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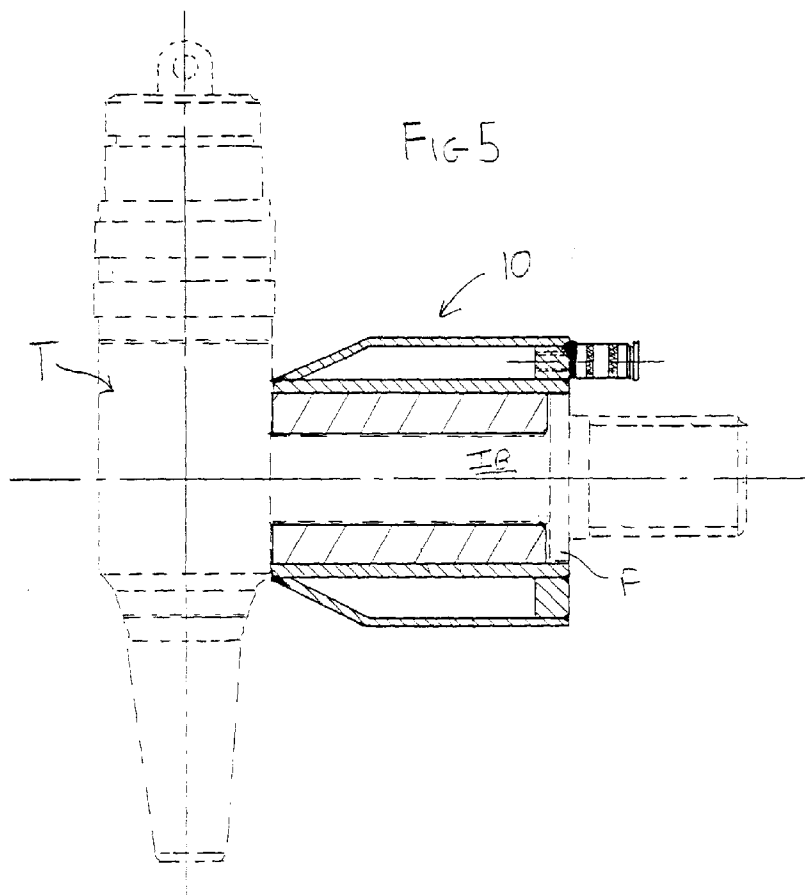
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(54) Heat exchanger for a beverage dispensing tap

(57) The invention provides a heat exchanger (10) for a dispensing tap (T) comprising a toroidal chamber (22) adapter to surround the flow passage forming part

of said tap, with packing segments (30,32) disposed between the chamber and the passage so as to maintain good heat conducting relationship between the respective surfaces.



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Description

[0001] This invention relates to a heat exchanger primarily for lowering the temperature of beverages dispensed using a tap for example in a public house.

[0002] It is known to provide heat exchangers for cooling alcoholic beverages such as bitters, lagers and stout. There are several different systems which are disposed close to the dispensing tap at the bar or point of sale which allow the beverage to flow around a heat exchanger circuit comprising an array of tubes for example, before then passing up towards the dispensing tap through uncooled tubing. The distance between the heat exchanger and dispensing tap can be several meters in length and accordingly beverage located in this tubing can warm up to ambient room temperatures if allowed to sit for any period of time. Moreover, the complex path through such a heat exchanger is disadvantageous in terms of cleaning and sterilisation as is necessary for health and hygiene reasons.

[0003] It is also known to provide a heat exchanger within the dispensing tap itself. However, such systems are quite large and installation calls for removal of an existing dispensing tap for that particular beverage and replacement with a completely new heat exchanger tap. This can be costly.

[0004] The invention seeks to avoid or at least mitigate the problems of the prior art. It is therefore an object of the invention is to provide a heat exchanger which is attachable to an existing dispensing tap to enable cooling of a beverage at a point immediately adjacent the tap outlet.

[0005] According to the invention a heater exchanger for a beverage dispensing tap comprises a chamber adapted to extend about a flow passage forming part of said tap and arranged to be in heat-conducting relationship therewith, said chamber having a pair of ports to allow inlet and exhaust of coolant circulated through said chamber. Preferably the chamber is generally toroidal.

[0006] Some beverage taps of a kind where the invention may be usefully employed include a tubular portion, forming part of the beverage flowpath, which also acts as a stand-off so that the outlet from the tap can be spaced a convenient distance from a supporting wall or the like extending in a generally vertical plane. However, the mounting of the tap on that wall maybe accomplished by means including an external flange projecting radially about that flow passage and seating against the wall. There would usually be a spigot, for example a screw-threaded tubular portion co-axial with the mentioned flow passage and located on the opposition side of said wall. Whilst it is an easy matter to unscrew the tap for access to mount the heat exchanger of the invention, there is a problem in that a heat exchanger which can be slid over the flange would be spaced from the tubular passage.

[0007] According to a feature of the invention, this

problem is solved by providing a plurality of packing segments arrangeable in a ring having an external plain cylindrical surface contactable by an internal cylindrical surface of the heat exchanger, and said ring having a bore shaped and configured to contact the exterior of the flow passage. In other words the segments provide filler pieces which can be tailored in both contour and length so as to contact the flow passage of the tap at their inner face and the interior of the heat exchanger at their external face, and it will be understood that the segments are of a radial thickness in excess of the height of the flange so as to enable the heat exchanger to be slid onto the assembly of tap and segments.

[0008] Preferably and conveniently a pair of such segments provide the complete ring.

[0009] Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:-

FIGURE 1 shows a sectional side elevation view of a heat exchanger according to the invention attached to a dispensing tap;

FIGURES 2,3 and 4 show end and side elevation views of the exchanger shown in Figure 1;

FIGURE 5 is a sectional side elevation view of a second embodiment attached to a second dispensing tap;

FIGURES 6 and 7 are end and side elevation views of parts of the arrangement according to Figure 5.

[0010] Referring first to Figure 1, a typical tap is shown in broken line and indicated by the reference T, having an outlet O. The tap has a generally tubular portion 1^a which is a flow passage connectable by way of a screw-threaded spigot or nipple. The portion 1^a is cylindrical.

[0011] Figures 1-4 show the invention in a form applied to a tap of Figure 1 where the heat exchanger comprises a generally annular (in cross-section) chamber generally indicated at 12 comprising an inner cylindrical wall 22 and an outer cylindrical wall 14, the latter being integral with a frusto conical portion 16 extending to a joint for example a welded joint with the inner wall 20. This provides a generally tyroid chamber 22.

[0012] The end opposite the wall 16 is provided with a filler ring 18 which again may be welded in place. The ring 18 is provided with a pair of ports 24 forming an inlet and an outlet for flow of coolant through the chamber 22.

[0013] It will be appreciated that the cylindrical wall 20 is intended to be in good heat conducting relationship with the external surface of an inlet 1^a, and for example it may be a push-fit thereon.

[0014] Turning now to Figures 5-7, the tap shown in Figure 5 by the broken lines and again indicated by the reference T differs from that in Figure 1 in that a radial flange F is provided between the spigot and the stand-off flow passage here indicated by the reference 1^b. This creates the mentioned difficulty which is overcome by using the pair of segments 30, 32 meeting at the dia-

metric plane 34 and these are appropriately dimensioned so as to be in good heat conducting contact with both the exterior of the passage 1^b and the interior of the cooling jacket or heat exchange. As illustrated the segments are of the same radial thickness as the projection of the flange so that the heat exchanger can be slid onto the assembly of cap and segment.

[0015] However, an arrangement generally similar to Figure 5 may be utilised with taps as in Figure 1 if the bore of the cylindrical wall 20 is greater than the external diameter of the corresponding part of the tap even if the flange is not provided.

[0016] It will be appreciated that the heat exchanger of the invention can be rapidly fitted possibly without even draining the system, and with appropriate provision of coolant flow can be used to maintain the temperature of beverage as it is dispensed well below ambient room temperature. This is partly because of the cooling effect utilising a mass of the tap as a heat sink (or perhaps cold sink) in the intervals between dispensing operations. This is seen at its best where the tap is of metal, but nevertheless the invention is found useful even with plastic taps.

[0017] It is also to be recognised that in general the beverage is kept in a cool place and the main problem is of heat gain between the storage place and the tap and the heat exchanger is thus called upon to cool a relatively small volume of beverage on any one dispensing operation.

[0018] Preferably the heat exchanger of the invention and also the filling segments where used are made of metals such as aluminum or brass so that they too act as a cold sink in intervals between dispensing operations.

4. A heat exchanger for a beverage dispensing tap substantially as described with reference to the accompanying drawings.

5. A heat exchanger according to any preceding claim wherein the chamber is generally toroidal.

Claims

1. A heat exchanger for a beverage dispensing tap comprises a chamber adapted to extend about a flow passage forming part of said tap and arranged to be in heat-conducting relationship therewith, said chamber having a pair of ports to allow inlet and exhaust of coolant circulated through said chamber.

2. A heat exchanger as claimed in claim 1 wherein said toroid is bounded at its inner periphery by a cylindrical wall, and said heat exchanger further comprises a plurality of packing segments arrangeable in a ring having an external plain cylindrical surface contactable by said cylindrical wall, said ring having a bore shaped and configured to contact the extension of a flow passage forming part of said tap.

3. A heat exchanger as claimed in claim 2 wherein said segments meet at a plane containing a diameter of said passage.

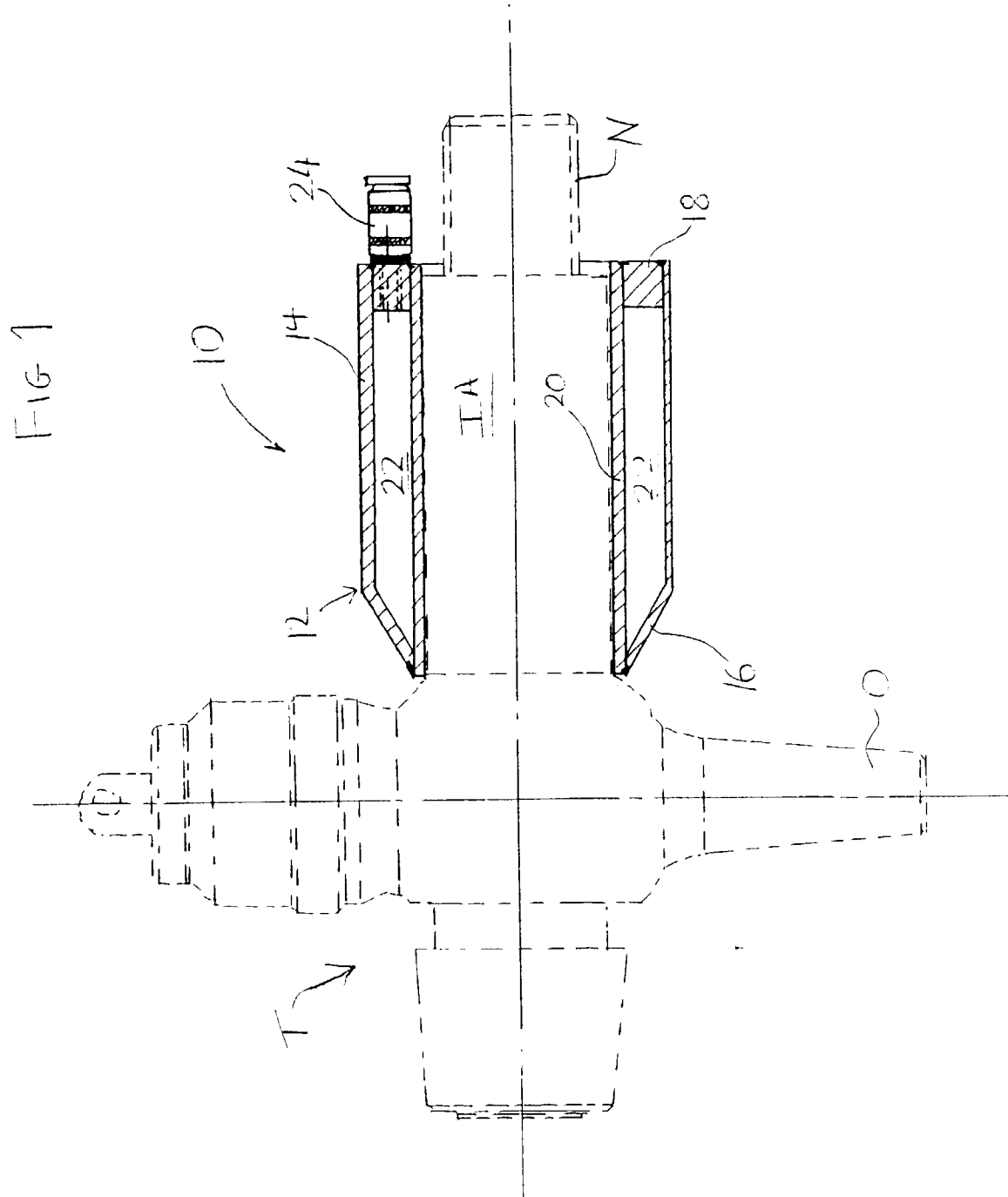


FIG 2

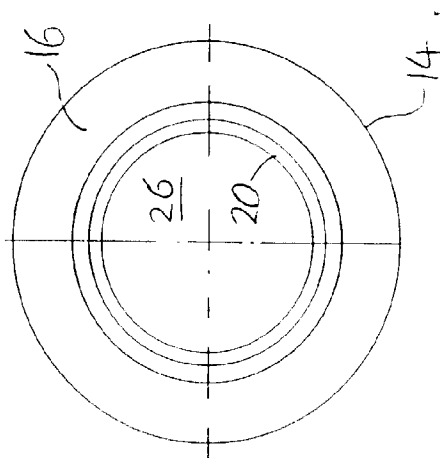


FIG 3

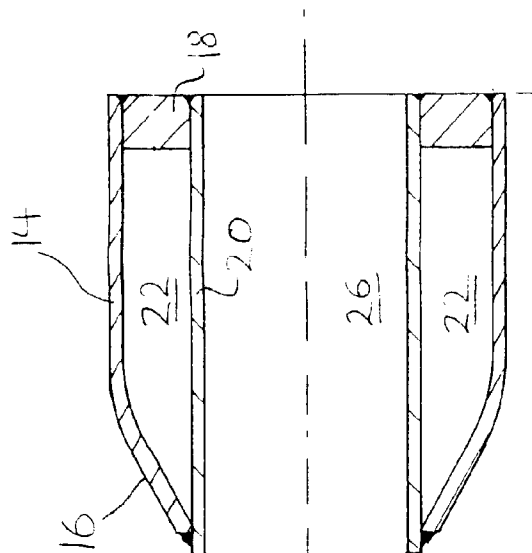
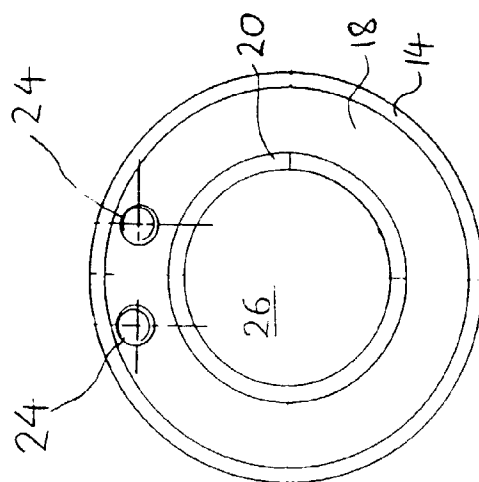
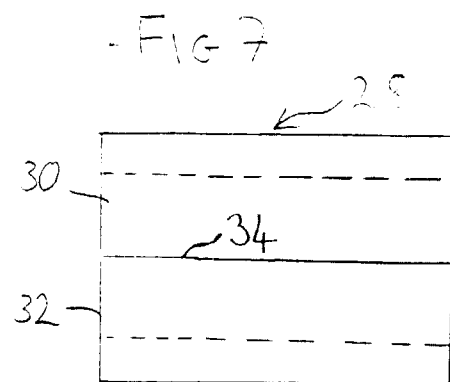
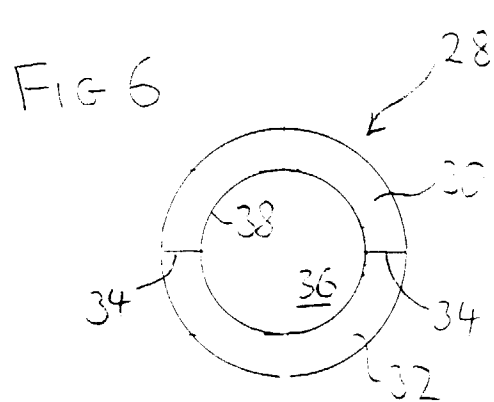
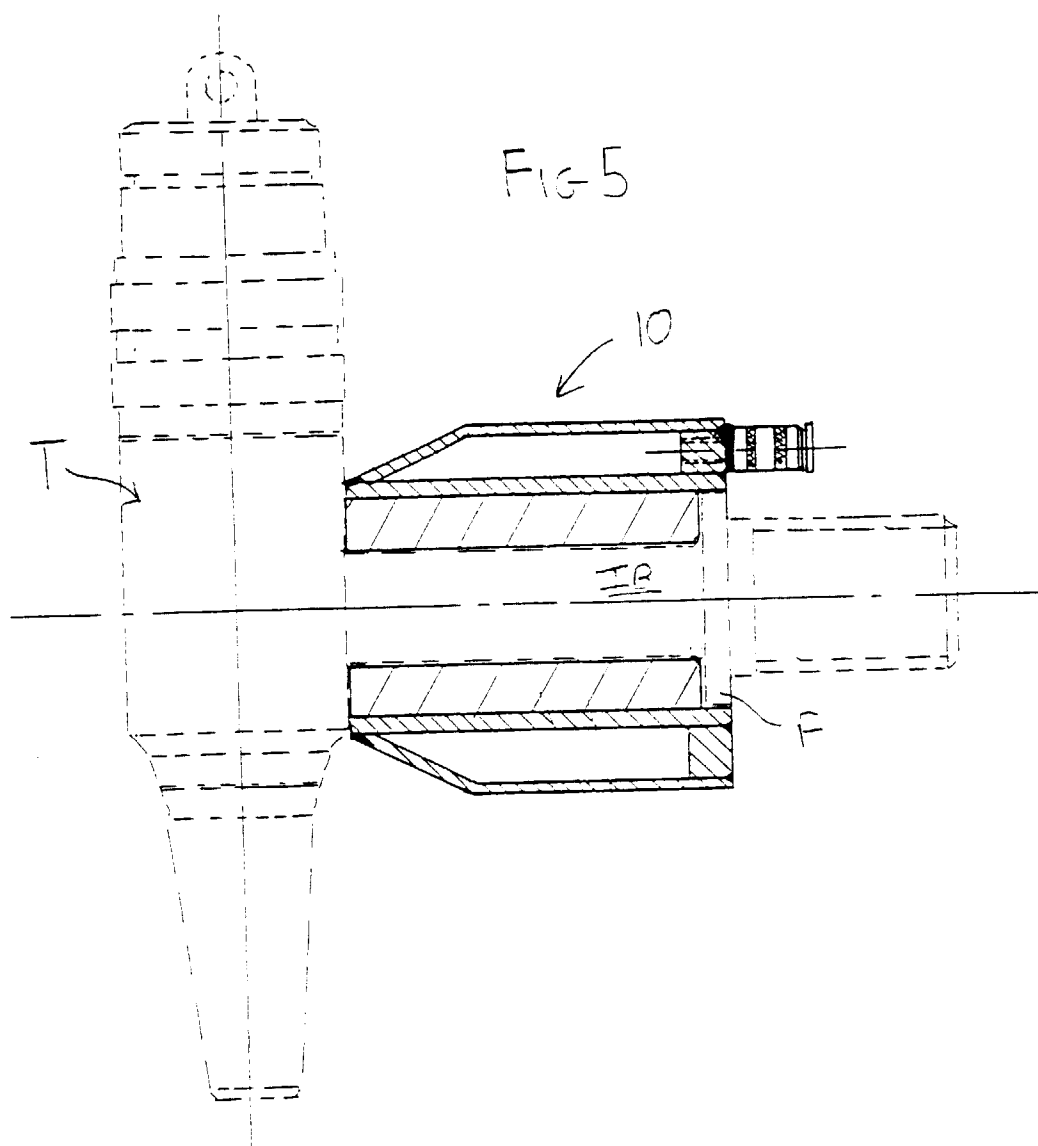


FIG 4







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EUROPEAN SEARCH REPORT

Application Number
EP 98 30 5521

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	DE 29 27 320 A (STUTE WALTER) 29 January 1981 * figures 1,2 *	1	B67D1/08 B67D1/14
A	DE 40 31 777 A (JW KUEHL GERAETE BAU GMBH) 16 May 1991 * column 2, line 37 - line 41 * * column 3, line 47 - line 49; figures 1,2 *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B67D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 14 October 1998	Examiner Martínez Navarro, A.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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