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(54) Titre : EMBALLAGE POUR DISTRIBUER DES FEUILLES A PARTIR DE CELUI-CI AVEC INVERSION ET PROCEDE DE DISTRIBUTION DE FEUILLES AVEC INVERSION

(54) Title: PACKAGE FOR DISPENSING OF SHEETS THEREFROM WITH INVERSION AND METHOD OF DISPENSING SHEETS WITH INVERSION

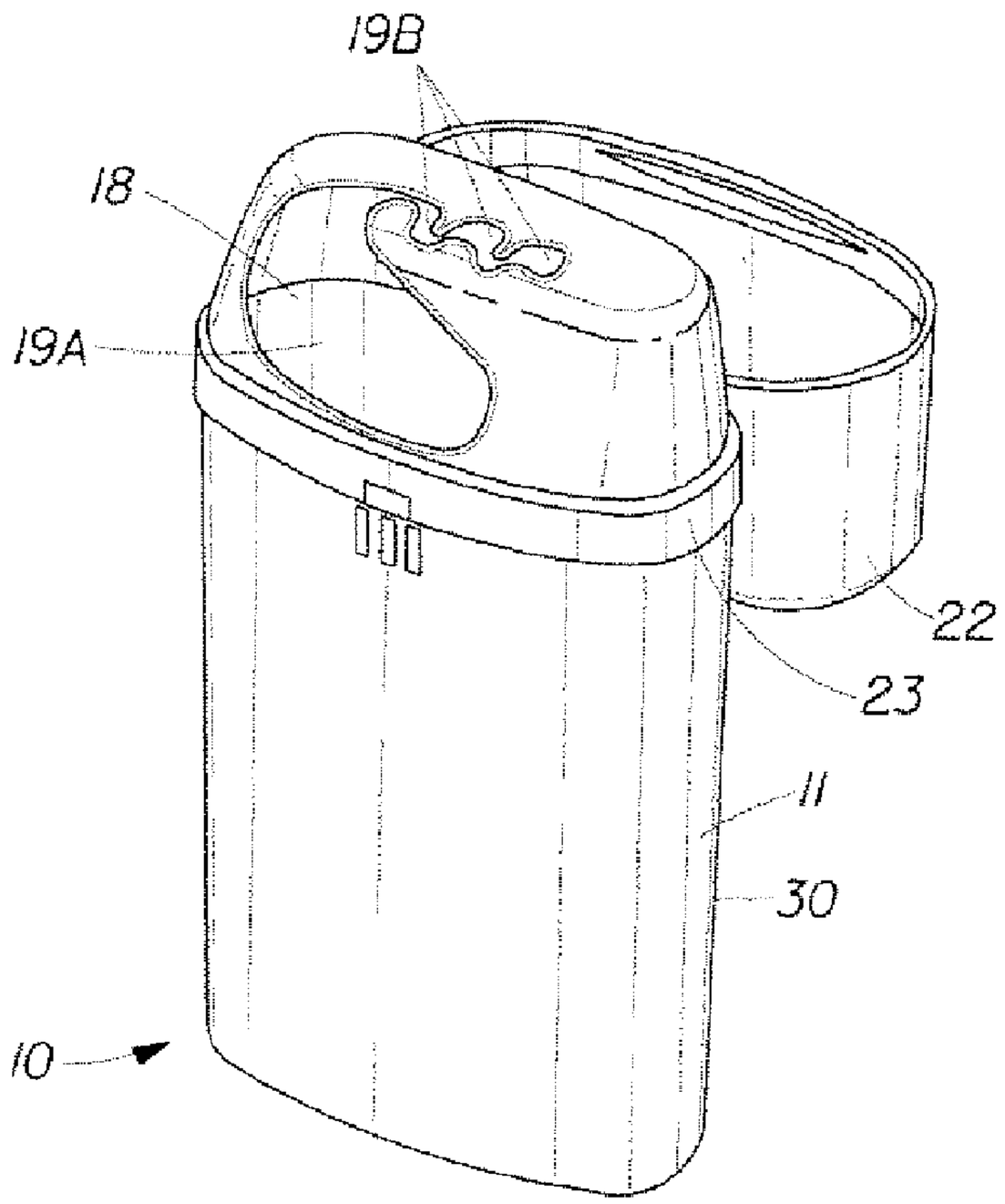


Fig. 1A

(57) Abrégé/Abstract:
A package containing sheets and having an orifice for dispensing the sheets from the package. The sheets may be joined together to allow pop-up dispensing. The sheets have first and second faces facing first and second directions, respectively. The package

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(57) Abrégé(suite)/Abstract(continued):
has two orifices in communication with each other. The sheet may be grasped through the first orifice and communicated to the second orifice for subsequent pop-up dispensing. The sheet inverts about an axis during such communication so that the first side of the sheet may face towards the second direction, and vice versa. If the sheets are wetted this arrangement also allows the wetting liquid to be distributed onto an adjacent sheet during dispensing without an additional step.

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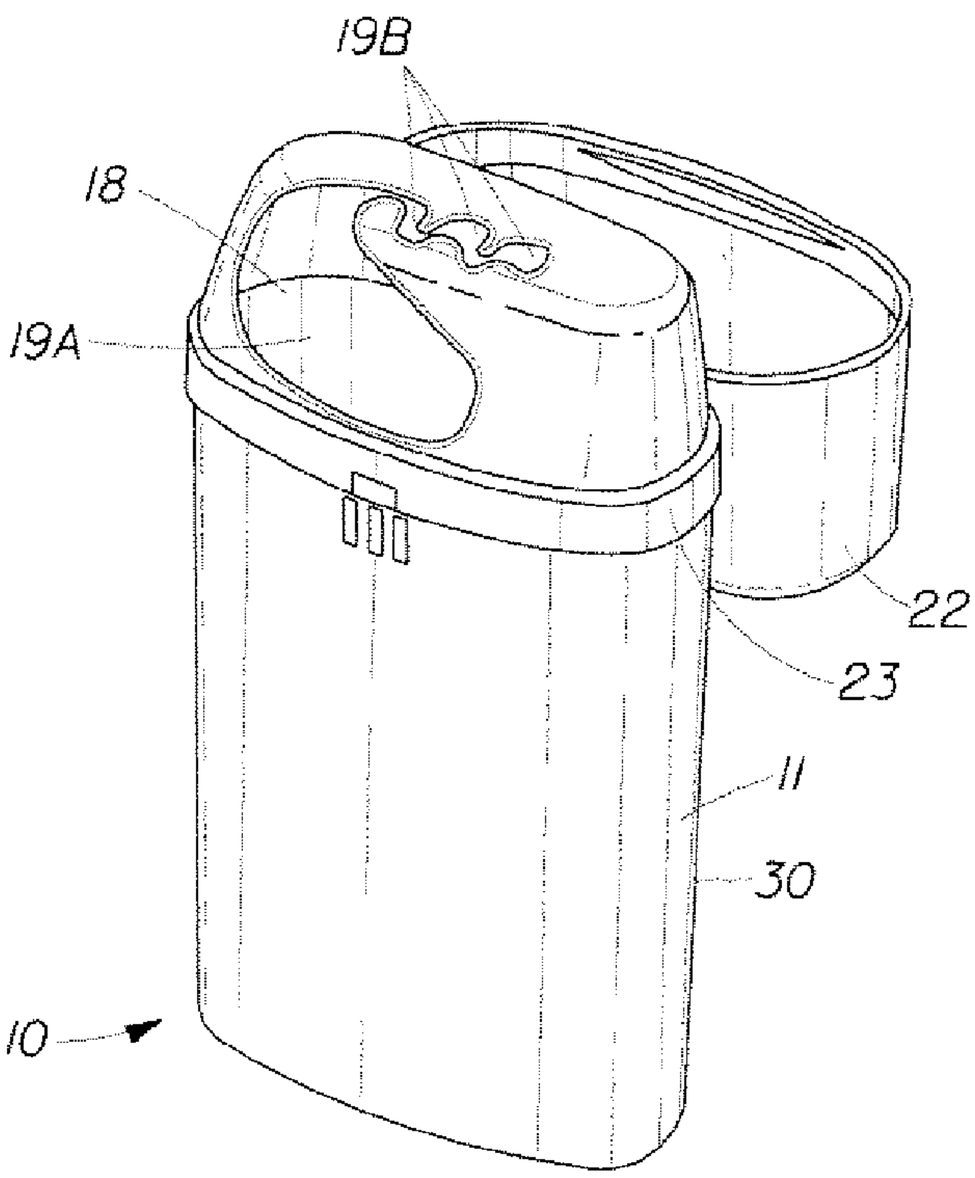


Fig. 1A

(57) Abstract: A package containing sheets and having an orifice for dispensing the sheets from the package. The sheets may be joined together to allow pop-up dispensing. The sheets have first and second faces facing first and second directions, respectively. The package has two orifices in communication with each other. The sheet may be grasped through the first orifice and communicated to the second orifice for subsequent pop-up dispensing. The sheet inverts about an axis during such communication so that the first side of the sheet may face towards the second direction, and vice versa. If the sheets are wetted this arrangement also allows the wetting liquid to be distributed onto an adjacent sheet during dispensing without an additional step.

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PACKAGE FOR DISPENSING OF SHEETS THEREFROM WITH INVERSION AND METHOD OF DISPENSING SHEETS WITH INVERSION

FIELD OF THE INVENTION

The present invention relates to dispensing of discrete sheets and more particularly to dispensing of discrete sheets from a container having an orifice.

BACKGROUND OF THE INVENTION

Dispensing of sheets from a container has long been done in the art. Reach-in dispensing allows multiple sheets to be dispensed at once, but can be inconvenient.

Pop-up dispensing is more convenient, but often dictates that a more vertically oriented package be used. If the sheets are wet, the package must have a lid, to prevent undue evaporation. A seal is formed between the lid and the body of the package.

If the seal does not have approximately equi-axed stresses, the seal may not fit tightly and evaporation may again result. This problem has been approached by using packages having a round seal and often a round cross section. However, this approach is not entirely successful. The consumer may desire a cross section having a different shape or footprint, more readily allowing indicia to be placed on a side wall of the package. Furthermore, the dispensing orifice, and hence seal may not be round in such a package.

If a package with a non-circular cross section is selected, dispensing discrete sheets may present particular challenges. If the sheets are disposed in a plane generally perpendicular to the orifice, an unduly large footprint may be required. If the sheets are packaged too tightly, tearing of the first few sheets to be dispensed may occur. The sheet may not easily unfold upon dispensing, particular if the sheet has cohesive forces due to wetting.

The need for improved dispensing and for improved dispensing packages continues. This need occurs with wet and dry sheets, which are both disposable and reusable.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1A is a perspective view of an exemplary package according to the present invention.

Fig. 1B is a perspective view, shown partially in cutaway, of the package of Fig. 1A and having sheets therein for dispensing.

Fig. 1C is a top plan view of the package of Fig. 1A.

Fig. 2 is a vertical sectional view taken a long line 2 -- 2 of Fig. 1B.

Figs. 3A – 3E are schematic side views of exemplary, representative interleaved patterns.

Figs. 4A – 4E are schematic side views of exemplary, representative non-interleaved patterns.

Fig. 5 is a frontal view of the package of Fig. 1B stack of sheets showing the inversion of the leading edge upon dispensing, the stack being in an exemplary package shown in cutaway.

SUMMARY OF THE INVENTION

In one embodiment the invention comprises a package in combination with at least one sheet therein and being dispensible the package. The package comprises a body for containing at least one sheet therein and an orifice for dispensing the sheet there through to remove it from the package. The orifice comprises a first aperture and a second aperture in unobstructed communication therewith. The second aperture has a major dimension and a minor dimension orthogonal thereto, with the major dimension being greater than the minor dimension. At least one sheet is disposed in the package. The sheet has a generally planar configuration. The plane of said sheet may be substantially aligned with the major dimension. The sheet has a first side and a second side opposed thereto, with the first side and said second side being oriented in a first direction and a second direction, respectively. The sheet can be partially dispensed through said first aperture and communicated to said second aperture, whereby at least a portion of said first side of said sheet inverts to face towards said second direction upon communication of said sheet into said second aperture.

In another embodiment the invention comprises a method of dispensing a sheet, disposed in a planar configuration, from a package in pop-up fashion. The method comprises the steps of reaching into a package and withdrawing a portion of a sheet from a starting position through a first aperture in the package, then moving the withdrawn portion of said sheet in an arcute path to a second aperture, whereby a portion of said sheet inverts about a first axis to face in the opposite direction from the starting position.

All patents and patent applications cited herein are incorporated herein by reference.

DETAILED DESCRIPTION OF THE INVENTION

Referring to Figs. 1A - 1C, the package 10 according to the present invention may comprise a body 11 for receiving articles therein. The articles are received in the body 11 of the package 10. The package 10 may have defined walls, may be generally parallelepipedly shaped, and may have a dispensing orifice 18 therein. A lid 22 may be provided to cover the orifice 18 and close the package 10.

If one or more articles are placed in the package, the articles may be dry, moist, wet or a combination thereof. The articles to be placed in the package 10 may comprise sheets 14, or may be other contents as desired.

Examining the package 10 in more detail, it may have defined walls 30. The walls 30 may define a top, a bottom, front and back sides, and left and right sides, and may define any suitable size and shape. The walls 30 of the body 11 and lid 22 may be generally coextensive when the lid 22 is in the closed position. Alternatively, the lid 22 may have a very different shape than the body 11.

The walls 30 of the package 10 need not be freestanding and rigid as depicted, but instead may be flaccid or resiliently deformable. This arrangement may provide a package 10 with an amorphous shape. Material such as polyethylene film may be suitable if flaccid walls are selected for the package 10. If so, a suitable package 10 may be made in accordance with the teachings of commonly assigned U.S. Pat. No. 5,379,897 issued Jan. 10, 1995 to Muckenfuhs et al. The package 10 may also be lightweight. By "lightweight" it is meant the package 10 is conveniently

portable and does not have dead weight specifically added thereto. Alternatively, the walls may be rigid. Suitable materials for rigid walls include HDPE and PP.

The orifice 18 may intercept both the top wall 30 and one of the other walls 30 of the package 10, so that the sheets 14 may be dispensed in either a pop-up manner or a reach-in manner. A suitable package 10 and orifice 18 may be made in accordance with the teachings of commonly assigned U.S. Pat. Nos. 4,623,074 issued Nov. 18, 1986 to Dearwester; 5,516,001 issued May 14, 1996 to Muchenfuhs et al or US Application Serial Number 11/377,788 filed Mar. 16, 2006 in the names of Wong et al. as P&G Case number 10337#.

Referring back to Figs. 1A - 1C, the orifice 18 may comprise any variety of shapes, and intercept one or more walls of the package 10. The orifice 18 may comprise a first aperture 19A and a second aperture 19B in communication therewith. By "in communication" it is meant that a sheet 14, or portion thereof, may be moved from the first aperture 19A to the second aperture 19B, and optionally, from the second aperture 19B to the first aperture 19A by the user. Such movement may occur from outside the package 10, by simply grasping the sheet 14, or a portion thereof and transferring such portion between the first aperture 19A and the second aperture 19B.

The communication between the first aperture 19A and the second aperture 19B may be unobstructed. By "unobstructed" it is meant that the path between the first aperture 19A and the second aperture 19B may be free of any pinch points, undue obstructions or other artifacts which would block movement of the sheet 14.

The first aperture 19A and/or the second aperture 19B may have a major dimension, defining the longest dimension of that first aperture 19A or second aperture 19B in any particular direction. Likewise the first aperture 19A and/or the second aperture 19B may have a minor dimension orthogonal the major dimension. The major dimension may be greater than the minor dimension for either or both of the first aperture 19A or second aperture 19B, as taken in any particular direction.

The first aperture 19A and the second aperture 19B may be of equal or unequal size/shape, be disposed on the same or different walls of the package 10, have the same or different orientations of the major and/or minor axes, as desired and suitable for a particular execution.

The first aperture 19A and/or the second aperture 19B may be sized to allow the user to reach into the package 10 and withdraw a portion of the sheet 14 therethrough, as occurs with reach-in dispensing. Additionally, the first aperture 19A and/or the second aperture 19B may be sized to allow the user to withdraw the sheet 14 therethrough and have a succeeding sheet 14 follow from the package 10 as occurs with pop-up dispensing. In the non-limiting embodiment illustrated in the figures, the first aperture 19A is larger than the second aperture 19B and sized to allow for reach-in dispensing, while the second aperture 19B is sized to allow for pop-up dispensing.

If desired, either aperture 19A, 19B, particularly the second aperture 19B may be provided with a geometry to impart friction to a sheet 14 to be dispensed there through. For example, overlapping plies, interference members, tabs, and, as illustrated, corrugations, or similar features which provide for holding a sheet 14 to be dispensed from the package 10 partially inside and partially outside the package 10 may be utilized. This arrangement allows for the user to easily grasp that potion of the sheet 14, to continue pop-up dispensing from that aperture 19A, 19B.

As noted above, the first aperture 19A and the second aperture 19B may be interconnected by a path which allows for communication of a sheet 14 there between. The path may substantially reverse its direction between the first aperture 19A and the second aperture 19B. By "reverse" it is meant that the user may pull the sheet 14 in somewhat opposed directions, or at least vector components thereof, during communication of the sheet 14 from the first aperture 19A to the second aperture 19B.

The path may lie generally transverse to the primary dispensing direction. If desired, the path between the first aperture 19A and the second aperture 19B may subtend two directions which are about 135 to 225 degrees apart. In a degenerate case, the path may reverse so that the communication occurs in two opposed directions, and the path subtend 180 degrees.

If desired, the path between the first aperture 19A and the second aperture 19B may be arcuate. This allows for relatively smooth and uninterrupted communication of the sheet 14 between the first aperture 19A and the second aperture 19B.

If desired, the orifice 18 may be asymmetric, as illustrated. In such an embodiment the first aperture 19A may have a first aperture 19A major dimension and the second aperture 19B may have a second aperture 19B major dimension. The first aperture 19A major dimension and the second aperture 19B major dimension may subtend an angle, if they lie in the same plane, or may project a dihedral angle if they lie in different planes.

The angle there between may be less than 90 degrees, less than 45 degrees or less than 20 degrees. In the degernate case discussed above, where the path reverses to subtend 180 degrees, the first aperture 19A major dimension and second aperture 19B major dimension may be thought to subtend an angle of zero degrees. Such an angle of less than 90 degrees allows for inversion of the sheet 14 about an axis, such as the first axis, not parallel to the path between the first aperture 19A and the second aperture 19B.

The walls of the package 10 may be discrete and defined from one another, and have a major depth M. The major depth is parallel to and may be measured coincident a major axis, which is generally the longest dimension intercepted by the package 10. The major depth M of the package 10 may be vertical if the orifice 18 is on the upper surface of the package 10 when the package 10 is placed on a horizontal surface or reference plane such as a table or countertop. Such a package 10 may have a primary dispensing direction generally parallel to the major axis.

The orifice 18 need not be juxtaposed with a particular edge of the package 10. The orifice 18 may be juxtaposed with the shorter edge of the package 10, a corner thereof, or in any other suitable configuration, including the front, back, or side walls 30.

The orifice 18 may be covered by a lid 22. The lid 22 may be juxtaposed with the orifice 18, in a closed position and removed from the proximity of the orifice 18 and an open position. The lid 22 may be hingedly attached to the package 10, particularly the body 11. If so, one or more hinges 24 may join the body 11 and lid 22 so that one that may move relative to the other by articulation. Alternatively, the lid 22 may be totally removable from the body 11, and not attached by hinges 24 or other means.

The package 10 may have a circular or noncircular cross section. Exemplary non-circular cross sections include squares, ovals, rectangles and other cross sections having an aspect ratio not

equal to unity. A noncircular cross-section provides the benefit that a flat surface may be presented to someone looking at the package 10. This arrangement provides the benefit that a label, advertising, instructions, graphics or other indicia may be placed on the flat surface and provide a billboard effect to the viewer. Furthermore, if the package 10 having a noncircular cross section is dropped on its side, such a package 10 will not roll.

If a generally parallelepipedally shaped package 10 is selected, the hinges 24 may be generally horizontally disposed when the package sits on in a counter or table. If the orifice 18 is at the top of the package 10, the axis of the hinge 24 may be generally perpendicular to the primary dispensing direction.

Referring to Fig. 2, the hinge 24 may be disposed on one of the long sides or one of the short sides of a package 10 having a generally rectangular cross section. While a package 10 having two hinges 24 equally spaced from the sides is shown, the invention is not so limited. A package 10 having a single hinge 24, two hinges 24 or three or more hinges 24 may be utilized. The hinges 24 may be collinear and of equal or unequal length, spacing, etc.

The hinge 24 may be a living hinge 24. A living hinge 24 may be made of a single piece of material, integrally joined to both the body 11 and lid 22. The living hinge 24 may have a region of reduced thickness, about which the articulation occurs and they thereby defines the axis of the hinge 24. Alternatively, the hinge 24 may be a hook-and-eye configuration, a piano hinge 24, a butt hinge 24 or any other configuration, which allows articulation between the body 11 and lid 22.

Alternatively, the lid 22 may be completely detachable from the body 11. In such an embodiment the lid 22 may be removably joined to the body 11. In such an embodiment, the lid 22 may be joined to the body 11 upon closure by the interference fit around the periphery.

The lid 22 and body 11 may be joined at an interference that when the lid is in the closed position. An interference fit occurs when the material of either the lid 22 or body 11 slightly displaces the material of the other upon closure of the lid 22. Such displacement may be elastic, due to the resilient material properties of the lid 22 and/or body 11. The body 11 may have a

periphery 23, about which the lid 22 fits upon closure. Alternatively, the lid 22 may fit inside the periphery 23 of the body 11 upon closure.

The interference fit provides a seal between the body 11 and lid 22. By seal it is meant that a barrier to evaporation or the transfer of gas into or out of the package 10 is present. The seal may also prevent intrusion of contamination into the package 10, providing for sanitary and hygienic storage of the contents. The seal may also prevent intrusion of oxygen, air, etc. into the package 10.

The interference fit may be quantified by the amount of deformation or overlap which occurs between the body 11 and lid 22 upon closure. In the embodiment shown, the interference is measured radially, generally perpendicular to the periphery 23 at any point. The radial measurement is taken generally perpendicular to the major axis of the package 10.

While the interference provides a friction fit between the body 11 and a lid 22, the package 10 may further comprise a closure. The closure may be any device, which impedes orifice of the body 11 when in the closed position. Suitable closures include snaps, various seals, hook and loop fasteners, latches, etc.

The package 10 may be disposable or refillable. By "disposable" is meant the package 10 is intended to be discarded after the contents supplied therewith are depleted. Such a package 10 is not intended to be restocked with articles. Likewise, each sheet 14 or other article placed in the package 10 may be discarded after a single use, and not laundered or otherwise restored. By "refillable" it is meant the package 10 is or may be restocked with articles after the supply is depleted. Such sheets 14, or other articles, may be disposable or reusable.

If desired, wet or moist sheets 14 may be packaged in a flow wrap, as is known in the art. A flow wrap is a polymeric film or other type of impervious wrapper which can be used to cover sheets 14 or articles, as desired. The flow wrap may be used to prevent evaporation of moisture of the articles contained therein, may be used to keep the articles hygienic and sanitary until ready for use.

Flow wrap may generally conform to the shape of the articles contained therein. If the articles comprise a clip or magazine of sheets 14, the flow wrap may comprise a generally parallelpiped geometry. The flow wrap may have an orifice, allowing the user to access the contents therein or dispense the contents there through. The orifice may be disposed on any side or position of the flow wrap, including without limitation the short sides, long sides, intermediate sides, etc.

The package 10 may contain articles, such as discrete sheets 14 to be dispensed. Suitable sheets 14 may be made according to commonly assigned U. S. Pat. Nos. 4,191,609 issued Mar. 4, 1980 to Trokhan, US 4,637,859 issued Jan. 20, 1987 to Trokhan, or U.S. Pat. No. 5, 332,118 issued Jul. 26, 1994 to Muckenfuhs. The sheets 14 may comprise natural fibers, manmade fibers, cellulosic materials, recycled materials, biodegradable materials, films, synthetic nonwovens, or combinations thereof. The sheets 14 may be wet, moist or dry. One skilled in the art will recognize that the package 10 may be water impervious if the sheets 14 are wet. Wetting enables the sheets 14 to be used for wiping the skin as, for example, upon removal of a soiled diaper or to remove soiling from a hard surface such as a countertop. Of course, it will be apparent at various additives such as perfumes, antibacterial agents, cleansers, etc. may be utilized with a lead a sheet 14.

A sheet 14 may be considered to have been "dispensed through" the orifice 18 when it passes at least partially from inside the package 10 to outside the package 10, either due to the consumer reaching in and grasping the sheet 14, or the sheet 14 popping up through the orifice 18, by trailing the sheet 14 previously withdrawn by the user. A sheet 14 may be considered to be "withdrawn" after it has passed completely from inside the orifice 18 to outside the orifice 18, and no portion or edge of the sheet 14 remains within the package 10.

The orifice 18 may be of a first size relative to the sheets 14. This first size may be designed to constrict the sheets 14 as they are pulled through the orifice 18 by the user. Sheets 14 are considered to be "constricted" when they must touch the walls 30 intercepted by the orifice 18 upon withdrawal by the user.

The sheets may be sequentially dispensed through the orifice 18 by popup dispensing. In such sequential dispensing, each sheet 14 may be releasably attached to two adjacent sheets 14 by any releasable attachment which allows easy separation to occur as the sheet 14 is being dispensed or

after the sheet 14 is withdrawn through the orifice 18. The releasable attachment should allow one sheet 14 to be readily separated from an adjacent or subsequent sheet 14, without undue stresses being applied, tearing of either sheet 14, or damage to the orifice 18 or other portions of the package 10.

Each sheet 14 may be releasably attached to an adjacent sheet 14 at a lap seal or a fin seal. The separation forces typically applied during dispensing to a lap seal, may be in shear. The separation forces typically applied during dispensing to a fin may be in peel. It will be apparent to one skilled in the art that the seal joining adjacent sheets 14 must be strong enough to pull the succeeding sheet 14 through the orifice 18, yet allow the sheets 14 to be easily separable at the point of use. In either arrangement, the lap or fin seal may comprise both bonded areas and free areas. Having both bonded areas and free areas in the seal may be important for controlling the separation forces and how the leading edge 15 of the sheet 14 is exposed before separation from the succeeding sheet 14.

While rectangular sheets 14 are common in the art, one of skill will recognize that the invention is not so limited. The sheets 14 may be of any size, shape and thickness which are suitable for the intended use and can be conveniently dispensed as described herein.

The releasable attachment may comprise adhesively joining one sheet 14 to adjacent sheets 14 with skin friendly adhesive, lotion compatible adhesive, or FDA approved adhesive, as desired. A suitable adhesive may be supplied by Findley Adhesives Inc. of Wauwatosa, WI. as Item No. H9087- 05 or by H.B. Fuller of St. Paul, MN as Product Code HZ-1620-B-ZP.

Other releasable attachments may be utilized. For example, fusion bonded releasable attachments, such as ultrasonic welding or heat sealing of adjacent sheets, 14 may be employed, as is well known in the art. Additionally, mechanical entanglement releasable attachments, such as needle punching, steam sealing, embossing, or crimping may be utilized as well. Autogeneous bonding releasable attachments, such as disclosed in commonly assigned U. S. Pat. No. 4,854, 984 issued Aug. 8, 1989 to Ball et al. may be utilized.

It will further be apparent that wetted sheets 14 may be releasably attached to one another

through cohesion at the overlap between adjacent sheets 14. The cohesion may not require an affirmative manufacturing step and may be used to augment other releasable attachments.

Alternatively, a sheet 14 may be releasably attached to an adjacent sheet 14 by a plurality of frangible lands. As used herein a "land" refers to a small connection separated by large cuts and joining adjacent sheets 14. Lands may be considered to be "frangible" if, upon separation of one sheet 14 from an adjacent sheet 14 in tension, the lands 18 break prior to significant ripping or tearing of either sheet 14. This arrangement allows perforated sheets 14 to be utilized. Of course, multiple releasable attachments may be used in any combination.

If the package 10 contains sheets 14 to be dispensed, the major depth M of the package 10 may be considered relative to the breaking strength of a releasable attachment between adjacent sheets 14. The releasable attachment may be overcome by the weight of the sheet 14 between a free-hanging releasable attachment means and the magazine of sheets 14 there below. As the package 10 becomes taller in the vertical direction, and the weight of a free hanging sheet 14 increases, the orifice 18 must become more restrictive to prevent the sheet 14 to be dispensed from falling back into the package 10. Furthermore, as the sheets 14 become thicker, the area of the orifice 18 should increase to allow the sheets 14 to be dispensed there through.

Each sheet 14 may have a leading edge 15 and a trailing edge 16. The leading edge 15 is that edge of the sheet, which is generally first drawn through the orifice 18 during dispensing. The trailing edge 16 is generally the last portion of the sheet 15 withdrawn through the orifice 18 during dispensing.

The trailing edge 16 of one sheet 14 may be releasably attached to the leading edge 15 of a subsequent sheet 14. This arrangement allows the trailing edge 16 of the first sheet 14 to be dispensed to pull the leading edge 16 of the subsequent sheet 14 through the orifice 18. The releasable attachment of successive trailing edges 16 and leading edges 15 provides for sequential dispensing of the respective sheets 14.

Referring to Figs. 3A – 3E, the sheets 14 may be disposed in a package 10 in an interleaved pattern. A pattern is considered to be "interleaved" when part of a sheet 14 is behind the succeeding sheet 14 to be dispensed while the sheets 14 are disposed in that pattern prior to

dispensing through orifice 18. Thus, in an interleaved pattern of sheets 14 according to the present invention, pop-up dispensing may be assisted by frictional engagement between adjacent sheets 14. The interleaved pattern may be assisted in maintaining popup dispensing through the addition of a releasable attachment, as discussed above. Such a releasable attachment may be disposed at the position marked with the “X.”

Referring to Figs 4A – 4E, the sheets 14 may be disposed in a package 10 in a non-interleaved pattern. A pattern is considered to be "non-interleaved" when no part of a sheet 14 is behind the succeeding sheet 14 to be dispensed while the sheets 14 are disposed in the pattern prior to dispensing through orifice 18. Thus, in a non-interleaved pattern of sheets 14 according to the present invention, pop-up dispensing does not have to rely upon frictional engagement between adjacent sheets 14. Again, a releasable attachment may be utilized, as discussed above.

In either an interleaved pattern or a non-interleaved pattern, the sheets 14 may be generally disposed in a stack. Thus, interleaved and non-interleaved patterns are collectively referred to as stacked patterns, as both such patterns yield a stack of the sheets 14.

One of skill will recognize that a single interleaved or non-interleaved arrangement may be used in a particular stack or clip of sheets 14. Alternatively a given stack of sheets 14 may have plural interleaved patterns, non-interleaved patterns, or combinations thereof. This arrangement can be used to accommodate different empty volumes of the body 11 as more sheets 14 are dispensed or to accommodate the first sheet 14, as desired.

The stack may be generally flat, and parallelepipedally shaped. Each sheet 14 in the stack may be folded into a configuration having a footprint which is smaller than the unfolded dimensions of the sheet 14. For example, if the sheet 14 is rectangularly shaped, the footprint of the stack may likewise be rectangularly shaped. However, either or both dimensions of the stack may be smaller than the corresponding dimension of the unfolded sheet 14. This arrangement provides a stack with a relatively smaller footprint, and which can fit in to the body 11 of the package 10.

Each sheet 14 in the stack may define a plane due to the folding pattern. That plane may be generally parallel to the major axis of the package 10, and to the dispensing direction. This geometry provides the benefit that a package 10 of noncircular cross-section, and having the

orifice 18 on a small side of that package may be provided with a relatively smaller footprint. Such a geometry may also yield a package 10 having a relatively larger side facing the user and providing the aforementioned billboard effect.

The sheets 14 need not be disposed in a flat plane as shown. If desired, the sheets 14 may be disposed in a curvilinear plane. For example, the sheets 14 may assume a curve having an S-shape or a shape with a bend at the bottom of the body 11 of the package 10. Such a geometry may improve the ability of the sheets 14 to stand in the vertical plane, if a vertical footprint is desired for the package 10. Such a geometry may also assist in maintaining alignment of the plane of the sheets parallel to the major axis of the package 10 and hence parallel to the primary direction of dispensing of the sheets 14 through the orifice 18.

Alternatively, the sheets 14 may be disposed in a package 10 in a spiral wound pattern. A pattern is considered to be spiral wound when the sheets 14 are disposed in a volute pattern prior to dispensing through orifice 18. In such a configuration the sheets 14 may be rolled into a core, providing a spool of sheets 14 to be dispensed, or may be roll A spiral wound pattern is common with packages 10 having a circular cross-section.

Referring to Fig. 5, the sheets 14 are generally planar, having a first face and a second face opposed thereto. The first face and second face are oriented in opposing first and second directions, respectively. Upon communication of a portion of the sheet 14 from the first aperture 19A to the second aperture 19B, the sheet inverts so that at least a portion of the first face and second face are oriented generally towards the second direction and the first direction, respectively. In a degenerate case the inversion may be 180 degrees, so that the first face and second face are oriented identically in the first direction and second direction, respectively. Furthermore, the inversion may even be greater than 180 degrees.

Thus the sheet 14 may be inverted about an axis, with the axis lying within the plane of the sheet. The axis may be coincident or generally parallel the primary dispensing direction. Such an axis may be thought of as the first axis about which the sheet 14 inverts during dispensing, or even prior to being dispensed from the orifice 18.

Of course, one of skill will recognize that the sheet 14 may not entirely invert about the first axis during communication from the first aperture 19A to the second aperture 19B. A portion of the sheet 14 may be in contact with the succeeding sheet 14. The portion of the first face and second face of the sheet 14 remaining in contact with the succeeding sheet will not yet be inverted, although may invert about the first axis during dispensing.

If desired the leading edge 15 of the sheet 14 may be disposed away from orifice 18. This geometry provides a sheet 14, with the trailing edge 16 of that sheet 14 closer to the orifice 18 than the leading edge 15 of that sheet 14 prior to dispensing. In such an embodiment, the sheet 14 may also invert about a second axis during dispensing. The second axis may be generally skewed relative to the first axis and also generally transverse to the primary dispensing direction. In a degenerate case, the first axis and second axis may be mutually orthogonal.

Such inversion, about either axis, allows the sheet 14 to begin unfolding prior to dispensing through the orifice 18. The inversion about the second axis allows for the leading edge 15 of the sheet 14 being dispensed to travel back across that sheet 14 as the leading edge 15 is pulled from a position remote from the dispensing orifice 18 towards the orifice 18.

This process allows the sheet 14 to unfold across the vertical axis, or such other axis as may be aligned with the primary dispensing direction as well as unfold about a direction orthogonal thereto, so that the sheet 14 may invert in two generally orthogonal planes. This arrangement provides the benefit that the sheet 14 may be less prone to tearing upon dispensing and that it may more easily unfold for use after dispensing.

If such an arrangement is elected, the body 11 of the package 10 may be provided with sufficient space to allow the sheet 14 to begin inversion and unfolding as dispensing occurs. This may be particularly desirable if one is concerned with tearing of the first sheet 14 to be dispensed.

While a package 10 having a lid 22 disposed above the body 11 is illustrated, the invention is not so limited. The lid 22 may be placed proximal to the dispensing orifice 18. The dispensing orifice 18 need not be juxtaposed with the top of the package 10 as illustrated. The dispensing orifice 18 may be placed central to the package 10, or juxtaposed with the bottom of the package 10 as desired.

Likewise, a package 10 having an orifice with two apertures 19A, 19B is illustrated. However, the invention is not so limited. The first aperture 19A may be connected to a second aperture 19B, which, in turn, may be connected to a third aperture (not shown), a fourth aperture (not shown), etc. This arrangement allows the user to select the amount of inversion desired, prior to dispensing of the sheet 14. The user may simply move the sheet 14 from the first aperture 19A to the second aperture 19B, to the third aperture, etc. as desired.

Furthermore, the first aperture 19A may be connected to two or more second apertures 19B. This arrangement allows the user to select the angle of the inversion. For example, it may be desired to invert in a first direction for a first use of the sheet 14, a second direction for a second use of the sheet 14, etc. Of course, either or both second apertures 19B may be interconnected to a third aperture, a fourth, aperture (either directly or through the third aperture), etc.

The sheets 14 may be inserted into the package 10 in a dry condition. If desired a wetting solution may later be added to the package, and allowed to equilibrate or generally diffuse through the sheets 14. This arrangement provides the benefit that the sheets 14 can be manufactured and packaged in a dry condition, but presented to the consumer in a wet condition. If the solution migrates to the bottom of a generally vertical package and dispensing may occur prior to full equilibration of the solution. If so, during the inverted dispensing described herein, some transfer of that solution to the top portions of the sheets 14 can be expected to occur. Such transfer may yield a more uniform distribution of the solution to the sheets 14.

The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as “40 mm” is intended to mean “about 40 mm”.

All documents cited in the Detailed Description of the Invention are, in relevant part, incorporated herein by reference; the citation of any document is not to be construed as an admission that it is prior art with respect to the present invention. To the extent that any meaning or definition of a term in this written document conflicts with any meaning or definition of the

term in a document incorporated by reference, the meaning or definition assigned to the term in this written document shall govern.

While particular embodiments of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other changes and modifications can be made without departing from the spirit and scope of the invention. It is therefore intended to cover in the appended claims all such changes and modifications that are within the scope of this invention.

CLAIMS

What is claimed is:

1. A package in combination with at least one sheet therein dispensible from said package comprising:

A package, said package comprising a body for containing at least one sheet therein and an orifice for dispensing said at least one sheet there through, said orifice comprising a first aperture and a second aperture in unobstructed communication therewith, said second aperture having a major dimension and a minor dimension orthogonal thereto, said major dimension being greater than said minor dimension; and

at least one sheet disposed in said package, said sheet having a generally planar configuration, said plane of said sheet being substantially aligned with said major dimension, said sheet having a first side and a second side opposed thereto, said first side and said second side being oriented in a first direction and a second direction, respectively,

whereby said sheet can be partially dispensed through said first aperture and communicated to said second aperture, whereby at least a portion of said first side of said sheet inverts to face towards said second direction upon communication of said sheet into said second aperture.

2. A package according to claim 1 wherein said sheet is folded.

3. A package according to claim 2 comprising a plurality of sheets.

4. A package according to claim 3 wherein said sheets are interfolded to provide for pop-up dispensing.

5. A package according to claim 4 wherein said second aperture is corrugated.

6. A package according to claim 5 wherein a portion of said sheet is folded upon itself during communication from said first aperture to said second aperture, and said folded portion inverts upon entering said second aperture.

7. A package according to claim 6 wherein said sheets are wetted and a sheet being dispensed applies moisture to a succeeding sheet.

8. A package according to claim 4 wherein said sheets are dispensed from said package in a primary direction, said primary direction lying within said plane of said sheets.

9. A package according to claim 8 wherein said primary direction is vertically upwards.

10. A method of dispensing a sheet from a package in pop-up fashion, said method comprising the steps of:

reaching into a package and withdrawing a portion of a sheet from a starting position through a first aperture in said package, said sheet being disposed in a planar configuration; and

moving said withdrawn portion of said sheet in an arcute path to a second aperture, whereby a portion of said sheet inverts about a first axis to face in the opposite direction from said starting position.

11. A method according to claim 10 wherein said inversion occurs prior to removing said sheet from said package.

12. A method according to claim 11 further comprising the step of causing said sheet to invert about a second axis, said second axis being skewed relative to said first axis.

13. A method according to claim 12 further comprising the step of causing said sheet to invert about a second axis, said second axis being orthogonal to said first axis.

14. A method according to claim wherein the step of causing said sheet to invert about a first axis, comprises the step of causing said sheet to invert at least 180 degrees about said first axis.

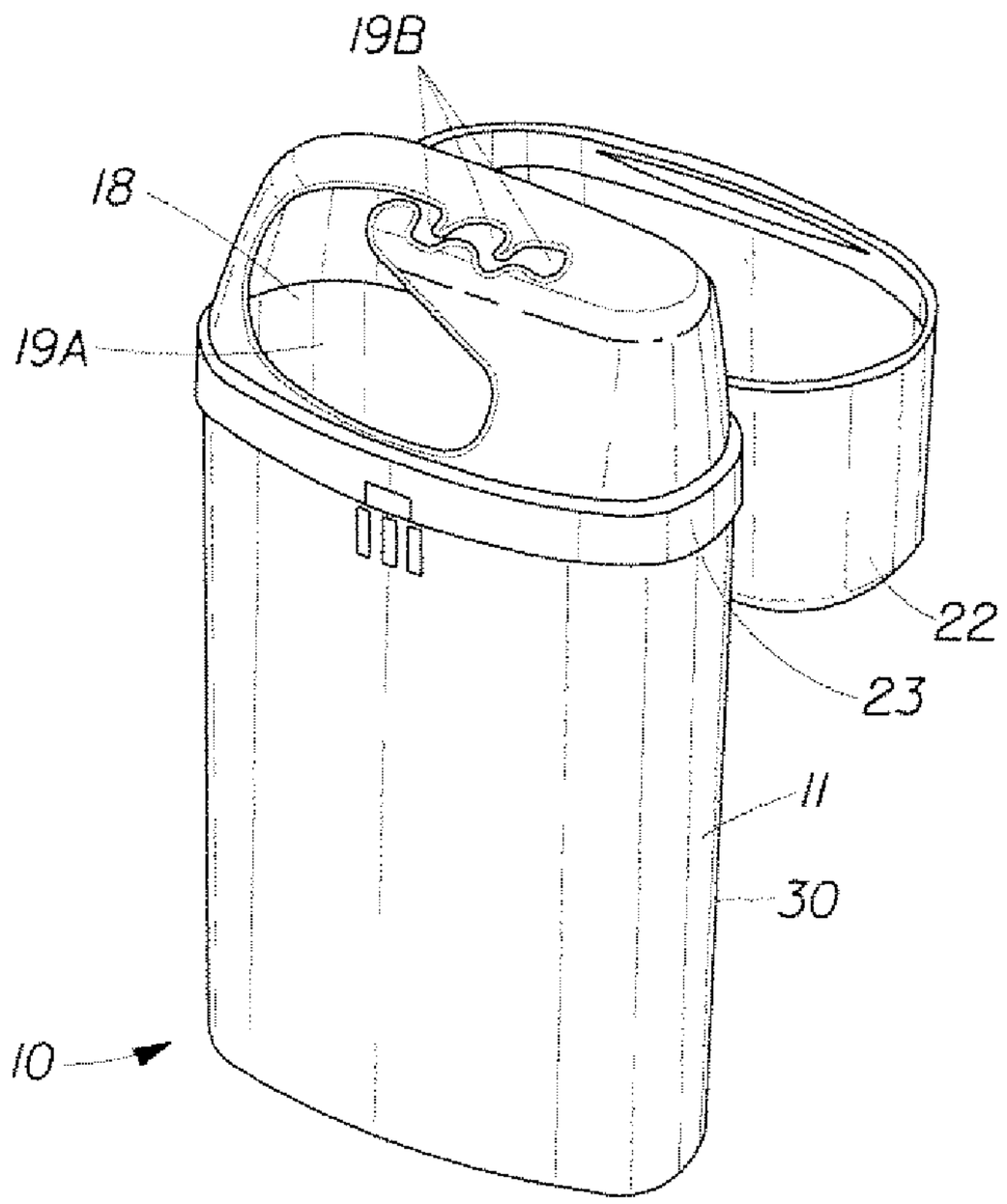


Fig. 1A

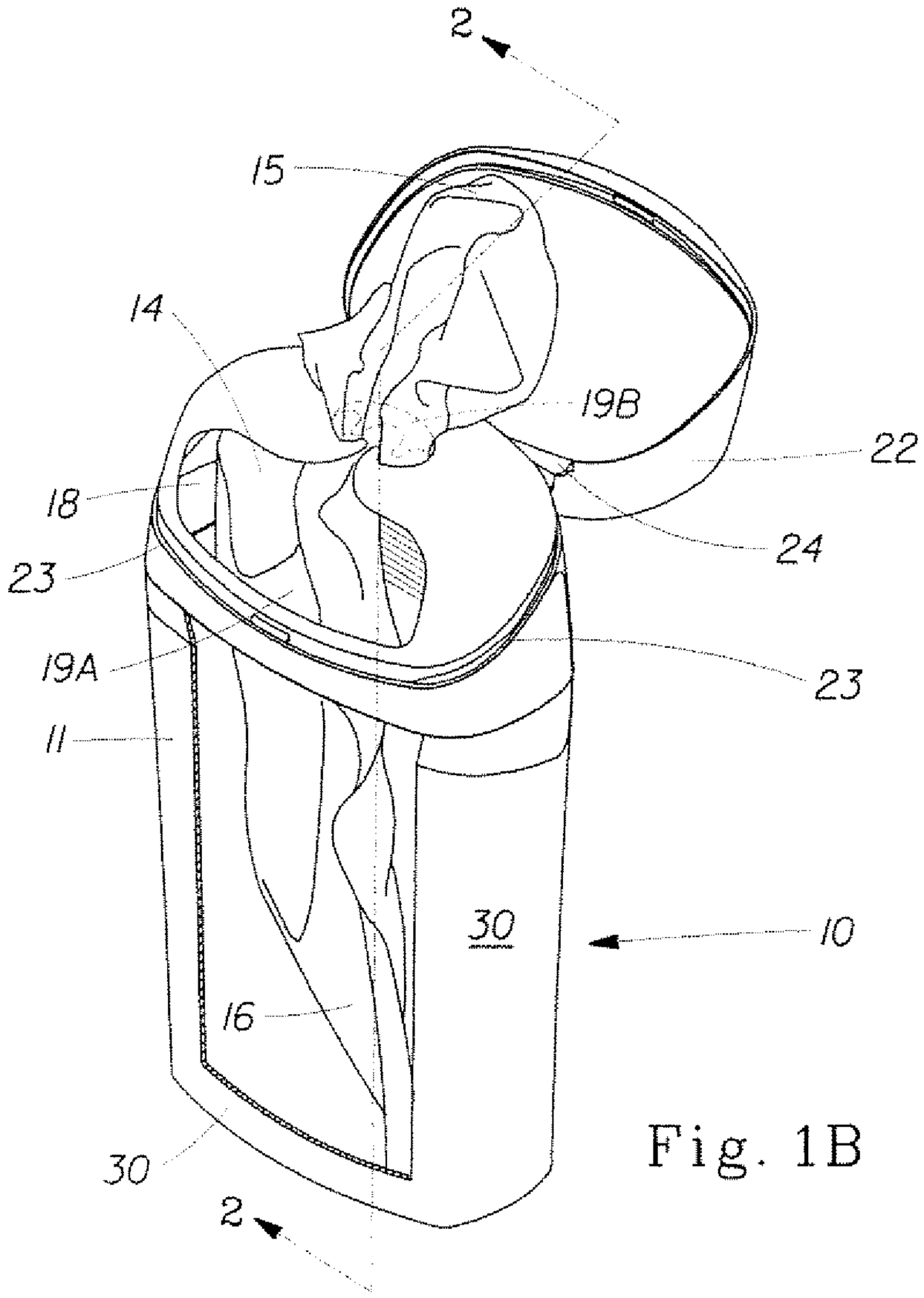

2
15
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19B
22
18
24
23
19A
23
11
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16
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2

Fig. 1B

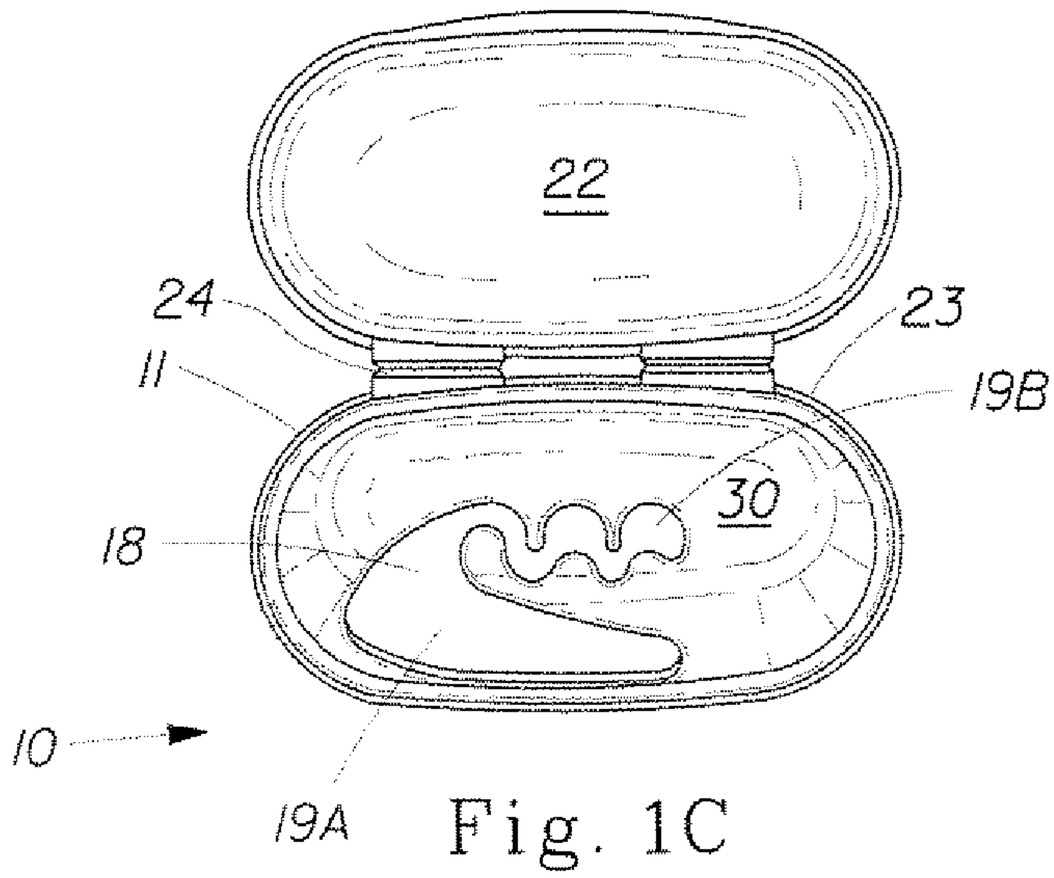

22
24
23
11
19B
30
18
10
19A

Fig. 1C

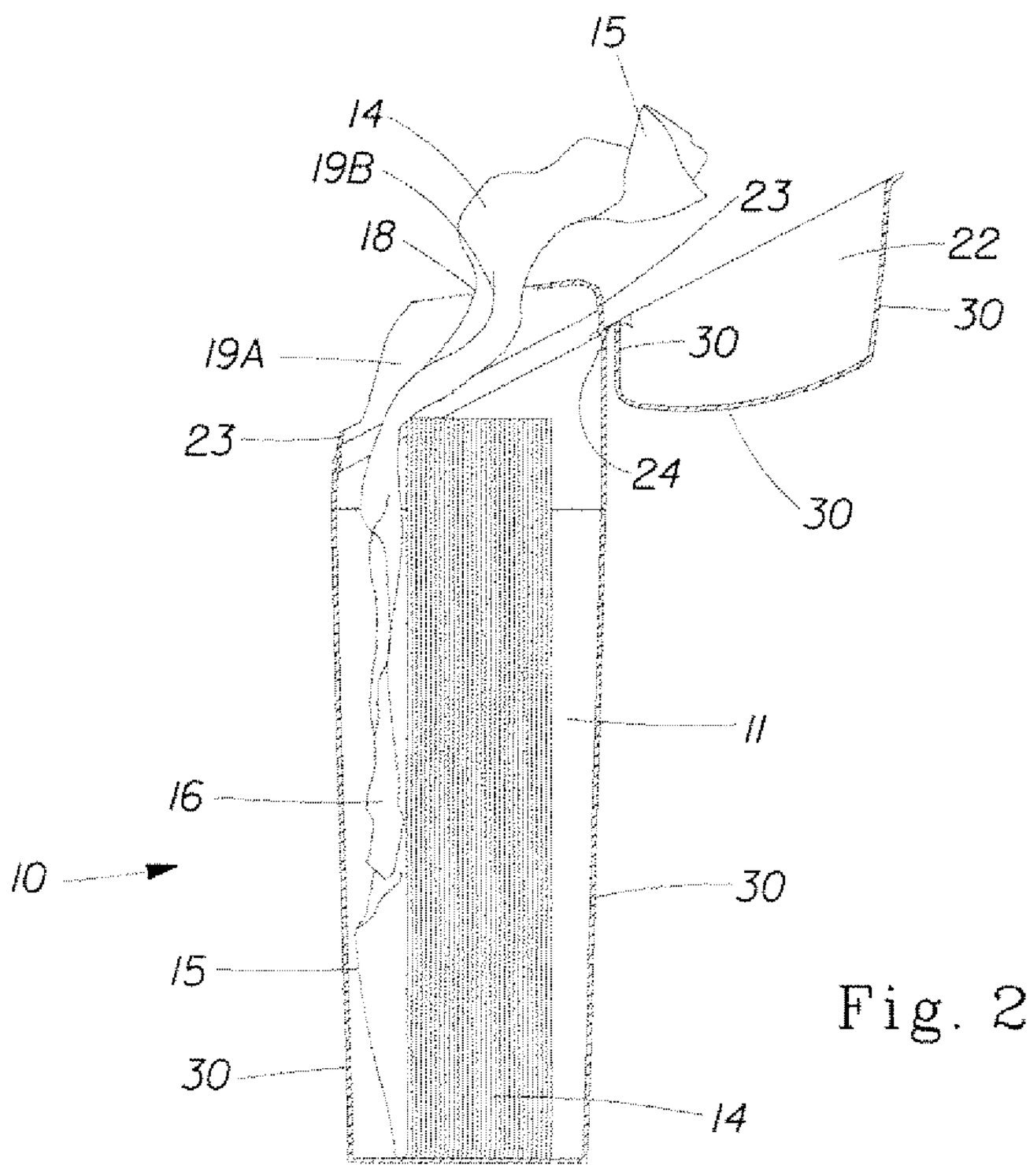


Fig. 2

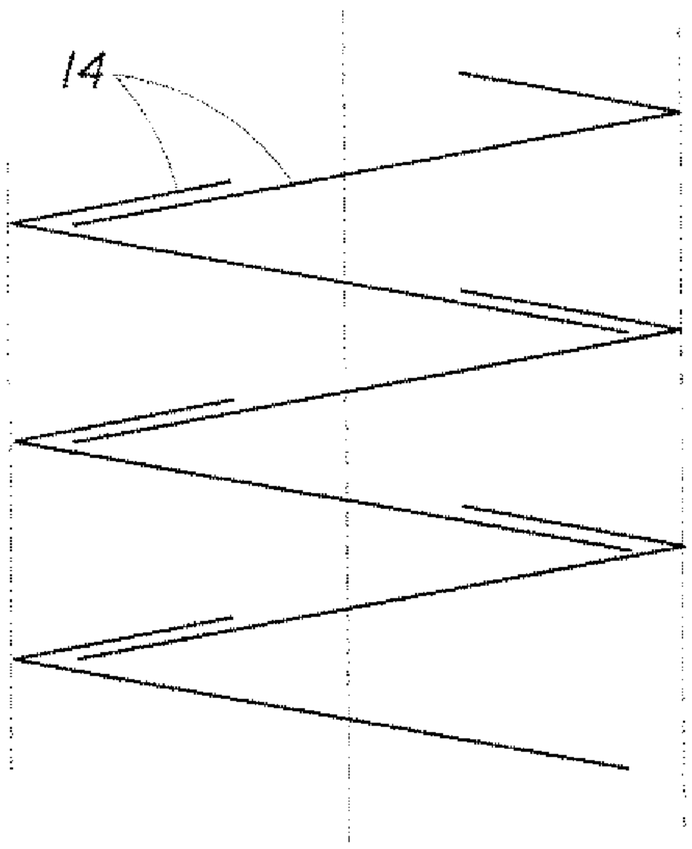


Fig. 3A

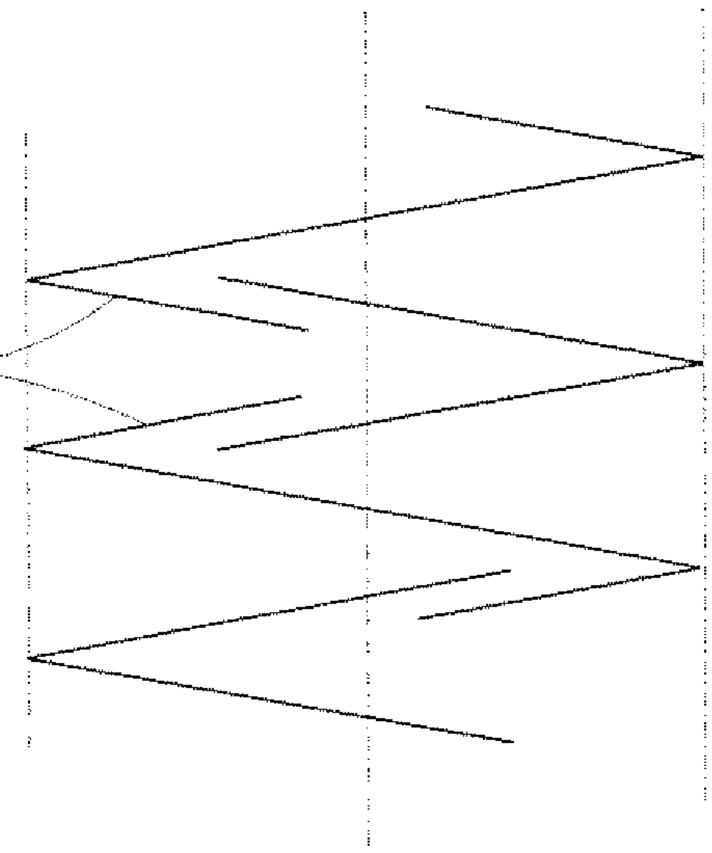


Fig. 3B

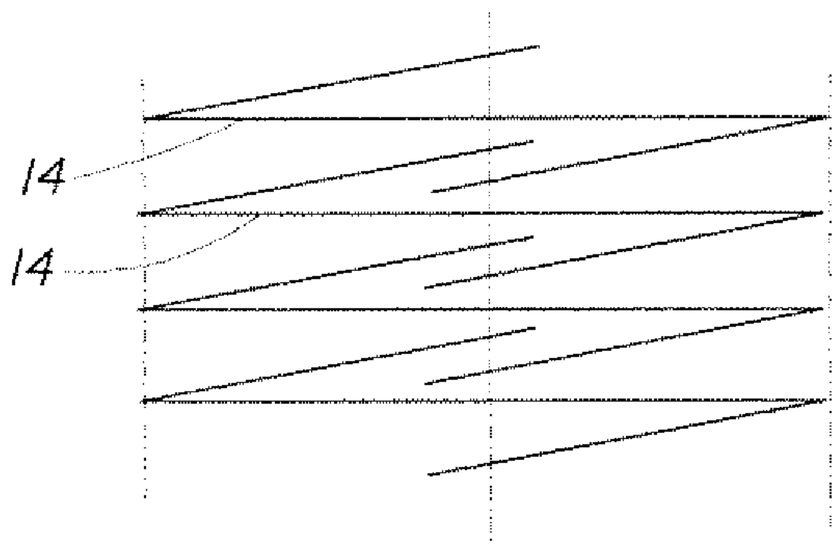


Fig. 3C

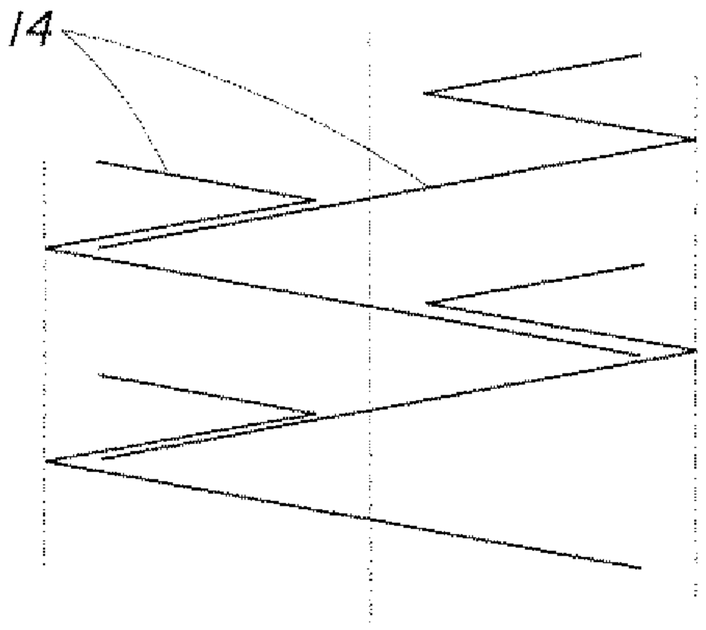


Fig. 3D

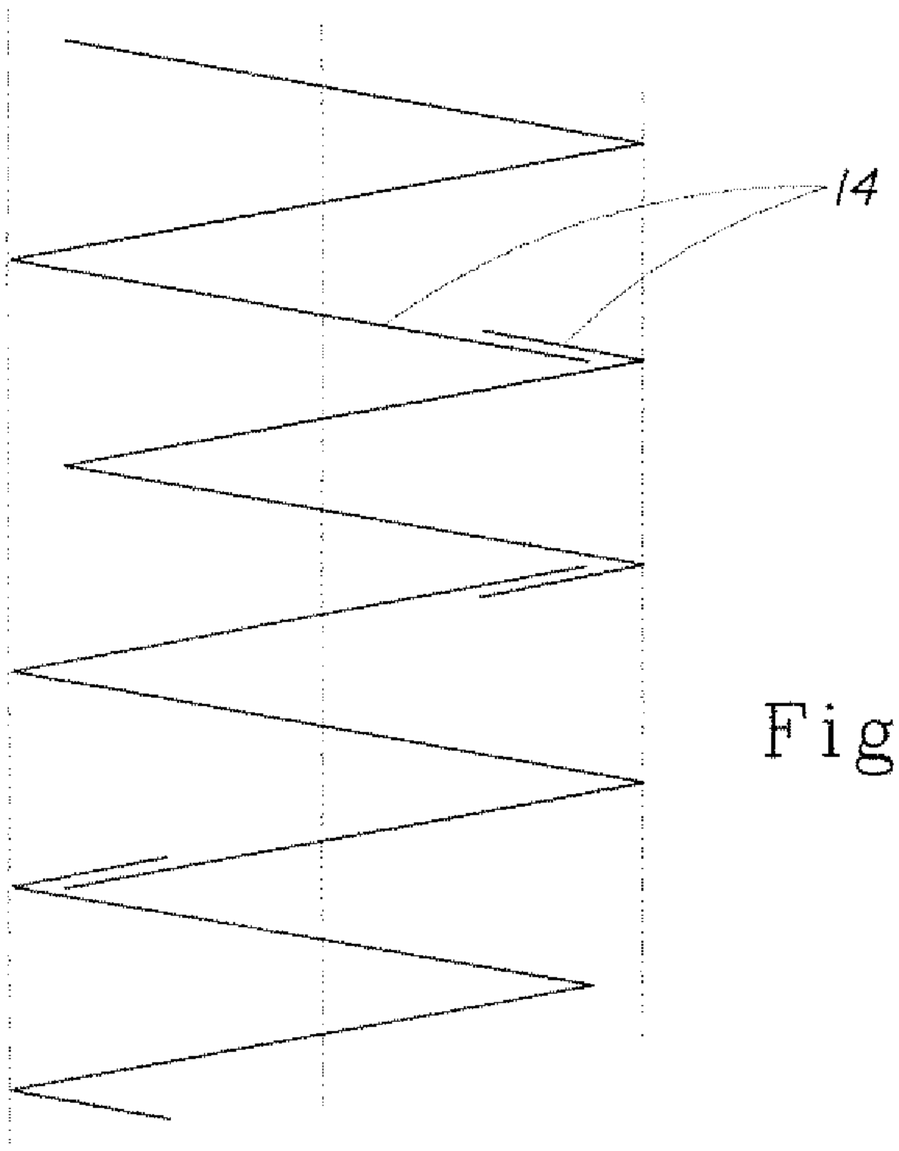


Fig. 3E

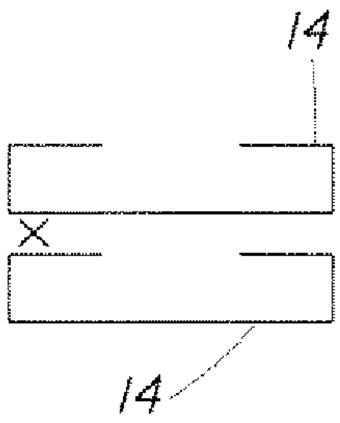


Fig. 4A

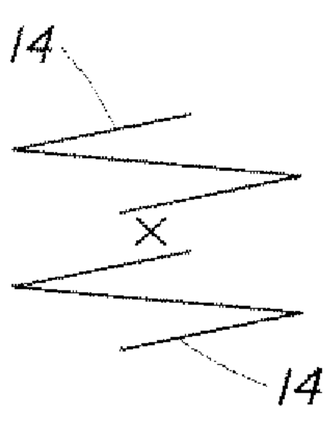


Fig. 4B

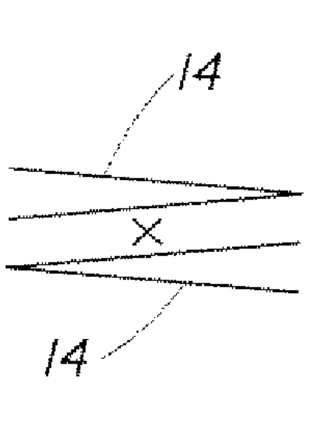


Fig. 4C

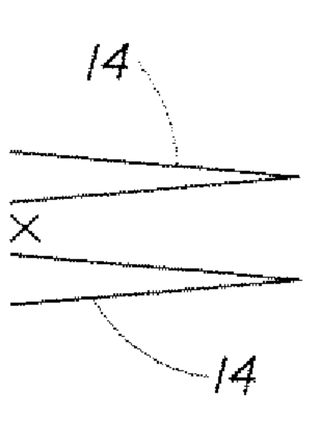


Fig. 4D

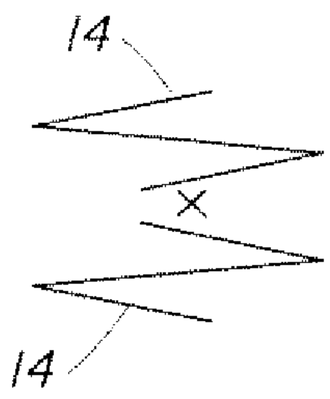


Fig. 4E

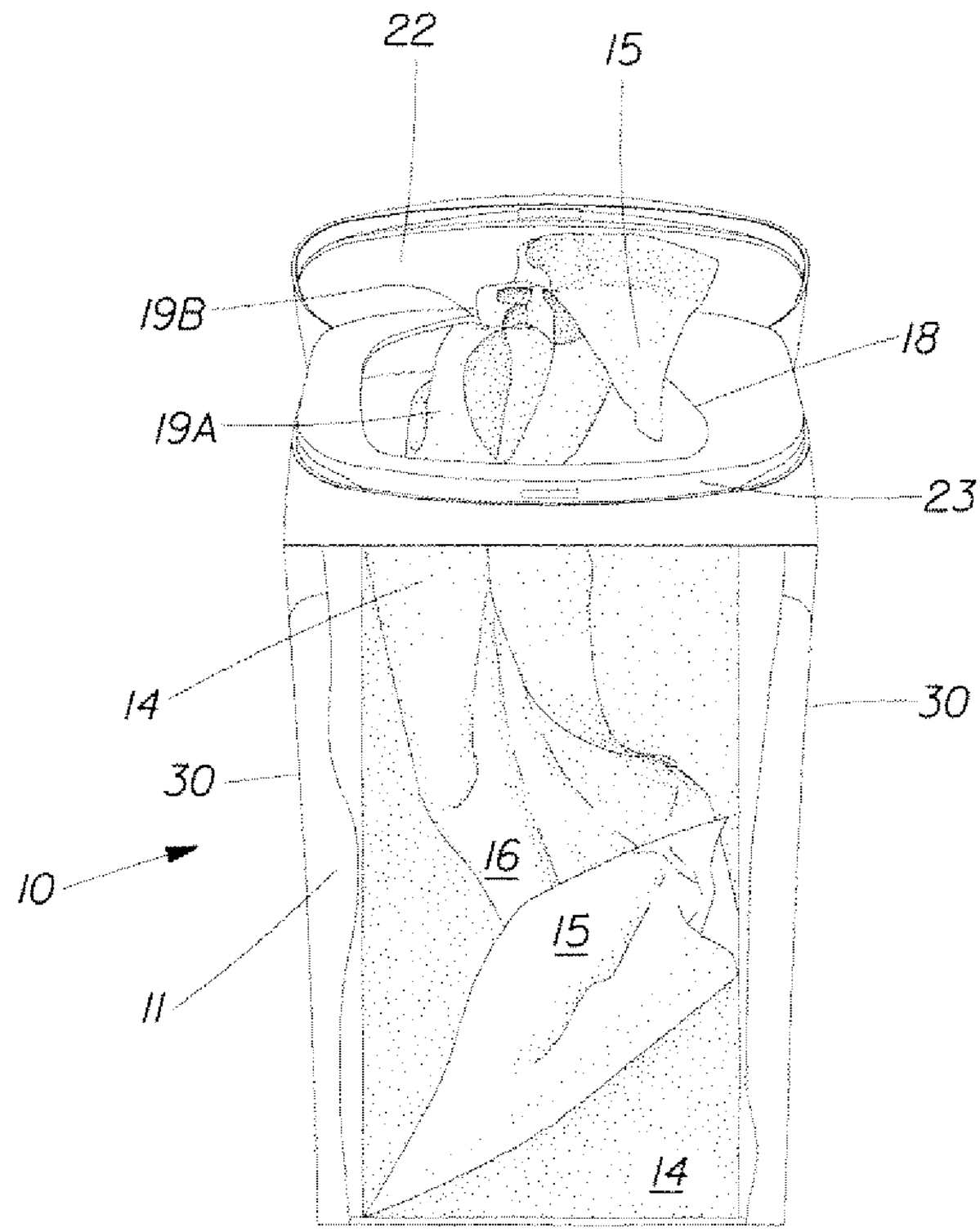


Fig. 5

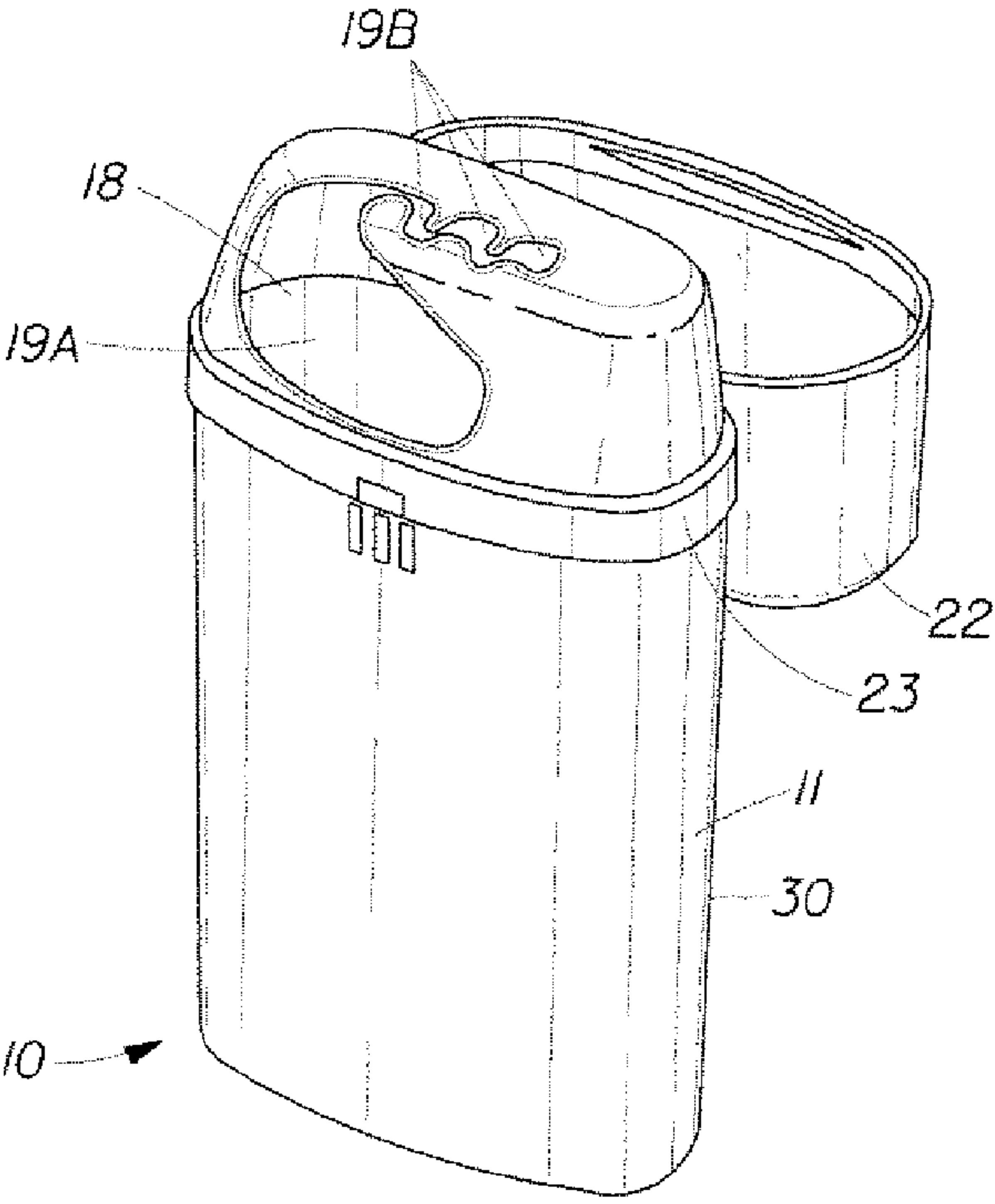


Fig. 1A