drive module configured to vary the power output of the motor to compensate for variations in a voltage of the power supply detected by the power supply voltage monitor and for variations in a force required to move the door at a substantially constant speed based on the position of the door detected by the door position monitor module;

a braking module configured to slow the movement of the door as it approaches a stop position by reversing the power output of the motor for a predetermined braking time beginning at a predetermined position before the opened and closed positions of the door; and

a fault detection module configured to stop operation of the motor and to provide an indication of a fault if the motor has been operating for more than a predetermined time period.

23. An enclosed receptacle comprising:

a receptacle portion defining a reservoir;

a door mounted relative to the receptacle and configured to move between opened and closed positions;

a power supply;

a motor configured to move the door between the opened and closed positions;

a controller configured to control operation of the door, the controller comprising:

a door movement trigger module configured to allow a user to issue a command to the controller to open the door; and

a power supply voltage monitor module configured to detect a voltage of the power supply when the command has been detected by the door movement trigger module.

24. The receptacle according to Claim 23, wherein the power supply voltage monitor module is configured to detect the voltage of the power supply only once each time the command has been detected by the door movement trigger module.

25. The receptacle according to Claim 24, wherein the power supply comprises a plurality of battery cells.

26. The receptacle according to Claim 24, wherein the door movement trigger module comprises a light emitter device and a light receiver device, the door movement trigger module being triggered when a beam of light emitted from the light emitter device is prevented from reaching the light receiver device.

27. An enclosed receptacle comprising:

a receptacle portion defining a reservoir;

a door mounted relative to the receptacle and configured to move between opened and closed positions;

a power supply;

a motor configured to move the door between the opened and closed positions;

a controller configured to control operation of the door, the controller comprising:

a door movement trigger module configured to allow a user to issue a command to the controller to open the door;

a door position monitor module having at least one sensor configured to monitor a position of the door; and

a door position sensor control module configured to selectively supply power to the at least one sensor when the door is being moved by the motor.

28. The receptacle according to Claim 27, wherein the door position sensor control module is configured to supply power to the at least one sensor only when the door is being moved by the motor.

29. The receptacle according to Claim 27, wherein the door position sensor control module is configured to cut off power to the least one sensor when the door stops moving.

30. An enclosed receptacle comprising:

- a receptacle portion defining a reservoir;
- a door mounted relative to the receptacle and configured to move between opened and closed positions;
- a power supply;
- a motor configured to move the door between the opened and closed positions;
- a controller configured to control operation of the door, the controller comprising:

- a power supply voltage monitor module configured to detect a voltage of the power supply; and

- a motor drive module configured to vary the power output of the motor to compensate for variations in a voltage of the power supply detected by the power supply voltage monitor.

31. The receptacle according to Claim 30 additionally comprising a door position monitor module having at least one sensor configured to monitor a position of the door.

32. The receptacle according to Claim 31, wherein the motor drive module is further configured to compensate for variations in a force required to move the door at a substantially constant speed based on the position of the door detected by the door position monitor module.

33. The receptacle according to Claim 30, wherein the motor drive module is configured to vary the power output of the motor in accordance with a predetermined relationship between a target power output and the position of the door.

34. The receptacle according to Claim 33, wherein the motor drive module is further configured to apply an offset value to the target power output based on the voltage detected by the power supply voltage monitor.

35. The receptacle according to Claim 34, where in the motor drive module is configured to reduce the target power output value by a larger magnitude offset when the power supply voltage is larger and to reduce the target power output value by a smaller magnitude offset when the power supply voltage is smaller.

36. An enclosed receptacle comprising:

- a receptacle portion defining a reservoir;

- a door mounted relative to the receptacle and configured to move between opened and closed positions;

- a power supply;

- a motor configured to move the door between the opened and closed positions;

and

- a controller configured to control operation of the door, the controller comprising:

- a braking module configured to slow the movement of the door as it approaches a stop position by reversing the power output of the motor for a predetermined braking time beginning at a predetermined position before the opened and closed positions of the door.

37. The receptacle according to Claim 36 additionally comprising a door position monitor module having at least one sensor configured to monitor a position of the door.

38. The receptacle according to Claim 37, the braking module configured to slow the movement of the door at a predetermined position detected by the door position monitor module.

39. An enclosed receptacle comprising:

- a receptacle portion defining a reservoir;

- a door mounted relative to the receptacle and configured to move between opened and closed positions;

- a power supply;

a motor configured to move the door between the opened and closed positions;
and

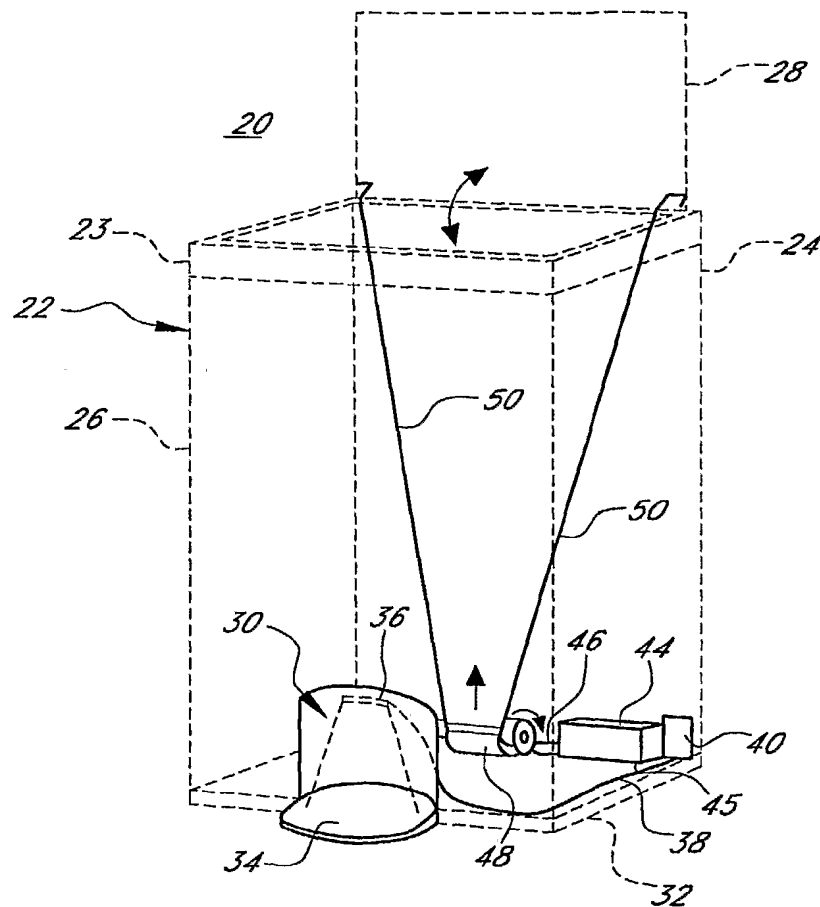
a controller configured to control operation of the door, the controller comprising:

a fault detection module configured to stop operation of the motor and to provide an indication of a fault if the motor has been operating for more than a predetermined time period.

40. The receptacle according to Claim 39 additionally comprising a timer, the controller resetting the timer to zero when the motor is initiated, the controller being configured to use the timer to determine if the motor has been operating for more than the predetermined time period.

41. The receptacle according to Claim 39, wearing the fault detection modules configured to stop operation if the motor has been operating continuously for more than the predetermined time period.

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*FIG. 1*

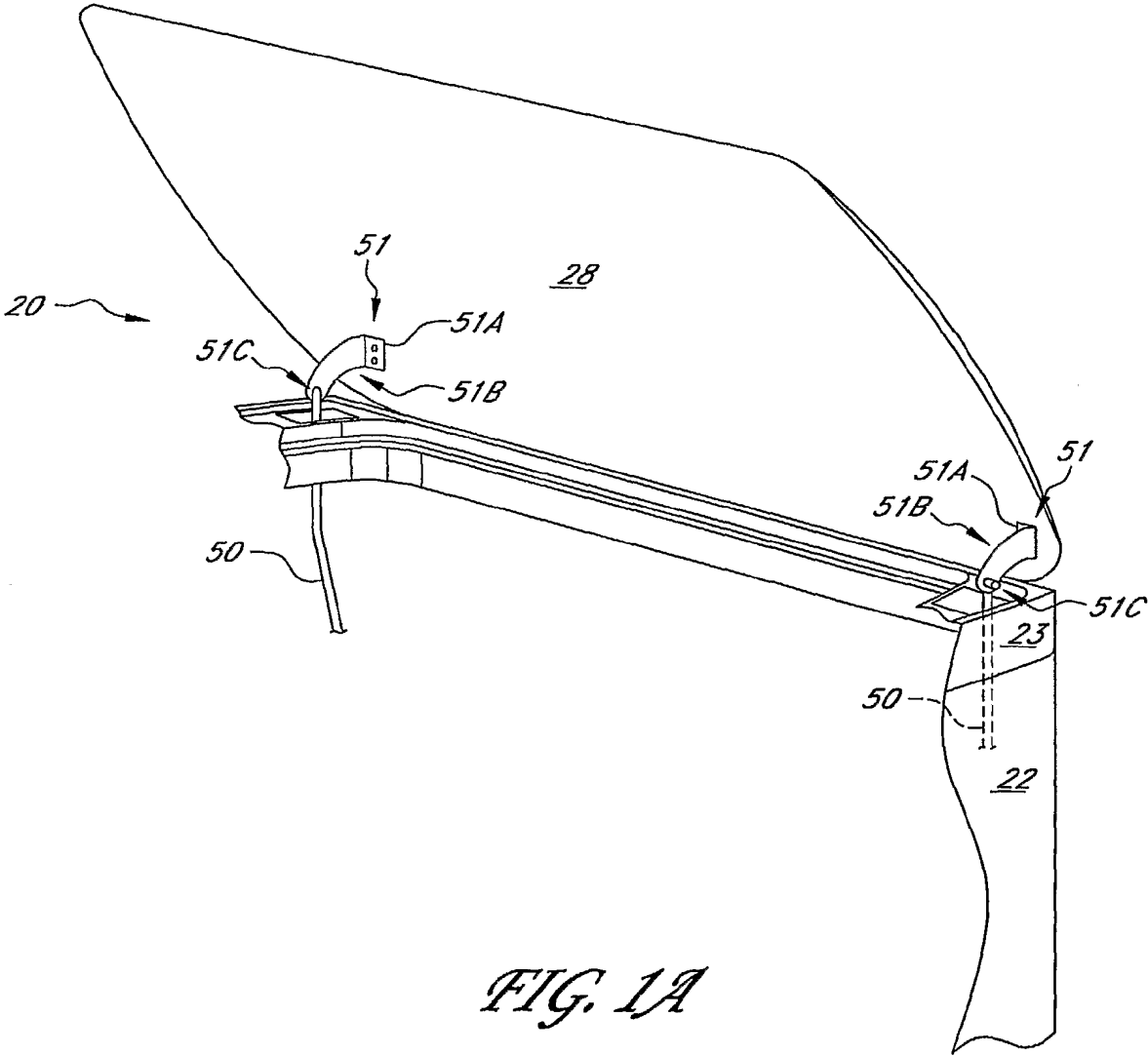
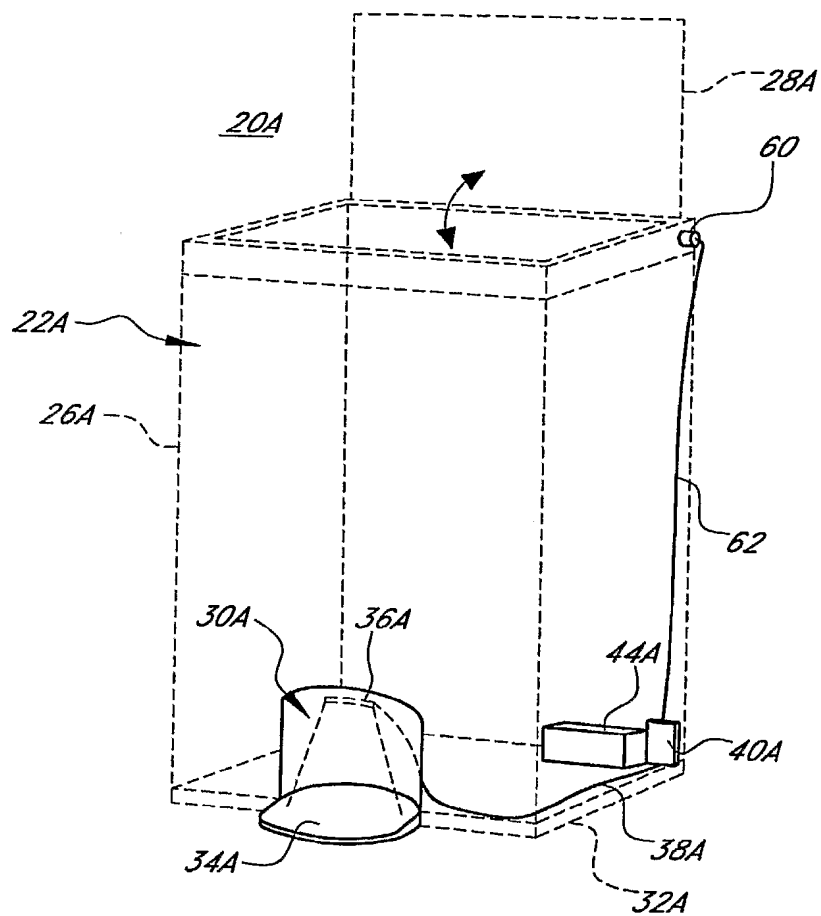


FIG. 1A

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*FIG. 2*

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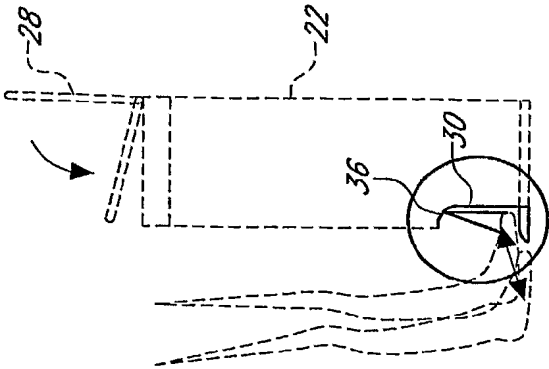


FIG. 3A

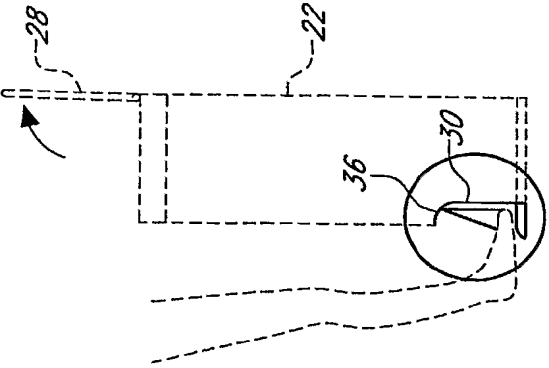


FIG. 3B

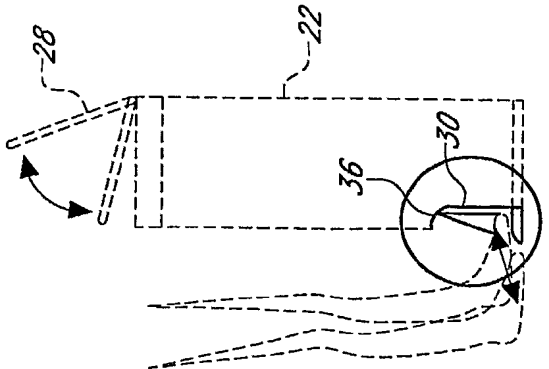


FIG. 3C

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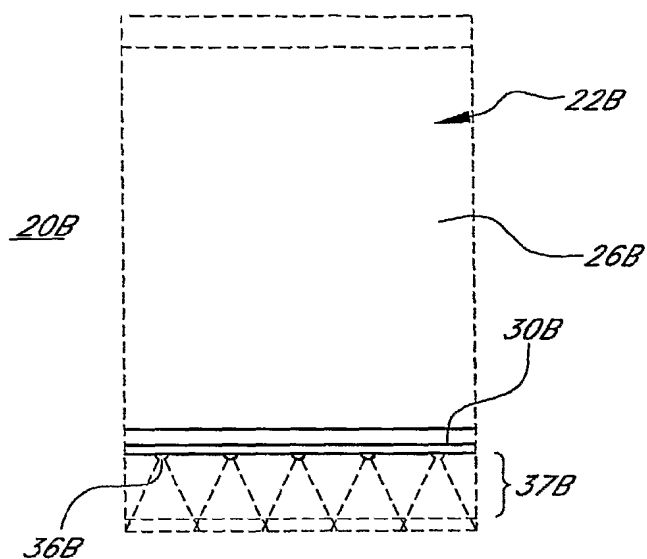


FIG. 4

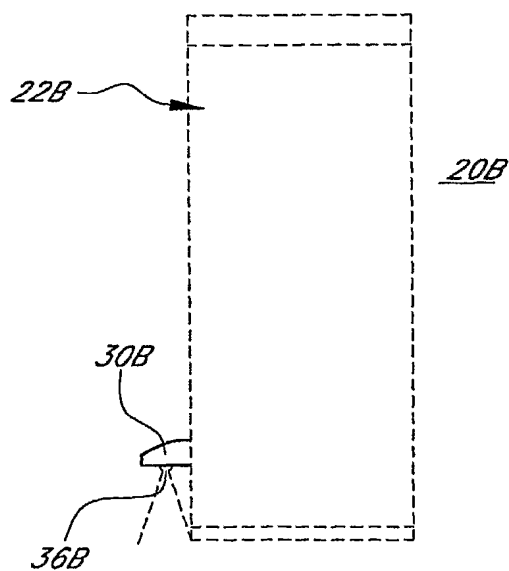
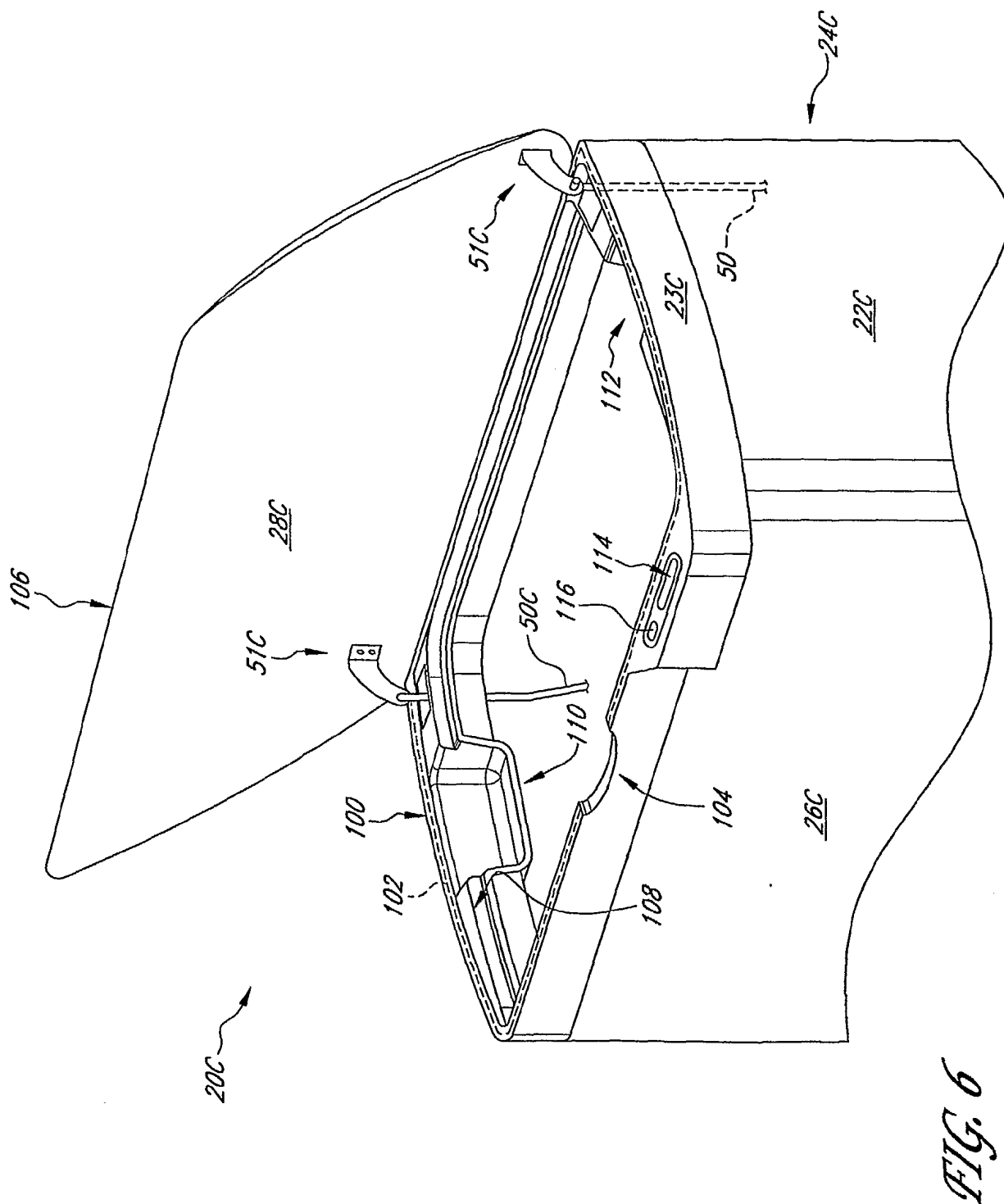
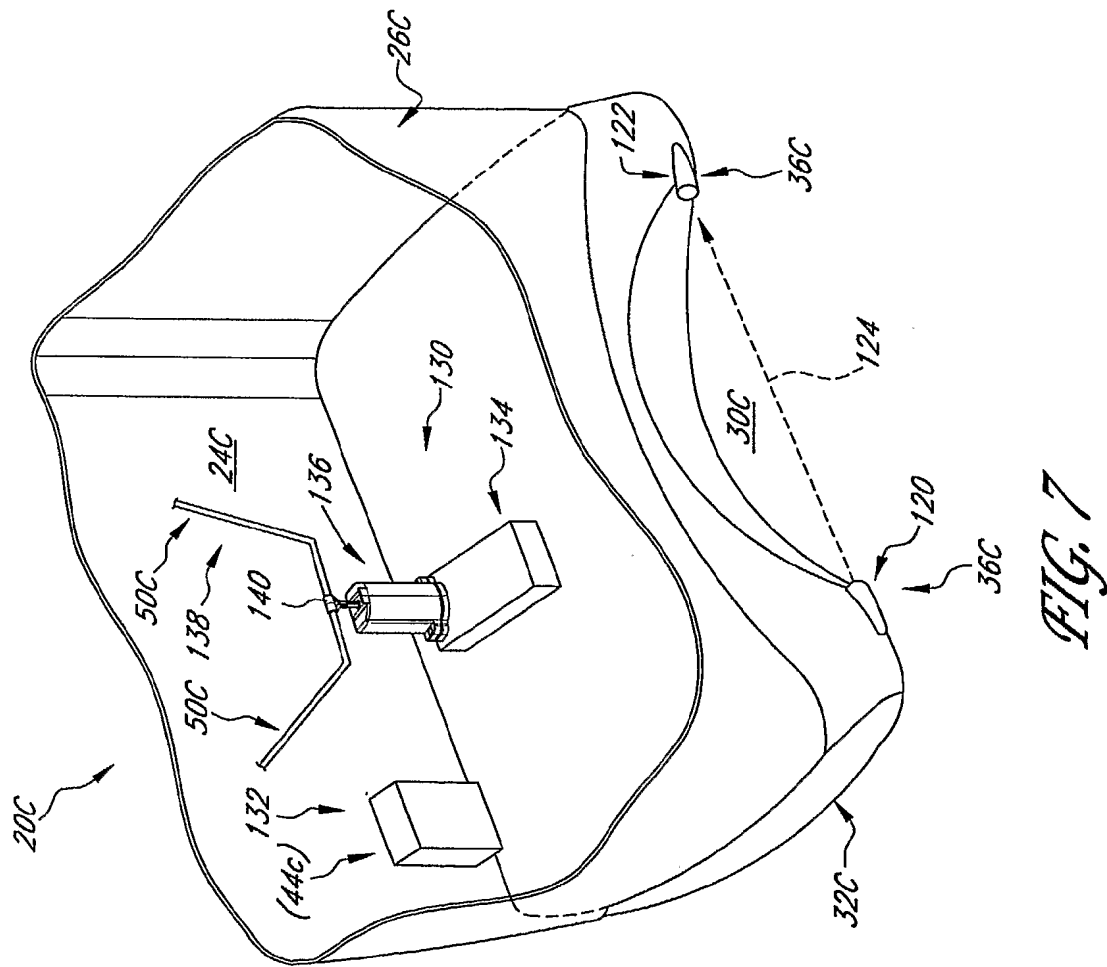


FIG. 5



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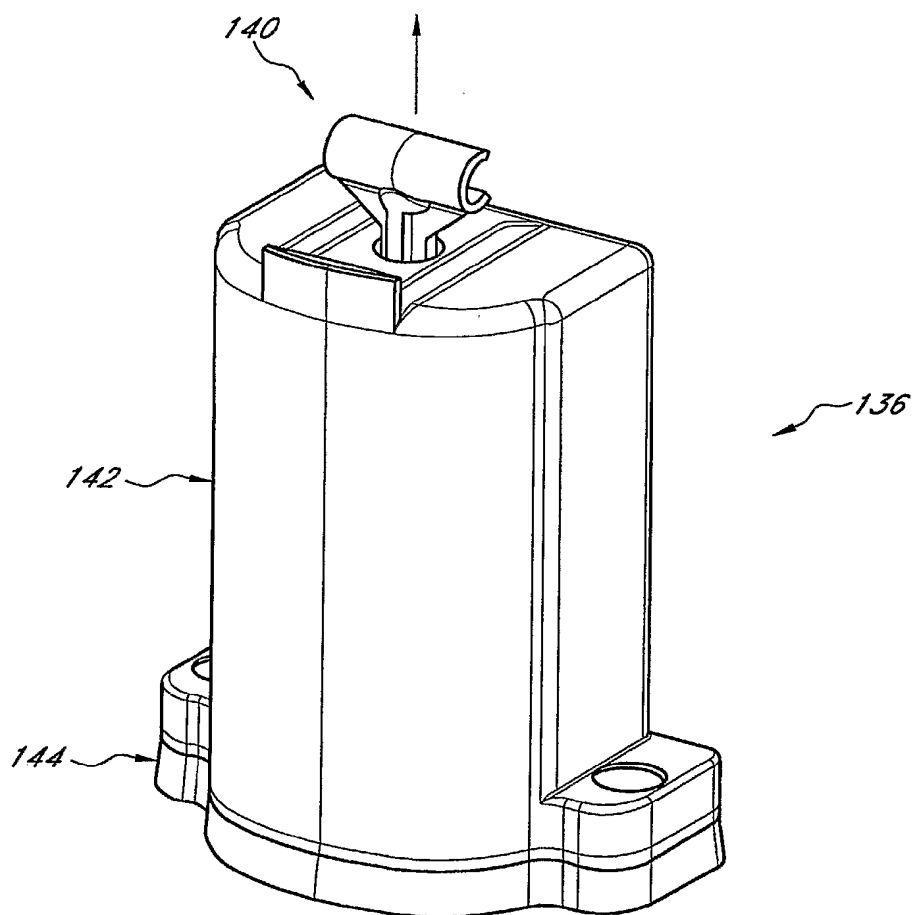


FIG. 8

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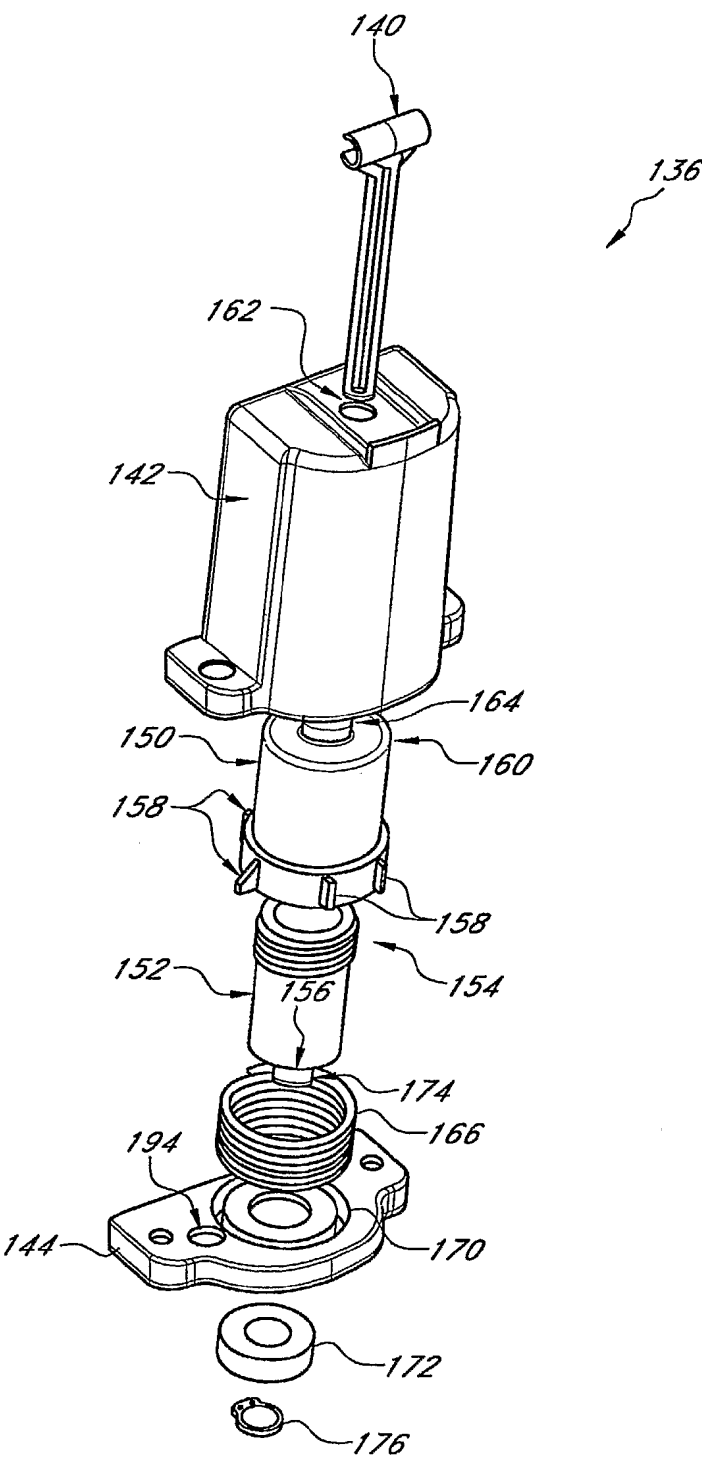


FIG. 9

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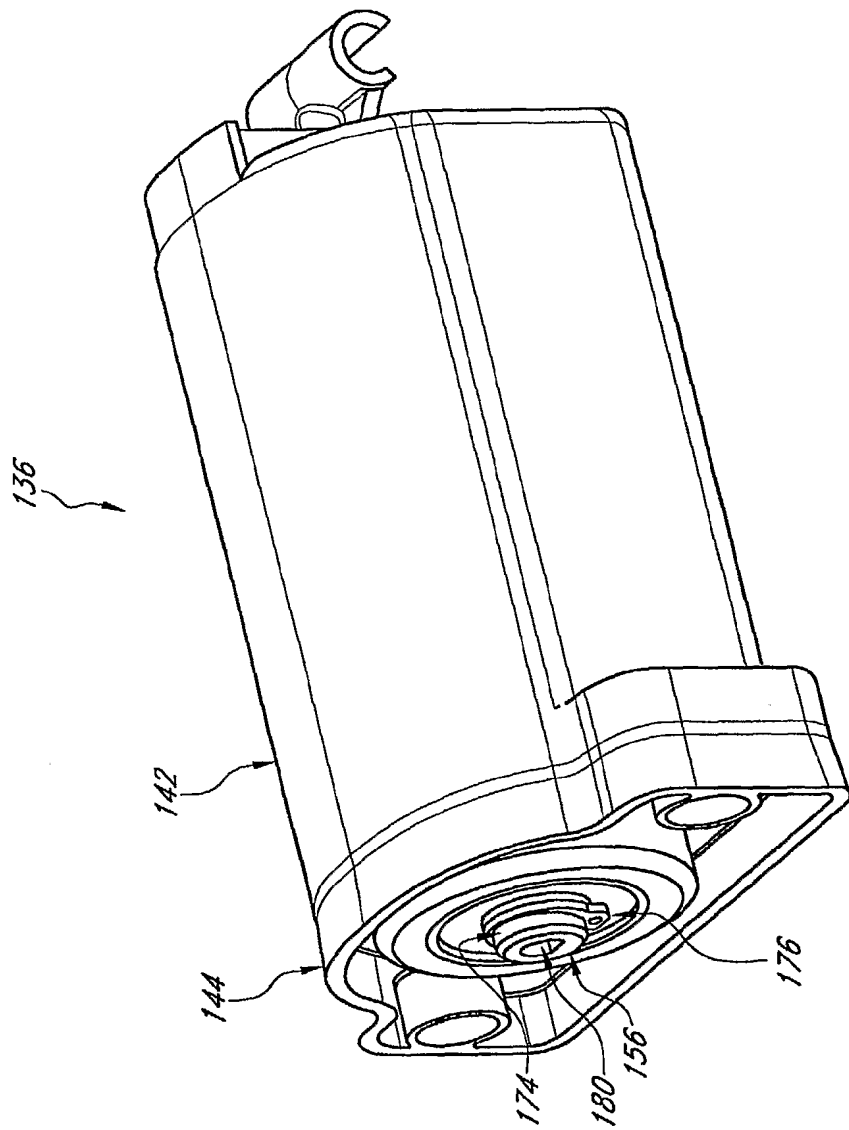
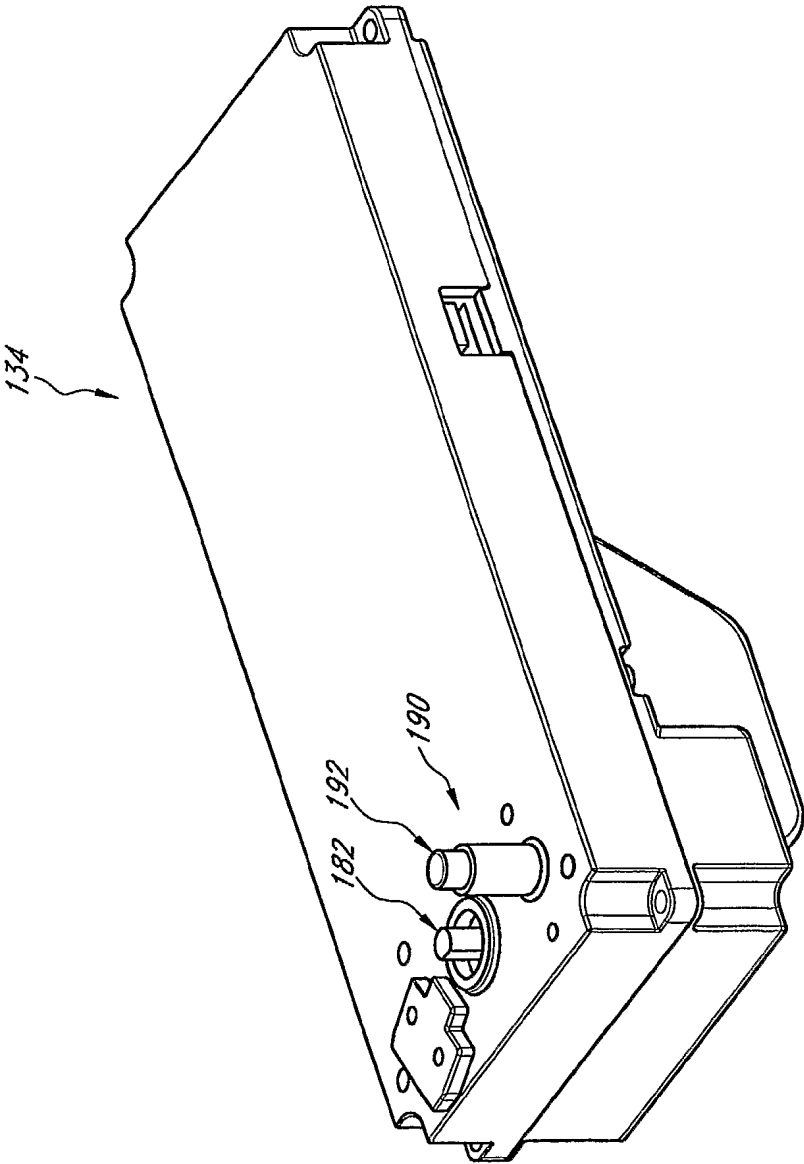


FIG. 10



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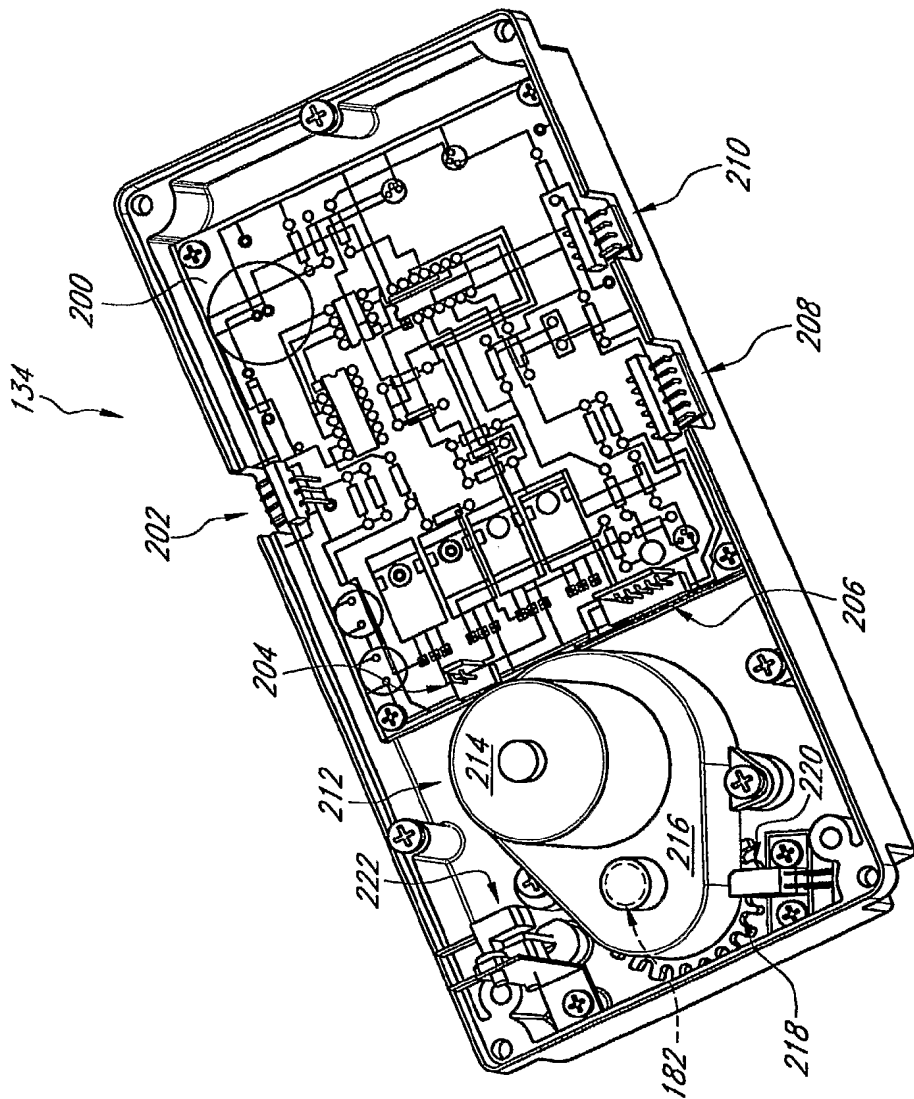


FIG. 12

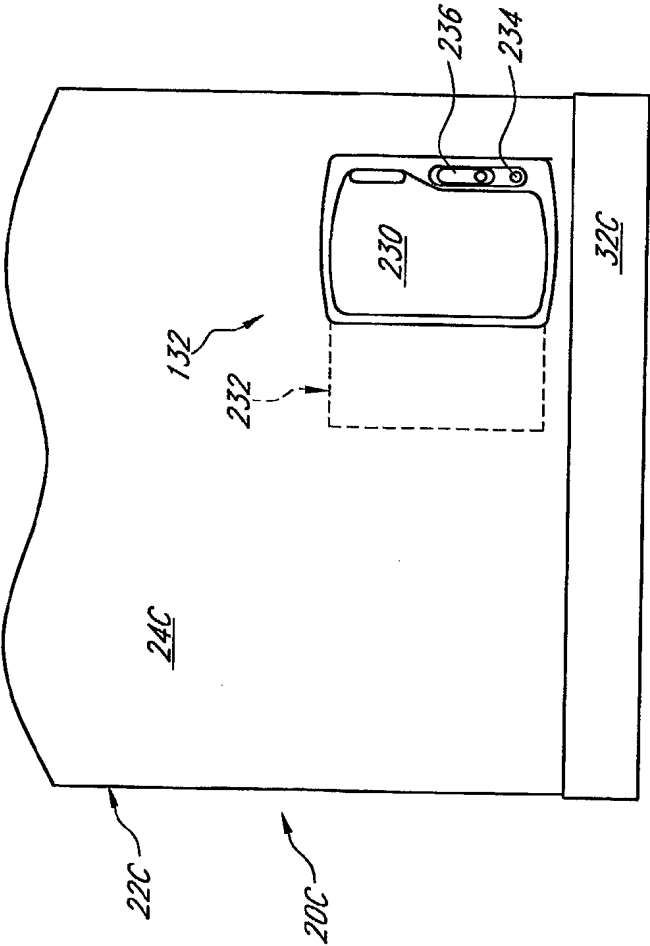
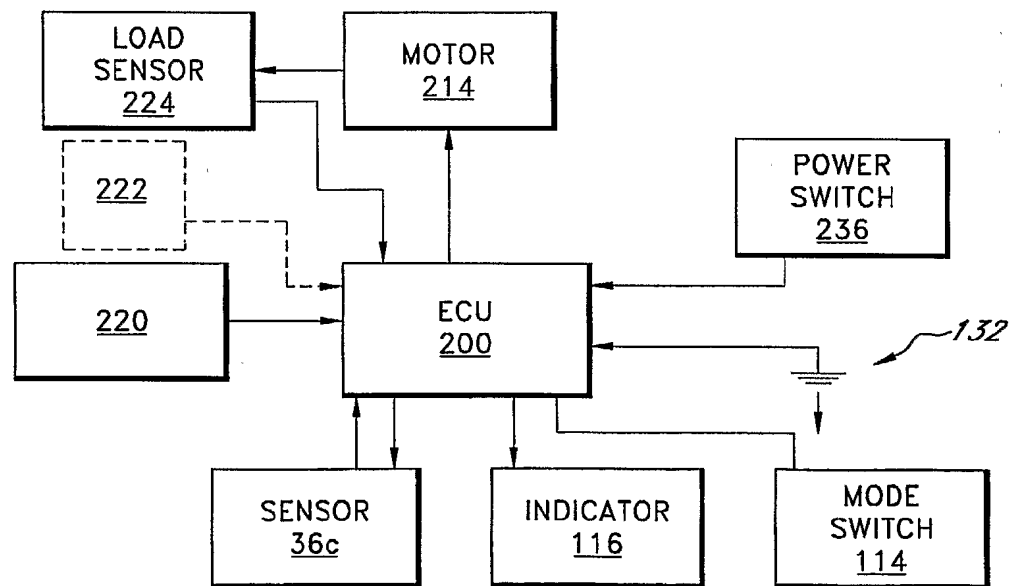


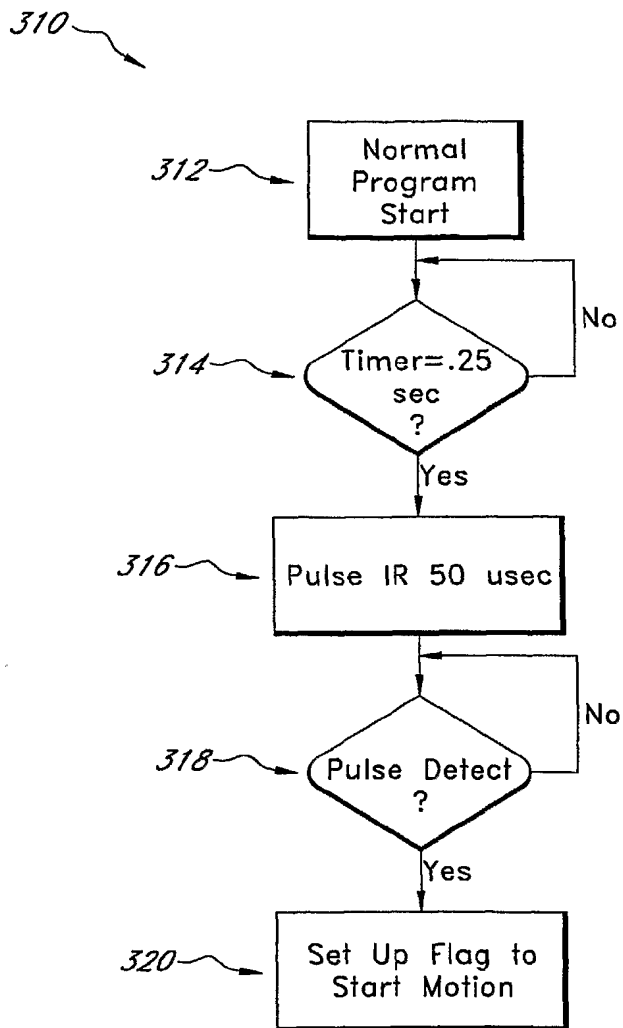
FIG. 13

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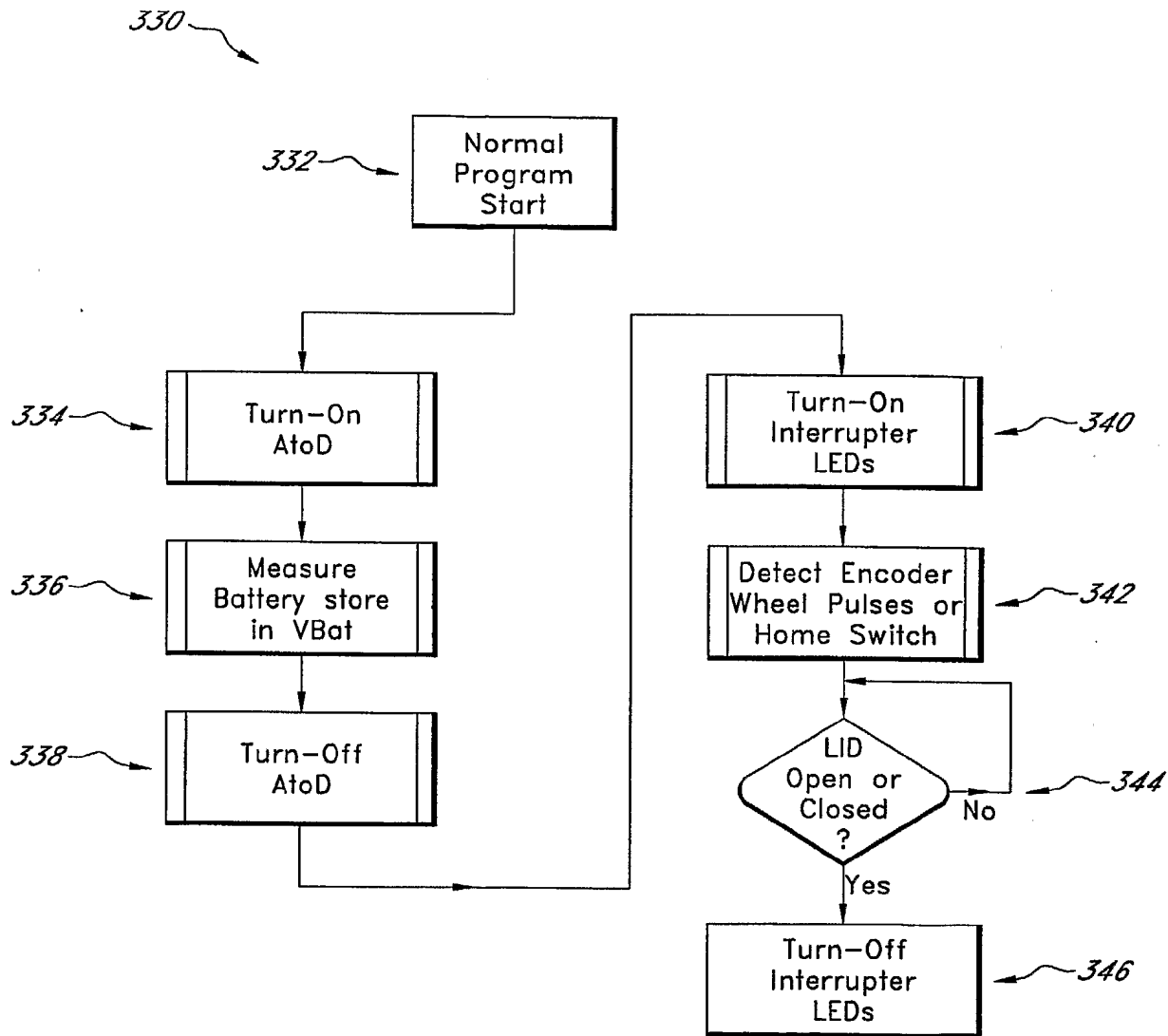
*FIG. 14*

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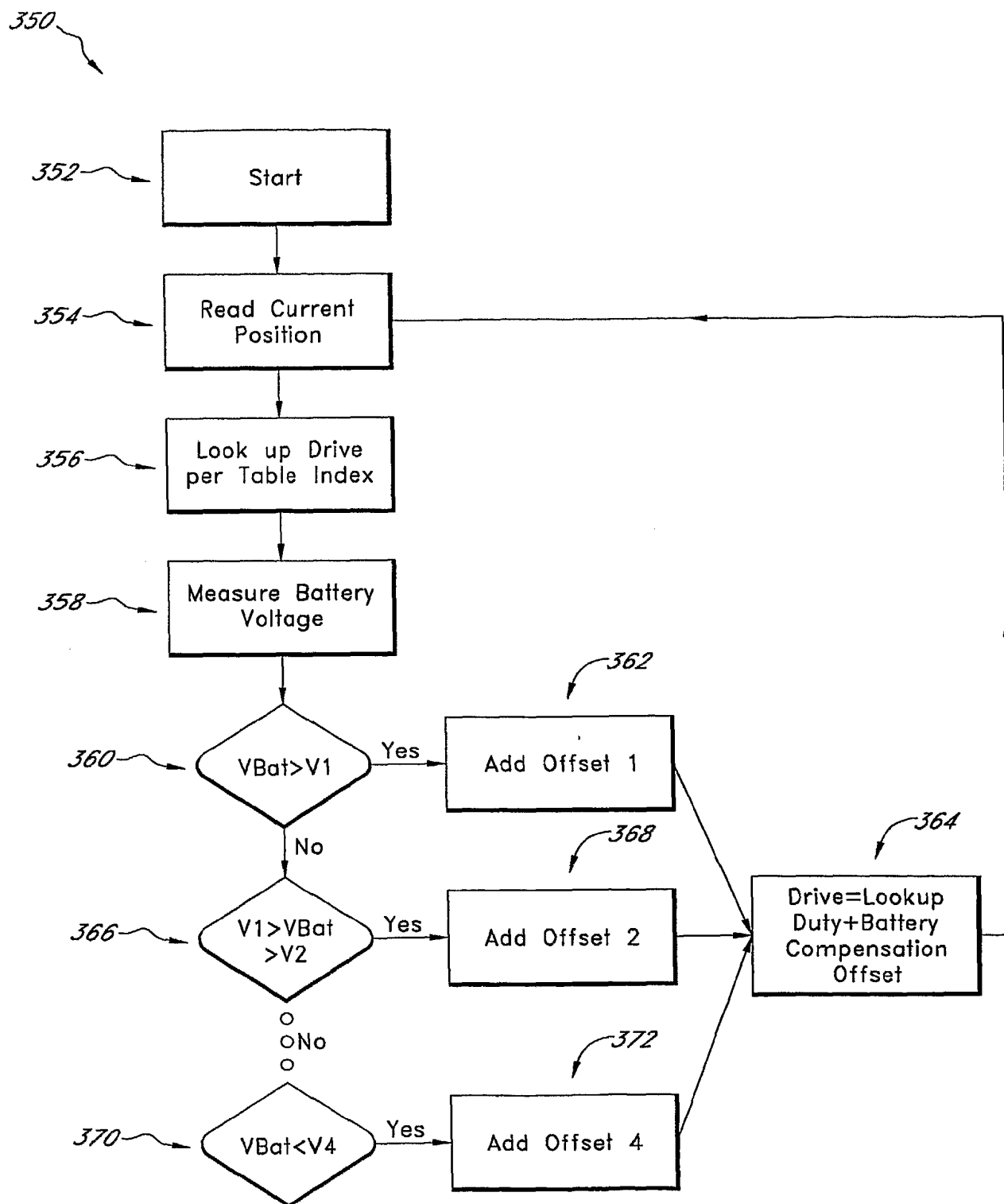
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*FIG. 15*

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*FIG. 16*

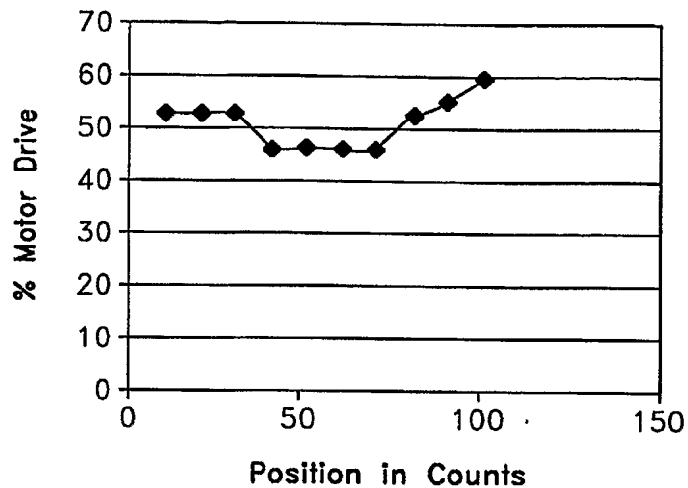
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*FIG. 17*

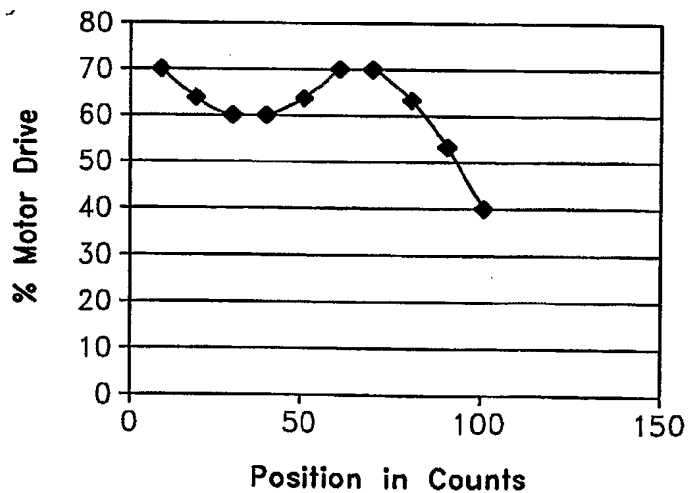
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Up Mode Velocity Ramp

*FIG. 18*

Down Mode Velocity Ramp

*FIG. 19*

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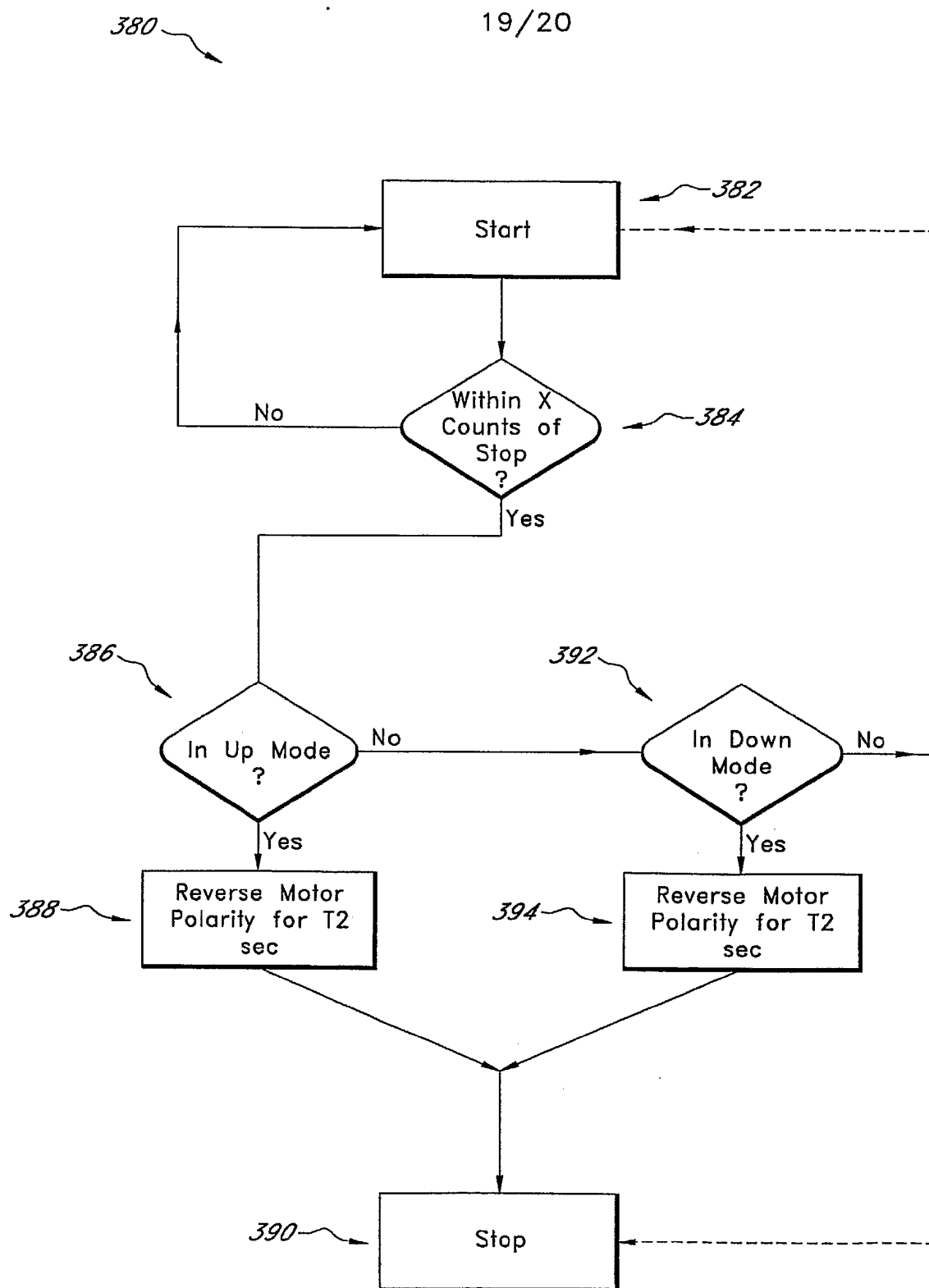
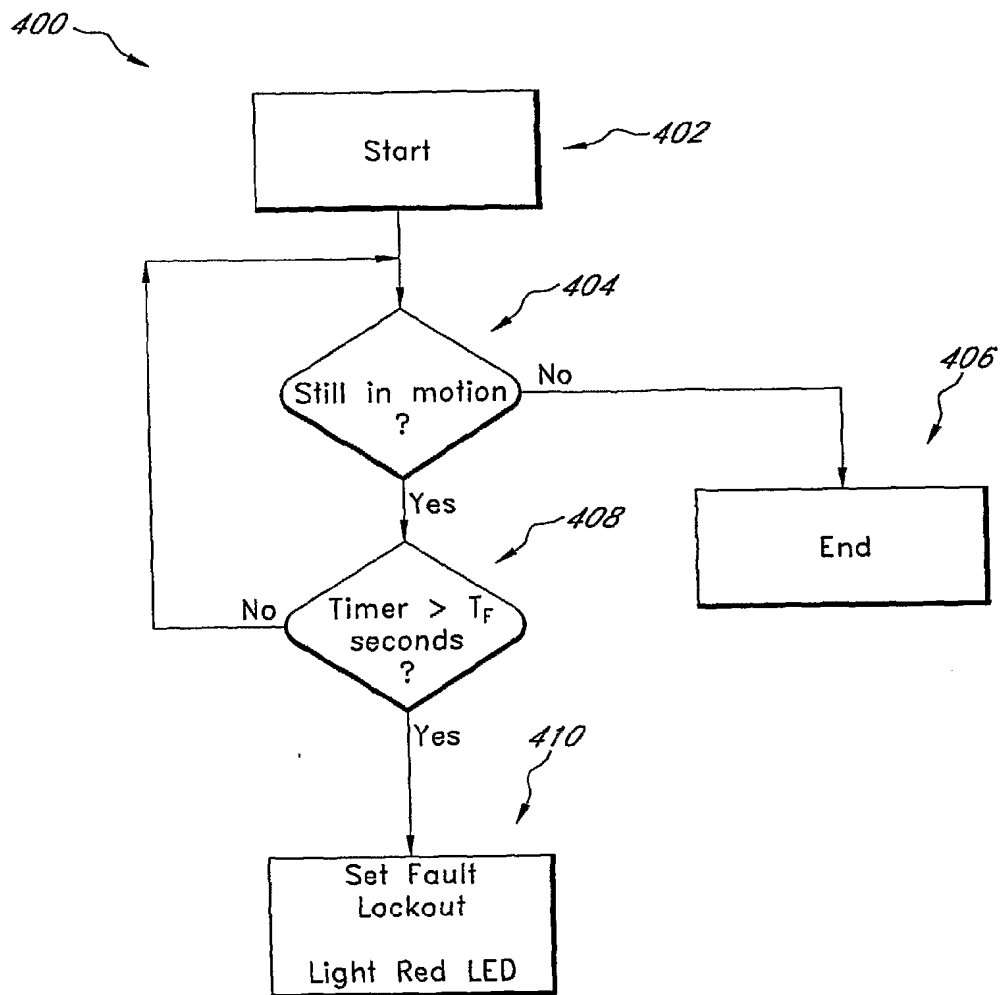


FIG. 20
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*FIG. 21*

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
17 September 2009 (17.09.2009)



(10) International Publication Number
WO 2009/114495 A1

(51) International Patent Classification:
B65F 1/14 (2006.01) **B65F 1/08** (2006.01)
B65F 1/16 (2006.01)

(21) International Application Number:
PCT/US2009/036600

(22) International Filing Date:
10 March 2009 (10.03.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/036,224 13 March 2008 (13.03.2008) US
12/257,754 24 October 2008 (24.10.2008) US
61/112,417 7 November 2008 (07.11.2008) US

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(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

[Continued on next page]

(54) Title: TRASH AND RECYCLABLES RECEPTACLE

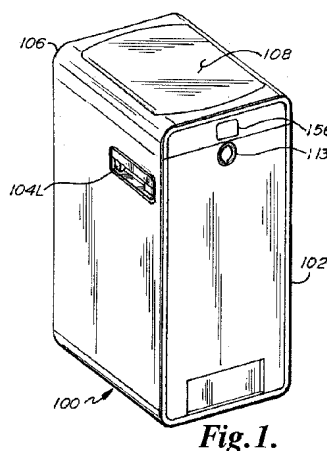


Fig. 1.

(57) Abstract: A trash receptacle is disclosed having a housing defining a cavity and having a lid openable to create an orifice to access the cavity, with a bin disposed in the cavity and removable therefrom through the orifice. The bin has a bottom surface and an upstanding peripheral wall, the wall having two pivotably engaged portions that are relatively separable to ease the removal of a filled liner bag. The peripheral wall terminates at its top in an annular rim, and the bin is adapted to receive the liner bag lining the interior of the peripheral wall and draped outwardly over the annular rim. The lid has downwardly extending annular wall adapted to engage the bin's annular rim to secure the draped-over portion of the liner bag to the annular rim when the lid is in its closed state. The receptacle has a seven-day timer and an indicator associated therewith for alerting when it is the day for disposing of trash.

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— as to the applicant's entitlement to claim the priority of — before the expiration of the time limit for amending the
the earlier application (Rule 4.17(iii)) claims and to be republished in the event of receipt of
amendments (Rule 48.2(h))

Published:

— with international search report (Art. 21(3))

TRASH AND RECYCLABLES RECEPTACLE

Cross-Reference to Related Applications

[001] This application claims the benefit of US Provisional Application No. 61/036,224, filed on March 13, 2008, US Utility Application No. 12/257, 754 filed on October 24, 2008, and US Provisional Application No. 61/112,417, filed on November 7, 2008, the contents of which are incorporated herein in their entireties by reference.

Background

[002] The present invention is related to receptacles for accumulating various types of trash and/or recyclables and for easing and accommodating the disposition thereof.

[003] Trash receptacles are often lined with a liner bag. When the receptacle is filled, its contents can be removed by removing the filled liner bag. However, in some trash receptacles, particularly when the receptacle is near capacity, removability of the liner bag can be difficult due to the pressure of the contents on the interior walls of the receptacle. Removal of the liner bag can be made even more difficult due to the formation of a low pressure “vacuum” inside the receptacle as the bag is pulled out. As a further complication, in some receptacles, the liner bag can fall into the receptacle as it is being filled, thereby making it later difficult to remove the contents.

Summary

[004] In one aspect, in general, a trash and/or recyclables receptacle includes a housing that defines a cavity and has a lid that is openable to create an orifice to access the cavity. A bin is disposed in the cavity having an open portion at one end. The bin has a number of portions that form an interior region. The portions are engaged with one another permitting the bin to change from a first configuration to a second configuration such that the volume of the interior region of the bin is larger in the second configuration than in the first configuration.

[005] Aspects can include one or more of the following features.

[006] The bin has two wall portions that are pivotably coupled to one another to permit changing from the first configuration to the second configuration of the bin by pivoting the wall portions relative to one another.

[007] The second configuration the bin has a relatively greater degree of upward tapering than in the first configuration.

[008] The bin is removable through the orifice formed when the lid is opened.

[009] The lid, when closed, maintains the bin in the first configuration. The lid can include a door that when open while maintaining the lid closed provides access to the interior region of the bin. The lid, when closed, can mate with the bin for securing a liner bag for the bin.

[010] In another aspect, in general, a trash receptacle has a housing defining a cavity and has a lid openable to create an orifice to access the cavity, with a bin disposed in the cavity and removable there-from through the orifice. The bin may have a bottom surface and an upstanding peripheral wall, the wall having two portions which may one or both pivotably engage the bottom surface such that the two portions are relatively separable to ease the removal of a filled liner bag.

[011] The bin may alternatively have a primary bin portion that has a bottom surface and an upstanding primary wall, and a secondary bin portion that has an upstanding secondary wall cooperating with the primary wall to form an upstanding peripheral wall, where the primary and secondary walls may be relatively pivotably engaged such that the two bin portions are relatively separable to ease the removal of a filled liner bag.

[012] The peripheral wall may terminate at its top in an annular rim, and the bin may be adapted to receive the liner bag lining the interior of the peripheral wall and draped outwardly over the annular rim. The lid may have a downwardly extending annular wall adapted to engage the bin's annular rim to secure the draped-over portion of the liner bag to the annular rim when the lid is in its closed state. The receptacle may have a timer and an indicator associated therewith for alerting when it is time for disposing of trash.

[013] In a general aspect, a receptacle includes a housing with a hinged lid, and the lid is rotated to an open position via a foot-actuated lift mechanism to provide access to the interior of the receptacle. The lift mechanism includes a pivot rod fixed to a foot pedal. The pivot rod includes one or more damper devices configured to damp rotational movement of the pivot rod. Upon release of the foot-actuated lift mechanism, the damper devices permit the lid to return slowly to a closed position.

[014] In some aspects, a receptacle is provided that includes a receptacle housing. The housing includes sidewalls arranged in a closed section, and a

bottom extending between a lower end of the sidewalls. A lid is pivotably connected to an upper end of one of the sidewalls. The receptacle includes a lift mechanism having an actuation pedal which rotates in concert with a horizontally extending pivot rod. The pivot rod is configured to rotate about a pivot axis with respect to the receptacle housing, a cross bar extends between the pivot rod and a vertical strut, and the strut connects the cross bar to the lid. The lift mechanism is configured to permit movement of the lid between a closed position and an open position by converting the rotational motion of the pedal about the pivot axis into the translational motion of the strut. In addition, the lift mechanism includes a damper configured to damp rotational movement of the pivot rod.

[015] Embodiments of the receptacle may include one or more of the following features: The damper includes a disk including an axial through hole; a closed damper housing including a vacancy sized and shaped to receive the disk therein; and a viscous fluid disposed in the vacancy. In some embodiments, the pivot rod extends through and is fixed within the axial through hole, and the disc is disposed within the vacancy within the damper housing. In some embodiments, the damper housing further includes a base portion, and a cover portion. The base portion has a first opening sized and shaped to receive a first portion of the disk therein; and the cover portion has a second opening sized and shaped to receive a remaining portion of the disk therein. The base portion and cover portion, when assembled together, surround a circumference of the disk and maintain the viscous fluid in contact with at least a circumferential surface of the disk. In some embodiments, the lift mechanism includes more than one damper.

[016] In some aspects, a rotational damper is provided for damping axial rotational motion of a rod. The damper includes a disk including an axial through hole configured to receive the rod therethrough and be fixed thereto, and a damper housing. The damper housing includes a vacancy sized and shaped to receive the disk therein, and openings configured to permit the rod to pass through. The disc is disposed within the vacancy within the damper housing, a viscous fluid is interposed between the damper housing and the disk, and the disk is rotatable with respect to the damper housing.

[017] In some aspects, a trash and/or recyclables receptacle includes a housing defining a cavity and having a lid openable to create an orifice to access said cavity, a foot pedal at least partially recessed relative to a front face of the housing, and a lift mechanism connecting the foot pedal to the lid configured to open the lid upon actuation of the foot pedal.

[018] Advantages of one or more aspect can include the following.

[019] Providing a bin with relatively separable wall portions, for example, that increase the volume of the interior region of the bin and/or increase the degree of upward taper when separated, reduces the effort required to remove a filled liner bag from the bin. Furthermore, providing air vents in the bin, for example, in the wall portions, further reduces the effort required by avoiding formation of a vacuum in the bin when removing liner bag.

[020] Among the other advantages, using the damper device on the pivot rod prevents inadvertent injury due to sudden lid closure, and also provides a receptacle that operates quietly. The damper device is of simple and inexpensive construction, and is easily assembled on the lift mechanism.

[021] Numerous other features may be included, not limited to those disclosed and taught in the Detailed Description of a representative embodiments included herein.

Description of Drawings

[022] Many aspects of the invention can be better understood with reference to the following drawings showing the representative embodiments of the accompanying Detailed Description. The components in the drawings are not necessarily to scale, emphasis instead being placed upon clearly illustrating the principles of the invention. Moreover, in the drawings, like reference numerals designate corresponding parts throughout the several views.

[023] FIG 1 is a perspective of a trash receptacle;

[024] FIG 2 is a front view of the receptacle of FIG 1;

[025] FIG 3 is a right side view of the receptacle of FIG 1;

[026] FIG 4 is a top view of the receptacle of FIG 1;

[027] FIG 5A is an exploded perspective view of the receptacle of FIG 1;

[028] FIG 5B is an exploded right side view of the receptacle of FIG 1;

[029] FIG 6 is a close up perspective view of the top of the receptacle of FIG 1;

[030] FIG 7 is a close up perspective view of the top of the receptacle of FIG 1 with the lid's inner door being opened;

[031] FIG 8A is a close up perspective view of the top of the receptacle of FIG 1 with the lid and inner door being opened;

[032] FIG 8B is a right side view of the top of the receptacle of FIG 1 with the lid and inner door being opened;

[033] FIG 9 is a side cross section of the receptacle of FIG 1;

[034] FIG 10 is a perspective view of the bin of the receptacle of FIG 1;

[035] FIG 11 is a perspective view of the bin of the receptacle of FIG 1 in its split open condition;

[036] FIG 12 is an exploded perspective view of the bin of the receptacle of FIG 1;

[037] FIG 13 is a side cross section of the bin of the receptacle of FIG 1;

[038] FIG 14 is a close up view of the control/display panel of the receptacle of FIG 1;

[039] FIGs 15A and 15B are side cross section views of the lid of the receptacle;

[040] FIG 16 is a perspective cut away view of a pedal operated inner door;

[041] FIGs 17A and 17B are side cross section views of a pedal operated bin restraint; and

[042] FIG 18 is a side view of a second exemplary embodiment of a bin.

[043] FIG 19 is a schematic side sectional view of a switch activated bin restraint.

[044] FIG 20 is a partial perspective view of a bin with a liner bag storage pocket on a front face thereof.

[045] FIG 21 is a front view of a closed receptacle.

[046] FIG 22 is a side cross sectional view of the receptacle of FIG 21.

[047] FIG 23 is a top view of a lower portion of the lift mechanism.

[048] FIG 24 is a partially exploded perspective view of the lower portion of the lift mechanism of FIG 23.

[049] FIG 25 is a side cross sectional view of a second embodiment of a receptacle.

[050] FIG 26 is a view of the receptacle of FIG 25 with the housing sidewalls and bin removed to show the lift mechanism.

[051] FIG 27 is a front view of the interior of receptacle of FIG 1 with the bin removed.

[052] FIG 28 is a side sectional view of a fluid damper.

[053] FIG 29 is a sectional view of a portion of the linkages connecting the foot pedal to the inner door.

Detailed Description

[054] A receptacle for trash and/or recyclables according to an exemplary embodiment of the invention is shown in FIGs 1 through 14. As used herein the terms “trash” and “recyclables” should be understood broadly to include, for example, items that are discarded and items that are collected to be reused in one form or another (e.g., by collection and re-manufacture as with plastic bottles, or collection for washing, laundering, etc. in the form that they are collected).

[055] Referring first to FIGs 1 through 5B, there are shown several external views of receptacle 100. The receptacle includes rectilinear housing 102 having carrying handles 104R and 104L on its left and right sides, respectively. On the horizontal top surface of the housing, lid 106 has an inner door 108. As seen in FIGs 6 to 8B, the lid is pivotably connected to the housing at hinge 112 so that it may swing up to open and fully expose the interior of the housing. Pressing the logo plate 113, which additionally serves as a release button for the lid, unlatches the lid and allows it to swing up and open. In some embodiments, the lid swings open under the bias of a torsion spring associated with the lid's hinge.

[056] Also seen in FIGs 6 to 8B, inner door 108 is unlatched and re-latched by a typical “push-push” latching mechanism. In some embodiments, the door is biased open about the hinge 114 coupling it to the lid by a torsion spring (not show) and held closed and latched by the latching mechanism. Slight downward push near the forward portion of the door causes unlatching of the mechanism and allows the spring to lift the door up and back approximately ninety angular degrees to gain limited access into the housing, such as for depositing trash there-through. Pushing the lid back to its closed state against the bias of the spring closes the door and re-latches the latching mechanism.

[057] Referring to FIGs 15A and 15B, in some embodiments the lid 106 includes a number of alignment tabs 310, for example two tabs with one on each side of the receptacle. The tabs mate with recesses in the housing providing stability to the lid when closed. Each recess includes a spring 320 at its base which is compressed when the tab 310 mates with the recess as shown in FIG 15A. When the lid is released, for example, when the lid is unlatched by pressing the release button 113, the lid is forced at least partially upward by the spring as shown in FIG 15B. This may allow a user to insert his or her fingers in a gap formed between the lid and the housing to further open the lid.

[058] In some embodiments, the lid or the inner door, or both, may be opened by one or more typical foot pedal actuators for hands-free opening. The pedal may be partially or preferably fully recessed relative to the front face of the housing. The lid or inner door may also be equipped with a replaceable odor reducing system, such as an odor-absorbing charcoal pad.

[059] Referring to FIG 16, in some embodiments in which a foot pedal actuator 400 used to open the inner door, one or more linkages 410 connect a pedal lever 420 with the inner door 108. When the lid 106 is closed (as shown in FIG 16), depressing the foot pedal causes the pedal lever to rise, thereby pushing the linkage upward. The linkage is coupled to the inner door such that when the linkage is pushed upward, the inner door opens (as shown in FIG 16). When the lid 106 is opened and inner door in the lid remains closed, the distance between the point 414 at which the linkage 410 is coupled to the inner door and the point 412 at which it is coupled to the pedal lever increases. To accommodate this increase the linkage 410 is made up of two telescoping sections that can be pulled apart as the lid 106 is opened and then contract again when the lid is closed.

[060] Referring now to FIGs 9 to 13, disposed within the housing's interior is a collection bin 116, which is optionally removable from the housing, for example, by pulling it upwardly through the top of the housing when lid 106 is opened. The bin includes a base pan 118 having a bottom surface 122 and an upstanding periphery 124. In some embodiments, the base pan forms a watertight container for capturing spilled liquid without requiring that the bin as whole be watertight. First and second peripheral wall portions 126A and 126B are received in the base's upstanding periphery and extend upwardly there-from to define an annular open top rim 128 and a hollow interior chamber 132. When the bin is properly positioned in housing 102, annular open top rim 128 and interior chamber 132 are disposed directly below inner door 108 so that trash dropped through the opened doorway will fall into the chamber.

[061] Preferably, the bin has a trash-storing capacity of approximately 10 gallons, and is approximately twelve inches wide by seventeen inches deep by twenty-eight inches tall.

[062] The bin is adapted to receive a disposable liner bag (not shown), which lines interior chamber 132 and has an upper open end that is draped outwardly over annular rim 128. When the bin is disposed in the housing, the annular top rim sits vertically above the orifice created by open lid 106, as seen best in FIG 9. The orifice and rim cooperate to form an annular gap 142 for receiving the draped-over portion of the liner bag. The gap of the disclosed embodiment is one and one-half to two inches wide all the way around, and preferably at least one-half of an inch wide, to allow the user's fingers to push the draped-over portion of the liner bag down and there-into, no matter how long the draped over portion may be. This prevents the unsightly appearance of having the end of the bag extend outside the housing when the lid is closed.

[063] Lid 106 has a downwardly extending annular wall 144 adapted to engage annular gap 142 and annular rim 128 to force the draped-over end 302 of the liner bag into the gap and to secure the draped-over portion to the annular rim when the lid is in its closed state.

[064] Referring to FIG 20, in some embodiments the bin 116 includes a liner bag storage pocket 702 formed on an upper, outward-facing portion of the periphery 124. In some embodiments, the storage pocket 702 is located on the surface of the periphery 124 which faces the front face of the housing 102. The storage pocket 702 is sized and shaped to receive and store several folded liner bags (not shown). For example, the storage pocket 702 is fixed to the bin surface along its side edges 703, 703 and bottom edge 705. The upper edge 704 is not fixed to the bin surface and is spaced apart from the bin surface to provide access to the interior space of the storage pocket 702. The location and arrangement of the storage pocket 702 provides the user with convenient access to a replacement liner bag when a full bag has been removed from the bin 116.

[065] Peripheral wall portions 126A and 126B of bin 116 both pivotably engage the base pan at hinges 146A and 146B, respectively, such that the wall portions may each be swung outwardly and are relatively separable by spreading open rim 128 and splitting it apart while the bin remains in the receptacle.

[066] In the illustrated embodiment, the bin 116 is sectioned so that peripheral wall portions 126A and 126B correspond generally to front and rear portions. However, in other embodiments, the bin 116 may be sectioned so that the

peripheral wall portions 126A and 126B correspond generally to opposing side portions, such as left and right side portions.

[067] In FIG 9, the bin 116 is shown with the wall portions together, with a space between the bin 116 and the housing 102 being available for the expansion of the bin. The bin 116 in its expanded state is shown in FIG 11 without the housing. The upwardly tapering expansion (i.e., progressively widening toward the top) of interior chamber 132 can allow the liner bag to be more easily removed, for example, when it has been over-stuffed with trash. In some embodiments, the positioning of the hinges allows gravity to cause the wall portions to drop back together after the bag is removed. In some embodiments, the wall portions are identical to each other so that only one mold is required to make both portions. In other embodiments, the wall portions have different shapes and use different molds. Extensions from each portion towards the other cover and avoid a gap during the spreading open. In some embodiments, the engagement of the lid 106 with the bin 116 inhibits the wall portions of the bin from spreading, and when the lid 106 is opened disengaging the wall portions, gravity and/or pressure from trash or recyclables that have been collected in a liner bag in the bin causes the walls to separate. In some embodiments, the wall portions may be biased, for example by a spring mechanism, to open when the lid 106 is opened, or may be biased to oppose pressure from the contents avoiding excessive spreading. In some embodiments, closing of the lid 106 optionally causes the walls to come together, for example, if they have been spread somewhat from the pressure of a partially-filled bin.

[068] The peripheral wall portions cooperate with the base pan to form vents 148 to allow air to enter the lower portion of interior chamber 132 as the stuffed bag is being removed, to further ease its removal by eliminating the creation of a vacuum. The vents have air intake openings 152 exterior of the peripheral wall portions and air exhaust openings 154 disposed within the hollow interior chamber and below the air intake opening, so that liquids inadvertently spilled into the bin are retained within the base pan and not allowed to flow into housing 102.

[069] In some embodiments, the receptacle includes a disengagable restraint mechanism that prevents the bin from being removed from the receptacle. For example, the user of the receptacle 100 can leave the mechanism engaged when removing a filled liner bag from the receptacle to prevent the bin 116 from being pulled out along with the bag. In some embodiments, a foot pedal is used to disengage the mechanism. In some embodiments in which depressing a foot pedal

400 opens the inner door, depressing the pedal 400 also disengages the restraint mechanism allowing the bin 116 to be removed. Referring to FIG 17A, one form of restraint mechanism is a hook 510 that pivots and disengages a slot 530 in the base of the bin when the pedal 400 is depressed. Referring to FIG 17B, the hook 520 engages the slot 530 when the pedal 400 is released. In some embodiments, the restraint mechanism uses a magnet that is disengaged to permit the bin to be removed. For example, the bin has a first fixed magnet in its base, and a second magnet is attached to the main body such that depressing the pedal causes the second magnet to separate from the first magnet, thereby reducing the force restraining the bin. In some embodiments, the restraint system uses one or more elastic members to engage corresponding detents formed in the outer bin surface, whereby the bin can be removed by overcoming the elastic force. For example, spring loaded pins biased to extend in a direction normal to the bin side surface can be provided to engage the detents.

[070] Referring to FIG 19, another form of restraint mechanism includes a hook 610 that engages the slot 530 through a translating motion of the hook 610 rather than a pivoting motion. In this form, the hook 610 can be actuated by foot using a switch located near the bottom of the receptacle 100 (not shown), or by hand using a switch 620 located near the top of the receptacle 100. To achieve manual activation, a linkage 605 is provided that connects the hook 610 to the switch 620 positioned near the top of the receptacle 100. In some embodiments, the linkage 605 is configured to pivot about a pivot point 615 located between the hook 610 and switch 620, whereby actuation of the switch 620 in one direction results in motion of the hook 610 in the opposed direction. For example, an inward push of the switch 610 would result in withdrawal of the hook 610 from the slot 530.

[071] Wall portions 126A and 126B are removable from base pan 118 to ease cleaning, and base pan 118 may be made of a high temperature material to allow dish-washer cleaning.

[072] Referring to FIG 14, receptacle 100 further includes an electrical system having a timer and an indicator associated therewith for alerting when the contents of the receptacle should be emptied. Control/Display panel 156 allows the user to operate and observe the electronic functions of the system. The timer is preferably a seven-day timer programmable to set a “trash day”, such as when the garbage disposal service is scheduled or when the user would normally bring trash to the dump. LCD display 164 normally shows the current time and day of the week. An indicator alert icon becomes visible and blinks on the LCD display and an audible signal is produced when it is the “trash day”. The current day/time may be set

using the “current day/time” selector switch 162 and the alert time may be pre-set using the alert time selector switch 160. In other embodiments, other criteria for generating the alert, for example, according to a time since the last emptying of the receptacle and/or according to a number of times the inner door 108 has been opened.

[073] The electrical system is preferably batter-operated with the LCD display including a low battery icon that becomes visible and/or blinks when the battery voltage drops below a pre-determined level.

[074] Referring to FIG 18, there is shown an alternative embodiment of bin for use in a receptacle. The bin 216 has a primary bin portion 226A that has a bottom surface 222 and an upstanding primary wall 224A, and a secondary bin portion 226B that has an upstanding secondary wall 224B cooperating with the primary wall to form an upstanding peripheral wall, where the primary and secondary walls are be relatively pivotably engaged at hinge 246 such that the two bin portions are relatively separable to ease the removal of a filled liner bag. That is, in this embodiment there are two wall portions which separate relative to one another, with one of the wall portions moving with respect to the housing 102 and the other remaining fixed. In other embodiments, a base pan is not necessary used, for example, with two wall portions being engaged such that they together form a base portion.

[075] In other embodiments, the wall portions are not necessarily pivotably attached to one another. Other approaches to engaging the wall portions can be used while providing the capability that the wall portions can move relative to one another to enlarge the volume of the inner chamber 132 and/or increase a degree of taper of the shape of the inner chamber. For example, a wall portion may be slideably coupled.

[076] Referring now to Figs. 27-29, a damping mechanism for providing damped closure of the inner door 108 of the lid 116 is described for receptacle 100. The damping mechanism includes a fluid damper 450 that is connected to the linkages 410 to control the rate at which the inner door 108 closes, once the foot pedal has been released.

[077] The fluid damper 450 is mounted to an inner wall surface of the receptacle housing 102 using a bracket 460 (FIG 28). In some embodiments, the fluid damper 450 is mounted to the housing rear, inner wall surface at a location above the mid-height of the housing 102, for example, adjacent the upper end of the

housing 102. In some embodiments, the fluid damper is an air damper. However, other fluids within the fluid damper 450 may be employed.

[078] The fluid damper 450 includes a fluid damper housing 456, and a piston 452 disposed in the fluid damper housing 456. The bracket 460 includes an opening 462, and the fluid damper 450 is positioned on the bracket 460 so that a damper arm 454 that extends from the piston 452 passes through the opening 462. An end of the damper arm 454 is connected to the linkages 410 through a horizontally-extending cross bar 432 (FIG 27).

[079] As previously described, each linkage 410 is made up of two telescoping sections 416, 418, and a linkage 410 extends generally vertically along each side of the receptacle 100 adjacent to a rear wall of the housing 200. In particular, each linkage 410 is formed of cylindrical tubular members and includes an upper link 416 and a lower link 418. The upper link 416 has a larger diameter than the lower link 418, and the upper end of the lower link 418 is received within the hollow interior space of a lower end of the upper link 416, and the upper link 416 slides axially along the lower link 418 (FIG 29).

[080] As seen in FIG 27, the cross bar 432 extends between the two linkages 410. Each end 436 of the cross bar 432 is provided with a through hole 434 sized to received the lower link 418 therethrough. In use, the respective upper ends of the lower links 418 extend through the through holes 434, and a stop member 430 is fixed on the lower link 418 to maintain the cross bar 432 at a desired minimum height on the linkages 410. Once the cross bar 432 is mounted between the linkages 410, the upper end of the lower link 418 is inserted into the interior space of the upper link 416, whereby the cross bar 432 and upper link 416 are free to slide along the upper end of the lower link 418 to the extent permitted by the stop member 430.

[081] When the foot pedal 400 is depressed, and the linkage 410 is pushed upward, the inner door 108 is driven to the open position shown in FIG 16. During upward movement of the linkages 410, the lower link 418 moves vertically upward within the upper link 116 until the stop member 430 abuts the cross bar 432 and lower end of the upper link 416. At that time, the upper link 416 and cross bar 432 are also driven upward, along with the lower link 418, due to the presence of the stop member 430.

[082] As the cross bar 432 rises along with the linkages 410, the piston 452 is driven upward within the fluid cylinder housing 456 through the corresponding movement of the damper arm 454. In some embodiments, the fluid damper 450 is

configured so that there is no resistance to the upward movement of the piston 452 within the fluid cylinder housing 456.

[083] When the foot pedal is released, the lower linkage 418 is drawn downward due to its connection 412 to the foot pedal lever 420. In addition, the inner door 108 begins to return to a closed position through force of gravity. As the inner door 108 closes, the cross bar 432 lowers, pulling down on the piston 452 within the fluid damper 450. However, the rate of return of the inner door 108 is slowed due to the damping action of the fluid damper 450. In particular, the fluid damper 450 is configured to provide resistance to the downward motion of the piston 452 within the fluid cylinder housing 456.

[084] In some embodiments, the resistance characteristics of the fluid damper 450 are adjustable. In some embodiments, the damping mechanism can be manually disconnected from the linkages 410 so that no damping of door closure is provided.

[085] Referring to FIGs. 21 and 22, another mechanism for providing damped closure of the lid is described with respect to a receptacle 200. The receptacle 200 includes a receptacle housing 12 having a hinged lid 14. In some embodiments, the receptacle housing 12 is a generally vertically elongate box that is configured to receive a bin or liner 24 therein for holding items to be stored. The housing 12 includes sidewalls 2, 4, 6, 8 arranged to form a closed section, and a bottom 20 extending between the lower ends of the sidewalls 2, 4, 6, 8. In the illustrated embodiment, the housing 12 is rectilinear in horizontal section, but it is well within the scope of the invention to form housing 12 having other horizontal sectional shapes, including oval and circular. The upper end of the housing 12 is open, and the lid 14 is pivotably attached to an upper end of the rear sidewall 4 by conventional means such as a hinge 16.

[086] The lid 14 can be manually opened and closed. In addition, the receptacle 200 includes a lift mechanism 26 that permits the lid 14 to be rotated between closed position (shown in solid lines in FIG 22) and an open position (shown in dashed lines in FIG 22) through actuation of a pedal 22. In the illustrated embodiment, pedal 22 is a foot actuated pedal disposed in a recess 18 formed in the lower portion of the front sidewall 2 of the housing 12. In other embodiments, pedal 22 may be a hand actuated pedal mounted at an upper end of the housing 12 (not shown).

[087] The lift mechanism 26 is most clearly seen in FIG 26, which illustrates the receptacle 200 with the sidewalls 2, 4, 6, 8 removed. The lift mechanism 26

includes the foot pedal 22 in the form of an elongate, generally rectangular plate. The foot pedal 22 extends horizontally and in parallel with the front sidewall 2 of the receptacle, and also extends between a pair of generally parallel cross bars 28, 28. A cross bar 28 is fixed at a front end thereof to each outer end of the foot pedal 22 and extends toward the rear sidewall 4. A pivot rod 30 extends between, and is rigidly fixed to, a respective mid portion of each cross bar 28. The pivot rod 30 is pivotably supported on the bottom 20 of the housing 12 via one or more dampers 40, described below. A rear end of each cross bar 28 is pivotably connected to a vertically extending strut 32. In some embodiments, a pin 34 connects the cross bar 28 to the strut 32. The strut 32 extends between the cross bar 28, disposed near a lower end of the housing, to the lid 14, disposed at the upper end of the housing. The strut 32 is pivotably connected to the lid 14, for example, through a pin 36.

[088] The pivot rod 30 includes one or more dampers 40 configured to damp the speed of the rotational movement of the pivot rod 40. Upon release of the foot-actuated lift mechanism, the dampers 40 permit the lid 14 to slowly return to a closed position. In addition, the dampers 40 serve as a pivot fulcrum for the foot pedal 22.

[089] Referring now to FIGs. 23 and 24, each damper 40 includes a disk 60 supported within vacancy 44 formed in a damper housing 42. The disk 60 is a solid cylinder and includes a through-hole 62 formed along its longitudinal axis. The through-hole 62 is sized to receive the pivot rod 30, and the disk 60 is mounted on the pivot rod 30 so that the disk 60 and pivot rod 30 move as a single unit. This is accomplished through conventional means, such as a press fit between the disk 60 and pivot rod 30 or use of a key (not shown) to connect the disk 60 to the pivot rod 30.

[090] The disk 60 may also include a circumferentially-extending groove 66 formed in a circumferential surface 64 thereof. A viscous fluid is disposed within the vacancy 44 along with the disk 60 so that the viscous fluid is interposed between the damper housing 42 and the disk 60. The groove 66 receives the viscous fluid and provides a channel through which the viscous fluid can be distributed about the disk 60 within the damper housing 42 during motion of the disc 60. The amount of damping provided by the damper 40 can be adjusted by adjusting the viscosity of the fluid disposed within the damper housing 42. In the disclosed embodiment, the fluid is highly viscous so as to provide a very slow rate of closure of lid 14.

[091] The damper housing 42 is fixed to the bottom 20 of the receptacle housing 12, and the disk 60 and pivot rod 30 rotate together within the damper housing 42. The damper housing 42 includes a base portion 50 and a cover portion 46. The base portion 50 has a first opening 52 sized and shaped to receive a first portion of the disk 60 therein, and the cover portion 46 has a second opening 48 sized and shaped to receive a remaining portion of the disk therein. In the illustrated embodiment, the base portion 50 houses the lower half of the disk 60, and the cover portion 46 houses the upper half of the disk 60, and the openings 48, 52 within the base and cover portions are arcuate to correspond to the circumferential shape of the disk 60. In other embodiments (not shown), the openings 48, 52 within the base and cover portions 46, 60 are sufficiently dimensioned to receive the disk 60 but are not shaped to correspond to the circumferential shape of the disk.

[092] The cover portion 46 is fixed to the base portion by conventional means. For example, the cover portion 46 may include holes 56a, and the base portion may include holes 56b, and screws 54 may be inserted in holes 56a, 56b to secure the cover portion 46 to the base portion 50. The base portion 50 and cover portion 46, when assembled together, surround a circumference and axial ends of the disk 60 and maintain the viscous fluid in contact with at least a circumferential surface of the disk 60. The base portion 50 and cover portion 46 further have detents 47, 57 formed their respective mating surfaces. When the base portion 50 and cover portion 46 are assembled, the detents 47, 57 are aligned to form openings that permit the pivot rod 30 to pass through the damper housing 42.

[093] In addition, the damper housing 42 retains the damper 40 at a fixed distance above the bottom of the housing 20, providing a fulcrum about which the pivot rod 30, and thus the foot pedal 22, rotates.

[094] In FIGs. 25 and 26, an alternative embodiment of a receptacle is illustrated. In this embodiment the housing 200' is provided with an alternative lid structure 14' and housing structure 12'.

[095] Various embodiments are tailored in their form for residential applications. However, non-residential applications such as commercial applications are addressed by these and/or other embodiments in which the form is adapted to meet the requirements of those applications.

[096] In summary, the invention may be embodied as a trash receptacle having a housing defining a cavity and having a lid openable to create an orifice to access the cavity, with a bin disposed in the cavity and removable there-from through the

orifice. The bin may have a bottom surface and an upstanding peripheral wall, the wall having two portions which may one or both pivotably engage the bottom surface such that the two portions are relatively separable.

[097] The invention may be embodied as a trash receptacle having a housing defining a cavity and having a lid movable into an open state to create an orifice to access the cavity and movable into a closed state for closing the orifice, with a bin disposed in the cavity and removable there-from through the orifice. The bin may have a bottom surface and an upstanding peripheral wall terminating at its top in an annular rim, and the bin may be adapted to receive a liner bag lining the interior of the peripheral wall and draped outwardly over the annular rim. The lid may have a downwardly extending annular wall adapted to engage the bin's annular rim to secure the draped-over portion of the liner bag to the annular rim when the lid is in its closed state.

[098] The invention may be embodied as a trash receptacle having a housing defining a cavity and having a lid openable to create an orifice to access the cavity, with a bin disposed in the cavity and removable there-from through the orifice. The bin may have a bottom surface and an upstanding peripheral wall terminating at its top in an annular rim, and the bin may be adapted to receive a liner bag lining the interior of the peripheral wall and draped outwardly over the annular rim. The orifice and peripheral rim may cooperate to form an annular gap for receiving the draped-over portion of the liner bag. The gap may be predominantly at least one-half inch in gap width to allow the insertion of a user's fingers to push the draped-over portion of the liner bag into the gap.

[099] The invention may be embodied as a trash receptacle having a housing defining a cavity and having a lid movable into an open state to create an orifice to access the cavity and movable into a closed state for closing the orifice, with a bin disposed in the cavity and removable there-from through the orifice. The bin may have a bottom surface and an upstanding peripheral wall terminating at its top in an annular rim, and the bin may be adapted to receive a liner bag lining the interior of the peripheral wall and draped outwardly over the annular rim. The orifice and peripheral rim may cooperate to form an annular gap for receiving the draped-over portion of the liner bag, and the lid may have a downwardly extending annular wall adapted to engage the annular gap to force the draped-over portion of the liner bag into the gap when the lid is in its closed state.

[0100] The invention may be embodied as a trash receptacle having a housing defining a cavity and having a lid movable into an open state to create an orifice to

access the cavity and movable into a closed state for closing the orifice, with a bin disposed in the cavity and removable there-from through the orifice. The bin may have a bottom surface and an upstanding peripheral wall terminating at its top in an annular rim, and the bin may be adapted to receive a liner bag lining the interior of the peripheral wall and draped outwardly over the annular rim. The orifice and peripheral rim may cooperate to form an annular gap for receiving the draped-over portion of the liner bag, and the lid may have a downwardly extending annular wall adapted to engage the annular gap and the annular rim to force the draped-over portion of the liner bag into the gap and to secure the draped-over portion to the annular rim when the lid is in its closed state.

[0100] The invention may be embodied as a trash bin having a base pan portion having a bottom surface and an upstanding periphery, a peripheral wall portion received in the base's upstanding periphery and extending upwardly there-from to define an open-topped hollow interior chamber. The peripheral wall portion may have first and second portions which may one or both pivotably engage the base pan such that the first and second portions are relatively separable.

[0101] The invention may be embodied as a trash bin having a base pan portion having a bottom surface and an upstanding periphery, a peripheral wall portion received in the base's upstanding periphery and extending upwardly there-from to define an open-topped hollow interior chamber. The peripheral wall portion may have first and second portions each connected to the base portion at and pivotable about a hinge such that the first and second portions are relatively separable.

[0102] The invention may be embodied as a trash bin having a base pan portion having a bottom surface and an upstanding periphery, a peripheral wall portion received in the base's upstanding periphery and extending upwardly there-from to define an open-topped hollow interior chamber. The peripheral wall portion may cooperate with the base pan to form a vent having an air intake opening exterior of the peripheral wall portion and an air exhaust opening within the hollow interior chamber and below the air intake opening.

[0103] The invention may be embodied as a trash and/or recyclables receptacle having a housing defining a cavity and having a lid openable to create an orifice to access said cavity and a bin disposed in said cavity having an open portion at one end. The bin has a plurality of portions forming an interior region, the portions being engaged with one another permitting the bin to change from a first configuration to a second configuration such that the volume of the interior region of the bin is larger in the second configuration than in the first configuration. The

plurality of portions of the bin may include two wall portions that are pivotably coupled to one another to permit changing from the first configuration to the second configuration of the bin by pivoting the wall portions relative to one another. In the second configuration, the bin has a relatively greater degree of upward tapering than in the first configuration. The bin is removable through the orifice formed when the lid is opened. The receptacle may further include a disengagable restraint mechanism for holding the bin in the housing. In some embodiments, the lid when closed maintains the bin in the first configuration. In some embodiments, the lid includes a door that when open while maintaining the lid closed provides access to the interior region of the bin. In some embodiments, the lid when closed mates with the bin for securing a liner bag for the bin.

[0104] The invention may be embodied as a trash receptacle having a timer and an indicator associated therewith for alerting when it is the time for disposing of trash contained therein, or the invention may be embodied as a trash receptacle having a seven-day timer and an indicator associated therewith for alerting when it is the day for disposing of trash contained therein.

[0105] The invention may be embodied as a trash bin having a primary bin portion having a bottom surface and an upstanding primary wall, and a secondary bin portion having an upstanding secondary wall cooperating with the primary wall to form an upstanding peripheral wall, wherein the primary and secondary walls are relatively pivotably engaged such that the two bin portions are relatively separable.

[0106] While the invention has been shown and described with reference to a specific exemplary embodiment, it should be understood by those skilled in the art that various changes in form and detail may be made without departing from the spirit and scope of the invention, and that the invention should therefore only be limited according to the following claims, including all equivalent interpretation to which they are entitled.

[0107] It is to be understood that the foregoing description is intended to illustrate and not to limit the scope of the invention, which is defined by the scope of the appended claims. Other embodiments are within the scope of the following claims.

What is claimed is:

1. A trash and/or recyclables receptacle comprising:
a housing defining a cavity and having a lid openable to create an orifice to access said cavity;
a bin disposed in said cavity and removable there-from through said orifice;
wherein said bin has a bottom portion and an upstanding peripheral wall, said wall having first and second wall portions which one or both pivotably engage said bottom portion such that said first and second wall portions are relatively separable.
2. The receptacle of Claim 1 wherein said bottom portion comprises a base pan portion comprising a bottom surface and a peripheral rim extending upwardly therefrom;
wherein said upstanding peripheral wall is received in said peripheral rim and extends upwardly there-from to define an open-topped hollow interior chamber; and
wherein said first and second wall portions engage said base pan portion at and pivotably about a hinge such that said first and second wall portions are relatively separable there-about.
3. The receptacle of Claim 1 wherein said bottom portion comprises a base pan portion comprising a bottom surface and an upstanding periphery;
wherein said upstanding peripheral wall is received in said upstanding periphery and extends upwardly there-from to define an open-topped hollow interior chamber; and
wherein said upstanding peripheral wall cooperates with said base pan portion to form a vent having an air intake opening exterior of said upstanding peripheral wall and an air exhaust opening within said hollow interior chamber and below said air intake opening.
4. The receptacle of Claim 1 wherein said bin further comprises:
a primary bin portion comprising a bottom surface and a primary portion of said upstanding peripheral wall; and

a secondary bin portion comprising a secondary portion of said upstanding peripheral wall cooperating with said primary bin portion to form said upstanding peripheral wall;

and wherein said primary and secondary bin portions are relatively pivotably engaged such that said primary and secondary bin portions are relatively separable.

5. The receptacle of Claim 1 wherein said upstanding peripheral wall defines an open-topped hollow interior chamber terminating at its top in an annular rim, and said receptacle further comprises:

a liner bag received in and lining said interior chamber and having a draped-over portion extending outwardly over and downwardly around said annular rim;

wherein said orifice and annular rim cooperate to form an annular gap for receiving said draped-over portion.

6. The receptacle of Claim 5 wherein said annular gap is at least partially approximately one-half of an inch in gap width.

7. The receptacle of Claim 6 wherein said lid has a downwardly extending annular wall adapted to engage said annular gap to force said draped-over portion into said annular gap when said lid is in its closed state.

8. A trash and/or recycling receptacle comprising:

a housing defining a cavity and having a lid movable into an open state to create an orifice to access said cavity and movable into a closed state for closing said orifice;

a bin disposed in said cavity and removable there-from through said orifice, wherein said bin has a bottom surface and an upstanding peripheral wall terminating at its top in an annular rim and defining a hollow interior chamber;

a liner bag received in said bin and lining said interior chamber and having a draped-over portion extending outwardly over and downwardly around said annular rim;

wherein said lid has a downwardly extending annular wall adapted to engage said annular rim to secure said draped-over portion to said annular rim when said lid is in its closed state.

9. The receptacle of Claim 8 wherein said orifice and annular rim cooperate to form an annular gap for receiving said draped-over portion.
10. The receptacle of Claim 9 wherein said gap said annular gap is at least partially approximately one-half of an inch in gap width.
11. The receptacle of Claim 10 wherein said downwardly extending annular wall is adapted to engage said annular gap to force said draped-over portion into said annular gap when said lid is in its closed state.
12. A trash and/or recyclables receptacle comprising:
 - a housing defining a cavity and having a lid openable to create an orifice to access said cavity;
 - a bin disposed in said cavity having an open portion at one end;
 - wherein said bin has a plurality of portions forming an interior region, the portions being engaged with one another permitting the bin to change from a first configuration to a second configuration such that the volume of the interior region of the bin is larger in the second configuration than in the first configuration.
13. The receptacle of Claim 12 wherein the plurality of portions of the bin includes two wall portions that are pivotably coupled to one another to permit changing from the first configuration to the second configuration of the bin by pivoting the wall portions relative to one another.
14. The receptacle of Claim 12 wherein in the second configuration the bin has a relatively greater degree of upward tapering than in the first configuration.
15. The receptacle of Claim 12 wherein the bin is removable through the orifice formed when the lid is opened.

16. The receptacle of Claim 15 wherein the receptacle includes a disengagable restraint mechanism for holding the bin in the housing.
17. The receptacle of Claim 12 wherein the lid when closed maintains the bin in the first configuration.
18. The receptacle of Claim 17 wherein the lid includes a door that when open while maintaining the lid closed provides access to the interior region of the bin.
19. The receptacle of Claim 17 wherein the lid when closed mates with the bin for securing a liner bag for the bin.
20. A receptacle for receiving and storing trash and/or recyclables, the receptacle comprising:
 - a timer having means to select a time for disposing of the stored trash; and
 - an indicator associated with said timer for alerting when said time occurs.
21. The receptacle of Claim 20 wherein said timer is a seven-day timer and said indicator alerts when a day has occurred for disposing of the stored trash.
22. The receptacle of Claim 21 wherein said indicator is a visual indicator.
23. The receptacle of Claim 22 wherein said indicator is a light-emitting device.
24. The receptacle of Claim 21 wherein said indicator is an audible indicator.
25. The receptacle of Claim 24 wherein said indicator is an electronic noise-emitting device.
26. The receptacle of Claim 20 wherein said timer is a one-month timer and said indicator alerts when a day has occurred for the stored trash.
27. The receptacle of Claim 20 wherein said timer is a one-day timer and said indicator alerts when an hour or minute has occurred for disposing of the stored trash.

28. The receptacle of Claim 20 wherein said indicator is taken from the group including a visual indicator and an audible indicator.

29. A receptacle comprising:
a receptacle housing including sidewalls arranged in a closed section,
and a bottom extending between a lower end of the sidewalls; and
a lid pivotably connected to an upper end of one of the sidewalls; and
a lift mechanism including
an actuation pedal which rotates in concert with a horizontally
extending pivot rod, the pivot rod configured to rotate about a pivot axis with respect
to the receptacle housing,
a damper configured to damp rotational movement of the pivot
rod,
a cross bar extending between the pivot rod and a vertical strut,
the strut connecting the cross bar to the lid,
wherein

the lift mechanism is configured to permit movement of the lid between a
closed position and an open position by converting the rotational motion of the pedal
about the pivot axis into the translational motion of the strut.

30. The receptacle of Claim 29 wherein the damper comprises
a disk including an axial through hole;
a closed damper housing including a vacancy sized and shaped to receive the
disk therein; and
a viscous fluid disposed in the vacancy,
wherein the pivot rod extends through and is fixed within the axial through hole, and
the disc is disposed within the vacancy within the damper housing.

31. The receptacle of Claim 29, wherein the damper housing further includes:
a base portion, the base portion including a first opening sized and shaped to
receive a first portion of the disk therein; and
a cover portion, , the cover portion including a second opening sized and
shaped to receive a remaining portion of the disk therein, and

wherein the base portion and cover portion, when assembled together, surround a circumference of the disk and maintain the viscous fluid in contact with at least a circumferential surface of the disk.

32. The receptacle of Claim 29 wherein the lift mechanism includes more than one damper.

33. A rotational damper for damping axial rotational motion of a rod, the damper comprising:

- a damper housing having openings configured to permit the rod to pass through; and

- a disk including an axial through hole configured to receive the rod therethrough and to be fixed thereto, the disk positioned within a vacancy of the housing, and a viscous fluid disposed within the vacancy; wherein the disc is rotatable with respect to the damper housing.

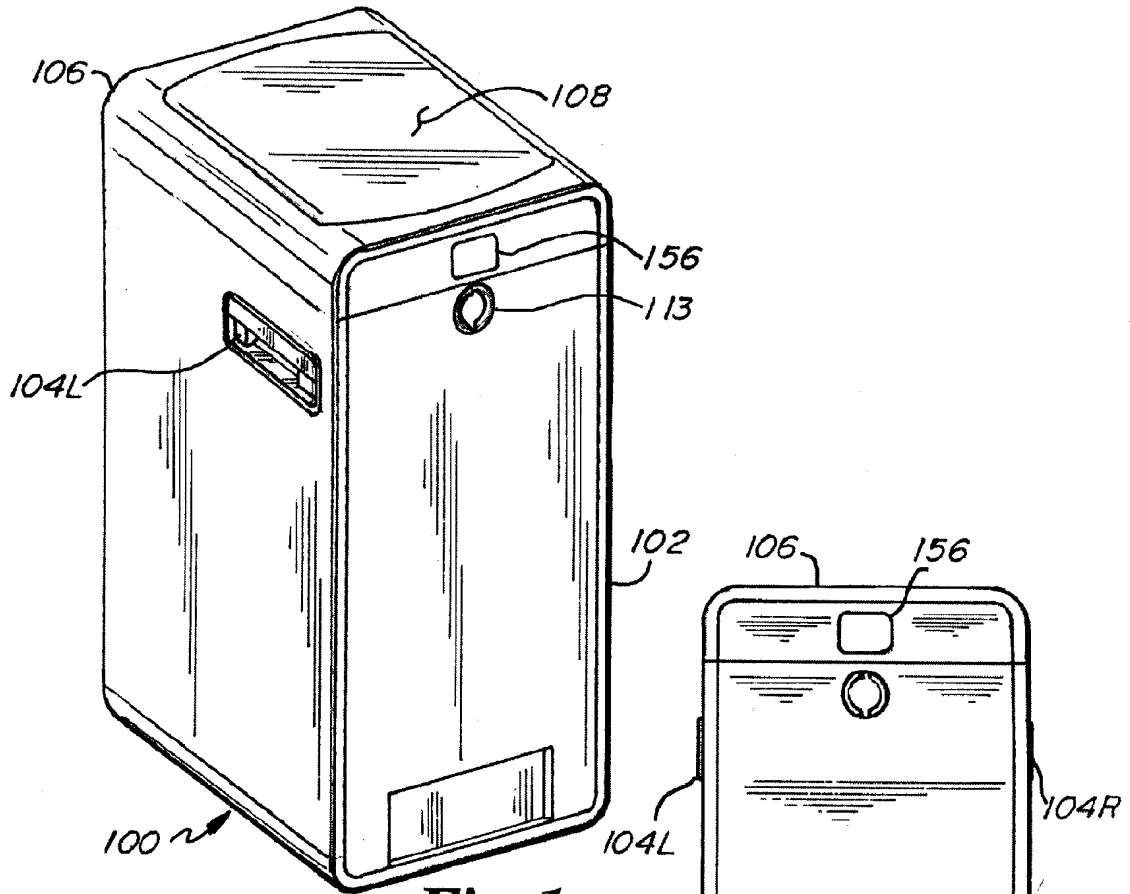
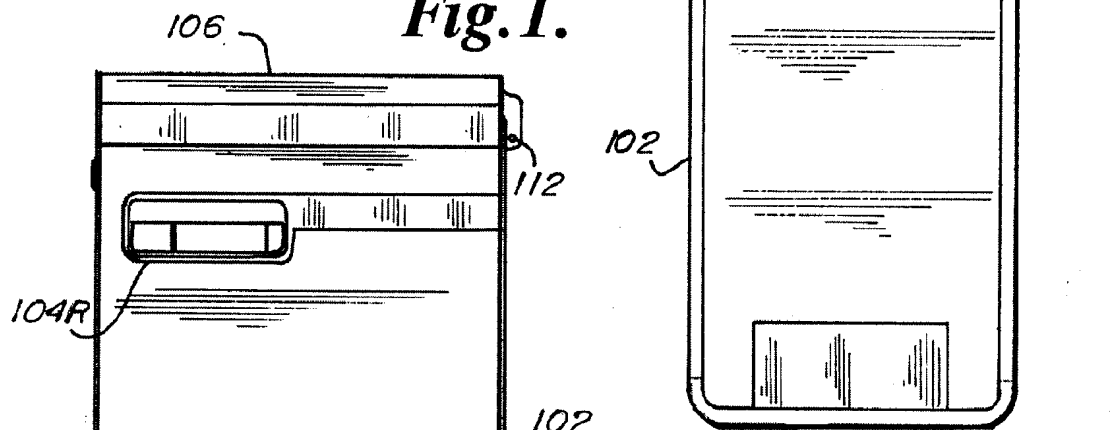
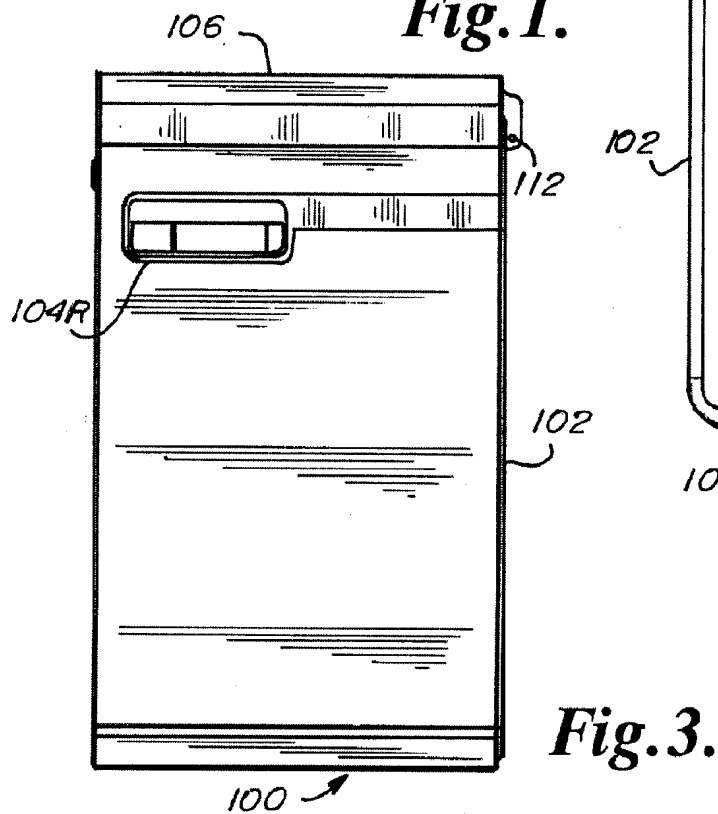
34. A trash and/or recyclables receptacle comprising:

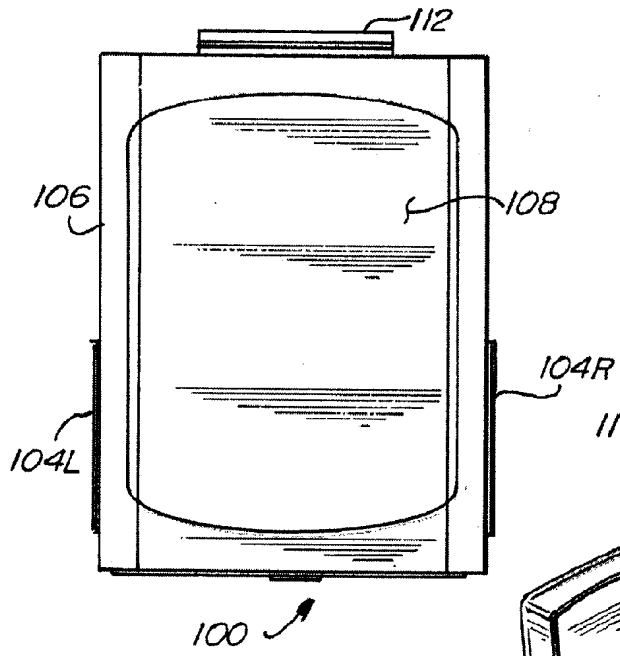
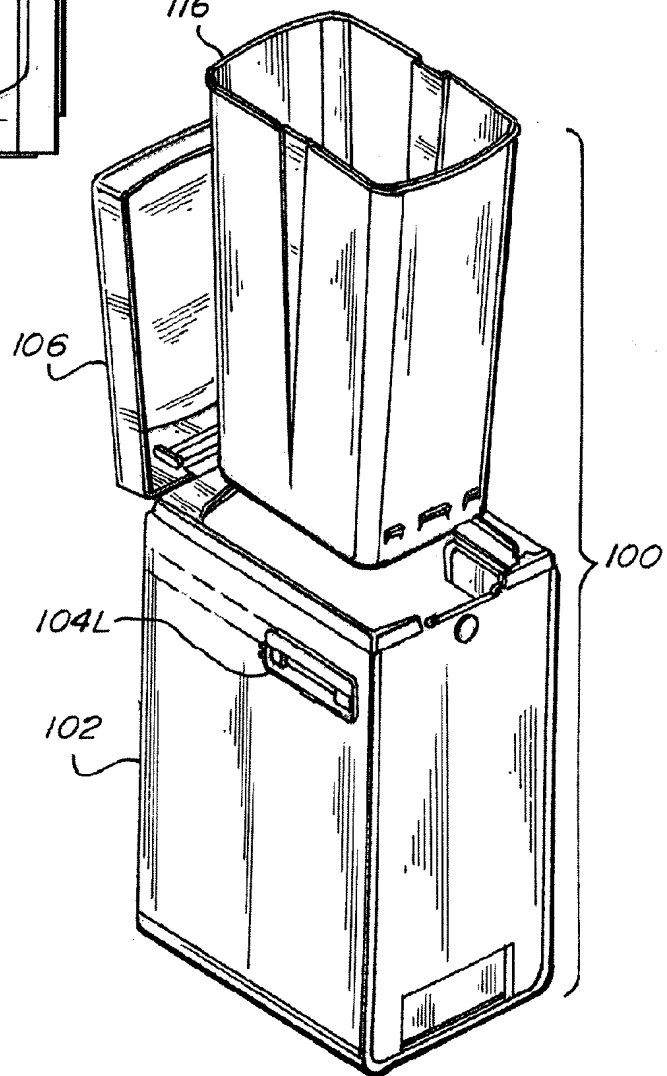
- a housing defining a cavity and having a lid openable to create an orifice to access said cavity;

- a foot pedal at least partially recessed relative to a front face of the housing;

and

- a lift mechanism connecting the foot pedal to the lid configured to open the lid upon actuation of the foot pedal.

**Fig. 1.****Fig. 2.****Fig. 3.**

**Fig. 4.****Fig. 5A.**

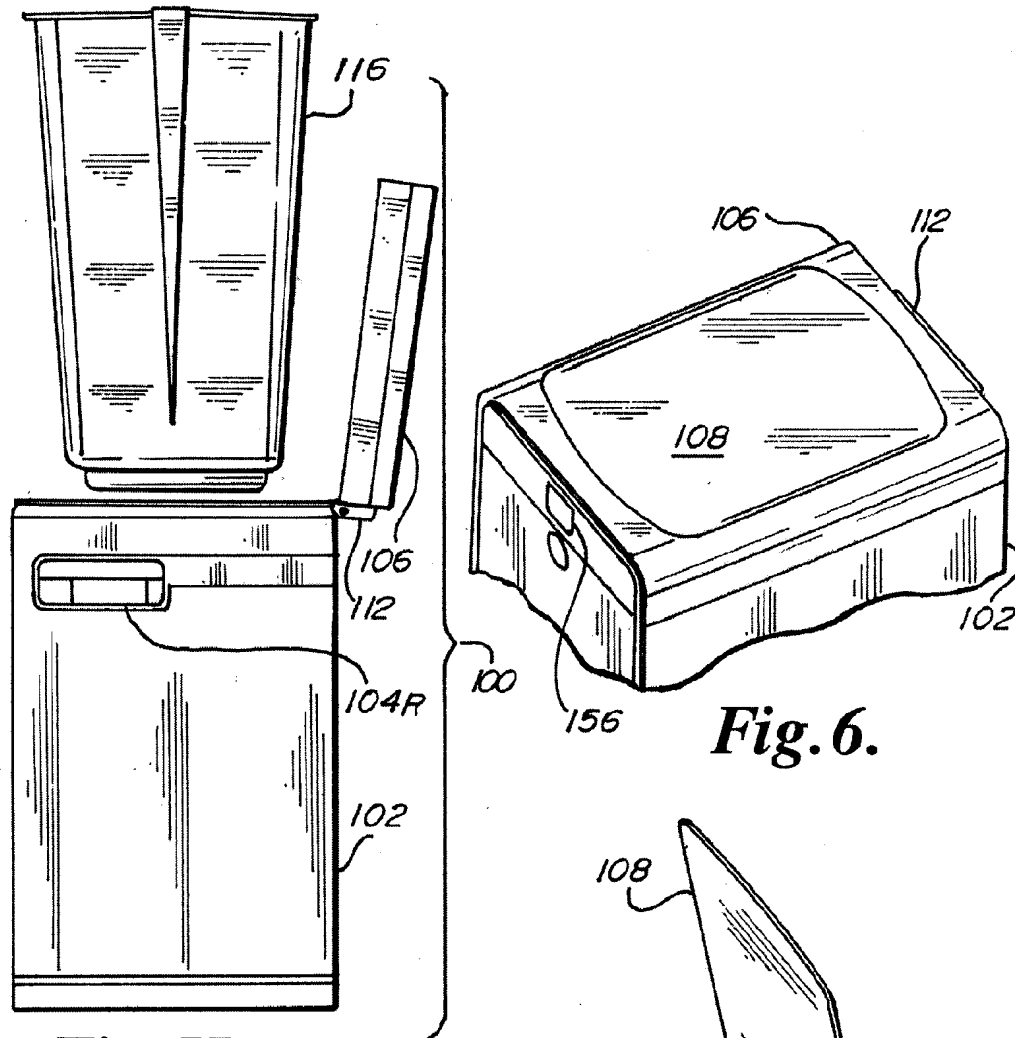


Fig. 5B.

Fig. 6.

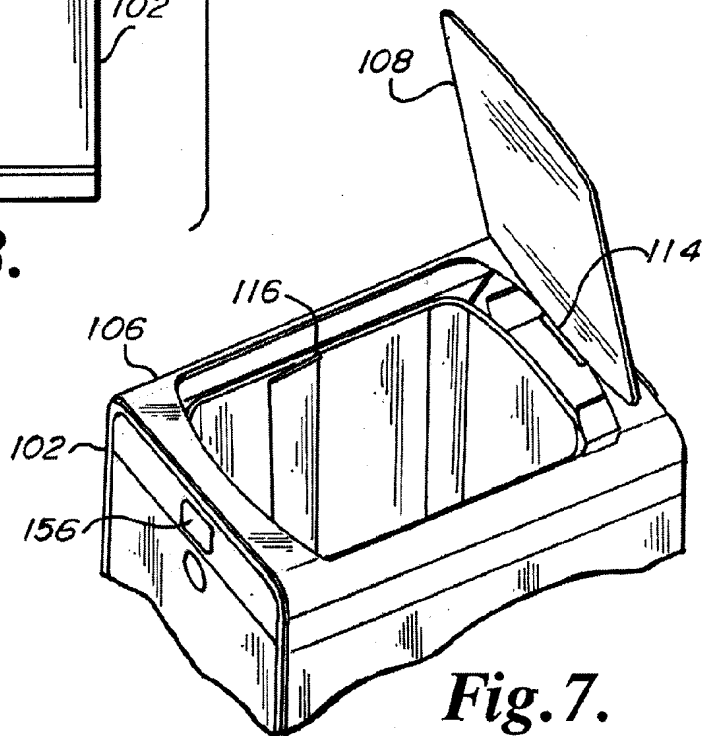


Fig. 7.

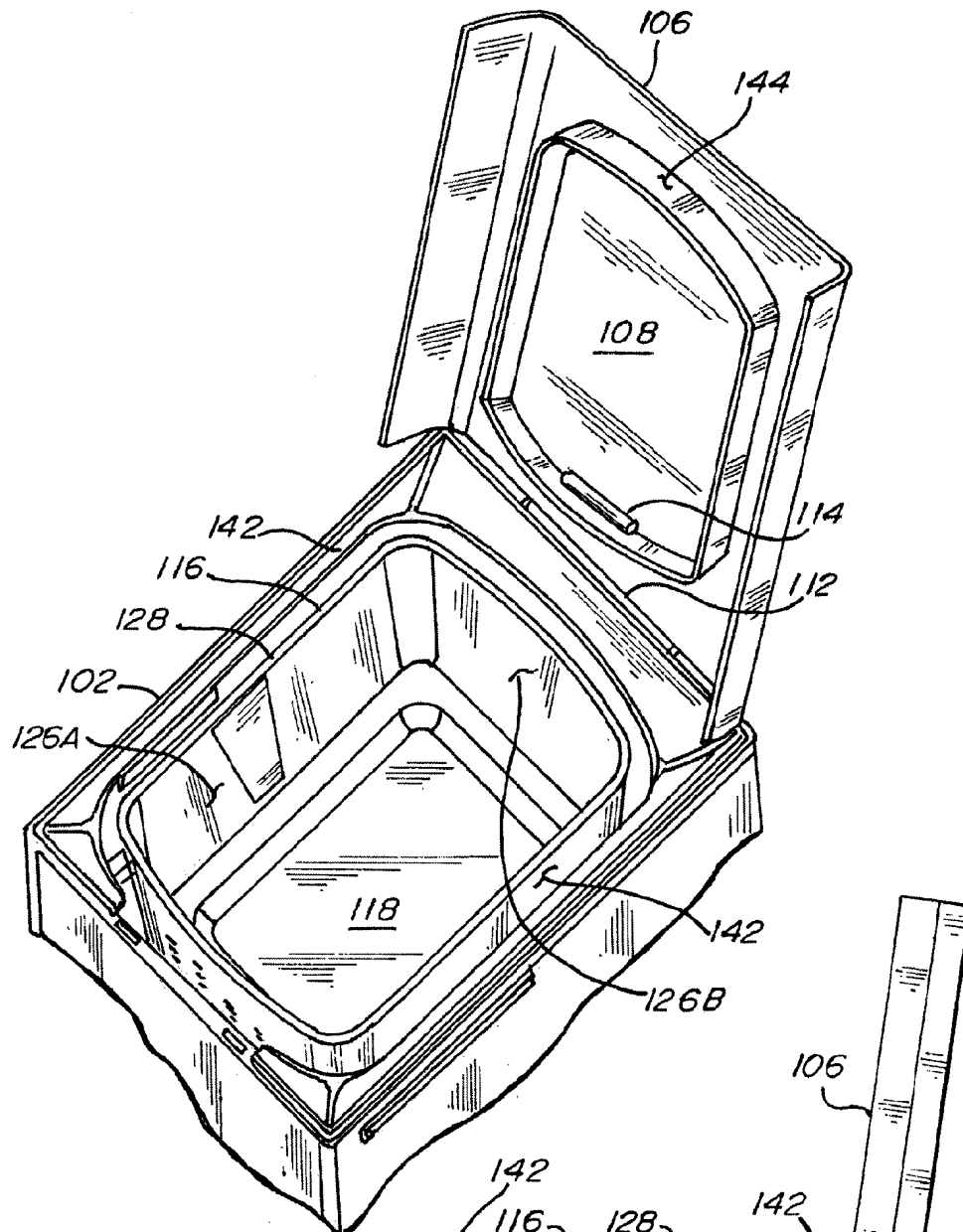


Fig. 8A.

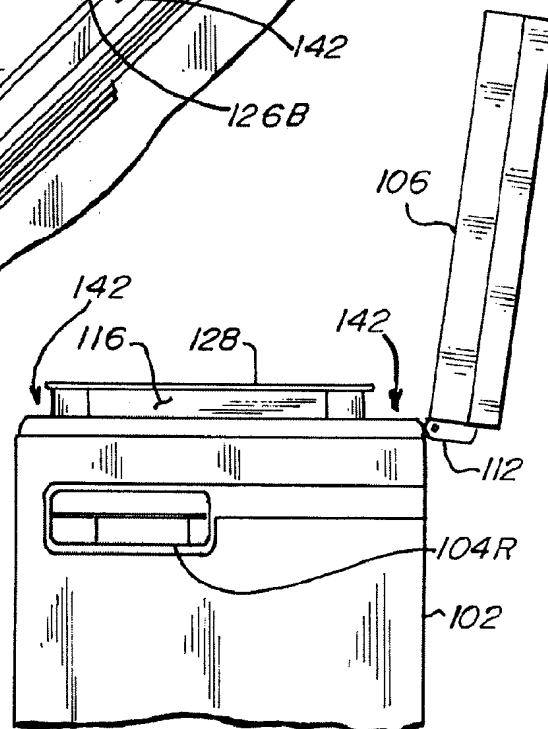


Fig. 8B.

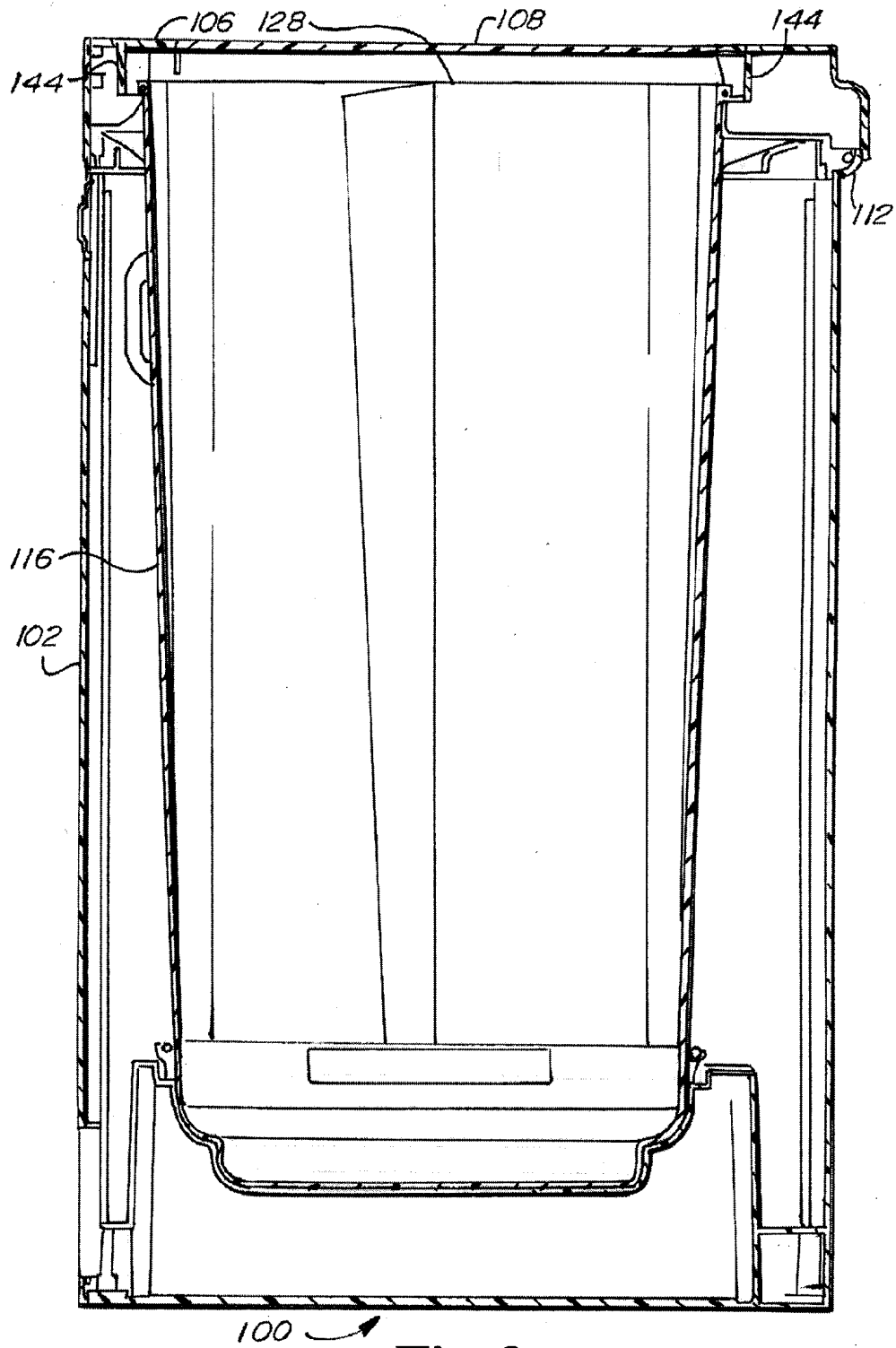
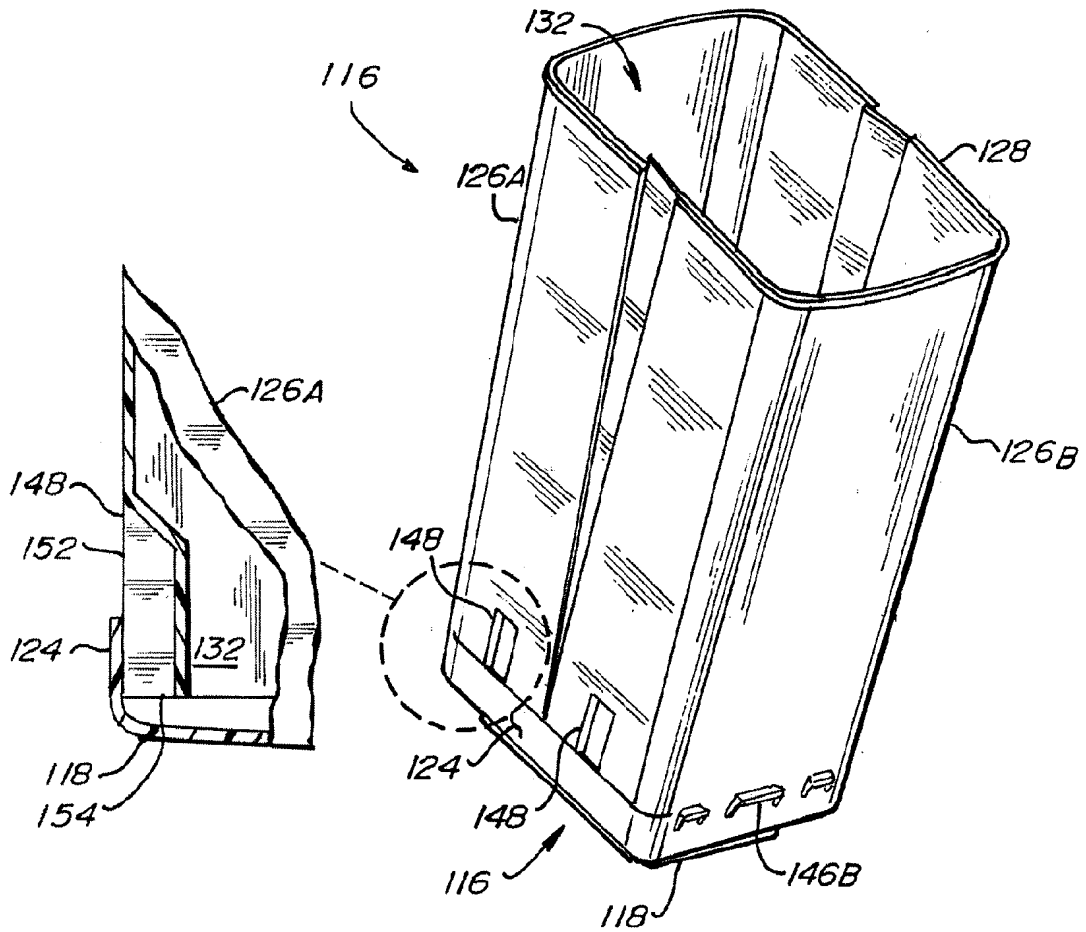
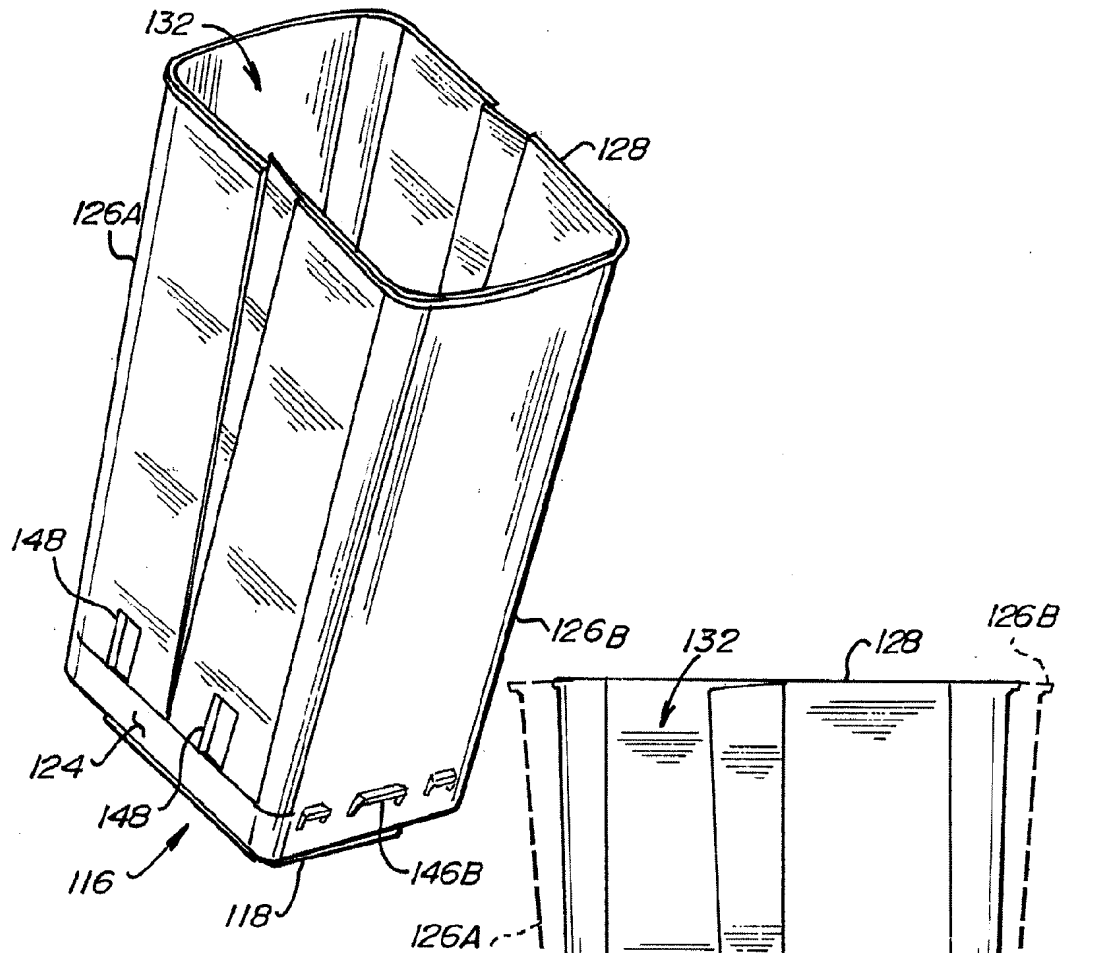
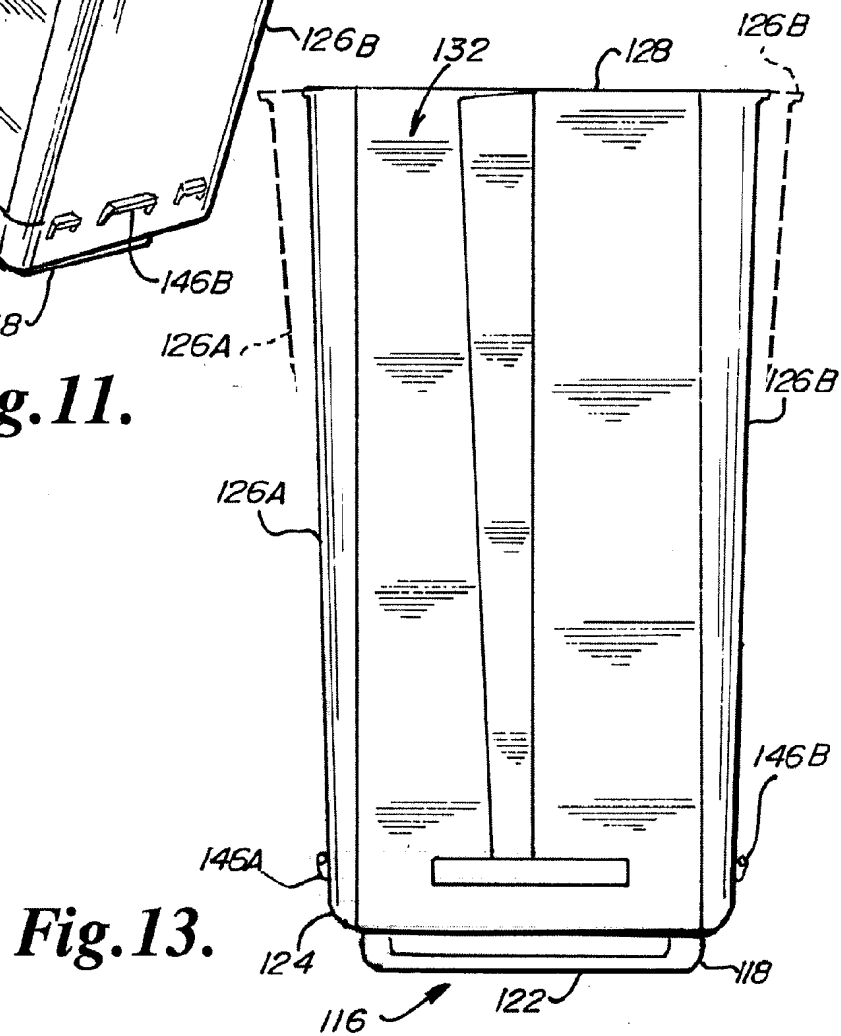
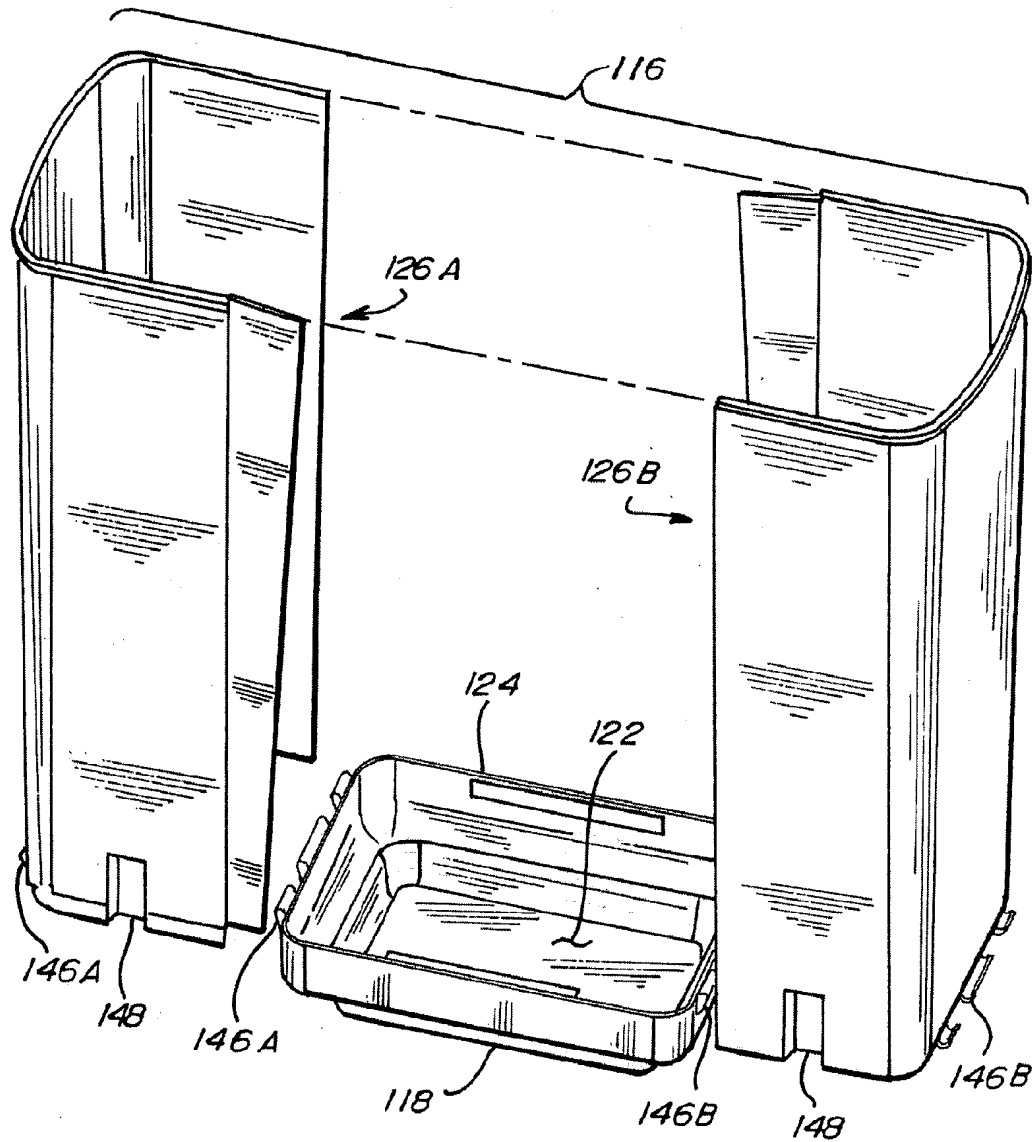
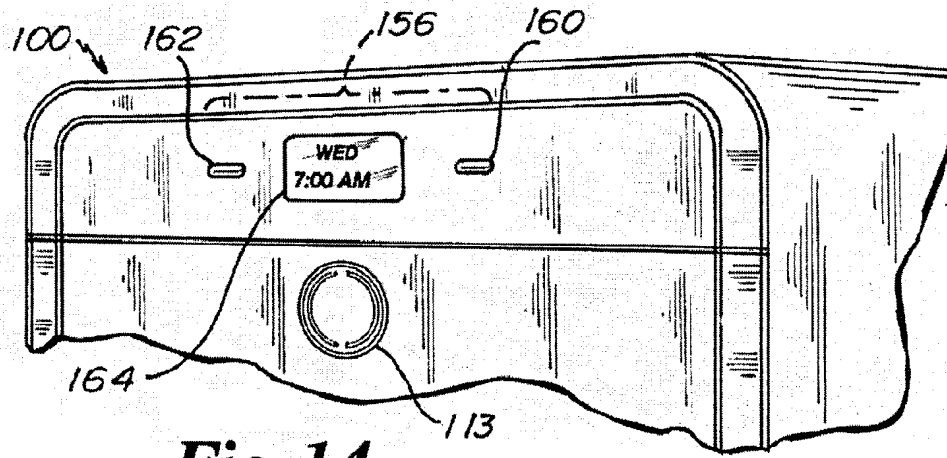
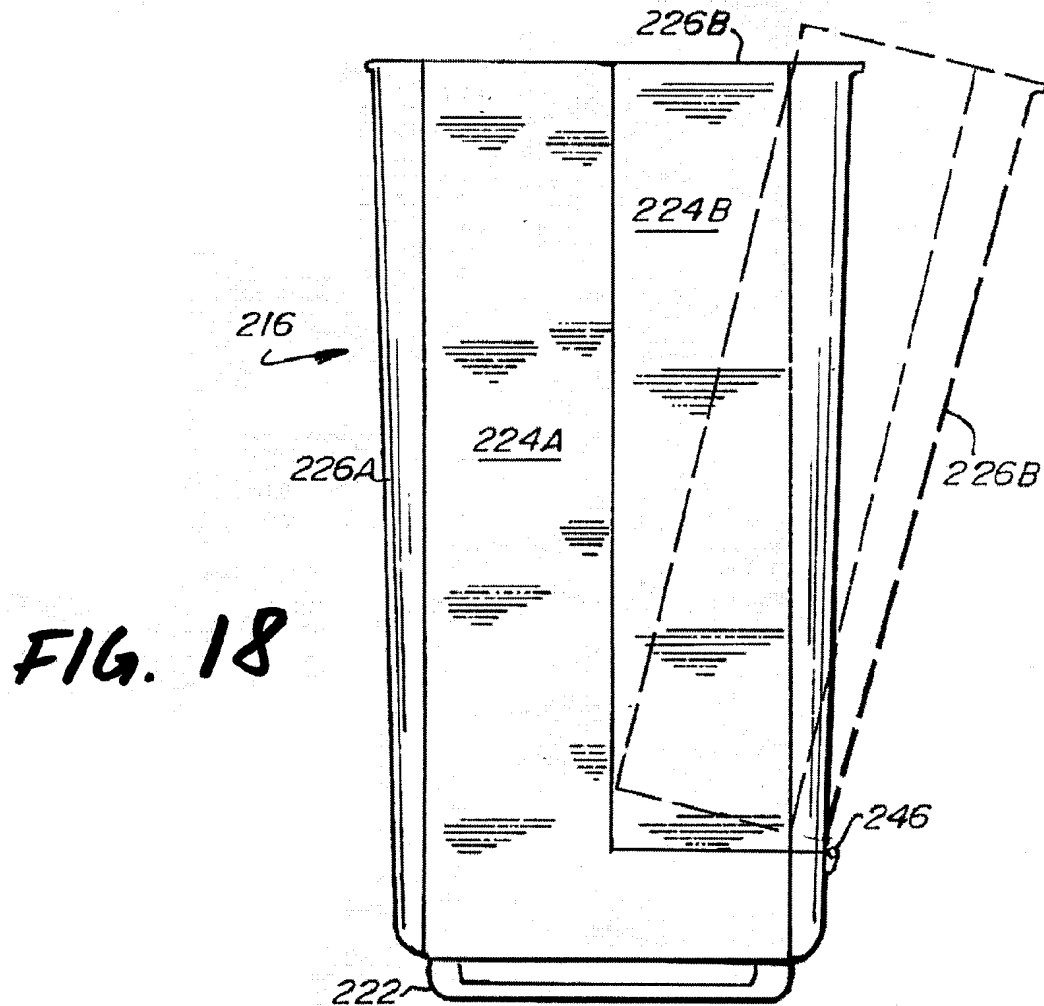


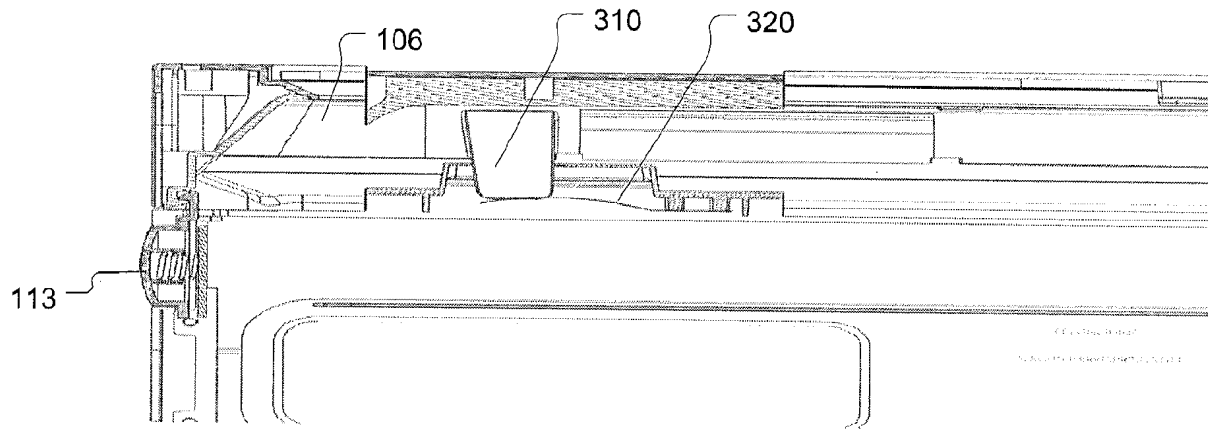
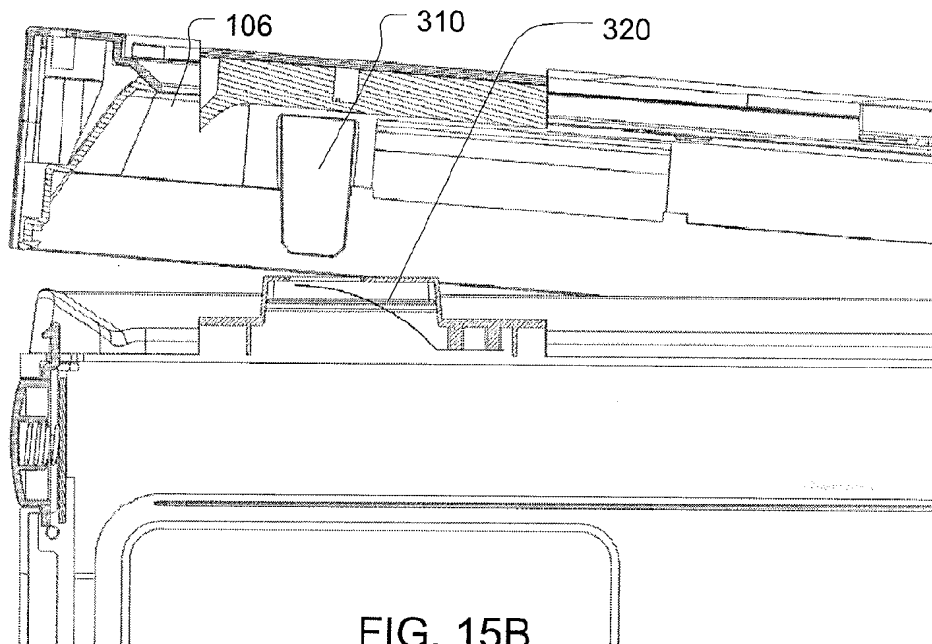
Fig. 9.

**Fig. 10.**

**Fig. 11.****Fig. 13.**

**Fig. 12.**





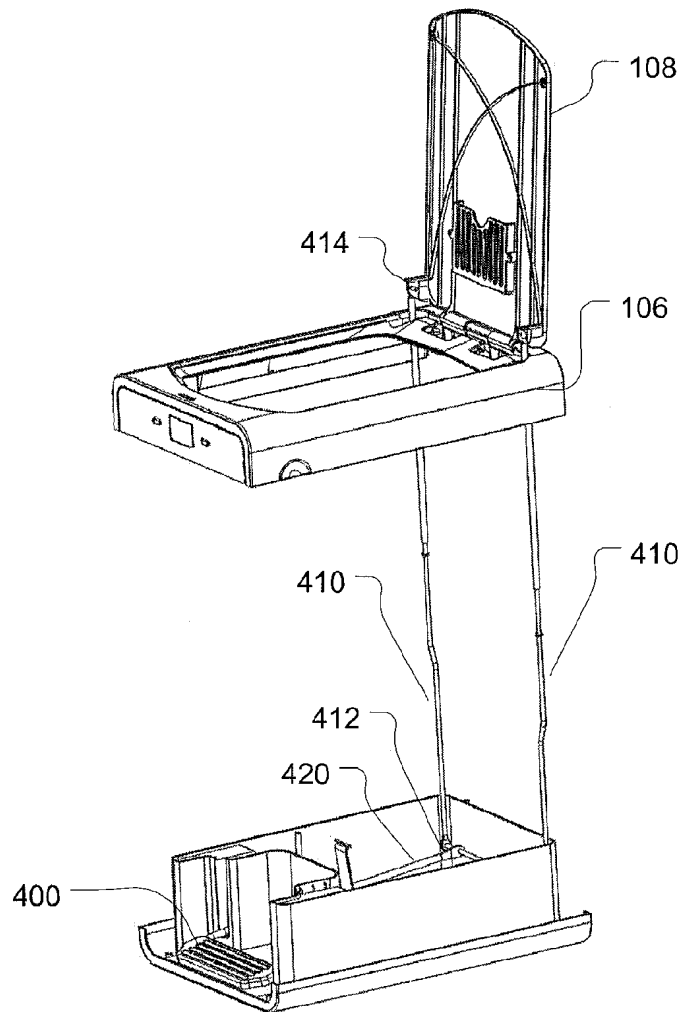


FIG. 16

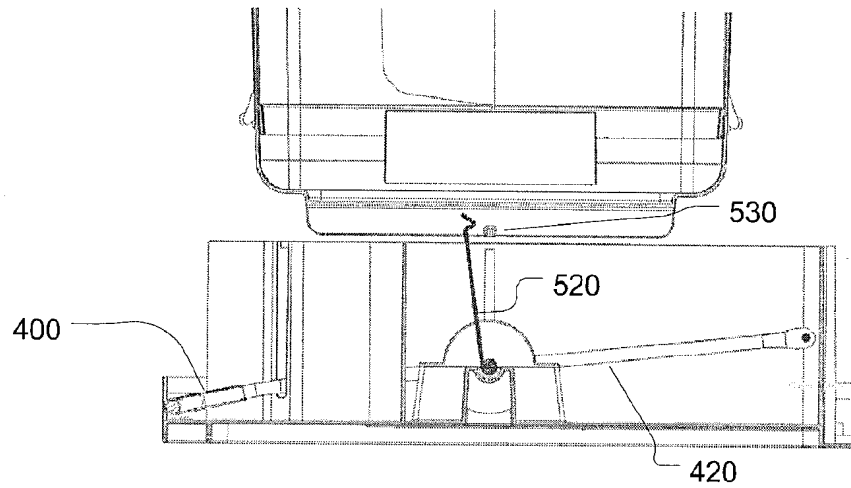


FIG. 17A

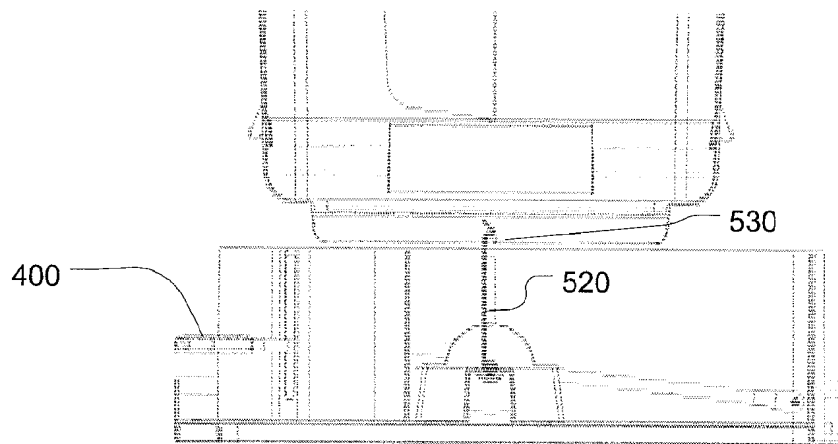


FIG. 17B

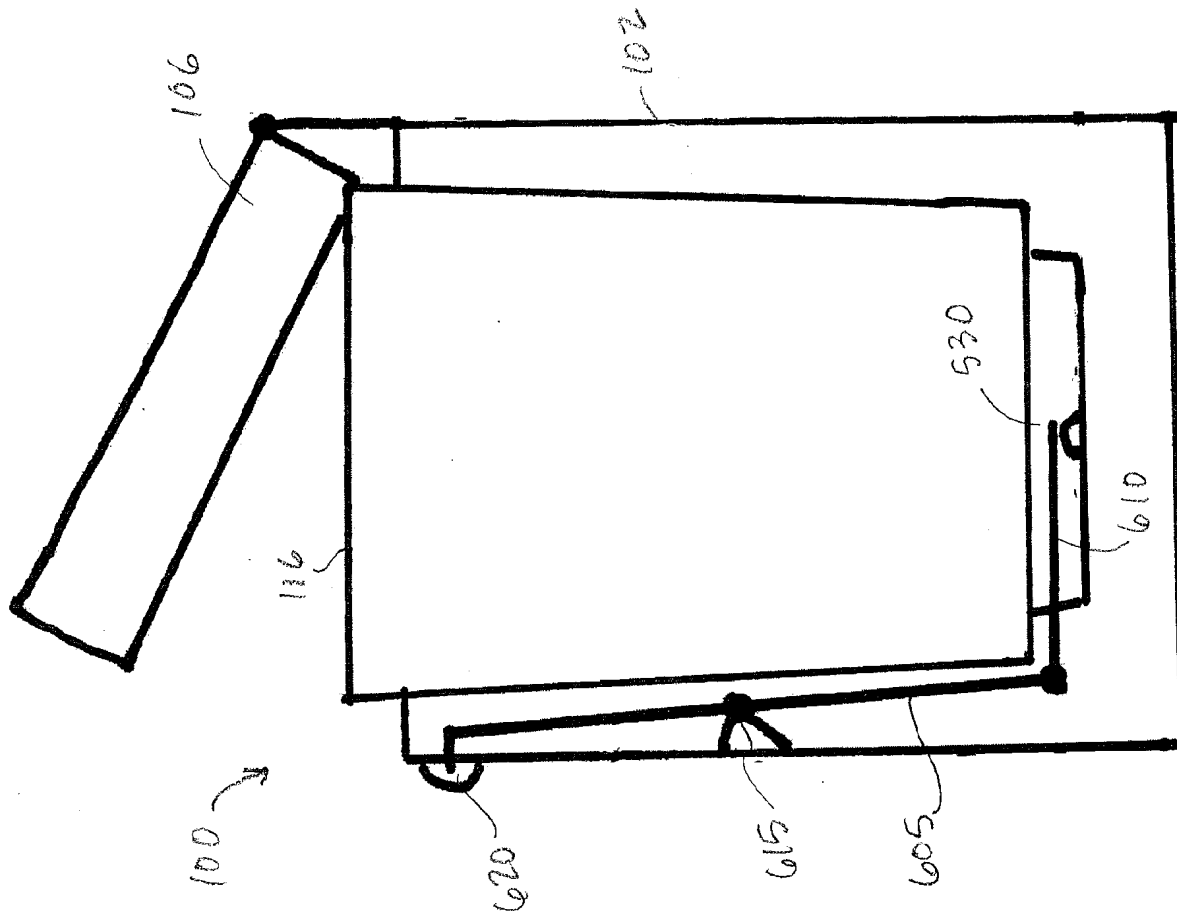


FIG. 19

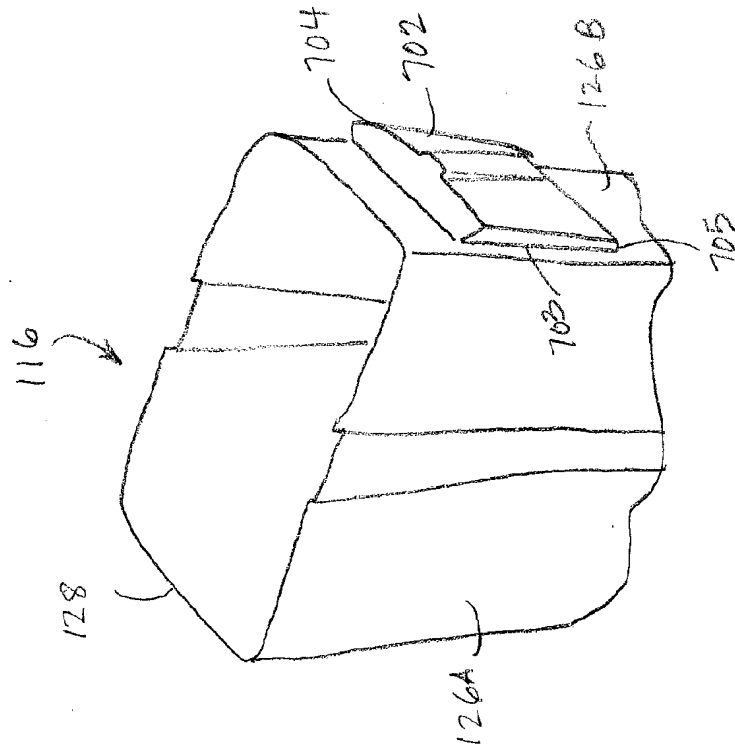


FIG. 20

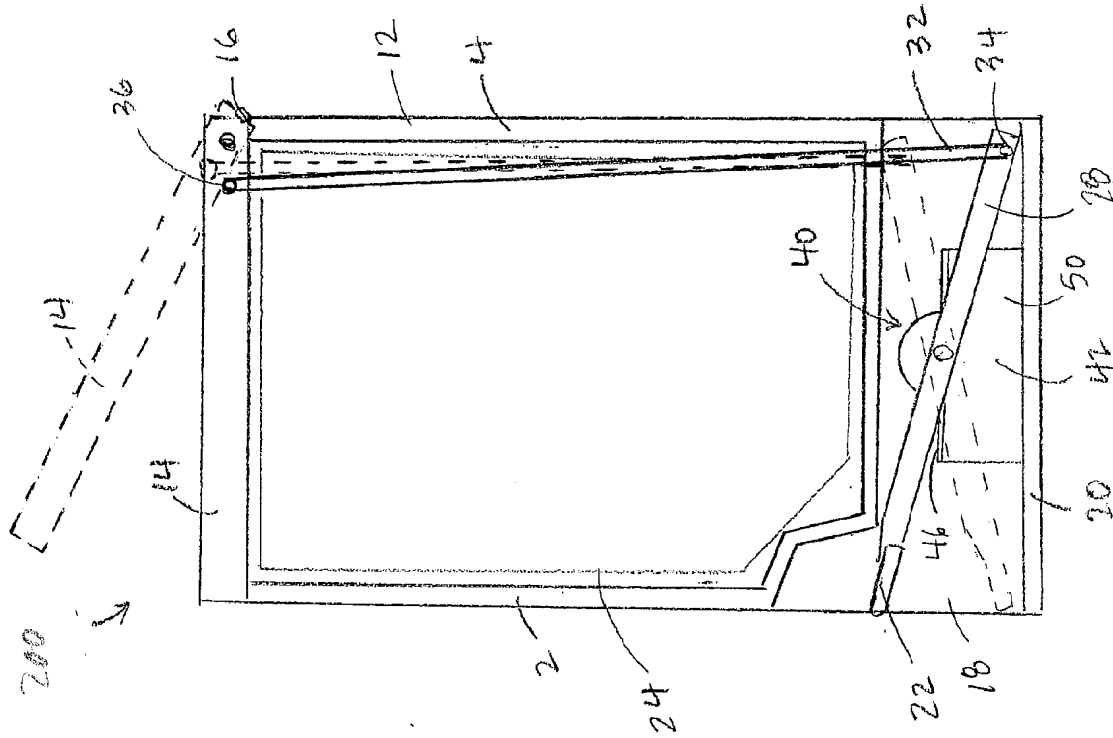


Fig. 2.2

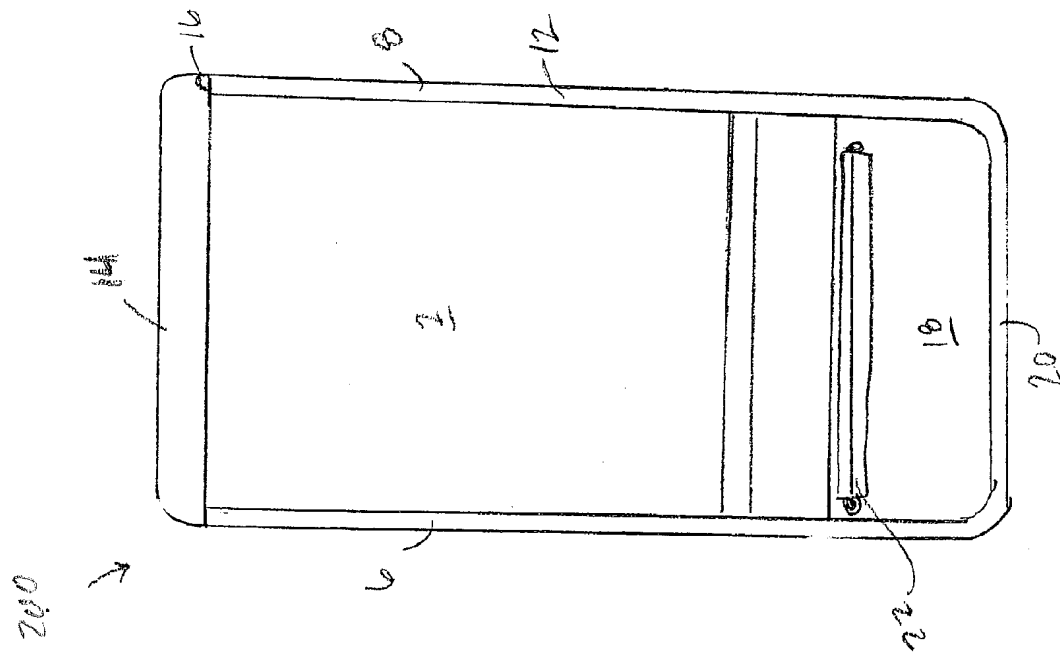
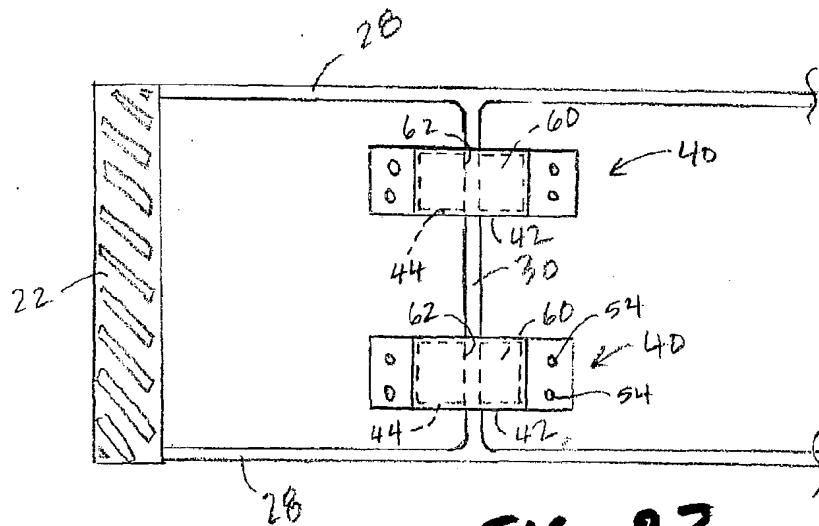
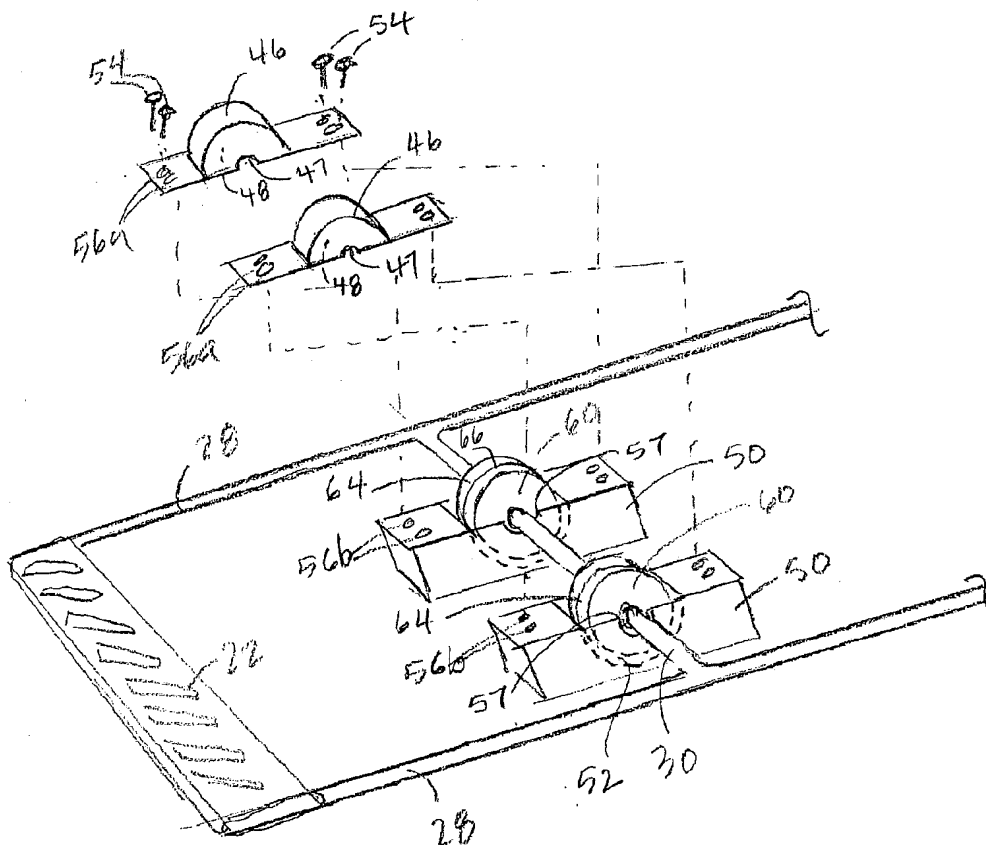


Fig. 2.1

**FIG. 23****FIG. 24**

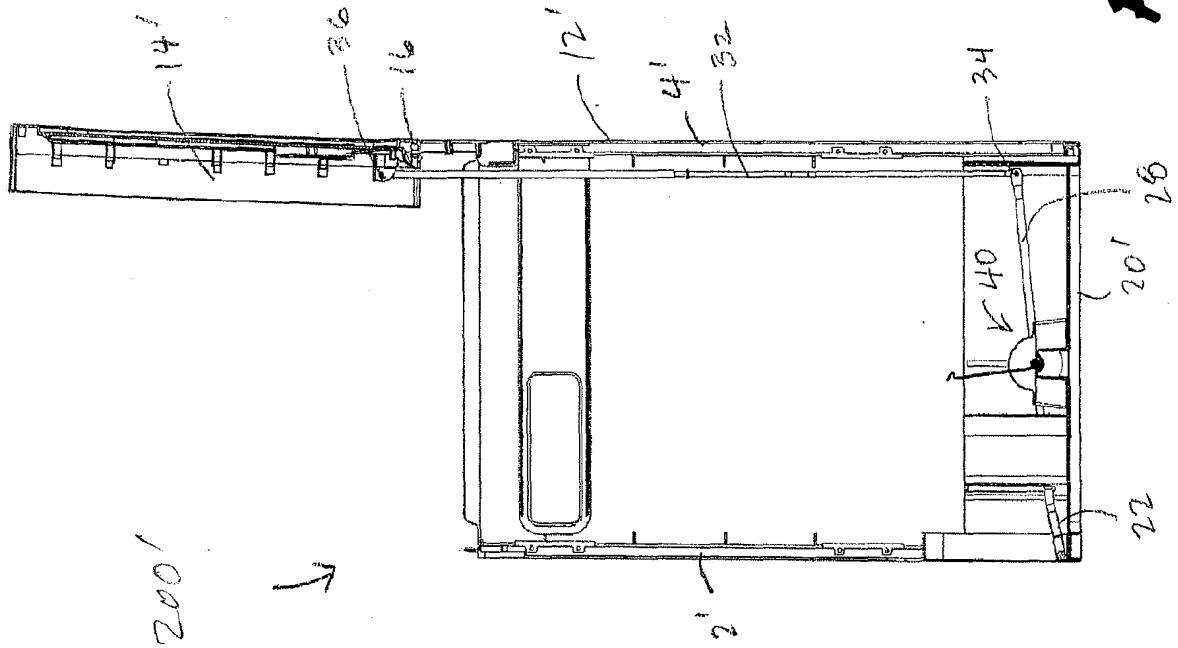


Fig. 25

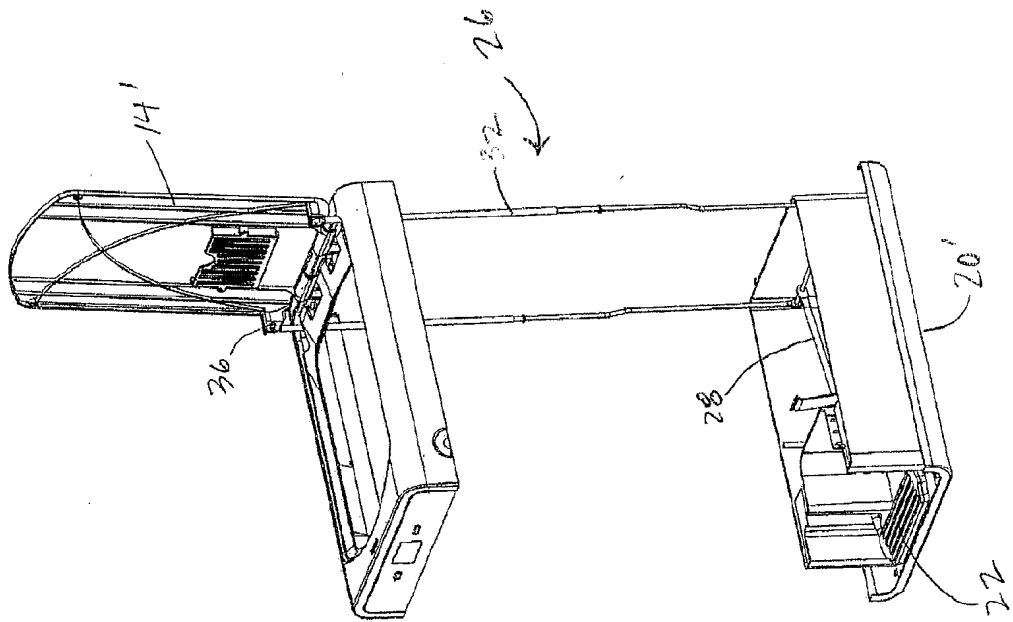
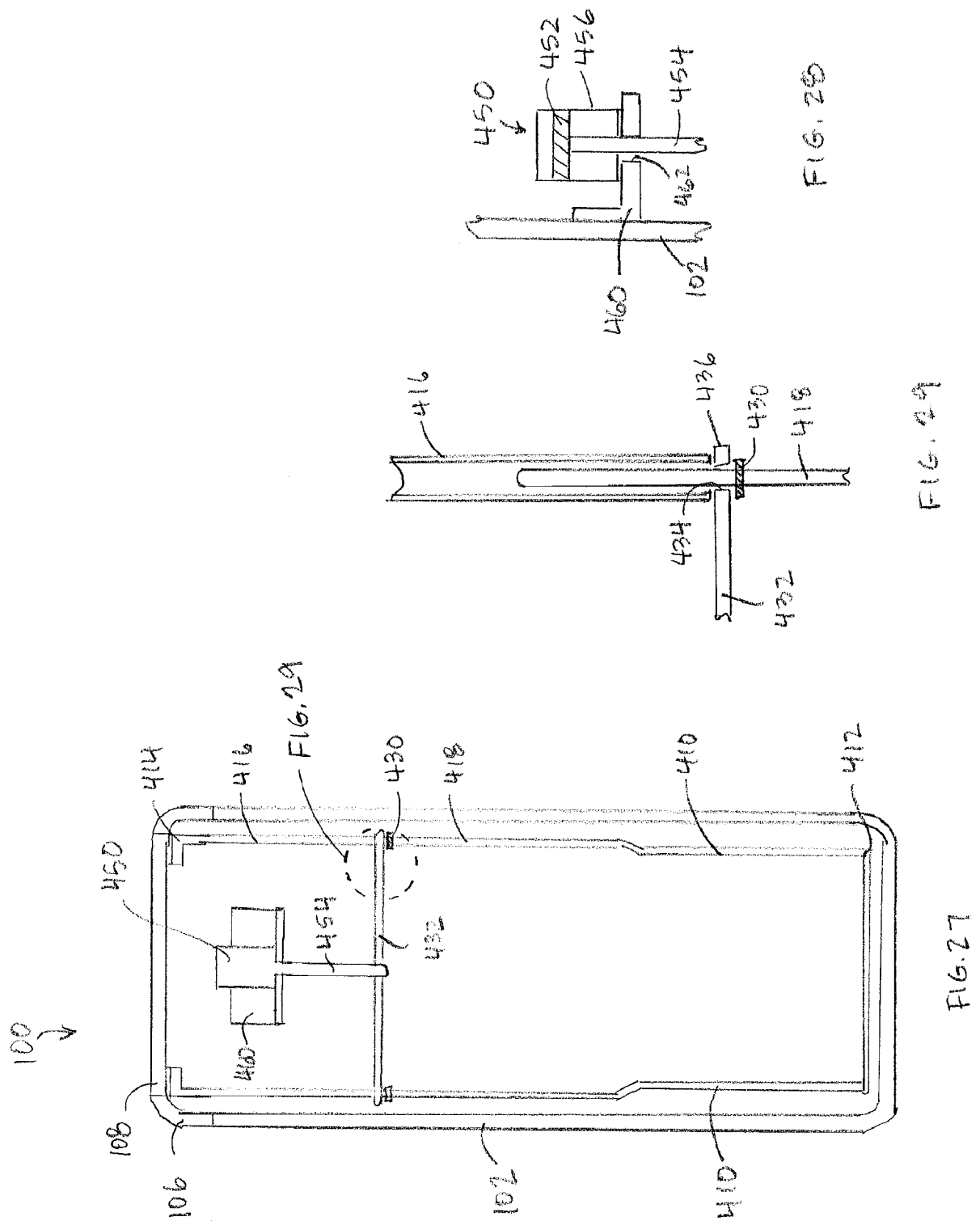


Fig. 26



A. CLASSIFICATION OF SUBJECT MATTER***B65F 1/14(2006.01)i, B65F 1/16(2006.01)i, B65F 1/08(2006.01)i***

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC : B65F 1/14

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models since 1975.

Japanese utility models and applications for utility models since 1975.

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS (KIPO internal) & keywords : trash, bin, recycle, cavity, lid, receptacle, and pivot

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 3171433 B2 (ARON KASEI CO., LTD.) 23 March 2001 See paragraphs 7-39 and figure 1.	12-19
X	JP 06-271002 A (SEKISUI CHEM CO., LTD.) 27 September 1994 See paragraphs 5-28 and figures 1 and 4.	34
A	JP 14-336271 A (IWAO MITSUMA et al.) 26 November 2002 See paragraphs 9-45 and figure 1.	1-34

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

27 AUGUST 2009 (27.08.2009)

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/036600

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 3171433 B2	23.03.2001	None	
JP 06-271002 A	27.09.1994	JP 3242507 B2 JP 03-242507 B2	25.12.2001 19.10.2001
JP 14-336271 A	26.11.2002	None	



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁵ :

B65D 43/26, B65F 1/08

A1

(11) International Publication Number:

WO 92/02430

(43) International Publication Date:

20 February 1992 (20.02.92)

(21) International Application Number: PCT/NL91/00147

(22) International Filing Date: 7 August 1991 (07.08.91)

(30) Priority data:

9001796

10 August 1990 (10.08.90)

NL

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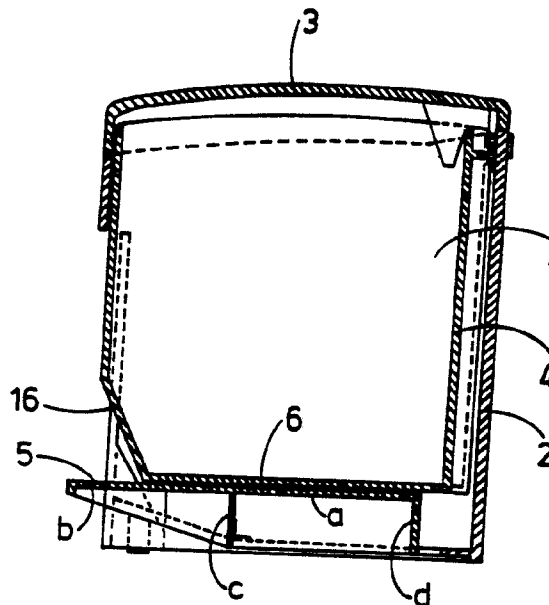
(81) Designated States: AT (European patent), AU, BB, BE (European patent), BF (OAPI patent), BG, BJ (OAPI patent), BR, CA, CF (OAPI patent), CG (OAPI patent), CH (European patent), CI (OAPI patent), CM (OAPI patent), CS, DE (European patent), DK (European patent), ES (European patent), FI, FR (European patent), GA (OAPI patent), GB (European patent), GN (OAPI patent), GR (European patent), HU, IT (European patent), JP, KP, KR, LK, LU (European patent), MC, MG, ML (OAPI patent), MR (OAPI patent), MW, NL (European patent), NO, PL, RO, SD, SE (European patent), SN (OAPI patent), SU, TD (OAPI patent), TG (OAPI patent), US.

Published

With international search report.

Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: PEDAL BIN WITH LID



(57) Abstract

The invention relates to a pedal bin with lid (3) comprising a container section (4), a jacket section (2) hingedly connected to the lid and with which the pedal bin normally stands on the ground, and a lever (5) in the form of a pedal provided near the bottom of the jacket section, on the operation of which the container section is moved upwards while the lid is simultaneously opened round its hinges. When the pedal is fully pressed, the lid hinges over an angle larger than 90°, and means have been provided that close the lid when the container section is lowered. The lid is provided on the hinged side with a lug and the container section is provided near its upper rim with a projection, which projection extends above the lug when the container section is in its highest position.

+ DESIGNATIONS OF "SU"

It is not yet known for which States of the former Soviet Union any designation of the Soviet Union has effect.

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- 1 -

PEDAL BIN WITH LID

The invention relates to a pedal bin with lid comprising a container section, a jacket section hingedly
5 connected to the lid and with which the pedal bin normally stands on the ground, and a lever in the form of a pedal provided near the bottom of the jacket section, on the operation of which the container section is moved upwards while the lid is simultaneously opened round its hinges.

10 Such a pedal bin is known from the French patent specification 2.453.797.

With this pedal bin according to the French patent specification, the container is moved upwards in respect of the jacket section on the operation of the pedal and in the
15 process pushes the lid up causing it to be opened upwards round its hinges. With the pedal fully pressed, the lid will hinge over an angle smaller than 90°, so that, when the pedal is released, the lid will automatically close. If the container is to be taken out of the jacket section, the lid
20 must be opened further by hand. After emptying the container and putting it back again in the jacket, the lid must be closed by hand. However, when waste is put in it, the lid is opened by the operation of the pedal less than 90°.

One of the disadvantages of such a pedal bin is the
25 limited opening potential of the lid by the operation of the pedal. This disadvantage is even more serious when both hands are needed for putting waste in the bin, so that there is a fair chance of the inside of the lid getting soiled, which is, moreover, not immediately apparent. This is

unhygienic and consequently undesirable.

The object of the invention is to provide a pedal
5 bin as mentioned in the opening paragraph without the said
disadvantages.

According to the invention this object is achieved
in that the lid hinges over an angle larger than 90° when
the pedal is fully pressed and in that means are provided
10 that close the lid when the container section is lowered.

The advantage of such a pedal bin is that, with the
pedal fully pressed, the lid is opened over an angle of more
than 90° and that both hands are free then for putting waste
in the container and, owing to the good visibility, the
15 chance of soiling the inside of the lid is small and can
immediately be ascertained, so that the use of the pedal bin
is hygienic.

According to an embodiment of the invention, the
lid is provided on the hinged side with a lug and the
20 container section is provided near its upper rim with a
projection, which projection extends above the lug when the
container section is in its highest position.

The effect of this embodiment is that, when
lowering the container section by the release of the pedal,
25 the projection strikes against the lug of the lid and thus
causes the lid to topple into its closed position.

The projection on the container section may have
the form of a lip. A plurality of lugs may be provided on
the hinged side of the lid, and on the container section
30 several lips, which extend above the lugs of the lid when
the container section is in its highest position.

The lid is connected to the jacket section
preferably by means of two hinges. The lips on the container
section and the lugs on the lid are preferably provided
35 between the hinges.

In another embodiment according to the invention
the container section is provided, on the hinged side of the
lid, with one or more lugs resting, with the lid in
completely opened position, on the edge of the lid at the

hinge and causing the lid to topple into its closed position when the container section is lowered.

5 The jacket section of the pedal bin is provided on the hinged side of the lid with a stop for the opened lid. This stop constitutes the limit to which the lid can be opened beyond 90°.

10 The lever provided in the jacket section in the form of a pedal is integrated in the bottom of the jacket and the operating portion of the pedal is provided partly in the bottom of the jacket. To this end, at the place where the pedal is provided, the container wall slants inwards.

15 Other characteristics and advantages will be clear from the description hereinafter, in which reference is made to the attached drawings.

Herein

- Fig. 1 is a perspective view of a pedal bin with closed lid;
- 20 Fig. 2 a section according to plane II-II in fig. 1;
- Fig. 3 a section as in fig. 2 with the lid partly opened;
- Fig. 4 a section as in fig. 2 with the lid completely opened;
- Fig. 5 a top view of the container section;
- 25 Fig. 6 a top view of another embodiment of the pedal bin with closed lid according to the invention;
- Fig. 7 a section according to plane VII-VII in fig. 6;
- Fig. 8 a section as in fig. 7 with partly opened lid;
- Fig. 9 a section as in fig. 7 with completely opened lid.
- 30

35 In the figures, 1 serves to indicate a pedal bin comprising a jacket section 2 with an oval or cylindrical shape and a flat back, a lid 3 and, placed in the jacket section, a container 4 with a shape corresponding with that of jacket section 2. In the bottom of jacket section 2, a pedal 5 is provided to operate lid 3. Pedal 5 consists of upper surface, of which portion a is provided under the bottom of the container and a portion b serves to operate the pedal. The flat portion is provided at the bottom with

two ribs c and d, the free end of rib c of which is the pivoting point for the pedal. Fig. 3 shows that container
5 rim 7 is situated against a lug 8 provided on the hinged side of lid 3.

Lid 3 is connected with hinges 9 to jacket 2. These hinges may be so-called film hinges. A film hinge is understood to mean a flat strip consisting of two parts interconnected by
10 a thinner portion, round which thinner portion the said parts can bend in respect of each other. Jacket 2 is provided at its top near hinges 9 with a stop 10 for lid 3. Lug 8 on lid 3 is provided with a projection 11. With lid 3 completely opened (see fig. 4), this projection 11 is
15 situated under a lip 12 provided on the outside of container 4. This lip 12 is provided at the top of a V or trapezium-shaped groove 13 of container 4.

In another embodiment according to the invention, shown in figures 6 to 9 inclusive, container 4 is provided
20 on the hinged side of lid 3 with one or more lugs 13. With lid 3 completely opened (see fig. 9), these lugs 13 rest, at hinges 9, on edge 14 of the lid. In this embodiment, too, jacket 2 is provided on the hinged side of lid 3 with a stop 15 for supporting the completely opened lid.

25 In the two embodiments according to the invention pedal 5 is integrated in the bottom of jacket section 2. In the former embodiment (see fig. 1) operating portion b of pedal 5 is provided partly in the bottom of jacket 2. To this end, container 4 has a wall portion 16 at pedal 5
30 slanting downwards and inwards.

The pedal bin according to the invention works as follows.

Figures 1 and 2 show that the lid is in closed position. By pressing down portion b of pedal 5, portion a
35 is moved up round the pivoting point of rib c of the pedal arm, which works as a lever. This portion a is provided, as stated earlier, under bottom 6 of container 4. This causes container 4 to be moved up also. As shown in fig. 3, rim 7 of container 4 causes lid 3 to be tilted round hinges 9,

because rim 7 rests against lug 8 of lid 3. When pedal 5 is pushed further, lid 3 is opened over more than 90°. This is shown in fig. 4. This tilting movement of lid 3 is limited by stop 10. As container 4 is moved up and lid 3 is simultaneously opened, lip 12 on the container freely passes lip 11 on lid 3. With lid 3 completely opened, lip 12 is situated above lip 11. Now, when the pedal is released, container 4 is lowered and lip 12 strikes against lip 11 and lid 3 topples into its closed position round hinges 9.

In the embodiment as represented in figures 6 to 9 inclusive container 4 is moved up by the pedal also, with rim 7 of the container pushing against lug 8 of lid 3. Lid 3 is opened over more than 90°, as shown in fig. 9. The opened lid 3 rests against stop 15. With lid 3 completely opened, lug 13, provided on the container, rests on edge 14 of lid 3 (see fig. 9). Now, when the pedal is released, container 4 is lowered, in which process lug 13, which rests on edge 14 of the lid, causes the lid to topple into its closed position. This restores the situation as shown in fig. 7.

With the pedal bin according to the invention, the simple pressing of the pedal suffices to open the lid over more than 90°, so that proper access is had to the container for the deposit of waste, and by releasing the pedal the lid will close automatically without any further manual operation being required.

C L A I M S

- 5 1. Pedal bin with lid comprising a container section, a
jacket section hingedly connected to the lid and with
which the pedal bin normally stands on the ground, and a
lever in the form of a pedal provided near the bottom of
the jacket section, on the operation of which the
10 container section is moved upwards while the lid is
simultaneously opened round its hinges, characterized in
that, when the pedal is fully pressed, the lid hinges
over an angle larger than 90° and in that means have
been provided that close the lid when the container
15 section is lowered.
2. Pedal bin according to claim 1, characterized in that
the lid is provided on the hinged side with a lug and
the container section is provided near its upper rim
with a projection, which projection extends above the
20 lug when the container section is in its highest
position.
3. Pedal bin according to claims 1 and 2, characterized in
that the projection of the upper rim of the container
section has the form of a lip.
- 25 4. Pedal bin according to claims 1-3, characterized in that
the lid is provided on the hinged side with a plurality
of lugs.
5. Pedal bin according to claims 1-4, characterized in that
a plurality of lips have been provided at the upper rim
30 of the container section, which extend above the lugs of
the lid when the container section is in its highest
position.
6. Pedal bin according to claims 1-5, characterized in that
the lid is connected to the jacket by means of two
35 hinges placed apart from each other.
7. Pedal bin according to claims 1-6, characterized in that
the lips on the container section and the lugs on the
lid are provided between the hinges.

- 5 8. Pedal bin according to claim 1, characterized in that the container is provided on the hinged side of the lid with one or more lugs resting, with the lid in completely opened position, on the edge of the lid at the hinge and causing the lid to topple into its closed position when the container section is lowered.
- 10 9. Pedal bin according to claims 1-8, characterized in that the jacket is provided on the hinged side of the lid with a stop for the opened lid.
10. Pedal bin according to claims 1-9, characterized in that the pedal is integrated in the bottom of the jacket.
- 15 11. Pedal bin according to claims 1-10, characterized in that the operating portion of the pedal is provided partly in the bottom of the jacket.

1/5

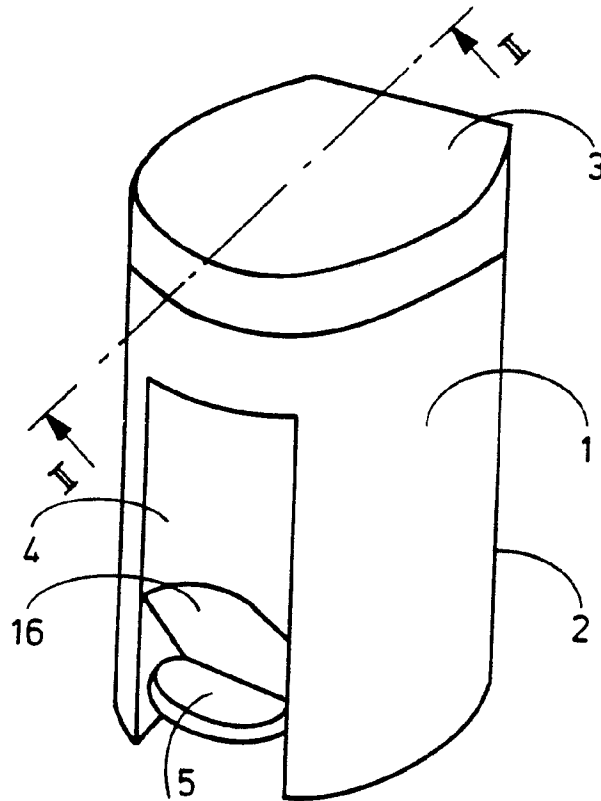


Fig. 1

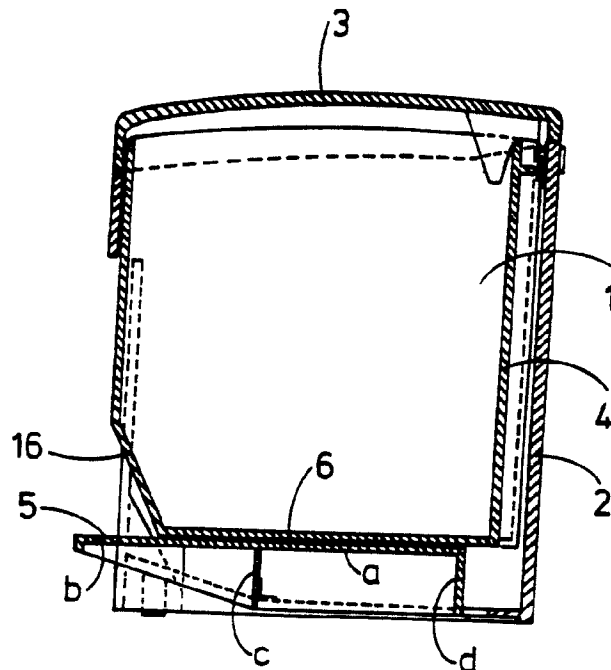
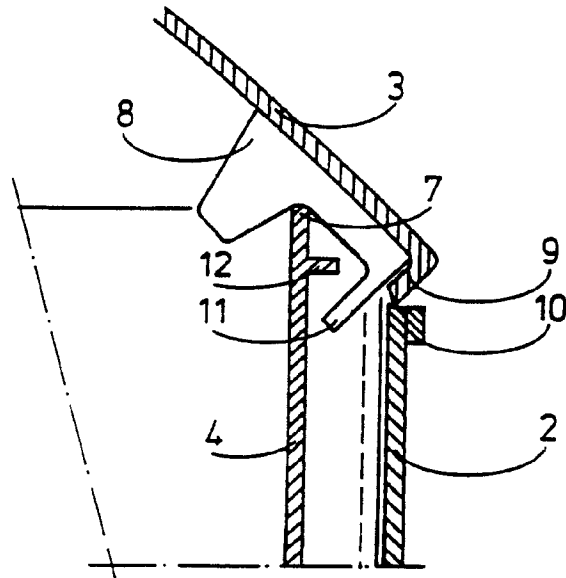
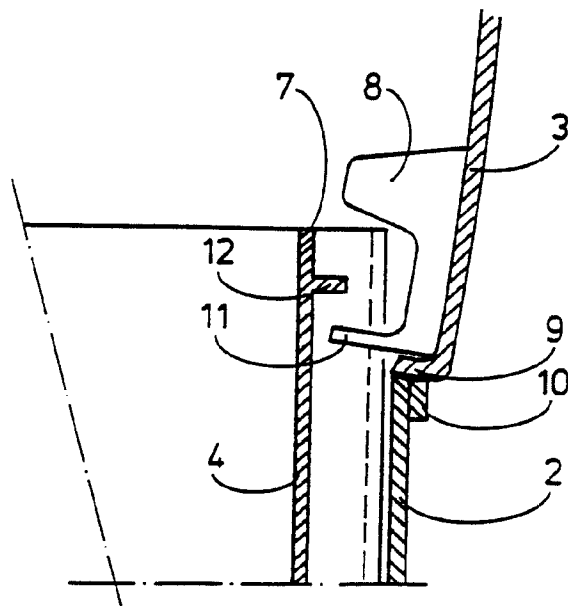


Fig. 2

2/5



3/5

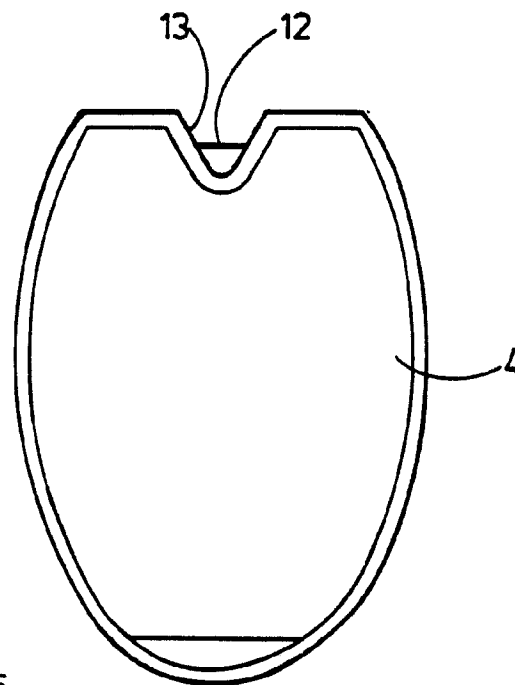


Fig. 5

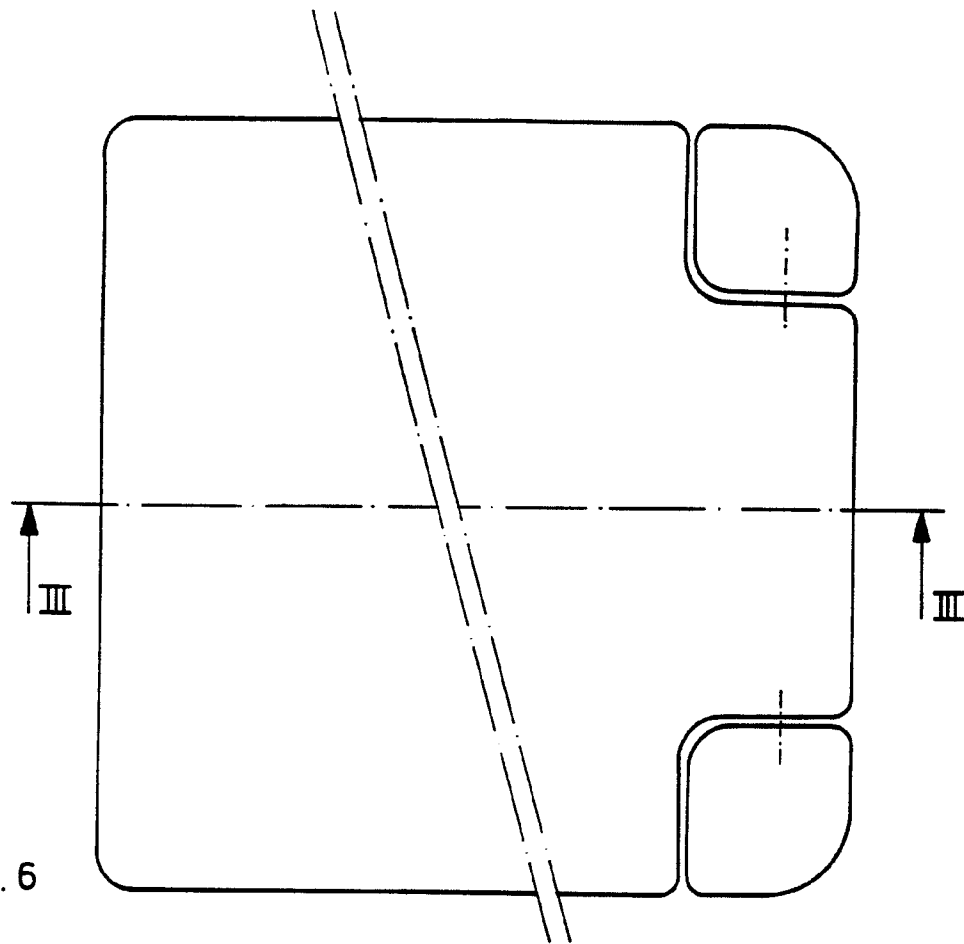
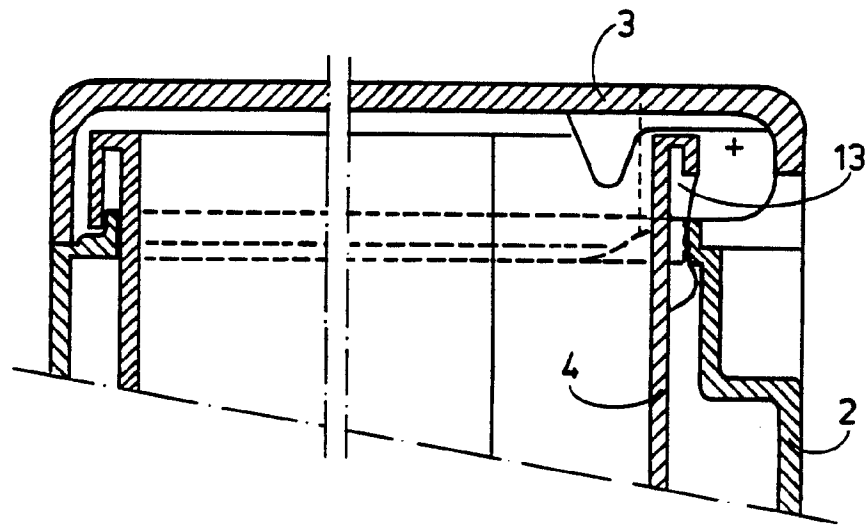


Fig. 7

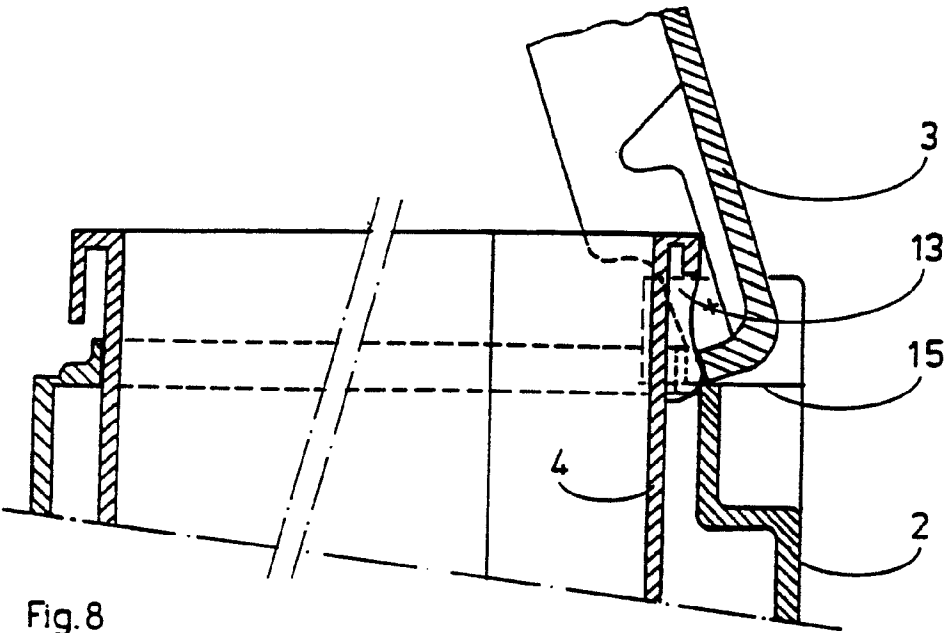


Fig. 8

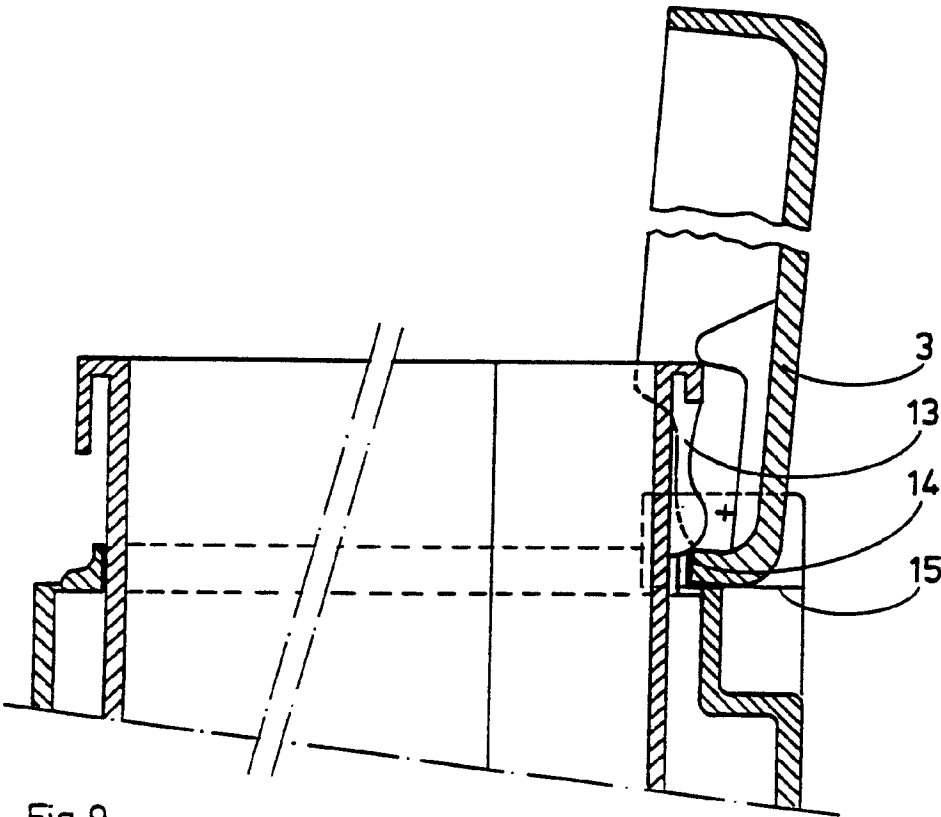


Fig. 9

INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 91/00147

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl.5 B 65 D 43/26 B 65 F 1/08		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int.Cl.5	B 65 D B 65 F	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
A	NL,A,7702456 (SICOPAL) 12 September 1978, see figure 2 -----	1
<p>* Special categories of cited documents : ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
14-11-1991	23. 12. 91	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	Natalie Weinberg	

Form PCT/ISA/210 (second sheet) (January 1985)

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

NL 9100147
SA 50244

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the European Patent Office EDP file on 03/12/91
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
NL-A- 7702456	12-09-78	None	

EPO FORM P0479

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification⁶ :

A61F 2/06, A61M 29/02

A1

(11) International Publication Number:

WO 96/33671

(43) International Publication Date:

31 October 1996 (31.10.96)

(21) International Application Number: PCT/US95/05095

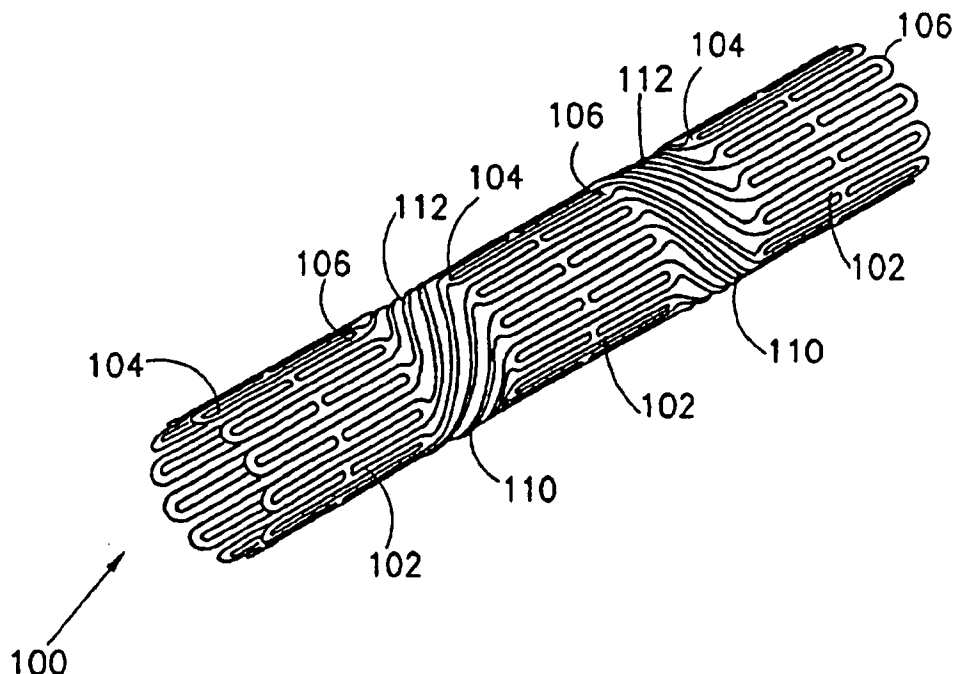
(22) International Filing Date: 26 April 1995 (26.04.95)

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San Jose, CA 95110 (US).(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH,
CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE,
KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN,
MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK,
TJ, TM, TT, UA, UG, UZ, VN, ARIPO patent (KE, MW,
SD, SZ, UG), European patent (AT, BE, CH, DE, DK, ES,
FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent
(BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD,
TG).

Published

With international search report.

(54) Title: ARTICULATED STENT



(57) Abstract

A connector (110) for connecting adjacent areas of adjacent segments (102) of an articulated stent, the connector includes a plurality of flexible links (112), wherein each of the flexible links includes a plurality of portions with each pair of neighboring portions having an area of inflection therebetween and wherein during expansion of said stent, said area of inflection of each flexible link remains inflected.

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VOLUME DISTRIBUTORS, INC. v. SIMPLEHUMAN LLC, IPR2024-00050

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GA	Gabon			VN	Viet Nam

VOLUME DISTRIBUTORS, Ex. 1004

VOLUME DISTRIBUTORS, INC. v. SIMPLEHUMAN LLC, IPR2024-00050

Page 703 of 2185

APPLICATION FOR PATENT

Title: ARTICULATED STENT

FIELD AND BACKGROUND OF THE INVENTION

- 5 The present invention relates to stents which are implanted as part of a balloon angioplasty procedure within a bodily conduit of a living animal or a human to maintain patency. In particular, the present invention relates to articulated intravascular stents for delivery through or implantation in a blood vessel having a curved portion.
- 10 Intravascular stents having a constricted diameter for delivery through a blood vessel and an expanded diameter for applying a radially outwardly extending force for supporting the blood vessel are known in the art. Articulated intravascular stents for either delivery through a curved blood vessel or implanted therein are also known in the art.
- 15 Self-expandable articulated stents are described, for example, in U.S. Patent No. 5,104,404 entitled "Articulated Stent" to Wolff. Balloon expandable articulated stents are commercially available under the trade name Palmaz-Schatz Balloon-Expandable Stents from Johnson & Johnson Intervention Systems Co.
- 20 A prior art self-expandable articulated intravascular stent 10 deployed in a curved blood vessel 16 is now described with reference to Figure 1 which is, in actual fact, Figure 2 of the above referenced U.S. Patent No. 5,104,404. Stent 10 is made up of a number of individual

segments 12 articulated by hinges 14 connected at each end to segments 12. Stent 10 is preferably fabricated from memory shape material, for example, nitinol, and as such is self expandable after delivery from a delivery system described in U.S Patent No. 4,830,003 to Wolff et al.

5 However, these prior art articulated intravascular stents suffer from a number of disadvantages both during delivery through a curved blood vessel and when implanted therein as will now described.

The delivery of stent 10 through curved blood vessel 16 is more complicated than the delivery of a non-articulated stent in that stent 10 has 10 to be angularly oriented such that its hinges 14 are located towards the convex portion of blood vessel 16 so that stent 10 can be flexed inward. In the present example, it will be noted that hinges 14 are located on the same side of segments 12 because blood vessel 16 has only a simple curve in one plane. It can be readily appreciated that delivery of stents through 15 blood vessels which have one or more curved portions which are not in the same plane is even more complicated and generally requires specially constructed stents.

Even when implanted in a curved blood vessel 16, stents 10 are shown to be lacking in that the gaps between segments 12 render the 20 curved portion of blood vessel 16 without support. Furthermore, the gaps at the convex portion of blood vessel 16 are substantially greater than the

gaps at the concave portion thereof, thereby inducing non-uniform and therefore undesirable stresses on blood vessel 16.

Therefore, it would be highly desirable to have an articulated stent which does not require any particular angular orientation when being
5 delivered through a curved bodily conduit and provides continuous and uniform support for both straight and curved portions of a bodily conduit when implanted.

It would also be highly desirable the structure of a stent does not depend on the particular orientations of curved portions of a blood vessel.

10 SUMMARY OF THE INVENTION

The object of the present invention is for an articulated stent which can be delivered through a curved bodily conduit using a routine medical procedure and a conventional stent delivery system. Furthermore, the stent provides continuous and uniform support for both straight and curved
15 portions of a bodily conduit when implanted. Still further, the structure of a stent and its support of a bodily conduit do not depend on the orientations of the curved portions of the conduit.

The objective of the present invention is achieved by an articulated stent, comprising: (a) at least two substantially rigid segments; and (b) a
20 flexible connector for connecting adjacent segments, wherein the connector

assumes a substantially cylindrical configuration when relaxed and a differentially stretched and compressed curved configuration when flexed.

After expansion, the rigid segments of the stent preferably present a fine diamond shaped mesh having 1 mm long sides to provide continuous
5 and uniform support for straight portions of a bodily conduit.

The connectors can be implemented as a plurality of substantially helical links connecting adjacent segments. Alternatively, the connectors can be implemented as links each having at least one kink. The connectors typically have between 8-24 links to provide continuous and uniform
10 support for both straight and curved portions of a bodily conduit.

The stents have constricted diameters for intraluminal delivery and are then deformed, by the inflation of a balloon forming part of their catheter delivery system, to expanded diameters for applying radially outwardly extending forces for supporting the lumen of bodily conduits.
15 The constricted and expanded diameters of the stents typically fall in the ranges of 1.0-3.5 mm and 3.5-10.0 mm, respectively.

The stents are preferably fabricated from low memory, more plastic than elastic, bio-compatible materials, for example, stainless steel 316L, gold, tantalum, etc. which enables them to be plastically deformed from
20 their constricted diameters to their expanded diameters.

A typical stent for implantation in a human coronary artery is 9-21 mm long comprising three to seven 2.2 mm long stent segments connected

by two to six 1 mm long connectors such that the ends of the stent subtend between a 45° to 135° angle at a radius of curvature of approximately 9 mm when flexed.

BRIEF DESCRIPTION OF THE DRAWINGS

5 The invention is herein described, by way of example only, with reference to the accompanying drawings, wherein:

FIG. 1 shows a close-up view of a prior art articulated stent of deployed in a curved blood vessel;

FIGS. 2a and 2b show a preferred embodiment of an articulated
10 stent, constructed and operative according to the teachings of the present invention, in its relaxed and flexed states before plastic deformation;

FIG. 2c shows the expanded stent of Figure 2 after plastic deformation;

FIG. 2d shows the stent of Figure 2 mounted on a catheter in its
15 flexed state;

FIGS. 2e and 2f show the stent of Figure 2 before and after expansion by a balloon forming part of its catheter delivery system;

FIGS. 3a and 3b show a second embodiment of an articulated stent, constructed and operative according to the teachings of the present
20 invention, in its relaxed and flexed states before plastic deformation; and

FIG. 3c shows the expanded stent of Figure 3 after plastic deformation.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention is of an articulated stent for delivering through
5 a curved bodily conduit, for example, a peripheral or coronary artery of a living animal or a human and implantation therein as part of a balloon angioplasty procedure to maintain patency.

The principles and operation of the articulated stent of the present invention may be better understood with reference to the drawings and the
10 accompanying description.

Referring now to the drawings, Figures 2a-2c show an articulated stent, generally designated 100, constructed and operative according to the teachings of the present invention, generally comprising a number of substantially rigid segments 102 connected by connectors 110.

15 Segments 102 are preferably made up to present a fine diamond mesh of interconnected diamond shaped cells 108 having 1 mm sides on expansion as best seen in Figure 2c. Depending on the intended diameter of stent 100, segments 102 typically comprise between 8-24 diamond shaped cells 108.

20 Connectors 110 comprise links 112 connecting a front end 104 to a tail end 106 of adjacent segments 102. Links 112 preferably extend in

a substantially helical fashion between apexes of diamond shaped cells 108 at front and rear ends 104 and 106 of adjacent segments 102 such that the number of links 112 equals the number of cells 108. Links 112 are preferably evenly deployed around perimeters of segments 102 such that 5 connectors 110 can be equally flexed in any direction and to provide continuous and uniform support to both straight and curved portions of a bodily conduit.

Alternate connectors 110 at front and rear ends 104 and 106, respectively, of a segment 102 preferably have links 112 wound in 10 clockwise and counter clockwise directions. Alternately winding connectors 110 ensures that the rotational displacement of links 112 and adjacent segments 102 relative to the walls of a blood vessel and more importantly the balloon of its delivery system is minimized when stent 100 is expanded.

15 It is particular feature of the present invention that connectors 110 have a generally cylindrical configuration when stent 100 is relaxed as best seen in Figure 2a and a differentially stretched and compressed curved configuration when stent 100 is flexed as best seen in Figure 2b. The flexed configuration is brought about by two relatively opposing 20 displacements of links 112. First, the differential stretching of connectors 110 occurs at the convex portion thereof denoted 114 by links 112 being displaced away from one another. Second, the differential compressing of

connectors 110 occurs at the concave portion thereof denoted 116 by links 112 being displaced towards one another.

Stent 100 has a constricted diameter for delivery through a curved bodily conduit as shown in Figures 2a and 2b and an expanded diameter 5 as shown in Figure 2c for supporting a bodily conduit. Stent 100 is preferably fabricated from low memory, more plastic than elastic, bio-compatible material, for example, stainless steel 316L, gold, tantalum, etc. which enables it to be plastically deformed from its constricted diameter to its expanded diameter. The constricted and expanded diameters of stent 10 100 typically fall in the ranges of 1.0-3.5 mm and 3.5-10.0 mm, respectively.

With reference now to Figures 2d-2f, stent 100 is shown overlying a balloon 118 forming part of its catheter delivery system 120. Stent 100 is mounted on its catheter delivery system 120 in its constricted diameter 15 state shown in Figure 2e for plastic deformation through inflation of balloon 118 to its expanded diameter shown in Figure 2f for supporting the walls of a bodily conduit. An exemplary stent for implantation in a human coronary artery, is typically 15 mm long made up of five 2.2 mm long segments 102 connected by four 1 mm long connectors 110 and capable 20 of flexion such that its ends subtend a 90° angle at a radius of curvature of approximately 9 mm.

The delivery of articulated stent 100 is considerably simpler than the delivery of prior art articulated stent 10 because stent 100 is equally flexible in all direction and therefore does not require a dedicated angular orientation to pass a particular curved portion. This advantage is particularly important for delivery through blood vessels having multiple curved portions. It is a further advantage of stent 100 over prior art stents 10, that stent 100 provides continuous and uniform support along the entire length of a blood vessel by means of segments 102 and unflexed connectors 110 supporting straight portions thereof while connector portions 114 and 116 supporting convex and concave curved portions thereof, respectively.

With reference now to Figures 3a and 3b, an articulated stent 122 is shown in which connectors 124 comprise links 126 having one or more kinks 128. The design of connectors 124 is preferred to that of connector 110 because stent 100 may have a tendency to rupture balloon 118 due to two reasons. First, links 112 overlying the convex portion of balloon 118 have a tendency to be biased inward when stent 100 is flexed. Second, segments 102 display a rotational displacement relative to balloon 118 when stent 100 is expanded.

In this case, the differentially stretched and compressed curved configuration of connector 124 is brought about by two relatively opposing displacements of links 112 as before except that the differential stretching

of connectors 124 at convex portion 114 occurs by kinks 128 being somewhat straightened out while the differential compressing of connectors 124 at concave portion 116 occurs by kinks 128 being more acutely bent.

In a similar fashion to stent 100, stent 122 has a constricted diameter 5 for delivery through a curved bodily conduit as shown in Figures 3a and 3b and an expanded diameter as shown in Figure 3c for supporting a bodily conduit when implanted therein.

While the invention has been described with respect to a limited 10 number of embodiments, it will be appreciated that many variations, modifications and other applications of the invention may be made.

CLAIMS

1. A connector for connecting adjacent areas of adjacent segments of an articulated stent, the connector comprising:

5 a plurality of flexible links,

wherein each of said flexible links includes a plurality of portions with each pair of neighboring portions having an area of inflection therebetween.

2. A connector according to claim 1 and wherein, during expansion of said stent, said area of inflection of each flexible link remains inflected.

10

3. An articulated stent, comprising:

15

(a) at least two substantially rigid segments having a plurality of connected cells each having apices, wherein, upon expansion, each of said rigid segments presents a substantially cylindrical diamond mesh; and

(b) a flexible connector, comprising a plurality of flexible links

wherein each of said flexible links connects apices of adjacent cells on adjacent rigid segments;

20

each of said flexible links includes a plurality of portions with each pair of neighboring portions having an area of inflection therebetween, and during expansion of said stent, said area of inflection remains inflected.

4. The stent as in claim 3, wherein said plurality of links includes between 8-24 links.

5. The stent as in claim 3 made from bio-compatible material capable of a more plastic than elastic deformation.

6. The stent as in claim 5, wherein said material is stainless steel.

5

7. The stent as in claim 5, wherein said material is gold.

8. The stent as in claim 5, wherein said material is tantalum

10

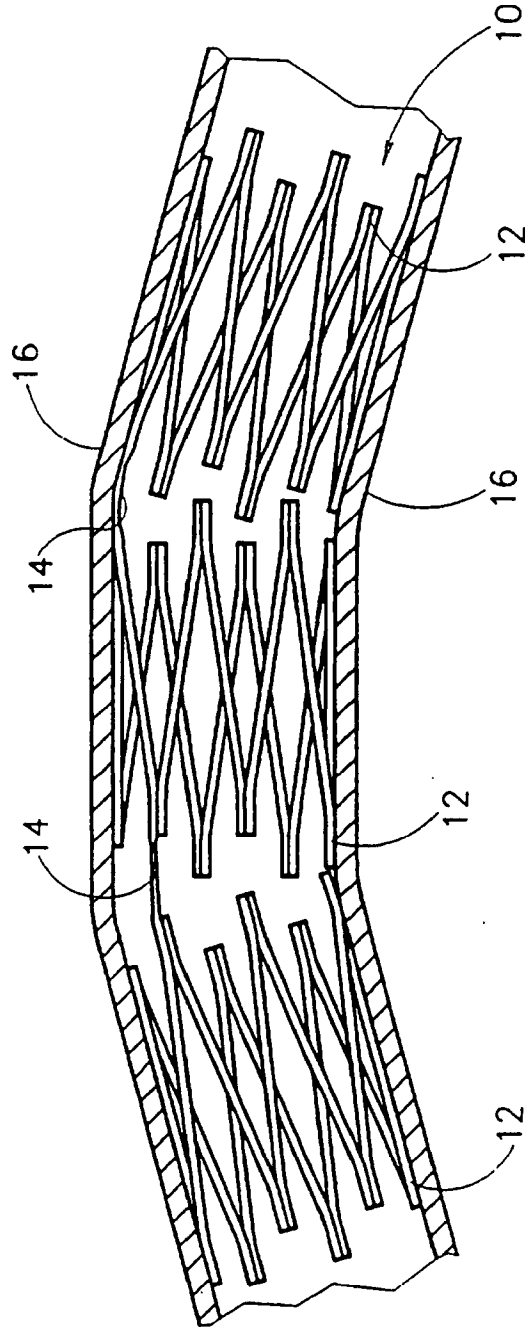


FIG. 1
PRIOR ART

2/5

FIG.2A

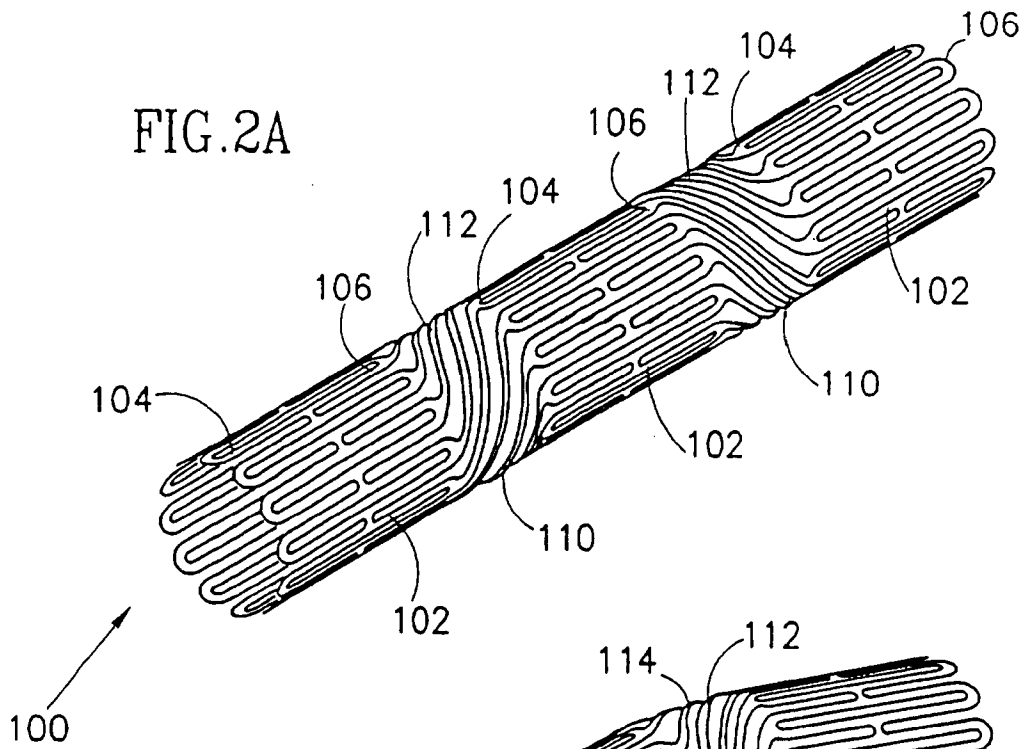


FIG.2B

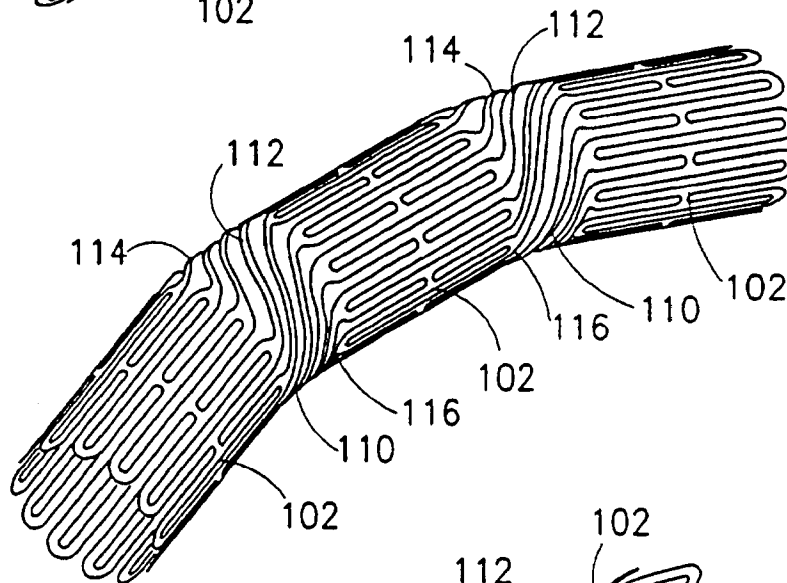
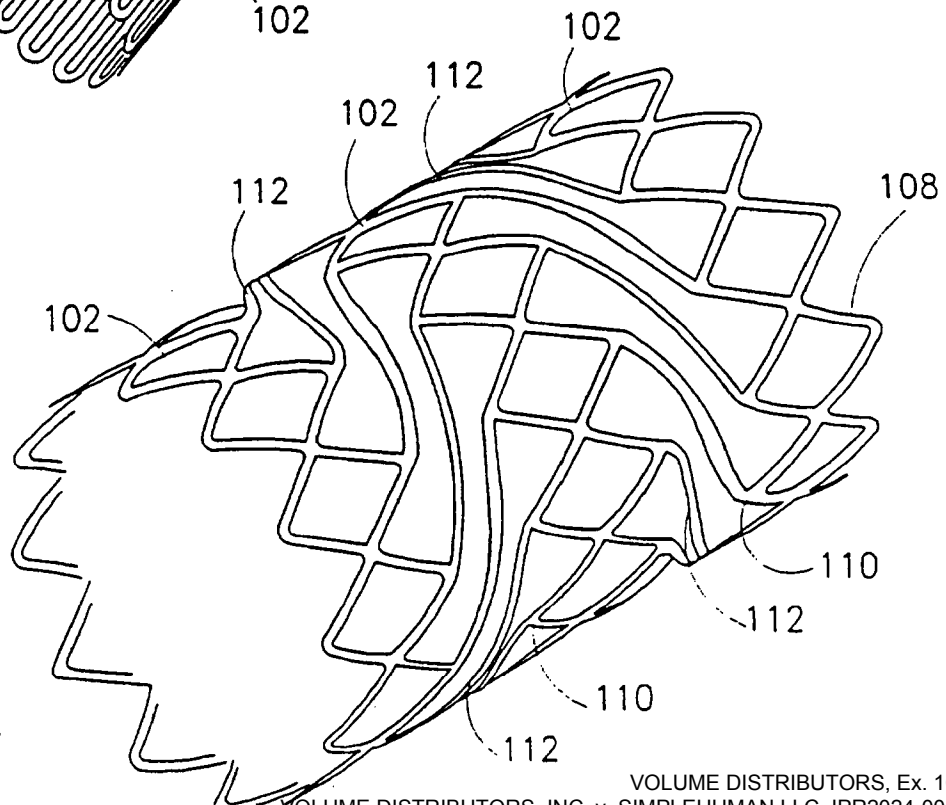
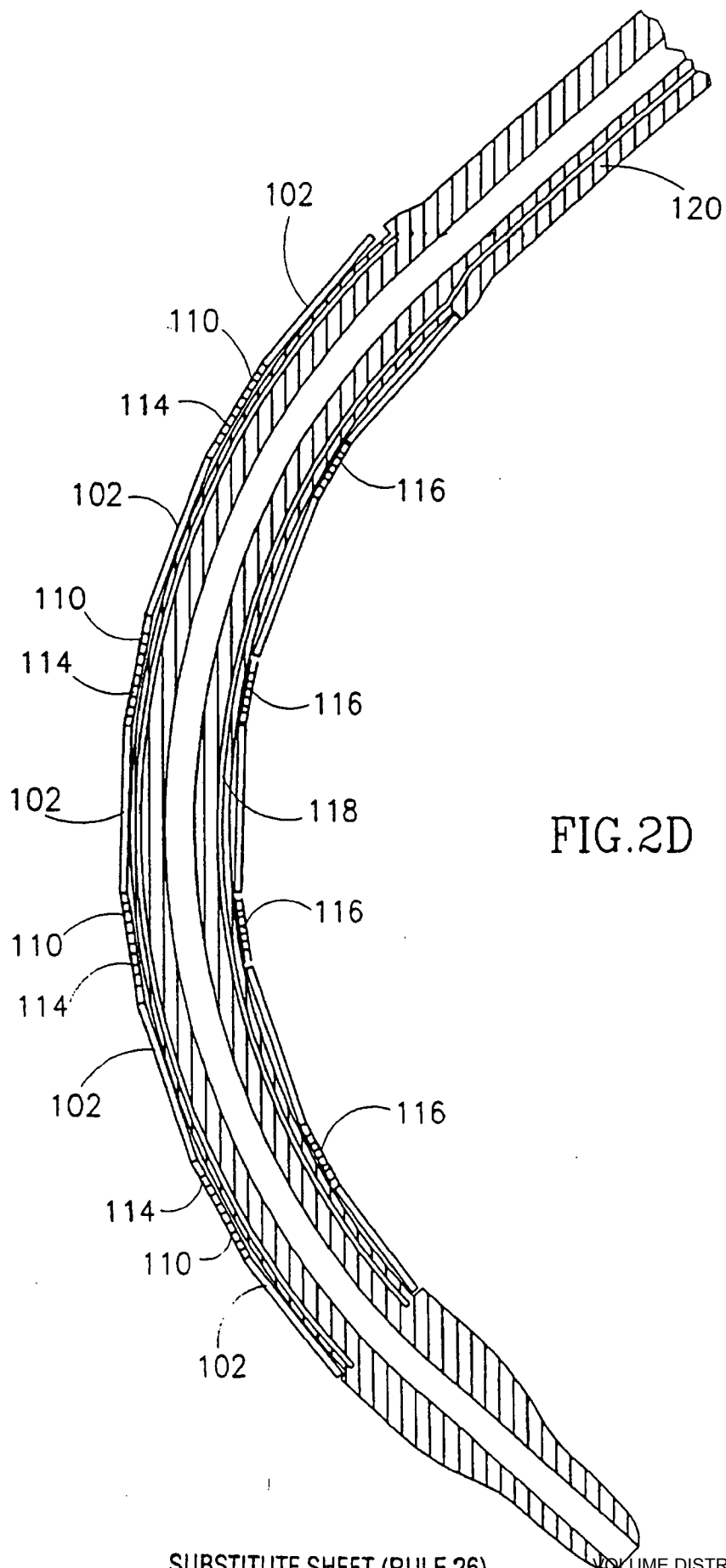


FIG.2C





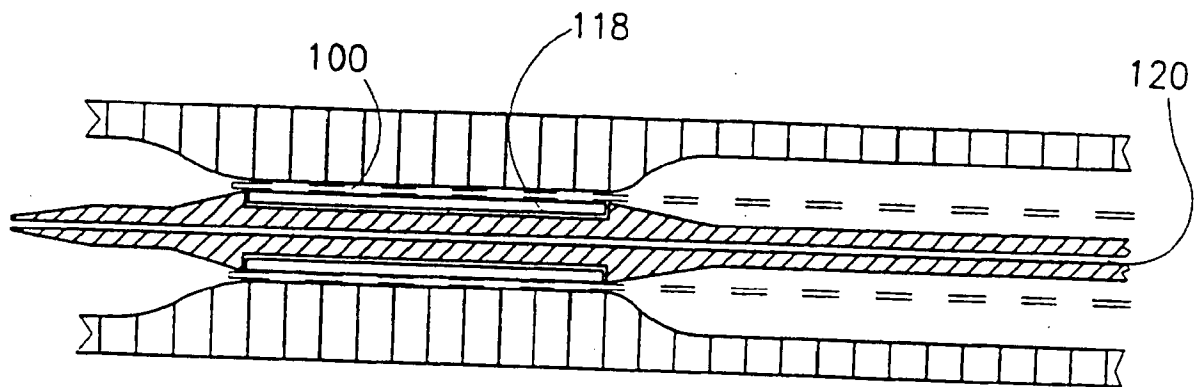


FIG. 2E

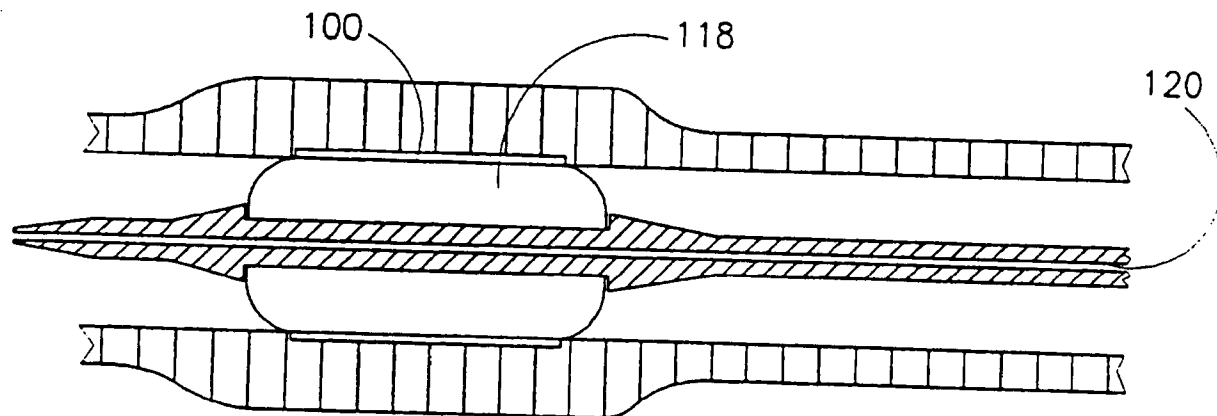


FIG. 2F

FIG.3A

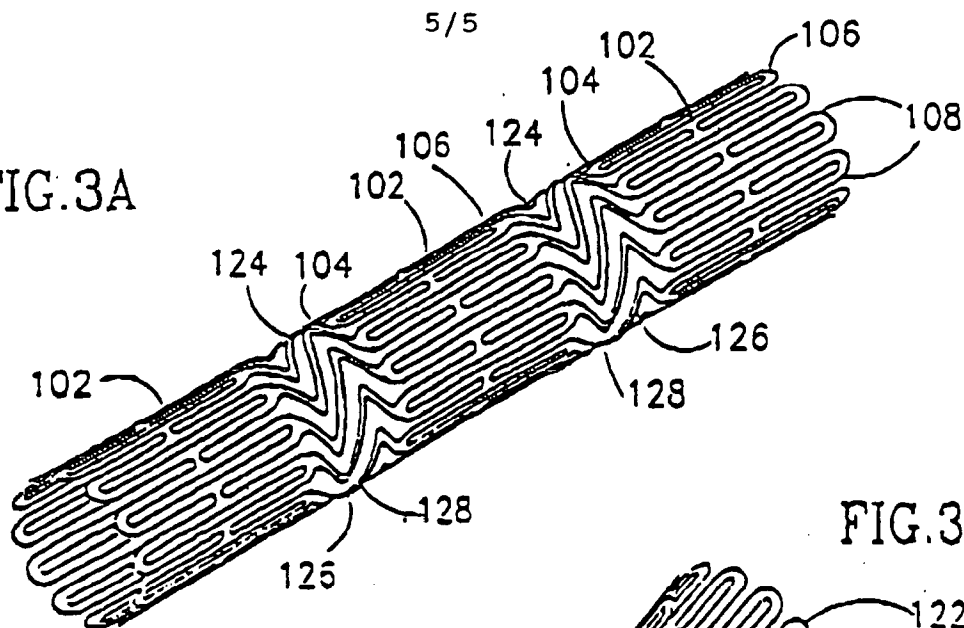


FIG.3B

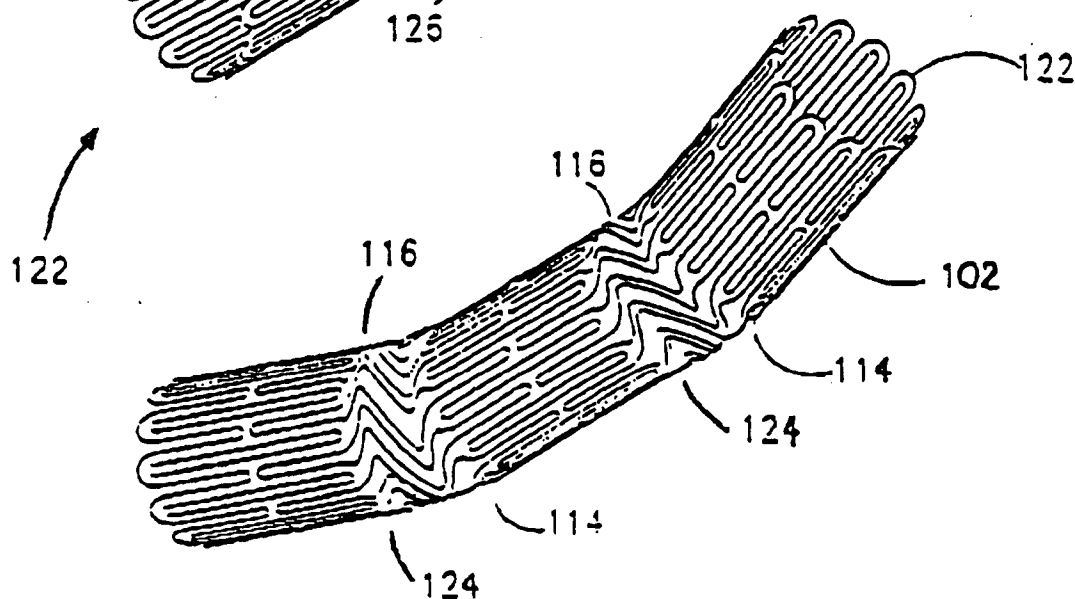
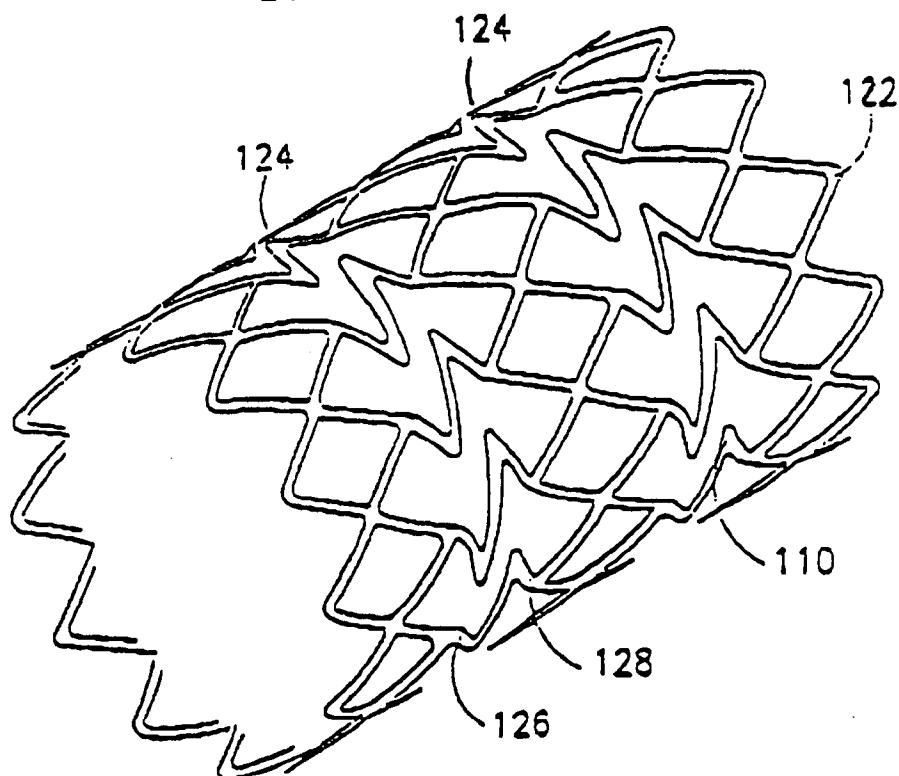


FIG.3C



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US95/05095

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : A61F 2/06; A61M 29/02

US CL : 606/195

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 604/8, 104; 606/195, 194, 198; 623/1, 11, 12

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONEElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 5,102,417 (PALMAZ) 07 April 1992, see entire document.	1-8



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	*T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be part of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

10 JUNE 1995

Date of mailing of the international search report

19 JUN 1995

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(12) 外观设计专利

(10) 授权公告号 CN 301947175 S

(45) 授权公告日 2012.06.06

(21) 申请号 201130284559.9

(22) 申请日 2011.08.22

(30) 优先权数据

29/386,880 2011.03.04 US

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(74) 专利代理机构 南京经纬专利商标代理有限公司 32200

代理人 楼高潮

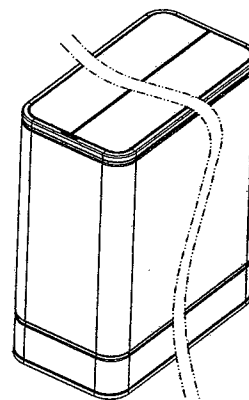
(51) LOC(9) CI.

09-09

图片或照片 8 幅 简要说明 1 页

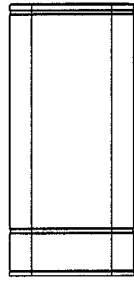
(54) 使用外观设计的产品名称

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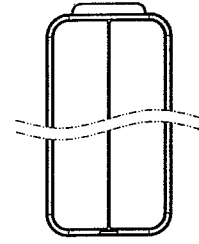


立体图 1

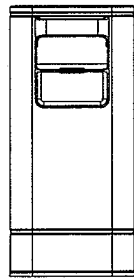
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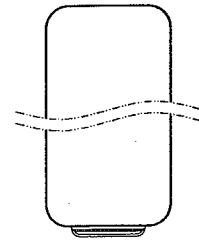
主视图



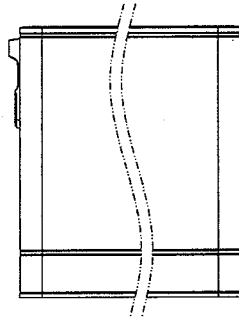
俯视图



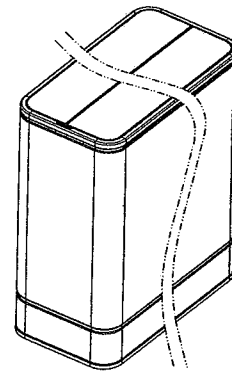
后视图



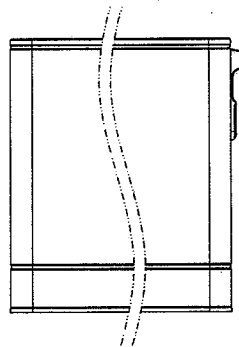
仰视图



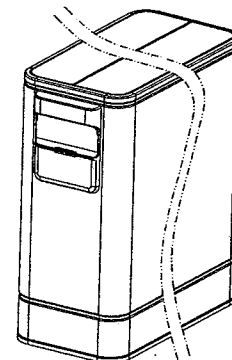
左视图



立体图 1



右视图



立体图 2

1. 本外观设计产品的名称 :垃圾桶。
2. 本外观设计产品的用途 :装放垃圾。
3. 本外观设计的设计要点 :整体外形设计。
4. 最能表明设计要点的图片或者照片 :立体图 1。
5. 如立体图 1、立体图 2、左视图、右视图、俯视图和仰视图中所示,本外观设计产品可以具有任意长度。

INFORMATION DISCLOSURE STATEMENT

Inventor	: Yang <i>et al.</i>
App. No.	: 13/787,638
Filed	: March 6, 2013
For	: TRASH CAN WITH CLUTCHING AND LINER RETENTION FEATURES
Examiner	: Unassigned
Art Unit	: 3781
Conf. No.	: 1009

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

References and Listing

Submitted herewith in the above-identified application is an Information Disclosure Statement listing references for consideration. Copies of the listed foreign and non-patent literature references are being submitted.

For certain Japanese patent references, Applicants have attached English abstracts obtained from the Japanese Patent Office website. Applicants make no representation as to the accuracy of the English abstracts. If the Examiner would like additional information regarding these references or if anything is unclear, the Examiner is invited to request such information, and Applicants will attempt to comply with any such request.

Certain Patents and Co-Pending Applications

At least the following are patents and co-pending applications that are assigned to, or that the inventors are believed to have a duty to assign to, the entity to which the present application is assigned or to which the inventors are believed to have a duty to assign:

<i>Cite No.</i>	<i>Application No. Docket No.</i>	<i>Patent/Publ. No.</i>
145	09/746,574 N/A	6,626,316
159	10/131,430 N/A	6,981,606
161	10/746,988 N/A	7,044,323

Application No.: 13/787,638
Filing Date: March 6, 2013

<i>Cite No.</i>	<i>Application No. Docket No.</i>	<i>Patent/Publ. No.</i>
163	10/614,557 N/A	7,077,283
165	10/828,067 N/A	7,086,550
166	10/717,038 N/A	7,121,421
167	10/405,725 N/A	7,225,943
170	10/609,076 N/A	7,374,060
173	11/086,932 SHUMAN.020A	7,494,021
174	11/201,369 N/A	7,540,396
176	11/007,100 N/A	7,559,433
179	11/438,839 SHUMAN.021CP1	7,656,109
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182	11/448,336 SHUMAN.059CP1C1	7,748,556
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187	11/134,107 SHUMAN.083A	7,950,543
190	11/724,677 N/A	8,074,833
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205	29/118,689 N/A	D435,951
208	29/178,459 N/A	D488,604
209	29/178,462 N/A	D488,903
211	29/185,919 N/A	D489,857

Application No.: 13/787,638
Filing Date: March 6, 2013

<i>Cite No.</i>	<i>Application No. Docket No.</i>	<i>Patent/Publ. No.</i>
212	29/179,888 N/A	D490,583
214	29/179,892 N/A	D491,706
217	29/190,310 N/A	D503,021
218	29/190,446 N/A	D507,090
221	29/210,546 N/A	D517,767
222	29/210,551 N/A	D518,266
223	29/214,722 N/A	D525,756
226	29/223,279 N/A	D535,800
232	29/238,700 N/A	D539,498
233	29/245,127 N/A	D539,499
235	29/251,337 N/A	D542,001
243	29/259,278 N/A	D552,321
244	29/263,255 SHUMAN.029DA	D552,823
246	29/263,258 SHUMAN.030DA	D552,825
247	29/267,029 SHUMAN.035DA	D559,494
248	29/271,251 N/A	D559,495
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256	29/293,498 N/A	D578,722
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259	29/293,406 N/A	D580,615
260	29/291,382 N/A	D585,618

Application No.: 13/787,638
Filing Date: March 6, 2013

<i>Cite No.</i>	<i>Application No. Docket No.</i>	<i>Patent/Publ. No.</i>
261	29/313,029 N/A	D603,119
262	29/303,204 SHUMAN.061DA	D611,216
263	29/308,501 N/A	D611,671
264	29/334,146 SHUMAN.084DA	D615,722
265	29/357,444 N/A	D631,221
266	29/357,560 N/A	D632,864
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323	12/024,946 SHUMAN.061A	2009/0194532
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331	13/040,770 SHUMAN.100A	2011/0220647
332	13/040,786 SHUMAN.100A2	2011/0220648

Application No.: 13/787,638
Filing Date: March 6, 2013

<i>Cite No.</i>	<i>Application No. Docket No.</i>	<i>Patent/Publ. No.</i>
333	13/047,662 SHUMAN.107A	2011/0220655
334	13/417,084 SHUMAN.128A	N/A
335	13/783,149 SHUMAN.135A	N/A
336	29/447,313 SHUMAN.135DA	N/A

With regard to the above-referenced patents and applications, Applicants respectfully request that the Examiner consider whether the subject matter claimed therein, now or as may be amended in the future, as well as the associated prosecution histories, now or in the future, may be relevant to the patentability of the present application (*e.g.*, for reasons of patentability or obviousness-type double patenting). Applicants believe that the Examiner has access to these patents and applications and the associated file histories through sophisticated U.S. Patent Office systems (*e.g.*, the Image File Wrapper system). Accordingly, Applicants have not provided copies of these patents and applications, or their associated file histories. Nevertheless, Applicants would be happy to provide copies of any of these patents and applications, or their associated file histories, now or in the future, upon request.

Timing of Disclosure

This Information Disclosure Statement is being filed before the receipt of a First Office Action on the merits, and presumably no fee is required. If a First Office Action on the merits was mailed before the mailing date of this Statement, the Commissioner is authorized to charge the fee set forth in 37 C.F.R. § 1.17(p) to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: June 11, 2013

By: Jason R. Swartz/

Jason Swartz

Registration No. 64,420

Attorney of Record

Customer No. 20995

(949) 760-0404

15498194

PATENT ASSIGNMENT

Electronic Version v1.1

Stylesheet Version v1.1

SUBMISSION TYPE:	NEW ASSIGNMENT																
NATURE OF CONVEYANCE:	ASSIGNMENT																
CONVEYING PARTY DATA																	
<table border="1"><thead><tr><th>Name</th><th>Execution Date</th></tr></thead><tbody><tr><td>Frank Yang</td><td>08/20/2013</td></tr><tr><td>David Wolbert</td><td>08/20/2013</td></tr><tr><td>Joseph Sandor</td><td>08/15/2013</td></tr><tr><td>Kenneth Yen</td><td>08/20/2013</td></tr><tr><td>Orlando Cardenas</td><td>08/20/2013</td></tr><tr><td>Michael Basha</td><td>04/25/2013</td></tr><tr><td>Christopher Fruhauf</td><td>04/25/2013</td></tr></tbody></table>	Name	Execution Date	Frank Yang	08/20/2013	David Wolbert	08/20/2013	Joseph Sandor	08/15/2013	Kenneth Yen	08/20/2013	Orlando Cardenas	08/20/2013	Michael Basha	04/25/2013	Christopher Fruhauf	04/25/2013	
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Orlando Cardenas	08/20/2013																
Michael Basha	04/25/2013																
Christopher Fruhauf	04/25/2013																
RECEIVING PARTY DATA																	
<table border="1"><tr><td>Name:</td><td>simplehuman, LLC</td></tr><tr><td>Street Address:</td><td>19850 Magellan Drive</td></tr><tr><td>City:</td><td>Torrance</td></tr><tr><td>State/Country:</td><td>CALIFORNIA</td></tr><tr><td>Postal Code:</td><td>90502</td></tr></table>	Name:	simplehuman, LLC	Street Address:	19850 Magellan Drive	City:	Torrance	State/Country:	CALIFORNIA	Postal Code:	90502							
Name:	simplehuman, LLC																
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Postal Code:	90502																
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<table border="1"><thead><tr><th>Property Type</th><th>Number</th></tr></thead><tbody><tr><td>Application Number:</td><td>13787638</td></tr></tbody></table>	Property Type	Number	Application Number:	13787638													
Property Type	Number																
Application Number:	13787638																
CORRESPONDENCE DATA																	
Fax Number: 9497609502 <i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i>																	
Phone: 949-760-0404																	
Email: efiling@knobbe.com																	
Correspondent Name: Knobbe, Martens, Olson & Bear, LLP																	
Address Line 1: 2040 Main Street, 14th Floor																	
Address Line 4: Irvine, CALIFORNIA 92614																	
ATTORNEY DOCKET NUMBER:	SHUMAN.122A																

OP \$40.00 13787638

NAME OF SUBMITTER:	Jason R. Swartz
Signature:	/Jason R. Swartz/
Date:	08/29/2013
	This document serves as an Oath/Declaration (37 CFR 1.63).
Total Attachments: 9 source=SHUMAN122A#page1.tif source=SHUMAN122A#page2.tif source=SHUMAN122A#page3.tif source=SHUMAN122A#page4.tif source=SHUMAN122A#page5.tif source=SHUMAN122A#page6.tif source=SHUMAN122A#page7.tif source=SHUMAN122A#page8.tif source=SHUMAN122A#page9.tif	

COMBINED DECLARATION & ASSIGNMENT (37 C.F.R. § 1.63(e))

Application Data Sheet filed previously or concurrently

Docket No.: SHUMAN.122A

Page 1 of 9

Title: TRASH CAN WITH CLUTCHING AND LINER RETENTION FEATURES

Inventors: Frank Yang, David Wolbert, Joseph Sandor, Kenneth Yen, Orlando Cardenas, Michael Basha, and Christopher Fruhauf

Declaration

This Declaration is directed to the application that was filed with the United States Patent and Trademark Office on March 6, 2013 as Application No. 13/787,638.

As a named inventor, I declare that:

The above-identified application was made or authorized to be made by me;

I believe that I am the original inventor or an original joint inventor in the application;

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. § 1001 by fine or imprisonment of not more than five years, or both;

I have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment; and

I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. § 1.56.

Assignment from Inventors

WHEREAS, **above-identified inventors** (individuals hereinafter "ASSIGNOR") invented certain new and useful improvements, technology, inventions, developments, ideas, ornamental designs, or discoveries, and hereby assign or are under an obligation to assign to the below-identified Assignee the above-titled application (collectively hereinafter referred to as the "Work") for which an application for Letters Patent in the United States was filed with the United States Patent and Trademark Office on March 6, 2013 as Application No. 13/787,638 (hereinafter the "Application").

AND WHEREAS, **simplehuman, LLC**, with its principal place of business at 19850 Magellan Drive, Torrance, CA 90502 (hereinafter the "ASSIGNEE"), desires to acquire the entire right, title, and interest in and to the Application and the Work.

NOW, THEREFORE, for good and valuable consideration of which receipt is hereby acknowledged, ASSIGNOR hereby acknowledges that ASSIGNOR has sold, assigned, transferred and set over, and by these presents does hereby sell, assign, transfer and set over, unto said ASSIGNEE, its successors, legal representatives and assigns, the entire right, title, and interest throughout the world in the Application and the Work, including all patent properties filed or issued upon the Application and the Work; where "Patent Properties" include, but are not limited to:

all provisional applications relating thereto (including but not limited to U.S. Provisional Application No. 61/609,233, filed **March 9, 2012**);

all nonprovisional applications claiming priority to aforementioned provisional(s) and/or the present Application, including, all divisions, continuations, continuations-in-part, and reissues, and all Letters Patent of the United States which may be granted thereon and all reissues and extensions thereof; and

all rights of priority under International Conventions and any related Letters Patent which may hereafter be granted or filed in any country or countries foreign to the United States, all extensions, renewals and reissues thereof.

ASSIGNOR hereby acknowledges the ASSIGNEE as the Applicant for all aforementioned patent properties, and authorizes and requests the Commissioner of Patents of the United States, and any

COMBINED DECLARATION & ASSIGNMENT (37 C.F.R. § 1.63(e))*Application Data Sheet filed previously or concurrently*

Docket No.: SHUMAN.122A

Page 2 of 9

Title: TRASH CAN WITH CLUTCHING AND LINER RETENTION FEATURES

Inventors: Frank Yang, David Wolbert, Joseph Sandor, Kenneth Yen, Orlando Cardenas, Michael Basha,
and Christopher Fruhauf

Official of any country or countries foreign to the United States, whose duty it is to issue patents on applications as aforesaid, to issue all related Letters Patent to the ASSIGNEE, its successors, legal representatives and assigns, in accordance with the terms of this instrument.

AND ASSIGNOR DOES HEREBY sell, assign, transfer, and convey to ASSIGNEE, its successors, legal representatives, and assigns all claims for damages and all remedies arising out of any violation of the rights assigned hereby that may have accrued prior to the date of assignment to ASSIGNEE, or may accrue hereafter, including, but not limited to, the right to sue for, collect, and retain damages for past infringements of said Letters Patent before or after issuance.

AND ASSIGNOR DOES HEREBY covenant and agree that ASSIGNOR will communicate to said ASSIGNEE, its successors, legal representatives and assigns, any facts known to ASSIGNOR respecting the Work, and testify in any legal proceeding, assist in the preparation of any other Patent Property relating to the Application and the Work or any improvements made thereto, sign/execute all lawful papers, execute and make all rightful oaths and/or declarations in connection with the Application and the Work including any improvements made thereto, any patent applications filed therefrom, and any continuing application filed from any of the aforementioned applications, and generally do everything possible to aid the ASSIGNEE, its successors, legal representatives and assigns, to obtain and enforce proper patent protection for the Work in all countries.

COMBINED DECLARATION & ASSIGNMENT (37 C.F.R. § 1.63(e))

Application Data Sheet filed previously or concurrently

Docket No.: SHUMAN.122A

Page 3 of 9

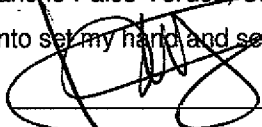
Title: TRASH CAN WITH CLUTCHING AND LINER RETENTION FEATURES

Inventors: Frank Yang, David Wolbert, Joseph Sandor, Kenneth Yen, Orlando Cardenas, Michael Basha,
and Christopher Fruhauf

Legal Name of inventor: Frank Yang

Residence: 6847 Alta Vista Drive, Rancho Palos Verdes, California 90275

IN TESTIMONY WHEREOF, I hereunto set my hand and seal this 20 day of August, 2013.

Signature: 

Date: 8/20/2013

Signature before a Notary is desirable but not required.

STATE OF CALIFORNIA

COUNTY OF _____

} ss.

On _____, before me, _____, notary public, personally appeared Frank Yang who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Notary Signature

[SEAL]

COMBINED DECLARATION & ASSIGNMENT (37 C.F.R. § 1.63(e))

Application Data Sheet filed previously or concurrently

Docket No.: SHUMAN.122A

Page 4 of 9

Title: TRASH CAN WITH CLUTCHING AND LINER RETENTION FEATURES

Inventors: Frank Yang, David Wolbert, Joseph Sandor, Kenneth Yen, Orlando Cardenas, Michael Basha,
and Christopher Fruhauf

Legal Name of inventor: David Wolbert

Residence: 1715 Herrin Street, Redondo Beach, California 90278

IN TESTIMONY WHEREOF, I hereunto set my hand and seal this 20th day of August, 2013.

Signature: [Signature] Date: 8/20/13

Signature before a Notary is desirable but not required.

STATE OF CALIFORNIA

COUNTY OF _____

} ss.

On _____, before me, _____, notary public, personally appeared David Wolbert who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Notary Signature

[SEAL]

COMBINED DECLARATION & ASSIGNMENT (37 C.F.R. § 1.63(e))

Application Data Sheet filed previously or concurrently

Docket No.: SHUMAN.122A

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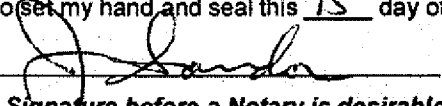
Title: TRASH CAN WITH CLUTCHING AND LINER RETENTION FEATURES

Inventors: Frank Yang, David Wolbert, Joseph Sandor, Kenneth Yen, Orlando Cardenas, Michael Basha,
and Christopher Fruhauf

Legal Name of inventor: Joseph Sandor

Residence: 1521 Pegasus Street, Newport Beach, California 92660

IN TESTIMONY WHEREOF, I hereunto set my hand and seal this 15 day of AUGUST, 2013.

Signature: 

Date: 8/15/2013

Signature before a Notary is desirable but not required.

STATE OF CALIFORNIA

} ss.

COUNTY OF _____

On _____, before me, _____, notary public, personally appeared Joseph Sandor who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Notary Signature

[SEAL]

COMBINED DECLARATION & ASSIGNMENT (37 C.F.R. § 1.63(e))

Application Data Sheet filed previously or concurrently

Docket No.: SHUMAN.122A

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Title: TRASH CAN WITH CLUTCHING AND LINER RETENTION FEATURES

Inventors: Frank Yang, David Wolbert, Joseph Sandor, Kenneth Yen, Orlando Cardenas, Michael Basha,
and Christopher Fruhauf

Legal Name of inventor: Kenneth Yen

Residence: 1604 Cabrillo Avenue #2, Torrance, California 90501

IN TESTIMONY WHEREOF, I hereunto set my hand and seal this 20 day of August, 2013.

Signature: [Signature] Date: 8/20/2013

Signature before a Notary is desirable but not required.

STATE OF CALIFORNIA

COUNTY OF _____

} ss.

On _____, before me, _____, notary public, personally appeared Kenneth Yen who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Notary Signature

[SEAL]

COMBINED DECLARATION & ASSIGNMENT (37 C.F.R. § 1.63(e))

Application Data Sheet filed previously or concurrently

Docket No.: SHUMAN.122A

Page 7 of 9

Title: TRASH CAN WITH CLUTCHING AND LINER RETENTION FEATURES

Inventors: Frank Yang, David Wolbert, Joseph Sandor, Kenneth Yen, Orlando Cardenas, Michael Basha,
and Christopher Fruhauf

Legal Name of inventor: Orlando Cardenas

Residence: 29252 Alfieri, Laguna Niguel, California 92677

IN TESTIMONY WHEREOF, I hereunto set my hand and seal this 20 day of August, 2013

Signature:  Date: 8/20/2013

Signature before a Notary is desirable but not required.

STATE OF CALIFORNIA

COUNTY OF _____

} ss.

On _____, before me, _____, notary public, personally appeared Orlando Cardenas who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Notary Signature

[SEAL]

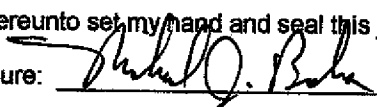
COMBINED DECLARATION & ASSIGNMENT (37 C.F.R. § 1.63(e))*Application Data Sheet filed previously or concurrently*

Docket No.: SHUMAN.122A

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Title: TRASH CAN WITH CLUTCHING AND LINER RETENTION FEATURES

Inventors: Frank Yang, David Wolbert, Joseph Sandor, Kenneth Yen, Orlando Cardenas, Michael Basha, and Christopher Fruhauf

Legal Name of Inventor: Michael Basha**Residence:** 632 Callippe Court, Brisbane, California 94005IN TESTIMONY WHEREOF, I hereunto set my hand and seal this 25th day of April, 2013.Signature: Date: 4/25/2013**Signature before a Notary is desirable but not required.****STATE OF CALIFORNIA**

} ss.

COUNTY OF _____

On _____, before me, _____, notary public, personally appeared Frank Yang who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

[SEAL]

Notary Signature

COMBINED DECLARATION & ASSIGNMENT (37 C.F.R. § 1.63(e))*Application Data Sheet filed previously or concurrently*

Docket No.: SHUMAN.122A

Page 9 of 9

Title: TRASH CAN WITH CLUTCHING AND LINER RETENTION FEATURES

Inventors: Frank Yang, David Wolbert, Joseph Sandor, Kenneth Yen, Orlando Cardenas, Michael Basha,
and Christopher Fruhauf

Legal Name of inventor: Christopher Fruhauf

Residence: 21 Kenrick Avenue, San Anselmo, California 94960

IN TESTIMONY WHEREOF, I hereunto set my hand and seal this 25th day of APRIL, 2013.Signature: Date: 4-25-13*Signature before a Notary is desirable but not required.*

STATE OF CALIFORNIA

} ss.

COUNTY OF _____

On _____, before me, _____, notary public, personally appeared Frank Yang who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

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Notary Signature

[SEAL]

14938179



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/787,638	03/06/2013	Frank Yang	SHUMAN.122A

CONFIRMATION NO. 1009

PUBLICATION NOTICE



OC00000063737983

20995
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

Title: TRASH CAN WITH CLUTCHING AND LINER RETENTION FEATURES

Publication No. US-2013-0233857-A1

Publication Date: 09/12/2013

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

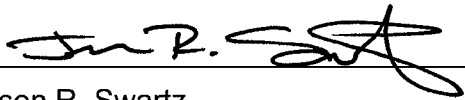
Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

**TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE
REGISTERED PRACTITIONERS**

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA/82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	13/787,638
Filing Date	March 6, 2013
First Named Inventor	Yang et al.
Title	TRASH CAN WITH CLUTCHING AND LINER RETENTION FEATURES
Art Unit	3781
Examiner Name	Unassigned
Attorney Docket Number	SHUMAN.122A

SIGNATURE of Applicant or Patent Practitioner

Signature		Date (Optional)	
Name	Jason R. Swartz	Registration Number	64420
Title (if Applicant is a juristic entity)	Attorney for Applicant		
Applicant Name (if Applicant is a juristic entity)			

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☐

*Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in the attached transmittal letter.

- ☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent):

20995

OR

- ☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent):

Name	Registration Number	Name	Registration Number

Please recognize or change the correspondence address for the application identified in the attached transmittal letter to:

- ☒ The address associated with the above-mentioned Customer Number.

OR

- ☐ The address associated with Customer Number:

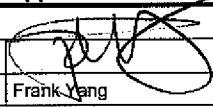
OR

☐ Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Email		

I am the Applicant:

- ☐ Inventor or Joint Inventor
☐ Legal Representative of a Deceased or Legally Incapacitated Inventor
☒ Assignee or Person to Whom the Inventor is Under an Obligation to Assign
☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document)

SIGNATURE of Applicant for Patent

Signature		Date	10/17/2013
Name	Frank Yang	Telephone	310-436-2250
Title and Company	Chief Executive Officer, simplehuman, LLC		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms for more than one signature, see below *:

- ☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	17218514
Application Number:	13787638
International Application Number:	
Confirmation Number:	1009
Title of Invention:	TRASH CAN WITH CLUTCHING AND LINER RETENTION FEATURES
First Named Inventor/Applicant Name:	Frank Yang
Customer Number:	20995
Filer:	Jason R. Swartz/Christine Showalter
Filer Authorized By:	Jason R. Swartz
Attorney Docket Number:	SHUMAN.122A
Receipt Date:	24-OCT-2013
Filing Date:	06-MAR-2013
Time Stamp:	14:50:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	POA_SHUMAN122A.pdf	127764 97877494fdd98837d8c851ee60c8a024a760b73b	no	2

Warnings:

Information:

VOLUME DISTRIBUTORS, Ex. 1004

VOLUME DISTRIBUTORS, INC. v. SIMPLEHUMAN LLC, IPR2024-00050

Page 744 of 2185

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/787,638	03/06/2013	Frank Yang	SHUMAN.122A

CONFIRMATION NO. 1009

POA ACCEPTANCE LETTER

20995
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614



Date Mailed: 10/30/2013

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/24/2013.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/zabaha/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor	:	Yang <i>et al.</i>
App. No.	:	13/787,638
Filed	:	March 6, 2013
For	:	TRASH CAN WITH CLUTCHING AND LINER RETENTION FEATURES
Examiner	:	Kevin Charles Castillo
Art Unit	:	3781
Conf No.	:	1009

PRELIMINARY AMENDMENT**Mail Stop Amendment**

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir:

Prior to examination on the merits of the above-identified application, please enter the following:

Amendments to the Claims, which begin on page 2; and

Remarks, which begin on page 6.

AMENDMENTS TO THE CLAIMS

Please amend Claim 1, and add Claims 21-25 as shown below:

1. (Currently Amended) A trash can assembly comprising:
 - a body component configured to receive a portion of a removable liner;
 - a trim member pivotally coupled with the body and configured to move between a closed position and an open position ~~such that, when the trim member is in the closed position and an upper portion of the removable liner is positioned over an upper edge of the body component, the trim member is configured to engage the upper edge of the body component to secure the upper portion of the removable liner between the trim member and the upper edge of the body component;~~ and
 - a lid pivotally coupled with the body and configured to move between a first position and a second position, a periphery of the lid being generally received in the trim when the trim is in the closed position and the lid is in the first position, the periphery of the lid being positioned generally outside of the trim when the trim is in the closed position and the lid is in the second position.
2. (Original) The trash can assembly of Claim 1, wherein the trim member further comprises a retaining mechanism configured to maintain the trim member in the open position, thereby allowing a user to mount the removable liner in the trash can assembly.
3. (Original) The trash can assembly of Claim 2, wherein the retaining mechanism comprises a first cam structure and a second cam structure, the first cam structure configured to be received in a recess of the second cam structure as the trim member moves toward the open position.
4. (Original) The trash can assembly of Claim 1, further comprising a power operated driving mechanism configured to move the lid between the first and second positions.
5. (Original) The trash can assembly of Claim 4, wherein the power operated driving mechanism is activated by a sensor.
6. (Original) The trash can assembly of Claim 5, wherein at least one of the power operated driving mechanism and the sensor is deactivated when the trim member is in the open position.

7. (Original) A trash can assembly comprising:
a body component;
a lid mounted relative to the body component and configured to move between open and closed positions, the lid having a lid driving mechanism;
a power operated driving mechanism comprising a motor coupled with a shaft;
and

a clutch mechanism engageable with the lid driving mechanism, the clutch mechanism configured to receive torque from the motor via the shaft and to transmit the torque to the lid driving mechanism to move the lid between the open and closed positions;

wherein the lid driving mechanism and the clutch member are configured to allow a user to manually move the lid between the open and closed positions substantially without applying torque to at least one of: the motor, the shaft, and the clutch mechanism.

8. (Original) The trash can assembly of Claim 7, wherein the lid driving mechanism is attached to a bottom surface of the lid and is configured to abut with the clutch mechanism such that, when the driving mechanism is operated, the clutch mechanism is configured to move the lid between the open and closed positions.

9. (Original) The trash can assembly of Claim 8, wherein the lid driving mechanism comprises radially inwardly extending first and second flanges configured to abut with first and second torque transmission members of the clutch mechanism respectively, such that rotation of the clutch mechanism rotates the first and second flanges and the lid moves between the open and closed positions.

10. (Original) The trash can assembly of Claim 9, wherein the first and second flanges are positioned on the lid such that circumferential spaces are defined between the first and second flanges, wherein the first and second torque transmission members are configured to be positioned within the circumferential spaces.

11. (Original) The trash can assembly of Claim 10, wherein the first and second torque transmission members comprise first and second arms extending radially outward from a central body of the clutch mechanism, wherein a circumferential space is disposed between the first and second flanges, at least one of the first and second arms being positioned within the circumferential space.

12. (Original) The trash can assembly of Claim 11, wherein at least one of the first and second arms having a first surface and second surface, the first surface configured to abut with the first flange and the second surface configured to abut with the second flange.

13. (Original) The trash can assembly of Claim 12, wherein, when the first surface is abutted with the first flange, a first circumferential distance is defined between a second surface of the second arm and the second flange, the first circumferential distance being greater than or equal to the amount of rotation of the lid between the closed and open positions.

14. (Original) A trash can assembly comprising:

a body component;

a lid mounted relative to the body component and configured to move between open and closed positions;

a driving mechanism operable to move the lid between the open and closed positions, the driving mechanism comprising a motor, a shaft, and an end member, the motor configured to rotate the shaft, the shaft configured to rotate the end member; and

a clutch mechanism rotatably engageable with the lid and adapted to receive torque from the end member so as to move the lid between the open and closed positions, the clutch mechanism being configured to move relative to the end member when the lid is moved between the opened and closed positions generally without operation of the driving mechanism.

15. (Original) The trash can assembly of Claim 14, wherein the driving mechanism comprises a biasing member configured to bias the clutch mechanism into engagement with the end member such that torque from the motor is transmitted to the clutch mechanism via the engagement between the end member and the clutch mechanism.

16. (Original) The trash can assembly of Claim 15, wherein the end member is rigidly coupled to the shaft such that the end member is generally prevented from rotating relative to the shaft.

17. (Original) The trash can assembly of Claim 16, wherein:

when the lid is moved between the opened and closed positions generally without operation of the driving mechanism, the clutch mechanism is configured to translate toward the motor along a portion of a longitudinal length of the shaft and to rotate relative to the end member; and

when such movement of the lid ceases, the bias of the biasing member translates the clutch mechanism towards and into engagement with the end member.

18. (Original) The trash can assembly of Claim 16, wherein the clutch mechanism and the end member comprise corresponding cam surfaces configured to allow the clutch mechanism to translate and rotate relative to the end member.

19. (Original) The trash can assembly of Claim 18, wherein the clutch mechanism comprises a first inclined cam surface and the end member comprises a second inclined cam surface, the first and second inclined cam surfaces configured to allow mating engagement between the clutch mechanism and the end member.

20. (Original) The trash can assembly of Claim 19, wherein when the lid is moved between the opened and closed positions generally without operation of the driving mechanism, the first and second inclined cam surfaces slide relative to each other.

21. (New) The trash can assembly of Claim 14, further comprising a trim member pivotally coupled with the body, the trim member and the lid being configured to rotate about the same axis.

22. (New) The trash can assembly of Claim 1, wherein the lid and the trim member are configured to pivot about the same axis.

23. (New) The trash can assembly of Claim 1, wherein, when the trim member is in the closed position and an upper portion of the removable liner is positioned over an upper edge of the body component:

the trim member is configured to engage the upper edge of the body component;
and

the upper portion of the removable liner is positioned between the trim member and the upper edge of the body component.

24. (New) The trash can assembly of Claim 23, wherein the trim member is further configured to secure the upper portion of the removable liner between the trim member and the upper edge of the body component.

25. (New) The trash can assembly of Claim 7, further comprising a trim member, the trim member and the lid being configured to rotate about the same axis.

REMARKS

Prior to examination on the merits, please amend Claim 1 and add Claims 21-25 as shown above. Applicants believe that the amended and added claims are fully support by the originally-filed disclosure (*see, e.g.*, Paragraphs [0056]-[0058] and Claim 1), and thus that no new matter is added.

No Disclaimers or Disavowals

Although the present communication may include alterations to the listing of claims, Applicants are not conceding in this application that previously pending claims are not patentable. Rather, any alterations are being made to facilitate expeditious prosecution of this application. Applicants reserve the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicants have made any disclaimers or disavowals of any subject matter supported by the present application.

Conclusion

Applicants believe that this application is in condition for allowance. However, should any questions arise, Applicants cordially invite the Examiner to contact the undersigned.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: February 27, 2014

By: Jason R. Swartz/

Jason R. Swartz
Registration No. 64,420
Attorney of Record
Customer No. 20995
(949) 760-0404

Electronic Patent Application Fee Transmittal

Application Number:	13787638			
Filing Date:	06-Mar-2013			
Title of Invention:	TRASH CAN WITH CLUTCHING AND LINER RETENTION FEATURES			
First Named Inventor/Applicant Name:	Frank Yang			
Filer:	Jason R. Swartz/Linh Do			
Attorney Docket Number:	SHUMAN.122A			
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Claims in excess of 20	2202	5	40	200
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				200

Electronic Acknowledgement Receipt

EFS ID:	18328519
Application Number:	13787638
International Application Number:	
Confirmation Number:	1009
Title of Invention:	TRASH CAN WITH CLUTCHING AND LINER RETENTION FEATURES
First Named Inventor/Applicant Name:	Frank Yang
Customer Number:	20995
Filer:	Jason R. Swartz/ThuyQuyen Nguyen
Filer Authorized By:	Jason R. Swartz
Attorney Docket Number:	SHUMAN.122A
Receipt Date:	27-FEB-2014
Filing Date:	06-MAR-2013
Time Stamp:	19:21:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$200
RAM confirmation Number	6424
Deposit Account	111410
Authorized User	KNOBBE MARTENS OLSON AND BEAR

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

VOLUME DISTRIBUTORS, Ex. 1004

VOLUME DISTRIBUTORS, INC. v. SIMPLEHUMAN LLC, IPR2024-00050

Page 755 of 2185

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Prelim_Amendment.pdf	40988 ec150aa9e8fc10abc061b9dc4e7f6705808865be	yes	6
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Preliminary Amendment		1	1	
	Claims		2	5	
	Applicant Arguments/Remarks Made in an Amendment		6	6	
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30325 f6b170a94db0bcc3488be1a7d1cb4bc6c2ba824d	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			71313		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	13/787,638
	Filing Date	March 6, 2013
	First Named Inventor	Yang et al.
	Art Unit	3781
(Multiple sheets used when necessary)	Examiner	Kevin Charles Castillo
SHEET 1 OF 2	Attorney Docket No.	SHUMAN.122A

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code (if known) Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1	2,308,326	01-12-1943	Calcagno	
	2	5,329,212	07-12-1994	Feigleson	
	3	7,712,285	05-11-2010	Stravitz et al.	
	4	7,741,801	06-22-2010	Fukuizumi	
	5	8,567,630	10-29-2013	Yang et al.	
	6	8,569,980	10-29-2013	Yang et al.	
	7	2006/0103086	05-18-2006	Niemeyer et al.	
	8	2007/0112699	01-18-2007	Yang et al.	
	9	2010/0170904	07-08-2010	Kalman et al.	
	10	2010/0294769	11-25-2010	Lee et al.	
	11	2013/0233853	09-12-2013	Yang et al.	
	12	2013/0248532	09-26-2013	Yang et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹
	13	CN 102190144 A	09-21-2011	simplehuman, LLC		
	14	CN 301947175 S	06-06-2012	simplehuman, LLC		
	15	CN 103300590 A	09-18-2013	simplehuman, LLC		
	16	EP 0582240	07-31-1993	Meseke et al.		X-abs
	17	EP 0903305 A1	03-24-1999	David Kennedy (Engineers) Holdings Limited		
	18	EP 0906876 A2	04-07-1999	Norfrost Limited		X
	19	EP 1094017 A1	04-25-2001	Hailo-Werk Rudolf Loh GmbH & Co. KG		X-abs
	20	EP 1447342 A2	08-18-2004	Dart Industries Inc.		
	21	EP 1600373 A2	11-30-2005	Jamco Corporation		
	22	EP 1647503 A1	04-19-2006	Brabantia Nederland B.V.		
	23	EP 1918223 A1	05-07-2008	Wang et al.		

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	13/787,638
	Filing Date	March 6, 2013
	First Named Inventor	Yang et al.
	Art Unit	3781
(Multiple sheets used when necessary)	Examiner	Kevin Charles Castillo
SHEET 2 OF 2	Attorney Docket No.	SHUMAN.122A

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code-Number-Kind Code Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T ¹
	24	EP 2636611 A1	09-11-2013	simplehuman, LLC		
	25	EP 2636613 A1	09-11-2013	simplehuman, LLC		
	26	EP 001381636-001	08-27-2013	simplehuman, LLC		
	27	EP 001381792-0001	08-29-2013	simplehuman, LLC		
	28	JP H06-56011	08-02-1994	Towa Industry Co., Ltd.		X-machine translation
	29	TW D129485	07-01-2009			
	30	TW D133678	03-11-2010			
	31	TW D154797	07-21-2013	simplehuman, LLC		
	32	TWD158187	01-01-2014	simplehuman, LLC		
	33	WO 2005/080232 A1	09-01-2005	Westermann KG		X-abs

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ¹

17362806

Examiner Signature	Date Considered
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Electronic Acknowledgement Receipt

EFS ID:	18328985
Application Number:	13787638
International Application Number:	
Confirmation Number:	1009
Title of Invention:	TRASH CAN WITH CLUTCHING AND LINER RETENTION FEATURES
First Named Inventor/Applicant Name:	Frank Yang
Customer Number:	20995
Filer:	Jason R. Swartz/Linh Do
Filer Authorized By:	Jason R. Swartz
Attorney Docket Number:	SHUMAN.122A
Receipt Date:	27-FEB-2014
Filing Date:	06-MAR-2013
Time Stamp:	20:11:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	CN102190144A_SHUMAN100C N.pdf	3249756 845d8abee3ac90de4c53488f094a2ba6586690a4	no	49

Warnings:

Information:

VOLUME DISTRIBUTORS, Ex. 1004

VOLUME DISTRIBUTORS, INC. v. SIMPLEHUMAN LLC, IPR2024-00050

Page 759 of 2185

2	Foreign Reference	CN301947175S.pdf	61725	no	3
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Information:					
3	Foreign Reference	CN103300590A_SHUMAN127C N.pdf	1936136	no	33
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Warnings:					
Information:					
4	Foreign Reference	EP0582240_wAbstract.pdf	503772	no	10
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Warnings:					
Information:					
5	Foreign Reference	EP0903305A1.pdf	655460	no	19
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Warnings:					
Information:					
6	Foreign Reference	EP0906876.pdf	383670	no	12
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Information:					
7	Foreign Reference	EP1094017_wAbstract.pdf	594424	no	14
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Warnings:					
Information:					
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20	Foreign Reference	TWD158187_SHUMAN122XTW.pdf	70355 d096239789c4a456c06d0b817045b036b8cd7375b	no	7
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22		IDS_SHUMAN122A.pdf	153078 3d6739c60e63576f9697149b3c2d2f355fd387aa	yes	4
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Total Files Size (in bytes):			18116401		
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(12) 发明专利申请

(10) 申请公布号 CN 102190144 A

(43) 申请公布日 2011.09.21

(21) 申请号 201110060533.5

(22) 申请日 2011.03.14

(30) 优先权数据

61/313,736 2010.03.13 US

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32200

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(51) Int. Cl.

B65F 1/16 (2006.01)

B65D 43/26 (2006.01)

权利要求书 4 页 说明书 17 页 附图 26 页

(54) 发明名称

具有动力操作盖的垃圾桶

(57) 摘要

具有动力操作盖的垃圾桶,其包括传感器组件和提升机构。传感器组件可以包括至少一个光发射器和至少一个光接收器,所述至少一个光接收器的观察区域尺寸有限。提升机构可以包括控制器、驱动电动机和提升构件。具有动力操作盖的垃圾桶还可以包括至少一个用来检测盖子的位置的位置传感器。

1. 一种封闭容器,其包括:

限定存储器的容器部分;

相对于容器安装并且被配置为在打开和关闭位置之间运动的盖子;

电源;

被配置为使得盖子在打开和关闭位置之间运动的电动机和齿轮组件;

与盖子连接并且被配置为由电动机和齿轮组件运动的提升构件;

设置在提升构件附近以便检测提升构件的位置的多个位置检测器;

设在容器的上端处并且被配置为发送加密脉冲光信号的至少一个光发射器,所述加密至少为三位加密;

位于所述容器的上端处的至少一个光接收器,被配置用来接收所述加密脉冲光信号,所述至少一个接收器具有用于接收所述脉冲光信号的有限长方形接收区域;以及

控制器,被配置用来控制所述盖子的操作,所述控制器包括:

至少一个盖子运动触发器模块,被配置用来检测所述光接收器是否已经接收到预定次数的加密脉冲信号,并且向控制器发送指令以打开所述盖子;

盖子位置监测器模块,被配置用来监测所述提升构件的位置并且确定所述盖子是处于打开状态还是处于关闭状态;

至少一个故障检测模块,被配置用来停止所述电动机的操作并且在所述电动机已经操作超过预定时间段的情况下提供故障指示;

高过滤模块,被配置用来在向所述控制器发出指令以将所述盖子打开之前提高接收所述加密脉冲光信号的次数;

保持打开模块,被配置用来在接收了第二时间量的所述加密脉冲光信号的情况下将所述盖子保持在打开位置第一时间量;

超级模式模块,被配置用来通过提高所述加密脉冲光信号的频率和/或安培数来提高所述至少一个光接收器的灵敏度;以及

速度补偿模块,被配置用来根据预定的最佳速度来调节所述盖子的运动速度。

2. 一种封闭容器,其包括:

限定储存器的容器部分;

相对于所述容器安装并且被配置为在打开和关闭位置之间运动的盖子;

电源;

电动机和齿轮组件,其被配置为使得所述盖子在所述打开和关闭位置之间运动;

至少一个光发射器,其设置在所述容器的上端处并且被配置为发送加密脉冲光信号;

至少一个光接收器,其设置在所述容器的上端处处并被配置用来接收所述加密脉冲光信号;以及

控制器,被配置用来控制所述盖子的操作,所述控制器包括:

至少一个盖子运动触发器模块,被配置用来检测所述接收器是否已经接收到预定次数的所述加密脉冲信号,并且向控制器发送指令以打开所述盖子;以及

高过滤模块,被配置用来在向所述控制器发出指令以将所述盖子打开之前提高接收所述加密脉冲光信号的次数。

3. 如权利要求2所述的封闭容器,其中所述高过滤模块将所述信号数量从7提高至

10。

4. 如权利要求 2 所述的封闭容器,其中只要盖子正在从完全打开位置朝着完全关闭位置运动就激活所述高过滤模块。

5. 如权利要求 2 所述的封闭容器,其中所述电动机和齿轮组件还包括被配置用来围绕着所述提升构件打开和关闭的门构件。

6. 如权利要求 2 所述的封闭容器,还包括位于所述电动机和齿轮组件中用于去除外来碎片的至少一个开口。

7. 如权利要求 2 所述的封闭容器,还包括多个被配置用来检测盖子的位置的位置检测器,所述位置检测器包括以光发射器和光接收器形式的成对光学临近检测器。

8. 如权利要求 2 所述的封闭容器,其中所述控制器包括至少一个被配置用来打开所述盖子的微控制器,所述至少一个微控制器被配置用来在所述光接收器没有接收到预定次数的所述加密脉冲信号的情况下进入休眠模式以便降低能耗。

9. 如权利要求 2 所述的封闭容器,其中所述控制器包括故障检测模块,其中如果盖子花费了超过预定时间的时间来运动到完全打开位置,则所述控制器被配置用来确定在盖子的打开运动中存在故障,并且所述控制器被配置用来使得所述电动机的所有操作停止以防止出现任何损坏,或者被配置用来使得所述盖子回到关闭的起始位置。

10. 如权利要求 9 所述的封闭容器,其中所述预定时间为 5 秒。

11. 一种封闭容器,其包括:

限定储存器的容器部分;

相对于所述容器安装并且被配置为在打开和关闭位置之间运动的盖子;

电源;

电动机和齿轮组件,其被配置为使得所述盖子在打开和关闭位置之间运动;

至少一个光发射器,其设置在所述容器的上端处并且被配置为发送加密脉冲光信号;

至少一个光接收器,其设置在所述容器的上端处并且被配置为接收加密脉冲光信号;

以及

控制器,被配置用来控制所述盖子的操作,所述控制器包括:

至少一个盖子运动触发器模块,被配置用来检测所述光接收器是否已经接收到预定次数的加密脉冲信号,并且向所述控制器发出指令以将所述盖子打开;以及

保持打开模块,被配置用来在接收到加密脉冲光信号第二时间量的情况下将所述盖子保持在打开位置第一时间量。

12. 如权利要求 11 所述的封闭容器,其中所述保持打开模块在接收到所述加密脉冲光信号持续至少 3 个连续秒之后使得盖子保持打开 30 秒。

13. 如权利要求 11 所述的封闭容器,其中所述电动机和齿轮组件包括延长杆形式的提升构件。

14. 如权利要求 11 所述的封闭容器,其还包括多个被配置用来检测所述盖子的位置的位置检测器,所述位置检测器包括以光发射器和光接收器形式的成对光学临近检测器。

15. 一种封闭容器,其包括:

限定储存器的容器部分;

相对于所述容器安装并且被配置为在打开和关闭位置之间运动的盖子;

电源；

电动机和齿轮组件，其被配置为使得所述盖子在打开和关闭位置之间运动；

至少一个光发射器，其设置在所述容器的上端处并且被配置为发送加密脉冲光信号；

至少一个光接收器，其设置在所述容器的上端处并且被配置为接收所述加密脉冲光信号；以及

控制器，被配置用来控制所述盖子的操作，所述控制器包括：

至少一个盖子运动触发器模块，被配置用来检测所述光接收器是否已经接收到预定次数的加密脉冲信号，并且向所述控制器发出指令以将所述盖子打开；以及

灵敏度增强模块，被配置用来通过提高所述加密脉冲光信号的频率和 / 或安培数来提高所述至少一个光接收器的灵敏度。

16. 如权利要求 15 所述的封闭容器，其中在所述灵敏度增强模块中的安培数为在灵敏度未增强模块中的水平的三倍。

17. 如权利要求 15 所述的封闭容器，其中所述灵敏度增强模块被配置为将所述信号的频率提高至大于 38KHz。

18. 如权利要求 15 所述的封闭容器，其中所述灵敏度增强模块被配置用来将所述至少一个光接收器的检测范围提高至在所述垃圾桶的 14 至 18 英寸范围内。

19. 如权利要求 15 所述的封闭容器，其中所述灵敏度增强模块被配置用来向所述控制器发出指令以将所述盖子保持打开预定时间。

20. 如权利要求 15 所述的封闭容器，其中所述灵敏度增强模块被配置用来激活所述保持打开模块。

21. 一种封闭容器，其包括：

限定储存器的容器部分；

相对于所述容器安装并且被配置为在打开和关闭位置之间运动的盖子；

电源；

电动机和齿轮组件，其被配置为使得所述盖子在打开和关闭位置之间运动；

至少一个光发射器，其设置在所述容器的上端处并且被配置为发送加密脉冲光信号；

至少一个光接收器，其设置在所述容器的上端处并且被配置为接收所述加密脉冲光信号；以及

控制器，被配置用来控制所述盖子的操作，所述控制器包括：

至少一个盖子运动触发器模块，被配置用来检测所述光接收器是否已经接收到预定次数的加密脉冲信号，并且向所述控制器发出指令以将所述盖子打开；以及

速度补偿模块，被配置用来根据预定最佳速度调节所述盖子的运动速度。

22. 如权利要求 21 所述的封闭容器，其中所述速度补偿模块被配置用来向所述盖子的当前速度增加和 / 或减去速度偏移。

23. 如权利要求 21 所述的封闭容器，其中所述垃圾桶具有用于使得盖子朝着打开位置运动的最佳速度，并且其中所述速度补偿模块被配置为只有在当前速度落入在包括所述最佳速度的速度范围之外的情况下才向所述盖子的当前速度增加和减去速度偏移。

24. 如权利要求 21 所述的封闭容器，其中所述垃圾桶具有用于使得所述盖子朝着关闭位置运动的最佳速度，并且其中所述速度补偿模块被配置为只有在当前速度落入在包括

所述最佳速度的速度范围之外的情况下才向所述盖子的当前速度增加和减去速度偏移。

25. 如权利要求 21 所述的封闭容器,其还包括多个被配置用来检测所述盖子的位置的位置检测器,并且其中所述速度补偿模块被配置为通过使用多个位置检测器检测所述盖子的位置或 / 或确定所述盖子当前速度。

26. 如权利要求 21 所述的封闭容器,其中所述速度补偿模块被配置用来检测给电动机供电的电池的启动电压,并且根据电池的启动电压来用一定的负载驱动所述电动机。

具有动力操作盖的垃圾桶

[0001] 相关申请的交叉参考

本申请依据 35 U.S.C § 119(e) 要求于 2010 年 3 月 13 日提交的美国临时专利申请 No. 61/313736 的权益,该文献其全文通过引用而结合到本申请中。

技术领域

[0002] 本发明涉及动力操作装置,例如用于容器的动力操作盖或门。

背景技术

[0003] 具有盖子或门的容器和其它装置用于各种不同的环境中。例如,在家用和商用环境中,垃圾桶和其它装置通常具有用于防止或阻止容器的内容物倒出的盖子。在垃圾桶的情况中,一些垃圾桶包括盖子或门,以防止臭味逸出并且将容器内的垃圾隐藏在视线外。另外,垃圾桶的盖子有助于防止污染物从容器中漏出。

[0004] 近来,具有动力操作盖的垃圾桶已经在市场上销售。这些垃圾桶包括设置在盖子上或其附近的传感器。这种传感器可以被配置用来检测运动,例如用户的手在传感器附近挥舞,作为用于打开盖子的信号。在激活这种传感器时,在垃圾容器内的电动机将盖子或门打开,从而使得用户能够将物品放置到容器中。之后,盖子能够自动的关闭。

[0005] 但是,这些运动传感器存在一些问题。例如,当前具有动力操作盖的垃圾桶的用户在容器或桶内的垃圾堆积得高于盖子本身的高度的情况下会遇到问题。如果桶内的垃圾或其它材料高于盖子本身的高度,则盖子将不能完全关闭。这会造成电动机或电池磨损,继续运转,和 / 或最终失效。它还会迫使用户将控制器重置、去除垃圾,或者手动挤压垃圾直到能够将盖子关闭。

[0006] 另外,典型的运动传感器被配置用来检测反射光的变化。因此,用户的衣服和皮肤颜色会使得该装置进行不同的操作。更具体地说,这些传感器能够更好地检测具有一种衣服和皮肤颜色组合的用户的手的运动,但是对具有不同衣服和 / 或皮肤颜色组合的另一个用户的手的运动却较不敏感。另外,传感器可以对在房间中接通和断开的或者在该垃圾桶前面运动或运动经过的灯敏感。

[0007] 如果将这种传感器校准成检测在距离传感器例如 12 英寸范围内的任意用户的手或身体部分的运动,则该传感器也可能被意外地触发。如果传感器意外触发太频繁,则给这种装置供电的电池会迅速用完,会浪费能量,和 / 或电动机会过度使用。但是,如果将传感器校准为较不敏感,对于一些用户而言则会难以根据其衣服和 / 或皮肤颜色组合来方便地激活该传感器。

[0008] 如果电池或其它电源在其端部上累积有电荷的,也存在问题。这些电荷会对在电池上的实际电位差给出错误指示,并且会造成电动机和 / 或盖子在不同的使用期间以不同的方式运动或作用或者以不同的速度运行。

[0009] 另外,如果用户希望倒空多组或一些垃圾,也会出现问题。一旦传感器已经被激活,则盖子会升至打开位置,然后自动地关闭。但是,一旦盖子开始关闭,则在盖子再次打开

之前,用户被迫等待直到盖子到达完全关闭位置。如果用户突然想要将该盖子再次打开或者在盖子正在关闭时有另一份垃圾要扔,则他或她在再次激活传感器之前必须等待直到该盖子恢复到其完全关闭位置。

发明内容

[0010] 在这里所披露的至少一个发明的一个方面包括这样的方案,可以通过周围的太阳光以及某些类型的室内灯光来触发光检测器,例如用于触发垃圾桶盖的打开或关闭的红外检测器,例如在美国专利公开号 2009/0194532 中所公开的那些检测器。例如,已经发现,即使在红外检测器被设计成检测与荧光灯发射的脉冲频率不同的脉冲频率的情况下,来自荧光灯管灯光的脉冲也能够触发已知的红外检测器。更具体地说,已经发现,随着荧光灯管的光的衰减,其发射的光的脉冲频率逐渐丢失了一些频率。另外,当在相同房间中设有将多个荧光灯管灯光时,不同脉冲频率的重叠流会产生出许多不同的有效脉冲。已经发现,在存在两种或多种荧光灯管灯光时,这些红外检测器的二位加密仍然会导致这些检测器的偶然错误触发。

[0011] 还已经发现,采用至少三位加密技术能够差不多消除错误触发。还已经发现,四位加密技术能够完全消除错误触发,不管装置的使用环境是在户外或是在以许多不同频率脉动的许多荧光灯管的环境下。但是,人们认识到,这些荧光灯管有可能触发具有四位加密的系统。但是,经过一些调查研究,还没有观察到任何这种错误触发。

[0012] 在这里所公开的至少一些具体实施方式中的另一个方面在于,实现了限制光学检测器的有效视角能够进一步提高对错误触发的防范。例如,在垃圾桶上使用的光检测器能够被配置为具有在与垃圾桶的正面平行的方向上更宽并且在与垃圾桶的正面垂直的方向上更窄的视角。并且这些光学传感器的这种长方形观察图案能够更好地防止在用户路过垃圾桶时出现意外驱动,并且能够令人满意地检测用户身体的部分沿着与垃圾桶正面垂直的方向在垃圾桶上面的运动。通过沿着垃圾桶的正面设置两个或更多个光学接收器还能够实现进一步的提高,从而有效地进一步加宽垃圾桶的光学感测系统的观察范围,同时保持了由上述较窄的检测角度所提供的错误触发保护。

[0013] 在这里所公开的至少一些具体实施方式的另一个方面在于,在垃圾桶盖正在关闭时,盖子往往会仅仅由于盖子自身的运动或者由于其他外来光源或运动而被意外激活。因此,有利的是具有一传感器垃圾桶,其在垃圾桶盖正在关闭时具有高过滤模式。

[0014] 在这里所公开的至少一些具体实施方式的另一个方面在于,在垃圾桶盖完全打开时,用户往往想要将垃圾桶盖保持打开,或者想要具有迅速方便地重新将盖子打开以使之保持打开的选择。这在用户在一段时间内要堆积许多垃圾并且考虑到盖子将关闭时尤其如此。因此,最好具有这样一种操作模式,该模式使得盖子能够在较长一段时间保持打开,和/或具有这样一种操作模式,该模式允许迅速方便地重新激活。

[0015] 在这里所公开的至少一个具体实施方式中的另一个方面在于,最好能够具有在打开时以预定速度并且在关闭时以预定速度运动的盖子,从而赋予该垃圾桶更一致的感觉和外观。最好还能够具有监控模式,该模式能够施加速度偏移以提高或降低盖子速度,以使之更接近预定值。

[0016] 因此,根据至少一个具体实施方式,封闭容器可以包括:限定存储器的容器部分;

相对于容器安装并且被配置为在打开和关闭位置之间运动的盖子；电源；被配置为使得盖子在打开和关闭位置之间运动的电动机和齿轮组件；与盖子连接并且被配置为由电动机和齿轮组件运动的提升构件；设置在提升构件附近以便检测提升构件的位置的多个位置检测器；设在容器的上端处并且被配置为发送加密脉冲光信号的至少一个光发射器，所述加密至少为三位加密；位于所述容器的上端处的至少一个光接收器，被配置用来接收所述加密脉冲光信号，所述至少一个接收器具有用于接收所述脉冲光信号的有限长方形接收区域；以及被配置用来控制所述盖子的操作的控制器。所述控制器可以包括：至少一个盖子运动触发器模块，其被配置用来检测所述接收器是否已经接收到预定次数的所述加密脉冲信号，并且向控制器发送指令以打开所述盖子；盖子位置监测器模块，被配置用来监测所述提升构件的位置并且确定所述盖子是处于打开状态或是处于关闭状态；至少一个故障检测模块，被配置用来停止所述电动机的操作并且在所述电动机已经操作大于预定时间段的情况下提供故障指示；高过滤模块，被配置用来提高在向所述控制器发出指令以将所述盖子打开之前接收所述加密脉冲光信号的次数；保持打开的模块，被配置用来在接收了所述加密脉冲光信号经过第二时间量的情况下将所述盖子在打开位置保持第一时间量；超级模式（hypermode）模块，被配置用来通过提高所述加密脉冲光信号的频率和/或安培数来提高所述至少一个接收器的灵敏度；以及速度补偿模块，被配置用来根据预定的最佳速度来调节所述盖子的运动速度。

[0017] 根据另一个具体实施方式，封闭容器可以包括：限定储存器的容器部分；相对于所述容器安装并且被配置为在打开和关闭位置之间运动的盖子；电源；电动机和齿轮组件，其被配置为使得所述盖子在所述打开和关闭位置之间运动；提升构件，其与所述盖子连接并且被配置为由所述电动机和齿轮组件运动；以及至少一个光发射器，其设置在所述容器的上端处并且被配置为发送加密脉冲光信号，所述加密至少为三位的加密信号。

[0018] 根据另一个具体实施方式，封闭容器可以包括：限定储存器的容器部分；相对于所述容器安装并且被配置为在打开和关闭位置之间运动的盖子；电源；电动机和齿轮组件，其被配置为使得所述盖子在所述打开和关闭位置之间运动；提升构件，其与所述盖子连接并且被配置为由所述电动机和齿轮组件运动；以及至少一个光接收器，其设置在所述容器的上端处并且被配置为接收加密脉冲光信号，所述至少一个光接收器具有用于接收所述脉冲光信号的有限的长方形接收区域。

[0019] 根据另一个具体实施方式，封闭容器可以包括：限定储存器的容器部分；相对于所述容器安装并且被配置为在打开和关闭位置之间运动的盖子；电源；电动机和齿轮组件，其被配置为使得所述盖子在所述打开和关闭位置之间运动；至少一个光发射器，其设置在所述容器的上端处并且被配置为发送加密脉冲光信号；至少一个光接收器，其设置在所述容器的上端处并且被配置为接收所述加密脉冲光信号；以及控制器，被配置用来控制所述盖子的操作。所述控制器包括：至少一个盖子运动触发器模块，被配置用来检测所述光接收器是否已经接收到预定次数的所述加密脉冲信号，并且向所述控制器发出指令以将所述盖子打开；高过滤模块，被配置用来增加在向所述控制器发出指令以打开所述盖子之前必须接收所述加密脉冲光信号的次数。

[0020] 根据另一个具体实施方式，封闭容器可以包括：限定储存器的容器部分；相对于所述容器安装并且被配置为在打开和关闭位置之间运动的盖子；电源；电动机和齿轮组

件,其被配置为使得所述盖子在所述打开和关闭位置之间运动;至少一个光发射器,其设置在所述容器的上端处并且被配置为发送加密脉冲光信号;至少一个光接收器,其设置在所述容器的上端处并且被配置为接收所述加密脉冲光信号;以及控制器,被配置用来控制所述盖子的操作。所述控制器包括:至少一个盖子运动触发器模块,被配置用来检测所述光接收器是否已经接收到预定次数的所述加密脉冲信号,并且向所述控制器发出指令以将所述盖子打开;保持打开模块,被配置用来在接收到所述加密脉冲光信号第二时间量的情况下将所述盖子保持在打开位置中第一时间量。

[0021] 根据另一个具体实施方式,封闭容器可以包括:限定储存器的容器部分;相对于所述容器安装并且被配置为在打开和关闭位置之间运动的盖子;电源;电动机和齿轮组件,其被配置为使得所述盖子在所述打开和关闭位置之间运动;至少一个光发射器,其设置在所述容器的上端处并且被配置为发送加密脉冲光信号;至少一个光接收器,其设置在所述容器的上端处并且被配置为接收所述加密脉冲光信号;以及控制器,被配置用来控制所述盖子的操作。所述控制器包括:至少一个盖子运动触发器模块,被配置用来检测所述光接收器是否已经接收到预定次数的所述加密脉冲信号,并且向所述控制器发出指令以将所述盖子打开;灵敏度增强模块,被配置用来通过提高所述加密脉冲光信号的频率和/或安培数来提高所述至少一个光接收器的灵敏度。

[0022] 根据另一个具体实施方式,封闭容器可以包括:限定储存器的容器部分;相对于所述容器安装并且被配置为在打开和关闭位置之间运动的盖子;电源;电动机和齿轮组件,其被配置为使得所述盖子在所述打开和关闭位置之间运动;至少一个光发射器,其设置在所述容器的上端处并且配置为发送加密脉冲光信号;至少一个光接收器,其设置在所述容器的上端处并且被配置为接收所述加密脉冲光信号;以及控制器,被配置用来控制所述盖子的操作。所述控制器包括:至少一个盖子运动触发器模块,被配置用来检测所述光接收器是否已经接收到预定次数的所述加密脉冲信号,并且向所述控制器发出指令以将所述盖子打开;速度补偿模块,被配置用来根据预定最佳速度调节所述盖子的运动速度。

[0023] 根据另一个具体实施方式,封闭容器可以包括:限定储存器的容器部分;相对于所述容器安装并且被配置为在打开和关闭位置之间运动的盖子;电源;以及电动机和齿轮组件,其被配置为使得所述盖子在所述打开和关闭位置之间运动,所述电动机和齿轮组件包括提升机构,其包括具有驱动齿轮的驱动电动机;具有绕轴旋转齿条的提升构件和标记构件,所述提升构件被配置为由所述驱动齿轮驱动;以及多个位置检测器,被配置用来检测所述标记构件的位置。

[0024] 根据另一个具体实施方式,封闭容器可以包括:限定储存器的容器部分;相对于所述容器安装并且被配置为在打开和关闭位置之间运动的盖子;电源;电动机和齿轮组件,其被配置为使得所述盖子在所述打开和关闭位置之间运动;提升构件,其与所述盖子连接并且被配置为由所述电动机和齿轮组件驱动;传感器组件,包括至少一个光发射器、至少一个光接收器以及被配置为设置在所述至少一个光发射器和所述至少一个光接收器两者上面的外壳部件,所述外壳部件具有至少一个形成为V形的开口,其设置在所述至少一个光发射器上以便在所述传感器组件上方提供光发射区域。

[0025] 根据另一个具体实施方式,封闭容器可以包括:限定储存器的容器部分;相对于所述容器安装并且被配置为在打开和关闭位置之间运动的盖子;电源;电动机和齿轮组

件,其被配置为使得所述盖子在所述打开和关闭位置之间运动;提升构件,其与所述盖子连接并且被配置为由所述电动机和齿轮组件驱动;传感器组件,其包括位于所述传感器组件的中央部分中的第一组多个光发射器以及位于所述传感器组件的外部中的至少第二组多个发光器,并且还包括位于所述传感器组件的所述中央部分中的至少一个光接收器。

附图说明

[0026] 下面将参照优选的具体实施方式的附图对在这里所公开的发明的上述和其他特征进行说明。所阐述的具体实施方式旨在用来说明而不是限制本发明。这些附图包含有以下附图:

图 1 为其盖子打开的封闭容器的一个具体实施方式的顶部、前部和右侧透视图。

[0027] 图 2 为在图 1 中所示的封闭容器的放大的顶部、前部和右侧透视图。

[0028] 图 3 为在图 1 中所示的容器的顶部、后部、右侧透视图。

[0029] 图 4 为在图 1 中所示的容器后盖拆除后的放大的顶部、后部、右侧透视图。

[0030] 图 5 为在图 1 中所示的容器的放大的顶部、后部、右侧透视图,其中盖子处于打开位置,部分分解,并且拆除了垃圾桶衬垫和上衬垫支撑件。

[0031] 图 6 为在图 5 中所示的提升机构的放大的顶部、后部和左侧透视图。

[0032] 图 7 为在图 6 中所示的提升机构的电动机和齿轮驱动机构的另一个放大的透视图。

[0033] 图 8 为提升机构的一部分的示意图,示出在盖子处于完全打开位置时提升机构的驱动齿轮和齿条的布置。

[0034] 图 9 为在图 8 中所示的提升机构的一部分的另一个示意图,示意性地示出在盖子处于位于打开和关闭位置之间的中间位置时某些部件的中间位置。

[0035] 图 10 为在图 8 中所示的提升机构的一部分的另一个示意图,示意性地示出在盖子处于位于打开和关闭位置之间的中间位置时某些部件的中间位置。

[0036] 图 11 为在盖子处于完全关闭位置时的图 8 中所示的部件的另一个示意图。

[0037] 图 12 为在图 1 中所示的垃圾桶的前部上的传感器组件的顶部、前部和右侧透视图。

[0038] 图 13 为在图 12 中所示的传感器组件的顶部、前部和右侧透视图,其中拆除了支撑环。

[0039] 图 14 为在图 13 中所示的传感器组件的顶部、前部和右侧透视图,其中拆除了传感器组件的另一个部分。

[0040] 图 15A 为在图 12 中所示的传感器组件的外壳部件的透视图。

[0041] 图 15B 为在图 12 中所示的传感器组件的板部件的透视图。

[0042] 图 15C 为在图 15A 中的传感器组件的外壳部件的剖视图。

[0043] 图 16A 为用于图 12 的传感器组件的传感器布置的示意性正视图,显示出其视角。

[0044] 图 16B 为用于图 12 的传感器组件的传感器布置的示意性侧视图,显示出其视角。

[0045] 图 16C 为用于传感器组件的传感器布置的另一个具体实施方式的示意性正视图,显示出其视角。

[0046] 图 16D 为具有位于传感器组件中的额外的光发射器的封闭容器的具体实施方式

的正视图。

- [0047] 图 16E 为图 16D 的封闭容器的正面和顶部透视图。
- [0048] 图 17 为与传感器组件连接的提升机构的透视图。
- [0049] 图 18 和 19 为提升机构的透视图,进一步示出门构件。
- [0050] 图 20 为可以用于图 1 中所示的垃圾桶的控制器的方框图。
- [0051] 图 21 为流程图,显示出可以用于图 1 的垃圾桶的控制程序。
- [0052] 图 22 为流程图,显示出可以用于图 1 的垃圾桶的另一个控制程序。
- [0053] 图 23 为时序图,显示出能够用于图 1 的垃圾桶的各种光学信号。
- [0054] 图 24 为流程图,显示出可以用于图 1 的垃圾桶的另一个控制程序。
- [0055] 图 25 为流程图,显示出可以用于图 1 的垃圾桶的另一个控制程序。
- [0056] 图 26 为流程图,显示出可以用于图 1 的垃圾桶的另一个控制程序。
- [0057] 图 27 为流程图,显示出可以用于图 1 的垃圾桶的另一个控制程序。
- [0058] 图 28 为流程图,显示出可以用于图 1 的垃圾桶的另一个控制程序。

具体实施方式

[0059] 用于打开和关闭容器或其他装置的盖子或门的动力系统的具体实施方式在垃圾桶的情况中进行描述。在这里所公开的发明结合垃圾桶进行描述,这是因为它们在这方面特别实用。但是,在这里所公开的发明同样可以用于其他方面,例如但不限于,大型市售垃圾桶、门、窗、安全门和其他更大的门或盖子、以及用于更小装置例如高精度标尺、计算机驱动器等的门或盖子。

[0060] 参照图 1 和 2,垃圾桶组件 20 可以包括外壳部件 22 和盖子 24。盖子 24 可以包括门部件,例如空气过滤器形式的门部件 26。垃圾桶组件 20 可以被配置为放在地板上,并且可以根据其他条件、用户需要、成本和制造简便性而具有各种高度和宽度。

[0061] 垃圾桶组件 20 可以包括外壳部件 22,该外壳部件可以包括上壳体部分 28 和下壳体部分 30。垃圾桶组件还可以包括被配置为保持在外壳体部件 22 内的内衬垫 32。例如,外壳体部件 22 的上周边可以被配置为支撑着内衬垫 32 的上周边,从而内衬垫 32 通过其上周边悬挂在外壳体部件 22 内。可选的,垃圾桶组件 20 可以包括由壳体部件 22 支撑并且被配置为将衬垫 32 支撑在外壳体部件 22 的内部中的衬垫支撑构件 34。在其他具体实施方式中,内衬垫 32 位于外壳体部件 22 的下部上。

[0062] 外壳体部件 22 可以采取任意结构。如图 1 所示,外壳体部件 22 可以具有大体上矩形的横截面结构,其具有侧壁 36、38、前壁 40 和后壁 42(图 3)。内衬垫 32 可以具有与由外壳体部件 22 限定的形状大体上相配的形状。但是,也可以采用其他结构。上和下壳体部件 28、30 可以由塑料、钢、不锈钢、铝或任意其他材料制成。

[0063] 垃圾桶组件 20 还可以包括底座 44。该底座 44 可以包括用于连接到外壳体部件 22 上的螺钉或其他部件,并且可以具有用于搁置在表面例如厨房地板上的平坦下部。该垃圾桶组件 20 的底座 44 可与外壳体部件 22 整体、成一体制成,或者与之分开制成。因此,该底座 44 可以由塑料、钢、不锈钢、铝或任意其他材料制成。另外,在一些具体实施方式中,例如在其中外壳体部件 22 为不锈钢的那些具体实施方式中,底座 44 可以为塑料材料。

[0064] 盖子 24 可以通过任意已知的装置枢轴地连接在垃圾桶组件上。在所示的具体实

施方式中,盖子 24 枢轴地连接到上盖支撑环 46 上,该支撑环可以牢固地安装在外壳体部件 22 的上周边上。铰链 48 和 50 可以按照任意已知的方式构造。该垃圾桶组件还可以包括门提升机构 52,该机构可以用来使得盖子 24 围绕着铰链 48 和 50 运动。

[0065] 参照图 3 和 4 并且如上所述,垃圾桶 20 可以包括后壁 42。沿着后壁 42,垃圾桶 20 可以包括后盖 54。后盖 54 可以包围和 / 或保护后侧附件 56。后侧附件 56 可以容纳用于该垃圾桶 20 的电源。例如,在一些具体实施方式中,后侧附件 56 可以被配置为接收并且保持至少一个电池。

[0066] 参照图 5,提升机构 52 可以包括控制器 58、驱动电动机 62 以及提升构件 62(例如用作绕轴旋转的齿条的延长杆)。提升机构 52 的至少一部分可以从封闭容器的剩余部分中拆除。例如,驱动电动机 60 或其他部件可以是可拆卸的,从而能够对它进行修理、更换等。控制器 58 可以与感测系统(下面所述的)通信以决定何时驱动电动机 60 以便沿着打开和关闭方向推进提升构件 62。

[0067] 如图 5 所示,驱动电动机 60 可以包括安装在其输出轴上的驱动齿轮 64。驱动齿轮 64 根据负载、速度等可以具有任意所期望的齿距结构。另外,驱动电动机 60 可以包括齿轮减速。在一些具体实施方式中,齿轮减速可以为 5:1、10:1、50:1、100:1 或任意其他齿轮减速,这将提供所期望的打开和关闭速度特性。在一些具体实施方式中,盖子 24 能够在操作期间的任意时刻手动推压关闭,从而驱动电动机 60、提升构件 62 和 / 或驱动齿轮 64 允许滑动。例如,驱动电动机 60 可以包括离合器或其他结构,该结构允许盖子 24 返回到关闭位置。在一些具体实施方式中,离合器可以被配置为很容易打滑,从而与将盖子 24 向上朝着打开位置推压相比,更容易将盖子 24 朝着关闭位置向下推压。

[0068] 提升机构 52 可以包括导辊 66,其被配置为在与驱动齿轮 64 相互作用时沿着打开和关闭方向引导提升构件 62,下面将参照图 8-11 进行更详细的描述。

[0069] 参照图 6 和 7,提升机构 52 还可以包括一个或多个位置检测器 68(上位置传感器)、70(下位置传感器)。位置检测器 68、70 可以采用成对光学临近检测器例如光发射器和光接收器的形式。但是,也可以采用其他类型的传感器。

[0070] 这些位置传感器 68、70 可以被配置用来在提升构件 62 在打开和关闭位置之间运动时检测其位置,下面也将参照图 8-11 进行更详细的描述。电动机 60 和这些位置检测器 68、70 可以与控制器 58 连接,以便协同控制提升构件 62 以及因此盖子 24 的运动。

[0071] 如图 8 所示,在盖子 24 处于打开位置时,将提升构件 62 拉到其远离位置传感器 68、70 的完全伸展位置。提升构件 62 在其上端处可以包括圆柱形通道 72(图 7),它可以通过铰链销组件 74 与盖子 24 连接(图 5)。提升构件 62 还可以包括标记构件 76,该构件可以用来与位置传感器 68、70 结合提供用于指示盖子 24 的位置的装置。在一些具体实施方式中,封闭容器 20 可以包括一个以上的盖子 24。例如,该封闭容器可以包括两个盖子 24(例如并排的)。在这种具体实施方式中,提升构件 62 可以在其上端处包括叉形的形状,从而该叉子的每个叉子齿可以接触两个盖子 24 中的一个。提升构件 62 因此可以被配置为同时打开两个盖子 24。可选的是,封闭容器 20 可以包括一个以上的提升构件 62 和驱动电动机 60。

[0072] 如图 8 所示,在提升构件 62 处于其完全伸展位置时,对应于盖子 24 处于完全打开位置,标记构件 76 已经经过上位置传感器 68 和下位置传感器 70 并且处于上方,即没有触发。因此,控制器 58 可以被配置用来在标记构件 76 已经经过两个位置传感器 70 和 68 之

后确定盖子 24 已经到达其最上面的位置。更具体地说,例如,控制器 58 可以被配置用来正好在标记构件 76 在其朝着打开位置的途中经过上位置传感器 68 并且位于其上方的时候确定盖子 24 已经到达其最上面的打开位置。

[0073] 如图 9 和 10 所示,在盖子 24 处于位于打开和关闭位置之间的中间位置时,标记构件 76 能够相互作用,并且因此触发上位置传感器 68。

[0074] 如图 11 所示,在盖子 24 处于其完全关闭位置时,提升构件 62 可以处于其完全回缩位置,并且标记构件 76 可以触发位置传感器 70 或者可以触发两个位置传感器 68、70。更具体地说,例如,控制器 58 可以被配置用来在标记构件 76 通过位置传感器 70 时确定盖子 24 处于关闭位置并且仍然触发传感器 68。但是,可以采用标记构件和位置传感器的任意组合来检测盖子 24 的位置。

[0075] 参照图 12,垃圾桶组件 20 还可以包括设置在垃圾桶组件 20 的外部上的传感器组件 78。在所示的具体实施方式中,传感器组件 78 沿着前壁 40 设置在外壳体部分 22 的上中央部分处。该传感器组件 78 可以包括外罩 80,该外罩可以包括允许光信号传输和 / 或接收的透明或半透明结构。例如,外罩 80 可以由塑料例如聚碳酸酯, Makrolon® 等制成。在一些具体实施方式中,外罩 80 可以与上支撑环 46 基本上齐平。在一些具体实施方式中,传感器组件 78 沿着宽度大约为 0.5cm 至大约 2cm 的上支撑环 46 设置。

[0076] 参照图 13,外罩 80 可以包括坐落在支撑环 46 下面的一部分结构 82。

[0077] 参照图 14 和 15A-15C,结构 82 可以包括壳体 84。壳体 84 可以包括多个上开口 86。在一些具体实施方式中,开口 86 为长方形。这些长方形开口 86 可以通过斜面 88 形成,这些斜面 88 在它们朝着下开口 90 延伸时以大体上 V 形构造朝着彼此延伸。下开口 90 与壳体 84 的其余部分一起可以在传感器组件 78 的一个或多个光发射器 92 和一个或多个光接收器 94 (例如光检测器)上面装配在板 96 上。如图 15B 所示,板 96 可以包括一个或多个按钮和 / 或开关 98,用于让用户能够给控制器 58 发送输入指令。在一些具体实施方式中,可以通过按压外罩 80 的一部分或多个部分来激活按钮和 / 或开关。

[0078] 图 15C 显示出壳体 84 的剖视图。在一些具体实施方式中,在光发射器 92 和光接收器 94 上面的开口 86 可以形成 V 形构造,以在传感器组件 78 和垃圾桶组件 20 上方提供发光区域。发光区域由于其形状可以为从大约开口 86 中伸出的大致锥形形状。在一些具体实施方式中,如在图 15C 的平面中所示一样,在光发射器 92 上面的开口 86 可以具有大约为 20 度至大约 80 度的打开角度。同样,在一些具体实施方式中,如在图 15C 的平面中所示一样,在光接收器 94 上面的开口 86 可以具有大约为 20 至大约 80 度的角度。

[0079] 在一些具体实施方式中,来自从光发射器 92 发射出的光的多个发光区域会重叠并且形成重叠区域,该区域在图 15C 中用阴影线表示。该重叠区域提供了放大或更强的发光区域以感测物体或用户的存在。

[0080] 继续参照图 15C,在一些具体实施方式中,光接收器 94 检测来自光发射器 92 的光的由物体或用户反射的光。在一些具体实施方式中,与例如位于任一侧上的光发射器 92 相比,光接收器 94 更深地嵌入到壳体 84 的开口 86 中,以便减少射入到光接收器 94 中并且使之错误触发的周围光。在一些具体实施方式中,光接收器 94 可以具有设置在其上方的衰减器 95。在光接收器 94 上的该衰减器 95 有助于通过过滤掉直接位于光接收器 94 上方的大量的周围光来防止传感器组件 78 的错误触发。在一些具体实施方式中,衰减器 95 可以形

成在壳体 84 上。在其它具体实施方式中,衰减器 95 可以结合到覆盖位于光接收器 84 上面的传感器组件 78 的外罩 80 (在图 12 和 13 中示出)上。衰减器 95 可以以不同材料形式结合到外罩 80 上,例如胶带,或不同于外罩 80 的纹理和厚度。衰减器 95 可以具有大约为光接收器 94 的宽度的宽度,例如为 1mm 至大约 3mm。

[0081] 继续参照图 15B,光发射器 92 可以被配置用来发射红外范围中的光,因此它对于肉眼而言通常是不可见的。这些光发射器可以在市场上广泛地以多种形式从许多来源中得到。

[0082] 光接收器 94 同样也可以广泛地从许多来源中得到。在一些具体实施方式中,光接收器 94 被配置用来接收在红外范围中的光。另外,接收器 94 自身或与单独的带通滤波器一起能够设计成只是发出在特定范围例如 38KHz 或其它频率范围内的输出信号。

[0083] 光接收器 94 可以被配置为例如借助壳体 84 和长方形开口 86 具有长方形接收或观察区域。参照图 16A,在一些具体实施方案中,光接收器 94 设计成接收大体上在与外壳体 22 的前壁 40 平行的方向上延伸的角度 X 上面的光。另外并且如图 16B 所示,光接收装置 94 可以被配置用来接收在大体上垂直于壳体 22 的前壁 40 的方向上延伸的视角 Y 上面的光。因此,这些装置 94 的相应观察区域在角度 X 大于角度 Y 时大体上为扇形。在一些具体实施方式中,角度 X 和 Y 均为锐角。在一些具体实施方式中,角度 X 可以大约为 45 度。另外,在一些具体实施方式中,角度 Y 可以小于大约 45 度。在一些具体实施方式中,角度 Y 小于 30 度。另外,在一些具体实施方式中,角度 Y 为 20 度或更小。在一些具体实施方式中,角度 Y 小于角度 X。在一些具体实施方式中,通过将壳体 84 及其长方形开口 86 设置在光接收装置 94 上,从而光接收器 94 可以具有这样的扇形观察区域。但是,也可以采用其它技术。

[0084] 通过提供在与前壁 40 平行的方向更宽但是在与前壁 40 垂直的方向上更窄的观察角度,光接收器会更不容易由与前壁 40 平行走动的人或用户触发,除非其部分身体朝着前壁 40 延伸从而大体上直接设置在光接收器 94 上方。在一些具体实施方式中,一旦盖子 24 由用户触发打开,则在将垃圾袋插入或更换进内衬垫 32 时,通过内衬垫 32 触发光接收器 94 能够将盖子 24 保持在打开位置中。在该具体实施方式中,至少一部分内衬垫 32 在外壳体 22 上面升起,并且向前朝着前壁 40 倾斜以便设置在光接收器 94 上面。垃圾桶组件 20 可以包括保持构件以在期望时将内衬垫 32 保持在该位置中。内衬垫 32 的这个位置在用户正在更换在内衬垫 24 中的垃圾袋期间将使盖子 24 保持打开。

[0085] 另外,在一些具体实施方式中,可以采用多个光接收器 94。例如,参照图 16C,可以采用两个光接收器 94。在这种具体实施方式中,光接收器 94 的相应观察区域可以重叠在由在图 16C 中的大写字母 A 标识的区域中。这种重叠可以提供额外的检测能力,并且不会干涉光接收器 94 的操作。同样,在一些具体实施方式中,可以只是采用一个光发射器 92。因此,在这里所描述的垃圾桶 20 可以采用光发射器 92 和光接收器 94 的任意数量组合。

[0086] 参照图 16D 和 16E,在一些具体实施方式中,传感器组件 78 可以具有多个例如四个光发射器 92 以及至少一个光接收器 94。在一些具体实施方式中,所有光发射器 92 最初可以同时操作。在其它具体实施方式中,最初只是可以操作一些光发射器 92 以发射光,例如两个内部的光发射器 92 在垃圾桶组件 20 (或者传感器组件 78)的中央部分上发射光,例如在图 16D 中表示为大写字母 I,并且接收器 94 被配置用来接收反射光。而且,在一开始激活两个内部的光发射器 92 并且感测到活动时,传感器组件 78 可以进入到超级模式操作(下面

参照图 27 进行更详细的描述)。在超级模式操作中,可以激活两个另外的外部的发射器 92 以在传感器组件 78 (以及垃圾桶组件 20) 上方的更宽区域上发射光,例如在图 16E 中表示为大写字母 O,以便在更宽范围内检测用户在垃圾桶组件 20 周围的活动。

[0087] 继续参照图 16D 和 16E,发光区域由在垃圾桶组件 20 上方的实线表示,并且光检测区域由虚线表示。发光区域可以投影至例如在图 16D 中的由大写字母 O 表示的宽度,该宽度大约与垃圾桶组件 20 的宽度相同。每个光发射器 92 和光检测器 94 的强度可以如此控制,从而它们将光投射至大约相同的高度。发光区域和光检测区域可以投射至大约相同的高度(在图 16D 中由在这些区域上方的水平线和大写字母 H 表示)。该高度可以任意调节以适应用户在传感器组件 78 上方的活动高度。高度 H 可以表示灵敏度区域或区。在一些具体实施方式中,高度 H 可以为大约 5 至大约 30 英寸,例如大约为 15 英寸。

[0088] 参照图 17,传感器组件 78 可以通过带状电线 100 或其它合适的结构与提升机构 52 连接和通信。在一些具体实施方式中,传感器组件 78 可以与提升机构 52 无线通信。

[0089] 参照图 18 和 19,提升机构 52 可以包括外壳 102 和门构件 104。如图 19 所示,门构件 104 可以摆动打开和关闭以适应提升机构 52 的运动。特别地,门构件 104 可以用来抑制或防止碎片和其它不想要的材料进入到提升机构 52 的区域中。另外,在一些具体实施方式中,提升机构 52 可以包括孔或开口 105,例如如图 18 所示一样。孔或开口 105 可以用来去除已经积累在提升机构 52 内的碎片或材料。

[0090] 参照图 20,控制器 58 可以按照任意已知的方式构造,包括以具有单独电子部件例如电阻器、电容器、脉冲发生器、操作放大器、逻辑门等的硬接线系统。在其它具体实施方式中,控制器 58 可以由市售的处理器、微处理器、微控制器构成,每个都包括相应适当的操作系统和软件以便执行下面所述的功能和控制程序。在所示的具体实施方式中,控制器 58 包括两个微控制器。

[0091] 一个微控制器 110 可以被配置为操作光学发射器和接收器系统,以便检测来自用户的用于打开盖子 24 的输入信号。例如,在一些具体实施方式中,微控制器 110 可以被配置为使得光发射器 92 以频率为 38KHz 的脉冲发射加密光信号,例如红外光。下面参照图 22、23 更详细描述了来自光发射器 92 的发射图案。

[0092] 在微控制器 110 确定已经检测到输入信号时,它能够向第二微控制器 120 发出指令以打开盖子 24。控制器 58 还可以包括被配置用来提供 5 伏的稳定输出的电源 122。例如,该电源 122 可以包括以电池形式的电源 124 或被配置用来输出 9 伏的 AC 至 DC 转换器。在电源 124 采用电池组形式时,它可以输出低至 5 伏的电压。电源 122 还可以包括被配置用来给微控制器 110 和 120 输出 5 伏稳定电压的调节器 126。

[0093] 微控制器 120 还可以被配置用来驱动可以与电动机 60 操作连接的电动机控制器 128。继续参照图 20,位置检测器(位置传感器)68、70 可以与第二微控制器 120 通信。微控制器 120 可以向电动机 60 和驱动齿轮 64 发送指令。

[0094] 上面所述的针对控制器 58 的所有部件可以安装在单块或多块电路板上。在所示的具体实施方式中,例如将控制器 58 可结合到控制板 59 中(例如参见图 5)。

[0095] 参照图 21,可以将控制程序 150 与控制器 58 结合使用。例如,控制程序 150 会以存储在微控制器 120 中的软件形式存储。在所示的具体实施方式中,控制程序 150 在操作块 152 处开始。在操作块 152 中,控制程序 150 将硬件初始化,并且将变量重置为例如 0 或

其它缺省设定值。在操作块 152 之后, 控制程序 150 可以转到判断块 154。

[0096] 在判断块 154 中, 可以确定盖子 24 是否处于关闭位置中, 也被称为“起始”位置。例如, 控制器 120 可以使用标记位置传感器 68、70 来确定盖子 24 的位置。例如, 如图 11 所示, 在完全关闭的位置中, 标记构件 76 与位置传感器 68 和 70 相互作用。如果微控制器 120 检测到这种状况, 微控制器 120 能够确定盖子 24 关闭。因此, 在操作块 154 中, 如果确定盖子 24 没有关闭, 则控制程序 150 能够转到操作块 156。

[0097] 在操作块 156 中, 微控制器 120 能够控制电动机控制器 128, 由此驱动电动机 60 来将盖子 24 朝着关闭(起始)位置驱动。微控制器 120 可以继续驱动电动机 60 直到盖子 24 达到关闭位置或者检测到超时故障, 例如下面参照操作块 182 所描述的。在操作块 156 之后, 控制程序可以返回到判断块 154 并且继续。

[0098] 如果, 在判断块 154 中, 控制器 58 确定出盖子 24 处于关闭位置, 则控制程序 150 可以转到判断块 158。

[0099] 在判断块 158 中, 可以确定是否已经接收到显示盖子 24 应该打开的信号。可以根据下面参照图 22-24 描述的控制程序来进行是否已经接收到这种信号的判断。如果没有检测到任何信号, 则控制程序 150 可以转到操作块 160。

[0100] 在操作块 160 中, 微控制器 120 可以进入休眠模式以便最小化能耗。该休眠模式可以为用于低能量操作的任意模式。例如, 在休眠模式操作期间, 电动机驱动器 128 或标记位置检测器 68、70 不必操作或者没有消耗任何能量。

[0101] 在操作块 160 之后, 控制程序 150 可以回到判断块 158 并且重复。在判断块 158 中如果确定检测到信号, 则控制程序 150 可以转到操作块 162。

[0102] 在操作块 162 中, 微控制器 120 可以驱动驱动控制器 128 以及因此驱动电动机 60 以便使得盖子 24 运动到打开位置。如在图 16 中所示, 操作块 162 可以根据包括形成电源 124 的电池状态和所期望的盖子 24 应该朝着打开位置运动的速度在内的某些参数进行向上驱动运动。这些特征由块 164 表示。这些技术可以根据在专利公开号 2007/0182551 中的图 15-21 和所附内容中所公开的相应技术进行, 该文献由此通过引用而结合。在操作块 162 之后, 控制程序 150 可以转到判断块 166。

[0103] 在判断块 166 中, 可以确定是否已经经过了特定的最大时间以便使得盖子 24 运动到完全打开位置。例如, 如果盖子 24 花费了超过 5 秒钟运动到完全打开位置, 则可以确定在盖子 24 的打开运动中存在故障。例如, 用户可能将物体留在盖子的顶部上, 由此阻止了盖子朝着打开位置运动。在一些具体实施方式中, 控制器 120 可以通过分析位置传感器 68、60 的输出或任意其它技术来确定盖子是否已经运动到打开位置。如果在判断块 166 中已经确定已经经过了最大时间, 则控制程序 150 可以转到操作块 168。

[0104] 在操作块 168 中, 可以给用户提供声频和 / 或视频信号来表明已经检测到故障。控制器 58 可以包括故障检测模块, 从而微控制器 120 能够使得电动机 60 的所有操作停止以防止出现破坏, 或者例如在检测到故障的情况下能够使得盖子 24 回到关闭位置、起始位置。

[0105] 如果在判断块 166 中已经确定在经过预定时间之前盖子 24 已经到达打开位置, 则该程序 150 可以转到操作块 170。操作块 170 表示在控制程序 150 中的一个点, 但是此时不必有任何的附加操作。在操作块 170 之后, 控制程序可以转到判断块 172。

[0106] 在判断块 172 中,可以确定盖子是否已经在打开位置处保持了预定打开时间。在一些具体实施方式中,打开时间为 5 秒。如果确定没有经过该打开时间,则程序 150 可以转到判断块 172。

[0107] 在判断块 174 中,可以确定是否已经激活了保持打开开关。例如,按钮和 / 或开关 98 (图 15)可以用作保持打开开关。因此,如果还没有激活保持打开开关 98,则控制程序可以回到判断块 172。

[0108] 在判断块 172 中,如果已经确定盖子已经在打开位置中保持了预定打开时间,则该程序可以转到操作块 176。

[0109] 在操作块 176 中,盖子 24 可以转到关闭位置。例如,微控制器 120 可以驱动驱动控制器 128 以驱动电动机 60,以便使得盖子 24 朝着关闭位置运动。同样,如上面参照块 164 所述的一样,可以根据由块 178 表示的参数进行操作块 176 的向下驱动操作。这些参数可以包括电池的状态和其它时间参数,例如所期望的盖子关闭运动的速度。在专利公开号 2007/0182551 中描述了这些参数和相关的控制程序,该文献由此通过引用而结合到本文中。在操作块 176 之后,该程序 150 可以转到判断块 180。

[0110] 在判断块 180 中,可以确定,自从已经激活电动机 60 以将盖子 24 朝着关闭位置驱动起,是否已经经过了预定时间。在一些具体实施方式中,预定关闭时间可以为 5 秒或其它预定时间量。如果确定驱动电动机已经被激活超过预定关闭时间,则控制程序 150 可以转到操作块 182。在操作块 182 中,可以给控制器 40 发信号以输出声频和 / 或视频指示,表示在盖子的关闭运动中已经检测到故障。另一方面,如果确定在盖子的关闭运动期间还没有经过所述关闭时间,则在判断块 180 中,控制程序可以返回到判断块 154 并且重复该程序。

[0111] 参照图 22,控制器 58 可以按照任意已知的方式操作以检测用于打开盖子 24 的信号。图 22 显示出控制程序 190 可以在操作块 192 处开始的实施例。在操作块 192 中,与操作块 152 类似(图 21),控制程序 190 可以通过将硬件初始化并且重置变量来开始。在操作块 192 之后,控制程序 190 可以转到判断块 194。

[0112] 在判断块 194 中,可以确定是否已经经过睡眠时间或(休眠)定时。如果确定还没有经过该定时时间,则控制程序 190 可以转到操作块 196。

[0113] 在操作块 196 中,控制程序 190 可以继续让该系统休眠,换句话说从发射器 92 不发射任何光信号直到定已经过。在一些具体实施方式中可以将定时设定为操作 0.25 秒。但是,也可以采用其它预定的时间量。

[0114] 在操作块 196 之后,控制程序可以返回到判断块 194 并且重复。如果另一方面确定休眠定时已经过了,则控制程序 190 可以转到操作块 198。

[0115] 在操作块 198 中,可以通过光发射器 92 发出脉冲光信号。在一些具体实施方式中,光发射器 92 的输出可以采用脉冲光形式。在一些具体实施方式中,光可以在 38KHz 的频率脉动。另外,在一些具体实施方式中,来自光发射器 92 的信号可以采用在下面参照图 18 更详细描述的两位、三位或四位编码信号的形式。在从光发射器 92 已经输出信号之后,控制程序 190 可以转到判断块 200。

[0116] 在判断块 200 中,判断来自光发射器 92 的信号是否已经被光接收器 94 接收。例如,在一些具体实施方式中,控制器 110 可以分析由光接收器 94 接收到的信号,以确定由光发射器 92 发出的相同脉冲输出信号是否已经被光接收器 94 接收到。如果确定由光发射器

92 发出的相同脉冲输出已经被光接收器 94 接收到,则控制程序可以转到操作块 202。

[0117] 在操作块 202 中,微控制器 110 可以给微控制器 120 发信号以唤醒并且开始操作以驱动盖子 24。另一方面,如果确定从光发射器 92 发出的输出信号还没有接收到,则控制程序 190 可以转到操作块 204。

[0118] 在操作块 204 中,可以从光发射器 92 中发出另一个信号。例如,输出信号可以为在操作块 198 中发出的相同输出信号,或者它可以为不同的输出信号。在操作块 204 之后,控制程序 190 可以转到判断块 206。

[0119] 在操作块 206 中,可以确定从光发射器 92 输出的代码是否已经被光接收器 94 接收到。如果确定来自光发射器 92 的输出信号还没有接收到,则控制程序 190 可以返回到判断块 194 并且继续。另一方面,如果在判断块 206 中确定在操作块 204 中从光发射器 92 中发出的信号已经被接收,则控制程序 190 可以转到操作块 202 并且如上所述一样继续。

[0120] 参照图 22 的操作块 198 和 204,图 23 显示出用于所发送的信号的各种可选加密技术。在图 23 中标为 220 的信号显示出脉冲信号的实例。例如,该信号可以表示在任意频率下的一系列脉冲。为了便于讨论,信号 220 的脉冲的频率可以为 38KHz。

[0121] 在图 23 中所示的信号 222 表示两次发出的四位信号,并且两次之间存在时间延迟。换句话说,信号 224 的第一部分表示 1010 的二进制代码信号。画出的信号的实线部分表示实际信号,并且虚线部分显示出丢失的脉冲。因此,信号的实线部分显示出信号从基础线到达上限的时候。另外,信号的虚线部分表示丢失的脉冲。因此,信号 224 的这个部分如上所述表示二进制代码脉冲:1-0-1-0。

[0122] 另外,信号 222 包括第二脉冲代码 228,也包括 1-0-1-0 代码。在信号 224、228 的这两个部分之间,存在延迟 226。在一些具体实施方式中,延迟可以为 800 微秒。但是,延迟 226 也可以采用其它的延迟量。

[0123] 已经发现,该四位加密技术足够不规则,从而周围太阳光或由多个荧光灯管光线产生出的光将不会重复产生该信号。因此,通过将控制器 58 配置为发送两个 (2) 四位间隔开的脉冲信号并且确定这两个间隔开的四位信号是否反射回到光接收器 92,从而控制器能够有效地防止电动机 60 的意外或不小心中触发。另外,至少为四位加密代码的代码的发送和检测能够足够快进行,从而该系统迅速响应用户输入指令。但是,也可以采用其它加密技术。

[0124] 图 24 显示出可以与控制器 58 联合使用的再一个控制程序 250。该控制程序 250 可以配置成通过减少由微控制器 110 执行的功能来降低电池能耗。

[0125] 例如,控制程序 250 可以在操作块 252 处开始。在操作块 252 中,可以将硬件初始化,并且将变量重置为 0 或缺省值。在操作块 252 之后,控制程序 250 可以转到操作块 254。

[0126] 在操作块 254 中,可以从光发射器 92 发出加密信号。在操作块 254 之后,控制程序 250 可以转到判断块 256。

[0127] 在判断块 256 中,可以确定垃圾桶 20 是否正在明亮环境例如周围太阳光中使用。例如,微控制器 110 可以被配置用来确定光接收器 94 是否正在基本上连续地接收光信号。例如,如果光接收器 94 在 800 微秒的时间段上接收信号并且在那个时期中具有超过大约 10 至 12 个信号丢失,则可以假设垃圾桶 20 正在暴露于明亮的周围光例如太阳光中。因此,微控制器 110 可以被配置用来避免分析光接收器 94 的输出。如果在判断块 256 中确定垃圾

桶 20 处于明亮环境中,则控制程序 250 可以返回到操作块 252 并且重复。另一方面,如果在判断块 256 中确定垃圾桶 20 不处于明亮环境中,则控制程序 250 可以转到操作块 258。

[0128] 在操作块 258 中,微控制器 110 可以操作以使得光发射器 92 发射加密光信号,例如在图 23 中所示的信号 222 或另一个信号。在操作块 258 之后,控制程序 250 可以转到判断块 260。

[0129] 在判断块 260 中,可以确定来自操作块 258 的加密信号是否由任一个光接收器 94 接收到。如果确定信号没有被接收到,则控制程序 250 可以返回到操作块 252 并且重复。另一方面,如果确定在判断块 260 中接收到加密信号,则控制程序 250 可以转到操作块 262。

[0130] 在操作块 262 中,控制程序 250 在继续进行之前可以等待预定时间。例如,该预定时间可以为 800 微秒或任意其它延迟。该延迟在一些具体实施方式中由在图 18 中的延迟 226 表示。在操作块 262 延迟之后,控制程序 250 可以转到操作块 264。

[0131] 在操作块 264 中,从任一个光接收器 94 中发出第二加密信号。在操作块 264 之后,控制程序 250 可以转到判断块 266。

[0132] 在判断块 266 中,可以确定在操作块 264 中发出的加密信号是否已经由任一个光接收器 94 接收。如果没有接收到来自操作块 264 的加密信号,则控制程序可以返回到操作块 252 并且重复。如果,另一方面,来自操作块 264 的加密信号由任一个光接收器 94 接收到,则控制程序 250 可以转到操作块 268。

[0133] 在操作块 268 中,以与上面参照图 21 的操作块 162 所描述的类似方式或任意其它技术,可以向微控制器 120 发出驱动指令以驱动电动机 60。在操作块 268 之后,控制程序 250 可以转到操作块 270 并且结束,这可以包括返回到操作块 252 以重复该程序。

[0134] 图 25 显示出用于控制器 58 的再一个控制程序 280。该控制程序 280 可以被配置用来在盖子 24 正处于关闭过程期间帮助将外来信号过滤掉。在盖子 24 正在关闭时,用户不希望盖子被无意地重新打开。该无意的重新打开有时会由于盖子自身的运动和 / 或其它来源的运动或光而出现。因此,在盖子正在关闭期间可以实施高过滤模式,其中控制器 58 在盖子 24 触发重新打开之前需要比要由光接收器 94 接收的加密光脉冲信号的正常值更多的脉冲。例如,相对于 7 个信号而言,控制器 58 可以寻找 10 个重复的加密信号。

[0135] 在操作块 282 中,控制器 58 可以将高过滤模式的变量初始化,并且一开始可以将上述高过滤操作禁用。

[0136] 在判断块 284 中,控制器 58 可以确定是否已经启动高过滤器。在一些具体实施方式中,不论什么时候盖子 24 开始关闭,高过滤器都可以自动启用。例如,在控制程序 150 的操作块 176 期间可以启用高过滤器。在一些具体实施方式中,可以需要用户通过推压按钮和 / 或开关 89 来启用高过滤器。

[0137] 在操作块 286 中,控制器 58 可以将十位(其它数字)计数高过滤检测初始化。

[0138] 在判断块 288 中,控制器 58 可以确定是否已经检测到超级模式。在控制程序 280 中,超级模式可以指的是控制器 58 是否已经接收到盖子仍然处于未关闭位置的指示(例如,位置传感器 68、70 还没有识别出盖子处于完全关闭位置中)。如果盖子仍然处于未关闭位置,则高过滤操作可以在操作块 290 和 292 中开始。

[0139] 在操作块 290 和 292 中,控制器可以将计数器初始化,该计数器开始统计来自光发射器 92 的加密信号由光接收器 94 接收到的次数。控制器例如可以需要 0.25 秒来检测信

号的十个循环,并且在每次加密信号的检测之间的延迟为 0.025 秒。也可以采用其它时间间隔,因此可以采用其它循环数。

[0140] 在判断块 294 中,控制器可以判断在 0.25 秒内是否已经接收到 10 个信号。如果是,则可以将盖子重新打开(例如可以实施控制程序 150 的操作块 162)。如果没有,则盖子可以继续朝着关闭位置落下(例如可以实施控制程序 150 的操作块 176)。

[0141] 图 26 显示出用于控制器 58 的再一个控制程序 300。该控制程序 300 可以被配置用来在光接收器 94 已经接收到加密光脉冲信号特定时间(例如 3 个连续秒)的情况下将盖子 24 保持打开更长的时间(例如 30 秒)。控制程序 300 优选让用户能够在正在扔垃圾期间让垃圾桶 20 的盖子 24 保持打开较长时间,从而用户能够将多个垃圾物品放置到垃圾桶 20 中,而不必担心盖子 24 在每个物品之间会关闭。

[0142] 在操作块 302 中,控制器 58 可以将延长的零星工作(chore)模式变量初始化并且启动至少一个定时。例如,控制器 58 可以启动 5 秒定时。也可以采用其它时间段。

[0143] 在判断块 304 中,控制器 58 可以确定在控制器 58 还没有接收到加密光脉冲信号预定时间的情况下是否已经经过了 5 秒。

[0144] 在判断块 306 中,控制器 58 还可以确定光接收器 94 是否已经检测到加密光脉冲信号持续至少 3 个连续秒。也可以采用其它时间段。如果 5 秒定时还没有过,并且控制器 58 已经确定光接收器已经接收到加密光脉冲信号至少 3 秒,则控制程序可以转到操作块 308。

[0145] 在操作块 308 中,控制器 58 可以将盖子 24 反弹两秒,以表示该垃圾桶 20 处于延长的零星工作类型模式。

[0146] 在操作块 310 中,控制器 58 可以启动 30 秒定时。在这 30 秒期间,用户可以开始将垃圾物品放入到垃圾桶 20 中,而不必担心盖子 24 关闭。

[0147] 在判断块 312 中,控制器 58 可以确定这 30 秒定时是否已经过了。一旦这 30 秒定时已经过了,则垃圾桶 20 可以返回到正常模式。例如,控制程序可以返回到在图 21 中所示的控制程序 150,并且更具体地例如返回到控制程序 150 的操作块 176,其中将盖子 24 关闭。

[0148] 图 27 显示出用于控制器 58 的再一个控制程序 320。该控制程序 320 可以被配置用来实施垃圾桶 20 的超级模式操作。该垃圾桶 20 的超级模式操作例如可以用来提高在盖子处于打开状态期间(例如在它完全打开或者还没有完全关闭期间)对来自光发射器 92 的加密光脉冲信号的检测。这增强的检测可以发生,这是由于加密光脉冲信号的安培数增加(即,因此使之更容易被光接收器检测到)和/或加密光脉冲信号的频率增加。在优选的布置中,在盖子 24 完全打开时,可以采用超级模式操作,从而如果用户突然决定将盖子保持打开并且将其手放在光发射器上,垃圾桶 20 将更迅速地识别出该指令。

[0149] 在操作块 322 中,控制器 58 可以将超级模式变量初始化,并且一开始禁用超级模式操作。

[0150] 在判断块 324 中,控制器 58 可以确定超级模式操作是否已经启用。在一些具体实施方式中,超级模式操作可以在每次盖子 24 到达完全打开位置(例如由位置检测器 68、70 检测到)时自动地启用。在一些具体实施方式中,可以通过使用上述按钮和/开关 98 中的一个来手动地实施超级模式操作。如果超级模式操作启用,则控制程序 320 可以转到操作块 326。

[0151] 在操作块 326 中,控制器 58 可以初始化超级模式,其中控制器 58 开始提高加密光脉冲信号的安培数(例如将安培数提高至正常水平的三倍)和 / 或提高加密信号的频率(例如将频率提高至大于 38KHz)。也可以采用其它数值和范围。在一些具体实施方式中,这能够提高加密光脉冲信号的检测范围。例如,在一些具体实施方式中,例如与在垃圾桶 20 没有处于超级模式时的较短范围相比,光接收器 94 的范围可以提高至垃圾桶的 14 至 18 英寸。

[0152] 在判断块 328 中,控制器 58 可以确定超级模式是否正确工作和 / 或光接收器 94 是否正在开始接收加密光脉冲信号。如果光接收器 94 正在开始接收加密光脉冲信号,则控制程序可以转到操作块 330 和 332。

[0153] 在操作块 330 中,控制器 58 可以将超级模式计数器初始化,该计数器可以用来统计光接收器 94 接收到的加密光脉冲信号的循环数。

[0154] 在操作块 332 中,控制器 58 可以延迟 0.025 秒。也可以采用其它时间段。

[0155] 在判断块 334 中,控制器 58 可以确定超级模式计数器是否已经统计出加密光脉冲信号的至少 7 个检测循环。如果已经检测到至少 7 个循环,则控制循环 320 可以转回到主代码,并且例如具体地说从图 21 到操作块 170,或者到上述在图 26 中所示的控制程序 300,在那里盖子处于打开状态。

[0156] 如果没有任何检测,则控制程序 320 可以回到主代码,并且具体地说例如回到图 21 的操作块 176,在那里盖子 24 可以开始关闭。

[0157] 图 28 显示出用于控制器 58 的再一个控制程序 340。该控制程序 340 可以用来在盖子从关闭状态运动到打开状态和 / 或从打开状态向关闭状态运动时调节盖子 24 的速度。速度调节例如可以通过监测一个或多个速度传感器或位置检测器(例如位置检测器 68、70)并且调节由电池施加给电动机 60 的电压量来进行。盖子 24 的速度可以如此调节,从而盖子 24 在每次使用垃圾桶 20 时保持大致恒定和 / 或可重复的速度。速度调节可以以盖子 24 的预定最佳速度为基础。因此,如果盖子 24 脱离最佳速度工作,则可以调节盖子速度以使得盖子 24 的速度回到其最佳速度。另外,为了防止接近恒定的调节盖子 24 的速度(和电池损耗),在一些具体实施方式中,可以只是在所识别的实际速度与最佳速度相差预定值的情况下才对盖子 24 的速度进行调节。

[0158] 在操作块 342 中,控制器 58 可以将速度值处理模式初始化。例如,控制器 58 可以根据位置传感器 68、70 检测盖子 24 的位置,并且根据从位置检测器 68、70 接收到的数据计算出盖子 24 运动得有多快。

[0159] 在判断块 344 中,控制器 58 可以确定起始电压是否大于 0.6 伏。起始电压可以为给电动机 60 供电的电池的电压。该起始电压可以代表当前速度。

[0160] 如果是,则在操作块 346 中可以使得第一速度偏移与当前速度相关联,从而使得当前速度上升或下降至最佳速度。

[0161] 在判断块 348 中,控制器 58 可以确定起始电压是否大于 9 伏,并且小于 9.6 伏。

[0162] 如果是,则在操作块 350 中可以使得第二偏移与当前速度相关联,从而使得当前速度上升或下降至最佳速度。

[0163] 在判断块 352 中,控制器 58 可以确定起始电压是否大于 7.5 伏,并且小于 9 伏。

[0164] 如果是,则在操作块 354 中,可以使得第三偏移与当前速度相关联,从而使得当前

速度上升或下降至最佳速度。

[0165] 在判断块 356 中,控制器 58 可以确定起始电压是否小于 7.5 伏。

[0166] 如果是,则在操作块 358 中,可以使得第四偏移与当前速度相关联,从而使得当前速度上升或下降至最佳速度。

[0167] 在操作块中,如果在判断块 344、348、352 和 356 中的回答每次都为否,则控制器 58 可以使得第五偏移与当前速度相关联,从而使得当前速度上升或下降至最佳速度。

[0168] 在判断块 362 中,控制器 58 可以确定盖子 24 是否正在朝着打开位置升起或者是否正在将它朝着关闭位置驱动。如果盖子正在朝着打开位置升起,则控制程序 340 可以转到判断块 364。

[0169] 在判断块 364 中,控制器 58 可以确定盖子 24 的当前速度是否小于用于打开盖子 24 的最佳速度(例如,如果该速度与最佳速度至少相差预定值,或者不在包含最佳速度的预定范围内)。如果该速度小于最佳速度,则控制程序可以转到操作块 366。

[0170] 在操作块 366 中,控制器 58 可以通过增加上述一个速度偏移来调节速度。

[0171] 在判断块 368 中,控制器 58 可以确定盖子 24 的当前速度是否大于用于打开盖子 24 的最佳速度(例如,如果该速度与最佳速度至少相差预定值,或者不在预定范围内)。如果该速度大于最佳速度,则控制程序可以转到操作块 370。

[0172] 在操作块 370 中,控制器 58 可以例如通过减去上述一个速度偏移来调节该速度。

[0173] 在判断块 372 中,如果正在向下驱动盖子(根据判断块 362),控制器 58 可以确定当前速度是否小于用于关闭盖子 24 的最佳速度(还有,例如,如果速度与最佳速度至少相差预定值,或者不在预定范围内)。如果当前速度小于用于关闭盖子 24 的最佳速度,则控制程序 340 可以转到操作块 374。

[0174] 在操作块 374 中,控制器 58 可以例如通过增加上述一个速度偏移来调节该速度。

[0175] 在判断块 376 中,如果控制器 58 可以确定当前速度是否大于用于关闭盖子 24 的最佳速度(还有,例如,如果速度与最佳速度至少相差预定值,或者不在预定范围内)。如果当前速度大于用于关闭盖子 24 的最佳速度,则控制程序可以转到操作块 378。

[0176] 在操作块 378 中,控制器 58 可以例如通过减去上述一个速度偏移来调节该速度。

[0177] 在操作块 380 中,一旦已经进行了速度调节,则控制器 58 可以回到主代码,例如回到在图 21 中的操作块 162 或 176,以便使得盖子 24 运动到打开或关闭位置。控制程序 340 然后可以继续监测盖子 24 的运动,并且需要时进行调节。

[0178] 虽然参照某些优选的具体实施方式和实施例对本发明进行了说明,但是本领域普通技术人员要理解的是,本发明在这里具体公开的实施方式之外还包括本发明的其它可选实施方式和/或用途及其显而易见的变型和等同方案。另外,虽然已经详细示出并且描述了本发明的几个变型,本领域普通技术人员将很容易根据公开内容想到落入在本发明的范围内的其它变型。还要想到的是,这些具体的实施方式的具体特征和方面可以具有各种组合或子组合,并且这些组合仍然落入在本发明的范围内。应该理解的是,所公开的具体实施方式的各个特征和方面可以相互组合或彼此替代以便形成所公开的发明的各种模式。因此,在这里所公开的至少一些发明的范围不应该局限于上述特别地公开的具体实施方式。

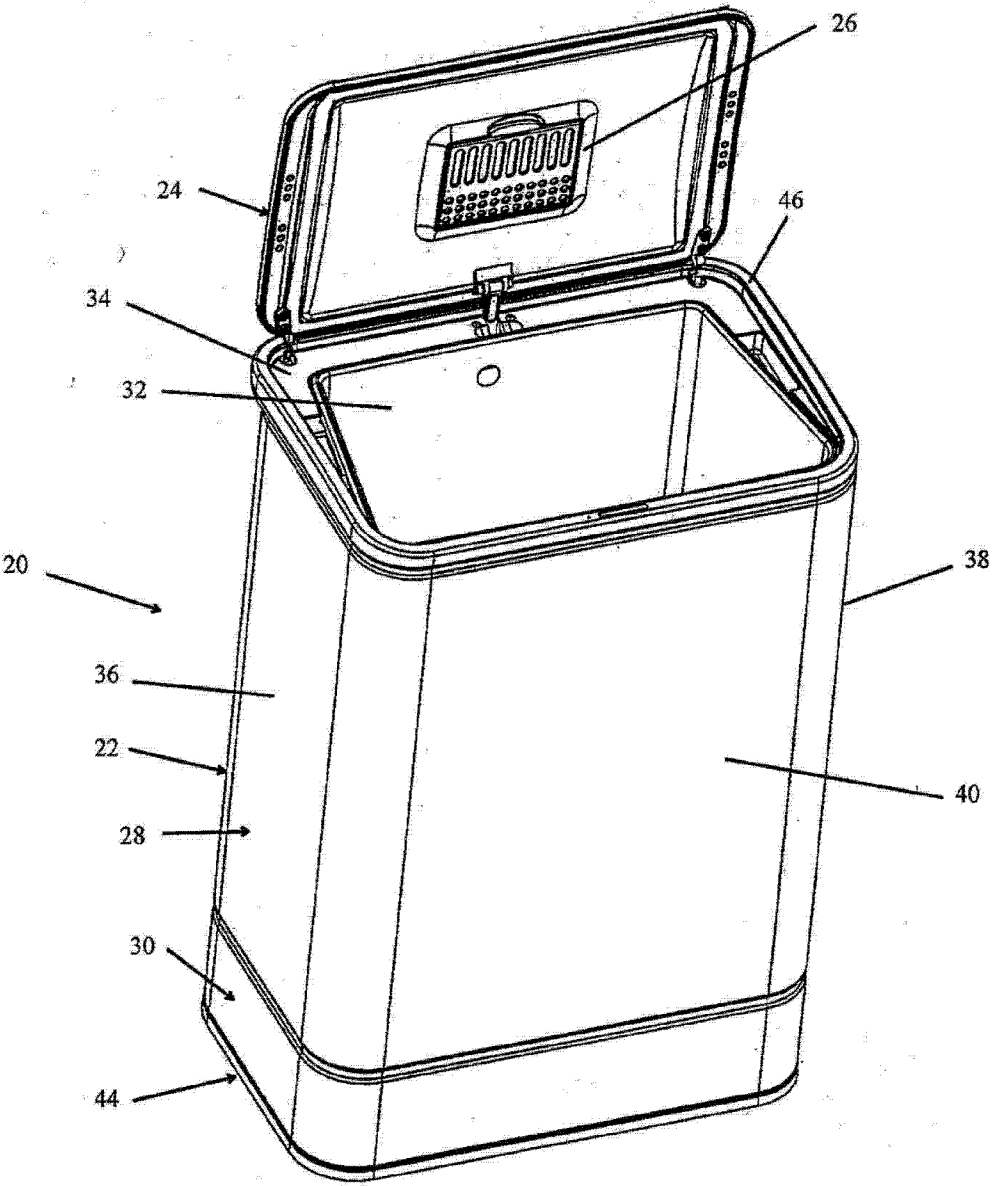


图 1

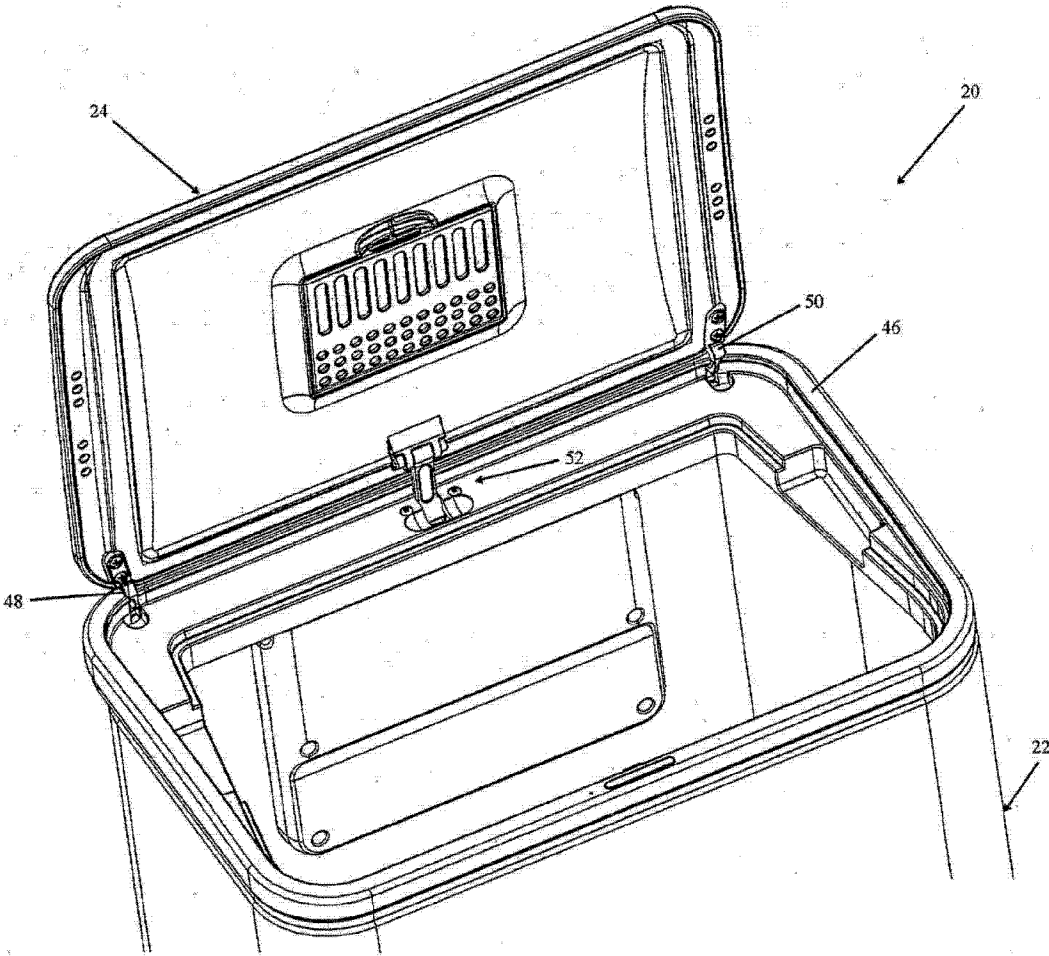


图 2

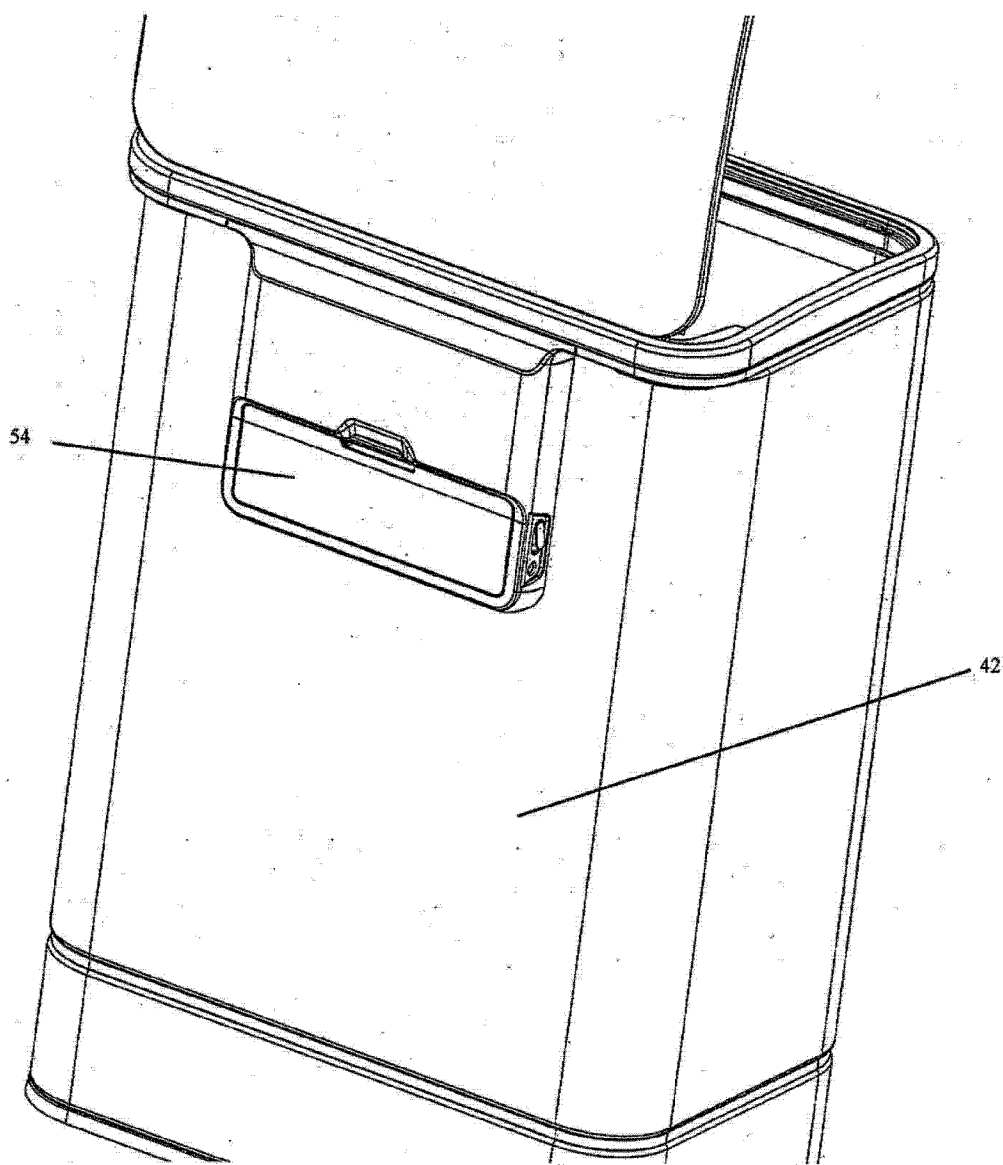


图 3

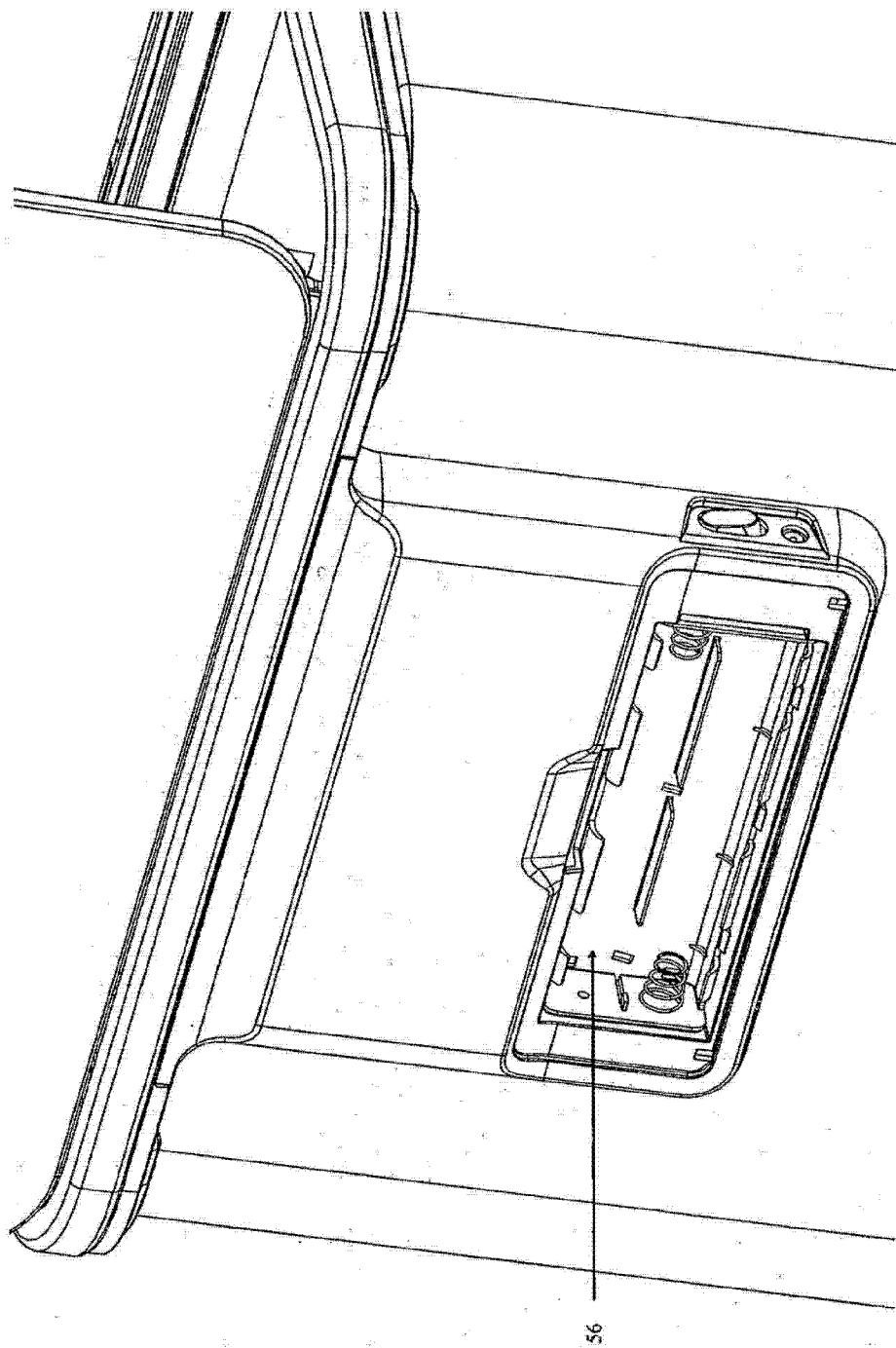


图 4

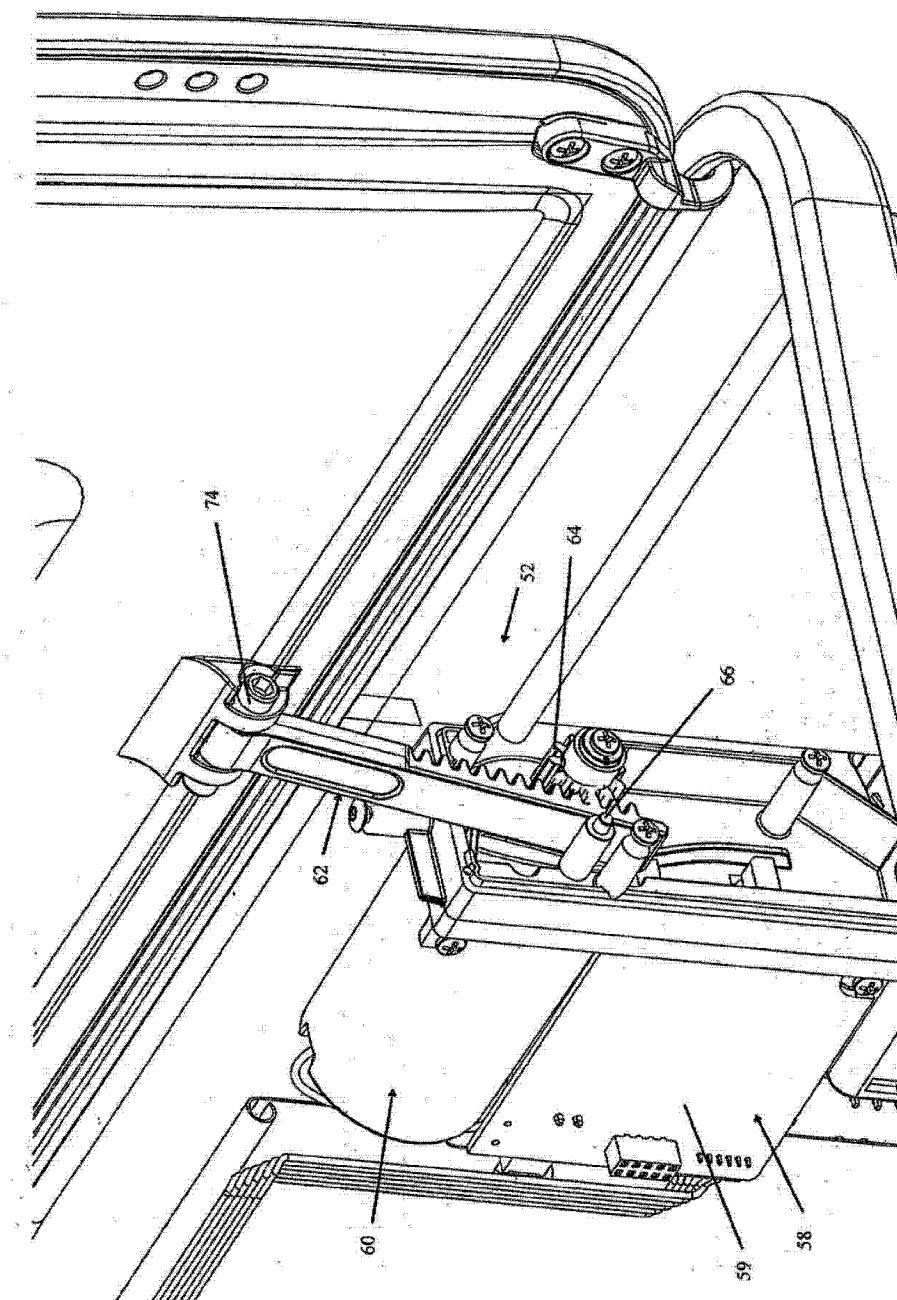


图 5

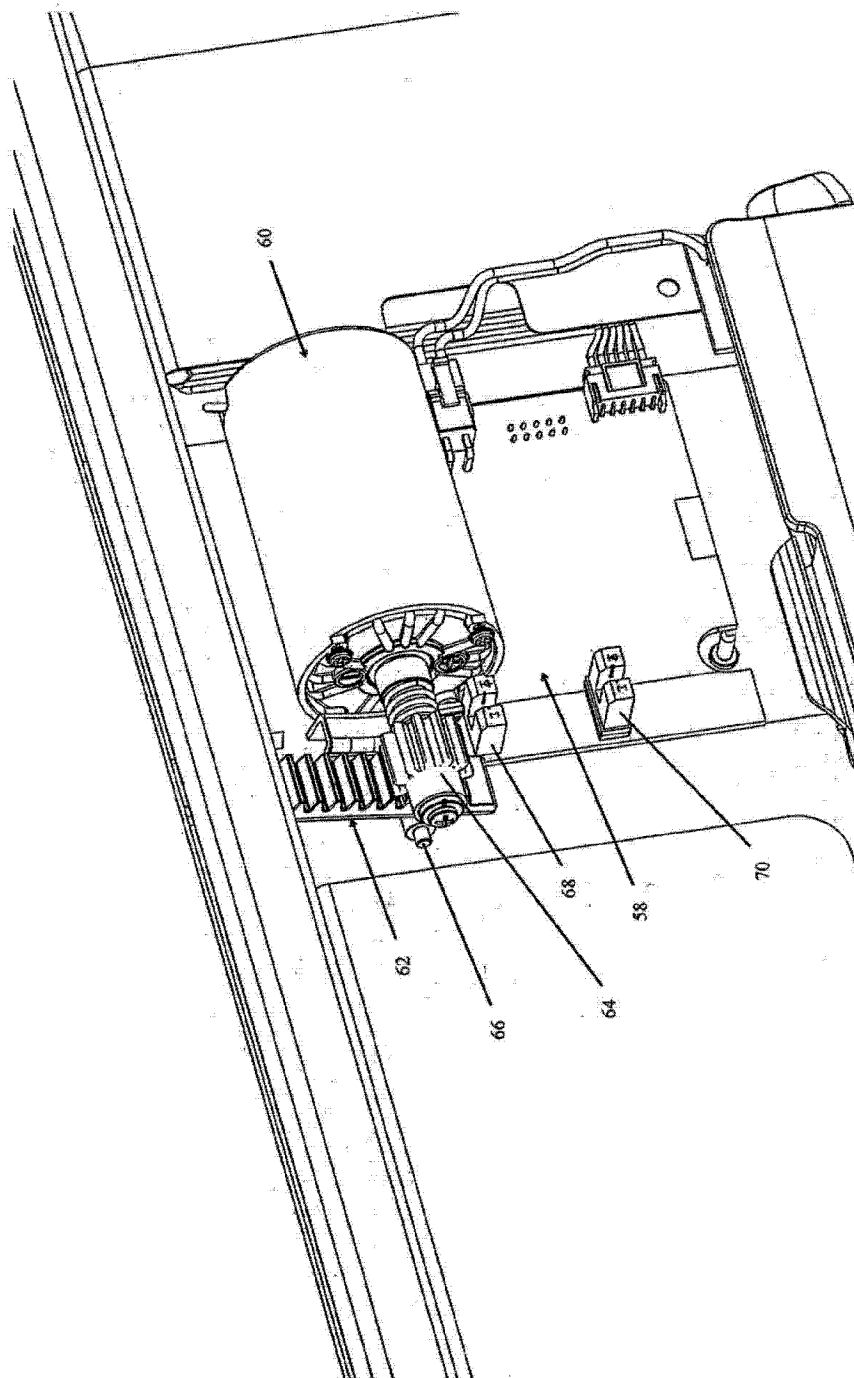


图 6

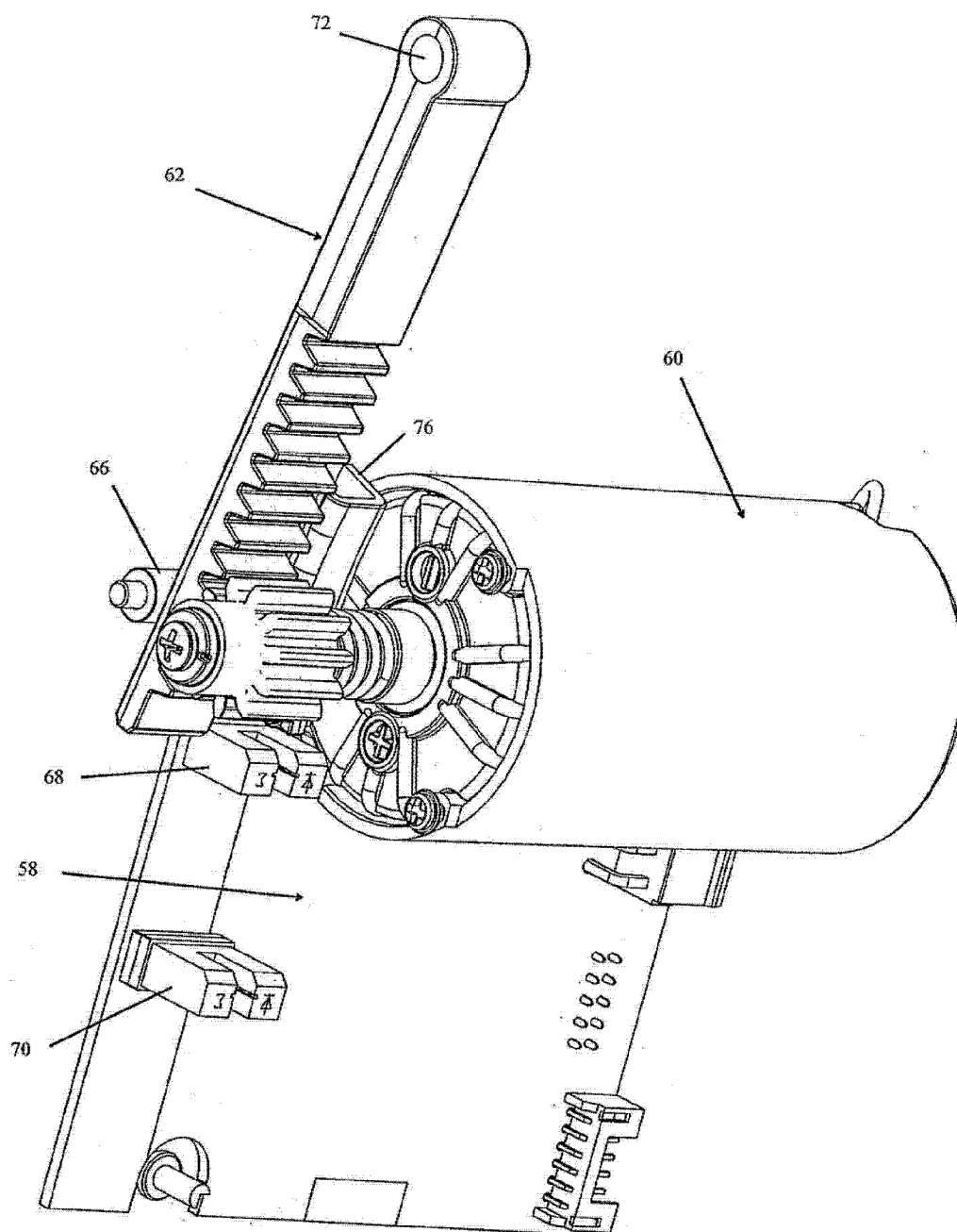


图 7

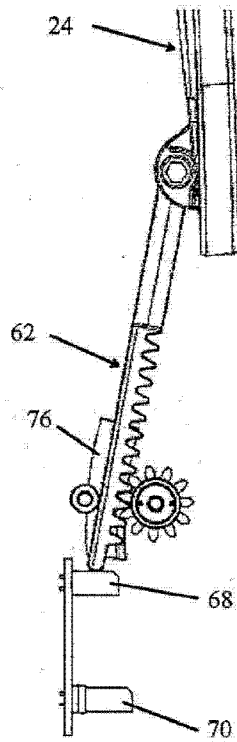


图 8

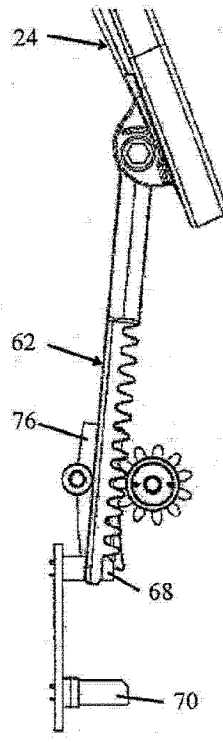


图 9

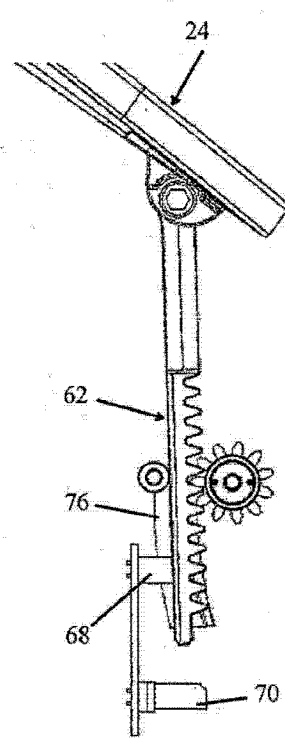


图 10

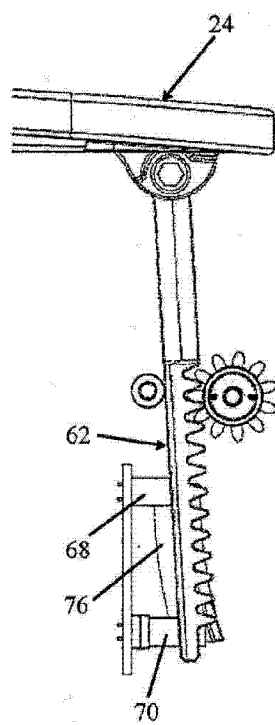


图 11

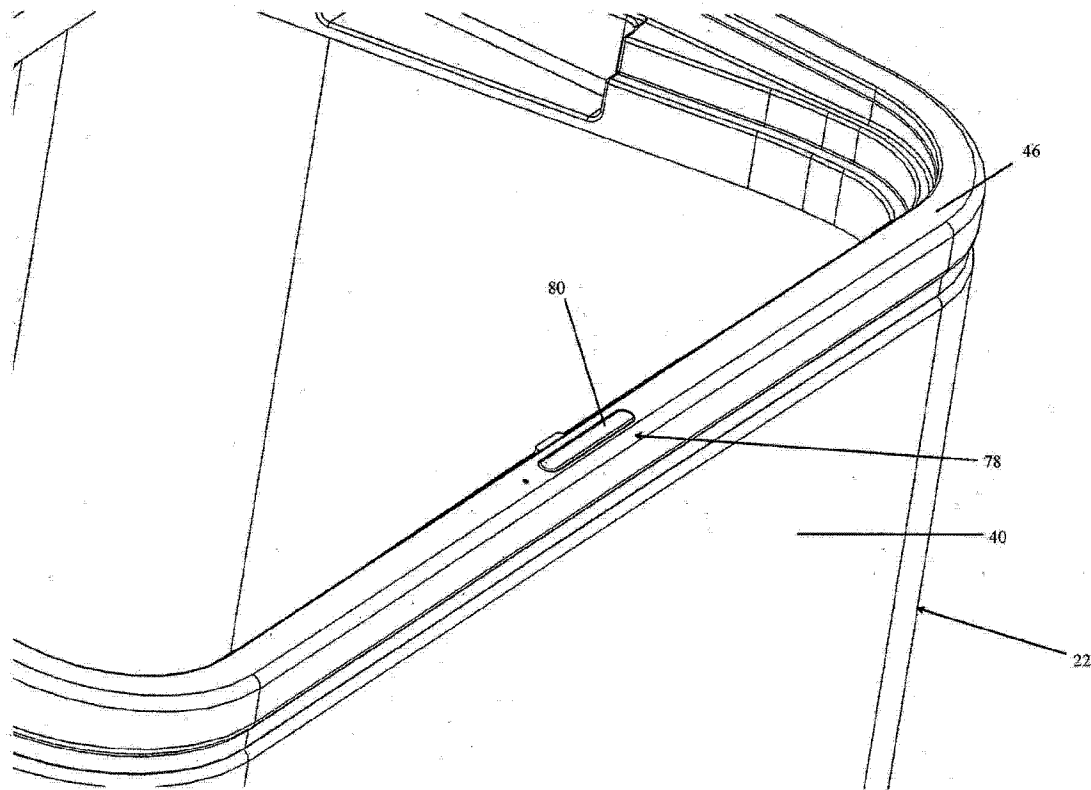


图 12

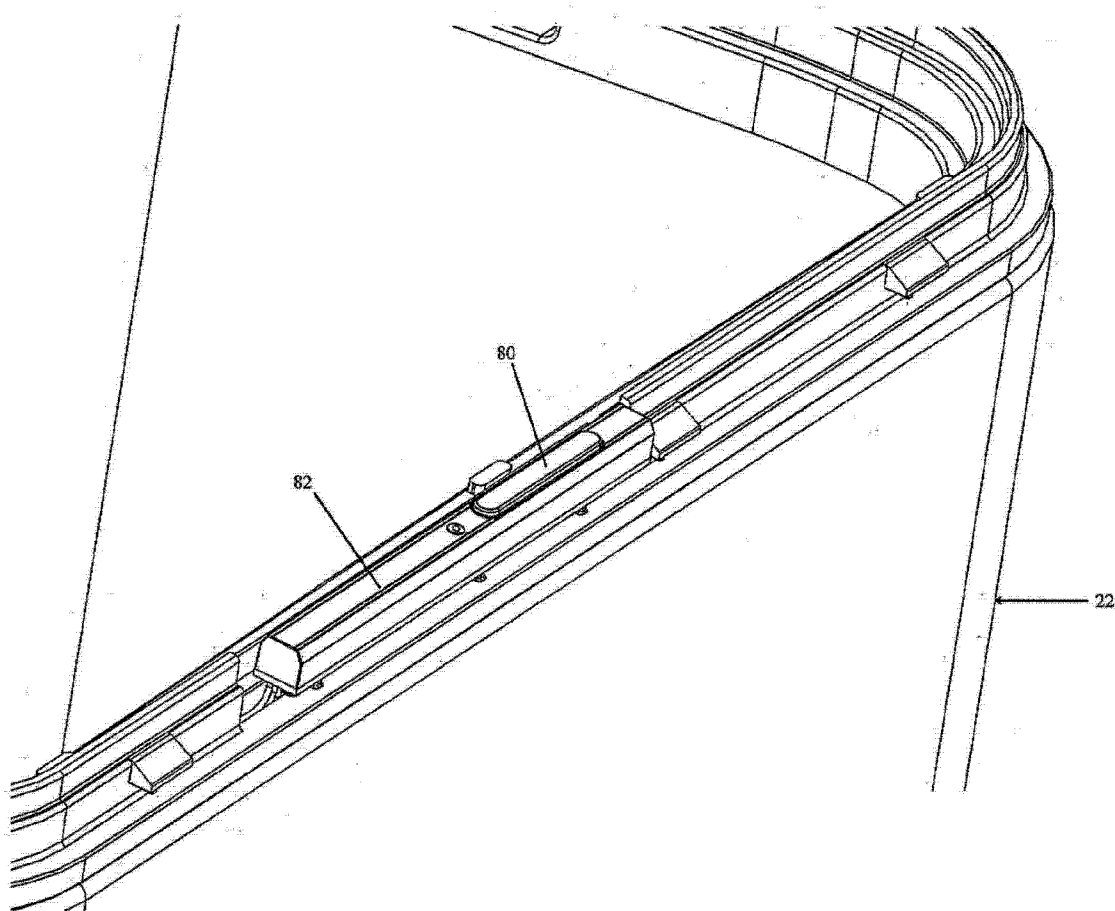


图 13

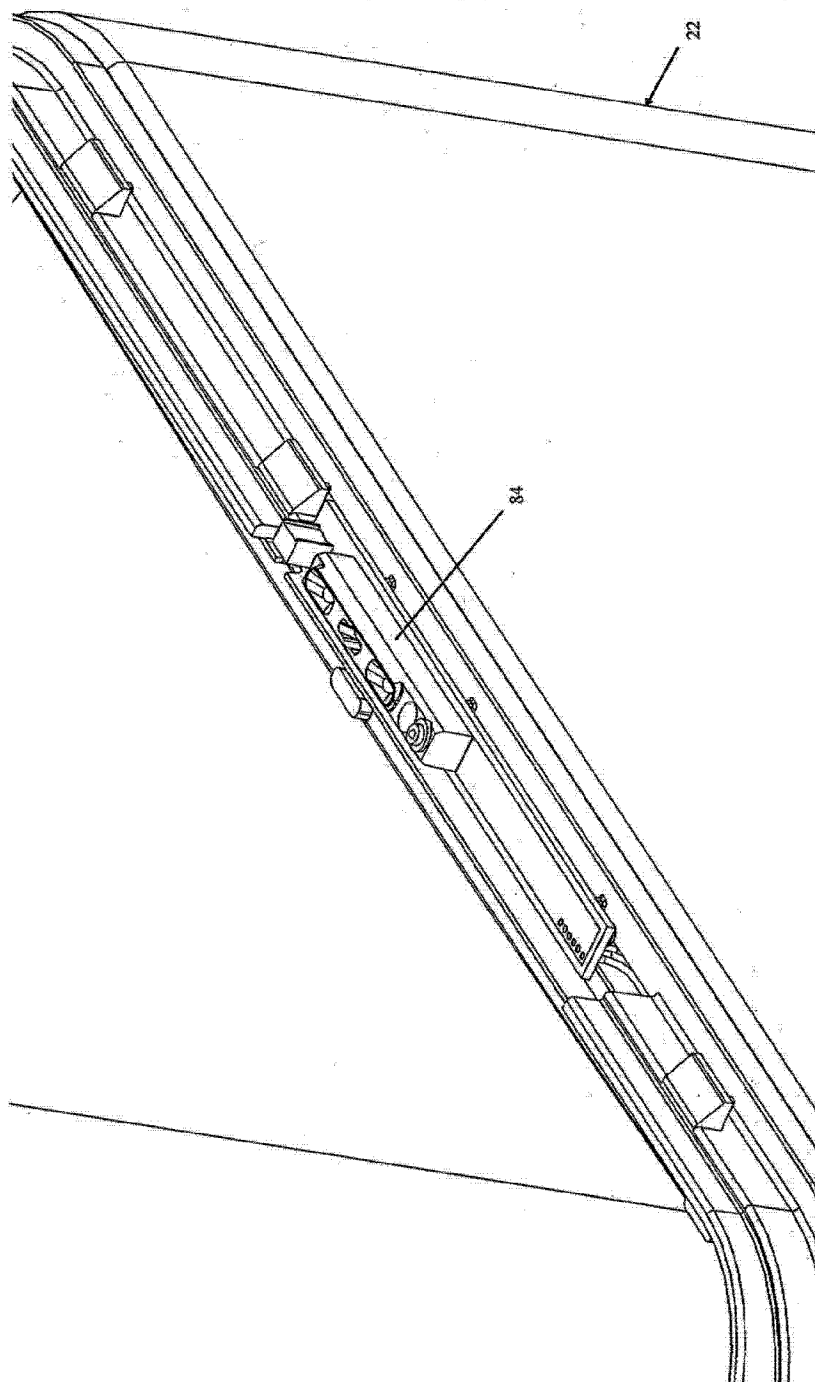


图 14

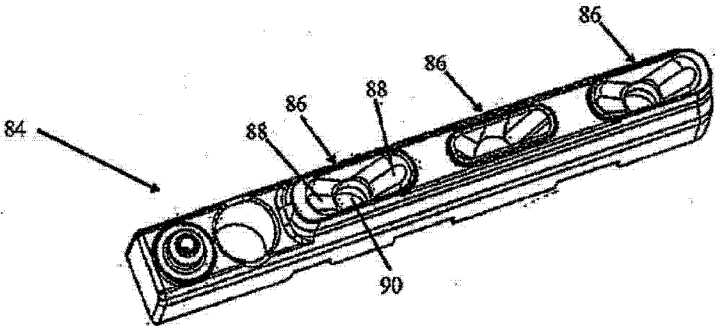


图 15A

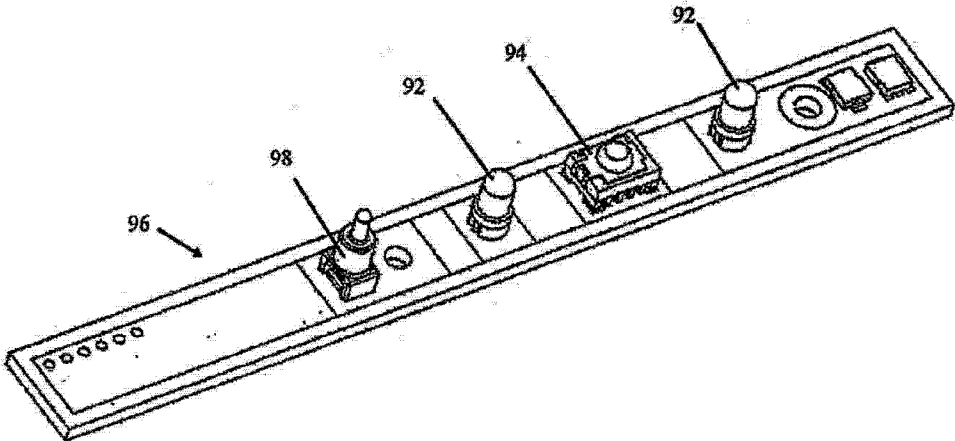


图 15B

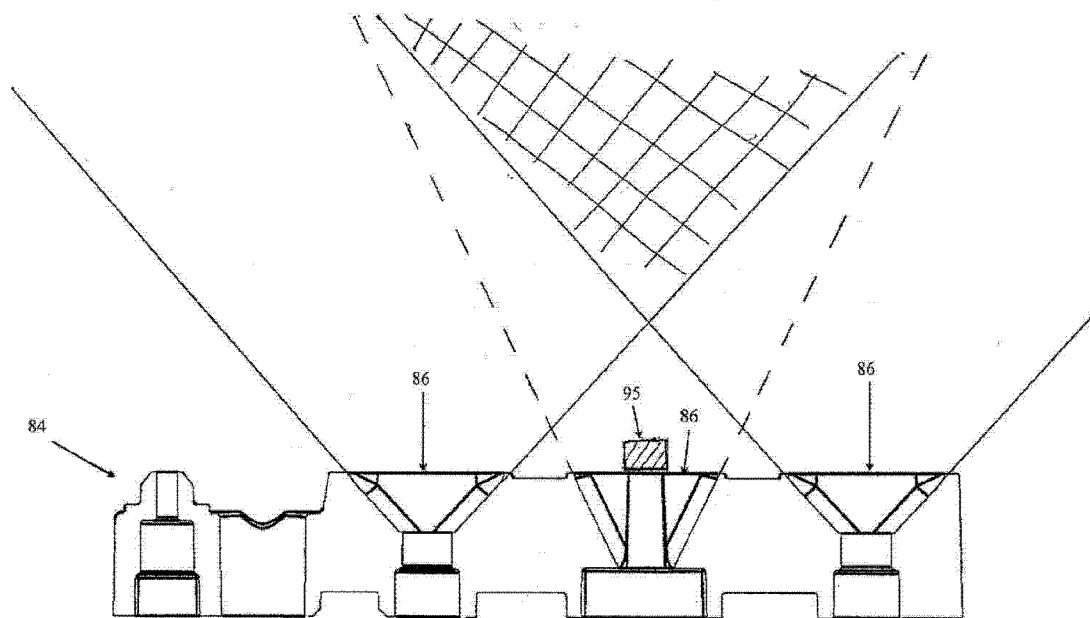


图 15C

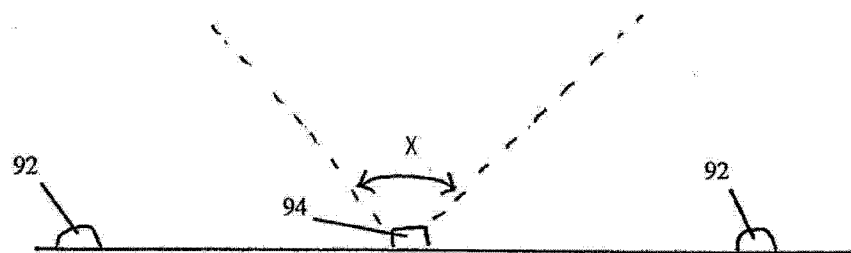


图 16A

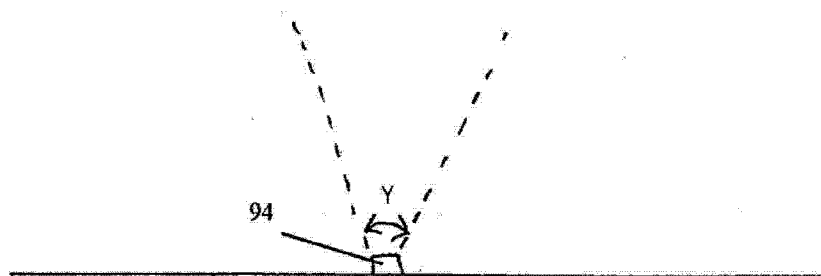


图 16B

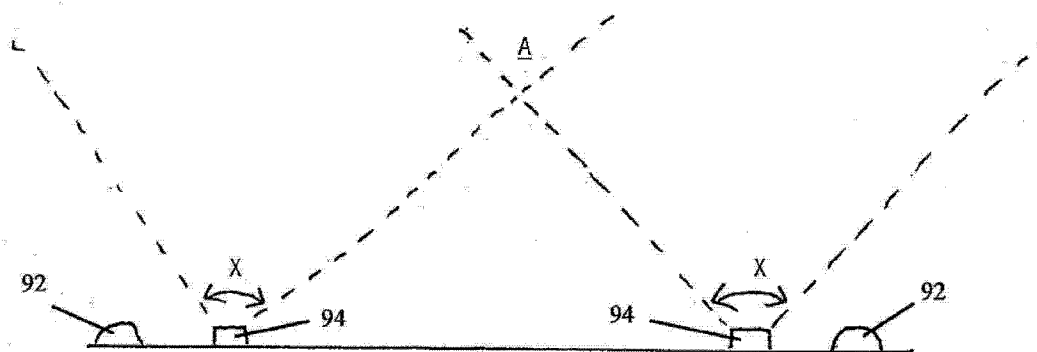


图 16C

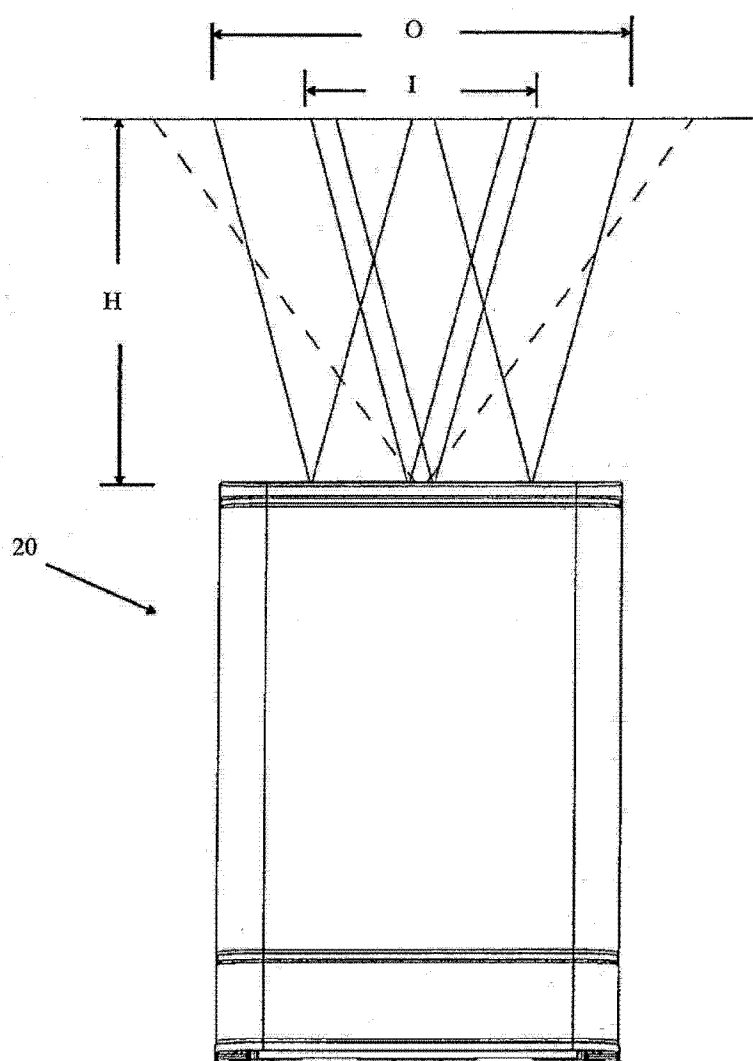


图 16D

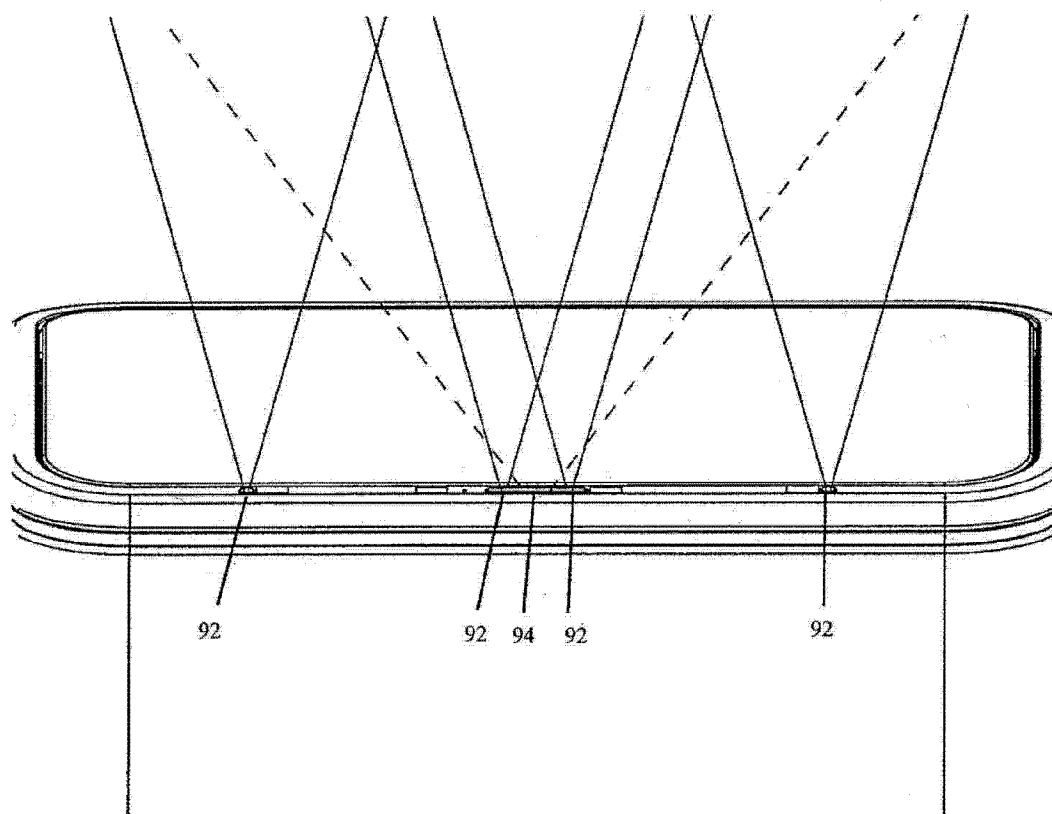


图 16E

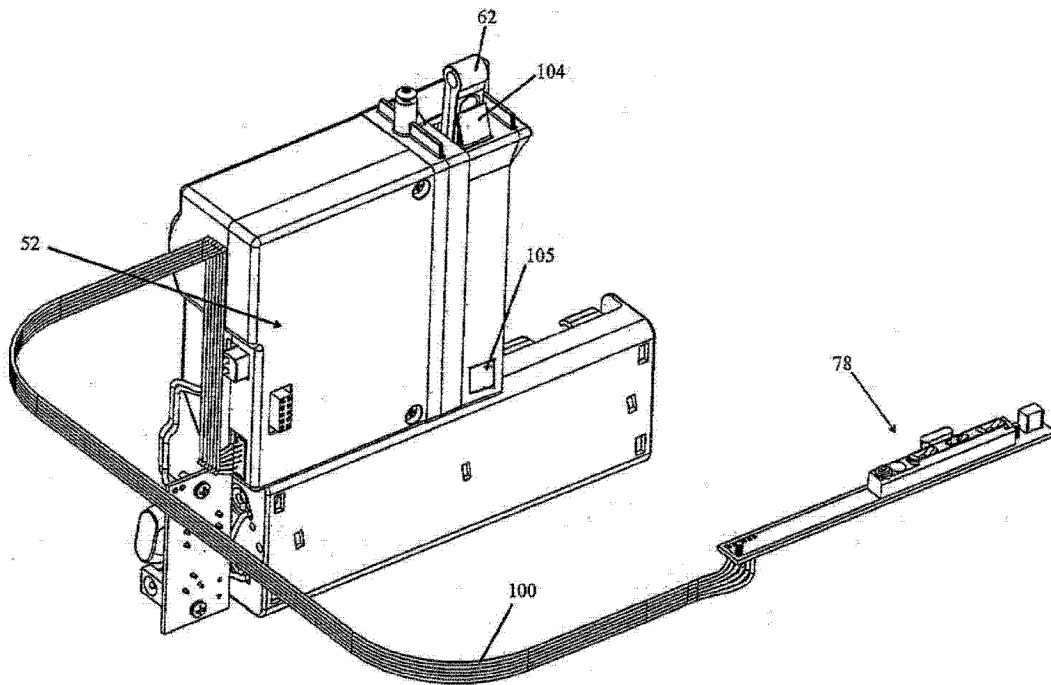


图 17

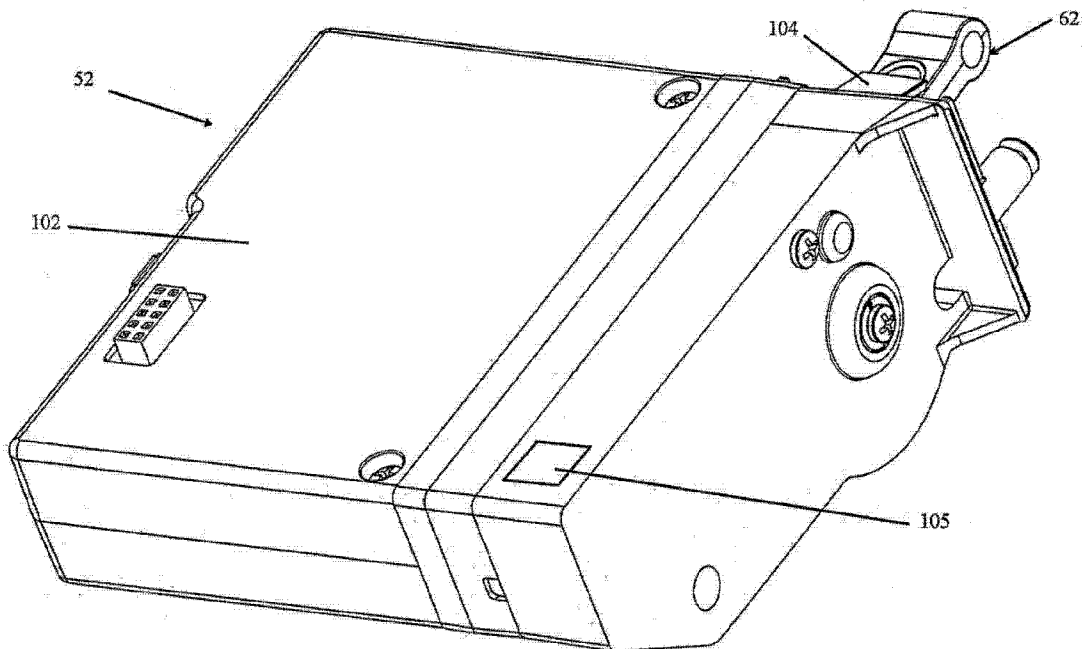


图 18

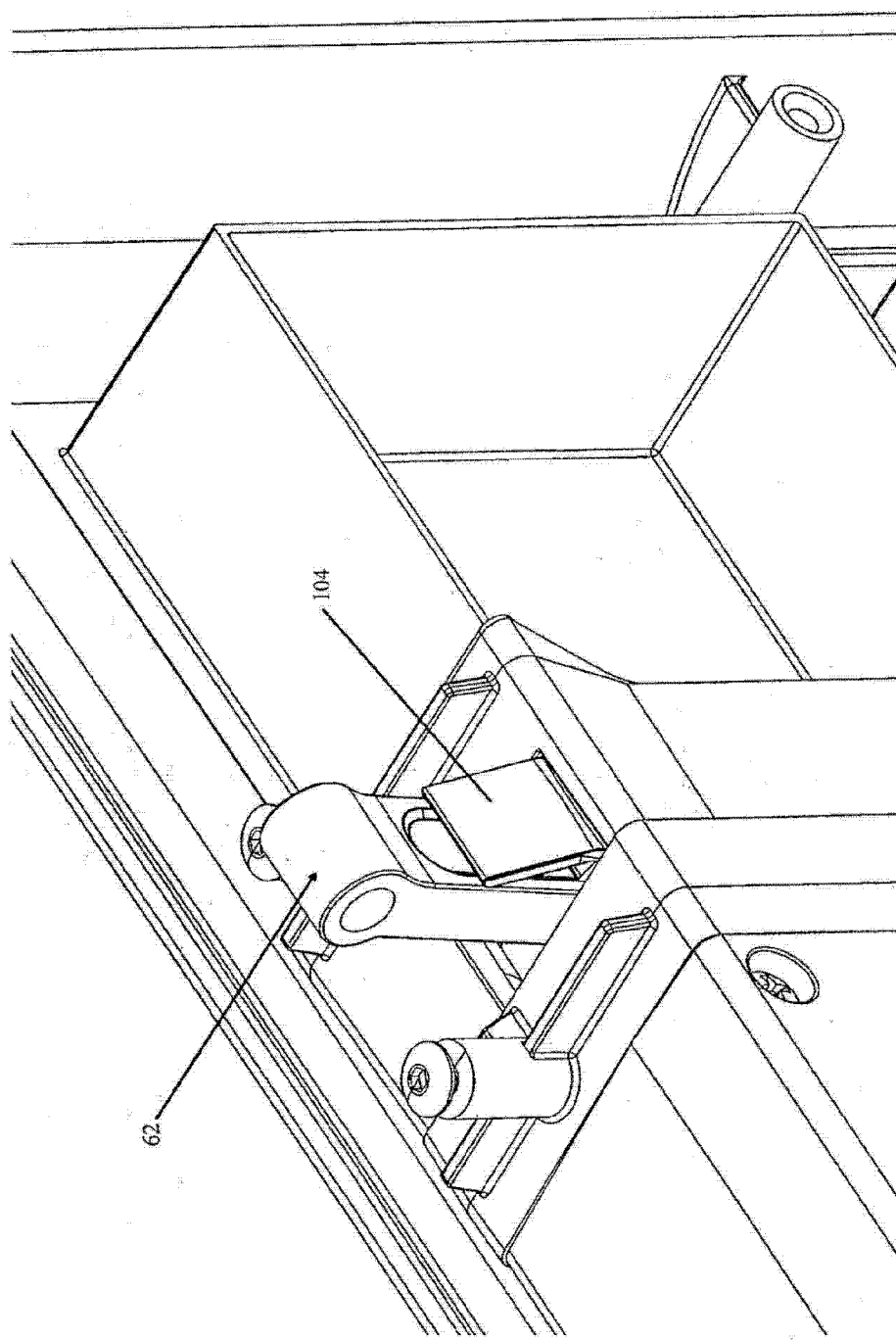


图 19

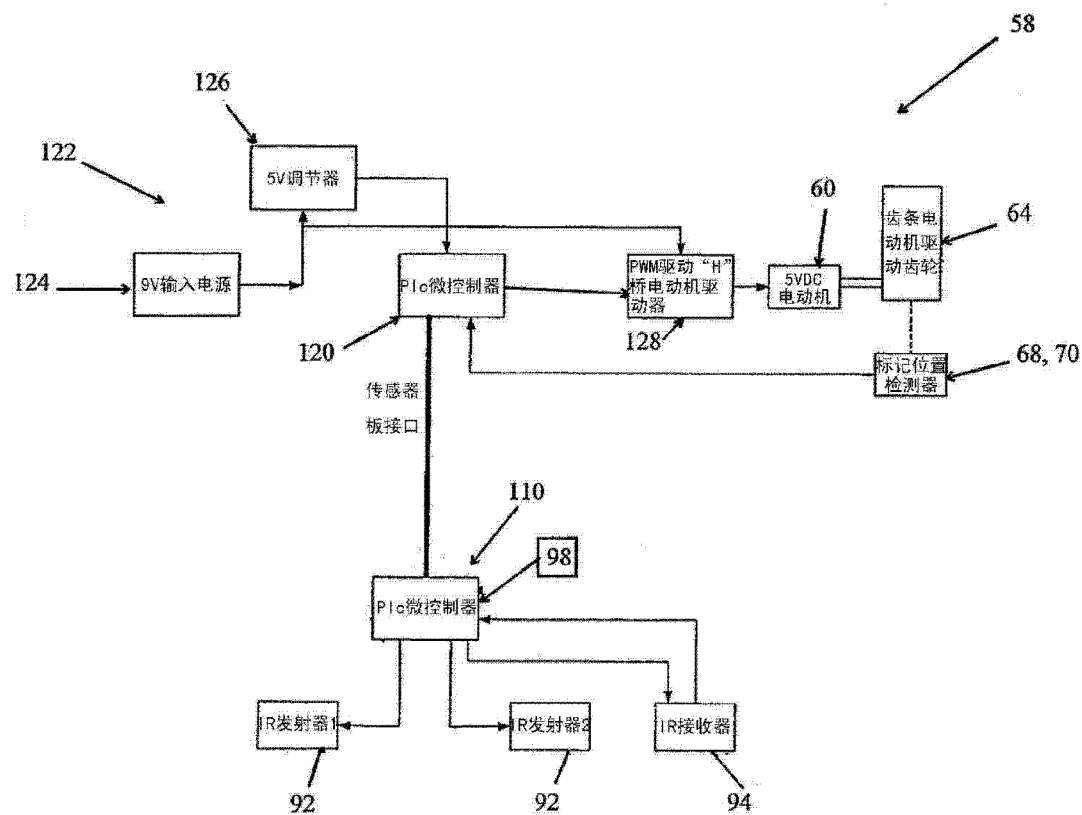


图 20

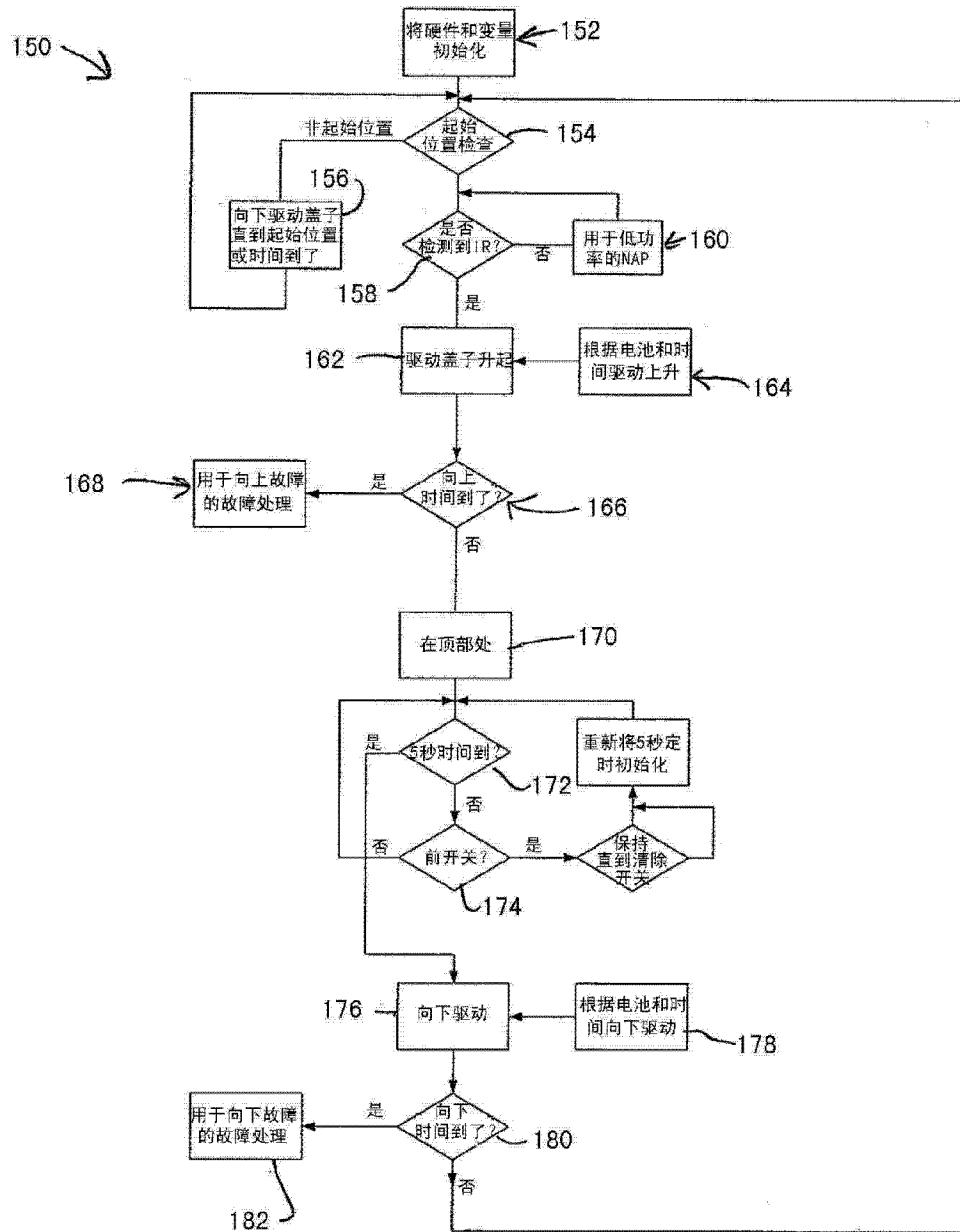


图 21

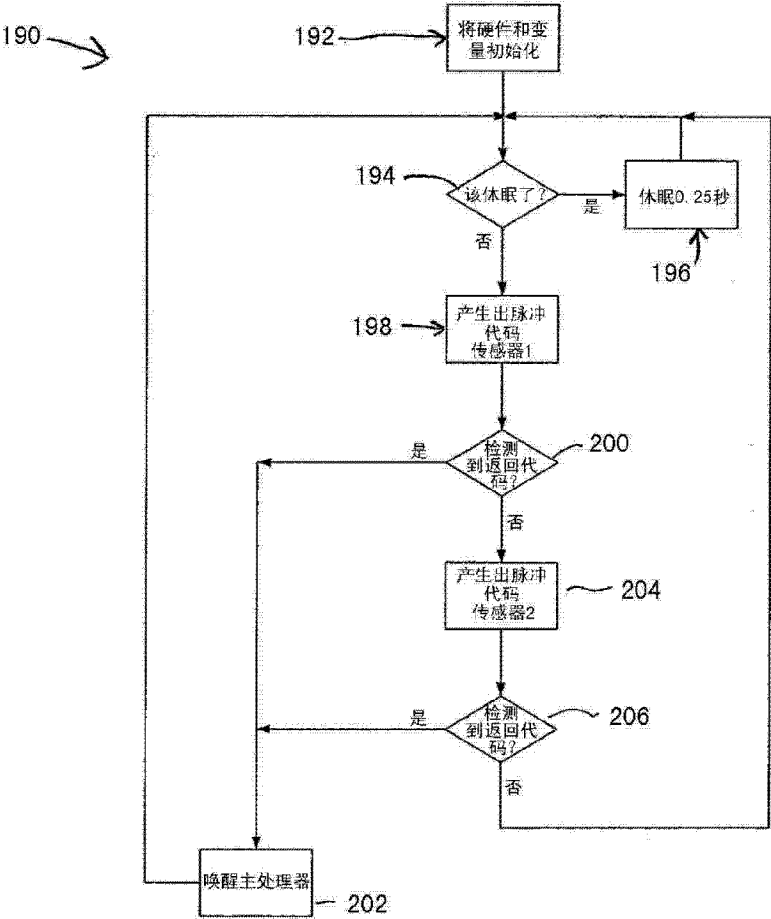


图 22

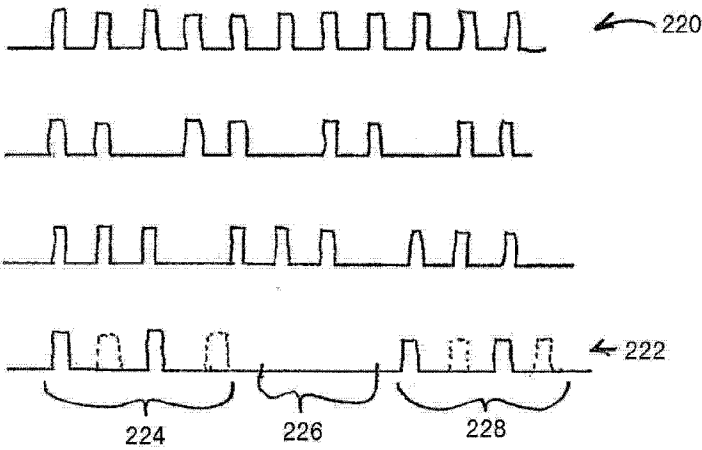


图 23

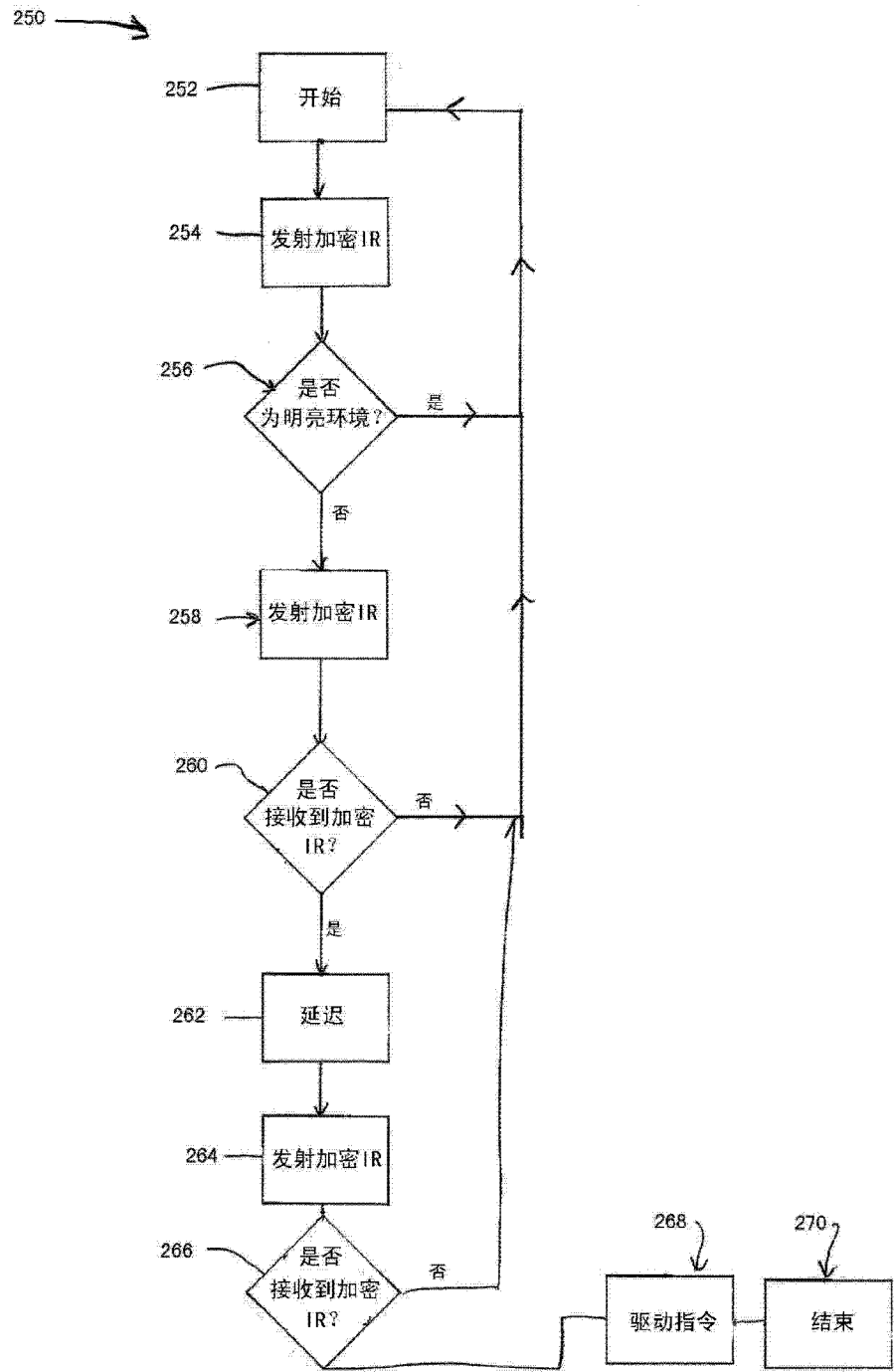


图 24

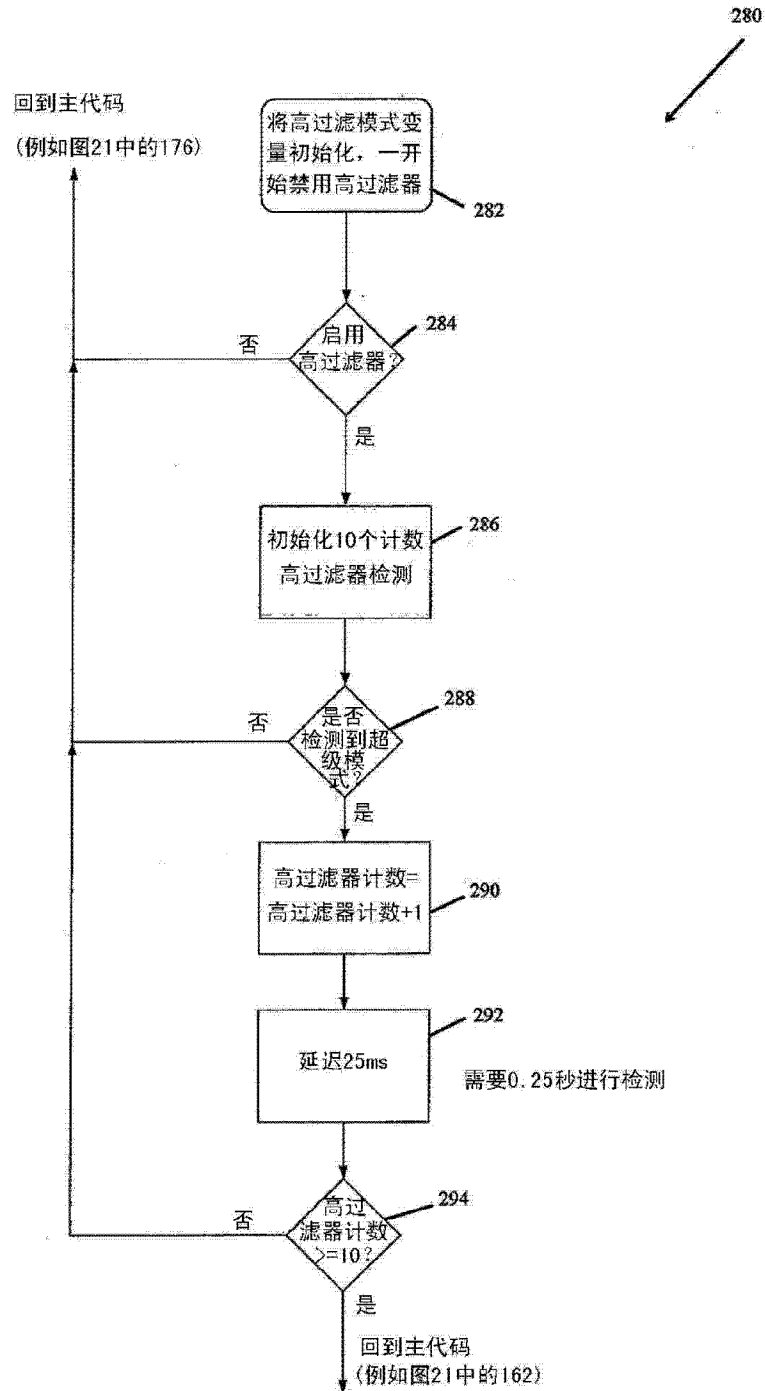


图 25

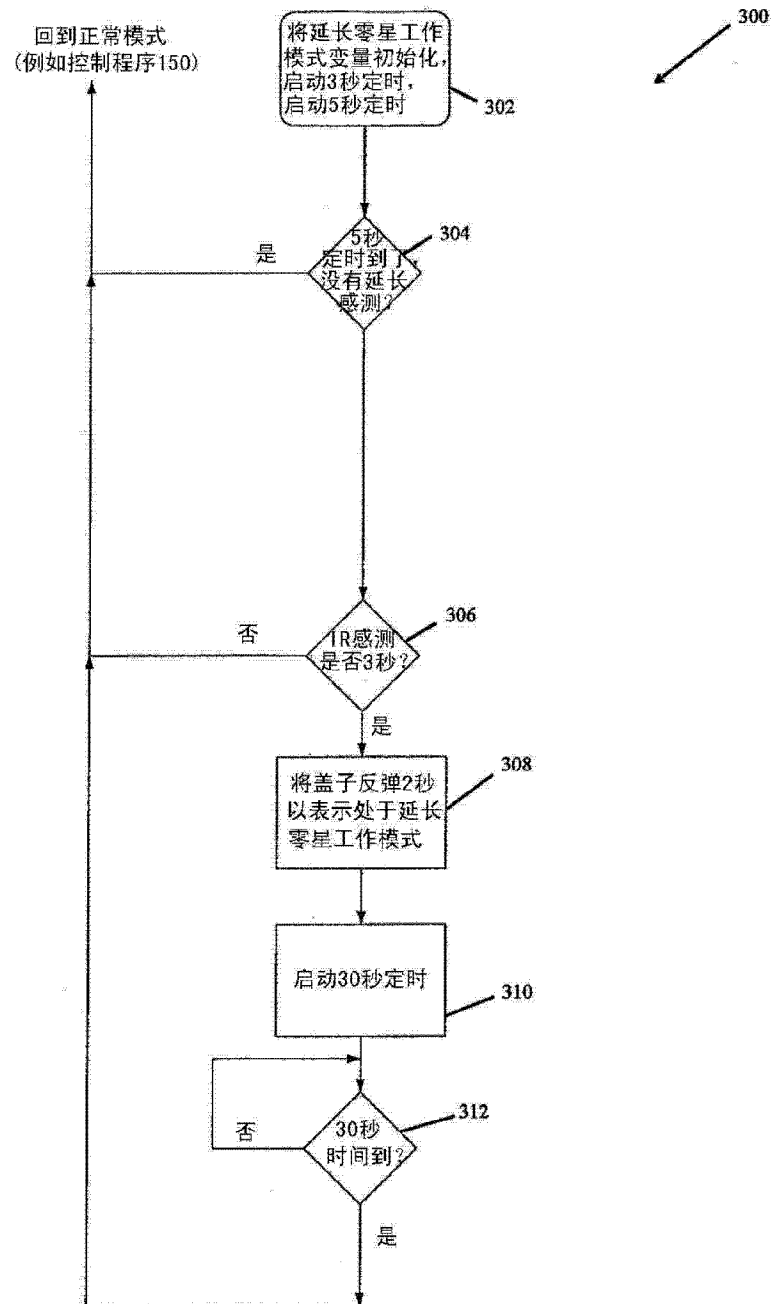


图 26

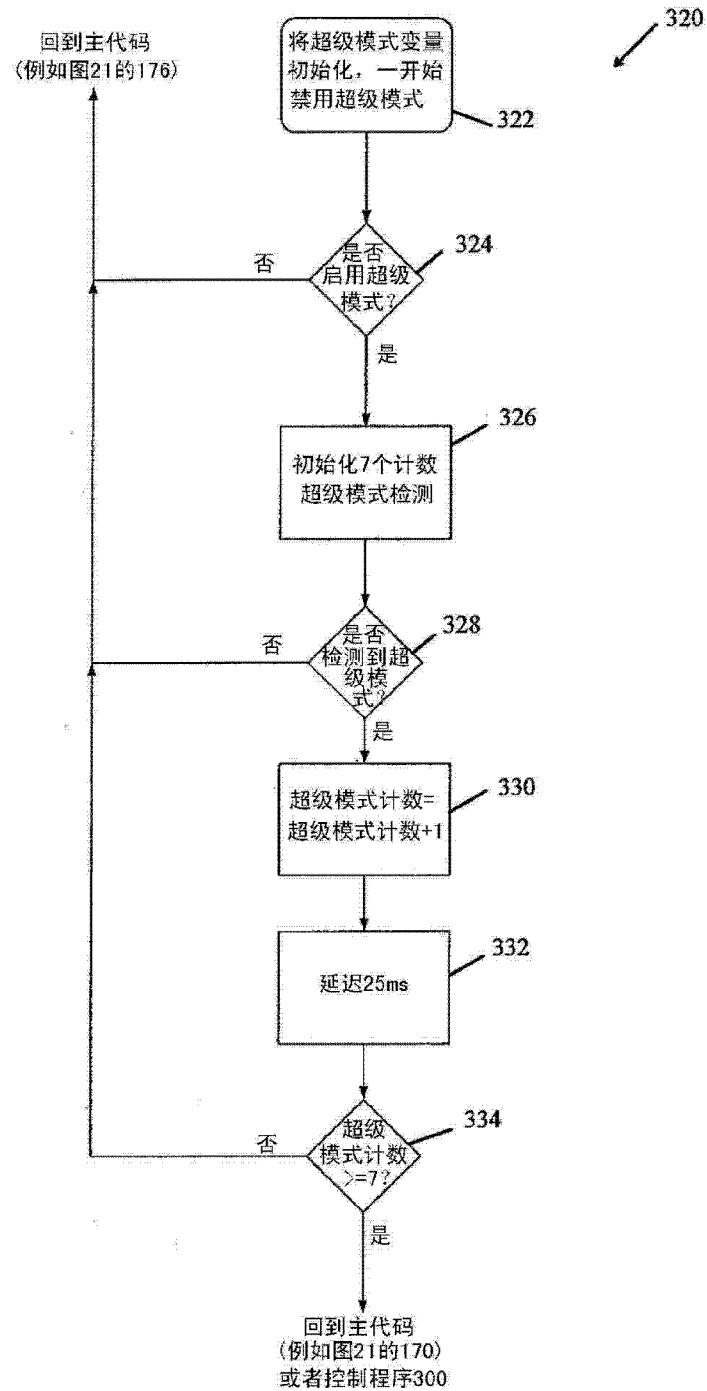


图 27

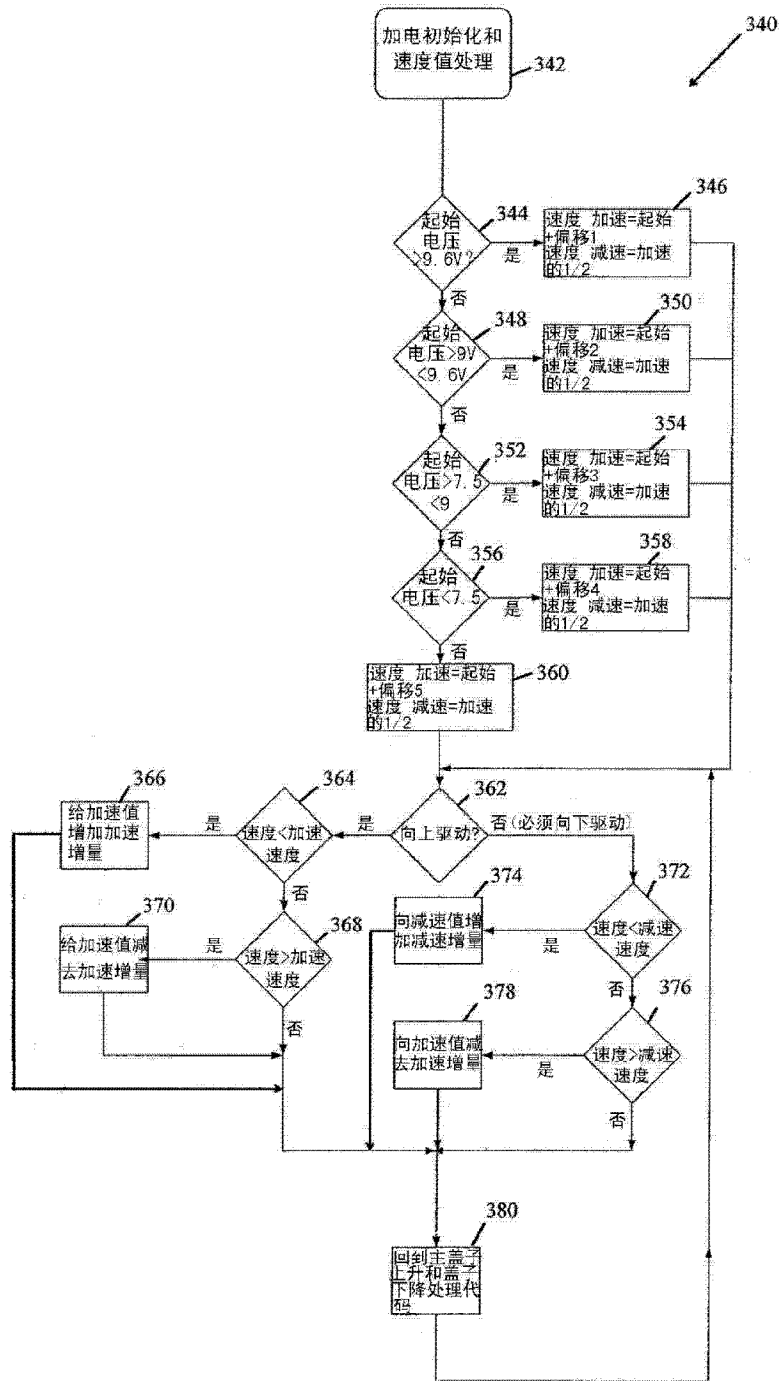


图 28

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November 3, 2011

Your Ref.: SHUMAN.100CN
Our Ref.: FP11US1219

Debit Note No.: FP11US1219-03

Re: Chinese patent application No.: 201110060533.5
Applicant: SIMPLEHUMAN, LLC

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(12) 外观设计专利

(10) 授权公告号 CN 301947175 S

(45) 授权公告日 2012.06.06

(21) 申请号 201130284559.9

(22) 申请日 2011.08.22

(30) 优先权数据

29/386,880 2011.03.04 US

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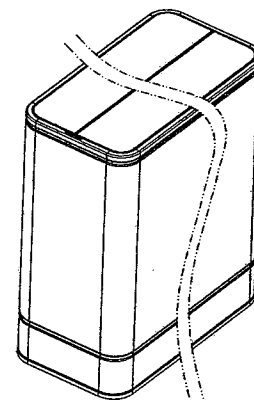
(51) LOC(9) CI.

09-09

图片或照片 8 幅 简要说明 1 页

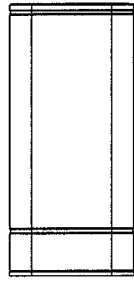
(54) 使用外观设计的产品名称

垃圾桶

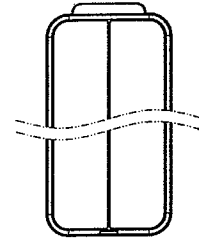


立体图 1

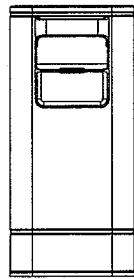
CN 301947175 S



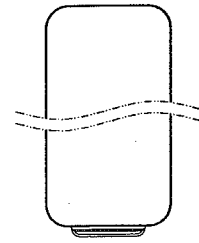
主视图



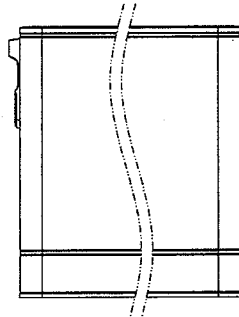
俯视图



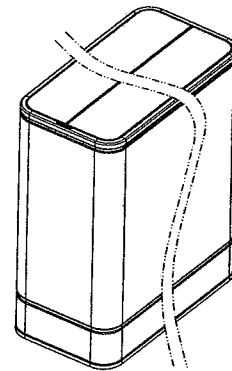
后视图



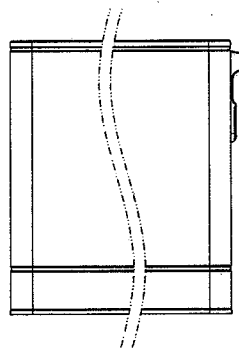
仰视图



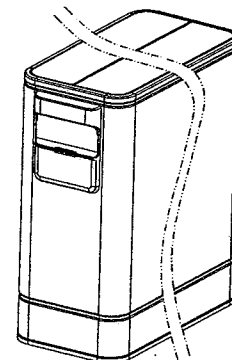
左视图



立体图 1



右视图



立体图 2

1. 本外观设计产品的名称 :垃圾桶。
2. 本外观设计产品的用途 :装放垃圾。
3. 本外观设计的设计要点 :整体外形设计。
4. 最能表明设计要点的图片或者照片 :立体图 1。
5. 如立体图 1、立体图 2、左视图、右视图、俯视图和仰视图中所示,本外观设计产品可以具有任意长度。



(12) 发明专利申请

(10) 申请公布号 CN 103300590 A

(43) 申请公布日 2013.09.18

(21) 申请号 201310066921.3

F21V 101/02 (2006.01)

(22) 申请日 2013.03.01

(30) 优先权数据

61/608,584 2012.03.08 US

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(51) Int. Cl.

A45D 42/10 (2006.01)

F21V 33/00 (2006.01)

F21V 13/02 (2006.01)

G01S 17/08 (2006.01)

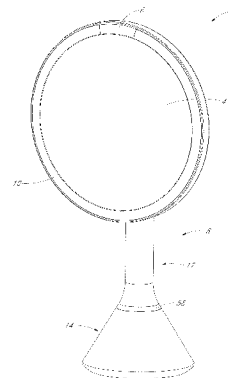
权利要求书3页 说明书17页 附图12页

(54) 发明名称

化妆镜

(57) 摘要

一种镜组件,包括壳部、镜子和光源。在特定实施方式中,镜子包括构造用于沿着镜子周边发出基本恒定数量光的光管。在一些实施方式中,该镜组件包括传感器组件。该传感器组件可进行构造以根据使用者相对镜子的位置调节发光的数量。镜子的特定实施方式包括有算法以根据使用者相对镜子的位置调节光、环境光的数量和/或不同光模式的停用。



CN 103300590 A

1. 一种镜组件,包括:

壳部;

与所述壳部连接的镜子;

设置在镜子周边的光源;

具有长度并绕镜子周边的至少一部分设置的光通道;和

沿着光通道长度设置并具有图案密度的光散射区域,所述光散射区域进行构造以促使撞击光散射部件的一部分光从光通道发出并朝向镜子的使用者,所述图案密度在与光源相隔开的区域中不太浓密,所述图案密度沿着镜子周边在大体上相对光源的区域中较浓密,从而促使沿着光通道的长度发出基本上恒定数量的光。

2. 根据权利要求 1 所述的镜组件,其中,所述散射区域包括在大体上接近所述光源的区域中的光散射部件,该部件小于大体上相对于光源的区域中的光散射部件。

3. 根据权利要求 1 所述的镜组件,其中,所述光源设置在镜子上部附近。

4. 根据权利要求 1 所述的镜组件,其中,所述光通道是沿着基本上镜子的所有周边设置的光管。

5. 根据权利要求 1 所述的镜组件,其中,所述光源沿着基本上垂直于镜子的观察表面的方向发光。

6. 根据权利要求 1 所述的镜组件,其中,所述光通道包括第一端和第二端,且其中光源发光到第一端中,另一光源发光到第二端中。

7. 根据权利要求 2 所述的镜组件,其中,所述光散射部件沿着至少一部分光通道大体上均匀地分布。

8. 一种镜组件,包括:

壳部;

与所述壳部连接的镜子;

设置在镜子周边的一个或多个光源,一个或多个光源进行构造以沿着基本上垂直于镜子的观察表面的方向发光;

具有长度并沿着基本上镜子的所有周边设置的光管,所述光管进行构造以从一个或多个光源接收光并沿着所述长度大体连续地分配光,从而向镜子周边提供基本上恒定数量的照明。

9. 根据权利要求 8 所述的镜组件,其中,所述一个或多个光源包括构造用于绕镜子周边沿第一方向发光的第一光源和构造用于绕镜子周边沿第二方向发光的第二光源。

10. 根据权利要求 8 所述的镜组件,其中,所述一个或多个光源是两个光源。

11. 根据权利要求 8 所述的镜组件,其中,每个所述的光源使用小于 3 瓦特的功率。

12. 根据权利要求 8 所述的镜组件,其中,所述一个或多个光源具有至少 90 的显色指数。

13. 根据权利要求 8 所述的镜组件,其中,所述一个或多个光源包括光发射二极管。

14. 根据权利要求 8 所述的镜组件,其中,所述光管进行构造以发送发射自所述一个或多个光源的光的至少约 95%。

15. 一种制造镜组件的方法,所述方法包括:

连接镜子和壳部;

在镜子周边设置光源；

绕镜子周边的至少一部分设置光通道；

沿着所述光通道的长度设置光散射区域，光散射区域具有图案密度，所述光散射区域进行构造以促使撞击光散射部件的一部分光从光通道发出，所述图案密度在于光源相隔开的区域中不太浓密，所述图案密度沿着镜子周边在大体上相对光源的区域中较浓密，从而促使沿着光通道的长度发出基本上恒定数量的光。

16. 根据权利要求 15 所述的方法，还包括设置所述光源在镜子的上部附近。

17. 根据权利要求 15 所述的方法，还包括绕基本上镜子的所有周边设置光通道。

18. 根据权利要求 15 所述的方法，还包括设置光源以沿着基本上垂直于镜子的观察表面的方向发光。

19. 根据权利要求 15 所述的方法，还包括设置光源以将光发射到光通道的第一端内并设置另一光源以将光发射到光通道的第二端中。

20. 根据权利要求 15 所述的方法，还包括按基本均匀的图案沿光通道的至少一部分将光散射部件设置在散射区域中。

21. 一种镜组件，包括：

壳部；

与所述壳部连接的镜子；

一个或多个光源；

构造用于检测感测区域内物体的近程传感器，所述近程传感器构造用于产生显示物体与近程传感器之间距离的信号，和

电子处理器，构造用于向所述一个或多个光源产生电子信号，以发出数量依赖于物体与传感器之间距离而变化的光。

22. 根据权利要求 21 所述的镜组件，其中，所述近程传感器大体设置在镜子顶部区域附近。

23. 根据权利要求 21 所述的镜组件，其中，所述电子处理器构造用于向一个或多个光源产生电子信号，以在近程传感器在一段时间没有检测到物体时停用。

24. 根据权利要求 21 所述的镜组件，其中，所述近程传感器构造成在近程传感器检测到物体后灵敏度增强。

25. 根据权利要求 21 所述的镜组件，还包括构造用于检测环境光数量的环境光传感器。

26. 根据权利要求 21 所述的镜组件，其中，所述感测区域相对于从近程传感器延伸的轴向下从约 0 度到约 45 度延伸。

27. 根据权利要求 21 所述的镜组件，其中，所述近程传感器倾斜于镜子的观察表面设置。

28. 根据权利要求 21 所述的镜组件，还包括设置在近程传感器附近的镜头盖。

29. 根据权利要求 28 所述的镜组件，其中，所述镜头盖的正面相对近程传感器倾斜设置。

30. 根据权利要求 21 所述的镜组件，还包括具有长度并沿着基本上镜子的所有周边设置的光管，所述光管构造成从一个或多个光源接收光并沿着所述长度大体连续地分配光，

从而向镜子的周边提供基本恒定数量的照明。

31. 一种制造镜组件的方法,所述方法包括:

连接镜子和壳部;

在镜子周边设置一个或多个光源;

构造近程传感器以产生显示物体与近程传感器之间距离的信号;

构造电子处理器以向所述一个或多个光源产生电子信号,以发出数量依赖于物体与传感器之间距离而变化的光。

32. 根据权利要求 31 所述的方法,还包括将近程传感器大体上设置在镜子顶部区域附近。

33. 根据权利要求 31 所述的方法,还包括构造电子处理器以向一个或多个光源产生电子信号,以在近程传感器在一段时间没有检测到物体时停用。

34. 根据权利要求 31 所述的方法,还包括构造近程传感器以在近程传感器检测到物体后灵敏度增强。

35. 根据权利要求 31 所述的方法,还包括构造环境光传感器以检测环境光的数量。

36. 根据权利要求 31 所述的方法,还包括构造近程传感器以检测感测区域内的物体,所述感测区域相对于从近程传感器延伸的轴向下从约 0 度到约 45 度延伸。

37. 根据权利要求 31 所述的方法,还包括倾斜于镜子的观察表面设置近程传感器。

38. 根据权利要求 31 所述的方法,还包括在近程传感器附近设置镜头盖。

39. 根据权利要求 38 所述的方法,还包括将镜头盖的正面相对近程传感器倾斜设置。

40. 根据权利要求 31 所述的方法,还包括沿着基本上镜子的所有周边设置光管,光管进行构造以从一个或多个光源接收光并沿着所述长度大体连续地分配光,从而向镜子周边提供基本上恒定数量的照明。

41. 一种镜组件,包括:

壳部;

与所述壳部连接的镜子;

设置在镜子周边的一个或多个光源;

构造用于检测感测区域内物体的近程传感器,所述近程传感器构造用于产生显示的信号,所述信号显示物体与近程传感器处在预定距离内,和

电子处理器,构造用于向所述一个或多个光源产生电子信号,以在物体与近程传感器处在预定距离内时发光。

42. 根据权利要求 41 所述的镜组件,其中,产生的光数量与物体和近程传感器之间的距离成比例。

43. 根据权利要求 41 所述的镜组件,还包括环境光传感器。

44. 根据权利要求 41 所述的镜组件,还包括用于抵抗错误激发的算法。

45. 根据权利要求 41 所述的镜组件,还包括可充电的移动电源。

化妆镜

相关申请的交叉引用

[0001] 本申请依据 35 U.S.C. § 119(e) 要求于 2012 年 3 月 8 日提交的名称为“化装镜组件”的美国临时申请号 61/608,584 的优先权权益,在此以引证的方式将其全部内容并入本文。

技术领域

[0002] 本发明涉及反射装置,例如镜子。

背景技术

[0003] 化装镜是通常用于在个人装饰、打扮、化装护理等期间反射出用户影像的镜子。市购的化装镜具有不同的结构,例如独立的镜子、手握的镜子、连接到化装桌上的镜子、浴室墙镜子,汽车镜子和 / 或附着到电子显示屏或电子装置上的或由其制造的镜子。

[0004] 许多化妆镜例如由于劣质的反射表面、不良的光源和 / 或光线的不均匀分布而扭曲反射图像。另外,传统化妆镜的光源通常是能效低的。此外,传统化妆镜的光源不可调节或者难以有效调节。

发明简述

[0005] 在一些实施方式中,镜组件包括基底、与基底连接的反射面、传感器(例如近程传感器或反射型传感器)、电子处理器和光源。在一些设备中,传感器构造用于检测、并产生显示出物体与传感器之间距离的信号。电子处理器能够构造用于从传感器接收信号并能够依赖于检测到的物体与传感器之间的距离例如通过改变光源发射的光的数量或质量来控制光源。

[0006] 在一些实施方式中,镜组件包括基底、反射面、一个或多个光源和光传送通道如光管。综合来讲,光源和光管沿着光管的长度基本上反射恒定的光。例如,在一些实施方式中,光传送通道通常设置在反射面的一些、基本上全部或所有边缘周围。

[0007] 本发明的一些方面涉及镜组件,该镜组件可包括与壳体部分连接的镜子和设置在镜子周边的光源。镜组件可包括具有长度并设置在镜子周边至少一部分周围的光通道,例如光管。镜组件可包括光散射区域,例如沿着光管长度设置的光散射部件。光散射部件可具有至少部分依赖于沿着光通道与光源的距离而变化的图案密度(pattern density)。光散射部件进行构造以使碰撞光散射部件的一部分光沿着光通道长度的期望部分从光通道射出。光通道上光散射部件的数量可至少部分依赖于沿着光通道与光源的距离而改变。在一些实施方式中,图案密度在大体上接近光源的区域中是不太浓密的,而在沿镜子周边与光源相隔开或大体上相对的区域中是较浓密的,因此随着光强度远离光源降低而更大程度地散射光并促使基本上恒定量的光沿着光管的长度被发射出。

[0008] 本说明书中公开的任何化妆镜的特征、结构、步骤和工艺都包含在任何实施方式中。大体上接近光源的区域中的光散射部件相比与光源相隔开的、或大体上相对的、或大体上最远的区域中的光散射元件是较小的。光源可设置在镜子的上部附近。光管可沿着基本

上镜子的所有周边设置。光源可沿着大体上垂直于镜子标准观察方向的方向上发光。光管大体上是圆形的,且包括第一端和第二端。光源可发光到第一端内,另一光源可发光到第二端内。在一些实施方式中,光散射部件沿着光管的至少一部分大体上是均匀分布的。

[0009] 本发明的一些方面涉及镜组件,其包括与壳体部分连接的镜子和设置在镜子周边的一个或多个光源。一个或多个光源可进行构造以沿着大体上垂直于镜子的主要观察方向的方向发光。光管可具有长度并能够沿着基本上所有的镜子的周边设置。光管进行构造以从一个或多个光源接收光并沿着长度基本连续地分配光,因而向镜子的周边提供大体上恒量的照明。

[0010] 本文中公开的所有化妆镜的特征、结构、步骤或工艺可包含在任何实施方式中。一个或多个光源可包括构造用于沿着绕镜子周边的第一方向发光的第一光源和构造用于沿着绕镜子周边的第二方向发光的第二光源。一个或多个光源可以是两个光源。每个光源可使用小于或等于约三瓦的功率。一个或多个光源可具有至少约 90 的显色指数。一个或多个光源可包括发光二极管。光管可进行构造以发射出由一个或多个光源发出的光的至少约 95%。

[0011] 本发明的某些方面涉及制造镜组件例如本说明书中公开的任何镜组件的方法。该方法可包括连接镜子与壳体部分。该方法可包括设置光源在镜子的周边。该方法可包括在镜子周边的至少一部分周围设置光管。该方法可包括沿着光管的长度设置多个光散射部件。在一些实施方式中,多个光散射部件可具有图案密度。光散射部件可进行构造以使碰撞光散射部件的光的一部分从光管发出。图案密度在大体上接近光源的区域中是不太浓密的,而在沿镜子周边与光源大体上相对、或相隔开、或最远的区域中是较浓度的,因而促使基本上恒量的光沿着光管的长度被发射出。在一些实施方式中,该方法可包括设置光源在镜子上部附近。在一些实施方式中,该方法可包括设置光管在镜子基本上所有的周边周围。在一些实施方式中,该方法可包括设置光源以沿着基本上垂直于镜子的主要观察方向的方向发光。在一些实施方式中,该方法可包括设置光源以发光到光管的第一端内并设置另一光源以发光到光管的第二端内。在一些实施方式中,该方法可包括以基本上均匀的图案沿着光管的至少一部分设置光散射部件。

[0012] 本发明的一些方面涉及镜组件,具有壳部、镜子、一个或多个光源、近程传感器和电子处理器。镜子可与壳部连接。一个或多个光源可设置在镜子的周边。近程传感器可进行构造以检测感测区域内的物体。近程传感器可进行构造以产生显示物体与近程传感器之间距离的信号。电子处理器可进行构造,向一个或多个光源发出信号以供发出数量依赖于物体与传感器之间的距离而变化的光。

[0013] 本说明书中公开的所有化妆镜的特征、结构、步骤或工艺可包含在任何实施方式中。近程传感器可大体设置在镜子顶部区域附近。电子处理器可进行构造,如果近程传感器在预定时间没有检测到物体的存在和 / 或运动,则向一个或多个光源产生电子信号以停用。近程传感器可进行构造,在近程传感器检测到物体后灵敏度增加(例如通过增加触发区域距离、通过增加触发区域内运动的灵敏度和 / 或通过增加时间段直到停用)。镜组件可包括构造用于检测背景光数量的背景光传感器。在一些实施方式中,感测区域可相对从近程传感器延伸的轴向下约 0 度到约 45 度扩展。近程传感器可以倾斜于镜子的观测表面进行设置。镜组件可包括设置在近程传感器附近的透镜盖。在一些实施方式中,透镜盖的正面

可倾斜于近程传感器进行设置。镜组件可包括具有长度并沿着基本上镜子的所有周边设置的光管。光管可进行构造以从一个或多个光源接收光并且大体上连续地沿着长度分配光，因而给镜子的周边提供基本上恒定数量的照明。

[0014] 本发明的一些方面涉及制造镜组件的方法。该方法包括将镜子与壳体部分连接。该方法可包括设置一个或多个光源在镜子的周边。该方法可包括配置近程传感器以产生显示物体与近程传感器之间距离的信号。该方法可包括配置电子处理器，向一个或多个光源产生电子信号以发射出依赖于物体与传感器之间的距离而变化的光数量。

[0015] 本说明书中公开的所有化妆镜的特征、结构、步骤或工艺可包含在任何实施方式中。该制造镜组件的方法可包括大体上设置近程传感器在镜子顶部区域附近。该方法可包括构造电子处理器，如果近程传感器在预定时间没有检测到物体，则向一个或多个光源产生电子信号以停用。该方法包括对近程传感器进行构造，在近程传感器检测到物体后灵敏度增加。该方法可包括构造背景光传感器以检测背景光数量。该方法可包括配置近程传感器，以感测相对于近程传感器延伸的轴向下约 0 度到约 45 度扩展的感测区域内的物体。该方法可包括倾斜于镜子的观测表面来设置近程传感器。该方法可包括在近程传感器附近设置透镜盖。在一些实施方式中，该方法包括倾斜于近程传感器来定位透镜盖的正面。该方法可包括沿着基本上镜子的所有周边来设置光管。光管可进行构造以从一个或多个光源接收光并且大体上连续地沿着长度分配光，因而给镜子的周边提供基本上恒定数量的照明。

[0016] 为了概括本说明书内容，在此已经阐明了本发明的一些方面、优点和特征。可以理解的是，未必任何的或所有的优点都能根据此处公开的本发明的任何特定实施方式都加以获得。本发明没有一些方面是基本的或必需的。

附图说明

[0017] 下面参照一些实施方式的附图对本文公开的镜组件的上述和其他特征进行说明。例示的实施方式旨在举例说明本发明，而非对本发明限制。附图包括以下的附图：

[0018] 图 1 例示了镜组件一实施方式的透视图。

[0019] 图 2 例示了图 1 中实施方式的正视图。

[0020] 图 3 和 4 例示了图 1 中实施方式的侧视图。

[0021] 图 5 例示了图 1 中实施方式的俯视图。

[0022] 图 6 例示了图 1 中实施方式的仰视图。

[0023] 图 7 例示了图 1 中实施方式的后视图。

[0024] 图 8A 例示了镜组件一实施方式的分解图。

[0025] 图 8B 例示了镜组件另一实施方式的分解图。

[0026] 图 9 例示了显示传感器组件的图 8A 中实施方式的放大图。

[0027] 图 10 例示了显示传感器组件背面的图 8B 中实施方式的放大图。

[0028] 图 11 例示了图 1 中所示实施方式的光传送通道。

[0029] 图 11A-11B 例示了图 11 中所示光传送通道部分的放大图。

[0030] 图 12 例示了显示基底部分部分分解图示的图 1 中实施方式的放大图。

[0031] 图 13 例示了图 1 中镜组件各部分所执行算法的实施方式的框图。

具体实施方式

[0032] 镜组件的某些实施方式在便携式,独立化妆镜的情形下公开,因为在该情形下特别实用。但是,本说明书的不同的方面也可以用于很多其它情形,例如壁装式的镜子,安装在家具上的镜子,汽车化妆镜(例如,位于遮阳板的镜子),等等。在此描述的特征都不是基本的或者不能去除的(indispensable)。在此公开的任何特征,结构或者步骤可以被替换为或者兼有任何其它在此公开或者忽略的特征,结构或者步骤。

[0033] 如图 1-7 中所示,镜组件 2 包括壳部 8 和视觉影像反射面,例如镜子 4。壳部 8 包括支撑部 20、轴部 12 和 / 或底座 14。壳部 8 还包括连接支撑部 20 和轴部 12 的枢部 16。壳部 8 的某些部件可以是一体成形或者分别形成并连接到一起来形成壳部 8。壳 8 可以包括塑料,不锈钢,铝或者其它合适的材料。

[0034] 镜组件 2 可以包括一个或多个结合图 8A 和 8B 描述的部件。图 8B 说明一种镜组件 102,其包括很多与镜组件 2 部件相似的部件。相似的部件包括用 100 表示的相似的附图标记(例如,镜子 4 与镜子 104 相似)。

[0035] 镜子 4 包括大致的平面或者球面,球面可以是凸或者凹的。曲率半径取决于需要的光强度。在一些实施方式中,曲率半径可以是至少大约 15 英寸和 / 或小于或等于大约 30 英寸。焦距是曲率半径的一半。例如,焦距是至少大约 7.5 英寸和 / 或小于或等于大约 15 英寸。在一些实施方式中,曲率半径可以是至少大约 18 英寸和 / 或小于或等于大约 24 英寸。在一些实施方式中,镜子 4 可以包括大约 20 英寸的曲率半径和大约 10 英寸的焦距。在一些实施方式中,镜子 4 是非球面的,其可以有利于自定义焦点。

[0036] 在一些实施方式中,镜子 4 的曲率半径被控制,从而物体的放大率(光强度)放大至少大约 2 倍和 / 或小于或等于大约 7 倍。在某些实施方式中,物体的放大率是大约 5 倍。在一些实施方式中,镜子可以有大约 19 英寸和 / 或大约 7 倍放大的曲率半径。在一些实施方式中,镜子可以有大约 24 英寸和 / 或大约 5 倍放大的曲率半径。

[0037] 如图 8A 中所示,镜子 4 大体上具有环形形状。在其它实施方式中,镜子 4 可以有大致为椭圆形的整体形状,大体上是正方形、矩形或者任何其它形状。在一些实施方式中,镜子 4 可以有至少大约 8 英寸和 / 或小于或等于大约 12 英寸的直径。在一些实施方式中,镜子 4 可以有大约 8 英寸的直径。在某些实施方式中,镜子 4 可以有至少大约 12 英寸和 / 或小于或等于大约 16 英寸的直径。在一些实施方式中,镜子 4 可以包括至少大约 2 毫米和 / 或小于或等于大约 3 毫米的厚度。在一些实施方式中,厚度小于或等于大约两毫米和 / 或大于或等于大约 3 毫米,取决于镜子 4 需要的性能(例如,降低的重量或者更巨大的强度(strength))。在一些实施方式中,镜子 4 的表面积实质上比底座 14 的表面积大。在其它实施方式中,镜子 4 的图像反射面的表面积比底座 14 的表面积大。

[0038] 镜子 4 可以是高反射的(例如,有至少大约 90% 的反射率)。在一些实施方式中,镜子 4 有大于大约 70% 的反射率和 / 或小于或等于大约 90% 的反射率。在其它实施方式中,镜子 4 有至少大约 80% 的反射率和 / 或小于或等于大约 100% 的反射率。在某些实施方式中,镜子有大约 87% 的反射率。镜子 4 可以被切断或者从更大的镜坯磨出,以便镜子边缘的扭曲减少或者消除。可以在镜子上提供一个或多个过滤器来调整反射光线的一个或多个参数。在一些实施方式中,过滤器包括吸收或者提高电磁能的某些带宽的反射率的薄膜和 / 或涂层。在一些实施方式中,一个或多个颜色可调过滤器,例如 Makrolon 过滤器,可以应

用于镜子以在可见光谱中减弱需要的光的波长。

[0039] 镜子 4 可以是高传输的（例如，几乎 100% 的传输）。在一些实施方式中，传输可以是至少大约 90%。在一些实施方式中，传输可以是至少大约 95%。在一些实施方式中，传输可以是至少大约 99%。镜子 4 可以是光学的等级和 / 或包括玻璃。例如，镜子 4 可以包括极端清楚的玻璃。或者，镜子 4 可以包括其它半透明的材料，例如塑料，尼龙，丙烯酸，或者其它合适的材料。镜子 4 还可以包括含有铝或者银的背面。在一些实施方式中，背面可以给予(impart)镜子轻微的色调，例如轻微的浅蓝色调。在一些实施方式中，铝背面可以防止生锈并且提供一种平稳的色调。镜子 4 可以使用模塑，机器加工，磨光，抛光，或者其它技术制造。

[0040] 镜组件 2 可以包括配置成传送光的一个或多个光源 30。例如，如图 9 中所示，镜组件可以包括多个(例如两个)光源 30。各种各样的光源 30 可以被使用。例如，光源 30 可以包括发光二极管(LED)、荧光光源、白炽光源、卤素光源或者其它。在某些实施方式中，每个光源 30 消耗至少大约 2 瓦特能量和 / 或小于或等于大约 3 瓦特能量。在某些实施方式，每个光源 30 消耗大约 2 瓦特能量。

[0041] 在某些实施方式中，每个光源的宽度可以小于或等于大约 10.0 毫米。在某些实施方式中，每个光源的宽度可以小于或等于大约 6.5 毫米。在某些实施方式中，每个光源的宽度可以小于或等于大约 5.0 毫米。在某些实施方式中，每个光源的宽度可以是大约 4.0 毫米。

[0042] 光源 30 可以用于模拟或者在可视区域非常近似于具有基本上全光谱的自然光。在一些实施方式中，光源 30 有大于等于大约 4500K 和 / 或小于或等于大约 6500K 的色温。在一些实施方式中，光源 30 的色温是至少大约 5500K 和 / 或小于或等于大约 6000K。在某些实施方式中，光源 30 的色温是大约 5700K。

[0043] 在一些实施方式中，光源 30 有至少大约 70 和 / 或小于或等于大约 90 的显色指数。一个或多个光源 30 的某些实施方式有至少大约 80 和 / 或小于或等于大约 100 的显色指数(CRI)。在一些实施方式中，显色指数是高的，至少大约 87 和 / 或小于或等于大约 92。在一些实施方式中，显色指数是至少大约 90。在一些实施方式中，显色指数可以是大约 85。

[0044] 在一些实施方式中，光通量可以是至少大约 80lm 和 / 或小于或等于大约 110lm。在一些实施方式中，光通量可以是至少大约 90lm 和 / 或小于或等于大约 100lm。在一些实施方式中，光通量可以是大约 95lm。

[0045] 在一些实施方式中，每个光源的正向电压都可以至少是大约 2.4V 和 / 或小于或等于大约 3.6V。在一些实施方式中，正向电压可以至少是大约 2.8V 和 / 或小于或等于大约 3.2V。在一些实施方式中，正向电压是大约 3.0V。

[0046] 在一些实施方式中，感测区域的外圆周的照明度是至少大约 500 勒克斯 / 或小于或等于大约 1000 勒克斯。在接近于镜子表面的距离照明度水平可以高一些。在一些实施方式中，感测区域的外圆周的照明度是大约 700 勒克斯。在一些实施方式中，感测区域的外圆周的照明度是大约 600 勒克斯。在一些实施方式中，感测区域从镜子的表面延长大约 8 英寸的距离。还可以利用很多其它感测区域，其中有一些描述如下。在某些变型，镜组件 2 可以包括一台调光器调整光的强度。

[0047] 在一些实施方式中，光源 30 构造成提供多种颜色的光和 / 或提供变化颜色的光。

例如,光源 30 可以提供两种或多个可识别颜色的光,例如红光和 Huang,或者提供一系列颜色(例如,红色、绿色、蓝色、紫色、橙色、黄色以及其它颜色)。在某些实施方式中,光源 30 构造成在遇到或将要遇到一情形时改变颜色或者呈现光。例如,某些实施方式暂时改变发光的颜色来告知用户光即将恢复非激活状态。

[0048] 如图 9 中所示,光源可以位于镜组件 2 的最重要的区域附近。在其它实施方式中,光源 30 位于镜组件 2 的其它部分,例如,在光导管 10 内,或者在镜子 4 的外围以隔开的间隔直接安装到镜子 4。例如,光源 30 可以沿镜子 4 的一部分、基本上全部或者全部设置。在某些实施方式中,光源 30 从镜组件 2 分离且不与其相连接。

[0049] 光源 30 可以相对于彼此以不同方向设置,例如,并排式、背对背或者其它。在某些实施方式中,光源 30 可以设置成在相对的方向上发光。例如,如图 9 中所示,第一光源 30a 在镜子 4 的周围的第一方向(例如,顺时针)发光,第二光源 30b 在镜子 4 的周围的第二方向(例如,反时针)发光。在某些实施方式中,光源 30 可以设置成与镜组件 2 的可见表面基本正交地发光。在某些实施方式中,光源 30 可以设置成与镜子 4 的边缘成切线地发光。

[0050] 镜组件 2 可以包括一种机构以主动或被动地从光源 30 驱散、转移或者辐射热,例如风扇、通风孔和/或一个或多个无源的散热或者放射结构 34。支撑部 20 在镜组件 2 的上面区域附近可以包括接纳部 22,用于容纳散热结构 34。散热结构 34 可以由具有高效热传导的材料形成,例如铝或者钢,帮助从镜组件除去由光源 30 产生的热。很多其它散热材料可以使用,例如铜或者黄铜。

[0051] 散热结构 34 可以使光源 30 生成的热消散和/或把电传导到光源。使热消散并且把电传导到光源 30 的散热结构 34 降低必要部件的总数。在一些实施方式中,如图所示,散热结构 34 可以包括一个或多个部件,在一个尺寸大体上比较长,在另一个尺寸大体上比较宽,且在另一个尺寸一般比较狭窄,提供在具有大表面积的薄面,从而通过散热结构 34 有效地传热,然后容易地将该热传输到周围的空气中并离开镜组件中的热敏电子元件。例如,散热结构 34 的长度可以比散热结构 34 的宽度大很多,并且散热结构 34 的宽度可以比厚度大很多。

[0052] 散热结构 34 可以是电气连接的电路板和/或直接或者间接给其上附着的光源 30 提供电力和信号。在一些实施方式中,具有散热结构 34 的光源 30 的温度小于或等于大约 70 °F。在一些实施方式中,具有散热结构 34 的光源 30 的温度是在大约 50 °F 和 60 °F 之间。

[0053] 如图 8A 中所示,散热结构 34 可以是包括支撑面板 34c 的单独结构,支撑面板 34c 放置为基本上和镜子 4 平行。在一些实施方式中,支撑面板 34c 是一电路板。散热结构 34 还可以包括安装到支撑面板 34c 上的一个或多个翅片。如图 8A 中所示,散热结构 34 可以包括两个翅片 34a、34b。翅片 34a、34b 可以位于支撑面板 34c 和镜子 4 之间。翅片 34a、34b 还可以放置为每个翅片 34a'、34b' 的第一端比翅片 34a''、34b'' 的第二端更加接近(例如,V 形)。翅片 34a、34b 可以直接或者间接连接到光源 30。例如,每个翅片 34a、34b 可以容纳光源 30。

[0054] 如图 8B 中所示,散热结构 134a、134b 可以是独立元件。类似于图 8A,散热结构 134a、134b 可以放置为每个翅片 134a'、134b' 的第一端比翅片 134a''、134b'' 的第二端更加接近(例如,大体上是 V 形)。翅片 134a、134b 可以直接或者间接连接到光源 130。例如,每个翅片 134a、134b 可以容纳光源 130。

[0055] 图 10 显示不具有后盖部 118 的镜组件 102 的后侧。每个散热结构 134a''、134b'' 的第二端可以位于灯管的第一端 140a 和第二端 140b 之间并在传感器装置 128 的任一侧。散热结构 134a、134b 可以置于支撑结构 120 后面。例如,散热结构 134a、134b 可以位于电路板 170 和后盖部(未示出)之间。支撑部 120 还可以包括一个或多个钩 172 或者其它结构,用于结合电路板 170。

[0056] 支撑部 20 可以支撑镜子 4 和沿镜子 4 的外围的至少一部分设置的光输送结构,例如光导管 10。在一些实施方式中,光导管 10 只沿着镜子 4 的上部或者镜子 4 的侧部设置。在其它实施方式中,光导管 10 沿镜子 4 的至少大部分边缘延伸,基本上镜子 4 的整个边缘,或者环绕镜子 4 的整个边缘。如图 8A 中所示,支撑部 20 可以包括一种结构,例如脊 21,其可以支撑光导管 10(例如,光导管 10 的部分可以沿着脊 21 安装)。

[0057] 光源 30 发出的部分或全部光一般可传送给,或者进入光导管 10。例如,如图 8A 中所示,光导管 10 可以包括末端 40a、40b,并且光源 30 可以发出光进入光导管 10 的末端 40a、40b 中的一个或两个。光源 30 可以设置为光一般朝向面对镜组件 2 的表面的使用者发射。例如,来自光源 30 和 / 或光导管 10 的部分或全部光都可以在接触到使用者之前射向其它元件并从其反射。在一些实施方式中,光源 30 置于镜子 4 之后(例如,形成镜子 4 的逆光效应)。在一些实施方式中,光源 30 放置为(例如,通过倾斜)从光源 30 发射的光以一角度接触镜组件 2 的可见表面,例如一锐角。在一些实施方式中,光源 30 设置为从光源 30 发射的光以一钝角接触镜组件 2 的可见表面。

[0058] 在安装到支撑部 20 上时,光导管 10 有径向宽度和轴向深度。一些变型有大于等于轴向深度的径向宽度。在某些实施过程中,光导管 10 构造为为镜子 4 的反射面提供足够的面积,并且为从光导管 10 发射的光提供足够的面积,在下文将更详细描述。例如,光导管 10 的径向宽度和镜子 4 的半径的比率可以小于或等于大约:1/5、1/15、1/30、1/50,值在此之间,或者相反。

[0059] 如图 8A 中所示,光导管 10 可以基本上成形为圆形。光导管 10 可以包括缺口 44,并且传感器装置 28 和 / 或光源 30 可以位于缺口 44。在一些实施方式中,光导管 10 可以基本上成形为线性,或者光导管 10 有一非线性和非圆形的形状。光导管 10 可以包括丙烯酸,聚碳酸酯或者任何其它透明或者高传送率的材料。光导管 10 可以是至少有点不透明的。

[0060] 光可以沿着并穿过光导管 10 的部分和 / 或通过光导管 10 的外表面 42 从光导管 10 发射。在一些实施方式中,光导管 10 构造成传送从光源 30 发射的光的至少大约 95%。光源 30 构造为与光导管 10 相结合,大体上沿镜子 4 的边缘发光。光导管 10 可以构造成从光源 30 通过光导管 10 散射光。光源 30 和光导管 10 构造为从外表面 42 发射的光量沿着光导管 10 的长度基本恒定。可以使用很多不同方式获得基本恒定的沿光导管 10 输送的光的强度。

[0061] 支撑部 20 和 / 或光导管 10 可以包括部件来促进大体上平稳或均衡的扩散、散射和 / 或光源 30 发射的沿镜子边缘的反射。例如,支撑部 20 和 / 或光导管 10 可以包括以一种不平的和 / 或非平面的方式模制的不规则的前面和 / 或后面,蚀刻、粗糙化、油漆和 / 或其它表面修整。光散射元件可以构造成沿着镜子 4 的边缘散射基本上恒定的光量。这些特征可以帮助获得高的能效,降低基本上照亮镜子的全部边缘所需的光源的总数,并且降低镜组件 2 的温度。

[0062] 光导管 10 可以包括有不同散射程度的大体上半透明的材料,从而最小量的散射在光源附近的区域发生,而大量的散射在离光源最远的光导管 10 的区域发生。光导管 10 可以包括构造成以不同方式发散光的区域。在一些实施方式中,光输送通道或者光导管 10 可以包括由任何合适的过程形成的各种各样的,非恒定的、非光滑前面、后面和 / 或内表面,例如模塑、蚀刻、粗化油漆、涂覆和 / 或其它方法。在一些实施方式中,一个或多个表面不规则可以是非常小的凸起,凸出物和 / 或凹口。

[0063] 在一些实施方式中,通过光导管 10 的光可以在多个不同的强度级散射,这取决于光在光导管 10 内的位置。例如,在光导管 10 上第一位置的光可以以第一强度级散射,在光导管 10 上第二位置的光可以以第二强度级散射,在光导管 10 上第三位置的光可以以第三强度级散射,第三强度级超过第二强度级,且第二强度级超过第一个强度级,等等。很多其它等级的散射和很多空间上增加或者减少散射的方式可以用于替代或者补充提供大量的散射元件,例如在光导管 10 的材料内空间上改变冲模等级或者去光效应,或者通过空间上改变散射粒子在材料内的嵌入,或者通过在材料的一个或多个外表面上空间地改变表面图案。

[0064] 光导管 10 可以包括一表面图案,例如如图 11 中所示的光散射元件 74 (例如,点图形)。光散射元件 74 可以构造成促使穿过光导管 10 的从光导管 10 的外表面 42 发出,从而大体上以平稳或均衡的方式照亮使用者。光散射元件构造为从光导管 10 的外表面 42 发射的光的强度沿着光导管 10 的长度的大部或者实际上全部基本恒定。因此,用户沿镜子 4 的边缘可以接收大体上恒定的光量或者强度。例如,光散射元件可以包括一个或多个各种密度,不规则的图案,或者各种尺寸。

[0065] 如图 11 中所示,光散射元件 74 可以在光源 30 附近较不密集 (图 11B),而根据从光源 30 增加的距离变得逐渐密集 (图 11A)。这样的结构可以,例如,减少在具有逐渐增大的光量或光强度的区域散射或反射 (因此从外表面 42 射出) 的光量,区域是例如在光源 30 附近的光导管 10 的部分。此外,这样的结构可以在具有大体上减小的光量或强度的区域促使额外的散射或者反射 (因此增加从外表面 42 发出的量),该区域例如是从光源 30 隔开的光导管 10 的部分。因此,镜组件 2 可以在镜子 4 的边缘的一些部分避开明亮部分而在其它部分避开黑暗区域。镜组件 2 可以具有沿着镜子 4 的边缘的部分、基本全部或者全部发出的基本恒定量的光。

[0066] 光散射元件可以以一种不规则的图案分散,从而在第一区域的光散射图案与第二区域的光散射图案不同。在第一光散射元件和第二光散射元件之间的一段距离可以不同于在第一光散射元件和第三光散射元件之间的一段距离。

[0067] 光散射元件的尺寸 (例如,直径) 可以改变。在一些变型中,当与从光源 30 变远的光散射元件相比,接近光源 30 的光散射元件可以有更小尺寸。例如,光散射元件在光源 30 附近可以包括更小的直径而根据光源 30 的距离变得逐渐增大。这样的结构允许光到外表面 42 基本上是平稳的反射。在某些实施方式中,每种光散射元件有小于或等于大约 1 毫米的直径。在一些实施方式中,光散射元件各自具有大于等于大约 1 毫米的直径。

[0068] 在一些实施方式中,光散射元件可以大致是圆的。在一些实施方式中,光散射元件有其它形状,例如大体上的正方形、大体上的矩形、大体上的五边形、大体上的六边形、大体上的八边形、大体上的椭圆形等等。在某些实施方式中,在光导管 10 中的这种图案是一系

列的直线、曲线、螺旋线或者任何其它图案。在某些实施方式中，光散射元件是白色的。光散射元件可以散射从而光导管 10 呈现为无光泽的。在一些实施方式中，光散射元件不容易被用户看见。例如，光导管 10 可以稍微不透明来隐藏表面图案的出现。在一些实施方式中，光散射元件对用户可见，光导管 10 可以是清楚的显示表面元件的大体上的颜色和图案。

[0069] 光导管 10 可以包括一种反射的材料以取得高的反射率。例如，光导管 10 可以包括沿着光导管的后侧的反射基材。在一些实施方式中，反射的材料可以反射至少大约 95% 的光。在一些实施方式中，反射的材料反射大约 98% 的光。反射的材料可以是光学上的反射纸。

[0070] 如图 8B 中所示，镜组件 102 还可以包括扩散器 156。扩散器 156 可以位于光导管 110 的表面上和 / 或沿镜子 104 的边缘。例如，该扩散器 156 可以位于光导管 10 和用户之间提供漫反射的、散射的光源，而不是将导致用户的眼睛不太舒服的集中的、强烈的光源。在一些实施方式中，扩散器的透射率沿其周边或者圆周基本上恒定。在一些实施方式中，扩散器 156 可以围绕镜子 104 的边缘的大部分，基本上镜子的整个边缘或者镜子的整个边缘。如图 8B 中所示，扩散器 156 可以如同围绕光导管 110 一样围绕镜子 104 的边缘的相同部分。扩散器 156 还可以包括用于传感器装置 128 的开口 160 和 / 或用于容纳镜子 104 的容纳部分 157。扩散器 156 可以包括一种至少部分不透明的材料。例如，扩散器 156 可以包括光学等级的丙烯酸。

[0071] 扩散器 156 可以包括通过蚀刻、粗糙化、油漆和 / 或其它表面修整的方法形成的不规则的前和 / 或后表面。例如，扩散器 156 可以包括使用在此讨论的任何方法创造的光散射元件（未示出）的图案(pattern)。光散射元件可以改良为包括与讨论的光导管 10 有关的任何形状和 / 或尺寸。

[0072] 光散射元件可以构造成通过更加散射光而产生柔光。例如，光散射元件可以包括具有相同的直径或者不同的直径的多个点。在一些实施方式中，光散射元件可以均匀地穿过扩散器 156 分散。在其它实施方式中，光散射元件可以随机穿过扩散器 156 分散。

[0073] 返回图 8A，覆盖元件 6 可以覆盖传感器装置 28 和光源 30。覆盖元件 6 可以是透明的且抛光的丙烯酸、聚碳酸酯或者任何其它合适的材料。在后侧上，壳部 8 可以包括后盖部 18，后盖部 18 可以构造成至少部分地封住镜组件 2 的一个或多个部件。后盖部 18 可以包括孔 32，枢部 16 通过其可以延伸到与支撑部 20 接合。后盖部 18 还可以包括一个或多个通风孔来更进一步降低温度。如图 8B 中所示，镜组件 102 可以包括位于支撑部 120 和后盖部 118 之间的垫片 164。

[0074] 如前所述，枢部 16 可以连结支撑部 20 和轴部 12。枢部 16 允许镜子 4 在一个或多个方向枢转（例如，向上、向下、向右、向左和 / 或在任何其它方向）。例如，枢部 16 可以包括球节，一个或多个铰链，或者其它。

[0075] 支撑部 20 和镜子 4 可以沿着基本上与镜子 4 的表面和地面平行的轴，和 / 或沿着基本与镜子 4 的表面平行并与地面垂直的轴调整（例如，可滑动移动和 / 或可转动）。例如，轴部 12 可以沿着基本与镜子 4 的表面平行并与地面垂直的轴调整（例如，可滑动地移动和 / 或可转动）。支撑部 20 和镜子 4 也可以沿着与镜子 4 的表面基本垂直的轴可转动（例如，可围绕镜子 4 的中心转动）。壳部 8 还可以包括另外的枢部分，例如沿着轴部 12。

[0076] 为了调整镜组件 2 的高度，轴部 12 可以构造成当镜组件 2 位于底座 14 上时转变

为一般垂直于地面。在一些实施方式中,轴部 12 的高度可以在至少大约 3 英寸的范围和 / 或至少大约 4 英寸的范围内调整。在一些实施方式中,轴部 12 的高度可以在大约 4 英寸的范围内调整。在一些实施方式中,轴部 12 的高度可以在大约 3 英寸的范围内调整。

[0077] 轴部 12 可以包括第一轴部 12a 和第二轴部 12b。轴部 12a、12b 可以构造成可调整地互相啮合,从而允许用户在需要的高度选择并保持镜组件 2。例如,第一轴部 12a 可以包括一个或多个偏的调整结构,例如弹簧加压的可伸缩的钉(未示出),并且第二轴部 12b 可以包括一个或多个相应的调整结构,例如槽口(未示出)。第一轴部 12a 的钉可以与第二轴部 12b 的槽啮合(例如对齐进入)以控制提供镜组件 2 的高度的连贯的(articulating)调整。

[0078] 在一些实施方式中,第一轴部 12a 和第二轴部 12b 可以形成过盈配合。该外加压力允许第一轴部 12a 和第二轴部 12b 相对于彼此稳定连接(例如在要求的高度支持支撑部 20)而没有被施加外力。不过,在轴部 12a 和 12b 之间的外加压力可以被控制,以便当用户想要调整支撑部 20 的高度时,可以克服压力且轴部 12a 和 12b 可以相对彼此移动。例如,需要用于向下或向上调整轴部 12 的高度或有效长度的力量可以比镜组件的大部分和上轴部引起的重力的向下的力大,但是大体上比自然人调整器具的力小或相等,例如小于或等于大约 3 或者大约 4 磅。轴元件的滑动或高度的调整或有效长度可以配置为当使用者的调整力停止时事实上立刻停止,而不需要其它调整或固定结构以停止滑动或相对于其它无意识的运动固定轴部的元件或改变高度或长度。外加压力在轴部 12a 和 12b 的运动期间也可以模拟一种阻尼效应。

[0079] 轴部 12 还可以包括限制构件,例如环件,抑制或者防止第一轴部 12a 相对于第二轴部 12b 移动。例如,环件的某些变型螺旋地与第二轴部 12b 接合,从而相对于第一轴部 12a 径向地压缩第二轴部 12b,这轮流(in turn)阻止第一轴部 12a 相对于第二轴部 12b 平移(translating)。在某些实施过程中,对环件的放松允许用户调整轴部 12 的高度,而对环件的紧固将第一轴部 12a 固定到第二轴部 12b。

[0080] 在一些实施方式中,轴部 12 包括连接器,例如固定螺钉(未示出),其大体上可以相对于第一轴部 12a 垂直设置。第二轴部 12b 可以包括开口(未示出),螺纹元件可以通过开口延长。在某些实施过程中,当固定螺钉放松后,第一轴部 12a 可以相对于第二轴部 12b 调整。拧紧螺纹元件直到它接触到第一轴部 12a,可以抑制或者防止第一轴部 12a 相对于第二轴部 12b 移动。

[0081] 如图 8B 中所示,轴部 112 可以包括一个或多个偏压构件 154,例如弹簧(例如,螺旋弹簧、波浪弹簧、锥形弹簧或者其它)。在某些变型中,一个或多个偏压构件 154 构造成有利于调节轴部 112 的高度。例如,一个或多个偏压构件 154 可以减少用户必须相对于底座 114 举起镜子 104 的高度所施加的垂直力量。偏压构件可以位于轴部 112 的内腔。

[0082] 轴部 12 可以包括塑料、不锈钢、铝或者其它合适的材料。当第一轴部 12a 插入第二轴部 12b 时,第一轴部 12a 还可以在其相对于第二轴部 12b 的内表面的外表面的至少一部分上,包括可压缩的材料,例如橡胶、尼龙和塑料,

[0083] 支撑部 20 的一部分可以从轴部 12 的纵轴的外面悬臂布置。这样的结构可以传递力矩到镜组件 2,该力矩如果得不到补偿,会导致倾斜。底座 14 也可以构造成抵消这样的力矩。例如,底座 14 可以包括足够用于大幅减少镜组件 2 的倾斜可能性的重量。

[0084] 镜组件 2 的底座 14 和 / 或其它部分在质量分布上大体上是平衡的,从而镜组件 2 的重心一般在轴 12 附近和 / 或在底座 14 附近。底座 14 的重量为至少大约 2 磅、4 磅、6 磅、8 磅、10 磅,值在此之间或者其它值。底座 14 还可以包括一个或多个支撑脚或者构造成半 - 永久可安装的 (例如,被一个或多个紧固件安装到工作台面上)。

[0085] 在一些实施方式中,如图所示,底座 14 可以有大体上弧形的外表面。例如,底座在沿其高度的多个点上的水平截面大体上是圆形或者大体上是椭圆形的。在列举的实施方式中,底座 14 大体上是圆锥形的,例如大体上截头圆锥形。底座的外表面可以是大体上光滑,大体上锥形和 / 或大体上倾斜,如图所示,和 / 或呈现大体上限制底座 14 的边缘的事实上全部连续表面。底座 14 的顶部的水平截面积或直径可以与轴部 12 的底部的水平截面积或直径大约相同。底座 14 的水平横截面积一般可以连续从底座 14 的顶部区域增加到底座 14 的底部区域。例如,底座 14 的底部区域的水平横截面积或者直径可以大致大于底座 14 的顶部的水平横截面积或者直径 (例如,至少大约两倍或者至少大约三倍),其是底座 14 的有助于抵抗镜子翻转的例子。在一些实施方式中,如图所示,从镜子部分的底部到底座部的顶部的距离与底座 14 的高度大致相同。

[0086] 在下面更加详细的描述中,底座 14 可以包括电池 (例如,可再充电电池)。电池的重量和定位也可以降低镜组件 2 的倾翻的机会。在一些实施方式中,电池每天可以将动力送到光源至少大约 10 分钟大约 30 日。电池 26 可以通过端口 24 再充电 (例如,通用串行总线 (USB) 端口或者其它),如图 12 中所示。端口 24 可以构造成永久或者可移动接收与线或者电缆 (未示出) 结合的连接。端口 24 也可以构造成允许电势在电池 26 与电源之间经由连接器经过。端口 24 可以在连接到计算机时用于程序编制或校正镜子照明或者物体感应的不同操作。可以使用其它充电方法,例如经由传统的插入到电源插座的电适配器。

[0087] 镜组件 2 可以包括指示设备,其配置成可对镜组件 2 的用户发出视觉、听觉或者其它类型的指示,指示关于镜组件 2 的特性,用户和 / 或镜组件 2 和用户之间的关系。例如,指示器可以指示开 / 关状态、电池水平、逼近的钝化作用和 / 或某些工作模式。指示器也可以用于其它目的。

[0088] 指示灯的颜色可以依指示不同而不同。例如,指示器可以在镜组件打开时发射绿光和 / 或电池不足时发出红光。

[0089] 如图 1 中所示,指示器 58 可以是环状的并绕底座 14 的上部设置。指示器 58 可以呈现任何其它形状并且绕支撑部 20 设置,沿着底座部 14,或者在镜组件 2 的任何其它位置上。

[0090] 控制器 50 控制光源 30 的操作。控制器 50 可以设置在底座 14 中,并且可以包括一个或多个电路板 (PCBs),其可以提供硬件连接的反馈控制电路,用于储存并执行例行程序的处理器和存储器,或者任何其它类型的控制器。

[0091] 镜组件 2 可以包括传感器装置 28,如图 2A 和 9 中所示。传感器装置 28 可以位于镜组件 2 的上面区域附近 (例如,镜子的顶部)。例如,传感器装置 28 可以位于光导管 10 中的缺口 44。传感器装置 28 也可以从镜组件 2 的前表面凹进。或者,传感器装置 28 可以沿着镜组件 2 的任何其它部分安装,或者不位于镜组件 2 上。例如,传感器装置 28 可以在设置镜组件 2 的房间中位于任何位置。传感器装置 28 可以包括接近传感器或者反射类型的传感器。例如,当物体 (例如,身体部分) 进入,和 / 或在感测区域产生运动时,传感器 28

可以被触发。

[0092] 传感器装置 28 可以包括发送器和接收器。发送器 36 可以是发射部分（例如，像红外光那样的电磁能），而接收器 38 可以是接收部分（例如，像红外光那样的电磁能）。从发光部 36 发出的光束可以确定感测区域。在某些变型，发送器可以发射其它类型的能量，例如声波，无线电波或者任何其它信号。发送器和接收器可以集成到相同的传感器或者作为独立元件配置。

[0093] 在一些实施方式中，发光部 36 可以从镜组件的前面在大致垂直的方向发光。在一些实施方式中，发光部 36 以从垂直于镜组件表面向下至少大约 5 度和 / 或小于或等于大约 45 度的角度发光。在一些实施方式中，发光部 36 以从垂直于镜组件表面向下至少大约 15 度和 / 或小于或等于大约 60 度的角度发光。在某些实施方式中，发光部 36 以大约 15 度的向下的角度发光。

[0094] 在一些实施方式中，传感器装置 28 可以在感测区域内检测物体。在某些实施方式中，感测区域可以有相对于从传感器装置 28 延伸的轴，和 / 或相对于大体与传感器装置的前表面垂直延伸的线，和 / 或相对于大体与传感器装置的前表面垂直延伸并从镜组件的顶部大体向外朝使用者的线，向下至少大约 0 度到小于或等于大约 45 度的范围。在某些实施方式中，感测区域可以有从至少大约 0 度到小于或等于相对于任何其它轴线或线向下大约 25 度的范围。在某些实施方式中，感测区域可以有从至少大约 0 度到小于或等于相对于任何其它轴线或线向下大约 15 度的范围。

[0095] 在一些实施方式中，感测区域可以通过以一角度安装传感器装置 28 而调整。在某些实施方式中，传感器装置 28 可以安装为传感器装置 28 的前表面可以与镜子 4 的前表面大致平行或共面。在某些实施方式中，传感器装置 28 可以安装为传感器装置 28 的前表面相对于镜子 4 的前表面成角度。

[0096] 在一些实施方式中，感测区域可以通过修改覆盖元件 6 的一个或多个部件被调整。在某些实施方式中，覆盖元件 6 可以包括一种透镜材料。在某些实施方式中，覆盖元件 6 可以包括大致矩形的截面。在某些实施方式中，覆盖元件 6 可以包括大致三角形的横截面。在某些实施方式中，覆盖元件 6 可以包括与镜子 4 的前表面大致平行或者共面的前表面。在某些实施方式中，覆盖元件 6 包括相对于镜子 4 的前表面成角度的前表面。在某些实施方式中，覆盖元件 6 的前表面可以相对于传感器装置 28 以一角度设置。

[0097] 在一些实施方式中，传感区一般作为覆盖元件 6 的前表面变宽，从与镜子 4 的前表面大致平行或者共面的结构移动到与镜子 4 的前表面成角度的结构。在某些实施方式中，当覆盖元件 6 的前表面与镜子 4 的前表面大致平行或者共面时，感测区域可以具有相对于从传感器装置 28 延伸和 / 或大致与传感器装置的前表面垂直的轴向下大约 0 度到大约 15 度的范围。在某些实施方式中，当覆盖元件 6 的前表面相对于镜子 4 的前表面成角度时，感测区域可以具有相对于从传感器装置 28 延伸和 / 或大致与传感器装置的前表面垂直的轴向下大约 0 度到大约 25 度的范围。

[0098] 传感器装置 28 可以只需要足够的动力来产生低功率光束，其可以或不可以被人眼可见。另外，传感器装置 28 可以以一种脉动的方式操作。例如，发光部 36 可以在一个循环以任何需要的频率（例如，每半秒一次、每秒一次、每 10 秒一次）打开和关闭，例如，用于短脉冲持续任何需要的时间（例如，小于或等于大约 0.01 秒，小于或等于大约 0.1 秒或者

小于或等于大约 1 秒)。循环可以极大地降低为传感器装置 28 提供动力需要的功率。在操作中,循环在一些实施方式中不降低性能,因为用户一般在光柱的路径中保持足够长的时间用于检测信号产生。

[0099] 如果接收部 38 从发光部 36 发射的光束内的物体检测到反射(例如,高于阈值),传感器装置 28 发送信号到控制器激活光源。

[0100] 传感器装置 28 可以根据反射回接收器 38 的光量将不同的信号发送到控制器 50。例如,传感器装置 28 配置为从光源 30 发射的光量与反射的光量成正比,其可以表明镜子 4 和用户之间的距离。在某些变型,如果用户在第一感测区域,然后控制器控制一个或多个光源 30 从关闭状态激活,或者发射第一量的量。如果用户在第二感测区域(例如,比第一感测区域远离传感器装置 28),然后控制器控制一个或多个光源 30 发射第二量的光(例如,少于第一量的光)。

[0101] 控制器 50 可以从光源 30 触发至少两个不同等级的亮度,例如亮光或者微亮。例如,如果用户在第一感测区域的任何地方,那么发射用于亮光的控制器 50 信号;如果用户在第二感测区域的任何地方,那么发射用于微亮的控制器 50 信号。

[0102] 控制器 50 也可以触发超过两个亮度等级。在某些实施过程中,发光的等级(例如,线性地,按指数增长地,或者其它)与从传感器到用户的距离相关。例如,随着用户接近传感器装置 28,一个或多个光源 30 发射更多的光。或者,镜组件 2 可以构造成当用户远离传感器装置 28 时发射更多的光而随着用户移近传感器装置 28 发出较少的光。

[0103] 传感器装置 28 可以包括两个发光部 36a 和 36b。每个发射器 36a、36b 用发射器 36a 和 36b 上的适当的屏蔽或引导发射锥形灯光,其确定传感器的检测区域(受制于传感器 28 的标称范围)。两个圆锥体重叠的区域形成主要感测区域,而两个圆锥体发光但是不重叠形成一次级感测区域。如果已经在主要感测区域发现用户,那么传感器装置 28 发送一合适的信号到控制器 50,其从光源 30 触发光的第一等级。如果已经在次级感测区域发现用户,那么传感器装置 28 发送合适的信号到控制器 50,从光源 30 激活第二等级的光。在一些实施方式中,光的第一等级比光的第二等级明亮。在其它实施方式中,光的第二等级比光的第一等级明亮。在一些实施方式中,传感器装置 28 限定多于两个感测区域,并且触发多于两个等级的光。

[0104] 如图 9 中所示,发光部 36 可以大致沿着相同的水平面(例如,相对于地面)设置。传感器装置 28 可以把一合适的信号发送到控制器 50,当用户在第一感测区域内时,其可以在传感器装置 28 的正前方触发亮光。当用户在第二感测区域内时,传感器装置可以在镜组件 2 的边缘触发微光。

[0105] 传感器装置 28 可以包括两个或多个发光部 36,其在传感器 28 的标称作用范围内不形成重叠检测圆锥体。第一锥形灯光确定第一感测区域,第二锥形灯光确定第二感测区域。如果发现用户已经单独在第一个感测区域或者单独在第二感测区域,那么传感器装置 28 向控制器 50 发信号,信号从光源 30 激活光的第一等级。在某些变型,如果已经发现用户同时在第一和第二感测区域,那么传感器装置 28 向控制器 50 发送信号,从光源 30 那里激活第二等级的光。在一些实施方式中,光的第一等级比光的第二等级明亮。在其它实施方式中,光的第二等级比光的第一等级明亮。

[0106] 光源 30 的激活或者调整从光源 30 发射的光量可以基于除了在一感测区域内的用

户的存在以外的因素。例如,从光源 30 发射的光量可以基于传感器 28 的检测区域和标称范围内的运动调整。某些实施方式配置为,如果用户在向上的运动中举起他 / 她的手,那么控制器发出光量增加的信号,并且如果用户在向下的运动中降低他 / 她的手,那么控制器发出由光量减少的信号。

[0107] 一旦光源 30 激活,光源 30 可以保持被激活,只要传感器装置 28 在感测区域检测到物体。或者,光源 30 保持激活一预定时期。例如,激活光源 30 可以预置定时器。如果传感器装置 28 在定时器到期之前没有检测到物体,那么光源 30 恢复非激活状态。如果传感器装置 28 在定时器到期之前检测到物体,那么控制器 50 或者立即或者时间用尽以后重新启动定时器。

[0108] 一个或多个感测区域在任何类型的结构中使用,该结构允许用户控制镜组件 2 的操作的一方面。例如,可以使用一个或多个感测区域来触发镜组件 2 以发射不同等级的光,操作不同的持续时间,旋转镜子或者任何其它合适的参数。

[0109] 在多种实施方式中,镜组件 2 有一个或多个工作模式,例如,开启模式和关闭模式。控制器 50 可以基于从不同的感测区域,运动或者任何其它参数接收的信号激活不同的模式。在下面描述的任何方式可以分别或者彼此组合使用。

[0110] 镜组件 2 可以包括任务模式。当该任务模式激活时,镜组件 2 可以触发光源 30 来保持激活或者使传感器进入超级模式(例如,在其期间传感器构造具有在一区域内增加的运动灵敏度,或者有更大或者更广阔的敏感度区域,或者有一些其它增加的敏感度信号检测)用于预定的时间段。例如,在一些实施方式中,当用户计划使用镜组件 2 一延长的时期时,这种任务模式可以特别有用,特别是如果用户的体位大致仍然处于延长期,以便当用户还在看镜子时避免照明的间歇损失。这种任务模式可以触发光源 30 保持激活一段预定的时间,即使没在感测区域内发现用户。预定时间量可以小于或等于大约:3 分钟、5 分钟、10 分钟或者任何其它合适时间。如果传感器装置 28 在定时器到期之前没有检测到用户,那么镜组件 2 使任务模式失去作用。在某些实施方式中,镜组件 2 保持在任务模式,直到用户发出光源 30 失去作用的信号。

[0111] 镜组件 2 可以包括节能模式。当节能模式激活时,光源 30 比镜组件 2 不处于节能模式发射较少的光。节能模式可以是用户激活的,并且在用户计划使用镜子相对长时间时可以使用。或者,镜组件 2 在打开模式和关闭模式之间自动进入节能模式作为一种过渡。例如,当光源 30 激活时,控制器 50 可以初始化定时器。如果传感器装置 28 在定时器到期之前没有检测到用户,那么控制器 50 进入节能模式并且初始化第二个定时器。如果传感器装置 28 在第二个定时器到期之前没有检测到用户,那么控制器 50 关闭光源 30。

[0112] 镜组件 2 可以包括一种超级(hyper)模式。如上所述,在一些实施方式中,镜组件 2 有两个发光部 36,每个发射锥形灯光。在某些实施过程中,控制器 50 只在传感器装置 28 在两束锥形光相交的区域(例如,初级感测区域)检测到物体时触发光源 30 从而激活。在一些实施方式中,在光源 30 已经激活后,镜组件 2 进入超级模式。控制器 50 可以保持光源 30 激活,只要传感器装置 2 在锥形光束的一个或两个中(次级或者主要感测区域)检测到用户。次级感测区域可以不同于主要感测区域。例如,次级感测区域可以比主要感测区域大。在一些实施方式中,这允许用户运动并且仍然保持光源 30 激活。当用户在镜组件 2 的周围附近时,超级模式也可以有助于通过阻止意外启动而节约能量。

[0113] 镜组件 2 还可以包括感知背景光的能力。例如,当背景光相对较低时,光源 30 发出的光将比如果背景光相对明亮时更明亮。光接收部 38 可以发现从发送器 36 发射的背景光和光,或者镜组件 2 可以包括用于检测背景光的第二传感器装置。

[0114] 控制器 50 可以基于检测到的背景光量来调整用于触发光源 30 而必要的信号数量。例如,需要激活光源 30 的检测到的光量可以与背景光成正比。这样的结构可以允许即使当背景光的等级不太大时(例如,在暗淡的浴室灯光)光源 30 可激活。当背景光小于或等于第一等级时,当检测到反射信号的第一等级时,控制器 50 激活光源 30。当背景光比第一等级高时,当检测到反射信号的第二等级时(例如,比第一等级大),控制器 50 激活光源 30。

[0115] 控制器 50 也可以调整基于背景光的光源 30 发射的光量。该结构可以,例如,避免发出起始的突然的非常明亮的光,该光将使用户的眼睛不舒服,特别是当用户的眼睛之前适应较低光等级时,比如周围环境是昏暗的。例如,光源 30 发射的光量可以与检测到的背景光量成正比。

[0116] 光源 30 激活后,控制器 50 可以逐渐增加光源 30 发光的等级,和/或当光源 30 恢复非激活状态后,逐渐减少从光源 30 发射的光量。该结构可以在光源 30 打开后避免使用户的眼睛不舒服。

[0117] 镜组件 2 还可以包括校准模式。例如,该校准模式可以根据用户的需求用不同的输出特性校验不同的感测区域。算法可以构造成利用多个感测区域执行不同的功能。例如,用户可以配置第一感测区域以符合光的第一等级(例如,较低的光强)并配置第二感测区域以符合第二等级的光(例如,高强度光)。在另一个实施例里,用户可以调整感测区域的尺寸(例如,宽度或者高度)。用户可以指定第一感测区域符合第一等级的光并且指定第二感测区域符合第二等级的光。通过用户指示器可以触发这种校准模式,例如按按钮,激活传感器或者任何其它合适的机构。

[0118] 在一些实施方式中,理想的感测区域被设计,以使用户的面部中心位于镜子部分的中心,与镜子合适的垂直距离允许用户将用户面部大致置于镜子外侧。接近传感器,大体上在镜子的顶部安置,可以在水平面向下斜着倾斜(例如,至少大约向下 10 度,例如大约向下 15 度),并且当用户面部(或其它部位)从镜子的前面在一个垂直的正向的距离的预定范围内发现时,算法将能量触发到镜子。例如,在一些实施方式中,第一区域可以从镜子的前面在至少大约 10 英寸和/或小于或等于 12 英寸(例如大于 11 英寸)的范围内,并且第二区域可以在从镜子的前面至少大约 7 英寸和/或小于或等于大约 9 英寸范围内(例如,大约 8 英寸)。

[0119] 算法可以构造成发送命令激活基于探测信号的光源 30。算法也可以构造成发射不同等级的光的或者改变持续的时间。算法也可以构造成发送命令来触发一个或多个模式,包括任何上述的模式。命令可以依接收的信号而变。例如,信号可以取决于在一个物体和传感器装置 28 之间的距离和/或其它参数,例如运动的持续时间或者路径。

[0120] 当光源激活时,算法可以初始化定时器。定时器可以运行至少 30 秒和/或小于或等于 60 秒,或者任何其它时间。在一些实施方式中,定时器可以运行不到 30 秒。在一些实施方式中,定时器可以运行大约 5 秒。在一些实施方式中,当时间用尽时,光源将立即关闭。在一些实施方式中,只要在时间用尽之前传感器装置 28 检测到物体,光将保持激活。如果

传感器装置 28 检测到物体, 定时器可以立即重新起动, 或者当时间用尽时重新起动。如果传感器装置 28 不在时间用尽之前检测到物体, 那么光源将关闭。

[0121] 算法可以包含使传感器失去作用或者防止光源 30 在光源 30 失去作用后立即发光的延迟。延迟可以是 1 秒、5 秒或者任何其它时间量。延迟有助于阻止用户无意触发光源 30。在延迟时期, 光源 30 将不发光, 即使在延迟时期物体在感测区域。如果传感器装置 28 在延迟时期之后检测到物体, 光源 30 可以再次发光。

[0122] 从光源 30 发射的光的等级不只单独或者全部取决于用户在感测区域中停留的时间长度。取决于用户在不同的感测区域的位置, 从光源 30 发射的光的等级可以不同, 即使某些其它参数相同 (例如在一区域检测到用户的持续时间)。

[0123] 镜组件 2 还可以包括配置成基于检测的信号来发送命令触发光源 30 从而激活的算法。例如, 算法 200 可以类似图 13 描述的流程图。从启动块 202 开始, 控制器初始化镜组件的硬件和运行块 204 的变量。移到判定块 206, 如果在第一感测区域检测到信号, 那么控制器在运行块 208 激活第一等级的光。如果没在第一感测区域检测到信号, 那么算法移到判定块 210。

[0124] 如果在第二区域检测到信号, 那么控制器在运行块 212 激活第二等级的光。如果没在第二感测区域检测到信号, 那么算法移到判定块 214。如果信号检测用于任务模式, 那么控制器在运行块 216 激活第三等级的光。

[0125] 光的第三等级可以是光的节省能量等级, 比如如果用户计划保持光源 30 激活相对长的时间 (例如, 30 分钟或者更长)。在光的第三等级激活之后, 定时器初始化 (218 块)。定时器可以是 30 秒或者任何其它时间段。如果在 30 秒定时时间内在感测区域内没有检测到用户, 光源 30 关闭, 算法正好返回运行块 104 中的硬件和变量初始化之后。如果在 30 秒定时时间内在感测区域内检测到用户, 那么重复 30 秒定时。

[0126] 在一些实施方式中, 通过根据电池寿命阶段而调整供给光源的电源的电特性 (例如, 随着电流减小增加电压或者随着电压减小增加电流), 镜组件 2 可以包括配置成保持光源 (例如, LED) 亮度在大致恒定等级的算法, 即使电池容量接近其寿命结束 (需要重新充电)。

[0127] 算法 200 可以不包括如上所述的所有块, 或者可以包括更多判定块用于如整个本发明描述的另外的感测区域, 其它模式或者其它参数。

[0128] 在一些实施方式中, 镜组件 2 可以包括配置成可检测镜子是否被无意间激活的算法, 例如用错误的触发器或者通过静止物体的存在。例如, 当传感器检测到物体时, 控制器可以初始化定时器。如果在定时器到期之前镜组件 2 没有检测到任何运动, 那么光源将关闭。如果镜组件 2 确实检测到运动, 那么定时器可以重新初始化。

[0129] 如上所述, 镜组件 2 可以包括处理器, 其可以通过各种计划和算法控制镜组件 2 的输入和输出特性以及功能。镜组件 2 还可以包括存储器, 例如固件, 储存各种控制方案和算法, 以及与镜组件 2 的各种特性有关的某些指令和 / 或设置。例如, 存储器可以包括与感测区域的大小、传感器的灵敏度、输出光的等级, 各种定时器的长度以及其它相关的指令和 / 或设置。

[0130] 镜组件 2 可以配置为用户可以修改 (例如, 更新、编程或者其它) 存储器, 例如将镜组件 2 连接到计算机。例如, 镜子 2 可以通过端口 24 (例如, 使用 USB, 电缆) 与计算机通

信连接。数据可以通过端口 24 在计算机和镜组件 2 之间传送。镜组件 2 或者可以构造例如以移动电话、高速无线网络协议或者蓝牙网络、红外或者其它与计算机进行通信。

[0131] 当镜组件 2 与计算机通信时,控制面板可以在计算机上显示。控制面板可以允许用户为镜组件 2 调整各种输入和输出特性。例如,用户可以使用控制面板调整发射部 36a 和 36b 的输出和 / 或发送器 36a、36b 的灵敏度。用户也可以配置与第一和第二感测区域相关的光等级。在另一个例子中,用户可以调整一个或多个感测区域的尺寸(例如,深度、宽度和 / 或高度)。在一些实施过程中,用户可以使用控制面板基于某些条件修改光源 30 的操作和输出(例如,光的强度和 / 或颜色),例如时间,背景光的等级、电池剩余电量,等等。在某些变型,使用控制面板修改镜组件 2 的运行参数的能力可以降低或者消除在镜组件 2 上对一个或多个调整装置的需要(例如,按钮、旋钮、开关,等等),从而提供镜组件 2 的大致均匀的外表面(可以便于清洁),并且降低运行参数的意外调节的机会(如运送镜组件 2 那样)。

[0132] 当镜组件 2 与计算机通信时,数据可以从镜组件 2 传送到计算机。例如,镜组件 2 可以传送数据,例如功耗、预计残余电量、激活的数量和 / 或光源 30 的去激活,光源 30 使用的长度(例如,个别实例和 / 或全部),等等。软件可以用来分析传送的数据,如计算平均数,检查应用统计(例如,在特殊的时期),对不正常的活动认出和 / 或引起注意以及以图表显示应用统计。把应用统计从镜组件 2 转移到计算机允许用户监控使用,并且可以使用户校验镜组件 2 的不同的特性(例如,基于以前的使用和参数)。把数据从镜组件 2 传送到计算机也可以降低或者避免需要一个或多个调节或者在镜组件本身上的显示设备。

[0133] 当镜组件 2 与计算机通信时,镜子计算机也可以传送数据到镜组件 2。而且,镜组件 2 与计算机通信时,电势可以在之前,期间,或者该双向数据传输之后提供到电池 26。

[0134] 尽管在某些实施方式和实施例中已经对化妆镜进行了公开,但本领域的技术人员应当理解,本说明书可延伸特定揭示的实施方式到保护主题的有关实施方式 and / 或用途,以及明显的修改和等价实施方式。另外,尽管已经对化妆镜的多种变型进行了详细描述,对于本领域的技术人员而言,其他本发明保护范围内的其他改进根据本公开内容来说也是显而易见的。也可以想到可进行实施方式的具体特征和方面的各种组合或者亚组合并仍落在本发明的保护范围内。应当理解的是,所公开的实施方式的各特征和方面可以彼此结合或者代替,以形成不同模式的化妆镜。因此,本文公开的主题的保护范围不应该受上述特定公开实施方式的限制。

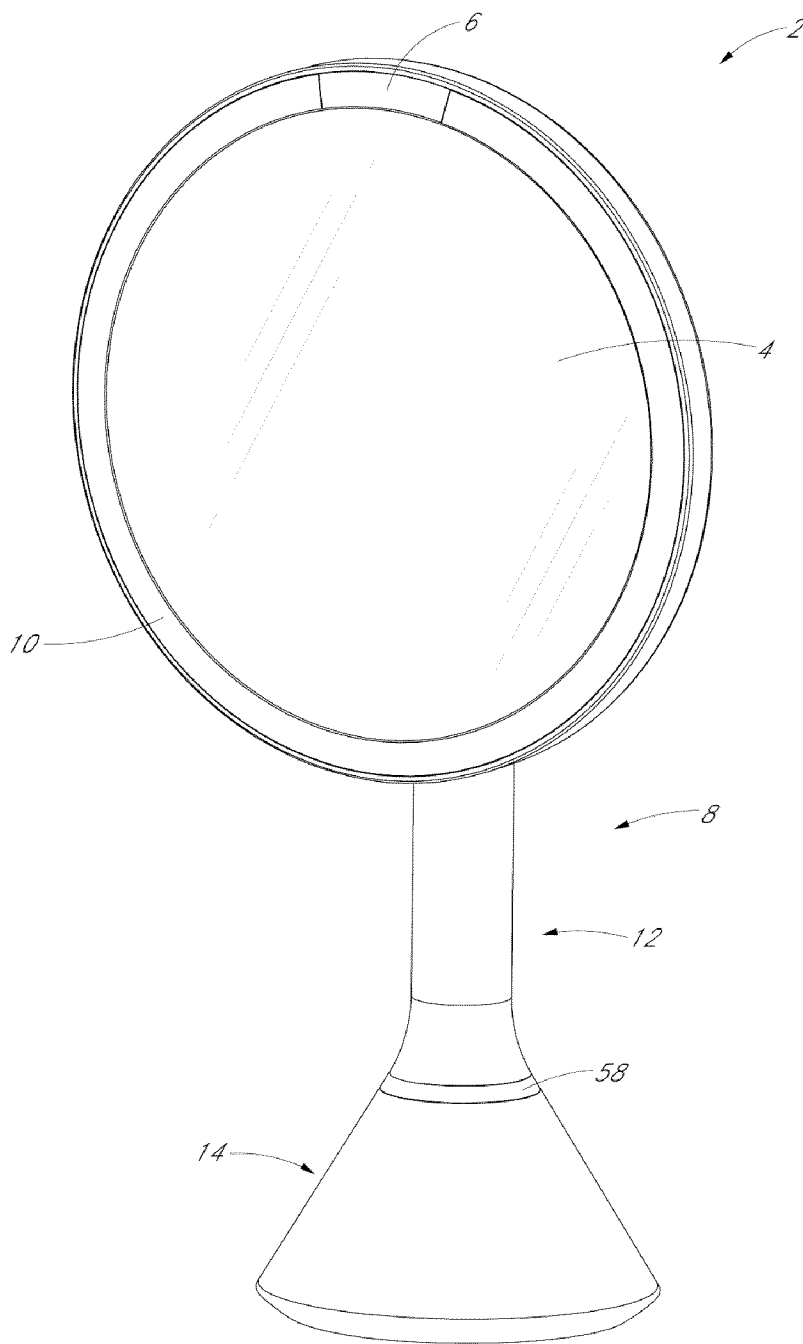


图 1

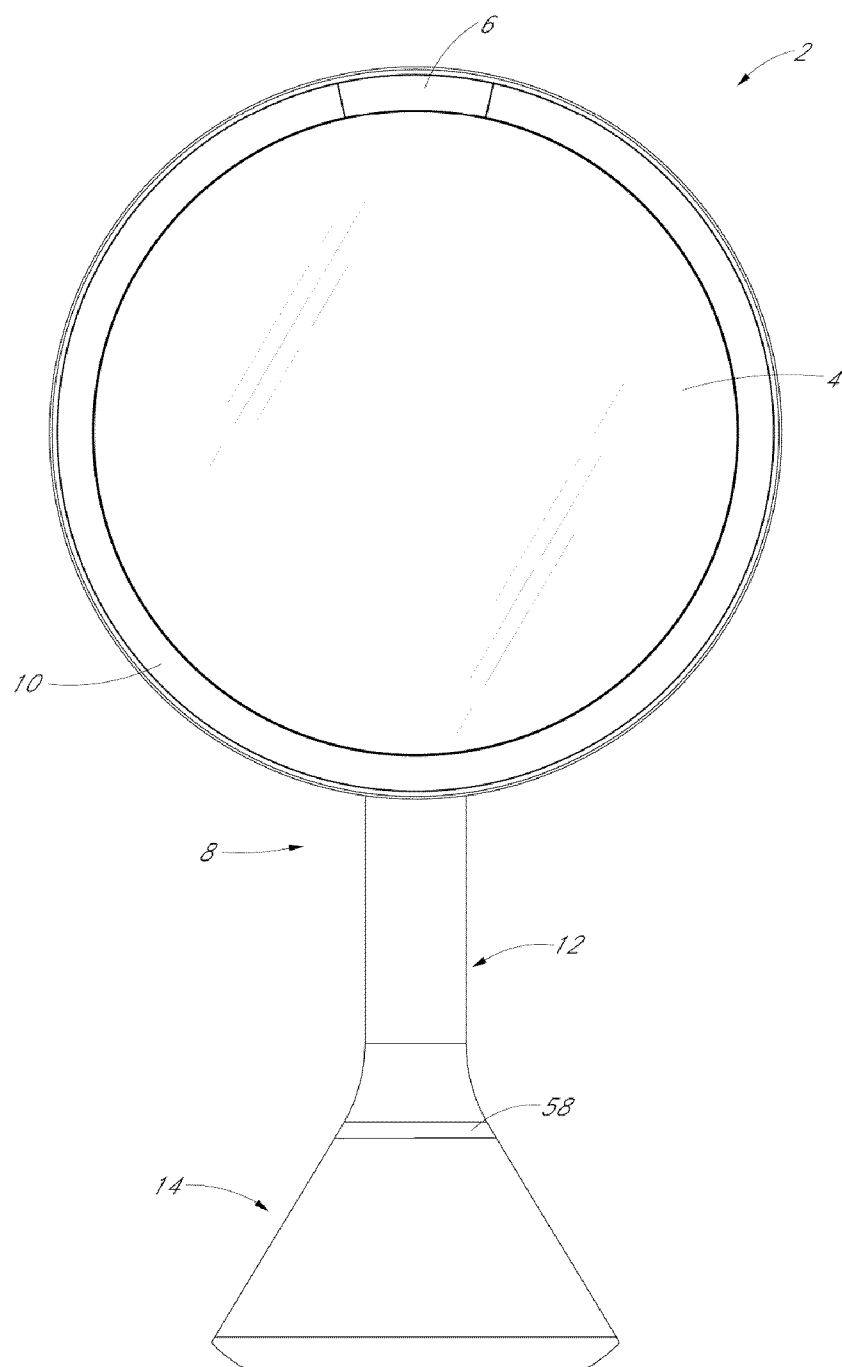


图 2

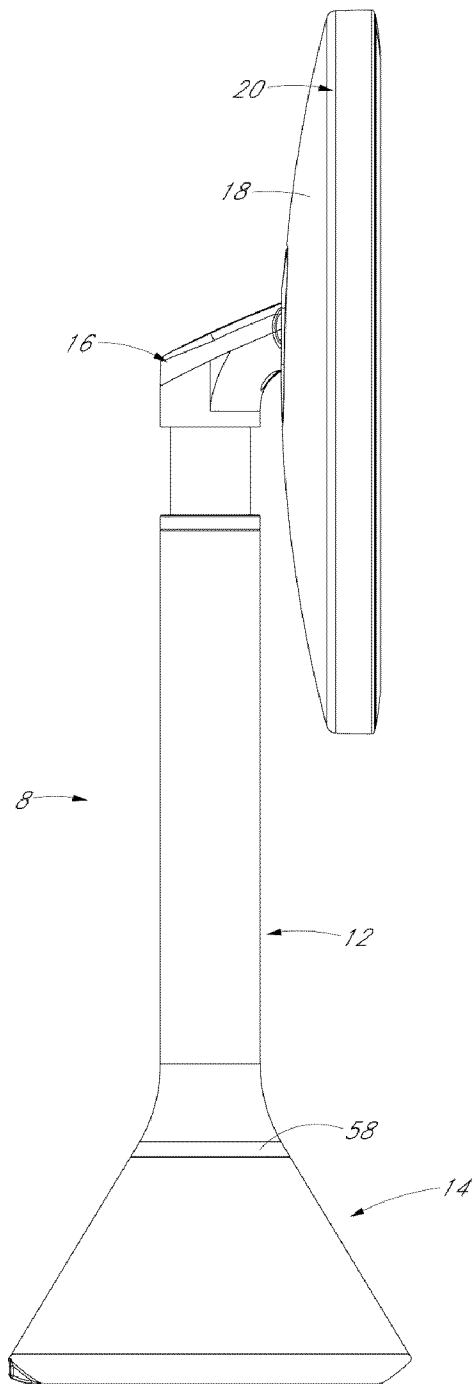


图 3

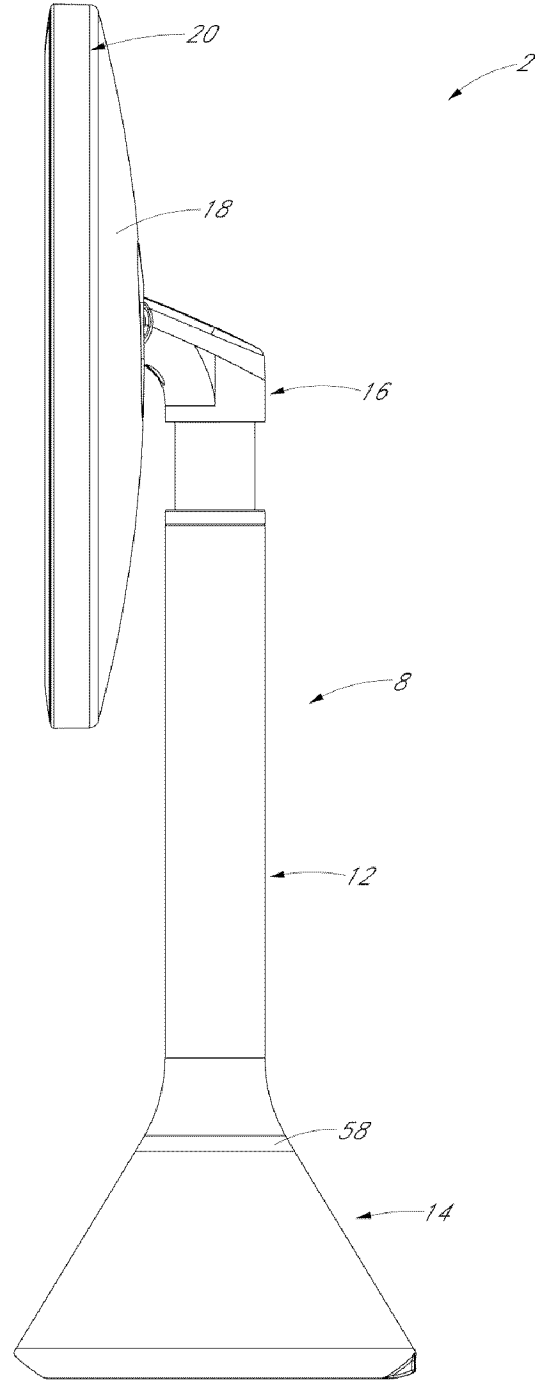


图 4

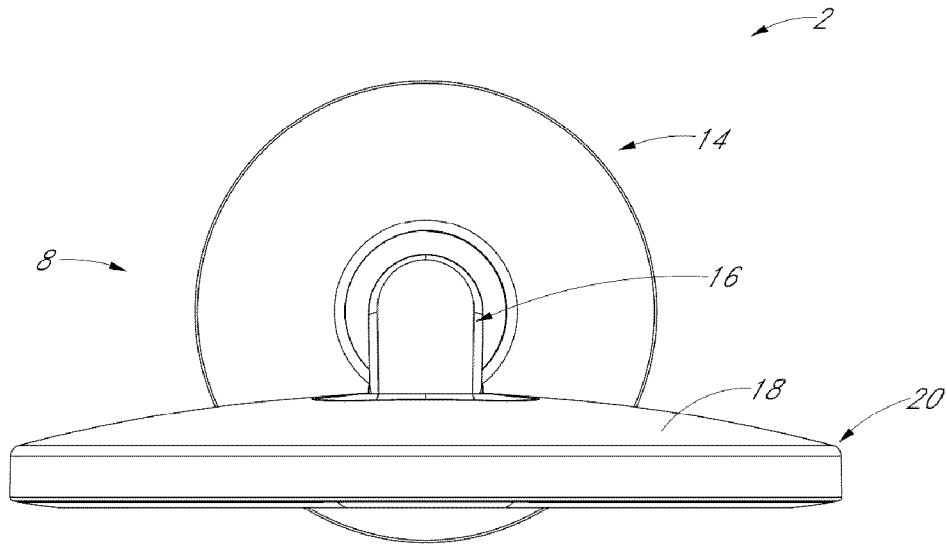


图 5

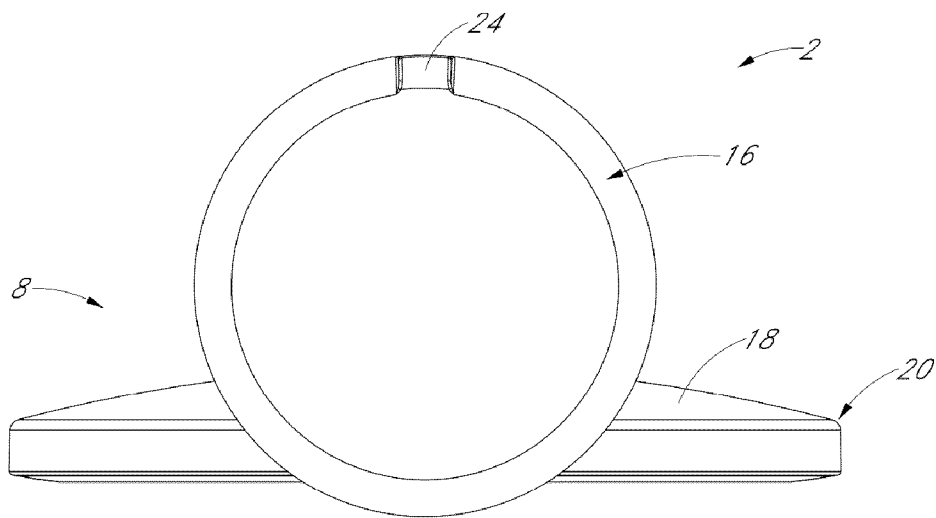


图 6

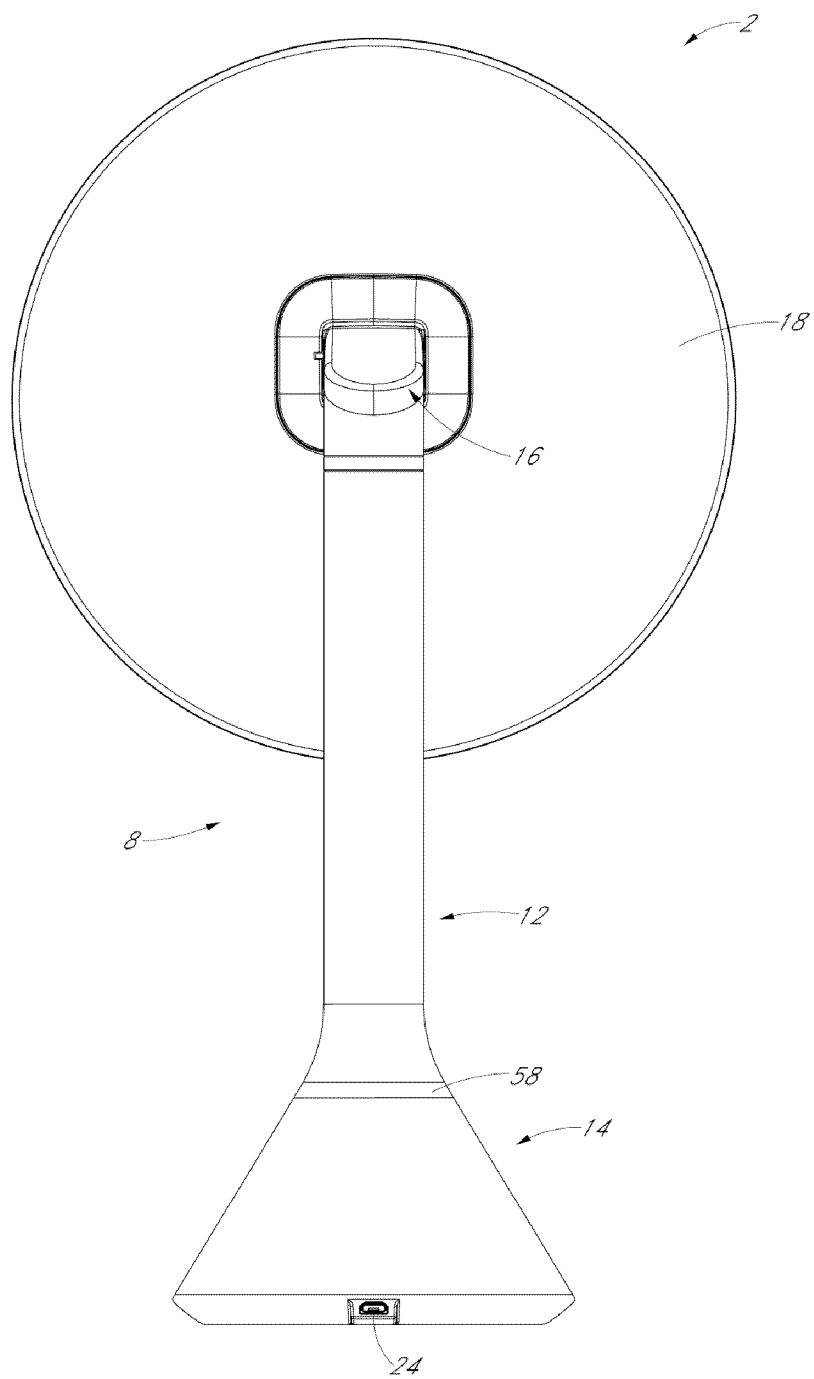


图 7

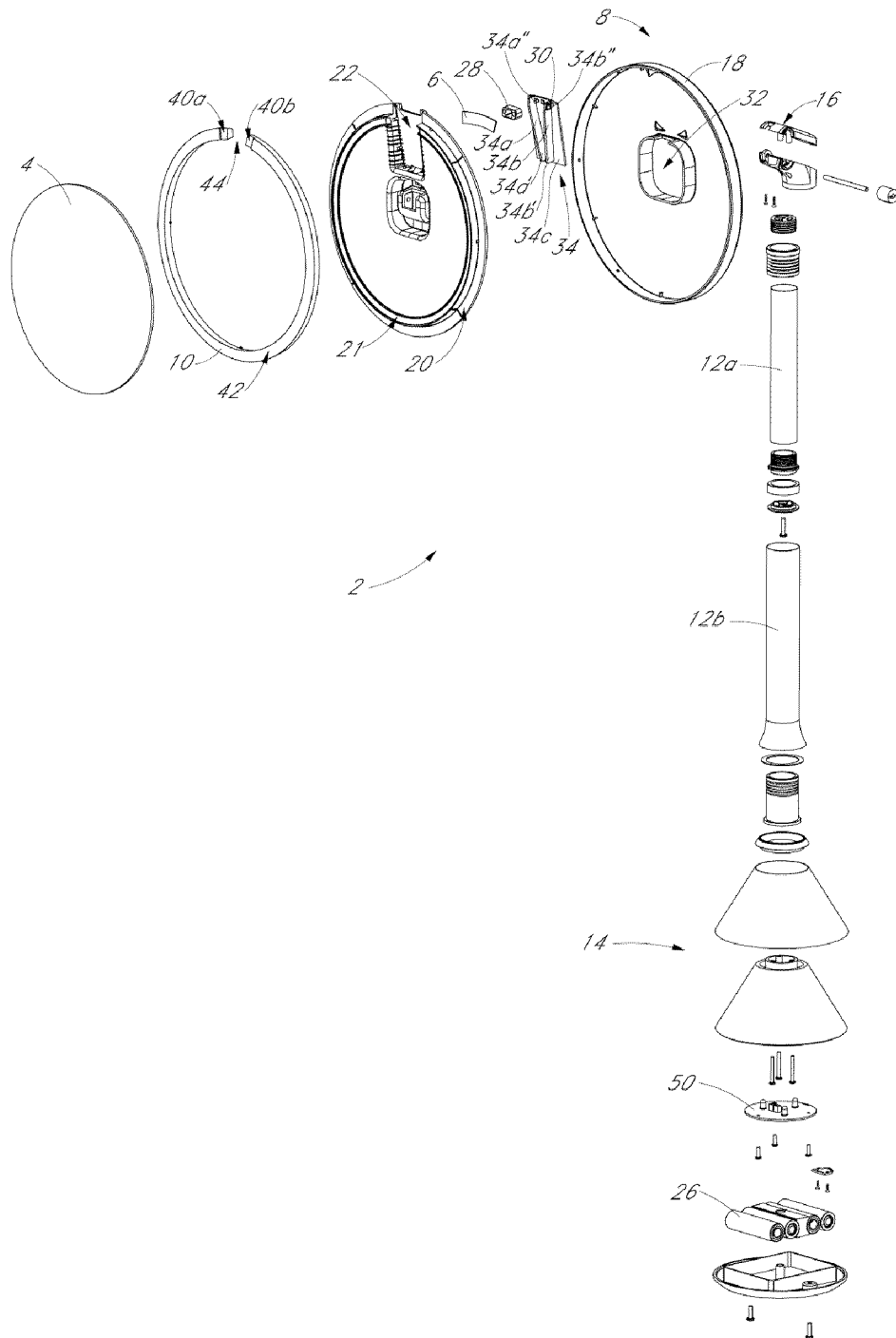


图 8A

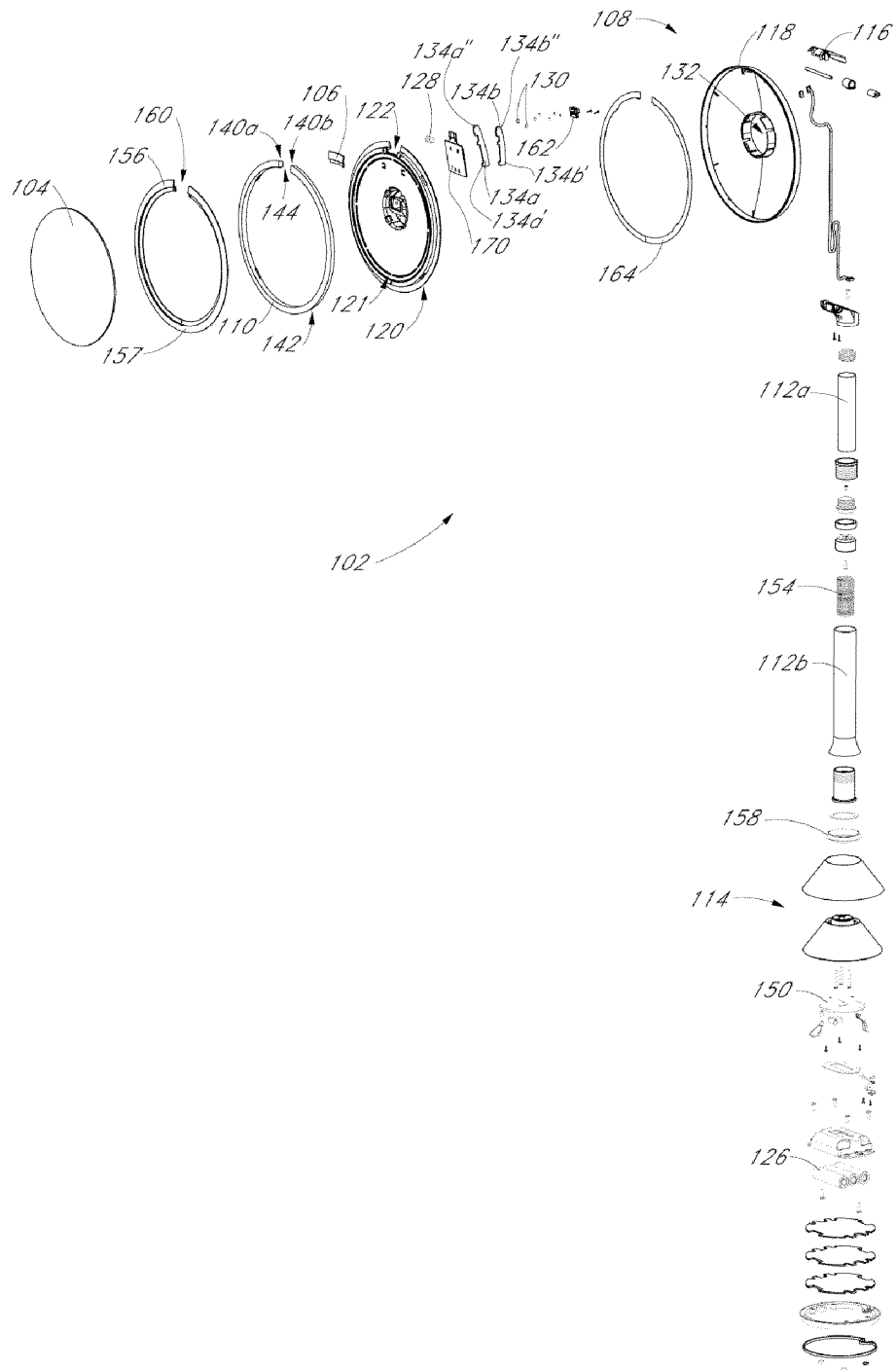


图 8B

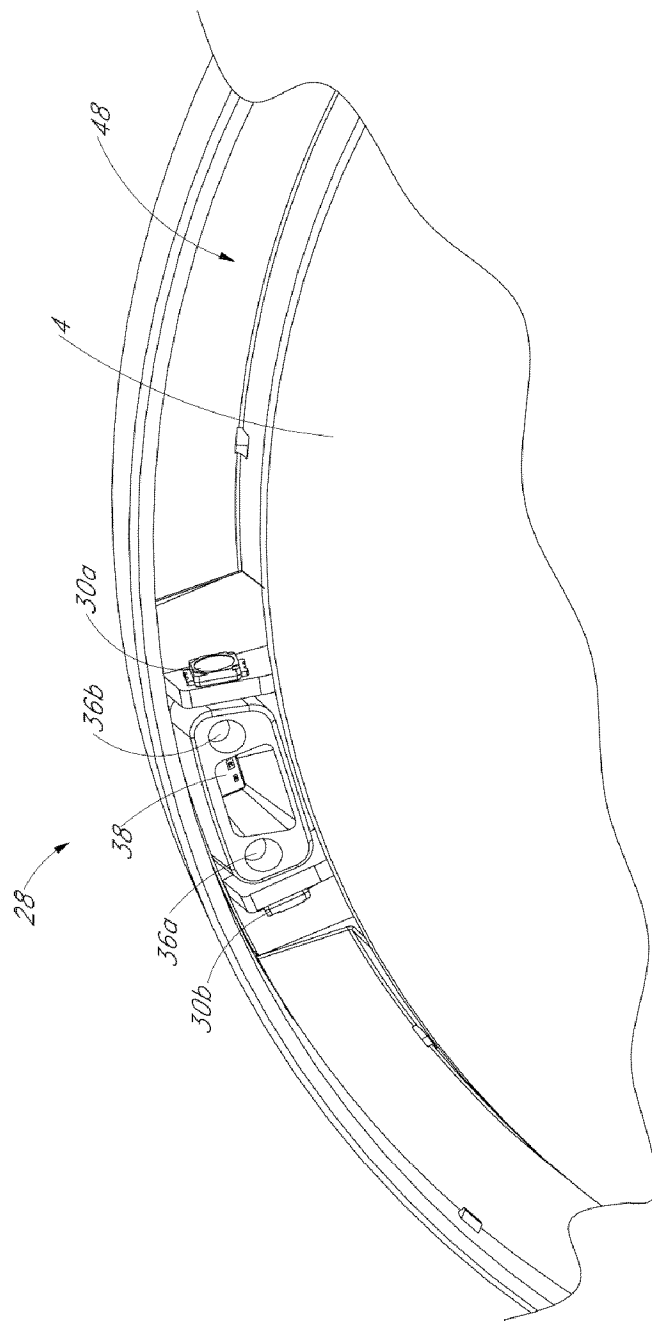


图 9

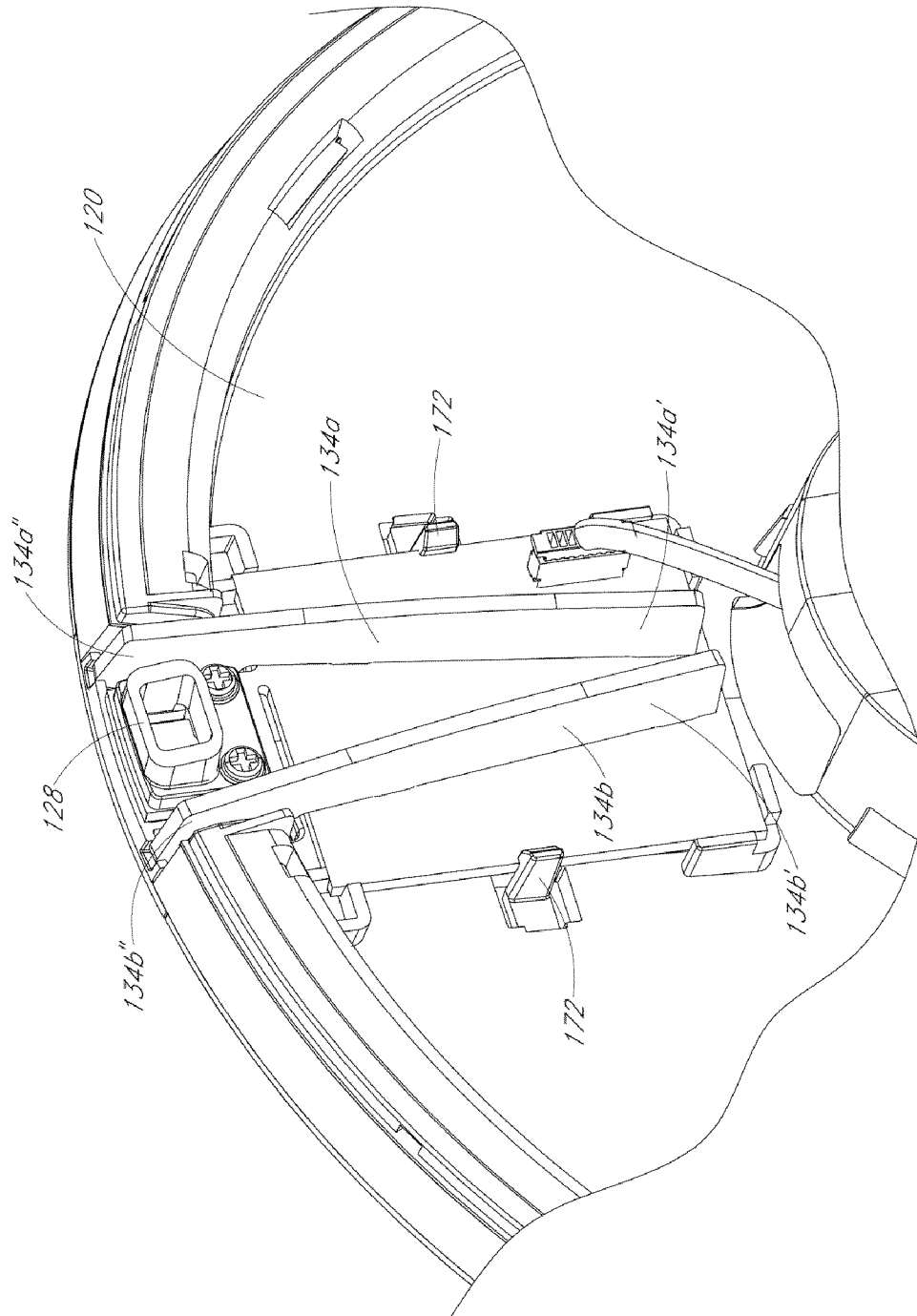


图 10

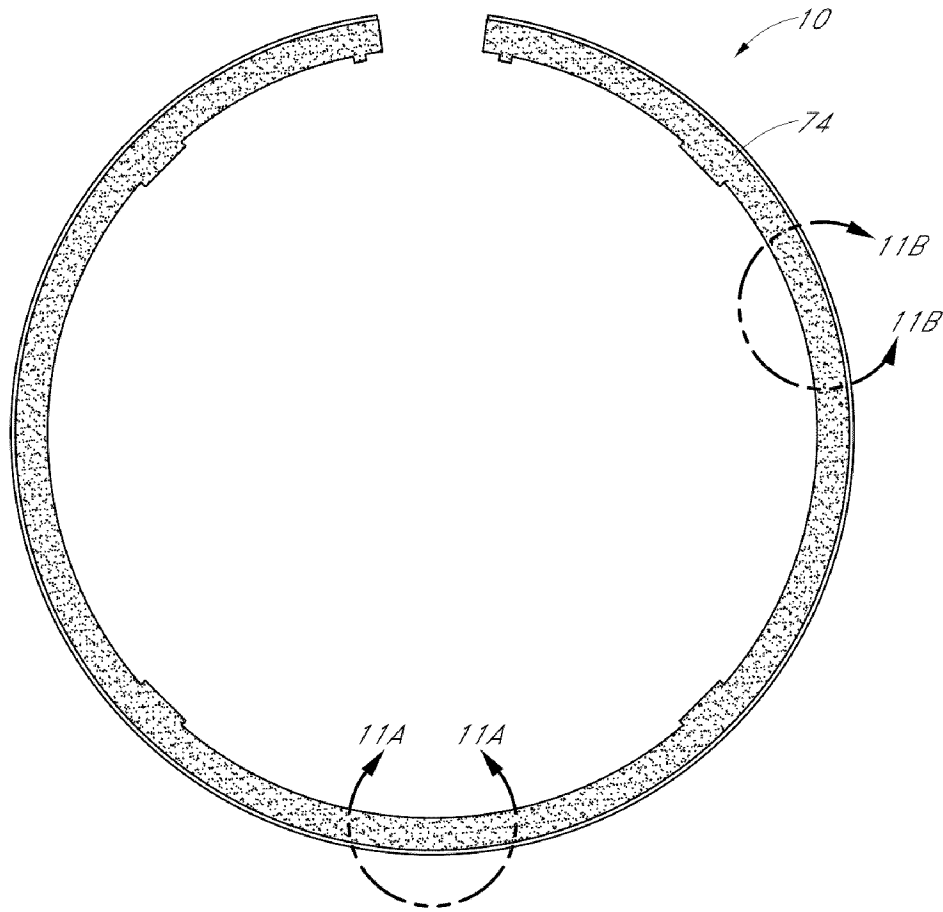


图 11

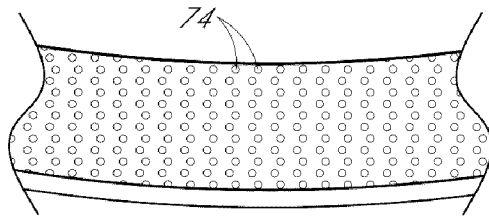


图 11A

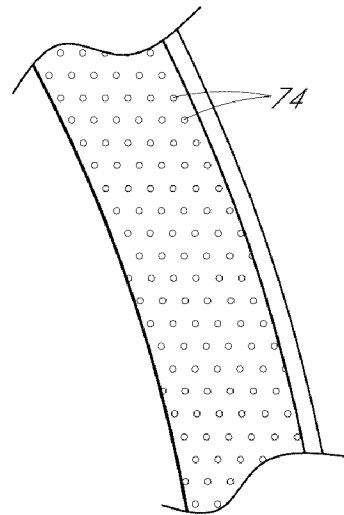


图 11B

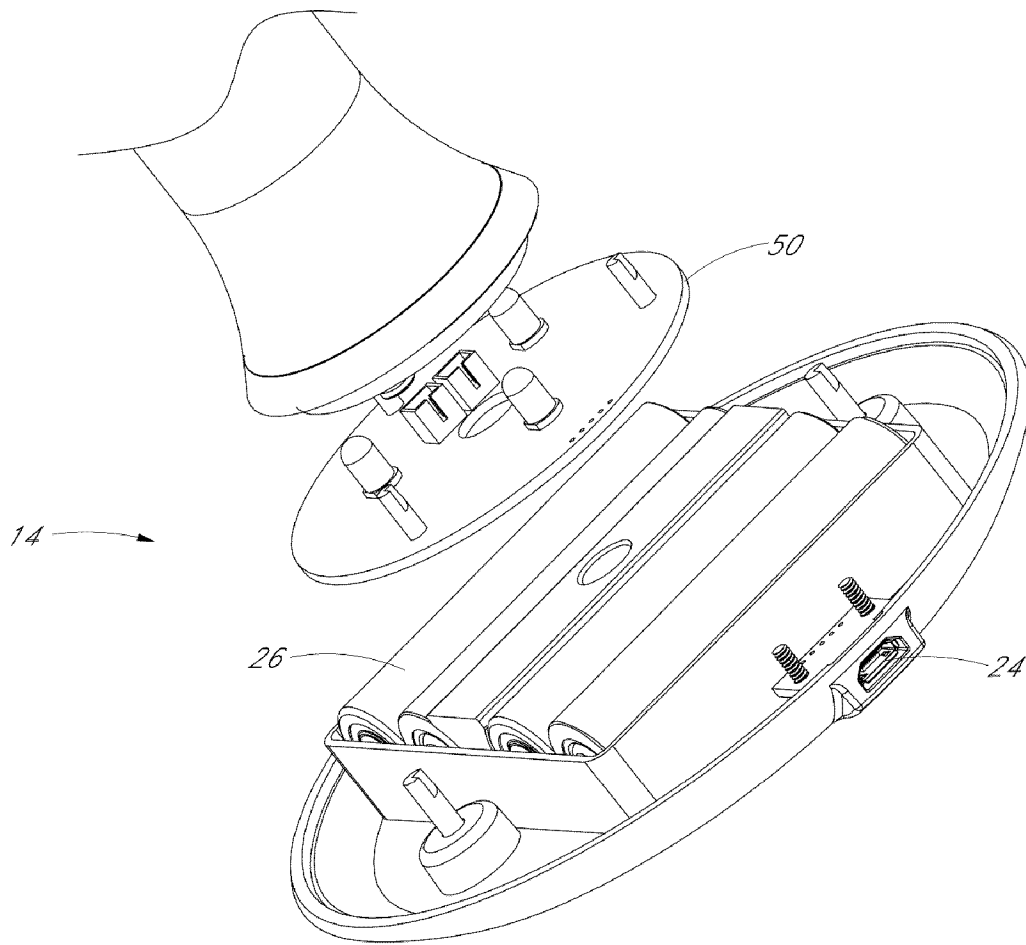


图 12

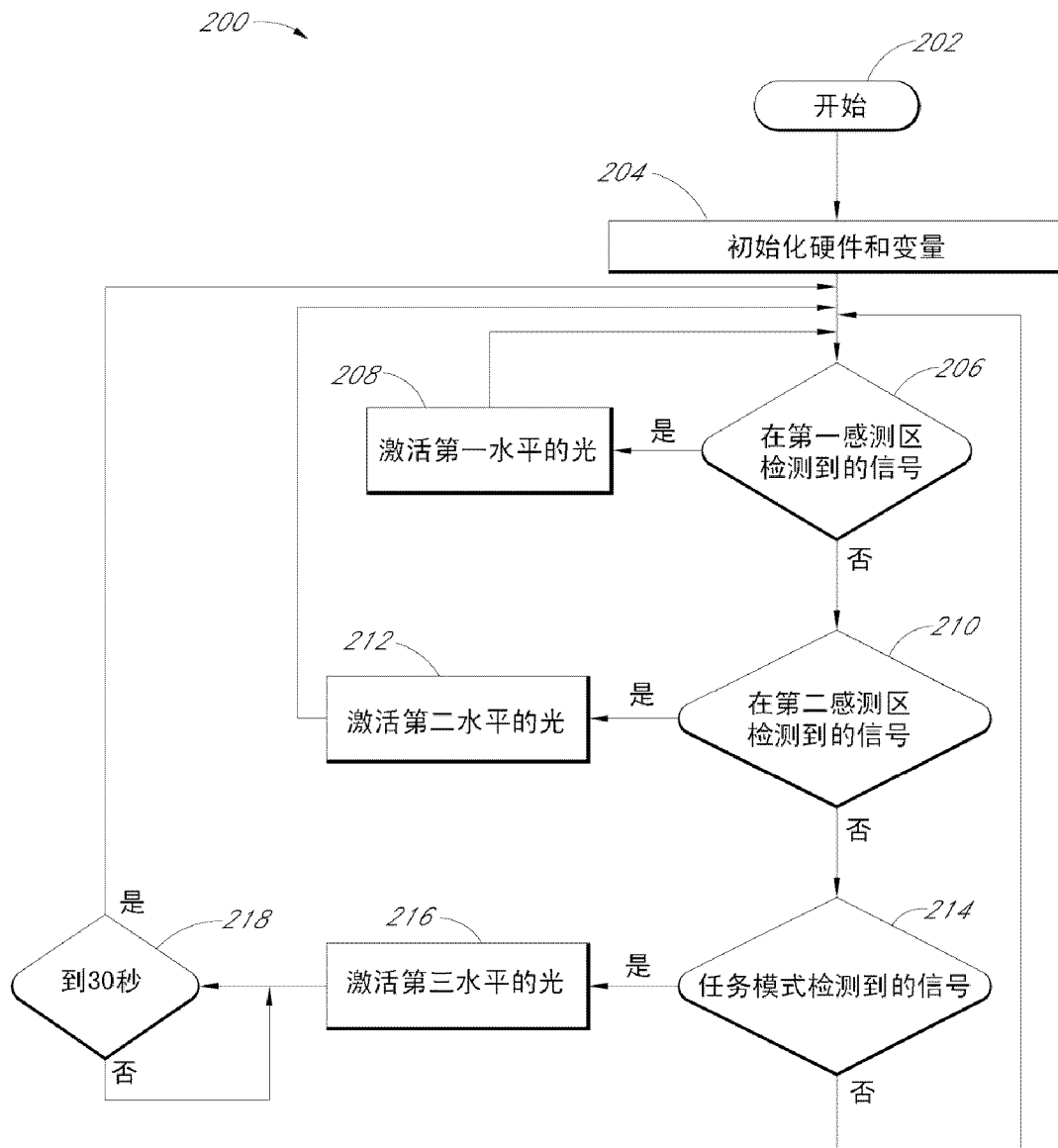


图 13

Support ring for bags or sacks, especially laundry bags

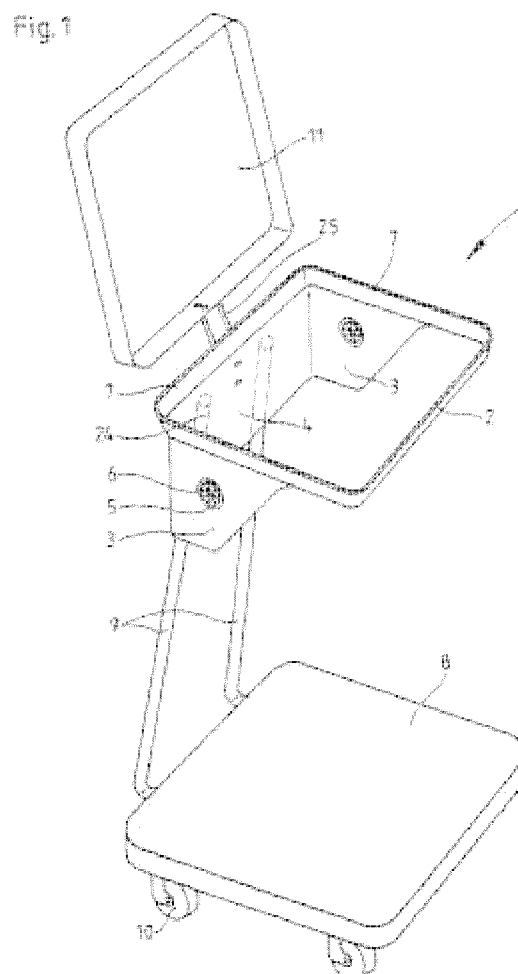
Patent number: EP0582240 (B1)
Publication date: 1996-12-18
Inventor(s): MESEKE CURT TH [DE]; WINKLER WINFRIED [DE]
Applicant(s): HAMMER LIT GMBH [DE]
Classification:
 - international: **B65B67/12; B65B67/00;** (IPC1-7): B65B67/12
 - european: B65B67/12E2
Application number: EP19930112325 19930731
Priority number(s): DE19924225936 19920806

Also published as:

 EP0582240 (A1)
 DE4225936 (A1)
 DE4225936 (C2)
 AT146428 (T)

Abstract of EP 0582240 (A1)

Carrier ring for sacks, pouches or bags, especially laundry bags, with a front narrow region (2), with lateral cheeks (3) widening to form a rear wide fastening region (4), and with clamping elements in the region of the lateral cheeks and/or the fastening region. The carrier ring can be fastened to a wall or be connected by means of carrier struts (9) to a baseplate (8) which, if appropriate, can be provided with running rollers (10). The laundry bag is suspended in the carrier ring, slipped with its edge outwards over the carrier ring and fastened to the clamping elements by means of part regions of the slipped-over bag edge.



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European Patent Office
Office européen des brevets



(11) Veröffentlichungsnummer: **0 582 240 A1**

(12)

EUROPÄISCHE PATENTANMELDUNG

(21) Anmeldenummer: **93112325.1**

(51) Int. Cl.⁵: **B65B 67/12**

(22) Anmeldetag: **31.07.93**

(30) Priorität: **06.08.92 DE 4225936**

(43) Veröffentlichungstag der Anmeldung:
09.02.94 Patentblatt 94/06

(84) Benannte Vertragsstaaten:
AT CH DE FR IT LI NL

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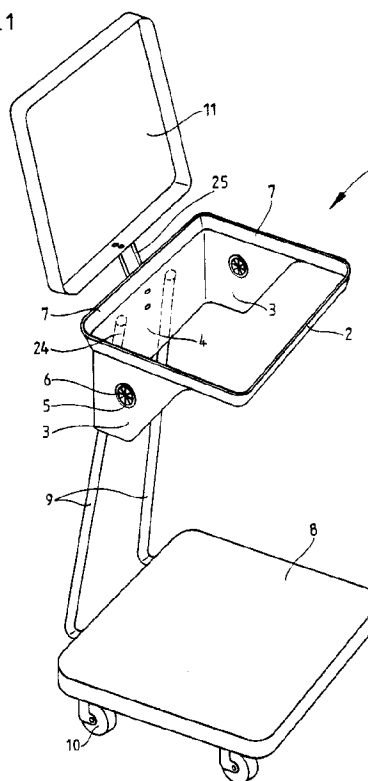
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(54) **Tragring für Beutel, Taschen oder Säcke, insbesondere Wäschesäcke.**

(57) Tragring für Beutel, Taschen oder Säcke, insbesondere Wäschesäcke, mit einem vorderen, schmalen Bereich (2), seitlichen, sich zu einem hinteren, breiten Befestigungsbereich (4) verbreiternden Wangen (3) und Klemmelementen im Bereich der seitlichen Wangen und/oder dem Befestigungsbereich. Der Tragring läßt sich an einer Wand befestigen oder mittels Tragstreben (9) mit einer Bodenplatte (8) verbinden, die ggf. mit Laufrollen (10) versehen sein kann. Der Wäschesack wird in den Tragring eingehängt, mit seinem Rand nach außen über den Tragring gestülpt und mit Teilbereichen des übergestülpten Sackrandes an den Klemmelementen befestigt.

Fig. 1



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Die Erfindung betrifft einen Tragring für Beutel, Taschen oder Säcke, insbesondere Wäschesäcke zur Verwendung in Krankenhäusern, Altersheimen oder dergleichen mit einem vorderen, schmalen Bereich, seitlichen, sich zu einem hinteren, breiten Befestigungsbereich verbreiternden Wangen und Klemmelementen.

Derartige Tragringe sind bekannt und weisen eine im wesentlichen kreisrunde oder rechteckige Form mit abgerundeten Ecken auf. Der Wäschesack wird in den Tragring eingehängt und über den Rand des Tragrings nach außen umgestülpt und dort z. B. mittels eines Spannbandes, wie in der US-Patentschrift 3 927 445 bezüglich der Befestigung eines Müllsacks am oberen Rand eines Mülleimers beschrieben, befestigt. Die Handhabung eines solchen Spannbandes ist unpraktisch, und das Spannband kann leicht verloren gehen.

Bei einem aus der deutschen Offenlegungsschrift 19 18 890 bekannten Tragring wird der obere Rand eines Müllsacks zunächst über einen Klemmring umgelegt und dann mit dem Klemmring im Tragring eingeklemmt. Dies bedingt das Vorhandensein eines Klemmrings, der umständlich zu handhaben ist und leicht verloren gehen kann. Um den gefüllten Sack aus dem Tragring herauszunehmen, muß der gefüllte Sack im Bereich des Klemmrings ergriffen werden, um ihn nach oben herauszuziehen. Dies ist meist nur schwer möglich, weil der prall gefüllte Sack nicht mehr durch den Ring paßt und bedeutete außerdem, daß die unerwünschte Gefahr besteht, mit dem Inhalt des Müllsacks in Berührung zu kommen.

Des weiteren ist der Tragring, um den Klemmring aufnehmen zu können, verhältnismäßig kompliziert mit Einstülpungen geformt, was die Herstellung dieses bekannten Tragrings verteuert.

In der CH-Patentschrift 569 629 ist ein Aufhänge- und Offenhalterahmen für die lösbare Befestigung eines Müllsacks beschrieben, der seitliche Halteklappen für den Müllsack aufweist. Um einen Müllsack mittels der Halteklappen festzuklemmen, muß jeweils eine Halteklappe mit der einen Hand abgespreizt und ein Bereich des Sackrandes mit der anderen Hand zwischen den Rahmen und die Halteklappe geschoben werden, worauf die von der Hand freigegebene Halteklappe diesen Sackrandbereich durch Federdruck einklemmt. Danach ist es erforderlich, denselben Vorgang auf der anderen Seite des Rahmens mit beiden Händen erneut durchzuführen. Dies ist umständlich und zeitraubend.

Dasselbe gilt auch für die in der CH-Patentschrift 520 495 beschriebene Aufhänge- und Offenhaltervorrichtung für Müllsäcke, die in gleicher Weise aufgebaut ist.

Eine weitere, aus der US-Patentschrift 4 669 689 bekannte Müllsackhaltervorrichtung besteht aus

einem hinteren Befestigungsteil und zwei Seitenteilen, die so geformt sind, daß sich Müllsäcke mit Traggriffen über die seitlichen Halteteile hängen lassen. Vom hinteren Trageil ragt eine schräge Klappe hervor, hinter die der rückwärtige Bereich des Müllsacks gelegt wird, damit beim Einwerfen von Müll kein Müll zwischen diesen Randbereich des Müllsacks und den Befestigungsbereich fallen kann. Diese Vorrichtung ist ausschließlich zum Tragen und Offenhalten von Müllsäcken mit zwei Traggriffen bestimmt.

Dies gilt auch für den Müllbehälter, der in der US-Patentschrift 5 100 087 beschrieben ist. Der Müllbehälter weist seitliche, unterschiedlich geformte Haken auf, in die die Traggriffe der in den Behälter eingesetzten Müllsäcke eingehängt werden.

In der britischen Patentschrift 1 494 835 ist eine Klemmvorrichtung für Säcke beschrieben, die aus einem ersten Tragrahmen mit nach oben gebogenen Seiten sowie zwei U-förmigen Bügeln besteht, die mit ihren Schenkeln gelenkig mit den tiefer gelegenen Seiten des Tragrahmens verbunden sind und mit ihren die Schenkel verbindenden Stegen auf den nach oben gebogenen Seiten des Tragrahmens aufliegen. Es wird ein Sackrand über die Klappbügel gestülpt, der dann auf den hochstehenden Seiten des Tragrahmens aufliegt. Der Sackrand wird zwischen den hochstehenden Seiten des Tragrahmens und den Klemmbügel eingeklemmt, wobei sich die Klemmwirkung mit zunehmender Füllung des Sackes verstärkt. Das Einhängen eines Sacks ist umständlich, da nacheinander ein Bereich des Sackrandes über einen Klemmbügel umgestülpt und eingeklemmt und anschließend derselbe Vorgang mit dem zweiten Klemmbügel wiederholt werden muß.

Bei einem in der CH-Patentschrift 651 516 beschriebenen Sackhaltering wird der Rand eines Müllsacks über den Sackhaltering übergestülpt und anschließend mittels eines Gummiringes festgeklemmt. Dieser Gummiring greift in eine Nut des Sackhalterings und gewährleistet eine sichere Halterung des Müllsacks, jedoch besteht die Gefahr, daß der Gummiring verlorengelht, auch ist die Handhabung umständlich, da der Gummiring mit beiden Händen gleichzeitig von hinten anfangend um den Tragring herumgeführt werden muß, was bei der beschriebenen Anordnung unterhalb eines Küchenmöbels unbequem ist.

In der CH-Patentschrift 533 038 ist eine Haltevorrichtung für Kehrrichtsäcke in Form eines Tragrings beschrieben, dessen oberer Bereich sich schräg nach oben und außen erweitert. Über diesen Bereich wird der freie Rand eines Müllsacks durch Umschlagen befestigt. Diese Art der Befestigung für sich allein ist nicht ausreichend, wenn es sich um große Säcke mit schwerem Füllgut han-

delt. Zum Abstützen des Müllsacks kann noch eine Bodenplatte vorgesehen sein, die mit dem Tragrings durch zwei Stützen verbunden sein kann, die jeweils in senkrechte Öffnungen der Bodenplatte und des Tragrings eingesteckt sind. Diese Art der Befestigung mit parallelen Stützen ergibt keine verwindungssteife, frei aufstellbare Anordnung.

Sollen Tragrings für Müllsäcke an einer Wand befestigt werden, ist es aus der deutschen Offenlegungsschrift 19 18 890 und der US-Patentschrift 3 870 261 bekannt, die Tragrings mittels Abstandshaltern an der Wand zu befestigen, um ein einfaches Aufklappen des Deckels und Einhängen des Müllsacks zu ermöglichen.

Der Erfindung liegt die Aufgabe zugrunde, einen Tragrings zu schaffen, der mit einfachen Mitteln eine sichere Befestigung des Beutels, der Tasche oder des Wäschesacks mit einfachen Handgriffen ermöglicht.

Ausgehend von dieser Aufgabenstellung wird daher bei einem Tragrings der eingangs erwähnten Art vorgeschlagen, daß erfindungsgemäß in den Wangen und/oder dem Befestigungsbereich Öffnungen mit radial angeordneten elastischen Zungen als Ausziehsicherung für in die Öffnungen eingesteckte Sackbereiche angeordnet sind, oder daß in den Wangen und/oder dem Befestigungsbereich rechteckige, insbesondere quadratische Öffnungen mit an der Oberkante scharnierartig angelenkten Klappen als Ausziehsicherung für in die Öffnungen eingesteckte Sackbereiche angeordnet sind, oder daß ein U-förmiger Bügel mit seinen Seitenschenkeln hochklappbar an den Wangen befestigt ist und mit einem Quersteg den Befestigungsbereich hintergreift, wo er unter Federwirkung stehend in einer Vertiefung des Befestigungsbereichs anliegt, oder daß im Innenbereich der Wangen und/oder des Befestigungsbereichs des Tragrings nach unten gerichtete, über den unteren Rand des Tragrings hinausragende, federnde Andruckplatten als Klemmelemente für einen über den Tragrings übergestülpten und den unteren Rand untergreifenden Sackrand angeordnet sind.

Die erfindungsgemäßen Klemmelemente lassen sich im Moment des Überstülpens des Sackrandes über den Tragrings benutzen, ohne einen zusätzlichen, unbequemen Bewegungsablauf zu erfordern. Da der obere Rand des Tragrings im wesentlichen freistehend ist, läßt sich der obere Rand des Sacks nach Einhängen um den Tragrings stülpen und mit einfachen Handgriffen mit den Klemmelementen befestigen.

Da der Sackrand nur bereichsweise am Tragrings festgeklemmt wird, kann die Sicherung gegen ein Abrutschen zusätzlich dadurch verstärkt werden, daß zumindest der vordere schmale Bereich von oben nach unten schräg trichterförmig nach innen verläuft und/oder die Oberkante des Tragrings

mit einem Haftbelag, z. B. aus Gummi versehen ist.

Wenn am Befestigungsbereich des Tragrings ein Scharnier für einen Klappdeckel angeordnet ist, läßt sich der Klappdeckel sehr einfach betätigen, wenn ein oder mehrere Abstandshalter zur Wandbefestigung vorgesehen sind.

Soll der Tragrings freistehend benutzt werden, können am Befestigungsbereich Stecköffnungen für wenigstens eine im wesentlichen senkrecht an einer Bodenplatte oder einem Bodenring befestigte Tragstange angeordnet sein.

Die Erfindung wird nachstehend anhand mehrerer, in der Zeichnung dargestellter Ausführungsbeispiele des näheren erläutert. In der Zeichnung zeigen:

- Fig. 1 eine perspektivische Darstellung eines an Tragstreben befestigten, freistehenden Tragrings mit einer ersten Ausführungsform der Klemmelemente,
- Fig. 2 eine perspektivische Teilansicht eines Tragrings mit einer zweiten Ausführungsform der Klemmelemente,
- Fig. 3 einen Querschnitt durch den Tragrings im Bereich der Klemmelemente gemäß Fig. 2,
- Fig. 4 einen Querschnitt durch den Tragrings gemäß Fig. 2 mit eingeklemmten Sack,
- Fig. 5 eine Seitenansicht eines Tragrings mit einem U-förmigen Bügel als Klemmelement,
- Fig. 6 eine Seitenansicht eines Tragrings mit der Darstellung eines Deckelscharniers und einer Wandbefestigung und
- Fig. 7 eine Seitenansicht eines Tragrings mit Federklammern als Klemmelementen.

Ein allgemein mit der Ziffer 1 bezeichneter Tragrings besteht aus einem vorderen, schmalen Bereich 2, seitlichen, sich verbreiternden Wangen 3 und einem hinteren, breiten Befestigungsbereich 4. Der obere Bereich 7 des Tragrings 1 ist entsprechend dem vorderen, schmalen Bereich 2 schräg nach innen gerichtet trichterförmig ausgebildet.

In den Wangen 3 sind Öffnungen 5 angeordnet, in denen sich radial nach innen gerichtete, elastische Zungen 6 befinden. Eine Bodenplatte 8 dient als Standhalterung für den Tragrings 1. Zu diesem Zweck sind Tragstreben 9 mit ihren oberen Enden in schematisch dargestellte Stecköffnungen 24 am Befestigungsbereich 4 und mit ihren unteren abgewinkelten Enden in entsprechende Aufnahmen der Bodenplatte 8 eingesteckt. Um dem Tragrings 1 eine ausreichende Standsicherheit zu geben, ist die Fläche der Bodenplatte 8 größer als die Fläche des Tragrings 1. Aus diesem Grunde sind die Tragstreben 9 gegenüber der Bodenplatte 8 leicht

geneigt angeordnet, so daß der Tragring 1 etwa mittig über der Bodenplatte 8 steht. Die Tragstreben 9 können parallel zueinander oder mit einem Winkel schräg nach oben zueinander verlaufen. Durch die schräge Anordnung wird die Steifigkeit des Systems von Bodenplatte 8, Tragstreben 9 und Tragring 1 erhöht.

Unter der Bodenplatte 8 können Laufrollen 10 angeordnet sein. Des weiteren kann ein Klappdeckel 11 mittels eines Scharnierbügels 25 am Tragring 1 angeschraubt sein. Ein Sack, vorzugsweise ein Wäschesack wird in den Tragring 1 eingehängt, und der obere Rand wird um die schräg nach innen gerichteten Bereiche 2, 7 des Tragrings 1 nach außen gestülpt und mit einzelnen Sackbereichen in die Öffnungen 5 eingesteckt, wo diese Sackbereiche durch die radial gerichteten, elastischen Zungen 6 gegen unbeabsichtigtes Herausziehen gesperrt sind. Durch dieses Einklemmen in Verbindung mit der Reibung um die schräg nach innen gerichteten Bereiche 2, 7 des Tragrings 1 ist eine ausreichend sichere Halterung des Sacks, auch wenn er gefüllt ist, gewährleistet. Zusätzlich kann die Oberkante des Tragrings 1 mit einem reibungserhöhenden Belag, z. B. aus Gummi versehen sein.

Das Befestigen des Sacks kann gemäß Fig. 2 auch in der Weise erfolgen, daß in den Seitenwangen 3 rechteckige oder quadratische Öffnungen 12 angebracht sind, die an der Oberkante 13 scharnierartig angelenkte Klappen 14 aufweisen. Z. B. kann der ganze Tragring 1 aus einem Kunststoffspritzgußteil, ggf. glasfaserverstärkt, bestehen. In diesem Fall lassen sich die Platten 14 einstückig mit dem Tragring 1 herstellen und sind über ein Filmscharnier 15 mit der Oberkante 13 der Öffnung 12 verbunden. Die Verbindung der Platten 14 mit der Oberkante 13 kann auch mit einem getrennt befestigten Scharnierelement erfolgen.

In Fig. 3 ist die Ruhestellung der Klappe 14 in der Wange 3 dargestellt. In Fig. 4 ist erkennbar, wie ein Wäschesack 16 in einem Tragring 1 eingehängt ist und mit einem Rand um den Tragring 1 umgestülpt ist. In jede Wange 3 wird ein Sackbereich 17 durch die Öffnung 12 gesteckt und durch die Klappe 14 festgeklemmt. Je größer die Füllung des Sacks 16 wird, desto stärker wird die Klappe 14 gegen den Sackbereich 17 gepreßt, wodurch die Ausziehsperre entsprechend verstärkt wird, da der unter Spannung stehende innere Teil des Sackes 16 die Klappe 14 gegen den Sackbereich 17 preßt.

Bei der Ausführungsform gemäß Fig. 5 ist ein U-förmiger Bügel mit seinen Seitenschenkeln 18 an den Seitenteilen 3 hochklappbar angelenkt, während sich ein die Seitenschenkel 18 verbindender Quersteg 19 in eine Vertiefung 20 im Befestigungsbereich 4 einlegen läßt. In dieser Stellung

wird das umgestülpte Ende eines Sacks festgeklemmt, wobei dieses Festklemmen durch nicht dargestellte Federn, die den Bügel in die Klemmstellung bringen, unterstützt wird.

Der Sackring gemäß Fig. 6 entspricht dem in Fig. 1 dargestellten und läßt in der Seitenansicht ein an den Befestigungsbereich 4 angeschraubtes oder direkt angespritztes Scharnier 22 für den Klappdeckel 11 erkennen. Zusätzlich ist an dem Scharnier 22 oder an anderer geeigneter Stelle des Bereichs 4 ein oder mehrere Abstandshalter 23 angeordnet, so daß sich dieser Tragring 1 an einer Wand anschrauben läßt, ohne das Überstülpen des Sackrandes über den Tragring 1 und das Öffnen des Klappdeckels 11 zu behindern.

Bei der Ausführungsform gemäß Fig. 7 können Federklemmen 27 oder gefederte Andruckplatten auch auf der Innenseite der Wangen 3 oder des Befestigungsbereichs 4 angebracht sein und nach unten über den unteren Rand hinausragen. Das über den Tragring 1 gestülpte Ende des Sackes kann dann zwischen die Wangen 3 bzw. den Befestigungsbereich 4 und die Federklammern 27 geschoben und eingeklemmt werden. Der Sackrand umschlingt dann das Profil des Tragringes 1 um 360°, was eine weitere Vergrößerung der Halterung am Tragring 1 bewirkt.

Patentansprüche

1. Tragring für Beutel, Taschen oder Säcke, insbesondere Wäschesäcke, mit einem vorderen, schmalen Bereich seitlichen, sich zu einem hinteren, breiten Befestigungsbereich verbreiternden Wangen und Klemmelementen, **dadurch gekennzeichnet**, daß in den Wangen (3) und/oder dem Befestigungsbereich (4) Öffnungen (5) mit radial angeordneten elastischen Zungen (6) als Ausziehsicherung für in die Öffnungen eingesteckte Sackbereiche (17) angeordnet sind.
2. Tragring nach dem Oberbegriff des Anspruchs 1, **dadurch gekennzeichnet**, daß in den Wangen (3) und/oder dem Befestigungsbereich (4) rechteckige, insbesondere quadratische Öffnungen (12) mit an der Oberkante (13) scharnierartig angelenkten Klappen (14) als Ausziehsicherung für in die Öffnungen (12) eingesteckte Sackbereiche (17) angeordnet sind.
3. Tragring nach dem Oberbegriff des Anspruchs 1, **dadurch gekennzeichnet**, daß ein U-förmiger Bügel mit seinen Seitenschenkeln (18) hochklappbar an den Wangen (3) befestigt ist und mit einem Quersteg (19) den Befestigungsbereich (4) hintergreift, wo er unter Federwirkung stehend in einer Vertiefung (20) des

Befestigungsbereiches (4) anliegt.

4. Tragrings nach dem Oberbegriff des Anspruchs 1, **dadurch gekennzeichnet**, daß im Innenbereich der Wangen (3) und/oder des Befestigungsbereichs (4) des Tragsrings (1) nach unten gerichtete, über den unteren Rand des Tragsrings (1) hinausragende, federnde Andruckplatten (27) als Klemmelemente für einen über den Tragrings (1) übergestülpten und den unteren Rand untergreifenden Sackrand angeordnet sind. 5
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5. Tragrings nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet**, daß zumindest der vordere schmale Bereich (2) an Außen- und Innenseite von oben nach unten schräg trichterförmig nach innen verläuft. 15
6. Tragrings nach einem der Ansprüche 1 bis 5, wobei am Befestigungsbereich (4) ein Scharnier (22) für einen Klappdeckel (11) angeordnet ist, **dadurch gekennzeichnet**, daß ein oder mehrere Abstandshalter (23) zur Wandbefestigung vorgesehen sind. 20
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7. Tragrings nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet**, daß am Befestigungsbereich (4) Stecköffnungen (24) für wenigstens eine im wesentlichen senkrecht an einer Bodenplatte (8) oder einem Bodenring befestigte Tragstange (9) angeordnet sind. 30

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Fig.1

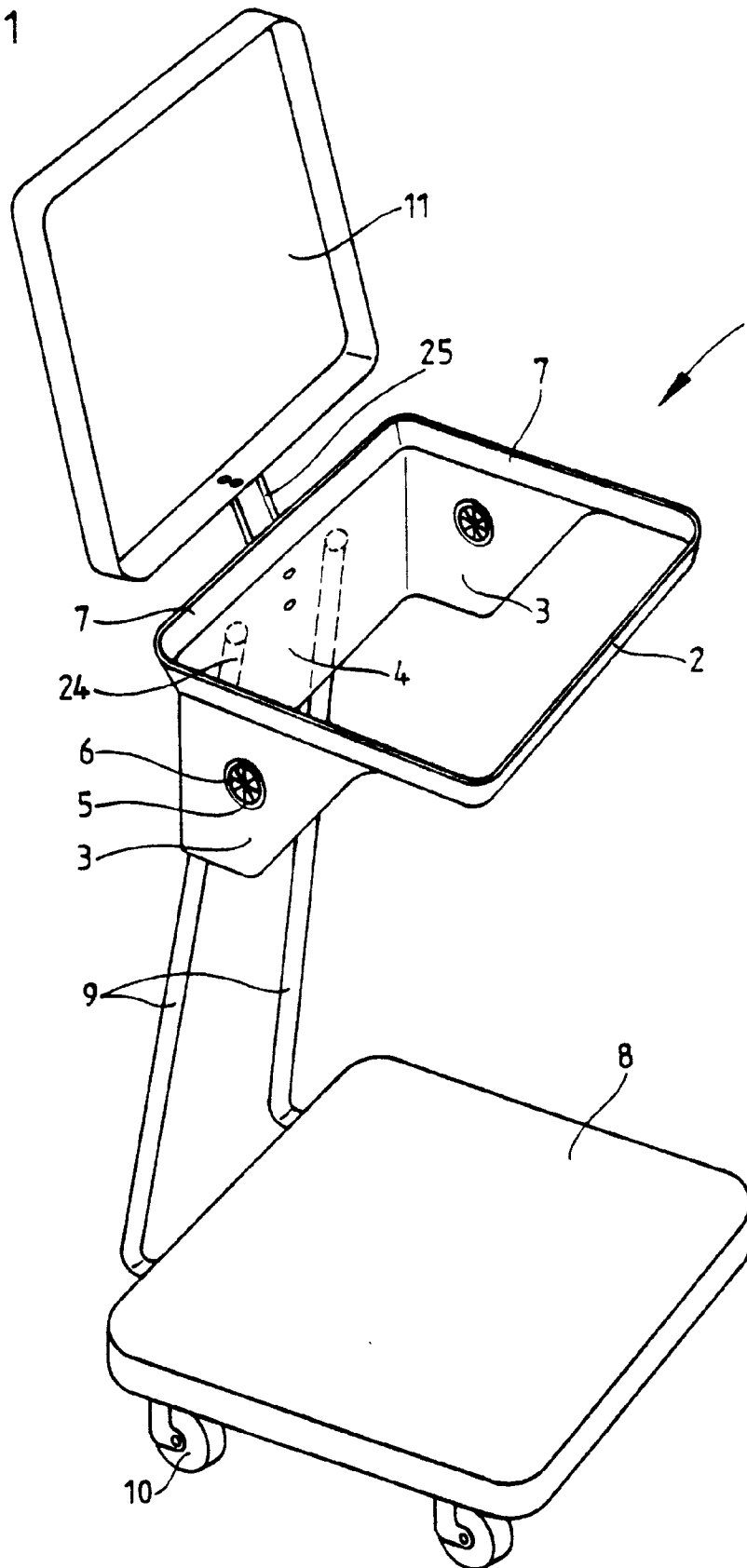


Fig. 2

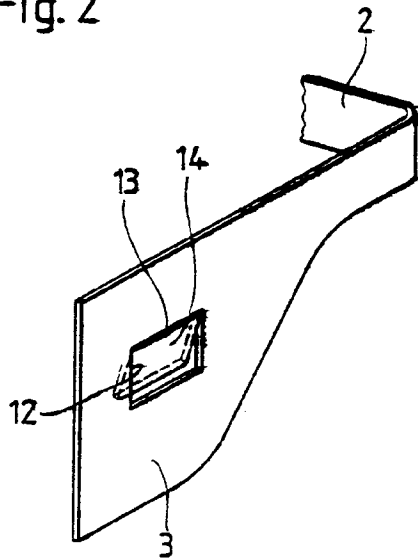


Fig. 3

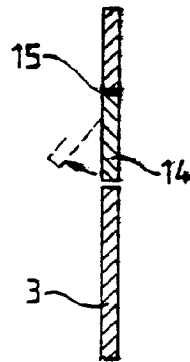


Fig. 4

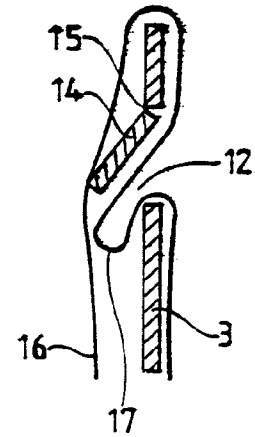


Fig. 5

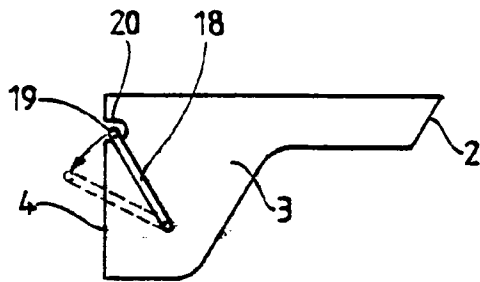


Fig. 6

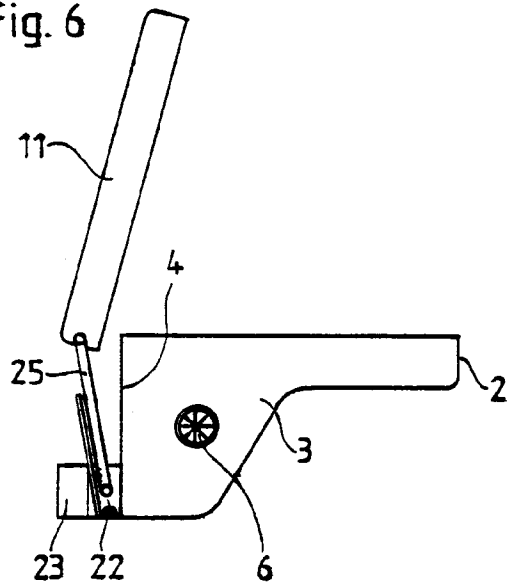
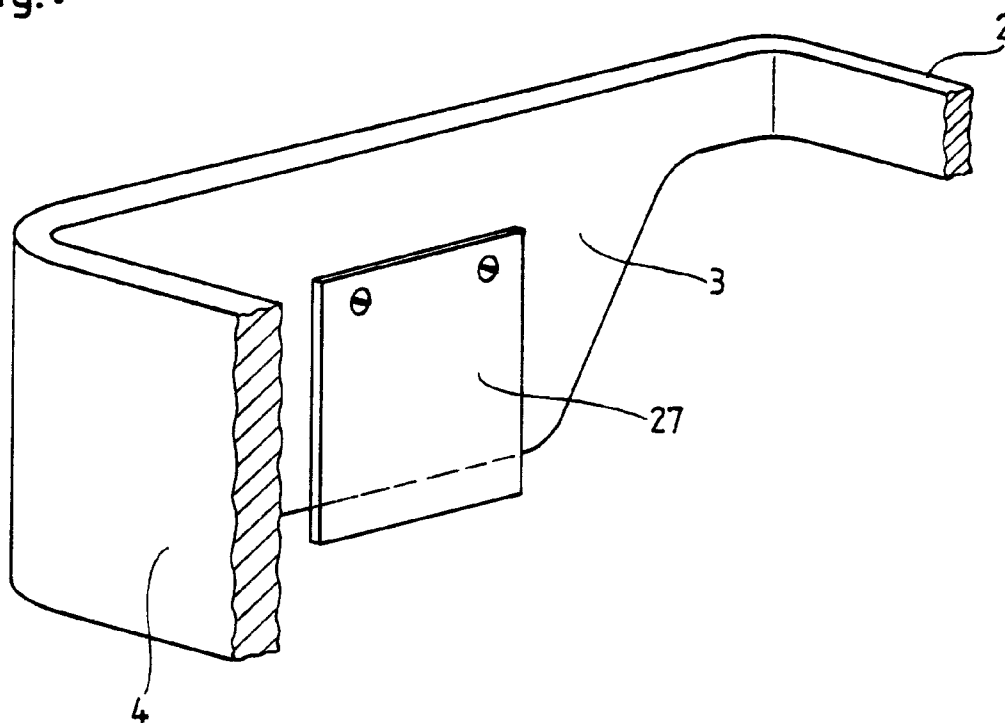


Fig.7





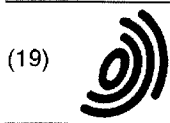
Europäisches
Patentamt

EUROPÄISCHER RECHERCHENBERICHT

Nummer der Anmeldung
EP 93 11 2325

EINSCHLÄGIGE DOKUMENTE			
Kategorie	Kennzeichnung des Dokuments mit Angabe, soweit erforderlich, der maßgeblichen Teile	Betrifft Anspruch	KLASSIFIKATION DER ANMELDUNG (Int.Cl.5)
X	CA-A-1 150 215 (GAGNE) * Seite 11, Zeile 8 - Seite 12, Zeile 7; Abbildungen 2,10-12 *	1	B65B67/12
A	---	2	
A	US-A-4 979 706 (FELDMAN) * Spalte 10, Zeile 46 - Spalte 11, Zeile 53; Abbildungen 1,2,4 *	3	
A	---		
A	US-A-3 825 150 (TAYLOR) ---		
A	US-A-4 834 260 (AUTEN) -----		
			RECHERCHIERTE SACHGEBIETE (Int.Cl.5)
			B65B B65F D06F B65D
Der vorliegende Recherchenbericht wurde für alle Patentansprüche erstellt			
Recherchenort DEN HAAG		Abschlußdatum der Recherche 9. November 1993	Prüfer CLAEYS, H
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EPO FORM 1503 03.82 (P04C03)



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Office européen des brevets



(11) EP 0 903 305 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
24.03.1999 Bulletin 1999/12

(51) Int Cl.⁶: B65F 1/16, B65F 1/06,
B65F 1/10

(21) Application number: 98307382.6

(22) Date of filing: 11.09.1998

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

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(30) Priority: 19.09.1997 GB 9720055
03.07.1998 GB 9814537

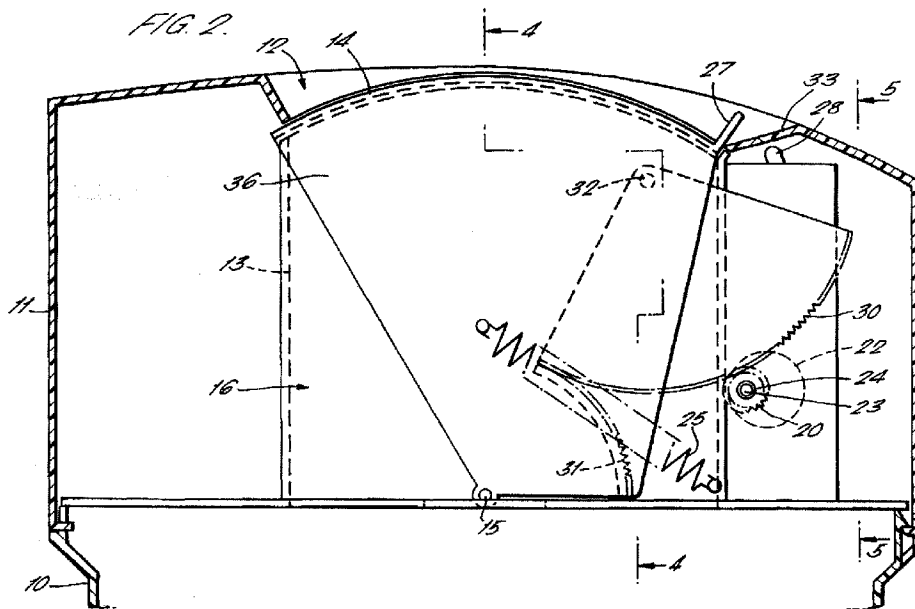
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(54) Bin with electrically actuated opening flap

(57) A bin has a base container (10; 40) and a flap (14; 54) at or on top of the base container, the flap being movable to allow items to be deposited into the base container when the flap is in its open position. Drive means (20, 30; 64, 70) are provided for opening the flap, the drive means being actuated by an electric motor (18; 60). The drive means includes a pinion (20; 64) for ro-

tation by the motor and a drive connection (30; 70) between the pinion and the flap, whereby rotation of the pinion by the motor opens the flap. At least the pinion can be rotated in the flap opening direction without actuating the motor, thereby allowing the flap to be opened manually in the event of failure of the motor to actuate the drive means.



Description

[0001] This invention relates to a bin with an opening flap. More particularly but not exclusively, the bin is a waste bin for depositing waste items.

[0002] Waste bins generally have a lid which is manually opened and closed by the user when depositing a waste item into the bin. Alternatively, the bin may be a pedal bin in which the user depresses a foot pedal to open the lid, which then closes when pressure is removed from the pedal.

[0003] It is also known to provide a waste bin with a flap which is opened by drive means, the drive means being actuated by an electric motor.

[0004] According to the invention there is provided a bin having a base container, a flap at or on top of the base container, the flap being movable between open and closed positions to allow items to be deposited into the base container when the flap is in its open position, and drive means for opening the flap, the drive means being actuated by an electric motor, characterised in that the drive means includes a pinion for rotation by the motor and a drive connection between the pinion and the flap, whereby rotation of the pinion by the motor opens the flap, and wherein at least the pinion can be rotated in the flap opening direction without actuating the motor, thereby allowing the flap to be opened manually in the event of failure of the motor to actuate the drive means.

[0005] In one embodiment of the invention the drive means includes an interruptor mechanism which is capable of disconnecting the pinion in the flap opening direction, whereby the flap can be opened manually without driving the motor. The interruptor mechanism may be a unidirectional clutch. In this case the pinion is mounted for rotation by the motor output shaft, with gear means in driving engagement with the pinion and connected to the flap, and wherein the unidirectional clutch is mounted in driving/non-driving relation between the motor output shaft and the pinion.

[0006] In another embodiment the pinion is mounted in fixed driving relation with the output shaft of the motor and associated gear means, the gear ratio of said gear means being sufficiently low to allow rotation of the pinion to drive the motor, and thereby allow the flap to be opened manually.

[0007] The flap may be closed by a spring. Alternatively, the flap is closed by gravity. In either case, the flap preferably back drives the motor, whilst the flap closes, the motor thereby acting as a brake.

[0008] The bin may be a waste bin for depositing waste items.

[0009] Preferably the flap is mounted for pivoting movement between open and closed positions.

[0010] It is also preferred that the flap is mounted in a lid for the base container.

[0011] In one embodiment the flap is V-shaped whereby the flap is adapted to conceal the contents within the

container in the open position of the flap.

[0012] The base container may have an inner frame for mounting a disposable bag within the base container.

[0013] Preferably the bin includes sensing means for operating the motor to open the flap, the sensing means detecting the proximity of the user's hand in relation to the flap whereby the user is not required to touch the flap.

[0014] The flap preferably has a projection for at least assisting the user to open the flap manually.

[0015] By way of example, specific embodiments in accordance with the invention will be described with reference to the accompanying drawings in which:-

Figure 1 is a perspective view of a waste bin with a lid flap, including powered drive means for opening the lid flap;

Figure 2 shows the bin lid, in section, with the lid flap closed;

Figure 3 is a similar section to Figure 2 showing the lid flap in its open position;

Figure 4 is a section along line 4-4 in Figure 2; and Figure 5 is a section along line 5-5 in Figure 2;

Figure 6 is a perspective view of another embodiment of waste bin with a lid flap;

Figure 7 is an exploded view of the bin of Figure 6; Figure 8 is a section along line 8-8 in Figure 6 with the lid flap closed;

Figure 9 is a similar section as Figure 8 with the lid flap open;

Figure 10 is a section along line 10-10 in Figure 6 showing the powered drive means for opening the lid flap;

Figure 11 is an exploded view of the lid, flap and drive means including a drive coupling comprising a unidirectional clutch for allowing the lid flap to be opened manually; and

Figure 12 is an exploded view of an alternative drive means which allows the flap to drive the motor when the flap is opened manually.

[0016] Referring to Figures 1 to 5, a waste bin comprises a base container 10 with a separate lid 11 releasably hooked thereon. In this embodiment, the lid defines a rectangular aperture 12 surrounded by internal wall 13 forming a central chute 16 extending downwardly. The chute is closable at its top end by a lid flap 14. The flap 14 has side walls 36, and is pivotally mounted for movement between a closed position (Figure 2) and an open position (Figure 3) by outwardly protruding pegs 15 on the wall 13 which engage in respective sockets in the side walls 36 of the flap. When the flap 14 is open (Figure 3), waste items can be deposited down the chute 16 into the base container below. If desired, the base container 10 contains a liner or liner bag for holding the waste items deposited therein and intended for subsequent disposal with the waste items. In this embodiment, there is shown a bag 38 suspended from two side bars

39.

[0017] For opening the flap 14 there is provided a drive pinion 20 actuated by electric motor 18 (Figure 5). The motor 18 is operated by batteries 19. The drive pinion 20 is in driving relation with the motor output shaft via a gear box 22. The pinion 20 is carried on the output shaft 23 of the gear box by a unidirectional clutch 24 providing a drive coupling for connecting the shaft 23 and the pinion in driving relation.

[0018] In this embodiment the pinion 20 meshes with a toothed quadrant 30 which is pivotally mounted on the wall 13 of chute 16 by pin 32, and which in turn meshes with a toothed quadrant 31 attached to or integral with the flap 14. Rotation of the pinion 20 in an anticlockwise direction as viewed in Figure 2 thereby opens the flap 14.

[0019] The clutch 24 comprises an interruptor mechanism which is capable of disconnecting the pinion 20 to allow the pinion to rotate relative to the shaft 23 in one direction only, i.e. the direction of rotation in which the flap 14 opens. The pinion 20 can thus override the motor 18, if necessary, and allow the user to manually open the flap 14 by applying pressure, e.g. with the thumb, on upstanding projection 27 on the flap. Spring 25 is provided to close the flap 14 whereupon the pinion 20 drives the shaft 23 through the clutch 24.

[0020] Sensing means 26 are provided for detecting the proximity of the user's hand in relation to the aperture 12 for the purpose of depositing a waste item in the bin, the sensing means actuating the motor 18 to open the flap 14, whereby the user is not required to touch the lid. However, the provision of the clutch 24 as an interruptor mechanism enables the user to open the flap 14 manually in the event of failure of the motor to drive pinion 20, whether due to failure of the motor, the batteries or the sensing means. On the other hand, since the clutch 24 is only unidirectional in the opening direction of the flap 14, the flap will close slowly by employing the motor 18 as a brake, against the resistance of the gear head and the back emf, whether the flap is opened by the motor or manually.

[0021] In this embodiment, the proximity sensing means 26 comprises an LED transmitter 28 and a receiver 29 positioned beneath a cover 33 acting as a shroud. A pulse signal from the transmitter 28 is reflected to the receiver 29, thereby actuating the motor 18 to open the flap 14 when the user's hand is in close proximity to the sensing means.

[0022] In use, the base container 10 of the waste bin is provided with an inner bag, if desired, and the lid 11 is fitted onto the base container with the flap 14 closed (Figure 1). When the user requires to deposit a waste item into the bin through the aperture 12, the sensing means 26 detects the proximity of the user's hand and actuates the motor 18 to rotate the pinion 20 to open the flap 14. In the event of failure of the sensing means 26, the motor 18 or the batteries 19, the user can still open the flap 14 manually by applying pressure on projection

27 for depositing the waste item in the bin. Whether the flap is opened by the motor or manually, the spring 25 will close the flap via the clutch 24, the motor acting as a brake.

[0023] Figures 6 to 11 concern an embodiment of waste bin having a base container 40 with a separate lid 41. The lid has internal pegs 42 which clip into key-hole slots or cut-outs 43 in the upper side edges of the base container 40 to locate and hold the lid on the container.

[0024] For supporting a disposable bag 44 within the container there is an upper frame 45 defining a central rectangular aperture 46 surrounded by upstanding rim 47 having outwardly protruding ears 48 at its four corners. The frame 45 is located in the top of the base container 40 by lugs 49 at the rear of the frame engaging apertures 71 in the back wall of the container, and is held in place by spring clips 50 at the front of the frame which clip into apertures 72 in the front wall of the container. The frame 45 incorporates a handle 51 which is accessible through a recess 52 in the lid.

[0025] When a bag is used, e.g. a plastics bin bag, its open top protrudes upwardly through the aperture 46 in the frame 45, is folded over the rim 47 and held by an elastic band 53.

[0026] To provide access for depositing waste items into the bag 44, there is provided flap 54 which is snap-fitted into the top of the lid 41 for pivotal movement between closed (Figure 7) and open (Figure 8) positions by key-hole sockets 73 on opposite ends of the flap 54 engaging with pins 55 on the lid 41. The flap 54 is generally V-shaped in transverse cross-section with an upper wall 57 lying flush with the upper surface of the lid 41 when the flap is closed and projecting vertically upwardly of the lid when the flap is open. A projection 58 on the upper wall 57 enables the flap to be opened manually, if required. The lower wall 59 of the flap is angled downwardly from the horizontal when the flap is open, at an angle whereby the inside of the bin, and thereby the contents in the bag 44, are concealed from the user. The open position of the flap 54 is also determined so that the flap closes by gravity after the user has deposited a waste item onto the lower wall of the flap.

[0027] For normal opening of the flap 54, there is provided a similar drive means to that employed in the previous embodiment. Housed in a casing 74 attached inside the lid 41 there is provided an electric motor 60 operated by batteries 61. The motor 60 drives output shaft 63 via gear box 62. A pinion 64 is mounted on the output shaft 63 by an intermediate drive coupling in the form of a unidirectional clutch 65, and is held on the shaft by a star lock 75.

[0028] The pinion 64 meshes with a toothed quadrant 70 attached to a side wall of the flap 54. Rotation of the pinion by the motor 60 thereby opens the flap. The clutch 65 is an interruptor mechanism which is capable of disconnecting the pinion 64 to allow the pinion to rotate relative to the shaft 63 in the direction in which the flap

opens. The pinion can thus override the motor 60, if necessary, and allow the user to open the flap manually by means of the projection 58.

[0029] As in the previous embodiment, sensing means 66 (Figure 11) are provided for detecting the proximity of the user's hand, the sensing means activating the motor 60 to open the flap 64. The proximity sensing means 66 comprises an LED transmitter 67 and a receiver 68 mounted in the top of the casing 64 for the drive means and positioned beneath a cover 69 in the lid 41. A pulse signal from the transmitter 67 is reflected to the receiver 68 thereby activating the motor 60 to open the flap 54 when the user's hand is in close proximity to the sensing means, whereby the user is not required to touch the flap.

[0030] In use, the base container 40 of the waste bin is provided with an inner bag 44, if desired. The lid 41 is fitted onto the base container with the flap 54 closed. When the user requires to deposit a waste item, the sensing means 66 detects the proximity of the user's hand and actuates the motor 60 to rotate the pinion 64 to open the flap 54. After a short time delay whilst the motor power is maintained, to allow the user to drop the waste item onto the lower wall 59 of the flap 54, the flap closes under gravity, against the resistance of the gear head and the back emf of the motor. The motor 60 thereby acts as a brake so that the closing movement of the flap is controlled, and the waste item is deposited into the bag 44.

[0031] Figure 12 shows an alternative drive means for the flap 54 in which the motor 60 and gear box 62 has an output shaft 76 with a longitudinal flat 77. The hub 78 of the pinion 64 has a corresponding D-shaped bore 79 for mounting the pinion directly on the shaft 76 in fixed driving relation in both directions. In this embodiment, the gear ratio of the gear box 62 is sufficiently low to allow rotation of the pinion 64 to drive the motor 60 when the flap is opened manually by the user, e.g. after a failure of the motor, the batteries or the sensing means. The clutch 65 or similar interruptor drive coupling can then be omitted.

[0032] The invention is not restricted to the specific details of the embodiments described above. For example, the bin may be any bin having a closure flap, and is not necessarily a waste bin. Also, the flap instead of pivoting may be mounted for sliding movement between its open and closed positions, the drive means being adapted accordingly. In this case, the pinion driven by the motor may drive a second pinion on the flap via an intermediate rack.

Claims

1. A bin having a base container (10;40), a flap (14; 54) at or on top of the base container, the flap being movable between open and closed positions to allow items to be deposited into the base container

when the flap is in its open position, and drive means (20;30; 64;70) for opening the flap, the drive means being actuated by an electric motor (18;60), characterised in that the drive means includes a pinion (20;64) for rotation by the motor and a drive connection (30;70) between the pinion and the flap, whereby rotation of the pinion by the motor opens the flap, and wherein at least the pinion can be rotated in the flap opening direction without actuating the motor, thereby allowing the flap to be opened manually in the event of failure of the motor to actuate the drive means.

2. A bin as claimed in Claim 1, wherein the drive means includes an interruptor mechanism (24) which is capable of disconnecting the pinion in the flap opening direction, whereby the flap can be opened manually without driving the motor.
3. A bin as claimed in Claim 2, wherein the interruptor mechanism is a unidirectional clutch (24).
4. A bin as claimed in Claim 3, wherein the pinion (20) is mounted for rotation by the motor output shaft (23), with gear means (30;31) in driving engagement with the pinion and connected to the flap, and wherein the unidirectional clutch (24) is mounted in driving/non-driving relation between the motor output shaft and the pinion.
5. A bin claimed in Claim 1, wherein the pinion (64) is mounted in a fixed driving relation with the output shaft (63) of the motor (60) and associated gear means (62), the gear ratio of said gear means being sufficiently low to allow rotation of the pinion to drive the motor, and thereby allow the flap (54) to be opened manually.
6. A bin as claimed in any one of the preceding claims, wherein the flap (14) is closed by a spring.
7. A bin as claimed in any one of Claims 1 to 5, wherein the flap (54) is closed by gravity.
8. A bin as claimed in Claim 6 or Claim 7, wherein the flap (14; 54) back drives the motor (18;60), whilst the flap closes, the motor thereby acting as a brake.
9. A bin as claimed in any one of the preceding claims, wherein the bin is a waste bin for depositing waste items.
10. A bin as claimed in any one of the preceding claims, wherein the flap (14;54) is mounted for pivoting movement between open and closed positions.
11. A bin as claimed in any one of the preceding claims, wherein the flap (14;54) is mounted in a lid (11;41)

for the base container (10;40).

12. A bin as claimed in any one of the preceding claims,
wherein the flap (54) is V-shaped whereby the flap
is adapted to conceal the contents within the base 5
container (40) in the open position of the flap.
13. A bin as claimed in any one of the preceding claims,
wherein the base container has an inner frame for
mounting a disposable bag within the base contain- 10
er.
14. A bin as claimed in any one of the preceding claims,
including sensing means (26; 66) for operating the
motor to open the flap, the sensing means detecting 15
the proximity of the user's hand in relation to the flap
whereby the user is not required to touch the flap.
15. A bin as claimed in any one of the preceding claims,
wherein the flap (14;54) has a projection (27; 58) 20
for at least assisting the user to open the flap man-
ually.

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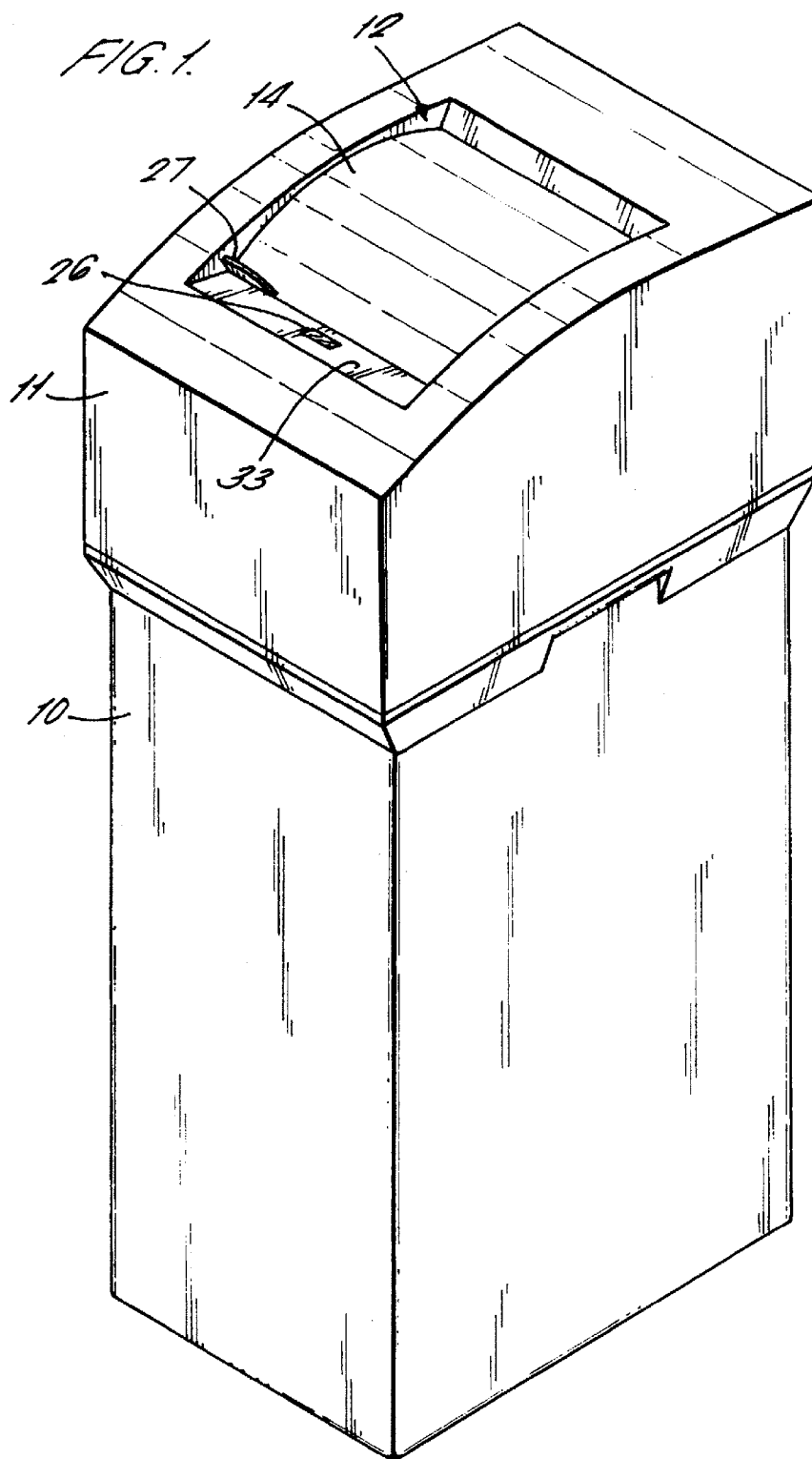
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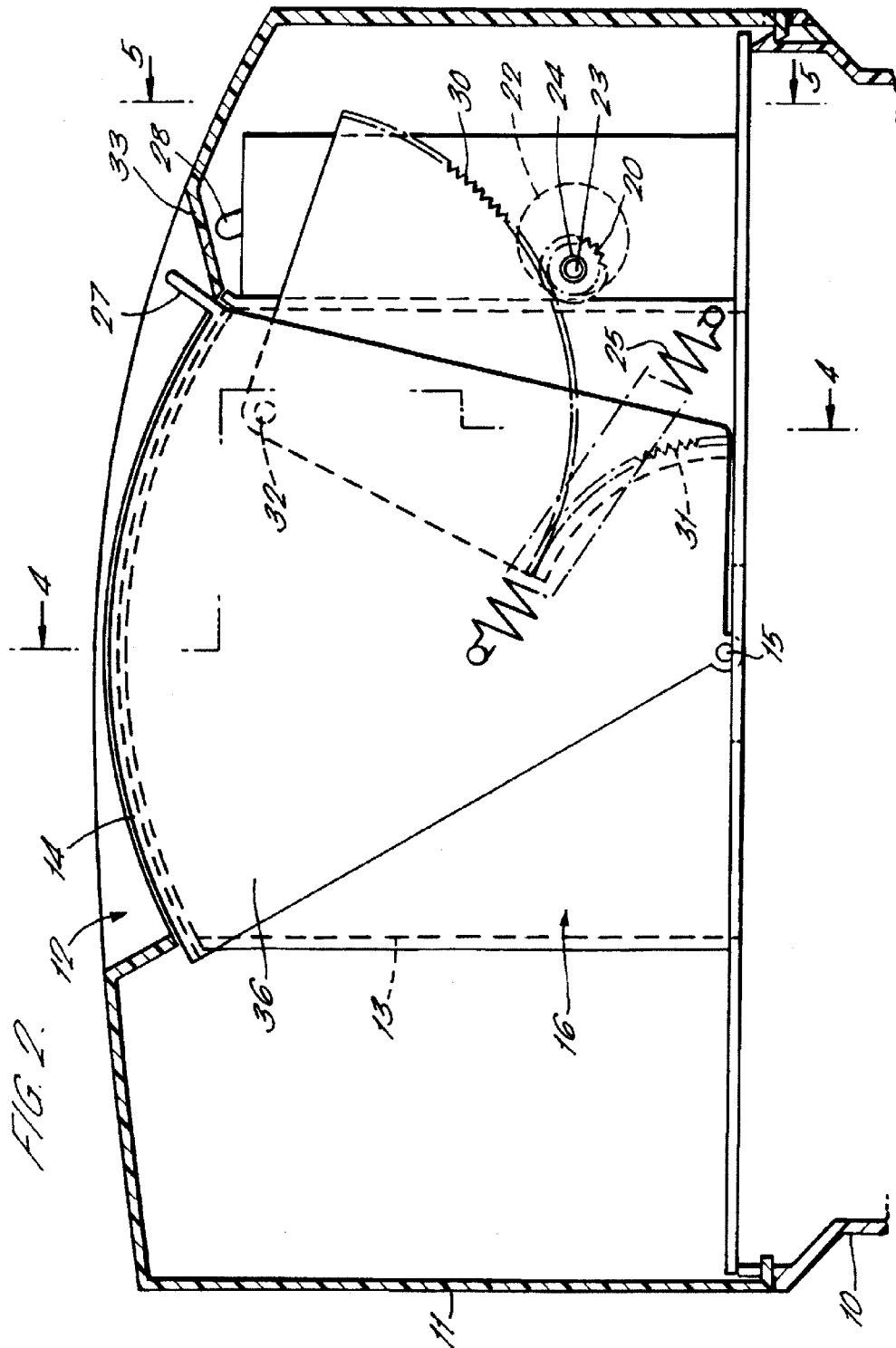
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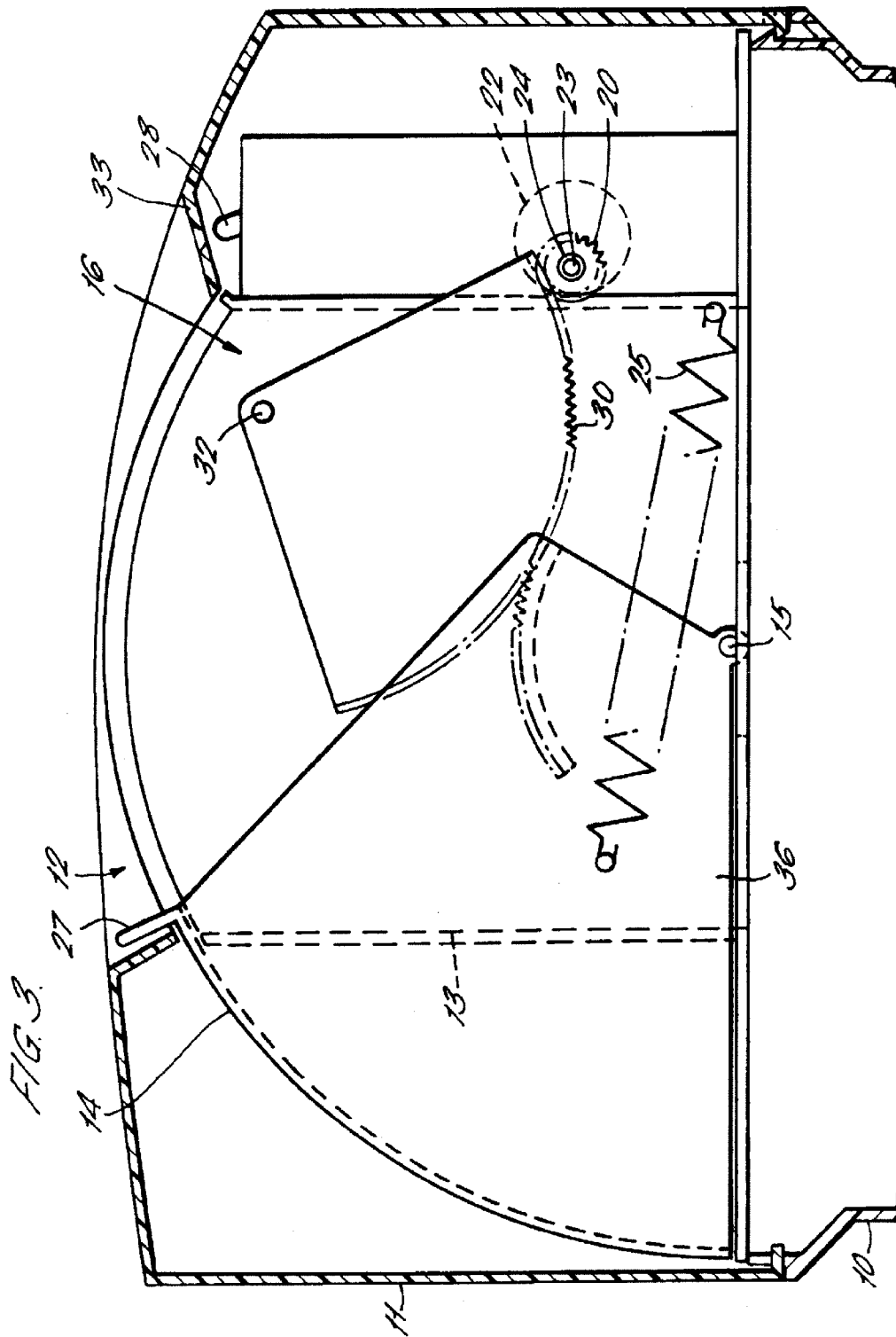
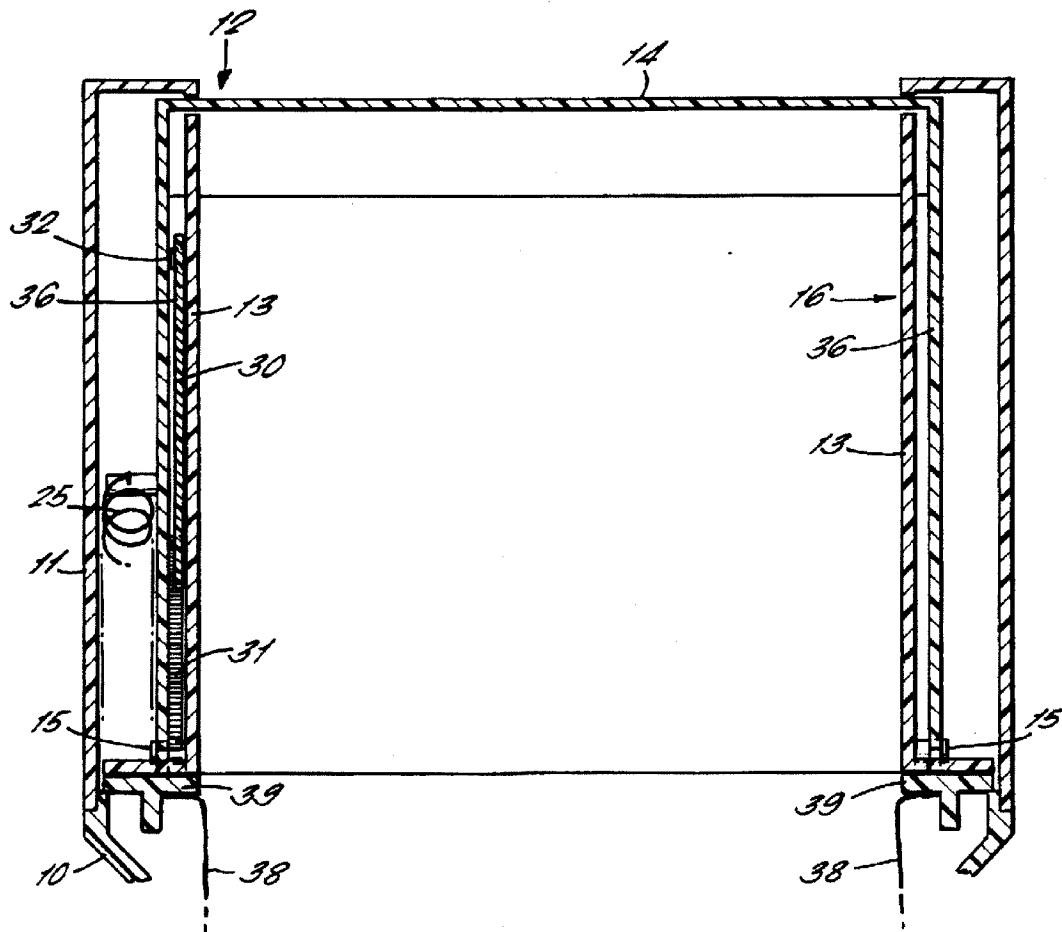


FIG. 4.



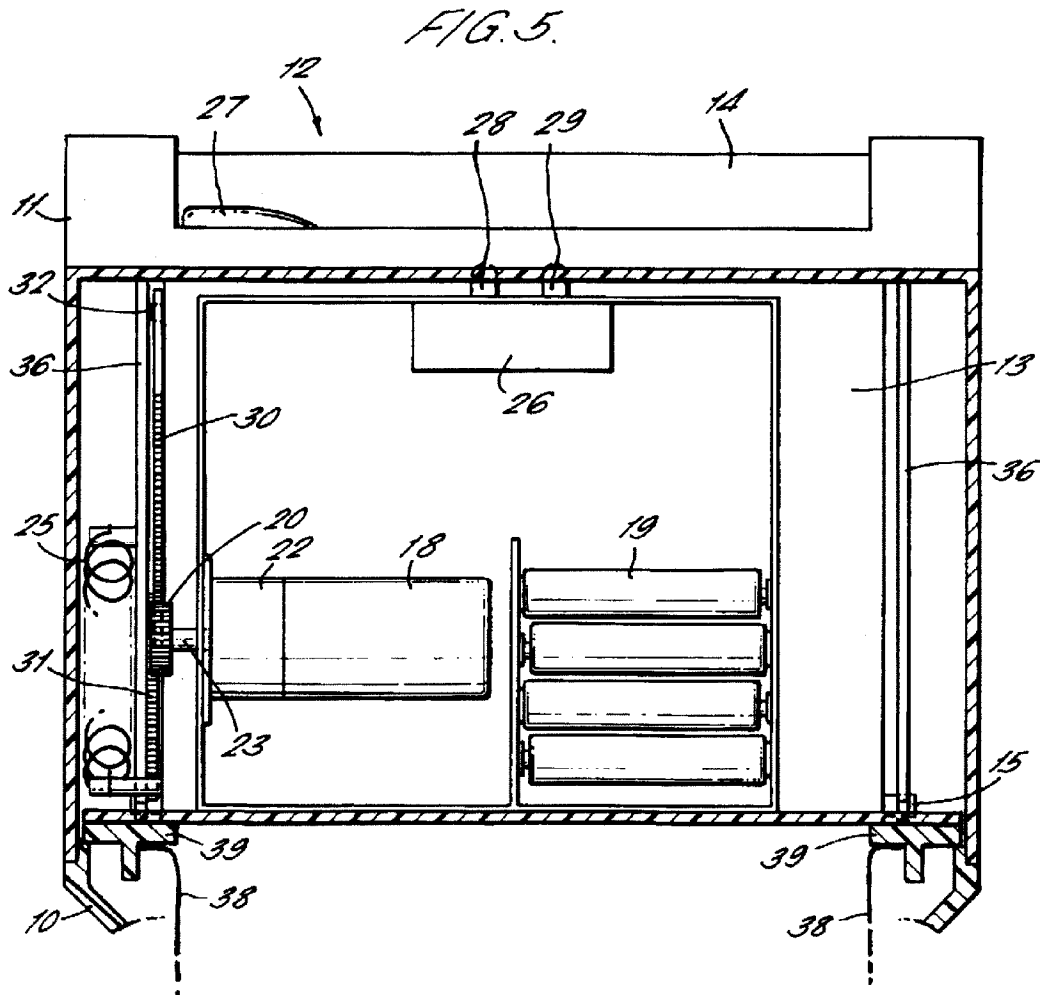
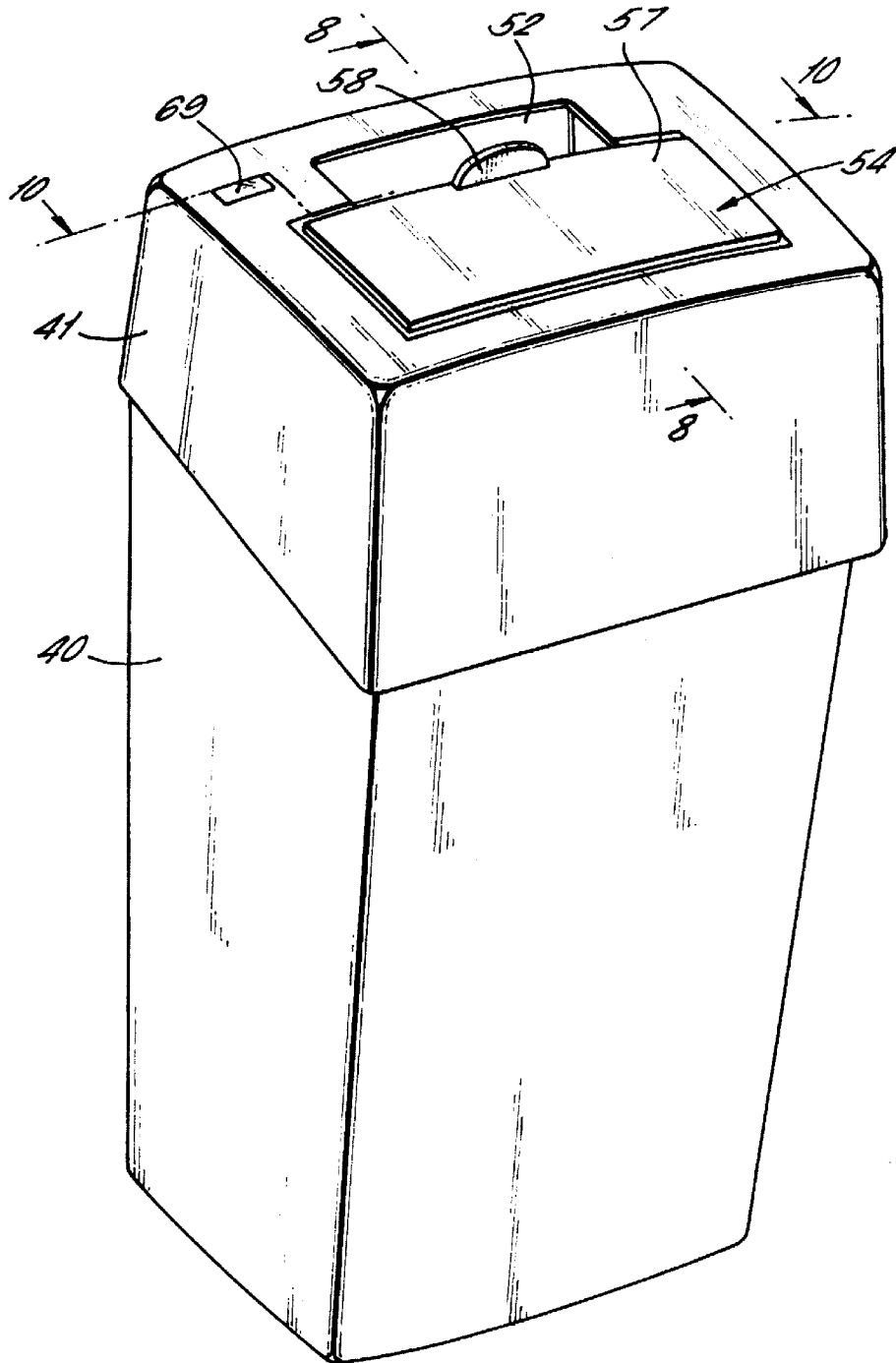


FIG. 6.



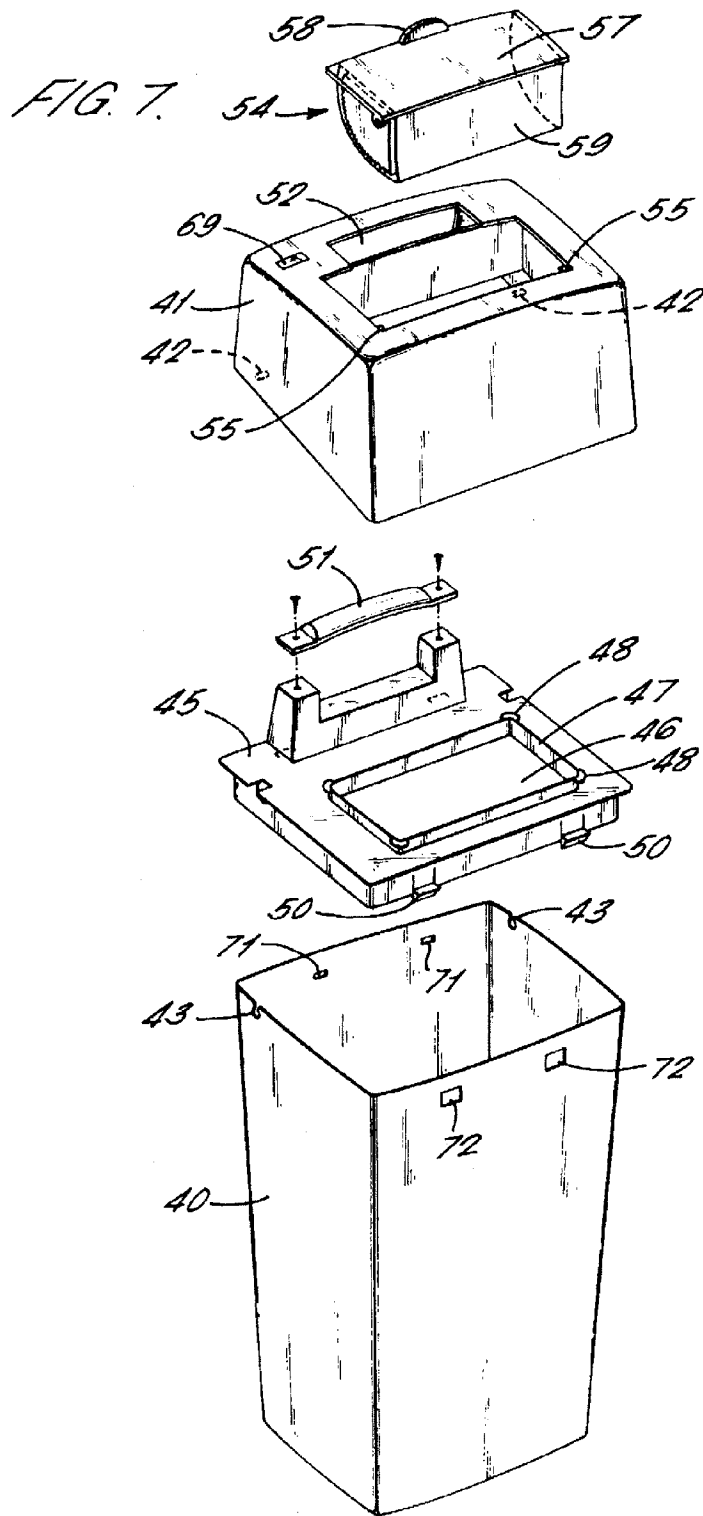


FIG. 8.

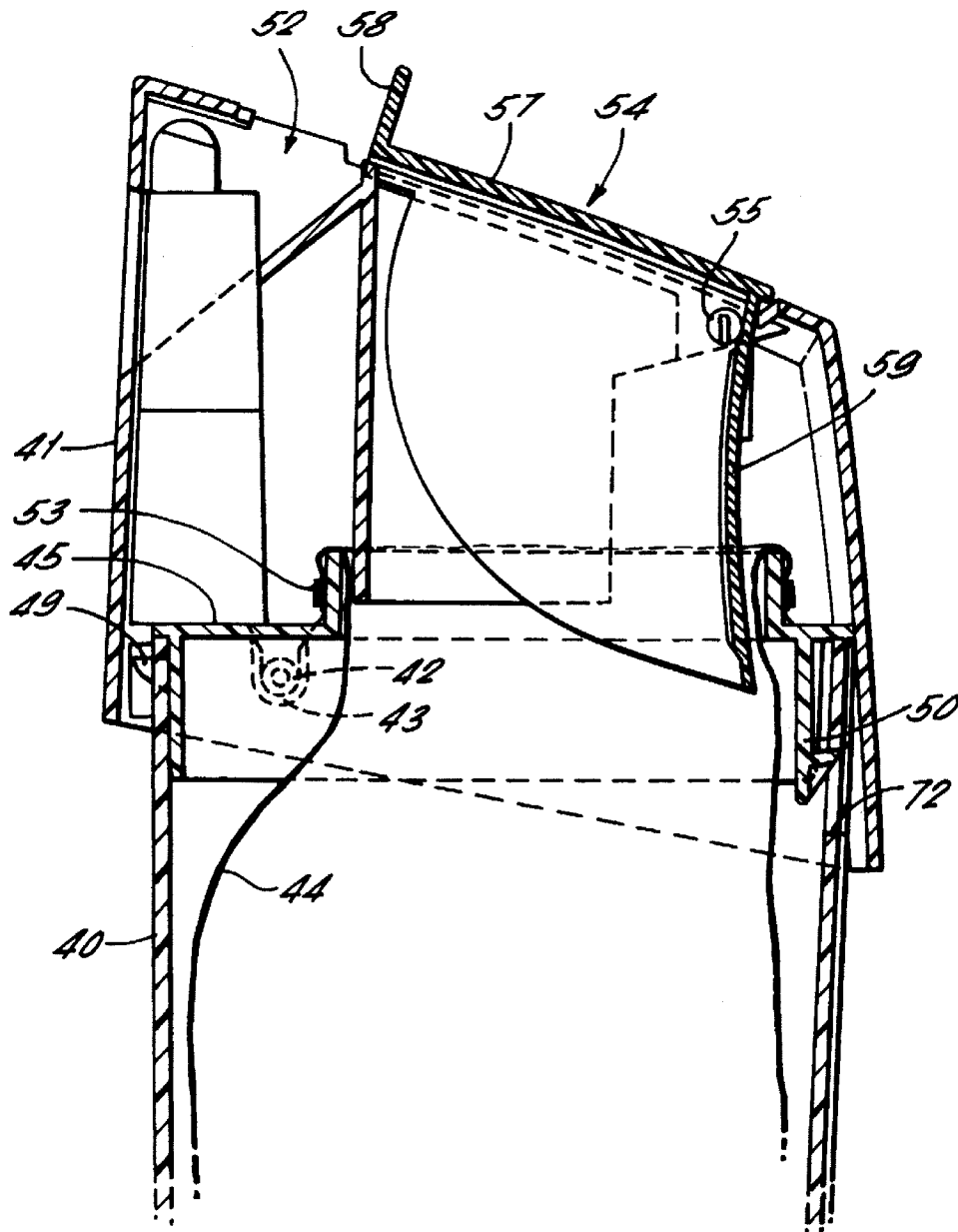
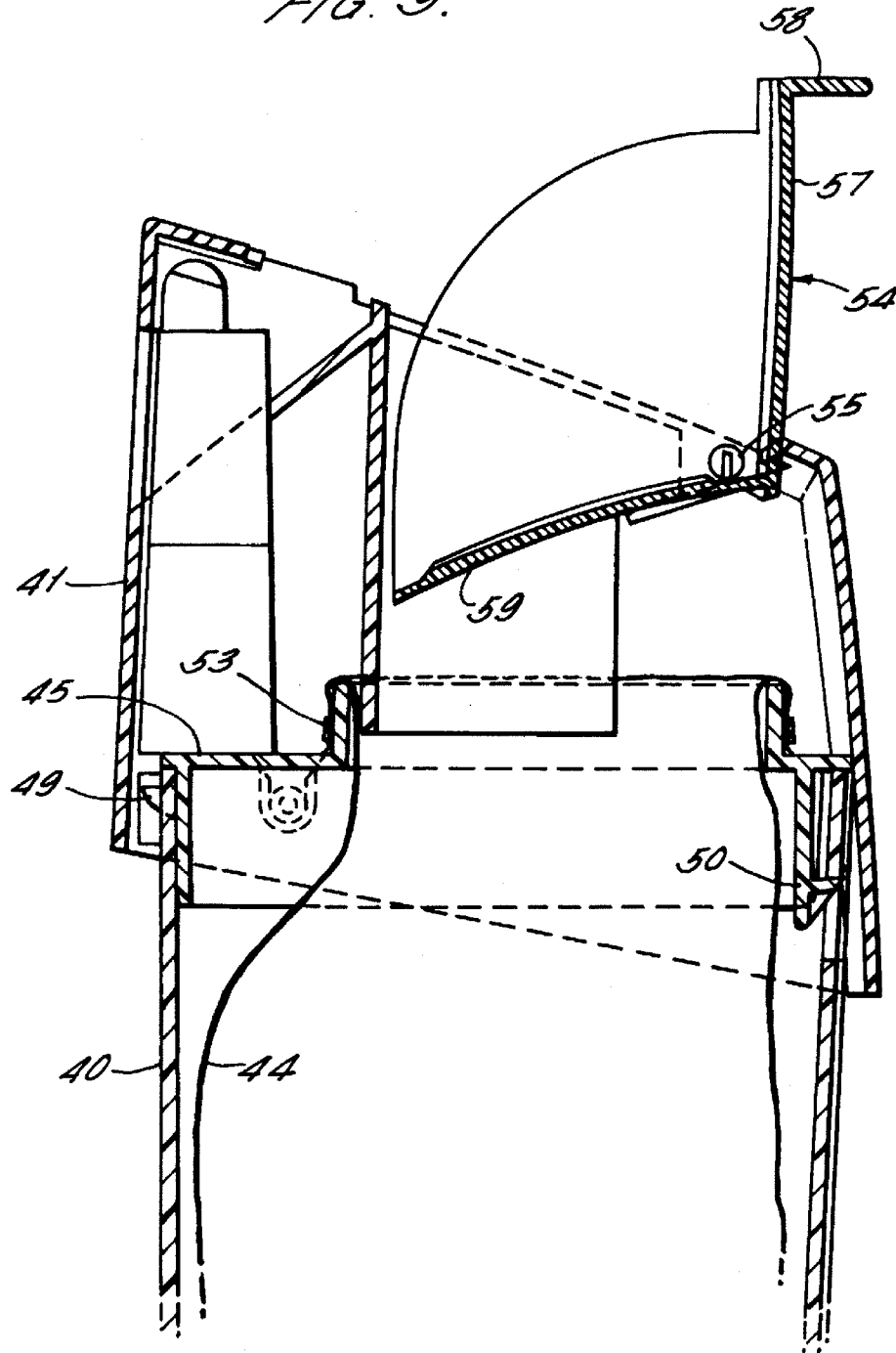
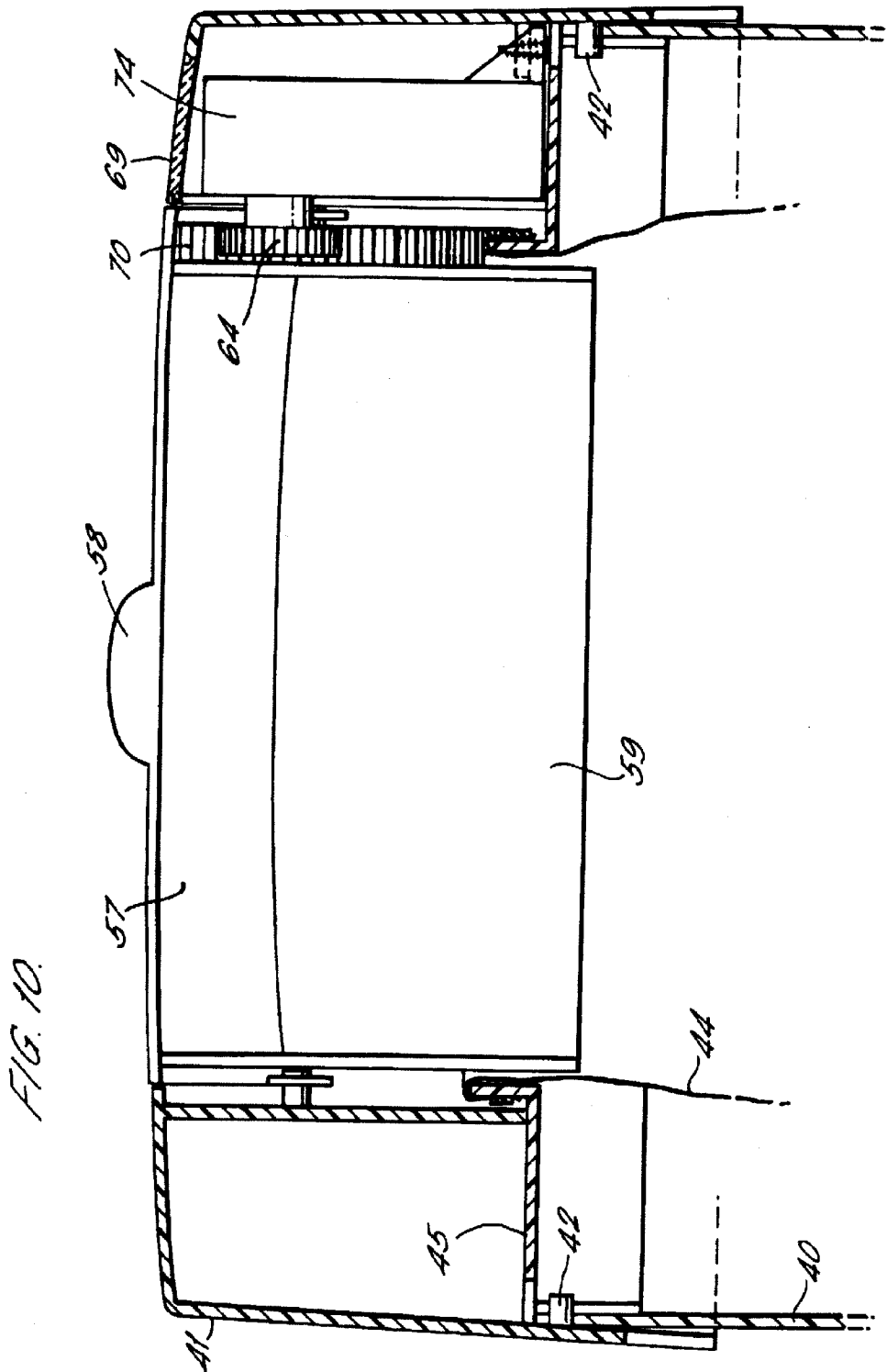


FIG. 9.





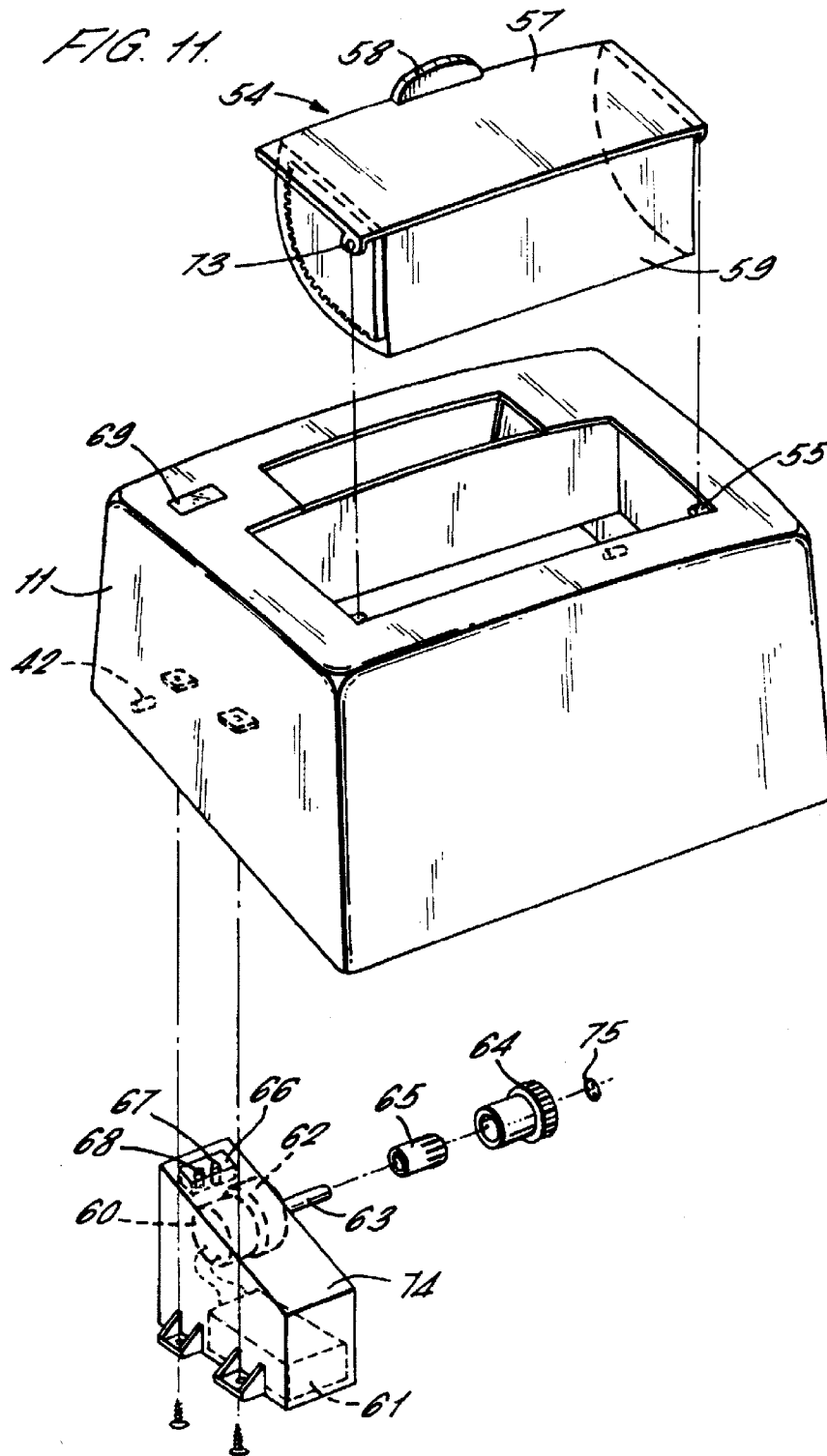
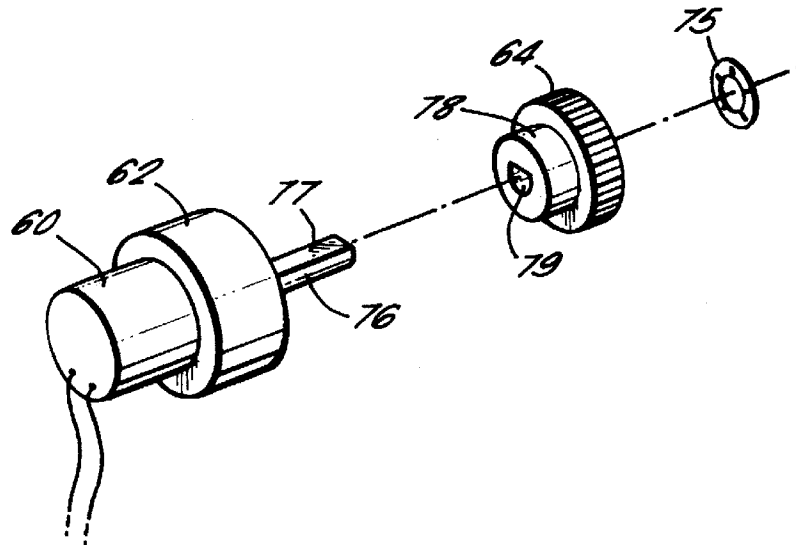


FIG. 12.





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 30 7382

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US 4 981 275 A (M. SHEU) 1 January 1991 * column 2, line 4 - line 55 * * figures 1-3 * ---	1,6,9, 10,13,14	B65F1/16 B65F1/06 B65F1/10
A	US 4 609 122 A (K. ZIEGENBEIN) 2 September 1986 * column 2, line 47 - column 3, line 22 * * figures 1-3 * ---	1,6,7,9, 10,14	
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A	DE 44 39 640 A (M. KOKEMOR) 15 May 1996 * the whole document * ---	1,6,9, 10,15	
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Place of search THE HAGUE		Date of completion of the search 17 December 1998	Examiner Smolders, R
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 98 30 7382

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EP 0 906 876 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
07.04.1999 Bulletin 1999/14

(51) Int Cl.⁶: **B65F 1/16**

(21) Application number: **98307823.9**

(22) Date of filing: **25.09.1998**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

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(30) Priority: **04.10.1997 GB 9720997**

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(54) **Shock absorber for waste container**

(57) A shock absorber (20) adapted for use on a pedal bin (1) in which the lid (7) of the pedal bin (1) is opened and closed by an actuating member, the shock

absorber (20) comprising damping means connected to the actuating means to limit the speed of movement of the actuating means when the lid (7) of the bin is opened or closed.

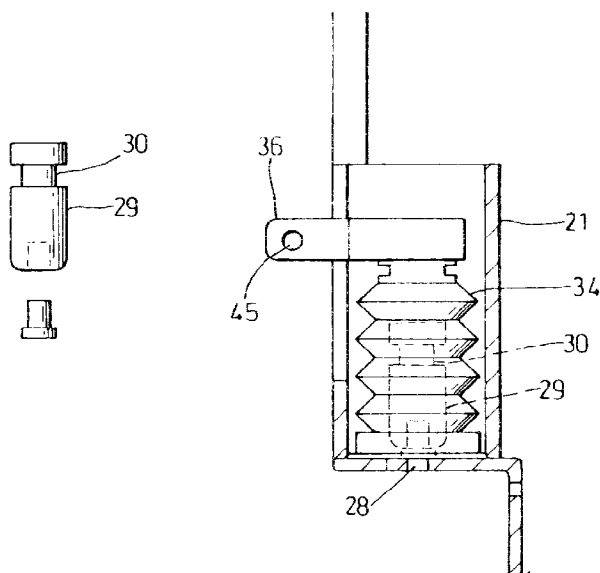


Fig. 3a

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Description

[0001] This invention relates to a shock absorber and, more particularly, to a shock absorber for use in a pedal bin to reduce the force with which the lid of the bin is returned to the closed condition during use.

[0002] Pedal bins are found in many different locations and have a particular usefulness in a hospital environment where a lid is required on the bin to keep any material in the bin isolated from the patients in the hospital. Pedal bins allow the operator to open the lid of the bin without having to manually operate the lid. This is particularly useful when the operator is carrying waste to be put into the bin and does not have a free hand.

[0003] The bins are operated by a pedal at the foot of the bin which is generally depressed in order to raise the lid of the bin. Once material has been placed into the bin, the pedal is released thereby allowing the lid to fall back onto the bin under the force of gravity. Whilst this ensures that the bin is closed securely, the noise generated from such an action can cause a disturbance. This is especially so where a number of such bins are provided in one room, for example in a hospital. Here it is imperative to ensure that the patients are not disturbed more than is necessary.

[0004] It is an object of the present invention to provide a shock absorber for a pedal bin which is both efficient and quiet in closing the lid of a bin after use, thereby overcoming or at least mitigating the disadvantages of the known pedal bins.

[0005] According to one aspect of the present invention there is provided a shock absorber adapted for use on a pedal bin in which the lid of the pedal bin is opened and closed by an actuating member, the shock absorber comprising damping means connected to the actuating means to limit the speed of movement of the actuating means when the lid of the bin is opened or closed.

[0006] Preferably, the shock absorber further comprises a body which is adapted to be mounted on the bin adjacent to the actuating means of the bin, the damping means being mounted within the body.

[0007] Advantageously, the damping means comprises bellows mounted which may expand or retract within the body.

[0008] Conveniently, means are provided to connect the bellows to the actuating member of the bin.

[0009] Advantageously, the connecting means comprises a planar member, one end of which is provided with a recess to receive the actuating member and the other end of which is connected to the leading end of the bellows.

[0010] Preferably also, the recess is defined between two arms of the planar member and means are provided to alter the distance between the two arms thereby altering the size of the recess to allow the connecting means to be securely affixed to the actuating means of the bin.

[0011] Advantageously, the body of the shock absorber

is provided with a longitudinal slot along at least part of the length thereof, through which the planar member extends as the bellows are expanded and retracted within the body.

[0012] Conveniently, the body is provided with an end cap closing the end of the body remote from the planar member.

[0013] Advantageously, the end cap comprises an integrally formed hollow boss which extends into the body and is received within the free end of the bellows.

[0014] Preferably also, an aperture is formed in outer surface of the end cap allowing air to be drawn into the hollow boss.

[0015] Conveniently, a weight is provided within the boss, the weight being moveable between a position wherein the aperture in the end cap is closed by the weight and a position where the weight is lifted free of the aperture to allow air to be drawn into the boss.

[0016] Advantageously, a limit stop is mounted on the boss to limit the movement of the weight between the two extreme positions.

[0017] Preferably, the body is formed of a rigid plastics material.

[0018] Preferably also, the bellows are formed of a resilient plastics material.

[0019] One embodiment of the present invention will now be described with reference to the accompanying drawings in which:

Figure 1 is a schematic side view of a pedal bin with a shock absorber according to one aspect of the present invention mounted thereon;

Figure 1a is a schematic rear view of the bin of Figure 1;

Figure 2 is an exploded side view of the shock absorber of Figure 1;

Figure 3 is a schematic side view of the shock absorber of Figure 1 when the lid of the bin is in a closed condition, and

Figure 3a is an enlarged view of the shock absorber as shown in Figure 3;

Figure 4 is a schematic side view of the shock absorber of Figure 1 when the lid of the bin is in an opened condition.

[0020] Turning now to the Figures there is shown in Figure 1 a pedal bin generally referred to as **1**. The pedal bin comprises a hollow body **2** with an opening **3** at one end which may be adapted to receive a waste receptacle such as a plastics waste bag for rubbish (not shown). The bin may be formed of a moulded plastics material.

[0021] The bin is provided with a hinged door **4** at the front thereof. This allows access to the bag when full, to

allow the bag to be removed from the bin and a new bag to be mounted within the body of the bin. The door is hinged **5** at one side to the body. A door knob **6** is mounted on the door approximately mid-way between the top and bottom of the door adjacent the edge remote from the hinges **5**.

[0022] The bin **1** is provided with a lid **7** which covers the opening **3** in the body. The lid extends **7a** beyond the rear of the bin and has a downward projecting lip **8** at the rear edge. The lip is extended **8a, 8b** around the sides of the lid which extend beyond the rear of the bin. An aperture **9** is provided through the lip at each side of the lid.

[0023] A pair of generally triangular flanges **10** extend upward from the rear of the bin **1**. The flanges are mounted to the bin adjacent the top edge and extend outwardly from the bin to a position level with the top edge of the bin and adjacent to the end of the lid **7**.

[0024] The flanges **10** are each provided with an aperture **11** which is of a similar size to the aperture **9** in the lip of the lid. A mounting pin **12** extends through the apertures in the flanges and the lip of the lid to hingedly connect the lid **7** to the bin **1**.

[0025] A handle **13** is provided adjacent the rear of the lid of the bin, between the flanges **10**.

[0026] At the base of the bin, the pedal **14** comprises a substantially rectangular plate **15** which is mounted underneath the bin. The front of the plate extends beyond the front of the bin. The plate is pivotally mounted to the underside of the bin on a pivot pin **16** which is retained in two apertures **17** in the sides of the lower section of the bin.

[0027] At the rear of the bin a wheel **18** is mounted at either side to enable the bin to be tilted back onto the wheels to allow the bin to be easily moved from one location to another.

[0028] An actuating rod **19** is mounted at the rear of the bin. The rod is centrally located between the wheels **18** at the base of the bin and extends between the rear of the rectangular plate **15** and the underside of the lid **7** between the flanges **10**.

[0029] A shock absorber **20** according to one aspect of the present invention is mounted between the base of the bin **1** and the actuating rod **19** as shown in Figure **1**. The shock absorber comprises a circular shroud **21**, open at both ends and provided with integrally formed mountings **22** at one end to allow the shroud to be mounted to the rear of the bin **1**. The shroud may be formed of any suitable plastics material and may be formed a known molding process.

[0030] A generally rectangular U-shaped slot **23** is provided in the shroud, the slot extending approximately three quarters of the length of the shroud and off-set from the centre of the shroud, towards one of the mountings **22** as shown in Figure

[0031] An end cap **24** is mounted in the lower end of the shroud **21** to close the lower side of the shroud. The end cap is generally circular and is of a similar diameter

to the diameter of the shroud itself.

[0032] A hollow boss **25** extends from the centre of the end cap and is adapted to be received within the shroud **21**. The boss is generally circular in cross-section and is of slightly smaller diameter than the end cap thereby defining a rim **26** on the end cap. The boss is frustoconical in configuration and has a circular aperture **27** in the centre. The underside of the endcap **24a** is provided with an aperture **28** which connects the inner chamber of the end cap, within the boss **25** with the atmosphere.

[0033] A cylindrical spigot **29** is mounted within the chamber in the boss, the circumference of the spigot being slightly smaller than the circumference of the aperture **27** in the boss thereby allowing the spigot to move freely within the aperture. The end of the spigot within the boss is provided with a countersunk aperture and a rubber insert (not shown) is mounted in the aperture. The spigot has a groove **30** around the circumference thereof adjacent to the end of the spigot remote from the rubber insert.

[0034] A limit stop **31** is located adjacent to the spigot **29**, the limit stop having a generally circular body **32** and a flat head **33**, the head being received within the groove **30** in the body of the spigot. The head **33** of the limit stop is approximately a third of the height of the groove and therefore allows the spigot **29** to move within the aperture in the boss between two extreme positions in which the head of the limit stop contacts either the lower side of the groove or the upper side of the groove.

[0035] Bellows **34** are mounted within the shroud **21** of the absorber. The bellows are formed of a lightweight, flexible plastics material. The diameter of the bellows is slightly less than the internal diameter of the shroud to allow the bellows to contract and expand within the shroud. The bellows are mounted over the boss **25** of the end cap **24**.

[0036] The end of the bellows **34** remote from the cap is provided with a circular aperture **35**. An actuation member **36** of the absorber is mounted on the bellows. The actuation member comprises a bifurcated body **37** having a generally circular end **38** with an aperture **39** corresponding in shape and size to the aperture **35** in the end of the bellows. A threaded bolt **40** passes through the aperture **39** in the body and the aperture **35** in the bellows and is retained in position by a threaded nut **41**.

[0037] The other end of the body **37** is bifurcated to provide two arms **42, 43**. A generally circular collar **44** is integrally moulded with the body where the arms join on the body. The diameter of the collar is slightly larger than the diameter of the actuating rod **19** to allow the actuating rod to be received in the collar.

[0038] An aperture **45** is provided through the end of each arm **42, 43** of the actuating member. A threaded bolt **46** is passed through the apertures and is retained within the apertures by a threaded nut **47** at either end.

[0039] The shock absorber **20** is mounted at the base

of the bin **1** at the rear in a recess **48**. The end cap **24** is placed over the end of the shroud **21**, the bellows **34** are mounted in the shroud over the cap and the actuating arm **36** is attached to the free end of the bellows.

[0040] The actuating rod **19** is then passed between the arms **42, 42** of the bifurcated actuating arm and is received in the collar **44**. The threaded nuts **47** are then tightened on the threaded bolt **46** to connect the shock absorber to the actuating rod.

[0041] When the lid **7** of the bin is in the closed condition, the bellows **34** are in the compressed condition as shown in Figure of the drawings. In this position the actuating member **36** is at the lower position within the slot **22** in the shroud **21**.

[0042] When the lid of the bin is to be lifted to place rubbish into the receptacle within the bin, the pedal **15** of the bin is depressed which causes the pedal to hinge around the mounting pin **16**. As the front of the pedal is lowered, the rear of the pedal is raised thereby lifting the actuating rod **19**. As the actuating rod is lifted, the end of the actuating rod contacts the underside of the rear of the lid **7a** of the bin and lifts the lid clear of the top edge of the bin allowing access to the receptacle.

[0043] As the actuating rod **19** is lifted to lift the lid **7** of the bin, the actuating member **36** moves upwards together with the rod, through the slot **22** in the shroud **21** and pulls the bellows **34** upwards within the shroud **21**.

[0044] As the bellows expand within the shroud, the spigot **29** is sucked from its seat within the boss **25** and is lifted until the head **33** of the limit stop contacts the lower edge of the groove **30** in the spigot, thereby preventing the spigot from lifting further. Whilst the spigot is lifted free from the aperture **28** in the end cap **25**, air is drawn in through the aperture and around the spigot into the bellows.

[0045] The lid **7** of the bin is held in the open condition whilst the operator's foot is on the pedal **15**. In this condition, the actuating rod **19** is raised thereby holding the lid **7** clear of the upper surface of the bin.

[0046] When it is required to close the lid **7** of the bin, the operator releases the pedal **15** of the bin which hinges upwards towards the bin. As the front of the pedal moves upwards, the rear of the pedal is hinged downwards thereby lowering the actuating rod **19** to allow the lid to be lowered towards the top of the bin and so causing a rapid compression of the air in the bellows. This in turn causes the cylindrical spigot **29** to be forced against its seat and so compressing the rubber insert and preventing escape of air in the chamber via the aperture **28**.

[0047] This prevents the lid from slamming back into position, as the actuating rod **19** is lowered. During this time the actuating member **36** is lowered through the slot **22** in the shroud **21** thereby so that the bellows **34** are compressed within the shroud. However, once an equilibrium has been reached in the bellows **34**, the second stage of the lowering then begins with the compressed air in the bellows **34** slowly escaping through the aperture **28** controlling the decent of the lid through

the final quarter of it's movement.

[0048] As the air in the bellows **34** is forced through the aperture **28** in the cap, the actuating rod **19** is slowly returned from the raised to the lowered position thereby gently lowering the lid **7** of the bin onto the top edge of the bin.

[0049] The weight of the lid **7** of the bin retains the bellows **34** in the compressed condition shown in Figure.

[0050] It should also be noted that for any particular arrangement the volume of air within the bellows **34** is determined by the mass of lid which has to have it's movement controlled. The cylindrical spigot **29** is weighted to prevent leakage of air under rapid compression but to allow controlled release under other conditions. The weight of the spigot compresses the rubber insert, but not overly thereby enabling the controlled release. Further when the bellows **34** are extended the spigot **29** is not too heavy to stay seated but moves to allow air through aperture **28** into the bellows **34**, but is heavy enough to remain located in the boss.

Claims

1. A shock absorber adapted for use on a pedal bin in which the lid of the pedal bin is opened and closed by an actuating member, the shock absorber comprising damping means connected to the actuating means to limit the speed of movement of the actuating means when the lid of the bin is opened or closed.
2. A shock absorber according to claim 1, wherein the shock absorber comprises a body which is adapted to be mounted on the bin adjacent to the actuating means of the bin, the damping means being mounted within the body.
3. A shock absorber according to claim 2, wherein the damping means comprises bellows mounted which may expand or retract within the body.
4. A shock absorber according to claim 3, wherein means are provided to connect the bellows to the actuating member of the bin.
5. A shock absorber according to claim 4, wherein the connecting means comprises a planar member, one end of which is provided with a recess to receive the actuating member and the other end of which is connected to the leading end of the bellows.
6. A shock absorber according to claim 5, wherein the recess is defined between two arms of the planar member and means are provided to alter the distance between the two arms thereby altering the size of the recess to allow the connecting means to

be securely affixed to the actuating means of the bin.

7. A shock absorber according to claim 5 or 6, wherein the body of the shock absorber is provided with a longitudinal slot along at least part of the length thereof, through which the planar member extends as the bellows are expanded and retracted within the body. 5
8. A shock absorber according to any one of claims 5 to 7, wherein the body is provided with an end cap closing the end of the body remote from the planar member. 10
9. A shock absorber according to claim 8, wherein the end cap comprises an integrally formed hollow boss which extends into the body and is received within the free end of the bellows. 15
10. A shock absorber according to claim 9, wherein an aperture is formed in the outer surface of the end cap allowing air to be drawn into the hollow boss. 20
11. A shock absorber according to claim 10, wherein a weight is provided within the boss, the weight being moveable between a position wherein the aperture in the end cap is closed by the weight and a position where the weight is lifted free of the aperture to allow air to be drawn into the boss. 25
12. A shock absorber according to claim 11, wherein a limit stop is mounted on the boss to limit the movement of the weight between the two extreme positions. 30
13. A shock absorber according to any one of claims 2 to 12, wherein the body is formed of a rigid plastics material. 35
14. A shock absorber according to any one of claims 3 to 13, wherein the bellows are formed of a resilient plastics material. 40

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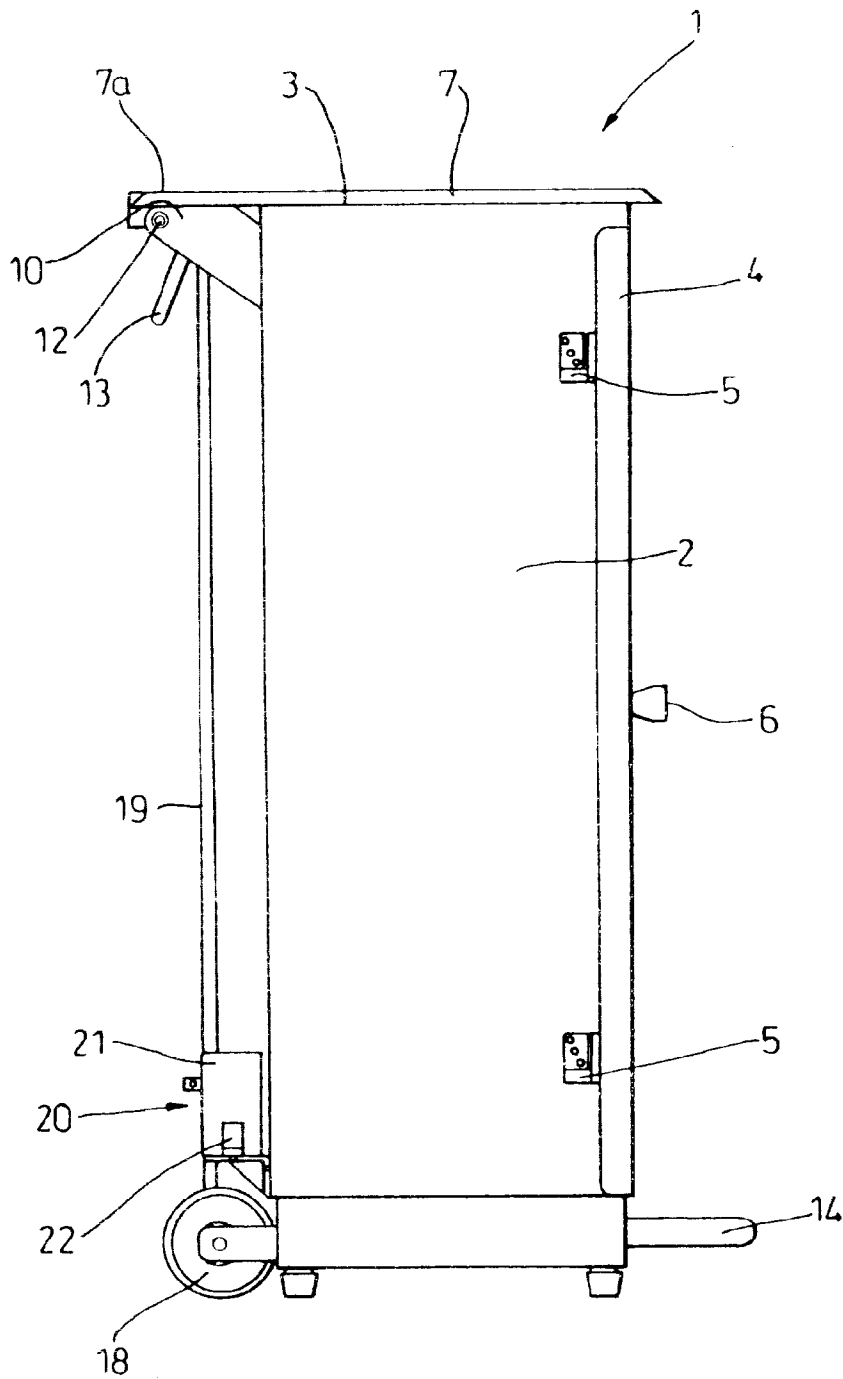


Fig. 1

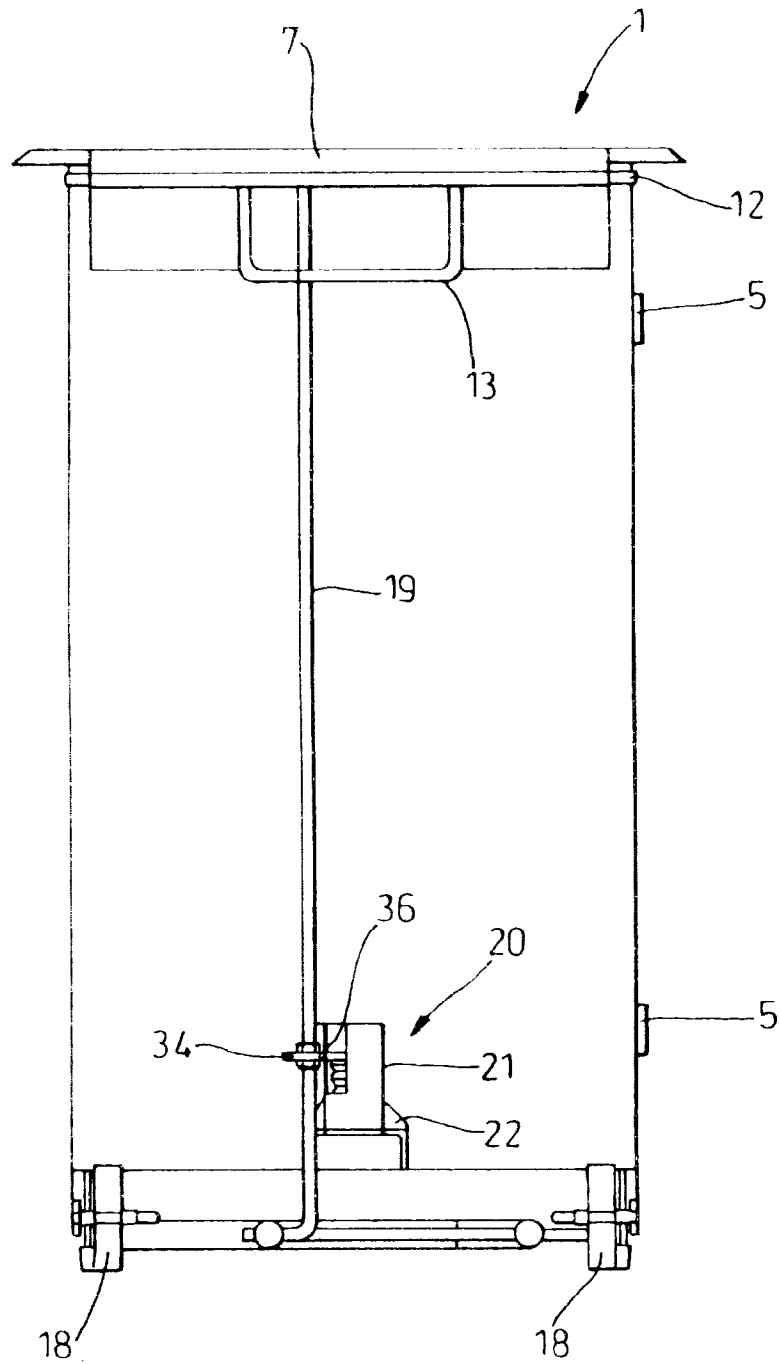


Fig. 1a

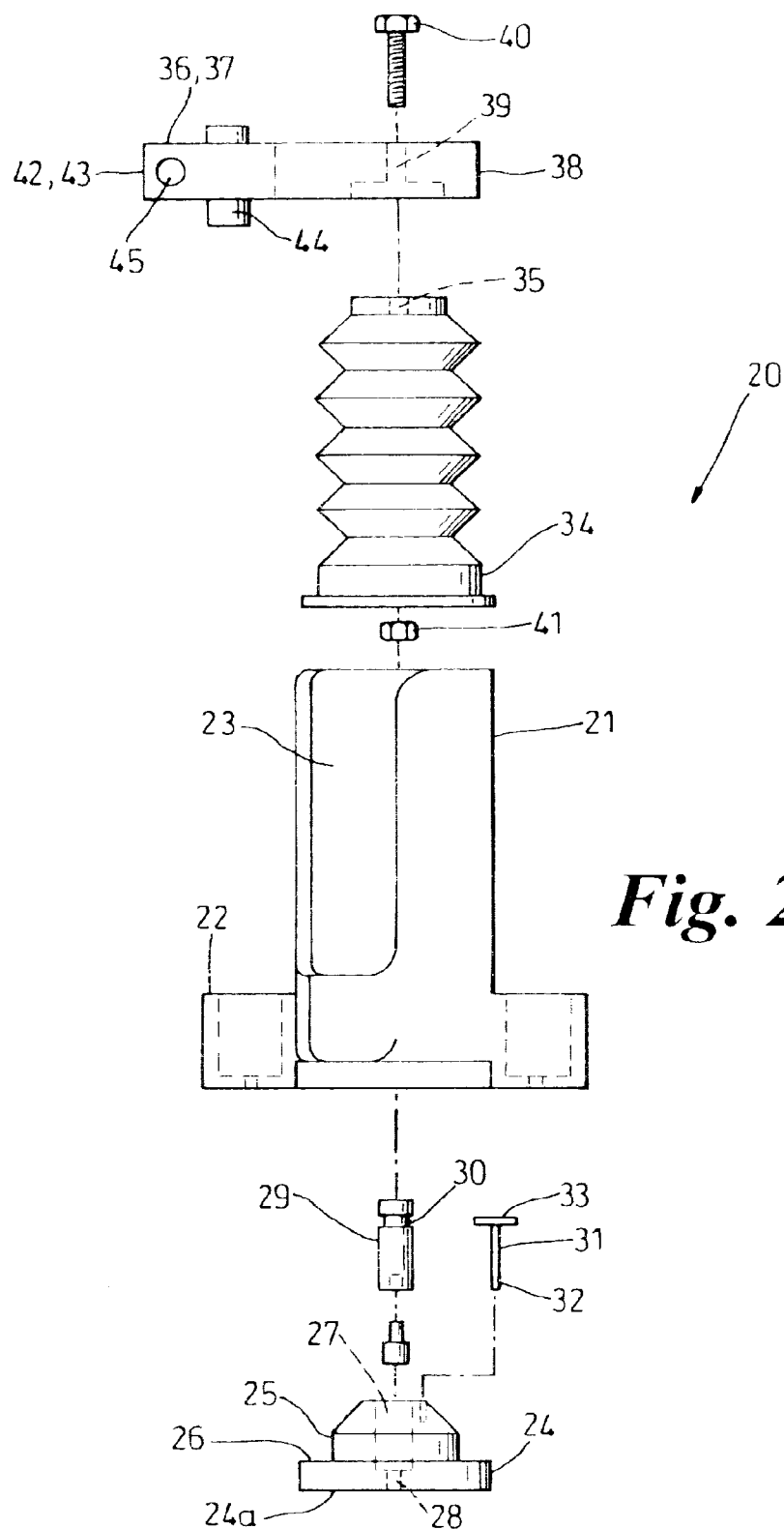


Fig. 2

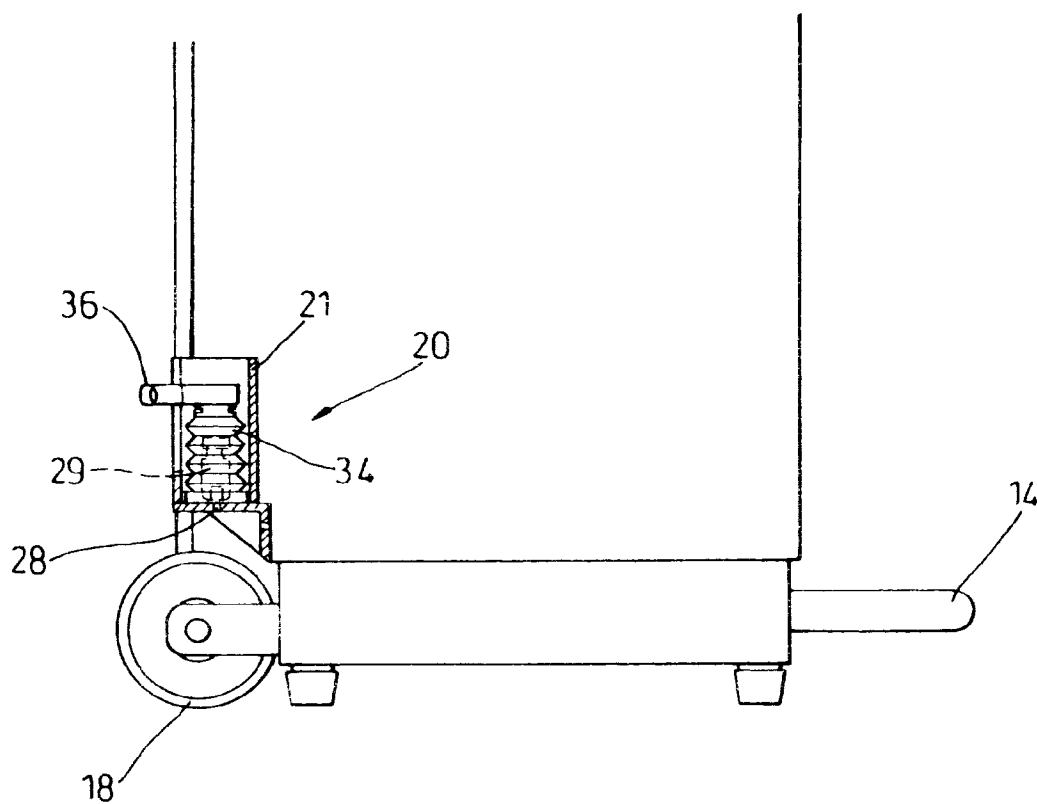


Fig. 3

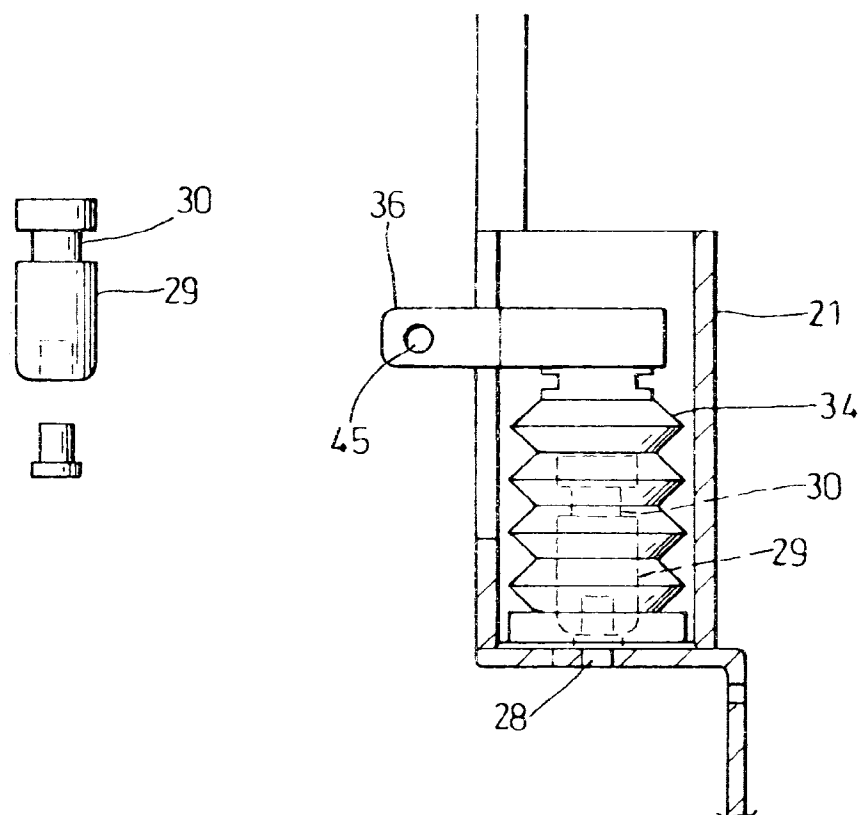


Fig. 3a

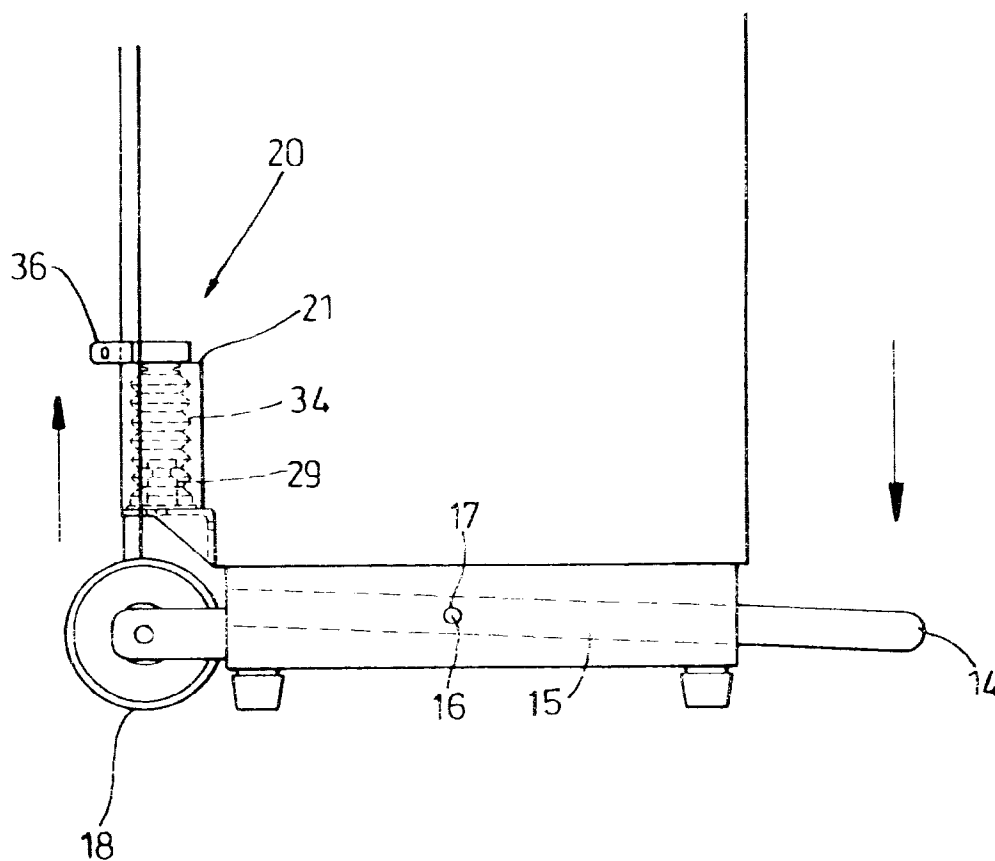


Fig. 4

PUB-NO: EP000906876A2
DOCUMENT-IDENTIFIER: EP 906876 A2
TITLE: Shock absorber for waste container
PUBN-DATE: April 7, 1999

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APPL-NO: EP98307823
APPL-DATE: September 25, 1998

PRIORITY-DATA: GB09720997A (October 4, 1997)

INT-CL (IPC): B65F001/16

EUR-CL (EPC): B65F001/16

ABSTRACT:

CHG DATE=19990905 STATUS=C> A shock absorber (20) adapted for use on a pedal bin (1) in which the lid (7) of the pedal bin (1) is opened and closed by an actuating member, the shock absorber (20) comprising damping means connected to the actuating means to limit the speed of movement of the actuating means when the lid (7) of the bin is opened or closed.



ABSTRACT / ZUSAMMENFASSUNG / ABRÉGÉ

10002273.0

A trash can (20) having a lid (24) can be provided with a pair of dampers (120,122) configured to slow the movement of the lid (24) from its open position toward its closed position. The dampers (120,122) can be provided at opposite ends of a pedal (32) connected to the trash can body (22) at opposite lateral positions relative to a side of the trash can body (22).



(11) **EP 1 094 017 A1**

(12) **EUROPÄISCHE PATENTANMELDUNG**

(43) Veröffentlichungstag:
25.04.2001 Patentblatt 2001/17

(51) Int. Cl.⁷: **B65F 1/16**

(21) Anmeldenummer: **00122509.3**

(22) Anmeldetag: **14.10.2000**

(84) Benannte Vertragsstaaten:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Benannte Erstreckungsstaaten:
AL LT LV MK RO SI

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(30) Priorität: **20.10.1999 DE 19950468**

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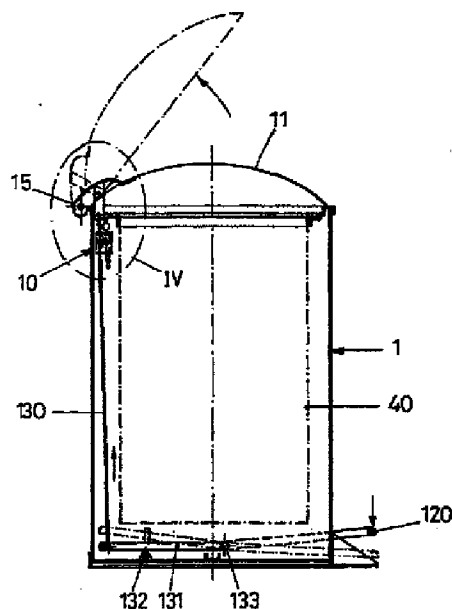
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(54) **Abfallsammler mit einem pedal-betätigbarem Deckel**

(57) Die vorliegende Erfindung betrifft einen Abfallsammler (1) umfassend ein den Abfall aufnehmendes Behältnis (40), einen gelenkig am Abfallsammler befestigten Deckel (11) sowie ein über ein Fußpedal (12) betätigbares Gestänge (13), das am Deckel (11) angreift, mittels dessen der Deckel (11) geöffnet werden kann, wobei eine Dämpfungsvorrichtung (10) vorgesehen ist, mittels derer die Absenkbewegung beim Schließen des Deckels (11) nach Loslassen des Fußpedals (12) gebremst wird. Der Deckel (11) des Abfallsammlers (1) senkt sich daher langsamer ab und schließt sich geräuschlos oder zumindest weitgehend geräuschlos. Das Geräusch beim Schließen des Deckels wird erfindungsgemäß mindestens soweit reduziert, daß es nicht mehr als unangenehm wahrgenommen wird.

Fig. 3



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Beschreibung

[0001] Die vorliegende Erfindung betrifft einen Abfallsammler umfassend ein den Abfall aufnehmendes Behältnis, einen gelenkig am Abfallsammler befestigten Deckel sowie ein über ein Fußpedal betätigbares Gestänge, das am Deckel angreift, mittels dessen der Deckel geöffnet werden kann.

[0002] Aus dem Stand der Technik sind Abfallsammler der vorgenannten Art bekannt. In der Regel werden Abfallsammler dieses Typs als sogenannter Standabfallsammler vorwiegend im Küchenbereich verwendet. Durch Betätigung des Fußpedals läßt sich bei einem solchen Abfallsammler der Deckel öffnen und in dem Moment, wo man das Fußpedal losläßt klappt der Deckel wieder herunter. Dabei fällt der Deckel bei dem herkömmlichen Abfallsammler aufgrund der Schwerkraft mit Schwung herunter, so daß es beim Zuklappen zu einem unerwünschten Geräusch kommt.

[0003] Die Aufgabe der vorliegenden Erfindung besteht darin, einen Abfallsammler der eingangs genannten Art zur Verfügung zu stellen, bei dem dieses Geräusch beim Zuklappen des Deckels weitgehend vermieden wird.

[0004] Die Lösung dieser Aufgabe liefert ein erfindungsgemäßer Abfallsammler der eingangs genannten Gattung mit den kennzeichnenden Merkmalen des Hauptanspruchs. Erfindungsgemäß ist eine Dämpfungsvorrichtung vorgesehen, mittels derer die Absenkbewegung beim Schließen des Deckels nach Loslassen des Fußpedals gebremst wird.

[0005] Der Deckel des Abfallsammlers senkt sich daher langsamer ab und schließt sich geräuschlos oder zumindest weitgehend geräuschlos. Das Geräusch beim Schließen des Deckels wird erfindungsgemäß mindestens soweit reduziert, daß es nicht mehr als unangenehm wahrgenommen wird.

[0006] Eine bevorzugte technische Lösung sieht im Rahmen der vorliegenden Erfindung vor, daß das Gestänge eine senkrechte Stange umfaßt, die über ein Gelenk unterseitig am Deckel des Abfallsammlers angreift. Dabei ist vorzugsweise die Dämpfungsvorrichtung im Bereich dieser senkrechten Stange angeordnet, weiter vorzugsweise etwa in dem oberen Bereich dieser senkrechten Stange.

[0007] Eine Weiterbildung der Erfindung sieht vor, daß diese Dämpfungsvorrichtung wenigstens ein Getriebeelement umfaßt. Über dieses Getriebeelement kann die Absenkbewegung der senkrechten Stange verlangsamt werden. Damit wird der gewünschte Bremsseffekt erzielt und der Deckel des Abfallsammlers wird leise geschlossen.

[0008] Das vorgenannte Getriebeelement, das Teil der Dämpfungsvorrichtung ist, kann beispielsweise eine Zahnstange umfassen. Weiterhin kann man zum Beispiel mit dieser Zahnstange ein Zahnrad koppeln, welches mit der Zahnstange kämmt, wenn sich der Deckel absenkt. Durch eine solche Getriebeanordnung mit

Zahnstange und Zahnrad, die ineinandergreifen, erzielt man aufgrund der Reibung eine Verlangsamung der Absenkbewegung des Deckels. Es sind aber ebensogut andere Getriebeelemente zu diesem Zweck einsetzbar, mittels derer der gleiche Effekt erzielt wird.

[0009] Eine bevorzugte Weiterbildung der Erfindung sieht vor, daß ein Ende eines Getriebeelements, vorzugsweise einer Zahnstange oder dergleichen beim Absenken des Deckels am Abfallsammler festgelegt ist. Weiterhin ist vorzugsweise ein korrespondierendes Getriebeelement, beispielsweise ein Zahnrad oder dergleichen vorgesehen, welches sich mit der senkrechten Stange beim Schließen des Deckels nach unten bewegt, wobei dieses Getriebeelement gegenüber der senkrechten Stange um eine Achse, vorzugsweise um eine horizontale Achse drehbar gelagert ist.

[0010] Eine Weiterbildung der Erfindung sieht vor, daß ein Lagerteil vorgesehen ist, an dem das Getriebeelement drehbar gelagert ist. Vorzugsweise wird dabei das Lagerteil während des überwiegenden Teils der Absenkbewegung der senkrechten Stange von dieser nach unten mitgenommen.

[0011] Eine weitere bevorzugte Weiterbildung der Erfindung sieht vor, daß Führungsteile mit dem Lagerteil verbunden sind. Dabei handelt es sich vorzugsweise um ein Führungsgehäuse. Durch ein solches Führungsgehäuse oder andere gleichwertige Führungsteile kann eine zusätzliche Führung bei der Absenkbewegung gegenüber dem zahnstangenartigen oder ähnlichen festgehaltenen Getriebeelement erzielt werden.

[0012] Eine Weiterbildung der Erfindung sieht vor, daß wenigstens ein Befestigungselement vorhanden ist, um die senkrechte Stange bei ihrer Abwärtsbewegung und/oder ihrer Aufwärtsbewegung an dem Lagerteil festzulegen. Damit ist also gewährleistet, daß bei der Aufwärtsbewegung der senkrechten Stange, mittels derer der Deckel angehoben wird, das bewegliche Getriebeelement ebenfalls sich in eine obere Position bewegt, da dieses Getriebeelement ja an dem Lagerteil zum Beispiel drehbar befestigt ist. Andererseits wird bei der Abwärtsbewegung der senkrechten Stange, die durch das selbsttätige Schließen des Deckels verursacht wird, das Lagerteil und damit das an diesem angebrachte Getriebeelement nach unten bewegt.

[0013] Vorzugsweise ist auch die senkrechte Stange an wenigstens einer Stelle an dem Lagerteil geführt. Eine geführte Bewegung der senkrechten Stange ist vorteilhaft, möglichst so, daß diese keine übermäßigen Lateralbewegungen ausführen kann.

[0014] Die Verbindung zwischen dem Fußpedal und der senkrechten Stange mittels derer das Öffnen des Deckels bewirkt wird, ist vorzugsweise so, daß die senkrechte Stange in ihrem unteren Endbereich gelenkig mit einem Betätigungselement verbunden ist, welches wiederum mit dem Fußpedal in Verbindung steht. Es kann sich beispielsweise um ein stangenförmiges Betätigungselement handeln, von dem sich beispielsweise ein Teil in einer senkrechten Bewegung bewegt,

wenn das Fußpedal heruntergedrückt wird. In diesem Fall ist es vorteilhaft, wenn man für dieses stangenförmige Betätigungselement wiederum eine Führung vorsieht, vorzugsweise befindet sich diese Führung im unteren Bereich des Abfallsammlers.

[0015] Man kann gemäß einer konstruktiven Variante das Fußpedal insgesamt stangenförmig ausbilden und das Fußpedal beispielsweise mit einem gebogenen Teil ausstatten, der den Betätigungsteil bildet, der sich vor dem Abfallsammler befindet. Das stangenförmige Fußpedal kann sich dann in dem Abfallsammler fortsetzen und es kann so gebogen sein, daß es in das stangenförmige Betätigungselement übergeht, mittels dessen dann die senkrechte Stange angehoben wird. Dies bedeutet, man kann eine durchgehende Stange vorsehen, die gleichzeitig das Fußpedal und das stangenförmige Betätigungselement bildet und die am Abfallsammler gelenkig gelagert ist, so daß die Absenkbewegung des Fußpedals unmittelbar eine Aufwärtsbewegung des stangenförmigen Betätigungselements bewirkt.

[0016] Wenn als Getriebeelement, welches Teil der Dämpfungsvorrichtung ist, eine Zahnstange oder dergleichen verwendet wird, dann wird diese festgehalten. Dies kann man im Prinzip dadurch erzielen, daß man beispielsweise im oberen Endbereich der Zahnstange diese mit einer Aufhängung verbindet, die wiederum vorzugsweise am oberen Randbereich des Abfallsammlers festgelegt ist.

[0017] Die in Unteransprüchen genannten Merkmale betreffen bevorzugte Weiterbildungen der erfindungsgemäßen Aufgabenlösung. Weitere Vorteile der Erfindung ergeben sich aus der nachfolgenden Detailbeschreibung.

[0018] Weitere Merkmale und Vorteile der vorliegenden Erfindung werden deutlich anhand der nachfolgenden Beschreibung bevorzugter Ausführungsbeispiele unter Bezugnahme auf die beiliegenden Abbildungen. Darin zeigen

- Fig. 1 eine perspektivische Ansicht eines erfindungsgemäßen Abfallsammlers;
- Fig. 2 eine Draufsicht auf den Abfallsammler von Fig. 1 ohne Deckel;
- Fig. 3 eine Seitenansicht des Abfallsammlers im teilweisen Schnitt;
- Fig. 4a eine vergrößerte Detailansicht eines Teils des Abfallsammlers mit der Dämpfungsvorrichtung;
- Fig. 4b eine Ansicht der Dämpfungsvorrichtung in Richtung des Pfeils IVb von Fig. 4a gesehen;
- Fig. 5 eine Ansicht eines zusätzlichen Dämp-

fungselements für die senkrechte Stange im unteren Endbereich;

Fig. 6 eine Ansicht einer Versteifungsvorrichtung für das Behältnis des Abfallsammlers;

Fig. 7 eine vergrößerte Detailansicht eines Teils der Dämpfungsvorrichtung.

[0019] Zunächst wird auf Fig. 1 Bezug genommen. Die Darstellung zeigt schematisch vereinfacht einen erfindungsgemäßen Abfallsammler, der insgesamt mit dem Bezugszeichen 1 bezeichnet ist. Dieser Abfallsammler enthält ein inneres Behältnis, welches den Abfall aufnimmt und welches über einen Griff verfügt und herausnehmbar ist. Dieses innere Behältnis ist in der Draufsicht gemäß Fig. 2 herausgenommen, so daß man den Mechanismus für die Dämpfungsvorrichtung 10 und die Betätigung des Deckels 11 des Abfallsammlers 1 in Fig. 2 besser erkennen kann. Der Deckel 11 wird mittels des in Fig. 1 sichtbaren Fußpedals 12 angehoben, indem man dieses herunterdrückt. Nach dem Loslassen des Fußpedals 12 fällt der Deckel 11 bei einem herkömmlichen Abfallsammler relativ rasch herunter, so daß es ein vergleichsweise lautes Schließgeräusch gibt. Um dies zu vermeiden, ist die erfindungsgemäße Dämpfungsvorrichtung 10 vorgesehen, die in Funktion tritt, nachdem man das Fußpedal 12 losgelassen hat. Durch diese Dämpfungsvorrichtung 10 wird die Absenkbewegung des Deckels 11 beim Schließen gebremst. Der Deckel 11 ist wie man aus Fig. 1 erkennt über ein Gelenk 15 an dem Abfallsammler 1 befestigt.

[0020] Es wird nun auf Fig. 2 Bezug genommen und anhand dieser die Funktion des Fußpedals 12 und des mit diesem verbundenen Gestänges 13 näher erläutert. Das Fußpedal 12 ist im Prinzip Teil eines Gestänges, das einen gebogenen Teil 120 vor dem Abfallsammler mit Abstand von dem Behältnis umfaßt, der als Fußpedal 12 dient und zum Öffnen des Deckels 11 mit dem Fuß nach unten gedrückt wird. An der in der Zeichnung gemäß Fig. 2 rechten Seite des Abfallsammlers ist das Gestänge gelenkig im Bereich der Wandung des Abfallsammlers gelagert. An der in Fig. 2 linken Seite setzt sich das Gestänge in das Innere des Abfallsammlers fort, wobei das Gestänge 13 zunächst horizontal verläuft und zwar in radialer Richtung und dann etwa im rechten Winkel abgewinkelt ist und in Richtung auf das hintere Ende des Abfallsammlers in dessen Innerem verläuft. Dieser stangenförmige horizontale Teil des Betätigungselements ist in Fig. 2 mit 131 bezeichnet und ist im hinteren Ende in einer Führung 132 geführt. Wenn man mit dem Fuß den als Fußpedal dienenden gebogenen Teil 120 herunterdrückt, dann wird das hintere Ende des stangenförmigen Betätigungselements 131 angehoben, da die Schwenkachse des stangenförmigen Betätigungselements etwa mit einer Achse durch die Mitte des Abfallsammlers in

Querrichtung in Fig. 2 zusammenfällt. Das stangenförmige Betätigungselement mit dem geführten Teil 131 und dem Teil 120, der als Fußpedal dient geht also durch und besteht hier aus einem Stück. Wird das hintere Ende des stangenförmigen Betätigungselements 131 angehoben, dann führt dies zu einem Anheben einer senkrechten Stange 130, die man in Fig. 4a erkennen kann und mittels derer der Deckel 11 angehoben wird.

[0021] Die senkrechte Stange 130 ist an ihrem unteren Ende gelenkig verbunden mit dem horizontalen stangenförmigen Betätigungselement 131 wie man in Fig. 3 gut erkennen kann. In Fig. 3 ist auch der herausnehmbare Innenbehälter 40 durch strichpunktete Linien angedeutet. Man erkennt außerdem in Fig. 3 die Dämpfungsvorrichtung 10, die sich im hinteren oberen Teil des Abfallsammlers befindet und die Absenkbewegung des Deckels 11 bremst. In Fig. 3 ist außerdem die quer durch den Abfallsammler verlaufende Achse des stangenförmigen Betätigungselements erkennbar, die mit dem radialen Teil 133 (siehe Fig. 2) zusammenfällt.

[0022] Die erfindungsgemäße Dämpfungsvorrichtung 10 wird nun nachfolgend unter Bezugnahme auf die Fig. 4a und 4b im Detail näher erläutert. Das Gestänge, welches mittels des Fußpedals 12 bedient wird, umfaßt eine senkrechte Stange 130, die über das Gelenk 16 unterseitig am Deckel 11 des Abfallsammlers angreift. Dies bedeutet, wenn mit dem Fuß das Fußpedal 12 heruntergedrückt wird, dann wird der Deckel 11 angehoben, so wie dies in Fig. 4a dargestellt ist. Wenn dann das Fußpedal 12 losgelassen wird, klappt der Deckel 11 nicht rasch herunter, sondern die Dämpfungsvorrichtung 10 verhindert dies. Dazu umfaßt die Dämpfungsvorrichtung eine Zahnstange 102, deren oberes Ende wie man aus der Zeichnung erkennen kann am Abfallsammler festgelegt ist. Weiterhin ist ein Zahnrad 103 vorhanden, welches sich beim Schließen des Deckels 11 einerseits mit der senkrechten Stange 130 nach unten bewegt, welches dabei jedoch andererseits mit der Zahnstange 102 in Eingriff steht und dadurch die Absenkbewegung verlangsamt. Das Zahnrad 103 ist dabei an dem Lagerteil 104 drehbar gelagert. Die senkrechte Stange 130 ist wiederum an dem Lagerteil 104 geführt und zwar wie man sieht an zwei Stellen. Dabei ist die senkrechte Stange 130 durch eine Bohrung im unteren Teil des Lagerteils 104 hindurchgeführt und außerdem in einem Schlitz im oberen Teil des Lagerteils geführt, wie man aus Fig. 4b erkennt. Mit dem Lagerteil 104 verbunden ist ein Führungsgehäuse 105, welches sich bei dem Absenken der Stange 130 mit dem Lagerteil 104 und mit dem Zahnrad 103 gegenüber der Zahnstange 102 nach unten bewegt. Dadurch bewirkt das Führungsgehäuse 105 eine Führung gegenüber der am Abfallsammler festgelegten Zahnstange 102.

[0023] Um zu gewährleisten, daß bei der Absenkbewegung der Stange 130, wenn der Deckel 11 in die geschlossene Stellung zurückfällt, das Lagerteil 104

mitgenommen wird, ist das Befestigungselement 106 vorgesehen, das beim Absenken des Deckels 11 zunächst einen kurzen Weg mit der senkrechten Stange 130 zurücklegt und dann an dem Lagerteil 104 anschlägt, so daß dieses mit nach unten genommen wird. Dadurch wird das Zahnrad 103, das ja am Lagerteil 104 drehbar gelagert ist, mit nach unten bewegt. Durch den Eingriff des Zahnrads 103 gegenüber der Zahnstange 102 wird die Bewegung des Lagerteils 104 und damit die Bewegung der senkrechten Stange 130 und diejenige des Deckels 11 verlangsamt. Beim Absenken des Deckels 11 wirkt ja nur dessen Eigengewicht, dem die durch die Getriebeelemente Zahnstange 102/Zahnrad 103 erzeugte Reibungskraft entgegengesetzt wird.

[0024] Durch ein entsprechendes Befestigungselement 107, zum Beispiel einen auf der senkrechten Stange 130 festgeklemmten Ring, Federring oder dergleichen, der sich unterhalb des Lagerteils 104 befindet, wird erreicht, daß beim Anheben der senkrechten Stange 130 das Lagerteil 104 mit dieser nach oben bewegt wird. Die Festlegung des oberen Endes der Zahnstange 102 kann beispielsweise über die in den Fig. 4a und 4b erkennbare Aufhängung 108 vorgenommen werden, die am oberen Randbereich des Abfallsammlers in dessen Innerem in der Nähe des Gelenks 16 für die gelenkige Anbringung des Deckels 11 am Abfallsammler befestigt ist. Die gesamte Dämpfungsvorrichtung 10 mit den Getriebeelementen 102, 103, dem Lagerteil 104 und der senkrechten Stange 130 ist in der Regel so in dem Abfallsammler untergebracht, daß sie in der Regel von dem herausnehmbaren inneren Behälter 40, welches den Abfall aufnimmt, verdeckt ist. Um bei eingesetztem inneren Behälter 40 die Verbindung zwischen der senkrechten Stange 130 und dem Deckel 11 zu schaffen, genügt es wenn sich im Randbereich des äußeren Gehäuses des Abfallsammlers eine Aussparung oder Öffnung befindet, durch die das obere Ende der senkrechten Stange beim Betätigen des Fußpedals 12 hindurchgreift. Dort ist das obere Ende der senkrechten Stange 130 gelenkig am Deckel 11 gelagert wie man aus Fig. 4a erkennt.

[0025] Nachfolgend wird auf Fig. 5 Bezug genommen. Die Darstellung zeigt eine Detailansicht im unteren Endbereich der senkrechten Stange 130, mittels derer der Deckel 11 angehoben wird. Wie man sieht ist hier ein zusätzliches Dämpfungselement 140 vorgesehen, das vorzugsweise eine formgebogene Blattfeder ist, die im Fußteil der Abfallsammlers befestigt werden kann. Diese als zusätzliches Dämpfungselement 140 dienende Blattfeder ist unterhalb des stangenförmigen Betätigungselements 131 im Bodenbereich des Abfallsammlers befestigt. Das stangenförmige Betätigungselement 131 ist wiederum, wie bereits ausgeführt wurde, mit dem unteren Ende der senkrechten Stange 130 verbunden. Bei angehobenem stangenförmigen Betätigungselement 131 befindet sich die Blattfeder 140 in einer entspannten oberen Position. Wenn dann

die Bedienungsperson das Fußpedal losläßt, senkt sich die senkrechte Stange 130 und damit das stangenförmige Betätigungselement 131 ab und drückt dabei auf das freie Ende der Blattfeder 140, die sich allmählich spannt. Da der schwerkraftbedingten Absenkbewegung des stangenförmigen Betätigungselements 131 die Federkraft der sich allmählich spannenden Blattfeder 140 entgegengesetzt wird, wirkt dies wie ein zusätzliches Dämpfungselement welches die Absenkbewegung des Deckels 11 abbremst, so daß sich der Deckel sehr leise schließt. Nachfolgend wird auf Fig. 6 Bezug genommen. Der erfindungsgemäße Abfallsammler umfaßt ein äußeres Behältnis, welches wie man im Prinzip auch aus den Fig. 1 und 2 erkennt aus vorzugsweise elliptisch gebogenen Seitenwandblechen 160 besteht, die sich gegenüberliegen und gemeinsam eine Ellipsenform beziehungsweise Linsenform ergeben. Das äußere Behältnis des Abfallsammlers 1 umfaßt weiterhin im oberen Bereich einen Kunststoffring 161, an dem die beiden gebogenen Seitenwandbleche 160 befestigt werden. Dieser Kunststoffring 161 ist in Fig. 6 erkennbar. Man sieht diesen Ring in Fig. 6 von der Unterseite her und erkennt, daß der Ring 161 eine spezielle Verrippung aufweist, die derjenigen eines Fachwerks ähnlich ist. Diese fachwerkartige Verrippung umfaßt Rippen 162, die sich in etwa in radialer Richtung erstrecken, Rippen 163, die sich in Umfangsrichtung etwa parallel zu den elliptisch gebogenen Seitenwandblechen erstrecken sowie Zwischenrippen 164, die in etwa diagonal zwischen zwei benachbarten radialen Rippen 162 verlaufen.

[0026] Diese Verrippung hat die Aufgabe, dem Seitenwandblechdruck entgegenzuwirken. Die Seitenwandbleche 160 werden im planen Zustand an den Ring 161 angelehnt und erhalten dann bei der Fertigmontage durch Biegung die gewölbte Ellipsenform. Aufgrund dieses Biegevorgangs, der im elastischen Bereich stattfindet, üben die Seitenwandbleche 160 einen ständigen Federdruck auf den Ring 161 aus. Die Verrippung sorgt dafür, daß der Ring 161, der in der Regel aus Kunststoff ist, diesem Druck standhält. Die einzelnen Rippen 162, 163, 164 sind dabei fachwerkähnlich so angeordnet, daß sie sich gegenseitig aussteifen, wobei die Stirnseite der diagonalen Rippe 164 jeweils an der Breitseite von zwei radialen Rippen 162 ansetzt.

[0027] In den Schnittbereichen der Rippen 162, 164 können gut Auswerfer angebracht werden, so daß sich das relativ komplexe Formteil des Rings 161 gut aus der Form ausstoßen läßt. Die Hauptwirkrichtung der Rippen wird vorzugsweise so gewählt, daß dem Gegenruck der gebogenen Seitenwandbleche 160 optimal entgegengewirkt wird. Jede zweite Rippe kann eine sogenannte Zwischenrippe sein, die nicht den vollen Querschnitt des Rippenbereichs überbrücken muß, wodurch Material eingespart werden kann.

[0028] Nachfolgend wird auf Fig. 7 Bezug genommen. Die Darstellung zeigt noch einmal für sich einen

Teil der Dämpfungsvorrichtung 10. Man kann eine solche Dämpfungsvorrichtung 10 auch als Lineardämpfer bezeichnen. Man erkennt aus Fig. 7, daß das Zahnrad 103 in einem Gehäuse 166 gelagert ist, in dem man eine relativ zähflüssige Flüssigkeit unterbringen kann, beispielsweise Silikonöl, um die Drehbewegung des Zahnrads 103 gegenüber der Zahnstange 102 beim Absenken des Deckels 11 zu verlangsamen. Durch die Viskosität dieser Lagerflüssigkeit wird also die Reibungskraft der Getriebeelemente 102, 103 der Dämpfungsvorrichtung 10 erhöht.

Patentansprüche

1. Abfallsammler umfassend ein den Abfall aufnehmendes Behältnis,

einen gelenkig am Abfallsammler befestigten Deckel sowie ein über ein Fußpedal betätigbares Gestänge, das am Deckel angreift, mittels dessen der Deckel geöffnet werden kann

dadurch gekennzeichnet, daß eine Dämpfungsvorrichtung (10) vorgesehen ist, mittels derer die Absenkbewegung beim Schließen des Deckels (11) nach Loslassen des Fußpedals (12) gebremst wird.
2. Abfallsammler nach Anspruch 1, dadurch gekennzeichnet, daß das Gestänge (13) eine senkrechte Stange (130) umfaßt, die über ein Gelenk (16) unterseitig am Deckel (11) des Abfallsammlers angreift und die Dämpfungsvorrichtung (10) im Bereich dieser senkrechten Stange (130), vorzugsweise etwa in deren oberem Bereich angeordnet ist.
3. Abfallsammler nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Dämpfungsvorrichtung (10) wenigstens ein Getriebeelement (101) umfaßt, welches die Absenkbewegung der senkrechten Stange (130) verlangsamt.
4. Abfallsammler nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß das Getriebeelement (101) eine Zahnstange (102) und ein mit dieser kämmendes Zahnrad (103) umfaßt.
5. Abfallsammler nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß ein Ende eines Getriebeelements, vorzugsweise einer Zahnstange (102) beim Absenken des Deckels (11) am Abfallsammler festgelegt ist und ein korrespondierendes Getriebeelement, vorzugsweise ein Zahnrad (103) sich mit der senkrechten Stange (130) beim Schließen des Deckels (11) nach unten bewegt, wobei das Getriebeelement (103) gegenüber der senkrechten Stange (130) um eine Achse, vorzugsweise um eine horizontale Achse drehbar gelagert ist.

6. Abfallsammler nach einem der Ansprüche 1 bis 5, dadurch gekennzeichnet, daß ein Lagerteil (104) vorgesehen ist, an dem das Getriebeelement (103) drehbar gelagert ist, wobei das Lagerteil (104) während des überwiegenden Teils der Absenkbewegung der senkrechten Stange (130) von dieser nach unten mitgenommen wird. 5
7. Abfallsammler nach einem der Ansprüche 1 bis 6, dadurch gekennzeichnet, daß Führungsteile, vorzugsweise ein Führungsgehäuse (105) mit dem Lagerteil verbunden sind durch die eine zusätzliche Führung bei der Absenkbewegung gegenüber dem Getriebeelement (102) gegeben ist. 10
8. Abfallsammler nach einem der Ansprüche 1 bis 7, dadurch gekennzeichnet, daß wenigstens ein Befestigungselement (106, 107) vorgesehen ist, um die senkrechte Stange (130) bei ihrer Abwärtsbewegung und/oder ihrer Aufwärtsbewegung an dem Lagerteil (104) festzulegen. 20
9. Abfallsammler nach einem der Ansprüche 1 bis 8, dadurch gekennzeichnet, daß die senkrechte Stange (130) an wenigstens einer Stelle an dem Lagerteil (104) geführt ist. 25
10. Abfallsammler nach einem der Ansprüche 1 bis 9, dadurch gekennzeichnet, daß die senkrechte Stange (130) vorzugsweise in ihrem unteren Endbereich gelenkig mit einem Betätigungselement (131) verbunden ist, welches mit dem Fußpedal (12) in Verbindung steht. 30
11. Abfallsammler nach einem der Ansprüche 1 bis 10, dadurch gekennzeichnet, daß das Betätigungselement (131) stangenförmig ist und für dieses eine Führung (132) im unteren Bereich des Abfallsammlers vorgesehen ist. 35
12. Abfallsammler nach einem der Ansprüche 1 bis 11, dadurch gekennzeichnet, daß das Fußpedal (12) insgesamt etwa stangenförmig ausgebildet ist mit einem gebogenen Teil (120) außerhalb des Abfallsammlers und dieser gebogene Teil einstückig in das stangenförmige Betätigungselement (131) übergeht. 40
13. Abfallsammler nach einem der Ansprüche 1 bis 12, dadurch gekennzeichnet, daß die Zahnstange (102) in ihrem oberen Endbereich an einer Aufhängung (108) festgelegt ist, die sich an dem oberen Randbereich des Abfallsammlers befindet. 50
14. Abfallsammler nach einem der Ansprüche 1 bis 13, dadurch gekennzeichnet, daß das Getriebeelement (103) in einem Gehäuse (166) in einer relativ viskosen Flüssigkeit gelagert ist. 55
15. Abfallsammler nach einem der Ansprüche 1 bis 14, dadurch gekennzeichnet, daß ein zusätzliches Dämpfungselement (140) vorgesehen ist, welches unterhalb der senkrechten Stange (130) beziehungsweise unterhalb des Betätigungselements (131) angeordnet ist.
16. Abfallsammler nach einem der Ansprüche 1 bis 15, dadurch gekennzeichnet, daß das zusätzliche Dämpfungselement (140) ein im Bodenbereich des Abfallsammlers befestigtes Federelement, vorzugsweise eine Blattfeder ist, welches bei angehobenem Deckel (11) des Abfallsammlers entspannt ist.
17. Abfallsammler nach einem der Ansprüche 1 bis 16, dadurch gekennzeichnet, daß dieser Seitenwandelemente aus gebogenen Blechen (160) umfaßt, die durch einen oberen Kunststoffring (161) gehalten werden.
18. Abfallsammler nach einem der Ansprüche 1 bis 17, dadurch gekennzeichnet, daß der obere Kunststoffring (161) durch nach Art eines Fachwerks angeordnete Rippen (162, 163, 164) ausgesteift ist.
19. Abfallsammler nach einem der Ansprüche 1 bis 18, dadurch gekennzeichnet, daß dieser in der Draufsicht gesehen eine etwa linsenförmige oder annähernd elliptische Umrißform aufweist.

Fig. 1

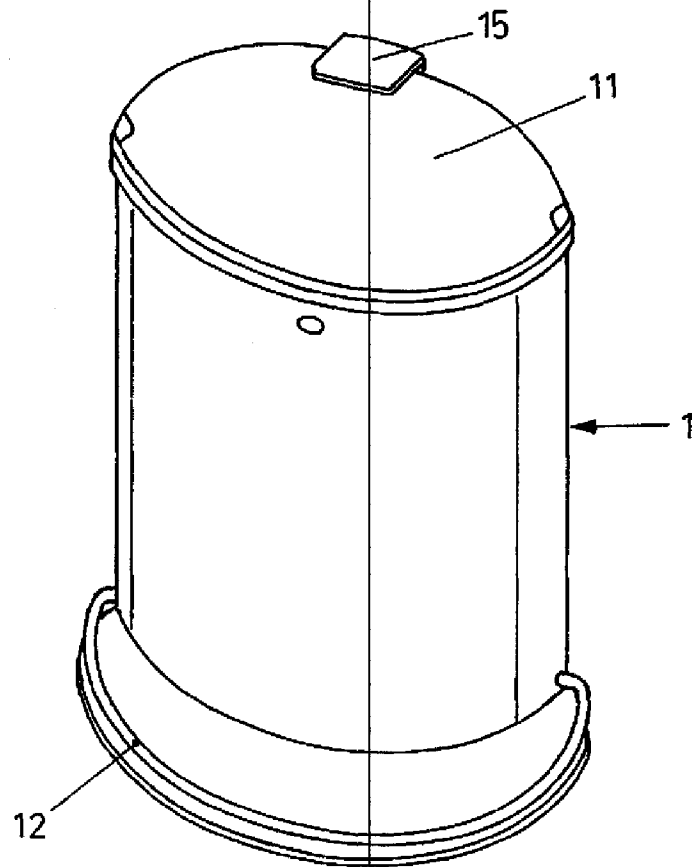


Fig. 3

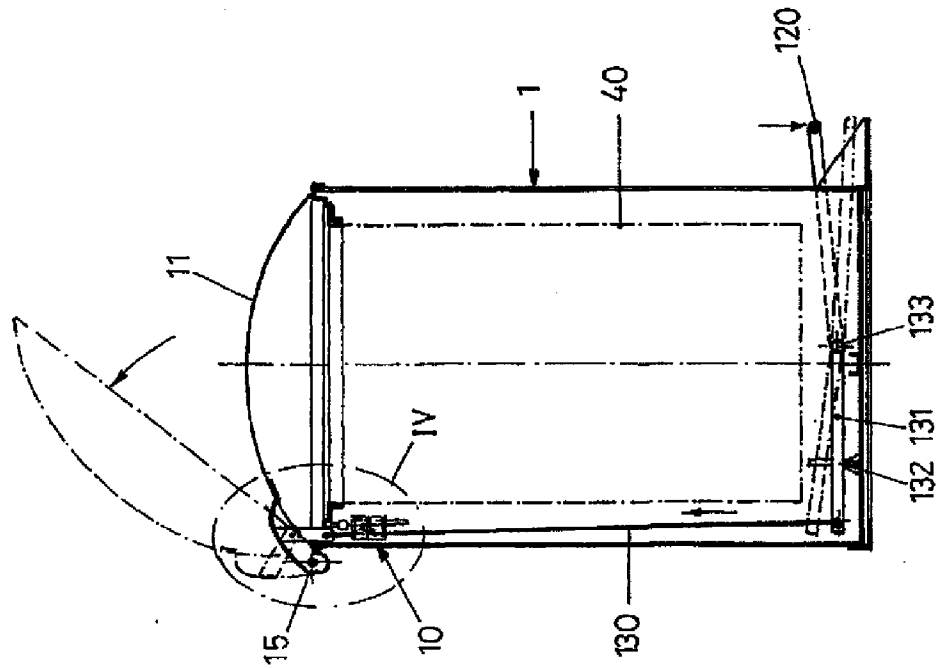


Fig. 2

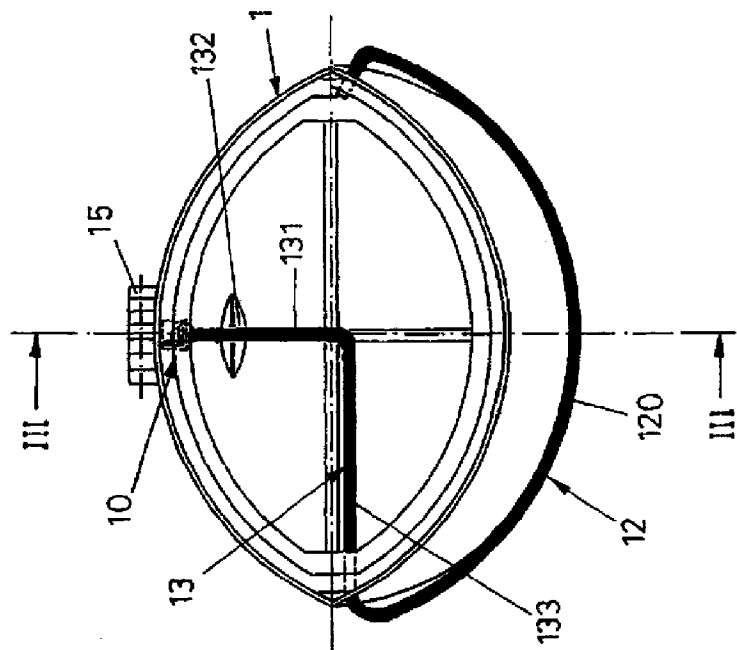


Fig. 4a

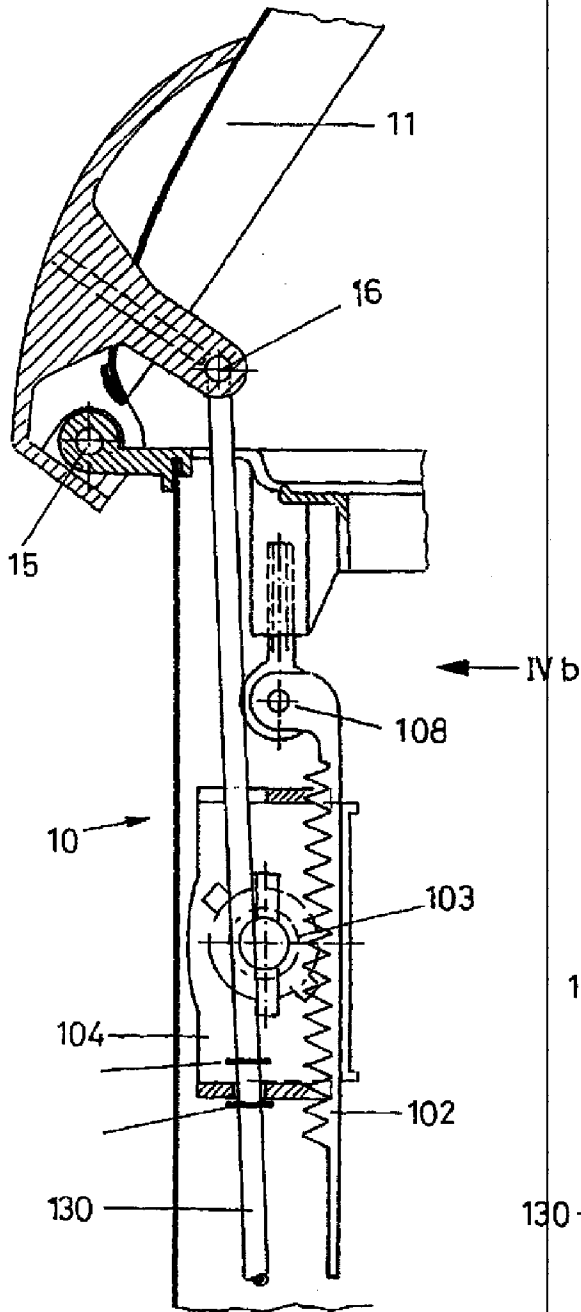


Fig. 4b

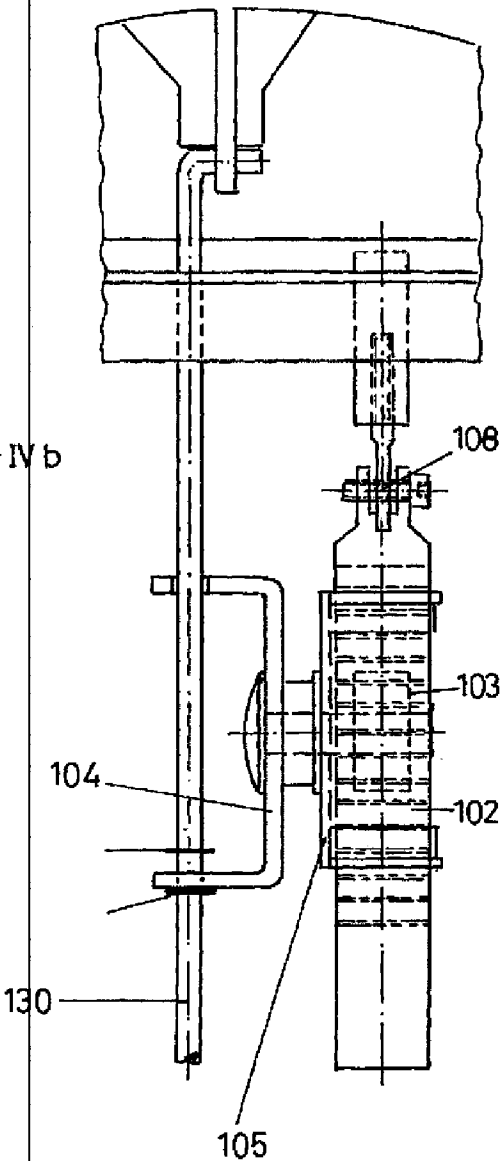


Fig. 5

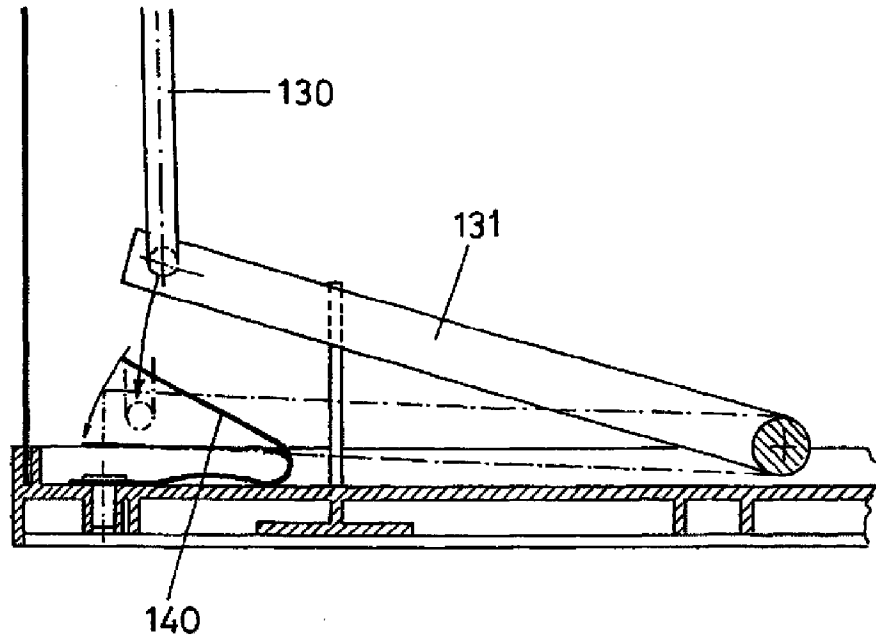


Fig. 7

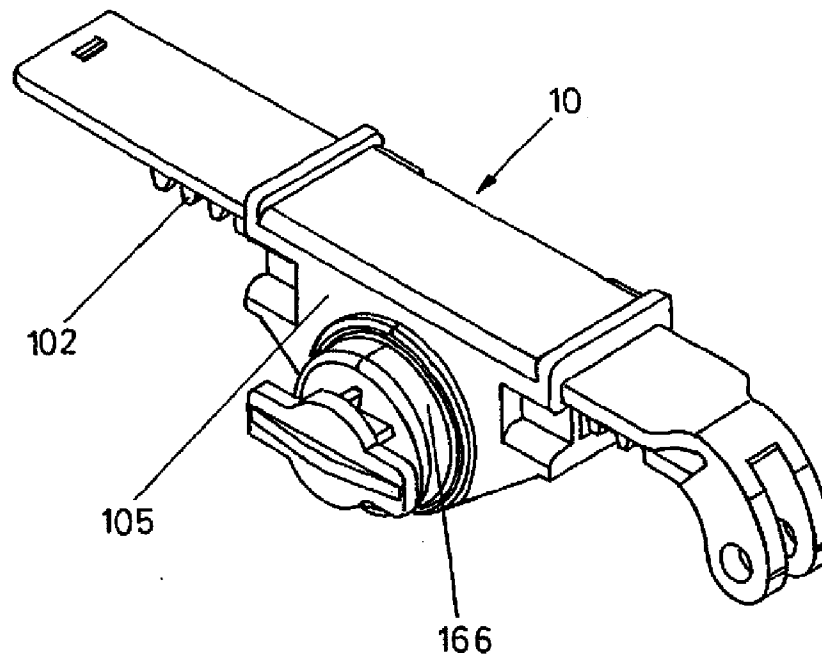
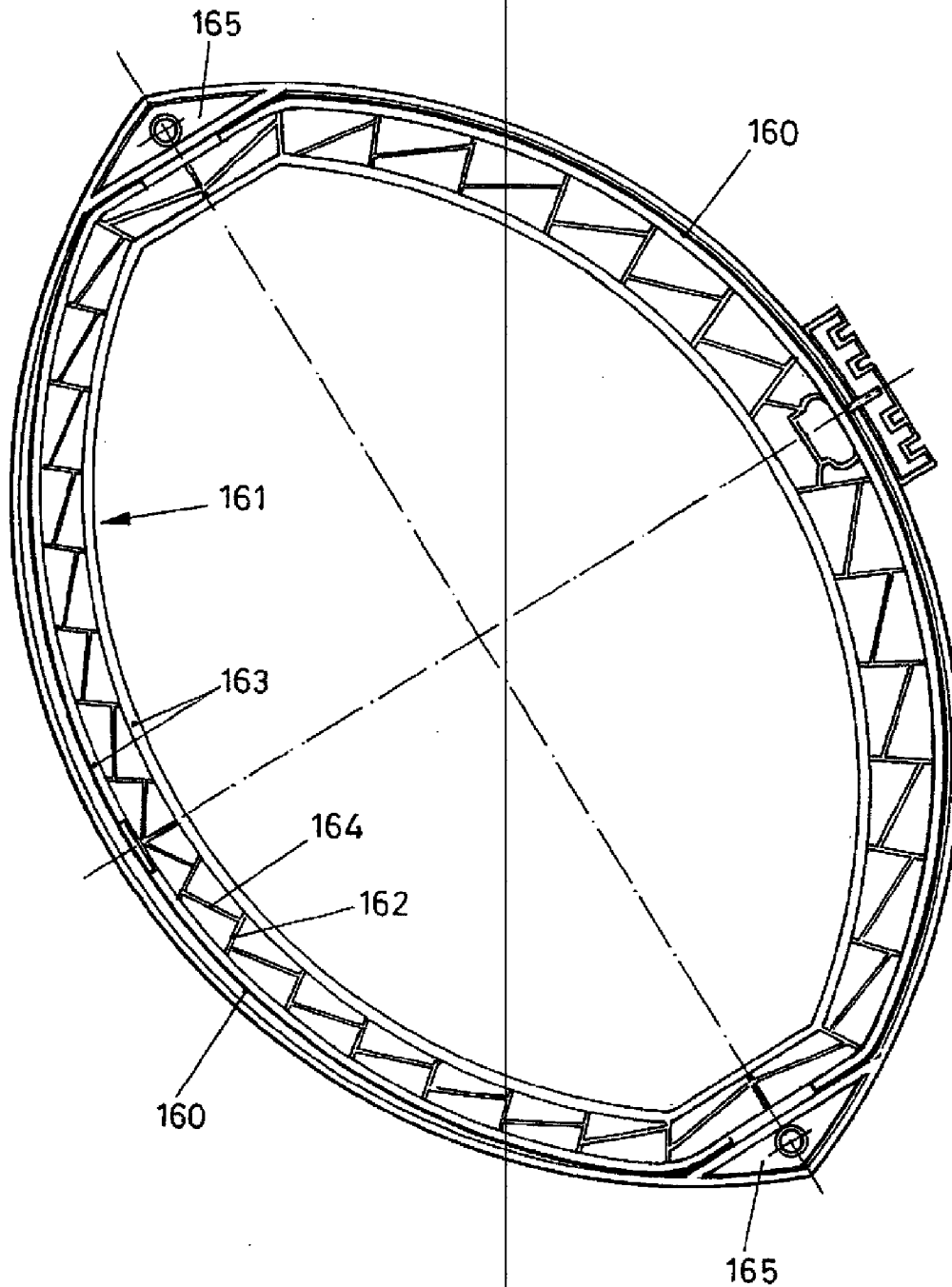


Fig. 6





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EUROPÄISCHER RECHERCHENBERICHT

Nummer der Anmeldung
EP 00 12 2509

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Kategorie	Kennzeichnung des Dokuments mit Angabe, soweit erforderlich, der maßgeblichen Teile	Betrifft Anspruch	KLASSIFIKATION DER ANMELDUNG (Int.Cl.7)
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Forschername DEN HAAG		Abschlußdatum der Recherche 18. Januar 2001	
		Prüfer Smolders, R	
KATEGORIE DER GENANNTEN DOKUMENTE			
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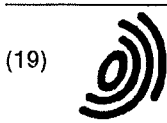
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Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

18-01-2001

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Für nähere Einzelheiten zu diesem Anhang : siehe Amtsblatt des Europäischen Patentamts, Nr.12/82



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European Patent Office
Office européen des brevets



(11) **EP 1 447 342 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.08.2004 Bulletin 2004/34

(51) Int Cl.7: **B65D 43/16, B65D 25/28**

(21) Application number: **04001832.7**

(22) Date of filing: **28.01.2004**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR**
Designated Extension States:
AL LT LV MK

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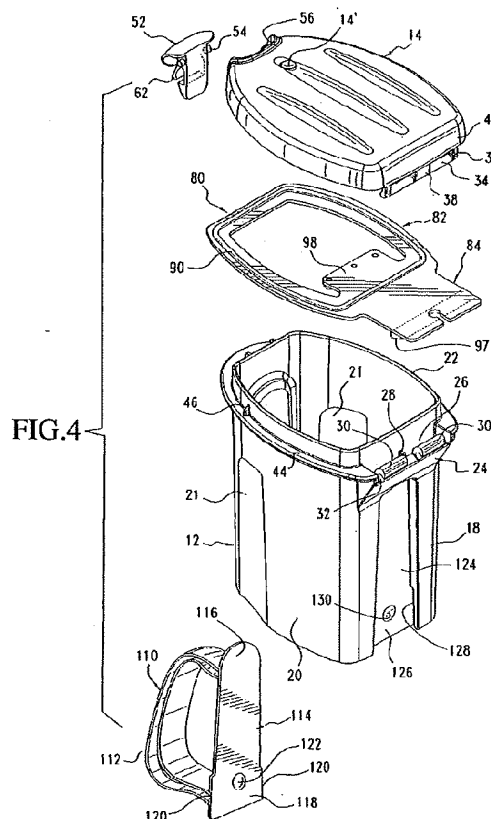
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(30) Priority: **13.02.2003 US 365902**

(71) Applicant: **Dart Industries Inc.**
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(54) **Container with one-piece seal and lid spring**

(57) A container including a container body (12) with a pivotally mounted top lid (14) utilizing a single generally planar elastomeric member (80) forming a seal section (90) releasably mounted to the undersurface of the lid and engageable with the rim (22) of the container body (12) peripherally thereabout, and a spring section (84) integral with the seal section (90) and extending from the lid (14) into a receiving chamber (26) on the container body (12) adjacent the pivotal mounting of the lid (14), the spring section (84) being resiliently compressed during the positioning thereof to provide a constant opening biasing force on the lid (14) relative to the container body (12). An alternately positionable handle (110) is removably mounted, at the option of the user, to either the front wall (16) or the rear wall (18) of the container body (12).



Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to containers of the type including a container body with an open mouth selectively closed by a spring biased pivotally mounted lid, and more particularly to such containers wherein a seal is provided between the lid and the rim defining the mouth of the container body.

Such seals are normally of an appropriate compressible elastomeric material and, inherently due to the elastomeric nature of the seal, tend to slightly move the lid toward an open position upon release of the normally provided lid latch. One example of such a seal will be noted in U.S. Patent No. 5,788,064 to Sacherer et al which refers to the partial opening of the lid to be followed by a manual opening of the lid to its fully opened position. The prior art also includes many examples of lidded containers wherein the lid, upon release of an appropriate latch, automatically fully or substantially fully moves to an open position by spring action. Such an opening force has normally heretofore relied upon metal springs of various types, including leaf or compression springs, torsion springs, and the like.

[0002] As a variation and improvement on conventional metal springs, it has, recently, been proposed to use elastically deformable springs such as rubber. Two examples of such usage will be found in U.S. Patent No. 5,344,037 to Favre, and U.S. Patent No. 6,206,221 B1 to Bando et al.

[0003] Another feature known in the prior art which has a bearing on the present invention is the expedient of providing the container body with a removable handle which may be accommodated in one or more positions about the container body. Note as an example U.S. Patent No. 6,037,872 to Dunnum. Also note the detachable handle per se disclosed in U.S. Patent No. 5,170,533 to Berry.

SUMMARY OF THE INVENTION

[0004] It is the principal intention of the present invention to advance the art in a significant manner, particularly with regard to those features referred to above as broadly known in the prior art. In doing so, it is intended that containers in accord with the present invention will enhance the seal effect commonly sought, provide a practical and highly efficient spring action to the lid, and provide a reversible handle particularly adopted to the container both with regard to the ease of handling the container and to enable manipulation of the container lid in accord with the desires of the particular user. All of goals of the invention are achieved while at the same time providing for particular economies in manufacture and assembly, specifically with regard to the seal and spring which are uniquely although rather simply formed as a single substantially planar member or panel easily

accommodated to both the lid and the container body, and, in conjunction therewith, easily replaceable by the end user.

[0005] With more specific reference to the container of the invention, the container body, in defining an interior receiving chamber, includes a rear wall or wall portion and an opposed front wall or front wall portion. A complimentary lid engages over the upwardly opening mouth of the container body and is pivotally joined to the rear wall by appropriate hinge means. Appropriate latch means on the container body front wall and cooperating front end of the lid act to selectively retain the lid in the closed position thereof.

[0006] Substantially duplicate vertical slots are defined in the front and rear walls of the container body for the selective reception of a container handle in accord with the preference of the user of the container. As an example, should the user wish the convenience of releasing the lid latch with the same hand engaging the handle, the handle will mount to the forward wall. Should the user wish to hold the container by one hand and release the latch with the other hand, the handle will mount to the rear wall. Depending upon the nature of the contents of the container, this will also enable the user to conveniently discharge the contents by a pouring thereof from the front of the container.

[0007] A particularly unique aspect of the invention is the utilization of a single sheet or member of elastomeric material, such as for example silicone, in forming both a seal for effectively sealing the container upon a closing of the lid, and a spring which, upon release of the latch, effects an automatic opening of the lid pivotally away from the container. The seal section or seal of the member or panel is configured to conform to and be coextensive with the rim defining the mouth of the container body. The seal will include inner and outer peripheral edges generally parallel to each other. This seal, as illustrated, is of what might be considered an oblong configuration with opposed truncated ends to conform to the similarly configured container body mouth. Were the container of a more conventional cylindrical configuration, the seal or seal section of the elastomeric member would be annular.

[0008] At that portion of the seal conforming to the rear of the container body, the elastomeric member extends rearward of the seal section in the manner of a planar extension and defines the spring or spring section. Extending integral from the inner periphery of the seal in alignment with the spring section of the member is an anchoring tongue of a width approximately that of the spring.

[0009] The elastomeric member mounts to the under-surface or bottom surface of the lid and is retained by a combination of depending ribs and undercut lugs which engage the inner periphery of the seal. The spring extends, upon mounting, laterally from the seal and engages within a spring pocket provided immediately adjacent and inward of the cooperating hinge components

on the rear container body wall and the depending lid skirt. The anchoring tongue is retained in intimate engagement with the bottom surface of the lid by a series of sockets defined in the elastomeric tongue and engaged over a corresponding number of stubs depending from the bottom surface. The elastomeric member or panel is both easily removed and readily mounted by the end user for replacement and cleaning as desired. The lateral positioning of the spring to engage within the spring pocket effects a compression of the spring which results in a resilient biasing tending to return the member to its planar position. This in turn continuously biases the lid to its open position away from the container body mouth. This biasing force is substantially increased in the closed position of the lid wherein maximum compression is achieved. Thus, upon a release of the latch means, the lid will rather rapidly, and in fact with a snapping action, move to its fully opened position and will be automatically retained in the fully open position in that the spring remains under compression, although to a lesser degree than with regard to the fully closed lid. The formation of both the seal and the spring utilizing a single planar elastomeric member or panel has been found to be both practical and economical, and has resulted in a particularly effective seal and spring action with the unique simplicity thereof providing for an interchangeability of both components simultaneously and in a manner easily effected by the ultimate user of the product.

[0010] Other features, objects and advantages of the invention will become apparent to those skilled in the art from the following more detailed description of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Attention is now directed to the drawings wherein like reference numerals refer to like parts throughout the several views and wherein:

FIGURE 1 is a perspective view of the closed container with the handle mounted on the front wall.

FIGURE 1A is a bottom plan view, in reduced scale, of the container.

FIGURE 2 is a perspective view of the closed container with the handle mounted on the rear wall.

FIGURE 3 is a perspective view of the container with the lid fully open.

FIGURE 4 is an exploded perspective view of the major components of the container.

FIGURE 5 is an enlarged vertical cross-section view through the container of FIGURE 2.

FIGURE 6 is an enlarged sectional detail through the container body and open lid at the hinge assembly and with the seal and spring sections mounted in operative position.

FIGURE 7 is an enlarged plan view of the elastomeric member which defines the seal and the spring.

FIGURE 8 is a longitudinal cross-section view through the member taken substantially on a plane passing along line 8-8 in FIGURE 7.

FIGURE 9 is an enlarged cross-section detail through the upper portion of the closed container.

FIGURE 10 is an enlarged cross-section detail taken substantially on a plane passing along line 10-10 in FIGURE 5.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0012] Referring now more specifically to the drawings, the container 10 includes an upright container body 12 and a container lid 14. While not limited thereto, the container body 12 has been illustrated as of a generally oval cross section with flat front and rear walls 16 and 18 which, in conjunction with slightly arcuate opposed side walls 20, terminate in a continuous upper edge or rim 22 defining the open mouth of the body 12. Side walls 20, as best appreciated from Figures 1 and 5, are provided with opposed hand grip depressions 21, which may if desired be molded of transparent or translucent resin to allow the contents of the container to be seen.

[0013] The lid 14 pivotally mounts to the container body 12 by cooperating pivot means or hinge components provided on the body and lid. More specifically, the rear wall 18 of the body 12 includes an integral rearwardly extending abutment or enlargement downwardly spaced although closely adjacent to the upper mouth-defining rim 22. The upper portion of the abutment is rearwardly spaced from the rear surface of the rear wall to define a full width pocket 26 centrally divided by a vertical divider 28 integral with and projecting outward from the rear wall 18. The abutment 24, outward of the pocket 26, includes a pair of outwardly curving hinge knuckles 30, one to each side of the divider 28 and defining restricted access slots 32 for the snap-in reception of a complementary hinge pin 34 integrally formed with depending ears 36 and a central pin stabilizer 38 which in turn integrally depend from a peripheral lid skirt 40. Noting Figure 9 in particular, it will be seen that, in the closed position of the lid, the rear portion of the lid skirt 40 and the engaged hinge components define a compartment or pocket extension 42 forming a continuous vertical chamber with the pocket 26 therebelow.

[0014] The lid 14 and the container body 12 are preferably provided with stacking means comprising a divot, or indentation 14', elongated depressions 14" in lid 14, which in use cooperate with feet 20', three in number, for example, see Figures 1A and 5 on a bottom wall portion 20" of body 12 of another container 10 being stacked thereon.

[0015] The container body 12 includes a peripheral flange 44 at substantially equal height as the hinge knuckles 30 with the flange 44 extending continuously from the rear hinge assembly about the opposed side and front walls of the container body and spaced below

the body rim 22 a distance corresponding to the height of the lid skirt 40 for a seated engagement of the lower edge of the lid skirt 40 thereon in the fully closed and latched position of the lid as shall be described subsequently. Stabilizing and guiding gussets 46 can be provided between the flange 44 and the adjacent body walls sufficiently inward of the outer peripheral edge of the flange 44 as to fully accommodate the lid skirt thereon.

[0016] The maximum open position of the lid 14, as illustrated in Figure 6, is approximately 100° from the container rim whereby an inherent bias to the open position is maintained once the lid is open. The movement of the lid to this open position is limited by an engagement of the pin supports 36 and 38 with an upper edge surface 48 of the rear body abutment 24.

[0017] Retention of the lid 14 in its closed position on the container body 12 is effected by a latch assembly including a retaining slot or keeper 50 in the body flange 44 centrally of the front wall 16, and a spring loaded manually releasable latch 52 integral with the lid 14. The latch 52 is in the form of a push button pivotally mounted, through opposing projecting pins 54, to opposed wall segments 56 integral with the lid skirt 40 and extending slightly laterally inward thereof to align to each side of the keeper opening 50 of the body. In order to accommodate the latch and keeper assembly, it will be noted that the peripheral flange 44 of the body extends forward of the front body wall to a greater distance than the extension of the flange 44 along the side walls. Similarly, the forward portion of the lid and the skirt thereon also extend forward to accommodate the latch assembly forward of the body rim 22.

[0018] The latch 52 includes an elongate depending latch stem 58 generally aligned with the axis of the pivot pins 54 and including a forwardly or outwardly directed lower hook end which, in the closed and latched position of the lid, engages under a rearwardly directed shoulder 60 defined by the undersurface of the forwardly projecting portion of the body flange 44 immediately forward of the keeper opening 50. A pair of guide panels 58' act, together with guiding gussets 46, to position lid 14 to thus minimize deformation of the cover. The latch stem is resiliently biased and retained into this position by an integral spring bar 62 forward of the latch stem and engaged with a transverse abutment 64 forward of the latch stem 58. The spring bar 62 has an inherent degree of flexible resiliency whereby upon an inward push on the button-like forwardly facing exterior of the latch 52, the spring bar will flex and accommodate inward movement of the latch to free the latch stem from hooked engagement with the keeper shoulder 60. In order to accommodate this movement and the flexing of the spring bar 62, a slight space 66 is provided between the spring bar 62 and the outer pressure-receiving shell of the latch 52. It will be noted that the actual movement of the latch 52 will be a swinging or pivotal movement about the pivot pins 54. Re-engagement of the latch 52 is automatically effected upon a closing of the lid 14 with the cam-

ming surface 68 on the lower hook portion of the latch stem 58 riding against the forward edge of the keeper opening 50. Finally, it will be noted that an integral shield 70 depends from the body flange 44 forward of the keeper opening 50 and extends to each side thereof so as to conceal and prevent accidental release of the latch stem hook portion.

[0019] A combined seal and lid-opening spring is provided uniquely utilizing a single or unitary sheet or panel member 80 formed of an appropriate elastomeric material such as silicone. This member 80, noting in particular Figures 7 and 8, is substantially planar and is formed of two sections, a seal or seal section 82 and a spring or spring section 84. The seal 82 is in the nature of a generally flat loop strip conforming to the configuration of the container body rim 22 and including an inner peripheral edge 86 and an outer peripheral edge 88. The seal strip is relatively wider than the body rim 22 and includes, toward the outer periphery 88 thereof, a downwardly offset seal seat 90 which, upon a mounting of the member 80, and a closure of the lid, directly aligns on and with the rim 22 for a compressing of the seal seat 90 by the rim 22 and a positive sealing of the mouth of the container body. The slight depression 92 in the opposed surface of the seal 82, formed by the downward offsetting of the seal seat 90, enhances the flexibility of the seat to ensure a complete and positive sealing action. In addition, the continuous depression 92 about the seal will, upon compression of the seal seat 90, provide for a more positive sealing of the seal to the undersurface of the lid.

[0020] The spring or spring portion 84 of the elastomeric member 80 is a generally coplanar extension of that portion of the seal 82 corresponding to the rear wall of the container body. The spring is narrower than the seal and, at the outer portion thereof, includes a positioning slot 94 extending inwardly from the outer edge 96 centrally between the opposed side edges of the spring 84. The spring 84, inward of the positioning slot 94, preferably has a thickened inner end area, or wedge 97, as best illustrated in Figure 6, which extends transversely of the spring 84, to avoid any tendency for dislodgement of the seal and to provide additional stability in the mounted position as shall be explained subsequently.

[0021] The elastomeric member 80 is completed by an integral mounting or anchoring tongue 98 narrower than the spring 84 and extending from the inner peripheral edge 86 of the seal in alignment with the spring 84. The anchoring tongue 98 extends only a minor distance inward of the inner peripheral edge 86 adjacent the spring. The opposed edges of the tongue 98 are inwardly spaced from edge 86 at the opposed sides thereof. The anchoring tongue 98 also includes a plurality, preferably three, of sockets 100 formed therein and opening to the opposite side of the member 80 from the downwardly offset seal seat 90.

[0022] In order to position the elastomeric member 80

on the lid 14, the bottom surface of the lid is provided with both positioning ribs 102 and retaining lugs 104. Noting Figure 3 in particular, the ribs are provided as elongate segments with the retaining lugs 104 interposed therebetween. As will be recognized, the ribs and lugs are intended to engage the inner peripheral edge 86 of the seal or seal section 82 of the elastomeric member 80. As such, the ribs and lugs are positioned along the opposed sides of the lid with forward most lugs 104' being forwardly or outwardly directed toward the front or latch end of the lid, and with rearmost lugs 104" being directed toward the hinge end of the lid, thus in effect fixing the longitudinal position of the received seal. The remaining lugs are laterally directed toward the corresponding sides of the lid. As seen in the drawings, the lugs 104 are undercut so as to receive and engage over the inner edge 86 of the seal section 82 for a retention of the seal.

[0023] A further positioning rib 106 is provided transversely of the lid parallel to and spaced from the lid hinge assembly and adapted to correspond to the inner edge of the anchoring tongue 98 of the seal section 82. Similarly, a series of anchoring stubs 108 are formed in spaced relation adjacent to the rib 106 and corresponding in number to the anchoring tongue sockets 100 for reception thereof.

[0024] In mounting the combined seal and spring, the seal or seal section 82 is positioned against the bottom surface or undersurface of the lid with the flat strip loop of the seal lying thereagainst in a manner whereby the positioning ribs 102 and undercut anchoring lugs 104 engage and both position and retain the inner peripheral edge 86 of the loop. So positioned, the free edge of the anchoring tongue 98 seats against the transverse positioning rib 106 with the seal to the opposite sides of the anchoring tongue being particularly retained by the anchoring lugs 104". The anchoring tongue is further and firmly anchored to the undersurface of the lid by an engagement of the lid stubs 108 within the formed elastomeric sockets 100 on the anchoring tongue 98. When so mounted, the downwardly offset seal seat 90 is in direct alignment with the container body rim 22 for a sealed seating engagement therewith upon a closure of the lid.

[0025] The mounting of the spring or spring section 84, noting Figure 6, involves a flexing of this spring section, with the lid pivoted fully open for easy access thereto, over the hinge assembly and into the pocket 26 with the positioning slot 94 receiving the divider 28 therein. Such a positioning of the spring requires a resilient compressing, or what might be considered a pre-compressing, of the spring in the open position of the lid 14. It is this pre-compressing which effectively retains the lid in its fully open position. As will be appreciated from the above described mounting of the elastomeric member, the member, while highly effective when mounted for both its intended sealing and spring functions, is easily removed for cleaning or replacement as desired.

[0026] Noting Figure 9 in particular, upon a closing of the lid 14 to its latched position, whereat the container body rim 22 intimately engages with the seal seat 90, the spring 84 folds rather neatly within the chamber 42 defined above the divided pocket 26 and between the lid skirt 40 and the wall of the body immediately below the rim 22. This action effects a further and rather substantial resilient compressing of the spring which in turn provides a substantial biasing force retained only by the latch mechanism. Thus, upon a release of the latch mechanism the lid will, through the action of the heavily compressed spring, rapidly move to its fully open position, and be retained therein by the remaining biasing force of the still compressed spring produced by the initial mounting of the elastomeric member. It will be appreciated that the relationship between the engaged position of the latch and the seal is such as to sufficiently compress the seal against the container body rim as to effect the desired sealing action.

[0027] The positioning slot 94 in the spring, in addition to properly positioning the spring within the container body pocket 26, assists in a positive retention of the spring whereby any tendency for the spring to displace from the pocket is specifically precluded. As noted in Figure 6 in particular, the enlargement or wedge-shaped protuberance 97 which is preferably provided adjacent the inner end of the slot will enhance this retention capability. Incidentally, it will also be noted that the spring section 84 overlies the hinge assembly in both the closed and open position of the container lid, providing in effect a protective shield for the hinge assembly.

[0028] The present invention also provides for an alternate positioning of the container handle 110 so as to accommodate the preferences of the ultimate user. In other words, the handle can mount vertically to the front wall 16 of the container in alignment below the latch assembly whereby the user can both grip the handle and manipulate the latch with a single hand. Alternatively, provision is also made for a mounting of the handle to the rear wall 18 of the container body, in which case, one hand will hold the handle, and the other hand will release the latch mechanism. Such a positioning of the handle will also allow for a convenient discharge of the contents from the front of the container. Both positionings of the handle have specific advantages which are available at the option of the user, the handle itself being readily removed and repositioned. At the same time, when mounted, the handle is firmly and rigidly affixed to the container against any possibility of accidental release therefrom. More specifically, the handle 110, in addition to the handgrip loop 112, includes a rigid flat mounting bar or plate 114 with opposed vertical edges which taper slightly upward from the lower end thereof and which extends slightly above the grip 112 to provide a projecting upper end or vertical extension 116. The lower end portion 118 of the mounting plate 114 is slightly wider than the plate thereabove, providing a pair of narrow laterally projecting edge extensions or wing por-

tions 120. This lower end portion 118 also includes a central rounded knob 122 projecting outward of the plane of the plate 114 to the opposite side thereof from the handgrip 112.

[0029] The front and rear walls of the container body include substantially duplicate vertical slots 124 therein, each slot narrowing upward from the open lower end thereof corresponding to the taper of the handle mounting plate 114. The side edges of the slot 24, at the lower end portion 126 thereof, are undercut or grooved as at 128 to accommodate the laterally projecting wings 120 of the corresponding lower portion 118 of the mounting plate 114. Thus, with the lower portion 118 of the mounting plate positioned immediately below the undercut lower portion 126 of the slot 124, at the open lower end of the slot, the handle can be introduced laterally into the slot and shifted slightly upward to engage the plate side edge extensions 120 within the undercuts or grooves 128 of the mounting slot 124. There is no need to slide the full length of the handle mounting plate 114 the full length of the corresponding receiving slot 124.

[0030] Upon a full seating of the handle mounting plate 114 in the corresponding slot or groove 124, the knob or projection 122 snap locks into a complementary recess 130 in the inner wall of the handle receiving slot 124 as a means for firmly although releasably retaining the handle on the container body.

[0031] The upper projecting planar portion 116 of the mounting plate 114 of the handle is in turn received within a downwardly opening pocket 132 at the upper end of each of the front and rear handle slots 124. The pocket is defined by the inner wall of the slot 124 itself and a parallel short depending outer wall segment 134 which is actually an integral continuation of the respective front and rear container body walls. In order to provide for a snug although releasable reception of the mounting plate extension 116, the outer wall segment 134, in each slot 124, includes a series of spaced vertical ribs 136 facing toward the interior of the pocket. In this manner, a firm retention of the upper portion 116 is provided without any tendency for a jamming or permanent locking of the handle. When fully seated, the mounting plate upper extension 116 will preferably engage the inner end of the pocket 132 simultaneously with the engagement of the knob or protuberance 122 within the slot recess 130.

[0032] In order to remove the handle from the slot, the handle need merely be forcibly shifted downward a distance only sufficient so as to vertically retract both the upper mounting plate extension 116 from the corresponding pocket and the lower mounting plate enlargement 118, and more particularly the opposed side extensions 120 thereof, from the receiving grooves 128 on the lower portions of the side walls of the slot 124. The handle can then be laterally removed from the container without requiring a longitudinal sliding or withdrawal of the mounting plate along the full height of the slot 124. Utilizing receiving grooves 128 only at the lower section of the slot 124, in conjunction with the upper slot pocket

132, while providing for a firm retention of the handle, does so in a manner which greatly facilitates both a mounting and removal of the handle, and avoids any tendency for the mounting plate to jam within the corresponding slot 124 such as might be the case where the locking grooves 128 to extend the full height of the slot 124 and the mounting plate 114 being required to slidably engage therein along the full height of the plate receiving slot 124.

[0033] The mounting of the handle to the front or rear wall of the container body will be in accord with the wishes of the user of the container with the handle being repositionable as desired. When mounted to the front wall, a single hand can be used to both grasp the handle and release the latch. With the handle mounted to the rear wall, release of the latch will normally be by the second hand of the user. This latter arrangement may be preferred by those with a particular lack of manual dexterity whereby one cannot, with a single hand, hold both the container and manipulate the latch. Other factors which may enter into handle positioning include the nature of the contents of the container, and the manner in which the contents are to be accessed.

[0034] The foregoing is illustrative of the principles of the invention, and while a specific embodiment of the invention has been set forth in detail, it is to be appreciated that variations may occur to those skilled in the art, such as dimensional changes resulting in both larger and smaller containers, and containers of shapes other than the basic oval shape illustrated, all without departing from the spirit and scope of the invention as set forth in the following claims.

Claims

1. A container comprising a container body and lid therefor; said body having a rim defining a mouth opening into the interior of said body, pivot means engaged with and between said body and said lid for pivotal movement of said lid between a closed position overlying and closing said mouth and an open position pivoted outward away from said mouth, said lid having a bottom surface, an elastomeric member positioned between said lid and said body, said member including a generally planar seal section affixed to said lid bottom surface, and, in said closed position, being coextensive with and engaging on said rim, said member also including a spring section integral with and extending outward of said seal section, said spring section including an outer portion remote from said seal section and engaged with said container body adjacent said pivot means, said spring section, in said closed position of said lid, being compressed and exerting a biasing force biasing said lid to said open position, and latch means engaged between said lid and said container body to releasably retain said lid in said

closed position against the biasing force of said spring section.

2. The container of claim 1 wherein said spring section, in said open position, is compressed to a lesser degree than in said closed position and maintains a continuing biasing force on said lid in said open position. 5
3. The container of claim 2 wherein said seal section is generally of a loop configuration corresponding to the configuration of the rim, said loop configuration including an inner peripheral edge and an outer peripheral edge, retaining means on said bottom surface of said lid engaging and releasably affixing said seal section to said lid bottom surface. 10 15
4. The container of claim 3 wherein said seal section, continuously about said loop configuration, includes a seal seat defined therefrom, said seal seat comprising a continuous downward offset in said seal section of said elastomeric member of a continuous width sufficient to receive said rim in engagement therewith upon a moving of the lid to said closed position. 20 25
5. The container of claim 3 wherein said retaining means on said bottom surface of said lid comprises spaced depending undercut lugs which engage about one of said peripheral edges of said loop configuration. 30
6. The container of claim 5 wherein said container body includes a pocket defined therein releasably receiving and retaining said outer portion of said spring section, said pocket being downwardly offset from said rim and opening upwardly relative thereto. 35
7. The container of claim 6 wherein said pocket includes a vertical central divider, said outer portion of said spring section including a central slot extending inwardly thereof and receiving said divider therein upon introduction of said spring into said pocket. 40 45
8. The container of claim 6 including a chamber formed between said body and said lid above and as a continuation of said pocket in said closed position of said lid, said spring section, upon a movement of said lid to said closed position, compressing and folding into said chamber. 50
9. The container of claim 8 including an anchoring tongue defined in said elastomeric member and extending inwardly of said seal section loop configuration in alignment with said spring section, and means releasably affixing said anchoring tongue to said lid for stabilization of said elastomeric member 55

during compression of said spring section.

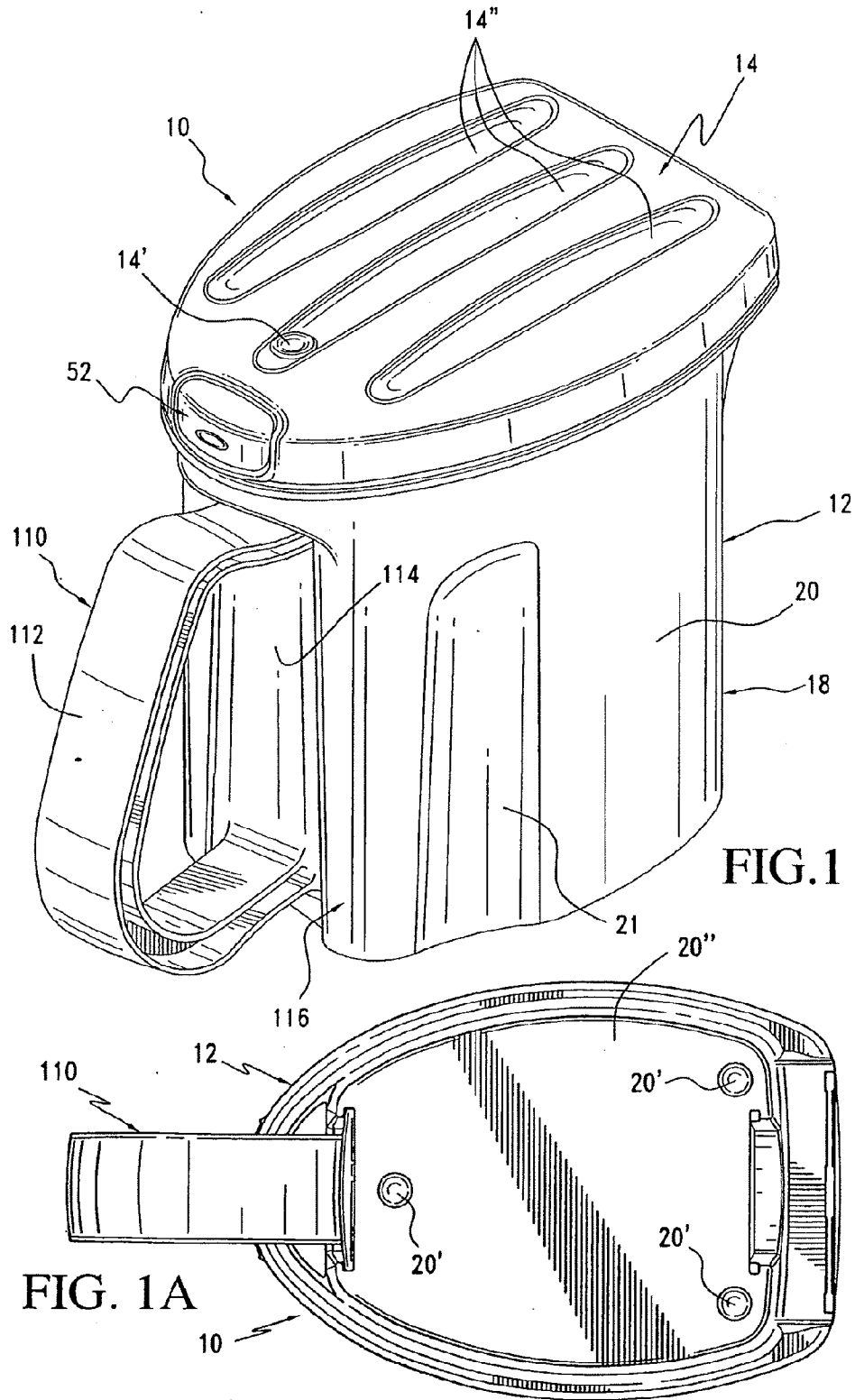
10. The container of claim 9 wherein the means affixing said anchoring tongue includes projecting stubs extending from said lid bottom surface and sockets integrally defined in said anchoring tongue and resiliently engaging over said stubs.
11. The container of claim 10 including a selectively positioned container handle, said handle including an elongate mounting plate, said container body having a plurality of receiving slots for said mounting plate, one of said slots generally aligning with said latch means, and a second of said slots remote therefrom.
12. The container of claim 11 wherein said handle, in addition to said mounting plate, includes a handgrip, said mounting plate including a vertical extension above said handgrip, said mounting plate further including a lower section of a greater lateral width than the remainder of said mounting plate thereabove, said greater lateral width defining a pair of opposed edge extensions, each of said mounting plate receiving slots including a downwardly directed pocket at the upper end thereof receiving said vertical extension of said mounting plate, and a pair of grooves at the lower end portion of said slot of a length equal to the height of the mounting plate edge extensions for reception of said extensions therein.
13. The container of claim 1 wherein said latch means comprises a keeper slot with latching shoulder in said container body, a latch stem mounted on said lid and aligned to engage with said keeper slot latching shoulder upon closure of said lid, and means selectively moving said latch stem for disengagement from said shoulder for release of said lid to allow opening biasing of said lid relative to said container body.
14. The container of claim 1 including a selectively positionable container handle, said handle including an elongate mounting plate, said container body having a plurality of receiving slots for said mounting plate, one of said slots generally aligning with said latch means, and a second of said slots remote therefrom.
15. The container of claim 14 wherein said handle, in addition to said mounting plate, includes a handgrip, said mounting plate including a vertical extension above said handgrip, said mounting plate further including a lower section of a greater lateral width than the remainder of said mounting plate thereabove, said greater lateral width defining a pair of opposed edge extensions, each of said mounting

plate receiving slots including a downwardly directed pocket at the upper end thereof receiving said vertical extension of said mounting plate, and a pair of grooves at the lower end portion of said slot of a length equal to the height of the mounting plate edge extensions for reception of said edge extensions therein.

16. The container of claim 15 wherein said mounting plate at said lower section thereof, and each of said mounting plate receiving slots, at a corresponding location therein, include releasable locking means comprising a projecting knob and a complementary recess which engage upon a full seating of said mounting plate within the slot.
17. The container of claim 2 wherein said elastomeric member is selectively removable from said lid and said body, and, when removed, is of a substantially planar configuration, said spring section being compressed upon positioning of said elastomeric member between said lid and said body.
18. For use in a lidded container in the formation of a container seal and lid biasing spring, an elongate generally planar elastomeric member including a seal section, and a spring section extending outward of said seal section coplanar therewith, said spring section being selectively laterally foldable relative to said seal section, said spring section terminating in an outer end remote from said seal section.
19. The elastomeric member of claim 18 wherein said seal section is of a generally loop configuration, an anchoring tongue coplanar and aligned with said spring section, said anchoring tongue extending inwardly of said loop configuration and terminating within said loop configuration, said anchoring tongue including a series of anchoring sockets defined therein.
20. The elastomeric member of claim 19 wherein said seal section loop configuration includes a continuous seal seat defined thereabout and comprising a continuous lateral offset out of the general plane of the elastomeric member for engagement by a container body rim.
21. In a container, a container body and a selectively repositionable handle for said container body, said handle including a handgrip and a mounting plate, said container body having a plurality of spaced receiving slots therein for selectively receiving said mounting plate, said mounting plate including a vertical extension above said handgrip, said mounting plate further including a lower section of a greater lateral width than the remainder of said mounting

plate thereabove, said greater lateral width defining a pair of opposed edge extensions, each of said mounting plate receiving slots including a downwardly directed pocket at the upper end thereof receiving said vertical extension of said mounting plate, and a pair of opposed grooves at the lower end portion of said slot of a length equal to the height of the mounting plate lower section edge extensions for reception of said edge extensions therein.

22. The container of claim 21 wherein said mounting plate at said lower section thereof, and each of said mounting plate receiving slots, at a corresponding location therein, include releasable locking means comprising a projecting knob and a complementary recess which engage upon a full seating of said mounting plate within the slot.



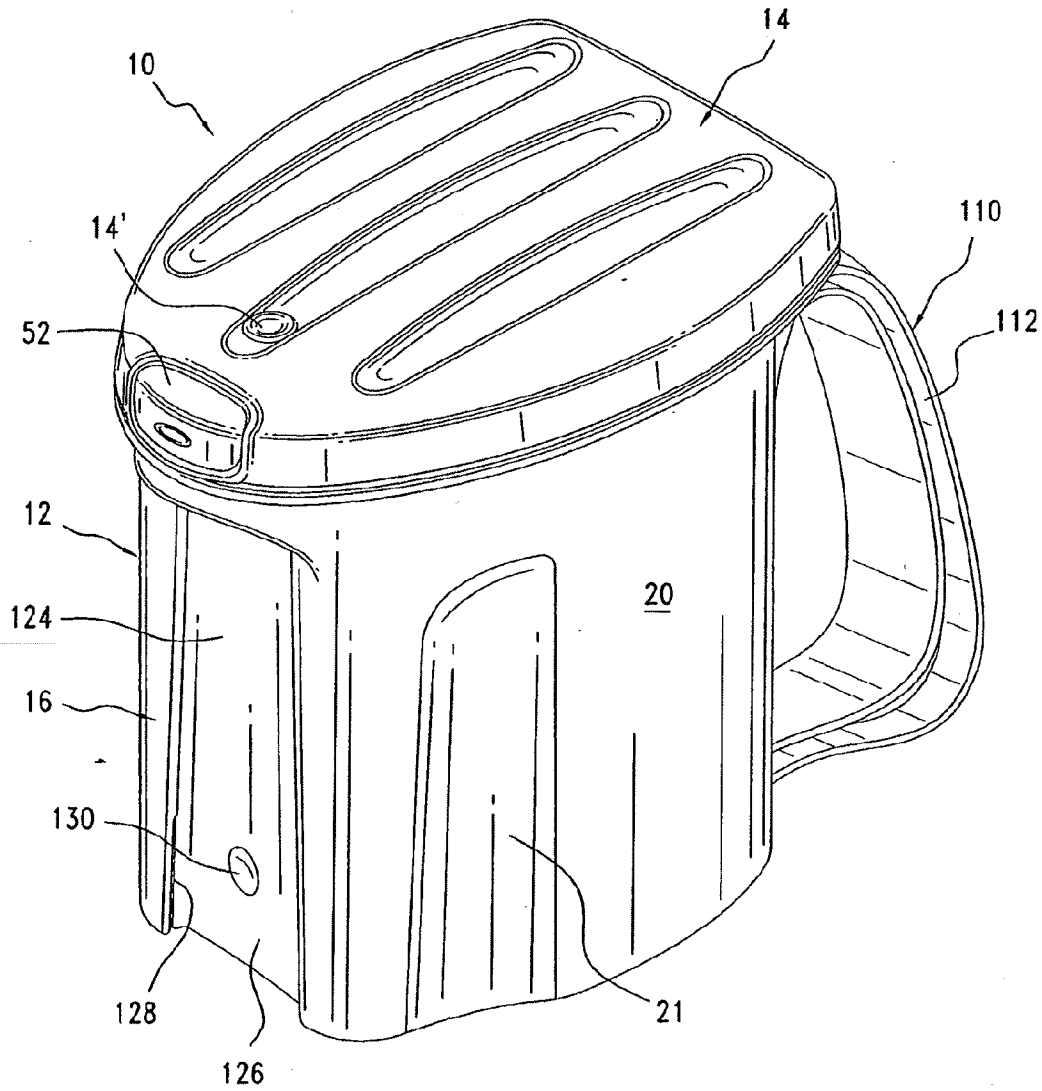


FIG.2

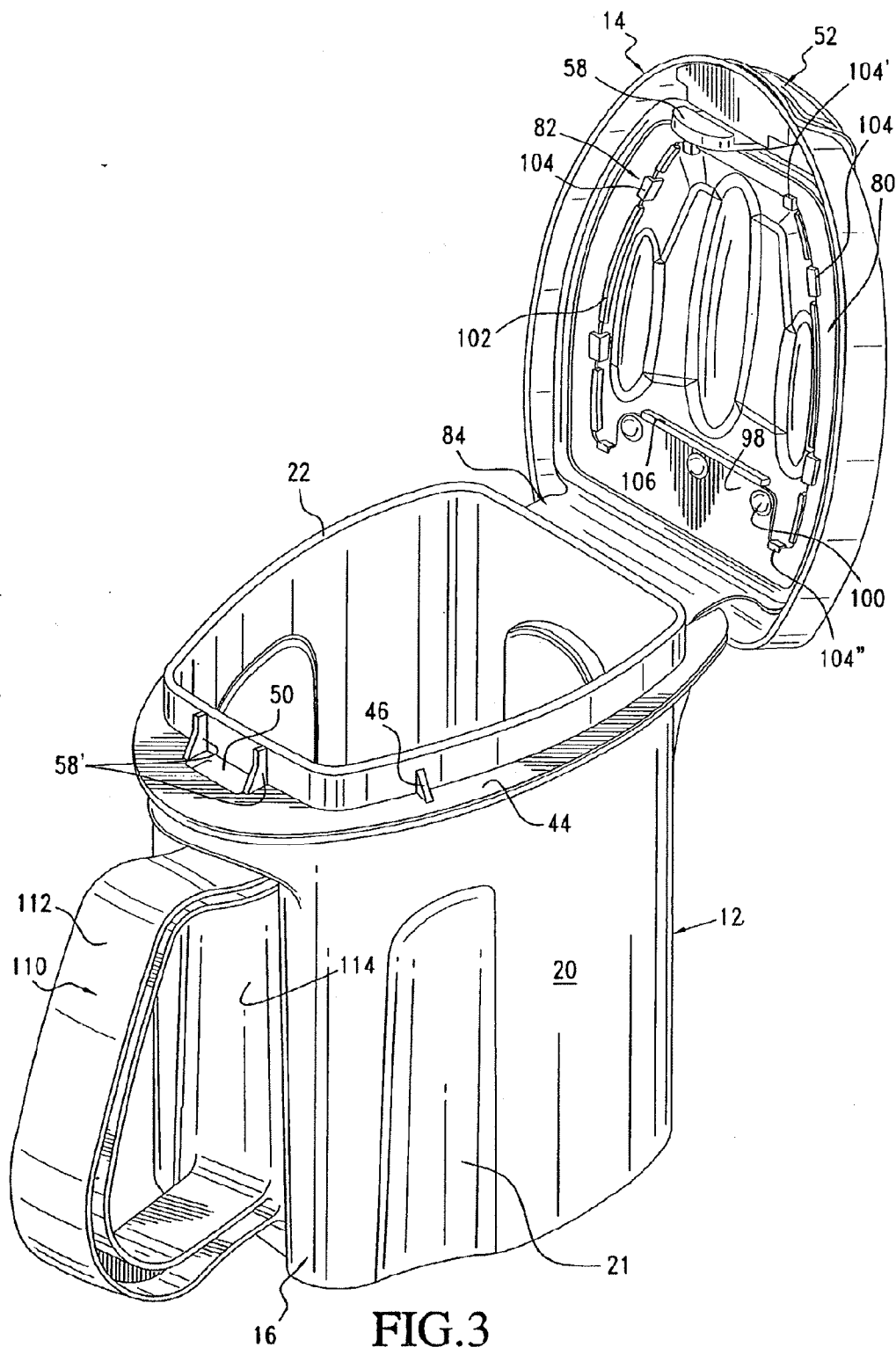
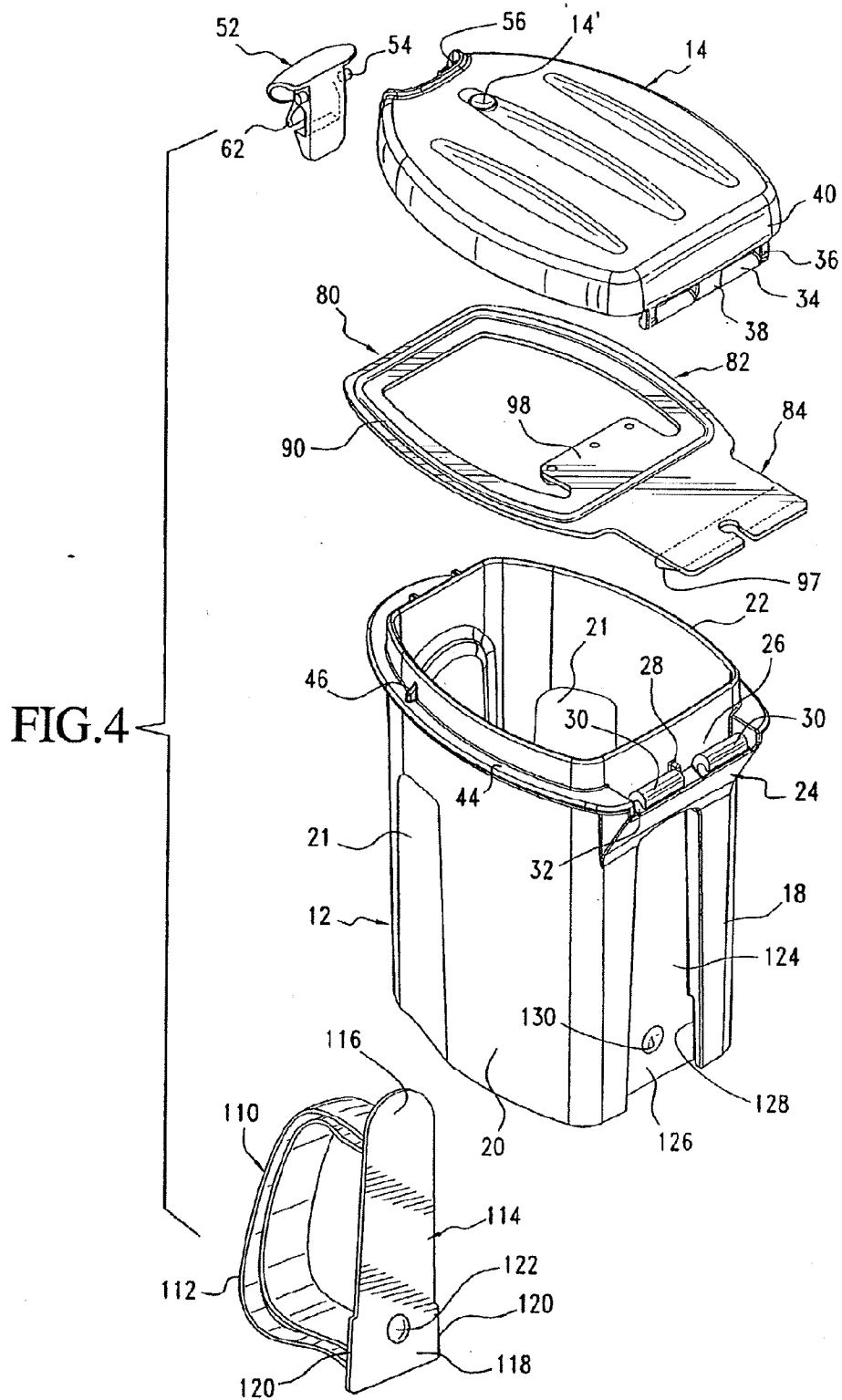


FIG.3



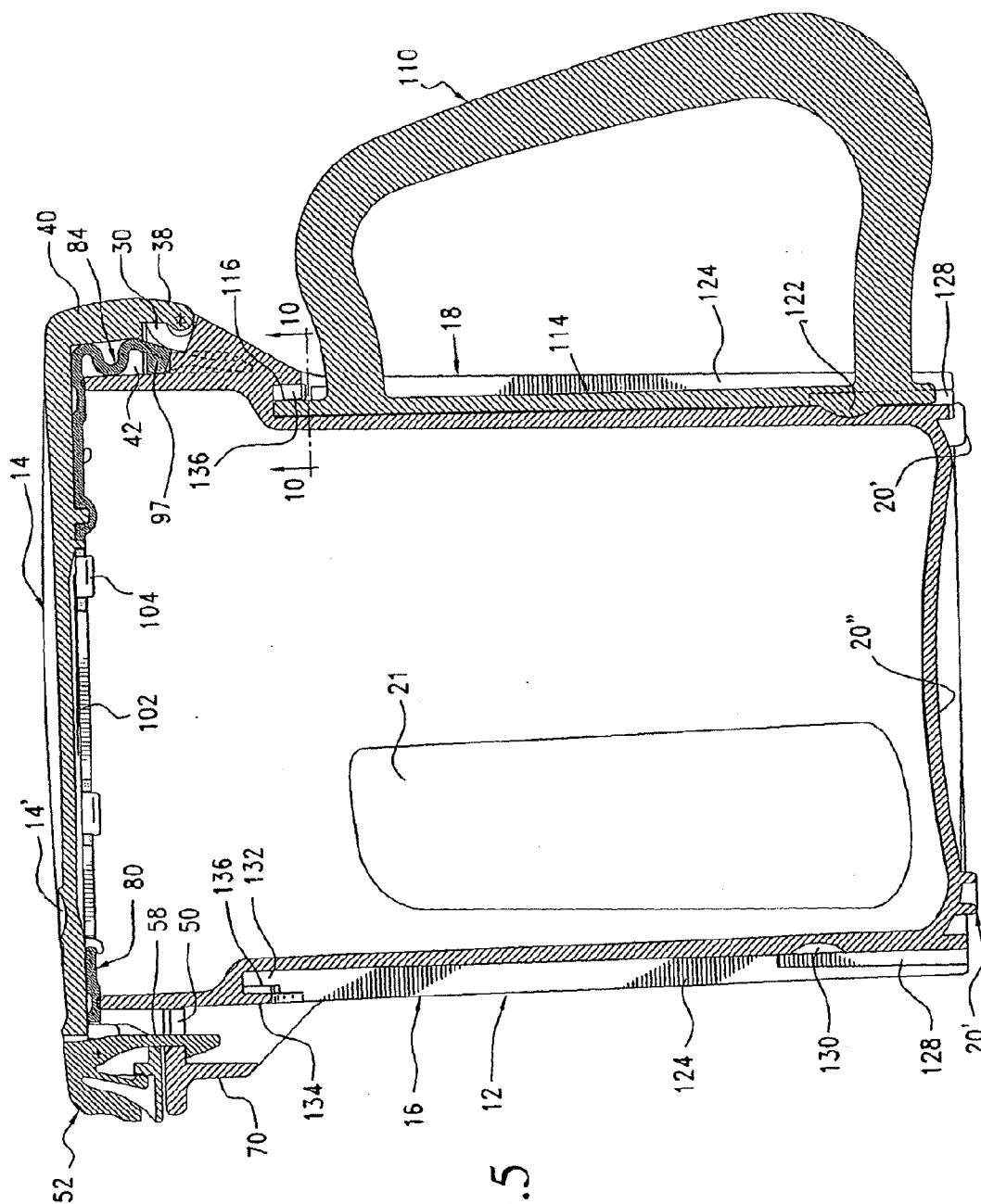
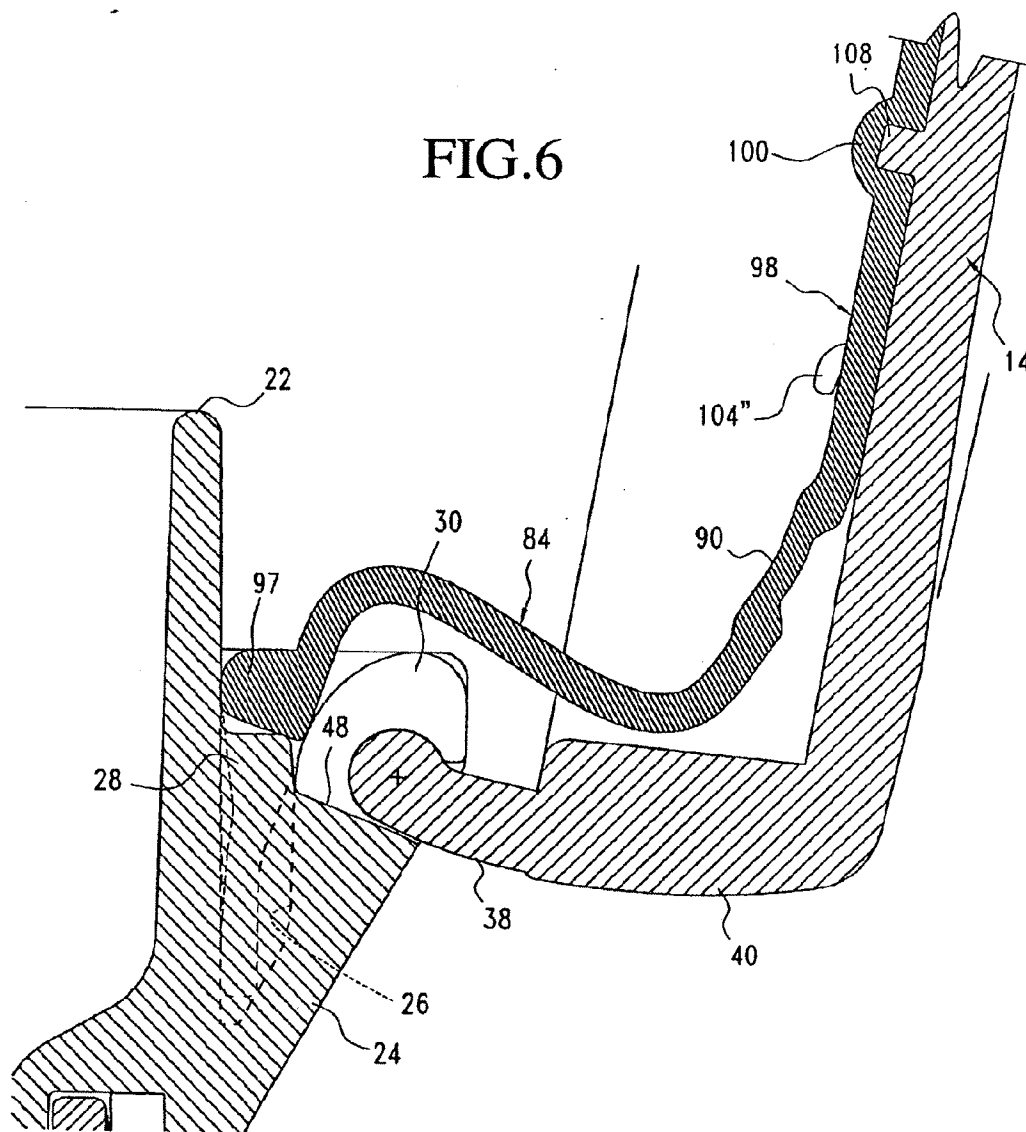
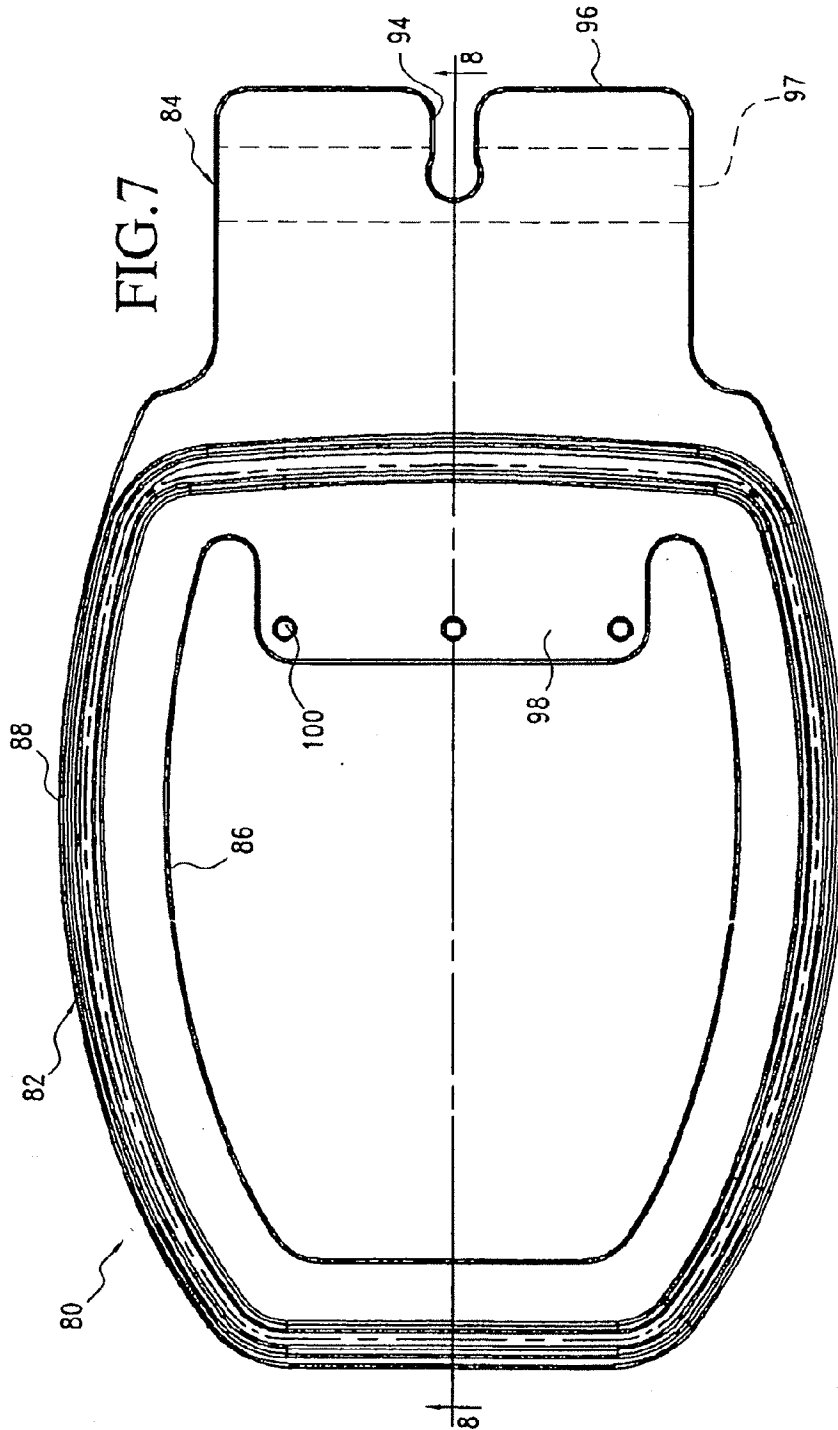
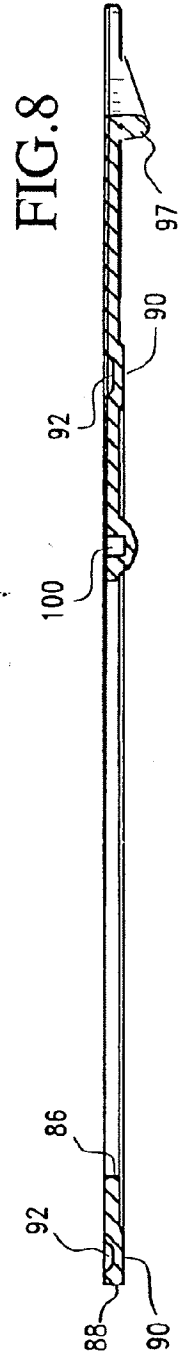


FIG. 5

FIG.6





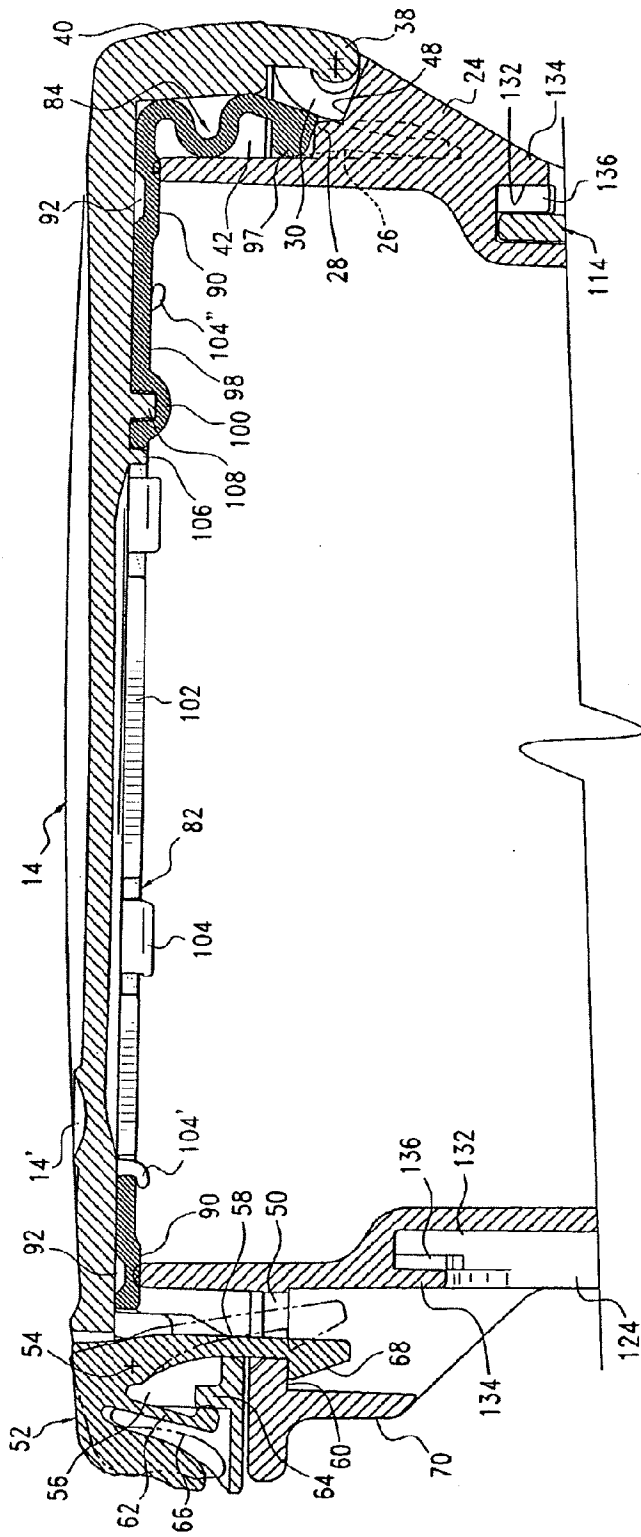


FIG. 9

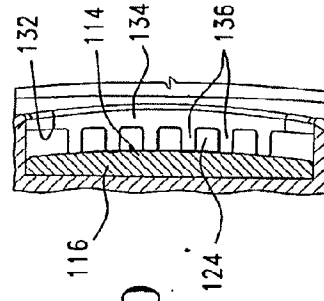
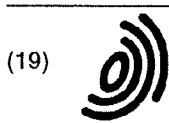


FIG. 10



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European Patent Office
Office européen des brevets



(11) **EP 1 447 342 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
27.10.2004 Bulletin 2004/44

(51) Int Cl.7: B65D 43/16, B65D 25/28

(43) Date of publication A2:
18.08.2004 Bulletin 2004/34

(21) Application number: 04001832.7

(22) Date of filing: 28.01.2004

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR
Designated Extension States:
AL LT LV MK

(72) Inventor: **Aochi, Yasumitsu**
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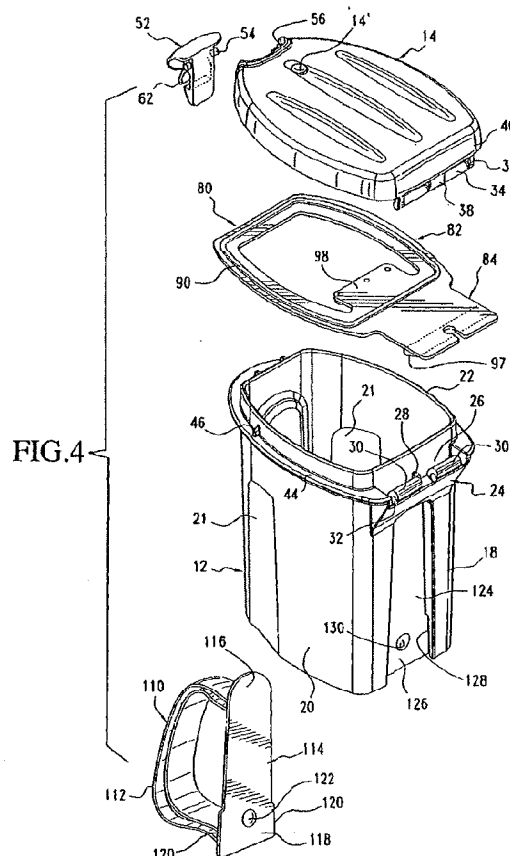
(74) Representative: **Carstairs, J. C.**
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Pettenkoferstrasse 20-22
80336 München (DE)

(30) Priority: 13.02.2003 US 365902

(71) Applicant: **Dart Industries Inc.**
Orlando, Florida 32837 (US)

(54) **Container with one-piece seal and lid spring**

(57) A container including a container body (12) with a pivotally mounted top lid (14) utilizing a single generally planar elastomeric member (80) forming a seal section (90) releasably mounted to the undersurface of the lid and engageable with the rim (22) of the container body (12) peripherally thereabout, and a spring section (84) integral with the seal section (90) and extending from the lid (14) into a receiving chamber (26) on the container body (12) adjacent the pivotal mounting of the lid (14), the spring section (84) being resiliently compressed during the positioning thereof to provide a constant opening biasing force on the lid (14) relative to the container body (12). An alternately positionable handle (110) is removably mounted, at the option of the user, to either the front wall (16) or the rear wall (18) of the container body (12).





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 04 00 1832

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 6 065 626 A (HAN KEH CHANG ET AL) 23 May 2000 (2000-05-23) * column 2, line 12 - line 50 * * column 3, line 21 - line 24 * * figures 1,2,7 *	1,18	B65D43/16 B65D25/28
A	EP 0 748 748 A (UNI CHARM CORP ;DAI NIPPON PRINTING CO LTD (JP)) 18 December 1996 (1996-12-18) * column 6, line 10 - line 32 * * figure 1 *	1	
A	EP 0 955 247 A (NICE PAK INTERNATIONAL LTD) 10 November 1999 (1999-11-10) * paragraph [0008] - paragraph [0010] * * figures 1-3 *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B65D A47J
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 13 May 2004	Examiner Rodriguez Gombau, F
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1501 03/82 (P04C01)



European Patent
Office

Application Number
EP 04 00 1832

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-20



European Patent
Office

LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 04 00 1832

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-20

Container with one-piece seal and lid spring

2. claims: 21,22

Container with selectively repositionable handle

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 00 1832

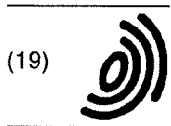
This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

13-05-2004

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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82



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European Patent Office
Office européen des brevets



(11) **EP 1 600 373 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
30.11.2005 Bulletin 2005/48

(51) Int Cl.7: **B64D 11/02, B65F 1/16**

(21) Application number: **04029653.5**

(22) Date of filing: **15.12.2004**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR LV MK YU

(72) Inventor: **Fukuzumi, Masahito**
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(74) Representative:
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Artur-Ladebeck-Strasse 51
33617 Bielefeld (DE)

(30) Priority: **24.05.2004 JP 2004152748**

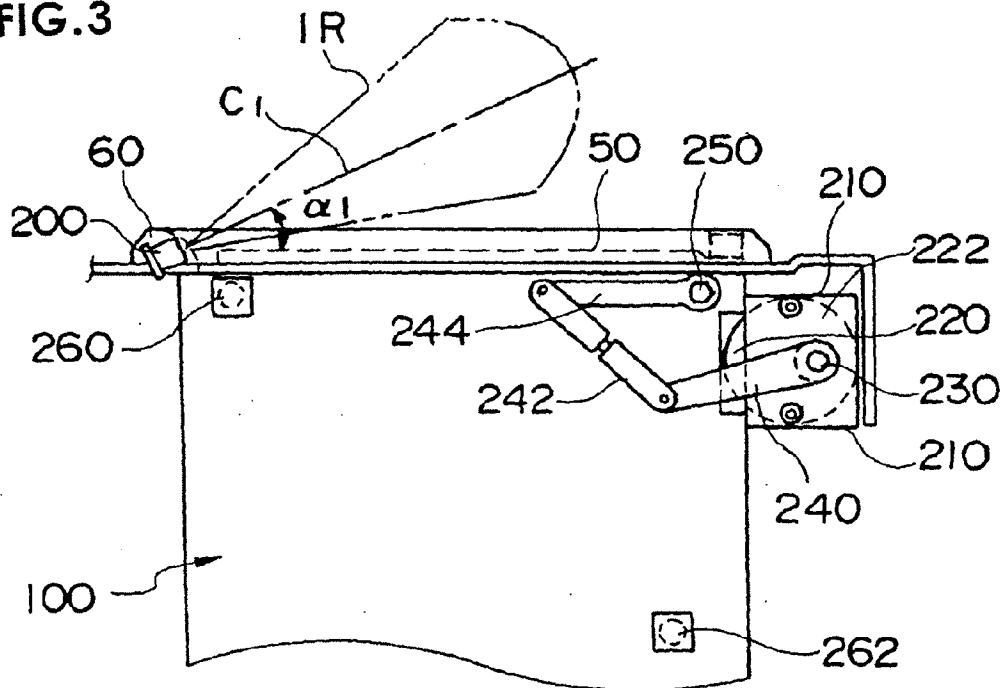
(71) Applicant: **JAMCO CORPORATION**
Mitaka, Tokyo (JP)

(54) **Automatic opening/closing trash bin lid for lavatory unit of aircraft**

(57) The invention provides a device for automatically opening and closing a lid of a trash bin in noncontact fashion disposed in a lavatory unit of an aircraft. On the upper portion of a trashbin 100 disposed in a lavatory unit of an aircraft is attached a lid 50 that pivots via a shaft 250. The reflective infrared radiation sensor 200

attached to a lid frame 60 irradiates infrared radiation IR and detects an object. When the object is detected, a control means drives the DC motor 220 to pivot the shaft 250 via a rotating lever 240 and link arms 242 and 244 to open the lid 50 downward. The fully closed state and the fully opened state of the lid 50 can be detected by position detecting sensors 260 and 262.

FIG.3



EP 1 600 373 A2

Description

[0001] The present application is based on and claims priority of Japanese patent application No. 2004-152748 filed on May 24, 2004, the entire contents of which are hereby incorporated by reference.

BACKGROUND OF THE INVENTION

Field of the invention

[0002] The present invention relates to an automatic opening/closing trash bin lid equipped in a lavatory unit of an aircraft.

Description of the related art

[0003] A lavatory unit of an aircraft is equipped with a stool, a wash basin, a trash bin and so on.

[0004] The lid of a trash bin in the lavatory unit of an aircraft that is used by an unspecified number of passengers should preferably be opened and closed in a noncontact fashion for sanitary reasons.

[0005] Japanese Patent Laid-Open Publication No. 08-020405 (patent document 1) discloses a mechanism for opening and closing a bottom cover of a refuse (trash) bin that can be operated single-handedly. Further, Japanese Patent Laid-Open Publication No. 11-318766 (patent document 2) discloses an automatic closing apparatus of a stool cover using an infrared sensor.

[0006] The trash bin and the like equipped in an aircraft is required by law to have a function to prevent fire from spreading. According to this function, when a fire occurs inside the trash bin, the trash bin is airtightly closed to cut the inflow of fresh air into the bin to thereby automatically extinguish the fire.

SUMMARY OF THE INVENTION

[0007] Therefore, the present invention provides an automatic opening/closing trash bin lid for a lavatory unit of an aircraft that satisfies the above-described function that can be opened and closed in a noncontact fashion using an infrared radiation sensor and a motor.

[0008] The automatic opening/closing trash bin lid equipped in a lavatory unit of an aircraft of the present invention comprises a pivotable lid covering a trash passage of a trash bin, a reflective infrared radiation sensor disposed on an upper portion of a lid frame, a means for driving a pivoting shaft of the lid via a link arm and a rotating lever connected to a motor and an output shaft of the motor, a control means for outputting a command to the motor when the reflective infrared radiation sensor detects an object, a sensor for sensing a fully closed position and a fully opened position of the lid, and a spring attached to the pivoting shaft of the lid for biasing the lid toward the fully closed position.

[0009] Further, when the lid is returned to the fully closed position by a spring force of the spring, the control means controls the motor to generate a torque smaller than the spring force.

[0010] Even further, the sensor region of the reflective infrared radiation sensor is set to have an angle of incidence with respect to a plane of the lid at its fully closed position.

[0011] According to the present invention, the lid on the trash bin in the lavatory unit used by a large number of passengers can be opened and closed without contact, which is sanitary. Moreover, since the lid can be airtightly closed constantly, the effect of preventing fire in the trash bin is enhanced.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

FIG. 1 is an explanatory view showing the general structure of a lavatory unit of an aircraft to which the present invention is applied;

FIG. 2 is a plan view of an automatic opening/closing trash bin lid for a lavatory unit of an aircraft according to the present invention;

FIG. 3 is a side view of the automatic trash bin lid for a lavatory unit of an aircraft according to the present invention;

FIG. 4 is a plan view of an automatic trash bin lid for a lavatory unit of an aircraft according to the present invention;

FIG. 5 is a side view of the automatic trash bin lid for a lavatory unit of an aircraft according to the present invention; and

FIG. 6 is a time chart showing the operation of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] FIG. 1 is an explanatory view showing a general outline of a lavatory unit of an aircraft in which the present invention is applied.

[0014] A lavatory unit, the whole of which being denoted by reference number 1, is structured using panel members, and shaped so as to correspond to the location of installation in the aircraft.

[0015] A stool 20, a wash basin 30, a mirror 32, an auxiliary folding bed 40 and so on are equipped inside the lavatory unit 1.

[0016] A trash slot lid 50 is disposed next to the wash basin 30, through which trashes such as tissue papers are thrown in. The trash slot lid 50 is a hinged door that opens downward, and below the lid 50 is disposed a trash bin 100.

[0017] FIG. 2 is a plan view of an automatic opening/closing trash bin lid according to the present invention, and FIG. 3 is a front view thereof, showing the state in

which the lid is at its fully closed position.

[0018] The trash bin lid 50 is disposed pivotably via a shaft 250 positioned inside a lid frame 60 attached on top of the wash basin 30.

[0019] A reflective infrared radiation sensor 200 is disposed on an upper portion of the lid frame 60 opposite to the shaft 250.

[0020] The reflective infrared radiation sensor 200 is composed of a light emitting element and a light sensitive element.

[0021] The reflective infrared radiation sensor 200 irradiates infrared radiation IR to the area above the lid frame covering the trash slot of the trash bin 100, and is equipped with a function to sense and generate a signal when an object, such as a hand of a user, enters that radiation range.

[0022] The reflective infrared radiation sensor 200 is positioned so that a center C_1 of IR (infrared radiation) of the IR wave region has an angle of incidence positioned upward by angle α_1 from the horizontal plane of the lid 50 at its fully closed position.

[0023] Further, the IR waves are expanded to left and right sides in the horizontal plane from the center of IR waves by angle θ_1 , respectively, covering both sides of the inner area of the lid frame 60.

[0024] A casing 210 is disposed under the wash basin 30 opposing to the reflective infrared radiation sensor 200, and a DC motor 220 and a gear box 222 for reducing the speed of output of the DC motor 220 are disposed in the casing.

[0025] A control means not shown generates an output command to the motor upon receiving the signal from the infrared radiation sensor.

[0026] A rotating lever 240 is attached to an output shaft 230 of the gear box 222, and the rotating lever 240 pivots the lid 50 around the shaft 250 via link arms 242 and 244.

[0027] The position of the lid 50 is detected by two position detecting sensors 260 and 262.

[0028] FIGS. 4 and 5 show the lid 50 in its fully opened position.

[0029] The lid 50 is driven by the DC motor 220 to open to its fully opened position, and when the lid is in contact with the wall of the trash bin, the rotation stops due to overload.

[0030] When the throw-in of trash is ended and the hand of the user etc. is drawn away from the IR wave region, the power to the DC motor 220 is turned off, and the lid 50 returns to its fully closed position due to the spring force of the spring 252.

[0031] At this time, by controlling the power supply to the DC motor 220 to be gradually reduced, the DC motor can function as a damper to prevent the generation of collision noise.

[0032] The time chart of FIG. 6 is referred to in explaining the operation of the present invention.

[0033] The reflective infrared radiation sensor 200 disposed inside the lid frame 60 radiates IR waves to-

ward the center of the trash bin lid 50, and detects the reflection from the object by the light-sensitive element. The detection pulse is sent to a microcomputer, and upon receiving the detection pulse, the microcomputer outputs a lid open command.

[0034] When the lid open command is output, the DC motor 220 is activated. When the DC motor 220 rotates, the connected gear box 222 shifts the transmission to a low-speed rotation, and thereafter, the trash bin lid 50 is pulled downward via the rotating lever 240. The DC motor 220 stops rotating due to overload when the lid contacts the wall of the trash bin. The driving current fed to the DC motor 220 is at constant value, and the lid is stopped at that position.

[0035] When the object moves away from the trash bin lid 50, the detection pulse from the reflective infrared radiation sensor 200 stops, and the microcomputer outputs a close command to a constant current drive circuit connected to the DC motor 220, by which the current in the constant current drive circuit becomes intermittent. The spring force of the spring 252 is used as the power for closing the trash bin lid 50. Therefore, the trash bin lid 50 can be closed by spring force even during power failure. If the trash bin lid 50 is closed only by spring force, however, the lid will close with a bang, generating unpleasant noise, so the present invention provides a damping mechanism in which the current of the DC motor 220 becomes intermittent so that the spring force is slightly stronger during closing action of the lid 50.

[0036] When an obstacle is left unattended near the trash bin lid 50, the lid may become opened at all times. In such case, the lid can be set to close automatically after being opened for a few seconds.

[0037] Thereafter, the obstacle should be moved outside of the IR wave range in order to restore automatic open/close operation.

[0038] Moreover, the two position detecting sensors 260 and 262 disposed on the outer side wall of the trash bin 100 are for detecting whether the trash bin lid 50 is fully closed and for detecting whether the lid is fully opened, respectively. It is possible to use these position detecting sensors 260 and 262 to output a warning to notify the cabin crew when the opening/closing of the trash bin lid 50 is stopped midway due to clogging of trash or other troubles.

Claims

1. An automatic opening/closing trash bin lid equipped in a lavatory unit of an aircraft, comprising:

a pivotable lid covering a trash passage of a trash bin;
a reflective infrared radiation sensor disposed on an upper portion of a lid frame;
a means for driving a pivoting shaft of the lid via a link arm and a rotating lever connected to a

motor and an output shaft of the motor;
a control means for outputting a command to
the motor when the reflective infrared radiation
sensor detects an object;
a sensor for sensing a fully closed position and
a fully opened position of the lid; and
a spring attached to the pivoting shaft of the lid
for biasing the lid toward the fully closed posi-
tion.

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2. The automatic opening/closing trash bin lid
equipped in a lavatory unit of an aircraft according
to claim 1, wherein when the lid is returned to the
fully closed position by a spring force of the spring,
the control means controls the motor to generate a
torque smaller than the spring force.

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3. The automatic opening/closing trash bin lid
equipped in a lavatory unit of an aircraft according
to claim 1, wherein a sensor region of the reflective
infrared radiation sensor is set to have an angle of
incidence with respect to a plane of the lid at its fully
closed position.

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FIG.1

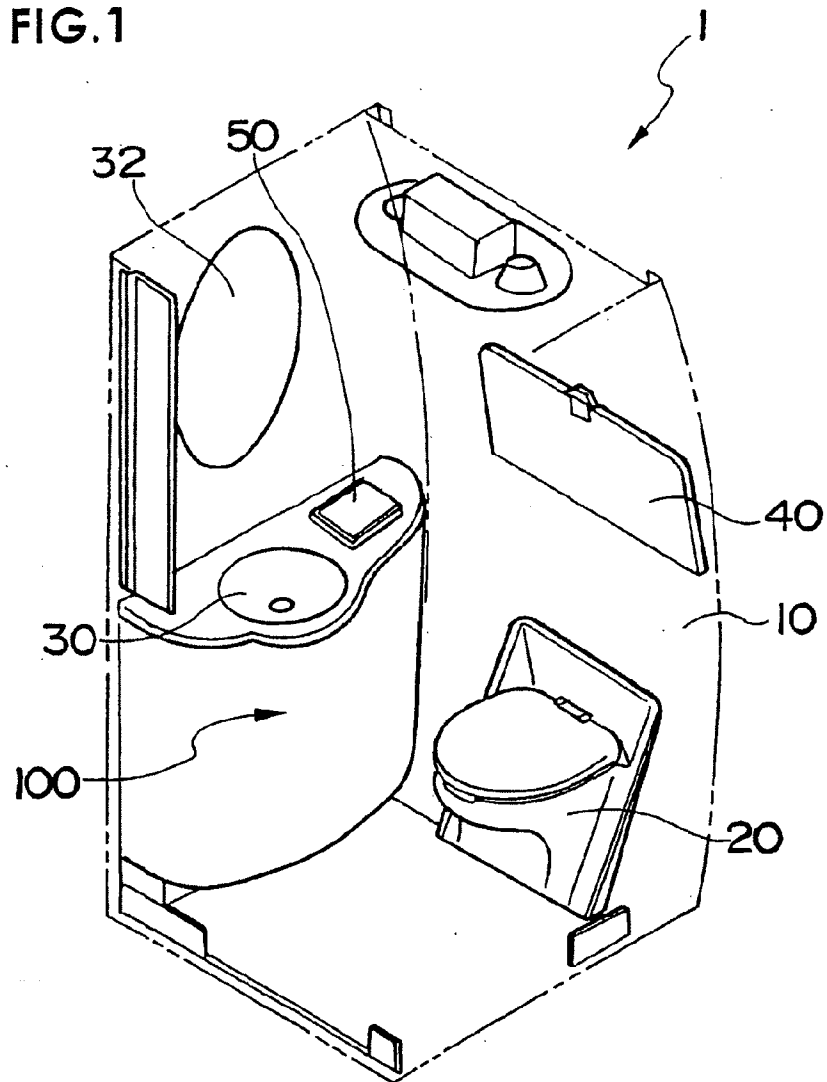


FIG.2

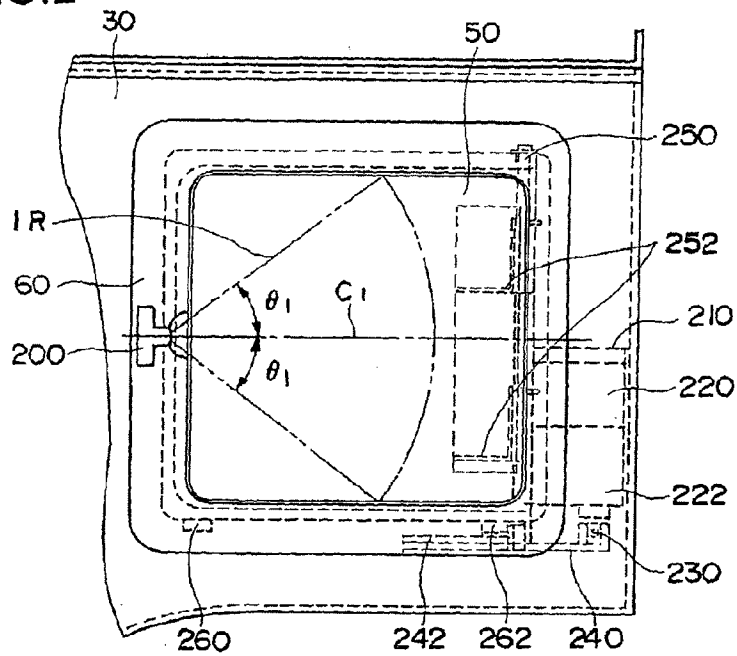


FIG.3

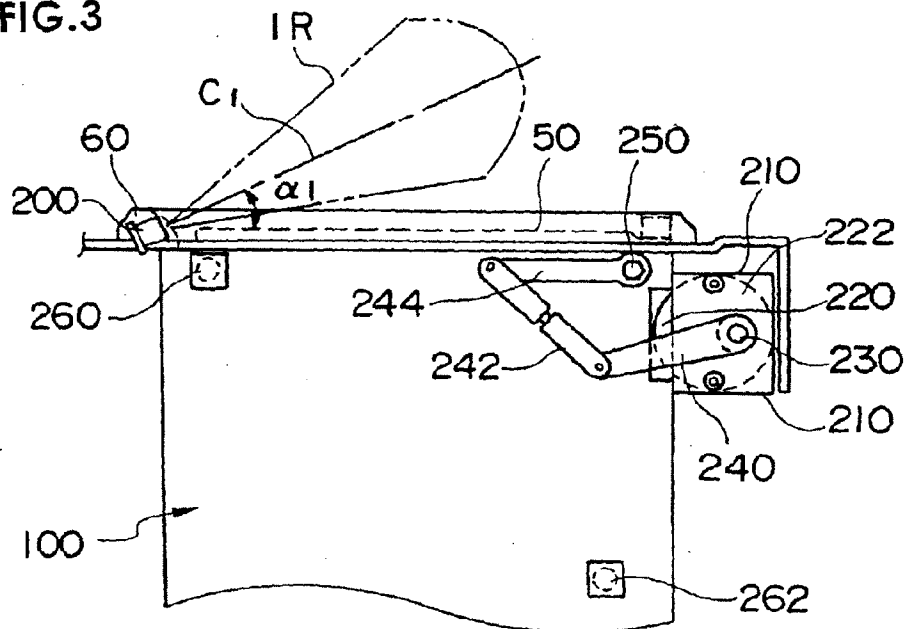


FIG.4

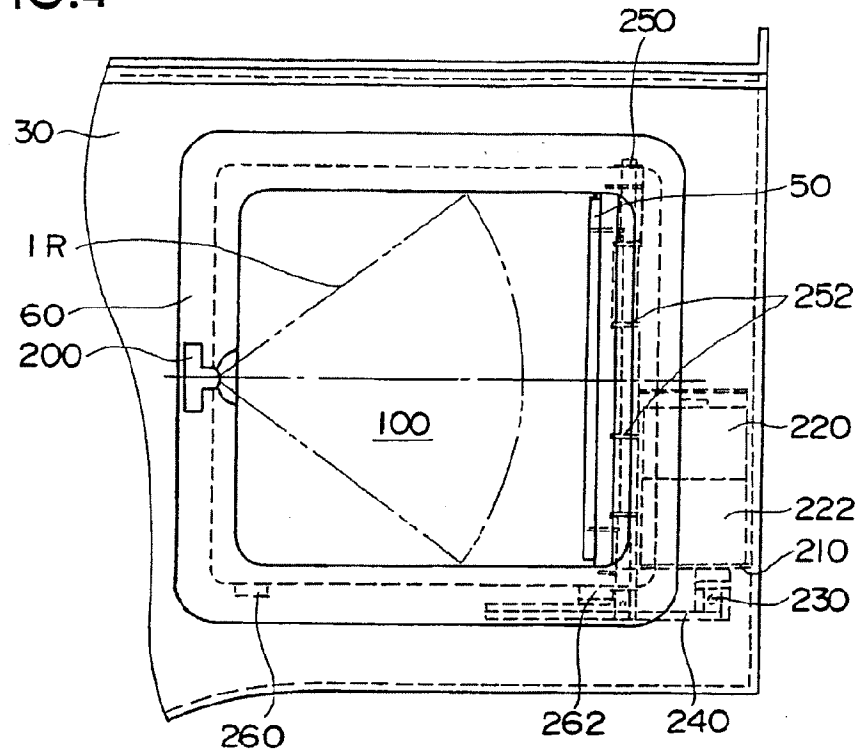


FIG.5

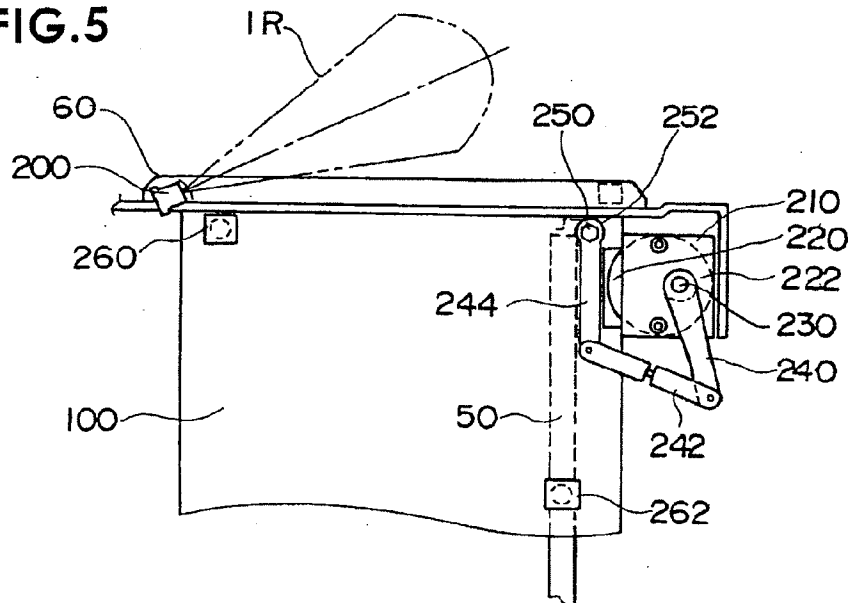
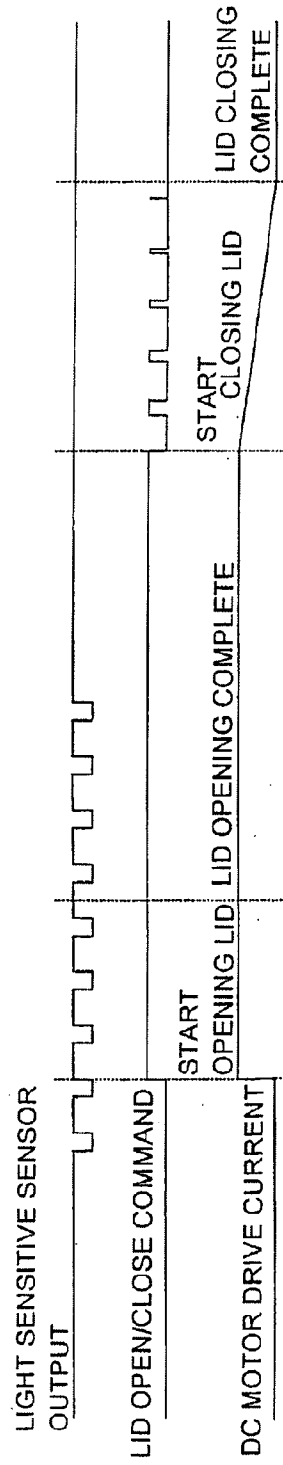


FIG. 6





(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
08.11.2006 Bulletin 2006/45

(51) Int Cl.:
B65F 1/16 (2006.01) B64D 11/02 (2006.01)

(43) Date of publication A2:
30.11.2005 Bulletin 2005/48

(21) Application number: **04029653.5**

(22) Date of filing: **15.12.2004**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR
 Designated Extension States:
AL BA HR LV MK YU

(72) Inventor: **Fukuizumi, Masahito**
Mitaka
Tokyo (JP)

(30) Priority: **24.05.2004 JP 2004152748**

(74) Representative: **TER MEER - STEINMEISTER & PARTNER GbR**
Artur-Ladebeck-Strasse 51
33617 Bielefeld (DE)

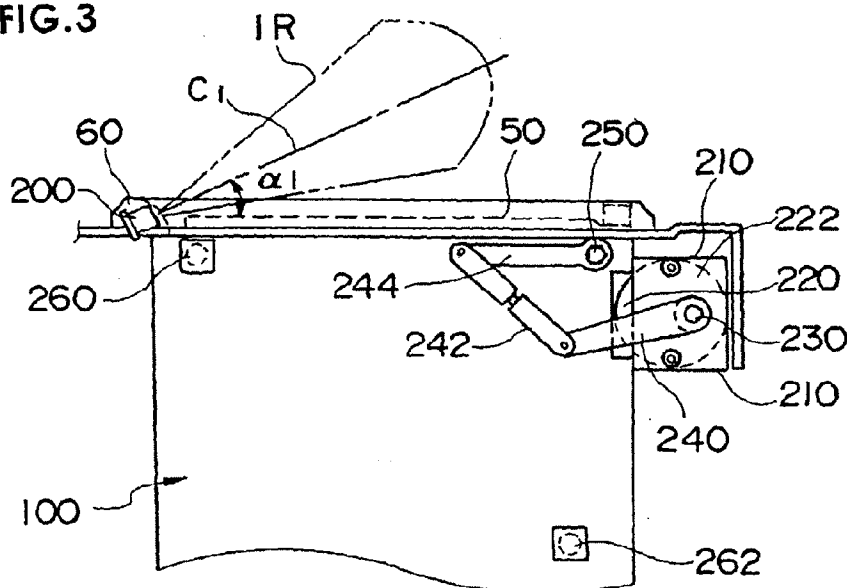
(71) Applicant: **JAMCO CORPORATION**
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(57) The invention provides a device for automatically opening and closing a lid of a trash bin in noncontact fashion disposed in a lavatory unit of an aircraft. On the upper portion of a trashbin 100 disposed in a lavatory unit of an aircraft is attached a lid 50 that pivots via a shaft 250. The reflective infrared radiation sensor 200 attached

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FIG.3



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 04 02 9653

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The present search report has been drawn up for all claims															
Place of search The Hague		Date of completion of the search 4 October 2006	Examiner Smolders, Rob												
<table border="0"><tr><td>CATEGORY OF CITED DOCUMENTS</td><td>T : theory or principle underlying the invention</td></tr><tr><td>X : particularly relevant if taken alone</td><td>E : earlier patent document, but published on, or</td></tr><tr><td>Y : particularly relevant if combined with another document of the same category</td><td>after the filing date</td></tr><tr><td>A : technological background</td><td>D : document cited in the application</td></tr><tr><td>O : non-written disclosure</td><td>L : document cited for other reasons</td></tr><tr><td>P : intermediate document</td><td>& : member of the same patent family, corresponding document</td></tr></table>				CATEGORY OF CITED DOCUMENTS	T : theory or principle underlying the invention	X : particularly relevant if taken alone	E : earlier patent document, but published on, or	Y : particularly relevant if combined with another document of the same category	after the filing date	A : technological background	D : document cited in the application	O : non-written disclosure	L : document cited for other reasons	P : intermediate document	& : member of the same patent family, corresponding document
CATEGORY OF CITED DOCUMENTS	T : theory or principle underlying the invention														
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Y : particularly relevant if combined with another document of the same category	after the filing date														
A : technological background	D : document cited in the application														
O : non-written disclosure	L : document cited for other reasons														
P : intermediate document	& : member of the same patent family, corresponding document														

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EPO FORM 1503 03 82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 04 02 9653

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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04-10-2006

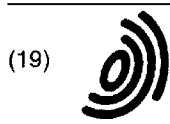
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82



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(11) **EP 1 647 503 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
19.04.2006 Bulletin 2006/16

(51) Int Cl.:
B65F 1/16 (2006.01)

(21) Application number: **05109467.0**

(22) Date of filing: **12.10.2005**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**
Designated Extension States:
AL BA HR MK YU

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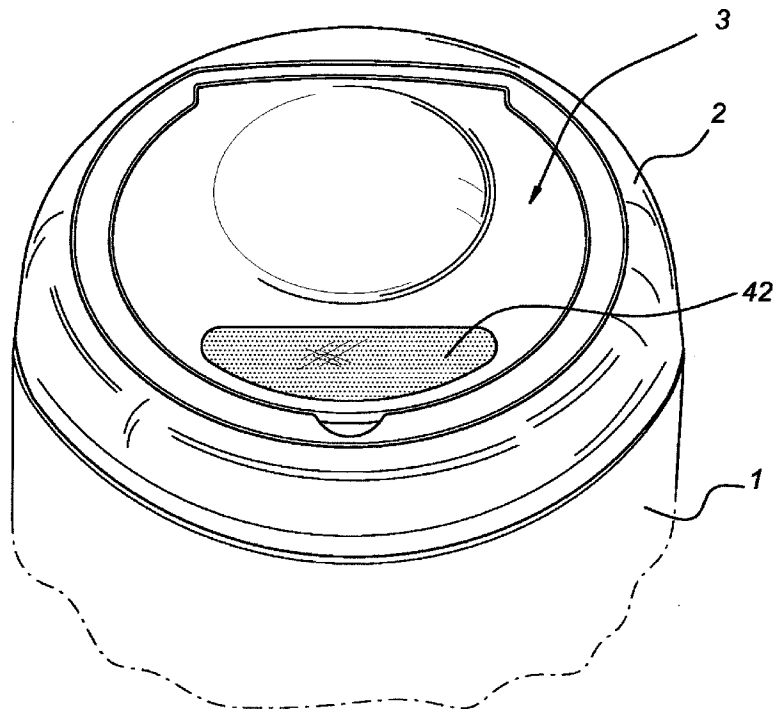
(30) Priority: **12.10.2004 NL 1027224**

(54) **Container with lid that can be operated electrically**

(57) A container comprises a container body (1) with a deposit opening, a lid (3) for closing off and, alternatively, exposing said opening as well as an electric control for moving the lid (3) between a closed position and an

open position. The electrical control has an electric motor (14), transmission (19-25,30-33), power source (15) and control means (16). The electric motor (14) is mounted in the lid (3) such that it is well protected from dirt.

Fig 1



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Description

[0001] The invention relates to a container, comprising a container body with a deposit opening, a lid for closing off and, alternatively, exposing said opening as well as an electric control for moving the lid between a closed position and an open position, which electric control comprises an electric motor, transmission, power source and control means.

[0002] Such a container is disclosed in EP-A 903 305. This known container has a lid that is mounted in a cap that is placed on the container body. An electric motor, which has a motor shaft with pinion, is mounted in the cap. The pinion engages in the toothing that is on the periphery of a quadrant that is fixed to the lid. By activating the electric motor the quadrant, and thus the lid, is moved between the open position and the closed position.

[0003] The disadvantage of such a construction is that it is relatively complex and that the motor and the transmission are split between both the cap and the lid. Should, for example, play arise between these components, the correct functioning of the lid can be adversely affected.

[0004] The aim of the invention is, therefore, to provide a container that has reliable operation and compact construction with regard to the movable lid. Said aim is achieved in that the electric motor is mounted on the lid.

[0005] Installation of the electric motor in the lid has the advantage that other components of the container are hardly involved or are not involved when operating the motor in connection with opening the lid. This effect is even more apparent if the transmission is also mounted on the lid. Furthermore, the power source can also be mounted on the lid. The lid with motor, transmission, power source and, optionally, also the control means for starting the motor form a compact unit that is easy to fit and, if necessary, to replace. It is clear that the transmission must have a point of reaction on the container body, which point of reaction can optionally also be on a cap in which the lid is mounted such that it can turn.

[0006] In this context the transmission preferably interacts with a shaft that cannot be turned with respect to the container body, on which shaft the lid is mounted such that it can turn. The transmission can have a number of gears that produce a reduction, such that the gear with the greatest reduction interacts with the shaft. Furthermore, the transmission can have two pulleys as well as a flexible member run over the pulleys, which pulleys produce a reduction such that the pulley with the greatest speed interacts with the motor shaft.

[0007] With the aim of improving the efficiency of the transmission and preventing peak loads for the motor that are too high, pretensioning means are provided for exerting a pretensioning force on the lid, which pretensioning force acts to force the lid into the open position. The pretensioning means can comprise an arm that is connected to the shaft, as well as a pretensioning spring that at one end is connected to the arm and at the other

end to the lid. Furthermore, a telescopic guide can be provided, around which a helical compression spring is fitted.

[0008] The electric control can comprise a sensor for activating the electric motor, which sensor is provided on the lid. There can be a sensor both on the inside and on the outside of the lid. The sensor on the outside detects whether there is a moving object in the vicinity, in response to which the control means open the lid. As long as the sensor on the inside still detects the movement of an object, the control means keep the lid in the open position. As soon as no further movement is detected, the control means can then emit a signal to close the lid.

[0009] The invention will be explained in more detail below with reference to an illustrative embodiment shown in the figures.

Figures 1 and 2 show the container with lid in the open and closed position, respectively.

Figures 3 - 6 show details of the mounting of the lid and the associated cap.

Figure 7 shows the lid in the dismantled state.

Figures 8a - c show various positions of a control member in plan view.

Figure 9 shows the control member in side view.

[0010] The container shown in Figures 1 and 2 comprises a container body 1 on which a cap 2 is placed in which the lid 3 is mounted such that it can pivot. In the edge of the cap 2 there is a recess 4, such that the lid 3 can also be grasped and opened by hand.

[0011] As shown in Figure 3, the lid 3 is mounted such that it can turn about a shaft to be described in more detail, one flattened end 5 of which protrudes with respect to the rear edge 6 of the lid 3. A recess 7 is provided at the other end of the rear edge 6, as shown in Figure 4. The lid 3 can be fitted in the cap 2 in a simple manner by first of all placing the flattened projection 5 in the correspondingly shaped flattened recess 8 in the cap, shown in Figure 5. The lid 3 is then tilted into the final position in which a pin 9 clicks into the recess 7 (Figure 4) thereof, which pin 9 is permanently pushed under spring pretension into the position in which it is pushed outwards, as shown in Figure 6. As a consequence of the flattened shape of the projection 5 and the recess 8, the shaft to be described in more detail cannot be turned with respect to the cap 2. Such an inability to turn is needed in order to be able to open the lid 3.

[0012] Figure 7 shows the lid 3 in the dismantled state with two lid halves 10, 11. The shaft 12, the flattened projection 5 of which can also be seen, is fitted in the one lid half 11 such that it can turn. The recess 7 that has been discussed above is on the other side of the lid half 11.

[0013] A transmission indicated in its entirety by 13, which is driven by the motor 14, engages on the shaft. A set of batteries 15 is accommodated in lid half 11.

[0014] Furthermore, the control means 16, as well as

the sensors 17, 18, are located in the lid half 11. As shown in more detail in Figure 8, the shaft 12 is mounted in the frame 21 such that it can turn. The gear 19 is fixed to the shaft 12, which is also shown in Figure 9. This gear 19 interacts with the further gear 20, which is mounted such that it can turn in the frame 21 that is fixed to the lid half. The gear 21 is coaxially connected to the gear 22, which meshes with the pinion 30. This pinion 30 is coaxially connected to the gear 31, which meshes with pinion 32, which is fixed coaxially to the pulley 24. This pulley 24 is connected by means of the cord 25 to the pulley 33 of small diameter on the shaft of motor 14.

[0015] The cord transmission 24, 25, 33 together with the gear transmission 19-22, 30-32 provides a reduction such that the lid can be opened gradually even with a motor 14 running at a high speed of revolution. During this operation the lid rotates about the shaft 12 that cannot be turned and which, after all, as a result of its flattened projection 5, is fixed with respect to the likewise flattened recess 8 in the cap 2.

[0016] In order to prevent peak loads on the motor 14, a pretensioning spring 26 is provided that interacts with the lever 27 on the shaft 12. The telescopic components 28, 29, which provide stability, are inside the spring 26.

[0017] As a consequence of the pretensioning of the spring, the drive provided by the motor 14 when initially lifting the lid from the approximately horizontal position is complemented by the drive of the pretensioned spring 26. When the lid is closed the spring is pretensioned again and made ready for the next action.

[0018] The sensors 17 (covered by the semi-transparent cover plate 42 as shown in Figure 1) which activate the control means 16 as soon as an object or movement is detected are on the outside of the lid. The sensors 18 (covered by the semi-transparent cover plate 43 as shown in Figure 2), which ensure that the lid remains in the open position as soon as a movement is detected, are on the inside of the lid. If no further detection signal is emitted after some time, the control means 16 emit a signal for closure of the lid.

[0019] The sensors 17, 18 are preferably infrared sensors. As a result the lid can be opened without touching it. The sensors 17, 18 are not active at the same time. After the lid has been opened, the sensor 17 on the outside is switched off and the sensor 18 on the inside is switched on. Switching takes place in the opposite direction on closure.

[0020] With the aim of being able to leave the lid permanently open, the sensors can be switched off by manually exerting a limited turning movement on the lid when the lid is in the open position. If the lid is then closed manually, the control means return to the normal status and the lid is ready for automatic operation again.

[0021] The shaft 12 has a slipping clutch 29. As a result the transmission cannot be forced if the lid is opened manually or if an excessively high load is exerted thereon.

[0022] The movements of the lid are furthermore controlled by the switches 34, 35 and 36, as shown in Figures

7 - 8. These switches are operated by the striker 37, which is mounted on the arm 38. This arm 38 is connected via a pivot joint 41 to a drive arm 39, which, in turn, is connected by means of a pivot joint 42 to the lever 40 on the shaft 12. When the shaft is turned, the arm 38, and thus the striker 37, executes the stroke shown in Figure 9.

[0023] In the part of this stroke that is at the bottom in the figures the striker 37 is in contact with the first limit switch 34, which stops the drive when the lid is closed. The second limit switch 35 stops the driving movement when the lid is opened.

[0024] The switch 36 located opposite the two limit switches 34, 35 ensures the lid is in the open position when it is operated manually. This switch 36 is activated during this operation such that the control device is switched off and the lid no longer closes automatically. The lid can then be closed again by moving it manually in the closing direction.

[0025] A significant advantage of installing all components, including the electronic components, in the lid results in it being possible to remove the lid from the container easily. Consequently the container can be cleaned well and there are no places that are difficult to reach.

Claims

1. Container, comprising a container body (1) with a deposit opening, a lid (3) for closing off and, alternatively, exposing said opening as well as an electric control for moving the lid (3) between a closed position and an open position, which electric control comprises an electric motor (14), transmission (19-25, 30-33), power source (15) and control means (16), **characterised in that** the electric motor (14) is mounted on the lid (3).
2. Container according to Claim 1, wherein the power source (15) is mounted on the lid (3).
3. Container according to Claim 1 or 2, wherein the transmission (19-25, 30-33) is mounted on the lid (3).
4. Container according to Claim 3, wherein the transmission (19-25, 30-33) interacts with a shaft (12) that cannot be turned with respect to the container body (1), on which shaft (12) the lid (3) is mounted such that it can turn.
5. Container according to Claim 4, wherein the transmission has a number of gears (19-22, 30-32) that produce a reduction, such that the gear (19) with the greatest reduction interacts with the shaft (12).
6. Container according to Claim 4 or 5, wherein the transmission has two pulleys (24, 33) as well as a flexible member (25) run over the pulleys (24, 33), which pulleys (24, 33) produce a reduction such that

the pulley (33) with the greatest speed interacts with the motor shaft.

7. Container according to one of the preceding claims, wherein pretensioning means (26-29) are provided for exerting a pretensioning force on the lid (3), which pretensioning force (26-29) acts to force the lid (3) into the open position. 5
8. Container according to Claim 7 in combination with one of Claims 4 - 6, wherein the pretensioning means comprise an arm (27) that is connected to the shaft (12), as well as a pretensioning spring (26) that at one end is connected to the arm (27) and at the other end to the lid (3). 10 15
9. Container according to Claim 8, wherein a telescopic guide (28, 29) is provided, around which a helical spring (26) is fitted. 20
10. Container according to one of the preceding claims, wherein the electric control (16) comprises at least one sensor (17, 18) for activating the electric motor (14), which sensor (17, 18) is provided in or on the lid (3). 25
11. Container according to Claim 10, wherein at least one sensor (17, 18) is provided for detecting the movement and/or presence of an object, hand and the like on the outside in connection with opening the lid (3). 30
12. Container according to Claim 10 or 11, wherein at least one sensor (17, 18) is provided for detecting an object, hand and the like on the inside of the lid, to prevent the closing movement of the lid (3) when such an object, hand and the like is detected. 35
13. Container according to one of the preceding claims, wherein the lid (3) is accommodated in a cap (2), which cap (2) can be placed on the container body (1). 40

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Fig 1

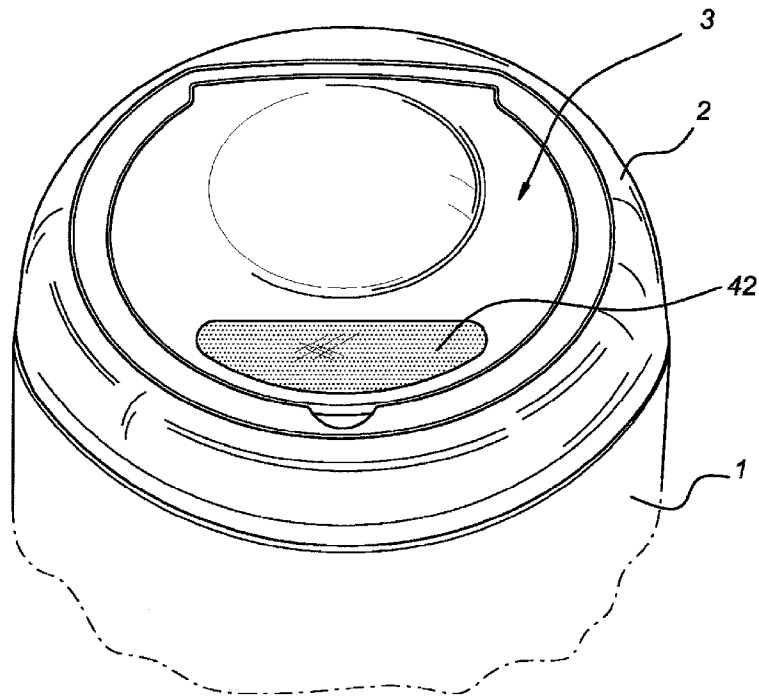


Fig 2

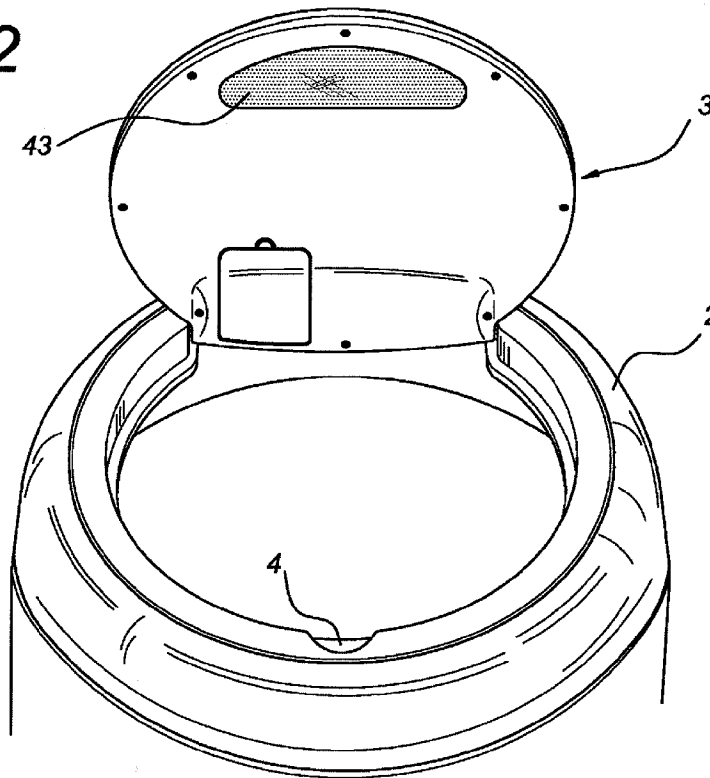


Fig 3

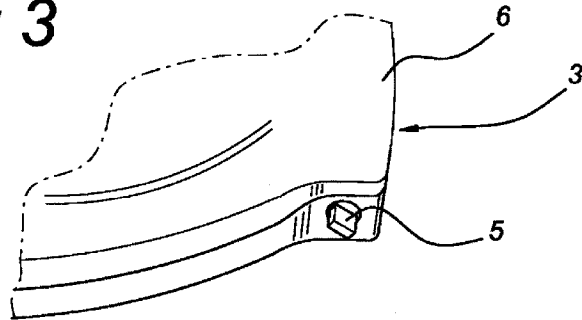


Fig 4

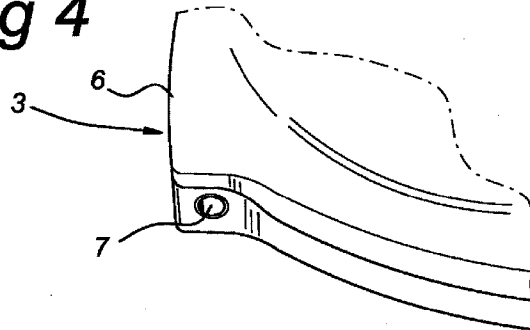


Fig 5

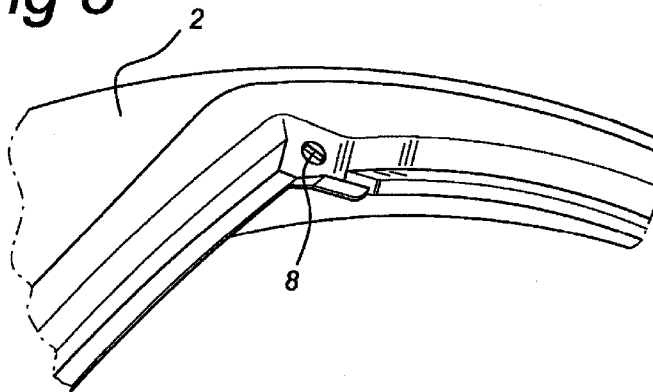


Fig 6

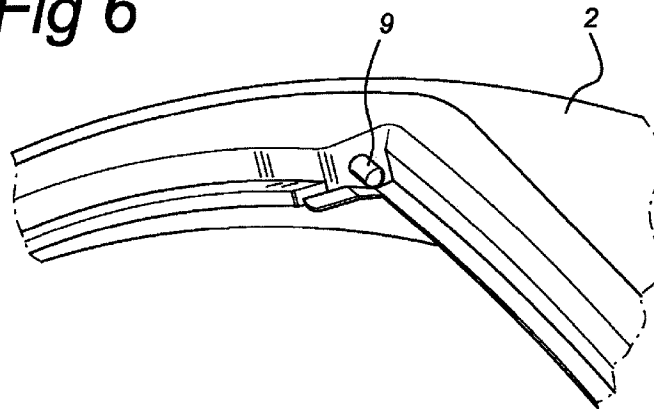


Fig 7

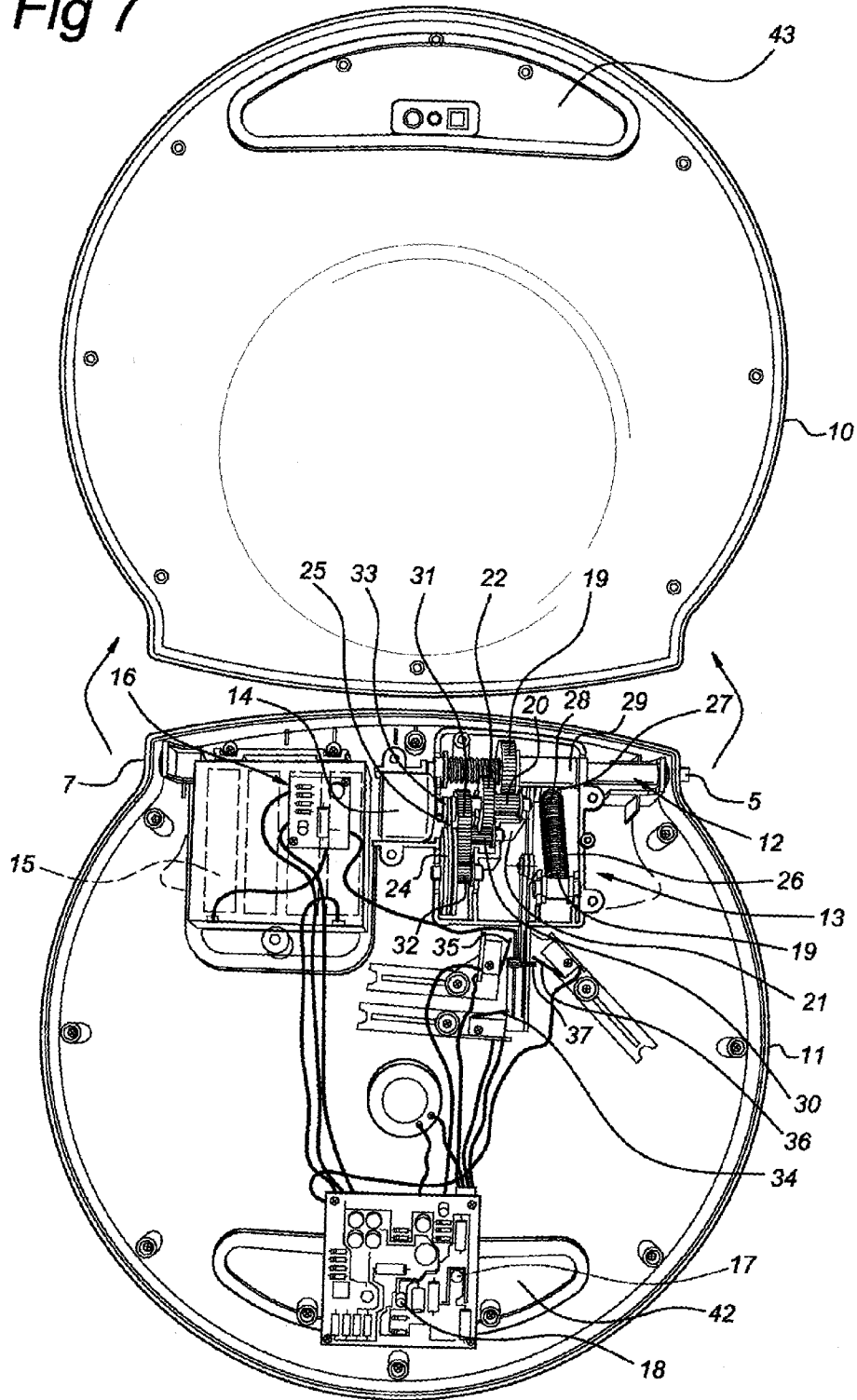


Fig 8a

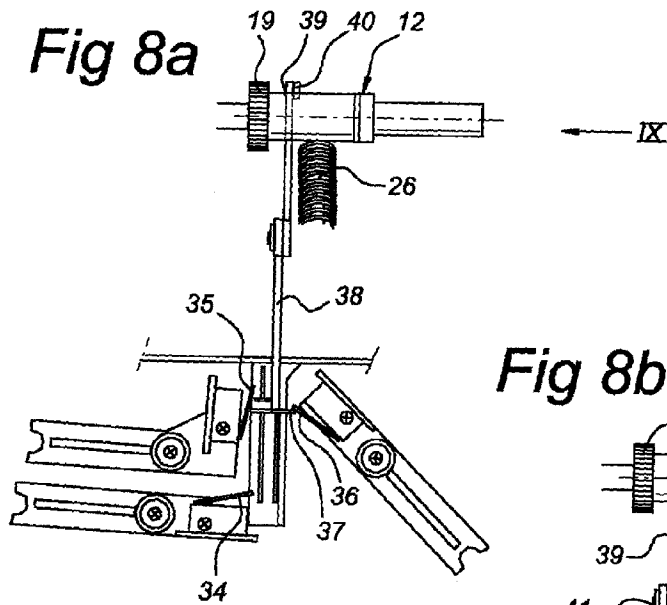


Fig 8b

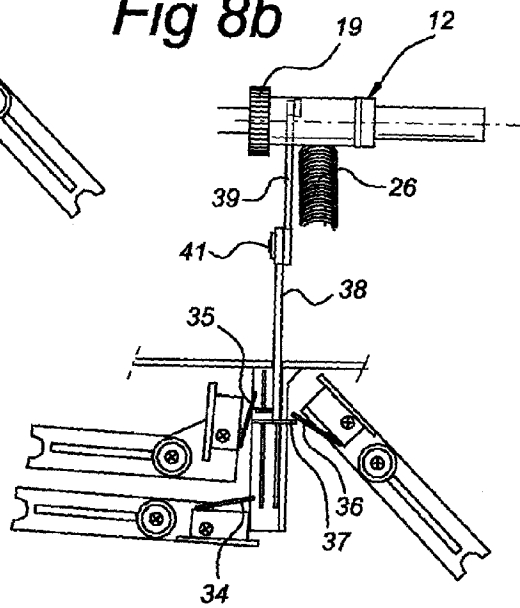


Fig 8c

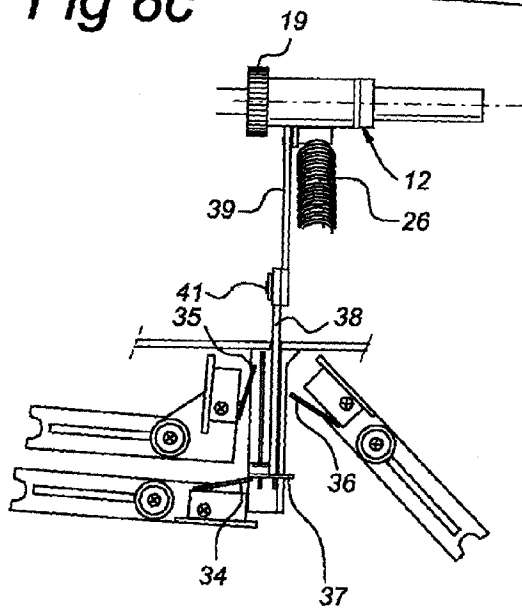
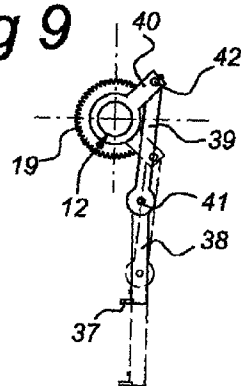


Fig 9



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EUROPEAN SEARCH REPORT

Application Number
EP 05 10 9467

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 25 33 161 A (KEELER BRASS CO.) 27 January 1977 (1977-01-27) * page 5, line 11 - page 8, line 30; figures 1-4 *	1,3,4	B65F1/16
D,A	EP 0 903 305 A (DAVID KENNEDY (ENGINEERS) HOLDINGS LTD) 24 March 1999 (1999-03-24) * the whole document *	1,7,10, 11,13	
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			TECHNICAL FIELDS SEARCHED (IPC)
			B65F E05F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 8 February 2006	Examiner Smolders, R
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EPO FORM 1503 (03.92) (P/MC/01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 05 10 9467

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08-02-2006

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EP 0903305	A	24-03-1999	NONE	
US 6774586	B1	10-08-2004	NONE	

EPC FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82



(11) **EP 1 918 223 A1**

(12)

EUROPEAN PATENT APPLICATION

published in accordance with Art. 153(4) EPC

(43) Date of publication:

07.05.2008 Bulletin 2008/19

(51) Int Cl.:

B65F 1/14 (2006.01)

B65F 1/00 (2006.01)

B65D 43/26 (2006.01)

(21) Application number: **05774362.7**

(86) International application number:

PCT/CN2005/001263

(22) Date of filing: **15.08.2005**

(87) International publication number:

WO 2006/097019 (21.09.2006 Gazette 2006/38)

(84) Designated Contracting States:

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR

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(54) **A GARBAGE CONTAINER AUTOMATICALLY OPENABLE THROUGH INFRARED INDUCTION**

(57) The garbage container, having a simple structure, a reliable performance, and being easy to install and cost effective, includes a container body, an infrared induction device, a movable cover automatically opened through infrared induction device, an infrared induction device, an automatic cover-opening device connected with the control unit, an output shaft of the driving motor connected with a cable-collecting wheel via a first set of reduction gears. One end of the cable is fixed to the cable-collecting wheel while the other end of the cable is connected with the cover. An output shaft of the cable-collecting wheel is connected with a cam via a second set of reduction gears. The protruding part of the cam is rotated to contact a cover-opening stroke switch and a cover-closing stroke switch respectively. The cover-opening stroke switch and the cover-closing stroke switch are connected respectively with the control unit through a data line.

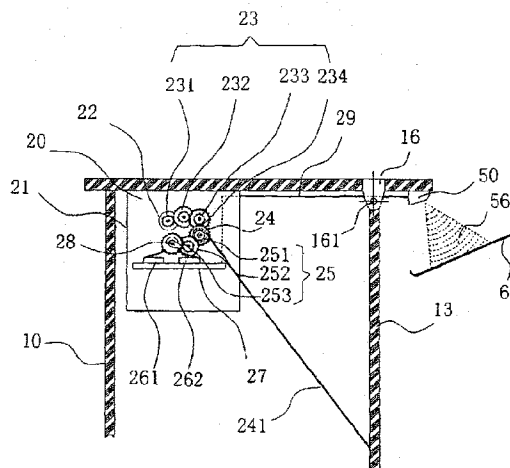


FIG. 2

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Description

Background of the Present Invention

Field of Invention

[0001] The present invention relates to a garbage container, and more particularly to a garbage container with an automatic cover.

Description of Related Arts

[0002] The existing garbage containers, having an automatic cover, do not have stroke switch, so the opening and closing time of the cover is controlled by a timing device. If the time interval is set longer than the time of actuation for the cover, the driving motor is still electrified after the opening or closing action is completed. In other words, the driving motor is blocked and unable to move after the opening or closing action is completed. If the time interval is set too short, the opening or closing action of the cover cannot be fully completed.

[0003] In addition, such automatically openable garbage containers generally use battery as the power source. However, the rotating speed is gradually slowing down as the battery voltage keeps dropping. Therefore, the time of the opening and closing process is changing with respect to the voltage of the battery.

[0004] Even through the automatically openable garbage container do have stroke switch, the design of the stroke switch is not proper. Some stroke switches are installed beside the cover, and connected with the space of the garbage container. After used for some time, the stroke switch will be corroded by the gas in the garbage container, which may affect the performance of the stroke switch, such as the contact disabling. Some stroke switches are too complicated to be installed.

Summary of the Present Invention

[0005] A main object of the present invention is to provide an automatically openable garbage container through infrared induction, using the cooperation between the stroke switch and the cam, and coordinating the opening and closing action of the garbage container to switch on or off the driving motor, and to avoid the block of the driving motor.

[0006] Another object of the present invention is to provide an automatically openable garbage container through infrared induction, installing the automatic cover-opening device in a casing to avoid switch disabling that may affect the performance of the present invention.

[0007] Accordingly, in order to accomplish the above object, the present invention provides an automatically openable garbage container through infrared induction, comprising:

a garbage container, having at least one opening for

littering at one side, and a cover mounted on the opening for littering in moveable manner from an opening position to a closing position;

an infrared induction device, mounted in the garbage container above the opening for littering, comprises an infrared transmitting tube and a infrared receiving tube, wherein the infrared transmitting tube transmits infrared pulse signals in front of the opening for littering forming a induction area, and the infrared receiving tube receives the infrared pulse signals reflected by a barrier in the induction area and converts the infrared pulse signals to corresponding electric signals;

an automatic cover-opening device mechanically connected with the cover via a cable; and

a control unit communicatively connected with the infrared induction device and the automatic cover-opening device,

wherein the automatic cover-opening device comprises:

a driving motor connected with the control unit;

a first set of reduction gears connected to the output shaft of the driving motor to be driven;

a cable-collecting wheel connected with the first set of reduction gears wherein one end of the cable is connected to the cable-collecting wheel, and the other end is connected to the cover;

a second set of reduction gears connecting to the output shaft of the cable-collecting wheel to drive the cable-collecting wheel; and

a cam connecting to the output shaft of the second set of reduction gears to be driven, that can rotate to touch a cover-opening stroke switch and a cover-closing stroke switch respectively, wherein the cover-opening stroke switch and cover-closing stroke switch is electrically connected with the control unit via a wire.

[0008] Accordingly, the automatic cover-opening device is mounted in a casing mounted on the upper inner side of the garbage container.

[0009] Accordingly, when the cover is in opening position, the cam rotates happening to touch the cover-opening stroke switch, meanwhile the cover-opening stroke switch sends a signal to the control unit to control the driving motor to stop rotating, and the friction of the first set of reduction gears, the second set of reduction gears and the driving motor is larger than the weight of the cover.

[0010] Accordingly, when the cover is in opening po-

sition, the infrared transmitting tube keeps sending infrared pulses signals to the induction area, and the cover does not close until the infrared receiving tube can not receive the infrared pulses signals reflected by the barrier.

[0011] Accordingly, when the cover is in closing position, the cam rotates happening to touch the cover-closing stroke switch, meanwhile the cover-closing stroke switch sends a signal to the control unit to control the driving motor to stop rotating.

[0012] Accordingly, the garbage container further comprises an electric motor positive and negative turn driving circuit to connect the control unit with the driving motor.

[0013] Accordingly, the garbage container further comprises an infrared driving circuit, an amplifying circuit, and a comparative circuit, wherein the control unit is connected with the infrared transmitting tube through the infrared driving circuit, and the infrared receiving tube is connected with the control unit through the amplifying circuit and the comparative circuit.

[0014] Accordingly, the output of the first set of reduction gears is mechanically connected with the input of the second set of reduction gears.

[0015] Accordingly, the cover is pivotally mounted on a shaft base via a shaft.

[0016] Accordingly, the cam comprises two pin rods or swing rods having a predetermined separated angle respectively, wherein the two pin rods or swing rods touch the cover-opening stroke switch and cover-closing stroke switch respectively.

[0017] These and other objectives, features, and advantages of the present invention will become apparent from the following detailed description, the accompanying drawings, and the appended claims.

Brief Description of the Drawings

[0018]

Fig. 1 is a perspective view of an automatically openable garbage container according to a preferred embodiment of the present invention.

Fig. 2 is a side sectional enlarged view of the automatically openable garbage container according to the above preferred embodiment of the present invention.

Fig. 3 is an enlarged view of an automatic cover-opening device of the automatically openable garbage container according to the above preferred embodiment of the present invention.

Fig. 4 is a schematic diagram of working principle of the automatically openable garbage container according to the above preferred embodiment of the present invention.

Fig. 5 is a chart flow of the microcontroller chip program of the automatically openable garbage container according to the above preferred embodiment of the present invention.

Fig. 6 is a preferred circuit diagram of the automatically openable garbage container according to the above preferred embodiment of the present invention.

Fig. 7A and 7B are schematic views of cam structure with pin rods according to the above preferred embodiment of the present invention.

Fig. 8A and 8B are schematic views of cam structure with swing rods according to the above preferred embodiment of the present invention.

Detailed Description of the Preferred Embodiment

[0019] Referring to Fig. 1 of the drawings, an automatically openable garbage container according to a preferred embodiment of the present invention is illustrated, in which the garbage container comprises a container body 10 with a cover 13, an automatic cover-opening device 20, an infrared induction device 50, and a control unit communicated with the infrared induction device 50 and the automatic cover-opening device 20, such a microcontroller chip.

[0020] The container body 10 has an opening for littering 11 on the side, and a door 15 under the opening for littering 11. The cover 13 is mounted on a shaft base 16 of the container body 10 through a shaft 16, and the cover is moveable between an opening and a closing position. The automatic cover-opening device 20 is connected with the cover 13 through a cable 241. The infrared induction device 50 comprising an infrared transmitting tube and an infrared receiving tube is mounted on the container body 10 above the opening for littering. The infrared transmitting tube transmits infrared pulse signals forming an induction area 56 in front of the opening for littering, and the infrared receiving tube receives the infrared pulse signals reflected by a barrier 60, converts the infrared pulse signals to the corresponding electrical signal, and outputs the electrical signal to the control unit.

[0021] When the infrared induction device 50 inducts a barrier 60, the control unit controls automatic cover-opening device 20 to draw back the cable 241, driving the cover 13 from a closing position to an opening position. And contrarily, when the infrared induction device 50 inducts a barrier 60 being away, the control unit controls automatic cover-opening device 20 to release the cable 241, letting the cover 13 from an opening position to a closing position.

[0022] Please referring to FIG.2 and 3 of the drawings, the structure of the automatic cover-opening device 20 of the automatically openable garbage container according to a preferred embodiment of the present invention

is illustrated. The automatic cover-opening device 20 packed in a casing 21 is mounted on the up and inner side of the container body 10. The automatic cover-opening device 20 in the casing comprises a driving motor 22, a first set of reduction gears 23, a cable-collecting wheel 24, a second set of reduction gears 25, a cover-opening stroke switch 261, a cover-closing stroke switch 262, and a main circuit board 27. The first set of reduction gears 23 comprises two single gears 231 and 234 and two tandem gears 232 and 233, and the second set of reduction gears 25 comprises two single gears 251 and 253 and one tandem gear 252, wherein the single gear 234 and 251 use a same shaft.

[0023] The single gear 231 is disposed on the output shaft 221 of the driving motor 22, driving the gears 232, 233 and 234 in turn through the connection between them. The cable-collecting wheel 24 uses a same shaft with gears 234 and 251. One end of the cable 241 is connected with the cable-collecting wheel 24, and the other end of the cable 241 is connected with the cover 13 through the casing 21. The cable-collecting wheel 24 is mechanically connected with a cam 28 through a connection with gears 251, 252 and 253 in turn. The cam 28 can touch stroke switches 261 and 262 when it rotates. The main circuit board 27 comprises a comparative circuit 271 and an infrared driving circuit 272, a control unit 273, and an electric motor positive and negative turn driving circuit 274, as shown in Fig. 4. The cover-opening stroke switch and cover-closing stroke switch are connected with the control unit 273, such as microcontroller chip, through data lines 281 and 282. The main circuit board 27 is connected with the induction device 50 through a data line 29.

[0024] The control unit 273 controls the infrared transmitting tube sending infrared pulse signals to the induction area 56 in a predetermined time interval. When a barrier is close to the induction area 56, the infrared receiving tube receives the infrared pulse signals reflected by the barrier, and sends a control signal to the control unit 273, and then the control unit controls the opening or closing of the cover 13.

[0025] To open the cover 13, the driving motor 22 rotates clockwise driving the cable-collecting wheel 24 to rotate anti-clockwise via the first set of reduction gears, and drawing back the cable 241 to drive the cover 13 from a closing position to an opening position. Meanwhile, the output shaft of the cable-collecting wheel 24 drives the cam 28 to rotate via the second set of reduction gears 25. As the cable-collecting wheel 24 rotates anti-clockwise for a few circles, the cover 13 is opened to a maximum extent, the opening position. The cam 28 also rotates anti-clockwise to a certain degree happening to touch the cover-opening stroke switch 261. The cover-opening stroke switch 261 controls the driving motor 22 to stop rotating clockwise via circuit.

[0026] To close the cover 13, the driving motor 22 rotates anti-clockwise driving the cable-collecting wheel 24 to rotate clockwise, and releasing the cable 241 to close the cover 13 from a closing position to an opening position

by its own weight. As the cable-collecting wheel 24 rotates clockwise for a few circles, the cover 13 is entirely closed, the closing position. Meanwhile, the cam 28 also rotates clockwise to a certain degree happening to touch the cover-closing stroke switch 262. The cover-closing stroke switch 262 controls the driving motor 22 to stop rotating anti-clockwise via circuit.

[0027] Fig. 4 illustrates the schematic diagram of electromechanical working principle of the automatically openable garbage container of the present invention. As shown in Fig. 4, three outputs of the control unit 273 are connected with the infrared driving circuit 272 and the electric motor positive and negative turn driving circuit 274 respectively, and the inputs of control unit 273 are connected with the comparison circuit 271, cover-opening stroke switch 261, and cover-closing stroke switch 262 respectively. The infrared receiving tube 52 is connected with the input of an amplifying circuit 53, the output of the amplifying circuit 53 is connected with the input of a comparison circuit 271, and the infrared transmitting tube 51 is connected with the infrared driving circuit 272. In this preferred embodiment, the infrared transmitting tube 51, the infrared receiving tube 52, and the amplifying circuit 53 are disposed in the casing of the infrared induction device 50. The comparison circuit 271, the infrared driving circuit 272, the control unit 273, and the electric motor positive and negative turn driving circuit 274 are mounted on the main circuit board 27.

[0028] The operation of the present invention is described explicitly hereinafter with Fig. 2 and Fig. 4.

[0029] The control unit 273 controls the infrared transmitting tube 51 via the infrared driving circuit 272 sending infrared pulse signals to the induction area 56 in a predetermined time interval. When a barrier is close to the induction area 56, the infrared receiving tube 52 receives the infrared pulse signals reflected by the barrier 60. The signals are sent to an input of the control unit 273 through the amplifying circuit 53 and the comparison circuit 271. After the control unit 273 receives the signals, the output of the control unit 273 controls the electric motor positive and negative turn driving circuit 274 to make the driving motor 22 rotate clockwise. And the driving motor 22 drives the cable-collecting wheel 24 to rotate anti-clockwise via the first set of reduction gears to enlase the cable 241 to the cable-collecting wheel 24, so the other end of the cable 241 opens the cover 13. As the cover is opened to the maximum extent, the cam 28 rotates anti-clockwise to a certain degree happening to touch the cover-opening stroke switch 261, and then the cover-opening stroke switch 261 sends a signal to the input of the control unit 273 to stop the clockwise rotation of the driving motor 22 via electric motor positive and negative turn driving circuit 274. Because the weight of the cover 13 is less than the friction between the first and second set of reduction gears 23, 24 and the driving motor 22, the cover remains opening. Meanwhile, the infrared induction device 50 keeps transmitting infrared pulse signals to the induction area 56. If the barrier is still in the induction area 56, and

the infrared receiving tube 52 receives the infrared pulse signals reflected by the barrier, the cover 13 remains opening.

[0030] Once the barrier leaves the induction area 56, and the infrared receiving tube 52 can not receive the infrared pulse signals reflected by the barrier, the cover 13 will remain opening for at most 3s. And then the control unit 273 controls the electric motor positive and negative turn driving circuit 274 to make the driving motor 22 rotate anti-clockwise. The driving motor 22 drives the cable-collecting wheel 24 to rotate clockwise via the first set of reduction gears to release the cable 241, and the cover 13 closes the opening for littering 11 by its own weight. Meanwhile, the cam 28 rotates clockwise to a certain degree happening to touch the cover-closing stroke switch 262, and then the cover-closing stroke switch 262 sends a signal to the input of the control unit 273 to stop the anti-clockwise rotation of the driving motor 22 via the electric motor positive and negative turn driving circuit 274. When the cover is fully closed, the driving motor stops rotating. Thus an opening and closing process is completed.

[0031] Referring to Fig. 6 of the drawings, a preferred circuit diagram according to the present invention is illustrated. The cover-opening strokes 261 and the cover-closing stroke switch 262 are connected with a resistance R15 and a resistance R14 in series respectively, and connected to the two ends of the power source respectively. Meanwhile, the junction of the over-opening strokes 261 and the resistance R15 and the junction of the cover-closing stroke switch 262 and the resistance R14 are connected with a port RB1 and a port RB2 of the microcontroller chip IC3 as the 273 shown in Fig. 4. When the cam 28 touches the cover-opening strokes 261, RB1=0 (low voltage) and RB2=1 (high voltage); when the cam 28 touches the cover-closing stroke switch 262, RB1=1 (high voltage) and RB2=0 (low voltage). The microcontroller chip judges the stopping moments of clockwise or anti-clockwise via the high or low voltage of the ports RB1 and RB2.

[0032] Referring the flow chart as show in Fig.5 with Fig. 3 and Fig. 6, when a barrier 60 entering into the induction area 56 is confirmed, the program sets RA0=1 and RA1=0, and the transistors Q2 and Q5 conduct. At this moment, the driving motor 22 is applied with positive voltage to rotate clockwise. As the driving motor drives the cable-collecting wheel 24 and the cam 28 to rotate via sets of reduction gears 23 and 25, the program keeps judging the voltage of the port RB1. When the cam 28 rotates anti-clockwise happening to touch the cover-opening stroke switch 261, the cover-opening stroke switch 261 is switched on. And then the high voltage of the port RB1 turns to low voltage, and the program sets RA0=0 and RA1=0 to cut off Q2 and Q5. The driving motor 22 stops rotating due to no current flow. Then the program controls the port RB3 to send a set of infrared coded pulse to the induction area 56, in order to judge whether the barrier leaves the induction area. If the bar-

rier 60 is still in the induction area, the program makes judgment in 3s.

[0033] Once the barrier leaves the induction area, the program sets RA0=0 and RA1=1. Q3 and Q4 conduct. At this moment, the driving motor 22 is applied with negative voltage to rotate anti-clockwise. As the driving motor drives the cable-collecting wheel 24 and the cam 28 to rotate via sets of reduction gears 23 and 25, the program keeps judging the voltage of the port RB2. When the cam 28 rotates clockwise happening to touch the cover-closing stroke switch 262, the cover-closing stroke switch 262 is switched on. The high voltage of the port RB2 turns to low voltage, and then the program sets RA0=0 and RA1=0 to cut off Q4 and Q3. The driving motor 22 stops rotating due to no current flow. Thus a cover opening and closing process is completed, and then the program returns to be ready for the next process.

[0034] The cam described in the present invention mainly has a function of touching the cover-opening and cover-closing stroke switch, not only the concept in the conventional mechanism. The cam in the conventional mechanism is only a special case of the present invention. When the projection portion of the cam is widened, the return angle of the cam needed to touch the cover-opening stroke switch or the cover-closing stroke switch becomes smaller; when the projection portion of the cam is narrowed, the return angle of the cam becomes bigger, so changing the width of the projection portion can adjust the return angle of the cam, so as to adjust the rotation circles of the cable-collecting wheel under the circumstance of the gear ratio unchanged, to change the stroke of the cable 241 to adjust the opening angle of the cover 13 or to be suitable for the garbage container of different size.

[0035] Fig. 7A, 7B and 8A, 8A illustrate two alternative modes of the cam structure of the present invention. Fig. 7B is the top exterior view of Fig. 7A, and Fig. 8B is the top exterior view of Fig. 8A. As shown in Fig. 7A, and 7B, the cam structure of the present invention can be replaced by two pin rods 283 and 284. The pin rod 283 is in charge of touching the cover-opening stroke switch 261, and the pin rod 284 is in charge of touching the cover-closing stroke switch 262. Two pin rods are fixed on the gear 253, so adjusting the separation angle between the pin rods 283 and 284 can change the stroke of the cable 241.

[0036] As shown in Fig. 8A and 8B, the cam structure of the present invention can be replaced by two swing rods 285 and 286. The swing rod 285 is in charge of touching the cover-opening stroke switch 261, and the swing rod 286 is in charge of touching the cover-closing stroke switch 262. Two swing rods are fixed on the gear 253, so adjusting the separation angle between the swing rods 285 and 286 can change the stroke of the cable 241.

[0037] The present invention coordinates the opening and closing of the cover through cooperation of the stroke switch and the cam, which effectively avoids the block of the driving motor. The present invention also mounts the automatic cover-opening device such as stroke switch in

a casing, such that the performance of the stroke switch can be assured, because the garbage container will not be corroded by the gas in the garbage container to cause the contact disabling. The garbage container has a simple structure, a reliable performance, and is easy to install and cost effective. Further more, the present invention has an automatic cover-opening function through infrared induction controlled by a microcontroller integrating optics and electromechanics.

[0038] One skilled in the art will understand that the embodiment of the present invention as shown in the drawings and described above is exemplary only and not intended to be limiting.

[0039] It will thus be seen that the objects of the present invention have been fully and effectively accomplished. Its embodiments have been shown and described for the purposes of illustrating the functional and structural principles of the present invention and is subject to change without departure from such principles. Therefore, this invention includes all modifications encompassed within the spirit and scope of the following claims.

Claims

1. An automatically openable garbage container through infrared induction, comprising:

a garbage container, having at least one opening for littering at one side, and a cover mounted on said opening for littering in moveable manner from a opening position to a closing position; an infrared induction device, mounted in the garbage container above said opening for littering, comprises an infrared transmitting tube and an infrared receiving tube, wherein said infrared transmitting tube transmits infrared pulse signals in front of the opening for littering forming an induction area, and said infrared receiving tube receives the infrared pulse signals reflected by a barrier in said induction area and converts said infrared pulse signals to corresponding electric signals;

an automatic cover-opening device mechanically connected with said cover via a cable; and a control unit communicatively connected with said infrared induction device and said automatic cover-opening device,

wherein said automatic cover-opening device comprises:

a driving motor connected with said control unit; a first set of reduction gears connected to the output shaft of said driving motor to be driven; a cable-collecting wheel connected with said first set of reduction gears wherein one end of said cable is connected to said cable-collecting

wheel, and the other end is connected to said cover;

a second set of reduction gears connecting to the output shaft of said cable-collecting wheel to drive said cable-collecting wheel; and a cam connecting to the output shaft of said second set of reduction gears to be driven, that can rotate to touch a cover-opening stroke switch and a cover-closing stroke switch respectively, wherein said cover-opening stroke switch and cover-closing stroke switch is electrically connected with said control unit via a wire.

2. The automatically openable garbage container through infrared induction, as recited in claim 1, wherein said automatic cover-opening device is mounted in a casing mounted on the upper inner side of said garbage container.
3. The automatically openable garbage container through infrared induction, as recited in claim 1 or 2, wherein, when said cover is in opening position, said cam rotates happening to touch said cover-opening stroke switch, meanwhile said cover-opening stroke switch sends a signal to said control unit to control said driving motor to stop rotating, and the friction of said first set of reduction gears, said second set of reduction gears and said driving motor is larger than the weight of said cover.
4. The automatically openable garbage container through infrared induction, as recited in claim 3, wherein, when said cover is in opening position, said infrared transmitting tube keeps sending infrared pulses signals to said induction area, and said cover does not close until said infrared receiving tube can not receive the infrared pulses signals reflected by said barrier.
5. The automatically openable garbage container through infrared induction, as recited in claim 4, wherein, when said cover is in closing position, said cam rotates happening to touch said cover-closing stroke switch, meanwhile said cover-closing stroke switch sends a signal to said control unit to control said driving motor to stop rotating.
6. The automatically openable garbage container through infrared induction, as recited in claim 5, wherein said garbage container further comprises an electric motor positive and negative turn driving circuit to connect said control unit with said driving motor.
7. The automatically openable garbage container through infrared induction, as recited in claim 6, wherein garbage container further comprises an infrared driving circuit, an amplifying circuit, and a com-

parative circuit, wherein said control unit is connected with said infrared transmitting tube through said infrared driving circuit, and said infrared receiving tube is connected with said control unit through said amplifying circuit and said comparative circuit.

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8. The automatically openable garbage container through infrared induction, as recited in claim 7, wherein the output of said first set of reduction gears is mechanically connected with the input of said second set of reduction gears.
9. The automatically openable garbage container through infrared induction, as recited in claim 1, wherein said cover is pivotally mounted on a shaft base via a shaft.
10. The automatically openable garbage container through infrared induction, as recited in claim 1, wherein said cam comprises two pin rods or swing rods having a predetermined separated angle respectively, wherein said two pin rods or swing rods touch said cover-opening stroke switch and cover-closing stroke switch respectively.

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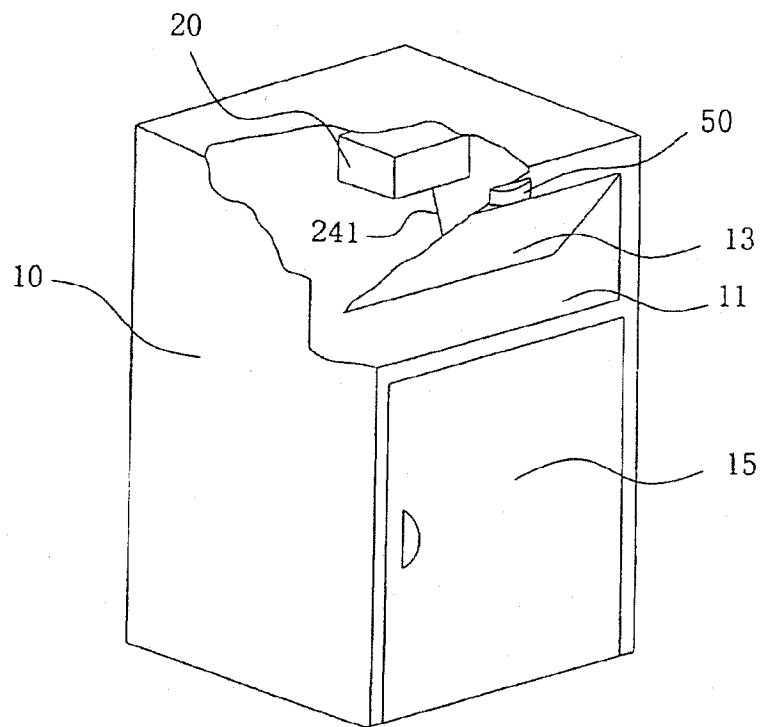


FIG. 1

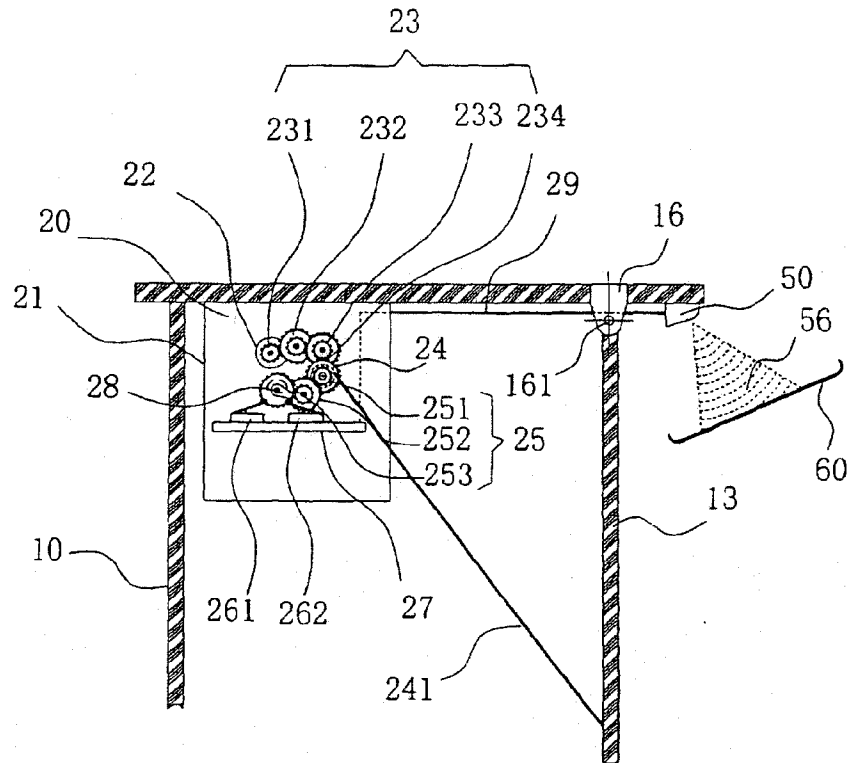


FIG. 2

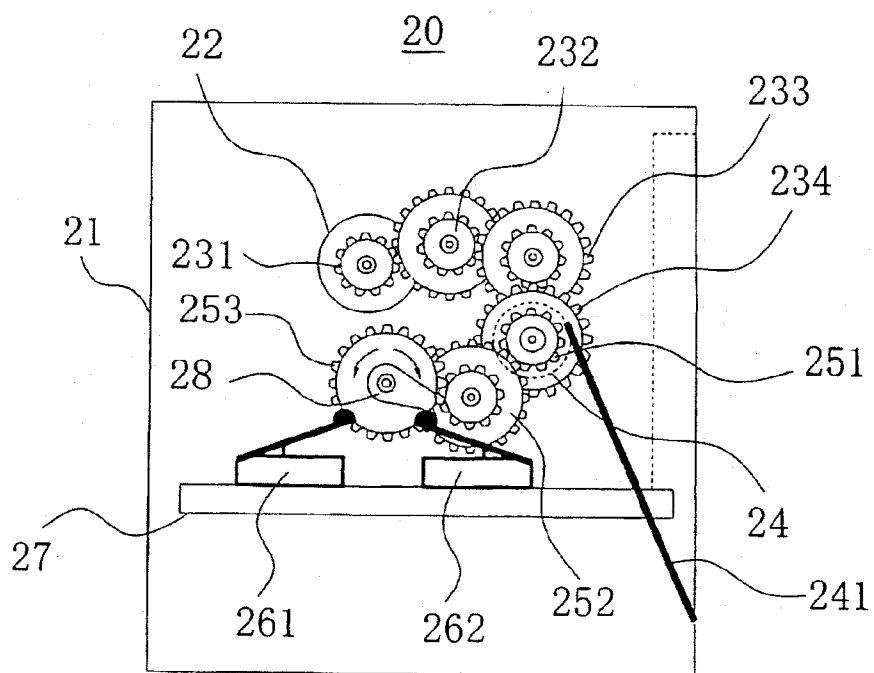


FIG. 3

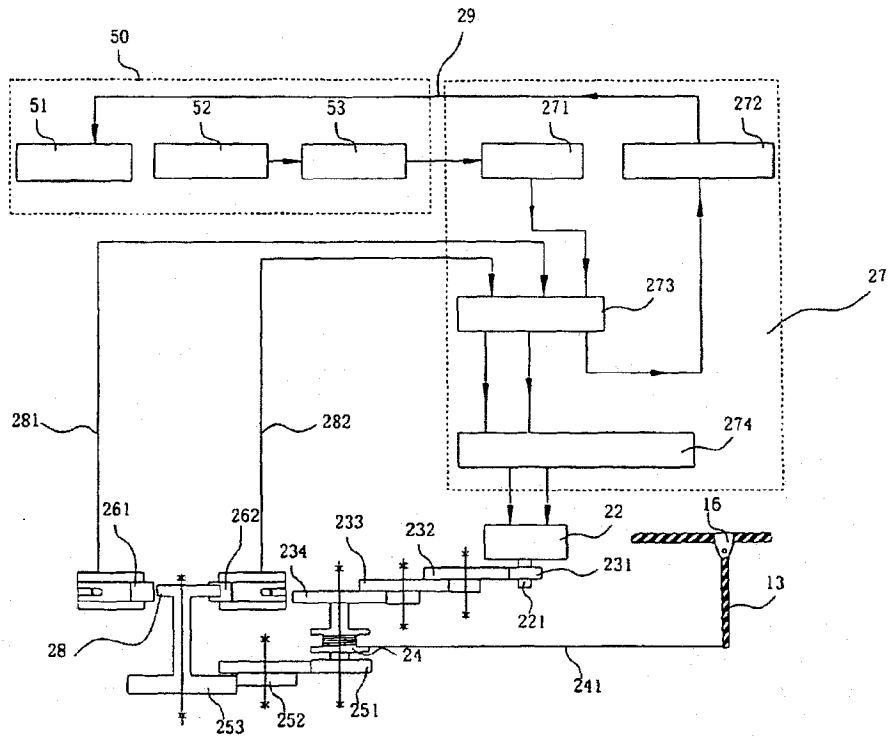


FIG. 4

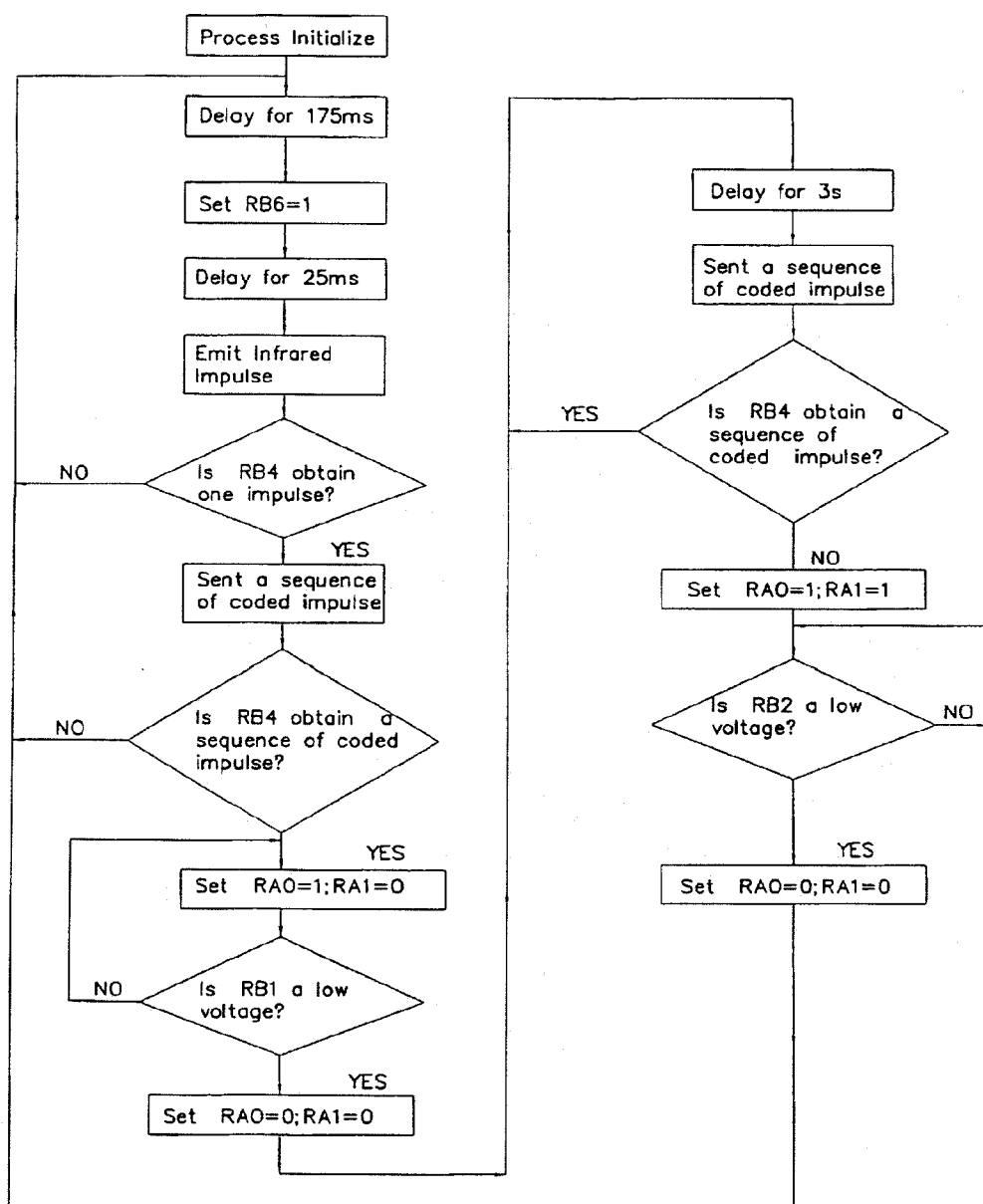


FIG.5

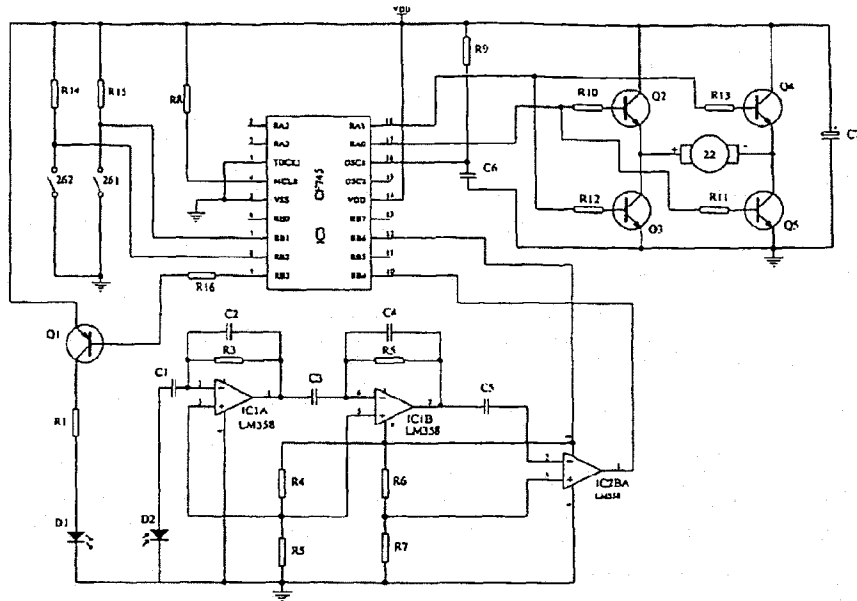


FIG. 6

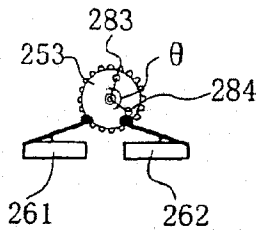


FIG. 7A

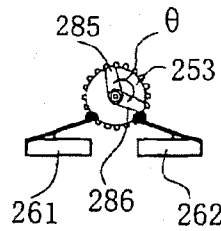


FIG. 8A

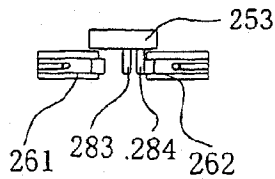


FIG. 7B

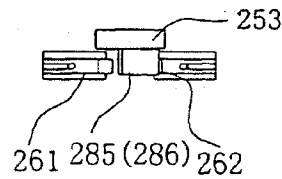


FIG. 8B

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2005/001263

A. CLASSIFICATION OF SUBJECT MATTER According to International Patent Classification (IPC) or to both national classification and IPC IPC ⁷ : B65F1/14, B65F1/00, B65D43/26		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC ⁷ : B65F1/14, 1/00, B65D43/26, 43/00 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched CNPAT: Chinese patent and utility model Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) CNPAT, WPI, EPODOC, PAJ keyword: dustbin, garbage, container, cam, switch, infrared, gear+, motor		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 5329212 (Michael J. Feigleson) 12.JUL.1994 (12.7.1994), the whole document	1-10
A	US, A, 4996467 (Jong-yih day) 26.FEB.1991 (26.2.1991), the whole document	1-10
A	CN, Y, 2606082 (Zhang Zhemin) 10.MAR.2004 (10.3.2004), the whole document	1-10
A	CN, Y, 2437639 (Wang huantu) 4 JUL.2001(4.7.2001), the whole document	1-10
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "I" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 18.DEC.2005 (18.12.2005)		Date of mailing of the international search report 29 · DEC 2005 (29 · 12 · 2005)
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R. China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451		Authorized officer Hu Zejian Telephone No. 86-10-62085526

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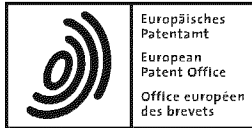
INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2005/001263

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
US, A, 5329212	12.JUL.1994	NONE	
US, A, 4996467	26.FEB.1991	NONE	
CN, Y, 2606082	10.MAR.2004	NONE	
CN, Y, 2437639	4. JUL.2001	NONE	

Form PCT/ISA/210 (patent family annex) (April 2005)

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(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

11.09.2013 Bulletin 2013/37

(51) Int Cl.:

B65F 1/06 (2006.01)

B65F 1/16 (2006.01)

(21) Application number: **13158229.8**

(22) Date of filing: **07.03.2013**

(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**

Designated Extension States:

BA ME

(30) Priority: **09.03.2012 US 201261609233 P**

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(54) **Trash can assembly**

(57) A trash can assembly (20) comprising a body component (22), a lid (24) mounted relative to the body component (22) and configured to move between open and closed positions, the lid (24) having lid driving mechanism components (74), such as flanges (88, 90), a power operated driving mechanism (58) comprising a drive motor (78) coupled with a shaft (80), and a clutch mechanism (84) engageable with the lid driving mechanism components (74), the clutch mechanism (84) configured

to receive torque from the drive motor (78) via the shaft (80) and to transmit the torque to the lid driving mechanism components (74) to move the lid (24) between the open and closed positions; wherein the lid driving mechanism components (74) and the clutch mechanism (84) are configured to allow a user to manually move the lid (24) between the open and closed positions substantially without applying torque to at least one of: the motor (78), the shaft (80), and the clutch mechanism (84).

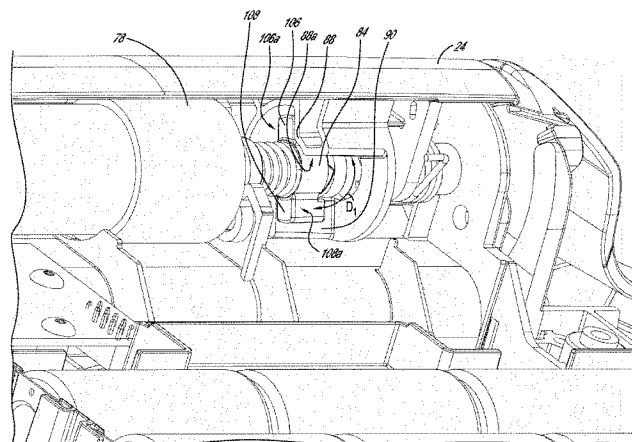


FIG. 13

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Description**CROSS-REFERENCE TO RELATED APPLICATIONS**

[0001] This application claims the priority benefit under 35 U.S.C. § 119(e) of U.S. Provisional Patent Application No. 61/609,233, filed March 9, 2012, the entirety of which is incorporated herein by reference.

BACKGROUNDField

[0002] Some embodiments relate to power transfer devices, such as mechanisms for operating lids or doors for receptacles.

Description of the Related Art

[0003] Receptacles and other devices with mechanisms for transferring power to a subcomponent, such as a lid or a door, are used in a variety of different settings. For example, in both residential and commercial settings, trash cans and other devices often have lids for protecting or preventing the escape of the contents of the receptacle. Some trash cans include lids or doors to prevent odors from escaping and to hide the trash within the receptacle from view. Additionally, the lid of a trash can help prevent contamination from escaping from the receptacle.

[0004] Some commercially available trash cans have powered or manually operated lids. Such cans generally include a motor that drives a gear assembly, which in turn drives the lid open and closed. Such trash cans can include a sensor positioned on or near the lid. Such a sensor can be configured to detect movement, such as a user's hand being waived near the sensor, as a signal for opening the lid. When such a sensor is activated, a motor within the trash receptacle opens the lid or door and thus allows a user to place items into the receptacle. Afterwards, the lid can be automatically closed.

[0005] However, certain conventional power or manually operated lids present some difficulties. For example, users of current trash cans with power operated lids can experience problems if the trash within the receptacle or can is piled higher than the level of the lid itself. If the trash or other material within the can is higher than the level of the lid itself, the lid will be unable to completely close. This can cause the motor or batteries to wear down, continue running, and/or ultimately fail. It can also force the user to reset the controller, remove trash, or manually compress the trash until the lid can be closed.

[0006] A number of other problems are associated with the deployment, use, and removal of receptacle liners, such as trash bags. A common problem is associated with maintaining the trash bag suspended at the top of the trash open with the mouth of the trash bag opened. For example, a user typically needs to fold the top edge

of the trash bag over the top edge of the trash can or its internal liner to maintain the mouth of the trash bag opened at the top of the trash can or an internal liner. However, the weight of the waste materials deposited into the trash bag may cause the trash bag to slip from the mouth of the trash can and fall into the interior of the trash can. This can result in the undesirable spillage of the waste material inside the trash bag and/or the inconvenience of having to reach into the interior of the trash can to retrieve and reposition the bag onto the trash can.

[0007] Further, problems can exist when a user manually opens and closes the lid or door of a trash receptacle configured to transfer power to the lid or door. Whether intentional or accidental, the act of directly manually opening or closing the lid (e.g., not opened and/or closed by the motor or another power transmission device, such as a foot pedal) may, for example, wear down, strip or lead to the failure of the components and parts of the power operated trash receptacle, such as the motor or gears. For instance, when the lid is manually operated, certain of the gears in connection with the lid are encouraged to move (e.g., rotate and/or translate). However, because the motor may be relatively difficult to rotate when not being operated, the motor may inhibit one or more of the gears from moving. Thus, when the lid is manually operated, a stress can result between the gears that the lid is urging to move and the gears that the motor is inhibiting from moving. Such a stress can result in damage to the gears, motor, lid, or other components of the receptacle. For instance, such stress can strip one or more teeth of the gears. Damage to the gears can, for example, result in reduced control over the motion of the lid, cause noise, and even inhibit or prevent the motor from operating the lid.

SUMMARY

[0008] Various embodiments of a trash can assembly (e.g., a receptacle configured to receive refuse, recyclable materials, or otherwise), and related methods, are provided. In some embodiments, the trash can assembly includes a body component, such as a shell or housing. In some embodiments, the body component is made of a metal, such as stainless steel. The body component can be configured to receive a portion of a removable liner, such as a trash bag, bin bag, bin liner, or otherwise.

[0009] Various embodiments of the trash can assembly include a trim member, such as a plastic or metal edge, border region, or otherwise. The trim member can be pivotally coupled (e.g., rotatably, hingedly, or otherwise) with the body. The trim member can be configured to move between a closed position and an open position. When the trim member is in the closed position and an upper portion (e.g., edge, ridge, rim, or otherwise) of the removable liner is positioned over an upper edge (e.g., lip, rim, or otherwise) of the body component, the trim member can be configured to engage the upper edge of the body component to secure (e.g., pinch, grasp, or oth-

erwise) the upper portion of the removable liner between the trim member and the upper edge of the body component.

[0010] In some embodiments, the trash can assembly includes a lid, such as a cover, top, closure member, or otherwise. The lid can be pivotably coupled with the body component and configured to move between a first position (e.g., closed or shut) and a second position (e.g., open). In some implementations, a periphery (e.g., an edge and/or radially outer portion) of the lid can be generally received in the trim when the trim is in the closed position and the lid is in the first position, the periphery of the lid being positioned generally outside of the trim when the trim is in the closed position and the lid is in the second position. In some embodiments, the lid is made of the same material as the body. In some embodiments, the lid is made of the same material as the trim member.

[0011] In some embodiments, the trim member includes a wall extending generally downwardly (e.g., generally transverse direction to a top surface of the trim member, generally toward a base of the trash can assembly, or otherwise) from a top surface of the trim member. In certain variants, the trim member includes a liner retention feature (e.g., one or more hooks, wings, detents, snaps, magnets, or otherwise) positioned on an inside surface of the wall. In some embodiments, the liner retention feature includes an inwardly (e.g., radially inwardly, in a direction generally toward the body, or otherwise) extending flap positioned on an inner surface of the wall. The inwardly extending flap can be configured to receive a portion of the upper edge of the body component. For example, in some embodiments, the upper edge of the body component includes an annular lip and the inwardly extending flap includes an engagement element (e.g., recess, aperture, channel, protrusion, or otherwise) configured to secure a portion of the removable liner between the flap and the annular lip.

[0012] In some embodiments, the trim member includes a retaining mechanism, such as a latch, detent, or other securing and/or holding device. The retaining mechanism can be configured to maintain the trim member in the open position, thereby allowing a user to mount the removable liner in the trash can assembly. In some embodiments, the retaining mechanism includes a first cam structure (e.g., arm, wheel, shaft, cylinder, gear, etc.) and a second cam structure. The first cam structure can be configured to be received in a holding feature (e.g., a recess, channel, or otherwise) of the second cam structure as the trim member moves (e.g., rotates, slides, translates, or otherwise) toward the open position.

[0013] In some embodiments, the trash can assembly includes a power operated driving mechanism, such as a motor and shaft. The power operated driving mechanism can be configured (e.g., with a linkage or gearing) to move the lid between the first and second positions. In some implementations, the power operated driving mechanism is activated by a sensor, such as an infrared sensor, proximity sensor, ultrasonic sensor, or otherwise.

For example, a signal from the sensor can be provided to a controller, which can be configured to regulate the operation of the power operated driving mechanism to move the lid between the first and second positions based on the signal. In certain variants, the sensor is configured to sense (e.g., detect, monitor, measure, or otherwise) the presence and/or lack thereof of an object or user in a vicinity of the trash can assembly. For example, the sensor can sense the presence of a user generally in front and/or above the trash can assembly, and thus signal for the lid to be opened. Some implementations of the sensor are configured to sense the presence and/or lack thereof of an object or user in a volume of space relative to the trash can assembly, such as within a generally conical volume of space above the trash can assembly. In some embodiments, at least one of the power operated driving mechanism and the sensor is deactivated (e.g., generally depowered, turned off, or otherwise) when the trim member is in the open position. Certain such implementations can, for example, reduce the likelihood of false positive readings and/or can conserve energy.

[0014] In accordance with some implementations, a trash can assembly includes a body component. The trash can assembly can have a lid mounted relative to the body component. The lid can be configured to move between open and closed positions. In some variants, the lid has a lid driving mechanism. Certain embodiments of the trash can assembly include a power operated driving mechanism that includes a motor coupled (e.g., directly or indirectly) with a shaft. In various embodiments, the motor is powered (e.g., by alternating current, direct current, or otherwise). In some implementations, the motor is configured to receive electrical power from one or more batteries. In some implementations, solar panels provide power to at least some components of the trash can, such as the motor.

[0015] Certain implementations of the trash can assembly include a clutch mechanism, such as a selectively engageable power and/or torque transfer member. In some variants, the clutch mechanism can be engageable with (e.g., abutted against, securable with, connectable to, or otherwise) the lid driving mechanism. The clutch mechanism can be configured to receive torque from the motor, such as via the shaft, and to transmit the torque to the lid driving mechanism to move the lid between the open and closed positions. The lid driving mechanism and the clutch member can be configured to allow a user to manually move (e.g., push, pull, rotate, translate, lift, etc.) the lid between the open and closed positions substantially without applying a force (e.g., torque) to at least one of: the motor, the shaft, and the clutch mechanism. In some embodiments, the lid driving mechanism and the clutch member can be configured to allow a user to manually move the lid between the open and closed positions substantially without applying a force (e.g., torque) to at least two of: the motor, the shaft, and the clutch mechanism (e.g., the motor and the shaft, the shaft and

the clutch, and/or the motor and the clutch). In certain implementations, the lid driving mechanism and the clutch member can be configured to allow a user to manually move the lid between the open and closed positions substantially without applying a force (e.g., torque) to the motor, the shaft, and the clutch mechanism.

[0016] In some embodiments, the lid driving mechanism is attached to a bottom surface of the lid, such as an underside, back, and/or surface generally directed toward the base of the trash can assembly. The lid driving mechanism can be configured to directly or indirectly abut (e.g., contact, touch, or otherwise) with the clutch mechanism. In some embodiments, when the clutch mechanism is operated (e.g., rotated by the shaft and/or the motor), such abutment can result in the lid driving mechanism being moved (e.g., rotated), thereby moving the lid between the open and closed positions.

[0017] According to some implementations, the lid driving mechanism includes first and second flanges, such as flaps, wings, protrusions, or otherwise. The flanges can be configured to abut with first and second torque transmission members (e.g., arms, shafts, etc.) of the clutch mechanism, respectively. In certain variants, at least one of the first and second flanges extend radially inwardly (e.g., generally toward the body, generally toward a radial center of the trash can assembly, or otherwise). According to certain variants, rotation of the clutch mechanism results in rotation of the first and second flanges, which in turn results in movement (e.g., rotation) of the lid between the open and closed positions. In some embodiments, the first and second flanges are positioned on the lid. For example, the first and second flanges can be molded or otherwise formed with the lid, or joined (e.g., by welding or adhesive) with the lid.

[0018] Some implementations include at least one circumferential space (e.g., a gap or recess) between the first and second flanges. In certain embodiments, at least one of the first and second torque transmission members is configured to be positioned within the at least one circumferential space. Certain embodiments include first and second circumferential spaces between the first and second flanges, with the first torque transmission member being positioned in the first circumferential space and the second torque transmission member being positioned in the second circumferential space.

[0019] In some embodiments, the first and second torque transmission members have at least one arm extending from a central body of the clutch mechanism. For example, some embodiments include first and second arms extending radially outward from the central body. In some variants, at least one of the arms has a first surface and second surface. The first surface can be configured to abut with the first flange and the second surface can be configured to abut with the second flange. In certain implementations, when the first surface is abutted with the first flange, a first circumferential distance is defined between the second surface (e.g., non-abutted surface) and the second flange. In some embodiments, the

first circumferential distance is greater than or equal to the amount of rotation of the lid between the closed and open positions. For example, in certain variants, the rotation of the lid between the closed and open positions can be at least about 80° and the circumferential distance can be greater than or equal to about 80°. In some embodiments, the circumferential distance being greater than or equal to the amount of rotation of the lid between the closed and open positions facilitates a user being able to manually (e.g., without operating the driving mechanism, etc.) open and/or close the lid without applying a force to the arms.

[0020] In some embodiments, the trash can assembly includes one or more lid position sensing elements, such as flagging members, proximity sensors, interrupt-type sensors, potentiometers, or otherwise. In certain implementations, the lid position sensing elements are communicatively (e.g., electrically connected, etc.) connected with a controller, such as a processor or other electrical circuit configured to execute one or more algorithms. The controller can be configured to determine whether the lid is in the open or closed position, such as based on a signal from the lid position sensing elements.

[0021] In accordance with some embodiments, a trash can assembly includes a body component and a lid that is mounted relative to the body component and is configured to move between open and closed positions. The trash can assembly can include a driving mechanism operable to move the lid between the open and closed positions. Some embodiments of the driving mechanism can include a motor, a shaft, and an end member. The motor can be configured to rotate the shaft, and the shaft can be configured to rotate the end member. In some embodiments, the end member is generally rigidly coupled (e.g., fixed or secured) with the shaft such that the end member is generally prevented from rotating relative to the shaft.

[0022] In some variants, the driving mechanism includes a clutch mechanism. The clutch mechanism can be rotatably engageable (e.g., able to be engaged and disengaged) with the lid. The driving mechanism can be adapted to receive torque from the end member, so as to move the lid between the open and closed positions. The clutch mechanism can be configured to move (e.g., rotate, translate, slide, etc.) relative to the end member when the lid is moved between the opened and closed positions generally without operation of the driving mechanism (e.g., generally without rotational movement of the motor and/or the shaft relative to the body).

[0023] In some embodiments the driving mechanism includes a biasing member, such as a spring, elastic member or otherwise. The biasing member can be configured to bias (e.g., to apply a force to) the clutch mechanism into engagement (e.g., contact, abutment, securement, or otherwise) with the end member. In certain implementations, the bias of the biasing member can facilitate torque from the motor being transmitted to the clutch mechanism via the engagement between the end mem-

ber and the clutch mechanism.

[0024] In some embodiments, the clutch mechanism is configured to move (e.g., translate and/or rotate) relative to the end member and/or the shaft. For example, in some embodiments, the clutch mechanism can move relative to the end member and/or the shaft when the lid is moved between the opened and closed positions generally without operation of the driving mechanism, such as when the lid is opened or closed manually (e.g., by hand). In some embodiments, when the clutch mechanism moves relative to the end member and/or the shaft, the clutch mechanism translates toward the motor along a portion of a longitudinal length of the shaft and/or rotates relative to the end member. In some embodiments, when movement of the clutch mechanism relative to the end member and/or the shaft ceases, the biasing member is configured to move (e.g., to translate and/or rotate) the clutch mechanism towards and/or into engagement with the end member.

[0025] In some embodiments, the clutch mechanism and the end member include corresponding cam surfaces. In certain implementations, the corresponding cam surfaces are configured to allow the clutch mechanism to translate and rotate relative to the end member. In some embodiments, the clutch mechanism includes a first inclined cam surface and the end member includes a second inclined cam surface. The first and second inclined cam surfaces can be configured to allow mating engagement between the clutch mechanism and the end member. In some embodiments, when the lid is moved between the opened and closed positions generally without operation of the driving mechanism, the first and second inclined cam surfaces slide (e.g., translate and/or rotate) relative to each other.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] The above-mentioned and other features of the trash cans disclosed herein are described below with reference to the drawings of certain embodiments. The illustrated embodiments are intended to illustrate, but not to limit the disclosure. The drawings contain the following Figures:

[0027] Figure 1 is a top, front, and left side perspective view of an embodiment of an enclosed receptacle, with a lid and a trim member in a closed position.

[0028] Figure 2 is an enlarged top, front, and left side perspective view of the receptacle illustrated in Figure 1, with the lid in an open position and the trim member is the closed position.

[0029] Figure 3 is a top, rear, and right side perspective view of the receptacle shown in Figure 1.

[0030] Figure 4 is an exploded top, front, and left side perspective view of an embodiment of an enclosed receptacle with the lid closed.

[0031] Figure 5 is an enlarged rear perspective view of the receptacle shown in Figure 1, with a back cover removed.

[0032] Figure 6 is an enlarged top, rear, and left side perspective view of the receptacle illustrated in Figure 1, with the lid and trim member removed to show a lifting mechanism.

[0033] Figure 7 is an enlarged bottom view of a portion of the trim member of Figure 1.

[0034] Figure 8 is an enlarged partial cross sectional view of the receptacle of Figure 1.

[0035] Figure 9 is an enlarged partial rear perspective view of the receptacle illustrated in Figure 1, with the back cover removed.

[0036] Figure 10 is an enlarged top, rear, and left side perspective view of the receptacle illustrated in Figure 1, with the lid and trim member in the open position.

[0037] Figure 11 is an enlarged front, bottom, and left side perspective view of the lid of Figure 1.

[0038] Figure 12 is an enlarged perspective view of the motor and gear drive mechanism of the lifting mechanism illustrated in Figure 6.

[0039] Figure 13 is an enlarged partial rear perspective view of the receptacle illustrated in Figure 1, with the back cover removed.

DETAILED DESCRIPTION OF CERTAIN EMBODIMENTS

[0040] The various embodiments of a system for transmitting power for opening and closing a lid or door of a receptacle, such as a trash can, or other device is disclosed in the context of a trash can. The present disclosure describes certain embodiments in the context of a trash can due to particular utility in this context. However, the subject matter of the present disclosure can be used in many other contexts as well, including, for example, commercial trash cans, doors, windows, security gates, and other larger doors or lids, as well as doors or lids for smaller devices such as high precision scales, computer drives, etc. The embodiments and/or components thereof can be implemented in powered or manually operated systems.

[0041] With reference to Figures 1-3, a trash can assembly 20 can include a body or shell component 22 and lid 24 and other modular pieces or components. The trash can assembly 20 is generally easy to assemble and maintain. It can have minimal parts and have a compact design. Lid 24 can include door components, such as an air filter (not shown). The trash can assembly 20 can be configured to rest on a floor, and can be of varying heights and widths depending on, among other things, consumer need, cost, and ease of manufacture. Additional details and examples of trash can assemblies that can be used with, or instead of, components discussed herein are provided in U.S. Patent Application Publication No. 2011/0220647, filed March 4, 2011, and U.S. Patent Application Publication No. 2009/0194532, filed February 1, 2008, the entirety of each of which is incorporated herein by reference.

[0042] The trash can assembly 20 can include the body

component 22. In some embodiments, the trash can assembly can be configured to receive a liner or trash bag (not shown), which can be retained at least partly within the body component 22. For example, an upper peripheral edge of the body component 22 can be configured to support an upper peripheral edge of the liner such that the liner is suspended and/or restrained by its upper peripheral edge within the body component 22. In some embodiments, the trash can assembly 20 can include a liner support member (not shown) supported by the body component 22 and configured to support the liner at least partly within the interior of the body component 22. In some embodiments, the body component 22 is configured such that the liner can be seated on a lower portion of the body component 22.

[0043] With reference to Figure 4, in some embodiments, the body component 22 includes an upper edge 26. As illustrated, the upper edge 26 of the body component 22 can be rolled, include an annular lip, or otherwise include features that extend outwardly from a generally vertical wall of the body component 22. In some embodiments, the upper edge 26 has a generally rounded cross-section. Other designs can also be used.

[0044] The body component 22 can assume many configurations. The nonlimiting embodiments of Figures 1-3 illustrate the body component 22 having a generally semi-circular configuration with a rear wall 28 and a curved, front wall 30. However, other configurations can also be used, for example, rectangular. The liner or trash bag (not shown) can have the same general configuration, or a different configuration from the body component 22. The body component 22 can be made from plastic, steel, stainless steel, aluminum or any other material.

[0045] As illustrated in Figure 4, the trash can assembly 20 can include a base portion 44. The base portion 44 can have a generally annular and curved skirt upper portion and a generally flat lower portion for resting on a surface, such as a kitchen floor. The base portion 44 of the trash can assembly 20 can be made integrally, monolithically, or separate from the body component 22. In some implementations, the base portion 44 comprises plastic, metal (e.g., steel, stainless steel, aluminum, etc.) or any other material. In some embodiments, such as those in which the body component 22 is metal (e.g., stainless steel), the base portion 44 can be a plastic material. In some embodiments, the base portion 44 includes projections 40 that are open or vented to the ambient environment (e.g., through the generally flat lower portion of the base portion 44), as will be discussed in further detail below. As illustrated, certain embodiments of the base portion 44 include a generally centrally located passage through the generally flat lower portion of the base portion 44.

[0046] In some embodiments, the base portion 44 can be connected with or attached to the body component 22 by connection components 46, such as hooks and/or fasteners (e.g., screws). For example, in some embodiments, the base portion 44 includes hooked tabs that are

configured to connect with a lower edge (e.g., a rolled edge) of the body component 22. In some embodiments, the hooked tabs engage the lower edge of the body component 22, such as by a snap-fit connection. In some embodiments, the base portion 44 and the body component 22 are joined with adhesive, welding, hooks and similar attachment mechanisms.

[0047] In some embodiments, a liner insert 100 is connected with, or attached to, the base portion 44. In some embodiments, the liner insert 100 can have support members, such as legs 48, which can support and/or elevate the liner insert 100 above an interior bottom of the base portion 44. In some embodiments, the legs 48 are joined with the base portion 44 (e.g., with fasteners, welding, etc.).

[0048] In some embodiments, the liner insert 100 is configured to generally support and/or cradle a lower portion of a trash bag disposed in the trash can assembly 20. For example, as illustrated, the liner insert 100 can be generally concave or bowl-shaped. In some embodiments, the liner insert 100 is configured to protect a trash bag from rupture or damage and retain spills. For instance, the liner insert 100 can have a generally smooth surface to reduce the likelihood of the trash bag being torn or punctured by contact with the liner insert 100. Several embodiments of the liner insert 100 thus can reduce the chance of damage to the trash bag even in embodiments of the trash can assembly 20 that do not utilize a generally rigid liner that extends along some or all of the height of the body component 22.

[0049] In certain implementations, the liner insert 100 forms a seal (e.g., generally liquid resistant) with a lower portion of the body component 22. In some embodiments, the liner insert 100 can include openings 42 that are configured to correspond to, or mate with, the projections 40 located on the interior bottom surface of the base portion 44, thereby placing the openings 42 and the projections 40 in fluid communication. By aligning the openings 42 of the liner insert 100 and the projections 40 of the base portion 44, the openings 42 can allow ambient air to pass into and out of the interior of the trash can assembly, which can inhibit or prevent the occurrence of a negative pressure region (e.g., in comparison to ambient) inside the trash can assembly 20 when a user removes a trash bag from the trash can assembly 20. Further, in certain variants, when a user inserts refuse or other materials into the trash bag in the trash can assembly 20, air within the trash can assembly 20 can exit via the openings 42 and the projections 40, thereby inhibiting the occurrence of a positive pressure region (e.g., in comparison to ambient) inside the trash can assembly 20 and allowing the trash bag to freely expand.

[0050] As described above, the trash can assembly 20 can include the rear wall 28. Along the rear wall 28, the trash can 20 can include a back cover 54. The back cover 54 can enclose and/or protect a back side enclosure 56, as illustrated in Figure 5. In some embodiments, the back side enclosure 56 can house the power source 66 for the

trash can 20. For example, in some embodiments, the back side enclosure 56 can be configured to receive and retain at least one battery. The back side enclosure 56 can have a generally low profile configuration. For example, the back side enclosure 56 can extend rearwardly from the rear wall 28 a distance of less than or equal to about 1 inch, or less than or equal to about 1/5th of the distance between the outside surfaces of the rear wall 28 and the front-most portion of the front wall 30.

[0051] With reference to Figure 6, in some embodiments, a housing 64 for a power operated driving mechanism 58 can be positioned on or near the rear wall 28, such as above or on top of the back side enclosure 56. In the illustrated embodiment, the housing 64 is a generally cylindrical structure or shell. In other embodiments, the housing 64 can be of other various designs and shapes. In some embodiments, the shape and location of the housing 64, the compactness of the driving mechanism 58 within the housing 64, and/or the generally low-profile of the back side enclosure 56 can allow the trash can assembly 20 to be positioned flush or substantially flush with a wall (not shown) or other generally flat vertical structure of a building or home. Thus, the trash can assembly 20 can have a smaller footprint and/or take up less floor space. In some embodiments, the back side enclosure 56 and/or the driving mechanism housing 64 extend rearwardly from the rear wall 28 less than or equal to about 1.5 inches.

[0052] Certain embodiments of the trash can assembly 20 include a trim member 38. As illustrated in Figure 4, in some embodiments, the trim member 38 is connected with the back side enclosure 56 and/or body components, such as by fasteners 29 (e.g., screws). Some embodiments of the trim member 38 are configured to rotate with respect to the body component 22 and/or the lid 24. The trim member 38 can be made of various materials, such as plastic or metal. The trim member 38 and the body component 22 can be made from the same or different materials. For example, the trim member 38 and the body component 22 can comprise a plastic material. Some embodiments of the trim member 38 can engage and/or overlap the upper edge 26 of the trash can assembly 20.

[0053] As illustrated in Figure 7, which shows a bottom portion of the trim member 38, certain embodiments of the trim member 38 are configured to support and/or mask electrical components, such as a sensor assembly 102 and/or wire 112 that connects the sensor assembly 102 to the power source 66 or a controller. One or several guide members 114 can be positioned underneath a top surface of the trim member 38 to generally inhibit movement of the wire 112 within the trim member 38, thereby generally hiding the wire from view and reducing the chance of rubbing or other damage to the wire 112.

[0054] With reference to Figures 7-8, in some embodiments, the trim member 38 is configured to secure or retain an upper portion of the trash bag between the trim member 38 and the upper edge 26 of the body component 22. The trim member 38 can include a wall 116 that

extends generally downwardly (e.g., in a generally transverse direction to the top surface of the trim member 38). In certain configurations of the trim member 38, the wall 116 extends downwardly beyond the upper edge 26 and along the body component 22. In some embodiments, bag retention features, such as radially inwardly extending flaps 118, are positioned on the inside of the wall 116. The flaps 118 can include an edge engagement element, such as a recess 119. In some embodiments, the recess 119 is positioned at one end of the flap 118 and/or near the top surface of the trim member 38. The flaps 118 can be configured to receive, nest with, and/or removably lock onto the upper edge 26, such as by a friction fit. In some embodiments, when a trash bag is placed in the body component 22 and the upper portion of the trash bag is positioned over the rolled edge or annular lip of the upper edge 26, the trim member 38 can be positioned (e.g., rotated into position) such that the trash bag is disposed between the trim member 38 and the body component 22. Further, the flaps 118 can be configured to receive the rolled edge or annular lip of the upper edge 26, thereby generally securing a portion of the trash bag between the flaps 118 and the upper edge 26 and inhibiting the trash bag from falling into the body component 22.

[0055] In some embodiments as illustrated in Figures 9-10, the trim member 38 can be positioned and/or maintained in an open position (e.g., against the force of gravity and/or without requiring a person to hold or otherwise keep the trim member 38 in the open position). The open position can, for example, allow a user to mount a trash bag in the trash can assembly 20 and/or do extended chores, such as cleaning the inside of the trash can assembly 20. As illustrated, in some embodiments, the trim member 38 rotates with respect to the body component 22 to reach the open position. In some embodiments, the trim member 38 includes a retaining mechanism. For example, as shown in Figure 9, the trim member 38 can include a first cam structure 120, such as a tooth, which can be located at the rear of the trim member 38 and on an adjacent side of the housing 64. The first cam structure 120 can be configured to engage a second cam structure, such as a ramp 122. In some embodiments, the second cam structure includes a recess 124 that is configured to receive some or all of the first cam structure 120. The recess 124 can be located at or near an end of the ramp 122 and may be positioned near the rear of the trash can assembly 20. In some embodiments, as the trim member 38 rotates (e.g., toward the open position), the first cam structures 120 rotate (e.g., clockwise) into abutment with the ramp 122. The first cam structure 120 can engage (e.g., slide and/or ride up) the ramp 122 and into the recess 124, which can retain the first cam structure. Thus, the trim member 38 can remain in the open position while the user switches bags or completes one or more chores. When such tasks are complete, the trim member 38 can be rotated in the generally opposite direction (e.g., counter-clockwise) to a closed position, in which the flaps 118

can be engaged with the upper edge 26 of the body component, as discussed above.

[0056] The lid 24 and trim member 38 can be pivotally attached to the trash can assembly 20 by any manner. In the illustrated embodiments, the lid 24 and trim member 38 are pivotally coupled to the trash can assembly 20 generally along the same pivot axis. The pivotal connection can be any type of connection allowing for pivotal movement, such as, hinge elements, pins, or rods. For example, with reference to Figures 6 and 9, first pivot features, such as pins 50, 52, extend laterally through the housing 64 of the driving mechanism 28 that opens and closes the lid 24, and can be adapted to be received in corresponding second pivot features, such as through-holes 36, provided at the rear of the trim member 38. The pins 50, 52 can extend through the through-holes 36 to pivotably connect the trim member 38 to the housing 64 of the trash can assembly 20 along a pivot axis. With reference to Figure 2, in some embodiments, a portion of or the entire lid 24 can be positioned, located, or received in a recess 68 in the interior of the trim member 38. In some embodiments, a damper 110 (e.g., foam, springs, rubber pads, or any other generally pliable, resilient, and/or damping structure) can be positioned between the lid 24 and trim member 38, such as to provide noise reduction when the lid 24 closes onto the trim 38.

[0057] In some embodiments, a rear portion of lid 24 can be pivotably coupled to the trash can assembly 20 along the same pivot axis as the trim member 38. For example, the rear portion of lid 24 can be pivotably coupled to the trash can assembly 20 along the same pivot axis as the trim member 38 via the pins 50, 52, which can also connect the trim member 38 to the driving mechanism housing 64 of the trash can assembly 20.

[0058] In some embodiments, the pins 50, 52 can extend through the trim member 38 and the housing 64 and are adapted to be received in corresponding through-holes 72 of additional structures secured to the inside of the rear of the lid 24 located adjacent to the driving mechanism components 74. In some embodiments, the pins 50, 52 can pivotably couple the lid 24 and trim member 38 to the trash can assembly 20 along the same pivot axis. In some embodiments, as illustrated in Figure 5, bias members 126, such as one or more torsion springs, can be positioned on the pins 50, 52. The biasing members 126 can provide a biasing force to assist in opening and/or closing the lid 24, which can reduce the amount of power consumed by the motor 78 when moving the lid 24 between the open and closed positions and/or can allow for the use a smaller motor (e.g., in dimensional size and/or in power output).

[0059] With reference to Figure 11, the lid can include lid driving mechanism components 74. In certain variants, the lid driving mechanism components 74 are configured to abut, mate, contact, receive and/or be received in the drive mechanism 58 in the housing 64 to facilitate opening and closing the lid 24. In some variants, the lid driving mechanism components 74 include a generally

C-shaped portion. In certain implementations, the lid driving mechanism components 74 can include rotation support members, such as flanges 88, 90, and lid position sensing elements, such as flagging members 92, 94. As illustrated, the flanges 88, 90 and/or the flagging members 92, 94 can extend radially inwardly and can be attached at or near the rear underside of the lid 24. As described in further detail below, the controller 70 can communicate with a sensing system to determine various functions and parameters of the trash can assembly, such as when to drive the motor 78 so as to open or close the lid 24. As illustrated, in some embodiments, a portion of or the entire lid driving mechanism components 74 can be secured to the inside of the rear of the lid 24.

[0060] With reference to Figures 5-6 and 11-12, the driving mechanism 58 can include a controller or circuit board 70. In some embodiments, the driving mechanism components in the housing 64 can include a drive motor 78 and shaft or axle 80. Some embodiments include a bias member, such as a spring 82. Certain embodiments include a clutch mechanism 84 and/or a torque transmission member, such as an end member 86. At least some of the driving mechanism components can be removable from the other components. For example, the drive motor 78, or other component, can be removable such so as to facilitate repair, replacement, etc.

[0061] With reference to Figure 9, the driving mechanism 58 can include a first position sensor 96 (e.g., a closed position sensor) and a second position sensor 98 (e.g., an open position sensor). The position sensors 96, 98 can comprise paired optical proximity detectors, such as light emitters, that cooperate with an intermediate sensor 128, such as a light receiver. However, other types of sensors can also be used. As illustrated, the position sensors 96, 98 can be located together in one housing, which can facilitate manufacturability and repair and can reduce the overall space occupied by the position sensors 96, 98. As described in more detail below, in some embodiments, the position sensors 96, 98 can be configured to facilitate detection of the position of the lid 24 as it moves between the open and closed positions. The motor 78 and the position sensors 96, 98 can be configured to communicate with the controller 70 so as to facilitate control of the movement of the lid 24.

[0062] In some embodiments, the lid 24 includes the flagging members 92, 94, which can be oriented or otherwise configured as to indicate, in cooperation with the position sensors 96, 98, a position of the lid 24. As shown in Figure 9, when the lid 24 is in its home or fully closed position, the flagging member 92 is located between the position sensor 96 and the intermediate sensor 128 and the flagging member 94 is not located between the position sensor 98 and the intermediate sensor 128. In some configurations, the flagging member 92 being between the position sensor 96 and the receiver 128 blocks an emission (e.g., a signal) between the position sensor 96 to intermediate sensor 128. In some embodiments, such emission blocking can be interpreted (e.g., by the

controller implementing an algorithm) to discern a position of the lid 24. For example, the controller 70 can be configured to determine that the lid 24 is in its home or closed position when flagging member 92 is located in position sensor 96 to block emissions to the intermediate sensor 128.

[0063] In some embodiments, as the lid 24 rotates into the fully open position, the flagging member 92 rotates such that it is no longer between the position sensor 96 and the intermediate sensor 128. However, in certain embodiments, as the lid 24 rotates into the fully open position, the flagging member 94 rotates such that it is between the position sensor 98 and the intermediate sensor 128, thereby blocking emissions (e.g., a signal) between the sensor 98 to intermediate sensor 128.

[0064] In some embodiments, when the flagging member 94 is located between the position sensor 98 and the intermediate sensor 128, and the flagging member 92 is not located between the position sensor 96 and the intermediate sensor 128, the controller 70 can be configured to determine that the lid 24 is in a fully open position. In certain embodiments, the controller 70 can be configured to determine that the lid 24 is in a fully open position when the opposite orientation occurs. In some embodiments, the intermediate sensor 128 is configured to receive emissions from one or both of the position sensors 96, 98. In some embodiments, the one or both of the position sensors 96, 98 are configured to receive emissions from the intermediate sensor 128.

[0065] Any combination of flagging members and position sensors can be used to detect various positions of the lid 24. For example, additional positions (e.g., an about half-way opened position) can be detected with additional sensors and flagging members in a manner similar or different than that described above. Some embodiments have flagging members located in the housing 64 and position sensors on the lid 24.

[0066] With reference to Figure 2, the trash can assembly 20 can also include a sensor assembly 102 disposed on a generally outer portion of the trash can assembly 20. In the illustrated embodiment, the sensor assembly 102 is disposed near the front of the trim member 38, in an upper generally central portion. In some embodiments, the sensor assembly 102 can include an outer covering 104 which can include a transparent or translucent structure that permits transmission and/or receipt of light signals. For example, the outer covering 104 can be made of glass or plastics, such as Polycarbonate, Makrolon®, etc. In some embodiments, the outer covering 104 can be substantially flush with a top surface of the trim member 38. In some embodiments, the sensor assembly 102 can sense a user's movements to direct the lid 24 to open or close. For example, the sensor assembly 102 can sense a reflected or emitted signal or characteristic (e.g., light, thermal, conductivity, magnetism, or otherwise) from a user (e.g., a body part). In some embodiments, the sensor assembly 102 is configured as is described in U.S. Patent Application Publication No.

2011/0220647, filed March 4, 2011, the entirety of which is hereby incorporated by reference.

[0067] In some embodiments, the lid 24 can be configured to permit manual operation of the lid 24 generally without damage (e.g., stripping or wearing down) to components of the trash can assembly 20, such as the motor 78, shaft 80, or otherwise. As previously noted, and as illustrated in Figure 11, the lid 24 can include flanges 88, 90, which can be positioned on the rear underside of the lid 24. As illustrated, generally open circumferential spaces exists between the flanges 88, 90.

[0068] The flanges 88, 90 can be configured to engage a clutch mechanism 84, which can enable the lid 24 to rotate without, or without substantial, rotation of the motor 78, shaft 80, or certain other components of the trash can assembly 20, as discussed in more detail below. As illustrated in Figure 12, the clutch mechanism 84 includes one or more torque transmission members, such as arms 106, 108, that can extend radially outward from a body of the clutch mechanism 84. In some embodiments, the arms 106, 108 are spaced apart from each other, such as by about 180 degrees. Various other angles are contemplated, such as at least: about 30°, about 45°, about 60°, about 90°, about 120°, values in between, or otherwise.

[0069] The arms can be positioned in the circumferential spaces between the flanges 88, 90. For example, the arms 106, 108 can abut or contact a surface the flanges 88, 90, as illustrated in Figure 13. In certain such configurations, when the arm 106 is abutted with flange 90 and the arm 108 is abutted with flange 90, a circumferential distance D1 exists between a non-abutted surface 108a of the arm 108 and a non-abutted surface 88a of the flange 88. In some embodiments, a generally equal circumferential distance D2 (not shown) exists between a non-abutted surface 106a of the arm 106 and a non-abutted surface 90a (not shown) of the flange 90. In certain configurations, the circumferential distance D1 and/or D2 is greater than or equal to the amount of rotation of the lid from the open to the closed position. For example, the circumferential distance D1 and/or D2 can be at least about 60° and/or less than or equal to about 125°. In certain variants, the circumferential distance D1 and/or D2 is greater than or equal to about 80°. As discussed below, such a configuration can allow the lid 24 to be manually moved between the open and closed positions.

[0070] In some embodiments, the clutch mechanism 84 is positioned on the motor shaft 80 between a biasing member, such as a spring 82, and an end member 86. In some embodiments, the end member 86 is fixed to the motor shaft 80, thus torque from the motor 78 can be transmitted through the shaft 80 and into the end member 86. In some embodiments, the bias on the clutch mechanism 84 against the end member 86 can result in a frictional interface between the clutch 84 and end member 86. The frictional interface between the clutch 84 and end member 86 can result in the clutch 84 rotating when the shaft 80 rotates. For example, torque from the motor 78

can be transmitted through the shaft 80, through the end member 86, and into the clutch mechanism 84. In some variants, certain components (e.g., the spring 82, clutch mechanism 84, and end member 86) are positioned in general coaxial alignment along a portion of the longitudinal length of the shaft 80.

[0071] During operation of some embodiments, the motor 78 can turn the shaft 80, which can turn the end member 86, which can turn the clutch mechanism 84 (e.g., by the frictional interface between the end member 86 and clutch mechanism 84). Rotation of the clutch mechanism 84 can result in rotation of the arms 106, 108. Because, in some embodiments, the arms 106, 108 generally abut or contact the flanges 88, 90 of the lid 24, rotation of the arms 106, 108 can result in rotation of the flanges 88, 90, and thus the lid 24 (e.g., from the closed to the open position).

[0072] As illustrated in Figure 13, due to the circumferential distances D1, D2 between the non-abutted surfaces 88a, 90a of the flanges 88, 90 and the non-abutted surfaces 106a, 108a of the arms 106, 108, the lid 24 can be manually opened without turning the motor 78. As an example, manual operation of the lid as illustrated in Figure 13 will now be discussed. As illustrated in Figure 13, the lid 24 is in the home or closed position. If a user, were to manually operate the lid 24 toward the open position (e.g., rotate the lid clockwise in the illustrated embodiment), the flange 88 would rotate generally clockwise in an arc path and the flange 90 would rotate about an equivalent distance in generally the same direction (e.g., clockwise). No force would be applied to the arms 106, 108 of the clutch mechanism 84, which, as discussed above, is connected with motor shaft 80 via the end member 86. Similarly, a user could then close the lid 24 and the flanges 88, 90 would rotate in generally the opposite direction (e.g., counter-clockwise) as when the lid was opened, back to their original positions when the lid 24 was in the home position, without applying any force to the arms 106, 108 of the clutch mechanism 84. Thus, in certain embodiments, no force is required to be applied to the arms 106, 108 to turn the clutch mechanism 84 and motor shaft 80.

[0073] As noted above, in some embodiments, the power operated driving mechanism 58 can be used to open or close the lid 24. For instance, the motor 78 can rotate the shaft 80, which can rotate the end member 86, which can transmit the torque to the clutch mechanism 84, which can rotate the flanges 88, 90 and the lid 24. In some embodiments, a coupling device can be positioned between the motor 78 and the shaft 80 to reduce vibrations from being transferred from the motor 78 to other mechanism being driven, such as the lid 24. In certain instances, after or during operation of the driving mechanism 58 (e.g., after or as the lid 24 is being moved between the open and closed positions), a user may accidentally or intentionally try to manually close or open the lid 24. In certain such situations, the flanges 88, 90 generally remain in contact with the arms 106, 108 rather

than rotating relative to the arms 106, 108 as discussed above. In some embodiments, this is because the rotational force produced by the motor 78 (via the shaft 80, end member 86, and/or clutch mechanism 84) encourages rotation of the arms 106, 108 against the flanges 88, 90 (e.g., the arms 106, 108 apply a pushing force to the surfaces of the flanges 88, 90 to rotate the lid 24). Thus, in some embodiments, a user who manually closes the lid 24 when the motor has opened, or is in the process of opening the lid 24, acts against the operation of the motor 78.

[0074] For example, when the motor 78 of Figure 13 is opening the lid 24, the motor 78 encourages the arms 106, 108 to abut against and turn the flanges 88, 90 to turn in a clockwise direction (viewed from the perspective of Figure 13). Yet when a user manually attempts to close the lid 24, the lid and the flanges 88, 90 are encouraged in a counter-clockwise direction (viewed from the perspective of Figure 13). Thus, in certain configurations, the arms 106, 108 are being encouraged to rotate in opposite directions concurrently. Such a scenario can result in damage to the arms 106, 108 of the clutch mechanism 84, the shaft 80, the motor 78, or otherwise. In some embodiments, to generally avoid such damage, the clutch mechanism 84 or other structure can be configured to rotate with respect to the end member 86 or other components.

[0075] In some embodiments, the clutch mechanism 84 includes a first cam surface 180 and a first return surface 182. As shown in Figure 12, the first cam surface 180 can be inclined from a first level to a second level, in relation to a plane extending generally transverse to the longitudinal axis of the clutch mechanism 84. The first return surface 182 can intersect the first cam surface 180 and can be disposed between the first and second levels.

[0076] In some embodiments, the end member 86 includes a second cam surface 184 and a second return surface 186. The second cam surface 184 can be inclined from a first level to a second level, in relation to a plane extending generally transverse to the longitudinal axis of the end member 86 and the shaft 80. The second return surface 186 can intersect the first cam surface 180 and can be disposed between the first and second levels.

[0077] The second cam surface 184 and the second return surface 186 of the end member 86 can be shaped to correspond with the first cam surface 180 and the first return surface 182 of the clutch mechanism 84, thereby allowing mating engagement of the end member 86 and the clutch mechanism 184. For example, summits 180a of the first cam surface 180 can be nested in the valleys 184b of the second cam surface 184, and summits 184a of the second cam surface 184 can be nested in the valleys 180b of the first cam surface 180.

[0078] As previously discussed, in some embodiments, torque from the motor 112 can be transmitted through the shaft 80 to the end member 86. In some embodiments, the end member 86 is generally rigidly

connected with the shaft 80, such as by a fastener (e.g., a screw). Thus, in certain variants, the end member 86 is inhibited or prevented from rotating relative to the shaft 80. In certain implementations, the end member 86 is configured to transmit torque from the motor 112 to the clutch mechanism 84, such as by friction between the first and second cam surfaces 180, 184 and/or between the first and second return surfaces 182, 186.

[0079] In some embodiments, the clutch mechanism 84 can translate along a portion of the longitudinal length of the shaft 80. As shown, the biasing member 82 can bias the clutch mechanism 84 into engagement with the end member 86. In some embodiments, translation of the clutch mechanism 84 (e.g., in a direction generally toward the motor 112) along a portion of the drive shaft 80 is generally against the bias of the biasing member 82.

[0080] In some embodiments, when the lid 24 is manually operated, the clutch mechanism 84 and the end member 86 rotate relative to each other. For example, in some embodiments, when the lid 24 is manually operated the first and second inclined cam surfaces 180, 184 move relative to each other. In certain configurations, the inclined cam surfaces 180, 184 slide relative to each other, which results in the inclined cam surfaces climbing each other. For example, as the inclined cam surfaces 180, 184 slide relative to each other, the summits 180a, 184a of the inclined cam surfaces 180, 184 circumferentially approach each other.

[0081] In certain embodiments, the relative movement between the first and second inclined cam surfaces 180, 184 (e.g., by the interaction of the inclines) urges the clutch mechanism 84 and the end member 86 apart. For example, the clutch mechanism 84 and the end member 86 can be urged in generally opposite directions along the longitudinal axis of the shaft 80. In some embodiments, the end member 86 is generally restrained from moving longitudinally (e.g., by the fastener). However, certain embodiments of the clutch mechanism 84 are able to move away from end member 86 by translating along the shaft 80 (e.g., against the bias of the biasing member 82). Thus, in certain implementations, relative rotation of the inclined cam surfaces 180, 184 results in the clutch mechanism 84 translating along a portion of the longitudinal length of the shaft 80 (e.g., in a direction generally toward from the motor 78), against the bias of the biasing member 82. Certain embodiments can facilitate relative rotation of the clutch mechanism 84 and the end member 86 without imposing undue stress on, or damage to, the clutch mechanism 84, end member 86, shaft 80, and/or motor 78. Accordingly, manual operation of the lid 24 can be performed without imposing undue stress on, or damage to, components of the trash can assembly 20.

[0082] In some implementations, when manual operation of the lid 24 ceases, the bias of the biasing member 82 can return the clutch mechanism 84 into generally full engagement with the end member 86. For example, after manual operation of the lid 24 ceases, the bias of the

biasing member 82 can facilitate re-engagement of the inclined cam surfaces 180, 184. In some embodiments, re-engaging the clutch mechanism 84 and the end member 86 allows the transmission of torque from the motor 78 to the clutch mechanism 84, which can provide powered operation of the lid. Thus, some embodiments provide automatic and/or passive engagement and/or disengagement of the motor 78 and/or drive shaft 80 from the clutch mechanism 84 and/or the lid 24.

[0083] Although the trash cans have been disclosed in the context of certain embodiments and examples, it will be understood by those skilled in the art that the present disclosure extends beyond the specifically disclosed embodiments to other alternative embodiments and/or uses of the trash cans and obvious modifications and equivalents thereof. In addition, while several variations of the trash cans have been shown and described in detail, other modifications, which are within the scope of the present disclosure, will be readily apparent to those of skill in the art. For example, a gear assembly and/or alternate torque transmission components can be included. For instance, in some embodiments, the trash can assembly 20 includes a gear assembly. Some embodiment of the gear assembly include a gear reduction (e.g., greater than or equal to about 1:5, 1:10, 1:50, values in between, or any other gear reduction that would provide the desired characteristics), which can modify the rotational speed applied to the shaft 80, clutch mechanism 84, and/or other components.

[0084] It is also contemplated that various combinations or sub-combinations of the specific features and aspects of the embodiments can be made and still fall within the scope of the present disclosure. It should be understood that various features and aspects of the disclosed embodiments can be combined with or substituted for one another in order to form varying modes of the trashcans. Thus, it is intended that the scope of the present disclosure should not be limited by the particular disclosed embodiments described above.

Claims

1. A trash can assembly comprising:

- a body component;
- a lid mounted relative to the body component and configured to move between open and closed positions, the lid having a lid driving mechanism;
- a power operated driving mechanism comprising a motor coupled with a shaft; and
- a clutch mechanism engageable with the lid driving mechanism, the clutch mechanism configured to receive torque from the motor via the shaft and to transmit the torque to the lid driving mechanism to move the lid between the open and closed positions;

- wherein the lid driving mechanism and the clutch member are configured to allow a user to manually move the lid between the open and closed positions substantially without applying torque to at least one of: the motor, the shaft, and the clutch mechanism. 5
2. The trash can assembly of Claim 1, wherein the lid driving mechanism is attached to a bottom surface of the lid and is configured to abut with the clutch mechanism such that, when the driving mechanism is operated, the clutch mechanism is configured to move the lid between the open and closed positions. 10
 3. The trash can assembly of Claim 2, wherein the lid driving mechanism comprises radially inwardly extending first and second flanges configured to abut with first and second torque transmission members of the clutch mechanism respectively, such that rotation of the clutch mechanism rotates the first and second flanges and the lid moves between the open and closed positions. 15 20
 4. The trash can assembly of Claim 3, wherein the first and second flanges are positioned on the lid such that circumferential spaces are defined between the first and second flanges, wherein the first and second torque transmission members are configured to be positioned within the circumferential spaces. 25 30
 5. The trash can assembly of Claim 4, wherein the first and second torque transmission members comprise first and second arms extending radially outward from a central body of the clutch mechanism, wherein a circumferential space is disposed between the first and second flanges, at least one of the first and second arms being positioned within the circumferential space. 35
 6. The trash can assembly of Claim 5, wherein at least one of the first and second arms having a first surface and second surface, the first surface configured to abut with the first flange and the second surface configured to abut with the second flange. 40
 7. The trash can assembly of Claim 6, wherein, when the first surface is abutted with the first flange, a first circumferential distance is defined between a second surface of the second arm and the second flange, the first circumferential distance being greater than or equal to the amount of rotation of the lid between the closed and open positions. 45 50
 8. The trash can assembly of any of the preceding claims, wherein: 55
 - the motor is configured to rotate the shaft;
 - the shaft is configured to rotate an end member;
- and
- the clutch mechanism is rotatably engageable with the lid and adapted to receive torque from the end member so as to move the lid between the open and closed positions, the clutch mechanism being configured to move relative to the end member when the lid is moved between the opened and closed positions generally without operation of the power operated driving mechanism.
9. The trash can assembly of Claim 8, wherein the power operated driving mechanism comprises a biasing member configured to bias the clutch mechanism into engagement with the end member such that torque from the motor is transmitted to the clutch mechanism via the engagement between the end member and the clutch mechanism.
 10. The trash can assembly of Claim 9, wherein the end member is rigidly coupled to the shaft such that the end member is generally prevented from rotating relative to the shaft.
 11. The trash can assembly of Claim 10, wherein:
 - when the lid is moved between the opened and closed positions generally without operation of the power operated driving mechanism, the clutch mechanism is configured to translate toward the motor along a portion of a longitudinal length of the shaft and to rotate relative to the end member; and
 - when such movement of the lid ceases, the bias of the biasing member translates the clutch mechanism towards and into engagement with the end member.
 12. The trash can assembly of Claim 11, wherein the clutch mechanism and the end member comprise corresponding cam surfaces configured to allow the clutch mechanism to translate and rotate relative to the end member.
 13. The trash can assembly of Claim 12, wherein the clutch mechanism comprises a first inclined cam surface and the end member comprises a second inclined cam surface, the first and second inclined cam surfaces configured to allow mating engagement between the clutch mechanism and the end member.
 14. The trash can assembly of Claim 13, wherein when the lid is moved between the opened and closed positions generally without operation of the power operated driving mechanism, the first and second inclined cam surfaces slide relative to each other.
 15. The trash can assembly of Claim 1, further compris-

ing a trim member pivotally coupled with the body
and configured to move between a first position and
a second position such that, when the trim member
is in the first position and an upper portion of the
removable liner is positioned over an upper edge of
the body component, the trim member is configured
to engage the upper edge of the body component to
secure the upper portion of the removable liner be-
tween the trim member and the upper edge of the
body component.

16. The trash can assembly of Claim 15, wherein the
power operated driving mechanism is activated by
a sensor.

17. The trash can assembly of Claim 16, wherein at least
one of the power operated driving mechanism and
the sensor is deactivated when the trim member is
in the second position.

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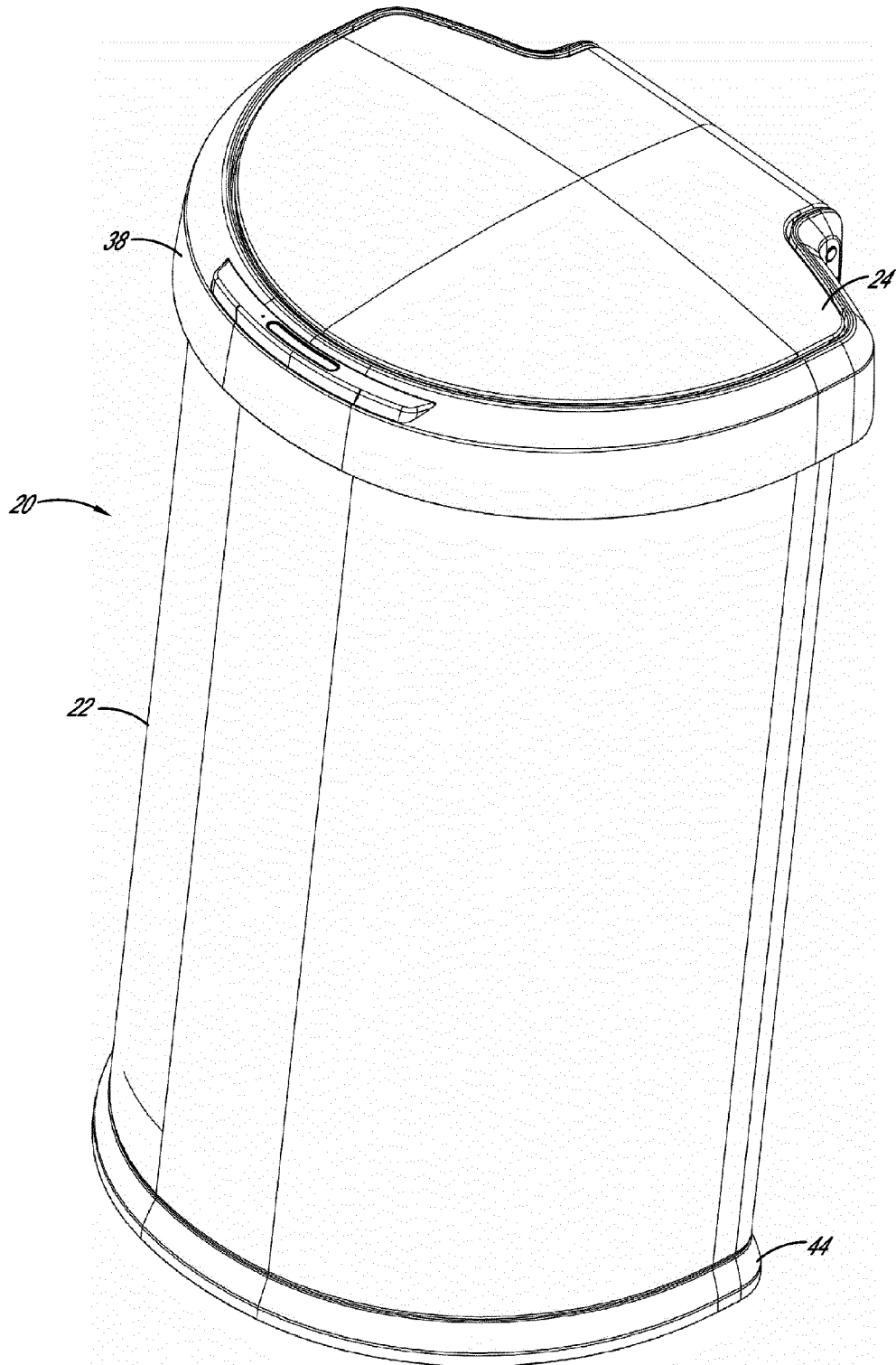
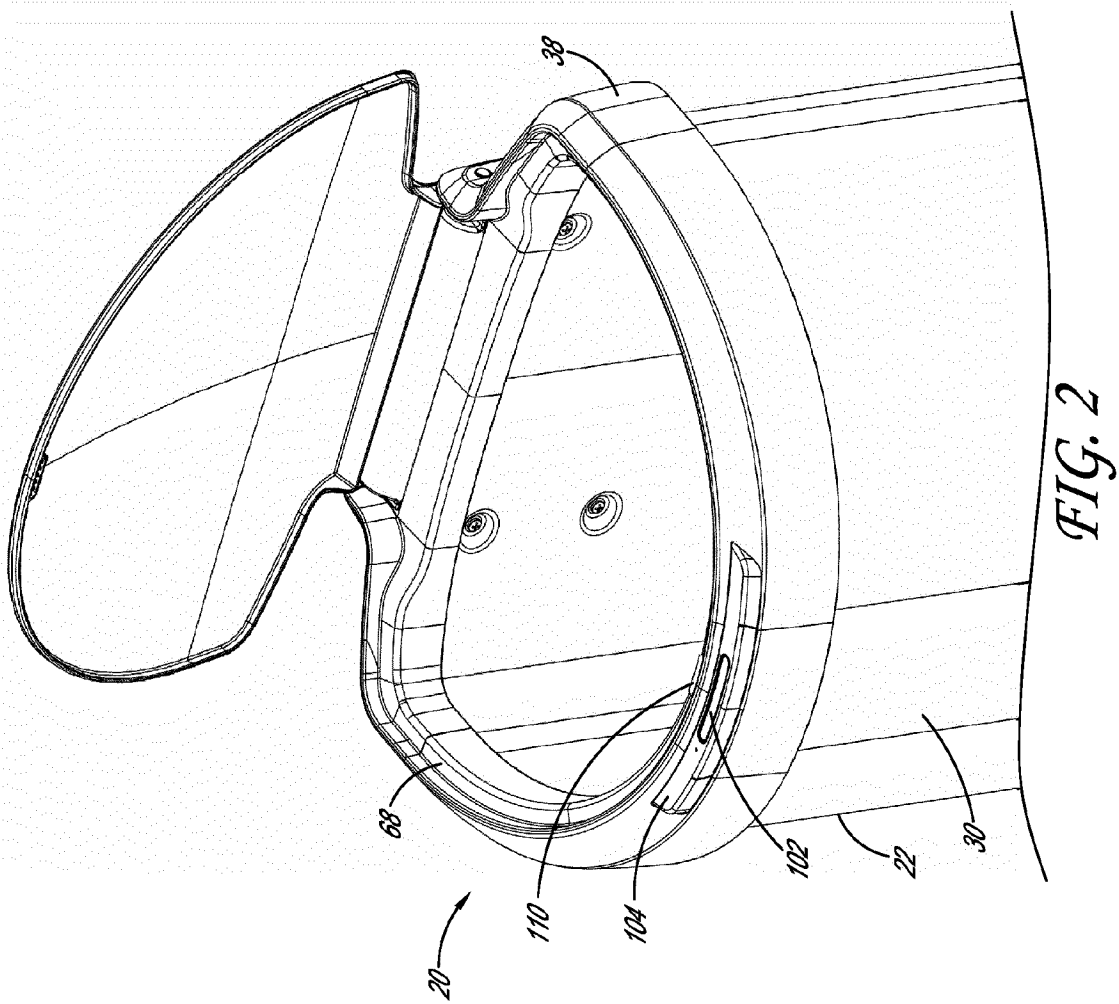


FIG. 1



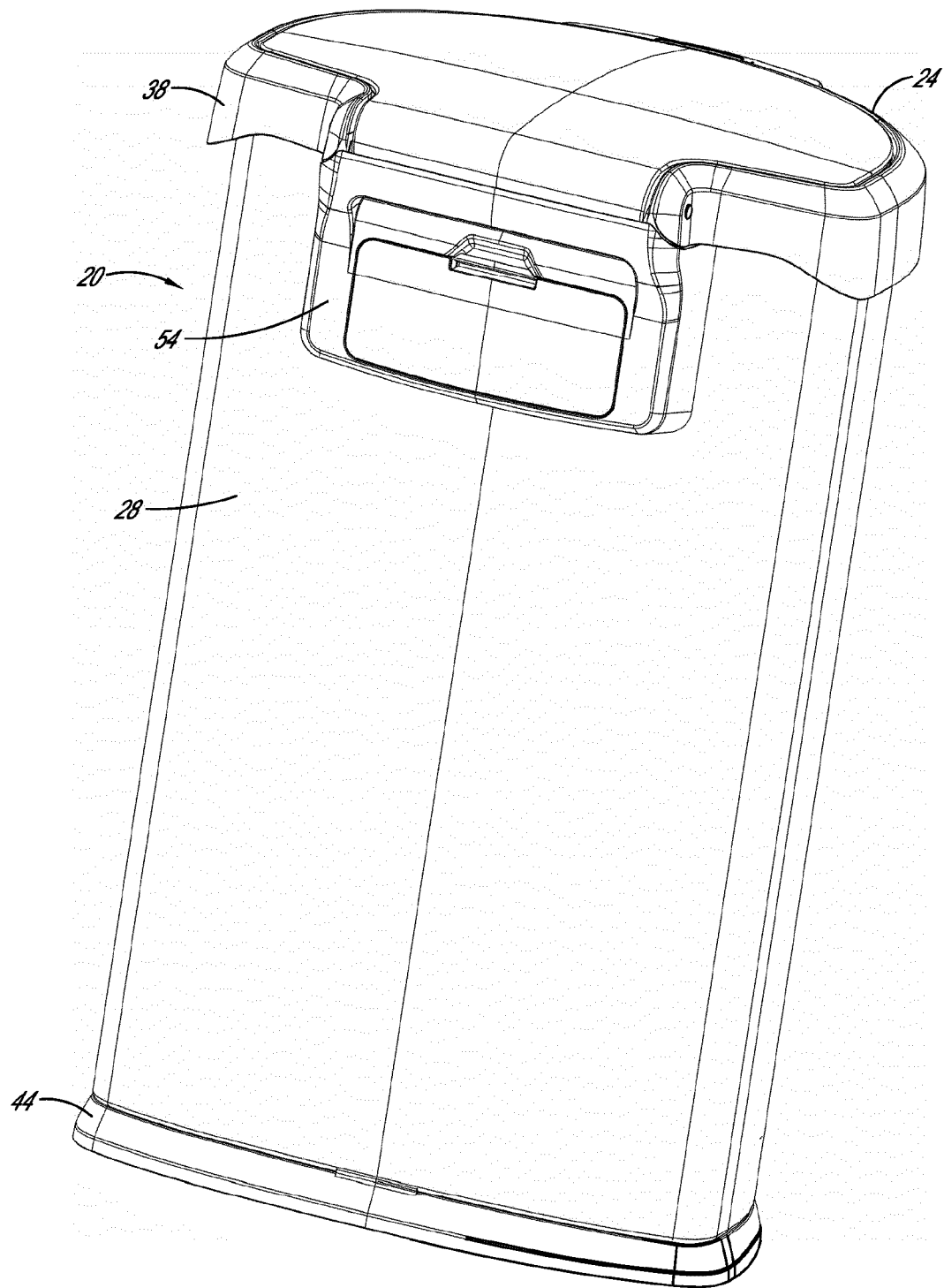


FIG. 3

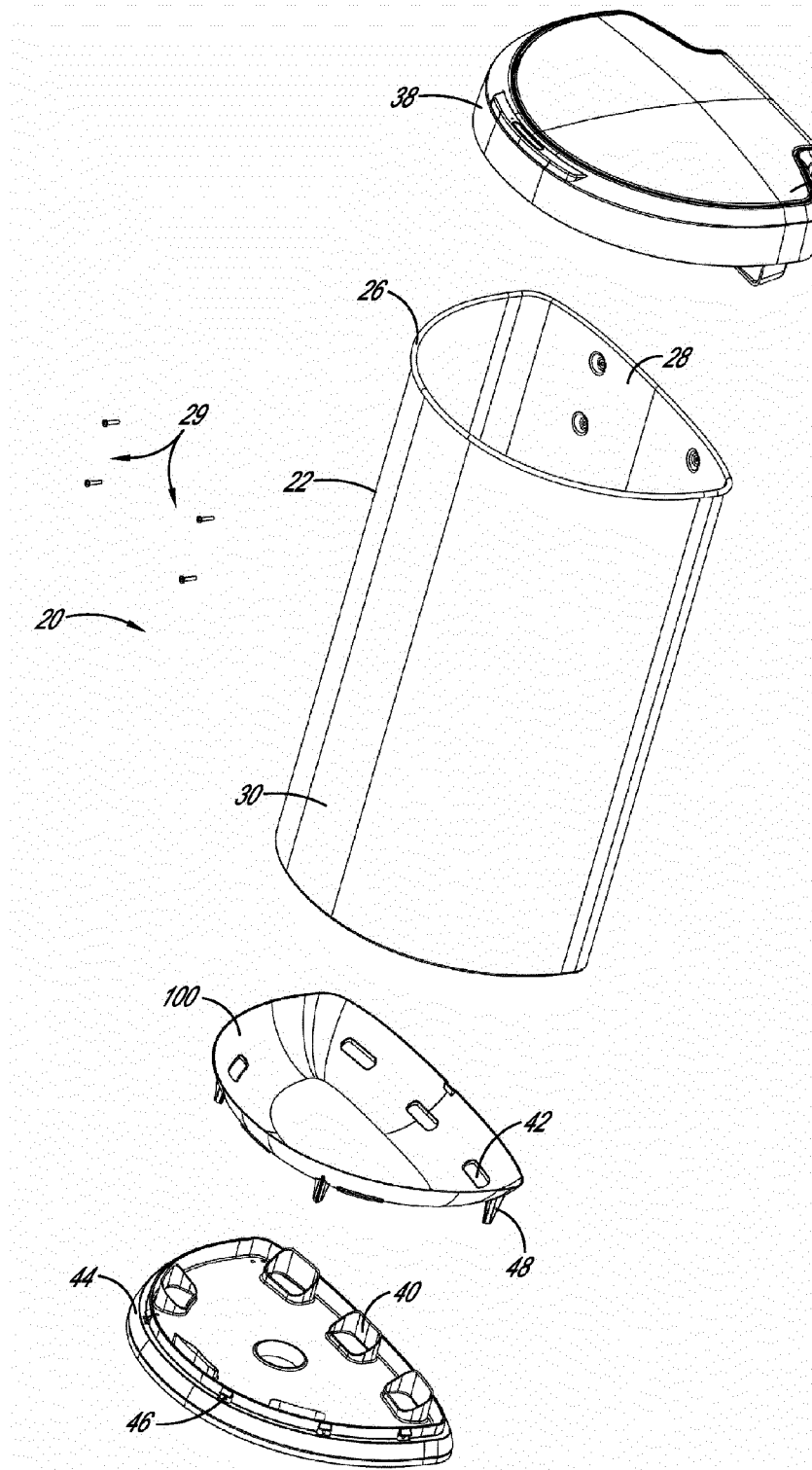
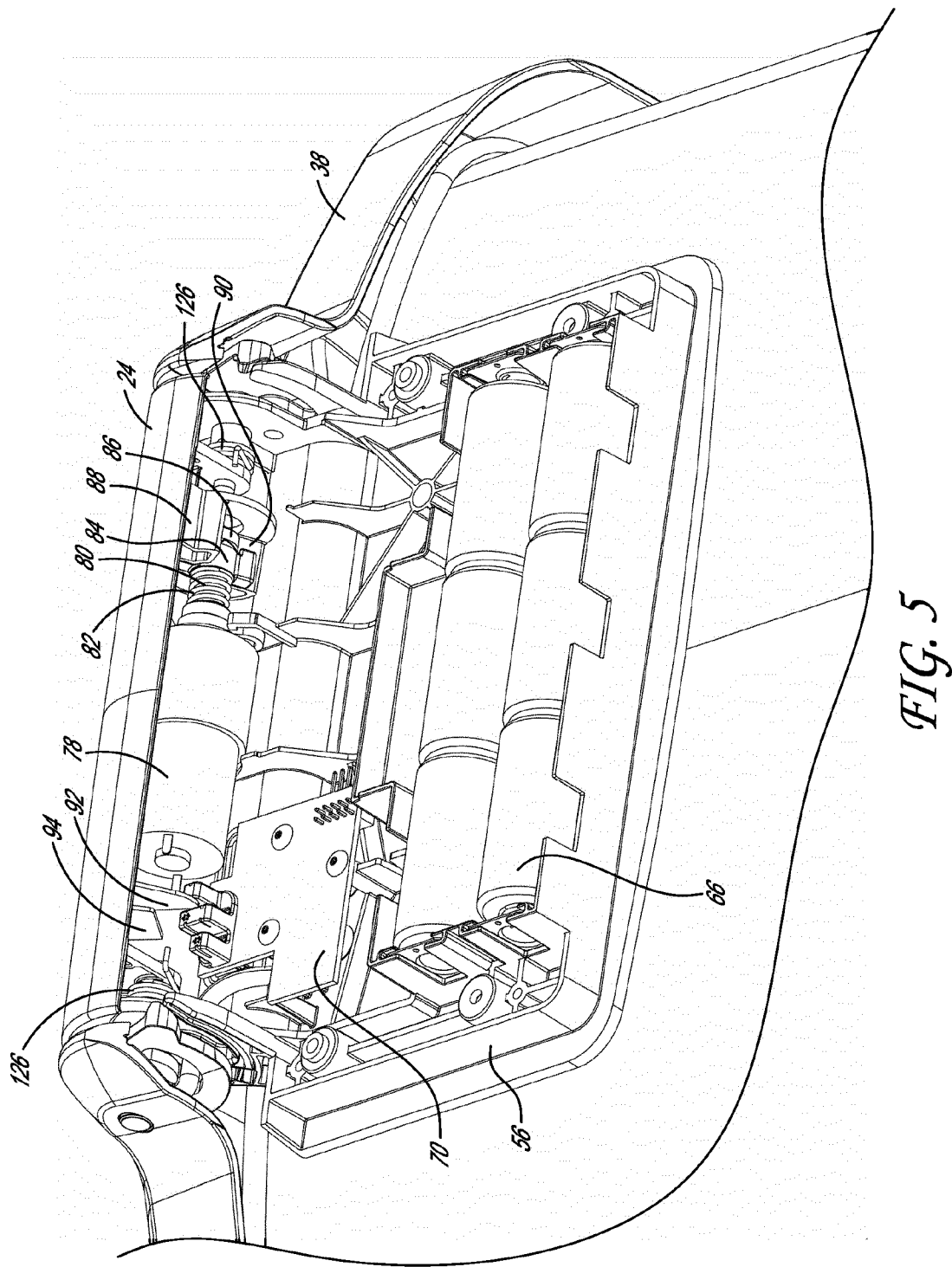
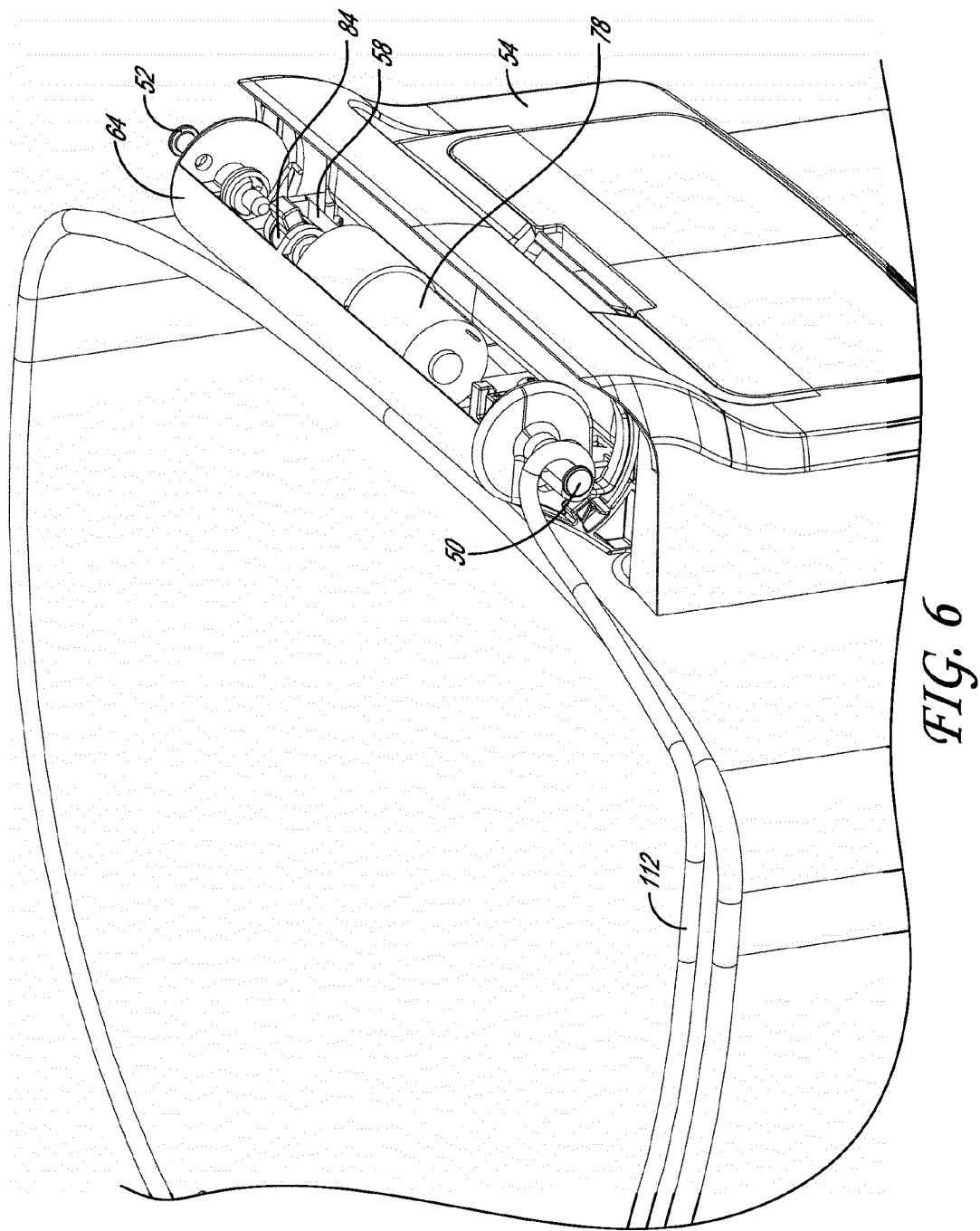


FIG. 4





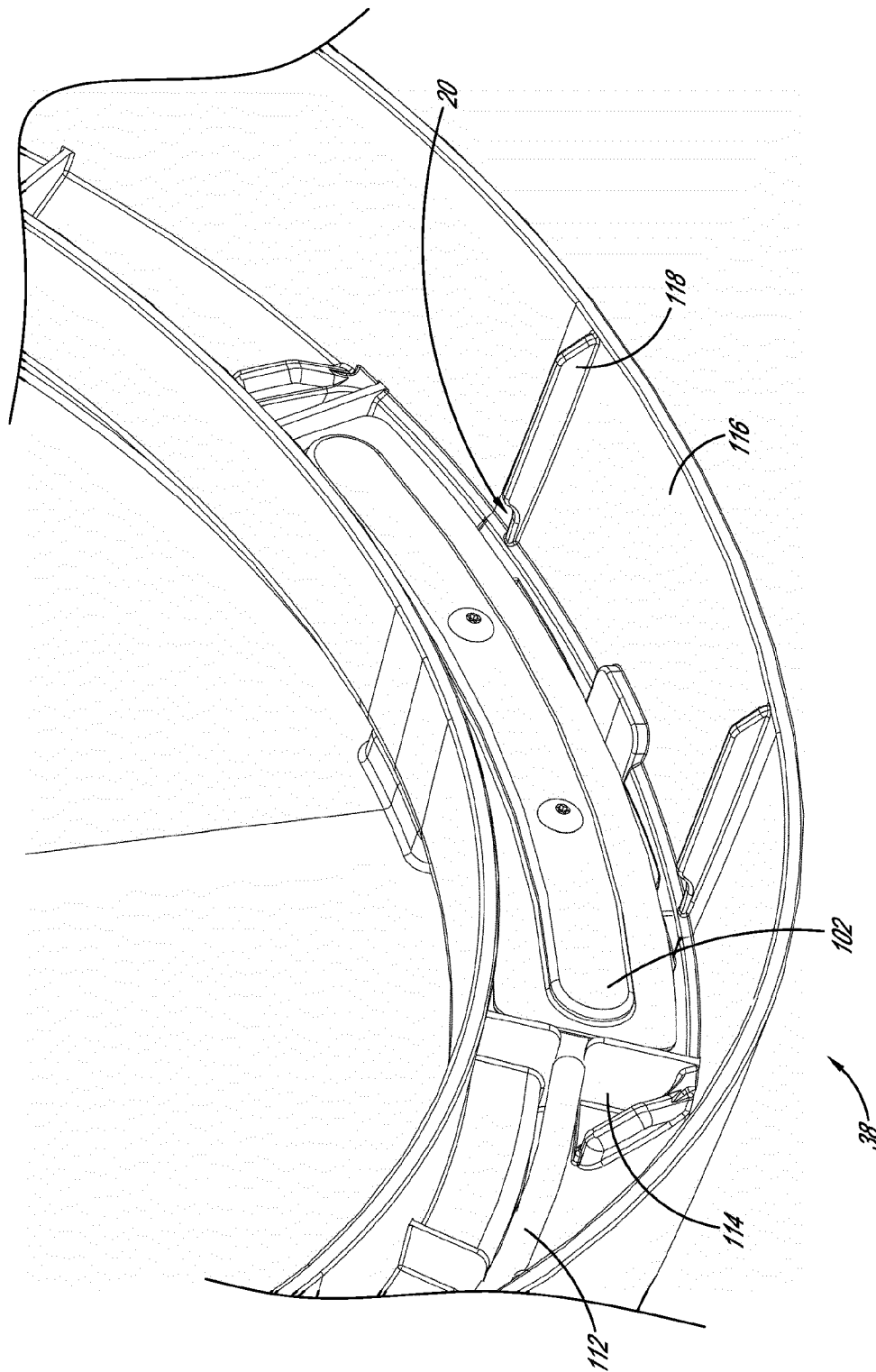


FIG. 7

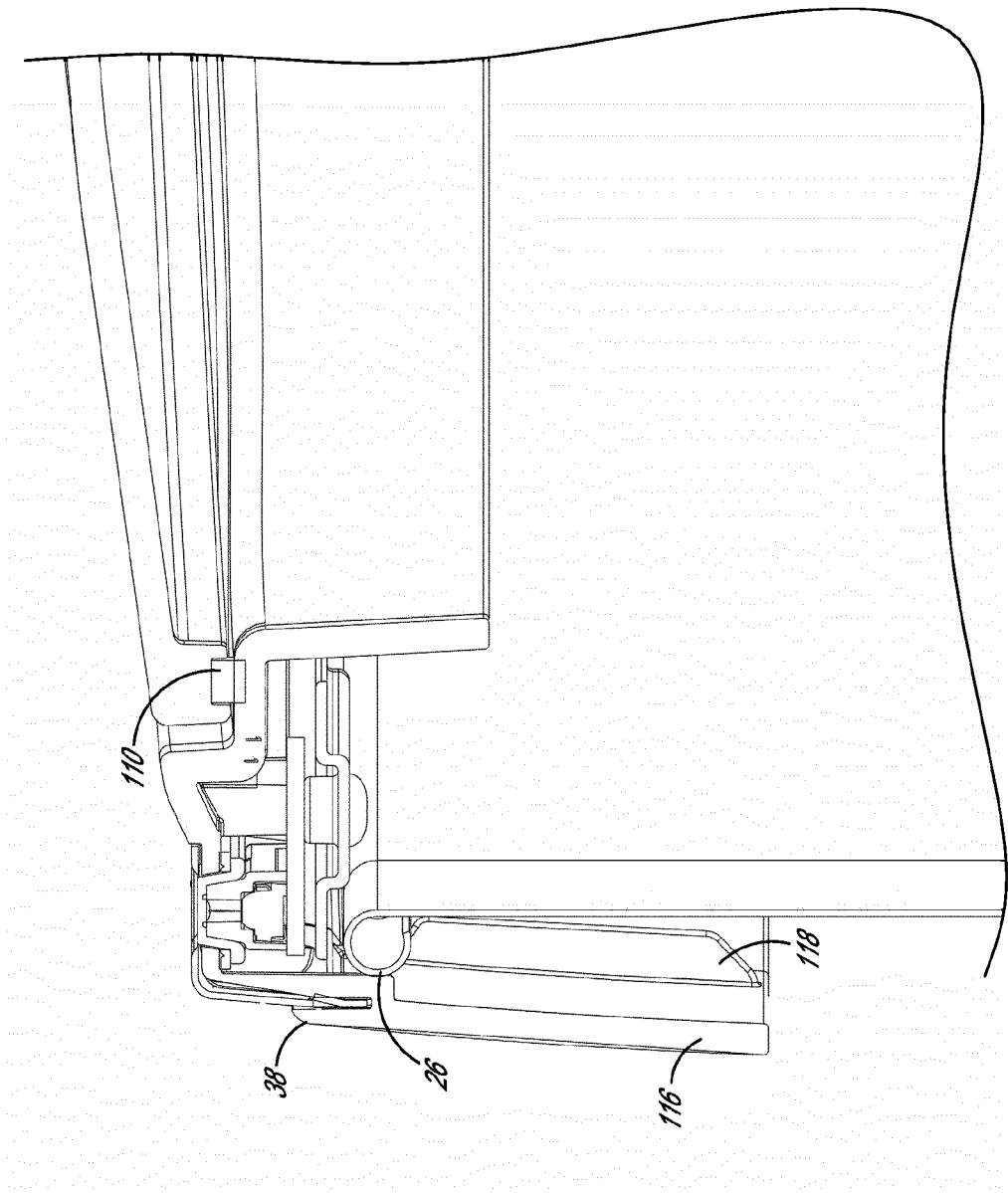


FIG. 8

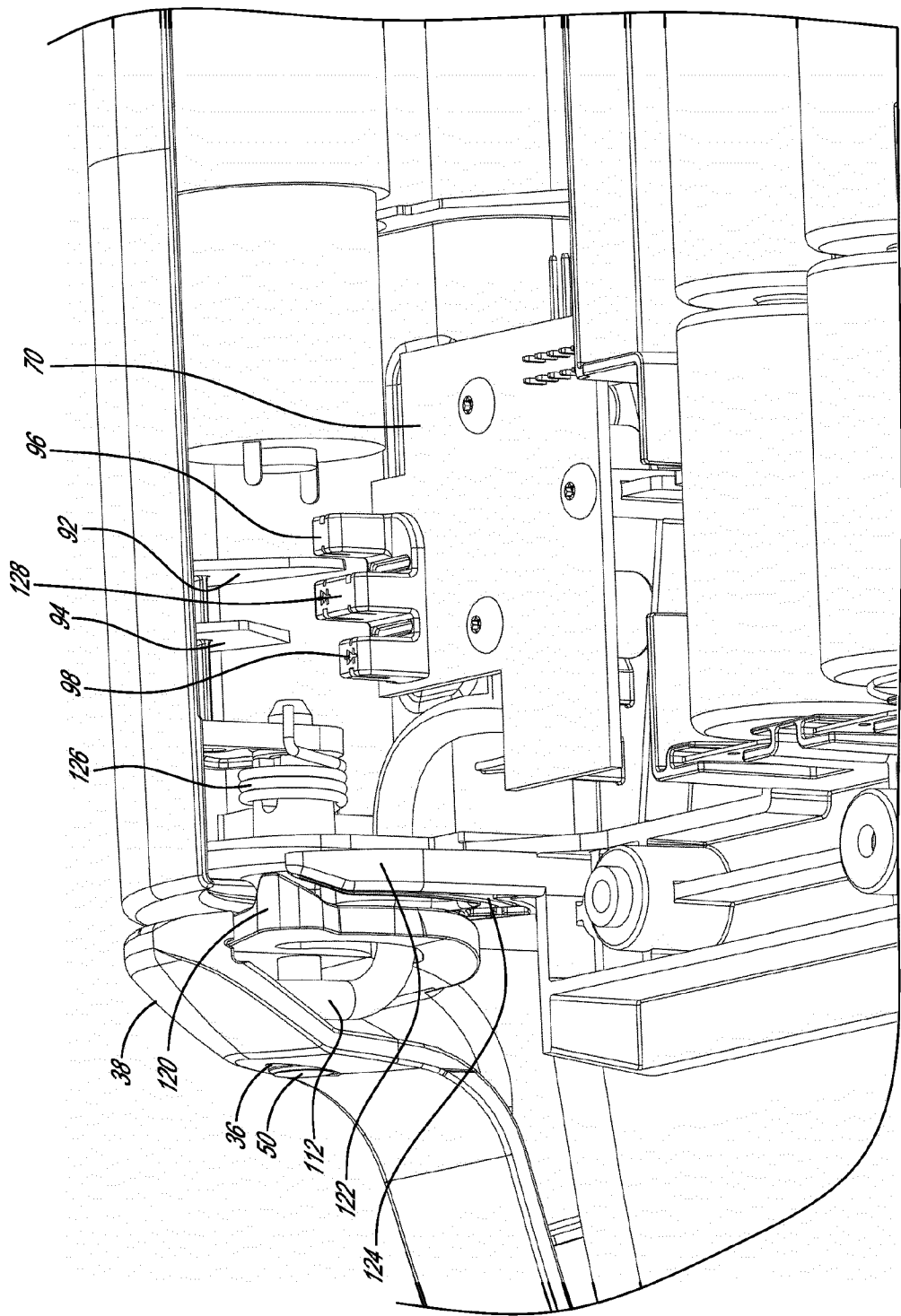
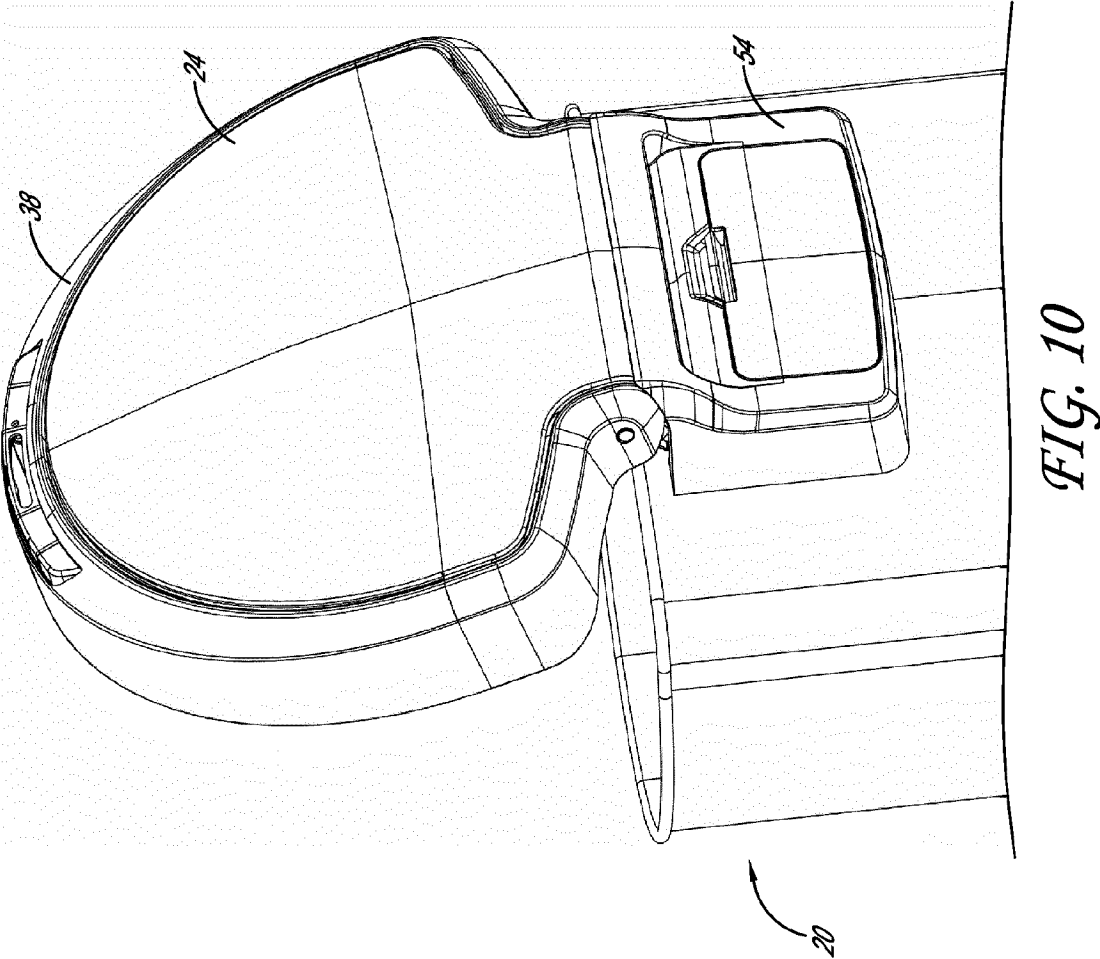
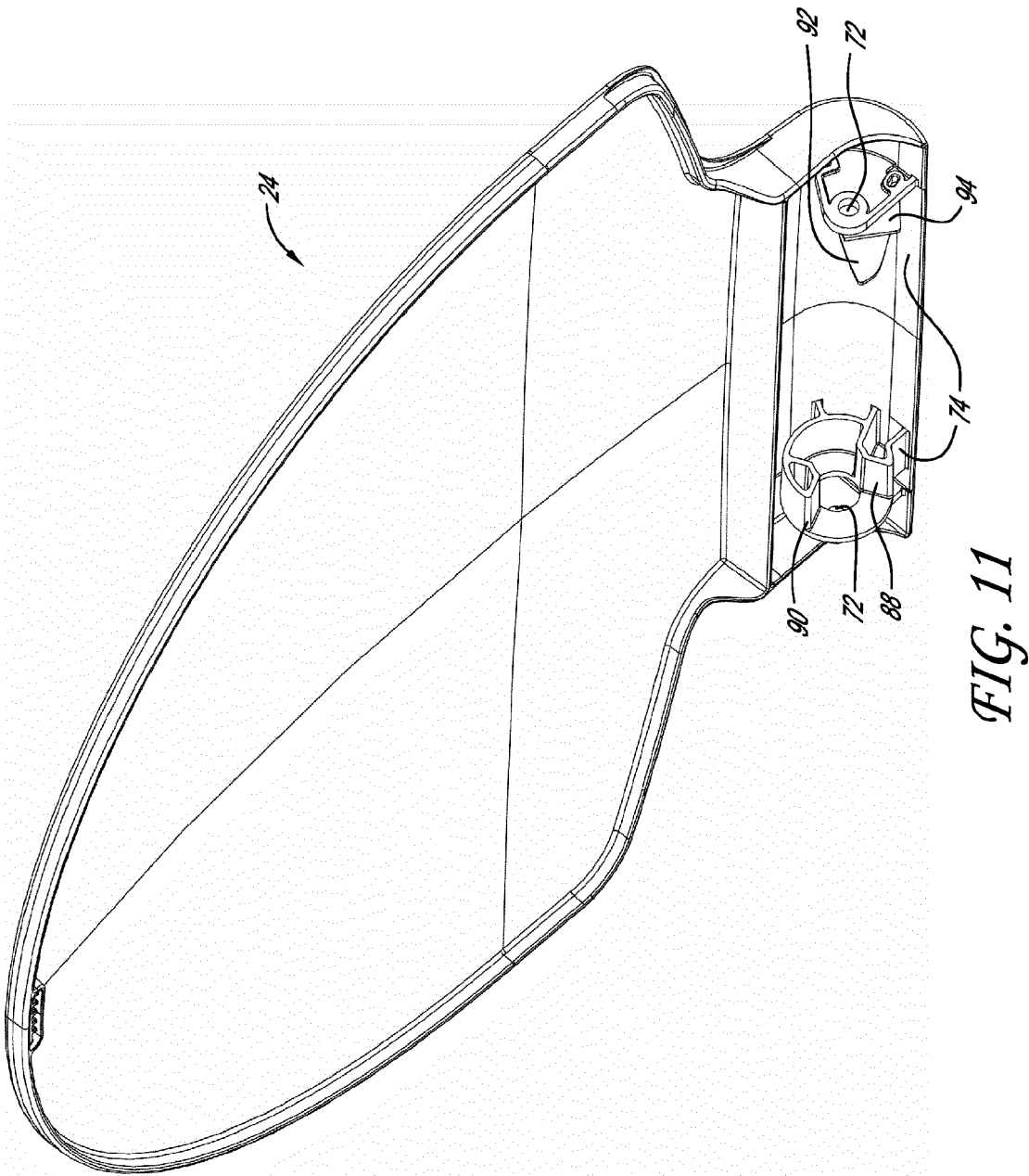
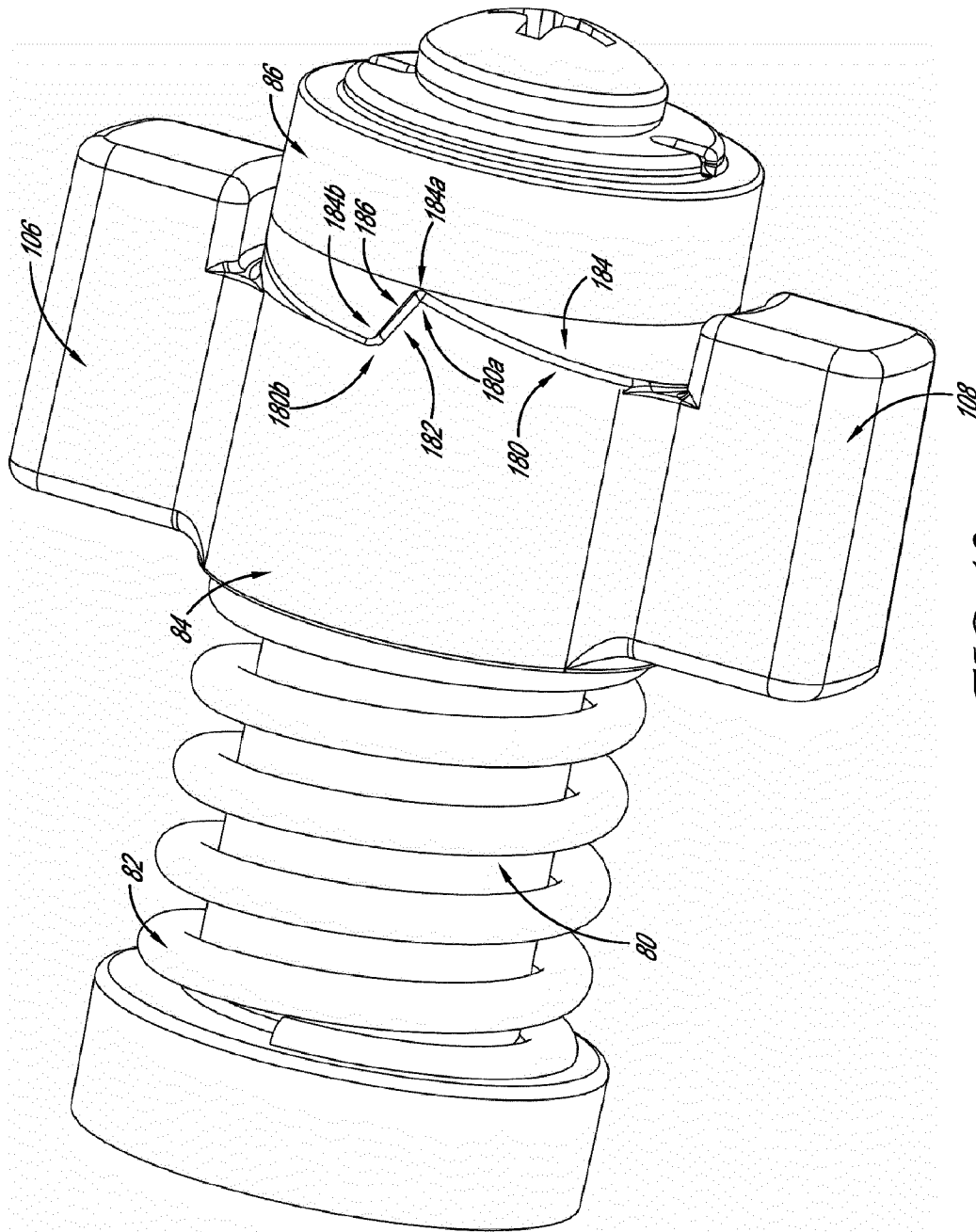


FIG. 9







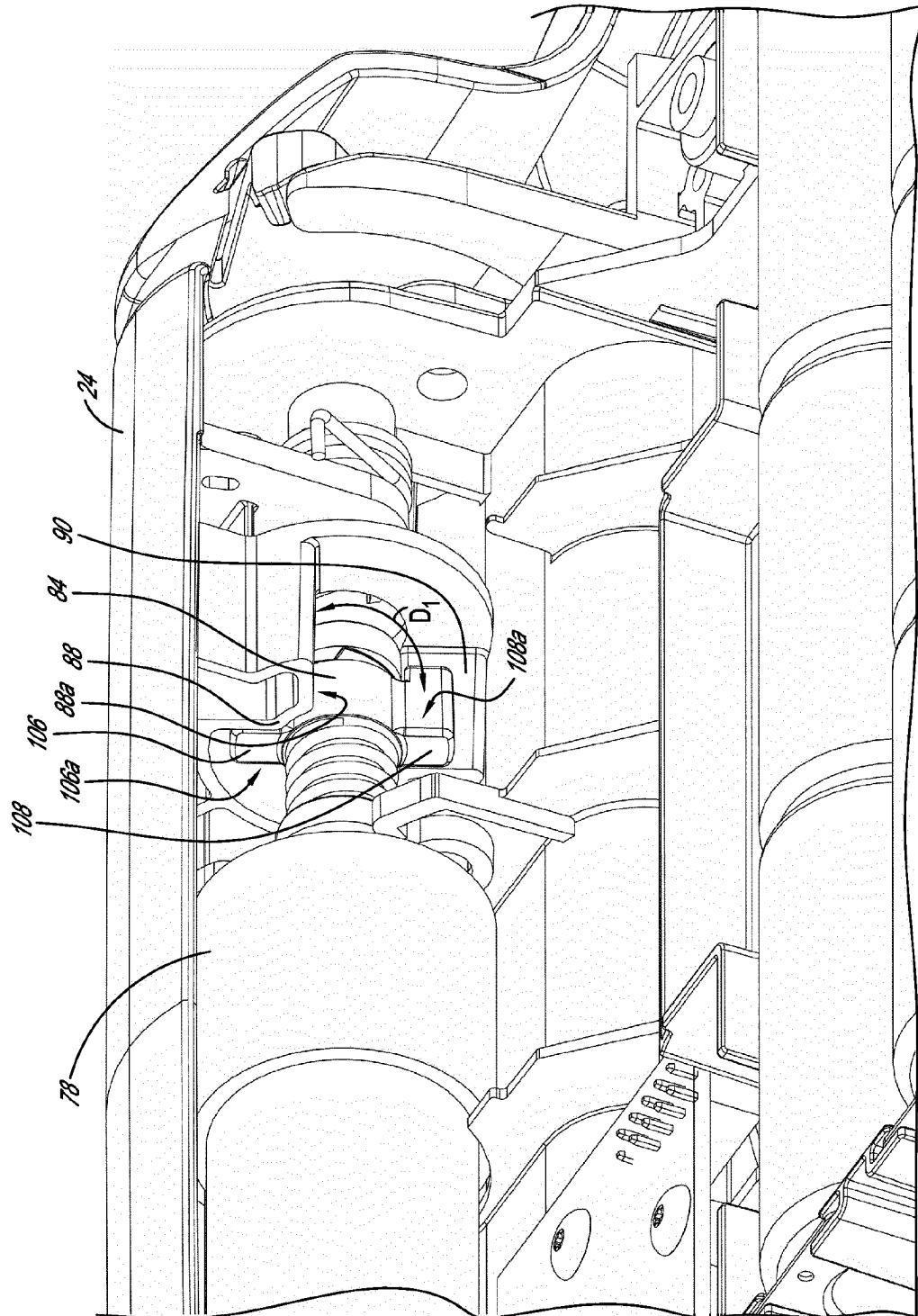


FIG. 13



EUROPEAN SEARCH REPORT

Application Number
EP 13 15 8229

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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 25 June 2013	Examiner Smolders, Rob
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EP 13 15 8229

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EUROPEAN PATENT APPLICATION

(43) Date of publication:
11.09.2013 Bulletin 2013/37

(51) Int Cl.:
B65F 1/14 (2006.01)

(21) Application number: **13158479.9**

(22) Date of filing: **08.03.2013**

(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**
Designated Extension States:
BA ME

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(30) Priority: **09.03.2012 US 201261609179 P**

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(54) **Trash cans with features to aid in actuation**

(57) Trash can (1) including a cap (4) with a lid (30) and an actuator (50). The actuator (50) can extend outwardly from the cap (4) at a downward angle. The actuator (50) can be configured to maintain the lid (30) in a closed position when a locking portion (56) of the actuator (50) is engaged with a securement portion (36) of the lid (30). The lid (30) can be rotationally biased toward an open position and the actuator (50) can be configured to release the lid (30) from the closed position upon an input of force (F) on the actuator (50). The range of effective angles for the input force (F) can enable a user of the trash can (1) to easily open the lid (30) by contacting the actuator (50) with from a wide variety of angles.

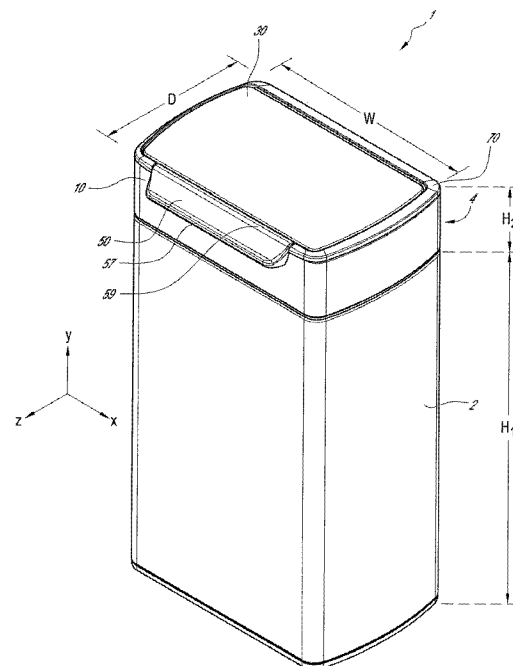


FIG. 1

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This present application claims priority benefit under 35 U.S.C. § 119(e) to U.S. Provisional Application No. 61/609,179, filed March 9, 2012, entitled "TRASH CANS WITH FEATURES TO AID IN ACTUATION," which is hereby incorporated by reference in its entirety.

BACKGROUND

Technical Field

[0002] Embodiments of the disclosed devices generally relate to the field of trash cans and other receptacles.

Description of the Related Art

[0003] Receptacles and other devices having lids or doors are used in a variety of different settings. For example, in both residential and commercial settings, trash cans and other devices often have lids or doors for protecting or preventing the escape of the contents of the receptacle. In the context of trash cans, some trash cans include lids or doors to prevent odors from escaping and to hide the trash within the receptacle from view. Additionally, the lid of a trash can help prevent contaminants from escaping from the receptacle.

[0004] In some instances, trash can lids or doors are equipped with a latching or locking mechanism which secures the lid in a shut position. These types of trash cans sometimes include a foot pedal which is connected to the lid for moving the lid toward the open position. Handles or other actuators for opening trash cans are sometimes located on the lid of the trash can.

SUMMARY OF THE DISCLOSURE

[0005] Several embodiments of refuse storage receptacles (e.g., trash cans) are disclosed. In some embodiments, a refuse storage receptacle includes a body portion comprising an interior cavity and at least one opening located on a top portion of the body. A refuse storage can also have a lid portion configured to engage with the top portion of the body. In some embodiments, the lid portion comprises a cap (e.g., a peripheral portion and/or a frame member). The frame member can have an upper portion and a lower portion. The lower portion can be configured to engage with a bin. In some embodiments, the frame member can have a frame aperture that is configured to allow refuse to pass through the frame member and into the interior cavity of the bin.

[0006] In some variants, the peripheral portion has an outer edge, an inner edge, and one or more lid engagement members. In some embodiments, the inner edge of the peripheral portion has an opening configured to allow refuse to pass through the peripheral portion and

into the interior cavity of the bin. In some embodiments, the peripheral portion is configured to connect with the upper portion of the frame member.

[0007] In some embodiments, the receptacle can have a lid rotationally connected to the peripheral portion in the region of the opening. The lid can have a shape that generally corresponds to the shape of the opening in the peripheral portion and can have at least one attachment member (e.g., a hinge member) on a first side of the lid and a securement member on a second side of the lid generally opposite the first side. In some embodiments, the at least one hinge attachment member is configured to connect to the one or more lid engagement members of the peripheral portion. The lid can be configured to transition between an opened configuration and a closed configuration, wherein the lid inhibits access to the opening in the peripheral portion when the lid is in a closed configuration.

[0008] In some embodiments, the receptacle has an actuator rotationally connected to the peripheral portion, the actuator extending outwardly and downwardly from the outer edge of the peripheral portion, the actuator configured to rotate between an open position and a closed position, and the actuator rotationally biased toward the closed position. In some embodiments, the receptacle has a locking member configured to engage with the securement member of the lid when the actuator is in the closed position such that the locking member secures the lid in the closed configuration and inhibits the lid from moving to the open configuration, the engagement of the locking member and the securement member being released upon application of an input force at an effective angle upon the actuator, thereby allowing the lid to move to the open configuration.

[0009] In some embodiments, the locking member comprises a flange with a sloped upper edge configured to deflect the actuator. In some embodiments, the securement member comprises a recess, the recess configured to receive the flange when the lid is in a closed configuration and the locking member is in a closed position. In some embodiments, the securement member comprises a flange with a sloped lower edge configured to engage and deflect the actuator. In some variants, the locking member comprises a recess configured to receive the flange when the lid is in a closed configuration and the locking member is in a closed position.

[0010] According to some configurations, the effective angle of the input force, as measured downward from level with the ground, is between 0° and 90°. In some embodiments, the peripheral portion further comprises at least one biasing member, such as a torsion spring, that is configured to engage with at least one of the at least one lid engagement members and to rotationally bias the lid toward the open configuration. In some embodiments, the peripheral portion further comprises at least one biasing member, such as a torsion spring, that is configured to engage with the actuator and to rotationally bias the actuator toward the closed position. In some embodi-

ments, the peripheral portion has a generally rectangular shape. According to some variants, the lid is rotationally connected to one side of the opening of the peripheral portion. The lid can be rotationally biased to the open configuration.

[0011] In some embodiments, the actuator comprises an outer edge on the side of the actuator generally opposite the peripheral portion, an inner edge on the side of the actuator adjacent the peripheral portion, and a hinge member about which the actuator can rotate. In some embodiments, the outer edge of the actuator and the outer edge of the peripheral portion form a substantially continuous curve. In some embodiments, the outer edge of the actuator is longer than the inner edge of the actuator. In some further embodiments, the inner edge of the actuator is longer than the outer edge of the actuator. And in some further embodiments, the inner edge of the actuator is substantially the same length as the outer edge of the actuator.

[0012] In some embodiments, the lid portion further comprises one or more damping members configured to slow down and diminish the momentum of the lid, thereby smoothing the transition between the open configuration and the closed configuration and diminishing noise and reverberation during closure. In some embodiments, one or more of the securement member and the locking member comprises a magnet. In some embodiments, when the receptacle is positioned on generally flat ground in the normal configuration for use, the distance between the generally lowest point on the actuator and the ground is greater than the distance between the ground and the lower portion of the frame member.

[0013] In some embodiments, the peripheral portion further comprises an inner shroud extending downward from the lid, the inner shroud being configured to guide trash or other articles from the peripheral aperture into the interior cavity of the body. In some embodiments, the frame member further comprises an outer shroud extending downward from the upper portion of the frame member, the outer shroud being configured to inhibit access from the sides of the lid portion to the interior cavity of the body. In some embodiments, the frame member has a frame aperture that is configured to allow refuse to pass through the frame member and into the interior cavity of the bin.

[0014] In some embodiments, the lid portion comprises a peripheral portion having an outer edge and an inner edge, the inner edge of the peripheral portion having an opening configured to allow refuse to pass through the peripheral portion and into the interior cavity of the bin, the peripheral portion configured to connect with the upper portion of the frame member. In some embodiments, the lid portion comprises a lid rotationally connected to the opening of the peripheral portion, the lid comprising a securement member and configured to transition between an opened configuration and a closed configuration, wherein the lid inhibits access to the opening in the peripheral portion when the lid is in a closed configura-

tion. The lid portion can comprise an actuator rotationally connected to the peripheral portion and configured to rotate between an open position and a closed position. In some embodiments, the actuator is rotationally biased toward the closed position. The actuator can comprise a locking member configured to releasably engage with the securement member of the lid when the actuator is in the closed position such that the locking member secures the lid in the closed configuration and inhibits the lid from moving to the open configuration. The engagement of the locking member and the securement member can be released upon application of an input force at an effective angle upon the actuator.

[0015] In some embodiments, the securement member is configured to contact the locking member before the securement member is engaged with the locking member as the lid rotates from the open configuration to the closed configuration, thereby rotating the actuator from the closed position toward the open position, whereupon the actuator is configured to rotate to the closed position upon engagement between the securement member and the locking member.

[0016] According to some variants, the locking member comprises a flange with a sloped upper edge configured to deflect the actuator. In some embodiments, the securement member comprises a recess, the recess configured to receive the flange when the lid is in a closed configuration and the locking member is in a closed position. In some embodiments, the securement member comprises a flange with a sloped lower edge configured to engage and deflect the actuator. In some embodiments, the locking member comprises a recess, the recess configured to receive the flange when the lid is in a closed configuration and the locking member is in a closed position.

[0017] A method of opening and closing the lid of a refuse receptacle having a frame member, peripheral portion, lid, and actuator, can include the step of deflecting the actuator from a closed position to an open position, thereby releasing a locking member on the actuator from engagement with a securement member on the lid. The method can include rotating the lid from a closed configuration to an open configuration. In some embodiments, the method includes releasing the actuator, thereby allowing the actuator to return to the closed position. According to some configurations, the method includes rotating the lid from the open configuration toward the closed configuration and bringing the securement member into contact with the locking member, thereby deflecting the actuator from a closed position toward an open position. In some embodiments, the method includes bringing the securement portion into engagement with locking member, thereby returning the actuator to the closed position.

[0017a] According to another aspect of the invention there is provided a refuse storage receptacle comprising: a body comprising an interior cavity and at least one opening located on a top portion of the body; and a lid

portion configured to engage with the top portion of the body, the lid portion comprising: a cap having an upper portion and a lower portion, the lower portion configured to engage with the body, the cap having an opening configured to allow refuse to pass through the cap and into the interior cavity of the body; a lid rotationally connected to the opening of the cap, the lid comprising a securement member, the lid configured to transition between an opened configuration and a closed configuration, wherein the lid inhibits access to the opening in the cap when the lid is in a closed configuration; and an actuator rotationally connected to the cap, the actuator configured to rotate between an open position and a closed position, the actuator rotationally biased toward the closed position, the actuator comprising a locking member configured to releasably engage with the securement member of the lid when the actuator is in the closed position such that the locking member secures the lid in the closed configuration and inhibits the lid from moving to the open configuration, the engagement of the locking member and the securement member being released upon application of a downward force upon the actuator; wherein the securement member deflects the actuator from the closed position toward the open position during a portion of the movement of the lid from the open configuration to the closed configuration, and the securement member is subsequently engaged with the locking member thereby allowing the actuator to return the closed position.

[0018] For purposes of summarizing the disclosure, certain aspects, advantages and features of the inventions have been described herein. It is to be understood that not necessarily any or all such advantages are achieved in accordance with any particular embodiment of the inventions disclosed herein. No aspects of this disclosure are essential or indispensable.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] Certain embodiments of trash cans will be discussed in detail with reference to the following figures. These figures are provided for illustrative purposes only, and the disclosure is not limited to the subject matter illustrated in the figures.

[0020] Figure 1 is a perspective view of a trash can with a cap portion including a lid.

[0021] Figure 2A is a top view of the cap portion of the trash can of Figure 1.

[0022] Figure 2B is a bottom view of the cap portion of Figure 2A.

[0023] Figure 2C is a rear view of the cap portion of Figure 2A.

[0024] Figure 2D is a front view of the cap portion of Figure 2A.

[0025] Figure 2E is a left side view of the cap portion of Figure 2A.

[0026] Figure 3A is a cross-section view of the cap portion of Figure 2A along the section plane 3A-3A of Figure

2A.

[0027] Figure 3B is a close-up view of the portion identified in Figure 3A.

[0028] Figure 4A is a cross-section view of the cap portion of Figure 2A along the section plane 4A-4A of Figure 2A with the lid in a closed configuration.

[0029] Figure 4B is a close-up view of the portion identified in Figure 4A.

[0030] Figure 4C is a close-up view of the portion identified in Figure 4A with the actuator rotated.

[0031] Figure 4D is a close-up view of the portion identified in Figure 4A with the lid partially open.

[0032] Figure 4E is a cross-section view of the cap portion of Figure 2A along the section plane 4A-4A of Figure 2A with the lid in an open configuration.

[0033] Figure 5A is a top view of the lid of the trash can of Figure 1.

[0034] Figure 5B is a rear view of the lid of the trash can of Figure 1.

[0035] Figure 5C is a front view of the lid of the trash can of Figure 1.

[0036] Figure 5D is a left side view of the lid of the trash can of Figure 1.

[0037] Figure 5E is a close-up left side view of the rear end of the lid of Figure 5D, as identified by the portion identified in Figure 5D.

[0038] Figure 5F is a close-up rear left side perspective view of the lid of Figure 5A.

[0039] Figure 5G is a close-up rear right side perspective view of the lid of Figure 5A.

[0040] Figure 6A is a front left perspective view of the cap portion of Figure 2A with the lid removed.

[0041] Figure 6B is a close-up front left perspective view of the cap portion of Figure 2A, as defined by the portion identified in Figure 6A.

[0042] Figure 6C is a close-up front right perspective view of the cap portion of Figure 2A, as defined by the portion identified in Figure 6A.

DETAILED DESCRIPTION OF CERTAIN EMBODIMENTS

[0043] Various trash cans are described herein in reference to various embodiments and drawings. It will be appreciated by those skilled in the art that variations and improvements may be accomplished in view of these teachings that are encompassed by the scope and spirit of the present disclosure. By way of illustration, the present subject matter is described in reference to a trash can, such as a trash can of the type typically used in kitchens, for example. Other types of containers, such as, for example, diaper pails or storage containers of any other type, are contemplated by the present disclosure and can be used with any or all of the features described herein.

[0044] With reference to Figure 1, a trash can 1 can generally have a body 2 having an inner cavity configured to receive trash. A cap portion 4 can be removably at-

tached to the top of the body 2. In some embodiments, the cap portion 4 can include a frame member 10 and a peripheral portion (e.g., a trim) 70. The peripheral portion 70 can define an opening in the top of the cap portion 4 through which trash or other matter can be inserted into the body 2 of the trash can 1. In some embodiments, the trash can 1 can include a plastic bucket or liner (not shown) for containing trash or objects therein, where the plastic liner is positioned inside the body 2 of the trash can 1. When the cap 4 is removed from the body 2, the top portion of the plastic liner can be exposed above the top portion of the body 2, such that it is easy for the user to insert or remove trash bags from the liner. When the cap 4 is attached to the body 2, the liner can be completely hidden from view. In some embodiments, a trash bag can be inserted in the body 2 to collect trash and when the cap portion 4 is attached to the body 2, the cap portion 4 can pinch down on any overhanging portions of the trash bag to prevent it from falling into the body 2. In some embodiments, the cap portion 4 can include a lid 30. In some embodiments, the lid 30 can be pivotally attached to the peripheral portion 70. In some embodiments, the lid 30 can be pivotally attached to the frame member 10. The lid 30 can be configured to transition between a closed configuration (as illustrated in Figure 1) and an open configuration (as illustrated in Figure 4E).

[0045] In some embodiments, the cap portion 4 includes an actuator 50. In some embodiments, the actuator 50 can be configured to allow the lid 30 to transition from the closed configuration to the open configuration upon application of an input force F on the upper surface 57A of the actuator 50, on or near the outer edge 57 of the actuator 50. In some embodiments, the input force F can be applied at an angle that is acute with respect to the ground and that is generally perpendicular to the contact surface (e.g., the upper surface 57A) of the actuator 50. As discussed in more detail below, the actuator 50 can be configured to rotate out of engagement with the lid 30. In some variants, the actuator 50 can be rotationally attached to the peripheral portion 70. In some embodiments, the actuator 50 can be rotationally attached to the frame member 10. In some embodiments, the actuator 50 can be attached to the lid 30.

[0046] In some embodiments, the outer edge 57 and an inner edge 59 of the actuator are substantially the same length. In some embodiments, the inner edge 59 is longer than the outer edge 57. For example, in some embodiments, the ratio of the length of the inner edge 59 to the length of the outer edge 57 is greater than or equal to about: 1:1, 1.3:1, 1.5:1, values in between, or otherwise. In some embodiments, the outer edge 57 is longer than the inner edge 59. For example, in some embodiments, the ratio of the length of the outer edge 57 to the length of the inner edge 59 is greater than or equal to about: 1:1, 1.05:1, 1.1:1, 1.3:1, 1.5:1, values in between, or otherwise. In some embodiments, a wide outer edge 57 (e.g., an edge that is substantially wider than the upper edge of the peripheral portion) can facilitate easier open-

ing of the lid 30 due to an increased area of contact on the actuator 50. In some embodiments, the upper surface 57A of the actuator 50 comprises a generally downwardly sloping or curved region. In some embodiments, the region is generally concave. In certain variants, the region is generally flat or convex.

[0047] As illustrated, the upper surface 57A can be generally or virtually entirely continuous from its upper edge to its lower edge, in either or both of the vertical and horizontal directions. The actuator can comprise a generally rounded or contoured lower edge to avoid or reduce discomfort upon contact with it. As illustrated in Figure 4D, the side horizontal cross-sectional thickness of the actuator 50 along its lower edge T_L can be substantially greater than the side horizontal cross-sectional thickness along its upper edge T_U to provide additional cantilevered mass in a region generally opposite from where the actuation force is applied to facilitate activation of the actuator 50.

[0048] It is contemplated that the overall dimensions of the trash can 1 can vary considerably. For example, the height $H1$ can have a broad range. In some embodiments, the height $H1$ can be greater than about six inches and/or less than or equal to about four feet. In some embodiments, the height $H1$ can be approximately three feet. Many variations are possible. Furthermore, the height $H2$ of the cap portion 4 can vary greatly. In some embodiments, the height $H2$ can be less than about one foot and/or greater than or equal to about one inch. In some embodiments, the height $H2$ can be about three and one half inches. Many variations are possible. The width W and depth D of the trash can and/or the cap portion 4 can also vary considerably. In some embodiments, the width W of the body 2 is greater than the width W of the cap portion 4. In some embodiments, the width W of the body 2 is less than or about the same as the width W of the cap portion 4. In some embodiments, the depth D of the body 2 is greater than the depth D of the cap portion 4. In some embodiments, the depth D of the body 2 is less than or about the same as the depth D of the cap portion 4. In some variations, the depth D of body 2 and/or the cap portion 4 can be greater than about five inches and/or less than about two feet. In some embodiments, the depth D of the body 2 and/or the cap portion 4 can be approximately one foot. In some variations, the width W of body 2 and/or the cap portion 4 can be greater than about eight inches and/or less than about three feet. In some embodiments, the width W of the body 2 and/or the cap portion 4 can be approximately fourteen inches. Many variations of the width W and depth D of the body 2 and cap portion 4 are possible.

[0049] As illustrated in Figures 2A and 2B, the cap portion 4 can have a substantially rectangular shape. In some embodiments, the cap portion 4 can have a generally oval shape, generally circular shape, generally semi-round shape, generally triangular shape, or any other appropriate shape for a trash can. The lid 30 can have the same or a substantially similar shape as the cap por-

tion 4. In some embodiments, the lid 30 has a substantially different shape from the overall shape of the cap portion 4. In some embodiments, the actuator 50 can extend outwardly from the frame member 10, as illustrated in Figure 2B. In some embodiments, the actuator 50 extends outwardly from the peripheral portion 70 of the cap portion 4, as illustrated in Figure 2A. In some embodiments, the peripheral portion 70 can extend outwardly in the vicinity of the actuator 50 such that the outer edge 57 of the actuator 50 and the outer edge of the peripheral portion 70 form a substantially continuous line or curve. For example, the peripheral portion 70 can extend from the points 74 near the front corners of the peripheral portion 70 to the points 54 near the front corners of the actuator 50. As shown, the front corners of the actuator 50 can be generally contoured or generally rounded. In some embodiments, the outer edge 57 of the actuator 50 can form a substantially straight edge. In some embodiments, the outer edge 57 of the actuator 50 can form a curved edge. In some embodiments, the outer edge 57 of the actuator can include surface features (e.g., dimples, high-friction features, projections, grooves, or any other surface feature). As illustrated in Figure 2A, the outer width of the actuator 50 on the side that is closer to the user and further from the trash receptacle (e.g., the distance between points 54) can be different from the inner width of the actuator 50 on the side that is further from the user and closer to the trash receptacle (e.g. the distance between points 54A). For example, as illustrated, the outer width can be smaller than the inner width. The actuator 50 can taper inwardly and/or downwardly from the inner width to the outer width.

[0050] In some embodiments, the cap portion 4 can include one or more lid hinge assemblies 80 located on the side of the cap portion 4 generally opposite the actuator 50. In some embodiments, the cap portion 4 includes more than two lid hinge assemblies 80. In some embodiments, the lid hinge assemblies 80 are the same as or substantially similar to each other functionally and/or structurally. In some embodiments, the lid hinge assemblies 80 are functionally and/or structurally distinct from each other. In some embodiments, the peripheral portion 70 can include one or more actuator hinge assemblies 72 located on the side of the peripheral portion 70 adjacent the actuator 50. In some embodiments, the peripheral portion 70 includes more than two actuator hinge assemblies 72. In some embodiments, the actuator hinge assemblies 72 are the same as or substantially similar to each other functionally and/or structurally. The actuator hinge assemblies 72 can be configured to rotationally couple with the actuator 50.

[0051] In some embodiments, the lid 30 can include one or more lid hinge attachments 32 attached to the rear bottom side of the lid 30. The lid hinge attachments 32 can be attached to the lid 30 via fasteners (e.g., screws, bolts), adhesives, or any other appropriate attachment method. In some embodiments, the lid 30 includes more than two lid hinge attachments 32. In some embodi-

ments, the lid hinge attachments 32 are the same as or substantially similar to each other functionally and/or structurally. In some embodiments, the lid hinge attachments 32 are functionally and/or structurally distinct from each other. The lid hinge attachments 32 can be configured to rotationally attach to the lid hinge assemblies 80 to allow rotation of the lid 30 with respect to the cap portion 4, as will be described in more detail below.

[0052] As illustrated in Figures 2C-2E, the lid 30 can be configured to have a low profile with respect to the peripheral portion 70 when the lid 30 is in a closed configuration. For example, the upper surface of the lid 30 can be generally flush with the upper surface of the peripheral portion 70. In some embodiments, the vertical distance between the upper surface of the lid 30 and the upper surface of the peripheral portion 70 can be approximately less than or equal to the width of the upper edge of the peripheral portion 70. As shown in Figure 2C and 2E, the lid 30 and/or peripheral portion 70 can be configured in some embodiments to substantially "hide" the lid 30 from behind and/or from the sides of the trash can 1. In some embodiments, the lid 30 is configured to have a more prominent profile than that illustrated in Figures 2C-2E.

[0053] In some embodiments, as illustrated in Figure 3A, the frame member 10 can include an outer shroud 18 extending downward from the lid 30. In some embodiments, the outer shroud 18 can be configured to engage with the top of the body, such as a bin 2. In some embodiments, the outer shroud 18 can include internal and/or external features that can be configured to facilitate locking the cap portion 4 onto the top of the bin 2. In certain embodiments, the outer shroud 18 can be formed of metal, such as stainless steel, and the lower portion of the shroud 18 can be rolled inward. The rolled portion of the outer shrouding 18 can engage with features, such as hooks or recesses, on top portion of the bin 2 to removably lock the frame member 10 with the bin 2. In some embodiments, the outer shroud 18 can have substantially the same cross section as the cross section of the top of the bin 2. In some embodiments, the peripheral portion 70 can include an inner shroud 78 extending downward from the lid 30. In some embodiments, the inner shroud 78 is located within the outer shroud 18. In some embodiments, the inner shroud 78 can be configured to help guide trash or other objects into the bin 2.

[0054] In some embodiments, the actuator 50 can extend outwardly from the peripheral portion 70 and/or the frame member 10. In some embodiments, the actuator 50 can extend outwardly from the peripheral portion 70 and/or the frame member 10 and downward at an angle θ_1 from level with the ground, as illustrated in Figure 2E. In some embodiments, the angle θ_1 of the actuator 50 can be greater than or equal to about 5° and/or less than or equal to about 85°. In some embodiments, the angle θ_1 of the actuator 50 can be about 45°. In some embodiments, the lowest portion (e.g., the portion closest to the ground) of the actuator 50 is located above (e.g., further

away from the ground than) the lowest portion of the frame member 10.

[0055] As illustrated in Figure 3B, the actuator 50 can include a hinge member 52 about which the actuator 50 can rotate. In some embodiments, the actuator 50 can be biased in a first direction of rotation 51 about the hinge member 52. The aforementioned biasing force can, in some embodiments, be provided by biasing member, such as a torsional spring 53 or other source of rotational bias. In some embodiments, the actuator 50 can be inhibited from rotating in the first direction 51 beyond a closed position (e.g., the position illustrated in Figures 2E and 3D). In some embodiments, the actuator 50 can be configured to reach a closed position when a portion of the actuator 50 comes into contact with the peripheral portion 70 and/or the frame member 10. In some embodiments, the actuator 50 can be configured to reach a closed position when the torsional spring 53 or other source of rotational bias reaches a resting position (e.g., when the torsional spring 53 or other source of rotational bias is under a reduced amount of tension or compression). As shown in Figure 3B, in some embodiments, the width of the generally sloping portion of the actuator (e.g., from its upper edge 11 to its outer edge 57) is substantially greater than the width V of a generally vertical front or outer portion. In some embodiments, the actuator is solid or generally solid.

[0056] In some embodiments, the actuator 50 can be configured to rotate about the hinge member 52 in a second direction 55 in response to a force F applied at or near the outer edge 57 of the actuator 50. In some embodiments, the actuator 50 can be configured to rotate in the second direction 55 in response to the force F applied over a range of effective angles θ_2 , as illustrated in Figure 3B. In some embodiments, the force F can effect movement of the actuator 50 in the second direction 55 when the angle θ_2 is greater than about 0° and/or less than about 110° . In some embodiments, the force F can effect movement of the actuator 50 in the second direction 55 when the angle θ_2 is greater than about 60° and/or less than or equal to about 90° . In some embodiments, the range of rotation of the actuator 50 in the second direction 55 can be limited to a range of motion defined by the space 58 between the lower portion of the actuator 50 and the frame member 10 and/or peripheral portion 70. In some embodiments, the range of rotation of the actuator 50 in the second direction can be limited by the twisting range of the torsional spring 53 or other source of rotational bias.

[0057] Figures 4A-4E illustrate opening the lid 30 and gaining access to the interior of the trash can 1. In some embodiments, the actuator 50 can include a locking portion, such as a flange 56. The locking portion can be configured to engage with a securing portion, such as a recess 36, of the lid 30. In some embodiments, the locking portion comprises a recess in the actuator 50 and the securing portion comprises a flange in the lid 30. In some embodiments, the flange 56 can have a sloped portion

56A. Other methods of engagement between the lid 30 and the actuator 50 are contemplated, such as magnets or other appropriate securing methods.

[0058] In some embodiments, the flange 56 of the actuator 50 can be configured to engage with the recess 36 of the lid 30 when the lid 30 is in a closed configuration and the actuator 50 is in a resting position. As illustrated in Figure 4B, the flange 56 can be configured to engage with a lip 37 in the recess 36 of the lid 30. Engagement between the flange 56 and the lip 37 can inhibit the lid 30 from transitioning to the open configuration. In some embodiments, the flange 56 can be removed from the recess 36 and can disengage the lip 37, such as upon rotation of the actuator 50 in the second direction 55 to an open position, as illustrated in Figure 4C. In some embodiments, the actuator 50 can be configured to rotate to the open position in reaction to the input force F. In some embodiments, the space 58 between the actuator 50 and the frame member 10 can be reduced when the actuator 50 is in the open position.

[0059] According to some configurations, the lid 30 can be rotationally biased toward the open configuration (e.g., to rotate away from the actuator 50 to an opened configuration), as will be described in more detail below. In some embodiments, disengagement of the flange 56 from the lip 37 can allow the lid 30 to move in a direction 35 away from the actuator 50. For example, in the embodiment illustrated in Figures 4A-4E, the lid rotates counterclockwise to achieve the open configuration.

[0060] As illustrated in Figure 4E, the lid 30 can rotate away from the actuator 50 such that an angle θ_3 is formed between the lid 30 and the peripheral portion 70 and/or frame member 10. In some embodiments, the angle θ_3 between the lid 30 and the peripheral portion 70 and/or frame member 10 when the lid 30 is in a fully opened configuration can be greater than about or equal to 15° and/or less than equal to about 160° . In some embodiments, the angle θ_3 is approximately 90° when the lid 30 is in an open configuration.

[0061] In some embodiments, the lid 30 can be returned to a closed configuration by rotating the lid 30 toward the actuator 50 (e.g., clockwise in the embodiment of Figures 4A-4E) until the flange 56 engages with lip 37 and/or recess 36 in the lid 30. In some embodiments, as the lid 30 comes into contact with the flange 56, the lower side of the front edge 39 of the lid 30 can contact the sloped portion 56A of the flange 56. As the lower side of the front edge 39 is pushed onto the sloped portion 56A of the flange 56, the force on the sloped portion 56A can be translated to a torsional force about the hinge member 52 of the actuator and can cause the actuator 50 to rotate in the second direction 55, as illustrated in Figure 3B. The front edge 39 can be rounded or sloped such that the flange 56 is easily guided to engage with the lip 37 when the lid 30 is rotating towards the closed position. In some embodiments, the actuator 50 can be configured to rotate (e.g., in the second direction 55) in response to the force applied by the lid 30 until the lower

side of the front edge 39 passes the tip of the flange 56. After this passage takes place, the bias of the biasing element (e.g., the torsional spring 53) can rotate the flange 56 in the first direction 51, thereby moving the flange 56 into engagement with the recess 36 such that the actuator 50 reaches its closed position.

[0062] In some embodiments, the securing member comprises the flange 56, which can have a sloped lower edge. In some embodiments, the locking portion comprises the recess 36. In some embodiments, the actuator includes the securing member and the lid 30 includes the locking portion. In certain variants, is the actuator includes the locking portion and the lid 30 includes the securing member. In some implementations, engagement between the sloped lower edge of the flange on the lid 30 and the upper edge of the actuator 50 can result rotation of actuator 50 in the second direction 55 until the sloped flange enters the recess in the actuator 50. Upon entry of the sloped flange into the recess, the actuator 50 can rotate in the first direction 51 until the actuator reaches its closed position. In some embodiments, subsequent rotation of the actuator 50 in the second direction 55 can release the sloped flange of the lid 30 and allow the lid 30 to rotate to an open configuration.

[0063] As described earlier, the actuator 50 can be configured to rotate in the first direction 51 to an open position in response to an input force F. Furthermore, the effective range of angles $\theta 2$ (e.g., the angles of force F which can cause the actuator 50 to rotate in the first direction 51) for the force F can be quite broad. In some embodiments, broad range of effective angles $\theta 2$ can increase the ease with which the actuator 50 can be transitioned to an open position. Increasing the ease with which the actuator 50 can be transitioned to an open position can increase the ease with which a user can open the lid 30. For example, in some embodiments, a user of the trash can 1 can open the lid 30 by using a hip, leg, knee, foot, or other object or body part to apply the force F with a relatively low angle $\theta 2$ on the actuator 50. In some configurations, the user can use a hand or other object or body part to push down on the actuator 50 with a relatively high angle (e.g., greater than about 60° and/or less than or equal to about 120°) $\theta 2$ of force F to open the lid 30.

[0064] Figures 5A-5G provide further illustration of the lid 30. As noted earlier, in some embodiments, the lid 30 can include one or more lid hinge attachments 32 located at or near the rear end of the lid 30. In some embodiments, the one or more lid hinge attachments 32 can include a rotation assembly 40. The rotation assembly 40 can include a rotation point 42 about which the lid 30 can be configured to rotate. In some embodiments, the one or more rotation assemblies 40 can include one or more surface features 49 that can be configured to engage with engagement features 89 of the lid hinge assemblies 80, as described below. In some embodiments, the rotation assemblies 40 can include stabilization portions 44, 45. In some embodiments, the rotation assemblies

40 can include bias engagement portions. In some embodiments, as illustrated, the bias engagement portions can comprise spring engagement ports 47.

[0065] As illustrated in Figures 6A-6C, the peripheral portion 70 and/or frame member 10 can include one or more lid engagement cavities 76. In some embodiments, the lid engagement cavities 76 can be configured to receive the one or more lid hinge attachments 32. In some embodiments, portions of or the entire lid hinge assemblies 80 can be housed within the one or more lid engagement cavities 76. In some embodiments, the lid hinge assemblies 80 can include a lid-biasing member. In some embodiments, the lid-biasing member can comprise a torsion spring 84 or some other appropriate source of rotational bias. The torsion spring 84 can include a rotation assembly engagement portion 87. In some embodiments, the engagement portions 87 can be configured to engage with the spring engagement ports 47. In some embodiments, the torsion spring 84 can be configured to bias the lid 30 to an open position.

[0066] As illustrated in Figure 6C, the lid hinge assemblies 80 can include one or more engagement features 89. The engagement features 89 can be configured to engage with the one or more surface features 49 of the rotation assemblies 40. In some embodiments, the lid hinge assemblies 80 can include hinge members 82. The hinge members 82 can be configured to rotationally engage with the rotation points 42 of the rotation assemblies 40. In some embodiments, the rotation assemblies 40 and/or the lid hinge assemblies 80 can include one or more damping members. In some embodiments, the one or more damping members can comprise rotary dampers, hydraulic dampers, frictional dampers, or some other appropriate mechanism for damping the rotation of the lid 30. In some embodiments, the damping members can help to facilitate a slow and/or steady opening and/or closing of the lid 30. The damping members inhibit sudden or fast opening of the lid 30 that can result in rocking of the trash can 1. The damping members also can reduce stress on the lid 30, as the lid 30 open slowly or gradually and not contact any surfaces within the trash can 1 or walls with great force.

[0067] Although the trash can has been disclosed in the context of certain embodiments and examples, those skilled in the art will understand that the present disclosure extends beyond the specifically disclosed embodiments to other alternative embodiments and/or uses of the trash can and obvious modifications and equivalents thereof. In addition, while several variations of the trash can have been shown and described in detail, other modifications, which are within the scope of this disclosure, will be readily apparent to those of skill in the art. It is also contemplated that various combinations or subcombinations of the specific features and aspects of the embodiments may be made and still fall within the scope of this disclosure. It should be understood that various features and aspects of the disclosed embodiments can be combined with, or substituted for, one another in order

to form varying modes or embodiments of the trash can. Thus, it is intended that the scope of the present disclosure should not be limited by the particular disclosed embodiments described above.

Claims

1. A refuse storage receptacle comprising:

a body comprising an interior cavity and at least one opening located on a top portion of the body; and

a lid portion configured to engage with the top portion of the body, the lid portion comprising:

a cap having an upper portion and a lower portion, the lower portion configured to engage with the body, the cap having an opening configured to allow refuse to pass through the cap and into to the interior cavity of the body;

a lid rotationally connected to the cap in the region of the opening, the lid having a shape that generally corresponds to the shape of the opening in the cap, the lid comprising at least one hinge attachment member on a first side of the lid and a securement member on a second side of the lid generally opposite the first side, the at least one hinge attachment member configured to connect to the one or more lid engagement members of the cap, the lid configured to transition between an opened configuration and a closed configuration, wherein the lid inhibits access to the opening in the cap when the lid is in a closed configuration;

an actuator rotationally connected to the cap, the actuator extending outwardly and downwardly from the outer edge of the cap, the actuator configured to rotate between an open position and a closed position, the actuator rotationally biased toward the closed position; and

a locking member configured to engage with the securement member of the lid when the actuator is in the closed position such that the locking member secures the lid in the closed configuration and inhibits the lid from moving to the open configuration, the engagement of the locking member and the securement member being released upon application of a downward input force at an effective angle upon the actuator, thereby allowing the lid to move to the open configuration.

2. The receptacle of Claim 1, wherein the locking mem-

ber comprises a flange with a sloped upper edge configured to deflect the actuator.

3. The receptacle of Claim 1 or 2, wherein the securement member comprises a recess, the recess configured to receive the flange when the lid is in a closed configuration and the locking member is in a closed position.

4. The receptacle of any one of the preceding Claims, wherein the effective angle of the downward input force, relative to generally flat horizontal ground, is between about 60° and about 90°.

5. The receptacle of any one of the preceding Claims, wherein the cap further comprises at least one torsion spring configured to engage with at least one of the at least one lid engagement members and to rotationally bias the lid toward the open configuration.

6. The receptacle of any one of the preceding Claims, wherein the cap further comprises at least one biasing member configured to engage with the actuator and to rotationally bias the actuator toward the closed position.

7. The receptacle of any one of the preceding Claims, wherein the lid is rotationally biased toward the open configuration.

8. The receptacle of any one of the preceding Claims, wherein the actuator comprises an outer edge on the side of the actuator generally opposite the cap, an inner edge on the side of the actuator adjacent the cap, and a hinge member about which the actuator can rotate.

9. The receptacle of any one of the preceding Claims, wherein the lid portion further comprises one or more damping members configured to slow down and diminish the momentum, thereby smoothing the transition of the lid between the open configuration and the closed configuration and diminishing noise and reverberation during closure.

10. The receptacle of any one of the preceding Claims, wherein when the receptacle is positioned on generally flat ground in the normal configuration for use, the distance between the lowest point on the actuator and the ground is greater than the distance between the ground and the lower portion of the cap.

11. The receptacle of any one of the preceding Claims, wherein the cap further comprises an inner shroud extending downward from the lid, the inner shroud being configured to guide trash or other articles from the peripheral aperture into the interior cavity of the

body.

ing the lid to move to the open configuration.

12. The receptacle of any one of the preceding Claims, wherein the frame member further comprises an outer shroud extending downward from the upper portion of the cap, the outer shroud being configured to inhibit access from the sides of the lid portion to the interior cavity of the body. 5
13. The receptacle of any one of the preceding Claims, wherein the actuator is disposed downwardly at about a 45° angle with respect to the ground. 10
14. The receptacle of any one of the preceding Claims, wherein the securement member deflects the actuator from the closed position toward the open position during a portion of the movement of the lid from the open configuration to the closed configuration, and the securement member is subsequently engaged with the locking member thereby allowing the actuator to return the closed position. 15
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15. A method of manufacturing a refuse storage receptacle comprising: 25
 - engaging a lower portion of a cap with a body, the cap having an opening configured to allow refuse to pass through the cap and into the interior cavity of the body;
 - connecting a lid to the cap in the region of the opening, the lid having a shape that generally corresponds to the shape of the opening in the cap, the lid comprising at least one hinge attachment member on a first side of the lid and a securement member on a second side of the lid generally opposite the first side; 30
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 - connecting the at least one hinge attachment member to one or more lid engagement members of the cap, the lid configured to transition between an opened configuration and a closed configuration, wherein the lid inhibits access to the opening in the cap when the lid is in a closed configuration; 40
 - connecting an actuator to the cap, the actuator extending outwardly and downwardly from the outer edge of the cap, the actuator configured to rotate between an open position and a closed position, the actuator rotationally biased toward the closed position; and 45
 - engaging a locking member with the securement member of the lid when the actuator is in the closed position such that the locking member secures the lid in the closed configuration and inhibits the lid from moving to the open configuration, the engagement of the locking member and the securement member being released upon application of a downward input force at an effective angle upon the actuator, thereby allow- 50
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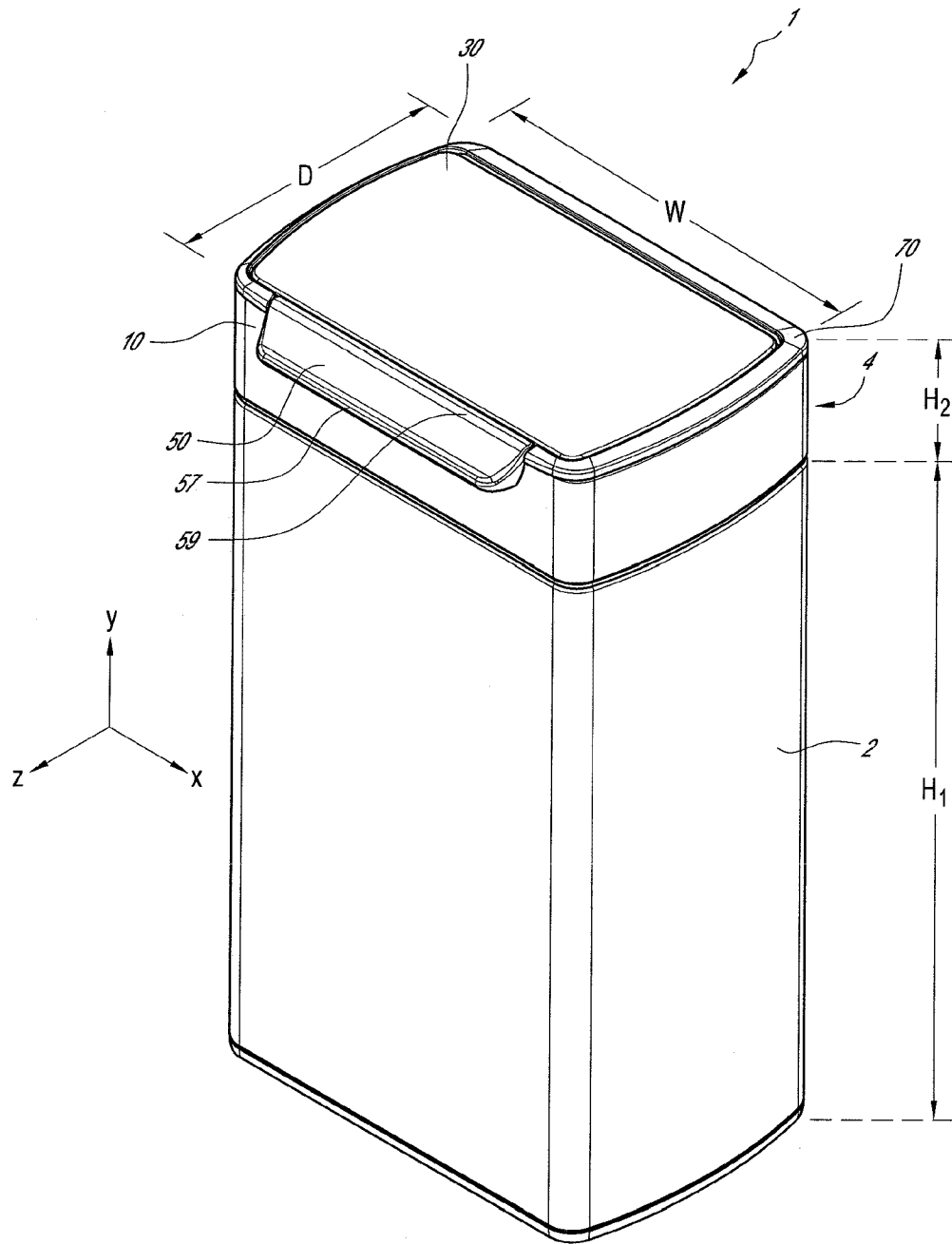


FIG. 1

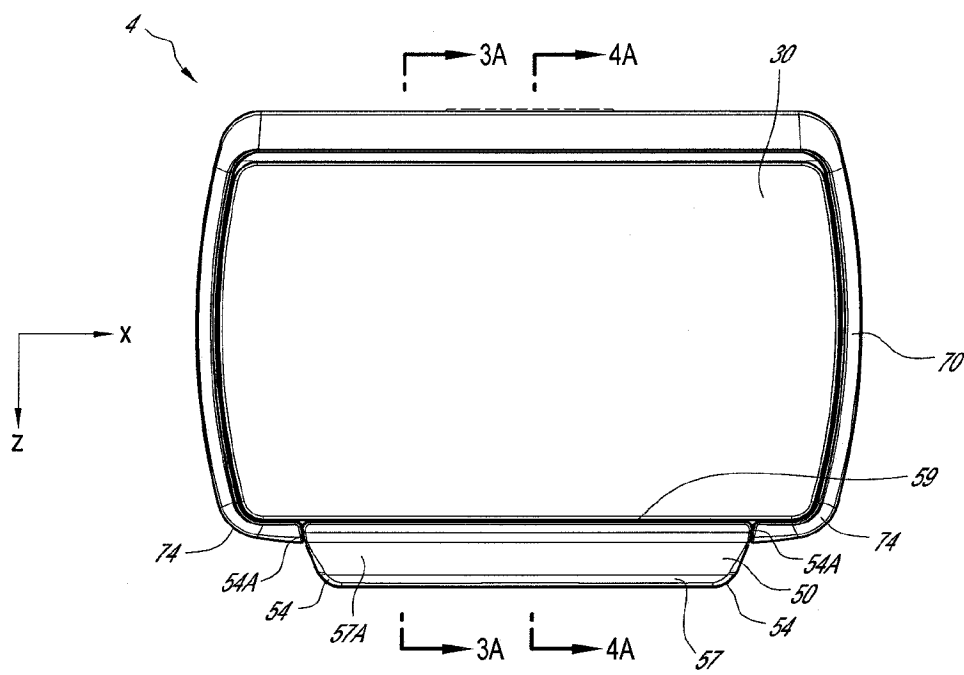


FIG. 2A

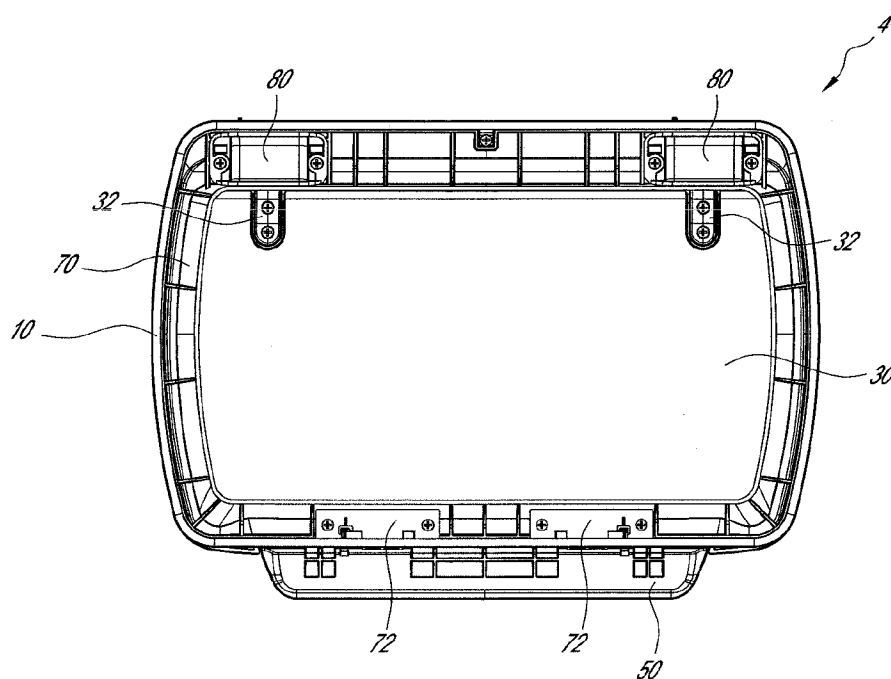


FIG. 2B

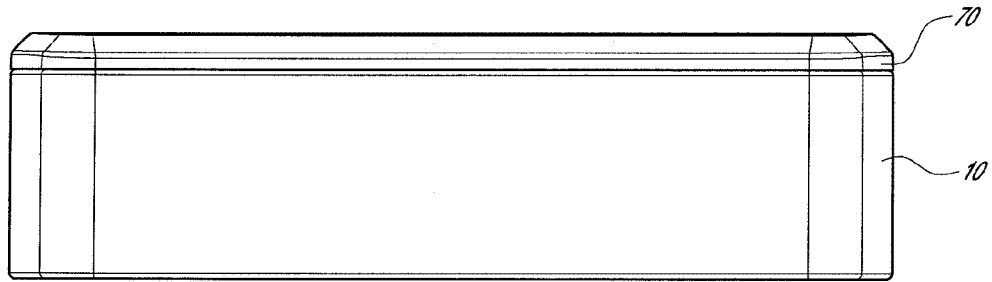


FIG. 2D

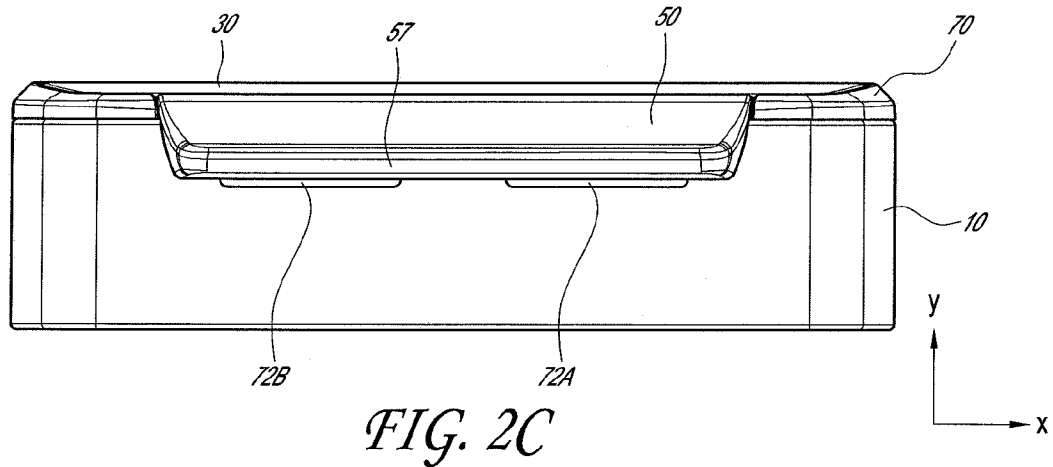


FIG. 2C

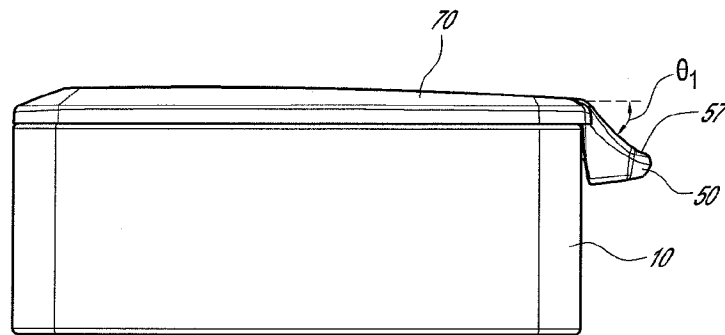


FIG. 2E

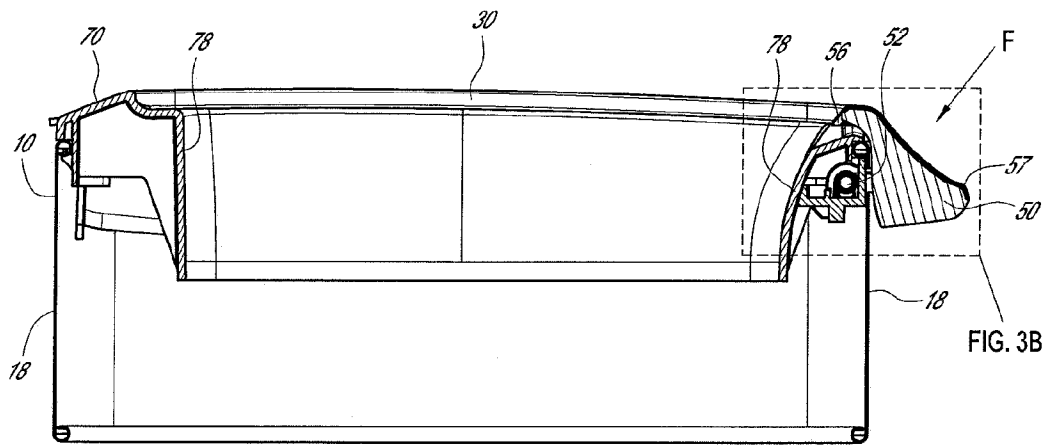


FIG. 3B

FIG. 3A

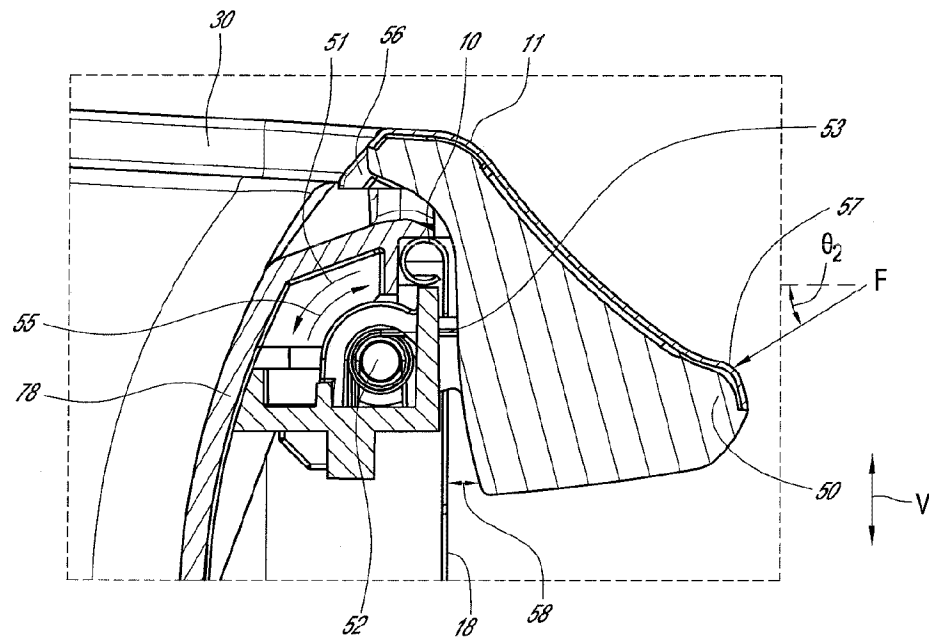


FIG. 3B

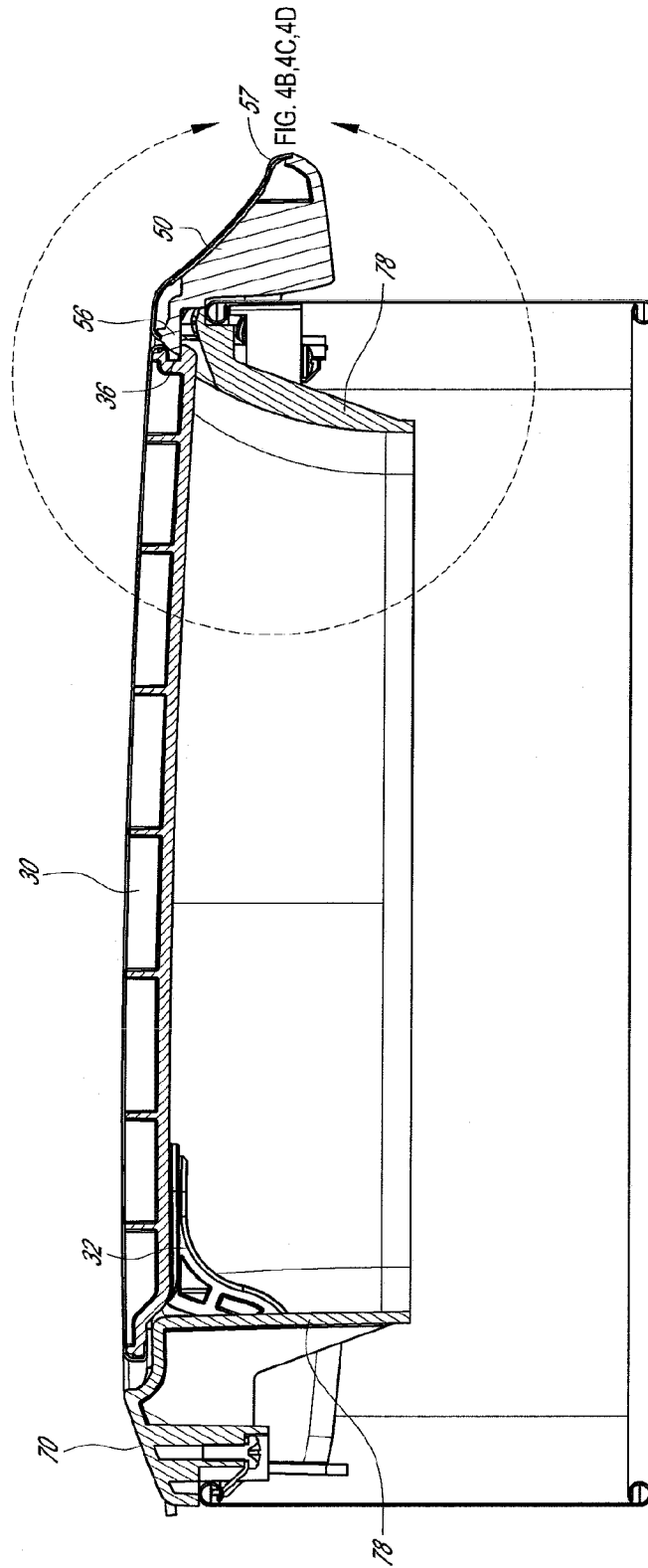


FIG. 4A

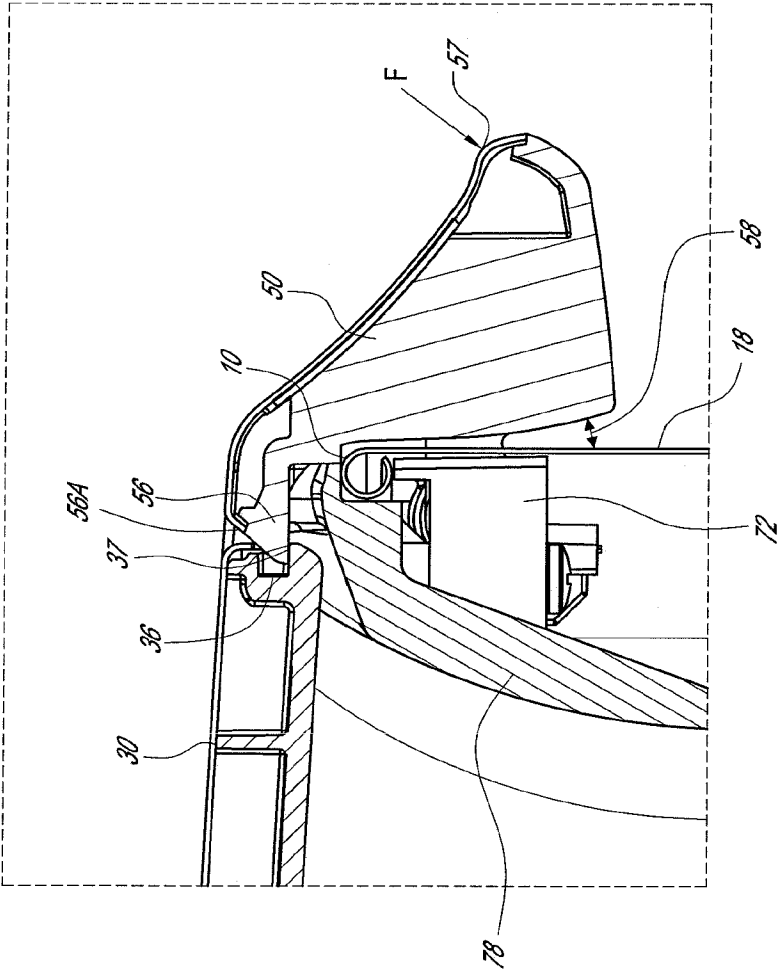


FIG. 4B

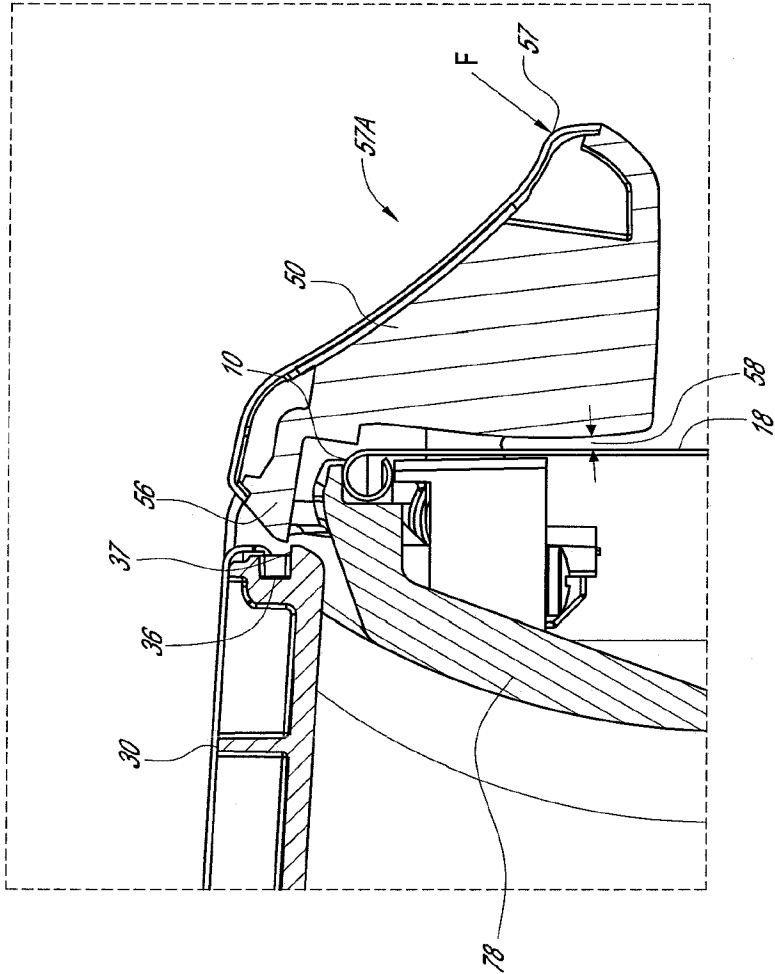


FIG. 4C

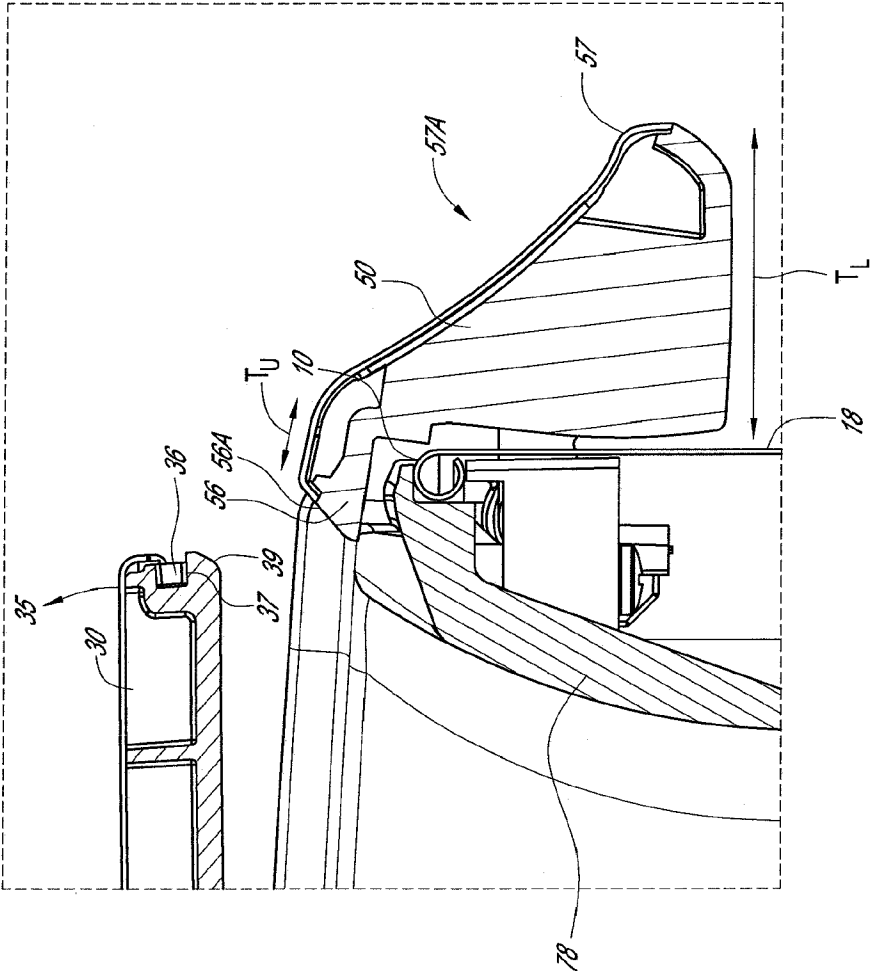


FIG. 4D

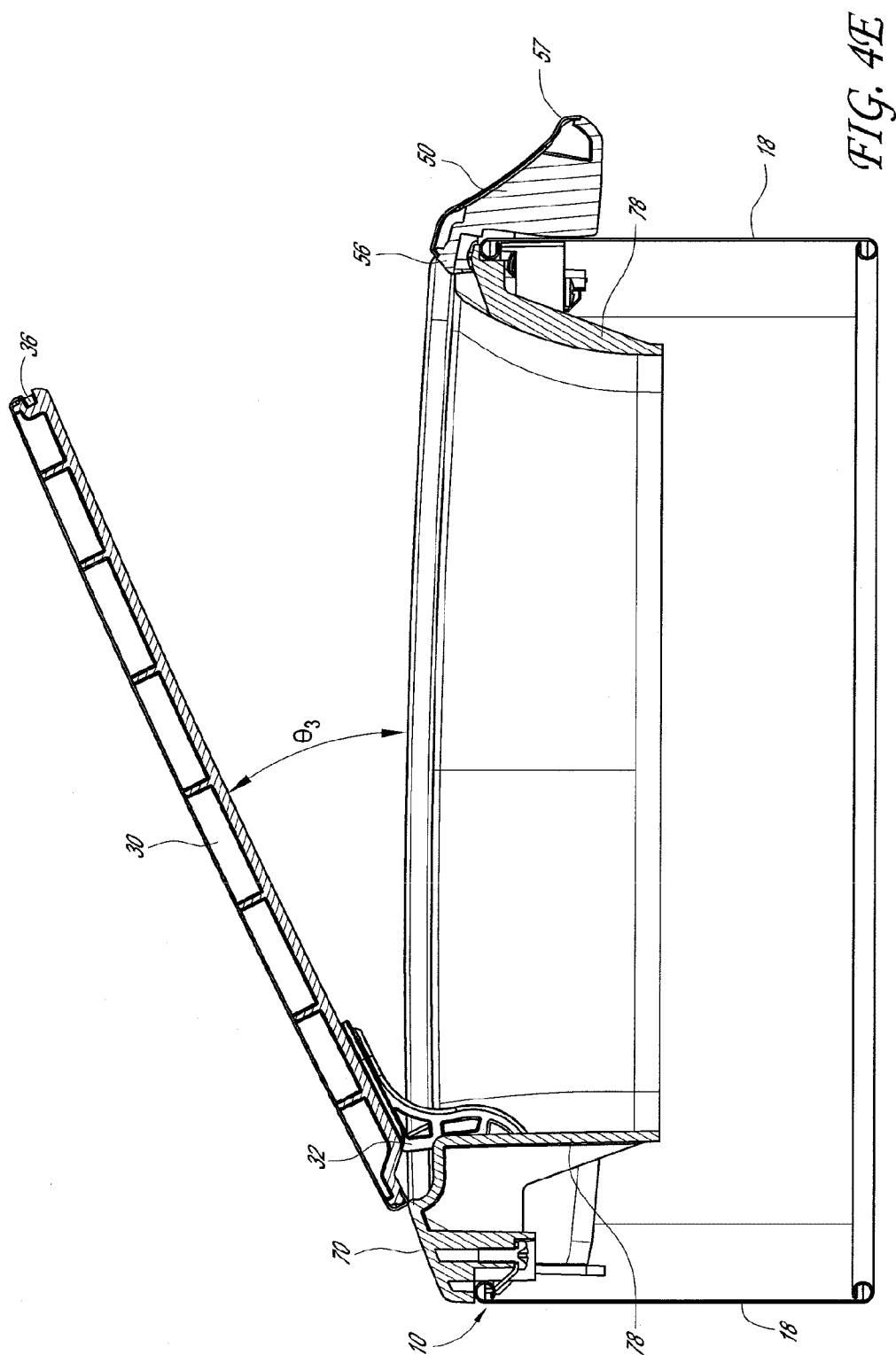


FIG. 4E

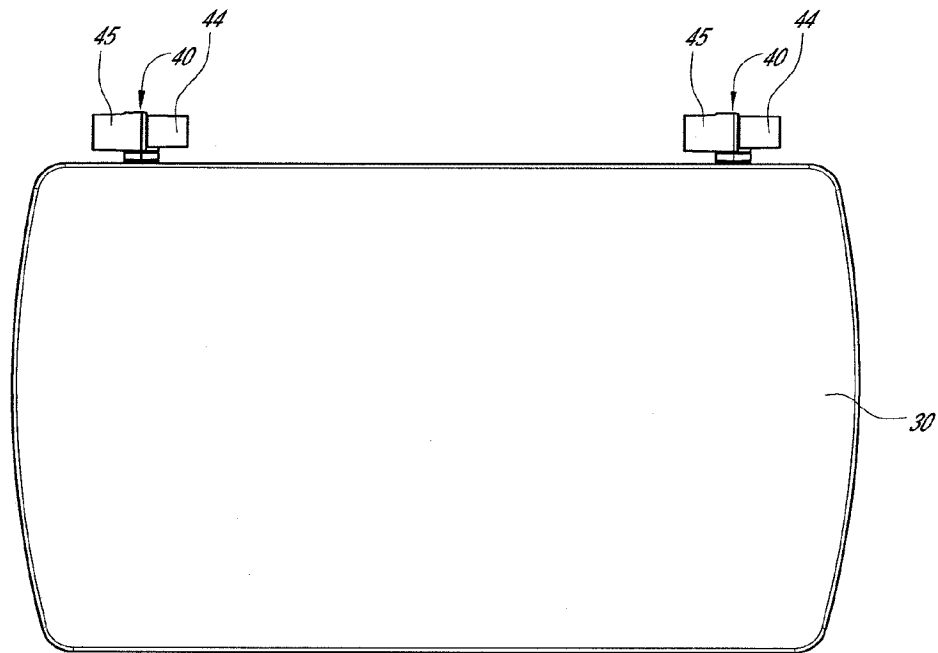


FIG. 5A

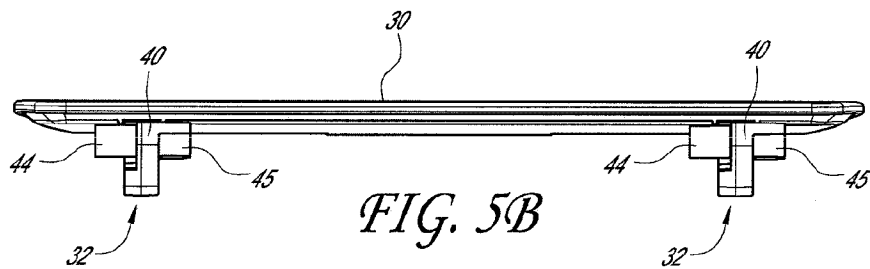


FIG. 5B

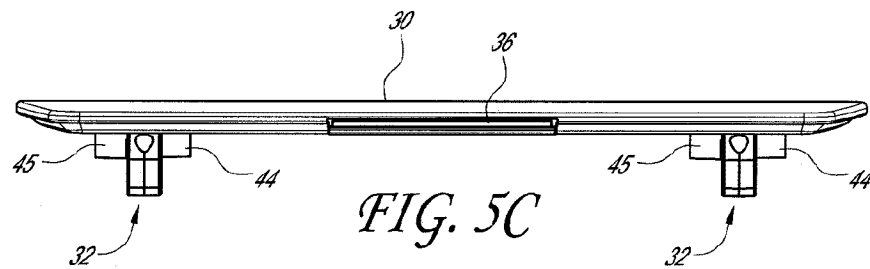


FIG. 5C

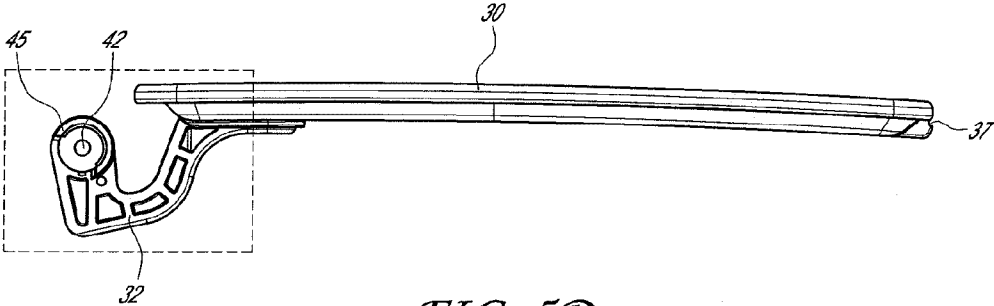


FIG. 5D

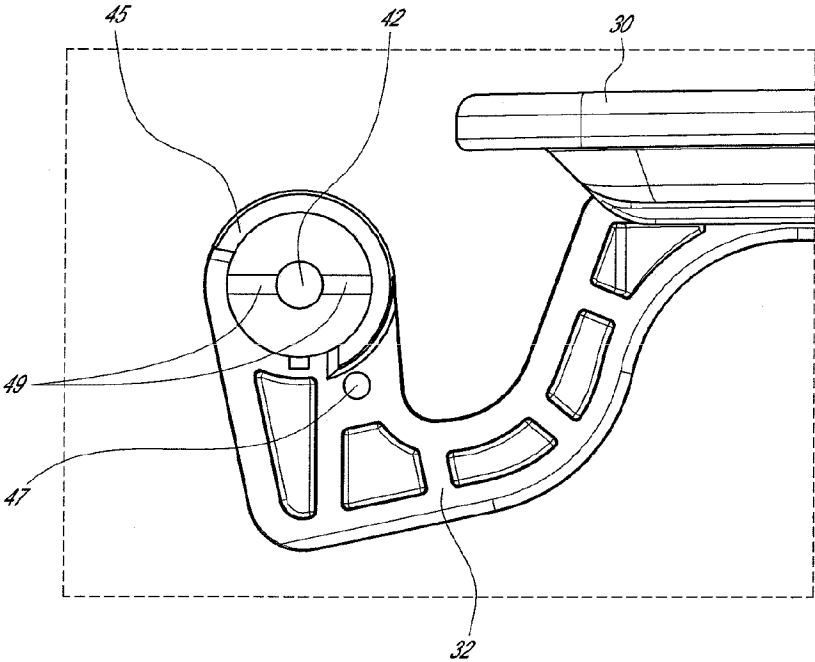


FIG. 5E

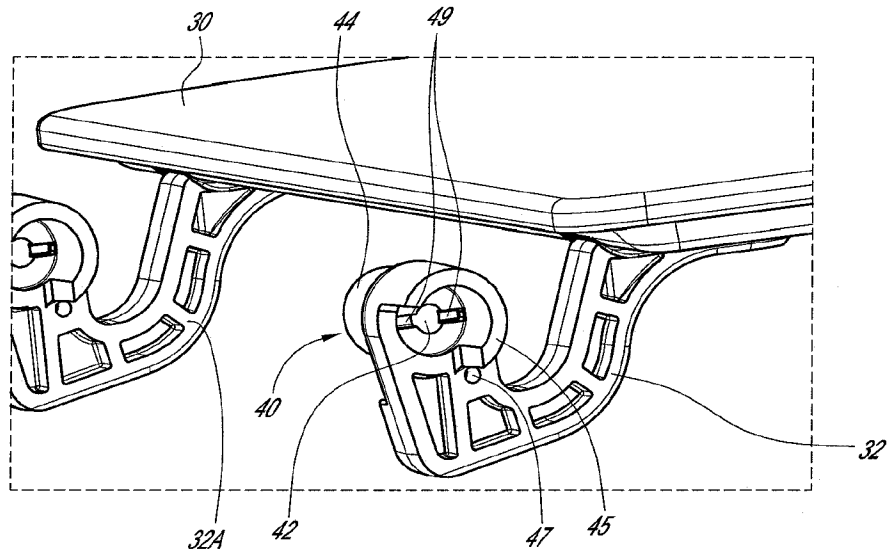


FIG. 5F

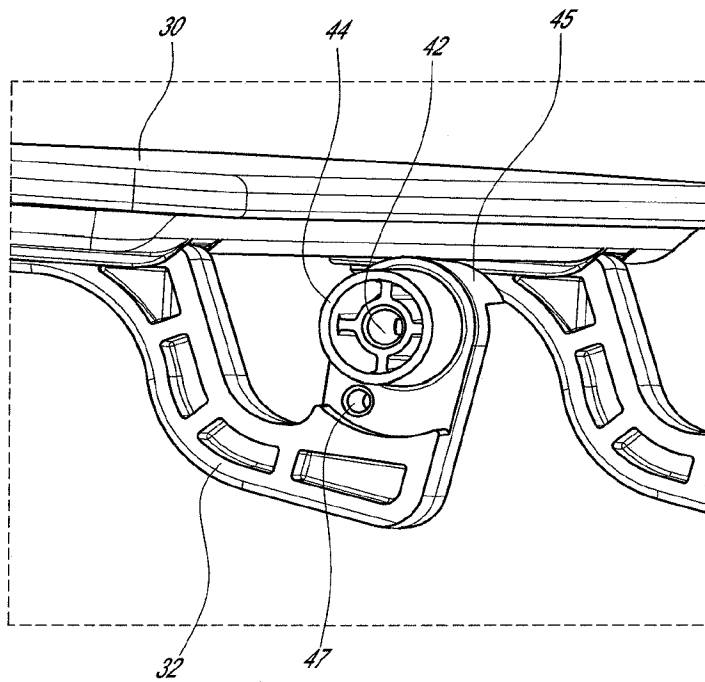


FIG. 5G

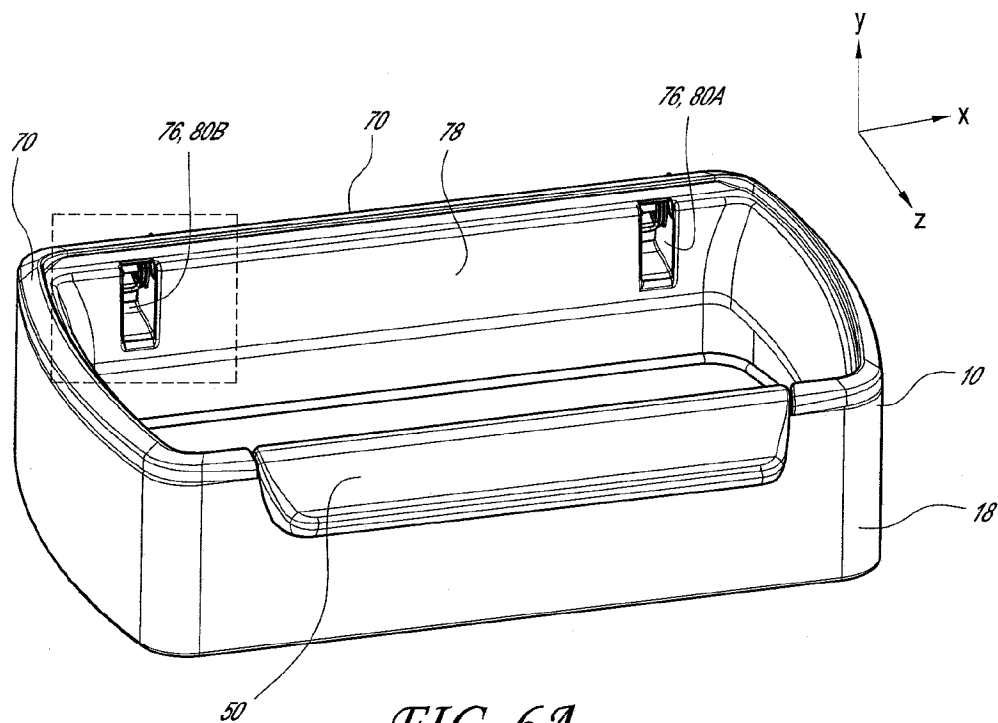


FIG. 6A

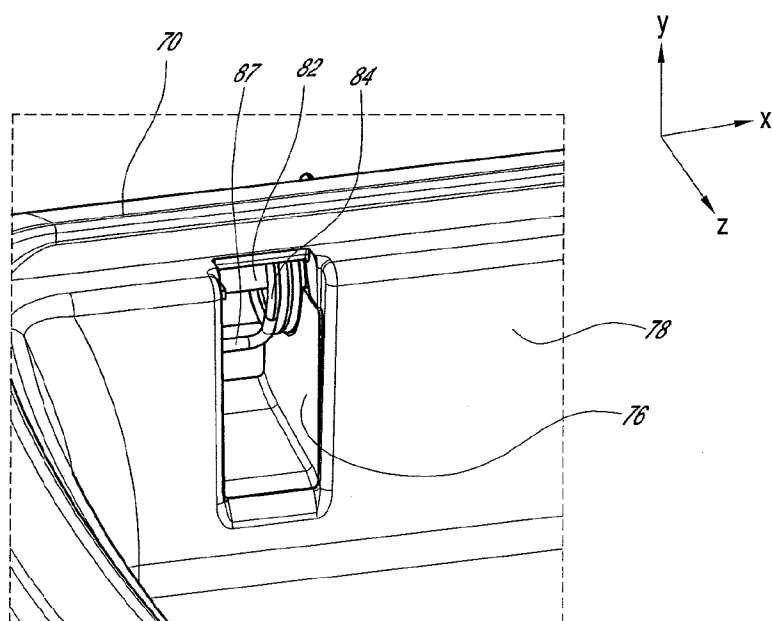


FIG. 6B

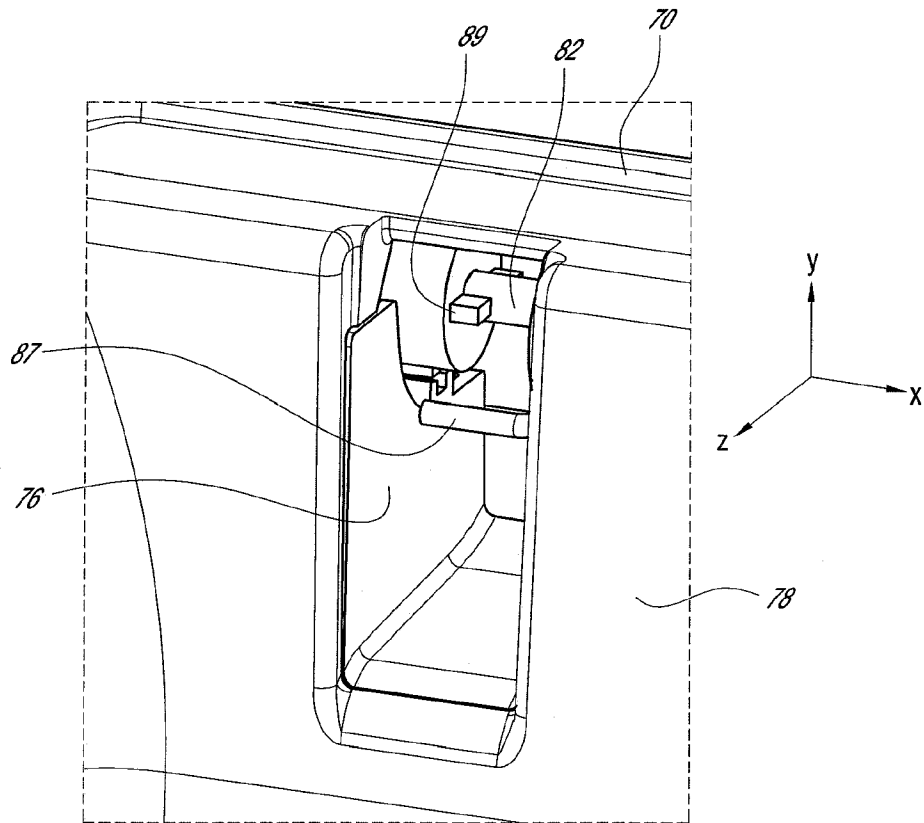


FIG. 6C



EUROPEAN SEARCH REPORT

Application Number
EP 13 15 8479

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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Place of search The Hague		Date of completion of the search 13 June 2013	Examiner Pardo, Ignacio
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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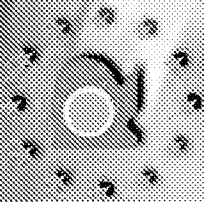
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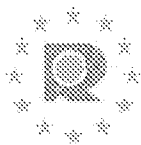
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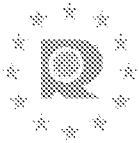
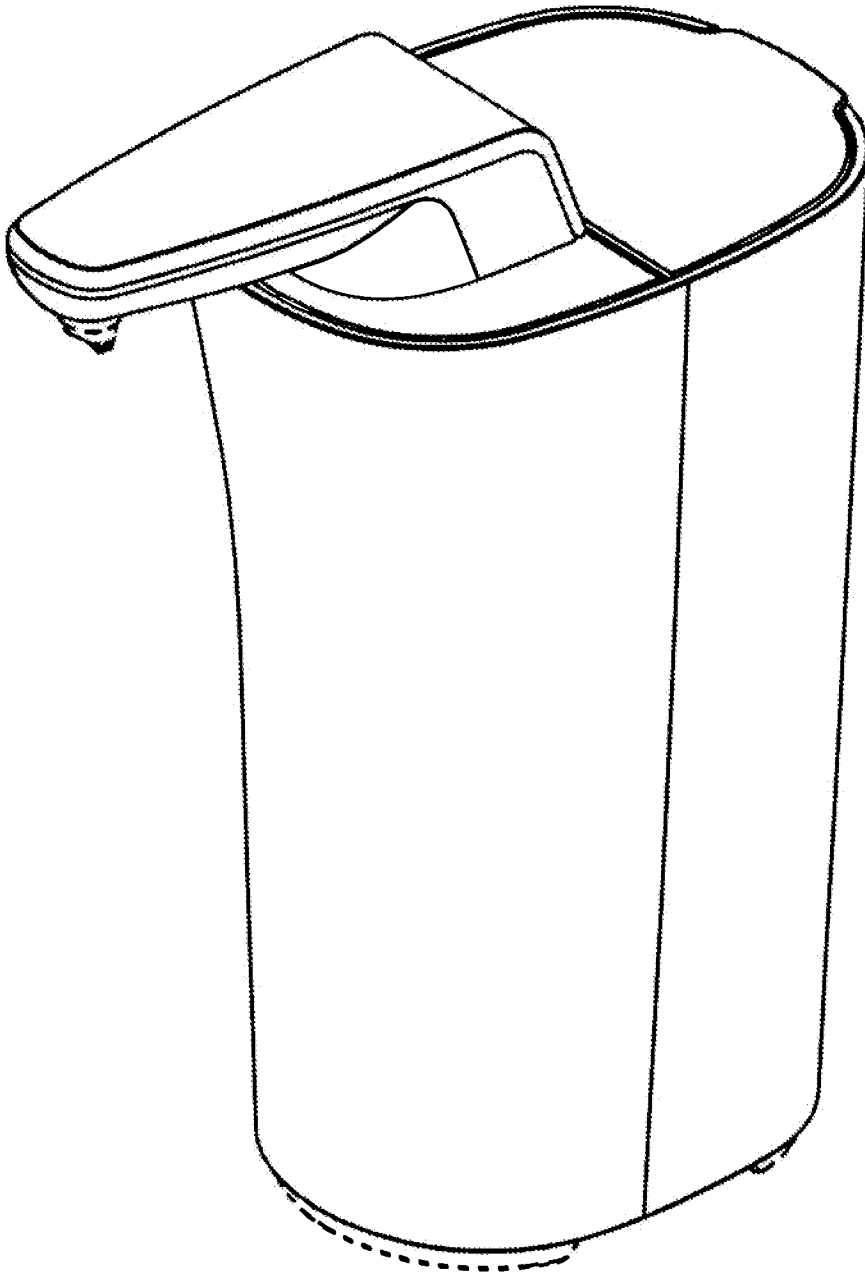
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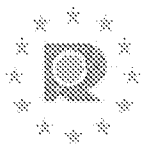
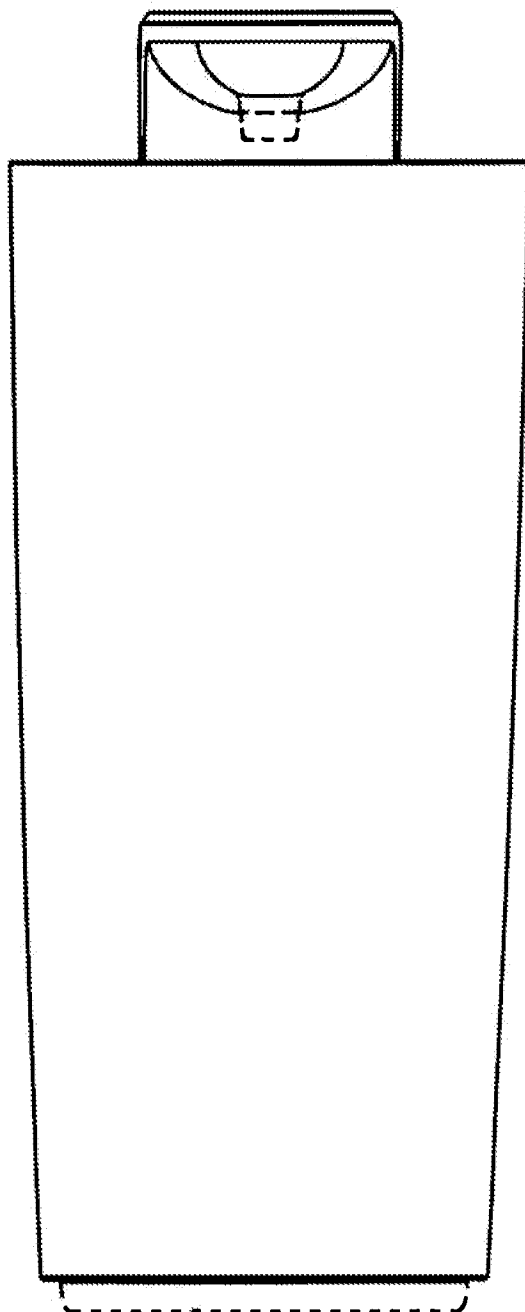
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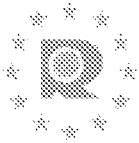
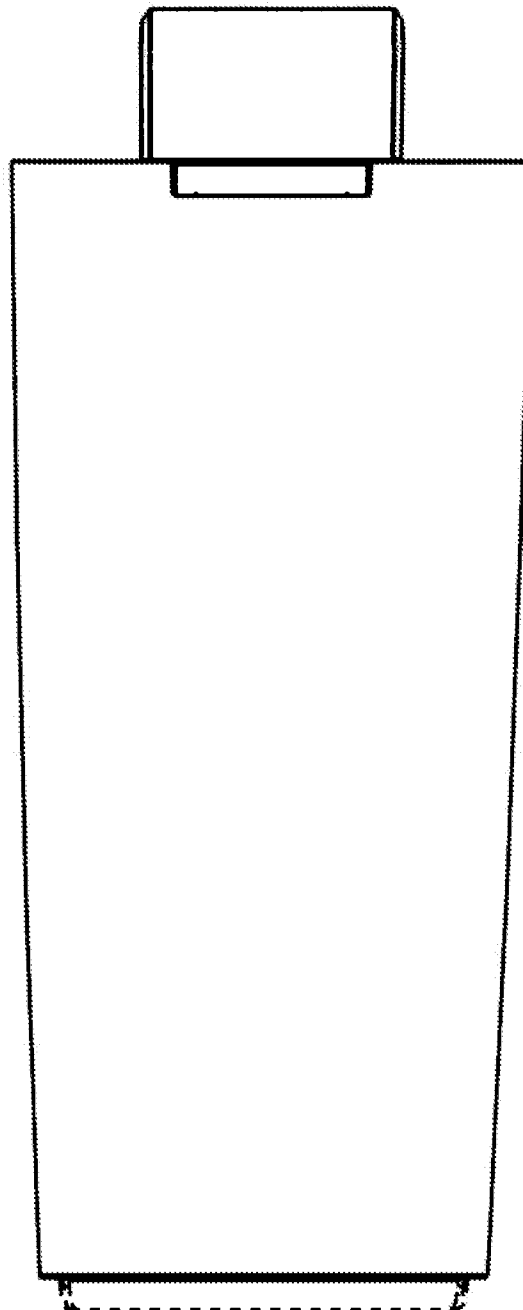
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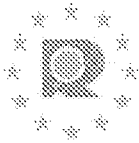
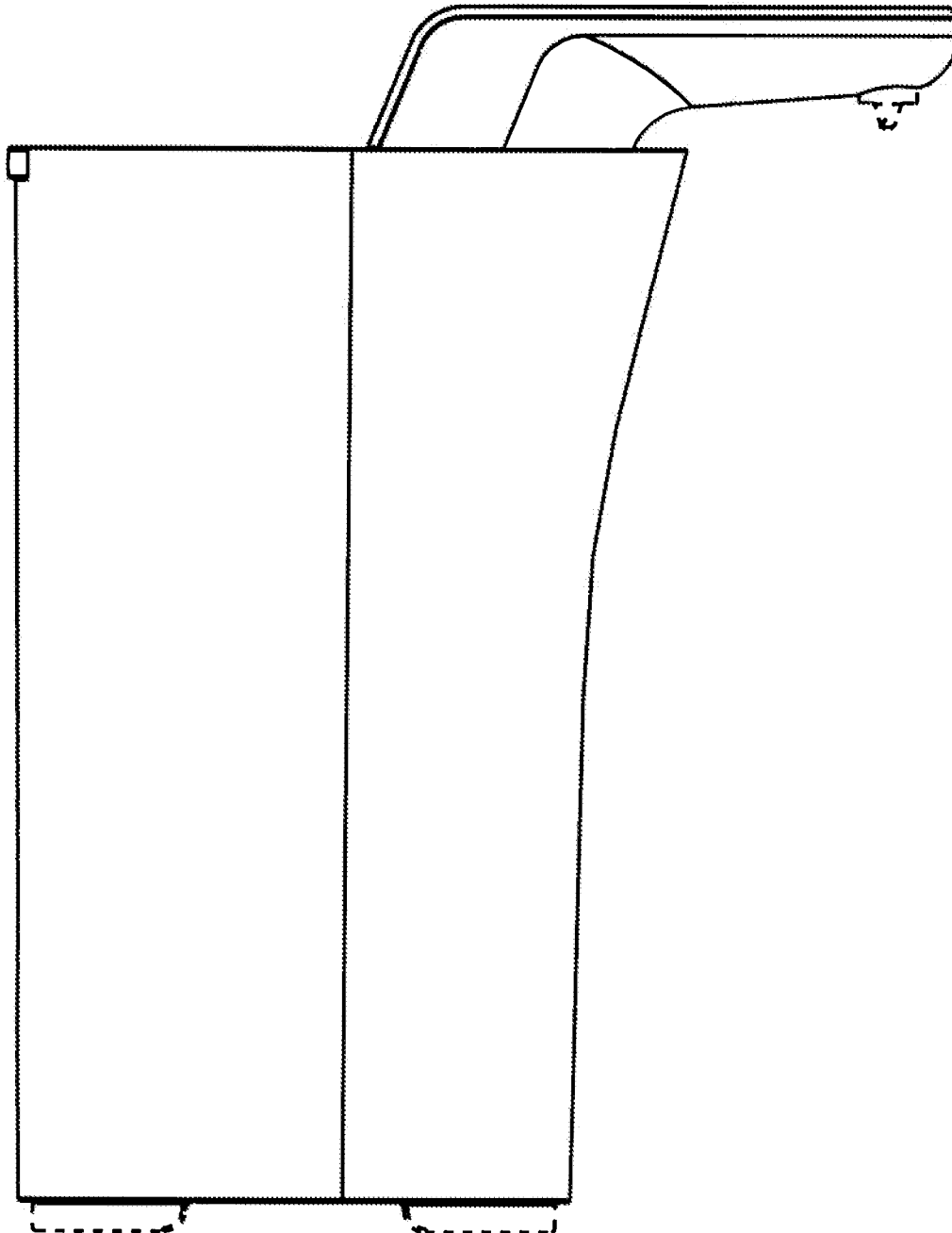
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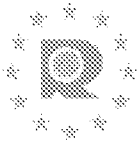
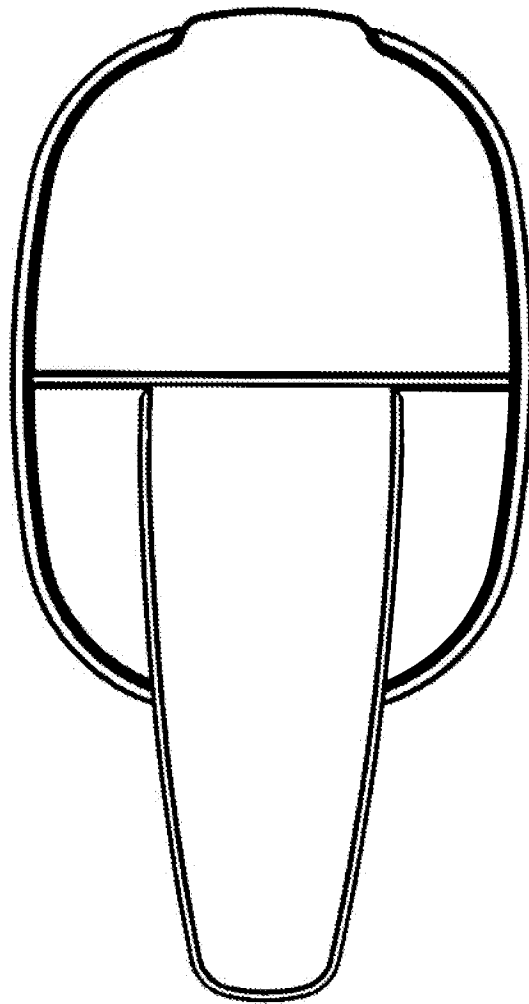
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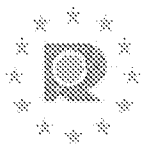
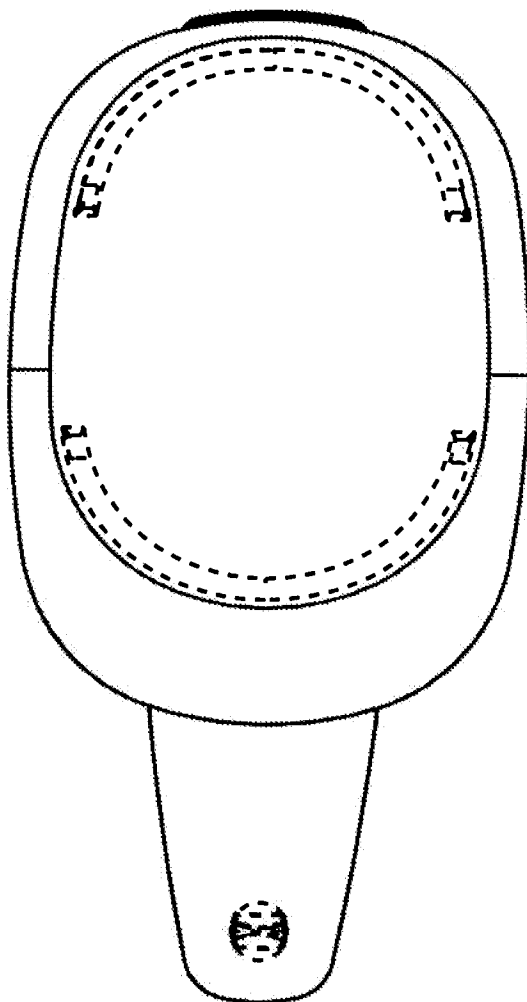
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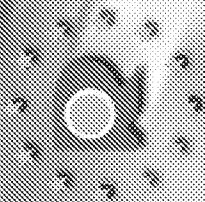
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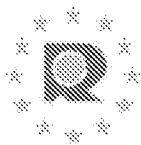
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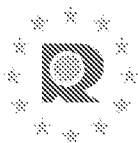
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António Campinos

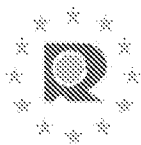
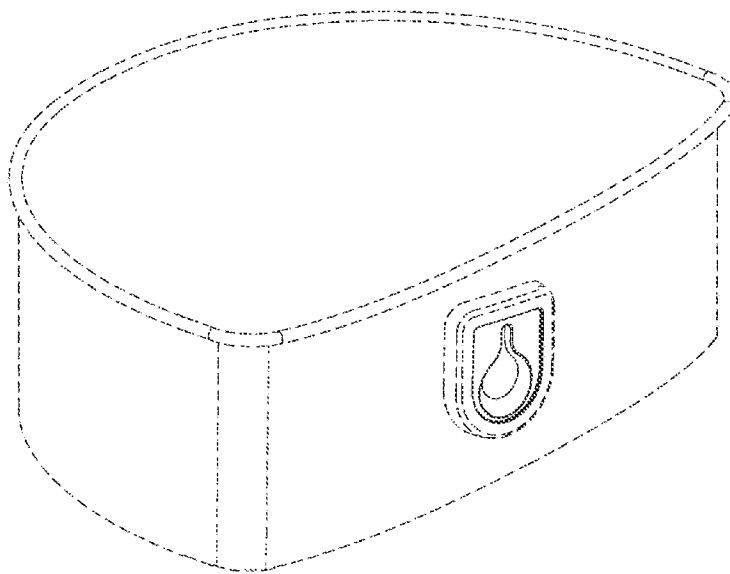


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FI - Varmistusosat
SV - Fasthållnings/säkerhetselement
-
BG - Заключващи или затварящи механизми
ES - Dispositivos de cerrojo o de cierre
CS - Zamykací a zavírací zařízení

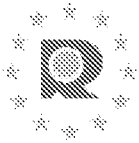
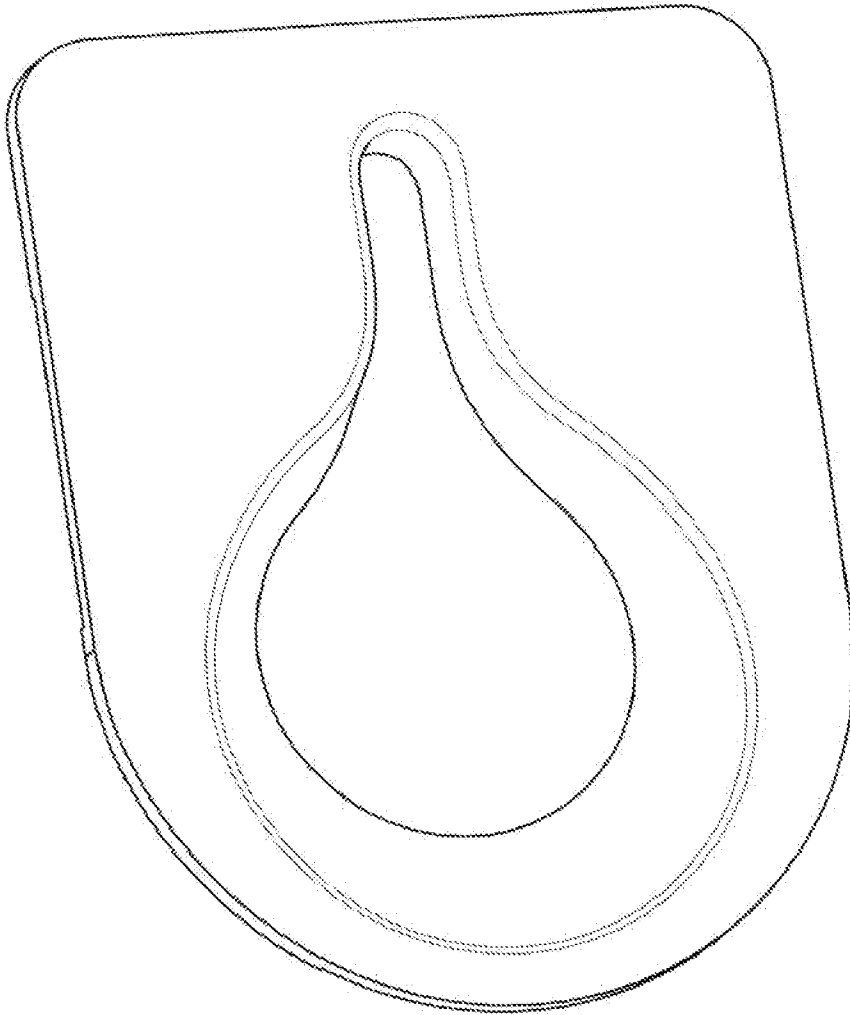


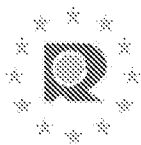
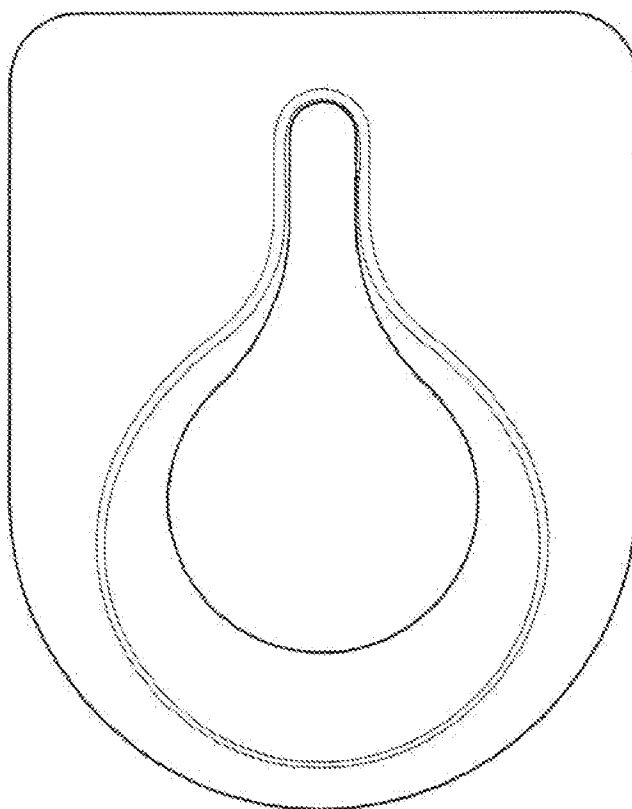
- DA - Låse- eller lukkeindretninger
- DE - Verriegelungs- und Verschlussvorrichtungen
- ET - Lukustus- või sulgemisvahendid
- EL - Συσκευές κλειδώματος ή σφράγισης
- EN - Locking or closing devices
- FR - Dispositifs de verrouillage ou de fermeture
- IT - Dispositivi di chiusura a catenaccio o di chiusura in genere
- LV - Aizslēgšanas vai aizvēršanas mehānismi
- LT - Rakinimo ar uždarymo prietaisai įtaisai
- HR - Naprave za zatvaranje ili zaključavanje
- HU - Záró- és reteszelőberendezések
- MT - Strumenti li jsakkru jew jagħlqu
- NL - Vergrendelings- of sluitmechanismen
- PL - Blokady i zamki
- PT - Dispositivos de ferrolho ou de fecho
- RO - Dispozitive de încuiere sau închidere
- SK - Zariadenia na zamčovanie alebo zatváranie
- SL - Naprave za zaklepanje ali zapiranje
- FI - Lukko- tai salpalaitteet
- SV - Lås och reglar

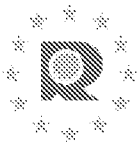
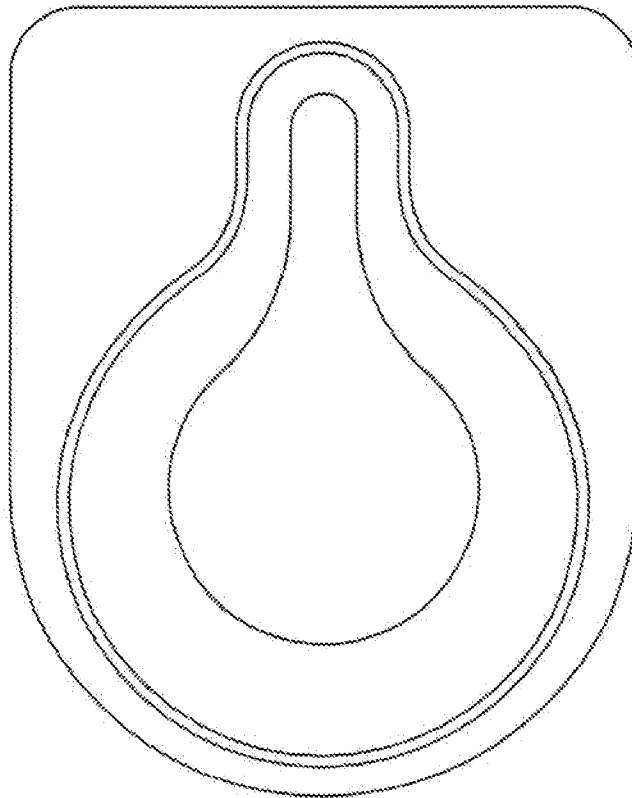
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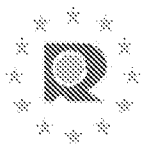


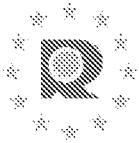
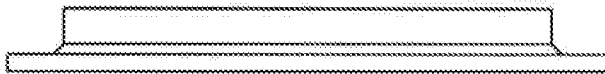
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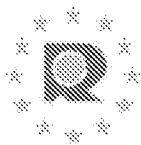
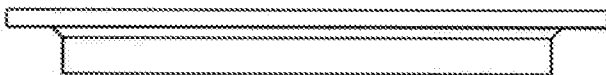












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CLAIMS

[Claims]

[Claim 1]they are opening and closing to a main part formed in case shape in which the upper part carries out an opening, a lid housing by which fitting was carried out to a peripheral edge part of an upper end opening of the aforementioned main part, and the aforementioned lid housing — in a toilet corner box provided with a lid supported pivotably rockable

A toilet corner box comprising:

An energizing means which energizes the aforementioned lid in a from cartridge to a cap opening direction.

The aforementioned lid can be restrained to the aforementioned lid housing by a closed state, and it is a restriction means of which the restrained condition can be canceled by operation from the outside.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed explanation of the device]

[0001]

[Industrial Application]

This design is related with the corner box with which the corner of a toilet is equipped.

[0002]

[Description of the Prior Art]

the former and this kind of toilet corner boxes are opening and closing about the end side to the main part formed in the case shape in which the upper part carries out an opening, the lid housing by which fitting was carried out to the peripheral edge part of the upper end opening of this main part, and this lid housing — what consists of a lid supported pivotably rockable is common.

When using such a toilet corner box, after making the lid swing up and considering it as an open condition, filth was stored inside the main part, and further, after that, the lid was made to swing caudad and it was considered as the closed state.

[0003]

[Problem(s) to be Solved by the Device]

The above conventional toilet corner boxes, It was required to use both hands so that it might say that a main part is held single hand and a lid is opened single hand when covering it the closed state by the weight and storing filth, and when especially one hand was closed, there was a fault that opening and closing of a lid and storage of filth were inconvenient. There was also a fault that the filth stored when a toilet corner box fell for a certain Reason disperses, or a lid was pushed up and opened with filth when storage filth becomes abundant.

[0004]

It is made in order that this design may eliminate the above faults, and it aims at providing the toilet corner box which can perform easily and reliably opening and closing of a lid, and storage of filth.

[0005]

[Means for solving problem]

they are opening and closing to a lid housing by which fitting was carried out to a peripheral edge part of an upper end opening of a main part formed in case shape to which the upper part carries out the opening of this design, and a main part in order that the present invention might attain the aforementioned purpose, and a lid housing — a toilet corner box provided with a lid supported pivotably rockable is characterized by comprising:

An energizing means which energizes a lid in a from cartridge to a cap opening direction.

A lid can be restrained to a lid housing by a closed state, and it is a restriction means of which the restrained condition can be canceled by operation from the outside.

[0006]

[Function]

The toilet corner box of this design is installed in the corner of a toilet floor line. Since a lid is made to open by the energizing means when storing filth in this toilet corner box, and a restriction means is operated and the restrained condition of a lid and a lid housing is released, filth can be stored inside a main part. Subsequently, if a lid is made to swing until it will be in a closed state, a lid will be restrained by the lid housing by a restriction means, and a closed state will be held. Therefore, also when the filth stored even if the toilet corner box fell does not disperse and storage filth becomes abundant, with filth, a lid is pushed up and does not open.

[0007]

[Working example]

Hereafter, one working example of this design is described based on Drawings. The A-A line cross sectional view of the Fig.1 in the state where the perspective view of the toilet corner box which requires Fig.1 for this design, and Fig.2 opened the A-A line cross sectional view of Fig.1, and Fig.3 opened the lid, and Fig.4 are the bottom views of a lid housing.

[0008]

This toilet corner box 1 makes the inside of the main part 2 formed in the case shape of the approximately quadrangle in which the upper part carries out an opening filth storage space with a synthetic resin, and fitting of the lid housing 3 formed in the peripheral edge part of the upper end opening of the main part 2 with the synthetic resin is carried out. making the pair of right and left pivot 4 the lid housing 3 with a fulcrum — the lids 5 are opening and closing — it is supported pivotably rockable.

[0009]

The coil part of the torsion coil spring 6 fits loosely into the pivot 4 as an energizing means, and it is attached by the spring bearing kick plate 7 with which the 1 side of the end of the torsion coil spring 6 protruded on the lid housing 3, and other sides protruded on the lid 5. When it is in an open condition, the spring bearing kick plate 7 and the attachment projection 3a to attach protrude on the lid housing 3.

[0010]

While turning to the central part of the periphery of front of the lid 5 caudad and carrying out formed protruding of the hook 8, formed protruding of the piece 8a of negotiations which goes to a front side is carried out to the point of the hook 8. The front wall of the piece 8a of negotiations forms an inclined plane which goes to a slanting back lower part. When the lid housing 3 is used with a closed state, the negotiations projected part 9 about which it negotiates with the piece 8a of negotiations of the hook 8 is formed, and the restriction means of the lid 5 is constituted by the hook 8 (piece 8a of negotiations), and the negotiations projected part 9. When the lid housing 3 is used with a closed state, while the backing plate 10 attached to the lower surface of the periphery of front of the lid 5 protrudes towards the inside, the restriction release board 12 which makes the pivotal support part 11 a swing pivotal supporting point is attached to the upper surface front side of the lid housing 3.

[0011]

The pressing body 13 is installed in the lower surface central part of the restriction release board 12 towards a slanting back lower part, and when the tip of the pressing body 13 is made into a closed state, the front wall of the piece 8a of negotiations of the hook 8 is abutted.

[0012]

Subsequently, the operation of the aforementioned working example is described. In the closed state, when the piece 8a of negotiations and the negotiations projected part 9 of the hook 8 negotiate, the lid 5 is restrained by the lid housing 3. Since the restriction release board 12 will swing the pivotal support part 11 as a fulcrum and the tip of the pressing body 13 will press the hook 8 back if the restriction release board 12 is depressed from this state, the hook 8 formed with the synthetic resin bends, negotiations with the piece 8a of negotiations and the negotiations projected part 9 separate, and the restrained condition of the lid 5 is released.

As a result, the spring bearing kick plate 7 of the lid 5 is caudad depressed by the resiliency of the torsion coil spring 6, it swings to the position which the lid 5 makes the pivot 4 a fulcrum and the spring bearing kick plate 7 and the attachment projection 3a attach, and filth is stored inside the main part 2 from an opening by that used as an open condition (refer to Fig.3). If the lid 5 is made to swing caudad after storage finishes, the piece 8a of negotiations and the negotiations projected part 9 will be multiplied, the lid 5 will be restrained by the lid housing 3, and a closed state will be held again.

In this example, since the lid 5 opens only by depressing the restriction release board 12, even when it can open easily single hand and one hand is closed, opening and closing of a lid and storage of filth are very convenient. It cannot be overemphasized that the embodiment of an energizing means and a restriction means is not limited to this example.

[Effect of the Device]

Only by operating a restriction means from the outside and releasing the restrained condition of a lid and a lid housing in the toilet corner box concerning this design, Since a lid is made to open automatically by the energizing means, it can open only single hand and opening and closing of a lid and storage of filth can be comfortably performed compared with a toilet corner box conventionally both hands were usually used [whose] for opening and closing of a lid, and storage of filth. Since the lid is restrained by the lid housing by the restriction means in the closed state, also when the filth stored also when a toilet corner box fell for a certain Reason does not disperse and storage filth becomes abundant, with filth, a lid is pushed up and does not open.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is a perspective view of the toilet corner box concerning one working example of this design.

[Drawing 2]It is an A-A line cross sectional view of Fig.1.

[Drawing 3]It is an A-A line cross sectional view of the Fig.1 in the state where the lid was opened.

[Drawing 4]It is a bottom view of a lid housing.

[Explanations of letters or numerals]

1 Toilet corner box

2 Main part

3 Lid housing

4 Pivot

5 Lid

6 Torsion coil spring

8 Hook

8a The piece of negotiations

9 Negotiations projected part

12 Restriction release board

13 Pressing body

[Translation done.]

(19)日本国特許庁(J P)

(12) 公開実用新案公報(U)

(11)実用新案出願公開番号

実開平6-56011

(43)公開日 平成6年(1994)8月2日

(51)Int.Cl. ⁵	識別記号	庁内整理番号	F I	技術表示箇所
B 6 5 F 1/16		8513-3E		
A 4 7 K 17/02	Z			
B 6 5 D 45/18	Z	8513-3E		

審査請求 有 請求項の数 1 O L (全 3 頁)

(21)出願番号 実願平5-1094

(22)出願日 平成5年(1993)1月20日

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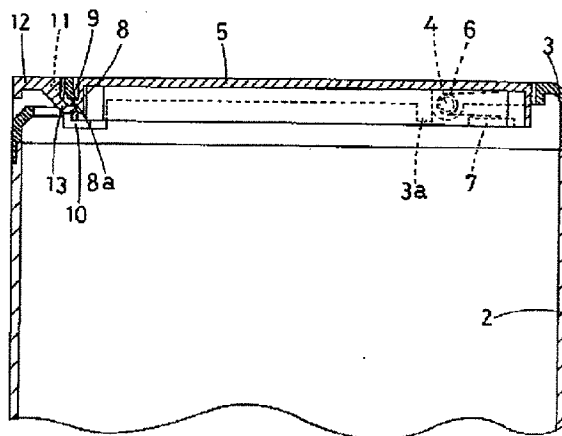
(74)代理人 弁理士 杉本 巖 (外1名)

(54)【考案の名称】 トイレコーナーボックス

(57)【要約】

【目的】 蓋の開閉および汚物の収納を容易かつ確実に行なうことのできるトイレコーナーボックスを提供する。

【構成】 本体2の上端周縁部に蓋支持棒3を嵌合し、蓋支持棒3に枢軸4を支点として蓋5を揺動可能に枢支する。枢軸4にねじりコイルばね6のコイル部を遊嵌し、ねじりコイルばね6の端部の一侧は蓋支持棒3に、他側は蓋5に突設されたばね受け板7に衝合する。蓋5に掛合片8aを有するフック8を形成し、蓋支持棒3に掛合片8aと掛合する掛合突部9を形成する。蓋支持棒3の上面に拘束解除板12を揺動可能に枢支し、拘束解除板12の下面に先端がフック8の前面に当接する押圧体13を延設する。



【実用新案登録請求の範囲】

【請求項1】 上方が開口する箱状に形成された本体と、前記本体の上端開口の周縁部に嵌合された蓋支持枠と、前記蓋支持枠に開閉揺動可能に枢支された蓋とを備えたトイレコーナーボックスにおいて、前記蓋を開蓋方向に弾発的に付勢する付勢手段と、前記蓋を閉蓋状態で前記蓋支持枠に拘束可能でありかつ外部からの操作によりその拘束状態が解除可能である拘束手段とを設けたことを特徴とするトイレコーナーボックス。

【図面の簡単な説明】

【図1】 本考案の一実施例に係るトイレコーナーボックスの斜視図である。

【図2】 図1のA-A線断面図である。

【図3】 蓋を開けた状態の図1のA-A線断面図であ

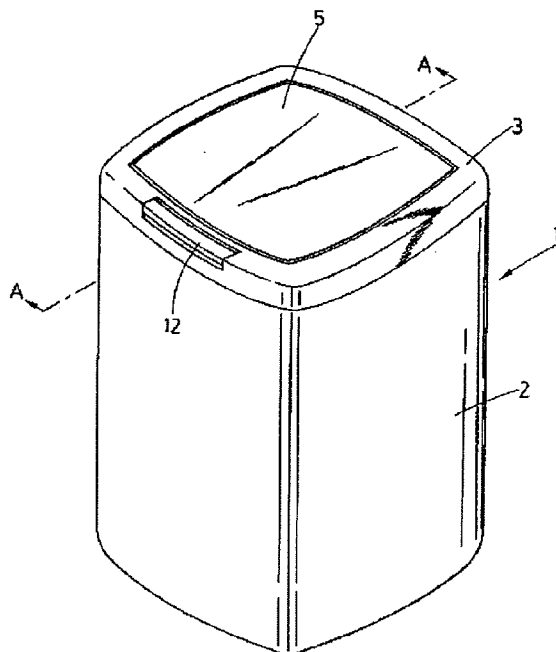
る。

【図4】 蓋支持枠の底面図である。

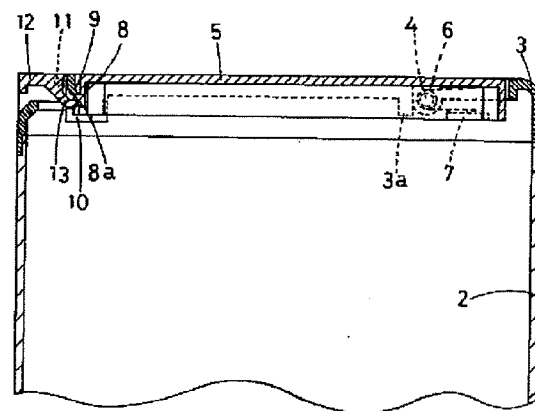
【符号の説明】

- 1 トイレコーナーボックス
- 2 本体
- 3 蓋支持枠
- 4 枢軸
- 5 蓋
- 6 ねじりコイルばね
- 8 フック
- 8a 掛合片
- 9 掛合突部
- 12 拘束解除板
- 13 押圧体

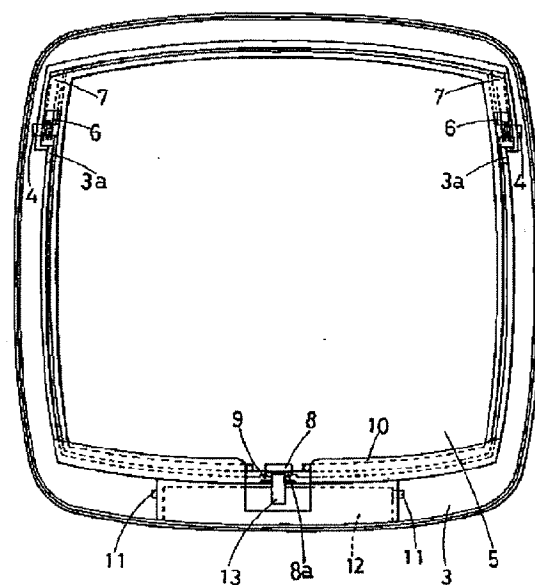
【図1】



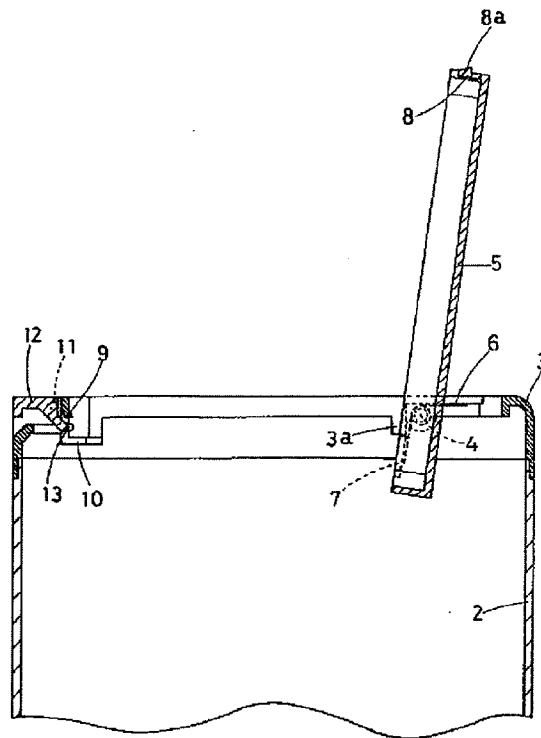
【図2】



【図4】



【図3】



【考案の詳細な説明】

【0001】

【産業上の利用分野】

本考案は、トイレのコーナーに備えられるコーナーボックスに関するものである。

【0002】

【従来の技術】

従来、この種のトイレコーナーボックスは、上方が開口する箱状に形成された本体と、この本体の上端開口の周縁部に嵌合された蓋支持棒と、この蓋支持棒に一端側を開閉揺動可能に枢支された蓋とからなるものが一般的である。

このようなトイレコーナーボックスを使用する際は、蓋を上方に揺動させて開蓋状態とした後、汚物を本体内部に収納し、さらにその後、蓋を下方に揺動させて閉蓋状態としていた。

【0003】

【考案が解決しようとする課題】

前記のような従来のトイレコーナーボックスは、蓋をその自重で閉蓋状態としているものであり、汚物を収納する際には片手で本体を保持して片手で蓋を開蓋する、というように両手を使うことが必要であり、特に片手がふさがっている場合など、蓋の開閉および汚物の収納が不便であるという欠点があった。また、何らかの理由でトイレコーナーボックスが転倒したときに収納していた汚物が飛散したり、収納汚物が多量になった場合に汚物によって蓋が押し上げられて開いたりするという欠点もあった。

【0004】

本考案は以上のような欠点を解消するためになされたものであり、蓋の開閉および汚物の収納を容易かつ確実に行なうことのできるトイレコーナーボックスを提供することを目的とするものである。

【0005】

【課題を解決するための手段】

前記目的を達成するため、本考案は、上方が開口する箱状に形成された本体と

、本体の上端開口の周縁部に嵌合された蓋支持棒と、蓋支持棒に開閉揺動可能に枢支された蓋とを備えたトイレコーナーボックスにおいて、蓋を開蓋方向に弾発的に付勢する付勢手段と、蓋を閉蓋状態で蓋支持棒に拘束可能でありかつ外部からの操作によりその拘束状態が解除可能である拘束手段とを設けたことを特徴とするものである。

【0006】

【作用】

本考案のトイレコーナーボックスは、トイレ床面の隅部に設置する。このトイレコーナーボックスに汚物を収納する際は、拘束手段を操作して蓋と蓋支持棒との拘束状態を解除すると、付勢手段により蓋が開蓋させられるので、本体の内部に汚物を収納できる。次いで、蓋を閉蓋状態となるまで揺動させると、蓋は拘束手段により蓋支持棒に拘束されて閉蓋状態が保持される。したがって、トイレコーナーボックスが転倒しても収納していた汚物が飛散することがなく、また、収納汚物が多量になった場合にも汚物によって蓋が押し上げられて開いたりすることがない。

【0007】

【実施例】

以下、本考案の一実施例を図面に基づき説明する。図1は本考案に係るトイレコーナーボックスの斜視図、図2は図1のA-A線断面図、図3は蓋を開けた状態の図1のA-A線断面図、図4は蓋支持棒の底面図である。

【0008】

このトイレコーナーボックス1は、合成樹脂で上方が開口する略四角形の箱状に形成された本体2の内部を汚物収納空間とし、本体2の上端開口の周縁部には合成樹脂で形成された蓋支持棒3が嵌合されている。蓋支持棒3には左右一対の枢軸4を支点として蓋5が開閉揺動可能に枢支されている。

【0009】

枢軸4には、付勢手段としてねじりコイルばね6のコイル部が遊嵌され、ねじりコイルばね6の端部の一側は蓋支持棒3に、他側は蓋5に突設されたばね受け板7に衝合されている。なお、蓋支持棒3には開蓋状態となったときにばね受け

板7と衝合する衝合突起3aが突設されている。

【0010】

また、蓋5の前周縁の中央部には下方に向けてフック8が突出形成されるとともに、フック8の先端部には前側に向かう掛合片8aが突出形成されている。掛合片8aの前面壁は斜め後ろ下方に向かう傾斜面となっている。また、蓋支持棒3には閉蓋状態としたときフック8の掛合片8aと掛合する掛合突部9が形成され、フック8（掛合片8a）および掛合突部9により蓋5の拘束手段が構成されている。さらに、蓋支持棒3には閉蓋状態としたとき蓋5の前周縁の下面に衝合する受け板10が内側に向けて突設されているとともに、蓋支持棒3の上面前側には、枢支部11を揺動枢支点とする拘束解除板12が取り付けられている。

【0011】

拘束解除板12の下面中央部には、斜め後ろ下方に向けて押圧体13が延設され、押圧体13の先端は、閉蓋状態としたときフック8の掛合片8aの前面壁に当接するようになっている。

【0012】

次いで、前記実施例の作動を説明する。閉蓋状態ではフック8の掛合片8aと掛合突部9とが掛合することにより蓋5が蓋支持棒3に拘束されている。この状態から拘束解除板12を押し下げると、拘束解除板12は枢支部11を支点として揺動し、押圧体13の先端がフック8を後方に押圧するので、合成樹脂で形成されたフック8が撓んで、掛合片8aと掛合突部9との掛合が外れ、蓋5の拘束状態が解除される。

【0013】

この結果、ねじりコイルばね6の弾発力により蓋5のばね受け板7が下方に押し下げられ、蓋5が枢軸4を支点としてばね受け板7と衝合突起3aとが衝合する位置まで揺動し、開蓋状態となる（図3参照）ので、開口部から汚物を本体2の内部に収納する。収納が終わると、蓋5を下方に揺動させれば、掛合片8aと掛合突部9とが掛合させられ、蓋5が蓋支持棒3に拘束されて、再び閉蓋状態が保持されることになる。

【0014】

本実施例では、拘束解除板12を押し下げるだけで蓋5が開くので、片手で容易に開蓋できることになり、片手がふさがっているような場合でも、蓋の開閉および汚物の収納が極めて便利である。なお、付勢手段および拘束手段の実施態様が本実施例に限定されないのは言うまでもない。

【0015】

【考案の効果】

本考案に係るトイレコーナーボックスでは、拘束手段を外部から操作して蓋と蓋支持棒との拘束状態を解除するだけで、付勢手段により自動的に蓋が開蓋させられるので、片手だけで開蓋できることになって、蓋の開閉と汚物の収納とに両手を使うのが通常であった従来トイレコーナーボックスと比べて、蓋の開閉および汚物の収納が楽に行なえる。また、閉蓋状態では蓋が拘束手段により蓋支持棒に拘束されているので、何らかの理由でトイレコーナーボックスが転倒したときにも収納していた汚物が飛散することがなく、かつ、収納汚物が多量になった場合にも汚物によって蓋が押し上げられて開いたりすることがない。

【19】中華民國 【12】專利公報 (S)

【11】證書號數：D129485

【45】公告日：中華民國98(2009) 年 7 月 1 日

【51】LOC. (8) Cl. : 09-09

新式樣 全 4 頁

【54】名稱： 垃圾桶

TRASH CAN

【21】申請案號：097303079

【22】申請日：中華民國97(2008)年5月28日

【30】優先權： 2007/11/28 美國 29/293,498

【72】創作人： 楊紹培 YANG, FRANK；魏孜浩 WEI, TZU-HAO；許世琛 HSU, WILLIAM；張狄風
CHANG, DI-FONG

【71】申請人： 新璞修人有限責任公司 SIMPLEHUMAN LLC
美國

【74】代理人： 陳翠華

【56】參考文獻：

TW D112733

US D525756

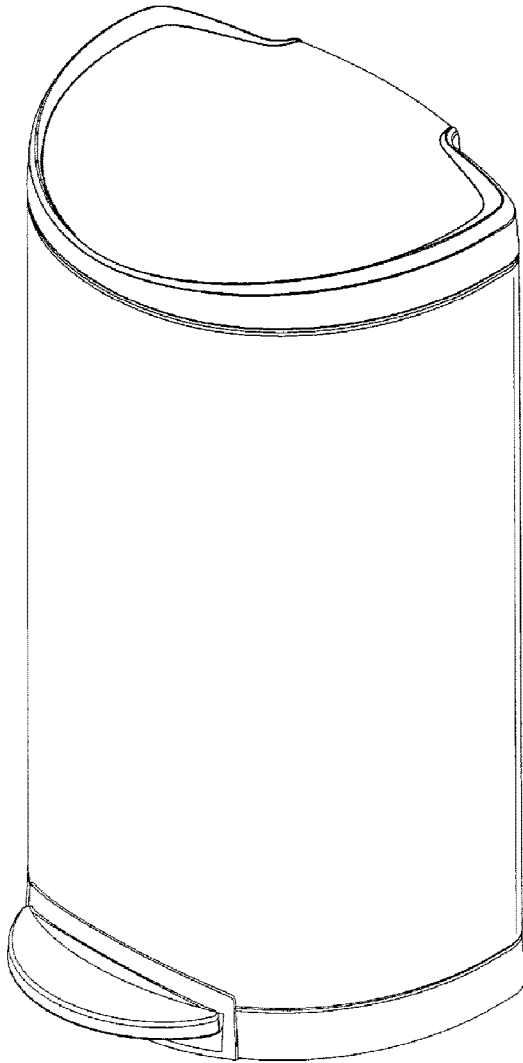
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2

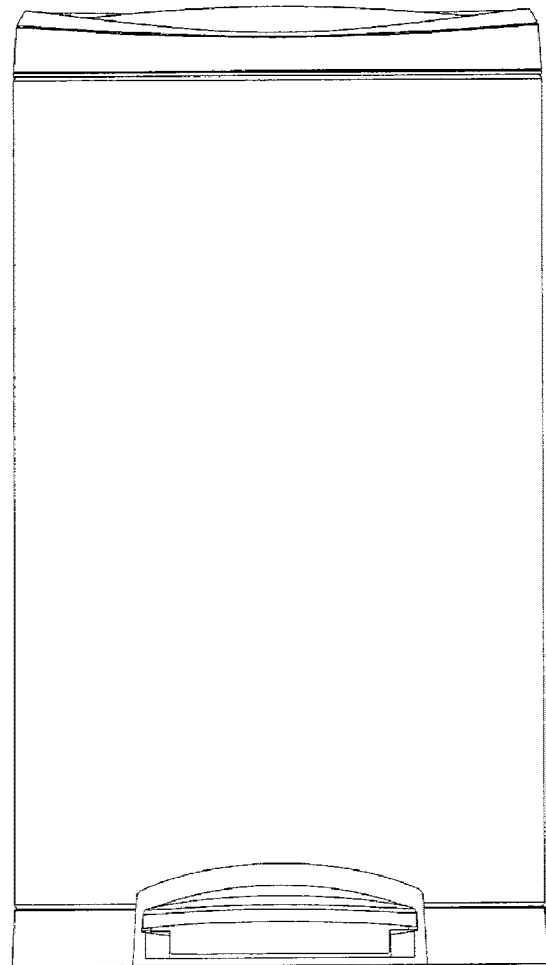
圖面說明：

參各圖面下方之說明。

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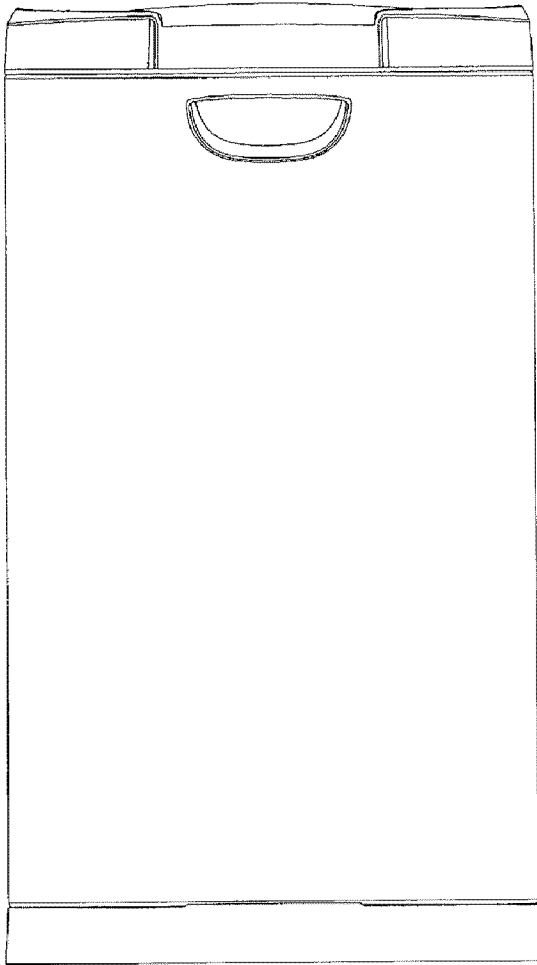


立體圖
(代表圖)

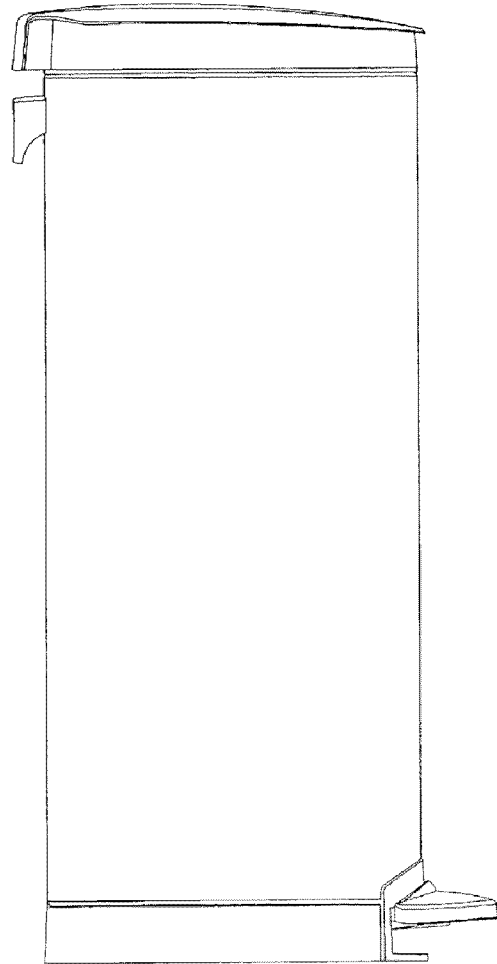


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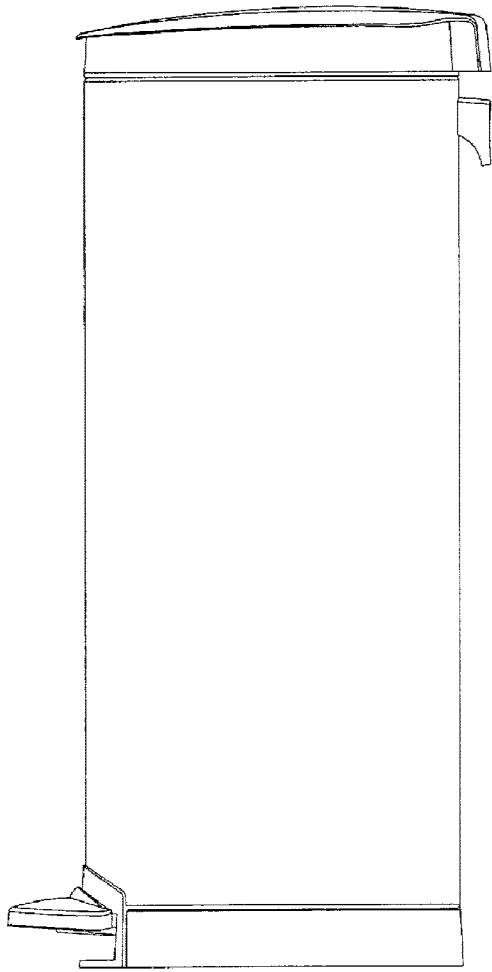


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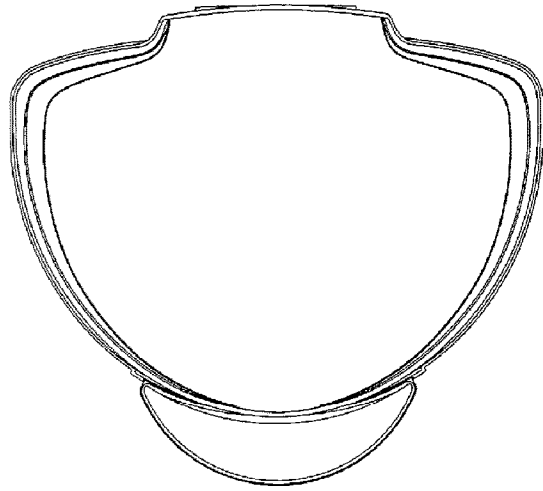


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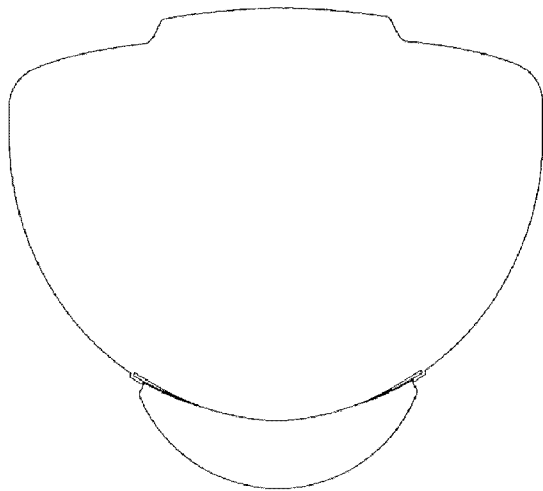
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右側視圖



俯視圖



仰視圖

【19】 中華民國

【12】 專利公報 (S)

【11】 證書號數：D133678

【45】 公告日： 中華民國 99 (2010) 年 03 月 11 日

【51】 LOC. (8) Cl.：09-09

新式樣

全7 頁

【54】 名 稱：垃圾桶

TRASH CAN

【21】 申請案號：097304453

【22】 申請日： 中華民國 97 (2008) 年 07 月 31 日

【30】 優先權： 2008/02/01

美國

29/303,204

【72】 創作人： 楊紹培(US) YANG, FRANK；魏祖豪(US) WEI, TZU-HAO；劉邁克偉恩(US)
LUM, MYK WAYNE；金勇 J (US) KIM, YOON J.

【71】 申請人： 辛普休曼股份有限公司

SIMPLEHUMAN, LLC

美國

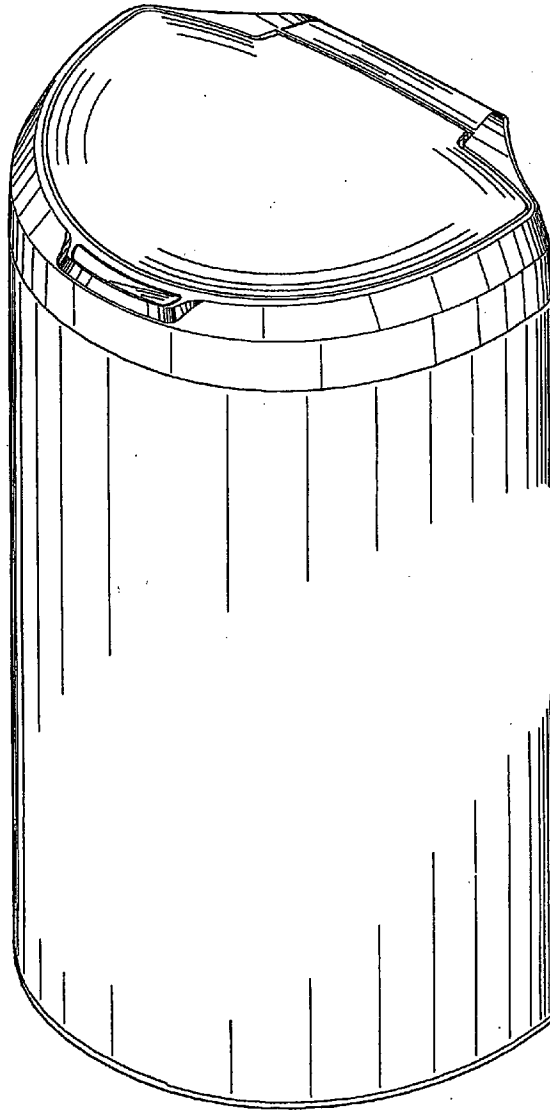
【74】 代理人： 蔡坤財；李世章

【56】 參考文獻：

TW D112733

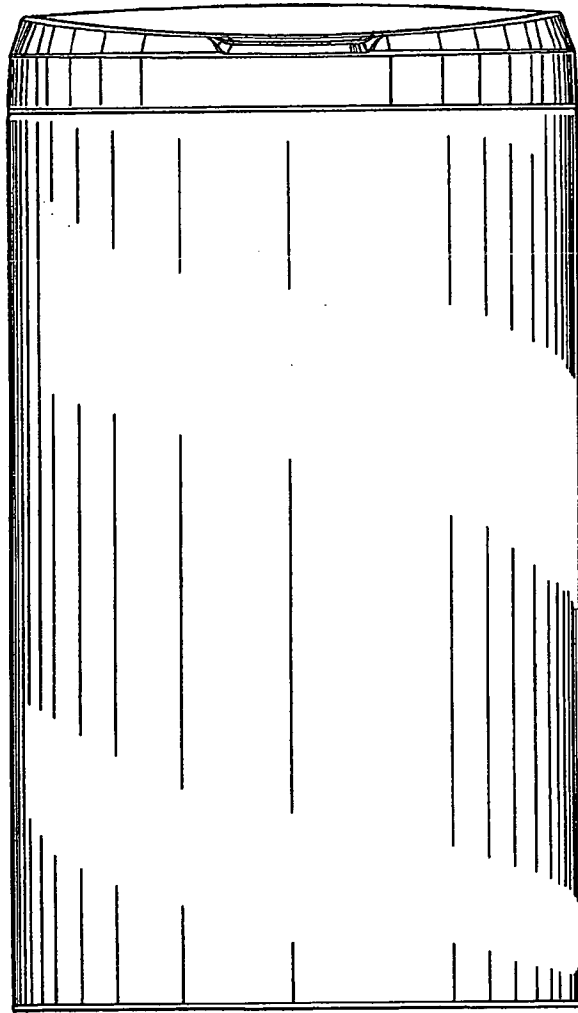
US D525756

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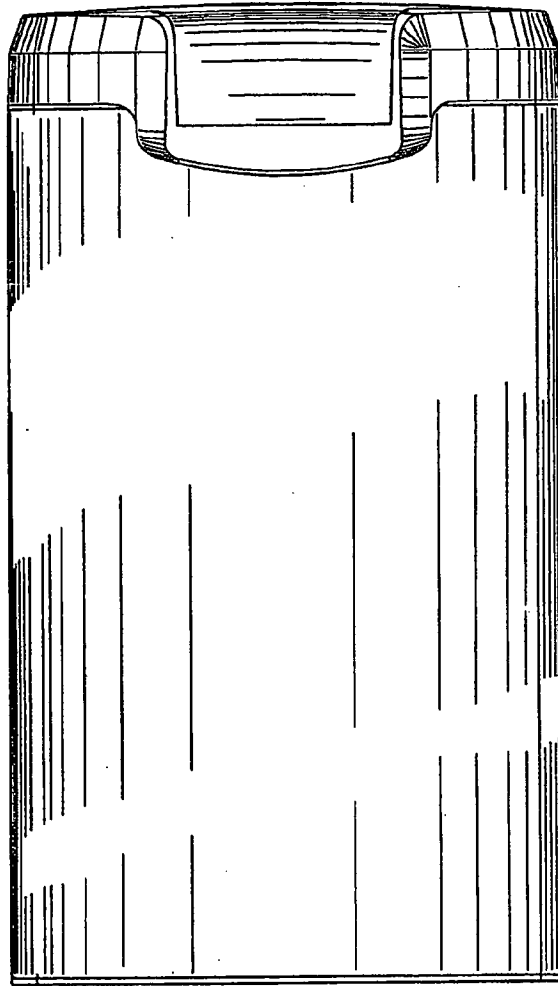
立體圖(代表圖)

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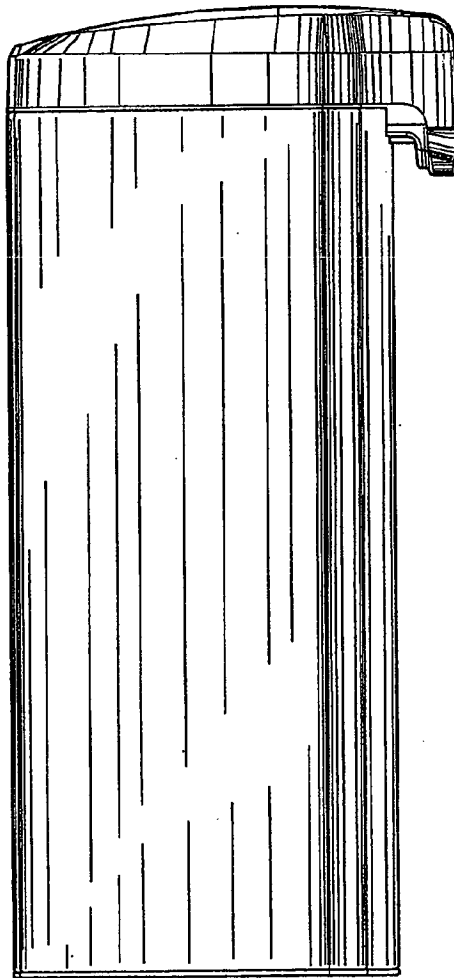
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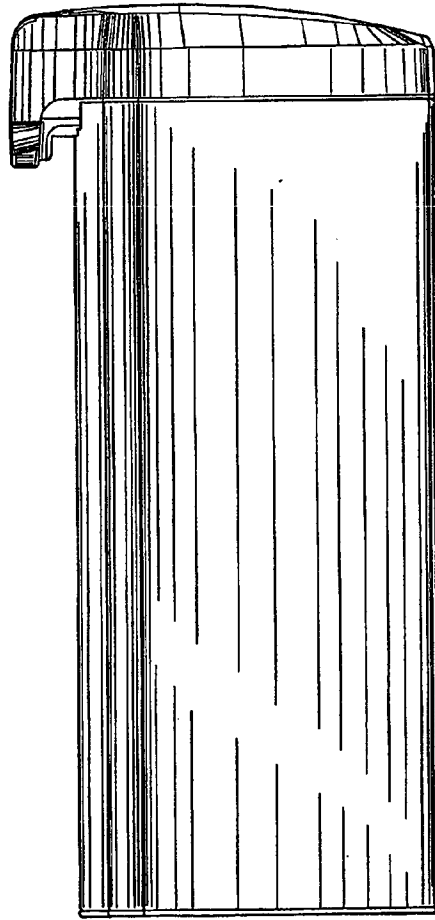
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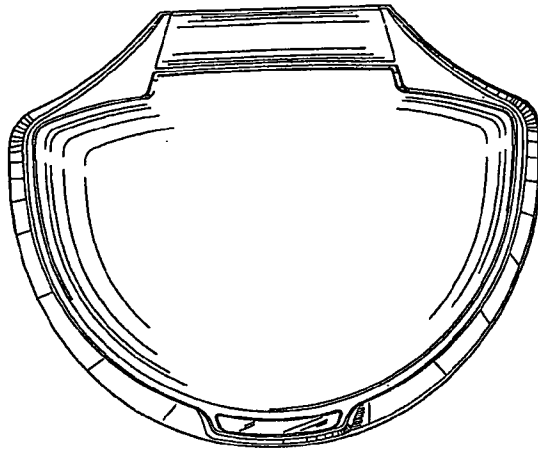
右側視圖

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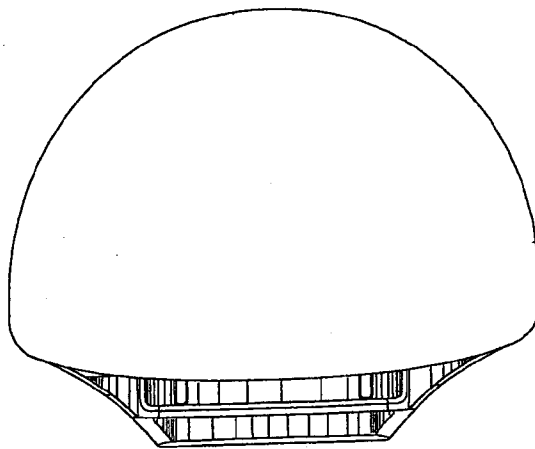


左側視圖

(7)



俯視圖



仰視圖

【19】中華民國

【12】專利公報 (S)

【11】證書號數：D154797

【45】公告日：中華民國 102 (2013) 年 07 月 21 日

【51】LOC. (9) Cl. : 09-09

設計

全7頁

【54】名稱：垃圾箱 (二)

TRASH CAN (2)

【21】申請案號：101304196

【22】申請日：中華民國 101 (2012) 年 07 月 19 日

【30】優先權：2012/01/20

美國

29/411,490

【72】設計人：楊紹培 (US) YANG, FRANK；魏孜浩 (US) WEI, TZU-HAO；張狄風 (TW)

CHANG, DI FONG；林邁克 (US) LUM, MYK；韋德亞當 (US) WADE,

ADAM；黃柏霖 (TW) HUANG, PO LING

【71】申請人：辛普休曼股份有限公司

SIMPLEHUMAN, LLC

美國

【74】代理人：蔡坤財；李世章

【56】參考文獻：

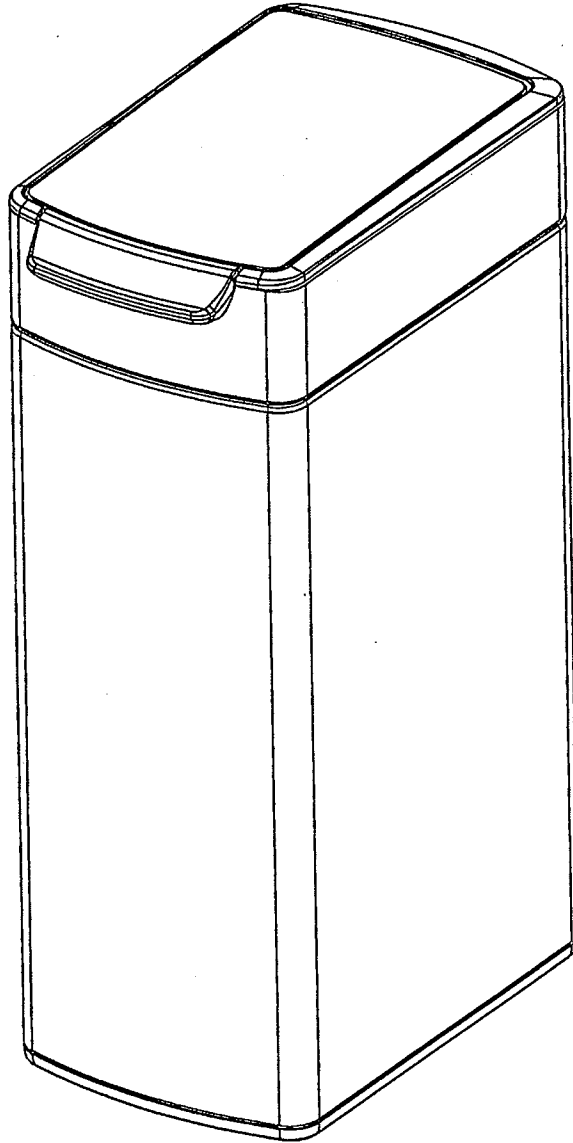
JP D1322056

審查人員：陳慧媛

圖式說明

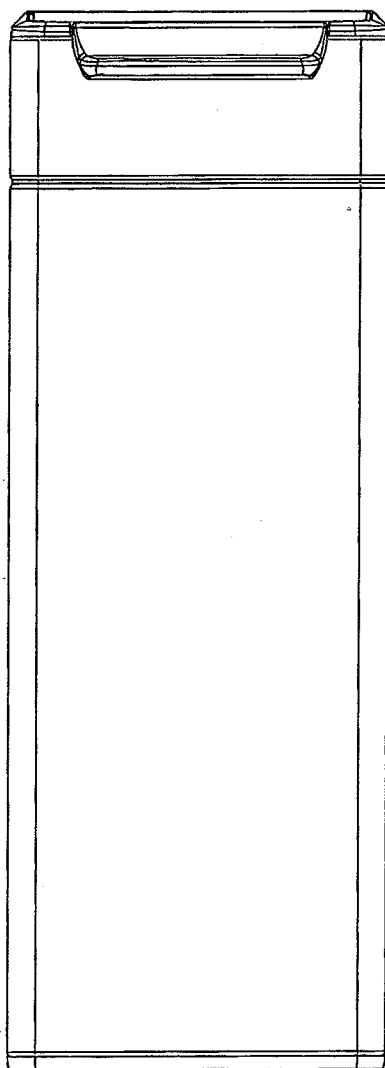
左側視圖與右側視圖係對稱，故省略左側視圖。

(2)



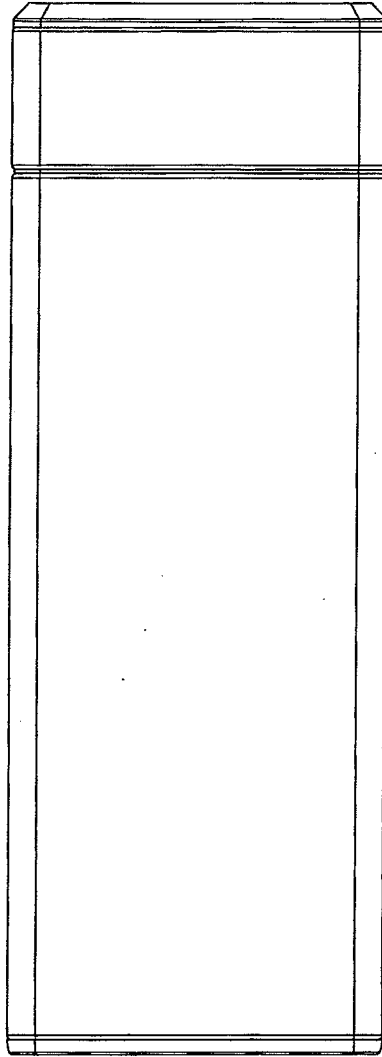
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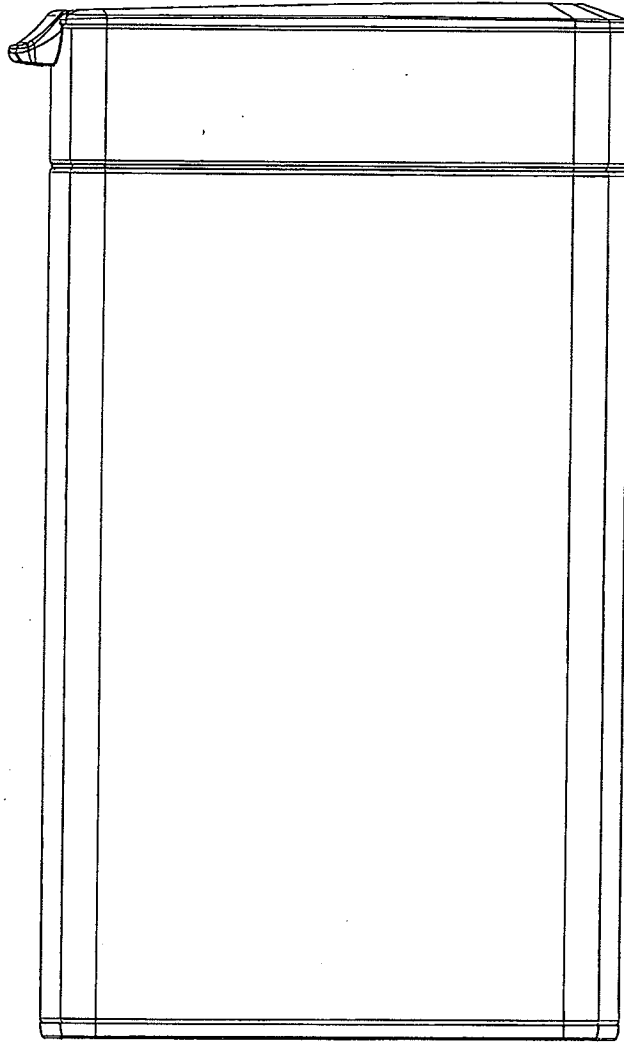
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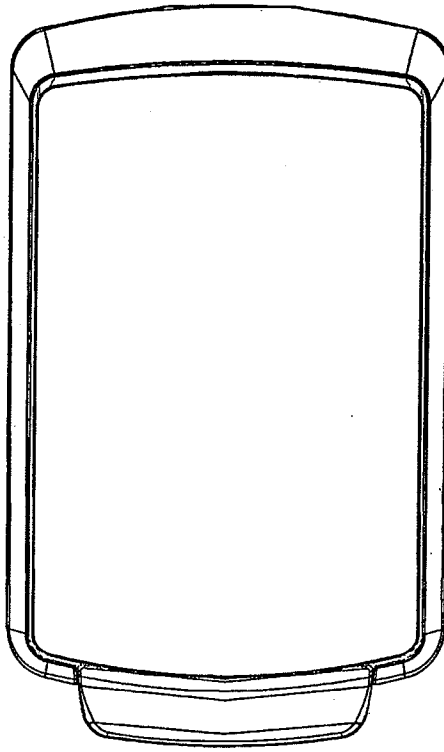
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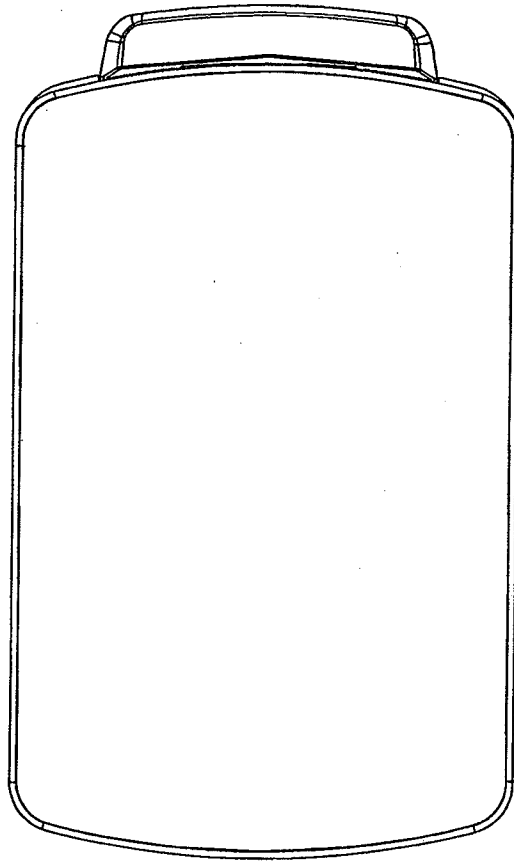
右側視圖

(6)



俯視圖

(7)



仰視圖

【19】 中華民國

【12】 專利公報 (S)

【11】 證書號數：D158187

【45】 公告日：中華民國 103 (2014) 年 01 月 01 日

【51】 LOC. (9) Cl. : 09-09

設計

全7頁

【54】 名 稱：垃圾箱之部分

PORTION OF A TRASH CAN

【21】 申請案號：102302061

【22】 申請日：中華民國 101 (2012) 年 07 月 19 日

【30】 優先權：2012/01/20

美國

29/411,482

【72】 設計人：楊紹培 (US) YANG, FRANK；林邁克 (US) LUM, MYK；韋德亞當 (US) WADE, ADAM

【71】 申請人：辛普休曼股份有限公司
美國

SIMPLEHUMAN, LLC

【74】 代理人：蔡坤財；李世章

【56】 參考文獻：

TW D112733

TW D129485

TW D133678

US D611216

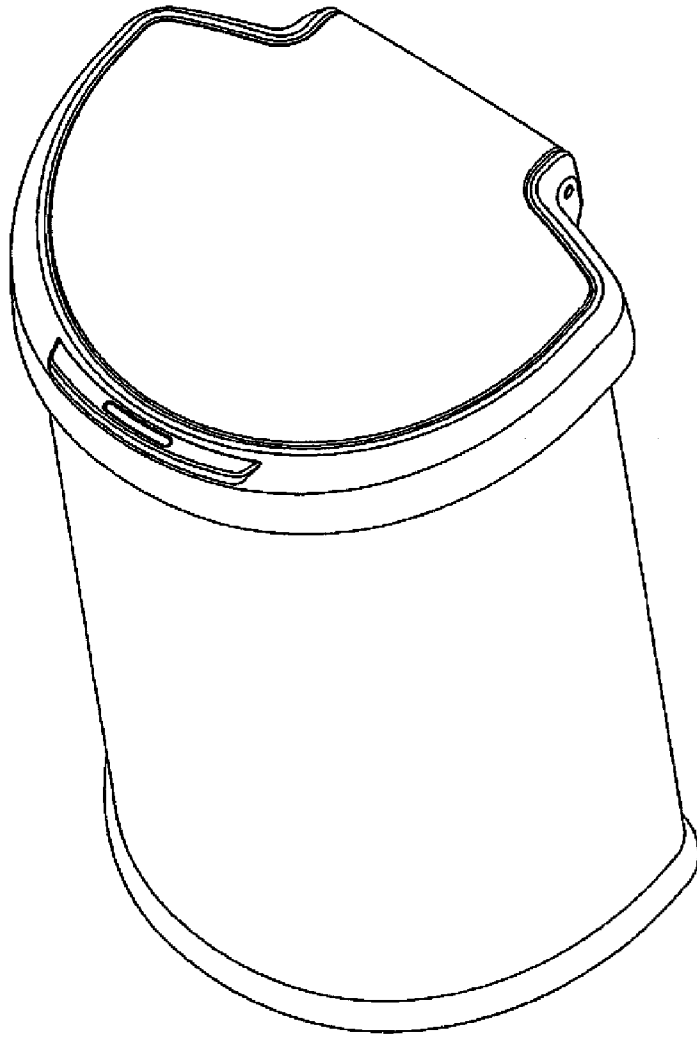
審查人員：陳慧媛

圖式說明

右側視圖與左側視圖呈垂直鏡向對稱，故省略之。

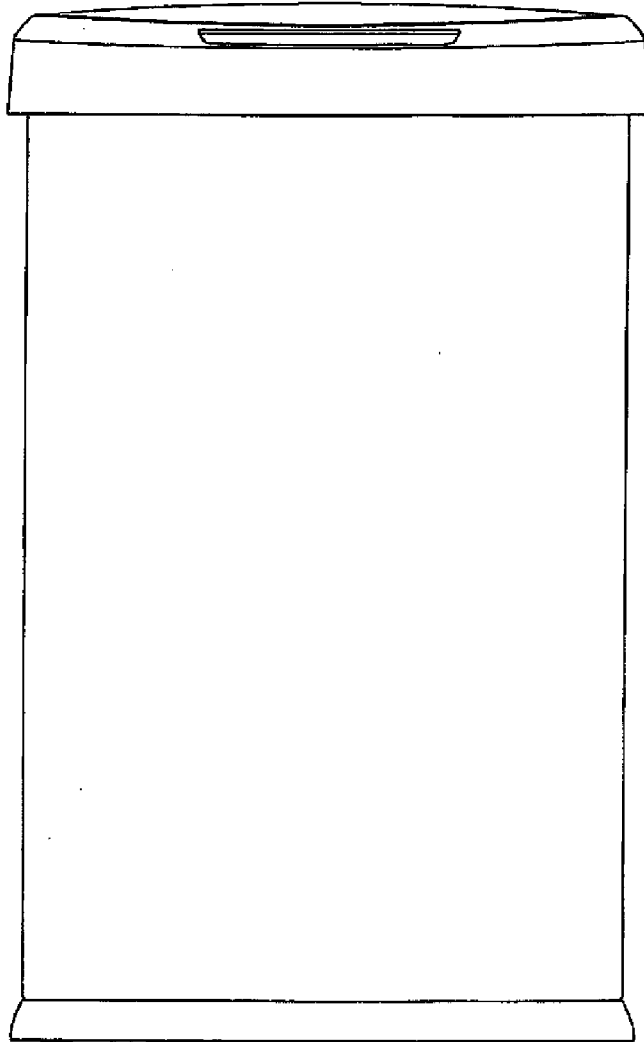
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(2)



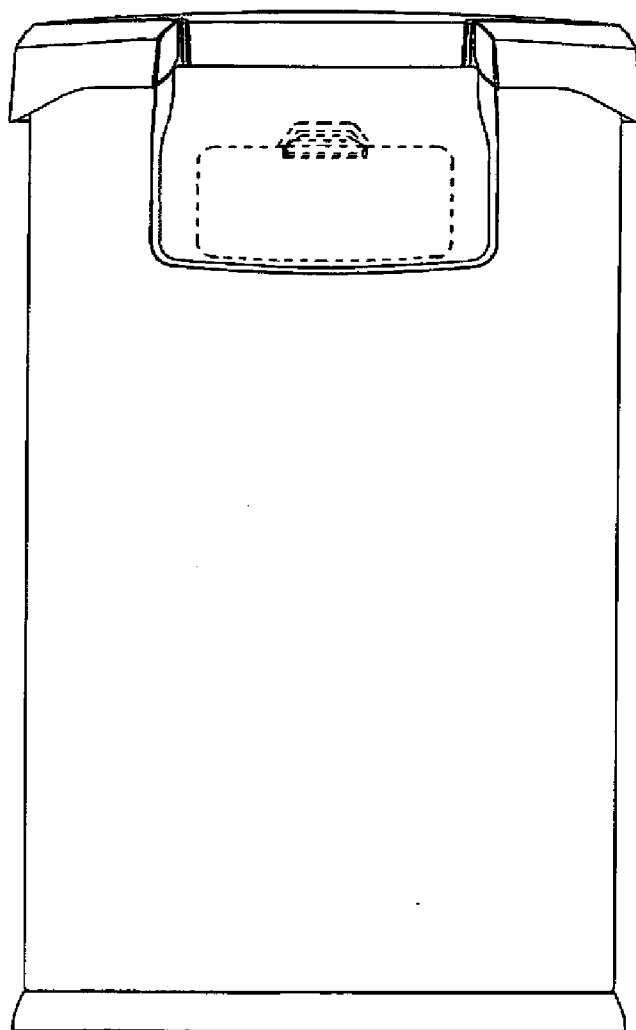
立體圖
(指定代表圖)

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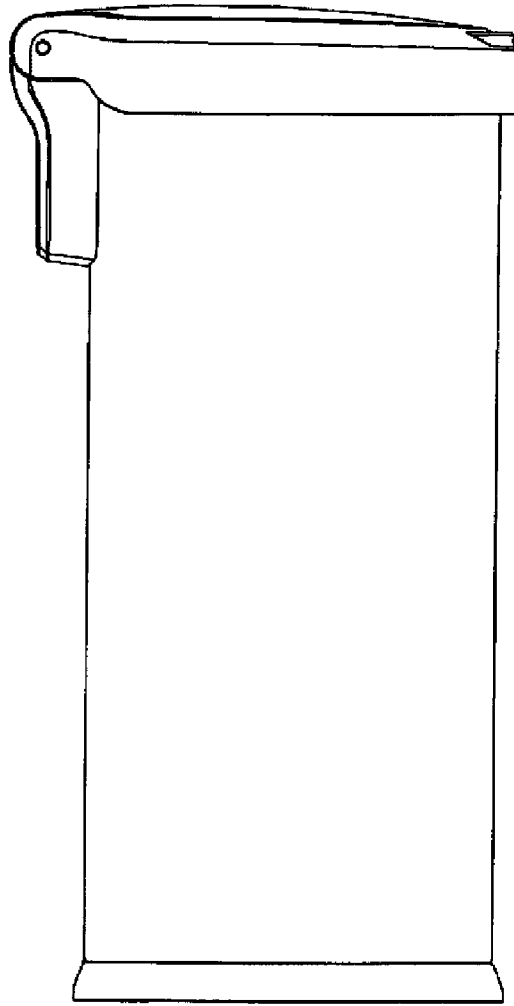
前視圖

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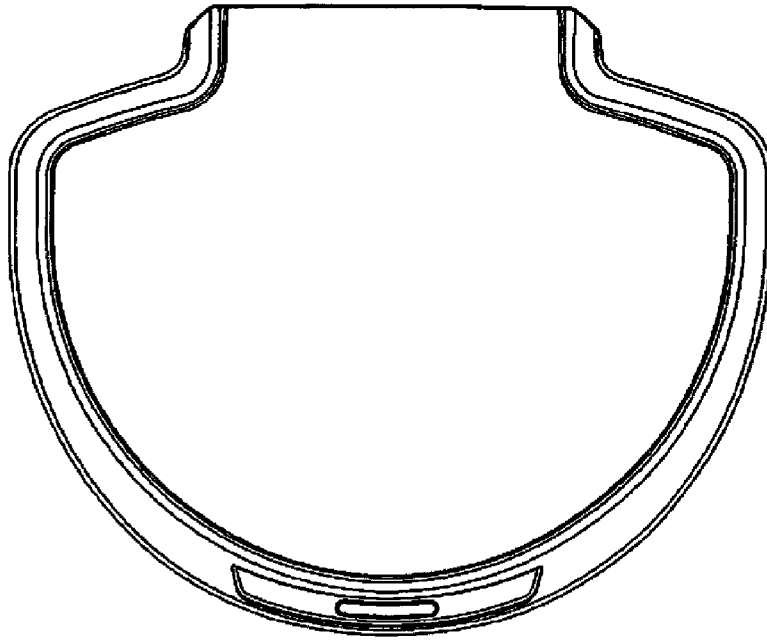
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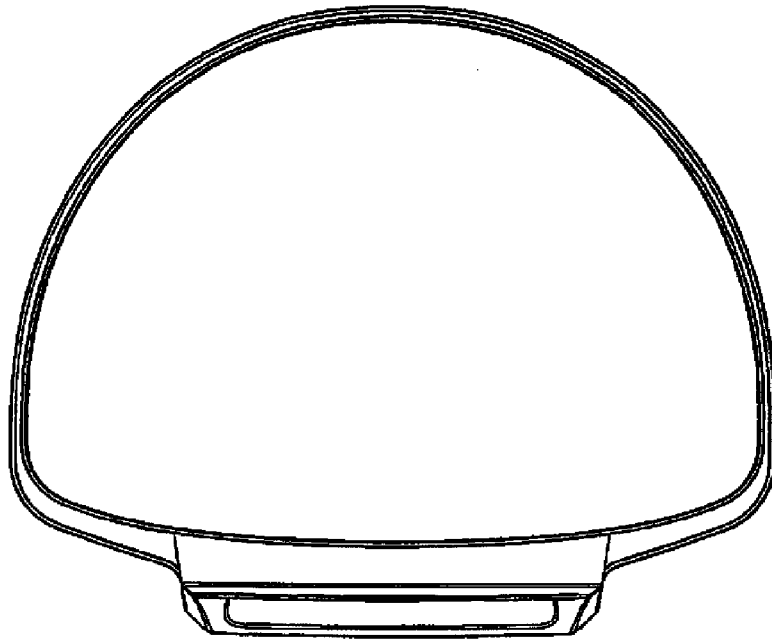
左側視圖

(6)



俯視圖

(7)



仰視圖

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES
PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro



(43) Internationales Veröffentlichungsdatum
1. September 2005 (01.09.2005)

PCT

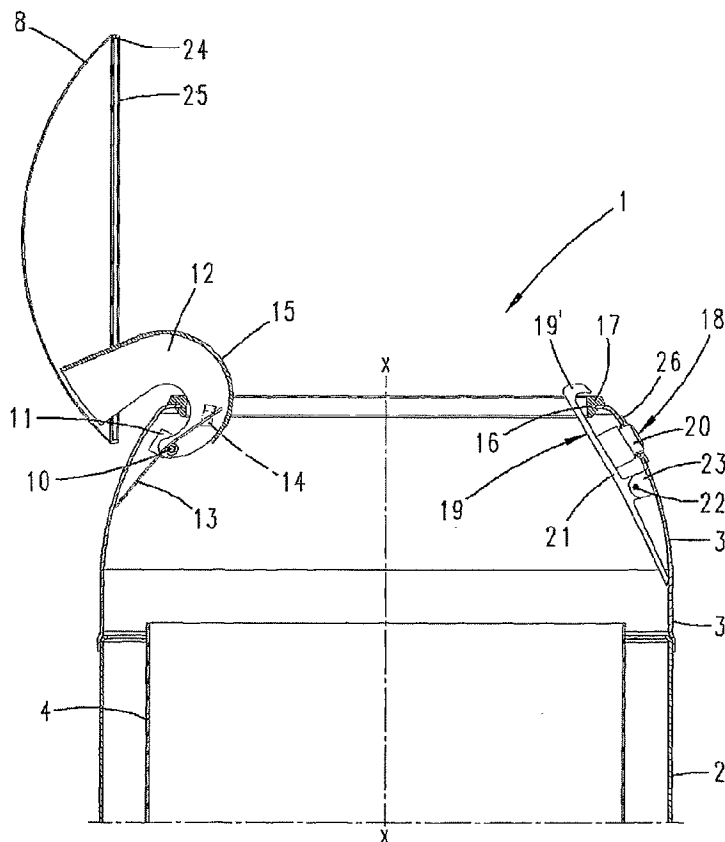
(10) Internationale Veröffentlichungsnummer
WO 2005/080232 A1

- (51) Internationale Patentklassifikation⁷: **B65F 1/16** (71) Anmelder (für alle Bestimmungsstaaten mit Ausnahme von
US): WESTERMANN KG [DE/DE]; Bahnhofstrasse 205,
59759 Arnsberg (DE).
- (21) Internationales Aktenzeichen: PCT/EP2005/050189
- (22) Internationales Anmeldedatum:
18. Januar 2005 (18.01.2005) (72) Erfinder; und
(75) Erfinder/Anmelder (nur für US): NEUHAUS, Egbert
[DE/DE]; Mühlenberg 33, 59759 Arnsberg (DE).
- (25) Einreichungssprache: Deutsch
- (26) Veröffentlichungssprache: Deutsch (74) Anwälte: MÜLLER, Enno usw.; Rieder & Partner, Cor-
neliusstrasse 45, 42329 Wuppertal (DE).
- (30) Angaben zur Priorität:
10 2004 008 067.4 17. Februar 2004 (17.02.2004) DE
10 2004 028 293.5 11. Juni 2004 (11.06.2004) DE
- (81) Bestimmungsstaaten (soweit nicht anders angegeben, für
jede verfügbare nationale Schutzrechtsart): AE, AG, AL,
AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH,

[Fortsetzung auf der nächsten Seite]

(54) Title: TRASH COLLECTOR

(54) Bezeichnung: ABFALLSAMMLER



(57) Abstract: The invention relates to a trash collector (1), preferably comprising a removable interior bin (4). The trash collector (1) also comprises a hinged lid (8) that is automatically displaced into the open position when the collector is actuated to open. An actuation element (18) is mounted opposite a hinge axis (10) of the lid (8) for triggering the opening movement of the lid (8). The aim of the invention is to provide a trash collector of the aforementioned type which is easy to open and the lid of which is displaced into the position of opening with little noise. For this purpose, the hinge axis (10) of the lid (8) is disposed in the interior of the lid (8). An opening rim (16) of the trash collector (1) is lined with an elastic buffer element (17) at least in the area of the hinge axis (10). A retaining arm (12) linking the lid (8) and the hinge axis (10) rests against the buffer element (17) when the collector is in the open position.

(57) Zusammenfassung: Die Erfindung betrifft einen Abfallsammler (1), vorzugsweise mit einem herausnehmbaren Inneneimer (4), wobei der Abfallsammler (1) einen angeschlossenen Deckel (8) aufweist, der bei Öffnungsbetätigung selbsttätig in die Öffnungsstellung verfährt, wobei weiter zur Auslösung der Öffnungsbewegung des Deckels (8)

gegenüberliegend zu einer Scharnierachse (10) des Deckels (8) eine Betätigungstaste (18) angeordnet

[Fortsetzung auf der nächsten Seite]

WO 2005/080232 A1



CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

TJ, TM), europäisches (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Veröffentlicht:

— mit internationalem Recherchenbericht

(84) Bestimmungsstaaten (soweit nicht anders angegeben, für jede verfügbare regionale Schutzrechtsart): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), eurasisches (AM, AZ, BY, KG, KZ, MD, RU,

Zur Erklärung der Zweibuchstaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

ist. Um einen Abfallsammler der in Rede stehenden Art derart verbessert weiterzubilden, dass bei benutzerfreundlicher Öffnungsbetätigung ein geräuscharmes Verfahren des Deckels in die Öffnungsstellung erreicht ist, wird vorgeschlagen, dass die Scharnierachse (10) des Deckels (8) in Innern des Deckels (8) angeordnet ist, dass ein Öffnungsrand (16) des Abfallsammlers (1) jedenfalls im Bereich der Scharnierachse (10) mit einem elastischen Pufferelement (17) ausgekleidet ist und dass ein den Deckel (8) und die Scharnierachse (10) verbindender Halterungsarm (12) im Öffnungszustand gegen das Pufferelement (17) anliegt.

Abfallsammler

Die Erfindung betrifft zunächst einen Abfallsammler, vorzugsweise mit einem herausnehmbaren Inneneimer, wobei der Abfallsammler einen anscharnierten
5 Deckel aufweist, der bei Öffnungsbetätigung selbsttätig in die Öffnungsstellung verfährt, wobei weiter zur Auslösung der Öffnungsbewegung des Deckels gegenüberliegend zu einer Scharnierachse des Deckels eine Betätigungstaste angeordnet ist.

10 Abfallsammler der in Rede stehenden Art sind bekannt. So wird bspw. auf die DE 299 18 759 U1 verwiesen. Dort ist ein Abfallsammler dargestellt und beschrieben, welcher insbesondere an einer Wand zu befestigen ist, wobei weiter über eine Betätigungstaste ein Deckel zum selbständigen Verfahren in die Öffnungsstellung freigegeben wird. Diese selbsttätige Öffnungsbewegung des
15 Deckels ist unterstützt durch ein Feder-Dämpfungselement.

Im Hinblick auf den zuvor beschriebenen Stand der Technik wird eine technische Problematik der Erfindung darin gesehen, einen Abfallsammler der in Rede stehenden Art in baulich einfacher Art derart verbessert weiterzubilden,
20 dass bei benutzerfreundlicher Öffnungsbetätigung ein geräuscharmes Verfahren des Deckels in die Öffnungsstellung erreicht ist.

Diese Problematik ist zunächst und im Wesentlichen durch den Gegenstand des Anspruches 1 gelöst, wobei darauf abgestellt ist, dass die Scharnierachse
25 des Deckels im Innern des Abfallsammlers, insbesondere im Innern eines den herausnehmbaren Inneneimer aufnehmenden Standteils des Abfallsammlers, angeordnet ist, dass ein Öffnungsrand des Abfallsammlers jedenfalls im Bereich der Scharnierachse mit einem elastischen Pufferelement ausgekleidet ist und dass ein den Deckel und die Scharnierachse verbindender Halterungsarm

im Öffnungszustand gegen das Pufferelement anliegt. Zuzufolge dieser Ausgestaltung ist ein Abfallsammler geschaffen, welcher sich insbesondere durch ein geräuschreduziertes Öffnungsverhalten auszeichnet. Das elastische Pufferelement kann hierbei ein entlang des Öffnungsrandes des Abfallsammlers angeordneter Gummi- bzw. Kunststoffring sein, welcher darüber hinaus auch zum dichtenden Verschluss in der Deckelschließstellung dient. Bevorzugt wird hierbei das so geformte elastische Pufferelement in der Deckelschließstellung zumindest leicht komprimiert, zuzufolge dessen einer Geruchsbelästigung des in dem vorzugsweise herausnehmbaren Inneneimer gesammelten Abfalls entgegengewirkt ist. Im Zuge der über die Betätigungstaste ausgelösten Öffnungsbewegung des Deckels tritt der den Deckel mit der Scharnierachse verbindende Halterungsarm anschlagbegrenzend gegen das Pufferelement, so dass der Deckel weich anschlägt. Dem konstruktiv und herstellungstechnisch einfachen Pufferelement kommt somit eine Doppelfunktion zu. Zum einen die Abdichtung des Abfallsammlers in der Deckelschließstellung und zum anderen der geräuschreduzierenden Anschlagbegrenzung des Deckels in der Öffnungsstellung. Das selbsttätige Verfahren des Deckels bei Öffnungsbetätigung in die Öffnungsstellung ist durch Anordnung einer entsprechend auf den Deckel einwirkenden Feder erreicht, welche letztere weiter bevorzugt im Bereich der Scharnierachse angeordnet ist.

Auch betrifft die Erfindung einen Abfallsammler nach den Merkmalen des Oberbegriffs des Anspruches 1. Um einen Abfallsammler der in Rede stehenden Art bei gebrauchsvorteilhafter Ausgestaltung verbessert auszubilden, wird vorgeschlagen, dass die Scharnierachse außerhalb des Abfallsammlers, insbesondere außerhalb des den herausnehmbaren Inneneimer aufnehmenden Standteils des Abfallsammlers, angeordnet ist und dass ein Halterungsarm des Deckels in der Öffnungsstellung gegen einen im Bereich der Scharnierachse

ausgebildeten Anschlag fährt. Dieser Anschlag kann weiter ein elastisches Pufferelement sein.

Die Erfindung betrifft auch einen Abfallsammler, wie eingangs vorausgesetzt,
5 bei welchem zur vorteilhaft einfachen und neuartigen Betätigung vorgesehen ist, dass bei dem als Standeimer ausgebildeten Abfallsammler die Betätigungstaste in einem Bereich zwischen Kniehöhe und Hüfthöhe eines erwachsenen Menschen angeordnet ist und die Betätigungstaste durch in das Innere des Abfallsammlers gerichtete Druckbeaufschlagung, etwa durch einen Knie-
10 oder Hüftstoß, zu betätigen ist. Hierbei ist die Betätigungstaste geeigneterweise auf einem Zylinderabschnitt des grundsätzlich zunächst zylindrisch ausgebildeten Abfallsammlers, oder in einem sich nach oben an die Zylinderfläche anschließenden kuppelförmigen Abschnitt. So, dass aber immer noch ein Erreichen durch die genannte Knie- oder Hüftbetätigung ermöglicht ist.

15

Die Gegenstände der weiteren Ansprüche 4 und 5 sind nachstehend sowohl in Bezug zu dem Gegenstand des Anspruchs 1 als auch in Bezug zu dem Gegenstand der Ansprüche 2 und 3 erläutert, können aber auch in ihrer unabhängigen Formulierung von Bedeutung sein. So erweist es sich weiter als vorteilhaft,
20 dass die Betätigungstaste aus einem mit einer Gegenrast am Deckel zusammenwirkenden Rastteil besteht. Diesbezüglich wird weiter vorgeschlagen, dass das Rastteil in sich elastisch federnd ausgebildet ist und mittels eines nach außen vorstehenden Druckteils zur Freigabe des Deckels federnd auslenkbar ist. Zuzufolge dieser Ausgestaltung ist eine sowohl handhabungstechnisch als auch
25 fertigungstechnisch einfache Lösung geschaffen, wobei weiter bevorzugt das sich elastisch federnd ausgebildete Rastteil und das Druckteil einstückig material-einheitlich ausgebildet sind, so weiter bevorzugt als Kunststoffteil. Es bedarf aufgrund der federnden Ausbildung des Rastteiles keiner für die Funktion des Rastteiles notwendiger gesonderter Federelemente.

Die Erfindung betrifft des Weiteren einen Abfallsammler nach den Merkmalen des Oberbegriffes des Anspruches 1, wobei diesbezüglich zur Erlangung einer sowohl handhabungs- als auch herstellungstechnisch einfachen Lösung vorge-

5 schlagen wird, dass die Betätigungstaste aus einem mit einer Gegenrast am Deckel zusammenwirkenden Rastteil besteht, dass das Rastteil in sich elastisch federnd ausgebildet ist und mittels eines nach außen vorstehenden Druckteils zur Freigabe des Deckels federnd auslenkbar ist. Zufolge dieser Ausgestaltung ist eine sowohl handhabungstechnisch als auch fertigungstechnisch einfache

10 Lösung geschaffen, wobei weiter bevorzugt das sich elastisch federnd ausgebildete Rastteil und das Druckteil einstückig materialeinheitlich ausgebildet sind, so weiter bevorzugt als Kunststoffteil. Es bedarf aufgrund der federnden Ausbildung des Rastteiles keiner für die Funktion des Rastteiles notwendiger gesonderter Federelemente. Um in einfachster Weise ein geräuschreduziertes

15 Öffnen des Deckels zu erreichen, ist in einer vorteilhaften Weiterbildung des Erfindungsgegenstandes vorgesehen, dass die Scharnierachse des Deckels im Innern des Deckels angeordnet ist, dass ein Öffnungsrand des Abfallsammlers jedenfalls im Bereich der Scharnierachse mit einem elastischen Pufferelement ausgekleidet ist und dass ein den Deckel und die Scharnierachse verbindender

20 Halterungsarm im Öffnungszustand gegen das Pufferelement anliegt. Das elastische Pufferelement kann hierbei ein entlang des Öffnungsrandes des Abfallsammlers angeordneter Gummi- bzw. Kunststoffring sein, welcher darüber hinaus auch zum dichtenden Verschluss in der Deckelschließstellung dient. Bevorzugt wird hierbei das so geformte elastische Pufferelement in der Deckel-

25 schließstellung zumindest leicht komprimiert, zufolge dessen einer Geruchsbelästigung des in dem vorzugsweise herausnehmbaren Inneneimer gesammelten Abfalls entgegengewirkt ist. Im Zuge der über die Betätigungstaste ausgelösten Öffnungsbewegung des Deckels tritt der den Deckel mit der Scharnier-

achse verbindende Halterungsarm anschlagbegrenzend gegen das Pufferelement, so dass der Deckel weich anschlägt.

- Die Gegenstände der weiteren Ansprüche sind nachstehend in Bezug zu dem Gegenstand des Anspruches 1 und/ oder in Bezug zu dem Gegenstand des Anspruches 2 und/ oder in Bezug zu dem Gegenstand des Anspruches 3 und/ oder in Bezug zu dem Gegenstand des Anspruches 5 erläutert, können aber auch in ihrer unabhängigen Formulierung von Bedeutung sein. So wird weiter vorgeschlagen, dass der Halterungsarm puffer- bzw. anschlagseitig eine geschlossene Fläche aufweist. So ist bei einer Ausbildung des Halterungsarms aus zwei Parallelarmen vorgesehen, die dem Pufferelement bzw. dem Anschlag zugewandten Stirnrandkanten mittels eines plattenartigen Abdeckteils zu verbinden, zur schonenden Beaufschlagung insbesondere des Pufferelements in der federbelasteten Deckel-Öffnungsstellung. In einer bevorzugten Ausgestaltung ist der Abfallsammler ein frei aufstellbarer Stand-Abfallsammler, der, wie bereits erwähnt, vorzugsweise mit einem herausnehmbaren Inneneimer versehen ist. Diesbezüglich wird weiter vorgeschlagen, dass der Abfallsammler mit Ausnahme seines oberen Bereiches zylinderförmig gestaltet ist, mit einer den Durchmesser übertreffenden vertikalen Höhe. Letztere entspricht etwa einem 1,5- bis 3-Fachen des Durchmessers im zylindrischen Bereich. Der Abfallsammler ist deckelseitig kuppelförmig gestaltet, so bevorzugt halbkugelförmig mit einem dem Durchmesser des zylindrischen Bereiches entsprechenden Durchmesser. Der Deckel ist hierbei in einem oberen Kuppelabschnitt gebildet. Der dem Deckel zugewandte Öffnungsrand des Abfallsammlers erstreckt sich parallel ebenenversetzt zu einer Aufstellfläche des Abfallsammlers. Die Betätigungstaste ist unterhalb des Deckels, jedoch im Kuppelbereich des Abfallsammlers angeordnet, welche Betätigungstaste bzw. dessen Druckteil in einem Grundriss kreisförmig gestaltet sein kann. Alternativ wird vorgeschlagen, dass das Druckteil in seinem nach außen vorstehenden Abschnitt in Verti-

kalrichtung des Abfallsammlers langgestreckt gebildet ist, so bspw. in Form eines langgestreckten, sich nach vertikal oben und unten hin nahezu ausspitzen Ovals. Die Bedienfläche des Druckteils ist kuppelabschnittförmig der Abfallsammler-Kuppel angepasst, so dass die Oberfläche des Druckteils bei

5 einer durch Betätigung desselben eingedrückten Stellung etwa mit der Kuppeloberfläche des Abfallsammlers fluchtet. In einer bevorzugten Ausgestaltung ist vorgesehen, dass das Druckteil nach außen vorstehend sich in Vertikalrichtung über eine Handbreite oder mehr erstreckt. So ist in einer bevorzugten Ausgestaltung vorgesehen, dass die Erstreckungslänge des Druckteiles in Vertikal-

10 richtung etwa an eine Handlänge angepasst ist. Auch kann vorgesehen sein, dass das Druckteil an dem Abfallsammler in einer vertikalen Höhe angeordnet ist, die von dem Knie eines Erwachsenen erreichbar ist. Zuzufolge dieser Anordnung ist der Abfallsammler kniebetätigbar zu öffnen, wobei sich diesbezüglich ein weiterer Vorteil ergibt, wenn die Betätigungstaste im zylindrischen Bereich

15 des Abfallsammlers angeordnet ist. Ist die gewählte Gesamthöhe des Abfallsammlers entsprechend geringer ausgelegt, kann die Betätigungstaste auch, wie bereits erwähnt, im Bereich der Kuppel unterhalb des Deckels angeordnet sein. Das Rastteil ist als Rastarm ausgebildet, mit einem bodenseitigen Ende, das sich gegen die Innenwand des Abfallsammlers abstützt. Hierbei ist weiter

20 bevorzugt zwischen dem einstückig mit dem Rastteil verbundenen Druckteil und dem Rastarm eine Schwenkachse der Betätigungstaste angeordnet. Insbesondere der Rastarm ist in sich elastisch federnd ausgebildet, zur selbsttätigen Rückstellung des Rastteils bzw. der gesamten Betätigungstaste in die Rast-

25 Grundstellung. In diesem Zusammenhang ist weiter zu erwähnen, dass in dieser federunterstützten Rast-Grundstellung der Deckel aus der Öffnungsstellung durch Rückverlagerung desselben per Hand selbsttätig die rastgesicherte Schließstellung erreicht, wobei die am Deckel ausgeformte Gegenrast das Rastteil der Betätigungstaste überläuft, welche letzteres nach diesem Überlaufen federunterstützt die Schließstellung des Deckels findet. In einer bevorzugten

Ausgestaltung ist vorgesehen, dass das bodenseitige Ende des Rastarms sich am zylindrischen Bereich des Abfallsammlers abstützt. Insbesondere aus hygienischen Gründen ist es gewünscht, die Oberfläche eines Abfallsammlers so weit wie möglich glattflächig auszugestalten. Aus diesem Grund erweist es sich als vorteilhaft, wenn nur das Druckteil die Wandung des Abfallsammlers durchsetzt. Die Schwenkachse und deren Lager, sowie die durch den Rastarm ausgeformte Rückstellfeder der Betätigungstaste sind in einer Verstecktlage innerhalb des Abfallsammlers positioniert. In der bevorzugten Ausführungsform, bei welcher der Abfallsammler aus einem den Deckel und die Betätigungstaste aufweisenden, ein Übergehäuse bildenden Standteil und einem herausnehmbaren Inneneimer besteht, sind die vorgenannten versteckt angeordneten Teile der Betätigungstaste in einem ringförmigen Zwischenraum zwischen Inneneimer und Übergehäuse positioniert. Das Druckteil durchsetzt die Wandung des Abfallsammlers im zylindrischen Bereich. Alternativ kann das Druckteil auch die Wandung des Abfallsammlers im Kuppelbereich durchsetzen. Die Deckelvorderkante ist jedenfalls gegenüber dem Druckteil in seinem nach außen vorstehenden Bereich zur Scharnierachse hin zurückversetzt. Um insbesondere bei einer alternativ vorgeschlagenen Kniebetätigung zur Öffnung des Deckels einem Verschieben oder Kippen des Abfallsammlers entgegenzuwirken, ist vorgesehen, dass der Abfallsammler fußseitig eine Trittfläche aufweist zum Gegenhalt bei Betätigung des Druckteils bzw. der Betätigungstaste. So kann der Benutzer mit demselben Bein zugleich mittels des auf die Trittfläche aufgesetzten Fußes die Standsicherheit des Abfallsammlers sichern und mit dem Knie das Druckteil zum Öffnen des Deckels betätigen. Die vorgeschlagene fußseitige Trittfläche ist auch im Zusammenhang mit einer Handbetätigung eines ggf. im Kuppelbereich vorgesehenen Druckteils von Vorteil. Die Rastzusammenwirkung zwischen tastenseitigem Rastteil und deckelseitiger Gegenrast ist bevorzugt im Bereich des Deckels ausgebildet. Die Gegenrast kann hierbei durch einen Deckelabschnitt selbst, bspw. durch einen Randkantenab-

schnitt gebildet sein. Das tastenseitige Rastteil kann bei einer solchen Konfiguration über die Trennebene zwischen Deckel und Korpus des Abfallsammlers in den Deckelbereich ragen. Alternativ kann die Rastzusammenwirkung im Bereich des Standteils und darüber hinaus auch im Bereich der Kuppel des

5 Standteils ausgebildet sein, wobei bei dieser Ausführung die deckelseitige Gegenrast in der Deckelschließstellung bevorzugt über die vorbeschriebene Trennebene in das Standteil bzw. in die Kuppel ragt. Die Gegenrast ist hierbei bevorzugt als gesondertes, am Deckel festgelegtes und im Wesentlichen stabartig mit einem hakenartigen Ende ausgebildetes Teil gefertigt, welches zum Über-

10 laufen im Zuge der Deckelschließung federnd ausgebildet sein kann. Schließlich ist bevorzugt vorgesehen, dass bei Ausbildung des Abfallsammlers als Stand-Abfallsammler die außen liegende Betätigungstaste in einer Höhe über der Standfläche des Abfallsammlers angeordnet ist, die einer Kniehöhe eines erwachsenen Menschen entspricht. Der Abfallsammler ist demnach zur Befül-

15 lung freihändig bedienbar. Die in einer vertikalen Höhe von etwa 40 bis 70 cm platzierte Betätigungstaste kann leicht mittels Kniebeaufschlagung verlagert werden, was das federunterstützte Öffnen des Deckels veranlasst. Die Betätigungstaste kann weiter in einer Höhe platziert sein, die einer durchschnittlichen Kniehöhe eines erwachsenen Menschen entspricht. Zur Erleichterung der Be-

20 dienung auch für körperlich kleinere oder auch größere Menschen, kann die Betätigungstaste eine entsprechend angepasste Länge in Vertikalerstreckung des Abfallsammlers aufweisen, so dass hierdurch eine relativ große Kniehöhen-Spannweite abgedeckt ist. Ein weiterer Vorteil dieser Anordnung besteht darin, dass auch bspw. in einem Rollstuhl sitzende Menschen freihändig den

25 Deckel öffnen können, so etwa mittels des Ellenbogens. Die Betätigungstaste ist auch hierfür in einer günstigen Höhe platziert.

Nachstehend ist die Erfindung anhand der beigefügten Zeichnungen, welche lediglich verschiedene Ausführungsbeispiele darstellen, näher erläutert. Es zeigt:

- 5 Fig. 1 den erfindungsgemäßen Abfallsammler in einer perspektivischen Darstellung, eine erste Ausführungsform in der Deckel-Schließstellung betreffend;
- 10 Fig. 2 die Seitenansicht hierzu;
- Fig. 3 die Draufsicht hierzu;
- Fig. 4 den Schnitt gemäß der Linie IV-IV in Fig. 3;
- 15 Fig. 5 die Herausvergrößerung des Bereiches V in Fig. 4;
- Fig. 6 den oberen, deckelseitigen Bereich in einer Schnittdarstellung gemäß Fig. 4, jedoch die Deckel-Öffnungsstellung betreffend;
- 20 Fig. 7 eine der Fig. 1 entsprechende perspektivische Darstellung des Abfallsammlers, betreffend die Deckel-Öffnungsstellung;
- Fig. 8 den Abfallsammler in perspektivischer Darstellung, eine zweite Ausführungsform in der Deckel-Verschlussstellung betreffend;
- 25 Fig. 9 die Seitenansicht hierzu;
- Fig. 10 die Draufsicht auf den Abfallsammler gemäß der zweiten Ausführungsform;

- Fig. 11 den Schnitt gemäß der Linie XI-XI in Fig. 10;
- Fig. 12 die Herausvergrößerung des Bereiches XII in Fig. 11;
- 5 Fig. 13 eine der Figur 6 entsprechende Schnittdarstellung, jedoch die zweite Ausführungsform betreffend;
- Fig. 14 die perspektivische Darstellung des Abfallsammlers der zweiten Ausführungsform in der Deckel-Öffnungsstellung;
- 10 Fig. 15 eine dritte Ausführungsform des Abfallsammlers in einer Schnittdarstellung gemäß der Darstellung in Fig. 4;
- 15 Fig. 16 eine der Fig. 5 entsprechende Ausschnittdarstellung, jedoch eine weitere Ausführungsform betreffend;
- Fig. 17 eine der Fig. 6 entsprechende Darstellung einer Ausführungsform gemäß Fig. 16;
- 20 Fig. 18 die Herausvergrößerung des Bereichs XVIII-XVIII in Fig. 17;
- Fig. 19 eine weitere der Fig. 6 entsprechende Darstellung, eine weitere Ausführungsform betreffend.
- 25

Der in den Zeichnungen in verschiedenen Ausführungsformen dargestellte Abfallsammler 1 besteht im Wesentlichen aus einem zylindrischen Standteil 2, welches zusammen mit einer oben anschließenden Kuppel 3 ein Übergehäuse

bildet für einen Inneneimer 4. Dieses Übergehäuse ist in der Benutzungsstellung über den Inneneimer 4 gestülpt. Das Standteil 2 ist dazu in Richtung einer Stellfläche 5 des Abfallsammlers 1 offen ausgebildet. Der dortige, fußseitige Rand 6 des zylindrischen Standteiles 2 ist in den dargestellten Ausführungsformen mit einem aus Gummi oder Kunststoff gebildeten Standring versehen. Alternativ zu einem solchen Standring 7 können auch unterseitig des fußseitigen Randes 6 mehrere, bspw. 4 oder 5 umfangsmäßig gleichmäßig verteilte Gummifüße vorgesehen sein.

- 10 Das Beschicken des nach oben hin offenen Inneneimers 4 erfolgt durch einen, aus einem oberen Kuppelabschnitt gebildeten Deckel 8 des Standteils 2.

Die Kuppel 3 weist semisphärische Gestalt auf. Der in Richtung der Stellfläche 5 weisende Rand geht in einen zylindrischen Zwischenabschnitt 3' über, welcher mit dem oberen Rand des Standteiles 2 verbunden ist. Es handelt sich hierbei um eine irreversible Verbindung.

Um das Abheben des durch das Standteil 2 und die Kuppel 3 gebildeten Übergehäuses zu erleichtern, sind in die Mantelwand des Standteiles 2 eingesenkte Griffmulden 9 vorgesehen.

Der kuppelabschnittförmige Deckel 8 ist an einer quer zur Längsmittelachse x des Abfallsammlers 1 sich erstreckenden Scharnierachse 10 angelenkt. Diese Scharnierachse 10 ist im Bereich der Kuppel 3 unterhalb des Deckels 8 positioniert und ist in kuppelwandungssinnenseitig befestigten Achslagern 11 gehalten. Der Deckel 8 weist hierzu zwei in Erstreckungsrichtung der Scharnierachse 10 parallel zueinander beabstandete, sichelförmige Halterungsarme 12 auf. Diese sind innenseitig der Deckelwandung ortsfest angeordnet und erstrecken sich von der Deckelinnenwandung ausgehend unter Einschließen einer Sichel-

krümmung nach radial außen, wobei die freien Enden der Halterungsarme 12 durchsetzt sind von der Scharnierachse 10.

Der Deckel 8 steht in Öffnungsrichtung unter Federvorspannung, wozu in den
5 dargestellten Ausführungsformen eine die Scharnierachse 10 zwischen den beiden Halterungsarmen 12 umfassende Schenkelfeder 13 vorgesehen ist, die sich einerends an der Innenwandung der Kuppel 3 und andernends an einem, an einer mit Bezug auf die Scharnierachse 10 radial inneren Wandung eines an einem Halterungsarm 12 befestigten Böckchens 14 abstützt.

10

Die nach innen weisenden Randkanten der Halterungsarme 12 sind miteinander verbunden durch eine entsprechend der Kontur dieser Randkanten gekrümmt verlaufenden Wandung 15, mittels welcher die Scharnierachse 10 sowie die Schenkelfeder 13 insbesondere in der Offenstellung des Deckels 8 ab-
15 gedeckt sind.

Der Deckel 8 ist nach unten, d. h. in Richtung auf die Stellfläche 5 offen ausgebildet. Die innenseitig am Deckel 8 festgelegten Halterungsarme 2 durchtreten diesen offenen Bodenbereich des Deckels 8 und greifen den Öffnungsrand 16
20 des Abfallsammlers 1 durchtretend in den Kuppelbereich ein.

Der Öffnungsrand 16 ist parallel zur Stellfläche 5 ausgerichtet und weist infolge der kuppelförmigen Ausgestaltung des oberen Bereiches des Abfallsammlers 1 einen kreisrunden Grundriss auf.

25

Dieser Öffnungsrand 16 ist ausgekleidet mit einem elastischen Pufferelement 17 in Form eines Gummiringes, gegen welchen die zugeordnete Deckelrandkante in der Deckelverschlussstellung zum dichtenden Verschluss des Abfall-

sammlers 1 anliegt, dies ggf. unter leichter Komprimierung des Pufferelementes 17.

5 Zur Freigabe des federbelasteten Deckels 8 ist auf der der Scharnierachse 10 gegenüberliegenden Seite im Bereich der Kuppel 3, d. h. unterhalb des Deckels 8, eine Betätigungstaste 18 vorgesehen.

Die Betätigungstaste 18 besteht aus einem Rastteil 19, an welchem einstückig, materialeinheitlich ein Druckteil 20 angeformt ist. Das Rastteil 19 ist zudem als
10 Rastarm 21 ausgeformt, an welchem einerseits eine in etwa nach radial außen weisende Rastnase 22 ausgebildet ist. Dieser Rastarm 21 ist unterhalb und mit Abstand zum Druckteil 20 um eine Schwenkachse 22 kippbeweglich gelagert. Über diese Schwenkachse 22 hinaus erstreckt sich der Rastarm 21 weiter zur Abstützung gegen die Innenwand des Abfallsammlers 1. Das Rastteil 19 erstreckt sich innerhalb des Abfallsammlers 1. Lediglich das Druckteil 20 liegt
15 nach außen, den Abfallsammler 1 im Kuppelbereich eine fensterartige Durchbrechung 30 durchsetzend frei. Die die Schwenkachse 22 tragenden Halterungen 23 sind innenwandig der Kuppel 3 befestigt.

20 Die Rastausformung 19' des Rastteils 19 ragt über die Öffnungsebene des Öffnungsrandes 16 hinaus zur Zusammenwirkung mit einer im Bereich des dem Öffnungsrand 16 zugewandten Deckelrandes 25 ausgeformten Gegenrast 24.

Das der Rastausformung 19' abgewandte Ende des Rastarmes 21 stützt sich im
25 Bereich des zylindrischen Zwischenabschnittes zwischen Kuppel 3 und Standteil 2 innenwandig ab. Aufgrund der gewählten elastisch federnden Ausgestaltung des Rastarmes 21 und der gewählten Anordnung desselben ist eine federunterstützte Beaufschlagung des Rastteils 19 bzw. der Rastausformung 19'

in die Schließstellung erreicht, in welcher Schließstellung der Rastarm 21 sich innenwandseitig an dem Pufferelement 17 abstützt.

Das Druckteil 20 liegt nach außen zur Betätigung frei, wobei in dem in den Fig. 1 bis 7 dargestellten ersten Ausführungsbeispiel das Druckteil 20 im Grundriss kreisförmig, knopfartig ausgebildet ist und von einer in der Kuppelwandung rastgehalteten Manschette 26 umfasst ist.

Wie insbesondere aus der Darstellung in Fig. 5 zu erkennen, ist der der Rastfestlegung des Deckels 8 dienende Hintergriff zwischen Rastausformung 19' und Gegenrast 24 relativ klein gewählt. So ist eine Betätigung des Druckteils 20 durch Eindrücken desselben von nur wenigen Millimetern nötig, um hierüber entgegen der Federkrafteinstellung des Rastarmes 21 die Rastausformung 19' abzuschwenken. Nach Aufheben dieser Raststellung zum Deckel 8 schwenkt letzterer aufgrund der Vorspannung mittels der im Bereich der Scharnierachse 10 auf den Deckel 8 einwirkenden Schenkelfeder 13 in die in Fig. 6 gezeigte Offenstellung, welche letztere anschlagbegrenzt ist. Die den Deckel 8 tragenden und um die Scharnierachse 10 schwenkenden Halterungsarme 12 treten innenrandseitig gegen das Pufferelement 17, zufolge dessen eine geräuschreduzierte Anschlagbegrenzung erreicht ist.

Das Schließen des Deckels 8 erfolgt in einfachster Weise, indem dieser von Hand wieder zurückverschwenkt wird, wobei über die Gegenrast 24 die Rastausformung 19' entgegen der Federwirkung des Rastarmes 21 überlaufen wird. Die Raststellung wird selbsttätig aufgefunden.

Bei dem in den Fig. 8 bis 14 gezeigten zweiten Ausführungsbeispiel ist das Druckteil 20 in seinem nach außen vorstehenden Abschnitt in Vertikalrichtung des Abfallsammlers 1 langgestreckt gebildet, wobei ein diesbezügliches Er-

streckungsmaß gewählt ist, welches in etwa einer Handlänge entspricht. So kann die zur Betätigung freiliegende Fläche des Druckteils 20 in der Gesamterstreckung an die Hand eines Erwachsenen angepasst sein, so dass eine zielsichere Betätigung erreicht wird. Darüber hinaus ist die freiliegende Oberfläche
5 des Druckteils 20 an die Wölbung der Kuppel 3 angepasst.

Die Halterungen 23 der rastarmseitigen Schwenkachse 22 sind in dem dargestellten Ausführungsbeispiel im zylindrischen Zwischenabschnitt 3' zwischen Kuppel 3 und Standteil 2 innenwandig befestigt. Der der Rastausformung 19'
10 gegenüberliegende, zum Boden hin weisende Armabschnitt des Rastarmes 21 stützt sich innenwandig im Bereich des zylindrischen Standteiles 2 in einem hier durch die Wandung des Standteiles 2 und dem Inneneimer 4 gebildeten Ringraum ab.

15 Zudem ist der Abfallsammler 1 der zweiten Ausführungsform fußseitig mit einer Trittpläche 27 versehen. Diese Trittpläche 27 ist in dem gezeigten Ausführungsbeispiel als ein sich radial nach außen auswachsender Abschnitt des Standringes 7 gebildet, wobei weiter diese Trittpläche 27 in einer Projektion auf die Stellfläche 5 in Zuordnung zu der Betätigungstaste 18 positioniert ist. Zu-
20 folge dieser Ausgestaltung ist einem Verkippen oder Verrutschen des Abfallsammlers 1 bei Betätigung der Betätigungstaste 18 entgegengewirkt, indem der Benutzer sich bei der Bedienung des Abfallsammlers 1 mit einem Fuß auf die Trittpläche 27 tritt.

25 Dies erweist sich des Weiteren im Zusammenhang mit einer weiteren Ausführungsform gemäß der Darstellung in Fig. 15 von Vorteil, da in dieser die Betätigungstaste 18 bzw. das nach außen frei vorstehende Druckteil 20 in einer vertikalen Höhe angeordnet ist, die von dem Knie eines Erwachsenen erreichbar ist. Die vertikale Höhe h der Druckteilanordnung über der Standfläche beträgt

etwa 40 bis 70 cm, bevorzugt etwa 55 cm, wobei durch die gewählte Vertikalerstreckung des Druckteils 20 eine relativ große Kniehöhen-Spannweite abgedeckt ist. So durchsetzt das Druckteil 20 den Abfallsammler 1 im Bereich des zylindrischen Standteiles 2. Das Druckteil 20 ragt in den Ringraum zwischen
5 Standteil 2 und Inneneimer 4, aus welchem Ringraum der endseitig die Rastausformung 19' tragende Rastarm 21 auswächst. Der Benutzer des Abfallsammlers 1 kann nunmehr diesen durch Aufstellen des Fußes auf die Trittfläche 27 sichern und mit dem Knie desselben Beines das Druckteil 20 zur Schwenköffnung des Deckels 8 betätigen.

10

Ist die Rastzusammenwirkung zwischen dem standteilseitigen Rastteil 19 und der deckelseitigen Gegenrast 24 in den zuvor beschriebenen Ausführungsformen im Bereich des Deckels 8 ausgebildet, so zeigen die Figuren 16 und 17 eine Alternative, bei welcher die Gegenrast 24 an einem deckelinnenseitig befestigten und in Deckelschließstellung nach unten in den Bereich der Kuppel 3
15 einragenden Ausleger 35 ausgebildet ist. Entsprechend ist die Rastzusammenwirkung mit dem Rastteil 19 im Bereich der Kuppel 3 realisiert. Die Länge des Rastteils 19 ist hierbei so gewählt, dass dessen Rastausformung 19' unterhalb der Deckelöffnungsebene verbleibt.

20

Die der Wandung 15 gegenüberliegenden Randkanten der Halterungsarme 12 sind mittels einem an die Krümmung der Halterungsarme 12 angepassten, plattenartigen Rückenteil 36 verbunden, dem zu Folge die Halterungsarme 12 pufferelementseitig eine geschlossene Fläche aufweisen. Das Rückenteil 36 ist
25 bevorzugt eine Kunststoffabdeckung. Hierdurch ist flächiges bzw. linienartiges Anschlagen der Halterungsarme 12 an dem Pufferelement 17 erreicht.

Die Scharnierachse 10 ist unterhalb der Deckelöffnungsebene angeordnet. Alternativ zu der gehäuseinneren Anordnung kann auch eine Anordnung der

Scharnierachse 10 außerhalb des Standteils 2 bzw. der Kuppel 3 gewählt sein.
Eine beispielhafte Ausgestaltung zeigt Fig. 19.

Auch bei dieser Ausführungsform wirkt die Betätigungstaste 18 bzw. das Rast-
5 teil 19 mit einer Gegenrast 24 des Deckels 8 zusammen, wobei der Deckel 8
durch eine achsnahe Feder 13 in die Öffnungsstellung belastet ist. Außenseitig
an dem Deckel 8 angebrachte Träger 37 dienen als Lager für die Scharnierachse
10, um welche der Deckel 8 mit seinen Halterungsarmen 12 klappbar ist. Die
Öffnungsstellung des Deckels 8 ist durch einen gehäuse- bzw. trägerseitigen
10 Anschlag 38, gegen welchen die Halterungsarme 12 treten, definiert.

Alle offenbaren Merkmale sind (für sich) erfindungswesentlich. In die Offen-
barung der Anmeldung wird hiermit auch der Offenbarungsinhalt der zugehö-
rigen/ beigefügten Prioritätsunterlagen (Abschrift der Voranmeldung) vollin-
15 haltlich mit einbezogen, auch zu dem Zweck, Merkmale dieser Unterlagen in
Ansprüche vorliegender Anmeldung mit aufzunehmen.

ANSPRÜCHE

1. Abfallsammler (1), vorzugsweise mit einem herausnehmbaren Inneneimer (4), wobei der Abfallsammler (1) einen anscharnierten Deckel (8) aufweist,
5 der bei Öffnungsbetätigung selbsttätig in die Öffnungsstellung verfährt, wobei weiter zur Auslösung der Öffnungsbewegung des Deckels (8) gegenüberliegend zu einer Scharnierachse (10) des Deckels (8) eine Betätigungstaste (18) angeordnet ist, dadurch gekennzeichnet, dass die Scharnierachse (10) des Deckels (8) im Innern des Abfallsammlers (1) angeordnet ist, dass ein Öffnungsrand (16) des Abfallsammlers (1) jedenfalls im
10 Bereich der Scharnierachse (10) mit einem elastischen Pufferelement (17) ausgekleidet ist und dass ein den Deckel (8) und die Scharnierachse (10) verbindender Halterungsarm (12) im Öffnungszustand gegen das Pufferelement (17) anliegt.
15
2. Abfallsammler nach den Merkmalen des Oberbegriffs des Anspruchs 1, dadurch gekennzeichnet, dass die Scharnierachse (10) außerhalb des Abfallsammlers (1) angeordnet ist und dass ein Halterungsarm (12) des Deckels (8) in der Öffnungsstellung gegen einen im Bereich der Scharnierachse (10) ausgebildeten Anschlag (38) tritt.
20
3. Abfallsammler nach den Merkmalen des Oberbegriffs des Anspruchs 1, dadurch gekennzeichnet, dass bei dem als Standeimer ausgebildeten Abfallsammler (1) die Betätigungstaste (18) in einem Bereich zwischen Kniehöhe und Hüfthöhe eines erwachsenen Menschen angeordnet ist, auf einer Zylinderfläche oder in einem kuppelförmig gewölbten Abschnitt des Abfallsammlers (1), und die Betätigungstaste durch in das Innere des Abfallsammlers (1) gerichtete Druckbeaufschlagung, etwa durch einen Knie- oder Hüftstoß, zu betätigen ist.
25

4. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass die Betätigungstaste (18) aus einem mit einer Gegenrast (24) am Deckel (8) zusammenwirkenden Rastteil (19) besteht.
5. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass das Rastteil (19) in sich elastisch federnd ausgebildet ist und mittels eines nach außen vorstehenden Druckteils (20) zur Freigabe des Deckels (8) federnd auslenkbar ist.
6. Abfallsammler nach den Merkmalen des Oberbegriffs des Anspruches 1, dadurch gekennzeichnet, dass die Betätigungstaste (18) aus einem mit einer Gegenrast (24) am Deckel (8) zusammenwirkenden Rastteil (19) besteht, dass das Rastteil (19) in sich elastisch federnd ausgebildet ist und mittels eines nach außen vorstehenden Druckteils (20) zur Freigabe des Deckels (8) federnd auslenkbar ist.
7. Abfallsammler nach Anspruch 6 oder insbesondere danach, dadurch gekennzeichnet, dass die Scharnierachse (10) des Deckels (8) im Innern des Abfallsammlers (1) angeordnet ist, dass ein Öffnungsrand (16) des Abfallsammlers (1) jedenfalls im Bereich der Scharnierachse (10) mit einem elastischen Pufferelement (17) ausgekleidet ist und dass ein den Deckel (8) und die Scharnierachse (10) verbindender Halterungsarm (12) im Öffnungszustand gegen das Pufferelement (17) anliegt.

8. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass der Halterungsarm (12) pufferelementseitig eine geschlossene Fläche aufweist.
- 5 9. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass der Abfallsammler (1) ein frei aufstellbarer Stand-Abfallsammler ist.
- 10 10. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass der Abfallsammler (1) mit Ausnahme seines oberen Bereiches zylinderförmig gestaltet ist, mit einer den Durchmesser übertreffenden vertikalen Höhe.
- 15 11. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass der Abfallsammler (1) deckelseitig kuppelförmig gestaltet ist.
- 20 12. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass der Deckel (8) einen oberen Kuppelabschnitt bildet und dass die Betätigungstaste (18) unterhalb des Deckels (8), jedoch im Kuppelbereich angeordnet ist.
- 25 13. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass das Druckteil (20) in seinem nach außen vorstehenden Abschnitt in Vertikalrichtung des Abfallsammlers (1) langgestreckt gebildet ist.

14. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass das Druckteil (20) nach außen vorstehend sich in Vertikalrichtung über eine Handbreite oder mehr erstreckt.

5

15. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass das Druckteil (20) an dem Abfallsammler (1) in einer vertikalen Höhe angeordnet ist, die von dem Knie eines Erwachsenen erreichbar ist.

10

16. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass die Betätigungstaste (18) im zylindrischen Bereich des Abfallsammlers (1) angeordnet ist.

15

17. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass das Rastteil (19) als Rastarm (21) ausgebildet ist, mit einem bodenseitigen Ende, das sich gegen die Innenwand des Abfallsammlers (1) abstützt.

20

18. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass das bodenseitige Ende sich am zylindrischen Bereich des Abfallsammlers (1) abstützt.

25

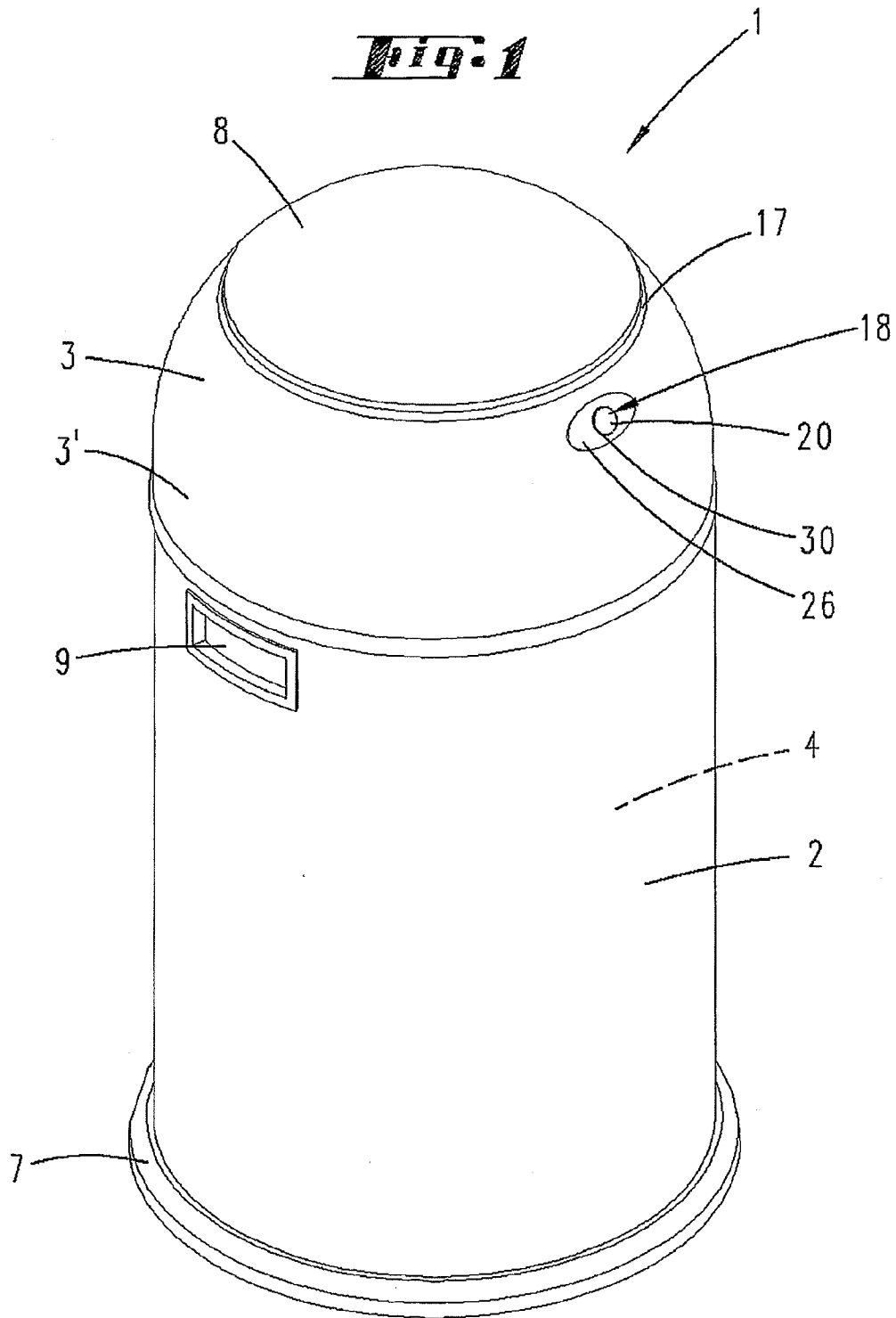
19. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass nur das Druckteil (20) die Wandung des Abfallsammlers (1) durchsetzt.

20. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass das Druckteil (20) die Wandung des Abfallsammlers (1) im zylindrischen Bereich durchsetzt.
- 5
21. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass das Druckteil (20) die Wandung des Abfallsammlers (1) im Kuppelbereich durchsetzt.
- 10
22. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass die Deckelvorderkante gegenüber dem Druckteil (20) in seinem nach außen vorstehenden Bereich zur Scharnierachse (10) hin zurückversetzt ist.
- 15
23. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass der Abfallsammler (1) fußseitig eine Trittpläche (27) aufweist, zum Gegenhalt bei Betätigung des Druckteils (20).
- 20
24. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass die Rastzusammenwirkung im Bereich des Deckels (8) ausgebildet ist.
- 25
25. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass die Rastzusammenwirkung im Bereich eines Standteils (2) ausgebildet ist.

26. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüche oder insbesondere danach, dadurch gekennzeichnet, dass die Rastzusammenwirkung im Bereich der Kuppel (3) des Standteils (2) ausgebildet ist.
- 5
27. Abfallsammler nach einem oder mehreren der vorhergehenden Ansprüchen oder insbesondere danach, dadurch gekennzeichnet, dass bei Ausbildung des Abfallsammlers (1) als Stand-Abfallsammler die außenliegende Betätigungstaste (18) in einer Höhe (h) über der Standfläche des Abfallsammlers (1) angeordnet ist, die einer Kniehöhe eines erwachsenen Menschen entspricht.
- 10

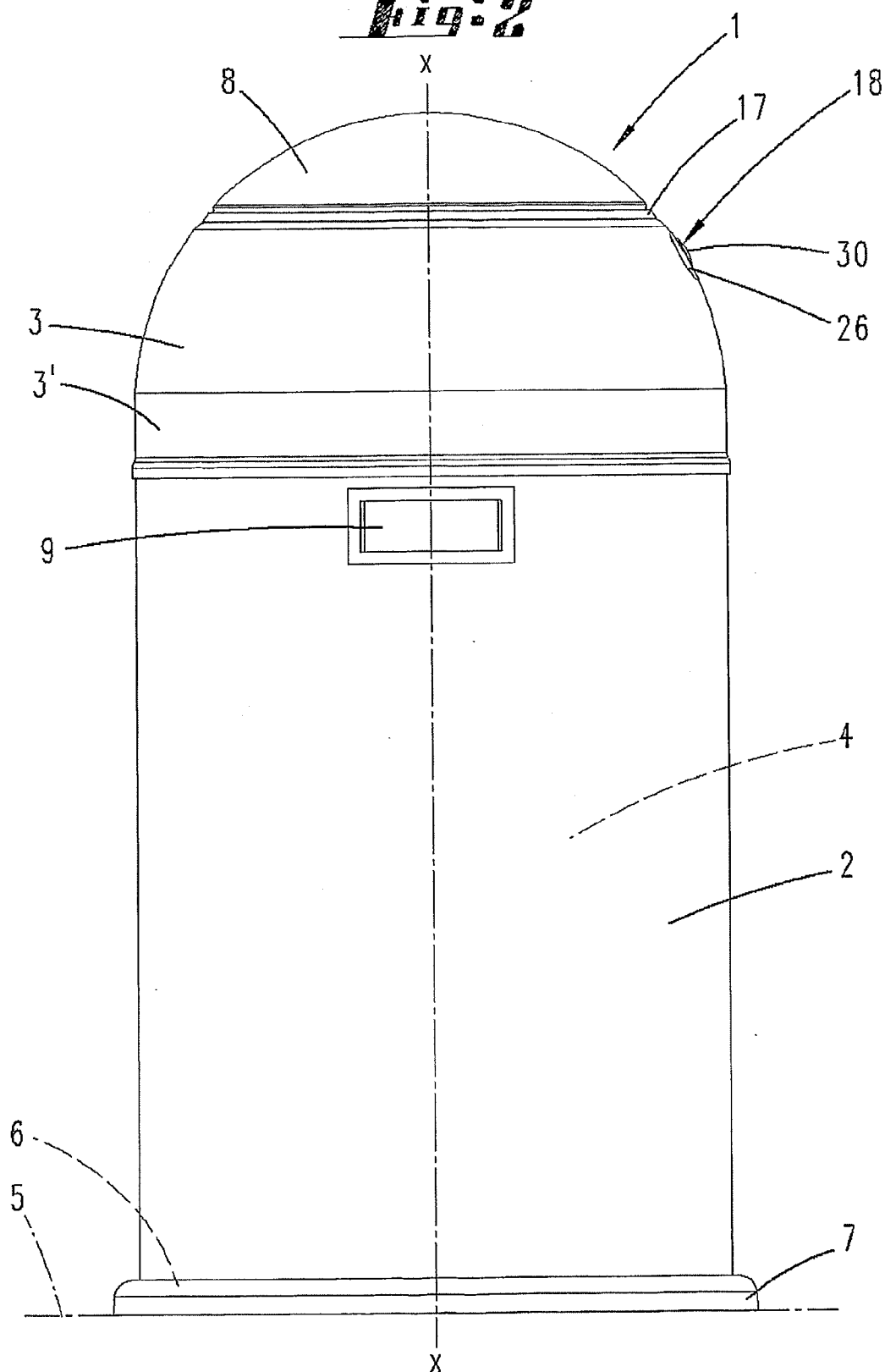
1/16

Fig. 1



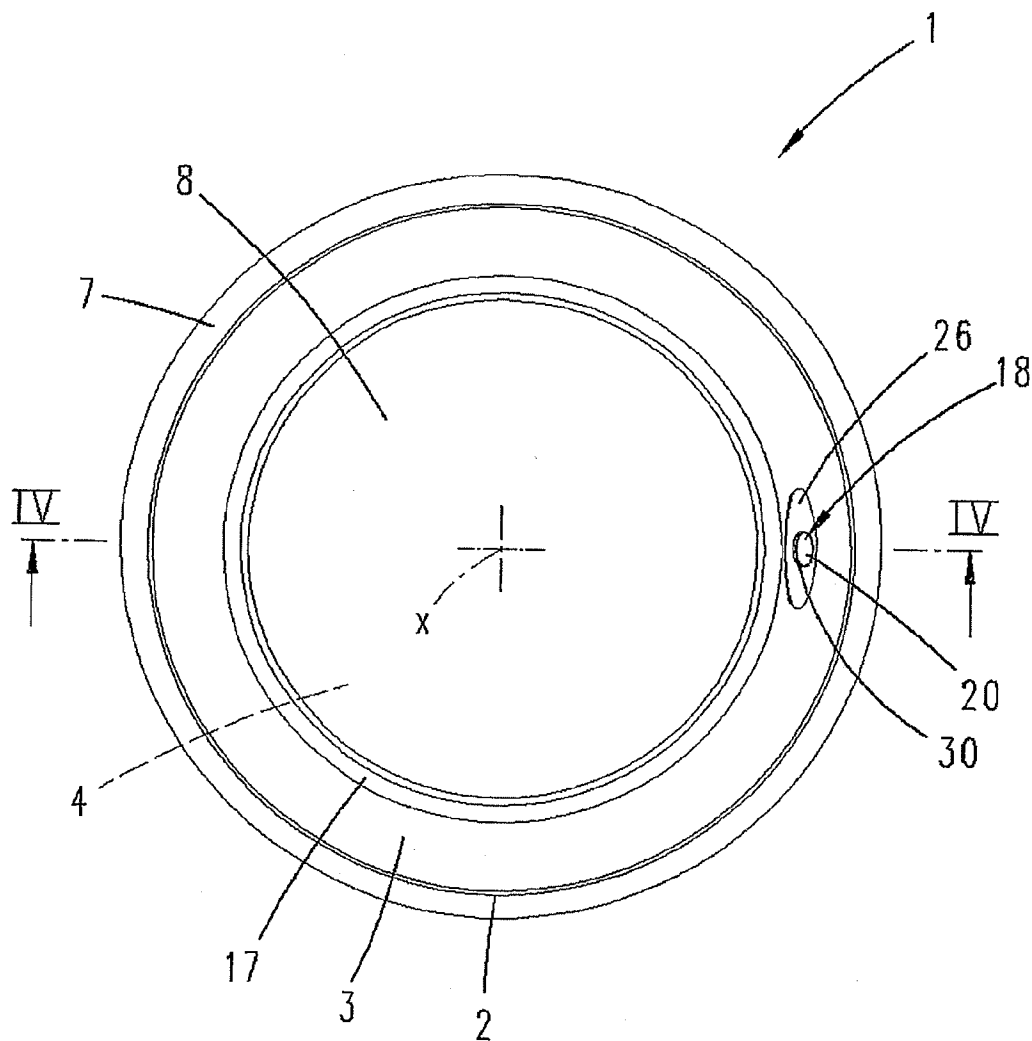
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Fig. 2



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Fig. 3



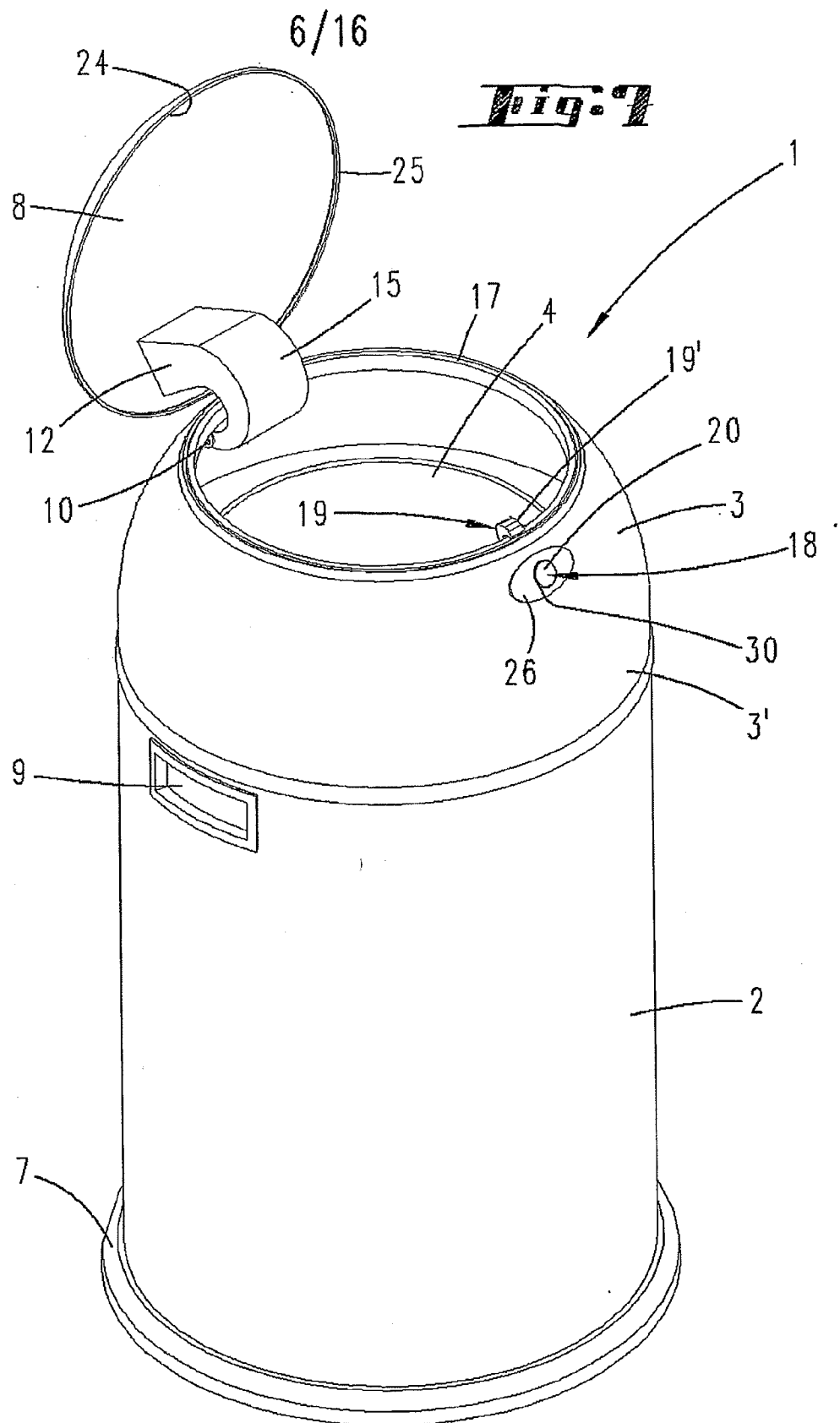
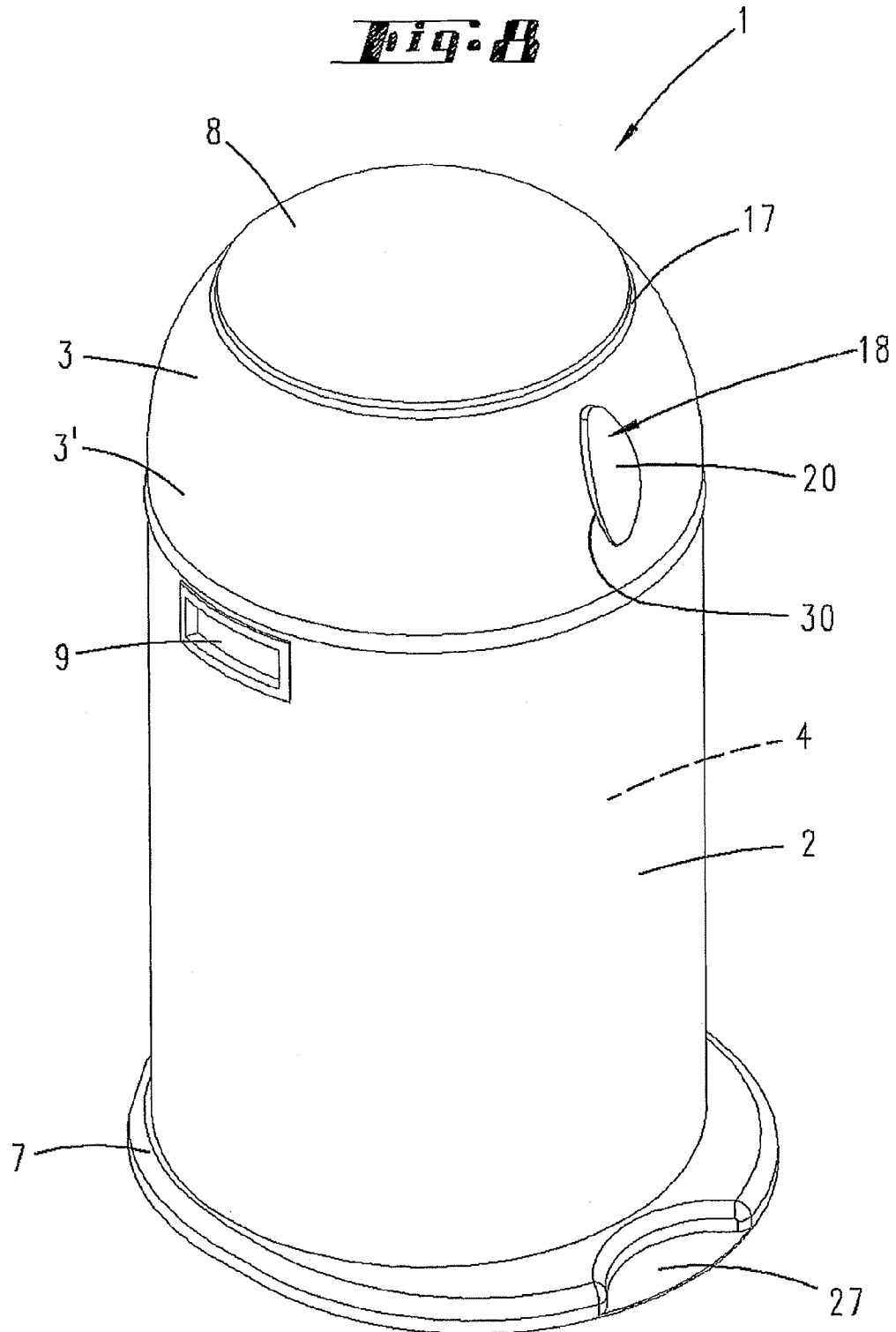
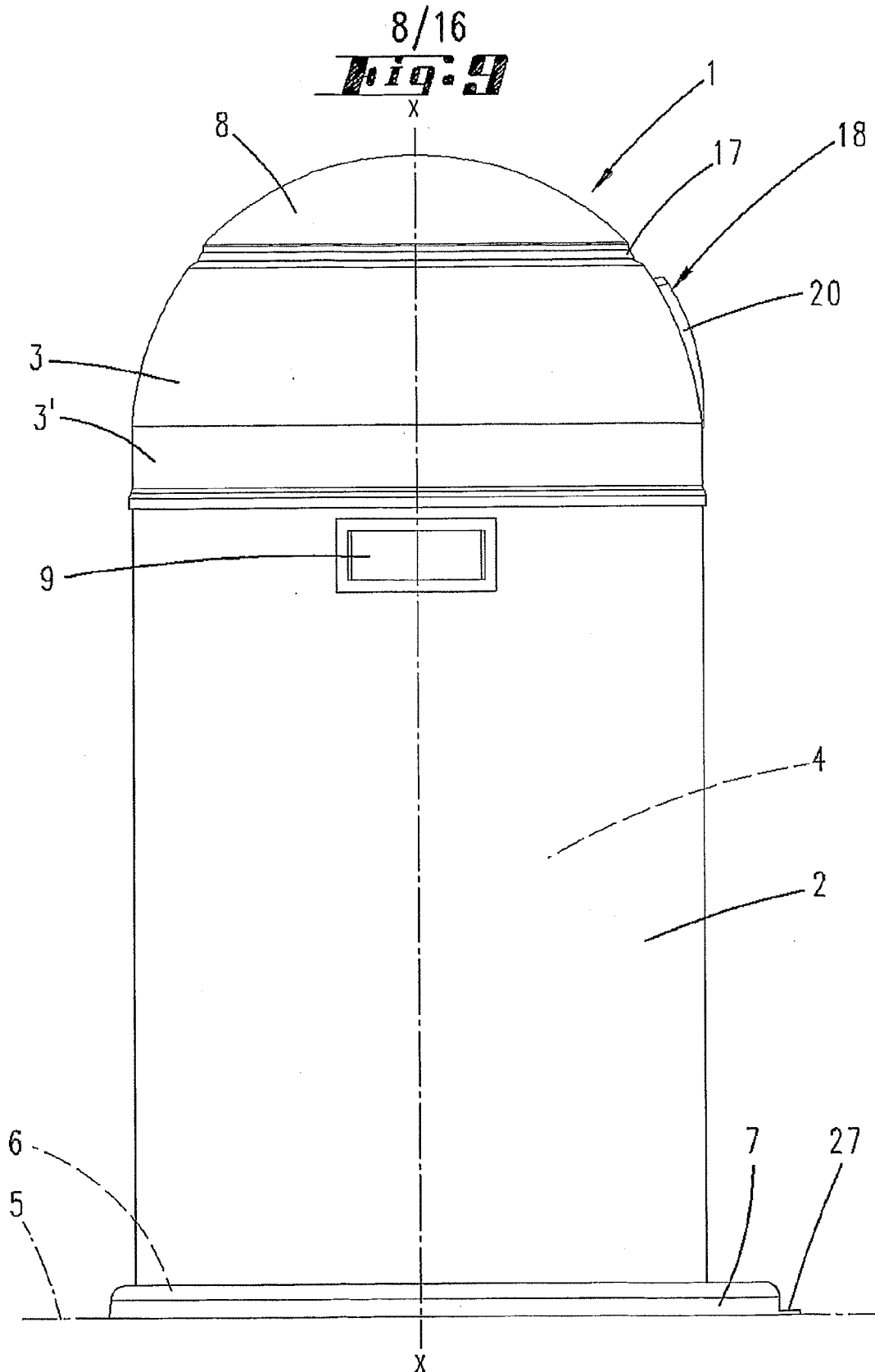


Fig. 7

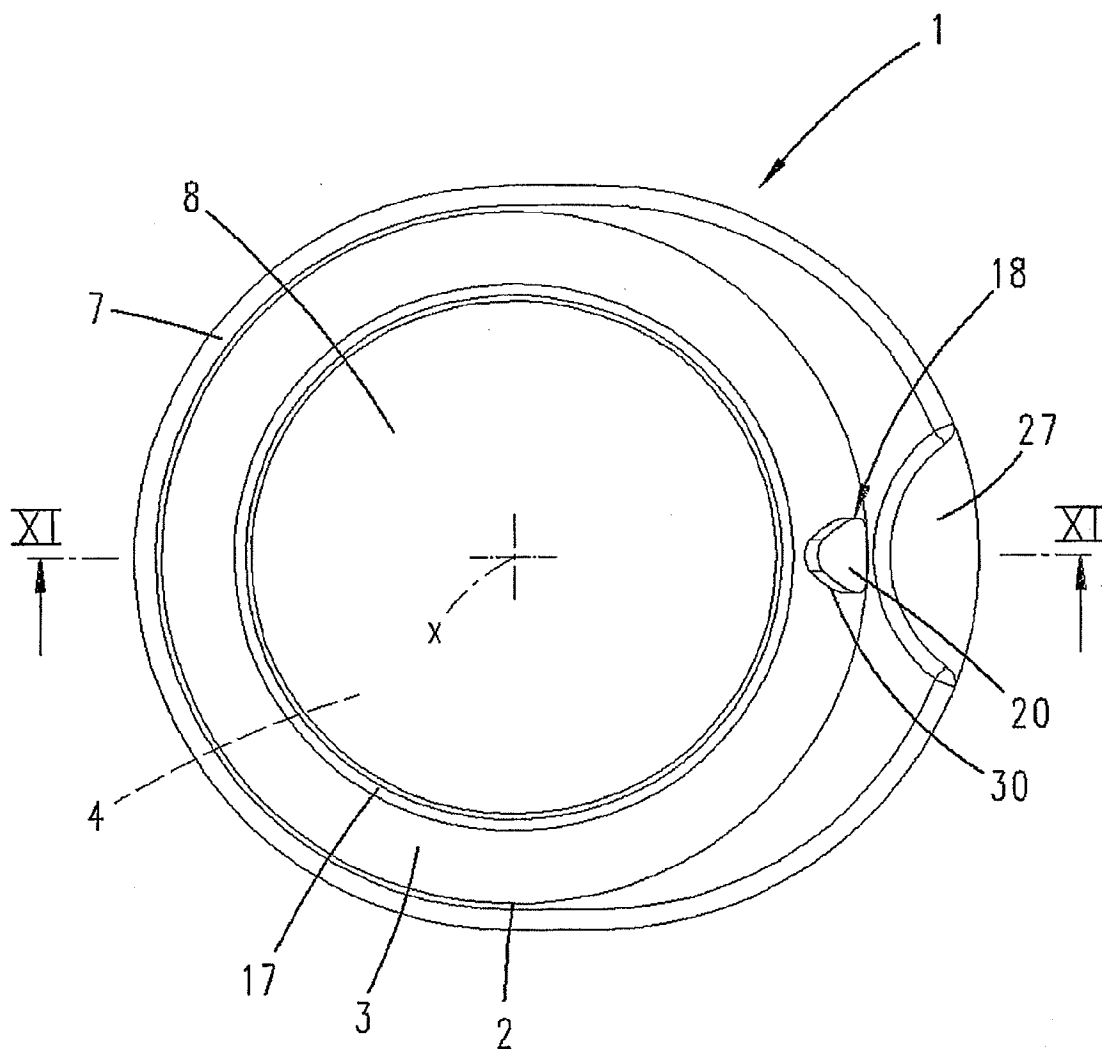
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Fig. A





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Fig. 10

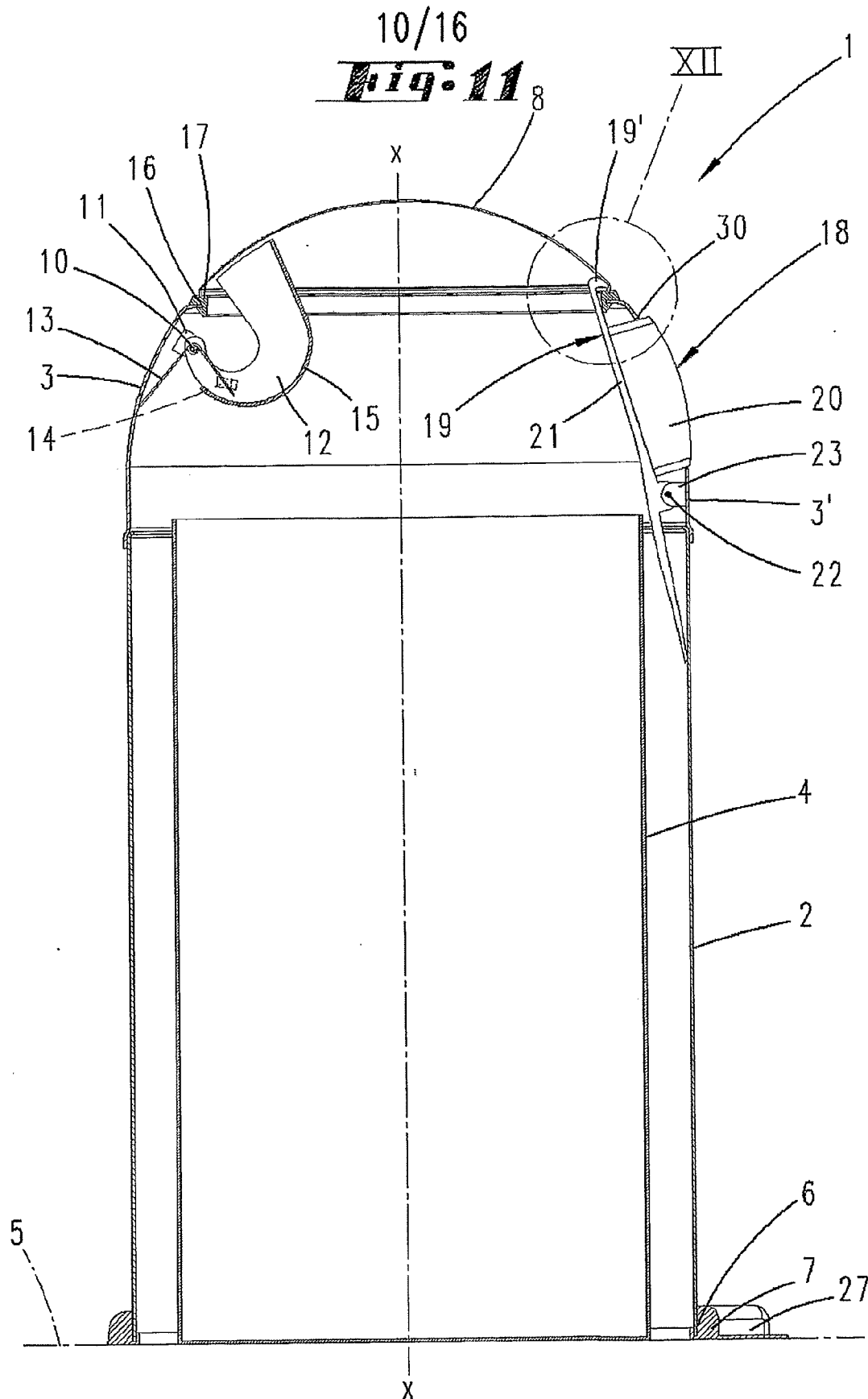


Fig: 12

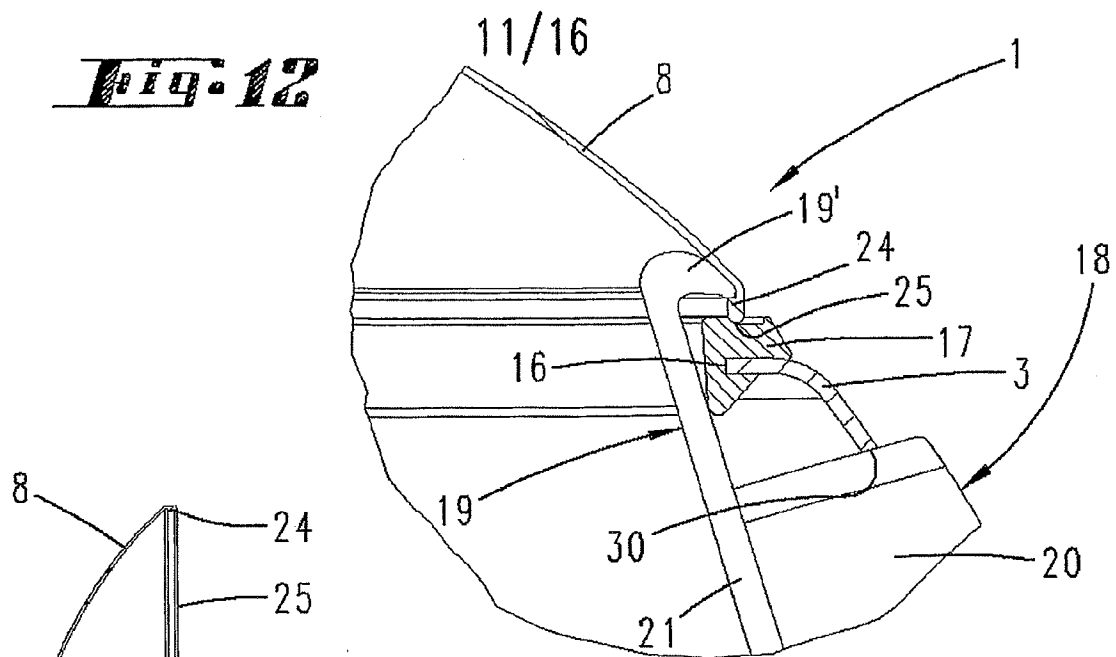
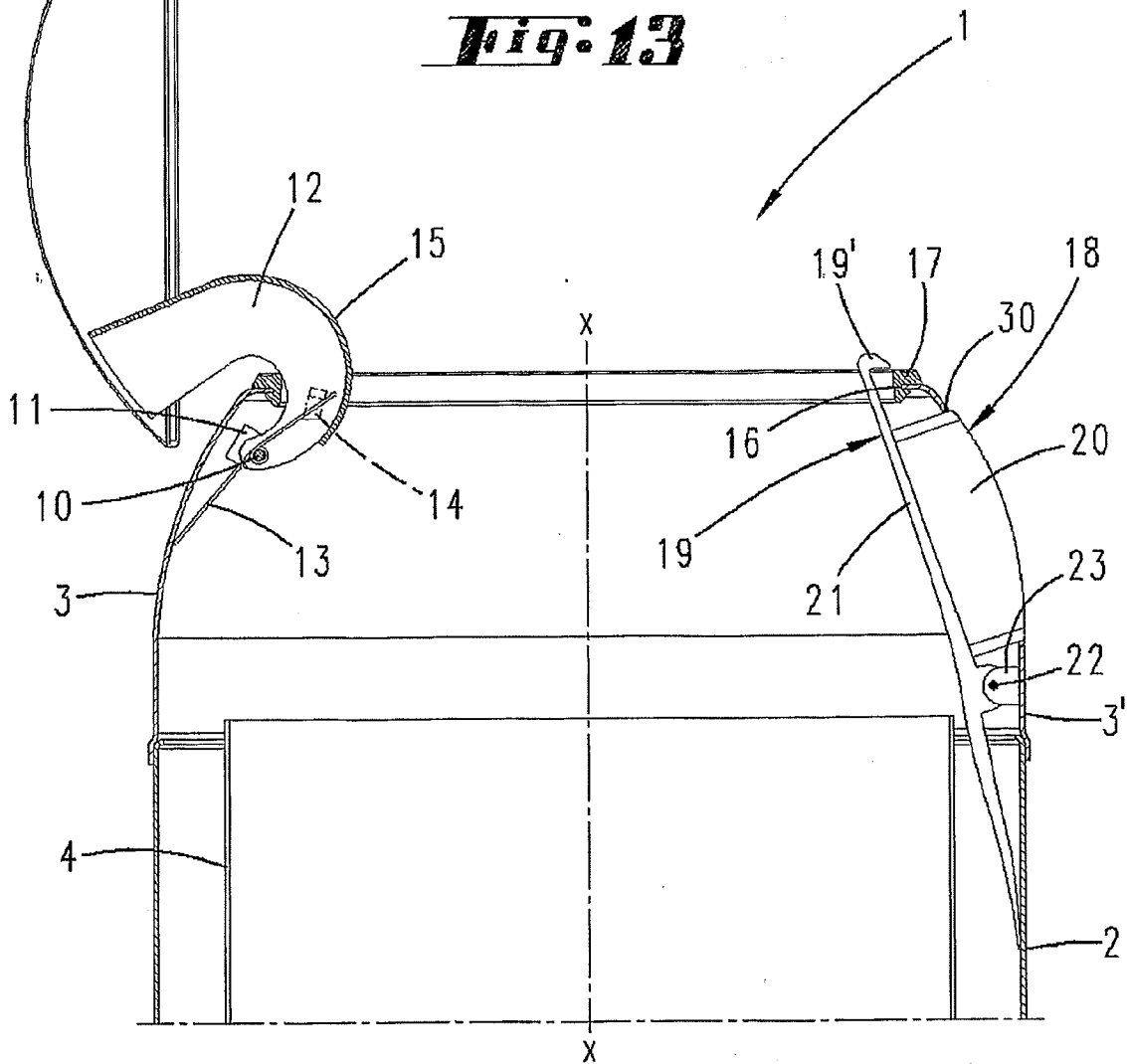
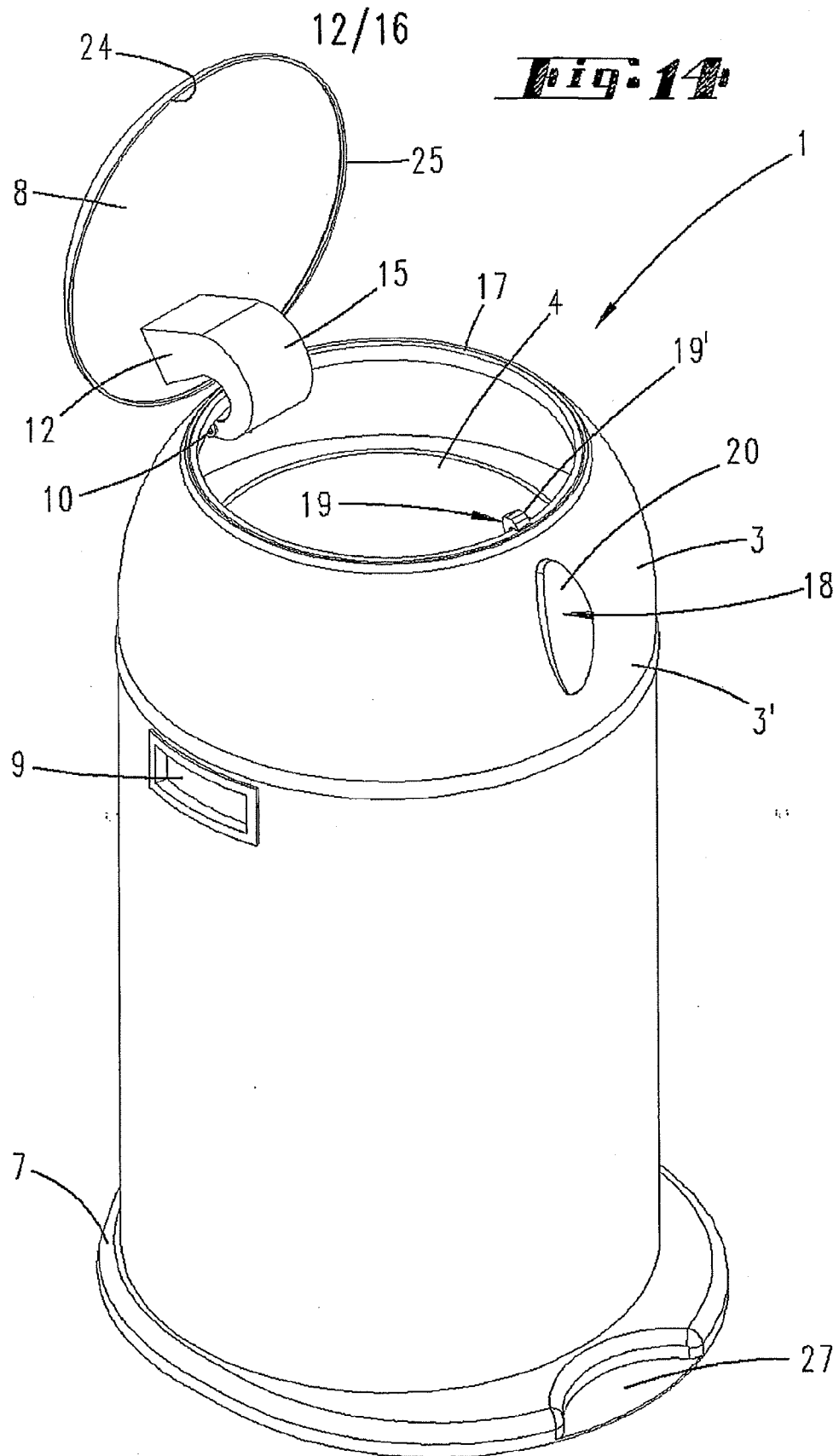
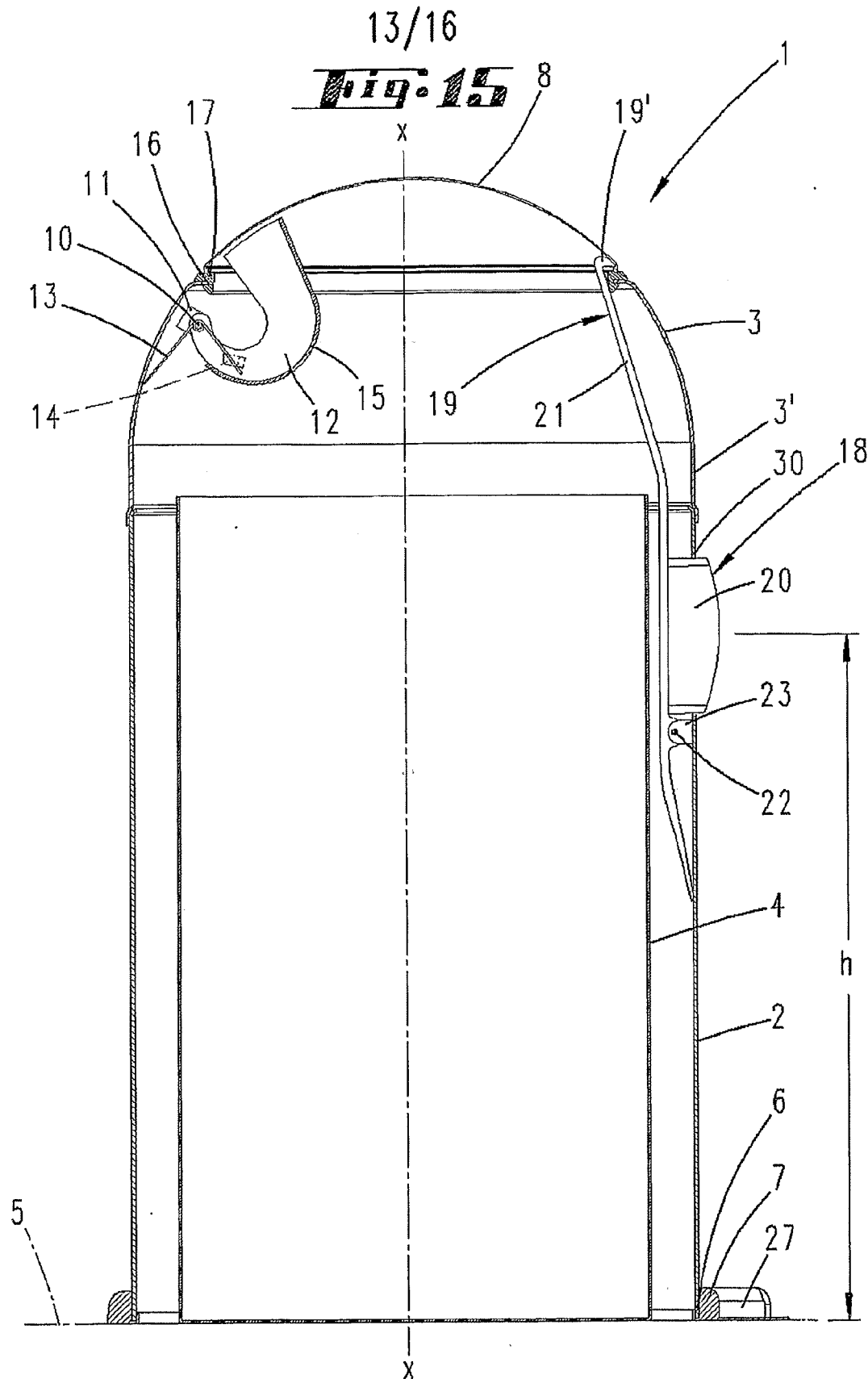


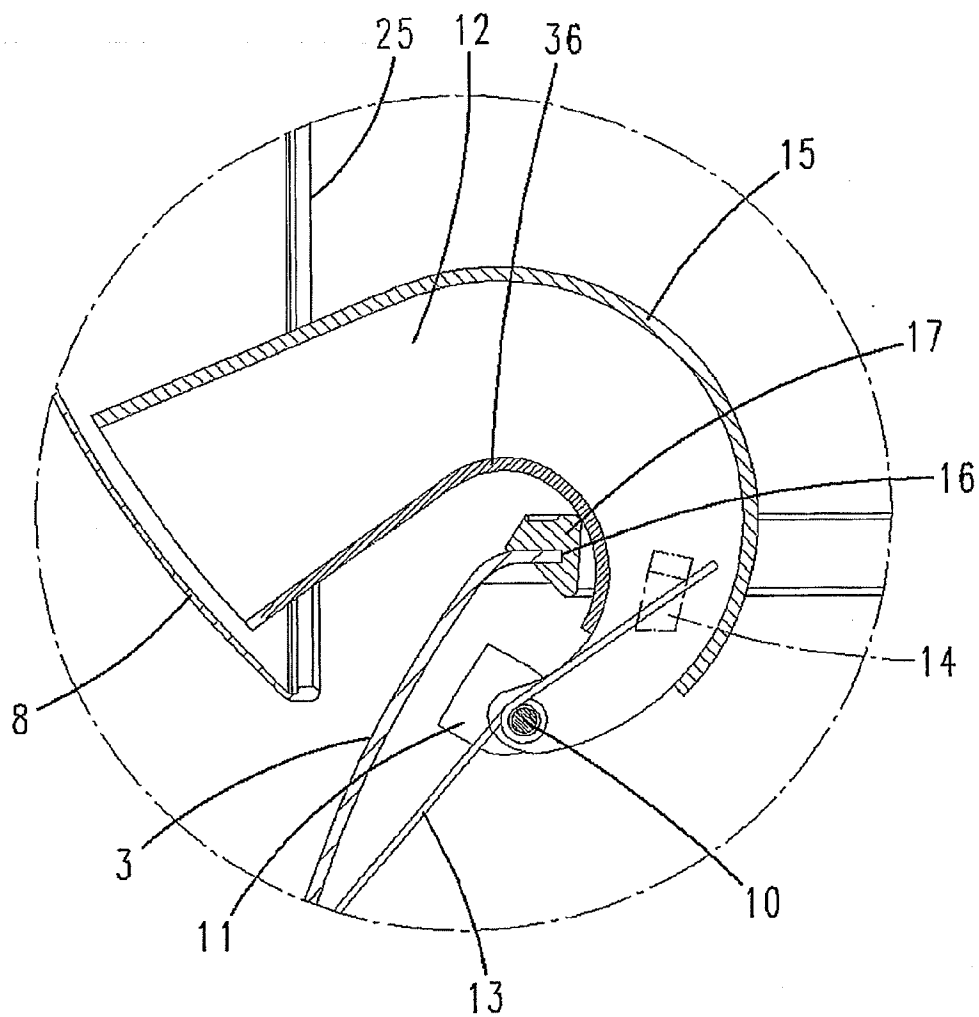
Fig: 13





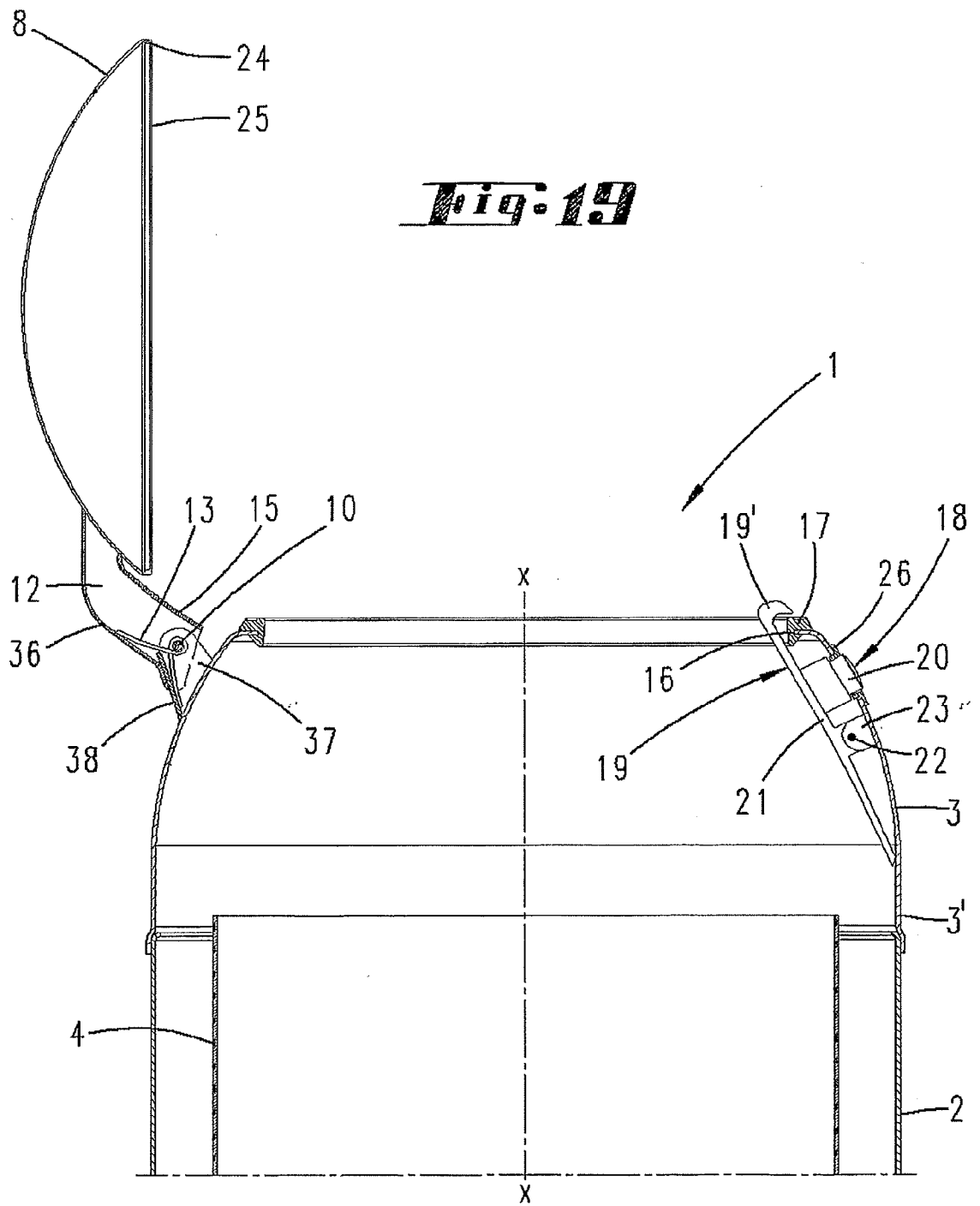


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Fig. 1B

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Fig. 19



INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP2005/050189

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B65F1/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B65F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 299 18 759 U (BRABANTIA NEDERLAND BV) 2 March 2000 (2000-03-02) cited in the application	3-6, 9, 15, 16, 24, 25, 27
Y	page 2, line 17 - page 3, line 22	1, 2, 7, 8
A	figures 1, 2	10, 13, 14, 17, 18
Y	GB 769 131 A (SEVENTEEN EIGHTY HARVEY CORPORATION) 27 February 1957 (1957-02-27) page 2, line 54 - line 120 figure 4	1, 7, 8
Y	US 5 323 923 A (CH. SCHAUER) 28 June 1994 (1994-06-28) column 7, line 61 - line 68 figures 14-16	2
	----- -/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
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- *O* document referring to an oral disclosure, use, exhibition or other means
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- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

26 May 2005

Date of mailing of the international search report

14/06/2005

Name and mailing address of the ISA

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Fax: (+31-70) 340-3016

Authorized officer

Smolders, R

INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP2005/050189

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

SEE SUPPLEMENTAL SHEET

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

Continuation of Box III

The International Searching Authority has found that the international application contains multiple (groups of) inventions, as follows:

1. Claims 1, 2, 4 (in part), 5 (in part) and 8-27 (in part)

Waste collector in which a hinge axis of the lid is arranged inside or outside the waste collector.

2. Claims 3, 4 (in part), 5 (in part) and 8-27 (in part)

Waste collector in which an actuator is operated by the knee or the hip.

3. Claims 6, 7 and 8-27 (in part)

Waste collector with an actuator consisting of a catch element which interacts with a counter-element on the lid.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2005/050189

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 201 04 639 U (TS.-Y. LIN) 16 August 2001 (2001-08-16) the whole document -----	1-6, 9, 10, 24, 25

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP2005/050189

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 29918759	U	02-03-2000	DE 29918759 U1	02-03-2000
GB 769131	A	27-02-1957	DE 1047114 B	18-12-1958
US 5323923	A	28-06-1994	NONE	
DE 20104639	U	16-08-2001	DE 20104639 U1	16-08-2001

INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen

PCT/EP2005/050189

A. KLASSIFIZIERUNG DES ANMELDUNGSGEGENSTANDES
IPK 7 B65F1/16

Nach der Internationalen Patentklassifikation (IPK) oder nach der nationalen Klassifikation und der IPK

B. RECHERCHIERTE GEBIETE

Recherchierter Mindestprüfstoff (Klassifikationssystem und Klassifikationssymbole)
IPK 7 B65F

Recherchierte aber nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Gebiete fallen

Während der internationalen Recherche konsultierte elektronische Datenbank (Name der Datenbank und evtl. verwendete Suchbegriffe)

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C. ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
X	DE 299 18 759 U (BRABANTIA NEDERLAND BV) 2. März 2000 (2000-03-02) in der Anmeldung erwähnt	3-6,9, 15,16, 24,25,27
Y	Seite 2, Zeile 17 - Seite 3, Zeile 22	1,2,7,8
A	Abbildungen 1,2	10,13, 14,17,18
Y	GB 769 131 A (SEVENTEEN EIGHTY HARVEY CORPORATION) 27. Februar 1957 (1957-02-27) Seite 2, Zeile 54 - Zeile 120 Abbildung 4	1,7,8
Y	US 5 323 923 A (CH. SCHAUER) 28. Juni 1994 (1994-06-28) Spalte 7, Zeile 61 - Zeile 68 Abbildungen 14-16	2
	----- -/-	

☒ Weitere Veröffentlichungen sind der Fortsetzung von Feld C zu entnehmen

☒ Siehe Anhang Patentfamilie

* Besondere Kategorien von angegebenen Veröffentlichungen :

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"&" Veröffentlichung, die Mitglied derselben Patentfamilie ist

Datum des Abschlusses der internationalen Recherche

26. Mai 2005

Absenddatum des internationalen Recherchenberichts

14/06/2005

Name und Postanschrift der Internationalen Recherchenbehörde
Europäisches Patentamt, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Bevollmächtigter Bediensteter

Smolders, R

INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen
PCT/EP2005/050189

C.(Fortsetzung) ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie°	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
A	DE 201 04 639 U (TS.-Y. LIN) 16. August 2001 (2001-08-16) das ganze Dokument -----	1-6,9, 10,24,25

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Feld II Bemerkungen zu den Ansprüchen, die sich als nicht recherchierbar erwiesen haben (Fortsetzung von Punkt 2 auf Blatt 1)

Gemäß Artikel 17(2)a) wurde aus folgenden Gründen für bestimmte Ansprüche kein Recherchenbericht erstellt:

1. ☐ Ansprüche Nr. _____
weil sie sich auf Gegenstände beziehen, zu deren Recherche die Behörde nicht verpflichtet ist, nämlich _____
2. ☐ Ansprüche Nr. _____
weil sie sich auf Teile der internationalen Anmeldung beziehen, die den vorgeschriebenen Anforderungen so wenig entsprechen, daß eine sinnvolle internationale Recherche nicht durchgeführt werden kann, nämlich _____
3. ☐ Ansprüche Nr. _____
weil es sich dabei um abhängige Ansprüche handelt, die nicht entsprechend Satz 2 und 3 der Regel 6.4 a) abgefaßt sind.

Feld III Bemerkungen bei mangelnder Einheitlichkeit der Erfindung (Fortsetzung von Punkt 3 auf Blatt 1)

Die internationale Recherchenbehörde hat festgestellt, daß diese Internationale Anmeldung mehrere Erfindungen enthält:

siehe Zusatzblatt

1. ☐ Da der Anmelder alle erforderlichen zusätzlichen Recherchegebühren rechtzeitig entrichtet hat, erstreckt sich dieser internationale Recherchenbericht auf alle recherchierbaren Ansprüche.
2. ☒ Da für alle recherchierbaren Ansprüche die Recherche ohne einen Arbeitsaufwand durchgeführt werden konnte, der eine zusätzliche Recherchegebühr gerechtfertigt hätte, hat die Behörde nicht zur Zahlung einer solchen Gebühr aufgefordert.
3. ☐ Da der Anmelder nur einige der erforderlichen zusätzlichen Recherchegebühren rechtzeitig entrichtet hat, erstreckt sich dieser internationale Recherchenbericht nur auf die Ansprüche, für die Gebühren entrichtet worden sind, nämlich auf die Ansprüche Nr. _____
4. ☐ Der Anmelder hat die erforderlichen zusätzlichen Recherchegebühren nicht rechtzeitig entrichtet. Der internationale Recherchenbericht beschränkt sich daher auf die in den Ansprüchen zuerst erwähnte Erfindung; diese ist in folgenden Ansprüchen erfaßt: _____

Bemerkungen hinsichtlich eines Widerspruchs

- ☐ Die zusätzlichen Gebühren wurden vom Anmelder unter Widerspruch gezahlt.
- ☐ Die Zahlung zusätzlicher Recherchegebühren erfolgte ohne Widerspruch.