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

(57) A container having a resealable closure and a process of producing such container includes the following. A hollow container (10) of desired shape and having an open upper (11) end of desired dimension is provided. An overcap substrate (13) is provided. A heat sealable membrane disc (12) of desired shape and dimensions to cover the open upper end of the hollow container is provided. 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. An overcap is then fabricated of desired shape and dimensions to fit over the open upper end of the hollow container from the substrate with the membrane disc on the inside thereof. The overcap is 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. Preferably, the container is constructed of a composite material including a paperboard body portion (15) and a heat sealable liner (17) and has an outwardly beaded open upper end. Preferably, the overcap is formed of paperboard material.

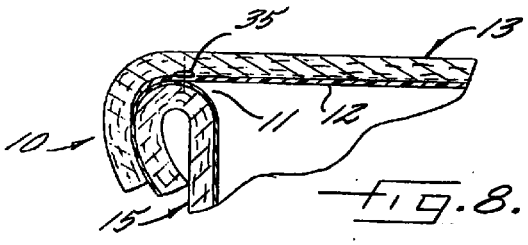

FIG. 8.

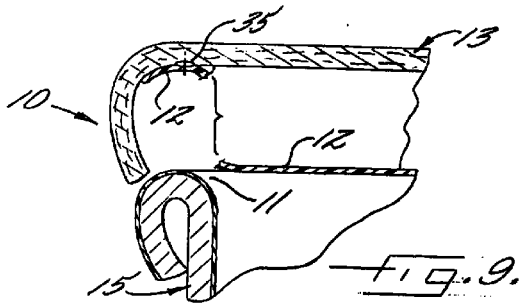

FIG. 9.

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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. 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 may be accomplished by providing such a manufacturing process for a container having a resealable closure which includes the following steps. 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 substrate 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] Preferably, 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. Preferably, 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, preferably 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 open upper end **11** of the container **10** to reclose the container.

[0010] The container **10** is preferably 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 0.010 and about 0.035 inch, preferably between about 0.015 and 0.030 inch, for example 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 Kraft or recycled paper and can typically range from, e.g. 50 to 100 lbs./ream. In some instances, the board stock can include a weak exterior layer, e.g. a 0.003 inch exterior news. The body portion **15** of the container **10** may further include 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 plies **18** which are also typically formed of similar materials as described above for the paperboard body plies **16**. 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 tom 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.

[0016] While the novel process and resulting product of this invention have been illustrated and described above in specific terms, it will be obvious to those skilled in the art that various changes and modifications can be made without departing from the spirit and scope of this invention and it is intended to cover, in the appended claims, all such changes and modifications that are within the scope of this invention.

Claims

1. Process for producing a container having a resealable closure comprising the steps of:

providing a hollow container of desired shape and having an open upper end of desired dimensions;
providing an overcap substrate;
providing a heat sealable membrane disc of desired shape and dimensions to cover the open upper end of the hollow container;
laminating the membrane disc to the overcap substrate with a material which releases the membrane disc from the overcap substrate under the application of heat;
fabricating an overcap of desired shape and dimensions to fit over the open upper end of the hollow container from the substrate with the membrane disc on the inside thereof;
positioning the overcap 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; and
applying heat 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.

2. Process for producing a container having a resealable closure comprising the steps of:

providing a generally cylindrical hollow composite container including a paperboard body portion and a heat sealable liner and having an outwardly beaded open upper end of desired dimensions;
providing a paperboard overcap substrate;
providing a heat sealable membrane disc of suitable dimensions to cover the open upper end of the hollow cylindrical container;
laminating the membrane disc to the overcap substrate with a material which releases the membrane disc from the overcap substrate under the application of heat;
fabricating a paperboard overcap of desired shape and dimensions to fit over the beaded open upper end of the hollow container from the substrate with the membrane disc on the inside thereof;
positioning the overcap over the beaded open upper end of the hollow container so that the membrane disc covers the open upper end of the container and is in contact with the heat sealable liner; and
applying heat to the overcap to effect heat sealing of the membrane disc to the liner in the beaded upper end to hermetically seal the container end and to effect release of the membrane disc from the overcap.

3. Process for producing a container having a resealable closure, as set forth in claim 1 or 2, further including the step of 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.

4. A container having a resealable closure produced in accordance with the process of claim 1.

5. A container having a resealable closure produced in accordance with the process of claim 2.

6. A container having a resealable closure produced in accordance with the process of claim 3.

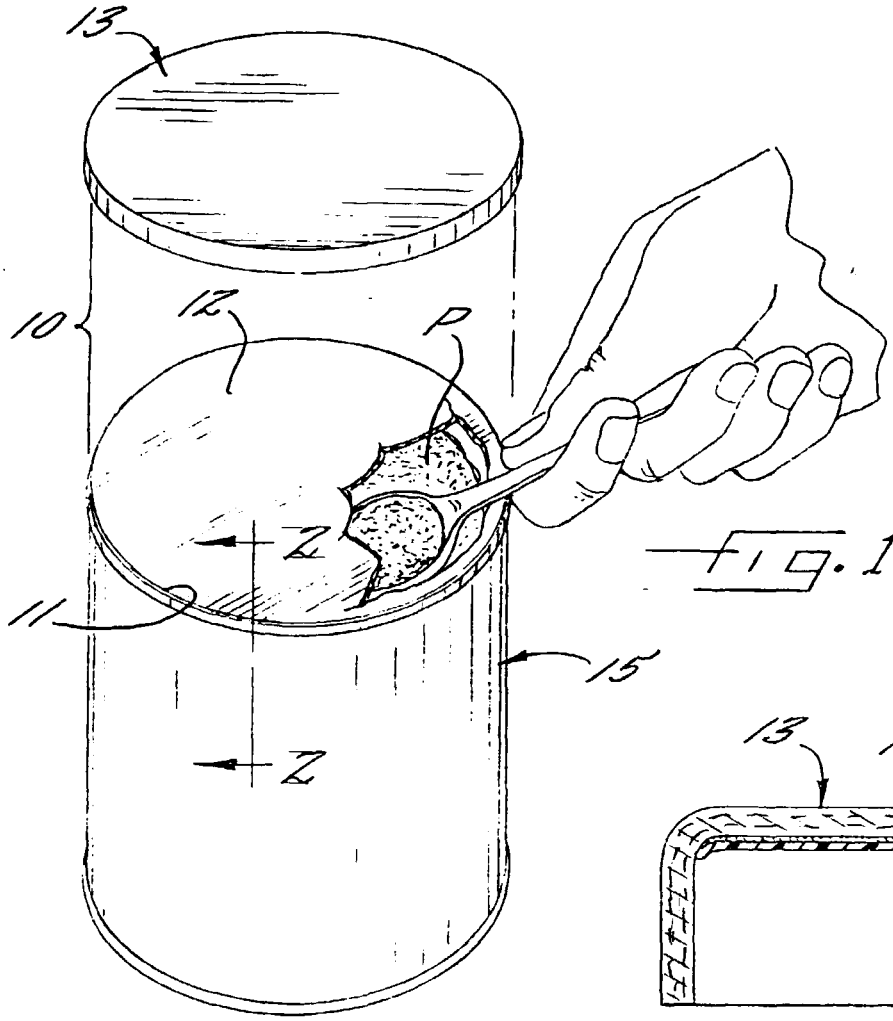

Fig. 1.

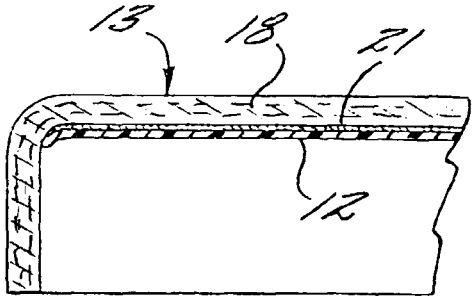

Fig. 6.

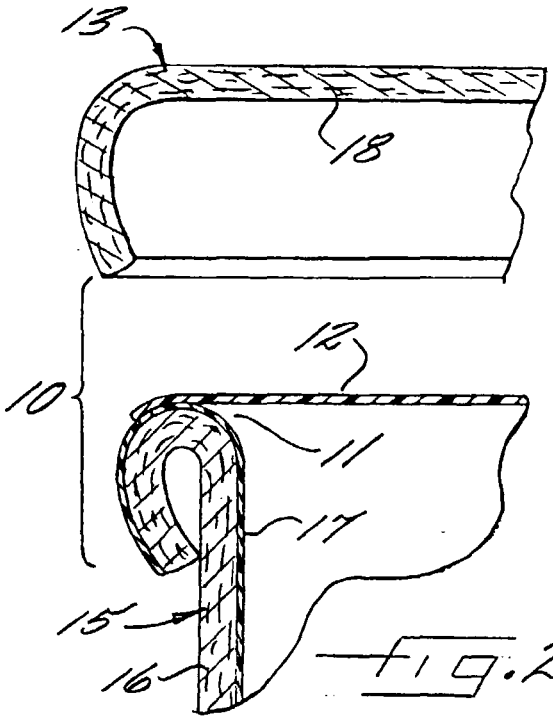

Fig. 2.

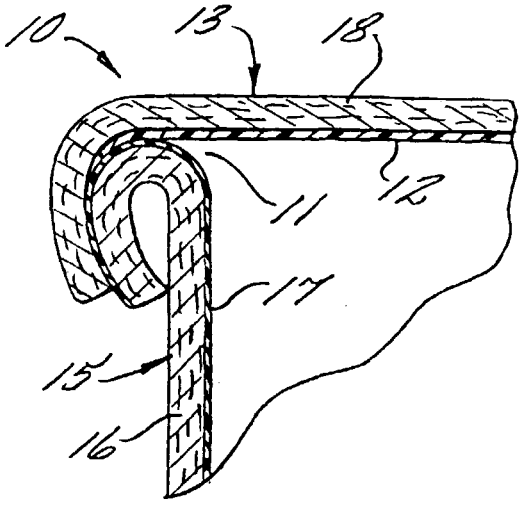

Fig. 7.

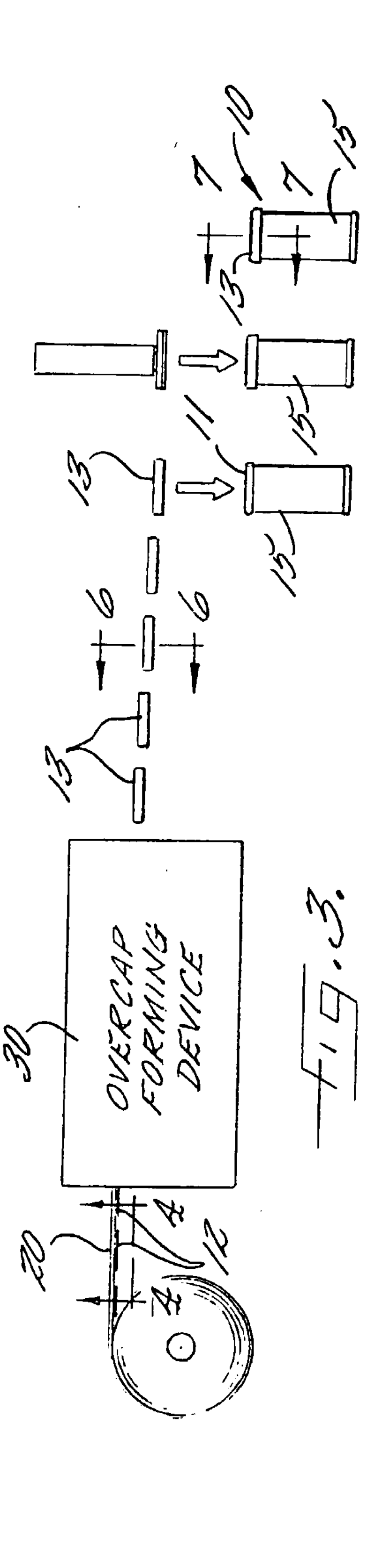

Fig. 3.

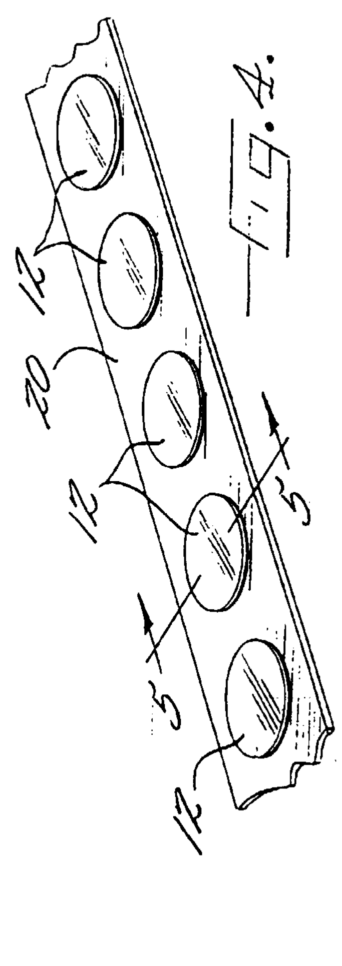

Fig. 4.

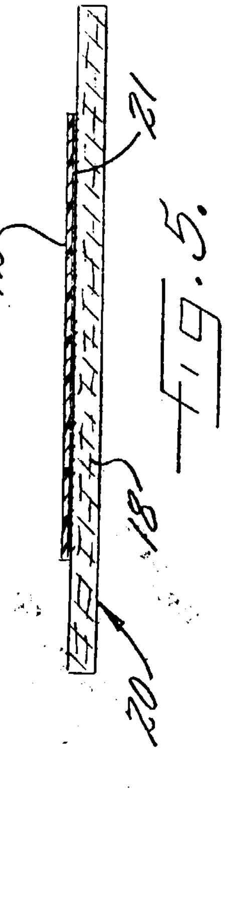

Fig. 5.

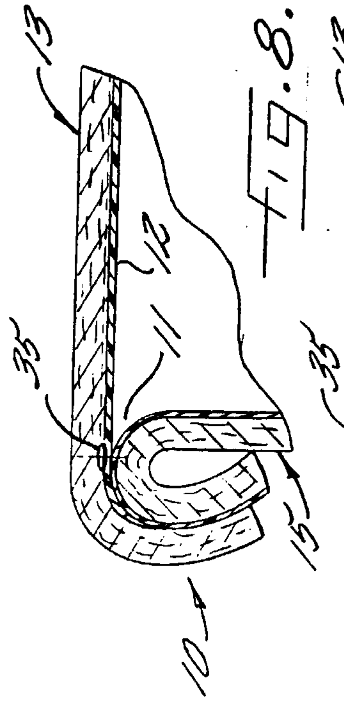

Fig. 8.

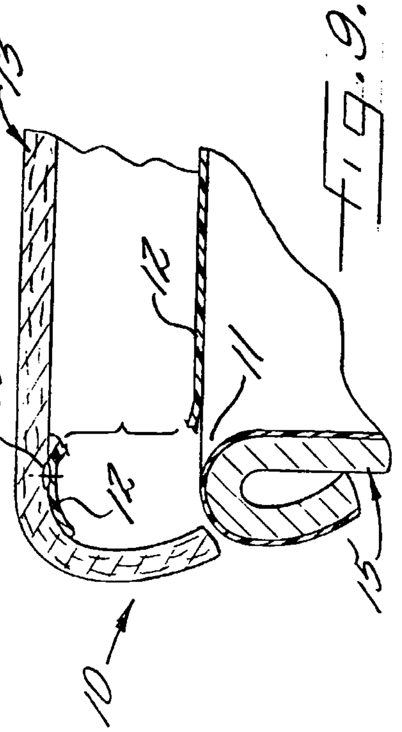

Fig. 9.

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 30 7774

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X A	EP 0 461 868 A (MINNESOTA MINING & MFG) 18 December 1991 (1991-12-18) * page 6, line 33 - line 51; figure 2 *	1,4 2,5	B65D51/20 B65D3/12 B65B7/28
X	US 2 531 914 A (LAGER ET AL.) 28 November 1950 (1950-11-28) * column 1, line 54 - column 3, line 38; figure 12 *	4,5	
A	US 4 557 414 A (FORD JAMES A ET AL) 10 December 1985 (1985-12-10) * column 2, line 52 - column 3, line 21; figure 2 *	1,2,4,5	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B65D
B65B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	1 March 2000	Bridault, A

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 99 30 7774

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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01-03-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0461868 A	18-12-1991	AU 663220 B	28-09-1995
		AU 640234 B	19-08-1993
		AU 7808091 A	19-12-1991
		CA 2042822 A	13-12-1991
		JP 4239456 A	27-08-1992
US 2531914 A	28-11-1950	NONE	
US 4557414 A	10-12-1985	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82