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(11) **EP 1 502 897 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
02.02.2005 Bulletin 2005/05

(51) Int Cl.7: **B67D 1/14, B67D 1/08**

(21) Application number: **03425515.8**

(22) Date of filing: **31.07.2003**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR**
Designated Extension States:
AL LT LV MK

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(54) **Tap for dispensing drinks at controlled temperature and related drink distribution installation**

(57) A tap for dispensing drinks at a temperature controlled by a regulating device (2) integrated in the tap (1), between an ambient temperature whereat the drink is found within at least a container thereof (3) and a lower temperature whereto the cooled drink is brought in an installation (5) for distributing the drink along at least

a dispensing column (6) or installation (66), where the tap (1) is applied. Said regulating device (2) integrated in the tap (1) allowing the construction of corresponding drink distribution installations with particular characteristics of precision and consistency of the temperature of the drink in every condition of use.

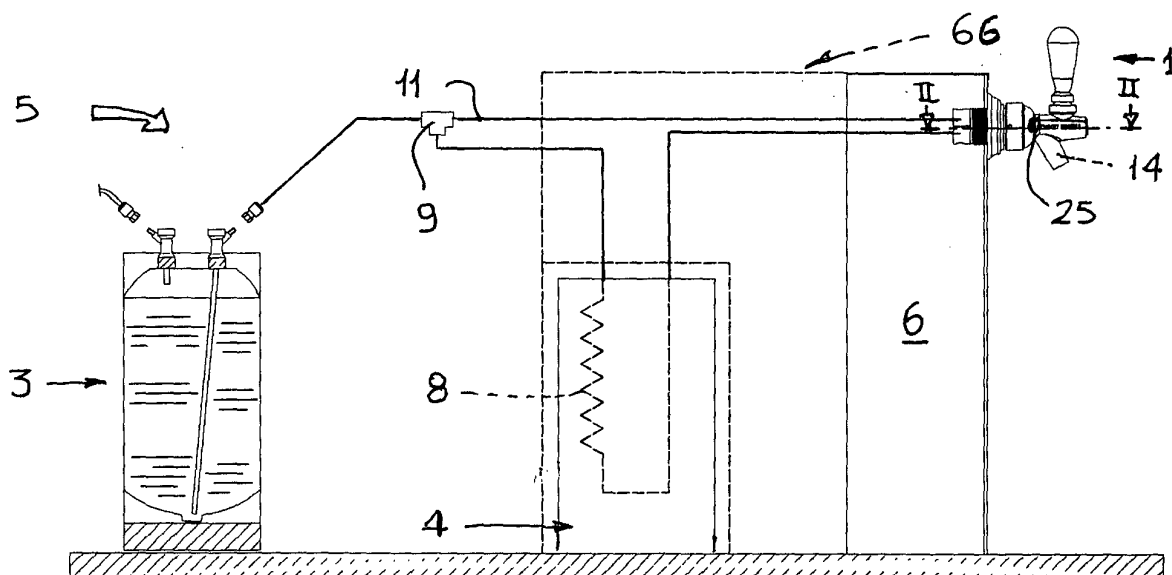


FIG.1

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Description

[0001] The present invention provides a tap for dispensing drinks at controlled temperature and it is of the type comprising a regulating device between an ambient temperature whereat the drink is found within at least a container thereof, and a lower temperature whereat the chilled drink is brought in an installation for distributing the drink along at least a column or a dispensing installation, where the tap is applied.

[0002] Said tap is can be applied in all known drink distribution installations, for instance drink distribution installations of the so-called "over-the-counter" type, in which the related dispensing installation comprises within it at least a system for chilling at least a spiralled or coiled chilling conduit, through which the drink travels, or installations of the so-called "under-the-counter" type, of the kind comprising at least a main chilling system, containing its own chilled fluid; at least a column for dispensing at least a drink, remotely served by the chilling system.

[0003] Some known installations are provided with temperature regulating devices, constituted by four-way by-passes: two inlets (one for the conduit of the drink at ambient temperature coming from one of said spiralled or coiled chilling conduits) and two outlets (one for the conduit that feeds the tap, where the drink at ambient temperature flows, mixed with the chilled drink, and one for the return conduit of said chilling conduit), or the by-passes may have three ways with a single outlet, but in this case they require two distinct organs for regulating the flow of the drink at the two inlets. Anyway, temperature regulation often requires intervening within the dispensing installation or in other positions, but never where it would be much more convenient, i.e. on the tap itself, which is already exposed to the exterior.

[0004] Moreover, the aforesaid by-passes are always separate from the corresponding ones and there is always at least a segment of conduit, containing the drink, which remains outside and upstream of the dispensing tap. The above contributes to a certain assembly complexity, but also and above all to the impossibility of obtaining a temperature of the dispensed drink that exactly corresponds to the desired one.

[0005] In particular, to the latter disadvantage contributes to a not inconsiderable extend the structure of known under-the-counter installations. In such installations, normally, in the cooled fluid of the main chilling system are immersed multiple chilling conduits, usually spiralled, through each of which flows the specific drink to be chilled and served to the corresponding dispensing columns, at least some of which are very distant from the chilling system itself. Therefore, long conduits are regularly provided, through which the chilled drink flows, though occasionally they are contained in thermally insulating sheaths, which go from the chilling system to all the dispensing columns.

[0006] If each drink, as often happens, were not dis-

pensed at sufficiently short time intervals, it would therefore be stationary for too long outside the chilling tank, with the constant result that the subsequent dispensing operation could never provide a drink at optimal temperature.

[0007] An aim of the present invention is to overcome the aforesaid drawbacks, making available a drink dispensing tap which enables, in any occasion and for any installation which uses it, a lways to obtain a drink at a predetermined optimal temperature, even when a long time interval elapses between a dispensing operation and the next one.

[0008] Furthermore, it is possible to simplify and reduce the path of the conduits, because the conduits returning to the chilling conduit, present in the aforesaid four-way by-passes, are eliminated, as is the conduit of the mixed drink, which goes from the by-pass to the tap. Moreover, the assembly of each dispensing column or installation is simplified since, once the tap is mounted, the temperature regulating device, integrated therein, is automatically mounted as well.

[0009] In addition, the invention provides particularly advantageous structures for under-the-counter installations, where there no longer is any problem with sizeable temperature variations along the conduits where the chilled drink flows.

[0010] Lastly, there is a greater a vailability of space, exploitable in the b est possible fashion especially in an installation solution that is characteristic of the invention, where the cooled fluid can inundate the dispensing column nearly completely, with dynamic circulation.

[0011] Additional aims and advantages, which shall become more readily apparent from the description that follows, are achieved, in accordance with the present invention, by a tap as set out in the claims.

[0012] The invention is described in greater detail hereafter with the aid of the accompanying drawings in which:

- Figure 1 shows a general schematic view of the tap of the invention and of an installation which uses it;
- Figure 2 shows a partial, enlarged horizontal section, according to the section line II-II, of the tap as per Figure 1;
- Figure 3 shows a general frontal schematic view of a first type of installation using the taps of the invention;
- Figure 4 shows a general frontal schematic view of a second type of installation using the taps of the invention.

[0013] It should preliminarily be specified that the term "dispensing installation" means a dispensing apparatus which comprises active chilling devices (such as compressor and e vaporator), w hilst t he term " dispensing c olumn" means a dispensing apparatus lacking said active elements. This stated, with reference to Figures 1 and 2, the reference number (1) designates a tap for

dispensing drinks at strictly controlled temperature, in the best possible manner, as shall become readily apparent hereafter. It comprises a device (2) for regulating the temperature, directly integrated in the tap (1) itself, preferably immediately upstream of the shutter (13) for opening and closing the dispensing conduit (14) of the tap (1) itself.

[0014] Said device (2) is able to regulate the temperature of the drink between an ambient temperature of the drink within at least a container (3) thereof, normally maintained under pressure for the circulation of the drink, and the lower temperature whereto the cooled drink is brought in an installation (5) for the distribution of the drink along at least a dispensing column (6) or installation (66) where the tap (1) is applied.

[0015] To do so, the tap (1) comprises at least a first delivery conduit (11) for supplying the drink at ambient temperature and at least a second delivery conduit (12) for supplying the cooled drink. Downstream of the delivery conduits (11, 12) there is a mixing chamber (15), calibrated by the regulating device (2), as Figure 2 clearly shows. The regulating device (2) comprises an organ (21) for the calibrated mixing of the drink at ambient temperature and of the cooled drink, which can be operated by means of a regulating organ (25) accessible from the exterior.

[0016] In particular, the calibrated mixing organ (21) is provided with a pair of plugs (22, 23) each frontally oriented towards a corresponding outlet orifice (16, 17) of said delivery conduits (11, 12), to vary the outflow port thereof, according to the action of the regulating organ (25).

[0017] In particular, in a possible embodiment, the mixing organ (21) is structured as a rocking lever. At least one end (24) of the rocking lever is subjected to the action of a thruster (27) obtained on the adjusting organ (25), maintained constantly in contact with the end (24) itself by elastic contrast organs (26), which can be spring actuated and acting in contrast (see Figure 2, solid line) or spiralled and acting in the fulcrum (see Figure 2, dashed line).

[0018] From the above, it is evident that it is always possible to obtain from the tap of the invention a drink whose temperature is perfectly regulated, since the mixing between the drink at ambient temperature and the cooled drink occurs directly inside the dispensing tap itself.

[0019] A temperature sensor (7) may also be provided, able to measure the temperature of the mixed drink within the mixing chamber (15) and to make it visible from the exterior.

[0020] The tap (1) of the invention enables to achieve a considerable technical improvement of all related installations that utilise it.

[0021] In particular, said tap can be used in over-the-counter installations, of the type comprising at least a dispensing installation (66) within which is provided at least a system (4) for chilling at least one spiralled or

coiled conduit (8), through which the drink flows. The outlet of the spiralled or coiled conduit (8) is directly and advantageously applied to the regulating device (2) integrated in the tap (1), whereto is also directly applied an end of the conduit (111) for supplying the drink at ambient temperature which comes from the corresponding container (3), all as clearly shown in Figure 3. Obviously, said tap (1) is advantageously usable also in installations similar to those known with the name of "under-the-counter", which substantially comprise:

- at least a main chilling system (4) containing its own cooled fluid (said fluid is cooled by means of a compressor (not shown) and a spiral evaporator (121), destined to form an iced deposit (122) in the walls of a tank (41) for collecting the fluid);
- at least a cooling conduit (8), immersed in the cooled fluid, where the drink to be cooled should flow;
- at least a column (6) for dispensing at least a drink, served remotely from the chilling system (4).

[0022] In this case, it is characteristic to provide an installation, also of the under-the-counter type described above, but where the main chilling system (4) no longer contains any chilling conduit (8), but substantially only the cooled fluid.

[0023] In this case, each served column (6) is destined to contain at least its own spiralled or coiled chilling conduit (8). The latter is traversed by the drink and immersed in a predetermined volume of cooled fluid, also contained in the column (6) and supplied, in continuous recirculation, by the chilling system (4) (and coming from the tank (41)). In this case, too, the outlet of the chilling conduit (8) is directly applied to the device (2) for regulating the tap (1), whereto is also directly applied an end of the conduit (111) for supplying the drink at ambient temperature which comes from the corresponding container (3), all as Figure 4 clearly shows.

[0024] It is now clear that, in this case, there no longer are any conduits, insulated or otherwise, in which the mixed drink destined to be dispensed remains stationary, but only conduits (112, 113) in which there is a continuous circulation of the cooled fluid which from the chilling system circulates continuously within the columns (6) and vice versa, where the respective chilling conduits (8) are located. It is therefore clear that it is always possible to obtain drinks at the desired temperature under any condition.

[0025] In an installation of this kind, excellent results can also be achieved using temperature regulating devices (2) of the usual kind, i.e. not integrated in the tap, but distanced therefrom, albeit as close as possible thereto, without thereby diminishing the greater effectiveness of the installation with respect to those of the prior art and on the pre-set aims.

[0026] The aforesaid installation, whether or not it uses temperature regulating devices (2) integrated in the

tap (1), may also provide for each dispensing column (6) to be inundated by said predetermined volume of cooled fluid, or comprises its own chilling tank (44) in turn containing the cooled fluid, which may be thermally insulated from the exterior, to prevent the production of condensation on the outer surface of the column (6).

[0027] Delving deeper in detail, it is noted that the drink is supplied to the chilling conduit (8) by means of a branch-off (9) applied directly to the conduit (111) for supplying the drink which comes from the corresponding container (3).

[0028] It is also advantageous for the delivery of the cooled fluid contained in the chilling system (4) to come from a pump (10) outside the installation. However, it can be advantageous to use the pump (10) of a common stirrer (101), internal to the system (4) and immersed in the cooled fluid thereof, as Figure 4 clearly shows. It is further noted that also in the solution illustrated above each conduit (112) for the delivery of the cooled fluid from each chilling system (4) to each dispensing column (6) and, vice versa, each return conduit (113), are contained in insulated sheaths (115) able to insulate thermally said conduits (112, 113) from the exterior.

[0029] Lastly, it is important to note that each conduit (112) for the delivery of the cooled fluid which goes from the chilling system (4) to each dispensing column (6) may comprise valves (114) for shutting off the flow of the cooled fluid, to condition the temperature in each column (6), according to different requirements.

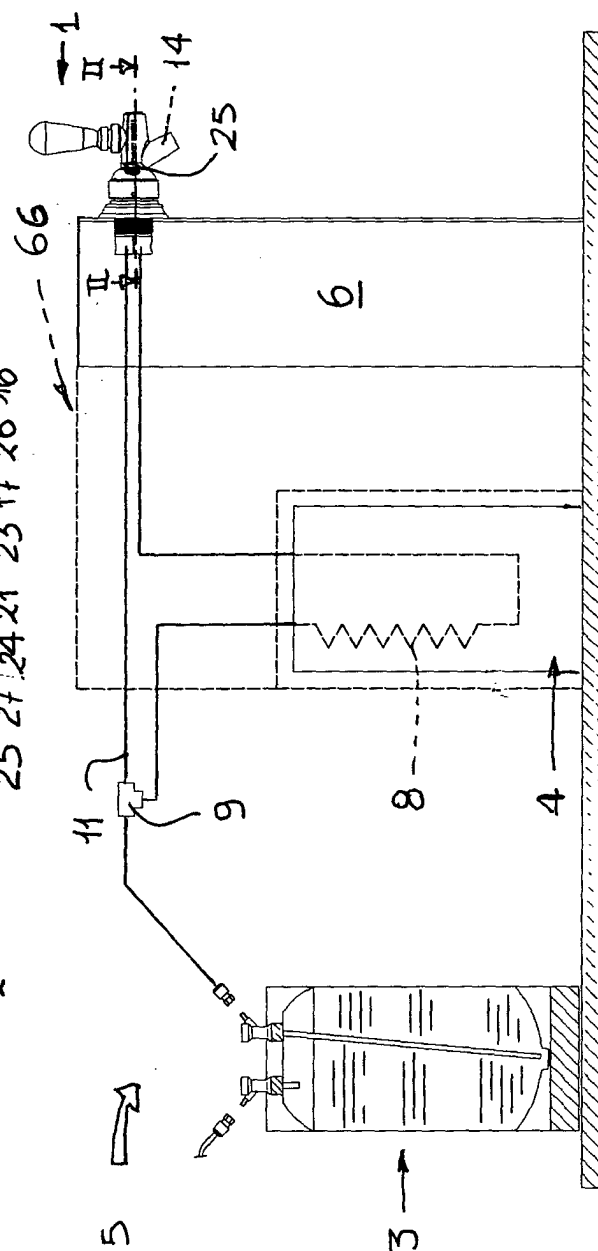
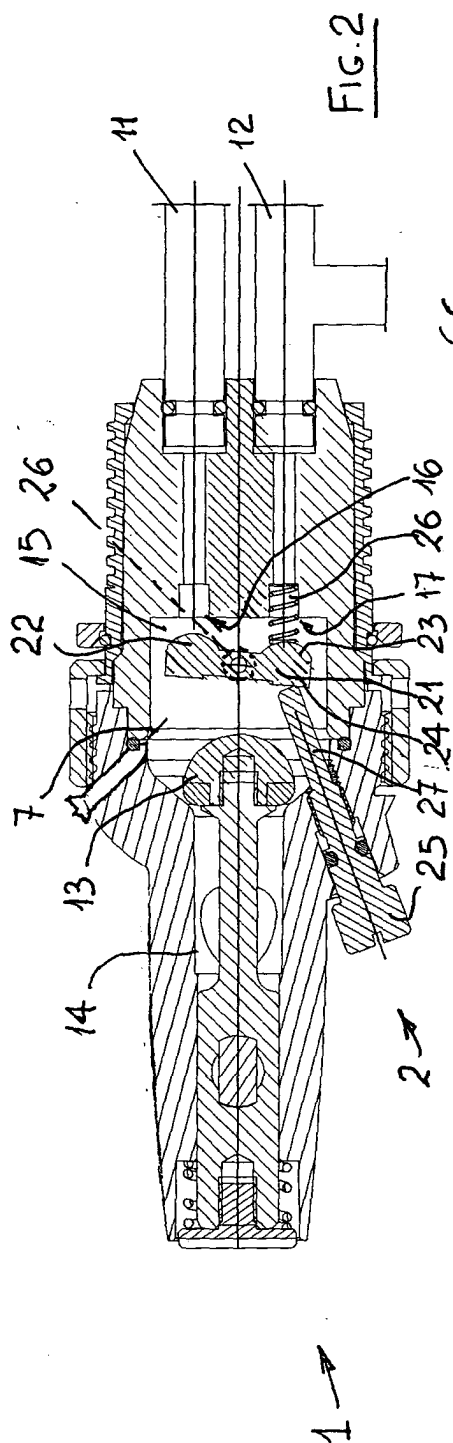
Claims

1. A tap for dispensing drinks at controlled temperature between an ambient temperature whereat the drink is found within at least a container thereof (3) and a lower temperature whereto the cooled drink is brought in an installation (5) for distributing the drink along at least a dispensing column (6) or installation (66), where the tap (1) is applied, **characterised in that** it comprises a temperature regulating device (2) integrated in the tap (1), upstream of the shutter (13) for opening and closing the dispensing conduit (14) of the tap (1) itself.
2. A tap as claimed in claim 1, **characterised in that** it comprises at least a first delivery conduit (11) for supplying the drink at ambient temperature and at least a second delivery conduit (12) for supplying the cooled drink, downstream of said delivery conduits (11, 12) being present a mixing chamber (15) calibrated by the regulating device (2).
3. A tap as claimed in claim 2, **characterised in that** the regulating device (2) comprises an organ (21) for the calibrated mixing of the drink at ambient temperature and of the cooled drink, able to be operated by means of a regulating organ (25) that is accessible from the exterior.
4. A tap as claimed in claim 3, **characterised in that** the organ (21) for calibrated mixing is provided with a pair of plugs (22, 23) each oriented frontally towards a corresponding outlet orifice (16, 17) of said delivery conduits (11, 12), to be able to vary its out-flow port, according to the action of said regulating organ (25).
5. A tap as claimed in claim 4, **characterised in that** the mixing organ (21) is structured as a rocking lever, at least an end (24) whereof is subjected to the action of a thruster (27) of said regulating organ (25), constantly maintained in contact with the end (24) itself by elastic contrasting organs (26).
6. A tap as claimed in any of the claims from 2 to 5, **characterised in that** it comprises at least a temperature sensor (7) able to measure the temperature of the drink mixed within the mixing chamber (15) and to make it visible from the exterior.
7. An installation for distributing drinks, **characterised in that** it comprises at least a tap (1) as claimed in any of the previous claims.
8. An installation for distributing drinks as claimed in claim 7, of the type comprising at least a dispensing installation (66) within which is provided at least a system (4) for chilling at least one spiralled or coiled conduit (8), through which the drink flows, **characterised in that** the outlet of the spiralled or coiled conduit (8) is directly applied to the regulating device (2) integrated in the tap (1), whereto is also directly applied an end of the conduit (111) for supplying the drink at ambient temperature which comes from the corresponding container (3).
9. An installation for distributing drinks, as claimed in claim 7, of the type comprising: at least a main chilling system (4), containing its own cooled fluid; at least a column (6) for dispensing at least a drink, remotely served by the chilling system (4); said system being **characterised in that** the column (6) contains at least its own spiralled or coiled chilling conduit (8), through which the drink flows, immersed in a predetermined volume of cooled fluid, also contained in the column (6) and coming, in continuous recirculation, from the chilling system (4), the outlet of said chilling conduit (8) being directly applied to the regulating device (2) integrated in the tap (1), whereto is also directly applied an end of the conduit (111) for supplying the drink at ambient temperature which comes from a corresponding container (3).
10. An installation for distributing drinks of the type

comprising: at least a main chilling system (4), containing its own cooled fluid; at least a column (6) for dispensing at least a drink, remotely served by the chilling system (4); said system being **characterised in that** the column (6) contains at least its own spiralled or coiled chilling conduit (8), through which the drink flows, immersed in a predetermined volume of cooled fluid, also contained in the column (6) and coming, in continuous recirculation, from the chilling system (4), the outlet of said chilling conduit (8) being directly applied to a common temperature regulating device (2) distinguished by its own tap, whereto is also directly applied an end of the conduit (111) for supplying the drink at ambient temperature which comes from the corresponding container (3).

11. An installation for distributing drinks, as claimed in claim 8 or 9 or 10, **characterised in that** said drink is supplied to the spiralled or coiled conduit (8) by means of a branch-off (9) applied directly to the conduit (111) for supplying the drink which comes from the corresponding container (3).
12. An installation for distributing drinks, as claimed in claim 9 or 10 or 11, **characterised in that** said dispensing column is inundated by said predetermined volume of cooled fluid.
13. An installation for distributing drinks, as claimed in claim 9 or 10 or 11 or 12, **characterised in that** said dispensing column (6) comprises a tank (44) containing said predetermined volume of cooled fluid.
14. An installation as claimed in claim 13, **characterised in that** each tank (44) is thermally insulated from the exterior.
15. An installation for distributing drinks, as claimed in any of the claims from 9 to 14, **characterised in that** the delivery of the cooled fluid contained in the chilling system (4) comes from an external pump (10).
16. An installation for distributing drinks, as claimed in any of the claims from 9 to 14, **characterised in that** the delivery of the cooled fluid contained in the chilling system (4) comes from a pump (10) immersed in the cooled fluid contained in the system (4) and belongs to a stirrer (101).
17. An installation for distributing drinks, as claimed in any of the claims from 9 to 16, **characterised in that** each conduit (112) for the delivery of cooled fluid from each chilling system (4) to each dispensing column (6) and, vice versa, each return conduit (113), are contained in insulated sheaths able thermally to insulate said conduits (112, 113) from the exterior.

18. An installation for distributing drinks, as claimed in any of the claims from 9 to 17, **characterised in that** each conduit (112) for the delivery of the cooled fluid which goes from the chilling system (4) to each dispensing column (6) comprises valves (114) for shutting off the flow of the cooled fluid, to condition the temperature in each column (6), according to different requirements.



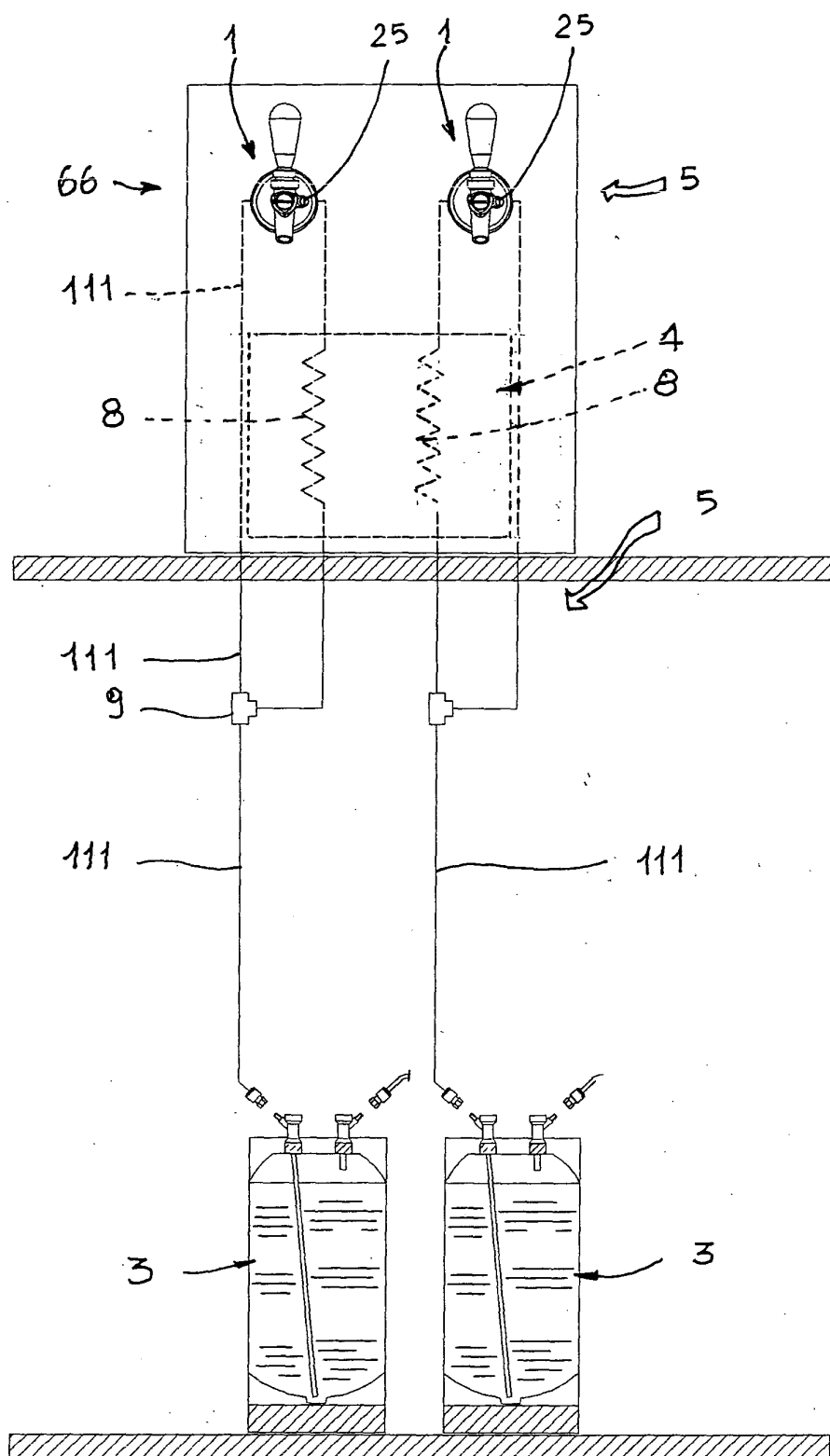


FIG. 3

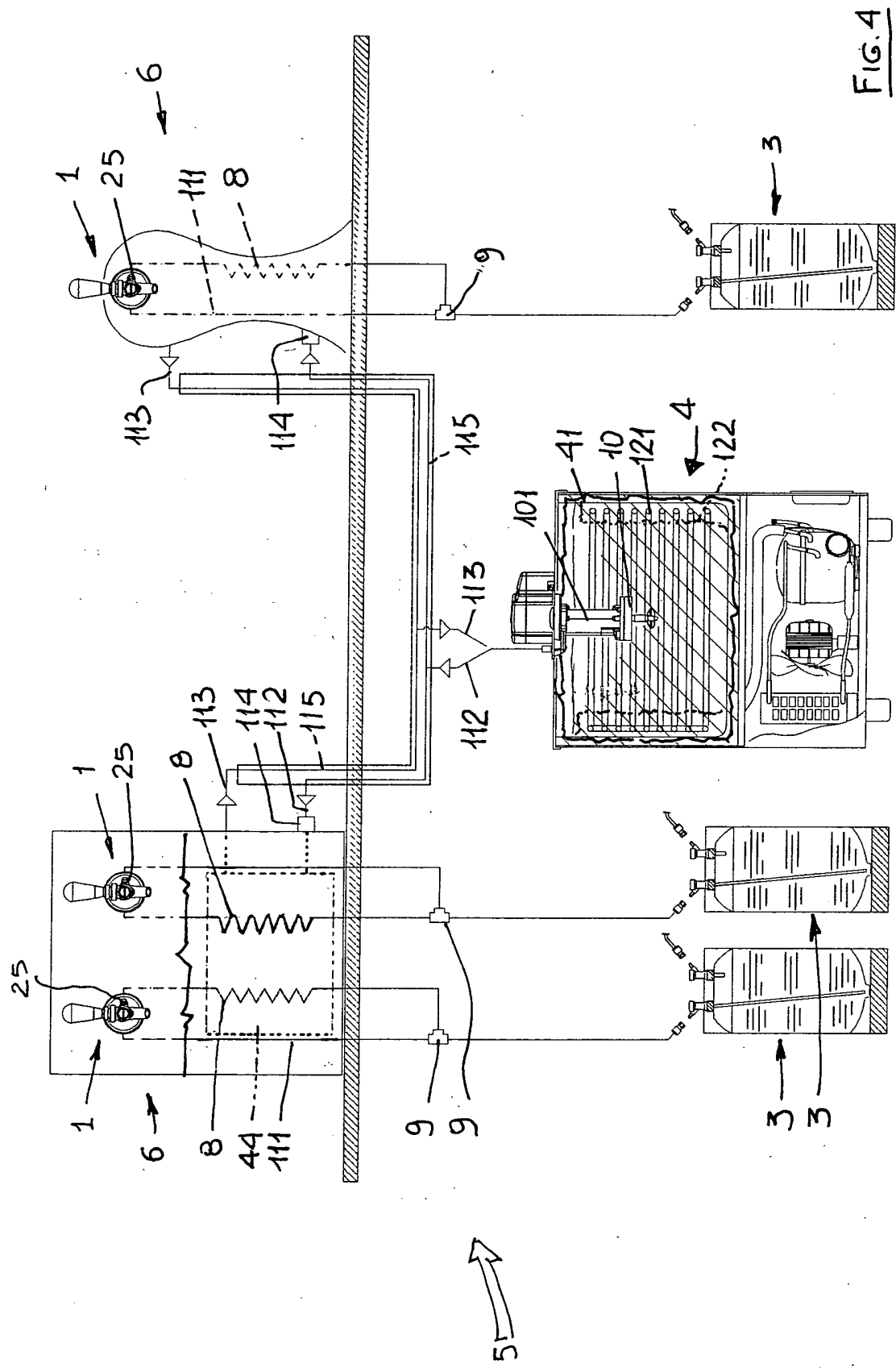


FIG. 4



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 03 42 5515

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.7)
X	GB 2 346 679 A (SHARP DAVID ;PETER PORTER ELECTRONICS (GB)) 16 August 2000 (2000-08-16)	1	B67D1/14 B67D1/08
A	* page 2, line 3 - line 4 * * claim 1 * * figure 1 *	2,10	
X	US 2003/071093 A1 (PINEDJIAN RAFFI S ET AL) 17 April 2003 (2003-04-17) * column 10, paragraph 77 *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B67D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 26 January 2004	Examiner Martínez Navarro, A.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

EPO FORM 1503 03/02 (P04001)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 03 42 5515

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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26-01-2004

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