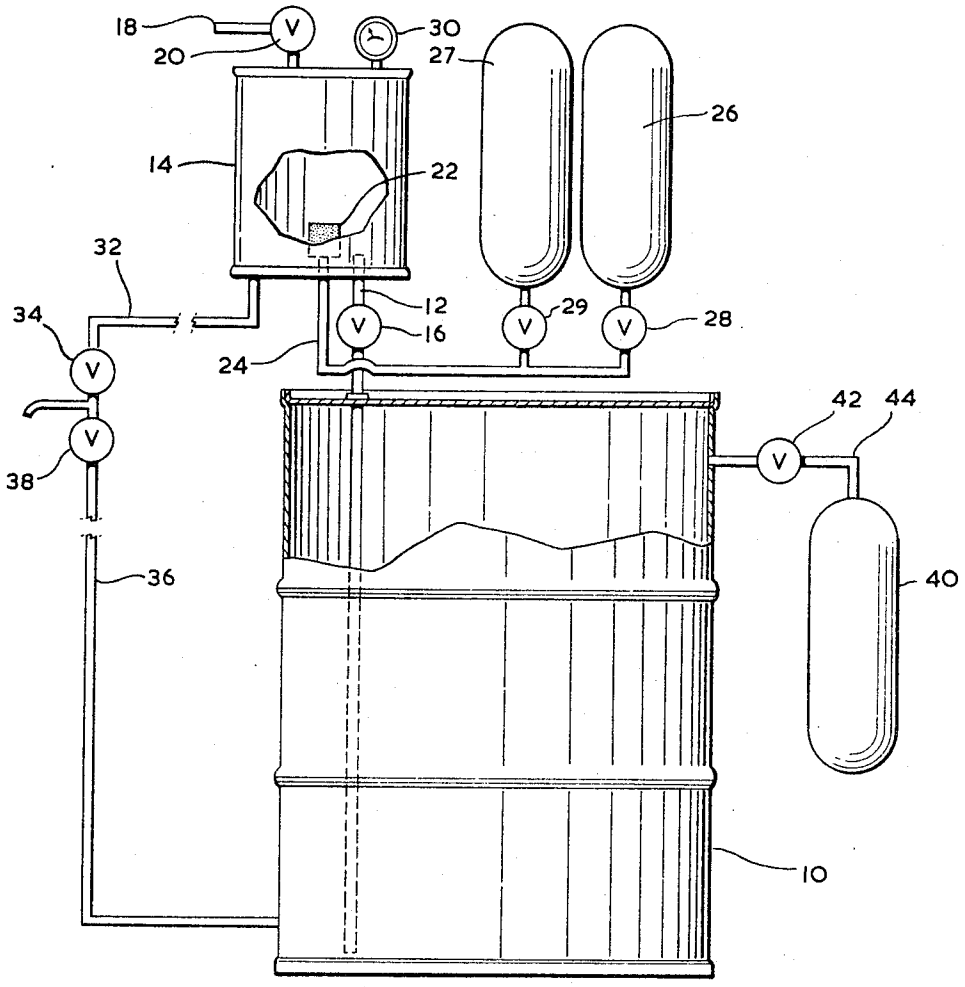
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METHOD AND APPARATUS FOR DISPENSING FERMENTED BEVERAGES

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METHOD AND APPARATUS FOR DISPENSING FERMENTED BEVERAGES

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This invention relates to a method and apparatus for dispensing fermented beverages such as stout, lager and ale with a head or fob of predetermined characteristics.

Draught stout, for example, is traditionally served with a cream-like head or fob of about ¾ inch in depth, and with the body of the drink below the head quite flat or non-carbonated.

The head consists essentially of bubbles of CO_2, and possibly other gases, which should be of fine and uniform size. The bubbles should also be stable in the sense that they will not merge with each other or collapse on standing.

The common method of dispensing, say stout, with its creamy head is to draw from two storage kegs, one of which contains a highly conditioned stout with a high degree of carbonation (a pressure of 35–40 p.s.i.g. at 60° F.) and the other of which contains a relatively flat or low carbonated stout. The highly conditioned stout is drawn first into the glass to produce a fob. After the fob is drawn, the glass is filled with low carbonated stout to give a drink of desired characteristics.

The system has a number of shortcomings. Two storage kegs are necessary and the requisite space must be provided in the dispensing area. Considerable skill on the part of the bartender is necesary to achieve a good and consistent result without overspill. Further, as the keg with the highly conditioned stout becomes emptied, the gas content of the remainder changes with the result that the dispensed drink is not of consistent quality.

Effort has been expended to improve the quality of the dispensed drink over the past few years and it has been discovered that a more stable fob can be achieved if an admixture of an oxygen-free inert low solubility gas and CO_2 are added to the beverage. The use of the low solubility gas and the relatively high solubility CO_2 produces a foam that collapses at a much slower rate than a foam produced from CO_2 alone.

Thus it is known to dispense the highly conditioned stout from a partially filled keg in which the space above the stout is filled with a compressed mixture of an oxygen-free, inert, slightly soluble gas such as nitrogen and CO_2. The admixed gases together with the CO_2 already in the stout from fermentation provide in solution a mixture of CO_2 and inert gases in such proportions that, when subjected to a sudden, controlled pressure drop a stable dense foam results.

With this dispensing method, where the admixed fob producing gases are stored in a common storage keg with the stout, it is necessary that the relatively insoluble gas be oxygen-free because the reaction of oxygen with various components of stout over the normal keg storage time can produce disagreeable flavours, odours and appearance.

The system, while it improves the stability of the fob, still requires the use of two storage kegs at the point of dispensing, one for the highly conditioned stout and the other for the flat stout.

An effort to avoid the double storage keg at the point of dispensing has resulted in the development of means for de-gassing a highly conditioned stout in a decompression chamber to provide a flat main portion of a drink and a means drawing a quantity of the highly conditioned stout from the same vessel to form a fob over the flat portion.

The latter system requires complex equipment that is very difficult to clean. It also uses unnecessarily large quantities of gas.

The present invention relates to apparatus and to a method for dispensing stout that overcome these shortcomings of the prior art. A dispensing device according to this invention for dispensing a beverage from a storage keg with a fob on the top thereof comprises a conditioning chamber, a vent from said conditioning chamber adjacent the top thereof, means for opening and closing said vent, beverage admitting means for admitting beverage to said chamber from a storage keg, gas admitting means for admitting gas to beverage in said conditioning chamber in the form of fine bubbles, and a dispensing valve through which liquid under pressure in said chamber can be dispensed, said dispensing valve being adapted to achieve a controlled pressure drop as beverage is dispensed therethrough to achieve a stable fob in use.

The method of the invention comprises the steps of storing a quantity of relatively flat beverage to be dispensed in a storage vessel, drawing a quantity of said beverage required for immediate use into a relatively small conditioning vessel with a small air space at the top, closing said conditioning vessel to the atmosphere and injecting a fob forming gas into said beverage in the form of fine bubbles until a predetermined pressure is reached, drawing a predetermined amount of beverage from said conditioning vessel and controlling the pressure drop in said drawing operation by means of a dispensing value to produce a fob, and drawing a predetermined amount of beverage from said storage vessel and adding it to said beverage drawn from said conditioning vessel to constitute a drink.

The invention will be understood after reference to the following detailed specification read in conjunction with the drawings.

In the drawings:

The single drawing figure is a schematic illustration of apparatus according to the invention.

Referring to the drawings the numeral **10** refers to storage keg for storing a large quantity of relatively flat beverage such as stout. It connects through flow pipe **12** with the bottom of a relatively small conditioning vessel **14** having a capacity for immediate use. A capacity of one-half to one gallon is a practical size for the conditioning vessel **14**. A check valve **16** which permits flow only from the storage keg **10** to the conditioning vessel **14** is installed in the flow pipe **10** preferably close to the conditioning vessel. Conditioning vessel **14** has a vent **18** with a valve **20** that can be opened or closed.

A porous head **22** is mounted adjacent the bottom of the conditioning vessel **14** and connects through conduit **24** to pressurized supplies of conditioning gas **26** and **27**. Valves **28** and **29** turn the supply of conditioning gas on or off for the supplies **26** and **27** respectively.

The porous gassing head is of known general design and can be made of sintered bronze, monel, stainless steel or like materials. A small pore size in the range of .25 micron to .5 micron is desirable to admit the gas in use in the form of small bubbles. However, a pore size of up to say 25 microns is workable.

The numeral **30** refers to a pressure gauge for the conditioning vessel **14**.

A beverage fob dispensing conduit **32** extends from the bottom of the conditioning vessel **14** and has a fob dispensing valve **34** therein that can be manually controlled.

A conduit **36** from the storage keg has a beverage body dispensing valve **38** therein.

A supply **40** of CO_2 or the like gas connects with the storage keg **10** through a pressure regulator **42** in conduit **44** to maintain the beverage in the storage keg under low pressure of about 10 p.s.i.g. which is adapted to move it to the conditioning vessel **14** as required in use. Alternatively, the storage keg could be located above the conditioning vessel in which case flow to the conditioning vessel would be by gravity and no gas supply like the one **40** would be necessary.

In use when one wants to dispense a drink from the storage keg **10**, one first opens the valve **20** in vent **18** to open the conditioning vessel **14** to the atmosphere. This permits the entry of beverage to the conditioning vessel **14** from the keg **10** through the check valve **16** in the supply pipe **12**. It will be recalled that the storage keg **10** is under pressure of the gas supply **40** which is adapted to drive beverage from the keg to the conditioning vessel when the pressure in the conditioning vessel is about atmospheric. The gas of gas supply **40** can be CO_2 or an inert gas that does not affect the quality of the beverage stored. When the beverage level in the conditioning vessel is about one inch from the top, valve **18** is closed. As pressure builds up in the conditioning vessel the flow to it from the keg will cease. After closing of the valve **18**, valve **28** on the supply of conditioning gas **26** is opened to permit conditioning gas to enter the beverage through the porous head **22**. The porosity of the head is such that the gas enters in the form of fine bubbles as discussed above. The gas supply **26** is carbon dioxide and the preferred practice is to admit carbon dioxide to the conditioning vessel **14** until the pressure therein reaches about 60 p.s.i.g. Following that, valve **28** is closed and additional gas is admitted to the conditioning vessel through the head **22** from the gas supply **27** by opening valve **29**. Gas supply **27** is an inert gas. The more expensive inert gases, such as nitrogen, can be used but with this invention where the size of the conditioning vessel is such that its contents are dispensed very shortly after they are admitted thereto, an inert gas such as compressed air is quite satisfactory. It achieves the desirable fob characteristics noted in the preamble to this specification and is very much cheaper. As indicated, it is not harmful to the beverage because it is not stored with the beverage for any appreciable amount of time.

Valve **29** is closed when the pressure in the conditioning vessel is increased to about 95 p.s.i.g.

To dispense a beverage from the conditioning vessel **14**, one first opens the valve **34** to draw a quantity of conditioned stout to make a fob in a container. When sufficient fob beverage has been drawn, valve **34** is closed and valve **38** is opened to draw the body of the drink from the relatively flat storage keg **10**.

Modifications of the invention, other than the one specifically described herein, will be apparent to those skilled in the art. The preferred pressures in the conditioning vessel **14** are, for example, capable of considerable variation. In addition, alternative ways other than the pressurized supply **40** are possible for admitting beverage to the conditioning vessel **14**. The essence of the invention is the provision of a small conditioning vessel for attachment to a storage keg and having a conditioning means associated therewith for conditioning the fob forming material just prior to making a drink and the generally described method of using it. The fob forming gas and/or the way of introducing it into the fob forming material is variable within the scope of the invention.

For example, the inert gas can be admixed to the relatively flat beverage in the storage keg **10**, with the result that inert gas supply **27** would not be necessary. Further, as indicated above, the specific inert gas used can be varied.

The period of time necessary to condition the fob producing material is also a somewhat variable thing and is a function of the gas pressure, the depth of beverage in the conditioning vessel and the original gas content of the stout. However, with the pressure ranges indicated, conditioning can be done as fast as is required for immediate use. Likewise, the needle valve adjustment at the fob producing tap can be varied, as is known in the art.

Further, in some cases, it will be desirable to increase the pressure in the dispensing vessel as it is emptied in use to insure a good discharge pressure.

What I claim as my invention is:

1. A device for dispensing a beverage with a fob on the top of a beverage comprising a conditioning chamber having a capacity adapted for immediate use, a vent from said conditioning chamber adjacent the top thereof, means for opening and closing said vent, a storage keg, beverage admitting means for admitting beverage to said chamber from said storage keg, gas admitting means adjacent the bottom of said chamber for admitting gas to beverage in said conditioning chamber in the form of fine bubbles, a dispensing valve through which beverage under pressure in said chamber can be dispensed, said dispensing valve serving to control the pressure drop in said chamber as beverage is dispensed therethrough to achieve a stable fob and a dispensing valve through which beverage in said storage keg can be dispensed.

2. A device for dispensing a beverage with a fob on the top thereof as claimed in claim **1** in which said gas admitting means includes a porous head, the porosity of said head being adapted to introduce gas to beverage in the form of fine bubbles as aforesaid.

3. A method of dispensing a beverage with a fob on the top thereof comprising the steps of storing a quantity of relatively flat beverage to be dispensed in a storage vessel, drawing a quantity of said beverage required for immediate use into a relatively small conditioning vessel with a small air space at the top, closing said conditioning vessel to the atmosphere and injecting a fob forming gas into said beverage in the form of fine bubbles until a predetermined pressure is reached, drawing a predetermined amount of beverage from said conditioning vessel and controlling the pressure drop in the drawing operation to produce a fob, and drawing a predetermined amount of beverage from said storage vessel and adding it to said beverage drawn from said conditioning vessel to constitute a drink.

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