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(54) **A PLANT FOR TAPPING BEVERAGES AND A PROCESS FOR THAT PLANT**

ANLAGE ZUM ABZAPFEN VON GETRÄNKEN UND VERFAHREN FÜR DIESE ANLAGE

INSTALLATION DE TIRAGE DE BOISSONS ET PROCÉDÉ DESTINÉ À CETTE INSTALLATION

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Description

FIELD OF APPLICATION

[0001] The present invention relates to a plant for tapping beverages, provided with means for managing a semi-automatic washing of the pipes which contain beverages to be dispensed on tap, typically represented by beer, as well as a process for automatic treatment of the tapping pipes that utilises the plant.

[0002] According to one embodiment, in the plant for tapping beverages of the invention, when the empty status of the container in use is signalled, the operator can intervene and carry out the washing operations, on termination of which the empty container is replaced with a new and loaded one.

[0003] In a further embodiment, in the plant for tapping beverages of the invention, the pulse signalling the empty status of the container in use is sent to a control unit which automatically starts the washing operations, on termination of which the empty container is replaced with a new and loaded one.

[0004] The present invention is advantageously applied in the sector of food distribution, especially in the sector of production of beverages served in businesses, such as bars, restaurants, pizzerias, or other businesses in which drinks are sold, in particular pressurised drinks, such as beer or the like.

PRIOR ART

[0005] It is known that in retail distribution of beverages, businesses use apparatus for direct dispensing to the glass. Though some beverages, such as soft drinks or wine, do not require special arrangements for maintaining said plants, beer has certain organoleptic characteristics that generate formation of bacteria internally of the pipes.

[0006] In particular, beer passing through the tapping plant pipes that are not subject at each change of keg to correct treatment, will, due to this bacteria, take on an unpleasant taste and a smell that are immediately noted by even an inexpert consumer; furthermore the micro-fermentation makes the beer cloudy.

[0007] In the prior art, so far known and used in the sector, the beer kegs are connected to a distribution plant associated to CO₂ gas cylinders loaded to about 50 bar via static pressure reducers and a water circuit for manual washing of the supply pipes which terminate with the classic bar-mounted dispensing taps.

[0008] The beer kegs are generally stored in store rooms where, very often, the plants are kept together with coolers for the purposes of refrigeration.

[0009] The environmental conditions of the rooms in which the beer kegs are positioned can change both over the short term and the long term and in the majority of cases it has been found that these rooms are not treated in respect of the variability of environmental conditions;

this leads to faults which compromise the functioning of the dispensers.

[0010] These environmental conditions accelerate the formation of deposits internally of the piping of the tapping plant and already after a few days significant alterations are noted only by carrying out a visual inspection.

[0011] The technology used at present comprises circuits and devices that require the direct intervention of the manager to replace the keg, the washing of the pipes and the resetting of the dispenser circuit.

[0012] When the keg, as often happens, becomes empty when the demand for the product is at its highest, the manager, lacking time and not wanting to risk losing custom, is forced to avoid the manual plant washing procedure, and thus replaces the keg and continues dispensing.

[0013] In this matter, the prior art has already developed solutions that in a first case, described in document EP0269152, include the use of pneumatic activators and balanced pressure control between two kegs connected in parallel, enabling a semi-automatic switching by means of a pneumatic control from the empty keg, with injection of water into the circuit.

[0014] This first described system has shown itself to be very complex and laborious and, possibly due to purchasing and installation costs, has probably not rendered the hoped-for results, as today the system is not used and the project design has probably been abandoned due to excessive cost of the plant.

[0015] This system further required a nozzle plug on the keg that was designed and realised specifically, which had a further effect on costs of a product already excessively expensive.

[0016] A second document, illustrated in patent application No. WO2015/015275A1, describes a control system of the dispensing flow based on a compensator located between the cooler and the tap, with the main objective of controlling the dispensing pressure on tap based on the environmental parameters, thus excluding any automatic mechanism enabling the keg change combined with a washing of the plant.

[0017] To summarise, in the analysis of the issues described in the foregoing, some unresolved aspects are identified, which have a different but negative impact on two distinct categories of involved subjects:

a) the final customer:

- might purchase a poor and untreated product and/or one not stored in an adequate way, and in fact the beer produces micro-organisms that deposit on the walls of the plant piping. These deposits are the source of micro-fermentations which make the beer cloudy as well as defective in terms of both taste and smell.
- Sometimes a too-long wait occurs, or indeed the customer might have to give up waiting for the by now unavailable product and opt for another.

b) The manager:

- at various times is forced not to follow the correct procedure due to lack of time;
- finds him or herself alone in the premises and is forced to absent him or herself for too long;
- cannot predict when the keg will be empty as there is no warning signal for this, if not with an approximate check;
- loses product each time he or she replaces a keg (about 1.5 litres);
- has no guarantee that the plant is operating in optimal conditions.

A third document DE 297 04 794 U1 discloses a plant for tapping beverages with means for automatic treatment of tapping pipes, whereby the plant comprises a pressurised beverage container, a tapping head installed on the beverage container, the tapping head is connected to a first pipe for pressurizing the container with CO₂, to a second pipe through which the beverage is supplied to a tap and to a third pipe that is connected to a municipal water source which selectively determines injection of washing water into the plant. Further a pressure reducer in the first pipe is connected to the source of CO₂ and a relief valve in the first pipe are foreseen. The flow of gas in the first pipe and the flow of water in the third pipe is selectively controlled on the basis of the dispensing conditions of the beverage or the washing conditions of the circuit by solenoid valves which are connected to a control logic.

DESCRIPTION OF THE INVENTION

[0018] The present invention discloses a plant for tapping beverages such as beer or the like that is able to obviate or at least drastically reduce the above-described drawbacks.

[0019] The invention in particular provides a plant for tapping beverages such as beer or the like, provided with semi-automatic washing means, during the keg-changing steps, able to increase the efficiency of the system, guaranteeing a higher quality of the product on tap and, consequently, an increase in the performance of the business which acquires value in terms of reliability and quality.

[0020] This is obtained with a plant for tapping beverages such as beer and the like of the above-described type and having the features described in the characterising part of the main claim.

[0021] The dependent claims of the present solution outline advantageous embodiments of the invention.

[0022] The main advantages of this solution relate to the fact that said tapping plant is able to guarantee no contact of the liquids with parts or organs which are not only the membranes of the solenoid valves which comply with the existing standards.

[0023] Further, the plant according to the invention is

able to guarantee a time saving for the manager and a significant increase in the hygiene conditions of the plant itself.

[0024] Not least, the plant can significantly reduce maintenance operations and may even not necessarily require the replacement of the keg fittings, as the ones already present can be used.

[0025] The plant of the invention also guarantees a very much reduced energy consumption, around 3 Wh for an annual cost of about € 5.00.

[0026] Substantially, this plant, as well as the traditional hydraulic components, comprises four normally-closed solenoid valves which manage the flows of liquids and gas. The flows are conveyed by pressure difference between two points involved in the switching. The valves are activated/deactivated by a programmed logic control system.

[0027] The system is equipped with a keypad membrane associated to an alphanumeric display for example of the four row/twenty column type, more than sufficient to give indications on the status of the plant.

[0028] Further, a graphic display is positioned on the tapping column to enable the manager to monitor the situation.

ILLUSTRATION OF THE DRAWINGS

[0029] Further features and advantages of the invention will become apparent from reading the following description of an embodiment of the invention provided by way of non-limiting example with the aid of the figures illustrated in the appended tables of drawings, in which:

- figure 1 illustrates the electrical-hydraulic diagram of a management plant according to the invention in the most complete use version, i.e. automatically managed;
- figure 2 illustrates an electrical-hydraulic diagram of the plant in the manually-managed version;
- figures 3 and 4 are schematic views of a nozzle plug of the beverage keg used in the system according to the invention, respectively in a tapping operation and in a washing operation.

DESCRIPTION OF AN EMBODIMENT OF THE INVENTION

[0030] With reference to the appended figures, and initially in particular with reference to figure 1, 10 generally indicates the electrical-hydraulic diagram of the plant according to the invention, which comprises some major components which in part are already used for tapping the beer.

[0031] Reference numerals 11 and 12 denote two kegs containing the beverage, normally beer, the first of which is connected to the plant and therefore in use and thus designed to be emptied, the second is new, completely loaded and ready to replace the keg 11 at the moment

in which it is empty.

[0032] A nozzle plug 13 is inserted in the keg 11, in which a first inlet pipe 14 is inserted for injection of CO₂ coming from a cylinder 15, a second pipe 16 which dispenses the beverage towards a tap 17, and a third pipe 18 which is connected to a washing tap 19 of washing water which at the appropriate time determines injection of washing water into the plant through a pipe 20.

[0033] The hydraulic plant further comprises a pressure sensor 21 located on the line 22 of the CO₂ cylinder 15 to which a pressure reducer 23 located on the same line 22 is also associated, a relief valve 24 positioned on the line 14 of the CO₂ which is injected into the keg 11, as well as possibly a litre counter 25 positioned on the pipe 16 which enables dispensing the beverage from the tap 17.

[0034] According to the invention, the plant comprises four normally-closed solenoid valves 26, 27, 28 and 29 which manage the flows of liquids and gas, the first three of which are located along the pipes 14 and 22 of the CO₂, dispensed by the cylinder 15, while the fourth valve 29 is positioned along the pipe 18 and 20 from which washing water coming from the tap 19 is injected into the plant.

[0035] More in particular the valve 26 is dedicated to the charging gas CO₂, the valve 27 is dedicated to the discharging of the gas when the keg is empty, the valve 28 is an overpressure discharge valve of the keg 11 and the valve 29 is for starting the washing operation.

[0036] If a half-consumed beer keg 11 is detached, in which the beer is under pressure, and if later the same keg were to be re-attached to the plant, the pressure inside the keg would cause an exit of beer towards the pipes 14 and 22 which are exclusively dedicated to the gas.

[0037] In this matter, the valve 28 is apt for blocking the outlet of the beer from the keg 11 towards the valves 26 and 27, which in a traditional plant is obtained via a check valve located on the gas inlet positioned on the nozzle plug 13.

[0038] Therefore, in the plant according to the invention, the traditional check valve has been replaced by the valve 28, which enables discharging the pressure internally of the keg once all the beer has been dispensed and before activating the washing mechanism. The valve 28 therefore has two purposes:

- it operates as a check valve in relation to the nozzle plug 13 towards the pipes dedicated to the gas 14 and 22,
- it enables discharging the gas pressure internally of the keg 11 so as to create a pressure difference, so that by opening the valve 29 the washing water can begin to flow out.

[0039] All the listed hydraulic components, and in particular the solenoid valves 26, 27, 28 and 29, the pressure sensor 21, the litre counter 25, are electrically connected

to a control unit 30 which in the case of automatic management of the plant comprises a control logic represented by a PLC or another like management unit, including of a digital type with one or more processors.

[0040] In particular, as illustrated in figure 1, the control logic 30 is connected to the valve 26 via the connection 40, to the valve 27 via the connection 41, to the valve 28 via the connection 42 and to the valve 29 via the connection 43.

[0041] One of the electrical connections, denoted by reference numeral 44, is further dedicated to the control of a liquid sensor 31, normally a colour sensor, i.e. a switch usable in a case of manual control, located along the conveying line 16 of the beverage towards the tap 17.

[0042] The connection 45 is dedicated to the sensor 25 which is not a button but only a litre counter and not part of the washing plant but only to give the manager the possibility of seeing the residual quantity of beer inside the keg 11, while the connection 46 is dedicated to the pressure sensor 21.

[0043] The presence of a check valve 35 located on the water pipe 20 is provided, which prevents the flow of the beverage towards the municipal water supply in a case of overpressure.

[0044] According to an embodiment of the invention, the plant 10 comprises further accessories which also enable controlling parameters external of the plant, i.e. at least an ambient temperature sensor 32, at least a cooler temperature sensor 33 and at least a cooler actuator relay 34.

[0045] With reference to figures 3 and 4, reference numeral 13 denotes in its entirety the nozzle plug applicable on the beer keg 11. The nozzle comprises 3 sleeves; the first, indicated by reference numeral 50, represents the inlet of the CO₂ flow coming from the cylinder 15 via the pipes 22 and 14, the second 51 is connected to the water connection 19 via the pipe 18 and the third sleeve denoted by reference numeral 52 is connected to the tap 17 via the pipe 16.

[0046] From the operating point of view, the flow exiting from the sleeve 52, in the normal dispensing operation is beer or another beverage as since the water pipe 18 is closed by the valve 29 the pressure in the sleeve 51 is zero.

[0047] Upon reaching the empty status of the keg 11 the pipe 14 is opened by means of the valves 28 and 27 which zero the pressure in the sleeve 52. At this moment the valve 29 is opened for injection of water into the plant.

[0048] In this situation the sleeve 52 is at zero pressure while the sleeve 51 is at a higher pressure, being equal to the municipal water system pressure. This pressure difference enables the water to enter automatically into the sleeve 51, to exit from the sleeve 52, to transit in the pipe 16 and to exit through the tap 17, thus carrying out the washing of the plant.

[0049] The system is equipped with a keypad membrane associated to an alphanumeric display for example of the four row/twenty column type, and is sufficient to

enter work parameters and control the information on the status of the plant.

[0050] Further, the plant can comprise a graphic display positioned on the tapping column to enable the manager to monitor.

[0051] The CO₂ gas contained in the cylinder 15 at a pressure of 50 bar, crosses a pressure reducer 23 which supplies the gas to the valve 26 at a pressure of 4/5 bar. The pressure sensor 21 is located downstream of the valve 26 and monitors the pressure in the keg.

[0052] The control logic or control unit 30 of the circuit regulates the pressure on the basis of characteristics of the plant defined during the installation step.

[0053] In the stand-by status with the plant at a standstill, all the valves 26, 27, 28 and 29, are inactive and therefore closed.

[0054] For use of the plant, the work cycle is started which leads to the opening of the valve 26, which enables dispensing the CO₂ from the cylinder 15 up to reaching the defined pressure value, controlled by the pressure sensor 21.

[0055] In this condition there is a dispensing of the product on opening the valve of the tap 17, through the pipe 16.

[0056] When the keg is empty, the liquid sensor 31, or a switch in a case where the system is of a manual type, intercepts the foam produced by the beer via the sleeve 52 and the pipe 16, and sends a signal of the empty status of the keg which activates a pre-washing status where the gas dispensing valve 26 is closed, while the valves 27 and 28 are opened for discharge of the pressure in the keg 11.

[0057] While the pressure sensor 21 detects a pressure of lower than the municipal water supply (2/3 bar) the system activates the washing status, in which the valve 27 closes at a pressure of around 0.5 bar and the gas injection valve 28 also closes, while the water pipe valve 29 is opened to enable water to flow into the plant and perform the washing cycle.

[0058] During the washing step the condition illustrated in figure 4 takes place, in which it can be observed that the water enters from the sleeve 51 connected to the water connection through the pipe 18 and exits from the adjacent sleeve 52 connected to the tap 17 through the pipe 16, so that the water exits from the tap and cleans the pipes.

[0059] In the meantime the barman is advised that the keg is empty and by opening the tap 17 he or she can still obtain about 1.5 litres of beer on the basis of the length of the plant, before the water begins to flow out.

[0060] At this moment a rapid replacement of the empty keg 11 with the new and completely loaded keg 12 can be carried out, so that in a very short time the cycle is re-initiated, and the barman is required to leave the room for a very short time and also is certain that the plant is perfectly in order and at its maximum efficiency.

[0061] Note that the valve 28 has the aim of preventing overpressure in a case of a connection with an already

pressurised keg.

[0062] On restarting the cycle, after about 1.5 litres of water dispensing, the beer returns on tap without excessive foam and the pipe 16 connecting the keg to the tap 17 has been thoroughly washed.

[0063] The invention has a characteristic that makes it unique in its type: the sensor 31 is not in direct contact with the liquid as it is made up of a housing, specifically designed, in which the transparent pipe 16 transits. The sensor 31 is arranged in the environs of the pipe 16 so as to sense the colour of the liquid and emit an RGB encoding processed by a specific algorithm being run, so as to recognise the type of liquid which is crossing the pipe, the beer or the foam, or the water or, indeed, if there is an absence of liquid.

[0064] A self-detecting procedure is also included of the use parameters enabling calibration in the specific ambient conditions if the programmed procedures did not perform the right measurements.

[0065] Also noteworthy is that the described plant is structurally very simple and requires no particular pressure sensors, nor pneumatic valves in contact with the liquid or other empirical devices which increase the calibrating difficulties, the risks of malfunctioning and the polluting of the liquid.

[0066] The plant according to the invention advantageously enables the user a short-term return of the investment for installation of the plant, which can be done over a short time, from savings in the amount of product, the reduction of the reset time for the plant and from a probable and hoped-for increase in sales due to the improved quality of the product.

[0067] The described system further comprises optimal plant hygiene conditions as pipes can be washed with water when the plant is not in use which prevents the formation of bacteria in the pipes when the plant is at standstill.

[0068] The business in which this plant, which is revolutionary and innovative in this sector, is installed, might state all of the above characteristics in its marketing approach.

[0069] In further embodiments, the system can also be used in a plant with two or more branches in which the following components are used once only: check valve 35, pressure reducer 23, gas cylinder 15, temperature sensors 32 and 33, cooler actuator 34, pipes 20 and 26.

[0070] Consequently there is the possibility of including several apparatus of the same type within a same box, in order to enable using more product branches, for greater productivity as the idle periods required for the replacement of empty kegs is increased.

[0071] The management system, i.e. the control logic of the plant, can be set to verify and authorise the use of the product applied, in respect of any commercial agreements, and can also be set for remote control via special applications.

[0072] The possible application for the system management can further be used for remote updates of the

management circuit software, and access can be afforded for data on the status of the plant and operating logs.

[0073] In further possible uses, the possible application for system management might instantaneously advise on malfunctioning issues, or control consumptions, and it would even be possible for it to be connected to an energy system backup in a case in which an electrical fault on the supply network were to occur.

[0074] Figure 2 illustrates a plant according to the invention realised for a manual use of the system. In this case the control panel of the preceding version is replaced by a power socket 60 and the electrical connections that lead to the valves 26, 27, 28 and 29 are respectively denoted by reference numerals 61, 62, 63 and 64.

[0075] In a case in which the plant were set for a completely manual management, the washing could be carried out by replacing the valves and the controls thereof with manual taps, which, to carry out the wash, must be open or closed, acting on the same logic for the automatic plant on the switches 61, 62, 63 and 64 connected to the respective valves 26, 27, 28 and 29.

[0076] The invention has been described in the foregoing with reference to a preferred embodiment thereof. However it is clear that the invention is susceptible to numerous variants which fall within the scope thereof, and which are technically equivalent.

Claims

1. A plant for tapping beverages comprising means for automatic treatment of tapping pipes, said plant comprising:

- a) a pressurised container (11) containing a beverage;
- b) a nozzle plug (13), insertable on said pressurised container (11), which is connected to a first pipe (14) for injection of gas originating from a source (15), to a second pipe (16) which dispenses the beverage towards a tap (17), and to a third pipe (18, 20) connected to a municipal water source (19) which selectively determines injection of washing water into the plant;
- c) a pressure reducer (23) positioned on the fourth pipe (22) connected to the first pipe (14) of said gas source (15);
- d) a relief valve (24) positioned on the first pipe (14) of said gas injected into said pressurised container (11); said plant further comprising at least a pressure sensor (21) positioned on a fourth pipe (22) connected to the first pipe (14) of said gas source (15), and in that said first and fourth pipes (14, 22), which connect said gas source (15) with said pressurised container (11), are intercepted by respective first (26), second (27) and third (28) solenoid valves which are

electrically connected to a control logic (30), or to a power socket (60), for determining a charging and/or a discharging of the pressure of said gas on the basis of the dispensing conditions of the beverage or the washing conditions of the circuit, and in that said third pipe (18, 20) connected to a municipal water source (19) is intercepted by a fourth solenoid valve (29) in turn electrically connected to said control logic (30), or to a power socket (60) for enabling or halting an inflow of water into the pipes of the plant.

- 2. A plant for tapping beverages according to claim 1, **characterised in that** said valve (26) controls opening or closing of the inflow of gas from said source (15), **in that** said valve (27) controls the gas discharge with the pressurised container (11) empty, and **in that** said valve (28) controls the overpressure discharge of the pressurised container (11).
- 3. A plant for tapping beverages according to any one of the preceding claims, **characterised in that** one of the electrical connections (44) is dedicated to control of a liquid sensor (31), i.e. a switch usable in a case of manual control, located along the conveying line (16) of the beverage towards the tap (17).
- 4. A plant for tapping beverages according to claim 3, **characterised in that** said liquid sensor (31) comprises a colour sensor suitable for identifying whether in the dispensing pipe (16) directed to said tap (17) there is or not an inflow of beverage so as to signal an empty status to the system.
- 5. A plant for tapping beverages according to any one of claims 3 and 4, **characterised in that** said liquid sensor (31) comprising a colour sensor is able to signal the empty status of beverage to the system and, in a case of automatic management, an initiation of the washing cycle.
- 6. A plant for tapping beverages according to any one of the preceding claims, **characterised in that** said nozzle plug (13) applicable on the beer keg (11) comprises three connecting sleeves:
 - a) a first gas sleeve (50) for gas coming from the gas source (15) through the first and fourth pipes (22, 14);
 - b) a second sleeve (51) connected to the water connection (19) via the third pipe (18);
 - c) a third sleeve (52) connected to the tap (17) via the second pipe (16).
- 7. A process for cleaning a plant for tapping beverages according to any one of claims 1 to 6, **characterised in that** the empty status of beverage in said pressurised container (11), signalled by said liquid sensor

(31), which intercepts passage thereof through the second pipe (16), determines an initiation of following operations:

- sending an empty status of beverage signal to a central control panel which activates a pre-washing status where the gas dispensing first valve (26) is closed, while said second and third valves (27, 28) are opened for discharge of the pressure in said pressurised container (11);
 - activating the washing status when the pressure sensor (21) has detected a pressure lower than a pressure of the municipal water system, and during this step the excess gas second valve (27) closes at a pressure of around 0.5 bar and the gas injection third valve (28) also closes, while the water pipe fourth valve (29) is opened to enable water to flow into the plant and perform the washing cycle;
 - inlet of the water from the sleeve (51) connected to the water connection through the third pipe (18) and outlet from the adjacent sleeve (52) connected to the tap (17) through the second pipe (16), so that the water exits from the tap, cleaning the pipes;
 - opening of the tap (17) which still contains the last residues of beverage, on the basis of a length of the plant, before the water begins to flow;
 - replacing the empty pressurised container (11) with a new and completely loaded container, leading to the restart of the cycle in a few moments;
 - restarting the cycle so that after a residual quantity of water the beverage reaches the tap, the beverage being able to be dispensed through the second pipe (16) which connects the pressurised container (11) to the tap (17), which tap (17) is now fully washed.
8. A process according to claim 7, **characterised in that** the flow exiting from the third sleeve (52) of said nozzle plug (13) applicable on the keg (11) during normal dispensing operation is represented by the beverage which can flow out towards the tap (17) as the third washing pipe (18) is closed by the fourth valve (29), the pressure in the second sleeve (51) is zero and the gas coming from the gas source (15) enters through the first sleeve (50).
9. A process according to any one of claims 7 and 8, **characterised in that** on empty status of the pressurised container (11) being reached, the pipe (14) is opened by a command sent to the valves (28, 27) which valves (28, 27) reset the pressure at the third sleeve (52) to zero, and at this moment the valve (29) is opened for injection of water into the plant.

10. A process according to any one of claims 7 to 9, **characterised in that** during the washing step the beverage dispensing third sleeve (52) is at zero pressure while the second sleeve (51) for water inlet is at a higher pressure, the higher pressure being equal to the municipal water system pressure and **in that** such pressure difference enables the water to enter automatically into the second sleeve (51), to exit from the third sleeve (52), to transit in the pipe (16) and to exit through the tap (17), thus carrying out the washing of the plant.

Patentansprüche

1. Anlage zum Zapfen von Getränken, die Mittel zur automatischen Behandlung von Zapfleitungen umfasst, die Anlage umfassend:
- a) einen Druckbehälter (11), der ein Getränk enthält;
 - b) einen Düsenstopfen (13), der an dem Druckbehälter (11) einführbar ist und mit einer ersten Leitung (14) zur Einspritzung von Gas, das aus einer Quelle (15) stammt, mit einer zweiten Leitung (16), die das Getränk zu einem Zapfhahn (17) hin abgibt, und mit einer dritten Leitung (18, 20) verbunden ist, die mit einer kommunalen Wasserquelle (19) verbunden ist und selektiv Einspritzung von Waschwasser in die Anlage bestimmt;
 - c) einen Druckminderer (23), der an der vierten Leitung (22) angeordnet ist, die mit der ersten Leitung (14) der Gasquelle (15) verbunden ist;
 - d) ein Entlastungsventil (24), das an der ersten Leitung (14) des Gases, das in den Druckbehälter (11) eingespritzt wird, angeordnet ist;
- wobei die Anlage ferner umfasst:
- zumindest einen Drucksensor (21), der an einer vierten Leitung (22) angeordnet ist, die mit der ersten Leitung (14) der Gasquelle (15) verbunden ist, und wobei die erste und vierte Leitung (14, 22), die die Gasquelle (15) mit dem Druckbehälter (11) verbinden, durch jeweilige erste (26), zweite (27) und dritte (28) Magnetventile unterbrochen sind, welche elektrisch mit einer Steuerlogik (30), oder einer Netzdose (60), verbunden sind, zum Bestimmen eines Ladens und/oder eines Entladens des Drucks des Gases auf der Grundlage der Abgabebedingungen des Getränks oder der Waschbedingungen des Kreislaufs, und wobei die dritte Leitung (18, 20), die mit einer kommunalen Wasserquelle (19) verbunden ist, durch ein viertes Magnetventil (29) unterbrochen ist, das wiederum elektrisch mit der Steuerlogik (30), oder einer Netzdose (60), verbunden ist, zum Ermöglichen oder Anhalten eines Zustroms von Wasser in die Lei-

tungen der Anlage.

2. Anlage zum Zapfen von Getränken nach Anspruch 1, **dadurch gekennzeichnet, dass** das Ventil (26) Öffnen oder Schließen des Zustroms von Gas aus der Quelle (15) steuert, dass das Ventil (27) die Gasabgabe mit dem Druckbehälter (11) im Leerzustand steuert, und dass das Ventil (28) die Überdruckabgabe des Druckbehälters (11) steuert.
 3. Anlage zum Zapfen von Getränken nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** eine der elektrischen Verbindungen (44) zum Steuern eines Flüssigkeitssensors (31) bestimmt ist, d.h. einem Schalter, der im Falle von manueller Steuerung verwendbar ist und entlang der Förderleitung (16) des Getränks zum Zapfhahn (17) angeordnet ist.
 4. Anlage zum Zapfen von Getränken nach Anspruch 3, **dadurch gekennzeichnet, dass** der Flüssigkeitssensor (31) einen Farbsensor umfasst, der zum Identifizieren geeignet ist, ob in der Abgabeleitung (16), die zum Zapfhahn (17) führt, ein Getränkezustrom vorliegt oder nicht, um dem System einen Leerzustand zu signalisieren.
 5. Anlage zum Zapfen von Getränken nach einem der Ansprüche 3 und 4, **dadurch gekennzeichnet, dass** der Flüssigkeitssensor (31), der einen Farbsensor umfasst, dazu imstande ist, dem System den Getränkeleerzustand und, im Falle von automatischer Verwaltung, eine Einleitung des Waschzyklus zu signalisieren.
 6. Anlage zum Zapfen von Getränken nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Düsenstopfen (13), der auf das Bierfass (11) anwendbar ist, drei Verbindungshülsen umfasst:
 - a) eine erste Gashülse (50) für Gas, das durch die erste und vierte Leitung (22, 14) von der Gasquelle (15) kommt;
 - b) eine zweite Hülse (51), die über die dritte Leitung (18) mit der Wasserverbindung (19) verbunden ist;
 - c) eine dritte Hülse (52), die über die zweite Leitung (16) mit dem Zapfhahn (17) verbunden ist.
 7. Prozess zum Reinigen einer Anlage zum Zapfen von Getränken nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, dass** der Getränkeleerzustand im Druckbehälter (11), der durch den Flüssigkeitssensor (31) signalisiert wird, welcher den Durchgang davon durch die zweite Leitung (16) unterbricht, eine Einleitung von folgenden Vorgängen bestimmt:
 - Senden eines Getränkeleerzustandssignals an ein zentrales Steuerpult, das einen Vorwaschzustand aktiviert, wobei das erste Gasabgabeventil (26) geschlossen wird, während das zweite und dritte Ventil (27, 28) zum Ablassen des Drucks im Druckbehälter (11) geöffnet werden;
 - Aktivieren des Waschzustands, wenn der Drucksensor (21) einen Druck erkannt hat, der niedriger als ein Druck des kommunalen Wasserversystems ist, und wobei während dieses Schritts das zweite Überschussgasventil (27) bei einem Druck von ungefähr 0,5 Bar schließt und das dritte Gaseinspritzventil (28) ebenfalls schließt, während das vierte Wasserleitungsventil (29) geöffnet wird, um zu ermöglichen, dass Wasser in die Anlage strömt und den Waschzyklus durchführt;
 - Einlassen des Wassers aus der Hülse (51), die mit der Wasserverbindung durch die dritte Leitung (18) verbunden ist, und Auslassen aus der benachbarten Hülse (52), die mit dem Zapfhahn (17) durch die zweite Leitung (16) verbunden ist, sodass das Wasser aus dem Zapfhahn austritt und die Leitungen gereinigt werden;
 - Öffnen des Zapfhahns (17), der immer noch die letzten Getränkereste enthält, auf der Grundlage einer Länge der Anlage, bevor das Wasser zu fließen beginnt;
 - Ersetzen des leeren Druckbehälters (11) durch einen neuen und vollständig gefüllten Behälter, was zum Neustart des Zyklus in wenigen Momenten führt;
 - Neustarten des Zyklus, sodass nach einer Restmenge von Wasser das Getränk den Zapfhahn erreicht, wobei das Getränk dazu imstande ist, durch die zweite Leitung (16) abgegeben zu werden, die den Druckbehälter (11) mit dem Zapfhahn (17) verbindet, wobei der Zapfhahn (17) nun vollständig gewaschen ist.
 8. Prozess nach Anspruch 7, **dadurch gekennzeichnet, dass** der Strom, der aus der dritten Hülse (52) des Düsenstopfens (13), welcher auf das Fass (11) anwendbar ist, während normalem Abgabebetrieb austritt, durch das Getränk dargestellt ist, das zum Zapfhahn (17) ausströmen kann, wenn die dritte Waschleitung (18) durch das vierte Ventil (29) geschlossen wird, der Druck in der zweiten Hülse (51) Null ist und das Gas, das von der Gasquelle (15) kommt, durch die erste Hülse (50) eintritt.
 9. Prozess nach einem der Ansprüche 7 und 8, **dadurch gekennzeichnet, dass**, wenn ein Leerzustand des Druckbehälters (11) erreicht wird, die Leitung (14) durch einen Befehl, der an die Ventile (28, 27) gesendet wird, geöffnet wird, wobei die Ventile (28, 27) den Druck an der dritten Hülse (52) auf Null

zurückstellen und in diesem Moment das Ventil (29) zur Einspritzung von Wasser in die Anlage geöffnet wird.

10. Prozess nach einem der Ansprüche 7 bis 9, **dadurch gekennzeichnet, dass** während des Waschschriffs die dritte Getränkeabgabehülse (52) auf Nulldruck ist, während die zweite Hülse (51) für Wassereinlass auf einem höheren Druck ist, wobei der höhere Druck gleich dem Druck des kommunalen Wassersystems ist, und dass solche Druckdifferenz ermöglicht, dass Wasser automatisch in die zweite Hülse (51) eintritt, aus der dritten Hülse (52) austritt, die Leitung (16) durchläuft und durch den Zapfhahn (17) austritt, wodurch das Waschen der Anlage ausgeführt wird.

Revendications

1. Une installation pour tirer des boissons comprenant des moyens pour le traitement automatique des tuyaux de tirage, ladite installation comprenant :

- a) un récipient sous pression (11) contenant une boisson ;
- b) un bouchon (13), insérable sur ledit récipient sous pression (11), qui est relié à un premier tuyau (14) pour l'injection de gaz provenant d'une source (15), à un deuxième tuyau (16) qui distribue la boisson vers un robinet (17), et à un troisième tuyau (18, 20) relié à une source d'eau municipale (19) qui détermine de manière sélective l'injection d'eau de lavage dans l'installation ;
- c) un réducteur de pression (23) positionné sur le quatrième tuyau (22) relié au premier tuyau (14) de ladite source de gaz (15) ;
- d) une soupape de sécurité (24) placée sur le premier tuyau (14) dudit gaz injecté dans ledit récipient sous pression (11) ; ladite installation comprenant en outre au moins un capteur de pression (21) positionné sur un quatrième tuyau (22) relié au premier tuyau (14) de ladite source de gaz (15), et en ce que lesdits premier et quatrième tuyaux (14, 22), qui relient ladite source de gaz (15) audit récipient sous pression (11), sont interceptés par des première (26), deuxième (27) et troisième (28) électrovannes respectives qui sont reliées électriquement à une logique de commande (30), ou à une prise de courant (60), pour déterminer une charge et/ou une décharge de la pression dudit gaz sur la base des conditions de distribution de la boisson ou des conditions de lavage du circuit, et en ce que ledit troisième tuyau (18, 20) relié à une source d'eau municipale (19) est interceptée par une quatrième électrovanne (29) à son tour reliée

électriquement à ladite logique de commande (30), ou à une prise de courant (60) pour permettre ou interrompre une arrivée d'eau dans les tuyaux de l'installation.

- 2. Installation pour le tirage de boissons selon la revendication 1, **caractérisée en ce que** ladite vanne (26) commande l'ouverture ou la fermeture de l'entrée de gaz provenant de ladite source (15), **en ce que** ladite vanne (27) commande la décharge de gaz avec le récipient sous pression (11) vide, et **en ce que** ladite vanne (28) commande la décharge de la surpression du récipient sous pression (11).
- 3. Installation pour le tirage de boissons selon l'une quelconque des revendications précédentes, **caractérisée en ce que** l'une des connexions électriques (44) est dédiée à la commande d'un capteur de liquide (31), c'est-à-dire un interrupteur utilisable dans un cas de commande manuelle, situé le long de la ligne de transport (16) de la boisson vers le robinet (17).
- 4. Installation pour le tirage de boissons selon la revendication 3, **caractérisée en ce que** ledit capteur de liquide (31) comprend un capteur de couleur approprié pour identifier si dans la conduite de distribution (16) dirigée vers ledit robinet (17) il y a ou non une entrée de boisson de manière à signaler un état vide au système.
- 5. Installation pour le tirage de boissons selon l'une quelconque des revendications 3 et 4, **caractérisée en ce que** ledit capteur de liquide (31) comprenant un capteur de couleur est capable de signaler l'état vide de boisson au système et, dans un cas de gestion automatique, une initiation du cycle de lavage.
- 6. Installation pour le tirage de boissons selon l'une quelconque des revendications précédentes, **caractérisée en ce que** ledit bouchon (13) applicable sur le fût de bière (11) comprend trois manchons de raccordement :
 - a) un premier manchon de gaz (50) pour le gaz provenant de la source de gaz (15) par les premier et quatrième tuyaux (22, 14) ;
 - b) un deuxième manchon (51) relié au raccord d'eau (19) par le troisième tuyau (18) ;
 - c) un troisième manchon (52) relié au robinet (17) par le deuxième tuyau (16).
- 7. Procédé de nettoyage d'une installation de tirage de boissons selon l'une quelconque des revendications 1 à 6, **caractérisé en ce que** l'état vide de boisson dans ledit récipient sous pression (11), signalé par ledit capteur de liquide (31), qui intercepte le passage de celle-ci par le deuxième tuyau (16), détermine

un lancement des opérations suivantes :

- envoyer un signal d'état vide de boisson à un panneau de commande central qui active un état de pré-lavage où la première vanne (26) de distribution de gaz est fermée, tandis que lesdites deuxième et troisième vannes (27, 28) sont ouvertes pour la décharge de la pression dans ledit récipient sous pression (11) ;
- l'activation de l'état de lavage lorsque le capteur de pression (21) a détecté une pression inférieure à une pression du réseau d'eau municipal, et pendant cette étape, la deuxième vanne de gaz en excès (27) se ferme à une pression d'environ 0,5 bar et la troisième vanne d'injection de gaz (28) se ferme également, tandis que la quatrième vanne de la conduite d'eau (29) est ouverte pour permettre à l'eau de s'écouler dans l'installation et d'effectuer le cycle de lavage ;
- l'arrivée de l'eau depuis le manchon (51) relié au branchement d'eau par le troisième tuyau (18) et la sortie depuis le manchon adjacent (52) relié au robinet (17) par le deuxième tuyau (16), de sorte que l'eau sort du robinet en nettoyant les tuyaux ;
- l'ouverture du robinet (17) qui contient encore les derniers résidus de boisson, sur la base d'une longueur de l'installation, avant que l'eau ne commence à couler ;
- le remplacement du récipient sous pression vide (11) par un nouveau récipient complètement chargé, ce qui permet de redémarrer le cycle en quelques instants ;
- le redémarrage du cycle de sorte qu'après une quantité résiduelle d'eau, la boisson arrive au robinet, la boisson pouvant être distribuée par le deuxième tuyau (16) qui relie le conteneur sous pression (11) au robinet (17), lequel robinet (17) est maintenant entièrement lavé.

8. Procédé selon la revendication 7, **caractérisé en ce que** l'écoulement sortant du troisième manchon (52) dudit bouchon (13) applicable sur le fût (11) pendant l'opération de distribution normale est représenté par la boisson qui peut s'écouler vers le robinet (17) lorsque le troisième tuyau de lavage (18) est fermé par la quatrième vanne (29), la pression dans le deuxième manchon (51) est nulle et le gaz provenant de la source de gaz (15) entre par le premier manchon (50).
9. Procédé selon l'une quelconque des revendications 7 et 8, **caractérisé en ce que** lorsque l'état vide du récipient sous pression (11) est atteint, la conduite (14) est ouverte par une commande envoyée aux vannes (28, 27), lesquelles vannes (28, 27) remettent à zéro la pression au niveau du troisième manchon (52), et à ce moment la vanne (29) est ouverte

pour l'injection d'eau dans l'installation.

10. Procédé selon l'une quelconque des revendications 7 à 9, **caractérisé en ce que**, pendant l'étape de lavage, le troisième manchon (52) de distribution de boisson est à une pression nulle tandis que le deuxième manchon (51) d'entrée d'eau est à une pression plus élevée, la pression plus élevée étant égale à la pression du système municipal d'eau et **en ce que** cette différence de pression permet à l'eau d'entrer automatiquement dans le deuxième manchon (51), de sortir du troisième manchon (52), de transiter dans le tuyau (16) et de sortir par le robinet (17), effectuant ainsi le lavage de l'installation.

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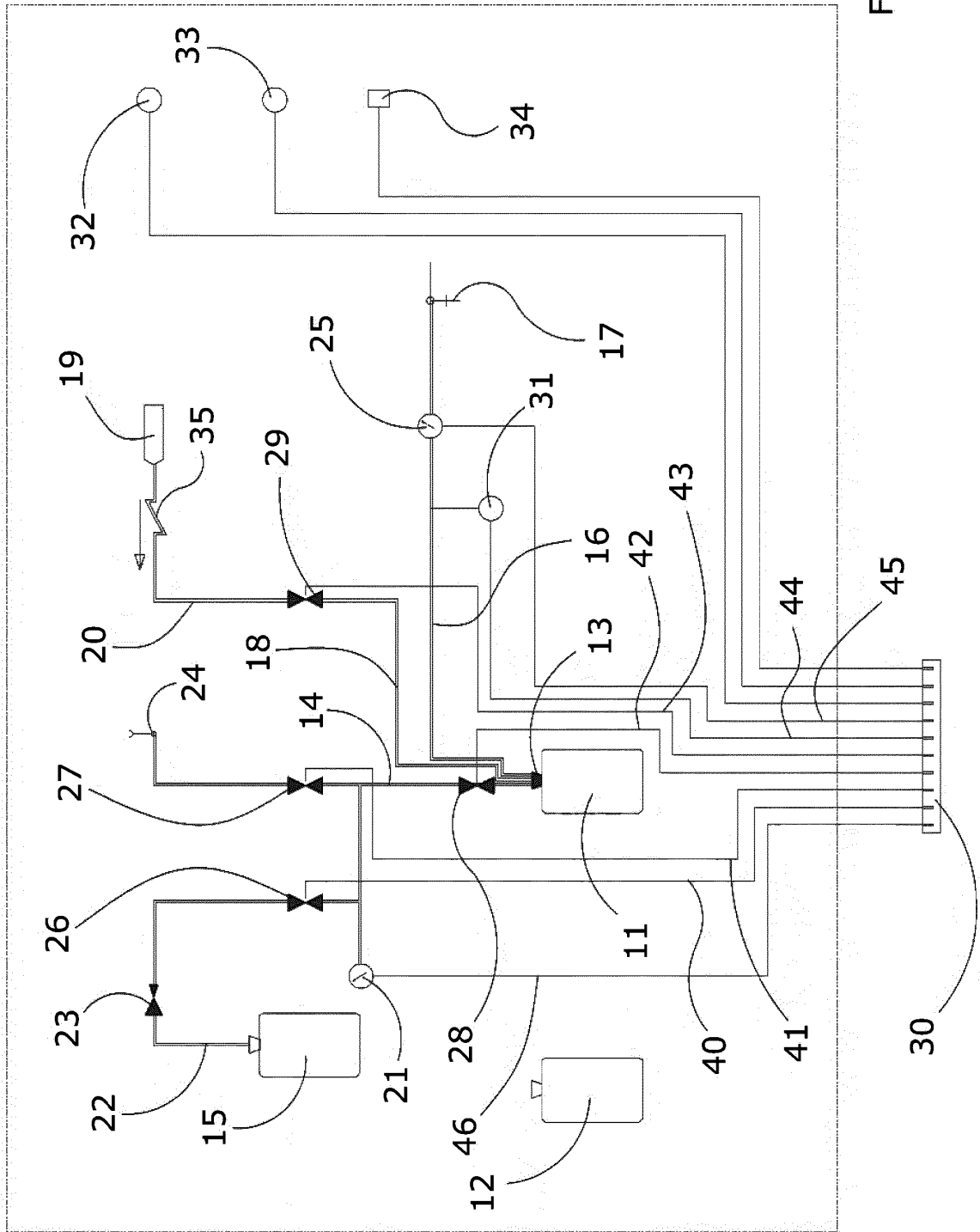


Fig. 1

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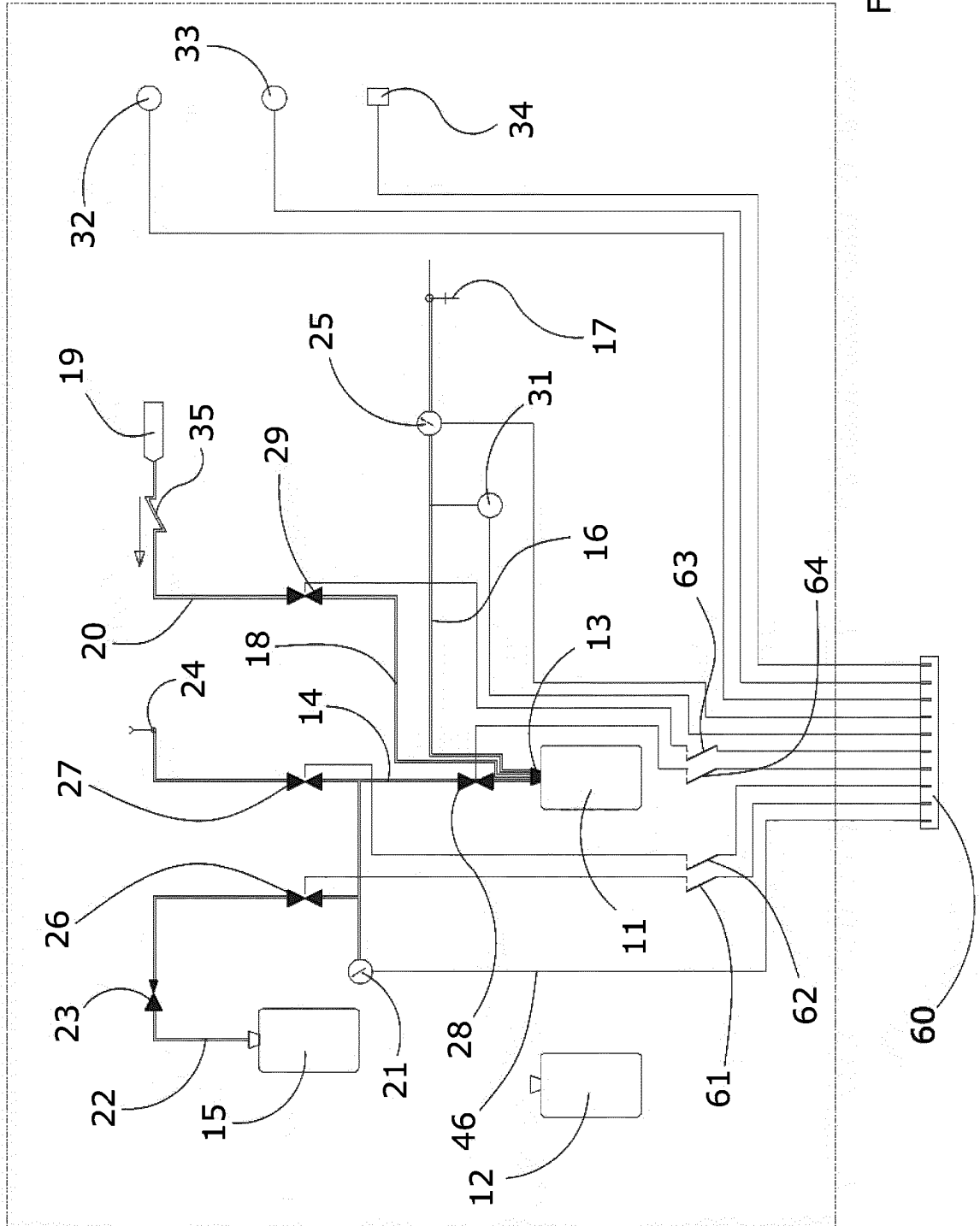


Fig. 2

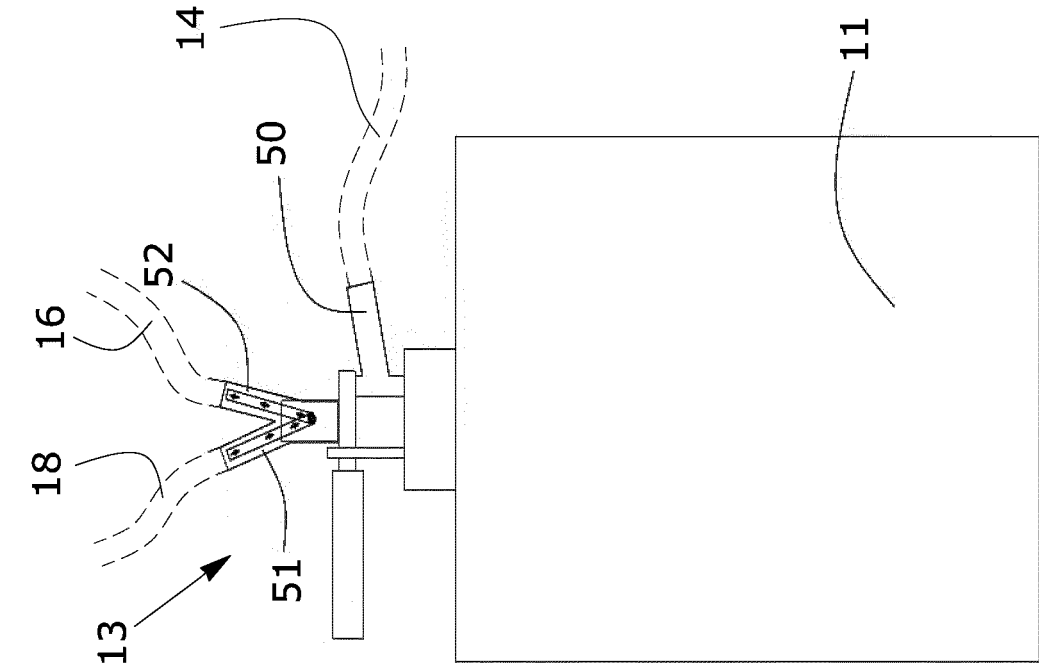


Fig. 3

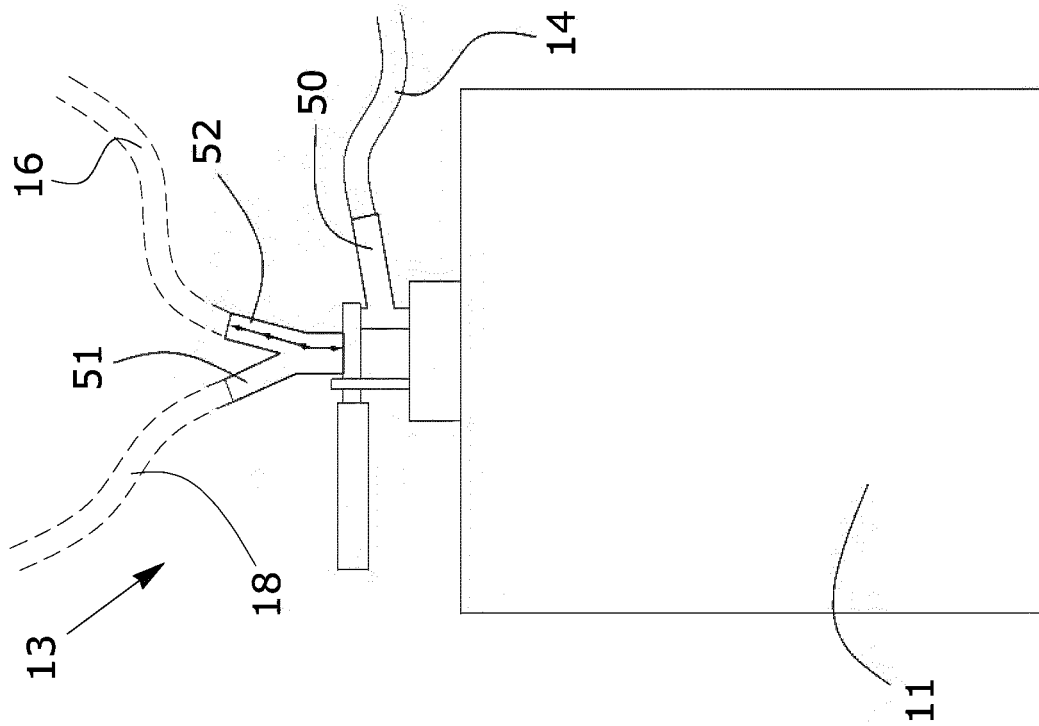


Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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