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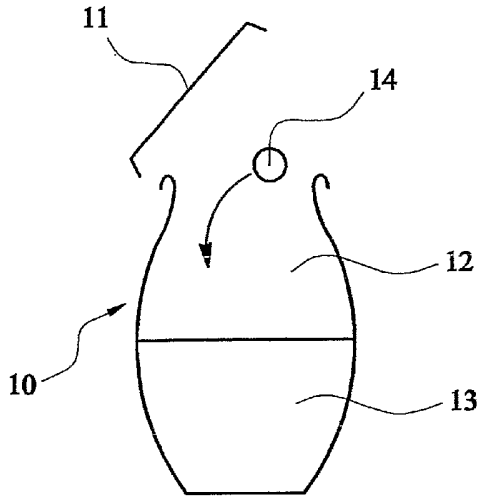
(54) Title: A BEVERAGE SYSTEM



(57) Abstract: A beverage system and packaging for same, wherein a beverage (13), e.g. margarita mix, is provided in a container (10) with a substantial headspace (12) and then cooled until at least partially frozen. When shaken the frozen beverage will be broken up, preferably with the aid of an agitation means such as a ball (14).

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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A BEVERAGE SYSTEM

TECHNICAL FIELD

The present invention relates to a beverage system, a method for serving a beverage and its container/packaging.

BACKGROUND ART

Many beverage products are known, a significant proportion of which are preferentially cooled before drinking. At the least these products are refrigerated and often served with ice cubes. Some further products/processes are known such as "slushies" which usually involves flavouring a volume of finely crushed ice before dispensing it into a cup or other container. A "slushy" product is usually eaten with a special spoon or with a straw, rather than intended for drinking (except perhaps the melted contents in the cup).

Most "slushy" type products are non-alcoholic. However, crushed ice-based alcoholic beverages are known such as a "frozen margarita".

In a bar a frozen margarita will be made by combining ice cubes with a margarita mix and blending this in a liquidiser. In an effort to bring frozen margaritas into the home environment, pre-mix packs are available (with or without alcohol added) to be frozen in a domestic freezer, e.g. overnight.

The pre-mix is formulated to freeze to a generally desired consistency in a domestic freezer that may have a range of operating temperatures (e.g. -5°C to - 25°C depending on how often it is accessed). Pre-mix is supplied in a bucket with a

capacity sufficient for multiple servings (e.g. a dozen glasses). The mix is scooped with a spoon into a glass.

In a practice, use of such a beverage product is limited to party situations where "bulk" alcoholic beverages are desirable, preferably at low cost.

DISCLOSURE OF THE INVENTION

It is an object of the present invention to provide a type of cooled/chilled beverage product that may be used within the home or public house environment. It is preferable that the beverage will be "self contained" for suitable preparation in its packaging.

In one broad aspect of the present invention there is provided a beverage system wherein beverage is introduced into a container and then cooled until at least partially frozen, characterised in that a substantial headspace is allowed when filling the container such that when shaken the frozen beverage will be broken up.

In a preferred form the container includes an agitation means to promote ice break-up and/or foam forming upon shaking. In one form the agitation means is a "ball bearing" or other object within the container. In another form the agitation means is an integral baffle or other protrusion from an inner wall of the container.

BRIEF DESCRIPTION OF DRAWINGS

Figure 1 is a basic illustration of the principle of the invention, and

Figure 2 is an example of a packaging type according to the invention.

MODE(S) FOR CARRYING OUT THE INVENTION

In Figure 1, a container 10 includes a removable lid 11. A substantial headspace 12 is allowed above the liquid beverage 13 during filling of the container. This is to allow movement of both the liquid and (in the illustrated embodiment) an object 14 that is introduced to the container 10 after freezing. The liquid may be an alcoholic or non-alcoholic beverage. It is intended that a 500mL vessel may be filled with 300mL of liquid, however, the vessel size may be in the range 50 mL to 5 litre and the respective liquid volume from 20 mL to 4 litre. The term "headspace" should be construed as including any unfilled portion of the container.

In order for the desired "slush" effect to be achieved, the container and liquid is subjected to cooling, e.g. placed in a freezer for partial or substantial "freezing" of the liquid at or to temperatures between about 0°C and -30°C. Optimum cooling times can be determined by known practice in the field of the invention. Furthermore, the beverage product may be formulated to give a desirable consistency on shaking, e.g. a thicker than usual formulation in a particular colour.

Shaking of the container and allowing a significant headspace uses collision forces to break the ice finely. An object e.g. ball bearing 14 or other agitation means introduced to the container headspace after freezing, also aids in breaking up the ice to a desired consistency. Clearly the lid 11 should be replaced to the container once the object 14 has been introduced prior to shaking.

Agitation not only breaks up the ice to give a softer, smooth consistency, it also may aid the incorporation of air or gas into the liquid to create a more foamy or frothy product. In one form the invention may incorporate a gas other than ambient air (e.g. carbon dioxide) in the headspace 12, particularly if the lid 11 is sealed when the container is filled during a production process as described below. Alternatively or in addition, the agitation means could incorporate a gas-releasing aperture similar to a "widget" used conventionally to form a foaming head on the beverage prior to drinking. Such a device would also have the effect of "seeding" ice crystal formation.

The shaking action and subsequent drinking of the cool slush product provides a novel drinking experience in a domestic or public house environment.

Figure 2 illustrates an example of a pre-packaged product according to the present invention intended, most likely, for the take-home market.

The general components are the same as Figure 1: a container 10, a removable lid (or cap) 11, a substantial headspace 12 above a liquid beverage 13 and an object 14 to serve as an agitating means.

It will be noted that a normal bottle filling process will deliver a volume of liquid to at least adjacent a narrowed neck area 15. The deliberate underfilling process is necessary for operation of the present invention.

Preferably neck area 15 is either too narrow to allow object 14 to exit the container 10 or, as illustrated, includes some kind of stop means 16 to prevent exit. Stop means 16 may be as simple as a cross piece that ensures no aperture at the neck 15

is wider than a smallest cross section dimension of object 14 (in this case a weighted ball).

Also shown in the embodiment of Figure 2 is a membrane 17 that would be punctured in order for the product to be used. A method of puncture includes allowing the stop means 16 some movement in a restricted vertical plane such that downward force, via ball 14, will puncture through the membrane and drop ball 14 into the headspace and onto the beverage 13. A small annular protrusion 18 then restricts stop means 16 from falling into the main headspace 12.

The components (ball 14, stop 16, membrane 17 and protrusion 18) illustrated within neck area 15 can be manufactured as a single insert module adhered within the neck, after filling and before cap 11 is placed on the container 10 and sealed.

It will be apparent that the advantage of keeping ball 14 out of liquid 13 prior to freezing is that its movement and role of breaking up ice is not impaired as it would be should ball 14 be submerged.

Other methods exist for keeping ball 14 from being frozen in the liquid. For example, ball 14 may be supplied outside or as a separate product from the bottle and dropped in by the consumer. Alternatively, it could be held in the neck of the bottle within a moulding that breaks when the closure is twisted (e.g. as with a tamper evident band) to drop the ball in.

It is preferable that beverage 13 be frozen "upright" as illustrated in Figure 2 so the headspace 12 is adjacent neck 15.

In the intended use situation a container 10 would be placed in a freezer for a minimum few hours but preferably overnight. Formulation of the beverage need not be too specific to achieve sufficient ice crystal formation. The beverage will not "freeze solid" as a block of ice but forms large crystals and thus, once agitated, will begin to break up into finer crystals (ice slush) in the headspace 12 provided. Shaking for 30 seconds should be sufficient to provide the desired slush prior to removal of cap 11 for pouring into a glass or drinking straight from the bottle (e.g. with a straw). In practice the cap may be fitted to a much wider bottle mouth than that illustrated.

Ball 14 aids in agitation (in a similar way to a ball bearing provided in a spray paint can), however, it is envisaged that the ball 14 may not be critical to implementing the invention. It is the headspace provided in the deliberate filling process that most facilitates fine crystal formation by striking against the container walls through shaking. However, without additional agitation means it may take longer than desirable to shake the container to the desired ice consistency.

Formulation of the beverage could be adjusted to facilitate shaking without an agitation means.

The present invention is particularly suited to application in the frozen margarita market, however virtually any other beverage type (especially pre-mixed spirit based drinks) can be subject to the present invention. A particular application is fruit juices/sorbet.

INDUSTRIAL APPLICABILITY

The present invention includes within its scope a novel packaging design, however, this can be manufactured with available processes and material. Bottle filling is subject to specific parameters to ensure a substantial headspace is left, far beyond the expected norm. As a rough guide the headspace should be between 25% to 50% volume of the liquid within the container. However, the headspace height must also be considered, therefore larger volumes may only need the same headspace as smaller volumes so long as the height (enabling travel of the ice to produce collision forces) is sufficient.

CLAIMS

1. A beverage system wherein beverage is introduced into a container and then cooled until at least partially frozen, characterised in that a substantial headspace is left when filling the container such that when shaken the frozen beverage will be broken up.

2. The beverage system according to Claim 1 further including an agitation means within the container.

3. The beverage system according to Claim 2 wherein the agitation means is a loose object within the container.

4. The beverage system according to Claim 3 wherein the loose object is a ball.

5. The beverage system according to Claim 2 wherein the agitation means is a protrusion (e.g. baffle) from the container.

6. A sealed pre-packaged beverage product, including a container, a closure and a beverage characterised in that a substantial space in the container is unfilled with beverage such that, in use, when the beverage is at least partially frozen and the container shaken manually, the frozen beverage will be broken up.

7. The beverage product of Claim 6 further including an agitation means in the container.

8. The beverage product of Claim 7 wherein the agitation means is a protrusion (e.g. baffle) in the container.

9. The beverage product of Claim 7 wherein the agitation means is a loose or a releasably mounted object.

10. The beverage product of Claim 9 wherein an opening in the container, adjacent the closure is smaller than any dimension of the agitation means.

11. The beverage product of Claim 9 or 10 wherein the agitation means is housed between the closure and a penetrable membrane.

12. The beverage product of any one of Claims 9 to 11 wherein the agitation means is a ball.

13. The beverage product of any one of claims 6 to 12 wherein the beverage is filled to at least 50% of the container volume.

14. A method of preparing a frozen beverage product including the steps of filling a container partially with beverage to leave a substantial space, cooling the beverage to cause ice crystal formation, and manually shaking the container to break up the beverage into finer ice crystals.

15. The method according to Claim 14 wherein, following partial filling with beverage, the container is sealed during manufacture; and not opened until after cooling and manual shaking.

16. The method of Claim 14 or 15 wherein an agitation means is inserted into the container.

17. The method of any one of claims 14 to 16 wherein the substantial space is less than 50% of the container volume.

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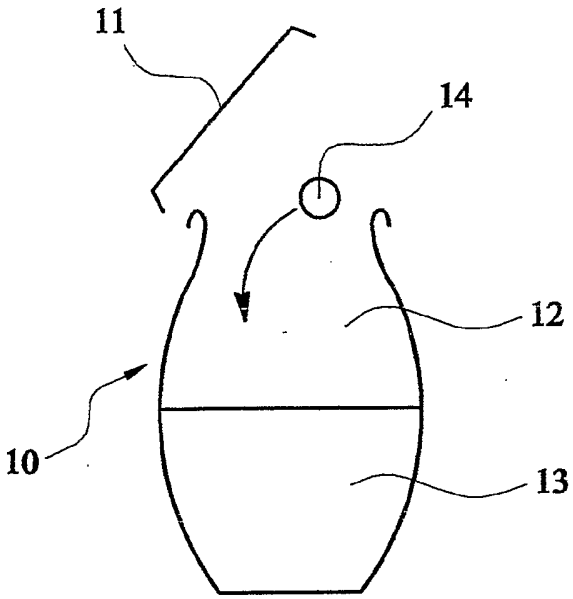

FIG. 1

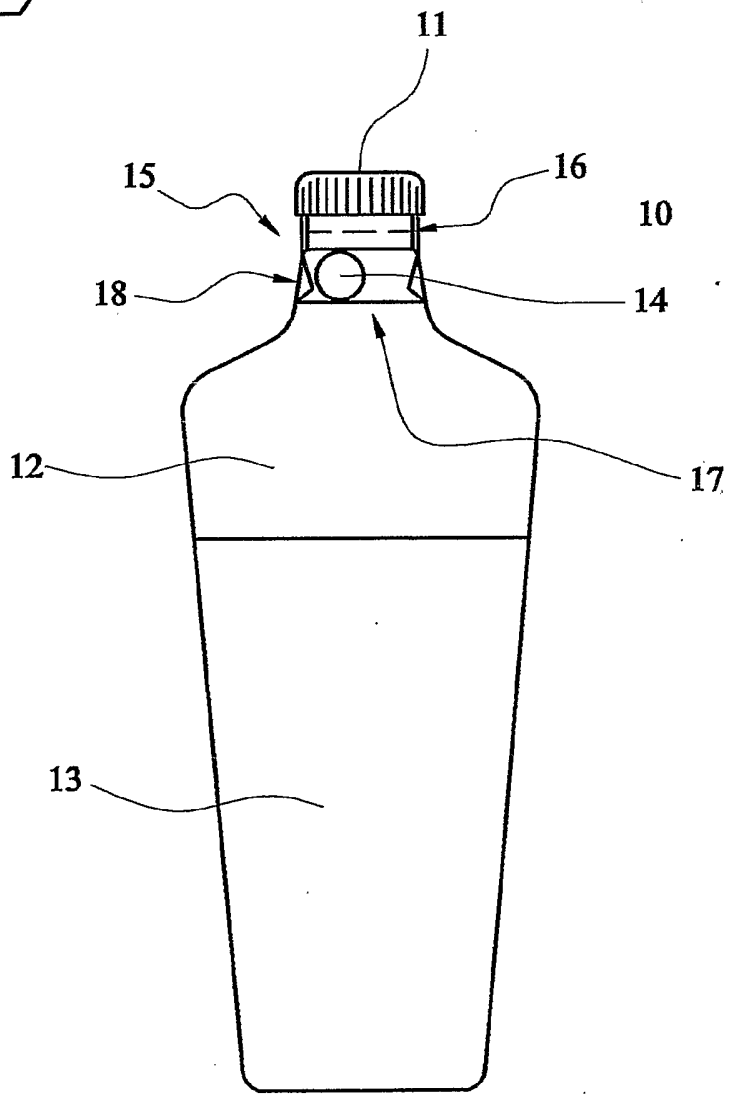

FIG. 2

INTERNATIONAL SEARCH REPORT

Inte al Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A23G9/04 A23G9/00 B65D85/78

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 7 A23G B65D

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2001/046545 A1 (JONES ROBERT C) 29 November 2001 (2001-11-29) paragraphs '0017! - '0019!; claims 14-22; figures 2,3	1-3,5-9, 13-17
X	US 3 479 187 A (ARBUCKLE WENDELL S) 18 November 1969 (1969-11-18) column 5, line 71 - column 6, line 44; examples	1-3,6,7, 9,13-17
A	US 6 060 099 A (ITO SADAHARU) 9 May 2000 (2000-05-09)	

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
14 June 2005	19/07/2005

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Lepretre, F

INTERNATIONAL SEARCH REPORT

....ormation on patent family members

Inte ial Application No
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2001046545 A1	29-11-2001	AU 4797701 A WO 0160184 A1	27-08-2001 23-08-2001
US 3479187 A	18-11-1969	NONE	
US 6060099 A	09-05-2000	JP 11221023 A	17-08-1999