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(54) **DISPOSAL BAG ASSEMBLY AND DISPOSAL SYSTEM**

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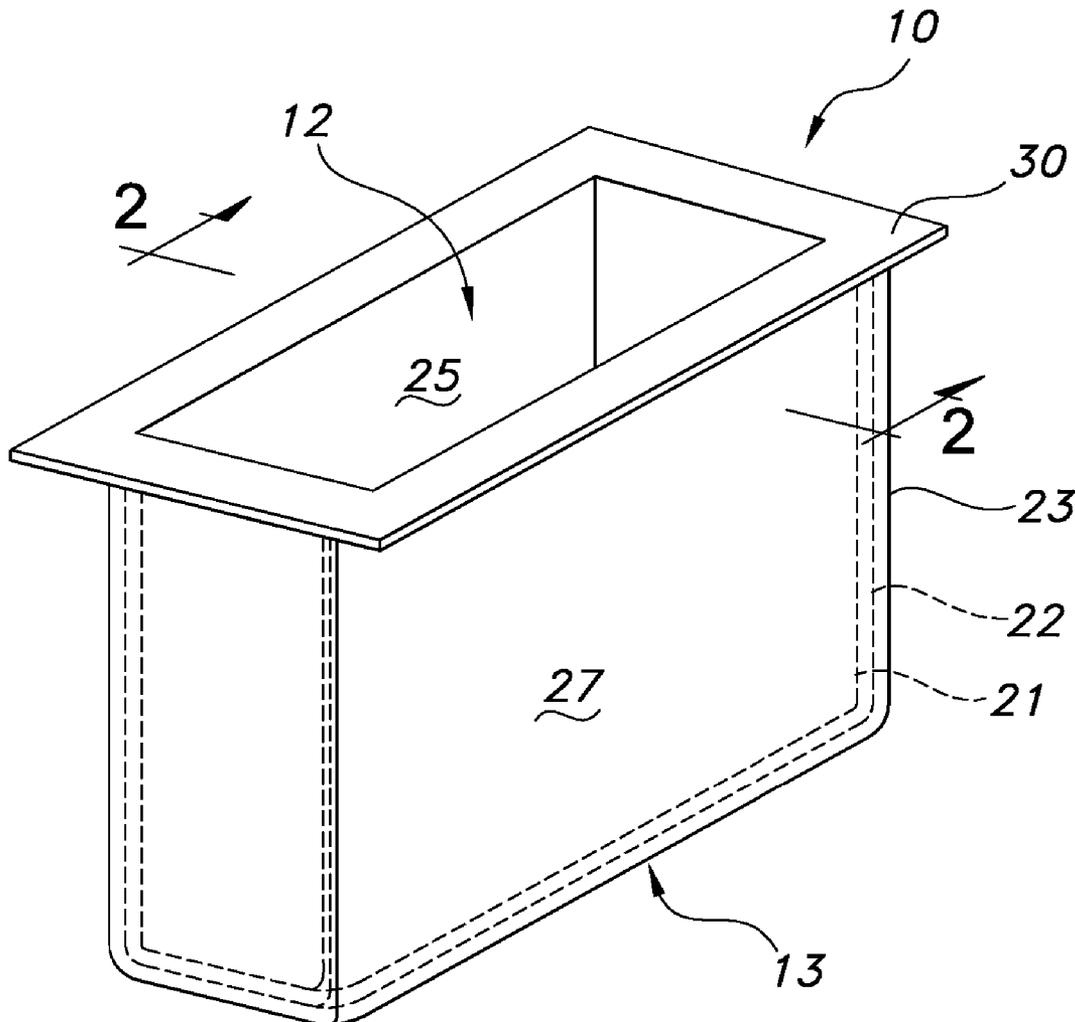
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(57) **ABSTRACT**
A system for disposal of refuse adapted for use within a waste disposal unit is disclosed. The system includes a frame and a plurality of bags, nested within each other and within an outermost bag, where the bags are attached to the frame and are held open for the disposal of refuse thereinto. A disposal bag assembly for disposal of refuse is also disclosed.

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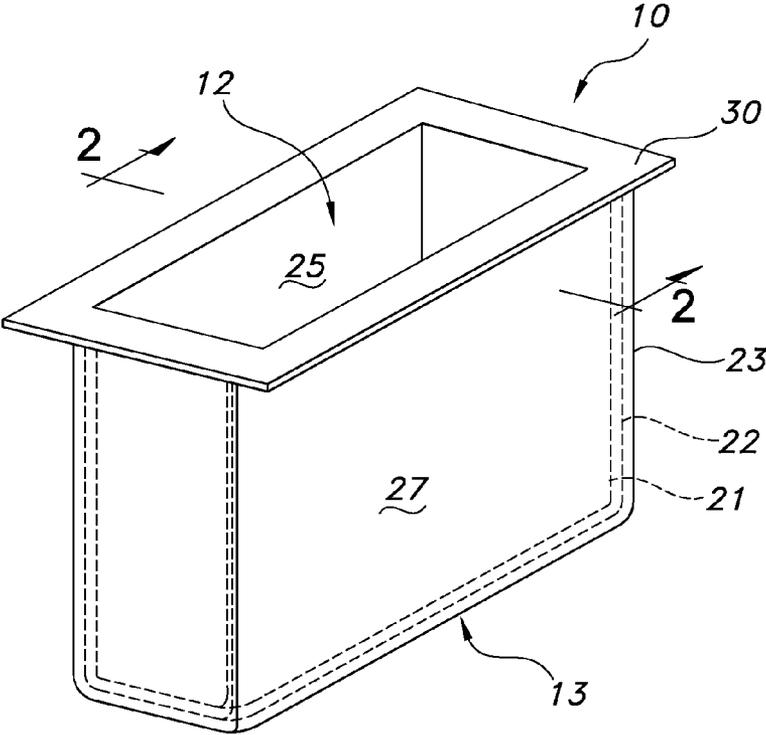


FIG. 1

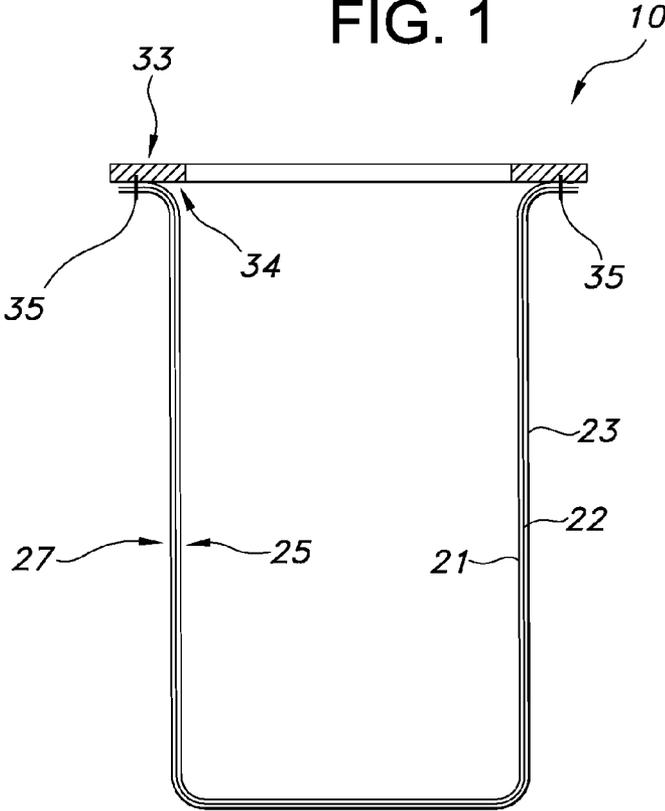


FIG. 2

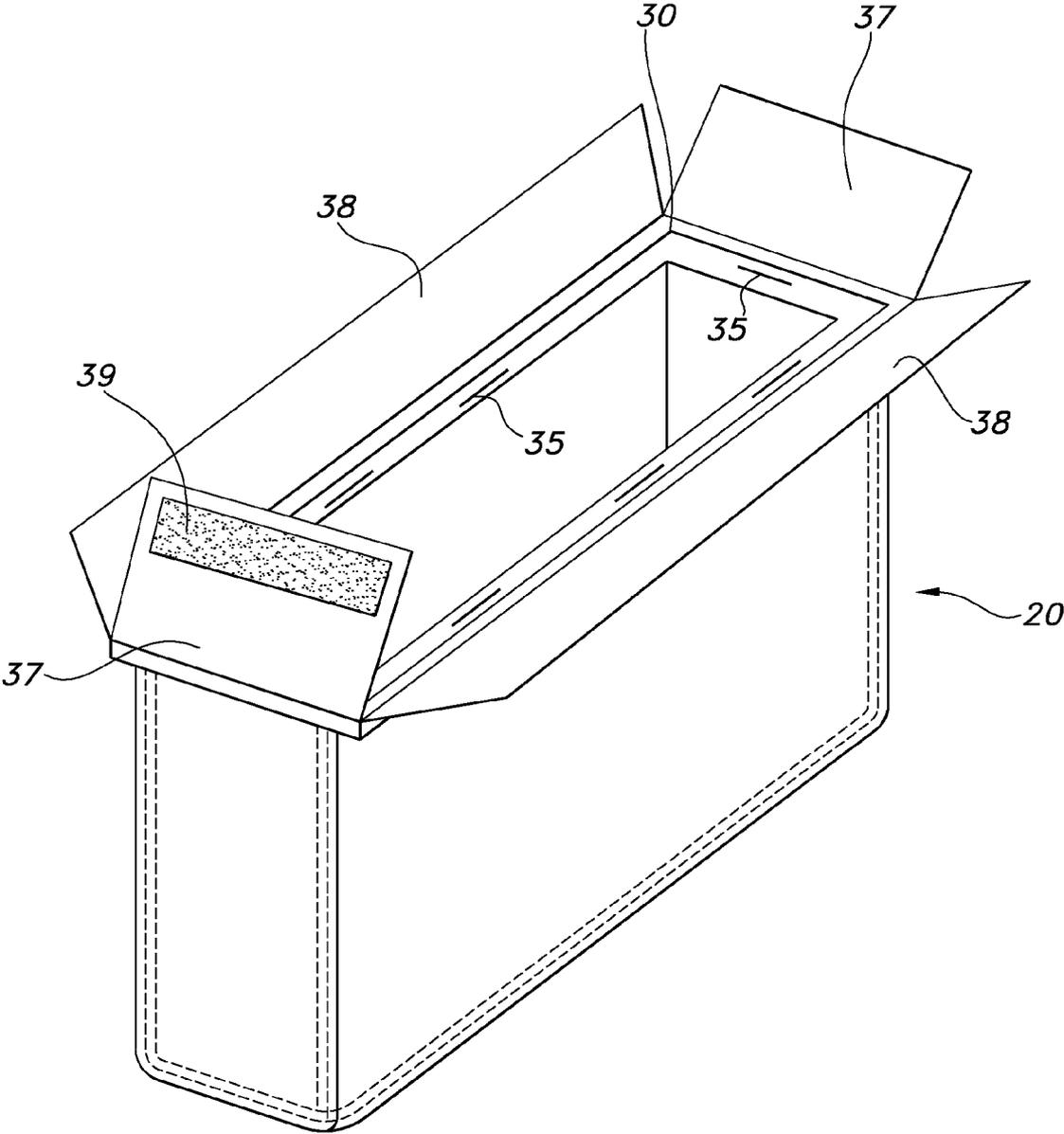


FIG. 3

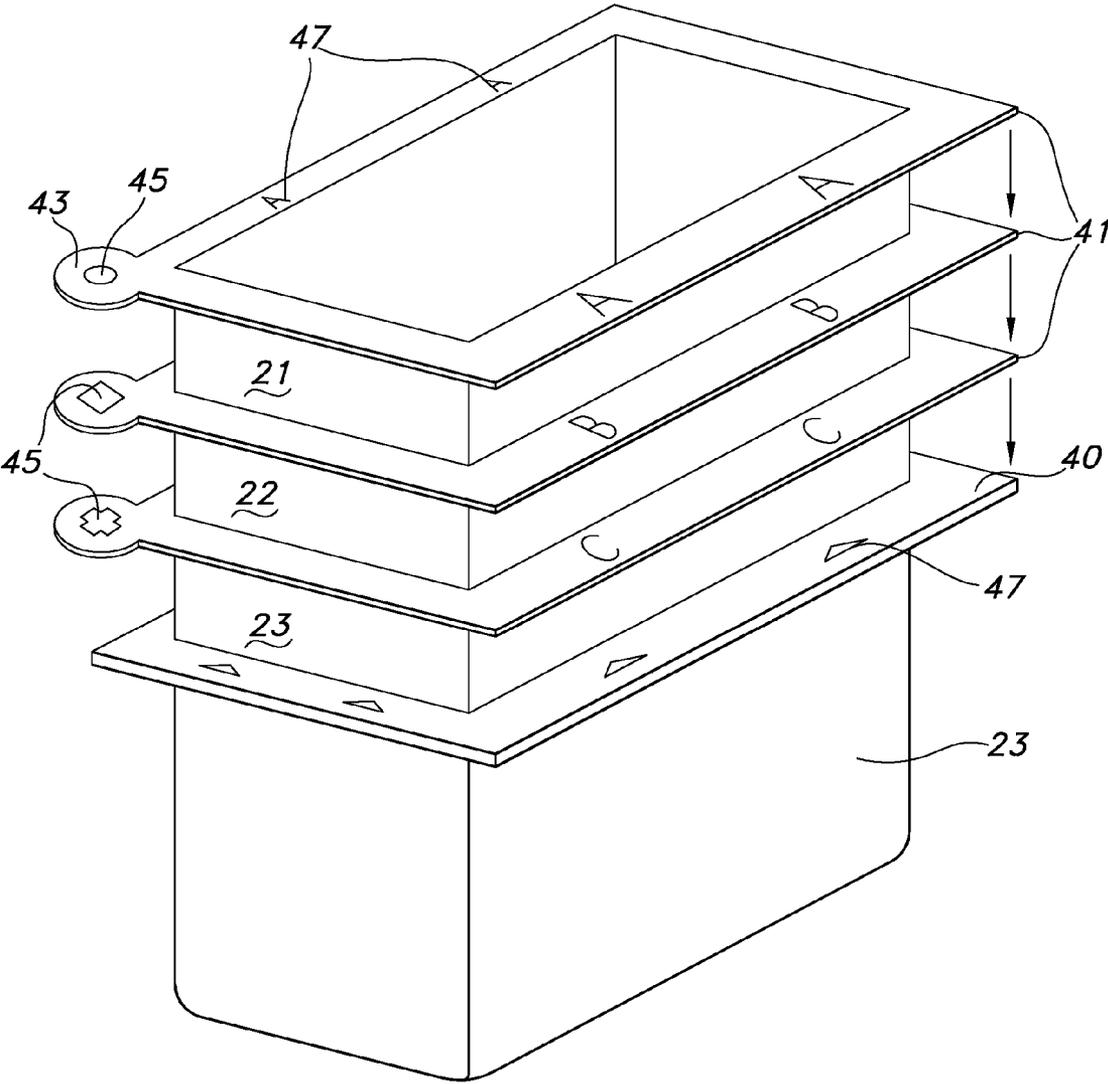


FIG. 4

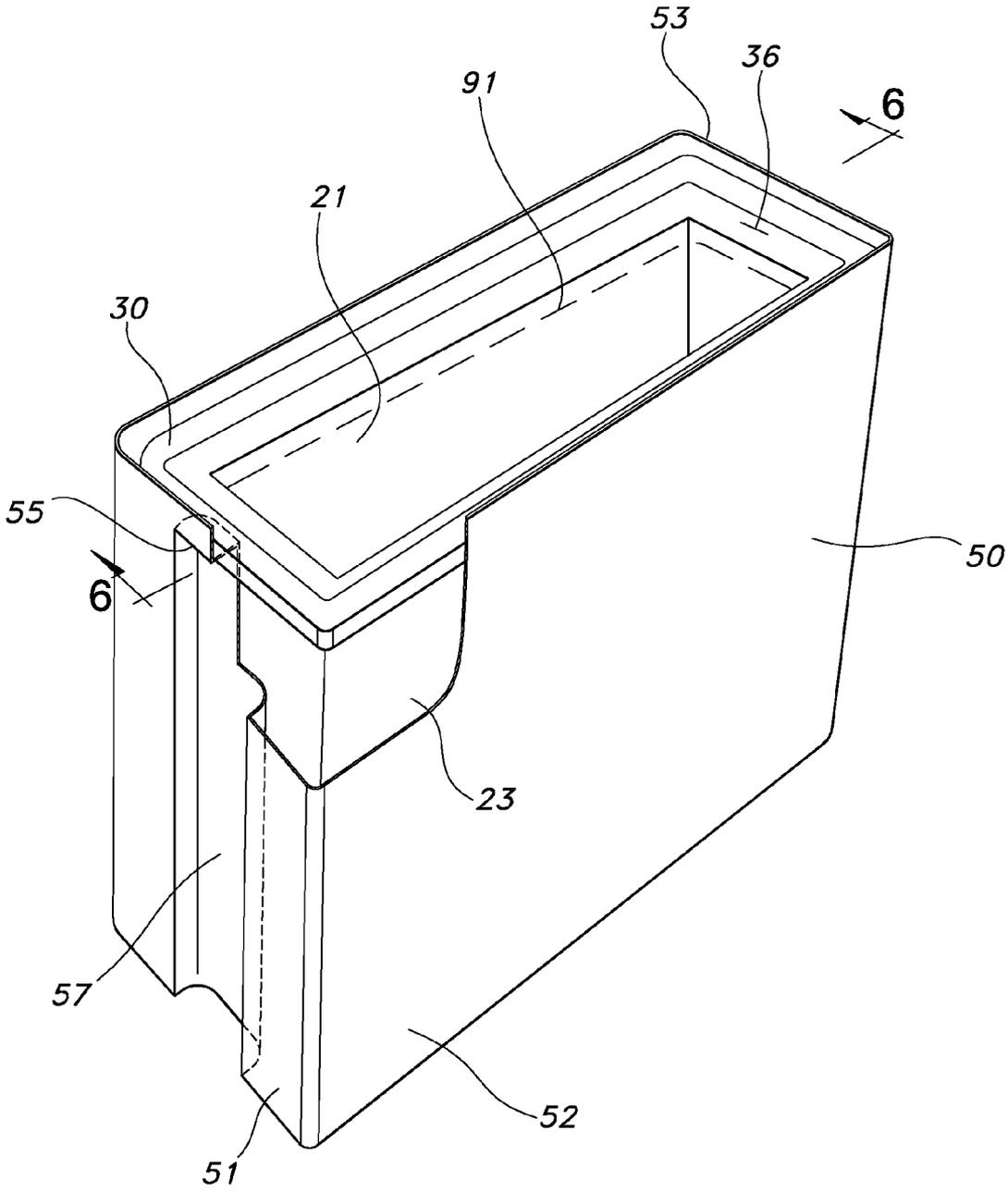


FIG. 5

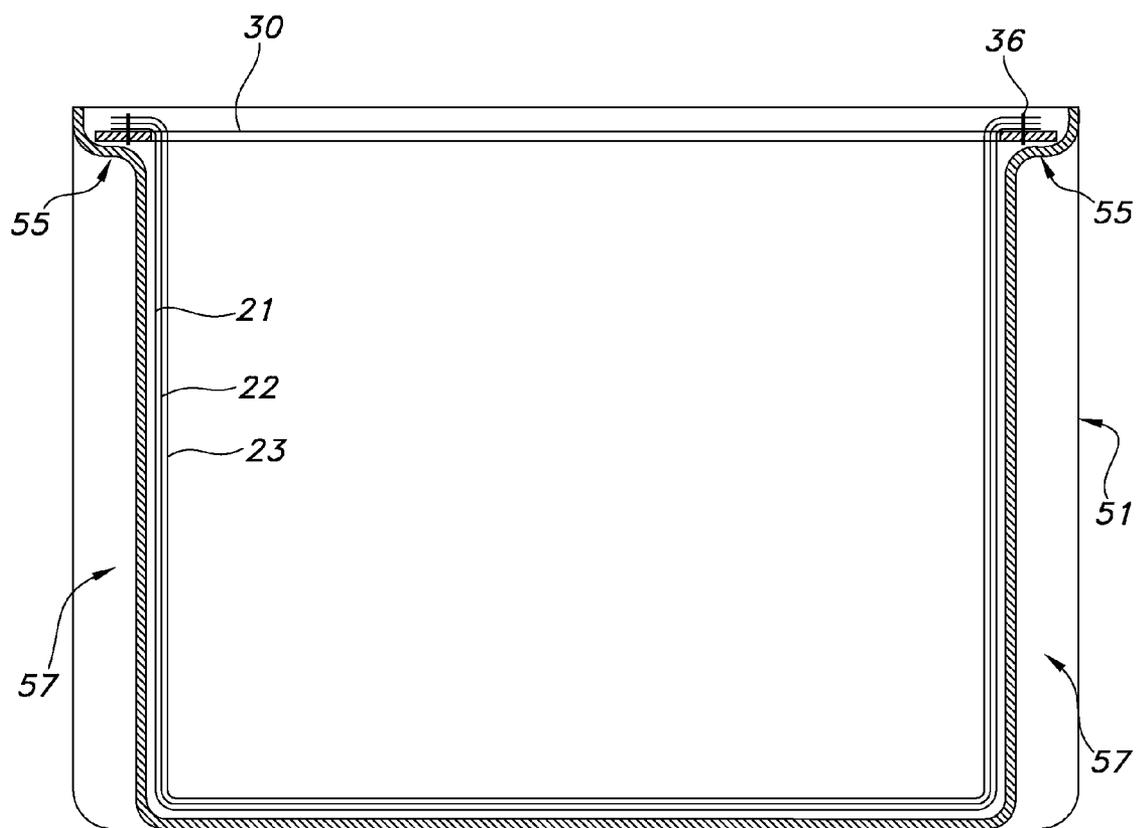


FIG. 6

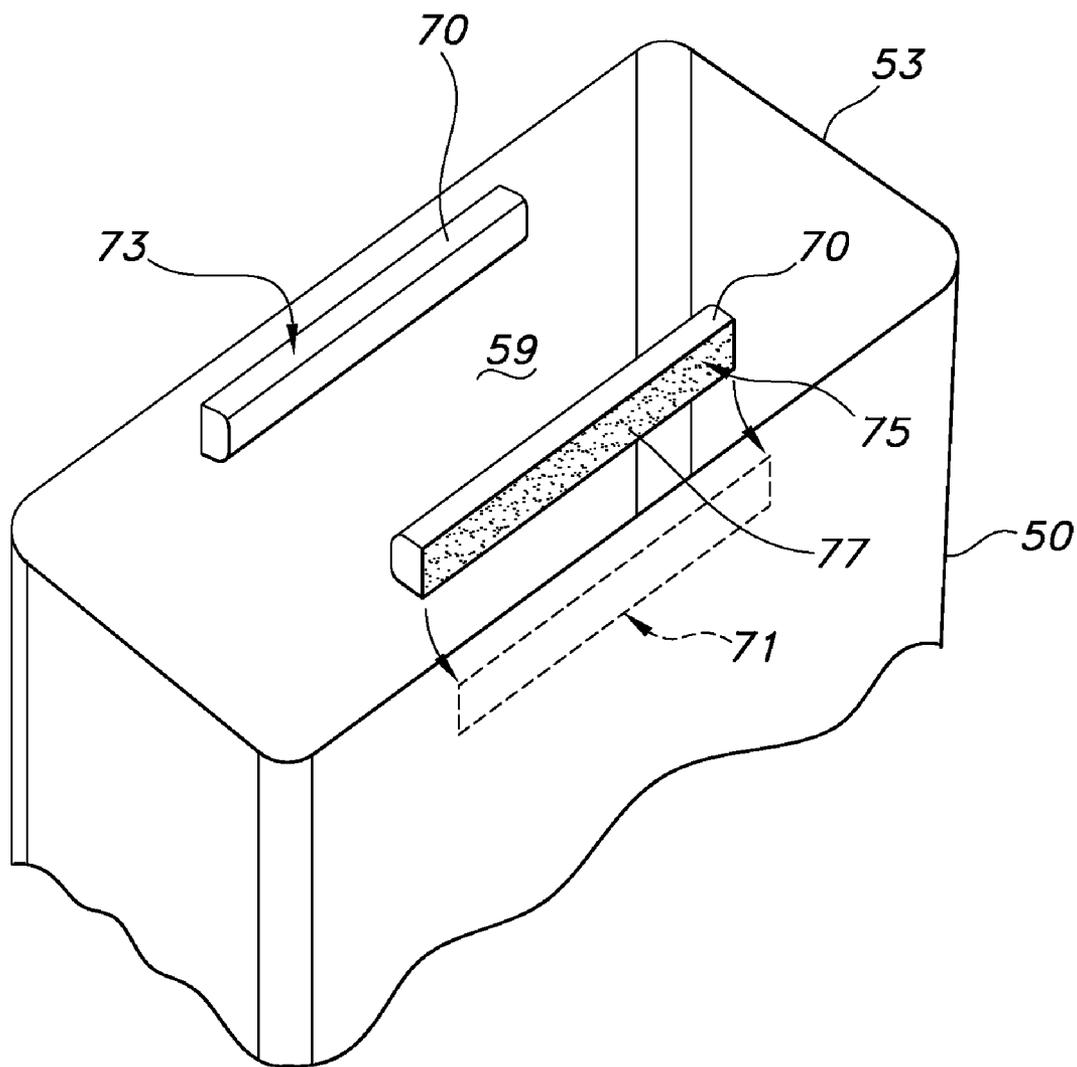


FIG. 7

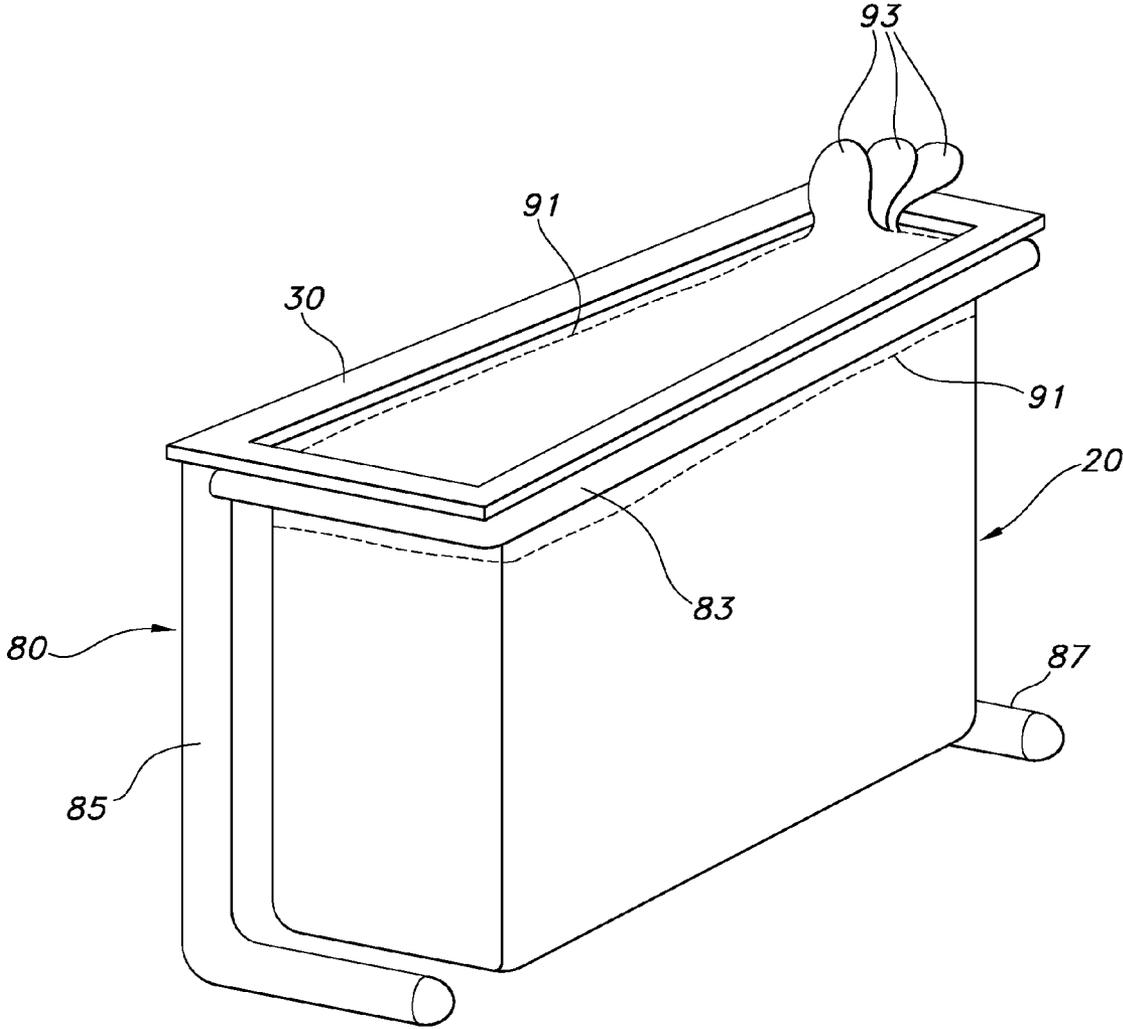


FIG. 8

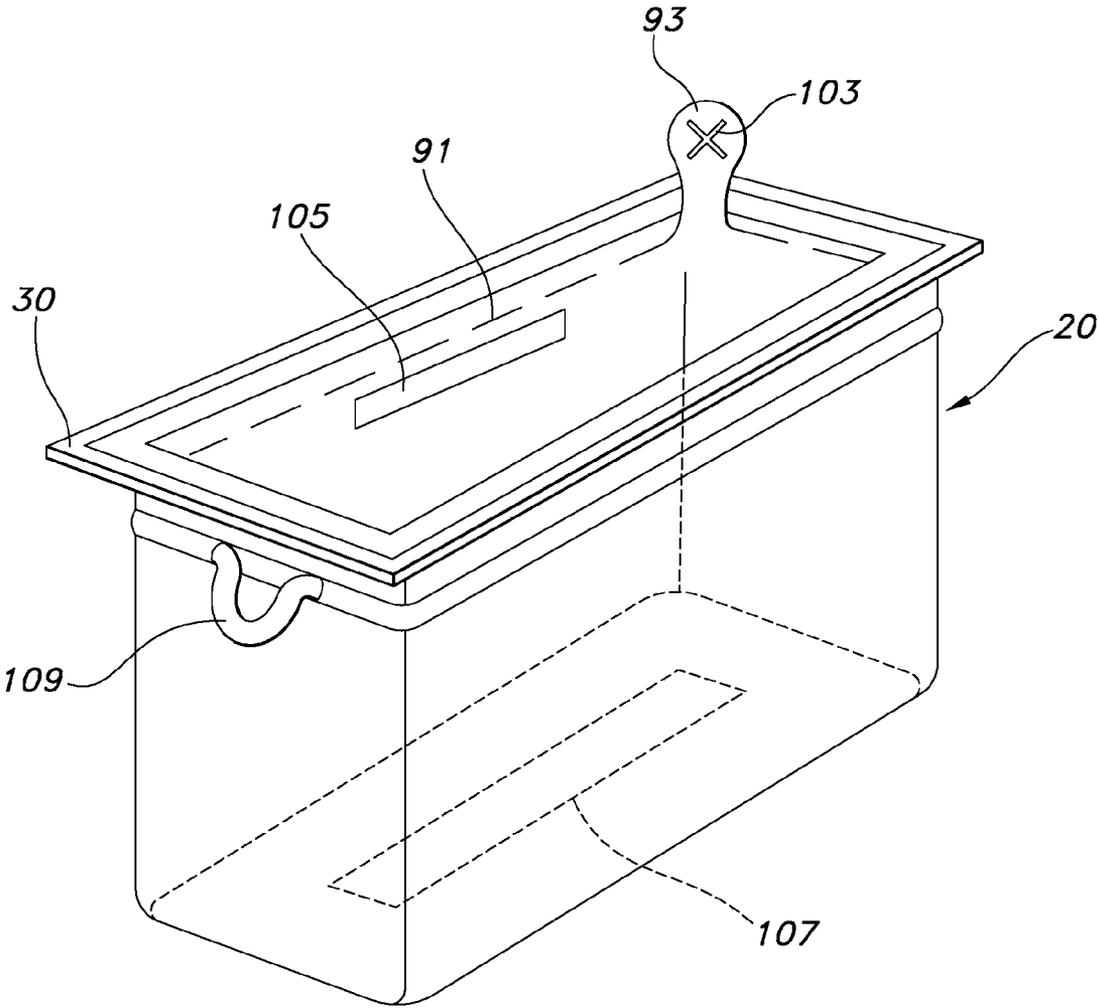


FIG. 9

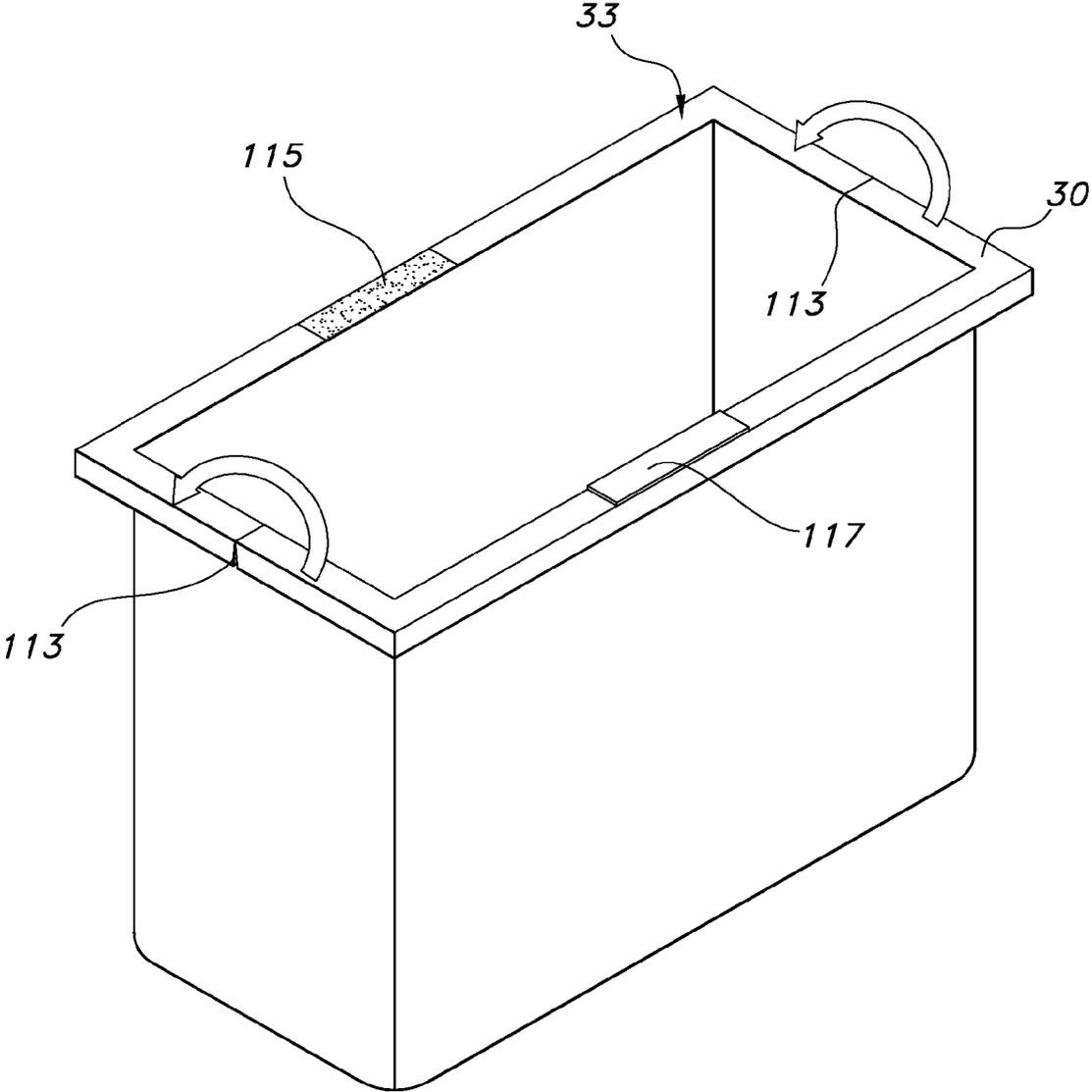


FIG. 10

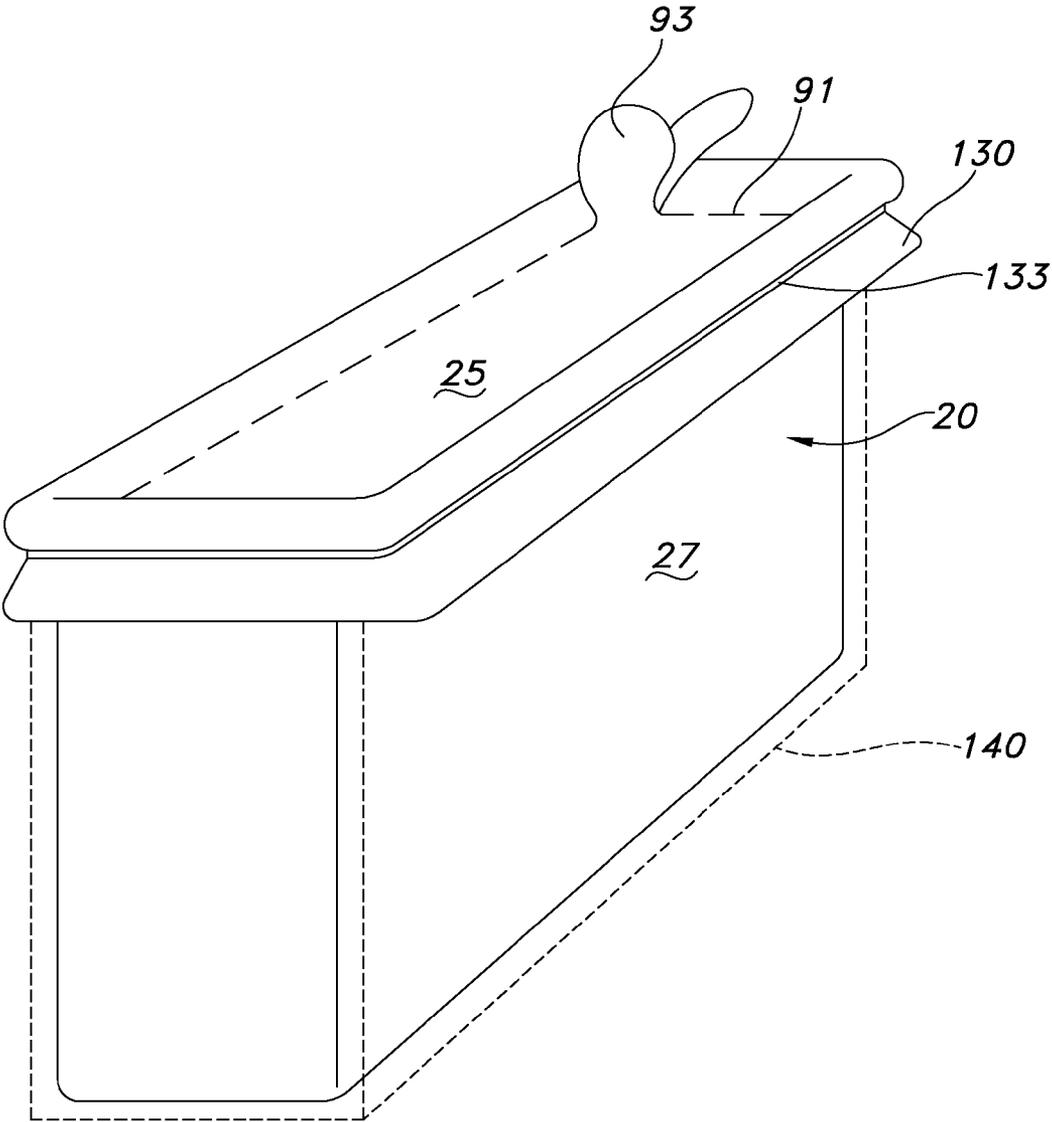


FIG. 11

DISPOSAL BAG ASSEMBLY AND DISPOSAL SYSTEM

[0001] This application is a Continuation-In-Part (CIP) application of U.S. application Ser. No. 11/217,036, entitled "Disposal Bag And System For Disposing Of Sanitary Products" and filed on Aug. 31, 2005, in the name of Wanda W. Jackson et al.; and U.S. application Ser. No. 11/215,908, entitled "Disposal Bag And System For Disposing Of Sanitary Products" and filed on Aug. 31, 2005, in the name of Joseph Mitchell et al.; which are both incorporated herein by reference in their entirety.

BACKGROUND

[0002] The current sanitary napkin disposal bins used in public bath room facilities use paper, wax-coated paper, cellophane or plastic bags which are loosely placed in the bins. The plastic bags, even when placed over the upper edge of the bin, often slips down into the bin when the bag becomes filled. Paper and/or cellophane bags frequently collapse or fold inward, allowing sanitary products and the like to be disposed between the bag and a wall of the bin, thereby soiling the bin.

[0003] Removal of a bag filled with refuse creates a problem as well. Maintenance staff must remove the bag and any sanitary products, or other refuse, which may have fallen between the bag and the wall of the bin. Further, maintenance personnel must then clean the bin before placing a new bag in the bin, so that the bin does not become malodorous. Bag removal and bin cleaning are hazardous activities for maintenance personnel, who must handle with care sanitary products and other refuse contaminated with body fluids and the like.

[0004] With the removal of each full bag, another empty bag must be secured in place prior to the disposal bin being ready to receive more disposed sanitary products. Each time a new bag is placed in the bin is another instance when the bag may be placed improperly such that sanitary products fall between the bag and the interior walls or the bin. In addition to the increased probability of incorrect bag installation or poor placement, placing a new bag in the bin is an extra step for the maintenance personnel to perform, incrementally increasing the time the maintenance personnel needs to take in cleaning an entire facility.

[0005] Such problems also exist for other refuse disposal systems. The problems discussed for sanitary disposal units are also experienced in commercial and residential settings. Just as custodial staff have issues with liner bags collapsing in sanitary disposal units, similar problems occur with liners slipping down inside of bathroom refuse bins, office paper bins, and the like. Similarly, consumers have problems with trash bags slipping off of the waste bins in the kitchen, home, office or bathroom such that refuse falls between the liner bag and the interior walls of the bin.

DEFINITIONS

[0006] As used herein, the term "refuse" refers to something that is discarded as worthless, useless, or used up. It is generally directed to rubbish, trash, garbage, and may include, among other thing, discarded sanitary products, kitchen waste, office waste, bathroom waste, household waste, yard and garden debris, and the like.

[0007] As used herein, the term "sanitary products" include, but are not limited to, feminine napkins, tampons, colostomy bags, ileostomy bags, male incontinence pads, baby diapers, disposable training pants for children, adult incontinence products including pads, disposable underwear, and so forth.

[0008] As used herein, the term "fasteners" means devices that fasten, join, connect, secure, hold, or clamp components together. Fasteners include, but are not limited to, screws, nuts and bolts, rivets, snap-fits, tacks, nails, loop fasteners, and interlocking male/female connectors, such as fishhook connectors, a fish hook connector includes a male portion with a protrusion on its circumference. Inserting the male portion into the female portion substantially permanently locks the two portions together.

[0009] As used herein, the term "couple" includes, but is not limited to, joining, connecting, fastening, linking, or associating two things integrally or interstitially together.

[0010] As used herein, the term "configure" or "configuration" means to design, arrange, set up, or shape with a view to specific applications or uses. For example: a military vehicle that was configured for rough terrain; configured the computer by setting the system's parameters.

[0011] As used herein, the term "hinge" refers to a jointed or flexible device that connects and permits pivoting or turning of a part to a stationary component. Hinges include, but are not limited to, metal pivotable connectors, such as those used to fasten a door to frame, and living hinges. Living hinges may be constructed from plastic and formed integrally between two members. A living hinge permits pivotable movement of one member in relation to another connected member.

[0012] As used herein, the term "substantially" refers to something which is done to a great extent or degree; for example, "substantially covered" means that a thing is at least 95% covered.

[0013] As used herein, the term "alignment" refers to the spatial property possessed by an arrangement or position of things in a straight line or in parallel lines.

[0014] As user herein, the terms "orientation" or "position" used interchangeably herein refer to the spatial property of a place where or way in which something is situated; for example, "the position of the hands on the clock."

[0015] As used herein, the term "waste disposal unit" refers to a unit provided in a commercial or residential setting which is configured to receive refuse. Such waste disposal units include, disposal units such as sanitary disposal units, residential bathroom waste bins, residential kitchen refuse bins, commercial office waste bins, garbage cans, and the like.

[0016] As used herein, the term "sanitary disposal unit" refers to a unit provided on or in a wall or other structure of a public bathroom, that is, in the stall of each area containing a toilet, which is configured to receive sanitary products.

[0017] These terms may be defined with additional language in the remaining portions of the specification.

SUMMARY OF THE INVENTION

[0018] In light of the problems and issues discussed above, it is desired to have an improved disposal bag system

for disposing of refuse. Such a system would desirably be configured so that the disposal bag(s) did not slip down into the bin, resulting in refuse being deposited between the bag(s) and the wall of the bin. Desirably, such a system would provide a structure which would hold bags in place on the bin. Furthermore, it would be desirable of such a system provided a new empty disposal bag upon removal of the used disposal bag. In addition, such a system would desirably provide a safe and easy way for maintenance personnel to remove used disposal bags and seal them. Further, it would be desired that such a disposal bag system provide the user with additional functionalities to enhance the operation of the system, improve the system in use, and make the disposal of the refuse clean and easy.

[0019] The present invention is directed to a system for disposal of refuse adapted for use within a waste disposal unit. The system includes a frame and a plurality of bags, where individual bags of the plurality are nested within each other and inside an outermost bag. The bags are attached to the frame and are held open for the disposal of refuse thereinto and where upon the removal of a bag, until the outermost bag, the system provides another open bag for ready disposal of refuse. Additionally, the frame is adapted to fit within the waste disposal unit such as to prevent refuse from falling between the frame and the interior walls of the waste disposal unit.

[0020] In various embodiments, the frame may have additional features or characteristics that facilitate use of the system, improve disposability of the system, or otherwise enhance the system. For example, the system may be adapted to fit within the waste disposal unit and rest upon a flange within the waste disposal unit or the system may alternatively include a flange that is installed within the waste disposal unit and upon which the frame may rest. In various embodiments, the frame may have a bonding material that keeps the frame in place during use, frame extensions, a cinch that secures the frame to a waste disposal unit, may be made of a plurality of laminate frames, may be foldable and have a closure bonding material, or any combination of such features.

[0021] In the same way, the bags may have additional features or characteristics that facilitate their use, improve the disposability of the bags, or otherwise enhance the bags. In various embodiments, the bags may have pull indicia, tabs, frame indicia, lines of weakness to facilitate removal from the frame, closure bonding material, odor control enhancements, or any combination of such features.

[0022] The present invention is also related to a system for disposal of refuse adapted for use within a waste disposal unit, where the system includes a frame, a plurality of bags nested within each other and within an outermost bag, and a support that holds the frame and plurality of bags near the open periphery of the waste disposal unit. The support may have an upper perimeter and at least one leg. Such a support may also be capable of being folded into a folded configuration and in some examples may be configured to self-erect from such a folded configuration.

[0023] Finally, the present invention is also directed to a disposal bag assembly for disposal of refuse, the assembly comprising a frame and a plurality of bags, where the individual bags of the plurality are nested within each other and within an outermost bag, and where the plurality of bags

are attached to the frame such that a first bag is held open for the disposal of refuse thereinto and where upon the removal of the first bag provides another bag open for ready disposal of refuse.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] FIG. 1 is a perspective view of a frame and bags assembly according to the present invention;

[0025] FIG. 2 is a cross-sectional view of the frame and bags assembly of FIG. 1 taken along the line 2-2;

[0026] FIG. 3 is a perspective view of another frame and bag assembly according to the present invention;

[0027] FIG. 4 is a perspective, exploded view of a multiple laminate frame and bag assembly according to the present invention;

[0028] FIG. 5 is a perspective view of the bag system of the present invention showing the system in place within a waste disposal bin with a cutaway in the bin to show the frame of the bag system resting on a flange within the disposal bin;

[0029] FIG. 6 is a cross-sectional view of the bag system and bin of FIG. 5 taken along the line 6-6;

[0030] FIG. 7 is a partial perspective view of the top of a waste disposal bin with one flange of the bag system of the present invention applied to the side of the bin according to the present invention and showing the installation of a second flange;

[0031] FIG. 8 is a perspective view of a support structure and bag system according to the present invention;

[0032] FIG. 9 is a perspective view of another bag system of the present invention showing various bag enhancements;

[0033] FIG. 10 is a perspective view of another bag system of the present invention showing a frame disposal embodiment; and

[0034] FIG. 11 is a perspective view of another bag system of the present invention having a flexible frame.

DETAILED DESCRIPTION

[0035] Reference will now be made in detail to one or more embodiments of the invention, examples of which are illustrated in the drawings. Each example and embodiment is provided by way of explanation of the invention, and is not meant as a limitation of the invention. For example, features illustrated or described as part of one embodiment may be used with another embodiment to yield still a further embodiment. It is intended that the invention include these and other modifications and variations as coming within the scope and spirit of the invention.

[0036] The system of disposal of the present invention may be used for any refuse disposal needs. For simplicity the invention is discussed and illustrated in terms of the specific needs and application for use in sanitary product disposal and other specific waste disposal applications. However, such examples are not intended to be limiting. Such concepts are applicable to not only to the specific waste disposal applications discussed, but also to any waste disposal application that relies on refuse bags.

[0037] Referring to FIGS. 1-11 in general, a plurality of bags 20 are provided attached to a frame 30 that is adapted to fit within a waste disposal unit. The bags 20 are nested within each other with the innermost bag 21 open for waste to be disposed into. When the innermost bag 21 is filled, it is removed from the frame 30 and the next bag 22 is then available for disposal of refuse. The frame 30 is adapted to fit within existing waste disposal units such that refuse does not fall between the frame 30 and the interior walls of the waste disposal unit.

[0038] Bags 20 are attached to the frame 30 and are individually removable when filled. Bags 20 are attached to the frame 30 by any means as is known in the art to attach bags 20 to the frame 30. For example, the bags 20 may be adhered to each other and the last bag adhered to the frame 30. Alternatively, the bags 20 may be attached to the frame 30 by fasteners 35, as shown in FIGS. 2 and 3, at various points about the frame 30. As another example, the bags may be thermally sealed to the frame 30. Such a thermal seal 36 is shown as the frame attachment in FIGS. 5 and 6. The bags 20 may alternatively be attached by any type of fastener that is appropriate for the materials used for the bags 20 and the frame 30. Any of such attachment methods or means may be used individually or in combination.

[0039] Additionally, it may be desired to attach the bags 20 to the frame 30 so they are easily and individually releasable from the plurality of bags upon the bag being filled with refuse. For example, the bag may be intermittently sealed to the frame 30 such that individual bags may be easily removed when appropriate. Alternatively, the bags may have perforations such that the bags may be torn from the plurality of bags without disturbing the attachment of the plurality of bags to the frame 30.

[0040] The frame 30 of the assembly 10 is sized appropriately to fit within the waste disposal unit with which the assembly 10 is to be used. As shown in FIGS. 1 and 3, the frame 30 may be generally rectangular in shape. However, the frame 30 may be any size and shape as is appropriate for particular waste disposal units. For example, the frame 30 may be rectangular, square, elliptical, circular, or any other shape, symmetrical or asymmetrical, that is desired. When properly fit within the waste disposal unit, and near the open end of the waste disposal unit, the system will prevent refuse from getting between the frame 30 and the interior side walls of such a disposal unit.

[0041] The frame 30 may be made from any material that is appropriate to attach and support the plurality of bags 20 of the assembly 10. The materials of the frame 30 may be rigid as shown in FIGS. 1 and 3, or may be flexible as shown in FIG. 11. It is intended that the frame 30 will be disposable and that the materials used to make the frame 30 will be appropriate for such disposal. Typically, the frame 30 will be made from heavy paper cardstock or plastic, however, the frame 30 may be made from any material that will support the plurality of bags 20.

[0042] The frame 30 may be a single, unitary piece or it may be made up of a plurality of individual laminate frames 41 that are plied together to form the frame 30. Alternatively, as shown in FIG. 4, individual laminate frames 41 may be plied upon a single base frame 40. In these laminate frame executions, the individual bags of the plurality of bags would each be attached to one of these individual laminate

frames 41. Each of these individual laminate frames 41 and individual bag assemblies could then be removed upon the filling of the individual bag.

[0043] Additional functionality could be added to the frame 30 to enhance the performance or capability of the frame 30. As shown in FIG. 3, frame extensions could extend the frame to, or beyond, the periphery of the waste disposal unit in which the assembly 10 is used. Such end extensions 37 or side extension 38 could be added to the frame 30 to help ensure that refuse is directed into the bags 20, rather than between the frame 30 and the interior walls of the waste disposal unit. Additionally, a bonding material 39 may be present on the underside of such frame extensions 37, 38 to help secure the extensions in place on the interior side walls of the waste disposal unit. Such adhesive may be a pressure sensitive adhesive, double sided tape or some other similar bonding materials 39 that would releasably attach the extension to the interior walls of the waste disposal unit. Such a bonding material 39 would have enough attachment strength to hold the frame extensions 37, 38 in place while allowing the frame 30 to be removed from the waste disposal unit at the end of the useful life of the assembly 10.

[0044] Additionally functionality may be added to the frame 30 or the laminate frames 41 to improve the ease of removal or alternatively, or additionally, communicate a desired message to the user. For example, as shown in FIG. 4, the laminate frames 41 may have frame tabs 43 that provide the user with a portion of the particular laminate frame 41 that can be easily grasped to remove that frame 41. Such frame tabs 43 may additionally have tab indicia 45 that help differentiate the frame tabs 43, indicate to the user where they need to pull to remove the frame 41, indicate the number of laminate frames 41 remaining in the assembly 10, or any other message, or combination of messages, that are desired to be communicated to the user.

[0045] Similarly, or alternatively, the laminate frames 41 may have frame indicia 47 associated with the frame 41 to indicate a message to the user. Such frame indicia 47 may be located at distinct locations on individual laminate frames 41 or may be located on the entire laminate frame 41. For example, as shown in FIG. 4, the laminate frames 41 have frame indicia 47 that differentiate the individual laminate frames from each other. As such, if the user saw a letter "A" on the frame they would know that they had several laminate frame and bag assemblies available before they would have to replace the entire assembly 10. Similarly, the base frame 40 may have an frame indicia 47; when such a frame indicia 47 was visible on the base frame 40, the user would know that a new assembly 10 should be installed.

[0046] Whether they are on the frame tabs 43, on the laminate frames 41, or both, such frame indicia 47 may be any word(s), numeral(s), line(s), symbol(s), picture(s), physical shape(s), color(s), texture(s) and/or combination(s) thereof, and so forth, which communicates to the user a desired message. One skilled in the art would be able to see how various indicia types and locations could be used to communicate a desired message to the user of the disposal system of the present invention.

[0047] It is intended that the frame 30 supports the plurality of bags 20 in such a way as to hold the bags open for the disposal of refuse thereinto. To facilitate such a use of the

assembly 10, the frame 30 needs to support the plurality of bags 20 in such away as to keep the frame 30 close to the periphery 53 of the waste disposal unit bin 50. Some typical bins, such as the bin 50 shown in FIGS. 5 and 6, include a strengthening strut 57. Such struts 57 are molded into the bin 50 to provide greater strength and rigidity to the bin 50. These struts 57 may be on the ends 51 of the bins 50, as shown in FIG. 5, may be on the sides 52 of the bin 50, or they may be on both the sides 52 and the ends 51.

[0048] Often, such strengthening struts 57 will not extend all the way to the periphery 53 of the bin 50 and thus will provide a flange 55 at some point in the interior of the bin 50 near the periphery 53 of the bin 50. In such bins 50, the frame 30 of the assembly may be sized and shaped appropriately such that the frame 30 may rest upon and be supported by such a flange 55. Additional security could be added by including a bonding material, such as an adhesive, double-sided tape or fastener, on the underside surface 34 of the frame 30 and in the area that the frame 30 come into contact with such a flange 55 within a bin 50. Such a bonding material may be covered with a protective peel strip that may be removed immediately prior to installation of the assembly 10 within the desired bin 50.

[0049] In bins 50 where there is no flange 55, the disposal system of the present invention may include a disposable flange 70, as shown in FIG. 7. Such a disposable flange 70, may be adapted to be installed on an interior wall 59 of a bin 50 in order to support the assembly 10 on the top surface 73 of the flange 70. As shown in FIG. 7, the disposable flange 70 would be installed near the periphery 53 of the bin 50 by any method or means appropriate to securely hold the disposable flange 70 in place while it supports the assembly 10 and any refuse within the bags during use. For example, as shown in FIG. 7, the disposable flange 70 may have an adhesive 77 present on the back 75 of the flange 70 which may be used to secure the flange in its installed position 71 on the interior wall 59 of the bin 50.

[0050] The disposable flange 70 is shown in FIG. 7 as two pieces that are installed on the interior side walls 59 of the bin 50. However, different configurations of disposable flange(s) 70 may be used to support the assembly 10 of the present invention. For example, instead of being located on the side walls of the bin 50, the flanges 70 may be present on the end walls, in the corners, or combinations of the sides, ends and corners. Alternatively, such a disposable flange 70 may be a single piece that extends about the entire periphery of the bin 50. One skilled in the art would be able to provide an appropriate number and configuration of such disposable flanges 70 to meet the particular needs of the particular bin 50 and the assembly 10 that is to be used.

[0051] Another way of keeping the assembly 10 of the present invention close to the opening of the waste disposal unit is by the use of a support 80. As shown in FIG. 8, such as support 80 would have an upper surface 83, on which the frame 30 could rest upon and be supported by and at least one leg 53 that raises the frame 30 up to the opening of the waste disposal unit and additionally provides room for refuse to be deposited into the bags 20. Additionally, the support 80 may have a foot 87 to provide a base for the support 80. The upper surface 83 of the support 80 may be a single continuous leg or may be multiple legs 85, as shown in FIG. 8.

[0052] Such a support 80 may be configured to fit within a bin of a waste disposal unit or it may be designed as a replacement to such a bin. Additionally, the support 80 may be designed such that it can be folded down into a folded configuration to take of less room during shipping and storage prior to installation and use. As used herein, a "folded configuration" would be a configuration in which the support 80 is folded down such that it takes up less space than when in use, but will take up the space that is inherent due to the dimensions of the support 80 itself, including overlapping legs 85 and feet 87, if present.

[0053] In systems where the support 80 is configured to be folded into a folded configuration, the support 80 may be configured to be unfolded through manually manipulation or it may be designed to self-erect. Such a self-erecting support 80 would include springs, elastic members, or other structure, that is biased to the desired configuration necessary to support the assembly 10 and hold the bags 20 open for disposal of refuse. As such, the self-erecting support 80 may need to be restrained to hold it in a folded configuration and when unrestrained may return to its unrestrained open configuration during use.

[0054] The support 80, as illustrated in FIG. 8, is desirably tubular, but is not limited to such a structure. It may be formed from light-weight plastic, metal, cardboard, paperboard, or any combination thereof. The materials used for the support 80 are dependent upon the desire use, design of the support 80, general design choice, and intended durability. One skilled in the art would understand how different materials would be appropriate with such a particular set of criteria.

[0055] Finally, the size and shape of the support 80 may be any size and shape as appropriate for the desired use. The systems 80 illustrated in FIG. 8 is shown as generally rectangular in shape, but it may be any shape, symmetrical or asymmetrical, that is appropriate for the intended location, desired use, design choice, or any combination of such factors. The support 80 may be of a size and shape to fit with bin of a waste disposal unit; it may be small enough to replace the bin in a sanitary disposal unit; it may be large enough to replace a trash bin in a home or a commercial setting; it may be large enough to be used outdoors to collect yard debris; or the support may be any other size adequate for the specific intended use. Such a support 10 may be configured, sized and shaped to work with an existing waste disposal unit or alternatively replace such a waste disposal unit.

[0056] The frames 30 shown in the variations of FIGS. 1, 4, and 5, all illustrate frames 30 that need to be rigid enough to be supported by a flange 55, a disposable flange 70, or support 80, as appropriate for the desired execution. However, the frame may alternatively be a flexible frame 130, as shown in FIG. 11. Such a flexible frame 130 may be made of the same materials as the bags 20 or may be made of some similar flexible material. The flexible frame 130 may be made of an elastic material.

[0057] As shown in FIG. 11, the flexible frame 130, may fit over the open end of the waste disposal unit 140. Alternatively, the flexible frame 130 may be fit over the open end of a bin 50 within a waste disposal unit or over a support 80, such as shown in FIG. 8. In any of those executions, the flexible frame 130 may also have a cinch 133 that helps

secure the flexible frame **130** to the waste disposal unit **140** or support **80**. Such a cinch **133**, may be an elastic band, a draw string capable of being pulled tight, crimping of a portion of the flexible frame **130**, or some other similar means or method associated with the flexible frame **130** configured to secure the flexible frame **130** in place while in use.

[0058] The bags **20** may be formed as one continuous unit having a shape which generally follows the rectangular shape and opening of the frame **30**, as illustrated in FIGS. **1** to **4**. Alternatively, the bags **20** may be formed from one or two substantially flat panels which are heat sealed together to provide a generally rectangular bag. Each of the bags **20** includes an outer surface **27** and an inner surface **25**. The configuration of the bags **20** is non-limiting, and any configuration for the bag may be used.

[0059] The bags **20** may be made of any material that is appropriate for the application and the refuse that is typically to be disposed of in such bags. Typically such refuse bags or waste receptacle liners are made from plastics such as polyethylene (LDPE, LLDPE), polypropylene, polyethylene terephthalate (PET), and other similar materials. The bags **20** may be made of a single ply of material or may be made from multiple plies of similar or dissimilar materials. Additionally, the bags **20** may be made from composites of films, nonwoven materials, woven materials, or combinations thereof. The bags **20** may incorporate elastic materials. The bags **20** may be puncture resistant. Different materials, substrate weights and thicknesses, elasticity, composite materials, and the like may be used in various combinations to provide the end user with a bag having the desired strength, flexibility, weight, puncture resistance, or other desired attributes.

[0060] The bags **20** are attached to the frame **30** in a nested configuration. Such a nested configuration refers to the bags being situated such that all but an outermost bag **23** is fitted inside another of the plurality of bags **20**. Furthermore, the plurality of bags **20** are held in an open configuration such that the innermost bag **21** is exposed at the open end **12** of the assembly **10**. Subsequent bag(s) **22** are fitted around the innermost bag **21** in a nested configuration. When the innermost bag **21** is filled, it is removed from the frame **30** and the subsequent bag **22** is then available for use as it is held open by the frame **30**. All of the bags of the plurality of bags **20** may be the same type of bags or different types of bags may be present within the plurality.

[0061] In such a nested configuration, the outermost bag **23** may be removed from the frame **30** in the same manner as the previous bags or it may be disposed along with the frame **30**. Additionally, the outermost bag **23** may be a stronger bag than the other bags that are nested within the outermost bag **23** or may have a reinforcing liner such that if the bags nested within the outermost bag **23** were to fail, the refuse would ultimately be contained within the outermost bag **23**.

[0062] The number of bags **20** used along with a particular assembly **10** is dependant on the desired use of such a assembly **10** and is a function of the particular use, convenience and design choice. For example, the number of bags for a particular assembly **10** may be the number of bags as are commonly removed during normal custodial intervals. If custodial staff empties a waste receptacle unit twice a day during a work week, it may be desired that the assemblies be equipped with ten bags. One skilled in the art would see that

any number of bags may be effectively used in the assemblies **10** of the present invention and would understand the balance between having enough bags to gain the efficiency of not having to replace bags with every disposal of a bag and having so many bags that the space for refuse is unacceptably limited.

[0063] The bags **20** of the assemblies **10** of the present invention, may additionally have tabs **93** that facilitate easy and cleanly removal bags **20** filled with refuse. As shown in FIG. **8**, such tabs **93** may be near the opening of the bags **20** and provide the user with a surface for the custodial staff to grab on to in order to pull the bag free of the frame **30**. Additionally, such tabs **93** may be associated with a line of weakness **91** to further facilitate the removal of the bags **20** from the frame **30**. Such a line of weakness **91**, may be perforations, areas of weakened material, scoring or other such means as to allow the bags **20** to be torn from the frame **30**.

[0064] Additionally, pull indicia **103** may be associated with the tabs **93**. Such indicia may be any word(s), numeral(s), line(s), symbol(s), picture(s), physical shape(s), color(s), texture(s) and/or combination(s) thereof, and so forth, which communicates to the user a desired message. The pull indicia **103** may be used to help the user locate the tab **93**, indicate the function of the tab **93**, and help the user differentiate the individual tabs **93** of the plurality of bags **20**.

[0065] Alternatively, or additionally, indicia may be used on the tabs **93**, or on the bags themselves, to help the custodial staff determine if a new assembly **10** should be installed or will need to be installed soon. For example, the outermost bag **23** may be a different color, or have a differently colored tab **93**, than that of the other bags and thus indicate to the custodial staff that the assembly **10** should be removed and a new assembly **10** may be installed. One skilled in the art would be able to see how different indicia could be used on the tabs **93**, or on the bags **20**, to communicate a desired message to the user of such an assembly **10**.

[0066] The bags **20** shown in FIGS. **1** to **10**, all show assemblies **10** in which the bags extend to near the edges of the frame **30**. However, the bags may alternatively extend beyond the edges of frames **30**. In such assemblies **10** the bags may extend beyond where the bags are attached to the frame **30** by a fastener **35**, adhesive, thermal seal **36** or other manner of attachment. Such an extension of the bag beyond the frame **30** may increase the ease of removal of an individual bag from a frame **30** and may improve the cleanliness of such a removal.

[0067] Additionally, the bags **20** of the present invention may have one or more features that aid in the closure and disposal of the bag **20** containing refuse. In one option, each bag **20** may include a bonding material **105** (FIG. **9**) which is desirably positioned on a surface of the bag **20** near the opening of the bag **20**. The bonding material **105** may include, for example, but not by way of limitation, an adhesive, such as a pressure sensitive adhesive, a cohesive adhesive, such as a latex, and so forth. The bonding material **105**, may additionally be covered by a release strip that would protect the bonding material **105** prior to use and could be removed when it is desired to securely close the bag **20**.

[0068] As discussed above, the bags **20** may have a tab **93** that aids in removing a particular bag from the frame **30**.

Such a tab **93** may additionally help securely close the bag. The tab **93** may be of a length to tie off a bag that has been twisted closed at its opening. Alternatively, more than one tab **93** may be present and such tabs **93** could be tied together to close the bag **20**.

[0069] The bag itself may be treated or may be made of material that allows for easy removal of an individual bag from the plurality of bags **20**. One problem often encountered with nested materials is the tendency of bags **20** to be attracted to each other, due to static electric charges when an inner bag of the plurality of bags **20** is being removed from the plurality of bags. To overcome this static attraction of bags, the bags may have an anti-static treatment or may be made of a reduced static-susceptible material such as ultra low density polyethylene.

[0070] As shown in FIG. 9, the bags **20** may have a draw string **109** associated with the opening of the bags **20**. When the bag **20** is removed from the frame **30**, the draw string **109** may then be pulled to close the open end of the bag **20**. Such a draw string **109** may be the same material as the bag **20**, plastic, string, or other material as is common for such draw strings **109**.

[0071] The frame **30** may also be designed to include disposal functionality. For example, as shown in FIG. 10, the frame **30** may be formed such that each opposed end portions of the frame **30** is formed to include a hinge or foldable portion, desirably a living hinge **113**. The foldable portion may be scored, folded and/or notched in middle to each opposed end portion of the frame **30** so that the frame **30** folds as shown and/or described herein. Therefore, as used herein, "foldable portion" includes both a hinge and a scored, folded and/or notched area which permits each end portion of the frame **30** to fold. The frame **30** desirably includes a bonding material **115** such as, for example, but not by way of limitation, an adhesive, such as a pressure sensitive adhesive, a cohesive adhesive, such as a latex, and so forth, that is disposed on at least a portion of the upper surface **33**. When a pressure sensitive adhesive is used, it is desirably covered by a release strip **117**. When the assembly is removed, the frame **30** is configured to fold inward along a direction **101**. Desirably, release strips **117** are removed and deposited in the bag, and the frame **30** is folded inward so that the upper surface **33** of the frame **30** adheres to itself to create a secure closure of the assembly.

[0072] Additional functionality could be added with an odor control functionality that is provided by the bags **20**. Odor sorbing material could be disposed on the surface of the bags **20**, within each of the bags **20**, or within the bag substrate. For example, a sheet of cardboard or paperboard **107** may be treated with an odor sorbing material and included in or on the bags **20**. The sheet of paperboard **107** is desirably treated with an odor sorbing material such as activated carbon. One such activated carbon is NUCHAR SA activated carbon from Westco Corporation, New York, N.Y. For example, to provide such a sheet of paperboard **107**, a mixture of 100 grams sodium silicate at 38.3% solids and 19.2 grams of activated carbon is dispersed in 20 grams of water. A final coating formulation having a solids of about 41% was obtained with the solids content consisting of about 33% carbon and 67% binder. The carbon concentration of the coating was about 14%. This formulation was applied to an uncoated side of paperboard. Such as PRINT-KOTE bleached paperboard (available from Westvaco Corporation, New York, N.Y.) using a No. 12 wire wound rod at a coat weight of about 26 lbs/ream (ream size 3000 ft²) to

a nominal thickness of about 1.2 mils. The weight of carbon in the applied coating was about 3.8 mg/in²

[0073] Starch or polyvinyl alcohol may be used as the binder system. Coating formulations useful in the present invention desirably have a solids content of from about 30-45% depending upon the method of application. Coat weights may range from 3-26 lbs/ream, and the activated carbon content of the coating may range from about 20-95%, depending upon the degree of odor absorption desired. One method of applying activated carbon to paperboard is disclosed in U.S. Pat. No. 5,540,916, to Parks, which is hereby incorporated by reference herein for all purposes. Another method of applying activated carbon to articles is disclosed in U.S. Pat. No. 6,417,424 to Bewick-Sonntag et al., which is hereby incorporated by reference herein for all purposes.

[0074] Moreover, adhesives, such as pressure sensitive adhesives, may also be used as the binder system. Such a binder permits the activated carbon to be applied to plastics and/or polymers. As such, for example, but not by way of limitation, the inner surface **25** of the bags **20**, or at least a portion thereof, may be treated with an activated carbon coating.

[0075] Other activated carbon treatments, such as activated carbon ink, may be used as well for any portion of the bags **20**.

[0076] In same manner as discussed above for the bags, odor control functionality may additionally, or alternatively, be provided by the frame **30**. Such frame odor control functionality may be incorporated into the substrate of the frame **30**, be included on the surface of the frame **30**, or otherwise provided by the frame **30** of the present invention.

[0077] In various embodiments, additional functionalities may be added to the bags. For example the bags may have an anti-viral or anti-bacterial treatment associated within or on the bags. Such treatments may help reduce the bacteria or virus levels within the bags.

[0078] Another possible functionality for the bags of the present invention is the incorporation of superabsorbent materials into the bags. Such superabsorbents could be added as a substrate to the bags or may be incorporated into the walls of the bags so to absorb any free liquid that may be present in the bags.

[0079] It will be appreciated that the foregoing examples and discussion, given for purposes of illustration, are not to be construed as limiting the scope of this invention, which is defined by the following claims and all equivalents thereto.

1. A system for disposal of refuse adapted for use within a waste disposal unit, the system comprising:

- a frame; and
- a plurality of bags, where each individual bag of the plurality of bags is nested within each other and inside an outermost bag,

where said plurality of bags is attached to said frame and each bag of said plurality of bags is held open for the disposal of refuse thereinto,

where each individual bag of the plurality of bags is detachable and removeable such that when an open bag is filled with refuse, the bag is detached and removed

and another bag is held open for the disposal of refuse thereinto, until all bags of the plurality are removed, and

where the frame is configured to fit within a waste disposal unit such as to prevent refuse from falling between the frame and an interior wall of such a waste disposal unit.

2. The system of claim 1, where the frame is adapted to rest upon a flange within a waste disposal unit.

3. The system of claim 2, where the frame comprises a bonding material on an underside of the frame, the bonding material facing the flange.

4. The system of claim 1, further comprising at least one disposable flange that is installed on an upper interior space of a waste disposal unit, where the frame rests upon the flange.

5. The system of claim 4, where the frame comprises a bonding material on an underside of the frame, the bonding material facing the flange.

6. The system of claim 1, where the frame further comprises at least one frame extension.

7. The system of claim 6, where the frame extension comprises a bonding material that releasably attaches the frame extension to a waste disposal unit.

8. The system of claim 1, where the frame comprises a plurality of laminate frames, where each laminate frame is attached to an individual bag of the plurality of bags.

9. The system of claim 1, where at least one of the individual bags of the plurality of bags comprises a pull indicia.

10. The system of claim 9, where the individual bags within the plurality of bags each comprise a tab configured to facilitate removal of the individual bag from the frame when the tab is pulled.

11. The system of claim 1, where the frame comprises a frame indicia.

12. The system of claim 1, where the individual bags of the plurality of bags each comprises a line of weakness, where the line of weakness facilitates the removal of the individual bag from the frame.

13. The system of claim 1, further comprising an odor control enhancement.

14. The system of claim 13, where the odor control enhancement is provided by the frame.

15. The system of claim 13, where the odor control enhancement is provided by the bags.

16. The system of claim 8, where the individual laminate frames each comprise at least one bonding material portion where the individual laminate frames are configured to be folded, and where when an individual laminate frame is removed from the system, the frame is configured to fold together, close off and seal the opening of the laminate frame.

17. The system of claim 1, where each individual bag of the plurality of bags further comprises a bonding material, where the bonding material is configured to close and seal the individual bag for disposal.

18. The system of claim 1, where the frame further comprises a cinch, where the cinch is configured to secure the frame to a waste disposal unit.

19. A system for disposal of refuse adapted for use within a waste disposal unit having an open periphery, the system comprising:

a frame;

a plurality of bags, where each bag is nested within each other and within an outermost bag; and

a support that holds the frame and the plurality of bags near an open periphery of a waste disposal unit;

where said plurality of bags is attached to said frame and each individual bag of plurality of bags is each held open for the disposal of refuse thereinto,

where each individual bag of the plurality of bags is detachable and removeable such that when an open bag is filled with refuse, the bag is detached and removed and another individual bag is held open for the disposal of refuse thereinto, until all bags of the plurality are removed, and

where the frame is configured for use with a waste disposal unit such as to prevent refuse from falling between the frame and an interior wall of such a waste disposal unit.

20. The system of claim 19, where the support comprises an upper perimeter and at least one leg.

21. The system of claim 20, where the support is configured to fold into a folded configuration.

22. The system of claim 21, where the support is configured to self-erect from the folded configuration.

23. The system of claim 20, where the frame further comprises a cinch configured to secure the frame to the upper perimeter of the support.

24. A disposal bag assembly for disposal of refuse, the assembly comprising a frame and a plurality of bags, where each individual bag of the plurality of bags is nested within each other and within an outermost bag, and where the plurality of bags is attached to the frame such that a first bag is held open for the disposal of refuse thereinto and where upon the removal of the first bag, another nested bag is provided for ready disposal of refuse, until all bags of the plurality of bags are removed.

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