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Guertin(10) **Pub. No.: US 2014/0263304 A1**(43) **Pub. Date: Sep. 18, 2014**(54) **RECYCLABLE COMPOST CONTAINER**(71) Applicant: **Richard Guertin**, Beauport (CA)(72) Inventor: **Richard Guertin**, Beauport (CA)(21) Appl. No.: **13/938,876**(22) Filed: **Jul. 10, 2013****Related U.S. Application Data**

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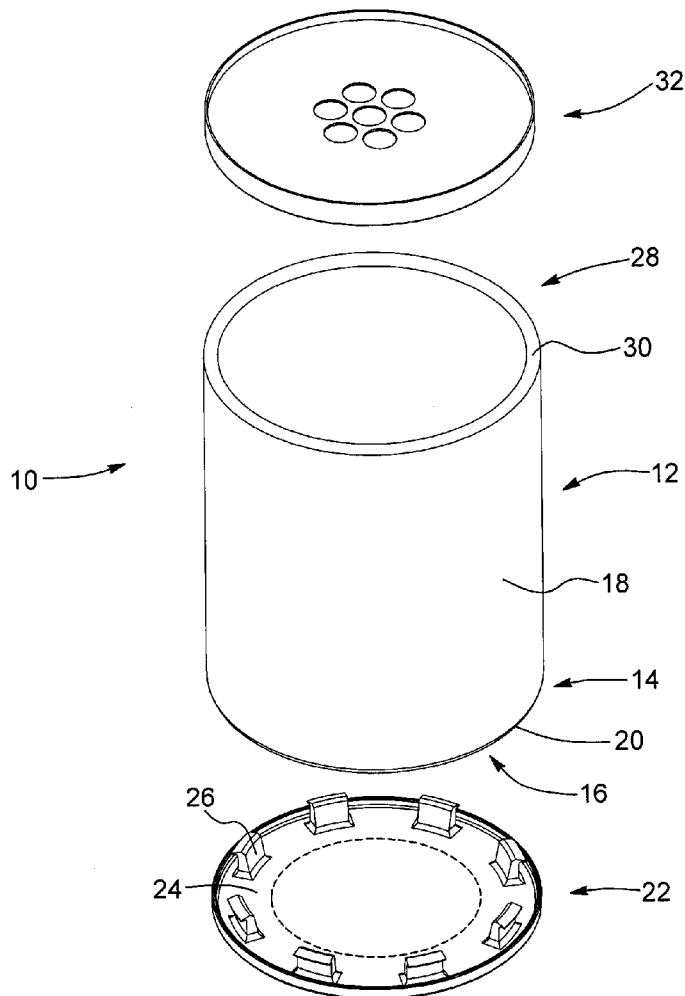
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B65D 88/08	(2006.01)
B65D 88/52	(2006.01)

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(57) **ABSTRACT**

The present invention provides a recyclable composite container. The recyclable composite container comprises a cardboard hollow body having an open end defining an opening. The body is formed by a sidewall having an inwardly rolled rim at the open end. The container also comprises a framing element which is removably connectable to the open end of the cardboard hollow body. The framing element has a peripheral portion and a hook-shaped connector linked to this peripheral portion. The connector is for engaging with the inwardly rolled rim of the cardboard hollow body. Such construction thereby allows connection of the framing element to the cardboard hollow body by hooking the connector to the rim of the cardboard hollow body, and disconnection of the framing element from the cardboard hollow body by pulling the framing element so as to disengage the connector from the rim.



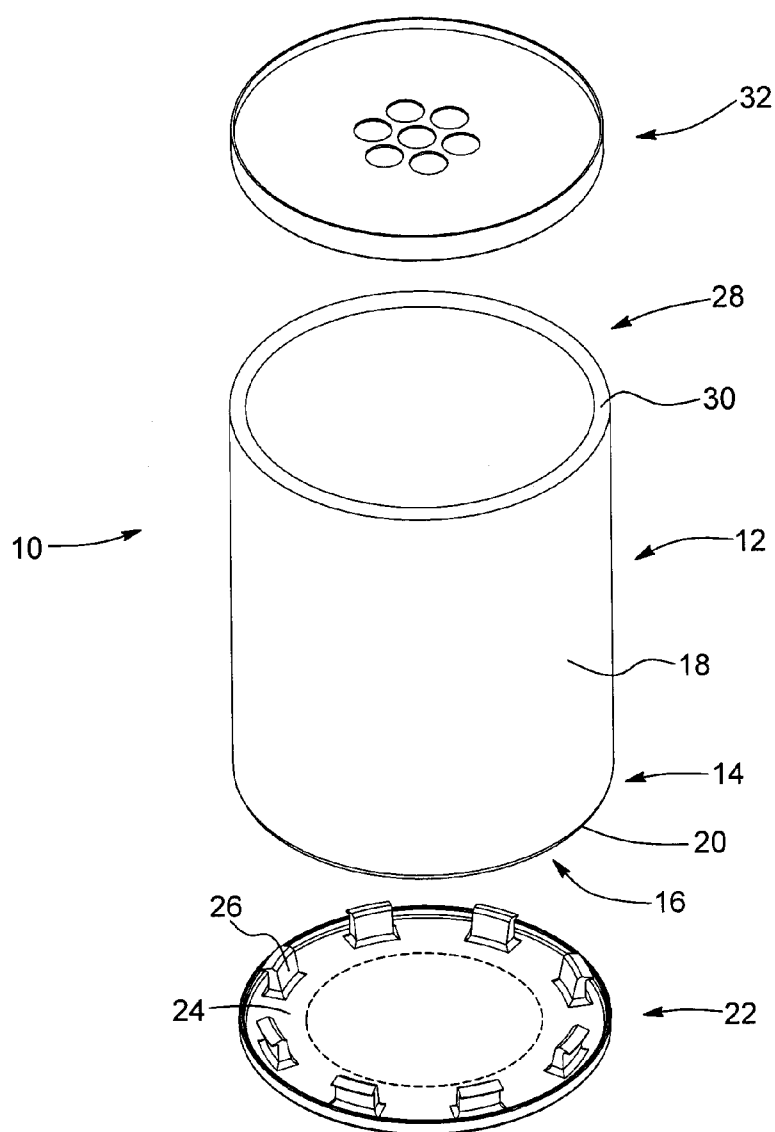


FIG. 1

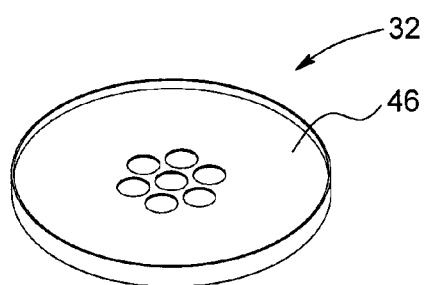


FIG. 2

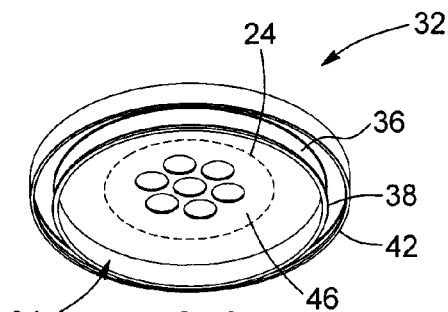


FIG. 3

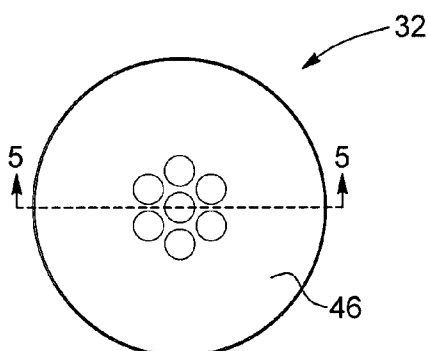


FIG. 4

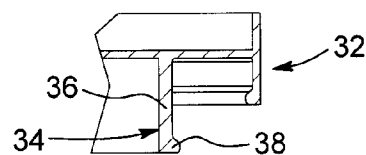


FIG. 5

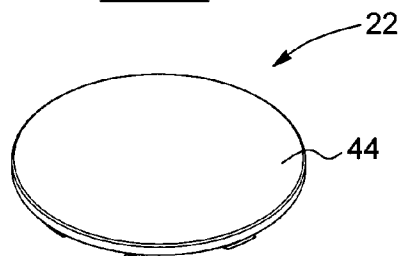


FIG. 6

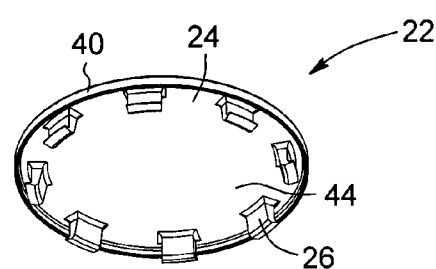


FIG. 7

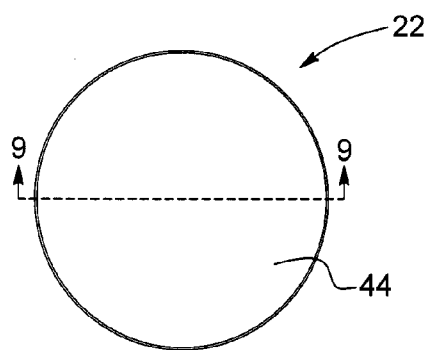


FIG. 8

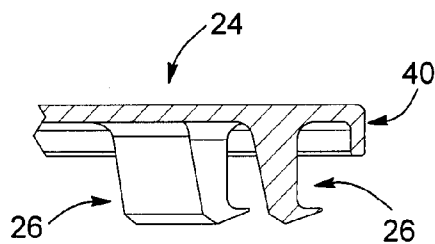


FIG. 9

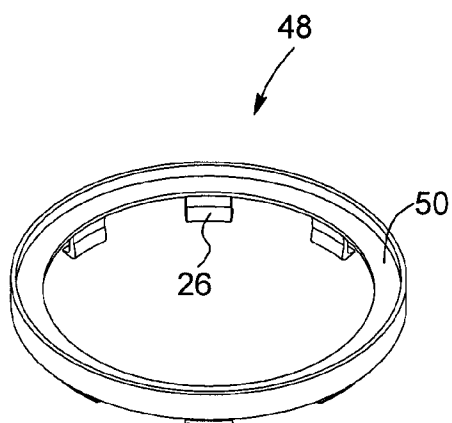


FIG. 10

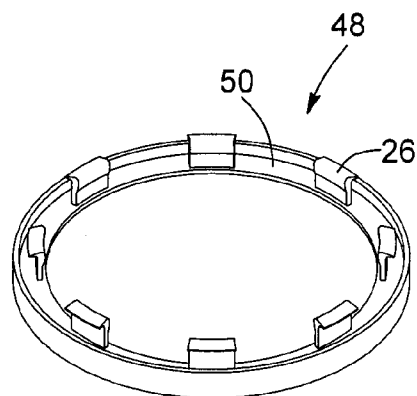


FIG. 11

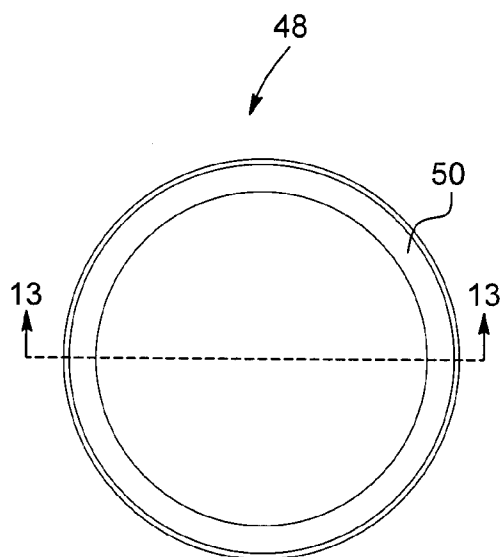


FIG. 12

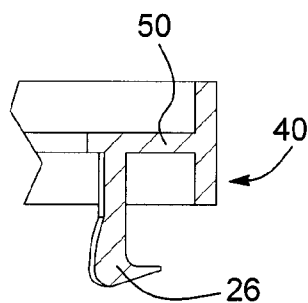


FIG. 13

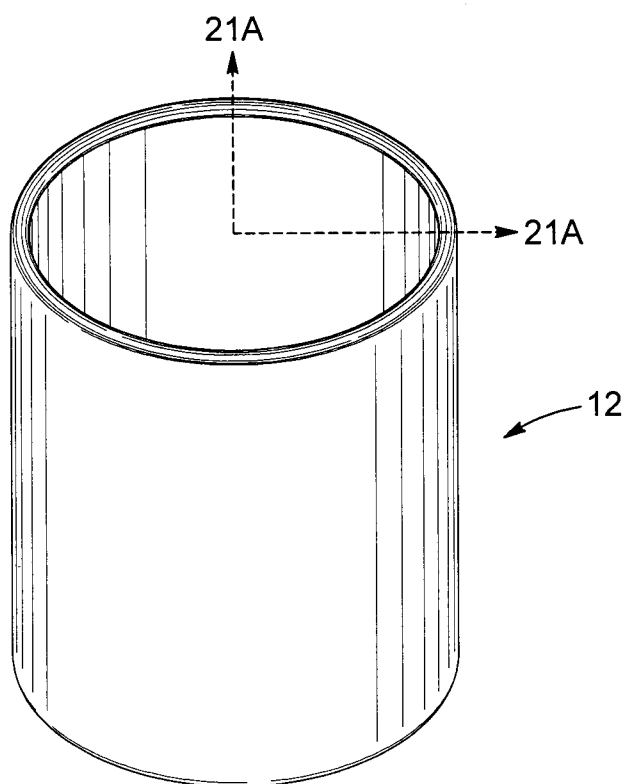


FIG. 14

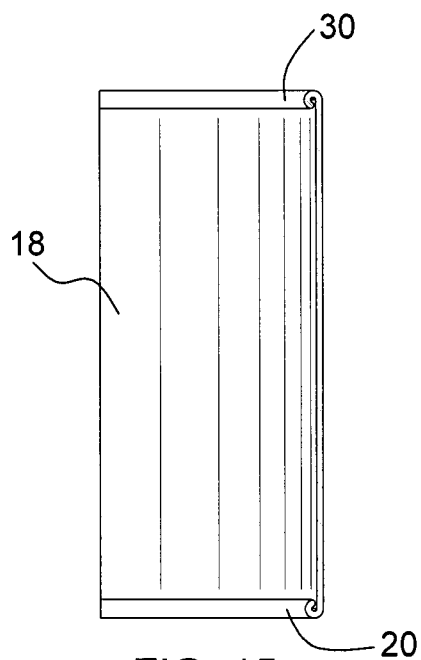


FIG. 15

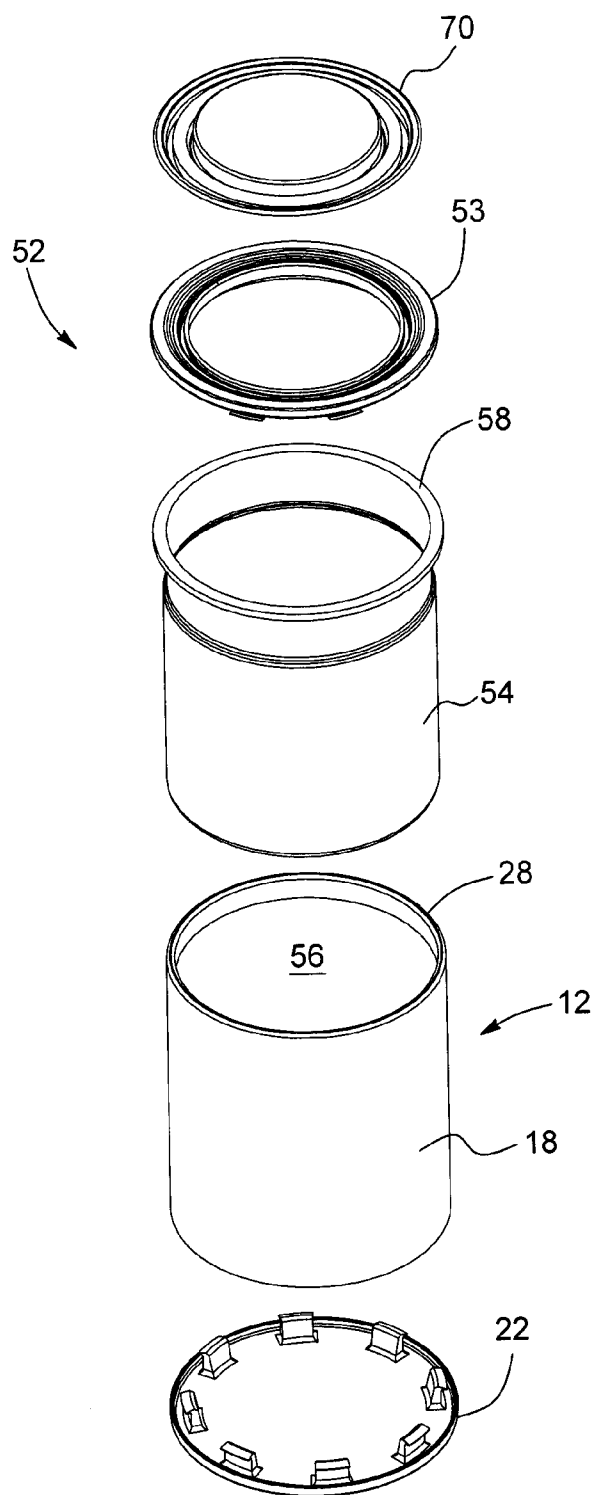


FIG. 16

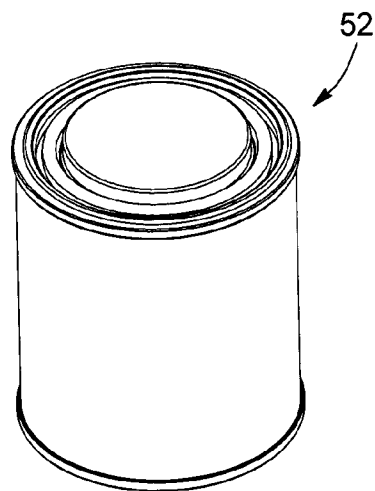


FIG. 17

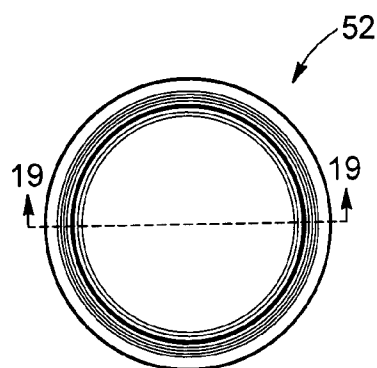


FIG. 18

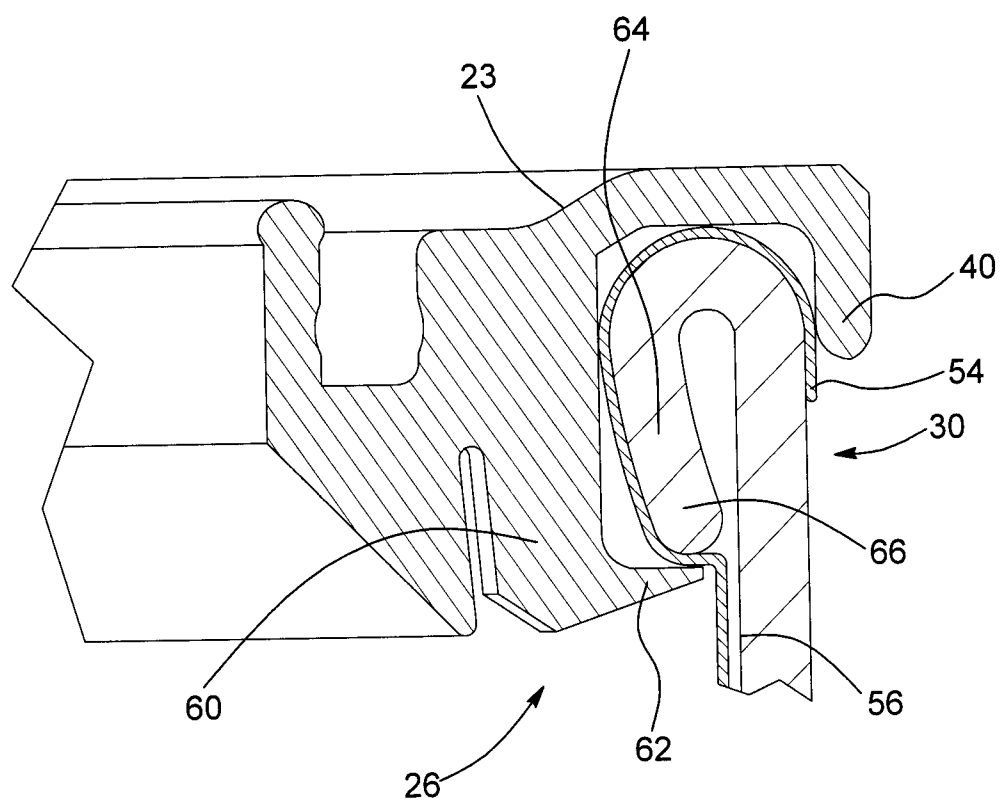


FIG. 19

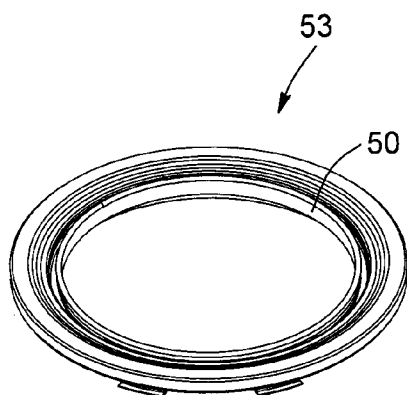


FIG. 20

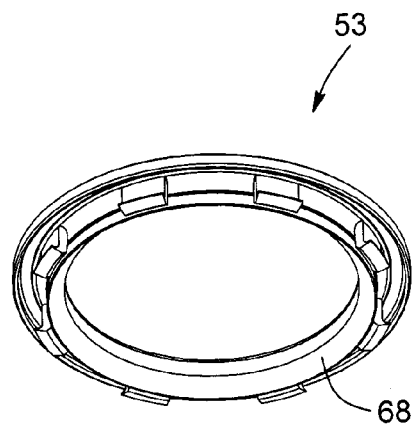


FIG. 21

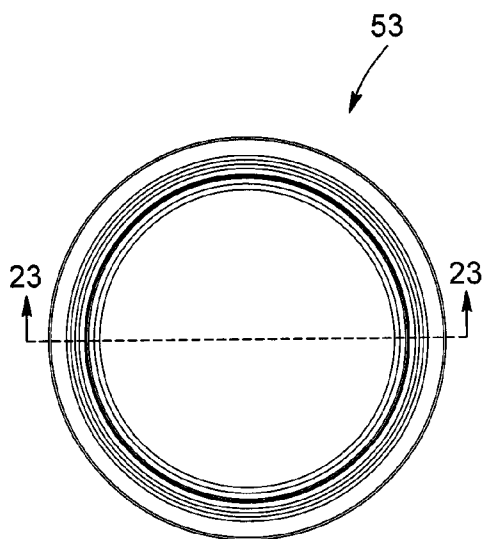


FIG. 22

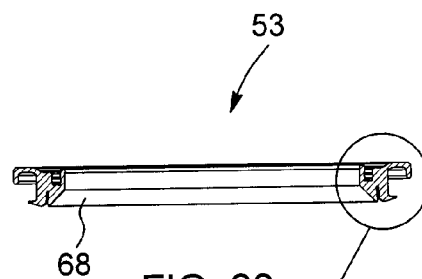


FIG. 23

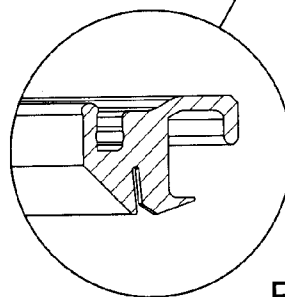


FIG. 23A

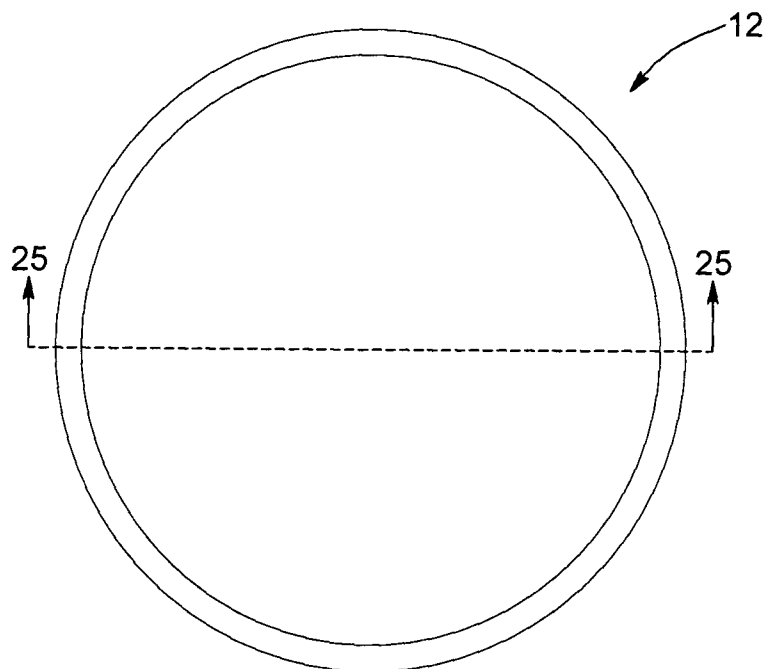


FIG. 24

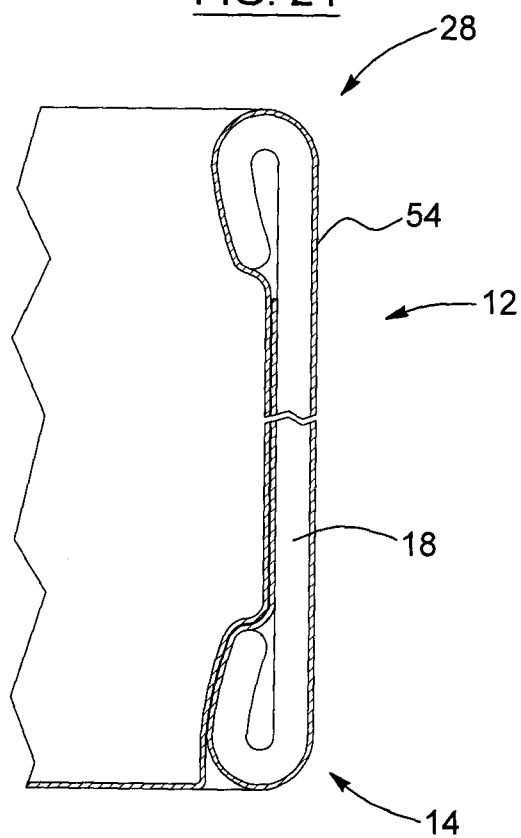


FIG. 25

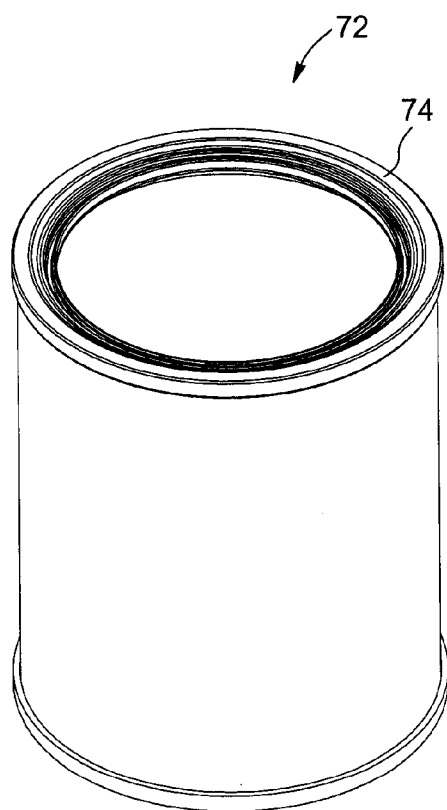


FIG. 26

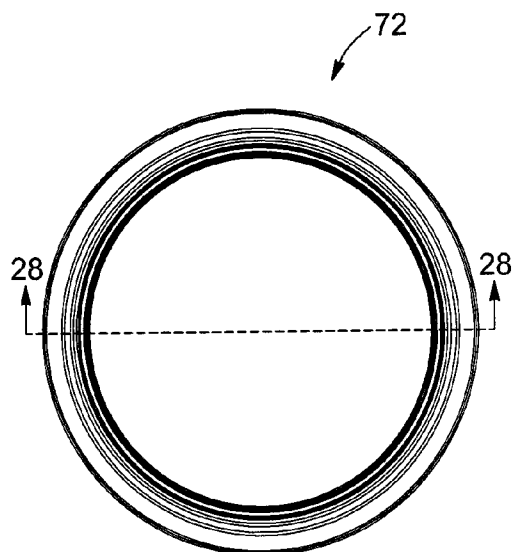


FIG. 27

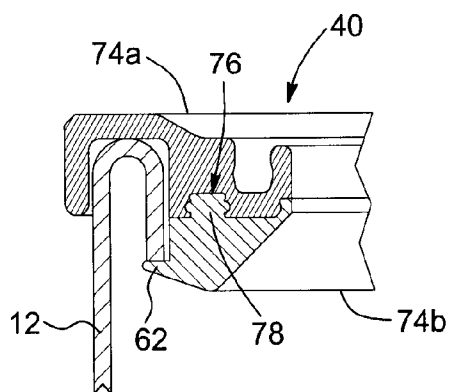


FIG. 28

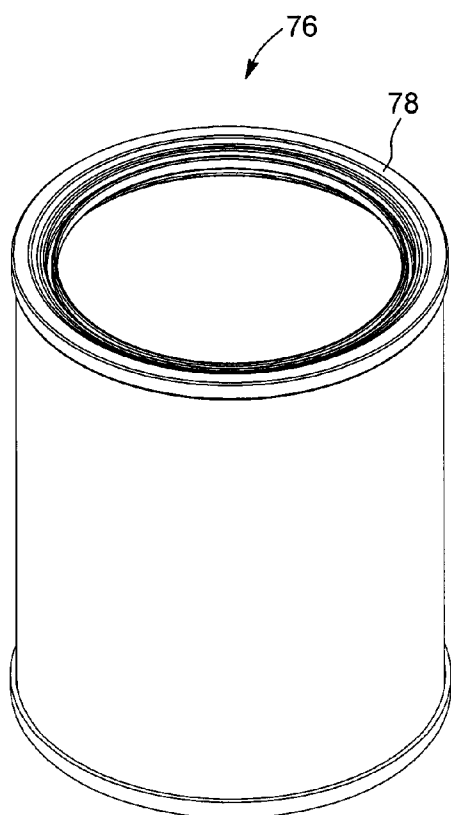


FIG. 29

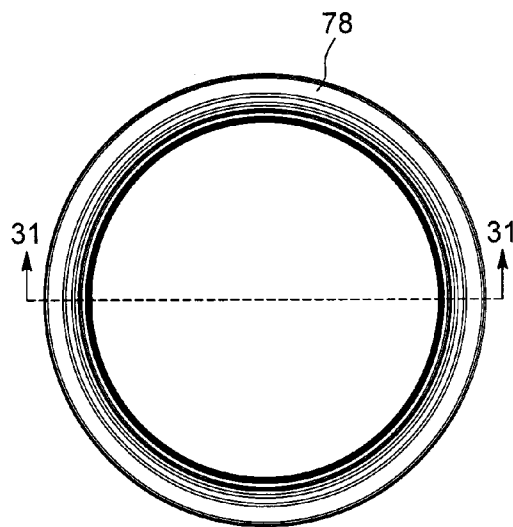


FIG. 30

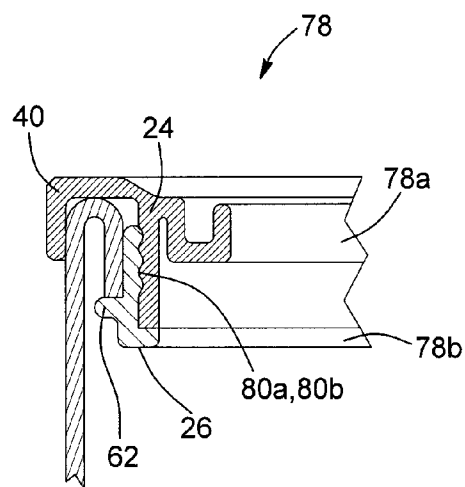


FIG. 31

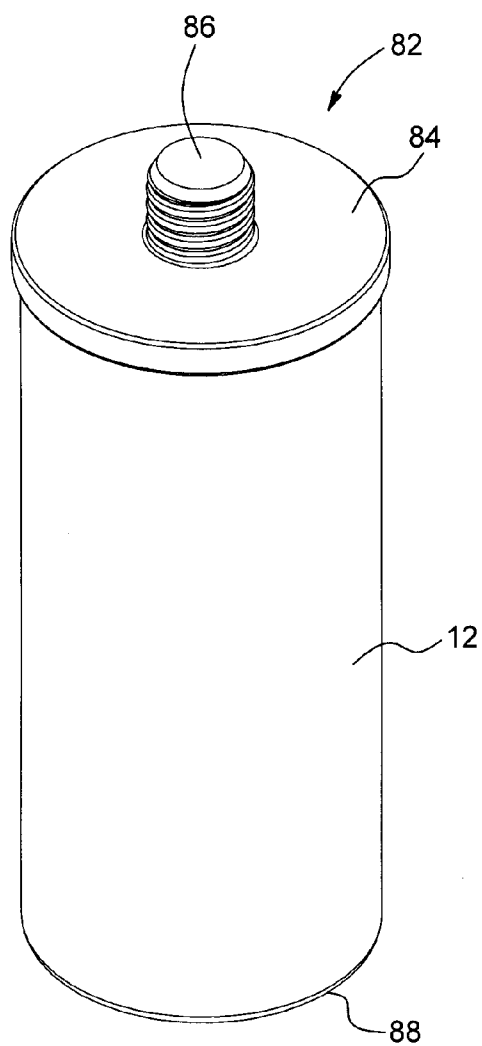


FIG. 32

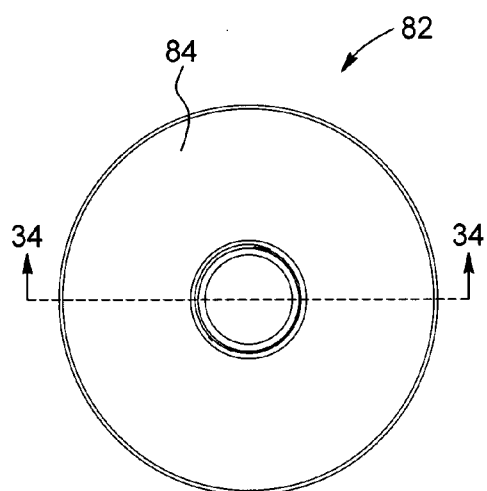


FIG. 33

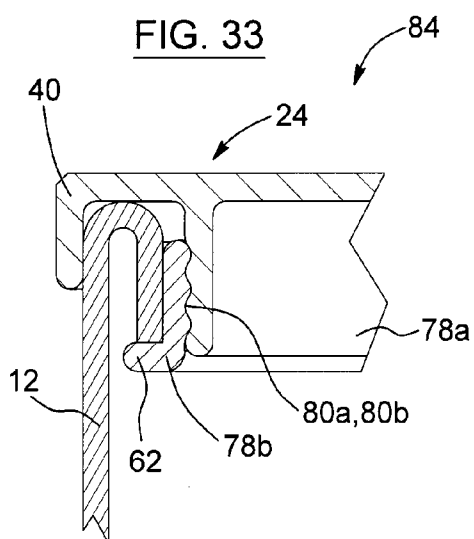


FIG. 34

RECYCLABLE COMPOST CONTAINER

FIELD OF THE INVENTION

[0001] The present invention generally relates to packaging and more particularly relates to a composite container system which can be disassembled and the components thereof recycled.

BACKGROUND

[0002] Packaging, such as box-shaped containers, are normally made entirely from a single material such as metal, plastic, wood or cardboard. Also known are composite containers made from combinations of either metal and plastic or metal and cardboard. When an impervious or leak-proof container is required for substances such as paint, toxic or harmful chemical products and the like, which may include volatile or other chemically active components, the containers are generally made entirely of a single material such as metal or plastic because these materials enable the containers to be made both leak-proof and structurally rigid.

[0003] The known composite containers typically comprise cardboard tubes closed at either end with metal end framing structures. The peripheral edges of these end framing structures are typically joined to the cardboard tube by a crimping or seaming process wherein the edge of the end framing structure is bent around one of the cylinder's extremities, thereby permanently deforming and connecting both the end framing structure and the cylinder's extremity. The crimping can also retain a metallised liner which is provided along the interior surface of the cardboard cylinder.

[0004] Other known composite containers are for containing food products. They are typically made of a cardboard tube having both extremities ending with outwardly rolled rims.

[0005] The inside wall of the tube is provided with an impervious liner in order to render it airtight and watertight. The bottom of such a container is generally provided with a metallic closure and the top end is closed with a membrane sealed to the impervious liner. The rim of the top end must be outwardly rolled in order to allow the membrane to be sealed to the exposed liner of the rim, as the sealing of the membrane would not be possible with inwardly rolled rims. A reusable end cap is snapped over the outwardly rolled rim.

[0006] When manufacturing such containers, the liner ply is applied over the cardboard ply using an adhesive, and the combined plies are heated in such a way that they are bonded together thus forming a single thicker ply, which is then rolled into a tube. The recycling of the different components of such containers is simply not possible because of the crimped metallic closure, and because the cardboard plies are bonded with polymeric liners using adhesive.

[0007] Also known to the Applicant is document U.S. Pat. No. 7,703,626, describing a container having an outwardly rolled rim and closed by a cover. The cover has an annular ring provided with a projection located underneath the rim. The cover also has a detachable portion which must be removed in order to access the interior of the container. The rolled rim must thus be rolled outwardly in order for users to access the detachable portion of the cover.

[0008] U.S. Pat. No. 4,856,708 describes an adhesively secured container cover. The cover includes a ring fitted over the rolled edge of a container wall. The ring is maintained in place with an adhesive, the ring having an annular cavity for

receiving the adhesive. As it can be appreciated, the closure of the container can not be removed from the sidewall of the container once in place, and thus can not be easily recycled.

[0009] U.S. Pat. No. 4,700,867 describes a sleeved container used to contain juice concentrates and the like. The container includes an outer cardboard sleeve and an inner plastic sleeve. The inner plastic sleeve is provided with an outturned flange fitted over the upper end of the cardboard sleeve and includes an upper portion which is moulded or formed such as to include a groove into which the tongue of the closure can fit.

[0010] U.S. Pat. No. 4,312,459 describes a paint can rim cover and a lid, the rim cover being used to prevent paint from drying within the groove of the rim of a paint can of well-known construction. A typical paint can is formed of a cardboard cylinder having its upper end outwardly rolled and of a metallic rim rolled and crimped around the outwardly rolled end of the cardboard cylinder. The connection between the cardboard cylinder and the metallic rim is made so as to be permanent. The plastic rim cover of the invention is destined to cooperate with the metallic rim of the paint can, the rim cover having a lip which cooperates with the bead of the metallic rim. U.S. Pat. No. 6,616,110 describes yet another type of device connectable to the metallic rim of a typical paint can.

[0011] Also known in the art or in related fields of the art are the following documents: U.S. Pat. No. 3,127,052; U.S. Pat. No. 3,815,778; U.S. Pat. No. 3,973,719; U.S. Pat. No. 4,280,653; U.S. Pat. No. 5,160,063; U.S. Pat. No. 5,669,550; U.S. Pat. No. 6,250,492; U.S. Pat. No. 6,675,971; U.S. Pat. No. 7,311,218; U.S. Pat. No. 7,703,626; EP0952087, EP1081051, EP1092526, EP1092647; EP 1104744; US 2009/0283526; WO97/47525; GB 2235920; U.S. Pat. No. 3,730,382; U.S. Pat. No. 3,753,511; U.S. Pat. No. 3,770,156; U.S. Pat. No. 3,792,797; U.S. Pat. No. 3,817,420; U.S. Pat. No. 3,915,336; U.S. Pat. No. 4,266,686; U.S. Pat. No. 4,312,459; U.S. Pat. No. 4,491,238; U.S. Pat. No. 4,518,097; U.S. Pat. No. 4,676,392; U.S. Pat. No. 4,679,699; U.S. Pat. No. 4,582,707; U.S. Pat. No. 4,700,867; U.S. Pat. No. 4,718,571; U.S. Pat. No. 4,856,708; U.S. Pat. No. 5,035,387; U.S. Pat. No. 5,161,689; U.S. Pat. No. 5,246,134; U.S. Pat. No. 5,295,632; U.S. Pat. No. 5,316,169; U.S. Pat. No. 5,443,853; U.S. Pat. No. 5,794,814; U.S. Pat. No. 5,806,710; U.S. Pat. No. 5,950,861; U.S. Pat. No. 6,220,471; U.S. Pat. No. 6,616,110; U.S. Pat. No. 6,964,348; U.S. Pat. No. 7,350,789; U.S. Pat. No. 7,350,789; U.S. 20090159607; and U.S. 20110056976.

[0012] The main drawback of prior composite containers is that once assembled these containers cannot be easily disassembled, making recycling of their various components very difficult.

[0013] It would therefore be desirable to provide a composite container system which can overcome this disadvantage.

[0014] It would also be desirable to provide a container system which can be dissembled and then recycled, at least partly, and that would also be versatile, lightweight, inexpensive and/or easily manufactured.

SUMMARY OF THE INVENTION

[0015] In accordance with the present invention, a recyclable composite container is provided.

[0016] The recyclable composite container comprises a cardboard hollow body having an open end defining an opening. The body is formed by a sidewall having an inwardly rolled rim at the open end.

[0017] The container also comprises a framing element which is removably connectable to the open end of the cardboard hollow body. The framing element has a peripheral portion and a hook-shaped connector linked to this peripheral portion. The connector is for engaging with the inwardly rolled rim of the cardboard hollow body.

[0018] Such construction thereby allows connection of the framing element to the cardboard hollow body by hooking the connector to the rim of the cardboard hollow body, and disconnection of the framing element from the cardboard hollow body by pulling the framing element so as to disengage the connector from the rim.

[0019] The container according to the invention provides a connection of the framing element and the cardboard hollow body sturdy enough to allow a normal use of the container, for example for containing paint, silicone or food, and for resisting pressure and temperature variations that can occur during transportation or handling of the container. The connection is at the same time removable such that by applying sufficient amount of force, the framing element can be disassembled from the cardboard hollow body, in order to recycle the main components of the container. When describing the relation of the connector to the peripheral portion of the framing element, it should be understood that the word "linked" means that the connector can be either integral to the peripheral portion of the framing element, or connected to it, either directly or indirectly, via another component.

[0020] Having the container with an inwardly rolled rim provides the advantage of hiding the rolled rim and the connector inside the container, such that the person handling the container during normal use does not have readily access to these connecting elements. Having the rims rolled inwardly also allows providing a more compact and uniform container when viewed from the outside, thus improving its aesthetics, because the connector and the rolled rims are hidden inside the container.

[0021] By composite container, it is meant the container is made of different parts made of different materials.

[0022] By framing element, it is meant an element substantially rigid to provide rigidity and structure to the cardboard hollow body.

[0023] By peripheral portion, it is meant a zone, an area or a section of the framing element located along its periphery.

[0024] The expression "removably connected" refers to the framing element rather than to a lid, and is intended to mean that when applying a predetermined amount of pulling force on the framing element, the connector can be disengaged from the inwardly rolled rims, allowing the framing element to be disconnected from the cardboard hollow body.

[0025] Preferably, the connector comprises an axial section ending with a hook extending radially and outwardly, and the rolled rim comprises an axial section and a free end, and when the framing element is connected to the open end, the axial section of the connector is adjacent the axial section of the rolled rim, and the hook interlocks the free end of the rolled rim.

[0026] In accordance with a first variant of the container, the connector comprises a flange having an outwardly curved end, the flange extending continuously along said peripheral portion.

[0027] In accordance with a second variant of the container comprises a plurality of said of hooked-shaped connector distributed along said peripheral portion.

[0028] Preferably, the framing element comprises a cover wall integral to the collar, for closing the opening of the cardboard hollow body when the framing element is connected to the open end.

[0029] Preferably, the peripheral portion of the framing element is a lid flange defining an aperture, for sealingly and removably receiving a lid.

[0030] Preferably, the recyclable composite container comprises a bag for lining an inner surface of the sidewall of the cardboard hollow body, the bag having an open end clampable between the inwardly rolled rim and the connector.

BRIEF DESCRIPTION OF THE DRAWINGS

[0031] Other objects, advantages and features of the present invention will become more apparent upon reading the following non-restrictive description of preferred embodiments thereof, given for the purpose of exemplification only, with reference to the accompanying drawings in which:

[0032] FIG. 1 is an exploded view of a container according to a preferred embodiment of the invention.

[0033] FIG. 2 is a top perspective view of a framing element according to a first variant.

[0034] FIG. 3 is a bottom perspective view of the framing element of FIG. 2.

[0035] FIG. 4 is a top view of the framing element of FIG. 2.

[0036] FIG. 5 is a close-up of a portion of the cross-sectional view of the framing element of FIG. 4, taken along line 5-5.

[0037] FIG. 6 is a top perspective view of a framing element according to a second variant.

[0038] FIG. 7 is a bottom perspective view of the framing element of FIG. 6.

[0039] FIG. 8 is a top view of the framing element of FIG. 6.

[0040] FIG. 9 is a close-up of a portion of the cross-sectional view of the framing element of FIG. 8, taken along line 9-9.

[0041] FIG. 10 is a top perspective view of a framing element according to a third variant.

[0042] FIG. 11 is a bottom perspective view of the framing element of FIG. 10.

[0043] FIG. 12 is a top view of the framing element of FIG. 10.

[0044] FIG. 13 is a close-up of a portion of the cross-sectional view of the framing element of FIG. 12, taken along line 13-13.

[0045] FIG. 14 is a top perspective view of preferred variant of a cardboard hollow body.

[0046] FIG. 15 is a cross-sectional view of the cardboard hollow body of FIG. 15.

[0047] FIG. 16 is an exploded view of a container according to another preferred embodiment of the invention.

[0048] FIG. 17 is a top perspective view of the container of FIG. 16 when assembled.

[0049] FIG. 18 is a top view of the container of FIG. 16, when assembled, without the lid.

[0050] FIG. 19 is a close-up view of a portion of the container of FIG. 18, taken along lines 19-19.

[0051] FIG. 20 is a top perspective view of a framing element according to a fourth variant.

[0052] FIG. 21 is a bottom perspective view of the framing element of FIG. 20.

[0053] FIG. 22 is a top view of the framing element of FIG. 20.

[0054] FIG. 23 is a cross-sectional view of the framing element of FIG. 22, taken along line 23-23. FIG. 23A is a closed view of a portion of FIG. 23.

[0055] FIG. 24 is a top view of a cardboard hollow body lined with a bag.

[0056] FIG. 25 is a cross-section view of the cardboard hollow body of FIG. 24, taken along lines 25-25.

[0057] FIG. 26 is a top perspective view of a container according to another preferred embodiment of the invention.

[0058] FIG. 27 is a top view of the container of FIG. 26.

[0059] FIG. 28 is a close-up view of a portion of the container of FIG. 27, taken along lines 28-28.

[0060] FIG. 29 is a top perspective view of a container according to another preferred embodiment of the invention.

[0061] FIG. 30 is a top view of the container of FIG. 29.

[0062] FIG. 31 is a close-up view of a portion of the container of FIG. 27, taken along lines 31-31.

[0063] FIG. 32 is a top perspective view of a container according to another preferred embodiment of the invention.

[0064] FIG. 33 is a top view of the container of FIG. 32.

[0065] FIG. 34 is a close-up view of a portion of the container of FIG. 27, taken along lines 34-34.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0066] In the following description, similar features in the drawings have been given similar reference numerals. In order to preserve clarity, certain elements may not be identified in some figures if they are already identified in a previous figure.

[0067] With reference to FIG. 1, a recyclable composite container 10, hereafter referred to as container, is shown. The container 10 comprises a cardboard hollow body 12 having an open end 14, defining an opening 16. The body 12 is formed by a sidewall 18 having an inwardly rolled rim 20 at the bottom open end 14. The container also comprises a framing element 22 removably connectable to the open end 14.

[0068] The framing element 22 has a peripheral portion 24 and a hook-shaped connector 26 linked to the peripheral portion 24 for engaging with the inwardly rolled rim 20 of the cardboard hollow body 12. In this variant of the framing element, the connector 26 extends from the peripheral portion 24. The framing element 22 can be connected to the cardboard hollow body 12 by hooking the connector 26 to the inwardly rolled rim 20 of the cardboard hollow body 12, and disconnected from the cardboard hollow body 12 by pulling the framing element 22 so as to disengage the connector 26 from the rim 20.

[0069] During assembly, the framing element 22 is forced into the cylinder 12 until the connectors 26 are past the rolled rim 20. Preferably, the connector 26 has a tapered surface opposite the rim 30 of the cylinder 12 so as to ease this process.

[0070] FIGS. 14 and 15 show the cardboard hollow body 12 with greater details. Although the cardboard hollow body 12 is shown as cylindrical, it will be appreciated that the shape of the body 12 is not limited to circular cross-sections. The cardboard body 12 has at least one rim, and in the present case two inwardly rolled rims 20, 30 which can have different types of shapes, such as a semi-circular or a semi-oval shape. At least one of the rims 20, 30 must be sufficiently curved to

allow a connector to interlock with the rim, thus forming a flange-like portion, or engaging surface, at angle from the sidewall 18 of the body 12.

[0071] A cardboard hollow body is typically formed by convoluting or spiralling plies of cardboard or kraft-type paper material. The rolled rims 20, 30 can be formed by forcing the edge of the cylinder 12 inward so as to form an inwardly extending, flange-like portion. Preferably, these rolled rims 20, 30 extend all around the first and second open ends 14, 28. Given a cardboard of suitable thickness and construction, the rims 20, 30 are stable and will generally not unroll or otherwise deform during regular use.

[0072] Back to FIG. 1, the container 10 also comprises a second framing element 32 removably connectable to the second open end 28, corresponding to the top end of the body 12. The second framing element 32 also has a peripheral portion and a hook-shaped connector (not shown in FIG. 1). Best shown in FIG. 3, the second framing element 32 is similar to the first framing element 22 in that it is provided with a peripheral portion 24 and a connector 34 extending from that portion 24 to engage with the rolled rim 30.

[0073] When assembled, the cardboard cylinder 12 is thus reinforced at either end by the first and second framing elements 22 and 32. Preferably, the end framing elements 22 and 32 are formed from moulded plastic. The first and second end framing structures 22 and 32 reinforce the bottom and top of the container 10, respectively. It will be appreciated that positional descriptions such as “top”, “bottom” and the like should, unless otherwise indicated, be taken in the context of the figures and should not be considered limiting.

[0074] Now referring to FIGS. 2 to 5, the first variant of the framing element 32 is best shown. The framing element 32 is provided with a variant of the hook-shaped connector 34 which is formed by a flange 36 having an outwardly curved end 38. The flange 36 extends continuously along the peripheral portion of the framing element 32. The framing element 32 is also provided with apertures to allow the product it contains to be poured out.

[0075] Referring to FIGS. 6 to 9, the second variant of the framing element 22 is best shown. The framing element 22 is provided with a plurality of hooked-shaped connectors 26 distributed along the peripheral portion 24 of the framing element 22.

[0076] With reference to FIGS. 1 to 9, these two variants of framing elements, 22 and 32, both comprise respective collars 40, 42 sized and shaped for fitting snugly over the corresponding open ends 14, 28 of the cardboard hollow body 12 when the framing elements 22, 32 are connected cardboard body 12.

[0077] The framing elements 22, 32 are also each provided with cover walls, 44 and 46 respectively, integral to collars 40 and 42. The cover walls 44, 46 are for closing the opening 16 of the cardboard hollow body when the framing elements 22, 32 are connected to the open ends 14, 28. When the container 10 is assembled, the cover walls 44, 46 integrally extend from the respective collars 40, 42, perpendicularly across the body 12, the framing element 22 closing the bottom of the container 10 completely, while the framing element 32 almost completely closes the top end of the container 10, save for the apertures. Such container can be used for example for powdered cleanser.

[0078] Now referring to FIGS. 10 to 13, a third variant of a framing element 48 is shown. This variant 48 can be used for example with the container 10 of FIG. 1, in replacement of the

top framing element 22. This variant of the framing element 48 has an annular shape and has its peripheral portion defining a lid flange 50, which defines in turn an aperture in the framing element 48. This lid flange 50 allows for sealingly and removably receiving a lid (not shown), allowing to close off the aperture. This variant of the framing element is particularly advantageous for container food product, such as pasta or coffee for example. The lid could be hinged to or snap fitted over the lid 50. This third variant 48 is also provided with hook-shaped connectors 26 extending from the lid flange 50, and a collar 40 for snugly fitting over the rim 30.

[0079] After using the container, and when time comes to disassemble it, the lid flange 50 advantageously provides a support for exerting the pulling force required to remove the framing element 48 from the cardboard body 12. Since the rolled rim 30 is made of cardboard, it has a relative flexibility and is able to be deformed when a substantial amount of pulling force is applied on the framing element 48. Such construction of the container 10, when assembled, is particularly advantageous since it is sturdy enough to allow normal usage of the container and resist impacts, changes of temperature and humidity generally occurring during normal use of the container, and yet it allows the container to be disassembled such that its main components can be recycled or even reused if their state permits it, when a sufficient amount of force is applied to disengage the framing elements from the cardboard tube 12.

[0080] With reference to FIGS. 16 to 23, another preferred embodiment of a recyclable composite container is shown. The container 52 comprises a framing element 22 for closing off the bottom end of the container. The container 52 includes a bag 54 for lining an inner surface 56 of the sidewall 18 the cardboard hollow body 12. The bag 54 comprises an open end 58, a closed end and a diameter that is sized to fit within the cylinder 12. The framing element 53 provides an end framing structure to the upper end of the body 12, and allows clamping and maintaining in place the bag 54 within the body 12. As best shown in FIG. 19, the bag 54 has an open end 58 clampable between the inwardly rolled rim 30 and the connector 26. The container 52 also includes a removable lid 70 which can be sealingly closed over the framing element 53.

[0081] The container 52 is provided with the bag 54 for containing a liquid, a gel or similar substance. In addition, a bag 54 may be desirable in order to protect the contents of the container 52 from humidity and/or to prevent odours from escaping the container 52. In addition, the bag 54 can advantageously be used to protect the cardboard cylinder 12, whose main role is to provide structure to the container 52, from being damaged by the substance contained therein. For embodiments where a liquid should be contained within a metallic surface, a metalized bag comprising an interior metallic layer can be used.

[0082] The closed end of the bag 54 could be fixed to the bottom end framing structure 14 or could simply be left loose, extending downwards within the cardboard body 12 as illustrated. As such, whatever is stored within the container 52 is sealed within the walls of the bag 54, the collar 40 and the lid 70. In addition, it will be appreciated that even if the bag 54 is loose, a desirable vacuum may be created between the bag 54 and the cardboard body 12 as the container 10 is assembled and filled. This vacuum can serve to keep the bag 54 tight against the inside of the cardboard body 12 even as it is emptied.

[0083] In FIG. 19, it can be seen that the connector 26 comprises an axial section 60 ending with a hook 62 extending radially and outwardly towards the sidewall of the container, and the rolled rim 30 comprises an axial section 64 and a free end 66, and when the framing element 53 is connected to the open end, the axial section 60 of the connector 26 is adjacent the axial section 64 of the rolled rim 30, and the hook 62 interlocks the free end 66 of the rolled rim 30, underneath the free end 66. Preferably, the ratio of the length of the hook 62 and of the length of the axial section 60 varies between 15% and 45%, and more preferably between 20% and 35%. As shown, the clamped section of the bag 38 extends all the way in the collar 40 of the framing element 53, further retaining the bag 54. As it can be appreciated, the bag 54 is not attached or fixed to the inner surface 56 of the cardboard hollow body 12 with any adhesive or glue. The bag 54 can simply be held loose within the body 12 or be maintained in contact with the inner surface 56 of the sidewall of the body 12 by vacuum. Both alternatives advantageously allow, after use of the container, easy removal of the bag from the cardboard body, in order to recycle the cardboard body 12 or both the cardboard body 12 and the plastic bag 54.

[0084] FIGS. 20 to 23 show the variant of the framing element 53. This variant is provided with a flange lid 50 especially adapted to receive a lid, such as the ones typically used for paint containers. The framing element 53 is also provided with a tapered inner flange 68 which can advantageously hide the inwardly rolled rim and provides a smooth transition between the interior of the container and the framing element 53, facilitating the pouring of paint in a pan for example.

[0085] With reference to FIGS. 24 and 25, another alternative for lining the cardboard hollow tube 12 is shown. The bag 54 is wrapped around the sidewall 18 the cardboard hollow body 12 for lining both inner and outer surfaces of the sidewall 18, the bag being then clampable at both ends 14, 28 of the cardboard hollow body 12. When the container 52 is assemble, the bag 54 is clamped between each of the inwardly rolled rims 20, 30 and the connectors 26 of the corresponding framing element 22, 53.

[0086] In this variant, a longer bag 54 is provided and extends not just within the body 12, as discussed above, but along its exterior as well. Rather than being clamped between the upper framing element 53 and upper end 28 at its open end, it would be clamped for example at the lower end first, with framing element 22, approximately at midpoint of the bag 54. The framing elements in FIGS. 24 and 25 are not shown for clarity purposes. The remainder of the bag 54, i.e. the portion between its midpoint and open end 28, would pass back along the outer surface of the body 12, preferably fitting tightly therearound. The bag 54 would then be clamped between the upper framing structure 53 and the upper end 28 of the cylinder 12. Such a bag 54 would therefore be able to both contain a liquid within the container 52 and provide protection for the exterior of the cardboard cylinder 12. The portion of the bag 54 which extends outside the body 12 could be heat-shrunk in order to ensure the tightness of the bag 54 around the exterior of the body 12. Of course, other ways of wrapping the inner and outer surfaces of the cardboard hollow body 12 can be considered. Preferably, the bag is not glued or fixed with an adhesive to the cardboard body 12.

[0087] Now referring to FIGS. 26 to 28, another preferred embodiment of a recyclable composite container 72 is shown. In this embodiment, the framing element 74 includes two

components, a first component **74a** comprising the peripheral portion **24** and a second component comprising the connector and its hook **62**. The two components **74a**, **74b** are connectable to one another with complementary connecting means. As illustrated, the first component **74a** is provided with a groove **76**, and the second component **74b** is provided with a clipping element **78** for fitting in the groove **76**. In other words, the groove **76** and clipping element **78** form a tongue-and-groove joint for connecting the first and second components **74a**, **74b** together. Optionally, as best shown in FIG. **28**, the connecting element **78** can be provided with a slight protuberance, or lip, in order to maintain the connecting element **78** compressed within the groove **76**.

[0088] Advantageously, this two-piece construction of the framing element **74** is divided into upper and lower portions which are clipped together along complementary radial surfaces. This two-piece construction is primarily advantageous when the framing elements are formed by injection moulding or the like. Of course, the axial portions of the components **74a** and **74b** can be fixed to one another by any other type of complementary attachment means.

[0089] Now referring to FIGS. **29** to **31**, the container **76** includes another variant of a two-piece construction for a framing element **78** is shown. The framing element **78** comprises two components, a first component **78a** comprising the peripheral portion **24** and a second component **78b** comprising the connector **26** and its hook **62**, the components **78a** being provided with a first threaded surface **80a**, and the other one of the components being provided with a complementary second threaded surface **80b**. The components **78a** and **78b** are thus screwable to one another. As explained previously, a two-piece construction is primarily advantageous when the framing elements are formed by injection moulding or the like. The framing element **78** can then be assembled by positioning the first and second components **78a**, **78b** on the top side of the rolled rim **30** and by screwing them together, thereby sandwiching the rim **30** such that the resultant hook-shaped connector **26** fixes the framing element **78** in place. It will be appreciated that constructing a framing element from two moulded pieces, and more particularly separating the outwardly extending hook **62** from the collar **40** such as shown here, can greatly reduce the complexity of the moulds required to form this part. Yet in another embodiment, a two-piece construction of the framing element can include a first component provided with a series of alternating grooves and bulges, and a second component provided with complementary alternating grooves and bulges, the first and second components being snapable or clipable to one another.

[0090] With reference now to FIGS. **32** to **34**, yet another embodiment of the recyclable composite container **82** is illustrated. The cardboard body **12** has an elongated form and comprises a framing element **84**. A bag (not visible) can be disposed within the body **12**. Best shown in FIG. **34**, the top framing element **84** has a construction similar to the one of the previous variant **78**. The framing element **84** has a threaded two-piece construction and further comprises a centrally mounted spout **86** through which the contents of the container **82** can exit. A bag can be positioned within the cardboard cylinder **12** and a piercing device can extend towards it, downwards from the spout **86**, such as generally used in container for silicone or other types of caulking. Instead of a bottom end framing element, a bottom plate **88** is provided at the opposite end of the body **12**. This bottom plate **88** is positioned initially at or near the bottom extremity of the

cardboard cylinder **12** and is able to slide axially within the cylinder **12**. Preferably, a bag is also anchored to the bottom plate **88**, although it is not clamped between the framing element **84** and the cylinder **12**, as described for embodiments illustrated in FIGS. **16-19**.

[0091] Such a container **82** can be used to distribute a liquid or gel substance, such as a silicone or polyurethane caulk or the like. In such cases, a bag is inserted in the cardboard body **12** and preferably comprises a metalized liner along its inside. As is known in the art, such a cylindrical cartridge can be loaded into a mechanical “gun” which is used to distribute the contents thereof.

[0092] Prior to use, the contents of the bag are sealed there-within. In use, the bottom plate **88** is pushed into the cylinder **12**, for example through the action of a caulking gun. Pushing the bottom plate **88** inwards will first force the bag against a piercing device, thereby puncturing it, and second force the contents of the bag out through the spout **86**.

[0093] While the containers illustrated all comprise a circular cross-section, it will be appreciated that various other shapes, including oval, square or rectangle, could also be used. Moreover, a composite container system in accordance with the present invention could be embodied by various other storing devices or containers.

[0094] In sharp contrast with existing containers, both composite and not, it will be appreciated that a container system in accordance with the present invention advantageously requires no crimping, seaming, bonding or other permanent joining. The cardboard hollow body can be connected to the framing element(s) via engagement of the rolled rim (or rims) alone. As such, the container system can be easily disassembled after use. It will be appreciated that this ability to be disassembled advantageously enables the individual components (the hollow body, the end framing structures, the bag if present) to be separated and recycled as desired. If the container system were filled with a non-recyclable substance such as paint, the plastic bag liner can be thrown out and, depending on the embodiment, the end framing structure if such were in contact with the paint. The remainder, including the cardboard hollow body, would nonetheless be recyclable.

[0095] The present container system, which can be used to store a wide range of substances and items, from paint and caulk as described above to foodstuffs such as pasta or coffee and various other products. In addition, it will be appreciated that a container system in accordance with the present invention may advantageously enable considerable weight savings compared to equivalently sized all-metal or all-plastic containers—up to 30% for an all-metal container. In addition, the present container system also enables considerable costs savings compared to conventional cardboard composite containers.

[0096] Although preferred embodiments of the present invention have been described in detail herein and illustrated in the accompanying drawings, it is to be understood that the invention is not limited to these precise embodiments and that various changes and modifications may be effected therein without departing from the scope of the present invention.

1. A recyclable composite container comprising:

- a cardboard hollow body having an open end defining an opening, the body being formed by a sidewall having an inwardly rolled rim at the open end;
- a framing element removably connectable to the open end, the framing element having a peripheral portion and a

hook-shaped connector linked to the peripheral portion for engaging with the inwardly rolled rim of the cardboard hollow body;

thereby allowing connection of the framing element to the cardboard hollow body by hooking the connector to the rim of the cardboard hollow body, and disconnection of the framing element from the cardboard hollow body by pulling the framing element so as to disengage the connector from the rim.

2. The recyclable composite container according to claim 1, wherein the connector comprises an axial section ending with a hook extending radially and outwardly, and the rolled rim comprises an axial section and a free end, and when the framing element is connected to the open end, the axial section of the connector is adjacent the axial section of the rolled rim, and the hook interlocks the free end of the rolled rim.

3. The recyclable composite container according to claim 1, wherein the connector comprises a flange having an outwardly curved end, the flange extending continuously along said peripheral portion.

4. The recyclable composite container according to claim 1, comprising a plurality of said of hooked-shaped connector distributed along said peripheral portion.

5. The recyclable composite container according to claim 1, wherein the peripheral portion comprises a collar sized and shaped for fitting snugly over the open end of the cardboard hollow body when the framing element is connected to the open end.

6. The recyclable composite container according to claim 4, wherein the framing element comprises a cover wall integral to the collar, for closing the opening of the cardboard hollow body when the framing element is connected to the open end.

7. The recyclable composite container according to claim 1, wherein the peripheral portion of the framing element is a lid flange defining an aperture, for sealingly and removably receiving a lid.

8. The recyclable composite container according to claim 1, further comprising a bag for lining an inner surface of the sidewall the cardboard hollow body, the bag having an open end clampable between the inwardly rolled rim and the connector.

9. The recyclable composite container according to claim 1, wherein the cardboard hollow body further comprises:

a second open end having an inwardly rolled rim defining a second opening;

a second framing element removably connectable to the second open end, said second framing element having a peripheral portion and a hook-shaped connector, said connector of the second framing element extending from the peripheral portion of the second framing element, for engaging with the inwardly rolled rim of the second open end of the cardboard hollow body.

10. The recyclable composite container according to claim 9, further comprising a bag wrapable around the sidewall the cardboard hollow body for lining both inner and outer surfaces of the sidewall, the bag being clampable at both ends of the cardboard hollow body between each of the inwardly rolled rim and the connector of the corresponding framing element.

11. The recyclable composite container according to claim 1, wherein the cardboard hollow body is tubular and the framing element has an annular shape.

12. The recyclable composite container according to claim 1, wherein the framing element comprises two components, a first component comprising the peripheral portion and a second component comprising the connector, one of the components being provided with a groove, and the other one of the components being provided with a clipping element for fitting in said groove, the groove and clipping element forming a tongue-and-groove joint for connecting the first and second components together.

13. The recyclable composite container according to claim 1, wherein the framing element comprises two components, a first component comprising the peripheral portion and a second component comprising the connector, one of the components being provided with a first threaded surface, and the other one of the components being provided with a complementary second threaded surface, whereby the first and second components are screwable to one another.

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