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(54) **Process for producing a container having a resealable closure and container made by this process**

Verfahren zur Herstellung eines Behälters mit wiederverschliessbarem Verschluss, sowie damit hergestellter Behälter

Procédé de fabrication d'un récipient à couvercle refermable et récipient ainsi obtenu

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(56) References cited:
EP-A- 0 461 868 **US-A- 2 531 914**
US-A- 4 557 414

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Description

Field Of The Invention

[0001] This invention relates to a process for producing a container having a resealable closure and more particularly to a process for producing a paper container closed at one end with a membrane disc and a paper overcap which may be used for resealing the container after opening thereof through the membrane.

Background Of The Invention

[0002] Containers have heretofore been provided for dry products including food, various powdered and the like products which have comprised a container body portion constructed primarily of paper, a heat sealable membrane closure on one end thereof and a plastic overcap covering the membrane closed end so that when the membrane is broken to obtain access to the product in the interior of the container, the plastic overcap may be used to reclose the container. These containers are made in a process according to the preamble of appended claim 1. Reference may be had to United States Patent 3,892,351 of July 1, 1975 for a general description of this type of container.

[0003] While this type of container has well served its purpose for packaging various types of products, it does not provide a container having an overcap constructed generally of the same materials as the container for recycling or other purposes. Paper overcaps have not been considered practical for these types of containers primarily because of the expense of producing this type of container with a paper overcap when compared to producing this type of container with a plastic overcap.

Object And Summary Of The Invention

[0004] Accordingly, it is the object of this invention to provide an improved process of producing a container having a resealable closure which makes it practical from a manufacturing and cost standpoint to fabricate an overcap and a container from generally the same materials (preferably and primarily paper).

[0005] It has been found by this invention that this object is accomplished by providing such a manufacturing process for a container having a resealable closure which includes the steps listed in claim 1. A hollow container of desired shape and having an open upper end of desired dimensions is provided. An overcap substrate is provided. A heat sealable membrane disc of desired shape and dimensions is provided to cover the open upper end of the hollow container. The membrane disc is laminated to the overcap substrate with a material which releases the membrane disc from the overcap substrate under the application of heat. Thereafter, an overcap of desired shape and dimension is fabricated to fit over the open upper end of the hollow container from the sub-

strate with the membrane disc on the inside thereof. The overcap is then positioned over the open upper end of the hollow container so that the membrane disc is in contact with and covers the open upper end of the container. Heat is applied to the overcap to effect heat sealing of the membrane disc to the upper end of the container to hermetically seal such container end and to effect release of the membrane disc from the overcap.

[0006] The composite container is cylindrical and includes a paperboard body portion and a heat sealable liner and has an outwardly beaded open upper end of desired dimensions. The overcap substrate includes a paperboard material for fabricating a paperboard overcap.

[0007] Optionally, the process of this invention may include permanently bonding a desired area of the membrane disc to the overcap so that a bond remains therebetween after heat release of the membrane disc from the overcap to provide a tamper evident means.

Brief Description Of The Drawings

[0008] Some of the objects and advantages of this invention have been set forth above, other objects and advantages will appear from the following detailed description of a preferred embodiment of this invention, when taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective exploded view of a container having a resealable closure and constructed in accordance with the process of this invention and illustrating the user removing product contents from the container;

FIG. 2 is an enlarged sectional exploded view and taken generally along the line 2-2 of FIG. 1;

FIG. 3 is a schematic view illustrating some of the steps of the process of this invention;

FIG. 4 is an enlarged partial perspective view of the overcap substrate with membrane disc laminated thereto and taken generally along the line 4-4 of FIG. 3;

FIG. 5 is a further enlarged sectional view through the overcap substrate and membrane disc and taken generally along the line 5-5 of FIG. 4;

FIG. 6 is an enlarged partial sectional view through a fabricated overcap having a membrane disc laminated on the inside thereof and taken generally along the line 6-6 of FIG. 3;

FIG. 7 is an enlarged partial sectional view through a container having the membrane disc heat sealed to the upper end thereof to hermetically seal such open end and having the overcap positioned over such open end and taken generally along the line 7-7 of FIG. 3;

FIG. 8 is a view, like FIG. 7 and illustrating an alternative feature of a bond between a desired area of the membrane disc and the overcap to provide a

tamper evident feature; and
 FIG. 9 is a view, like FIG.8 illustrating the overcap being removed from the container resulting in a tear of the membrane at the bond to show the tamper evident feature in operation.

Description Of Preferred Embodiments Of The Invention

[0009] Referring now to the drawings and particularly to FIGs 1 and 2, a container 10 is illustrated which is produced in accordance with this invention. This container 10 is of desired shape, cylindrical, and has an open upper end 11 of desired shape, preferably circular. The lower end of the container 10 may be closed by any suitable closure as well understood by those with ordinary skill in the art and does not form a part of the present invention and will not be described in detail herein. The open upper end 11 of the container 10 is hermetically sealed by a heat sealable membrane disc 12 of desired shape, preferably circular, and dimensions to cover the open upper end 11 of the hollow container 10. An overcap 13 of desired shape, preferably circular with a depending peripheral flange, and dimensions is provided to fit over the open upper end 11 of the hollow container 10 and is adapted to be removed for breaking the membrane 12 to gain access to the product P within the container 10 and to then be positioned back over the upper end 11 of the container 10 to reclose the container.

[0010] The container 10 is constructed of composite materials and includes a cylindrical open ended body portion 15 which may be preferably constructed of one or more paperboard body plies 16 which may be spirally or convolutely wound or otherwise formed. These paperboard body plies 16 are typically formed of spiral-winding paperboard or board stock having a thickness of between 0.254 mm (0.010 inch) and about 0.889 mm (0.035 inch), preferably between about 0.381 mm (0.015 inch) and 0.762 mm (0.030 inch), for example 0.533mm (0.021 inch). The board stock conventionally used in the manufacture of spirally-wound composite containers is commercially available from various manufacturers including Sonoco Products Company, Republic Paperboard Corporation and Middletown Board Corporation. In order to function advantageously as the spirally-wound bodywall layer, the board stock typically is composed of e.g., Kraft or recycled paper and can typically range from, e.g., 21.8 to 43.6 kg/ream (50 to 100 lbs./ream). In some instances, the board stock can include a weak exterior layer, e.g., a 0.076 mm (0.003 inch) exterior news. The body portion 15 of the container 10 further includes a heat sealable liner-layer 17 which is suitably laminated to the body ply 16 and may be spirally or convolutely wound or otherwise formed with the body ply 16 into the open ended hollow container body portion 15. The liner layer 17 may be typically constructed of a barrier type, flexible sheet material, such as a polymer/

foil, a Kraft/foil/polymer, a polymer/polymer, or a Kraft/foil laminate. The container body portion 15 may also include an outside label layer (not shown) if desired. The open upper end 11 is outwardly beaded in a manner well understood by those with ordinary skill in the art so that the liner layer 17 is positioned on the outer surface of the outwardly beaded open upper end 11 (as shown in FIG. 2). The overcap 13 may preferably be constructed of one or more paperboard body plies 18 which are also typically formed of similar materials as described above for the paperboard body plies. The heat sealable membrane disc 12 may suitably be constructed of a laminate of polymer and paper layers with or without foil.

[0011] In order to manufacture or produce this container 10 from an economical and practical standpoint, the novel process of this invention is utilized and which is illustrated more specifically in FIGs. 3-7. Firstly, the hollow container body portion 15, as described above, is provided having the open upper end 11. An overcap substrate material 20, which may be constructed of the paperboard plies 18, is provided. Heat sealable membrane discs 12 of the desired shape and dimensions to cover the open upper end 11 of the container body portion 15 are provided. These heat sealable membrane discs 12 are laminated to the overcap substrate 20 with a material 21 which release the membrane disc 12 from the overcap substrate 20 under the application of heat. This heat releasable material may be in the form of a polymer, hot melt or wax material.

[0012] Next, an overcap 13 of desired shape and dimensions to fit over the open upper end 11 of the hollow container body 15 is fabricated from the substrate 20 with a membrane disc 12 on the inside thereof (as shown in FIG. 6). Commercially available overcap forming equipment, well known to those with ordinary skill in the art, may be utilized for such overcap forming operation. Such equipment is available from a number of sources including Michael Hörauf Maschinenfabrik GmbH & Co. KG. The thus fabricated overcap 13 is positioned over the open upper end 11 of the hollow container body 15 (as shown in FIGs. 3 and 7) so that the membrane disc 12 is in contact with and covers the open upper end 11 of the container body portion 15. Heat is then applied with any suitable device, schematically illustrated at 31, to the overcap 13 to effect heat sealing of the membrane disc 12 to the upper end 11 of the container 10 and preferably to the heat sealable liner layer 17 of the outwardly beaded open upper end 11 to hermetically seal the container end 11 and to effect release of the membrane disc 12 from the overcap 13. This release is caused by melting, evaporating or otherwise eliminating the releasable material 21 between the overcap 13 and the membrane disc 12 (as shown in FIG. 7).

[0013] In accordance with an alternative feature of this invention (as illustrated in FIGs. 8 and 9), a permanently bonded area 35 may be provided between the overcap 13 and the membrane disc 12 so that a bond remains therebetween after heat release of the mem-

brane disc **12** from the overcap **13** to provide a tamper evident feature or means in the container **10**. With this permanently bonded area **35**, when the overcap **13** is removed from the container **10** a portion of the membrane disc **12** will be torn and remain with the overcap **13** (as shown in FIG. 9) to evidence that the overcap has been removed from the container and to provide the tamper evident feature.

[0014] The above described container **10** and its novel process of manufacture produces a container product which is normally sold by the container manufacturer to a customer who fills the container **10** with the desired product **P** and closes the bottom or other end of the container **10** with a suitable closure.

[0015] Heretofore, in the manufacturing processes for these types of containers, which commonly utilized a composite container body portion and a plastic overcap, additional manufacturing steps were necessary which added to the cost of producing the container. The membrane disc **12** had to be separately positioned and applied to the open upper end **11** of the container body portion **15** and heat sealed thereto, while the plastic overcap was formed in an entirely separate manufacturing operation. These separate operations also required that the membrane disc **12** be made of a material which provided more body and stiffness thereto and the less expensive thinner membrane materials could not be used from a practical standpoint in these prior manufacturing operations. By combining the membrane disc and the overcap substrate into one material prior to forming of the overcap, these manufacturing processes have been greatly reduced and simplified, resulting in a substantial cost savings which renders practical the use of overcaps preferably constructed of paperboard material and of the same material as the container body portion.

Claims

1. Process for producing a container (10) having a re-sealable closure comprising the steps of:

providing a generally cylindrical hollow composite container including a paperboard body portion (15) and a heat sealable liner (17) and having an outwardly beaded open upper end (11) of desired dimensions;

providing a heat sealable membrane disc (12) of suitable dimensions to cover the open upper end (11) of the hollow cylindrical container;

characterised in that the process further comprises the steps of:

providing a paperboard overcap substrate (20); laminating the membrane disc (12) to the overcap substrate (20) with a material (21) which

releases the membrane disc (12) from the overcap substrate (20) under the application of heat;

fabricating a paperboard overcap (13) of desired shape and dimensions to fit over the beaded open upper end (11) of the hollow container from the substrate (20) with the membrane disc (12) on the inside thereof;

positioning the overcap (13) with the membrane disc on the inside thereof over the beaded open upper end (11) of the hollow container so that the membrane disc (12) covers the open upper end (11) of the container and is in contact with the heat sealable liner (17); and

applying heat to the overcap (13) to effect heat sealing of the membrane disc (12) to the liner (17) in the beaded upper end (11) to hermetically seal the container end and to effect release of the membrane disc (12) from the overcap (13).

2. Process for producing a container (10) having a re-sealable closure, as set forth in claim 1 further including the step of permanently bonding a desired area of the membrane disc (12) to the overcap (13) so that a bond remains therebetween after heat release of the membrane disc (12) from the overcap (13) to provide a tamper evident means.

Patentansprüche

1. Verfahren zur Herstellung eines Behälters (10) mit einem wiederverschließbaren Verschuß, mit den folgenden Schritten:

Bereitstellen eines allgemein zylindrischen hohlen Verbundbehälters mit einem Körperteil (15) aus Pappe und einer heißsiegelbaren Decklage (17) und einem nach außen gebördelten offenen oberen Ende (11) mit gewünschten Abmessungen; Bereitstellen einer heißsiegelbaren Membranscheibe (12) mit geeigneten Abmessungen, um das offene obere Ende (11) des hohlen zylindrischen Behälters zu überdecken;

dadurch gekennzeichnet, daß das Verfahren ferner die folgenden Schritte umfaßt:

Bereitstellen eines Überdeckel-Trägermaterials (20) aus Pappe;

Laminieren der Membranscheibe (12) auf das Überdeckel-Trägermaterial (20) mit einem Material (21), das die Membranscheibe (12) von dem Überdeckel-Trägermaterial (20) bei Aufbringen von Wärme löst;

Herstellen eines Überdeckels (13) aus Pappe

mit gewünschter Form und gewünschten Abmessungen zum Aufstecken auf das gebördelte offene obere Ende (11) des hohlen Behälters, aus dem Trägermaterial (20), wobei die Membranscheibe (12) auf dessen Innenseite angeordnet ist; 5

Positionieren des Überdeckels (13) mit auf dessen Innenseite liegender Membranscheibe über dem gebördelten offenen oberen Ende (11) des hohlen Behälters, so daß die Membranscheibe (12) das offene obere Ende (11) des Behälters überdeckt und mit der heißsiegelbaren Decklage (17) in Kontakt ist; und 10
Aufbringen von Wärme auf den Überdeckel (13), um ein Heißsiegeln der Membranscheibe (12) an die Decklage (17) in dem gebördelten oberen Ende (11) zum hermetischen Abdichten des Behälterendes zu bewirken und ein Lösen der Membranscheibe (12) von dem Überdeckel (13) zu bewirken. 15 20

2. Verfahren zur Herstellung eines Behälters (10) mit einem wiederverschließbaren Verschuß, nach Anspruch 1, ferner mit dem Schritt des dauerhaften Verbindens eines gewünschten Bereiches der Membranscheibe (12) mit dem Überdeckel (13), so daß eine Verbindung zwischen diesen nach einem Wärmeabblösen der Membranscheibe (12) von dem Überdeckel (13) bleibt, um Mittel zum Nachweis eines unerlaubten Eingriffes zu bilden. 25 30

fabrication d'un couvercle en carton (13) de forme et de dimensions désirées pour s'ajuster sur l'extrémité supérieure ouverte à rebord (11) du récipient creux, à partir du substrat (20) sur l'intérieur duquel est appliqué le disque de membrane (12);

positionnement du couvercle (13), à l'intérieur duquel est appliqué le disque de membrane, sur l'extrémité supérieure ouverte à rebord (11) du récipient creux, de sorte que le disque de membrane (12) couvre l'extrémité supérieure ouverte (11) du récipient et est en contact avec le revêtement thermosoudable (17); et application de chaleur au couvercle (13) pour effectuer le thermosoudage du disque de membrane (12) au revêtement (17), à l'extrémité supérieure à rebord (11), de manière à fermer hermétiquement l'extrémité du récipient et à détacher le disque de membrane (12) du couvercle (13). 15 20

2. Procédé de fabrication d'un récipient (10) ayant un couvercle refermable selon la revendication 1, comprenant en outre l'étape de liaison permanente d'une région désirée du disque de membrane (12) au couvercle (13) de sorte qu'une jonction subsiste entre ces derniers après détachement par la chaleur du disque de membrane (12) par rapport au couvercle (13), afin de constituer un moyen d'indication d'effraction. 25 30

Revendications

1. Procédé de fabrication d'un récipient (10) ayant un couvercle refermable, qui comprend les étapes de : 35

préparation d'un récipient composite creux sensiblement cylindrique incluant un corps en carton (15) et un revêtement thermosoudable (17) et ayant une extrémité supérieure ouverte à rebord extérieur (11) de dimensions désirées; et 40

préparation d'une membrane thermosoudable en forme de disque (12) de dimensions appropriées pour couvrir l'extrémité supérieure ouverte (11) du récipient cylindrique creux; 45

caractérisé en ce que le procédé comprend en outre les étapes de : 50

préparation d'un substrat de recouvrement en carton (20);
contre-collage du disque de membrane (12) au substrat de recouvrement (20) avec une matière (21) qui libère le disque de membrane (12) du substrat de recouvrement (20) lors de l'application de chaleur; 55



