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(54) Title: APPARATUS FOR COOLING BEVERAGES

(57) Abstract: The present invention provides an apparatus for cooling a beverage package. The apparatus comprises a cooling unit having a cooling chamber for accommodating the beverage package, and a cooling medium circuit, for cooling the cooling chamber. It further comprises a cooler, located at a position remote from the cooling unit, for cooling a cooling medium, and a python having one or more cooling lines. The cooling lines are connected between the cooler and the cooling medium circuit for delivering cooling medium from the cooler to the cooling medium circuit.
The present invention relates to apparatus for cooling beverages.

Draft beverages, including beers, lagers and ciders, are typically dispensed from beverage packages such as large kegs or barrels (typically 20 l (litres) to 100 l in volume). By "draft beverages" is meant beverages which are stored at a point remote from the point of dispense and transferred on demand to the point of dispense through a beverage line.

It is common in public or licensed houses and bars for draft beverages to be stored in a cellar or a storage room and transferred to the bar area where dispense occurs at a font. To maintain the beverage at a cold temperature prior to dispense, it is known to provide a remote cooler in or near the cellar/storage room to cool the beverage and then to transport the beverage to the dispense site (i.e. bar area) via a relatively long beverage delivery line. The remote cooler typically comprises an ice bank and a water bath, the water in the water bath being cooled by the ice bank. The beverage delivery line is arranged to extend from the beverage package through the water bath of the cooler, whereupon beverage travelling through the delivery line is cooled. The delivery line continues from the cooler to the dispense site, commonly through an insulated and cooled conduit known as a "python". The python carries a cooling circuit through which cooling medium such as water and/or glycol is circulated to maintain the beverage travelling through it at a cold temperature.
In the arrangement described above, the beverage line may need to be relatively long to reach from the cellar or storage room to the bar area. A number of problems are associated with using a long beverage delivery line. Firstly, a complicated urging means may be required to move the beverage through the line. Furthermore, the beverage delivery line can be difficult and expensive to clean before and after use. Still furthermore, before cleaning, the line will have to be drained of any contents (this can typically be between 0.5 l and 2 l of beverage), which may lead to considerable wastage of beverage.

There is a trend for draft beverages to be distributed in smaller beverage packages. This can have numerous advantages, for example allowing smaller licensed houses to dispense the entire contents of a beverage package within a given broached life, i.e. 'time on dispense', and therefore maintain quality standards. Amongst other advantages, smaller beverage packages can ease the introduction of new beverages, and they are particularly suitable for beverages that are normally sold in lower volumes such as 'guest' or 'speciality' beers, ciders, still or sparkling wines and still or sparkling soft drinks, etc.. However, in view of the problems discussed above, the potential cost, time and wastage of beverage associated with using a long beverage delivery line is not commercially justifiable in some circumstances. Furthermore, it is not possible to use a gas pressurised delivery system with some small beverage packages in order to urge the beverage along the beverage line.

One solution to alleviate the problems associated with the length of beverage delivery lines is to dispense directly from the smaller beverage packages by locating them within a self-contained dispense unit at the dispense site. To dispense the beverages at low temperatures, a cooler is integrated with the dispense unit. However, the cooler can increase considerably the size of the dispense unit, taking up potentially valuable space at the dispense site. Furthermore, the cooler can output a considerable amount of heat, which can result in unpleasant conditions at the dispense site.
At its most general, the present invention provides apparatus for cooling a beverage package, comprising a unit having a cooling chamber for accommodating and cooling the beverage package, the cooling chamber being arranged such that it can be cooled by a cooling medium supplied from a cooler remote from the unit. Accordingly, the problems associated with a long beverage delivery line and/or a cooler integrated with the unit may be reduced or eliminated.

According to a first aspect, the present invention provides an apparatus for cooling a beverage package comprising:

- a cooling unit having:
  - a cooling chamber for accommodating a beverage package, and
  - a cooling medium circuit, for cooling the cooling chamber;
  - a cooler, located at a position remote from the cooling unit, for cooling a cooling medium, and
  - a python having one or more cooling lines, the cooling lines being connected between the cooler and the cooling medium circuit for delivering cooling medium from the cooler to the cooling medium circuit.

According to a second aspect, the present invention provides a cooling unit, for use in the apparatus of the first aspect of the present invention, the cooling unit having:

- a cooling chamber for accommodating a beverage package, and
- a cooling medium circuit, for cooling the cooling chamber;
- the cooling unit being connectable to one or more cooling lines of the python for delivering cooling medium from the remote cooler to the cooling medium circuit.

By locating the cooler at a position remote from the cooling unit (e.g. in a cellar), less space may be taken up at the location of the cooling unit (e.g. a beverage dispense site), than if the cooler were integrated with the cooling unit. Additionally, since the cooler may emit considerable heat in order to cool the cooling medium, locating the cooler remotely from the cooling unit can reduce heat output at the beverage dispense site. This may make conditions more comfortable for staff working at the dispense site.
Furthermore, the spacing of the cooling unit and remote cooler allows the cooling unit to be placed much closer to the point of beverage dispense thus reducing the need for a long beverage delivery line between a beverage package located in the cooling chamber and the point of dispense. Therefore, a potentially complicated urging means to move the beverage through a long beverage delivery line and cleaning of a long beverage delivery line, which can be difficult, expensive and wasteful, may not be necessary. Furthermore, the reduction in the length of the beverage delivery line and the fact that the beverage delivery line is thermally isolated from other beverage delivery lines improves the control of the temperature of the beverage at the point of dispense.

To allow the cooler to be positioned remotely from the cooling unit, a python is used to connect the cooler and the cooling medium circuit of the cooling unit. As discussed previously, a python is a cooled, insulated conduit comprising one or more cooling lines for carrying cooling medium from the remote cooler (housed, for example, in a cellar) to a beverage dispense site. A python typically also carries one or more beverage lines running coaxially with the cooling lines for carrying beverage from the cellar to the beverage dispense site. However, in the present invention, since the cooling unit is remote from the cooler it can be located close to the point of dispense (e.g. at, on or under a bar) so it is not necessary for the python to supply beverage to the dispense site via its beverage delivery lines; only the cooling medium is delivered to the dispense site (bar) via the python. Since the presence of a python may be a pre-existing feature at the dispense site, there may be reduced time and cost associated with the manufacture and installation of the apparatus of the present invention. Also, energy usage may be reduced if a cooler is already connected to the python for supplying cooling medium to traditional dispense fonts etc., and therefore no additional cooler is required.

Preferably the apparatus is arranged such that cooling medium is delivered to the cooling medium circuit via the python, whereupon it travels through the circuit, and is then discharged from the circuit and delivered back to the cooler via cooling return lines in the python. The
cooling medium is preferably a liquid such as water and/or glycol. The cooling circuit may comprise a tube or pipe through which the cooling medium can travel, which tube or pipe may be wound round the cooling chamber. Preferably an insulating material is provided on the outside of the cooling circuit. Most preferably, the insulating material is an aerogel as this provides significant thermal insulation with a minimal thickness such that the dimensions of the cooling unit can be minimised.

The cooler may be located remotely from the cooling unit by being located in a different room from the cooling unit, e.g. as discussed above, the cooling unit may be located in a bar area of a public house, and the cooler may be located in the cellar or storage room of the public house. As an alternative, the cooler may be located at a position remote from the cooling unit, but within the same room. For example, the cooling unit may be located on a bar and the cooler may be located under the bar. Although this arrangement may be less effective at reducing heating at the dispense site, some heat reduction may be achieved. Preferably the cooling unit is located at a distance of at least: 0.5 m, 1 m or 3 m from the cooler. To achieve this, preferably, the python can extend to a distance of at least: 0.5 m, 1 m or 3 m respectively.

The cooler may be a flash cooler. This is considered particularly appropriate when the cooler is located in the same room as the cooling unit. In normal use, a flash cooler is arranged to receive beverage from a remote beverage source, in order to cool the beverage prior to delivering the beverage to a dispense unit. However, in accordance with the present invention, the flash cooler need only supply cooling medium to the cooling unit.

As an alternative, the cooler may be a cooler that is not capable of receiving beverage and/or it may not comprise a beverage delivery line. Accordingly, the construction of the cooler may be simplified, reducing costs. The cooler may be arranged only to provide, and be capable of providing, cooling medium to the cooling unit.
In this application, the terms "cooling", "cooled", "to cool" etc. are intended to refer not only to the reducing in temperature of something, i.e. the making of something less warm, but also to the maintaining of something at a cold temperature, e.g. a temperature that is below normal air temperature. For example, the cooling chamber is intended to cool beverage packages accommodated therein. If a beverage package is at air temperature upon being located in the cooling chamber, it is intended that the cooling chamber will reduce the temperature of the beverage package; however, if the beverage package is already at a cold temperature upon being located in the cooling chamber, the cooling chamber may serve simply to maintain the beverage package at the same cold temperature.

In some embodiments, the cooling unit is located at a dispense site and further comprises dispense means for dispensing a beverage from a beverage package housed in the cooling chamber. The dispense means may comprise a tap assembly and/or a dispense font. Herein after, the cooling unit comprising dispensing means will be called "a beverage dispense unit" or "a dispense unit".

By using a beverage dispense unit which can accommodate a beverage package (in the cooling chamber), and which is located at the beverage dispense site, a long beverage delivery line may not be required. Therefore, a potentially complicated urging means to move the beverage through a long beverage delivery line and cleaning of a long beverage delivery line, which can be difficult, expensive and cause wastage of beverage, may not be necessary. This makes the apparatus particularly, although not necessarily exclusively, appropriate for use with beverages provided in relatively small beverage packages, such as 'mini-kegs' or beverage bags. Such beverage packages may be designed to hold less than 20 l, 10 l, 8 l or even less than 5 l of beverage.

The dispense means may be mounted on a housing of the dispense unit or located remotely from the housing. A short beverage delivery line may be connected between the dispense means and the beverage package.
The cooling circuit may be arranged to cool the dispense means by extending into the dispense means, in order to cool the beverage up to the point of dispense, and/or to cause condensation to be formed on the dispense means for cosmetic purposes.

The beverage package and/or the dispense unit may comprise an urging means to dispense the beverage through the short beverage delivery line and dispense means. The urging means may comprise: a local air pump; CO\(_2\) provided in the beverage package, an external CO\(_2\) supply, or otherwise.

The cooler may be located remotely from the dispense unit by being located in a different room from the dispense unit. For example, the dispense unit may be located in a bar area of a public house, and the cooler may be located in the cellar or storage room of the public house. As an alternative, the cooler may be located at a position remote from the dispense unit, but within the same room. For example, the dispense unit may be located on a bar and the cooler may be located under the bar. Although this arrangement may be less effective at reducing heating at the dispense site, some heat reduction may be achieved. Preferably the dispense unit is located at a distance of at least: 0.5 m, 1 m or 3 m from the cooler. To achieve this, preferably, the cooling medium delivery means can extend to a distance of at least: 0.5 m, 1 m or 3 m respectively.

In a third aspect, the present invention provides an apparatus for cooling a beverage package comprising:

- a beverage dispense unit located at a beverage dispense site, the dispense unit comprising:
  - a cooling chamber for accommodating a beverage package, and
  - a cooling medium circuit, for cooling the cooling chamber;
- a cooler, located at a position remote from the beverage dispense unit, for cooling a cooling medium, and
a python having one or more cooling lines, the cooling lines being connected between
the cooler and the cooling medium circuit for delivering cooling medium from the cooler to the
cooling medium circuit.

In a fourth aspect, the present invention provides a beverage dispense unit for use in the
apparatus of the third aspect of the present invention, the dispense unit comprising:

a cooling chamber for accommodating a beverage package; and

a cooling medium circuit, for cooling the cooling chamber,

the cooling medium circuit being connectable to one or more cooling lines of the python for
delivering cooling medium from the remote cooler to the cooling medium circuit.

By using a beverage dispense unit which can accommodate a beverage package, and which
is located at the beverage dispense site, a long beverage delivery line may not be required.
Therefore, a potentially complicated urging means to move the beverage through a long
beverage delivery line and cleaning of a long beverage delivery line, which can be difficult,
expensive and cause wastage of beverage, may not be necessary. This makes the
apparatus particularly, although not necessarily exclusively, appropriate for use with
beverages provided in relatively small beverage packages, such as 'mini-kegs' or beverage
bags. Such beverage packages may be designed to hold less than 20 l, 10 l, 8 l or even less
than 5 l of beverage.

Furthermore, by locating the cooler at a position remote from dispense unit, less space may
be taken up by the dispense unit at the dispense site, than if the cooler were integrated with
the dispense unit. Additionally, since the cooler may emit considerable heat in order to cool
the cooling medium, locating the cooler remotely to the dispense unit can reduce heating at
the dispense site. This may make conditions more comfortable for operators of the dispense
unit, e.g., bar staff.

Preferably the apparatus is arranged such that cooling medium is delivered to the cooling
medium circuit via the python, whereupon it travels through the circuit, and is then discharged
from the circuit and delivered back to the cooler via the python. The cooling medium is
preferably a liquid such as water or glycol. The dispense unit may comprise a dispense
means such as a tap assembly and/or dispense font to dispense beverage from the beverage
package. The dispense means may be mounted on a housing of the dispense unit or located
remotely from the housing. A short beverage delivery line may be connected between the
dispense means and the beverage package. The cooling circuit may comprise a tube or pipe
through which the cooling medium can travel, which tube or pipe may be wound round the
tooling chamber. Preferably an insulating material is provided on the outside of the cooling
circuit. Most preferably, the insulating material is an aerogel as this provides significant
thermal insulation with a minimal thickness such that the dimensions of the cooling unit can
be minimised. The cooling circuit may be arranged to cool the dispense means by extending
into the dispense means, in order to cool the beverage up to the point of dispense, and/or to
cause condensation to be formed on the dispense means for cosmetic purposes.

A python comprises one or more beverage delivery lines, running parallel with one or more
cooling lines. However, since the dispense unit is intended to accommodate a beverage
package, it is not necessary for the python to supply beverage to the dispense unit from an
external source via its beverage delivery lines; the cooling medium only is delivered to the
dispense unit via the python. In accordance with the discussions above, using the python in
this manner obviates a potentially complex and expensive pressurising arrangement
associated with the beverage package, which would otherwise be required to transport
beverage through a long beverage delivery line of the python to the dispense unit, and
eliminates any time, cost and beverage wastage associated with cleaning the beverage
delivery line. Furthermore, it enables the cooler to be located remotely from the dispense
unit, freeing up space and reducing heat output at the dispense site. Since the presence of a
python may be a pre-existing feature at the dispense site, there may be reduced time and
cost associated with the manufacture and installation of the apparatus of the present
invention. Also, energy usage may be reduced if a cooler is already connected to the python
for supplying cooling medium to traditional dispense fonts etc., and no additional cooler is
therefore required.
The beverage package and/or the dispense unit may comprise an urging means to dispense the beverage through the short beverage delivery line and dispense means. The urging means may comprise: a local air pump; CO₂ provided in the beverage package, an external CO₂ supply, or otherwise.

The cooler may be located remotely from the dispense unit by being located in a different room from the dispense unit. For example, the dispense unit may be located in a bar area of a public house, and the cooler may be located in the cellar or storage room of the public house. As an alternative, the cooler may be located at a position remote from the dispense unit, but within the same room. For example, the dispense unit may be located on a bar and the cooler may be located under the bar. Although this arrangement may be less effective at reducing heating at the dispense site, some heat reduction may be achieved. Preferably the dispense unit is located at a distance of at least: 0.5 m, 1 m or 3 m from the cooler. To achieve this, preferably, the cooling medium delivery means can extend to a distance of at least: 0.5 m, 1 m or 3 m respectively.

The cooler may be a flash cooler. This is considered particularly appropriate when the cooler is located in the same room as the dispense unit. In normal use, a flash cooler is arranged to receive beverage from a remote beverage source, in order to cool the beverage prior to delivering the beverage to a dispense unit. However, in accordance with the present invention, the flash cooler need only supply cooling medium to the beverage unit.

As an alternative, the cooler may be a cooler that is not capable of receiving beverage and/or it may not comprise a beverage delivery line. Accordingly, the construction of the cooler may be simplified, reducing costs. The cooler may be arranged only to provide, and be capable of providing, cooling medium to the dispense unit.

The cooling unit of the second aspect of the present invention may be used as a general purpose refrigerator, e.g. in a bar area. However, preferably, the cooling unit is used to pre-
cool one or more beverage packages, prior to placing the beverage packages in a dispense unit configured as the dispense unit described above. As an alternative, the cooling unit of the second aspect may provide a means for pre-cooling beverage packages that are dispensed in a conventional manner, e.g., via the beverage line of a python. The cooling chamber may be sized to accommodate a plurality of beverage packages. Beverage packages may include mini-kegs, beverage containing bags, bottles, cans or otherwise.

The apparatus/cooling unit of the first/second aspects of the present invention may be used in conjunction with the apparatus/dispense unit of the third/fourth aspects of the invention, in which case the cooling unit and dispense unit may be connected to the cooling lines of the same python, in parallel or in series.

According to a fifth aspect, the present invention provides apparatus for cooling a beverage package comprising:

a beverage dispense unit located at a beverage dispense site, the dispense unit comprising:

a cooling chamber for accommodating a beverage package, and

a cooling medium circuit, for cooling the cooling chamber;

a cooler, located at a position remote from the beverage dispense unit, for cooling a cooling medium, and

a cooling medium delivery means connected between the cooler and the cooling medium circuit to deliver cooling medium from the cooler to the cooling medium circuit.

According to a sixth aspect, the present invention provides a beverage dispense unit for use in the apparatus of the first aspect of the present invention, the dispense unit comprising:

a cooling chamber for accommodating a beverage package; and

a cooling medium circuit, for cooling the cooling chamber,

the cooling medium circuit being connectable to a cooling medium delivery means for delivering cooling medium from a remote cooler to the cooling medium circuit.
By using a beverage dispense unit which can accommodate a beverage package, and which is located at the beverage dispense site, a long beverage delivery line may not be required. Therefore, a potentially complicated urging means to move the beverage through a long beverage delivery line and cleaning of a long beverage delivery line, which can be difficult, expensive and cause wastage of beverage, may not be necessary. This makes the apparatus particularly, although not necessarily exclusively, appropriate for use with beverages provided in relatively small beverage packages, such as 'mini-kegs' or beverage bags. Such beverage packages may be designed to hold less than 20 l, 10 l, 8 l or even less than 5 l of beverage.

Furthermore, by locating the cooler at a position remote from dispense unit, less space may be taken up by the dispense unit at the dispense site, than if the cooler were integrated with the dispense unit. Additionally, since the cooler may emit considerable heat in order to cool the cooling medium, locating the cooler remotely to the dispense unit can reduce heating at the dispense site. This may make conditions more comfortable for operators of the dispense unit, e.g., bar staff.

In this application, the terms "cooling", "cooled", "to cool" etc. are intended to refer not only to the reducing in temperature of something, i.e. the making of something less warm, but also to the maintaining of something at a cold temperature, e.g. a temperature that is below normal air temperature. For example, the cooling chamber is intended to cool beverage packages accommodated therein. If a beverage package is at air temperature upon being located in the cooling chamber, it is intended that the cooling chamber will reduce the temperature of the beverage package; however, if the beverage package is already at a cold temperature upon being located in the cooling chamber, the cooling chamber may serve simply to maintain the beverage package at the same cold temperature.

Preferably the apparatus is arranged such that cooling medium is delivered to the cooling medium circuit via the cooling medium delivery means, whereupon it travels through the
circuit, and is then discharged from the circuit and delivered back to the cooler via the delivery means. The cooling medium is preferably a liquid such as water or glycol. The dispense unit may comprise a dispense means such as a tap assembly and/or dispense font to dispense beverage from the beverage package. The dispense means may be mounted on a housing of the dispense unit or located remotely from the housing. A short beverage delivery line may be connected between the dispense means and the beverage package. The cooling circuit may comprise a tube or pipe through which the cooling medium can travel, which tube or pipe may be wound round the cooling chamber. Preferably an insulating material is provided on the outside of the cooling circuit. Most preferably, the insulating material is an aerogel as this provides significant thermal insulation with a minimal thickness such that the dimensions of the cooling unit can be minimised. The cooling circuit may be arranged to cool the dispense means by extending into the dispense means, in order to cool the beverage up to the point of dispense, and/or to cause condensation to be formed on the dispense means for cosmetic purposes.

The delivery means may comprise one or more cooling lines, e.g. tubes or pipes, for delivering the cooling medium. Preferably, the delivery means is a python. A python comprises one or more beverage delivery lines, running parallel with one or more cooling lines. However, since the dispense unit is intended to accommodate a beverage package, it is not necessary for the python to supply beverage to the dispense unit from an external source via its beverage delivery lines; the cooling medium only is delivered to the dispense unit via the python. In accordance with the discussions above, using the python in this manner obviates a potentially complex and expensive pressurising arrangement associated with the beverage package, which would otherwise be required to transport beverage through a long beverage delivery line of the python to the dispense unit, and eliminates any time, cost and beverage wastage associated with cleaning the beverage delivery line. Furthermore, it enables the cooler to be located remotely from the dispense unit, freeing up space and reducing heat output at the dispense site. Since the presence of a python may be a pre-existing feature at the dispense site, there may be reduced time and cost associated with the manufacture and installation of the apparatus of the present invention. Also, energy usage
may be reduced if a cooler is already connected to the python for supplying cooling medium to traditional dispense fonts etc., and no additional cooler is therefore required.

The beverage package and/or the dispense unit may comprise an urging means to dispense the beverage through the short beverage delivery line and dispense means. The urging means may comprise: a local air pump; CO₂ provided in the beverage package, an external CO₂ supply, or otherwise.

The cooler may be located remotely from the dispense unit by being located in a different room from the dispense unit. For example, the dispense unit may be located in a bar area of a public house, and the cooler may be located in the cellar or storage room of the public house. As an alternative, the cooler may be located at a position remote from the dispense unit, but within the same room. For example, the dispense unit may be located on a bar and the cooler may be located under the bar. Although this arrangement may be less effective at reducing heating at the dispense site, some heat reduction may be achieved. Preferably the dispense unit is located at a distance of at least: 0.5 m, 1 m or 3m from the cooler. To achieve this, preferably, the cooling medium delivery means can extend to a distance of at least: 0.5 m, 1 m or 3 m respectively.

The cooler may be a flash cooler. This is considered particularly appropriate when the cooler is located in the same room as the dispense unit. In normal use, a flash cooler is arranged to receive beverage from a remote beverage source, in order to cool the beverage prior to delivering the beverage to a dispense unit. However, in accordance with the present invention, the flash cooler need only supply cooling medium to the beverage unit.

As an alternative, the cooler may be a cooler that is not capable of receiving beverage and/or it may not comprise a beverage delivery line. Accordingly, the construction of the cooler may be simplified, reducing costs. The cooler may be arranged only to provide, and be capable of providing, cooling medium to the dispense unit.
The apparatus of one or more of the aspects of the present invention described above may be suitable for use in a variety of different places, including public houses, licensed premises, restaurants, hotels and private houses.

Examples embodying the present invention are now described with reference to the accompanying drawings, in which:

Fig. 1 shows a schematic diagram of an apparatus for cooling a beverage package according to a first embodiment of the present invention;

Fig. 2 shows an oblique view of a dispense unit and python configured in accordance with the apparatus of Fig. 1;

Fig. 3a shows a detailed view of the dispense unit of Fig. 2, and Fig. 3b shows the dispense unit of Fig. 3a with its front panel removed;

Fig. 4 shows a schematic diagram of an apparatus for cooling a beverage package according to a second embodiment of the present invention;

Fig. 5a and 5b show oblique and front views of a dispense unit, python and cooling unit configured in accordance with the apparatus of Fig. 4;

Fig. 6 shows a schematic diagram of an apparatus for cooling a beverage package according to a third embodiment of the present invention; and

Fig. 7 shows a schematic diagram of an apparatus for cooling a beverage package according to a fourth embodiment of the present invention.

Apparatus according to a first embodiment of the present invention is shown schematically in Fig. 1. The apparatus comprises a dispense unit 1 that includes a housing 10 having an outer wall 11 and an inner wall 12. The inner wall 12 surrounds a cooling chamber 13, in which a beverage package 100 is accommodated. Surrounding the inner wall 12 is a cooling coil 14, consisting of a pipe wound round an outer surface of the inner wall 12. The cooling coil 14 provides a circuit through which a cooling medium (e.g., cold water) can travel. The cooling coil 14 has an inlet 14a and an outlet 14b. Insulating material 15, e.g. an aerogel, surrounds the cooling coil 14, between the cooling coil 14 and the outer wall 11. The insulating material 15 is provided to reduce heat transfer from air surrounding the dispense unit 1 to the cooling
coil 14 and cooling chamber 13, enhancing cooling performance. Aerogels are known to give high levels of insulation (typically between 10 and 15 mW/mK) and thus a relatively small thickness of insulation may be required (typically a thickness of between 6 mm and 12 mm), reducing the size of the dispense unit. All though not shown, it is conceived that the insulating material 15 may not surround the entire cooling chamber, or no insulating material may be used at all, in order to increase condensation formation on the outer surface of outer wall 11, for visual effect. The beverage package 100 is connected to a tap assembly 16, through which the beverage can be dispensed.

The dispense unit 1 is connected to a remote cooler 3, via a python 2. The python comprises a cooling loop 20 with an outward cooling line 21 and a return cooling line 22. The cooling coil 14 of the dispense unit 1 is connected to the cooling loop 20 such that cooling medium can be delivered from the cooler, along the outward cooling line 21 and into the cooling coil 14 via the inlet 14a, whereupon it moves through the cooling coil 14, cooling the cooling chamber 13 and the beverage package 100 located therein, and subsequently travels into the outward cooling line 22 via the inlet 14b and along the outward cooling line 22 back to the remote cooler 3. The cooler may comprise an ice bank 31 and a water bath 32, the water bath 32 providing cooled water as the cooling medium.

The python 2 also comprises a beverage delivery line 23. However, since the dispense unit 1 accommodates a beverage package 100, it is not necessary for the python 2 to supply beverage to the dispense unit 1, e.g. by connecting a beverage package to the beverage delivery line 23 as indicated by the dotted lines in Fig. 1 (a keg 24 is shown connected to delivery line 23). Nonetheless, it is conceived that the python 2 could be used to supply beverage from a beverage package, e.g. keg 24, and cooling medium, to traditional font assemblies 25, at the same time supplying cooling medium only to the dispense unit 1 of the present invention. Generally, one or more traditional font assemblies 24 and one or more dispense units 1 of the present invention can be connected to the python 2 at the same time. They may be connected in parallel, as shown in Fig. 1 or in series (in which case the cooling
loop 20 would essentially pass from one of the font assemblies and dispense units 1 to the next).

By accommodating the beverage package 100 in the dispense unit 1, beverage contained in the package 100 may be dispensed using a gravity method or similar. It is therefore not necessary to connect an external pressurized gas supply to the beverage package 100, as required for the keg 24 to dispense beverage via the beverage delivery line 23. Furthermore, by locating the cooler 3 at a position remote from the dispense unit 1, the dispense unit 1 can take up less space at the dispense site, and heat emissions by the cooler 3, produced as a result of cooling the cooling medium, can be kept away from the dispense site. The heat emissions could otherwise make conditions uncomfortable for the persons dispensing the beverage, e.g., bar staff.

A 3D representation of a dispense unit 1' and python 2', configured in accordance with the schematic of Fig. 1 is shown in Fig. 2. The dispense unit V is located on the top surface 1001 of a bar 1000 in a bar area. The dispense unit V is supported on the bar 1000 by two support elements 101, 102. A drip tray 103 is connected to one of the support elements 102 and is located underneath the tap assembly of the dispense unit 1' to catch drips therefrom.

The cooling coil of the dispense unit 1' is connected to the outward cooling line and the return cooling line of a python 2' via a first pipe 104 and a second pipe 105 respectively. The python extends to a remote cooler (not shown).

The dispense unit 1', support elements 101, 102 and drip tray 103 are shown in more detail in Figs. 3a and 3b. In Fig. 3b, a front panel of the housing 10' of the dispense unit has been removed to show the chamber 13' surrounded by the inner wall 12' of the housing, in which a beverage package (not shown in this Fig.) can be accommodated. In this embodiment, the chamber 13' is shaped to accommodate a mini-keg. In Figs. 3a, 3b, a clamp mechanism 106, for clamping the dispense unit 1' to the bar 1000 is shown.
Apparatus according to a second embodiment of the present invention is shown schematically in Fig. 4. The apparatus comprises a dispense unit 1, python 2 and remote cooler 3, as the apparatus of the first embodiment of the invention, and further comprises a cooling unit 4.

The cooling unit 4 is configured very similarly to the dispense unit 1; however, it does not comprise a tap assembly to dispense beverage. In more detail, the cooling unit 4 comprises a housing 40 having an outer wall 41 and an inner wall 42. The inner wall 42 surrounds a cooling chamber 43, in which one or more beverage packages 100 are located. Surrounding the inner wall 42 is a cooling coil 44, consisting of a pipe wound round an outer surface if the inner wall 42. The cooling coil 44 provides a circuit through which cooling medium can travel. The cooling coil 44 has an inlet 44a and an outlet 44b. Surrounding the cooling coil 44, between the cooling coil 44 and the outer wall 41, is insulating material 45, e.g., an aerogel. The insulating material 45 is provided to reduce heat transfer from air surrounding the cooling unit 4 to the cooling coil 44 and cooling chamber 43, enhancing cooling performance.

The cooling unit 4 is connected to the cooling loop 20 of the python 2. The cooling coil 44 of the dispense unit 1 is connected to the cooling loop 20 such that cooling medium can travel along the outward cooling line 21 and into the cooling coil 44 via the inlet 44a, whereupon it moves through the cooling coil 44, cooling the cooling chamber 43, and then travels into the outward cooling line 22 via the inlet 14b and back to the remote cooler 3. The cooling unit 4 is connected to the cooling loop 20 in parallel with the dispense unit 1, although conceivably it could be employed in series with the dispense unit 1, or on its own, i.e. without the dispense unit 1.

The cooling unit 4 can be used to pre-cool beverage packages 100, prior to placement in the dispense unit 1 for dispense. By using the python 2 to provide cooling medium from the remote cooler 3 to the cooling unit 4, space-saving and reduction in heating can be achieved, as described above with respect to the dispense unit 1.
The cooling unit 4 is not limited to pre-cooling beverage packages prior to placement in the dispense unit. It may be used as a general purpose fridge, for example.

A 3D representation of a dispense unit 1', python 2' and cooling unit 4', configured in accordance with the schematic of Fig. 4 is shown in Figs. 5a and 5b. The dispense unit 1' is located on the top surface 1001 of a bar 1000, as described above with respect to Fig. 2. The cooling unit 4' is located underneath the bar 1000 and is connected to the outward cooling line and the return cooling line of the python 2' via a first pipe 404 and a second pipe 405 respectively. The cooling unit 4' has a clear front door panel 406 to enable the contents of the cooling chamber 43' to be observed. The front door panel 406 can be opened to enable access to the contents of the cooling chamber 43'. Two mini-kegs 100' are shown located in the cooling chamber 43' in Fig. 4.

Apparatus according to a third embodiment of the present invention is shown schematically in Fig. 6. The apparatus comprises a dispense unit 1 configured as the dispense unit 1 described above with respect to the first and second aspects of the present invention, but in this embodiment, the dispense unit 1 is connected by a python 5 to a different type of cooler. In particular, it is connected to a cooler 6 that, unlike the cooler 3 discussed above with respect to the first and second embodiment, is not arranged to cool a beverage delivery line.

The cooler 6 is designed only to supply cooling medium to the dispense unit 1, such as water contained in a water bath surround by an ice bank.

The python 5 has an outward cooling 51 line and a return cooling 52 line for delivering and receiving the cooling medium to and from the cooling coil 14 of the dispense unit 1.

The cooler 6 may be located in the same room as the dispense unit 1. Accordingly, the distance that the python 5 extends to connect the dispense unit 1 and the cooler 6 may be relatively short. Accordingly, the python may be described as a 'mini python'.
Again, by using a remote cooler 6 to supply cooling medium to the dispense unit 1, the dispense unit accommodating a beverage package 100, advantages can be achieved as described above.

5 Apparatus according to a fourth embodiment of the present invention is shown schematically in Fig. 4. The apparatus comprises a dispense unit 1, python 2 and remote cooler 6, as the apparatus of the third embodiment of the invention, and further comprises a cooling unit 4, which is employed in substantially the same manner, and serves the same function, as the cooling unit 4 described above with respect to the second embodiment of the invention.

10 Preferred features of the invention will now be described with reference to the following numbered paragraphs:

1. Apparatus for cooling a beverage package comprising:
   a beverage dispense unit located at a beverage dispense site, the dispense unit comprising:
   a cooling chamber for accommodating a beverage package, and
   a cooling medium circuit, for cooling the cooling chamber;
   a cooler, located at a position remote from the beverage dispense unit, for cooling a cooling medium, and
   a cooling medium delivery means connected between the cooler and the cooling medium circuit to deliver cooling medium from the cooler to the cooling medium circuit.

2. The apparatus of paragraph 1, wherein the cooler comprises an ice bank and a water bath.

3. The apparatus of paragraph 1, wherein the cooler is a glycol cooler.
4. The apparatus of paragraph 1, 2 or 3, wherein the delivery means is a python having one or more cooling lines and one or more beverage delivery lines, wherein the one or more cooling lines are connected between the cooler and the cooling medium circuit.

5. The apparatus of paragraph 4, wherein the beverage delivery lines of the python are not arranged to supply beverage to the dispense unit.

6. The apparatus of any one of the preceding paragraphs, wherein the cooling medium circuit comprises a pipe wound round the cooling chamber, through which the cooling medium can travel.

7. The apparatus of any one of the preceding paragraphs, wherein the dispense unit and cooler are located in separate rooms.

8. The apparatus of paragraph 7, wherein the dispense unit is located in a bar area, and the cooler is located in a cellar or storage room.

9. The apparatus of any one of paragraphs 1 to 7, wherein the dispense unit and cooler are located in the same room.

10. The apparatus of paragraph 9, wherein the dispense unit is located on a bar and the cooler is located under a bar.

11. The apparatus of any one of the preceding paragraphs, wherein the dispense unit comprises a tap assembly or dispense font for dispensing beverage contained in the beverage package.

12. The apparatus of any one of the preceding paragraphs, wherein the cooling chamber is arranged to accommodate a plurality of beverage packages.
13. A beverage dispense unit for use as the dispense unit in the apparatus of any one of paragraphs 1 to 12, the dispense unit comprising:
   a cooling chamber for accommodating a beverage package; and
   a cooling medium circuit, for cooling the cooling chamber,
   the cooling medium circuit being connectable to a cooling medium delivery means for delivering cooling medium from a remote cooler to the cooling medium circuit.

14. The dispense unit of paragraph 13, wherein the cooling medium circuit comprises a pipe wound round the cooling chamber, through which the cooling medium can travel.

15. The dispense unit of paragraph 13 or 14, wherein the cooling medium delivery means is a python having one or more cooling lines and one or more beverage delivery lines, wherein the cooling medium circuit is connectable to the one or more cooling lines.

16. The dispense unit of paragraph 15, wherein the dispense unit is not arranged to be connectable to the beverage delivery lines.

17. The dispense unit of any one paragraphs 13 to 16, wherein the dispense unit comprises a tap assembly or dispense font for dispensing beverage contained in the beverage package.

18. Apparatus for cooling a beverage package comprising:
   a cooling unit having:
   a cooling chamber for accommodating a beverage package, and
   a cooling medium circuit, for cooling the cooling chamber;
   a cooler, located at a position remote from the cooling unit, for cooling a cooling medium, and
a python having one or more cooling lines, the cooling lines being connected between the cooler and the cooling medium circuit for delivering cooling medium from the cooler to the cooling medium circuit.

19. The apparatus of paragraph 18, wherein the cooler comprises an ice bank and a water bath.

20. The apparatus of paragraph 18, wherein the cooler is a glycol cooler.

21. The apparatus of paragraph 18, 19 or 20, wherein the python comprises one or more beverage delivery lines and the beverage delivery lines are not arranged to supply beverage to the cooling unit.

22. The apparatus of any one of paragraphs 18 to 21, wherein the cooling medium circuit comprises a pipe wound round the cooling chamber, through which the cooling medium can travel.

23. The apparatus of any one of paragraphs 18 to 21, wherein the cooling unit and cooler are located in separate rooms.

24. The apparatus of paragraph 23, wherein the cooling unit is located in a bar area, and the cooler is located in a cellar or storage room.

25. The apparatus of any one of paragraphs 18 to 22, wherein the dispense unit and cooler are located in the same room.

26. The apparatus of any one of paragraphs 18 to 25, wherein the cooling chamber is arranged to accommodate a plurality of beverage packages.
27. A cooling unit for use in the apparatus of any one of paragraphs 18 to 26, the cooling unit comprising:

a cooling chamber for accommodating a beverage package, and

a cooling medium circuit, for cooling the cooling chamber;

the cooling unit being connectable to a one or more cooling lines of python for delivering cooling medium from a remote cooler to the cooling medium circuit.

28. The cooling unit of paragraph 27, wherein the cooling medium circuit comprises a pipe wound round the cooling chamber, through which the cooling medium can travel.

29. The cooling unit of paragraph 27 or 28, wherein the python comprises one or more beverage delivery lines and the cooling unit is not arranged to be connectable to the beverage delivery lines.

30. The cooling unit of any one paragraphs 27 to 29, wherein the cooling chamber is arranged to accommodate a plurality of beverage packages.
Claims

1. An apparatus for cooling a beverage package comprising:
   a cooling unit having:
   a cooling chamber for accommodating a beverage package, and
   a cooling medium circuit, for cooling the cooling chamber;
   a cooler, located at a position remote from the cooling unit, for cooling a cooling medium, and
   a python having one or more cooling lines, the cooling lines being connected between
   the cooler and the cooling medium circuit for delivering cooling medium from the cooler to the
   cooling medium circuit.

2. The apparatus of claim 1 wherein the cooling unit is located at least 1m from the
   cooler and the python extends for at least 1m.

3. The apparatus of claim 1 or 2 wherein the cooler is a flash cooler or an ice/water bath
   cooler.

4. The apparatus of any one of claims 1 to 3 wherein the cooling unit is located at a
   dispense site and comprises dispense means for dispensing beverage from the beverage
   package in the cooling chamber.

5. The apparatus of claim 4 wherein the cooling circuit is arranged to cool the dispense
   means by extending into the dispense means, in order to cool the beverage up to the point of
   dispense, and/or to cause condensation to be formed on the dispense means.

6. A cooling unit, for use in the apparatus as defined in any one of claims 1 to 5, the
   cooling unit having:
   a cooling chamber for accommodating a beverage package, and
   a cooling medium circuit, for cooling the cooling chamber;
   the cooling unit being connectable to one or more cooling lines of the
python for delivering cooling medium from the remote cooler to the cooling medium circuit.

7. The apparatus/unit of any one of the preceding claims, wherein the cooling chamber is arranged to accommodate a plurality of beverage packages.

8. The apparatus/unit of any one of the preceding claims, wherein the cooling medium circuit comprises a pipe wound round the cooling chamber, through which the cooling medium can travel.

9. Apparatus/unit substantially as any one embodiment described herein with reference to the Figures.
**INTERNATIONAL SEARCH REPORT**

**International application No**

PCT/GB2009/001045

**A. CLASSIFICATION OF SUBJECT MATTER**

INVENTION F25D15/00 F25D31/00 B67D1/08

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)

F25D B67D

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

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

EPO-Internal, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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<td>US 2 618 938 A (BOOTH GEORGE M; PATCH ARTHUR H) 25 November 1952 (1952-11-25) figures 1, 2 column 9, line 53 - column 11, paragraph 18</td>
<td>1-9</td>
</tr>
<tr>
<td>X</td>
<td>WO 98/51611 Al (GALOCKIN LONGIN [US]; MONTGOMERY B DOUGLASS [CA]) 19 November 1998 (1998-11-19) abstract; figures 1-7 page 7, line 24 - line 34 page 8, line 4 - line 35 page 13, line 31 - line 37</td>
<td>1-9</td>
</tr>
<tr>
<td>X</td>
<td>US 2 252 173 A (LOWELL GIBSON J) 12 August 1941 (1941-08-12) figure 1 page 2, line 34 - line 42</td>
<td>1-9</td>
</tr>
</tbody>
</table>

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**Date of the actual completion of the international search**

27 August 2009

**Date of mailing of the international search report**

04/09/2009

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**INTERNATIONAL SEARCH REPORT**

International application No
PCT/GB2009/001045

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No</th>
</tr>
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<tbody>
<tr>
<td>X</td>
<td>US 5 584 187 A (WHALEY GLENN E [US]) 17 December 1996 (1996-12-17) abstract; figure 1</td>
<td>1-3, 6-7, 9</td>
</tr>
<tr>
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<td>DE 17 51 950 A1 (AEG) 9 September 1971 (1971-09-09) figure</td>
<td>1-9</td>
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Form PCT/ISA/2/10 (continuation of second sheet) (April 2005)
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<th>Patent family member(s)</th>
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<tr>
<td>US 2618938</td>
<td>A 25-11-1952</td>
<td>NONE</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>AU 7484998 A 08-12-1998</td>
<td></td>
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<tr>
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<td></td>
<td>BR 9809630 A 03-10-2000</td>
<td></td>
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<td></td>
<td>CA 2289854 A1 19-11-1998</td>
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<td>CN 1256681 A 14-06-2000</td>
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<td>EE 9900538 A 15-06-2000</td>
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<td>IL 132943 A 01-12-2002</td>
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<td>JP 2000511275 T 29-08-2000</td>
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<td>NZ 501153 A 24-11-2000</td>
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<td>PL 336991 A1 31-07-2000</td>
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<td>RU 2182690 C2 20-05-2002</td>
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<td></td>
<td>US 5974824 A 02-11-1999</td>
<td></td>
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<tr>
<td>US 2252173</td>
<td>A 12-08-1941</td>
<td>NONE</td>
<td></td>
</tr>
<tr>
<td>US 5584187</td>
<td>A 17-12-1996</td>
<td>NONE</td>
<td></td>
</tr>
<tr>
<td>DE 1751950</td>
<td>A1 09-09-1971</td>
<td>NONE</td>
<td></td>
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