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(54) A collapsible lightweight container

(57) The present invention concerns a container (1) suitable for packing and dispensing a non flowable food product, said container comprising a collapsible container body (2) and a container neck (3) with a dispensing opening (4), said container body having an internal volume (V1) when said body is in fully compressed configuration and an internal volume (V2) when said body is in a fully expanded configuration, characterized in that:

(i) said container is manufactured by injection-blowing process out of a thermoplastic material chosen from the list comprising:
polyethyleneterephtalate (PET), polyethylenenaphtalate (PEN), polyethyleneterephtalateglycol (PETG), polypropylene (PP), or a combination thereof,
(ii) said body walls (2) have a thickness not higher than 100 μm, and
(iii) the ratio V1/V2 is lower than, or equal to, 0.05.

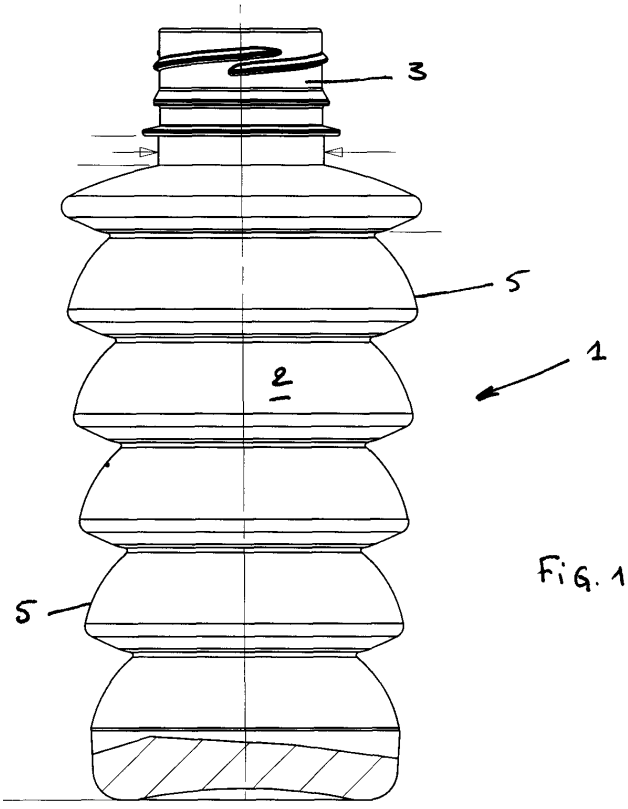

Fig. 1

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Description

[0001] The present invention concerns a collapsible lightweight container, in particular a container suitable for packing and dispensing non flowable food products.

[0002] By non-flowable products, it is meant products which do not flow, or hardly flow under their own weight.

[0003] In the following description, the products to be contained in the invention will be described as dairy semi-liquid or pasty products, for instance yogurts with or without fruit pieces and the like. It should be however understood that the present invention applies to all non flowable food products.

[0004] In the recent years, many nutritional and food products, were developed which are proposed to the consumer in a ready-to-drink form, i.e. in a liquid or semi-liquid form, for instance creams, gels, viscous liquids. This allows a consumer to consume the product "on-the-go", that is to say, without using a specific tool, directly from a bottle or bottle-like container into which such products are packed.

[0005] It was found however that the viscosity of such products prevents correct and full dispensing of the product from its container, which is highly undesirable to the consumer, for product quality image and also legal aspects. Indeed, it is very frequent that about 10% of the product volume as marked on the container label, cannot be dispensed and is lots for the consumer, because due to its viscosity, it stays inside the container, even though this container is turned upside-down by the consumer.

[0006] Although collapsible containers exist, they are most of the time directed to large volumes, and therefore not applicable in the case of small food portions. In addition, although they are collapsible, their internal volume cannot be sufficiently reduced by collapsing the container body, so as to allow forcing the remaining of a small food portion out of the container.

[0007] It is therefore one main purpose of the present invention to propose a collapsible container made such that the internal volume of the container body can be reduced by more than 95% by collapsing at least part of the said body.

[0008] The purpose described above is achieved with the present invention which provides a container suitable for packing and dispensing a non flowable viscous food product, said container comprising a collapsible container body and a container neck with a dispensing opening, said container body having an internal volume V1 when said body is in fully compressed configuration and an internal volume V2 when said body is in a fully expanded configuration, characterized in that said container is manufactured by injection-blowing process out of a thermoplastic material chosen from the list comprising: polyethyleneterephtalate (PET), polyethylenenaphtalate (PEN), polyethyleneterephtalateglycol (PETG), polypropylene (PP), or a combination thereof, said body walls have a thickness not higher than 100 μm, and the ratio V1/V2 is lower than, or equal to, 0.05.

[0009] Surprisingly, the applicant found that, in particular, by reducing importantly the thickness of the container body walls, it is possible to achieve a very high reduction of the internal volume.

[0010] In a first embodiment of the invention, said container body comprises two halves, the lower half being so flexible and shaped as to be foldable upwards into the upper half, in order to collapse entirely said container body.

[0011] Preferably in that case, the said lower half of the container body comprises at least one helical groove and/or at least one helical ridge extending at least once around the whole circumference of said container body.

[0012] In a second embodiment of the invention, said container body comprises a plurality of flexible bellows that allow collapsing of the container body along an axis that is substantially coaxial with the longitudinal axis of the container.

[0013] Said non flowable food product can have a viscosity index of 1000 to 50000 centipoises, preferably 3000 to 35000 centipoises, measured by the Brookfield measurement method.

[0014] In a preferred embodiment of the invention, the said non flowable food product is a chilled, a frozen or shelf-stable dairy product.

[0015] Additional features and advantages of the present invention are described in, and will be apparent from, the description of the presently preferred embodiments which are set out below with reference to the drawings in which:

Figure 1 is a schematic profile view of a first embodiment of the invention ;
Figure 2 is a schematic profile view of a second embodiment of the invention ;
Figure 3 is a bottom view of the container shown in figure 2;
Figure 4 is a schematic profile, partially cut, view of the container shown in figure 2, said container being in a collapsed configuration.

[0016] The present invention, as illustrated in figures 1 and 2, concerns a container 1 suitable for packing and dispensing a non flowable viscous dairy product like a yogurt with fruit pieces, which has a viscosity index of about 10000 to 35000 centipoises.

[0017] The container 1 comprises a collapsible container body 2 and a container neck 3 with a dispensing opening 4. The whole container is manufactured by blowing in a mould an injected preform that is made out of polyethyleneterephtalate (PET).

[0018] As shown in figures 1 and 2, the container 1 can be set in a first configuration wherein the said container body 2 is fully expanded and has an internal volume V2.

[0019] In a second configuration illustrated in figure 4, the container body 2 can be collapsed. In the fully collapsed configuration shown in figure 4, the container

body 2 has an internal volume V1.

[0020] According to the present invention, the container walls have a thickness not higher than 100 μm, so that the whole container has a particularly low weight.

[0021] Also, according to the invention, the ratio of the internal volumes of the container body between the fully collapsed and fully expanded configuration, V1/V2, is about 0.03.

[0022] As can be seen from figures 1 and 2, such a very low collapsing ratio is obtained by a special configuration of the container body which has a shape such that it can entirely fold from its bottom upwards into its upper parts.

[0023] As can be seen from figure 1 illustrating a first embodiment of the invention, the whole container body profile has a generally frusto-conical shape and a series of bellows 5 with concentric cross-sections from the bottom - smallest cross-sections - to the top - largest cross sections -, so that each bellow of said body can fold exactly into the upper bellow.

[0024] Similarly, as shown in figure 2 that illustrates a second embodiment of the invention, it can be seen that the lower half of the container body 2 has symmetrically the same cross section - up to the functional play - than the upper half, so that said lower half can be turned outside in, to exactly fit the upper half of said container body, as illustrated in figure 4.

[0025] In order to be sufficiently flexible to be turned outside in, the lower half of the container body comprises one helical ridge 6 extending all around the whole circumference of said container body from the flat bottom part 7 of the container body 2, up to the top part 8 of the lower half of said container body, as shown in figure 3.

[0026] More generally, the said container body comprises two halves, the lower half being so flexible as to be foldable upwards into the upper half, in order to collapse entirely said container body.

[0027] Whatever the particular shape of the container, the said container is meant to be formed, then filled in its fully expanded configuration, and then closed, for instance by means of a screw cap that is screwed onto the neck.

[0028] At use, the consumer unscrews the cap to open the container, and then consume the contents by pressure on the container, collapsing the container body by applying a small pressure onto the container top and lower ends, so that the internal volume of the container body that is left is just sufficient to contain the rest of the product. Then the container can be closed again until the next use.

[0029] When the container is almost empty, the consumer can use the collapsing effect to reduce as a minimum the internal volume of the container body and therefore force the viscous product remaining inside the container out. Due to the minimal volume inside the body when the container is fully collapsed, the consumer can be sure that almost the entire amount of product as labelled is dispensed and consumable. Basically, one can consider that the internal volume of the container that cannot be collapsed, corresponds to the volume of the neck. This maximises the appearance of the container and indicates to the amount of product remaining in the container to the consumer.

[0030] It should be understood that various changes and modifications to the presently preferred embodiments described herein will be apparent to those skilled in the art. Such changes and modifications can be made without departing from the spirit and scope of the present invention and without diminishing its attendant advantages. It is therefore intended that such changes and modifications be covered by the appended claims.

Claims

1. A container (1) suitable for packing and dispensing a viscous food product, said container (1) comprising a collapsible container body (2) and a container neck (3) with a dispensing opening (4), said container body having an internal volume V1 when said body is in fully compressed configuration and an internal volume V2 when said body is in a fully expanded configuration,
   characterized in that:

   (i) said container is manufactured by injection-blowing process out of a thermoplastic material chosen from the list comprising: polyethyleneterephtalate (PET), polyethylenenaphtalate (PEN), polyethyleneterephtalateglycol (PETG), polypropylene (PP), or a combination thereof,
   (ii) the walls of said container body (2) have a thickness not higher than 100 μm, and
   (iii) the ratio V1/V2 is lower than, or equal to, 0.05.

2. A container (1) according to claim 1, wherein said container body (2) comprises two halves, the lower half being so flexible and shaped as to be foldable upwards into the upper half, in order to collapse entirely said container body.

3. A container (1) according to claim 2, wherein said lower half of the container body (2) comprises at least one helical groove and/or at least one helical ridge (6) extending at least once around the whole circumference of said container body.

4. A container (1) according to claim 1, wherein said container body (2) comprises a plurality of flexible bellows that allow collapsing of the container body along an axis that is substantially coaxial with the longitudinal axis of the container.

5. A container (1) according to any of the preceding claims, wherein said non flowable food product has

a viscosity index of 1000 to 50000 centipoises, preferably 3000 to 35000 centipoises.

6. A container (1) according to claim 5, wherein said non flowable food product is a chilled, or shelf-stable dairy product.

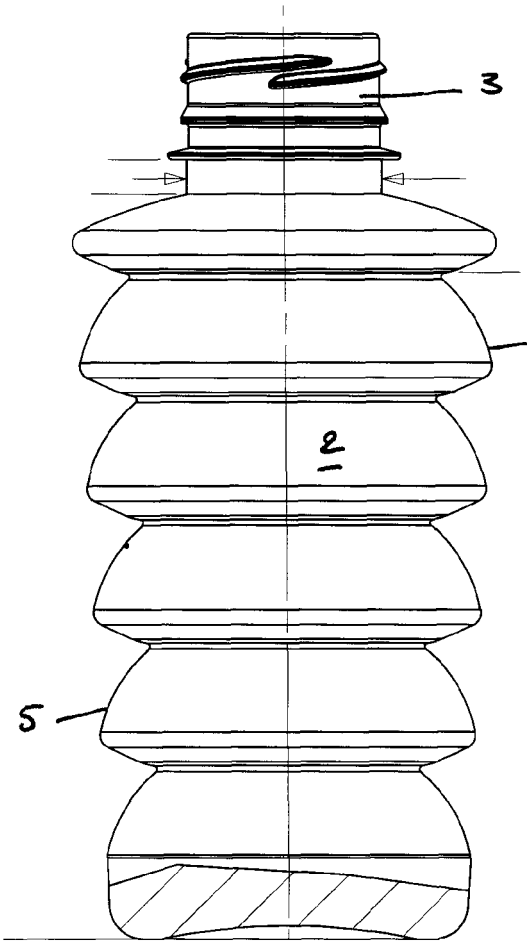

Fig. 1

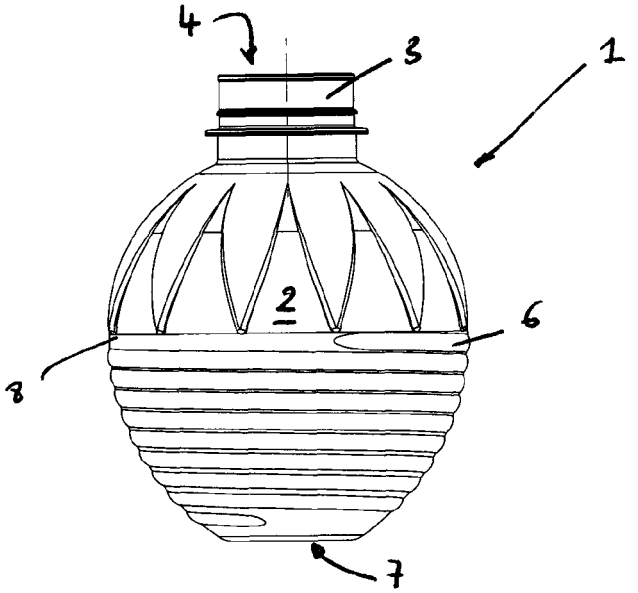

Fig. 2

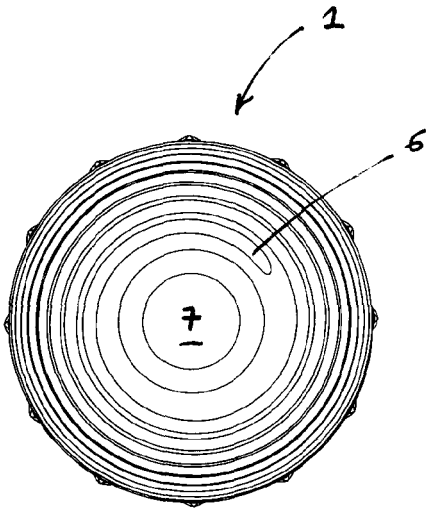

Fig. 3

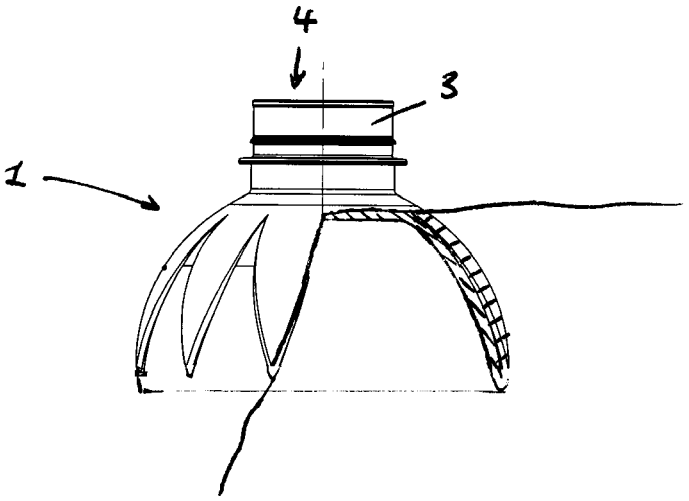

Fig. 4

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PARTIAL EUROPEAN SEARCH REPORT

which under Rule 45 of the European Patent Convention shall be considered, for the purposes of subsequent proceedings, as the European search report

Application Number EP 07 10 1790

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	EP 1 650 133 A (NESTEC SA [CH]) 26 April 2006 (2006-04-26) * paragraph [0030] - paragraph [0032]; claims 1-3; figures 1,2 *	1-4	INV. B65D1/02
Y	DE 195 00 006 A1 (HOERMANSDOERFER GERD [DE]) 4 July 1996 (1996-07-04) * column 3, line 31 - line 51; claim 1; figures 1-3 *	1-4	
Y	EP 0 733 557 A1 (MAZDA MASAYOSI [JP]) 25 September 1996 (1996-09-25) * column 4, line 51 - column 5, line 33; claim 1; figures 1-4b *	1-4	

TECHNICAL FIELDS SEARCHED (IPC)

B65D

INCOMPLETE SEARCH

The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC to such an extent that a meaningful search into the state of the art cannot be carried out, or can only be carried out partially, for these claims.

Claims searched completely :

Claims searched incompletely :

Claims not searched :

Reason for the limitation of the search:

see sheet C

Place of search	Date of completion of the search	Examiner
Munich	27 June 2007	Janosch, Joachim

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

3

EPO FORM 1503 03.82 (P04C07)

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INCOMPLETE SEARCH SHEET C

Application Number
EP 07 10 1790

Claim(s) searched completely:
1-4

Claim(s) not searched:
5,6

Reason for the limitation of the search:

Dependent claims 5 and 6 do not define features of the subject-matter of claim 1, the container, but of the food product, which is not defined as forming part of the container. Thus, it is completely unclear which additional features shall be defined by the additional features of claims 5 and 6.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 10 1790

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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27-06-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82