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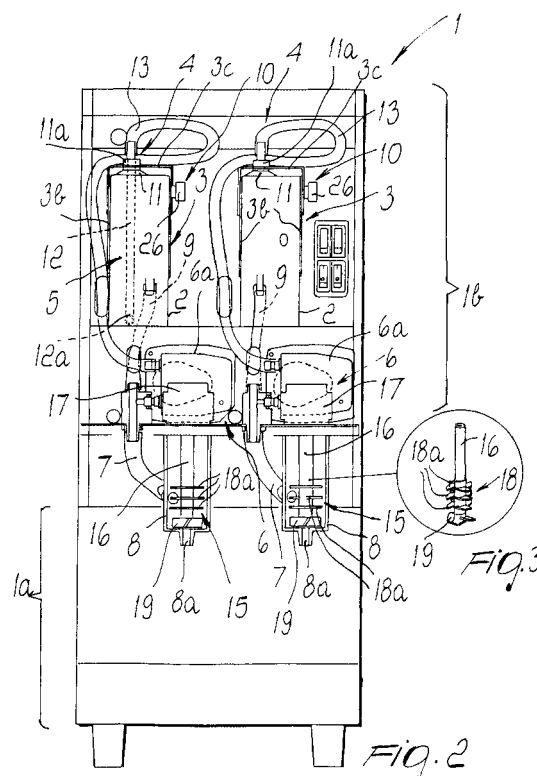
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(54) **Beverage dispenser with pierceable ingredient containers**

(57) A machine for instantly producing and dispensing beverages having premixable concentrated components which can be diluted with water and the like, pre-packaged in pierceable box-like refills (2), is constituted by a box-like frame which is divided into at least two regions (1a, 1b), a first region (1a) for containing cooling elements and a second one (1b) for accommodating the refills (2) of concentrated components, and has, in the second region (1b), at least one modular support (3) for inserting the box-like refills (2) which is provided with means (4) for retaining the refills (2) by contact, and with piercing means (5) which cooperate with the retention means (4) and are connected to a suction element (6) which is interconnected to a mixing tank (8) arranged upstream of a conventional dispensing tap (8a), at least one second duct (9) for feeding dilution water or the like leading into the tank (8).



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Description

[0001] The present invention relates to a machine for instantly producing and dispensing beverages having premixable concentrated components which can be diluted with water and the like, pre-packaged in pierceable box-like refills.

[0002] Machines for instantly producing and dispensing beverages composed of a part of concentrate of flavor-providing substance, and a part of dilution liquid, generally constituted by water, have long been used.

[0003] The concentrated substances are packaged during production in conventional box-like packages, usually made of cardboard, which are used on the machines by an operator who, before starting operation of said machines, opens the packages and transfers their content into appropriately provided containment tanks.

[0004] Each tank can be paired with a second tank which contains dilution water or is connected, by means of an appropriate duct, to a dispenser tap, upstream of which there is also provided a second water feed pipe being directly connected to the normal user supply line.

[0005] This prior art suffers from a substantial drawback, consisting of the fact that handling of the box-like packages by the assigned operators provides no assurance as to the overall hygiene of the beverage: bacterial contaminations of various kinds can in fact occur during the opening and transfer operations.

[0006] Moreover, said handling requires availability of time on the part of the operator, who has to perform a number of required actions in order to feed each time the machines when the concentrate packages are used up.

[0007] The aim of the present invention is to solve the above-noted drawbacks of the conventional art, by providing a machine for instantly producing and dispensing beverages having premixable concentrated components which can be diluted with water and the like, pre-packaged in pierceable box-like refills, which requires minimal handling on the part of the operators, without such handling being in any case able to cause bacterial contamination, such handling being completed in an extremely short time.

[0008] This aim and this and other objects are achieved by a machine for instantly producing and dispensing beverages having premixable concentrated components which can be diluted with water and the like, pre-packaged in pierceable box-like refills, said machine being constituted by a box-like frame which is divided into at least two regions, a first region for containing cooling elements and a second one for accommodating said refills of concentrated components, characterized in that it has, in said second region, at least one modular support for inserting said box-like refills which is provided with means for retaining said refills by contact and with piercing means which cooperate with said retention means and are connected to a suction element which is interconnected to a mixing tank arranged up-

stream of a conventional dispensing tap, at least one second duct for feeding dilution water or the like leading into said tank.

[0009] Further characteristics and advantages will become better apparent from the description of a preferred embodiment of a machine for instantly producing and dispensing beverages having premixable concentrated components which can be diluted with water and the like, pre-packaged in pierceable box-like refills, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a sectional side view of the instant producing and dispensing machine according to the invention;

Figure 2 is a corresponding front sectional view thereof;

Figure 3 is an enlarged-scale detailed view of a stirring and shredding element with which the machine according to the invention is equipped.

[0010] With reference to the figures, 1 designates a machine for instantly producing and dispensing beverages having premixable concentrated components which can be diluted with water and the like, pre-packaged in pierceable box-like refills 2.

[0011] The machine 1 is constituted by a box-like frame which is divided into at least two regions 1a and 1b: a first region for containing conventional cooling elements and a second one for accommodating the refills 2 of concentrated components.

[0012] In said second region 1b, the machine 1 has at least one modular support 3 for inserting the box-like refills 2; said support is provided with means 4 for retaining the refills by contact, and with piercing means 5 which functionally cooperate with the retention means 4 and are connected to a suction element 6 being connected, by means of a first duct 7, to a mixing tank 8 being provided with a dispensing port 8a in a downward region; a second duct 9 for feeding dilution water or a similar liquid also leads into the tank 8.

[0013] The base 3a of the modular support 3 is slightly inclined in order to insert and rest the refills 2 in a slightly reclined position in order to make their content flow towards a lower edge, and is substantially constituted by a box-like receptacle which is composed of said base 3a and two side walls 3b; its shape substantially duplicates the shape of the box-like refills 2, and it is provided with a front wall which is open to allow the insertion or extraction of said refills.

[0014] The means 4 for retaining the box-like refills 2 are constituted by a lid 3c which is provided with means 10 for adjustable coupling to the walls 3b of the receptacle 3 and has, on its lower face for contact with said refills 2, at least one sucker element 11 for hermetic resting on the opposite upper faces of said refills 2; the sucker element 11 is provided with a short neck 11a which protrudes upwards, passes through the lid 3c and is ax-

ially traversed by a through channel 11b.

[0015] The piercing means 5 are constituted by a rigid tube 12 which is slightly longer than the height of the refills 2; an end 12a of said tube adapted to pierce said refills has a sharp tapering portion, and the opposite end is fitted onto a duct 13 for connection to said suction element 6.

[0016] The tube 12 can be inserted hermetically in the through channel 11b of the neck 11a and can be inserted through said neck into the box-like refill 2 after piercing the wall of the refill.

[0017] The suction element 6 is constituted, in the preferred embodiment of the invention, by a pump 6a of the peristaltic type.

[0018] The mixing tank 8 can be removably fitted on the frame of the machine 1, by interposing quick-coupling means 14 which are substantially constituted by a coupling of the so-called bayonet type between the inlet of said tank and the frame.

[0019] An element 15 for stirring and shredding the lumps and pulp of the concentrated components is also fitted inside the mixing tank 8; said element 15 is constituted by a shaft 16 which protrudes from a motor drive assembly 17 of its own which is arranged in an upward region, and a plurality of cutters 18 with radial blades 18a and a rotor 19 with vanes are mounted at the free end and coaxially in succession on said shaft; the rotor is mounted at the tip.

[0020] A tank 20 for accumulating water for dilution or a similar liquid is fitted in the second region 1b of the frame, in a rearward position with respect to the receptacle 3; the tank 20 is provided with means 21 for constantly maintaining the static head of the dilution water or the like.

[0021] Said means 21 are constituted by a second open-top tank 22 which is rigidly fitted in the internal upper region of said tank 20 and is provided, in a downward region, with a discharge port 23 which leads into the mixing tank 8 through the second duct 9; the end of a duct 24 for feeding dilution water or the like also leads into the second tank 22.

[0022] The tank 20 is also provided with coil-shaped cooling means 25 which can be immersed in the dilution water or the like.

[0023] The adjustable coupling means 10 are constituted by corresponding knobs 26 which can be tightened in vertical slotted seats 27 formed in the side walls 3b of the receptacle 3.

[0024] The operation of the invention is as follows: an operator places a box-like refill 2 in the receptacle 3, inserting it snugly between the walls 3b of said receptacle.

[0025] Advantageously, the inclination of the base 3a allows to keep the concentrate collected towards the edge of the refill 2 that is directed towards the inside of the machine 1 even when said concentrate decreases to a small amount.

[0026] The operator then applies the lid 3c on top of

the walls 3b, lowering it until the sucker element 11 rests and adheres against the upper face of the refill 2.

[0027] Once this position has been reached, the lid 3c is coupled by acting on the knobs 26.

[0028] Then the operator inserts the rigid tube 12 in the through channel 11b, whose diameter is advantageously calibrated so that said tube 12 forms a seal in sliding; through the channel 11b, the tube reaches and pierces the box-like refill 2 with its own sharp end 12a.

[0029] The operator then completes insertion, without however making contact with the contents of the refill 2, until said end reaches the bottom of the refill 2, or more specifically arrives proximate to the internal edge towards which the concentrate collects.

[0030] In this manner, the machine 1 is ready to dispense the beverage with the maximum assurance of hygiene.

[0031] When a consumer requests it, the operator activates the peristaltic pump 6a, which produces suction in the duct 13 connected to the tube 12 and draws through it a preset dose of concentrate which is sent towards the mixing tank 8.

[0032] At the same time, the equally preset amount of dilution water is drawn from the normal user mains or from the tank 20 by way of a conventional electric valve 29 which reaches the mixing tank 8 by means of the second duct 9.

[0033] The amalgamation of the components of the beverage then occurs within said tank; this operation is completed by the rotation of the shaft 16 and the intervention of the blades 18a and of the vane-fitted rotor 19, which provide the actual mixing and breaking up of the pulp of the concentrate (which is usually very dense) and of any lumps or pieces of natural substance that were present in it from packaging.

[0034] The beverage is then dispensed through the appropriately provided port 8a.

[0035] It is noted that the dilution water can arrive directly, as mentioned, from the normal user line or can also be contained in the tank 20 after being transferred into it.

[0036] However, in order to maintain a constant static head and ultimately maintain the correct stoichiometric composition between the concentrate and the dilution water, it is possible to install inside the tank 20 an open-top tank 22 into which the duct 24 that arrives from a conventional submersed pump 28 leads; the volume of water inside said tank 22 is thus kept substantially constant even during the dispensing of the beverage, and the static head, which is also constant, ensures that the beverage has no imbalances between the volumes of the two components that reach the mixing tank 8.

[0037] It is also possible to arrange in the tank 20 a cooling coil 25 in order to keep the dilution water, and ultimately the dispensed beverage, pleasantly cool.

[0038] In practice it has been found that the described invention achieves the intended aim and objects.

[0039] The invention thus conceived is susceptible of

numerous modifications and variations, all of which are within the scope of the inventive concept.

[0040] All the details may further be replaced with other technically equivalent elements.

[0041] In practice, the materials used, as well as the shapes and the dimensions, may be any according to requirements without thereby abandoning the scope of the protection of the appended claims.

[0042] The disclosures in Italian Patent Application No. MO2000A000034 from which this application claims priority are incorporated herein by reference.

[0043] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A machine for instantly producing and dispensing beverages having premixable concentrated components which can be diluted with water and the like, pre-packaged in pierceable box-like refills (2), said machine (1) being constituted by a box-like frame which is divided into at least two regions (1a, 1b), a first region (1a) for containing cooling elements and a second one (1b) for accommodating said refills (2) of concentrated components, **characterized in that** it has, in said second region (1b), at least one modular support (3) for inserting said box-like refills (2) which is provided with means (4) for retaining said refills (2) by contact and with piercing means (5) which cooperate with said retention means (4) and are connected to a suction element (6) which is interconnected, by means of a first duct (7), to a mixing tank (8) provided with a dispensing port (8a), at least one second duct (9) for feeding dilution water or the like leading into said tank (8).
2. The machine according to claim 1, **characterized in that** said modular support (3) has a slightly inclined base (3a) in order to insert and rest said refills (2) in a slightly reclined position.
3. The machine according to claims 1 and 2, **characterized in that** said modular support (3) is constituted by a box-like receptacle which substantially duplicates the shape of said box-like refills (2) and has a front wall which is open for the insertion or extraction of the refills (2).
4. The machine according to claims 1, 2 and 3, **characterized in that** said means (4) for retaining the box-like refills (2) are constituted by a lid (3c) provided with means (10) for adjustable coupling to the walls (3b) of said receptacle and is provided, on its lower contact face, with at least one sucker element (11) for resting hermetically on the opposite upper faces of the box-like refills (2), said sucker element (11) being provided with a short neck (11a) which protrudes upwards, passes through said lid (3c), and is axially crossed by a through channel (11b).
5. The machine according to claims 1 and 4, **characterized in that** said piercing means (5) are constituted by a rigid tube (12) which is slightly longer than the height of said box-like refills (2), an end (12a) of said tube (12) meant to pierce said refills (2) having a sharp tapering portion, the opposite end being fitted on a pipe (13) for connection to said suction element (6).
6. The machine according to claims 4 and 5, **characterized in that** said tube (12) can be fitted hermetically in said through channel (11b) of the neck (11a) of the sucker element (11) and can be inserted through it into the box-like refill (2) after piercing the wall of said refill (2).
7. The machine according to the preceding claims, **characterized in that** said suction element (11) is constituted by a pump of the peristaltic type.
8. The machine according to claim 1, **characterized in that** said mixing tank (8) can be installed removably on said frame by interposing quick coupling means (14).
9. The machine according to claim 8, **characterized in that** said quick coupling means (14) are constituted by a coupling of the so-called bayonet type.
10. The machine according to claims 1, 8 and 9, **characterized in that** an element (15) for stirring and shredding the lumps and pulp of said concentrated components is installed inside said mixing tank (8).
11. The machine according to claim 10, **characterized in that** said stirring and shredding element (15) is constituted by a shaft (16) which protrudes from its own motor drive unit (17) accommodated in an upward region, a series of cutters (18) with radial blades (18a) and a rotor (19) with vanes being fitted coaxially in succession at the free end of said shaft (16), the rotor (19) being arranged at the tip.
12. The machine according to the preceding claims, **characterized in that** a tank (20) for accumulating dilution water or the like is fitted in said second region (1b) of said frame.
13. The machine according to claim 12, **characterized in that** said tank (20) is provided with means (21)

for maintaining a constant static head of the dilution water or the like.

14. The machine according to claim 13, **characterized in that** said means (21) for maintaining a constant static head are constituted by a second open-top tank (22) which is rigidly installed in the internal upper region of said tank (20) and is provided, in a downward region, with a discharge port (23) which leads, through said second duct (9), into said mixing tank (8), the end of a duct (24) for feeding dilution water or the like leading into said second tank (22). 5 10
15. The machine according to claim 12, **characterized in that** said tank is provided with cooling means (21) which are shaped like a coil which can be immersed in said dilution water or the like. 15
16. The machine according to claim 4, **characterized in that** said adjustable coupling means (10) are constituted by corresponding knobs (26) which can be tightened in vertical slotted seats (27) formed in the side walls (3b) of said receptacle (3). 20

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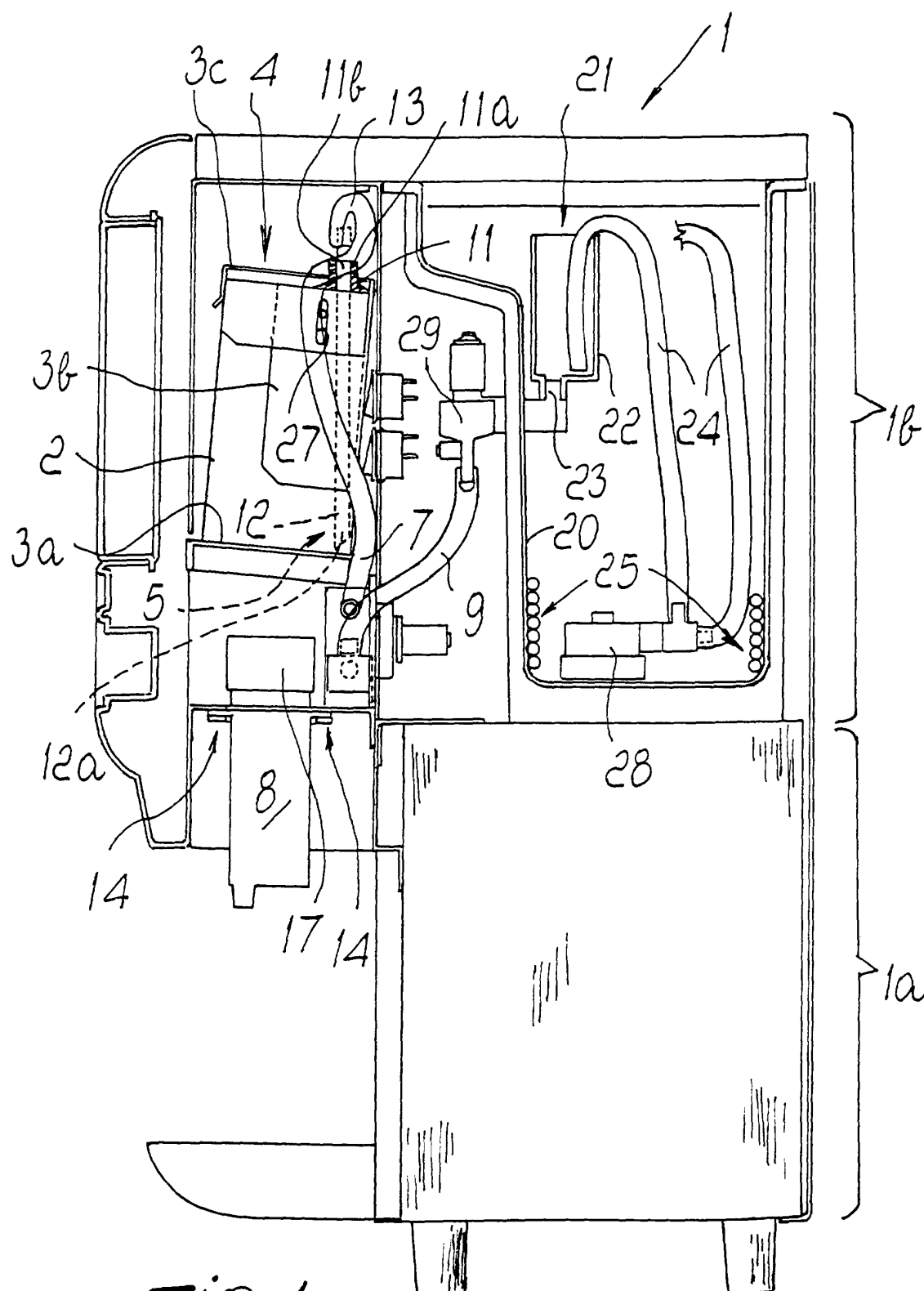
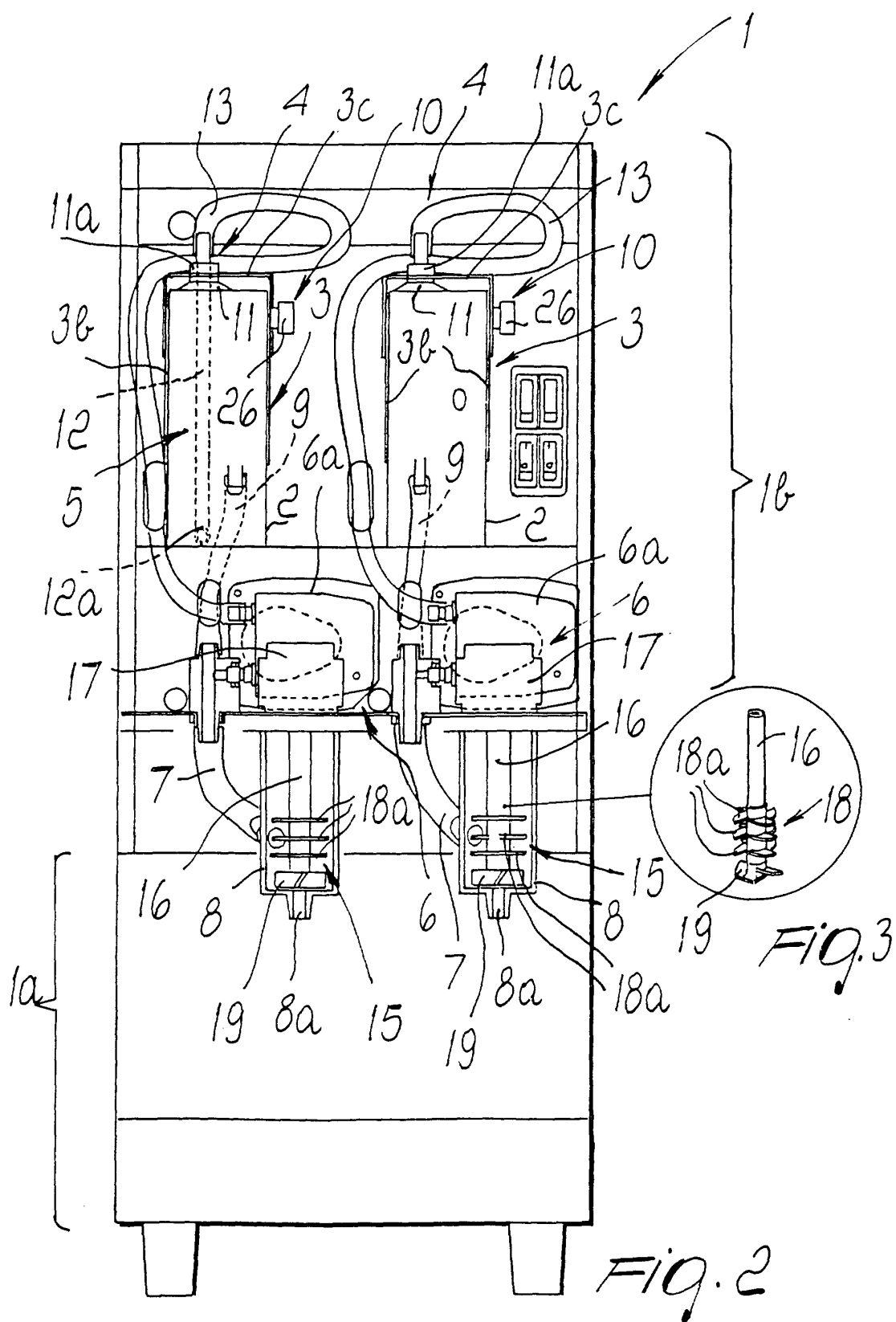


Fig. 1





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 01 10 3610

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)
A	WO 99 37577 A (THE COCA COLA COMPANY) 29 July 1999 (1999-07-29) * claim 11; figures 1,6,12 * ---	1	B67D1/00
A	EP 0 141 433 A (DOUWE EGBERTS) 15 May 1985 (1985-05-15) * page 2, line 21 - page 3, line 13; figures 1,2 * -----	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 29 May 2001	Examiner Deutsch, J.-P.
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			

EPO FORM 1503 03 82 (P04C01)

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

EP 01 10 3610

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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29-05-2001

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