(12) STANDARD PATENT (11) Application No. **AU 2009202131 B2**
(19) AUSTRALIAN PATENT OFFICE

(54) Title
Method and Systems for Manufacture of Containers

(51) International Patent Classification(s)
B65D 43/16 (2006.01) ***B65D 85/78*** (2006.01)
B65D 55/02 (2006.01) ***G06F 7/00*** (2006.01)
B65D 85/74 (2006.01)

(21) Application No: **2009202131** (22) Date of Filing: **2009.05.29**

(30) Priority Data

(31) Number	(32) Date	(33) Country
2008904191	**2008.08.15**	**AU**

(43) Publication Date: **2010.03.04**
(43) Publication Journal Date: **2010.03.04**
(44) Accepted Journal Date: **2015.07.02**

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(56) Related Art
WO 2005/056414
US 4293079
US 2002/0134783
US 6003203
US 2005/0035118
US 2006/0219652
US 2005/0045577
US 2007/0062949

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ABSTRACT

The present invention relates to the field of containers. In one form, the invention relates to containers for foodstuff. In one particular aspect, the present invention relates to containers for foodstuffs, such as ice-cream, margarine and so on, and in particular, to containers comprising a base having a top opening and a lid secured on the base and extending across the top opening. Aspects of the invention relate to the manner in which the components of the container are coupling together.

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Figure 1

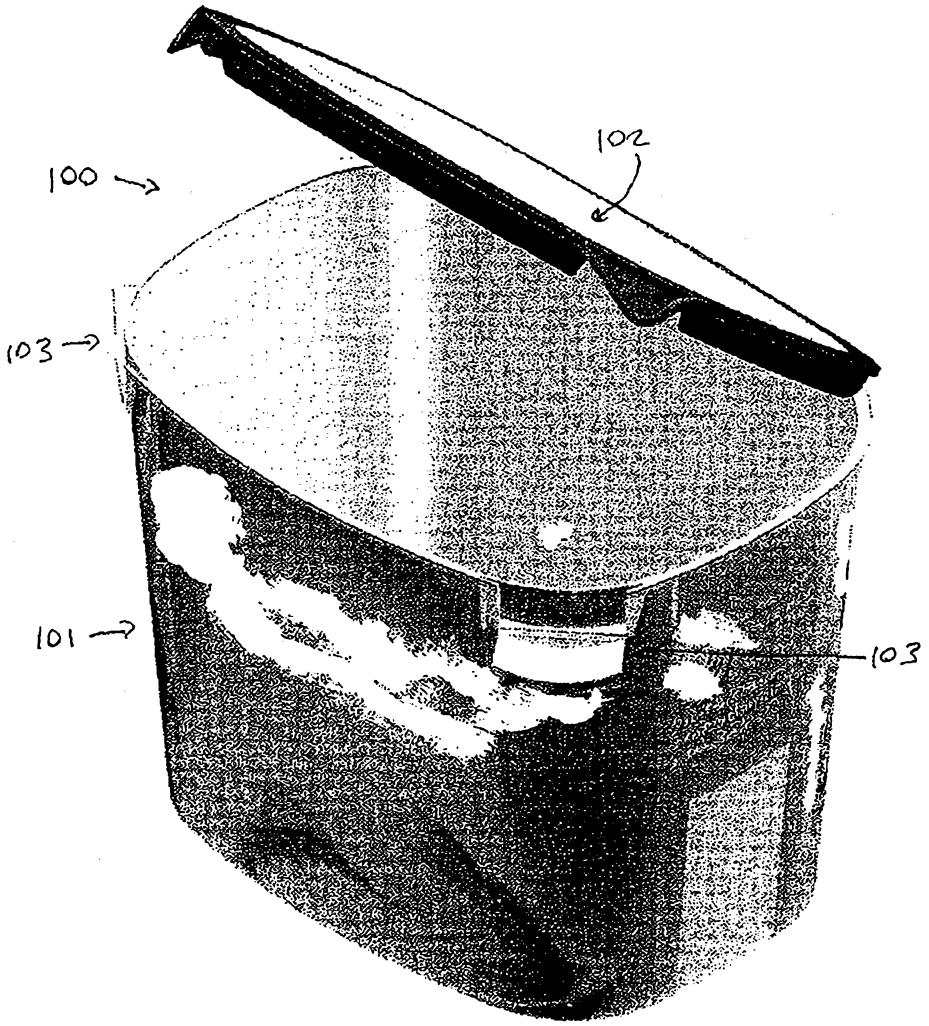

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Figure 3

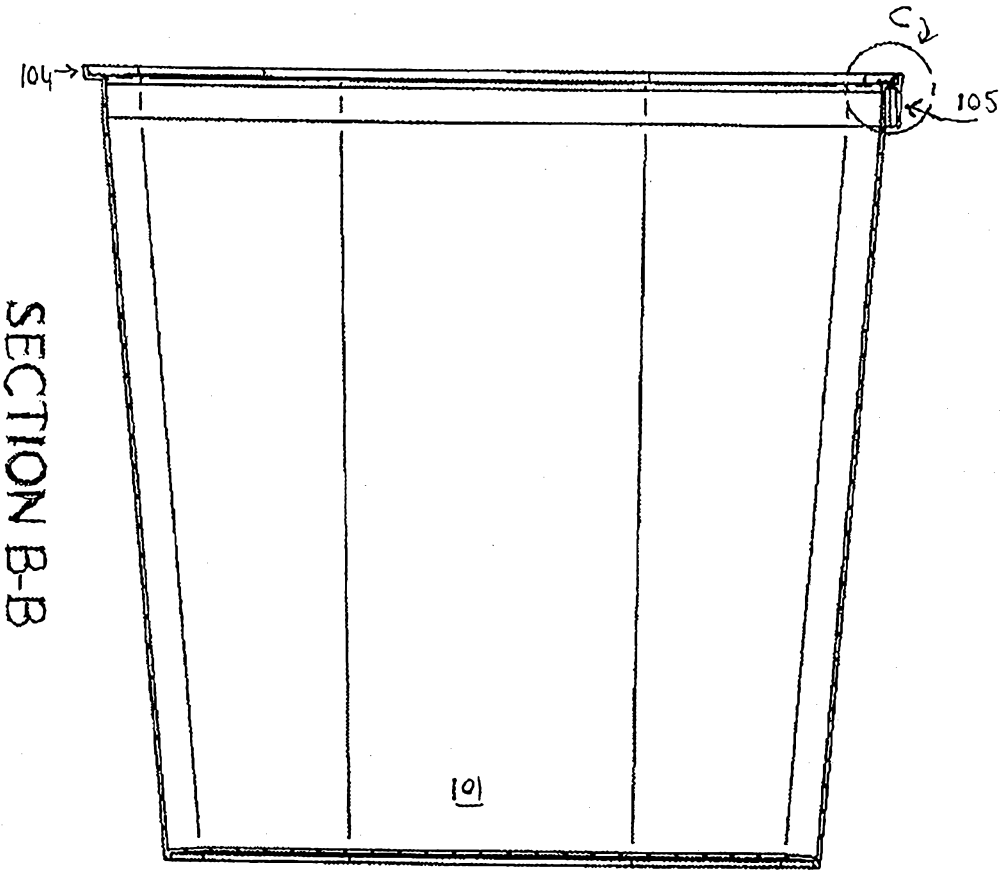

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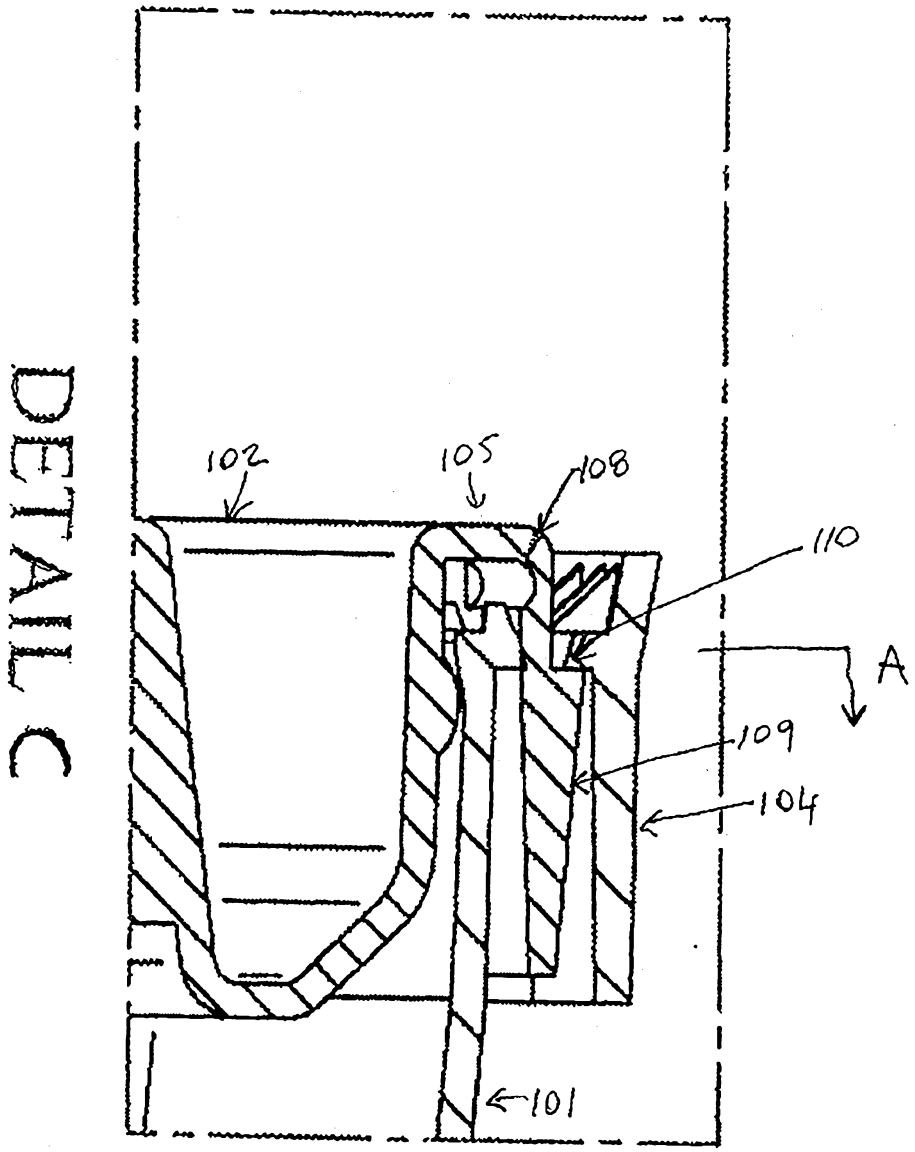
Figure 5



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P/00/009
Regulation 3.2

AUSTRALIA

Patents Act 1990

COMPLETE SPECIFICATION

Invention Title: Method and System for Manufacture of Containers

The invention is described in the following statement:

COMS ID No: ARCS-236551 Received by IP Australia: Time (H:m) 12:05 Date (Y-M-d) 2009-05-29

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METHOD AND SYSTEM FOR MANUFACTURE OF CONTAINERS

FIELD OF INVENTION

The present invention relates to the field of containers.

In one form, the invention relates to containers for foodstuff.

In one particular aspect, the present invention relates to containers for foodstuffs, such as ice-cream, margarine and so on, and in particular, to containers comprising a base having a top opening and a lid secured on the base and extending across the top opening.

It will be convenient to hereinafter describe the invention in relation to foodstuff containers, however it should be appreciated that the present invention is not limited to that use only.

BACKGROUND ART

Throughout this specification the use of the word "inventor" in singular form may be taken as reference to one (singular) inventor or more than one (plural) inventor of the present invention.

Containers for food products are well known in the art. Many of the containers, however, have a separable lid and container base. Containers of the above noted type typically have a snap fittingly re-engageable arrangement between the lid and the base to facilitate removal and re-engagement of the lid over the top opening of the base. This arrangement ensures that the lid is releasable, yet securely held in place to the base. This type of container design is particularly appropriate when the lid needs to be made of a different material or colour than the base. In opening the container, the lid is removed from the base, and the lid is placed, for example, on a surface while the contents of the base are accessed. This is not desirable because the lid is susceptible to contamination. That is, once the lid is separated from the base, the lid may become contaminated by being placed on the surface. When the container is again closed by locating the lid on the container base, the contamination may spread to the container contents. This may lead to health issues. Furthermore, the lid may be misplaced, and the container thereafter may not be able to be again closed in a reliable manner.

The inventor(s) have realized that it is however, advantageous to have the lid at all times attached to the rest of the container in order to prevent the

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misplacing of the lid or possible contamination by foreign material if the lid is separated from the base.

In an effort to overcome this problem, various arrangements have been proposed whereby the lid is attached to the container base, usually by a hinge-like mechanism. These containers are typically formed in one piece and then folded along the hinged line to provide the final closed container. The engagement of the lid and base of such one piece containers are however not always particularly secure. Furthermore, the tooling cost for one piece containers can be high. In addition, it is not convenient to use different materials or colours for the lid and the base.

In more recent developments, the inventors have become aware of various containers have been proposed with alternative arrangements for providing a hinge-like engagement of the lid to the container base. Examples include Australia patent application number 2008202715 and PCT publication number WO2005056414.

The inventors have realised that it is nonetheless desirable to provide a further one-piece container arrangement, with relatively minor or low cost changes to tooling. It is also desirable to provide the hinge does not hinder access to the contents of the base.

The discussion throughout this specification comes about due to the realisation of the inventor and/or the identification of certain related art problems by the inventor and, moreover, any discussion of documents, devices, acts or knowledge in this specification is included to explain the context of the invention. It should not be taken as an admission that any of the material forms a part of the prior art base or the common general knowledge in the relevant art in Australia or elsewhere on or before the priority date of the disclosure and claims herein.

SUMMARY OF INVENTION

It is an object of the embodiments described herein to overcome or alleviate at least one of the above noted drawbacks of related art systems or to at least provide a useful alternative to related art systems.

In a first aspect of embodiments described herein there is provided a container comprising a base portion having an opening, and a lid portion at least partially extendible across the opening, and an engagement portion adapted to

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provide coupling between the lid and base, the engagement portion having a hinge region enabling the lid and base to move relative to each other, the hinge region being provided proximate a portion of the opening of the base portion.

Preferably, the engagement portion is provided integral with the lid or base.

In another aspect of embodiments described herein there is provided a hinge portion adapted to provide coupling between a lid and base of a container, the hinge portion comprising a first portion adapted to engage the lid, a second portion adapted to engage the base, a hinge region adapted to enable the lid and base to move relative to each other, wherein the hinge region is proximate the opening of the container.

In yet a further aspect of embodiments described herein there is provided a method of coupling a lid portion to a base portion of a container, the base portion of the container having an opening, and the lid portion being extendible substantially across at least a portion of the opening, the method comprising providing an engagement portion adapted to enable coupling between the lid and base, the engagement portion having a hinge region enabling the lid and base to move relative to each other, the hinge region being provided proximate a portion of the opening of the base portion.

In a still further aspect of embodiments described herein there is provided a method of forming a container, the method comprising providing a base portion having an opening, and a lid portion at least partially extendible across the opening, and coupling the lid and base portions with an engagement portion, the engagement portion having a hinge region enabling the lid and base to move relative to each other, the hinge region being provided proximate a portion of the opening of the base portion.

Other aspects and preferred forms are disclosed in the specification and/or defined in the appended claims, forming a part of the description of the invention.

In essence, embodiments of the present invention stem from the realization that a hinging mechanism can be provided between a lid and base of a container by coupling the hinge to a portion of a rim of the container. The hinge may be formed integral with the lid or the base, or the hinge may be made separately and be adapted to be coupled to both the lid and the base.

Advantages provided by the present invention comprise the following:

- The lid and hinge or base and hinge may be manufactured as a one piece component;
- Manufacturing a one-piece component enables existing moulding equipment to make lid or base with 'interlocking mechanism';
- By providing a hinge on the lid, the lid can remain relatively secured to the container base, and still flex open to enable access to the container contents. This avoids, in part, in appropriate disposal of the lid.
- A label may be used in a dual roll, that of labelling or packaging, and that of a hinge or flexible region.
- Providing the hinge in the lid and/or in the base of the container enables many different shapes of containers with lids to be made. This enables containers to be designed more with customer and/or product needs in mind.
- The present invention may integrate with a tamper evident feature
- The present invention is relatively convenient and/or cost effective to manufacture.

Further scope of applicability of embodiments of the present invention will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the disclosure herein will become apparent to those skilled in the art from this detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

Further disclosure, objects, advantages and aspects of preferred and other embodiments of the present application may be better understood by those skilled in the relevant art by reference to the following description of embodiments taken in conjunction with the accompanying drawings, which are given by way of illustration only, and thus are not limitative of the disclosure herein, and in which:

Figure 1 illustrates an embodiment of the present invention;

Figure 2 illustrates, in cross section, the container of Figure 1;

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Figure 3 illustrates view B-B of Figure 2;

Figure 4 illustrates view A of Figure 2;

Figure 5 illustrates view C of Figure 3;

Figure 6 illustrates an alternative view C of Figure 3; and

Figure 7 illustrates another alternative view of C of Figure 3.

DETAILED DESCRIPTION

Figure 1 illustrates an embodiment of the present invention. The container 100 has a base portion 101 and a lid portion 102. The lid and that base are coupled by a hinge portion (see Figure 5). In one preferred embodiment, the container also has tamper evident means 103 which serves to provide evidence of the lid being separated from the base.

Figure 2 illustrates a top view of the container base 101. In this embodiment there is a rim 104 provided around the top of the base. The rim 104 is shaped to cooperate with the lid 102 to enable the lid 102, when placed over the base 101, to form a closed container. The rim 104 may also form or be a part of a tamper evident feature. Such tamper evident features are well known in the art. The detail A illustrates a region where the lid 102 and base 101 are adapted to engage. Although only one region is shown, one or more regions of engagement may be provided in alternative embodiments.

Figure 3 illustrates cross sectional view B-B of Figure 2. The container base101, rim 104 and hinge portion 105 can be seen. The hinge portion 105 is shown in more detail in Figure 5.

Figure 4 illustrates a cut-away top view (see Figure 5) of the manner in which the hinge portion 105 engages with the rim 104 as shown in Figure 2. It can be seen that the hinge 105 can engage with the rim 104, for example by engaging between an outer surface 106 of the rim 104 and an inner surface 107 of the container base 101.

Figure 5 provides an enlarged view of Detail C in Figure 3. The base 101 has a rim 104 located proximate the top of the base 101. The rim 104 serves to strengthen the base 101. As shown in the embodiment of Figure 5, the lid 102 has an integral hinge portion 105. The hinge 105 has a hinging region 108, which is a region about which the lid 102 and the base 101 are able to move relative to another. Preferably, the hinge 105, at least in the vicinity of the hinge region 108

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is made of a flexible material, such as various plastics materials depending on the use of the container. One plastics material may be polypropylene.

Preferably, when the hinge is formed integrally with the lid 102 or the base 101, the hinge 105 can be made of the same material as the lid 102 or the base 101. In an alternative embodiment, the hinge 105 is made separately form the base 101 and lid 102, and couples (such as interlocks) with the base 101 and lid 102.

Figure 5 also illustrates a preferred manner of interlocking or mutual coupling between the hinge 105 and the base 101 or lid and hinge. It should be understood, that as described above, the hinge may also be formed integral with the base 101, in which case, the hinge will interlock with the lid 102, or the hinge 105 may be formed separately and thus interlock with both the base 101 and the lid 102. The interlocking mechanism illustrated comprises a barb 109 and a corresponding protrusion 110. In coupling the base 101 and lid 102, the barb 109 is pushed past the protrusion 110 in the rim 104. In one embodiment, the rim 104 has some flexibility to enable the hinge 105 to be coupled to the rim, for example in the manner described. The shape of the barb 109 makes it difficult to separate the base 101 and lid 102. The hinge may alternatively be glued or affixed in another way, if the coupling is to be relatively permanent.

In another embodiment, as illustrated in Figure 6, the hinge 105 may be realisably coupled, for example where the hinge 105 has a protrusion 111 and the rim has a corresponding recess 112, or visa versa. Other suit ways of coupling the hinge 105 to the lid 102 and / or base 101 are also contemplated within the scope of the present invention.

In a further embodiment, as illustrated in Figure 7, the lid 102 maybe coupled to the rim 104. The rim 104 has a hinge 105 provided proximate the foot of the rim, and with a hinging region 108. In this arrangement, when the lid is opened, the rim 104 and lid 102 pivot around hinging region 108 to enable access to the container.

One benefit of the integral nature of the hinge with the base or lid is that, in injection moulding equipment, such an arrangement (where the coupling is formed by a barb or some other means coupling associated with the rim), can more easily be manufactured without the need for more complex moulds.

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In yet another alternative, and with reference to the disclosure of PCT publication number WO2005-056414 (herein incorporated by reference), the hinge region may comprise a label or some suitable flexible material.

Furthermore, the coupling of the lid and base may be provided in a releasable manner. In other words, the lid and base may be disengaged, if required, depending on the nature of the coupling provided.

While this invention has been described in connection with specific embodiments thereof, it will be understood that it is capable of further modification(s). This application is intended to cover any variations uses or adaptations of the invention following in general, the principles of the invention and including such departures from the present disclosure as come within known or customary practice within the art to which the invention pertains and as may be applied to the essential features hereinbefore set forth.

As the present invention may be embodied in several forms without departing from the spirit of the essential characteristics of the invention, it should be understood that the above described embodiments are not to limit the present invention unless otherwise specified, but rather should be construed broadly within the spirit and scope of the invention as defined in the appended claims. The described embodiments are to be considered in all respects as illustrative only and not restrictive.

Various modifications and equivalent arrangements are intended to be included within the spirit and scope of the invention and appended claims. Therefore, the specific embodiments are to be understood to be illustrative of the many ways in which the principles of the present invention may be practiced. In the following claims, means-plus-function clauses are intended to cover structures as performing the defined function and not only structural equivalents, but also equivalent structures. For example, although a nail and a screw may not be structural equivalents in that a nail employs a cylindrical surface to secure wooden parts together, whereas a screw employs a helical surface to secure wooden parts together, in the environment of fastening wooden parts, a nail and a screw are equivalent structures.

Various embodiments of the invention may be embodied in many different forms, including computer program logic for use with a processor (e.g., a

microprocessor, microcontroller, digital signal processor, or general purpose computer), programmable logic for use with a programmable logic device (e.g., a Field Programmable Gate Array (FPGA) or other PLD), discrete components, integrated circuitry (e.g., an Application Specific Integrated Circuit (ASIC)), or any other means including any combination thereof. In an exemplary embodiment of the present invention, predominantly all of the communication between users and the server is implemented as a set of computer program instructions that is converted into a computer executable form, stored as such in a computer readable medium, and executed by a microprocessor under the control of an operating system.

Computer program logic implementing all or part of the functionality where described herein may be embodied in various forms, including a source code form, a computer executable form, and various intermediate forms (e.g., forms generated by an assembler, compiler, linker, or locator). Source code may include a series of computer program instructions implemented in any of various programming languages (e.g., an object code, an assembly language, or a high-level language such as Fortran, C, C++, JAVA, or HTML) for use with various operating systems or operating environments. The source code may define and use various data structures and communication messages. The source code may be in a computer executable form (e.g., via an interpreter), or the source code may be converted (e.g., via a translator, assembler, or compiler) into a computer executable form.

The computer program may be fixed in any form (e.g., source code form, computer executable form, or an intermediate form) either permanently or transitorily in a tangible storage medium, such as a semiconductor memory device (e.g, a RAM, ROM, PROM, EEPROM, or Flash-Programmable RAM), a magnetic memory device (e.g., a diskette or fixed disk), an optical memory device (e.g., a CD-ROM or DVD-ROM), a PC card (e.g., PCMCIA card), or other memory device. The computer program may be fixed in any form in a signal that is transmittable to a computer using any of various communication technologies, including, but in no way limited to, analog technologies, digital technologies, optical technologies, wireless technologies (e.g., Bluetooth), networking technologies, and inter-networking technologies. The computer program may be

distributed in any form as a removable storage medium with accompanying printed or electronic documentation (e.g., shrink wrapped software), preloaded with a computer system (e.g., on system ROM or fixed disk), or distributed from a server or electronic bulletin board over the communication system (e.g., the Internet or World Wide Web).

Hardware logic (including programmable logic for use with a programmable logic device) implementing all or part of the functionality where described herein may be designed using traditional manual methods, or may be designed, captured, simulated, or documented electronically using various tools, such as Computer Aided Design (CAD), a hardware description language (e.g., VHDL or AHDL), or a PLD programming language (e.g., PALASM, ABEL, or CUPL).

Programmable logic may be fixed either permanently or transitorily in a tangible storage medium, such as a semiconductor memory device (e.g., a RAM, ROM, PROM, EEPROM, or Flash-Programmable RAM), a magnetic memory device (e.g., a diskette or fixed disk), an optical memory device (e.g., a CD-ROM or DVD-ROM), or other memory device. The programmable logic may be fixed in a signal that is transmittable to a computer using any of various communication technologies, including, but in no way limited to, analog technologies, digital technologies, optical technologies, wireless technologies (e.g., Bluetooth), networking technologies, and internetworking technologies. The programmable logic may be distributed as a removable storage medium with accompanying printed or electronic documentation (e.g., shrink wrapped software), preloaded with a computer system (e.g., on system ROM or fixed disk), or distributed from a server or electronic bulletin board over the communication system (e.g., the Internet or World Wide Web).

"Comprises/comprising" when used in this specification is taken to specify the presence of stated features, integers, steps or components but does not preclude the presence or addition of one or more other features, integers, steps, components or groups thereof." Thus, unless the context clearly requires otherwise, throughout the description and the claims, the words 'comprise', 'comprising', and the like are to be construed in an inclusive sense as opposed to an exclusive or exhaustive sense; that is to say, in the sense of "including, but not limited to".

EDITORIAL NOTE
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Please note that the claims commence on page 11.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A container comprising:

a base portion having an opening and a rim proximate the opening, and a lid portion at least partially extendible across the opening, the base portion and the lid portion being made separately and

an engagement portion adapted to provide coupling between the lid and base and located substantially at the rim of the container, the engagement portion formed by at least a portion of an edge of the lid and a recess defined by an outer surface of the base and an inner surface of the rim and a hinge region enabling the lid and base to move relative to each other.

2. A container as claimed in claim 1, wherein the hinge is provided integral with the lid.

3. A container as claimed in claim 1 wherein the hinge is provided integral with the base.

4. A container as claimed in any one of claims 1 to 3, wherein the engagement portion includes interlock of at least a portion of an edge of the lid with the recess.

5. A container as claimed in claim 4, wherein the interlock comprises a barb.

6. A container as claimed in any one of the preceding claims wherein the opening is a top opening.

7. A container as claimed in any one of the preceding claims wherein the lid and base cooperate to enable the container to be closable.

8. An engagement portion adapted to provide coupling between a lid and a base of a container, the base having a rim and being made separately from the lid, the engagement portion comprising:

a recess defined by an outer surface of the base and an inner surface of the rim and adapted to engage the lid;

at least a portion of an edge of the lid adapted to engage the base;

a hinge region adapted to enable the lid and base to move relative to each other.

9. An engagement portion as claimed in claim 8, formed integral with either the lid or base.

10. An engagement portion as claimed in claim 8 or 9, wherein at least a portion of the edge of the lid engages the recess via complementary coupling means.

11. An engagement portion as claimed in claim 10, wherein the complementary coupling means comprises a barb.

12. In combination, an engagement portion as claimed in any one of claims 8 to 11, and a lid and base of a container.

13. A method of coupling a lid portion to a base portion of a container, the base portion of the container having an opening with a rim proximate the opening, and the lid portion being extendible substantially across at least a portion of the opening, the method comprising:

providing the lid portion and the base portion separately,

providing an engagement portion located substantially at the rim of the container and adapted to provide coupling between the lid and base portions, the engagement portion formed by at least a portion of an edge of the lid and a recess defined by an outer edge of the base and an inner surface of the rim and a hinge region enabling the lid and base to move relative to each other.

14. A method as claimed in claim 13, wherein the engagement portion is provided integral with the lid or the base.

15. A method as claimed in any one of claims 13 and 14, wherein the engagement portion includes interlock of at least a portion of an edge of the lid with the recess.

16. A method of forming a container, the method comprising:

providing a base portion having an opening with a rim proximate the opening,

providing a lid portion at least partially extendible across the opening, the base portion and the lid portion being made separately, and

coupling the lid and base portions with an engagement portion, provided substantially at the rim of the container, the engagement portion formed by at least a portion of an edge of the lid and a recess defined by an outer surface of the base and an inner surface of the rim and a hinge region enabling the lid and base to move relative to each other.

17. A method as claimed in claim 16, wherein the lid or base of the container is formed by moulding.

18. Apparatus adapted to form components of a container as claimed in claim 1, said apparatus including:

processor means adapted to operate in accordance with a predetermined instruction set,

said apparatus, in conjunction with said instruction set, being adapted to perform the method as claimed in claim 17.

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Figure 1

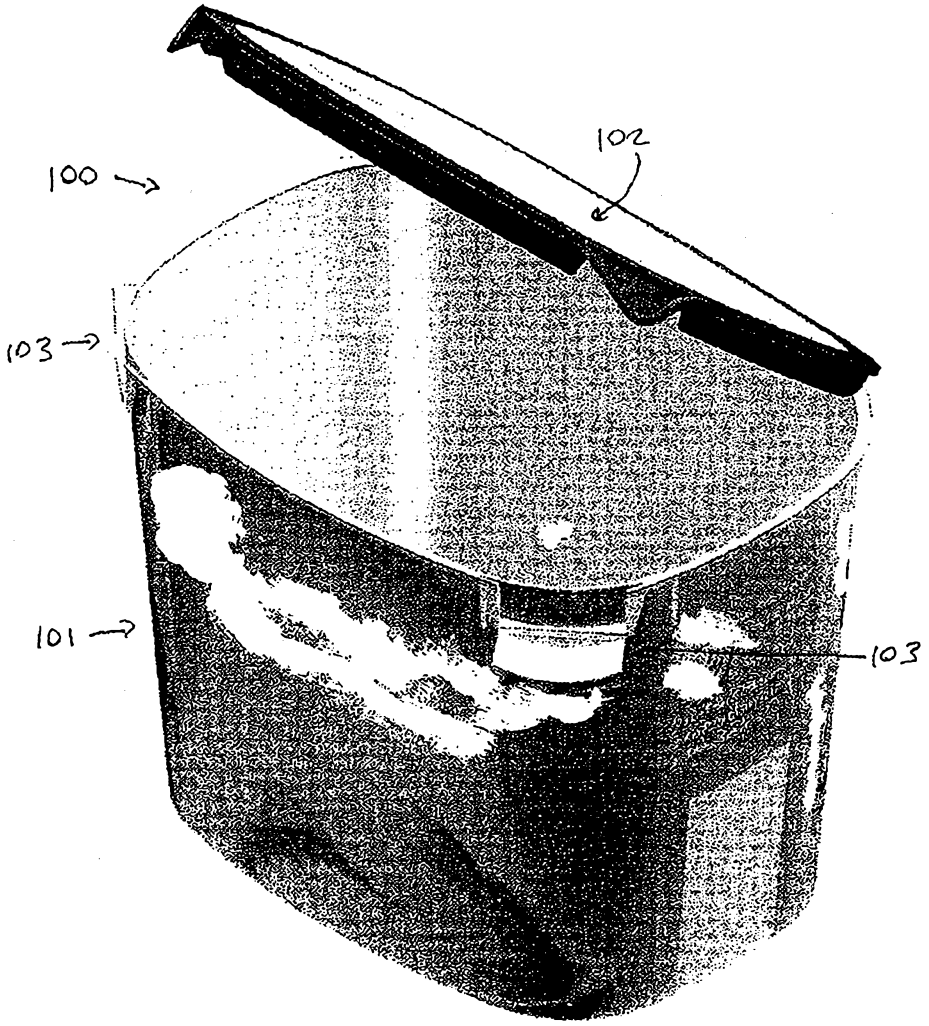

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Figure 2

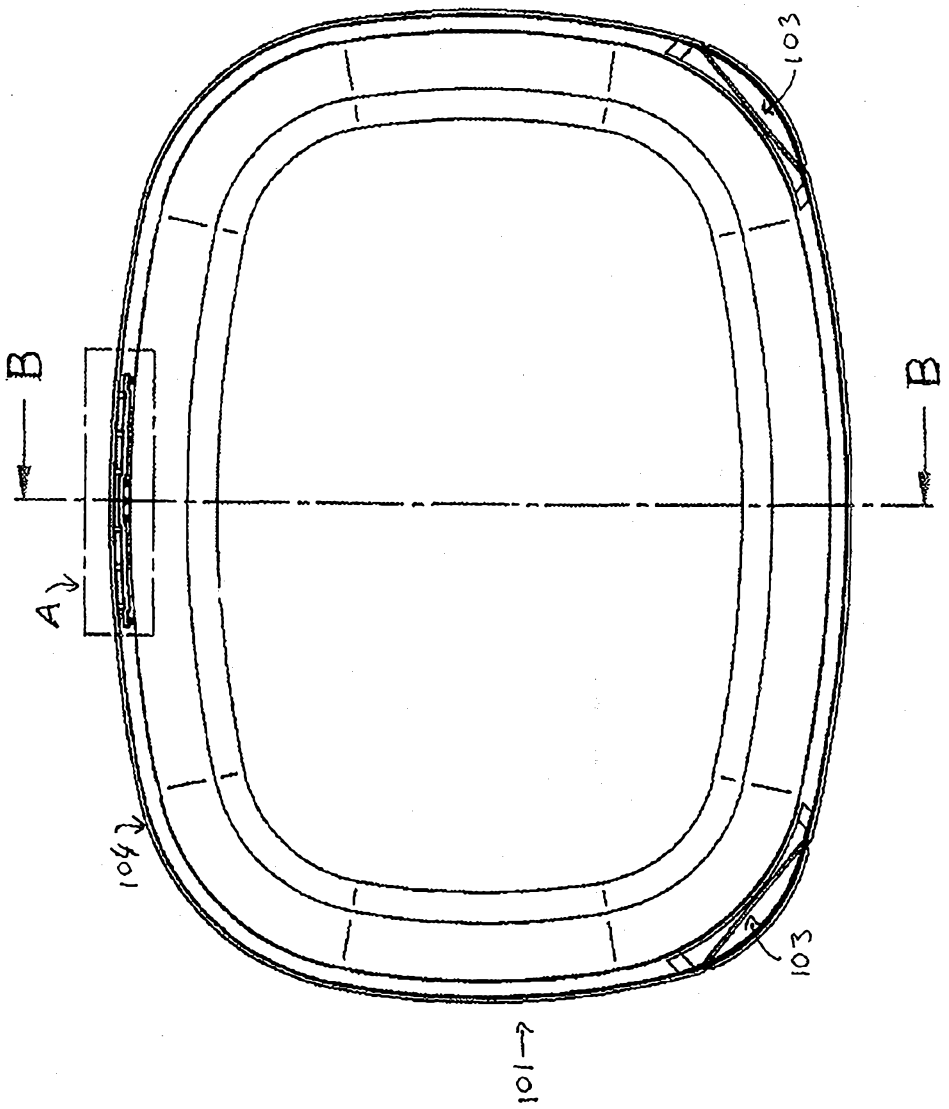

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Figure 3

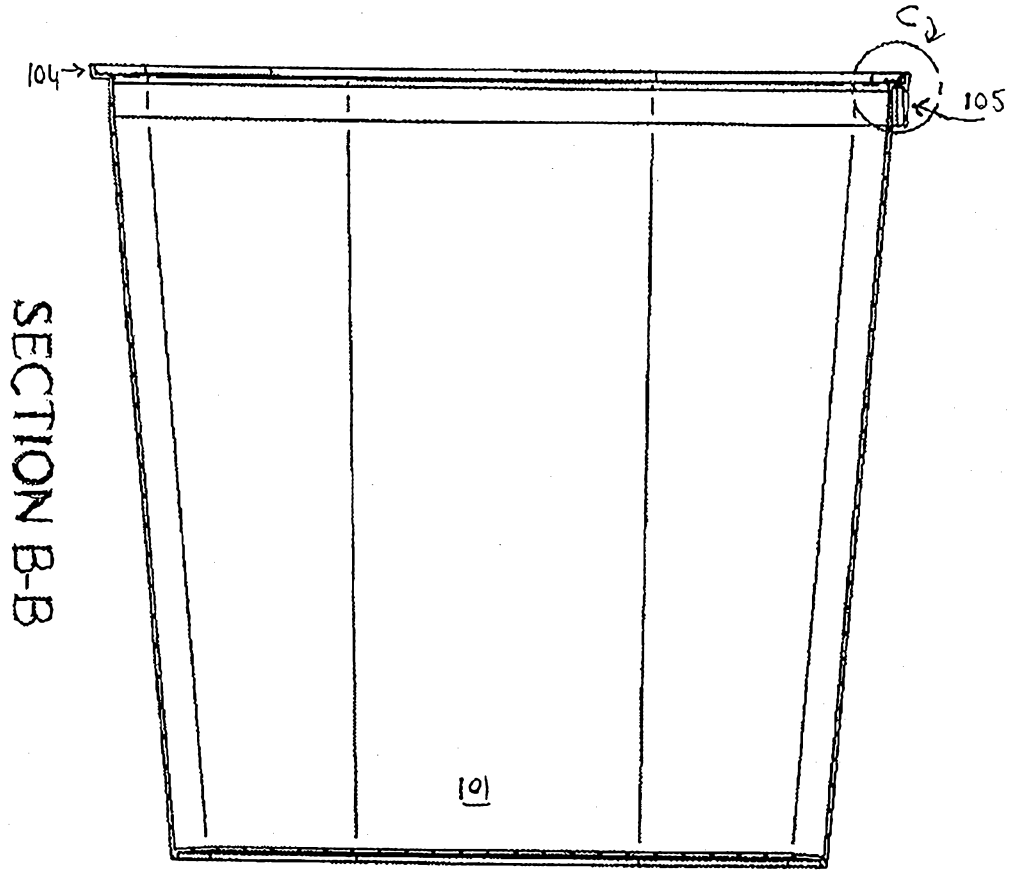

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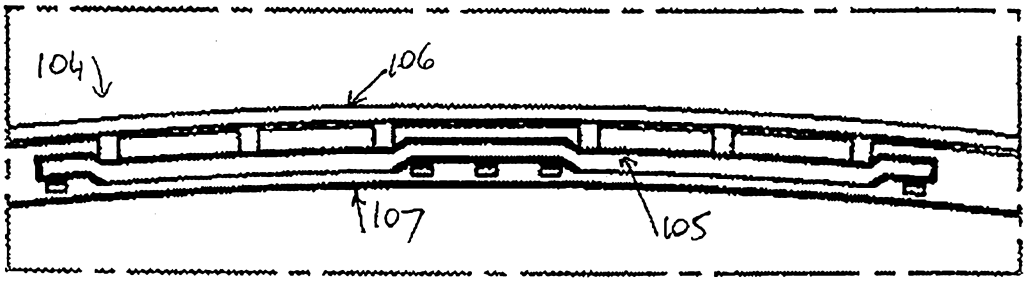
Figure 4



DETAIL A

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Figure 5

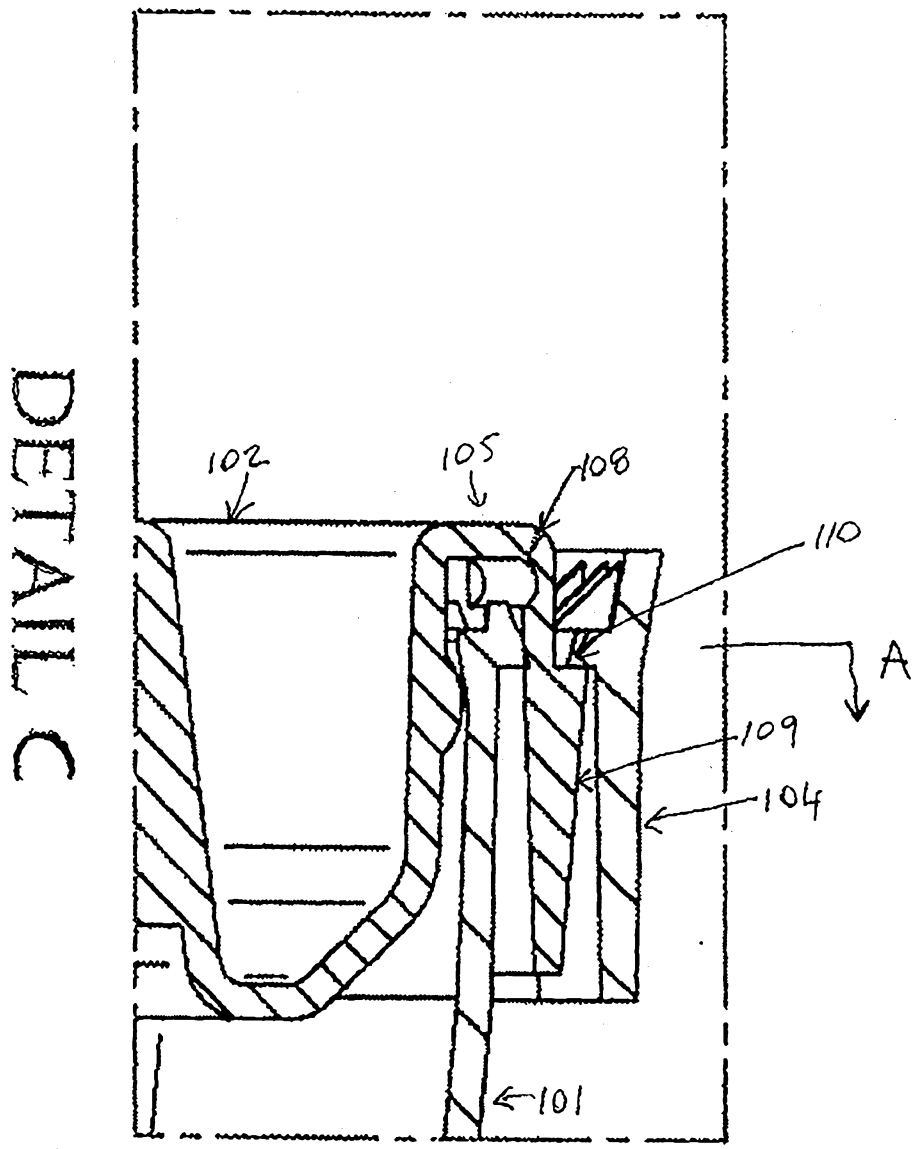

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Figure 6

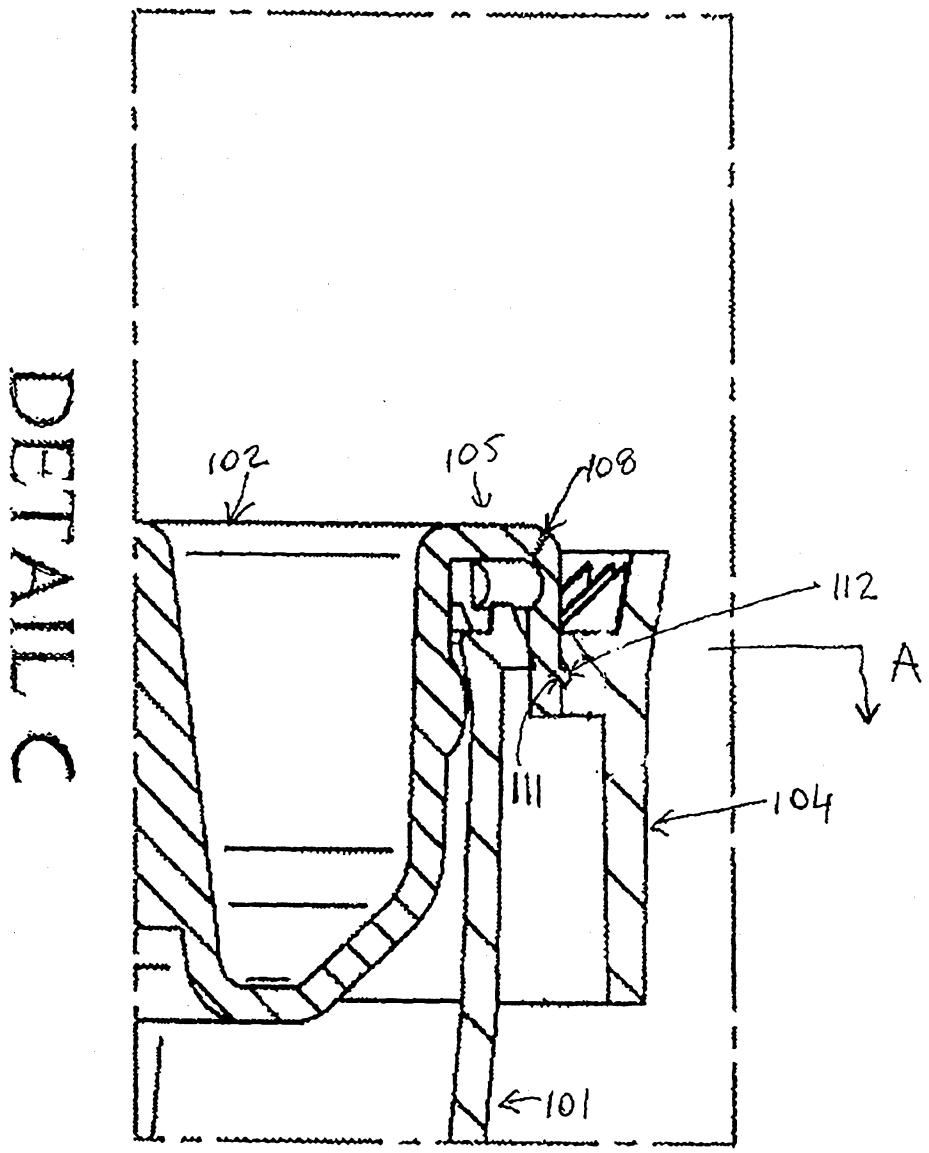

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Figure 7