Abstract Title: HEAD CONTROL SYSTEM

A head control system (10) for use when dispensing beverages, the system (10) comprising: a beverage dispensing tube (13) having a nozzle (14) at a distal end thereof through which, in use, the beverage is caused to flow; a shroud (15) surrounding at least part of the nozzle (14) and of the beverage dispensing tube (13) and having an opening (20) in fluid communication with the nozzle (14), the shroud (15) being movable relative to the tube (13) such that, in use, the relative positions of at least two of the shroud opening (20), the nozzle (14) and the end of the tube (13) control the size of head generated on the beverage; and shroud moving means (17) remote from the shroud opening (20) for moving the shroud (15) relative to the tube (13).
HEAD CONTROL SYSTEM

The present invention relates to a head control system for use when dispensing beverages. In particular, the present invention relates to a beverage dispensing system for dispensing carbonated beverages such as beer and lager, and having means which allows the size of the head on the beverage to be varied.

Carbonated beverages such as beer and lager are normally dispensed through a device such as a beer engine or a gas assisted pump by means of a nozzle into a glass. Most nozzles will cause dissolved carbon dioxide and/or nitrogen to be liberated from the liquid beverage to form a head or froth on the beverage.

The size of the head or froth on the beverage may be dependent on personal or local preferences. Furthermore, because of variations in the storage conditions of beverages and handling conditions of the stored beverage it is frequently necessary to adjust manually the size and type of head formed on the beverage.

It is known that the size and type of head on a beverage can be adjusted by means of a sparkler which is attached to the nozzle. A conventional sparkler comprises a device which has a number of holes that is screwed onto a threaded end portion of the nozzle. The sparkler is provided in order to vary the orifice size and shape of the nozzle through which the beverage passes. However, it is necessary to turn the sparkler by hand. The sparkler is a component that is regularly immersed in the beverage and is therefore the subject of scrutiny on hygiene and public health grounds.

Other known means of performing the adjustment to vary the size and type of the head on the beverage is by variable means within the tap, upstream of the dispensing nozzle. However, this has a disadvantage in that the variation in the head is not generated at the point of exit of the beverage from the nozzle. It is generally known that the control of the size of the head is most effective if the variation in head characteristics is generated at the point of exit of the beverage from the nozzle.

Typically, beverages such as beer and lager are dispensed into a glass through a spout, at the end of which is a nozzle which is submerged in the
beverage. This allows the glass to be filled from the bottom up and is a known method of controlling the outbreak of carbon dioxide and/or nitrogen within the beverage. This means that the spout lengths must be greater than the depths of the glass. The amount of beverage contained in the length of the spout is subject to degradation over time due to heat absorption from the ambient temperature of the operating environment.

A customer trend towards colder beverages means that condensation is caused to form on the surface of the beverage spout. This can occur due to a reduced temperature beverage being held within the spout and/or heat transfer through conduction of a cold liquid re-circulation system of the dispensing apparatus, which is in direct contact with the spout. Condensation forming on the length of the spout that is submerged in the beverage is not desirable due to hygiene reasons.

It is an aim of this invention to provide a hygienic head control system for use when dispensing beverages that allows the size and/or shape of the head on the beverage to be adjusted.

According to the present invention there is provided a head control system for use when dispensing beverages, the system comprising:

a beverage dispensing tube having a nozzle at a distal end thereof through which, in use, the beverage is caused to flow;

a shroud surrounding at least part of the nozzle and of the beverage dispensing tube and having an opening in fluid communication with the nozzle, the shroud being movable relative to the tube such that, in use, the relative positions of at least two of the shroud opening, the nozzle and the end of the tube control the size of head generated on the beverage; and

shroud moving means remote from the shroud opening for moving the shroud relative to the tube.

The head control system of the present invention is constructed so that the size of the head on the beverage that has been dispensed can be adjusted by means which are remote from the nozzle. Accordingly, it is not necessary to handle a part of the head control system which is regularly submerged in the beverage. This allows the size of the head to be adjusted in a hygienic manner. The shroud is moveable such that the flow rate through the opening
in the shroud can be adjusted in order to control the size and/or type of head on the beverage.

The head control system is also particularly advantageous because it can reduce the amount of time it takes to dispense drinks. If a customer purchases a beverage and requests a particular style of head on the beverage, it is not necessary for the vendor to attach a new sparkler to the beverage dispensing tube.

Preferably, the shroud is elongate.

Preferably, the movement of the shroud relative to the tube causes the size and/or shape of the flow path from the nozzle to the shroud opening to vary. This allows the style of the head formed on the beverage to be adjusted.

The shroud may define, at a first end, a chamber that surrounds the nozzle and the first end of the beverage dispensing tube.

The shroud may be positioned around the tube such that there is a gap between the tube and the shroud from the nozzle to the shroud moving means. This gap creates a thermal barrier and helps to avoid condensation forming on the part of the head control system that is submersed in the beverage.

The shroud moving means may be located substantially adjacent a second end of the shroud. Preferably, the shroud extends from the first end to the second end.

A seal may be provided adjacent the first end in the gap between the tube and shroud in order to prevent fluid entering the gap from the chamber.

A further seal may be provided between the tube and shroud at the second end, thereby forming a sealed chamber.

Preferably, the shroud moves longitudinally relative to the tube by rotation of the shroud moving means.

The position of the shroud may be varied continuously between two extreme positions.

One example of a head control system for use when dispensing beverages will now be discussed with reference to the accompanying drawings in which.

Figure 1 shows a side cross section view of the head control system.
Figure 2 shows a side cross section view of the head control system.
Figure 3 shows an end view of the beverage dispensing tube.
Figure 1 shows a head control system 10 which, in use, is connected to a pump (not shown). Typically, the head control system 10 will be connected to a beer engine comprising a piston type pump mounted below a bar top which is connected to a beer keg or other suitable beverage container at a remote location. The manual actuation of a handle mounted above the bar operates the piston type pump and draws beverage from the keg, through a pipe and into a glass. The head control system can also be connected to dispensing means other than a beer engine, such as a gas assisted pump.

Figure 1 shows a head control system 10, part of which is submerged in a beverage 11 within a glass 12.

The head control system 10 comprises a static beverage dispensing tube 13 having a plurality of nozzles 14 at a distal end of the beverage dispensing tube 13. The term “distal end” refers to the end of the beverage dispensing tube which is remote from the container which holds the beverage to be dispensed. In this example, four nozzles 14 are shown, although it will be realised that any number of nozzles can be provided at the distal end of the beverage dispensing tube 13.

An elongate shroud 15 is external to and surrounds the beverage dispensing tube 13 and the nozzle 14. The shroud 15 is a cylindrical component that extends from the distal end of the beverage dispensing tube 13 and has a length such that a part of it extends above the level of the beverage 11 in use. A typical UK pint glass has a depth of around 15 cm, this means that the length of the shroud should be greater than 15 cm.

The shroud 15 can be rotated by means of a handle 17 which is attached to the end of the shroud that will not be submerged in the beverage. The shroud 15 is attached to the beverage dispensing tube 13 by means of a screw thread 16, such that the rotational action of the shroud 15, via the handle 17, is translated into vertical lift relative to the beverage dispensing tube 13.

The distal end of the beverage dispensing tube 13 has a frusto-conical end 18 having an outer surface which is complementary to a corresponding interior tapered surface 19 on the distal end of the shroud 15.

Accordingly, when the shroud 15 is positioned, such that there is a gap between the frusto-conical end 18 and the tapered surface 19 forming a flow
path, beverage can flow from the nozzles 14 to an opening in the shroud 20 and thus dispense beverage into the glass 12.

By rotation of the shroud 15 relative to the beverage dispensing tube 13 the shroud is moved axially such that the frusto-conical end 18 and the tapered surface 19 mate and the orifice 20 in the shroud 15 is shut off, as shown in Figure 2.

As can be seen in Figure 3, the frusto-conical end 18 has formed within it a number of converging narrow grooves 21 of a predetermined width, in order to define a flow path between the frusto-conical end 18 and the tapered surface 19. These grooves 21 ensure that the correct flow rate is achieved to create the desired head. The grooves 21 will be dimensioned such that they can be manufactured accurately. The provision of the grooves 21 means that is not possible to shut the opening 20 off completely. The grooves contribute to head generation on the beverage by creating jets of fluid.

The taper angle of the frusto-conical end 18 and the tapered surface 19 should substantially match such that the orifice 20 can be almost shut off.

In this example, grooves 21 are shown. However, it would also be possible to use radial ridges on the frusto-conical end 18 or by having raised pips on the frusto-conical end 18.

Accordingly, it can be seen that the opening 20 in the shroud 15 can be varied in size from a remote location, which varies the flow rate of the beverage when it is dispensed. This allows the size of the head on the beverage to be varied according to personal preferences without having to manually adjust a component which is submerged in the beverage.

As can be seen in Figures 1 and 2, the shroud 15 is positioned around the beverage dispensing tube 13 such that there is a gap 24 between the tube and the shroud from the nozzle 14 to the screw thread 16. This gap 24 is sealed at both ends by O rings 22 and 23, which are located in circumferential grooves formed on the outside of the beverage dispensing tube 13.

The O rings 22 and 23 prevent beverage from entering the gap 24 between the shroud 15 and the beverage dispensing tube 13. The air that it entrapped in this gap or plenum chamber acts as a thermal barrier between the beverage dispensing tube 13 (which may be cold due to cold beverage) and the ambient environment. This minimises heat transfer from the beverage.
dispensing tube 13 to the shroud 15 such that condensation on the length of the beverage dispensing tube 13 that is submerged in the beverage is eliminated. If the shroud 15 is placed and sealed around the beverage dispensing tube 13 at room temperature, when the air in the gap 24 is subsequently cooled in use, the air in the gap 24 will reduce in volume. This will create a partial vacuum in the gap 24 which will increase the effectiveness of the thermal barrier.

The shroud 15 can be quickly and easily removed from the head control system 10 to enable the different components of the system to be cleaned thoroughly which is, of course, important for hygiene reasons.
CLAIMS

1. A head control system for use when dispensing beverages, the system comprising:
   a beverage dispensing tube having a nozzle at a distal end thereof through which, in use, the beverage is caused to flow;
   a shroud surrounding at least part of the nozzle and of the beverage dispensing tube and having an opening in fluid communication with the nozzle, the shroud being movable relative to the tube such that, in use, the relative positions of at least two of the shroud opening, the nozzle and the end of the tube control the size of head generated on the beverage; and
   shroud moving means remote from the shroud opening for moving the shroud relative to the tube.

2. A system according to claim 1, wherein the shroud is elongate.

3. A system according to claim 1 or claim 2, wherein movement of the shroud relative to the tube causes the size and/or shape of the flow path from the nozzle to the shroud opening to vary.

4. A system according to any one of the preceding claims, wherein the shroud defines, at a first end, a chamber that surrounds the nozzle and the first end of the beverage dispensing tube.

5. A system according to any one of the preceding claims, wherein the shroud is positioned around the tube such that there is a gap between the tube and the shroud from the nozzle to the shroud moving means.

6. A system according to claim 4, wherein the shroud moving means is located substantially adjacent a second end of the shroud.

7. A system according to claim 6, wherein the shroud extends from the first end to the second end.
8 A system according to any one of the preceding claims, wherein a seal is provided adjacent the first end in the gap between the tube and shroud in order to prevent fluid entering the gap from the chamber.

9 A system according to claim 8, wherein a further seal is provided between the tube and shroud at the second end, thereby forming a sealed chamber.

10 A system according to any one of the preceding claims, wherein the shroud moves longitudinally relative to the tube by rotation of the shroud moving means.

11 A system according to claim 10, wherein the position of the shroud can be varied continuously between two extreme positions.
Application No: GB0705916.5  Examiner: Mr A. Budtz-Olsen
Claims searched: 1-11  Date of search: 12 June 2007

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

<table>
<thead>
<tr>
<th>Category</th>
<th>Relevant to claims</th>
<th>Identity of document and passage or figure of particular relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>1-8, 10, 11</td>
<td>GB2232228 A (IMI CORNELIUS (UK) LIMITED see figure 2</td>
</tr>
<tr>
<td>A</td>
<td>1-11</td>
<td>GB2260310 A (MCLENNONS LIMITED) see figures 2, 3</td>
</tr>
<tr>
<td>A</td>
<td>1-11</td>
<td>GB2311739 A (JIM GENE BEER PUMPS LIMITED; BATEMAN GEORGE &amp; SON LTD) see figures</td>
</tr>
</tbody>
</table>

Categories:

- X: Document indicating lack of novelty or inventive step
- Y: Document indicating lack of inventive step if combined with one or more other documents of the same category
- A: Member of the same patent family
- P: Document published on or after the declared priority date but before the filing date of this invention
- F: Patent document published on or after, but with priority date earlier than, the filing date of this application

Field of Search:
Search of GB, EP, WO & US patent documents classified in the following areas of the UKC:

Worldwide search of patent documents classified in the following areas of the IPC

B67D

The following online and other databases have been used in the preparation of this search report:

EPODOC, WPI

International Classification:

<table>
<thead>
<tr>
<th>Subclass</th>
<th>Subgroup</th>
<th>Valid From</th>
</tr>
</thead>
<tbody>
<tr>
<td>B67D</td>
<td>0001/14</td>
<td>01/01/2006</td>
</tr>
</tbody>
</table>