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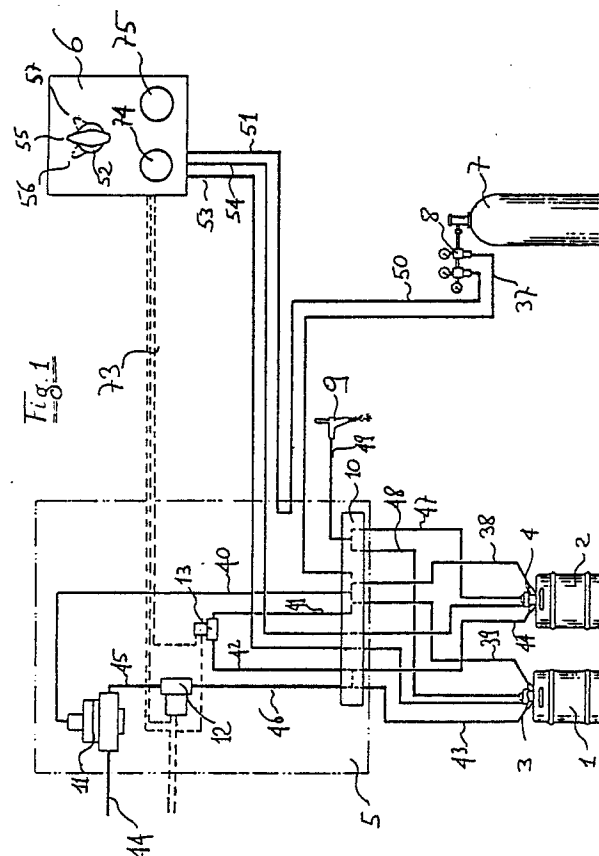
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(54) **Washing system for tapping installations and provision for automatic barrel changing.**

(57) An equipment is described which permits an installation for the distribution of beer or other beverages, the washing of the pipes in contact with the beverages in a semi-automatic manner, with no disconnection of any part, with water and gas preferably brought to the same pressure as that of the beverage in order to prevent infiltration in the barrels, and in addition permits one or more barrels to be connected and disconnected by remote control so that the barrels can be changed without disconnecting the coupling, characterised by the fact that the aforesaid coupling has passages for gas inlets and beer outlets and an additional passage for washing and that the movements of opening and closing the coupling itself are effected by means of a pneumatic control.



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"WASHING SYSTEM FOR TAPPING INSTALLATIONS WITH AUTOMATIC PRESSURE EQUALISATION AND PROVISION FOR AUTOMATIC BARREL CHANGING".

The invention described here concerns a washing system for tapping installations provided with automatic pressure equalisation and the possibility of automatic barrel changing.

Tapping installations for beer or other drinks constituted by a barrel to carry the drink equipped with a connecting valve and a coupling which engages with the aforesaid valve to permit the entry of the propulsion gas (normally CO₂ or nitrogen) and the consequent expulsion of the drink which flows towards the serving tap after being chilled are already well-known.

The problems of these installations are also well-known. Basically, these problems are the need for frequent washing to ensure that mould does not form in the passages and that, thus, the drink deteriorates and, secondly, the need to change the barrel when it is empty and replace it with another. This operation means that the coupling must be disconnected and then re-connected and perhaps this operation must be performed in the cellar, involving a return to the serving point, normally at a time when there is a great demand for the drink.

Automatic equipments to carry out these functions have been produced, with complicated and sophisticated control systems and problems of excessive gassiness in the drinks because the connections have to remain plugged in.

The present invention solves these problems in a simple and effective way. Some of the possible embodiments will now be described in detail. These are purely by way of example and are not limitative. The descriptions refer to the attached illustrative drawings.

Figure 1 shows a schematic representation of an example of a general installation

Figure 2 shows the cross-section of a coupling used on the barrels;

Figure 3 shows the cross-section of a pressure reducer for washing water with automatic equalisation control of the water pressure and the pressure of the propulsion gas.

Figure 4 shows another example of a completely pneumatically controlled washing system and

Figure 5 shows an example of a system with a manual pneumatic control.

In Figure 1 the barrels containing the drink are marked 1 and 2, the couplings which connect the barrels to the appropriate pipes are marked 3 and 4. The cross-section of the coupling is shown in Figure 2, which also shows the box containing the various items of the equipment 5, the control panel 6, the CO₂ cylinder 7, which is equipped with the

pressure reducer 8 which has two bodies. The serving tap is indicated by the number 9.

The box contains the manifold 10 which permits the various pipes required by the installation to be connected in accordance with a pre-established scheme. Number 11 indicates the water pressure reducer which is shown in detail in Figure 3. The two solenoid valves which control the water and gas lines are marked 12 and 13.

Figure 2 shows a cross-section of the coupling. The locking section of this coupling is of the well-known internal locking or Sankey type which is commonly used on beer barrels. This plugs into the relative Sankey type internal locking pin valve. However, the coupling could be an external locking type, a round type or of any other type commonly used in tapping systems and this would in no way be prejudicial to the invention as a whole.

Referring to Figure 2, the body of the coupling 14 engages the valve seat of the barrel by means of the teeth 15 and is sealed with the gasket 16. The water inlet 17, together with the non-return valve 18 and the adapter connection for the water 19 form an integral part of the coupling. The water inlet terminates in chamber 20. The inlet for the propulsion gas is indicated with the number 21. This also has a non-return valve 22 and an adapter connection 23. The piston 24 moves inside the body of the coupling. At rest, the piston is kept in a raised position by the spring 25, as shown in the drawing. The piston carries a gasket 26 which seals the valve when the piston is driven downwards, thus opening the internal passage 27 to allow the drink to flow through and connecting the gas inflow channel 21 to chamber 20 and the upper part of the barrel by means of the restriction 28.

Gasket 29 is also mounted on the piston. This seals cylinder 30, closed by the cover 31 by means of the screws 32. The upper chamber of the piston 33 can be connected to a pressure source by adapter 34 and pipe 35. In this way the piston is driven downwards compressing the spring 25 which acts on the flange 36 which is screwed onto the piston.

When this happens, a passage is created for the gas to enter the upper part of the barrel and the beer to flow through the extraction pipe, the inside of the coupling and the adapter 36 which is connected to the pipe which leads to the serving tap.

Figure 1 shows the propulsion gas pressure line 37 which, through the manifold, is sent to the two gas inlets 23 on the adapters of pipes 38 and 39 and is also sent through pipe 40 to the reducer

11 and through pipe 41 to solenoid valve 13.

Pipe 42 leads out of solenoid valve 13, leads through the manifold and joins up with pipes 43 and 44 at the washing adapters of the couplings. Water from pipe 44 also flows through these pipes, passing through the pressure reducer 11, into pipe 45, solenoid valve 12 and pipe 46.

The two flows of beer through pipes 47 and 48 converge in pipe 49 and then proceed to the serving tap 9. Pressure line 50 then starts from the second body of pressure reducer 8, passes through pipe 51 to the control 6 and, for example by means of two pneumatic valves actuated by control 52, transmits pressure through either pipe 53 or pipe 54 to the controls of the pistons of the couplings so that the selection knob can be set to a rest position 55 or to positions 56 and 57 which select the two barrels.

The water pressure reducer is shown in Figure 3 in which 58 indicates the section which contains the water inlet 59 and the modulated pressure water outlet 60. The regulating piston 61 moves inside the pressure reducer, closing the passage through which the water enters by gasket 62 and equilibrating the thrust of the water which arrives by means of chamber 63 which communicates through aperture 64.

By means of the connecting components of diaphragm 65, this piston can move to open or close the passage of water as a function of the thrust exerted on the diaphragm. Chamber 66 is in communication with the modulated water pressure while chamber 67 is connected to the pressure of the gas which propels the drink by means of adapter 68 and pipe 69. The rear closing plug is indicated with the number 70; 71 is the cover of the pressure reducer and 72 is the upper closing plug.

Therefore, when the installation has to be washed, it is enough to turn the selector knob on panel 6 to position 55, thus disconnecting the two heads and connecting the washing adapter to chamber 20 and internal aperture 27 and actuating, by means of cable 73 and switches 74 and 75, the gas and water solenoid valves to expel the remaining drink and wash out the supply pipes.

Since the water pressure regulator automatically equilibrates the water and gas pressures, the washing operation can be carried out with a mixture of gas and water, thus obtaining an extremely powerful mechanical effect. In addition, there is no danger of water entering the barrel and thus diluting or ruining the drink because the thrust of both the gas and the water is equal to the thrust imparted to the drink itself.

The washing cycle described here is clearly the most simple one but it is also possible to have a cycle in which the times and the ways in which the two valves are inserted can be electronically

controlled or additional valves can be provided to feed solvents or special sterilising products into the installation.

Figures 4 and 5 illustrate a second way of constructing the washing system and a completely pneumatic general control system.

Figure 4 illustrates the reducer-regulator unit, showing the body 36 which houses a pneumatically controlled cut-in valve 77 and the pressure reducer 78 which has the same characteristics as the one shown in Figure 3, with the addition of the gaskets and springs required for this particular embodiment. The water entering from adapter 79 is intercepted by valve 77 and then brought up to the propulsion pressure of the beer by means of reducer 78. It then flows through the non-return valve 80 into chamber 81 to join washing pipes 43 and 44 by means of one or more adapter.

The gas required for evacuating and scrubbing the pipes can also enter chamber 81 through pipe 83 with non-return valve 84.

Tap 85 which contains chamber 86 can be used to introduce sterilising liquid into the washing circuit just as sterilising liquid can be introduced into chamber 81 through aperture 87, which is shown in the drawing closed by tap 88.

The pneumatically controlled cut-in valve 77, located in parallel to the pressure reducer, is used exclusively to provide a double guarantee that there is absolutely no possibility of water from the washing circuit infiltrating into the drink when this valve is excluded.

The two valves 77 and 78 are controlled simultaneously by the pressure line which arrives through pipe 79A.

Figure 5 illustrates a practical layout of a completely manual pneumatic control system of all the operations of barrel changing and washing of the installation. The body is marked with the number 89, the closing cover of the four valves with 90 and the valves themselves are indicated with the numbers 109-110-111-112. The pressure-containing member 91 is compressed by the spring 92 and carries the gasket 83 to close aperture 94, thus impeding the flow of pressure from pipe 95 to the outlet adapter which will connect up to the hatched aperture 96.

The spring 98 forces the piston 97 to rest on the cams 99 expelling air from pipe 96 by means of aperture 100.

Using the knob 101 which turns together with the axis 102 and the pin 103 and a whole series of cams and spacers, it is possible to select various positions which correspond to those in the housing block of the ball 104. These positions correspond to clearly defined profiles and therefore workings of the valves.

Line 95 carries the control pressure indicated

on the general layout by line 51. Apertures 96 and 105 are connected to lines 53 and 54 which pneumatically control the couplings. Line 106 will instead be connected to pressure line 37 which propels the beer connected in parallel to lines 38 and 39.

Outlet 107 will therefore be connected to pipe 83 and outlet 108 to pipe 79. Obviously, the circuit will no longer contain any solenoid valves.

In the rest position shown in Figure 5 all the valves are discharged with the consequent detachment of the barrels from the serving line and with no liquids entering chamber 81. Turning the knob 101 in a clockwise direction, at the first position (for example 20°) piston 97 will be driven upwards, acting on gasket 94 closing passage 100 for discharge and opening the passage of pressure on outlet line 94, thus coupling the first of the two barrels.

A further rotation of 20° to a second stopping point will return the piston to an open position, engaging the second valve 110, opening line 105 to the second barrel. There could also be a further position which actuates both the valves (109 and 110) so that the two barrels could be used in parallel or with two different beers and two different serving taps.

Returning to position O and rotating in an anti-clockwise direction, there could be a first position of 20° for example engaging valve 112 which, maintaining the barrels uncoupled, opens passage 66, by means of pipe 107 to the gas for emptying the piping.

A further rotation returning the aforesaid valve to the uncoupled position would instead open valve 111, sending gas at equilibrated pressure through pipe 29 to the pneumatic cut-in valve 77 and the reducer 78 so that washing water would enter chamber 81 and pipe 82. A further rotation of the knob would simultaneously actuate valves 111 and 112 so that water and propulsion gas would enter chamber 81 producing the bubble effect previously described.

The present embodiment is particularly advantageous because it eliminates all electrical lines which, in an environment like a cellar, can easily lead to accidents and, in addition, it permits the whole system to function even in the absence of a source of electricity utilising exclusively the gas which is in all cases required to propel the drink.

The installation described is purely indicative since it can be implemented with one barrel only, or with two or more, without in anyway affecting the global validity of the invention.

Claims

1. Equipment for use in an installation for the distribution of beer or other beverages for washing the pipes in contact with the beverages in a semi-automatic fashion, without any disconnection, using washing water and gas, preferably brought to the same propulsion pressure as the beverage itself so that there is no infiltration into the barrels, and which in addition allows one or more barrels to be connected or disconnected by remote control so that the barrels can be changed without disconnecting the coupling, wherein the aforesaid coupling contains gas inlet and beer outlet passages and an additional passage for washing and where the movement of opening and closing the coupling is carried out by pneumatic controls.

2. Equipment according to claim 1, wherein pneumatic control of the coupling is effected by a piston which moves within a cylinder which is an integral part of the coupling and this can also be done with CO₂ gas.

3. Equipment according to claim 2, wherein the pneumatic piston is actuated by a valve controlled by a manual selection system, so that several barrels can be placed in parallel and the operator can use the control to select the one to use.

4. Equipment according to claim 2, wherein the pneumatic control of the piston of the coupling is effected by an automatic device with a liquid presence sensor, so that barrels can be changed automatically.

5. Equipment according to claim 1, wherein the pipes are bled by means of the propulsion gas used for the beverage and washed by water brought to the same pressure by an equalising pressure reducer.

6. Equipment according to claim 5, wherein washing operations are controlled by a manual control or by pre-set cycles which are mechanically or electronically controlled.

7. Equipment according to claim 5, wherein a pneumatic cut-in valve is inserted upstream of the pressure reducer, is actuated in parallel with the said reducer, and the washing water and the washing gas combine in a chamber flowing there through non-return valves, and where steriliser can also be introduced.

8. Equipment according to claim 7, wherein the actuation of barrel changing and washing is effected by means of manually controlled pneumatic valves.

9. Equipment according to claim 8, wherein the central valves are located in a single unit and are actuated by means of a position selector, in such a way that a single command produces all the operations described here above.

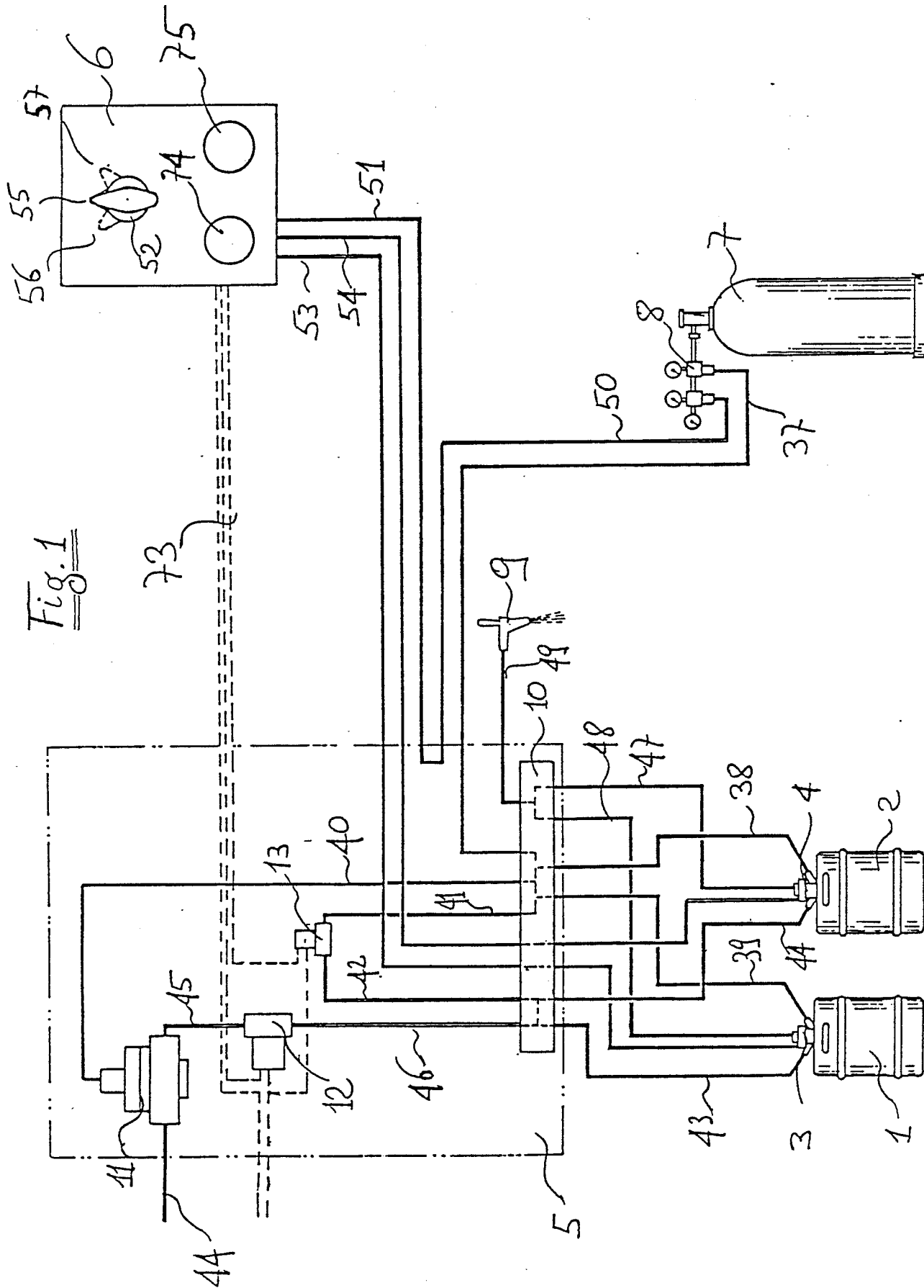
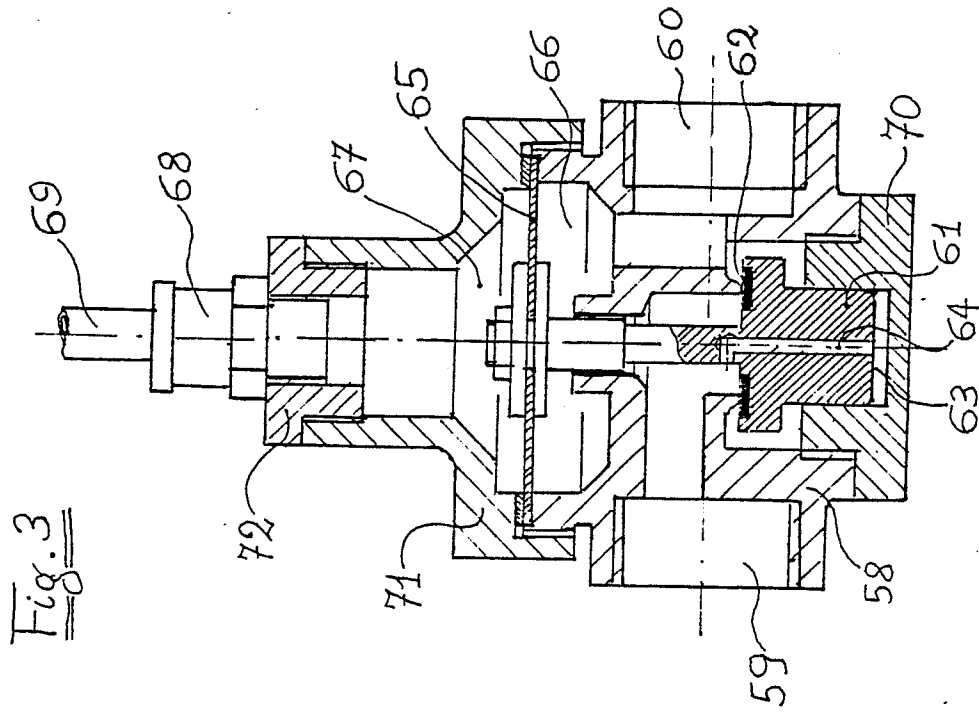
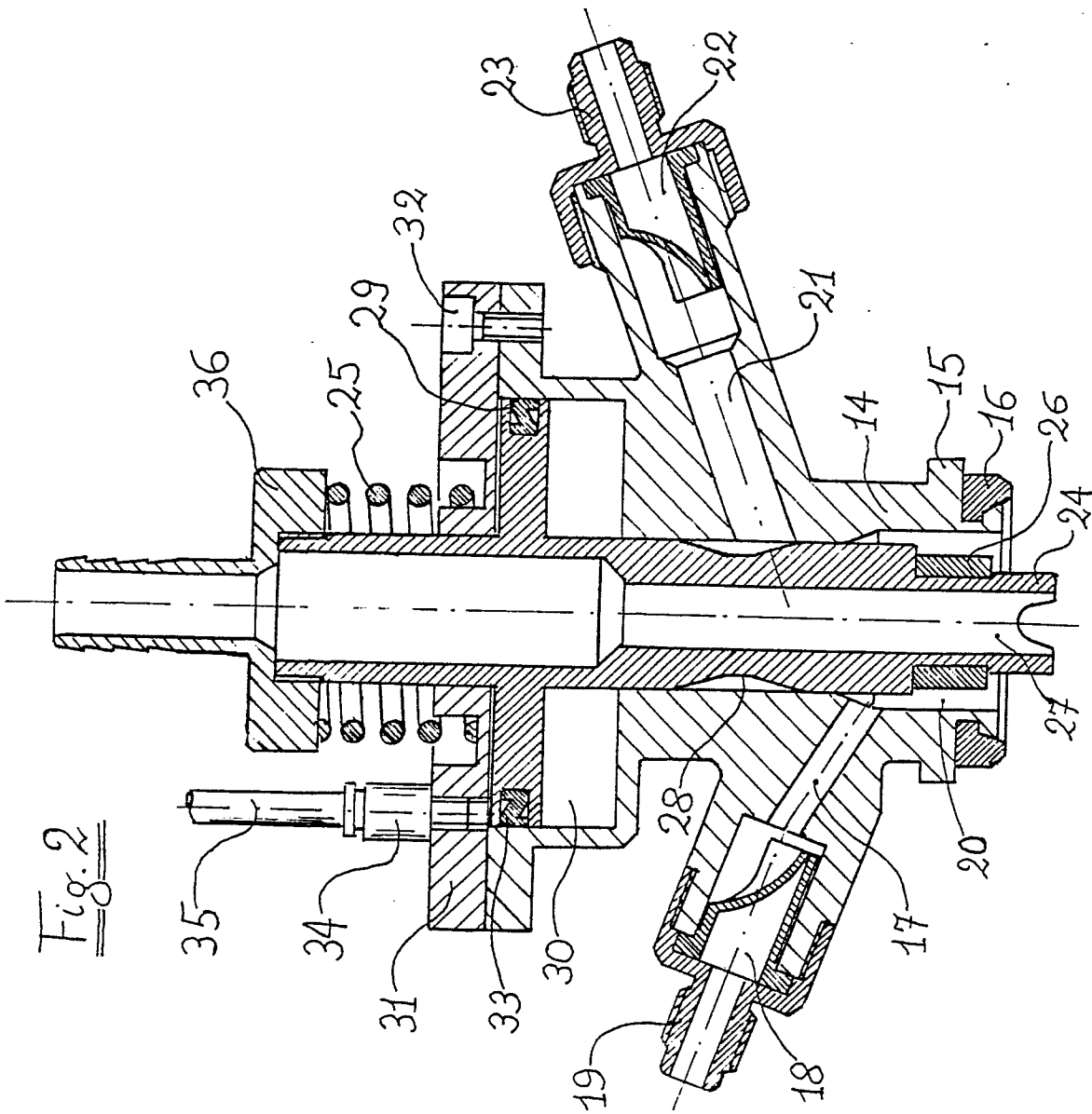


Fig. 1



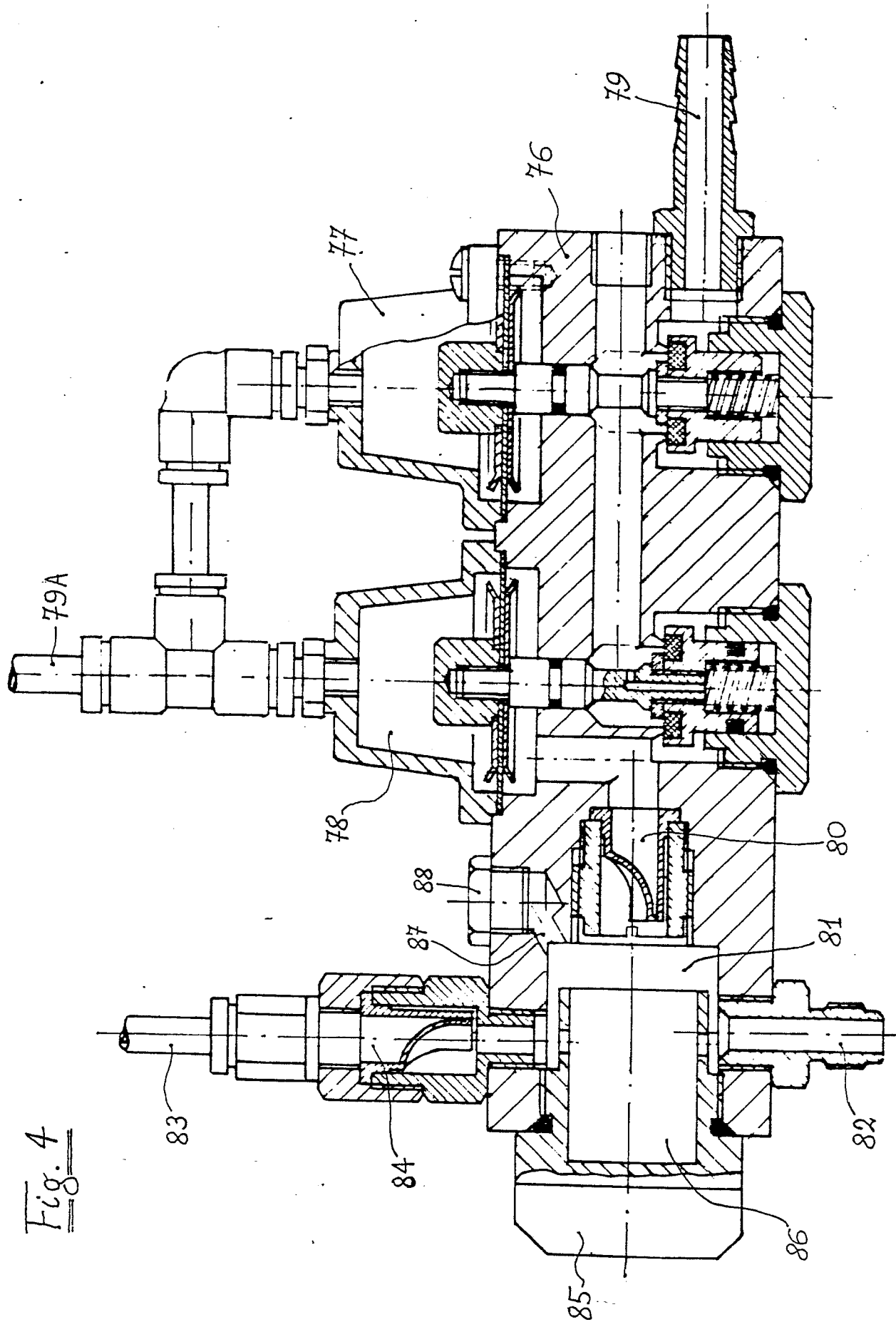


Fig. 5

