

A BEVERAGE

This invention relates to a beverage, to a method of serving said beverage, and to providing a visual display in a beverage.

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According to a first aspect of the invention a beverage comprises a water content and a dissolved gas content, wherein prior to being drunk said beverage is cooled to a temperature below the freezing point of water at ambient atmospheric pressure and delivered in a container to be drunk
10 exposed to ambient atmospheric pressure, and wherein in said container aforesaid dissolved gas bubbles out of the beverage and at least a portion of said water content becomes ice.

According to a second aspect of the invention a beverage comprises a
15 water content and a dissolved gas content, wherein said beverage is to be stored in a sealed container and cooled by chilling means to a temperature below the freezing point of the water at ambient atmospheric pressure, and wherein when the container is opened to expose the beverage to said atmospheric pressure, aforesaid dissolved gas bubbles out of the beverage
20 and at least a portion of said water content becomes ice.

The beverage may be stored in said container.

According to a third aspect of the invention there is provided a beverage
25 for providing a visual display in a container in which it is served, said beverage comprising a water content and a dissolved gas content, wherein said beverage is in a sealed said container in which it is stored and cooled by chilling means to a temperature below the freezing point of water at ambient atmospheric pressure, and wherein when the container is opened
30 to expose the beverage to said atmospheric pressure aforesaid gas bubbles

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out of the beverage and said visual display occurs provided at least by at least a portion of said water content becoming ice.

If desired the container may be shaped to promote formation of said ice.

- 5 The container can have an internal surface arranged to provide nucleation sites to promote formation of said ice. For example, at least a portion of the internal surface can be roughened. The surface portion can be roughened by etching, for example by laser etching, or by adhering granular material, for example glass particles to the surface portion.

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If desired, the container can have at least a wall portion arranged to change colour automatically with variation in temperature. Such a wall portion may comprise thermo-chromic material.

- 15 Preferably the container has a wall portion of sufficient transparency to allow the beverage and/or ice inside the container to be seen.

The container may be a bottle and/or may be of glass. Alternatively, the container may be a can.

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The beverage may be non-alcoholic or alcoholic. If the latter, the beverage may be a lager, a beer, a porter, a stout, a cider, or a flavoured alcoholic beverage or alco-pop.

- 25 Desirably, the gas is a non-oxidising gas. This can avoid or at least slow deterioration of the beverage. The gas comprises carbon dioxide and/or nitrogen. By cooling the beverage and forming ice therein, this appears to, initially at least, reduce the rate of release of dissolved gas from the beverage, for example lager, and appears to improve the drinking
30 sensation, taste, flavour or bight. We believe that this is a combination of

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the low drinking temperature (maintained by the ice) and the greater amount of retained gas in the beverage.

5 The presence of the ice can provide an interesting and attractive feature which can be particularly fascinating as the ice may expand at a noticeable rate through the beverage after the container is opened. To add to the interest, the ice may include therein one or more streaks or regions of one or more colours which contrast(s) with the colour of the ice and/or beverage.

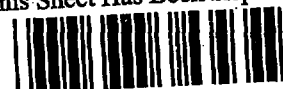
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The aforesaid ice may be, or may have, the character of slush.

According to a fourth aspect of the invention a method of serving a beverage which comprises a water content and a dissolved gas content,
15 said method comprising providing said beverage in a sealed container, cooling the beverage in the container to a temperature below the freezing point of the water at ambient atmospheric pressure, ceasing to cool the beverage, opening the container to expose the beverage to the ambient atmospheric pressure, and wherein aforesaid gas bubbles out of the
20 exposed beverage and at least a portion of said water becoming ice.

According to a fifth aspect of the invention a method of providing a visual display or effect within a container having at least a portion of wall of some transparency, said method comprising introducing into the container
25 a beverage comprising a water content and a dissolved gas content, sealing the container, cooling the beverage in the container to a temperature below the freezing point of the water at ambient atmospheric pressure, and opening the container to expose the beverage to the ambient atmospheric pressure, so that there develops in the beverage a visual

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display or effect comprising aforesaid gas bubbling out of the beverage and formation of ice due to at least a portion of said water becoming ice.

Formation of the ice can develop subsequent to opening the container so
5 as to increase the amount and extent of the ice from substantially an upper level of the beverage downwards through the beverage.

The container may be a bottle. If desired, the container may be of glass,
or the container may be a can. Preferably the container has a wall portion
10 of some transparency. If desired, the container may have at least a wall portion which changes colour with variation in temperature. For example, the wall portion may comprise thermo-chromic material.

If desired, the container may have a shape or formation which encourages
15 the formation of the ice. To that end, the container may have one or more internal formations to encourage the ice formation. For example, at least a portion of an internal wall of the container may have a roughened texture. The container may be adapted to encourage formation of further ice in the beverage below an upper layer of forming ice, said further ice
20 rising to join the upper layer.

To encourage formation of the ice, an implement can be inserted into the beverage in the open container to encourage formation of the ice. The implement can disturb the beverage so as to cause release of gas bubbles
25 creating nucleation sites for the ice. The implement may be a swizzle-stick, or it may be an elongate thermometer, which may also take the temperature of the beverage to see if it has risen to a safe temperature (for example to about -4.0°C) for the beverage to be drunk.

the invention wherein the beverage is being cooled in readiness for use in performing the method according to the fourth or fifth aspect of the invention, different stages in the method being represented in Figures 2 to 5;

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Figures 6 to 8 respectively show diagrammatic sections illustrating modifications of the method according to the fourth or fifth aspect of the invention; and

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Figure 9 is a diagrammatic perspective view of another container containing a beverage according to the first, second or third aspect of the invention for performing the method according to the fourth or fifth aspect.

15 In Figure 1, a container in the form of a bottle 2 formed of a material, for example a glass, of sufficient transparency for the content of the bottle to be seen from outside. The bottle contains a beverage 4 comprising a water content and a dissolved gas content. This gas may be any suitable non-oxidising gas, for example carbon dioxide and/or nitrogen. A
20 suitable closure 6 closes the bottle 2 in a fluid-tight manner, in this instance the closure being of the known crimped-cap or crown-cork type. The amount of gas dissolved in the beverage 4 may be within the usual known range for beverages and the pressure within the sealed bottle may also be within the usual known range for gassified drinks. In Figure 1,
25 the bottle of beverage is being cooled, for example to substantially -8.0°C, in bath 8 of cooling liquid 10 which may be a mixture of water and ethylene glycol cooled by any suitable known manner.

When the bottle 2 is removed from cooling and the closure 6 is removed
30 to expose the beverage to ambient atmospheric pressure and ambient or

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Colouring material or dye may be provided to form at least one coloured steak or region in the beverage and/or ice, the colour of the material or dye being in contrast to that of the ice and/or beverage so as to be visible.

- 5 An aforesaid implement may be used to add the colouring material or dye to the beverage and/or ice. Alternatively, the colouring material or dye may be automatically released in consequence of the container being opened. For example, the act of opening the container may automatically rupture or otherwise open a receptacle containing the colouring material
10 or dye in the container to release that material or dye, or a reduction in pressure within the container consequential to it being opened may cause the rupture or otherwise cause the receptacle to open.

- The sealed container may be placed in a tank of cooling liquid to cool the
15 beverage. If desired, the beverage may be cooled to substantially -8.0°C . After the container is opened the beverage may be raised to a temperature of at least -4.0°C .

- Preferably the gas is a non-oxidising gas, for example the gas may
20 comprise carbon dioxide and/or nitrogen.

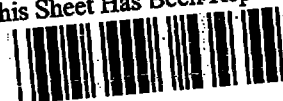
- The beverage may be non-alcoholic or it may be alcoholic. Appropriate alcoholic beverages comprise lager, beer, porter, stout, cider or flavoured alcoholic beverages or alco-pops.

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The invention will now be further described, by way of example, with reference to the accompanying drawings, in which:-

- Figure 1 shows a diagrammatic section of a sealed container
30 containing a beverage according to a first, second or third aspect of

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room temperature, the beverage temperature starts to increase. Almost immediately, a slug of ice 12a forms in the neck of the bottle 2 at the upper level of the beverage, the ice being caused (we believe) as a result of nucleation sites resulting from the forming of bubbles of the dissolved gas. The ice is in the nature of slush and is formed from the water already forming the beverage. The slug of ice grows as indicated at 12b in Figure 3 and 12c in Figure 4 until it may substantially occupy the bottle 2 suggested at 12d in Figure 5. The growth of ice can be accomplished in a minute or two, is fascinating to watch and can give rise to interesting visual effects based on the growth of the ice and the bubbling off of the gas. In the case of a bottle of about 300ml capacity containing a flavoured alcoholic beverage or alco-pop, for example HOOPER'S HOOCH™ the development of the ice from the stage in Figure 2 to that in Figure 5 can take about one minute and forty-five seconds.

Not only does the formation of the ice give rise to interesting visual effects, but the existence of the ice helps to keep the drink cool longer. Also, since the ice is formed from the water in the beverage, the beverage is not diluted by the ice. In fact, for an alcoholic beverage, the overall amount of alcohol remains the same in the container when the ice forms, but since water is being used for the ice the alcoholic strength of the remaining liquid beverage increases until the ice melts.

25 The container may be shaped or formed to encourage formation of the ice. In Figure 6 a region 14 (having a rough surface) is provided to encourage formation of nucleation sites to promote formation of a further ice slug 12e which rises as indicated by arrow A to enlarge the ice slug 12 developing from the top of the container.

In Figure 7, formation of further ice 12f in the body of the beverage 4 is encouraged by the insertion therein of an elongate implement or rod 16 represented in Figure 7 by a swizzle-stick having formations 18 and 20 at its lower end and shank respectively which further encourage development of nucleation sites. In another instance, the rod 16 may be a thermometer body which can also be used to take the temperature of the drink to see if it has risen sufficiently high, for example to about -4.0°C , for it be safe to drink. The implement can be used to push the ice around.

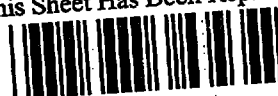
10 In Figure 8, coloured regions or streaks 22 are shown in the ice 12 and beverage 4. These coloured formations are formed by the release of non-toxic, edible, colouring materials or dyes into the beverage 4. The colouring material or dye, which stands out visually from the ice and beverage, may be injected into the beverage, or may be introduced into
15 the beverage by or on the aforesaid implement, or means may be provided to automatically release the colouring material or dye when the closure 6 (Figure 1) is removed.

In Figure 9, an opened drinks can 24 is shown having a transparent wall panel or window 26 through which the formation of ice slug 12 in the
20 beverage 4 can be observed and its changing nature visually appreciated.

The containers 2,24 can be formed of, or have external surface areas formed of, material (for example thermo-chromic material), which
25 automatically changes colour with temperature change. Apart from this being a further interesting visual effect, the attainment of one particular colour may signal that the container is cooled sufficiently whilst the attainment of another particular colour may signify that the beverage is at a suitable temperature for drinking.

Whilst any kind of beverage having a water and dissolved gas content may be used, we believe that lager and alcoholic flavoured beverages or alco-pops demonstrate the nature of the invention well.

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CLAIMS

1. A beverage comprising a water content and a dissolved gas content, wherein prior to being drunk said beverage is cooled to a temperature
5 below the freezing point of water at atmospheric pressure and delivered in a container to be drunk exposed to ambient atmospheric pressure, and wherein in said container aforesaid gas bubbles out of the beverage and at least a portion of said water content becomes ice.
- 10 2. A beverage comprising a water content and a dissolved gas content, wherein said beverage is to be stored in a sealed container and cooled by chilling means to a temperature below the freezing point of the water at ambient atmospheric pressure, and wherein when the container is opened
15 to expose the beverage the said atmospheric pressure, aforesaid dissolved gas bubbles out of the beverage and at least a portion of said water content becomes ice.
3. A beverage as claimed in Claim 1 or Claim 2 in a said container.
- 20 4. A beverage for providing a visual display in a container in which it is served, said beverage comprising a water content and a dissolved gas content, wherein said beverage is in a sealed said container in which it is stored and cooled by chilling means to a temperature below the freezing
25 point of water at ambient atmospheric pressure and wherein when the container is opened to expose the beverage to said atmospheric pressure aforesaid gas bubbles out of the beverage and said visual display occurs provided at least by at least a portion of said water content becoming ice.
5. A beverage as claimed in Claim 3 or Claim 4, in which the
30 container is shaped to promote formation of said ice.

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6. A beverage as claimed in any one of Claims 3 to 5, in which the container has an internal surface arranged to provide nucleation sites to promote formation of said ice.

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7. A beverage as claimed in Claim 6, in which said surface has at least a surface portion which is roughened.

8. A beverage as claimed in any one of claims 3 to 7, in which said
10 container has at least a wall portion arranged to change colour automatically with variation in temperature.

9. A beverage as claimed in claim 8, in which said wall portion comprises thermo-chromic material.

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10. A beverage as claimed in any one of claims 3 to 9, in which the container has a wall portion of sufficient transparency to allow the beverage and/or ice inside to the container to be seen.

20 11. A beverage as claimed in any one of claims 3 to 10, in which the container is a bottle.

12. A beverage as claimed in any one of claims 3 to 11, in which the container is a glass container.

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13. A beverage as claimed in any one of claims 3 to 11, in which the container is a can.

14. A beverage as claimed in any preceding claim, in which the
30 beverage is alcoholic.

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15. A beverage as claimed in claim 14, in which the beverage is a lager, a beer, a porter, a stout, a cider, or a flavoured alcoholic beverage or alco-pop.

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16. A beverage as claimed in any one of Claims 1 to 13, in which the beverage is non-alcoholic.

17. A beverage as claimed in any one of Claims 1 to 16, in which the
10 gas is a non-oxidising gas.

18. A beverage as claimed in Claim 17, in which the gas comprises carbon dioxide and/or nitrogen.

15 19. A beverage as claimed in Claim 3 or claim 4 and in any one of Claims 5 to 18 in said container and exposed to ambient atmospheric pressure, in which the formed ice includes therein one or more streaks or regions of one or more colours which contrast(s) with the colour of the ice and/or beverage.

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20. A method of serving a beverage which comprises a water content and a dissolved gas content, said method comprising providing said beverage in a sealed container, cooling the beverage in the container to a temperature below the freezing point of the water at ambient atmospheric
25 pressure, ceasing to cool the beverage, opening the container to expose the beverage to the ambient atmospheric pressure, and wherein aforesaid gas bubbles out of the exposed beverage and at least a portion of said water becoming ice.

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21. A method of providing a visual display or effect within a container having at least a portion of wall of some transparency, said method comprising introducing into the container a beverage having a water content and a dissolved gas content, sealing the container, cooling the
5 beverage in the container to a temperature below the freezing point of the water at ambient atmospheric pressure, and opening the container to expose the beverage to the ambient atmospheric pressure so that there develops in the beverage a visual display or effect comprising aforesaid gas bubbling out of the beverage and formation of ice due to at least a
10 portion of said water becoming ice.
22. A method as claimed in Claim 20 or Claim 21, in which formation of ice develops subsequent to opening of the container so as to increase the amount and extent of the ice from substantially an upper level of the
15 beverage downwards through the beverage.
23. A method as claimed in any one of Claims 20 to 22, in which the container is a bottle.
- 20 24. A method as claimed in any one of Claims 20 to 23, in which the container is formed of glass.
- 25 25. A method as claimed in any one of claims 20 to 22, in which the container is a can.
26. A method as claimed in claim 20 or in any one of claims 22 to 24 when appended to Claim 20, in which said container has a wall portion of some transparency.

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27. A method as claimed in any one of claims 20 to 26, in which the container has at least a wall portion which changes colour with variation in temperature.
- 5 28. A method as claimed in claim 27, in which said wall portion comprises thermo-chromic material.
29. A method as claimed in any one of claims 20 to 28, in which the container has a shape or formation to encourage the forming of the ice.
- 10 30. A method as claimed in any one of Claims 20 to 29, in which the container has one or more internal formations to encourage the forming of the ice.
- 15 31. A method as claimed in Claim 30, in which at least a portion of an internal wall of the container has a roughened texture.
32. A method as claimed in any one of claims 20 to 31, in which the container is adapted to encourage formation of further ice in the beverage
- 20 below an upper layer of forming ice, and said further ice rising to join said upper layer.
33. A method as claimed in any one of claims 20 to 32, in which an implement is inserted into the beverage in the open container to encourage
- 25 formation of said ice.
34. A method as claimed in Claim 33, in which said implement is a thermometer.

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35. A method as claimed in claim 33, in which said implement is a swizzle-stick.

36. A method as claimed in any one of Claims 20 to 35, in which
5 colouring material or dye is provided to form at least one coloured streak or region in the beverage and/or ice, the colour of said material or dye being in contrast to that of the ice and/or beverage so as to be visible.

37. A method as claimed in Claim 36 when appended to any one of
10 claims 33 to 35, in which said implement is used to add the colouring material or dye to the beverage and/or ice.

38. A method as claimed in Claim 36, in which the colouring material or dye is automatically released in consequence to the container being
15 opened.

39. A method as claimed in any one of Claims 20 to 38, in which the sealed container is placed in a tank of cooling liquid to cool the beverage.

20 40. A method as claimed in any one of Claims 20 to 39, in which the gas is a non-oxidising gas.

41. A method as claimed in Claim 40, in which the gas comprises carbon dioxide and/or nitrogen.

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42. A method as claimed in any one of Claims 20 to 41, in which the beverage is alcoholic.

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43. A method as claimed in Claim 42, in which the beverage is a lager, a beer, a porter, a stout, a cider, or a flavoured alcoholic beverage or alco-pop.
- 5 44. A method as claimed in any one of Claims 20 to 41, in which the beverage is non-alcoholic.
45. A method as claimed in any one of Claims 20 to 44, in which the beverage in the sealed container is cooled to substantially -8°C .
- 10 46. A method as claimed in any one of Claims 20 to 44, in which the beverage in the opened container is raised to a temperature of at least -4°C after cooling ceases.
- 15 47. A beverage as claimed in any one of Claims 1 to 19 or a method as claimed in any one of Claims 20 to 46, in which said ice comprises slush.
- 20 48. A beverage substantially as hereinbefore described with reference to Figures 1 to 5, or Figure 6, or Figure 7, or Figure 8, or Figure 9 of the accompanying drawings.
- 25 49. A method of serving a beverage substantially as hereinbefore described with reference to Figures 1 to 5, or Figure 6, or Figure 7, or Figure 8, or Figure 9 of the accompanying drawings.
- 30 50. A method of providing a visual display or effect within a container having at least a portion of wall of some transparency substantially as hereinbefore described with reference to Figures 1 to 5, or Figure 6, or Figure 7, or Figure 8, or Figure 9 of the accompanying drawings.

