The present invention relates to disposing of waste in a safe manner by supplying an apparatus with a sealing system configured to only apply a seal to an elongated tube of material when several conditions are met, wherein the conditions indicate that the apparatus is in a safe configuration for applying the seal. The apparatus includes a push switch for sensing when the lid has been closed, and another push switch for sensing when a bin has been locked in the apparatus. Thus, when the lid and bin are closed and locked, a child cannot reach into the apparatus and the seal can be applied safely without fear of burning a child.
Designated States (unless otherwise indicated, for even-
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ,
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,
TM), European (AL, 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, RS, SE, SI, SK,
SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

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HEAT-SEALED WASTE DISPOSAL

BACKGROUND OF THE INVENTION

1. TECHNICAL FIELD

This invention relates to heat sealed waste disposal. More particularly, this invention relates to heat sealing an elongated tube of material to seal packets of odorous waste therein. Specifically, this invention relates to forming sealed pockets along the length of the tube of material for containing waste and odor therein while including safety features to prevent children from operating the sealing mechanism or disposing of non-waste items.

2. BACKGROUND INFORMATION

Many disposable or waste items include an unpleasant smell. For example, babies generate a significant number of feces/urine-laden diapers, which due to the smell, require frequent trips to the garbage can or trash receptacles for disposal. Most of those trash receptacles are fitted with a lid designed to contain odors when the lid is closed. However, most lids are not designed to be perfectly air-tight with respect to their receptacles, or after repeated use becomes less than air-tight, permitting odor to emanate from the receptacles even when they are closed. Even with the most air-tight containers, upon opening the container, the nauseous odors escape into the area giving an extremely unpleasant sensation to the person attempting to add more trash to the receptacle. Location of the receptacles in a remote location is inconvenient and generally unsatisfactory. Furthermore, inasmuch as trash receptacles may be disposed in the presence of children, the children may, through their natural curiosity, either open the trash receptacle and allow nauseous odors to escape or may even deposit non-waste items in the trash receptacle. Many parents have been surprised to find that their child has thrown away a valuable item through their natural curiosity. Often the parent does not discover such an action has occurred until after the trash bag has been removed and taken to the city dump.

Diapers are a particularly difficult waste item to retain for ultimate disposal, as diapers are typically stored and accumulated in the container. The cumulative odor of diapers being stored within the container frequently reaches such an offensive level that the diapers must be disposed of before the container is full. The latter leads to a large use of container liners or bags, coupled with excessive emptying operations. Excessive emptying operation can be of particular concern as one
hesitates to leave the infant unattended or to carry the infant and soiled diapers to a remote location. A further problem associated with such containers is that the containers themselves over a time tend to retain the odor even when no diapers are present in the containers. Therefore, a thorough complete cleaning of such containers is often necessary to reduce the lingering odor. Further, as many diaper disposal receptacles are not child proof, toddlers playing around the container may inadvertently open the container or allow odors to escape or the child may reach in to touch soiled diapers.

Numerous attempts to alleviate such problems have been employed. One such attempt relates generally to an air-lock approach. The air-lock approach includes a lid that covers a first chamber, a transfer mechanism, and a second chamber for finally receiving the waste. After depositing the waste into the first chamber, the user closes the lid and then actuates a transfer mechanism to transfer the waste material from the first chamber to the second chamber. Operation of the transfer mechanism involves opening the lid, depositing the waste into a holding chamber, and closing the lid. A constrictor or transfer mechanism is then opened to allow the waste to fall from the first chamber into the second chamber. Finally the transfer mechanism is closed to prepare the pail or receiving area for the next deposit of waste.

Another approach is a sealed packaging approach which requires a mechanism for sealing waste in a liner bag attached to a disposal receptacle. Most mechanisms of such kind require an inner lid and twisting mechanism for closing the neck of the plastic liner bag used to hold the soiled diapers. U.S. Patent No. 6,370,847 and 6,516,588 to Jensen et al. discloses a diaper system employing heat-sealing members moved between an open position and a closed/sealed position by either twisting an inner lid, closing the lid, or moving an activation arm. The sealing member thermally-fuses the tubing to form a sealed package containing the diaper. While this approach has seen modest success in the marketplace, adding a heat-sealing mechanism to an apparatus which is intended to reside around children is inherently dangerous. Thus, many parents are hesitant to bring such a device into their home. A child may inadvertently reach or touch the heating portion of such an apparatus and receive a burn or electrical shock. In some systems, a child simply has to open the lid and reach into the container after the sealing phase to receive a burn.
Thus, there is a need for an improved apparatus for storing waste such as diapers contaminated with fecal material and urine. Preferably, such a device would provide an impenetrable odor seal to a liner bag as desired by the user, and will be configured to provide a safe and secure mechanism for heating and applying such a seal. The apparatus should include multiple features which prevent the heat sealing mechanism from operating when the apparatus is not in a closed off and safe configuration with the lid shut. The apparatus should include lockable components and a release button which is disposed at the farthest liner point from the ground, to prevent children from reaching the release button to open the lid. Furthermore, the lid should open in an angle away from any possible reach by the child, so even if the child manages to open the lid, the internal components of the apparatus remain inaccessible.

BRIEF SUMMARY OF THE INVENTION

This invention relates to heat sealed waste disposal using an elongated tube of material having a rolled portion and an unrolled portion. An embodiment of the present invention can be implemented in the form of an apparatus having a housing defining a bin chamber, a bin opening, and a lid opening; a bin assembly, wherein the bin assembly is removably received in the bin chamber through the bin opening; a lid assembly disposed in the lid opening and movable between an open position and a closed position; a waste channel defined by the lid assembly, wherein the waste channel is exposed when the lid assembly is in the open position, and concealed by the housing when the lid assembly is in the closed position; an annular recess proximate the waste opening, wherein the annular recess is adapted to receive the rolled portion therein and further adapted orient the unrolled portion to extend through the waste channel; a release button disposed on the lid assembly; a locking engagement between the lid assembly and the housing for locking the lid assembly in the closed position, wherein the locking engagement releases the lid assembly when the release button is depressed; an actuator button disposed on the housing; a first sealing member disposed on the lid assembly; a second sealing member disposed on the housing; and wherein the second sealing member is operably connected to the actuator button and abuts the first sealing member to form a seal on the unrolled portion when the actuator button is depressed and the lid assembly is in the closed position.
BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

A preferred embodiment of the invention, illustrated of the best mode in which Applicant contemplates applying the principles, is set forth in the following description and is shown in the drawings and is particularly and distinctly pointed out and set forth in the appended claims.

Fig. 1 is a perspective view of a preferred embodiment of a heat sealed waste disposal apparatus of the present invention;

Fig. 2 is a perspective view thereof with a bin assembly removed from a bin cavity in the apparatus;

Fig. 3 is a cross-sectional view taken along line 3-3 of Fig. 1;

Fig. 4A is a cross-sectional view taken along line 4A-4A of Fig. 3 with a latch shown in a latched position;

Fig. 4B is a similar view thereof with the latch in an unlatched position;

Fig. 5A is a cross-sectional view taken along line 5A-5A of Fig. 3 with a pair of lock arms in a locked position;

Fig. 5B is a similar view thereof with the lock arms in an unlocked position;

Fig. 6A is a cross-sectional view taken along line 6A-6A of Fig. 5A showing a lid assembly in a closed position;

Fig. 6B is a similar view thereof with the lid assembly in an open position;

Fig. 7 is a cross-sectional view of an upper portion of the apparatus with an annular cap exploded therefrom;

Fig. 8 is a perspective view of the apparatus with the bin assembly removed and a garbage bag being deposited therein;

Fig. 9 is a cross-sectional view of the upper portion with an elongated tube of material disposed along with the garbage bag in the apparatus;

Fig. 10 is a partial cross-sectional view taken along line 10-10 of Fig. 9;

Fig. 11 is a perspective view of the apparatus with the lid assembly in the open position;

Fig. 12 is a cross-sectional view thereof showing several waste items being deposited therein;

Fig. 13 is a similar view thereof with the lid assembly moved to a closed position;

Fig. 14 is an enlarged view taken from Fig. 13;

Fig. 15 is a perspective view of the apparatus with the bin assembly removed with the material being cut by a razor disposed in the bin assembly; and
Fig. 16 is a similar view thereof with the garbage bag having the material disposed therein being removed from the bin assembly. Similar numbers refer to similar parts throughout the drawings.

DETAILED DESCRIPTION OF THE INVENTION

The present invention relates to disposing of waste in a safe and efficient manner. An embodiment of the present invention can be implemented in the form of an apparatus shown in Figs. 1-17 and indicated generally at 1. As shown in Figs. 1, 2, and 7, apparatus 1 extends from an upper end 2 to a lower end 4 and is generally broadly comprised of three main elements, a housing 3, a bin assembly 5, and a lid assembly 7.

As shown in Figs. 1 and 2, housing 3 includes a pair of side walls 9, a back wall 11 (Fig. 3), a front wall 13, a pair of angled walls 15, an arcuate top wall 17, and a flared base 19 disposed proximate lower end 4 for supporting and stabilizing apparatus 1. As shown in Fig. 2, front wall 13, top wall 17, and base 19 define a bin opening 21 sized to allow bin assembly 5 to pass therethrough. Base 19 includes an upper surface 23 sized to allow bin assembly 5 to rest thereon. Each side wall 9 includes inner ribbing 25 or other stabilizing features which provide strength and overall bracing for apparatus 1. Side walls 9, back wall 11, front wall 13, and upper surface 23 of base 19 define a bin cavity 27 therebetween, sized to fittedly receive bin assembly 5 therein. As shown in Fig. 1, when bin assembly 5 is fitted into bin cavity 27 by way of bin opening 21, apparatus 1 presents a generally smooth exterior surface 29.

As shown in Figs. 1-3, bin assembly 5 is formed in an open-top box-like structure and includes a pair of sidewalls 31, a front wall 33, a back wall 35, a bottom wall 37, an exterior surface 36, and an interior surface 38. A bin chamber 40 (Fig. 2) is defined by sidewalls 31, front wall 33, back wall 35, and bottom wall 37. As shown in Figs. 1 and 2, bin assembly 5 further includes a handle 39 secured to front wall 33 proximate exterior surface 36 and rotatable between a locked position shown in Fig. 1 and an unlocked position shown in Fig. 2. In this exemplary embodiment of the present invention, the locked position and the unlocked position are generally at a ninety degree angled turn with respect to one another. However, any rotation or overall change in the position of handle is encompassed by the present invention.

As shown in Fig. 3, bin assembly 5 further includes a latch 41 secured to front wall 33 proximate interior surface 38 on the opposite side of front wall 33 with respect
to handle 39. Latch 41 and handle 39 are coupled together by way of a pivot pin 43 extending from latch 41 to handle 39 through front wall 33. As shown in Figs. 3, 4A, and 4B, latch 41 rotatably engageable with a pocket 45 formed on housing 3. Thus, latch 41 is rotatable in the directions of Arrows A and B between a latched position shown in Fig 4A and an unlatched position shown in Fig. 4B. Inasmuch as latch 41 and handle 39 are coupled by way of pivot pin 43, when handle 39 is rotated to the unlocked position, latch 41 is rotated to the unlatched position, wherein latch 41 is free of pocket 45. Likewise, when handle 39 is rotated to the locked position, latch 41 is rotated to the latched position, wherein latch 41 is engaged and disposed within pocket 45. When handle 39 is in the locked position, the engagement between latch 41 and pocket 45 prevents a user from pulling bin assembly 5 out of bin cavity 27, thereby locking bin assembly 5 in housing 3.

As shown in Fig. 4A, latch 41 further includes an alignment notch 47 configured to align and receive a fin 49 therein when latch 41 is in the latched position. Fin 49 acts as a camming mechanism for engaging notch 47 and adding tension to the rotation of latch 41 and providing tactile feedback to the user to ensure latch 41 is fully rotated to the latched position. Fin 49 also acts to retain latch 41 in pocket 45 to ensure bin assembly 5 is locked in housing 3 until the user wishes to remove bin assembly 5 by overcoming the camming engagement of fin 49 and notch 47.

As shown in Figs. 4A and 4B, latch 41 further includes an actuator tab 51 sized and positioned on latch 41 to optionally depress or undepress a button 53 on a push switch 55 disposed on housing 3. As will readily be understood in the art, push switch 55 allows electricity to flow between internal contacts (not shown) when button 53 is depressed, and prevents electricity from flowing between the internal contacts when button 53 is undepressed. Latch 41 and actuator tab 51 are positioned such that when latch 41 is in the latched position, button 53 is depressed. Likewise, when latch 41 is in the unlatched position, button 53 is undepressed. Push switch 55 is used in conjunction with an overall circuit for controlling a sealing system 57 disposed in housing 3, as discussed in more detail hereinafter.

As shown in Figs. 2, 8, and 9, bin assembly 5 may be used in conjunction with a standard garbage bag 59 having a pair of handles 61 and a rim portion 63 intermediate handles 61. A pair of arcuate flanges 65 are spaced outwardly from interior surface 38 to form a handle channel 67 therebetween. Bin assembly 5 further includes a side flange 69 extending from interior surface 38 and defining a rim
channel 71 therein. As shown in Fig. 9, rim channel 71 is sized to receive and
removably hold rim portion 63 and each handle channel 67 is sized to receive and
removably hold one of the handles 61 of garbage bag 59 to maintain bag 59 in an
open position inside bin assembly 5. It will be readily understood that holding
garbage bag 59 in the open position allows waste and other refuse to be placed
therein.

As shown in Fig. 3, side flange 69 may also define a razor channel 73 with a
razor 75 disposed at the terminal end of razor channel 73. Razor 75 is intended to
be used to manually cut or sever a portion of an elongated tube of material 77, as
discussed in more detail hereinafter.

As shown particularly in Figs. 6A, 6B, and 7, lid assembly 7 is disposed in a lid
opening 18 defined by housing 3 and rotatable between an open position (Fig. 6B)
and a closed position (Fig. 6A). Lid assembly 7 includes a front wall 90 (Fig. 10)
extending between a pair of lid assembly sidewalls 89 and a top wall 92 extending
between sidewalls 89. Lid assembly 7 is laterally supported and movably secured to
housing 3 by way of a pair of torsion springs 81, each coupled with a pivot shaft 83
extending through an inner sidewall 85 disposed in housing 3 and lid assembly
sidewalls 89. Lid assembly 7 receives and rotates about pivot shafts 83 to move
between the open position and the closed position. Each inner sidewall 85 includes
an outer side 86 (Fig. 6A) opposite an inner side 88, where inner side 88 is proximate
lid assembly 7 inside housing 3. Torsion spring 81 includes a spiral tension portion
80 disposed around pivot shaft 83 and intermediate a stationary first portion 82 and a
movable second portion 84. Each inner sidewall 85 defines a track 87, wherein a
movable second portion 84 of torsion spring 81 extends therethrough and is secured
to lid assembly 7. Lid assembly 7 is biased by torsion spring 81 to the open position.
As shown in Fig. 6A, torsion spring 81 is compressed when lid assembly 7 is in the
closed position, creating a bias to the open position. As shown in Fig. 6B, torsion
spring 81 is uncompressed when lid assembly 7 is in the open position.

To maintain lid assembly 7 in the closed position, apparatus 1 includes a
locking engagement between lid assembly 7 and housing 3 for locking lid assembly 7
in the closed position. As shown in Figs. 5A and 5B, lid assembly 7 includes a
release button 91 with a pair of cam surfaces 93. Each cam surface 93 is slidingly
engaged with a corresponding cam surface 95 on a lock arm 97. Each lock arm 97
includes a lock shoulder 99 extending outwardly away from release button 91
through a lock opening 101 defined by each inner sidewall 85 (Fig. 6B). Each lock
arm 97 further includes a spring post 103 spaced apart from lock shoulder 99. Each post 103 is sized to fittingly engage with an end of a release spring 105. Release spring 105 acts to bias each lock arm 97 towards inner sidewall 85 in general, and lock opening 101 in particular.

As shown in Figs. 5A and 5B, lock arms 97 move between a locked position (Fig. 5A) and an unlocked position (Fig. 5B). When lock arms 97 are in the locked position, release button 91 is undepressed and each lock shoulder 99 extends through lock opening 101 and into inner sidewall 85. Release spring 105 acts to bias lock arms 97 to remain in inner sidewall 85, wherein the firm abutment between lock shoulders 99 and inner sidewall 85 prevents lid assembly 7 from moving from the closed position to the open position. When a user presses release button 91 in the direction of Arrow C, cam surface 93 moves against cam surface 95 in a controlled camming engagement to move lock arms 97 away from inner sidewall 85 to the unlocked position. Consequently, lock shoulder 99 moves out of inner sidewall 95, retracting through lock opening 101. Thus, in the unlocked position, the abutment between lock shoulder 99 and inner sidewall 95 is removed, and lid assembly 7 is free to move into the open position in the direction of Arrow D (Fig. 6B) due to torsion springs 81.

Referring particularly to Figs. 3 and 7, when lid assembly 7 is in the open position (Fig. 7), a waste channel 107 is exposed. Conversely, when lid assembly 7 is in the closed position (Fig. 3), waste channel 107 is concealed by housing 103 and a general lid portion 109 disposed on lid assembly 7. Lid assembly 7 further includes an annular recess 111 proximate waste channel 107, sized to receive a rolled portion 113 of an elongated tube of material 115 therein, wherein the user moves rolled portion 113 of material 115 in the direction of Arrow E and into annular recess 111. Lid assembly 7 further includes an annular cap 114 configured to removably cover a portion of annular recess 111 and allow an unrolled portion 117 of material 115 to pass therewith and through waste channel 107, as shown in Fig. 9 in the direction of Arrow H.

As shown in Fig. 7, lid assembly 7 further includes a first sealing member 121 having a press arm 119. A tab 123 extends from press arm 119 and is configured to mate with a button 124 of a push switch 125. As will readily be understood in the art, push switch 125 allows electricity to flow between internal contacts (not shown) when button 124 is depressed, and prevents electricity from flowing between the internal contacts when button 124 is undepressed. Press arm 119 and tab 123 are
positioned such that when lid assembly 7 is in the closed position, button 124 is depressed and the internal circuit of push switch 125 is completed, as shown in Fig. 3. Likewise, when lid assembly 7 is in the open position, button 123 is undepressed, and the internal circuit of push switch 125 is not completed, as shown in Fig. 7. Push switch 125 is used in conjunction with an overall circuit for controlling a sealing system 57, as discussed in more detail hereinafter.

As shown in Figs. 3, 7, and 10, lid assembly 7 further includes a guide fin 127. Guide fin 127 is generally aligned with a guide channel 129 (Fig. 10) defined by housing 3. Guide fin 127 rides within guide channel 129 as lid assembly 7 moves between the open position and the closed position to stabilize and direct the movement of lid assembly 7 as lid assembly 7 is opening or closing.

Housing 3 include sealing system 57 configured to apply a seal onto unrolled portion 117 of the elongated tube of material 115. A seal is applied longitudinally to material 115 to trap waste and odor inside unrolled portion 117. Sealing the waste inside material 115 prevents the waste and odor from escaping, as is typically experienced with standard garbage bags. As discussed previously, sealing system 57 includes push switch 55, push switch 125, and first sealing member 121. Sealing system 57 further includes second sealing member 131, which is formed from a nichrome wire 133 set behind a length of Teflon® tape 135. While wire 133 is preferably formed from nichrome, any form of resistance heating wire or similar heating element is encompassed by the present invention. Likewise, any similar style of tape 135 is encompassed by the present invention. Sealing system further includes an electrical input jack 137 connected to a control unit 139. Control unit 139 provides the electronic logic for connecting and switching the various circuits (not shown) required by the elements of sealing system 57. Nichrome wire 133 is heated as directed by control unit 139 to provide a heat source to seal material 115.

As shown in Fig. 10, sealing system 57 also includes an actuator button 141 disposed proximate waste channel 107 and exposed when lid assembly 7 is in the open position. When lid assembly 7 is in the closed position, actuator button 141 is concealed by housing 3 and lid assembly 7. Thus, actuator button 141 cannot be inadvertently depressed or actuated by a child while lid assembly 7 is in the closed position. The wiring and other necessary electronic components to support actuator button 141 are received in a bracket 142 or other containment structure to connect actuator button 141 to control unit 139. As shown in Fig. 7, sealing system 57 further includes an LED light 143 observable through top wall 17. LED light 143 provides...
visual feedback to the user as to the operation and state of sealing system 57 and is configured to emit a first hue 104, a second hue 106, and a third hue 108 as determined by the state of sealing system 57 and as directed by control unit 139. The circuitry and electronic components used in support of LED light 143 are commonly known in the art, and as such, not shown.

The operation of sealing system 57 is now herein described. Sealing system 57 generally moves from a wait state, to an armed state, to a sealing state, and back to a wait state after the sealing state has completed. The wait state is the default state of the system, as a user opens and closes lid assembly 7 to deposit waste items therein. Sealing system 57 moves to the armed state when a user moves lid assembly 7 into the open position and subsequently depresses actuator button 141. The armed state is a logical state, no mechanical or thermal changes occur when sealing system 57 moves from the wait state to the armed state. Control unit 139 requires the internal circuits associated with push switch 125 and push switch 55 to close or be completed before control unit 139 moves sealing system 57 from the armed state to the sealing state. Apparatus 1 is configured such that the internal circuits of push switch 125 and 55 may only be completed or closed when apparatus 1 is in the safest configuration, with respect to the heat of nichrome wire 133. As a user manually moves lid assembly 7 from the open position to the closed position, tab 123 depresses button 124 on push switch 125, which completes the internal circuit associated with push switch 125. Thus, for the circuit of push switch 125 to be closed, lid assembly 7 must be in the closed position. When lid assembly 7 is in the closed position, access to waste channel 107 is prevented by lid portion 109. Similarly, as a user manually moves handle 39 from the unlocked position to the locked position, tab 51 depresses button 53 on push switch 55, which completes the internal circuit associated with push switch 55. Thus, for the circuit of push switch 55 to be closed, bin assembly 5 must be secured in bin cavity 27. When bin assembly 5 is secured in bin cavity 27, access to the internal portion of housing 3 through bin opening 21 is prevented by bin assembly 5. Inasmuch as sealing system 57 cannot move to the sealing state without lid assembly 7 being in the closed position and bin assembly 5 being in the locked position, apparatus 1 is safe for use around children as the internal heating elements and nichrome wire 133 must be inaccessible for apparatus 1 to move to the sealing state.

As described above, when apparatus 1 is in the armed state, and the circuits associated with push switch 55 and push switch 125 are completed, apparatus 1
moves into the sealing state. As shown in Fig. 14, while in the sealing state, first sealing member 121 pins unrolled portion 117 of material 115 against second sealing member 131, pressing material 115 firmly against Teflon® tape 135. During this operation, nichrome wire 133 receives electricity from control unit 139, which heats nichrome wire 133 such that the heat is transferred through tape 135 and into material 115. The heat from wire 133 through tape 135 in turn heats material 115 sufficiently to form a seal 147 (Fig. 15) on the portion of material 115 which is pinned between first sealing member 121 and second sealing member 131. Control unit 139 is configured to transmit electricity through wire 133 for an effective amount of time, and thereafter shut off the flow of electricity. When the seal has been formed and electricity is shut off from wire 133, sealing system 57 waits a short amount of time for wire 133 to cool down. Once wire 133 is sufficiently cooled down, sealing system 57 moves to the wait state.

LED light 143 emits different hues of light to provide visual feedback to the user to indicate what state sealing system 57 is currently in. When sealing system 57 is in the wait state, LED light 143 emits first hue 104, which in the preferred embodiment of the present invention is a green color of light. Thus, a user knows by observing first hue 104 that sealing system 57 is in the wait state. When the sealing system 57 moves into the armed state, LED light 143 emits second hue 106, which in the preferred embodiment of the present invention is a yellow color of light. Thus, the user knows by observing second hue 106 that sealing system 57 is in the armed state, and the user must move lid assembly 7 to the closed position and bin assembly 5 to the locked position to move sealing system 57 into the sealing state. When sealing system 57 moves into the sealing state, LED light 143 emits a third hue 108, which in the preferred embodiment of the present invention is a red color of light. Thus, the user knows by observing third hue 108 that sealing system 57 is in the sealing state. Finally, when sealing system 57 moves from the sealing state to the wait state, LED light 143 changes from third hue 108 to first hue 104 to indicate to the user that the sealing state is completed.

As shown in Figs. 1-16, sealing system 57 is configured to provide heat to material 115 to form a seal thereon. However, in an improvement over the prior art, sealing system 57 includes significant safety features to prevent accidental burns to a child by the heating mechanism. These safety features are broadly comprised of the placement of actuator button 141, push switch 125, and push switch 55.
It is one of the primary features of the present invention that apparatus 1 is configured to prevent accidental actuation of sealing system 57. It is another primary feature of the present invention that apparatus 1 is configured to prevent accidental disposal of non-waste by children. Any parent will readily understand the benefits of a disposal system which prevents odors from escaping in a safe and secure electronic manner, while simultaneously preventing children from throwing non-waste into the waste container. As such, actuator button 141 is concealed by housing 3 and lid assembly 7 while lid assembly 7 is in the closed position. Thus, a child cannot accidentally actuate sealing system 57 as actuator button 141 is not available for unsupervised depressing. Further, release button 91 is purposely disposed at the farthest linear distance from the surface or flooring whereupon base 19 rests. One will readily understand that this configuration for release button 91 is the most optimal placement, as release button 91 is the maximum distance from a child's reach. Thus, a majority of children will be incapable of depressing release button 91.

Inasmuch as lid assembly 7 is locked in the closed position by way of release button 91 and the locking engagement of lock arms 97, the child has no way of exposing actuator button 141.

As described above, in the unlikely event that a child manages to depress release button 91 to expose actuator button 141, sealing system 57 is configured to prevent accidental burns. If release button 91 is depressed, and if the child subsequently depresses actuator button 141, sealing system 57 will not begin heating nichrome wire 133 until lid assembly 7 is manually moved back to the closed position, as indicated by tab 123 depressing button 124 to complete the circuit of push switch 125. As shown in Fig. 7, the child would need to provide an extremely long reach to be able to move lid assembly 7 back to the closed position, as lid assembly 7 extends even farther away at an inconvenient angle for an individual reaching from a position generally horizontally lower than lid assembly 7. One would need to reach to lid portion 109 to pivot lid assembly 7 back to the closed position. This manual movement of lid assembly 7 from the open position to the closed position is only realistically available to adults.

Preventing accidental burns is a primary goal of the present invention, but many parents have been surprised to find that their child has thrown a valuable possession into the garbage can, often finding out after the garbage has been hauled away to the city dump. Thus, preventing unintentional disposal of valuable possessions is another primary goal of the present invention. As shown in Fig. 7,
assuming *arguendo* that a child can manage to depress release button 91, one will readily understand that waste channel 107 opens upward in a difficult to access angle. Furthermore, access to waste channel 107 is substantially blocked on three sides by lid portion 109 overhanging waste channel 107 from one direction, and the general nature of lid assembly 7 in two other directions. As shown in Fig. 7, in the remaining direction, wherein a child is attempting to deposit non-waste while standing proximate front wall 13, the outwardly extending nature of handle 39, the domed nature of top wall 17, and the flared nature of base 19 forces the child away from waste channel 107, thereby preventing easy access.

Furthermore, as described previously here, handle 39 locks bin assembly 5 to housing 3 when in the locked position, by way of latch 41. Alignment notch 47 and fin 49 act in concert to provide tension on handle 39 and prevent children from releasing bin assembly 5 from housing 3, which would expose bin opening 21. Thus, the internal area of housing 3 is inaccessible to a child due to latch 41.

In operation, apparatus 1 is configured to allow a user to operate apparatus 1 as a typical garbage can while selectively applying a seal to portions of material 115 to contain the waste and odors therein. As unrolled portion 117 of material 115 fills with waste, gravity moves unrolled portion 117 into bin assembly 5 for later removal.

As shown in Fig. 8, bin assembly 5 may incorporate garbage bag 59 therein to receive unrolled portion 117 of material 115. A user removes bin assembly 5 from bin cavity 27 in the direction opposite Arrow G and thereafter places garbage bag 59 into bin assembly 5, in the direction of Arrow F. As shown in Fig. 9, handles 61 are positioned on handle channels 67 and secured thereon by arcuate flanges 65. Rim portion 63 of garbage bag 59 is aligned and disposed in rim channel 71 by the user to hold garbage bag 59 in an opened and receiving position to receive unrolled portion 117 as waste is deposited therein. The user then turns handle 39 from the unlocked to locked position to secure bin assembly 5 in bin cavity 27. As discussed previously, locking bin assembly 5 in bin cavity 27 also moves tab 51 against button 53 to complete the internal circuit of push switch 55. Once bin assembly 5 is secured in bin cavity 27, the user deposits the elongated roll of material into annular recess 111. Rolled portion 113 remains in annular recess 111 and unrolls as needed to form unrolled portion 117. As shown in Fig. 9, the user ties a knot 149 in the farthest distal end of unrolled portion 117 to create a pocket to allow the waste to reside therein. The user then deposits annular cap 114 proximate annular recess 111 and presses unrolled portion 117 in the direction of Arrow H to deposit unrolled portion 117 in recess 111.
117 in housing 3. As shown in Fig. 10, the user is then presented with waste
channel 107 having material 115 thereover and ready to receive waste therethrough.

As shown in Fig. 12, the user deposits a packet of waste 145 in the direction of Arrow I to dispose of waste 145. Waste packets 145 fill unrolled portion 117 and
congregate therein. As desires, the user presses actuator button 141 while lid
assembly 7 is in the open position, moving sealing system 57 into the armed state.
This actuates LED light 143 to emit second hue 106, which is generally seen as a
yellow hue to the user. Thereafter, the user manually presses lid assembly 7 to
move lid assembly 7 from the open position to the closed position in the direction of
Arrow J. As shown in Fig. 13, a portion of material 115 is pinned between first
sealing member 121 and second sealing member 131. As such, sealing system 57
moves to the sealing state and consequently LED light 143 moves to emit third hue
108, generally seen as a red hue to the user. In the sealing state, control unit 139
transmits electricity through wire 133, which as discussed previously, acts to heat
material 115 and apply a seal thereon.

The user may continue using apparatus 1 in this way and applying a seal as
desired until garbage 59 is sufficiently full. At this time, the user rotates handle 39
from the locked position to the unlocked position thereby releasing bin assembly 5
from bin cavity 27 in the direction of Arrow L. The user then manually moves
material 115 into razor channel 173 and across razor 75 in the direction of Arrow K.
This movement across razor 75 cuts material 115 to release the used and filled
portion of material 115 into garbage bag 59, shown as sealed bag 138 (Fig. 16). As
shown in Fig. 15, material 115 is cut after seal 147 is applied to material 115. It will
readily be understood that this creates a self-contained packet of material 115
preventing odor from escaping after material 115 is cut by razor 75. As shown in Fig.
16, the user thereafter removes garbage bag 59 in the direction of Arrow M and
disposes of garbage bag 59 in a typical manner. The user then ties knot 149 in
material 115 to create a new lower portion for receiving waste packets 145 therein,
and the general principle and method of operating apparatus 1 is repeated as
desired.

In the foregoing description, certain terms have been used for brevity,
clearness, and understanding. No unnecessary limitations are to be implied
therefrom beyond the requirement of the prior art because such terms are used for
descriptive purposes and are intended to be broadly construed.
Moreover, the description and illustration of the invention is an example and the invention is not limited to the exact details shown or described.
CLAIMS

1. An apparatus adapted to receive an elongated tube of material having a rolled portion and an unrolled portion, the apparatus comprising:
   a housing defining a lid opening;
   a lid assembly disposed in the lid opening and movable between an open position and a closed position;
   a waste channel defined by the lid assembly, wherein the waste channel is exposed when the lid assembly is in the open position and concealed when the lid assembly is in the closed position;
   a recess proximate the waste opening, wherein the recess is adapted to receive the rolled portion therein and further adapted to orient the unrolled portion to extend through the waste channel;
   a first sealing member;
   a second sealing member, wherein the first sealing member abuts the second sealing member when the lid assembly is in the closed position to press the unrolled portion therebetween; and
   a heat element adapted to selectively form a seal on the unrolled portion when the first sealing member abuts the second sealing member.

2. The apparatus of Claim 1, further comprising an actuator button exposed when the lid assembly is in the open position and concealed when the lid assembly is in the closed position, wherein the actuator button is operably connected to the heat element, and wherein the heat element forms the seal in response to actuation of the actuator button.

3. The apparatus of Claim 2, further comprising a lid push switch movable between an open position and a closed position;
   wherein the lid push switch is biased to the open position;
   wherein the lid assembly abuttably moves the lid push switch from the open position to the closed position as the lid assembly moves from the open position to the closed position; and
   wherein the heat element is prevented from forming the seal when the lid push switch is in the open position.
4. The apparatus of Claim 1, further comprising:
   a locking engagement between the lid assembly and the housing for locking
   the lid assembly in the closed position;
   a release button operably connected to the locking engagement; and
   wherein the locking engagement releases the lid assembly in response to
   actuation of the release button.

5. The apparatus of Claim 4, wherein the apparatus is adapted to rest on a surface,
   and wherein the release button is located on the apparatus at generally the farthest
   linear distance from the surface.

6. The apparatus of Claim 5, further comprising at least one torsion spring, wherein
   the torsion spring acts to bias the lid assembly towards the open position.

7. The apparatus of Claim 1, further comprising at least one guide fin extending from
   the lid assembly and generally aligned with a guide channel defined by the housing,
   wherein the guide fin rides within the guild channel as the lid assembly moves
   between the open position and closed position to stabilize and direct the movement
   of the lid assembly.

8. The apparatus of Claim 1, further comprising a cap configured to removably cover
   a portion of the recess, wherein the unrolled portion extends from the rolled portion
   past the cap to pass through the waste channel.

9. The apparatus of Claim 1, further comprising:
   a bin chamber defined by the housing;
   a bin assembly, wherein the bin assembly is removably received in the bin
   chamber;
   a handle rotatable between a locked position and an unlocked position;
   a latch rotatable between a latched position and an unlatched position,
   a channel defined by the housing;
   wherein the latch is disposed in the channel in the latched position to thereby
   prevent removal of the bin assembly from the bin cavity;
   wherein the latch is not disposed in the channel in the unlatched position to
   thereby allow removal of the bin assembly from the bin cavity; and
wherein the latch is operably connected to the handle such that the latch is in the latched position when the handle is in the locked position and the latch is in the unlatched position when the handle is in the unlocked position.

10. The apparatus of Claim 9, further comprising a bin push switch movable between an open position and closed position;
   wherein the bin push switch is biased to the open position;
   wherein the latch abuttably moves the bin push switch from the open position to the closed position as the latch moves from the unlatched position to the latched position; and
   wherein the heat element is prevented from forming the seal when the bin push switch is in the open position.

11. The apparatus of Claim 9, further comprising:
   an inner surface on the bin assembly generally defining a bin cavity therebetween;
   an outer surface on the bin assembly; and
   wherein the handle is disposed on the outer surface and the latch is disposed on the inner surface.

12. The apparatus of Claim 11, further comprising:
   a pair of opposed side flanges extending from the inner surface of the bin assembly into the bin cavity;
   a back flange extending from the inner surface into the bin cavity and disposed intermediate the pair of side flanges;
   a bag recess defined by the back flange;
   wherein each side flange is adapted to receive a handle of the trash bag;
   wherein the bag recess is adapted to receive another portion of the trash bag; and
   wherein the side flanges and bag recess work in concert to hold the trash bag in an open position to receive a segment of the unrolled portion therein.

13. The apparatus of Claim 12, further comprising a cutting device disposed on the back flange for manually cutting the unrolled portion thereupon to release the segment from the unrolled portion.
14. The apparatus of Claim 1, further comprising:

- an indicator;

  wherein the indicator is configured to emit a first indication when the apparatus is in a default state;

- wherein the indicator is configured to emit a second indication when the apparatus is in an armed state; and

- wherein the indicator is configured to emit a third indication when the apparatus is in a sealing state.

15. The apparatus of Claim 14, wherein the first indication is a first hue of colored light, wherein the second indication is a second hue of colored light, and wherein the third indication is a third hue of colored light.

16. A method of operating an apparatus adapted to receive an elongated roll of material, the method comprising the steps of:

- moving a lid assembly in a housing from a closed position to an open position to expose an actuation button and a waste channel lined with a portion of the material;

- depositing waste into the portion through the waste channel;

- actuating the actuation button;

- moving the lid assembly from the open position to the closed position to conceal the waste channel and the actuation button; and

- forming a seal on the portion to seal the waste therein.

17. The method of Claim 16, further comprising the step of waiting until a bin assembly is locked with the housing to form the seal.

18. The method of Claim 16, further comprising the steps of:

- emitting a first indication when the apparatus is in a default state;

- emitting a second indication when the apparatus is in an armed state; and

- emitting a third indication when the apparatus is in a sealing state.
19. A sealing system adapted for use with an apparatus having a lid assembly disposed in a housing and movable between an open position and a closed position, the sealing system comprising:
   a first sealing member disposed on the lid assembly;
   a second sealing member disposed on the housing and having a heating wire adapted to selectively apply a seal to a tube of material, wherein the first sealing member moves proximate the second sealing member when the lid assembly is in the closed position, and wherein the first sealing member is spaced distally from the second sealing member when the lid assembly is in the open position;
   a first push switch disposed on the housing and having a first internal circuit, wherein the first internal circuit exists in a closed state when the lid assembly is in the closed position and exists in an open state when the lid assembly is in the open position;
   an actuator button disposed on the housing and operably connected to the heating wire and the first internal circuit; and
   wherein the heating wire is configured to apply the seal to the tube of material when the actuator button is depressed and the first internal circuit is in the closed state.

20. The sealing system of Claim 19, further comprising:
   a bin assembly lockable with the housing;
   a second push switch disposed on the housing and having a second internal circuit;
   wherein the second internal circuit exists in a closed state when the bin assembly is locked with the housing and exists in an open state when the bin assembly is not locked with the housing;
   wherein the actuator button is further operably connected to the second internal circuit; and
   wherein the heating wire is configured to apply the seal to the tube of material when the actuator button is depressed and the first internal circuit is in the closed state and the second internal circuit is in the closed state.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPPC(8) - B65B 9/00 (2012.01)
USPC - 53/459

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)

IPPC(8) - A61F 13/551, B65B 9/00, 9/08 (2012.01)
USPC - 53/203, 370, 373, 451, 456, 459, 469, 476, 483, 551, 552, 567, 576, 577; 220/203, 263, 495.06, 908, 908.1; 604/317, 358, 385.0

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 practicable, search terms used)

PatBase, MicroPatent, Google Patents

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category* Citation of document, with indication, where appropriate, of the relevant passages Relevant to claim No.

| Y | US 6,516,588 B2 (JENSEN et al) 11 February 2003 (11.02.2003) entire document | 1,4-8 |
| Y | US 2010/0083616 A1 (PLACE et al) 08 April 2010 (08.04.2010) entire document | 1,4-8 |
| Y | US 5,520,303 A (BERNSTEIN et al) 28 May 1996 (28.05.1996) entire document | 4-6 |
| Y | GB 1,555,543 A (CHIVRALL) 14 November 1979 (14.11.1979) entire document | 7 |

* 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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  "&" Document member of the same patent family

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