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(54) Method of dispensing a beverage having a gas content and apparatus therefor

(57) A method of and apparatus for dispensing a beverage, comprise providing a bulk container (2) containing a beverage having a base gas content. At least two supply lines (6,8) are provided for dispensing the beverage from the container, and the gas content of the beverage is altered from the base gas content at (12,14) within at least one of the supply lines. Such gas content alteration may be of the CO_2 or N_2 content of the beverage, and alteration may take place across a liquid-impervious, gas-permeable membrane.

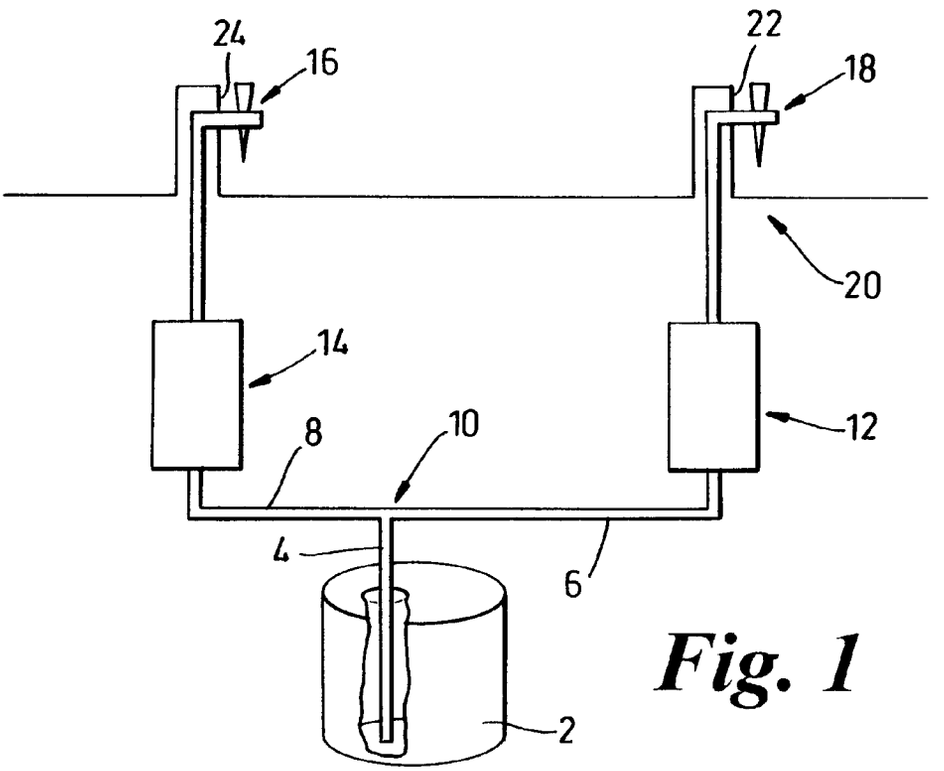

Fig. 1

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Description

[0001] This invention relates to a new apparatus and method related to the delivery of beverages, for example flavoured alcoholic beverages.

[0002] It is known for beverages, in particular fermented beverages such as beers, lagers, stouts, wines and ciders to be dispensed from a bulk container such as a barrel, cask, keg, etc. via a dispense tap at a bar. It is also known for the gas content of any such beverage to be altered between the bulk container and the dispense tap.

[0003] Such a system is shown in United States patent US 5,062,548 in which it is proposed to introduce air, nitrogen, or carbon dioxide into a beverage in order to produce a head of froth as the beverage is dispensed.

[0004] It is also known to provide a normally carbonated beverage substantially without any carbon dioxide present so that that beverage can be transported in a bulk container which is light and flexible and thus insufficiently robust to withstand pressure due to carbonation of a beverage within the container. Such a flexible container is less expensive to manufacture than a container which can contain a pressurised or carbonated beverage. It is then also well known to add carbon dioxide to such a beverage after it is removed from such a flexible container.

[0005] According to a first aspect of the invention we provide a method of dispensing a beverage, the method comprising providing a bulk container containing a beverage, the beverage having a base gas content; providing at least two supply lines for dispensing the beverage from the container and altering the gas content of the beverage from the base gas content within at least one of the supply lines.

[0006] An advantage of the present invention is that it is possible to provide a single bulk container of beverage, and to dispense from that container beverages (one from each supply line) having different gas properties so as to accommodate different consumer preferences, for example as to the amount or texture of a head of froth on the dispensed beverage. Such a system has a number of advantages: it takes up less space than providing two or more containers; beverage dwell time within an opened container may be reduced so there is less chance of the beverage going off; manufacturing costs are reduced (it will be less expensive to produce a single beverage than to produce two beverages). Distribution savings may also be achievable, and stock control may be simplified.

[0007] The container is preferably a keg, but it may be a cask or other such beverage container.

[0008] Preferably gas is added to or removed from the beverage through a membrane provided within at least one supply line. This is advantageous in that the membrane allows the gas to be readily passed into or out of the beverage simply.

[0009] The or at least one such gas-permeable membrane is preferably substantially liquid-impermeable. This helps to maintain the beverage to a beverage side of the membrane while a gas or gas mixture is maintained on the other, gas side of the membrane. An advantage of such a preferred structure is that the gas can readily diffuse or pass by osmosis into the beverage or out of the beverage while at the same time the beverage is contained within the supply line in a convenient and hygienic manner.

[0010] A suitable membrane device is available from Headmaster Ltd., Unit 6, Moorplace Farm Estate, Plough Lane, Bramshill, RG27 ORF, UK.

[0011] Generally gas will be added to the beverage contained in at least one of the supply lines but in some instances gas may be removed from the beverage contained in one or more of the supply lines.

[0012] Nitrogen or carbon dioxide, or a mixture of nitrogen and carbon dioxide is preferably held on the gas side of the membrane for adding to the beverage within the respective supply line. These gases are advantageous in that they can be used to alter the properties of the beverage. Of course, other gases (possibly inert gases) may be held on the gas side of the membrane. For example nitrous oxide or helium might be used.

[0013] The nitrogen content of the beverage in the supply line may be increased by an amount in the range 10 mg/L to 70 mg/L, preferably in the range 15 mg/L to 55 mg/L, and for example by about 40 mg/L (40 mg/L ± 10%).

[0014] The carbon dioxide content of the beverage in the supply line may be increased by an amount in a range 0.25 vol./vol. to 1.75 vol./vol., preferably in the range 0.75 vol./vol. to 1.25 vol./vol. and for example by about 1 vol./vol. (1 vol./vol. ± 10%).

[0015] There may be more than one membrane device, possibly in series, within the or each supply line to alter the gas content. This is advantageous if a large enough change in the gas content of the beverage within the supply line cannot be achieved by a single membrane device.

[0016] Alternatively, or additionally, the method may use a single membrane device provided in one or each supply line. This is advantageous if a single device can provide a large enough change in the gas content of the beverage within the supply line; it is less expensive to provide and maintain a single device.

[0017] In the most preferred embodiment the method is used to alter the gas content of a flavoured alcoholic beverage (FAB), but can of course be used to alter the gas content of any beverage being dispensed. A flavoured alcoholic beverage is a beverage which contains alcohol derived from fermentation with or without distillation and/or blending, and which is flavoured with fruit, herbs, and/or spices. The drink will usually contain added sugar (or sweetener). Of course, the alcohol may be pure alcohol added to a drink. FAB's do not include beers, ales, porters, lagers, stouts,

ciders or wines. It would be usual to flavour the FAB before adding alcohol, but it could be flavoured in the presence of alcohol. FAB's are usually (but not necessarily) coloured (for example a bright colour, such as orange, yellow, red, etc.). Colouring may be added to achieve that. FAB's are not usually coloured to match the colour of a beer, ale, porter, lager, stout, cider or wine, but they could be.

[0018] The method may comprise providing three, or four, or five, or more, supply lines and altering the gas content of the beverage in some of the supply lines in different ways from the beverage contained in other of the other supply lines. One or more of the supply lines may have the beverage contained within unaltered. One or more of the supply lines may have the beverage contained within altered in the same way as within other supply lines.

[0019] Each supply line may draw the beverage from the container separately from the other supply lines. Alternatively, or additionally, at least one primary supply line may draw the beverage from the container and feed the supply lines; that is the primary supply line may divide into a number of other supply lines. This can provide a structure wherein only a single supply line enters the container, and such an arrangement will tend to simplify the tapping of a standard container.

[0020] The method may comprise using each supply line to carry beverage to a dispensing tap. The method may further comprise providing each dispensing tap with a removable/re-attachable label attached to a label mounting device to identify the beverage being dispensed by the tap. This is advantageous when and if the gas content of the beverage contained within the supply lines is altered; by providing the dispensing tap with an interchangeable label, and changing the label as appropriate, the consumer may be given up to date information as to what products are available for consumption.

[0021] According to a second aspect of the invention there is provided a beverage dispensing apparatus comprising a bulk container for containing a beverage, at least two supply lines and at least one gas content altering means adapted to alter the gas content of the beverage contained within at least one of the supply lines.

[0022] The gas content altering means is preferably a membrane means, so providing a convenient way to alter the gas content of the beverage within the supply line.

[0023] At least one primary supply line may be provided to draw beverage from the container to feed the supply lines. This has the advantage that only a single line enters the container.

[0024] Certain preferred embodiments of the invention will now be described by way of example only, and with reference to the accompanying drawings of which:-

Figure 1 is a schematic diagram showing a first embodiment of the present invention;

Figure 2 shows a cross section through a portion of a supply line; and

Figures 3 and 4 are schematic diagrams showing a second and third embodiment of the present invention.

[0025] In Figure 1 there is shown a bulk beverage container, or keg 2, which contains a beverage in this case a Flavoured Alcoholic Beverage (or FAB). As is usual with kegs 2 there is a pipe, or primary supply line 4 for removal of beverage from the container 2. The primary supply line 4 is split into two supply lines 6, 8 by a dividing means 10. In each supply line 6, 8 there is provided a membrane device 12, 14 which is adapted to alter the gas content of the beverage contained within the supply lines 6, 8.

[0026] The container 2 is conveniently kept in a cellar and supplies two dispensing taps 16, 18 provided on a bar 20. Each dispensing tap may be provided with a label mounting device or face 22, 24 upon which there is a removable/re-attachable label attached.

[0027] In use, the FAB is drawn from the keg 2 in the usual manner up the primary supply line 4. The FAB contained in the keg 2 has a base gas content and passes into the supply lines 6, 8. The membrane devices 12, 14 can be used to alter the gas content of the FAB contained within the supply lines 6, 8.

[0028] In practice, only one of the membrane devices 12, 14 may be provided. The base gas content of the beverage in the keg 2 may correspond to a desired gas content of the beverage which is to be dispensed from one of the dispense taps 16, 18 and that base gas content can therefore be left unaltered.

[0029] In one particular example the FAB contained within the keg 2 has a desired carbon dioxide content and is pumped from the keg 2, via the primary supply line 4, through the supply line 8 to the dispense tap 16 without having the gas content altered. The same FAB is drawn from the keg 2 via the primary supply line 4 and flows into the supply line 6. The membrane device 12 is used to increase the nitrogen content of the FAB by 40 mg/L and the CO_2 content by 1 vol./vol. and this altered FAB is dispensed from tap 18.

[0030] The FAB being dispensed from the two dispense taps 16, 18 although coming from the same keg 2, has different properties (due to the different gas content)and could thus be sold under different trade name styles. Different drinkers may prefer to consume one or other of the FAB's and thus what are effectively two different beverages can be dispensed from the same keg 2.

[0031] Should one or other or both of the membrane devices be altered to provide a different gas content to the beverage flowing through them, the drink being dispensed by the respective dispense tap or taps 16, 18 may be altered and consequently the label on the face 22, 24 should also be changed to reflect the different style of the beverage being dispensed.

[0032] Figure 2 shows a possible detail of one of the membrane devices 12, 14 and explains the principle behind the operation of the membrane device. A membrane 50 is provided in a wall of a pipe 52 which acts as a supply line for a beverage 54. A gas-containing vessel 56 is located against the pipe 52 around the membrane 50 so that the gas 58 contained by the vessel 56 contacts the membrane 50. The membrane 50 thus divides the combination of pipe 52 and vessel 56 into a beverage side (54) (beverage flowing through the supply line) and a gas side (58). The gas can diffuse from or into the beverage (depending on the concentrations of gas in the beverage 54 and in the gas 58) through the membrane 50.

[0033] Figure 3 shows a second embodiment of a beverage dispensing apparatus which in many respects is similar to that shown in Figure 1, and like reference numerals have been used on identical parts.

[0034] The skilled person will realise that there is no dividing means, nor primary supply line and that each supply line 6,8 extends into the container 2. This embodiment functions in the same way as the embodiment shown in Figure 1.

[0035] Figure 4 is again similar in some respects to the embodiment shown in Figure 1, and like reference numerals have been used in identical parts.

[0036] As in the embodiment shown in Figure 1, a single primary supply line 4 is used to draw beverage from the container 2 and a dividing means 10, is provided to supply beverage to supply line 6. In this embodiment a further dividing means 11 is provided which divides the beverage supply into two supply lines 8, 9.

[0037] A third dispense tap 17 is provided on supply line 9 as is a further membrane device 15.

[0038] Again the embodiment shown in Figure 4 functions in the same way as that shown in Figure 1 except that three flavoured alcoholic beverages each having a different gas content can be dispensed from the same container 2.

[0039] The skilled person will realise that more than three taps 16, 17, 18 could be provided. Further, some of the taps could dispense identical FAB, but in different parts of the bar, or indeed, in different bars.

[0040] We may set the gas contents of the different taps 16, 17, 18 so that the FAB dispensed from one tap is dispensed as normal (e.g. as normal cola, or lemonade, or FAB) and from another tap as a full glass of foamy liquid which collapses over time (possible of the order of minutes). The initial, protohead, foamy volume may collapse to form a drink with substantially the same volume of liquid (plus a head of froth if a true, stable frothy head is present on the drink). For example we may provide a lemon flavoured FAB which is dispensed as a glass substantially full of foam which collapses down to substantially the same volume of cleared liquid plus a true head of froth (or just to all cleared liquid, no head).

[0041] It might take 20, 30, 60, 90, 120, 150, 180 or more seconds for the foamy protohead to collapse to a substantially constant volume of cleared liquid (possibly plus head), or the above points may define the start/end of ranges of time for that effect to be achieved.

[0042] The following table shows the gas content of various beverages which could be dispensed using the present invention.

Example 1		
	FAB	FAB MODIFIED
IN KEG BEFORE GAS MODIFICATION	1 VOL/VOL CO_2 LOW N_2	1 VOL/ VOL CO_2 LOW N_2
AFTER GAS MODIFICATION AT TAP	1 VOL/VOL CO_2 LOW N_2	ADDED 10, 20, 30, or 40 mg/L N_2

Example 2		
	FAB	FAB MODIFIED
IN KEG BEFORE GAS MODIFICATION	1 VOL/VOL CO_2 LOW N_2	1 VOL/ VOL CO_2 LOW N_2
AFTER GAS MODIFICATION AT TAP	1 VOL/VOL CO_2 LOW N_2	2 VOL/ VOL CO_2 LOW N_2

[0043] Of course, the skilled man will appreciate that the base gas content could be zero, or substantially zero (for a particular gas). Thus, it may be possible to have a common bulk container provide beverage for a "still" tap and for a "gassified" tap - for example still water and carbonated water, or still fruit drink or carbonated fruit drink.

Claims

1. A method of dispensing a beverage, the method comprising providing a bulk container containing a beverage, the beverage having a base gas content; providing at least two supply lines for dispensing the beverage from the container and altering the gas content of the beverage within at least one of the supply lines from the base gas content.

2. A method according to Claim 1, wherein gas is added to or removed from the beverage through a membrane provided in at least one supply line.

3. A method according to Claim 2, wherein the beverage is maintained to a beverage side of the membrane and a gas or gas mixture is maintained on the other, gas side of the membrane.

4. A method according to any preceding claim, wherein nitrogen or carbon dioxide, or a mixture of nitrogen and carbon dioxide is added to the beverage within at least one supply line.

5. A method according to Claim 4, wherein the nitrogen content of the beverage in the supply line is increased by an amount in the range 10 mg/L to 70 mg/L.

6. A method according to Claim 5, wherein the nitrogen content is increased by an amount in the range 15 mg/L to 55 mg/L.

7. A method according to Claim 6, wherein the nitrogen content is increased by 40 mg/L ± 10%.

8. A method according to Claim 4 wherein the carbon dioxide content of the beverage in the supply line is increased by an amount that is in a range between 0.25 vol./vol. to 1.75 vol./vol.

9. A method according to Claim 8, wherein the carbon dioxide content of the beverage in the supply line is increased by an amount in the range 0.75 vol./vol. to 1.25 vol./vol.

10. A method according to Claim 9, wherein the carbon dioxide content of the beverage is increased by 1 vol./vol. ± 10%.

11. A beverage dispensing apparatus comprising a bulk container for containing a beverage, at least two supply lines and at least one gas content altering means adapted to alter the gas content of beverage contained within at least one of the supply lines.

12. A beverage dispensing apparatus according to Claim 11, wherein the or at least one said gas content altering means includes a gas-permeable membrane provided in at least one supply line.

13. A beverage dispensing apparatus according to Claim 12, wherein the or at least one said gas-permeable membrane is substantially liquid-impermeable.

14. A beverage dispensing apparatus according to any of Claims 11 to 13, wherein a single primary supply line is provided for drawing the beverage from the container and distributing beverage to a plurality of supply lines.

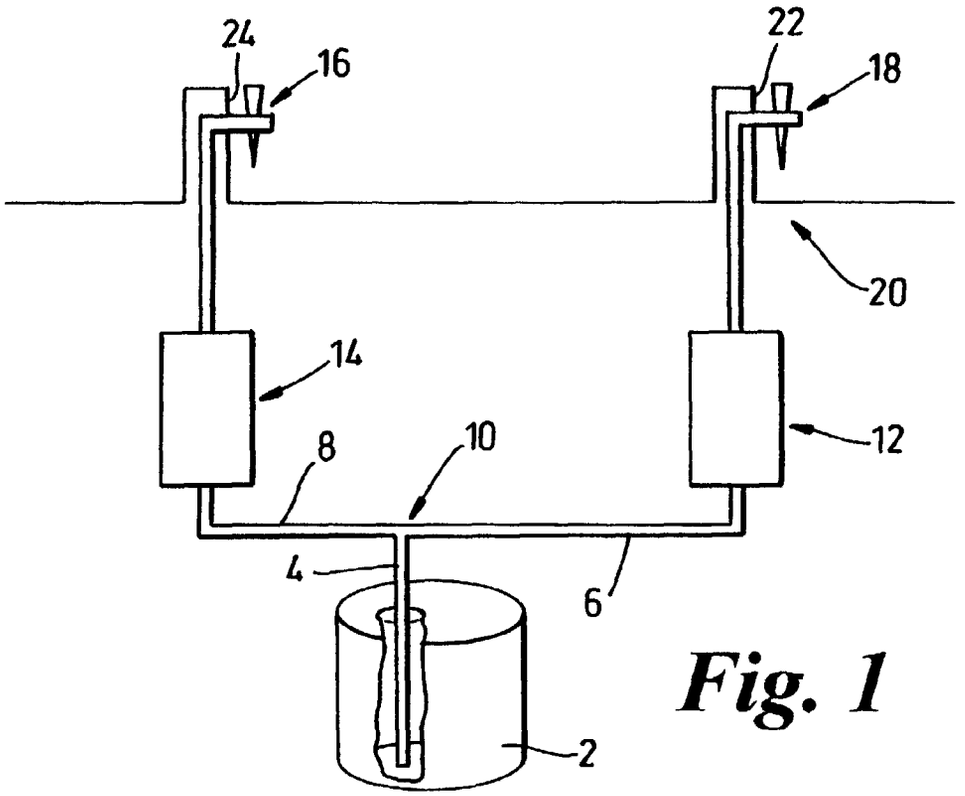

Fig. 1

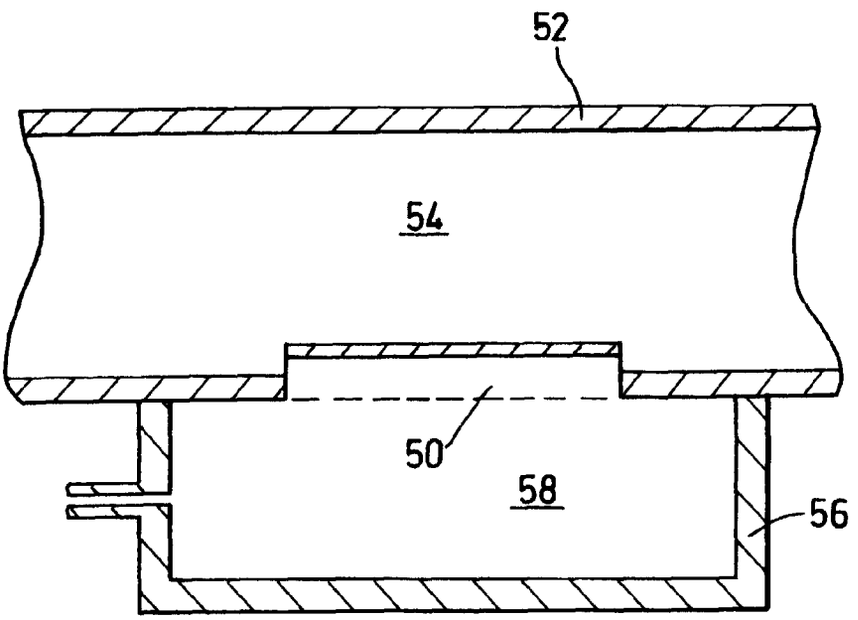

Fig. 2

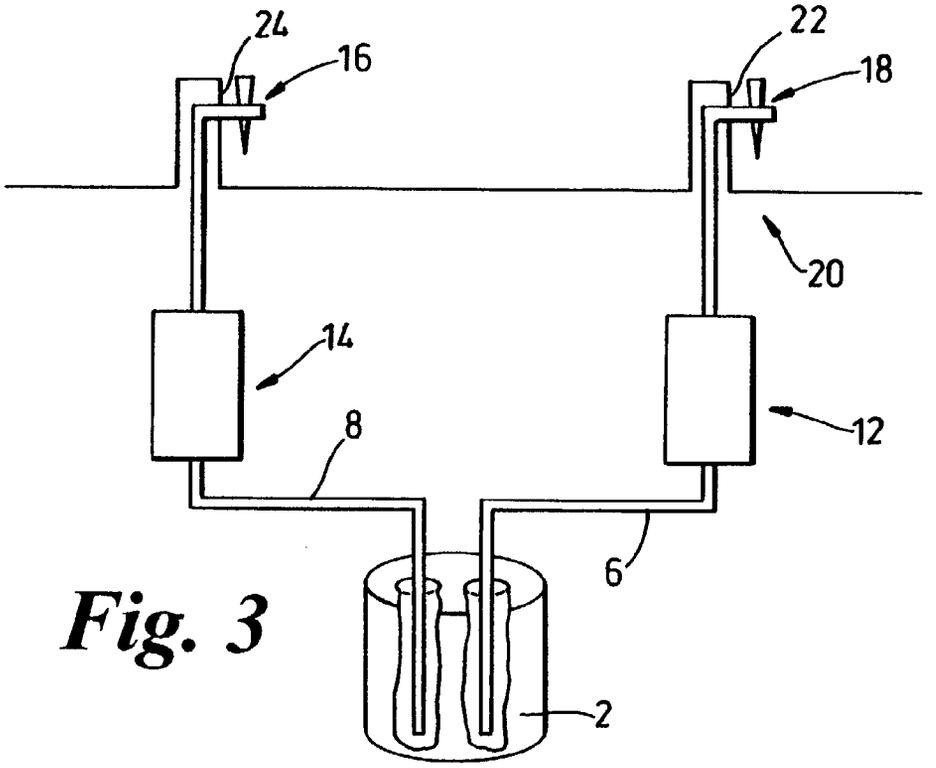

Fig. 3

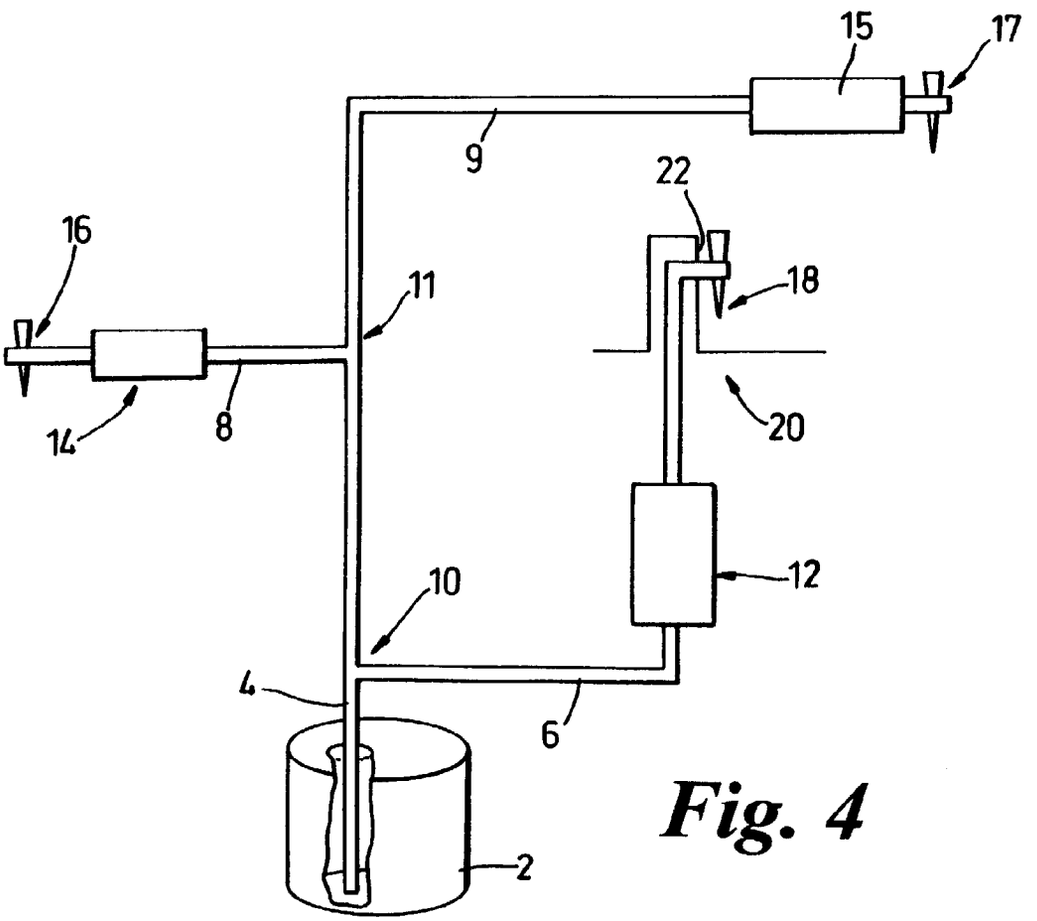

Fig. 4

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 30 0086

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	13 April 1999	Martínez Navarro, A.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 99 30 0086

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