Title: AN EXPANDABLE CONTAINER

Abstract: An expandable container has a bellows portion within its body that permits the container to change volume as the bellows portion expands or collapses.

Published:
— with international search report (Art. 21(3))
— with amended claims and statement (Art. 19(1))

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— as to the identity of the inventor (Rule 4.17(i))
— as to applicant’s entitlement to apply for and be granted a patent (Rule 4.17(H))
— as to the applicant’s entitlement to claim the priority of the earlier application (Rule 4.17(H)(i))
— of inventorship (Rule 4.17(iv))
Description

Title of Invention: AN EXPANDABLE CONTAINER

Technical Field

[1] The invention is within the field of containers. Specifically the invention is an expandable container.

Background Art

[2] Containers, such as peanut butter containers, typically come in a rigid form. That is, the container is unable to expand or contract to accommodate a variable volume of material inside the container. To use a peanut butter container as an example, as the contents of the container are consumed it becomes increasingly difficult to obtain peanut butter from the bottom of the container. Alternatively, it may be necessary to transfer a volume of material from, for example, a metal container, to a container that does not corrode once exposed to air. The transferring container may be larger than the receiving container and so it is necessary to search for a container having sufficient volume to hold all of the contents of the can. In both cases it would be beneficial to have a container that was expandable or collapsible. For an expandable container, the volume can change from small to larger. For a collapsible container the volume can decrease and move the floor of the container closer to the mouth of the container to access contents in the bottom of the container.

Disclosure of Invention

Technical Problem

[3]

Technical Solution

[4] The present invention overcomes the shortcomings noted above by providing an expandable container. The container has a first configuration which is a collapsed configuration and a first volume. The container has a second configuration which is an expanded configuration with a second volume that is larger than the first volume. The body of the container is a continuous membrane with a bellows portion formed in the side of the body that is able to expand and contract as desired.

Advantageous Effects

[5] The invention has the following advantages:


[7] 2. The expandable container permits access to material contained in the bottom of the container.

[8] 3. The expandable container can be sold empty as a storage container having a varying volume or the container can be sold with contents in the expanded con-
configuration that is able to collapse as the contents are emptied from the container.

**Description of Drawings**

[9] Figure 1 is a perspective view of one embodiment of the invention in an expanded configuration.

[10] Figure 2 is a perspective view of the embodiment of Figure 1 in a collapsed configuration.

[11] Figure 3 is a side view of one embodiment of the invention in an expanded configuration.

[12] Figure 4 is a side view of the embodiment of Figure 3 in a collapsed configuration.

**Best Mode**

**Mode for Invention**

[14] Referring now to the figures, the invention 10 is an expandable container shown generally as 10 comprising a body 12 having a bottom portion 14, a top portion 16 and a bellows portion 18 disposed between the bottom portion 14 and the top portion 16. Figure 1 and Figure 3 show the bellows portion 18 in a fully expanded configuration as it would appear when filled with a consumable material such as peanut butter. The consumable material would have a full level 20 within the expandable container proximate to the top portion 16. The container would assume a partially collapsed configuration (not illustrated) between the fully expanded configuration shown in Figure 1 and the fully collapsed configuration shown in Figure 2 when the consumable material was partially depleted. In Figure 2 and Figure 4 there is illustrated a fully collapsed configuration wherein the bellows portion 18 is fully compressed. In the configuration shown in Figure 2 and Figure 4 the consumable material would be nearly depleted however the top surface of the consumable material within the container would remain at a level 20 proximate to the top portion 16 of the container. Advantageously, this permits access to the contents of the container even when the contents are depleted without having to resort to long handled implements and ensure little wastage of the consumable.

[15] To collapse the expandable container it is only required to apply an axial compressive hand force on the top surface 24 of the container that is sufficient to overcome the natural resiliency of the bellows portion 18. Similarly, to expand the container, a similar axial tensile hand force is required to expand the bellows. The ability to collapse the bellows 18 as the consumable is depleted permits the level of consumable material remains proximate to the top portion and easily extracted from the expandable container.

[16] In the embodiments shown in the figures, the expandable container body 12 is
cylindrical as this is a typical shape of a consumable container. However, it is possible
to adopt other shapes such as ovoid and even rectangular.

The bottom portion 14 comprises a floor 26 and a non-expandable wall 28. The non-
expandable wall 28 further comprises a first indentation 30 and a first band 32. First indentation 30 provides more flexibility to the bottom portion wall when axial forces are being applied compressively so that the wall 28 is not over stressed and fractured. The band 32 provides a suitable boundary layer between the bottom portion 14 and the bellows portion 18.

The top portion 16 comprises an open mouth 40 for receiving and extracting the consumable material. The top portion 16 further comprises a threaded neck 42 disposed contiguously below the open mouth 40 for accepting a threaded closure (not illustrated) to seal the open mouth. The threaded neck 42 also comprises an abutment 44 to create an air-tight sealing engagement with the threaded closure to maintain the consumables fresh.

The top portion 16 further comprises an outwardly flared non-expandable wall section 46 disposed contiguously from the abutment. Below the flared wall section 46 there is a second band 48 disposed contiguously from the flared wall section and a second indentation 50 disposed contiguously from the second band 48. The second indentation 50 provides additional flexibility and force absorption during the application of an axial hand force. This helps to ensure that the hand force does not damage the bellows or over-compress the bottom portion 14. Beneath the second indentation is a third band 52 disposed contiguously from the second indentation 50. The third band 52 forms a boundary between the top portion 16 and the bellows portion 18.

The bellows portion 18 is disposed contiguously between the third band 52 and the first band 32.

The bellows portion comprises a contiguous series of interlocking discs 60 so that the bellows portion 18 remains in a desired configuration until a sufficient hand force is applied axially either compressively to further collapse the bellows or in tension to expand the bellows. Each disc of the series of interlocking discs comprises a top wall 62, a bottom wall 64 and a protruding ring 66 disposed between the top wall and the bottom wall. The ring 66 is adapted to permit the bottom wall 64 to fold upwards into the top wall 62 as illustrated by arrow 69 and retain the bottom wall in folded configuration as shown in Figure 2 and Figure 4.

In one embodiment the invention the container is a moulded plastic container.

In another embodiment of the invention the container is sufficiently flexible to permit hand grasping.

**Industrial Applicability**
Sequence List Text

[25]
Claims

[Claim 1] An expandable container comprising:
   a. A body having a bottom portion, a top portion and a bellows portion
disposed between said bottom portion and said top portion;
   b. A fully expanded configuration when filled with a consumable material
so that said consumable material has a level within said expandable container
proximate to said top portion;
   c. A partially collapsed configuration when said consumable material is
partially depleted; and,
   d. A fully collapsed configuration when the consumable material is
nearly depleted;
   e. Wherein a sufficient hand force axially applied will collapse said
bellows portion so that said level of consumable material remains
proximate to the top portion and easily extracted from the expandable container.

[Claim 2] The expandable container of claim 1 wherein said body is cylindrical.

[Claim 3] The expandable container of claim 2 wherein said bottom portion
comprises a floor and a non-expandable wall.

[Claim 4] The expandable container of claim 3 wherein said non-expandable wall
further comprises a first indentation and a first band.

[Claim 5] The expandable container of claim 1 wherein said top portion
comprises an open mouth for receiving and extracting the consumable material.

[Claim 6] The expandable container of claim 5 wherein the top portion further
comprises a threaded neck for accepting a threaded closure to seal said open mouth.

[Claim 7] The expandable container of claim 6 wherein said threaded neck further
comprises an abutment for sealing engagement with said threaded closure.

[Claim 8] The expandable container of claim 7 wherein the top portion further
comprises an outwardly flared non-expandable wall section disposed
contiguously from said abutment.

[Claim 9] The expandable container of claim 8 wherein the top portion further
comprises a second band disposed contiguously from said outwardly
flared non-expandable wall section, a second indentation disposed contiguously
from said second band and a third band disposed contiguously from said second indentation.
[Claim 10] The expandable container of claim 9 wherein said bellows portion is disposed contiguously between said third band and the first band.

[Claim 11] The expandable container of claim 10 wherein the bellows portion comprises a contiguous series of interlocking discs so that the bellows portion remains in a desired configuration until said sufficient hand force is applied.

[Claim 12] The expandable container of claim 11 wherein a disc of said series of interlocking discs comprises a top wall, a bottom wall and a ring disposed between said top wall and said bottom wall, wherein said ring is adapted to permit the bottom wall to fold upwards into said top wall and retain the bottom wall in folded configuration.

[Claim 13] The expandable container of claim 1 wherein the container is a moulded plastic container.

[Claim 14] The expandable container of claim 13 wherein the container is sufficiently flexible to permit hand grasping.
1. An expandable container comprising:
   a. a body having a first width, a variable body height, a bottom portion, a top portion and a single expandable bellows portion disposed between said bottom portion and said top portion, wherein said variable body height is variable between a fully expanded bellows configuration and a fully collapsed bellows configuration;
   b. a scalable mouth having a second width that is substantially the same as said first width of said body so that the bottom portion of said expandable container is easily accessible by a utensil from said scalable mouth when the expandable container is in said fully collapsed bellows configuration; and,
   c. wherein said single expandable bellows portion comprises a contiguous series of interlocking discs.

2. The container of claim 1 wherein the variable body height in said fully expandable bellows configuration is approximately twice the variable body height in the fully collapsed bellows configuration.

3. The container of claim 1 wherein when in the fully expanded bellows configuration each of said contiguous series of interlocking discs comprises a protruding ring member, a top wall having a top wall length and extending in a diagonally upwards and inwards disposition from an inside surface of said protruding ring member and a bottom wall having a bottom wall length and extending in a diagonally downwards and inwards disposition from an outside surface of the protruding ring member.

4. The container of claim 3 wherein each of the contiguous series of interlocking discs are joined between said top wall and said bottom wall at generally right angles.

5. The container of claim 4 wherein said top wall length is greater than said bottom wall length.

6. The container of claim 5 wherein when in the fully collapsed bellows configuration the top wall retains said diagonally upwards and inwards disposition and the bottom wall is folded upwards and around said inside surface of the disk member so that it rests substantially parallel to the top member.

7. The container of claim 1 wherein said contiguous series of interlocking discs comprises seven discs.

8. The container of claim 1 wherein the contiguous series of interlocking discs comprises less than seven discs.
9. The container of claim 1 wherein the contiguous series of interlocking discs comprises more than seven discs.

10. An expandable container comprising:
   a. a body having a first width, a bottom portion, a top portion and a single expandable bellows portion disposed between said bottom portion and said top portion, wherein said body has a height in a fully expanded bellows configuration that is approximately half said height in a fully collapsed bellows configuration;
   b. a scalable mouth having a second width that is substantially the same as said first width of said body so that the bottom portion of said expandable container is easily accessible by a utensil from said scalable mouth when the expandable container is in said fully collapsed bellows configuration; and,
   c. wherein when in said fully expanded configuration said single expandable bellows portion comprises a contiguous series of interlocking discs each comprising a protruding ring member, a top wall having a top wall length and extending in a diagonally upwards and inwards disposition from an inside surface of said protruding ring member and a bottom wall having a bottom wall length and extending in a diagonally downwards and inwards disposition from an outside surface of the protruding ring member;
   d. so that each of the contiguous series of interlocking discs are joined between said top wall and said bottom wall at generally right angles.

11. The container of claim 10 wherein said top wall length is greater than said bottom wall length.

12. The container of claim 10 wherein when in the fully collapsed bellows configuration the top wall retains said diagonally upwards and inwards disposition and the bottom wall is folded upwards and around said inside surface of the disk member so that it rests substantially parallel to the top member.

13. The container of claim 10 wherein said contiguous series of interlocking discs comprises seven discs.

14. The container of claim 10 wherein the contiguous series of interlocking discs comprises less than seven discs.

15. The container of claim 10 wherein the contiguous series of interlocking discs comprises more than seven discs.
Statement Under Article 19(1)

The amendments to the claims submitted herein are in response to the Written Opinion of the International Searching Authority. The amendments overcome the comments with respect to novelty and inventive step noted in Box V of the Written Opinion. The claim amendments submitted herein did not require any change to the specification or to the drawings as originally submitted.
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC: B65D 21/08 (2006.01) , B65D 23/00 (2006.01) , B65D 8/14 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC: B65D 21/08 (2006.01) , B65D 23/00 (2006.01) , B65D 8/14 (2006.01); ECLA: B65D21/08C; USPC: 220/8, 220/666.

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)

Total Patent, Canadian Patent Database, Keywords: expandable, contractible, bellows, variable.

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

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Date of the completion of the international search: 24 August 2011 (24-08-2011)

Date of mailing of the international search report: 6 September 2011 (06-09-2011)

Name and mailing address of the ISA/CA

Canadian Intellectual Property Office

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