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(54) Adapter manifold for bottled water fountain

(57) Adapter for a water fountain, comprising :

- a first conduit having an inlet connectable to a domestic or industrial mainline water supply ;
- a chamber located above a water distribution system into which mainline water is introduced from an outlet of the first conduit ;
- the chamber having an outlet which receives a feeding means of a bottled water distribution system and through which the water flows into the water distribution system.

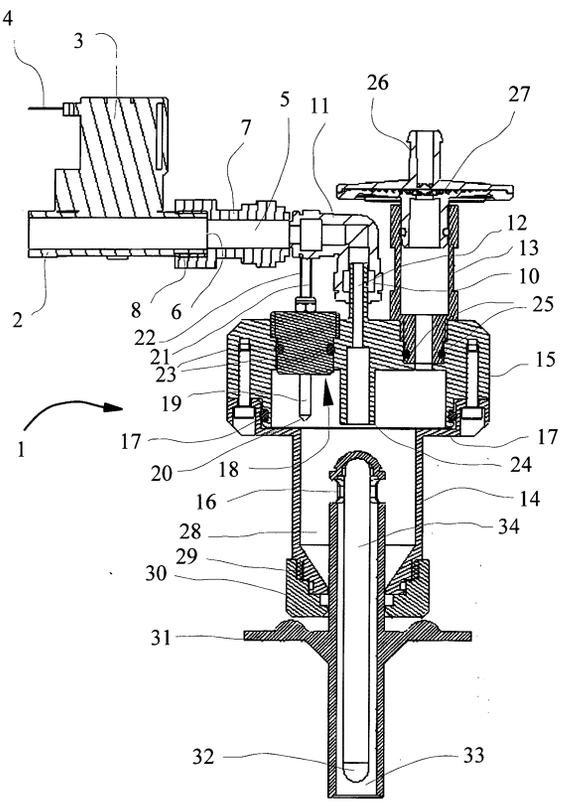

Fig. 1

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Description

[0001] The present invention relates to water fountains in general, and in particular to gravitational or compressed air activated bottled water fountains. Such fountains are well known in the art and generally comprise a removable water storage system, such as water bottle, that can be replaced once the store of water is depleted, or respectively once the bottle is empty, and one or more distribution circuits for distributing the water stored in the water storage system. Such systems optionally have cooling or heating systems included to chill or temper the water that is distributed via the distribution circuit. The water stored in the water bottle is generally placed in a holder system which sits on top of the distribution system, and the water in the bottle enters the distribution system via a feed tube or equivalent means and is then distributed either under the effect of gravity or via a compressed air mechanism. Taps or valves are often provided at outlet points of the distribution system in order to actuate or cease flow of the water from the distribution system. Many such bottle-fed water fountains are currently in widespread use today, since they have the advantage of being independent of the water source, that is, they do not need to plumbed into a water mains system, and can be positioned generally in any suitable place. These water fountains can also be provided with sterilizing or sanitizing systems, or with disposable distribution systems, that enable the water fountain to be kept relatively free of microbial contamination.

[0002] In some situations, however, it may be too difficult or too costly to obtain bottled water in a regular sufficient supply. Another problem with bottle-fed systems is that the water storage systems, or bottles, tend to be specific to the housing that surrounds the distribution system and on which the bottle is placed in an inverted position. This means that it is extremely difficult, if not impossible to have one manufacturer's housing and distribution system that functions with another manufacturer's water storage system.

[0003] The present invention proposes to solve this problem by providing a water fountain that is equipped with an adapter that makes the typical bottle-fed water fountain available for connection directly to a mainline water system. Thus, it will be possible with the adapter and water fountain thus equipped of the invention to use any bottle fed water fountain system and simply plug it into a domestic or industrial mainline water connection instead of the bottle, thereby obviating the necessity to have at hand a readily available supply of bottled water. In addition, if the bottle-fed water fountain is equipped with a sanitizing or sterilizing system, it will also be possible to regularly sanitize the distribution system within the water fountain, reducing the likelihood of serious microbial contamination.

[0004] In the present specification and claims, the term "domestic or industrial mainline water supply" refers to piped water under pressure that originates from a private or public water provider, and is generally distributed at a given pressure by the provider, for example tap water as is commonly distributed by municipal authorities or private water utilities or companies. This in opposition to "bottled water", which is provided in relatively small volume, airtight containers stored at ambient pressure and temperature, and which are placed upside down on the bottled water fountains.

[0005] Consequently, one of the objects of the present invention is a method for distributing water from a bottle-fed water fountain with water from a domestic or industrial mainline water supply, comprising the steps of :

- introducing domestic or industrial mainline water under pressure from a domestic or industrial mainline supply into a water distribution system ;
- storing the water within the water fountain in a manner sufficient to cause the pressure of the water to become substantially equal to that of bottled-water stored in a water storage system positioned above the water distribution system ;
- releasing the water into the water distribution system.

[0006] Preferably, the mainline water is introduced into a chamber located above a water distribution system. Alternatively, and preferably, the mainline water is introduced into a chamber that is located below the level of a distribution outlet, and the distribution system in that case comprises a compressed air circuit that can push the water out of the chamber and into the conduits of the distribution system to the outlet. The general idea behind the present invention is that the mainline water is stored only temporarily in the chamber, and can then either fall into the distribution system via gravity, as will be explained in more detail in the detailed description of the invention or can be pumped or pushed into the distribution system by a compressed air circuit. Even more preferably, the mainline water is introduced into the chamber in a quantity corresponding to a preset volume. Most preferably, the preset volume entering the chamber is controlled by a water level detection system, or alternatively by a mechanical volume control system, for example similar to a cistern release mechanism. It is however preferred that the water level detection system actuates a flow release valve on the mainline water supply, thereby controlling the flow and volume of water introduced into the chamber. Even more preferably, the flow release valve on the mainline water supply is opened when substantially all of the water in the chamber has been released into the water distribution system.

[0007] In a preferred embodiment of the present method of the invention, an electric current between two electrodes in the water level detection system is applied to detect the presence of water at a given level in the chamber and thereby actuate the flow release valve to close or open the mainline water supply. In such a sys-

tem, the method most preferably involves applying an alternating current, but a direct current can be applied as an alternative. However, the alternating current is preferred, since this minimizes problems of electrolysis, and accretion of solids on the electrodes that inhibit performance. Although application of a direct current also works and can be used in the present method and device of the invention, it has been found that a direct current leads to electrolysis of the water, and since the mainstream water contains minerals and other impurities, to accretion of solids at the electrodes, leading to increased wear of the electrodes, and thereby reduced performance of the device and the method. The current applied is generally comprised between about 0 Volts and about 40 Volts, and preferably is about 5 Volts. When applied, the current only flows between the electrodes when the water level has reached the tips of the electrodes, and the creation of an electrical circuit due to the water having reached the appropriate level causes the water supply to be shut off. Once water in the chamber is released into the distribution system, the level falls, and the circuit is broken, which again causes a flow release valve on the water supply to be actuated.

[0008] In an alternative embodiment of the present method, an electrical current is induced between a floatable magnet in the chamber and a reed switch in the water level detection system and thereby actuate the flow release valve to close or open the mainline water supply. Reed switches are known to the skilled person in general. A reed switch generally consists of two magnetic contacts in a glass tube filled with protective gas. When a magnet comes close to a reed switch the two contacts become magnetized and attracted to each other allowing an electrical current to pass through. When the magnet is moved away from the reed switch the contacts demagnetize, separate, and move to their original position. According to the present invention, the magnet is a floating magnet, that is to say, it is located within a housing that floats on the surface of the water as the water level rises. In this way, when the chamber is substantially empty or below a predetermined level, the magnet induces an electrical contact in the switch and causes water to be introduced into the chamber from the mainline supply. As the level rises, so the floatable magnet also rises, moving away from the switch, which becomes demagnetized and the electrical contact is therefore broken. When the electrical contact breaks, the supply of water is cut off. Once the level of water drops after it is released into the distribution system, the floatable magnet falls back down to the reed switch and the electrical circuit is reestablished, thus actuating the flow release valve to open and introduce water again into the chamber. It goes without saying that an inversely operational circuit can be devised by the skilled person without undue burden, in which an electrical signal generated by the reed switch contacts coming together is interpreted to shut off the flow release valve. In this case, the reed switch would be positioned at a suitable height within the chamber to take into account the height of the floatable magnet in order to obtain a constant level of water in the chamber.

[0009] In a preferred embodiment of the invention, the water flows out of the chamber into a gravitational distribution system via gravity. This avoids the need for pumps and additional systems that are sometimes used in water fountains, but which make maintenance more complex, and the fountains more likely to malfunction. However, it may be desirable, for example for esthetic design reasons, to have distribution outlets that are located above the chamber, and in such a case, a compressed air circuit can be used.

[0010] Preferably, air within the chamber is vented via an air vent outlet. In this way, when water is introduced under pressure from the mainline source, any excess or insufficient air pressure in the chamber is relieved via the air vent outlet. Optionally, this air vent outlet can be fitted with an air filter to filter any incoming air that might be required.

[0011] Another object of the present invention is an adapter for a water fountain, comprising :

- a first conduit having an inlet connectable to a domestic or industrial mainline water supply ;
- a chamber located above a water distribution system into which mainline water is introduced from an outlet of the first conduit ;
- the chamber having an outlet into which receives a feeding means of a bottled water distribution system.

[0012] Preferably, the conduit has a locking collar adapted to be fitted to a corresponding locking system on the mainline water supply to form a watertight seal. Accordingly, and in a preferred manner, the locking collar can have an internally threaded screw fit that couples with an external screw thread on the mainline water supply. Alternatively, and in another preferred embodiment, the locking collar and corresponding locking system on the mainline water supply are of the snap-lock type.

[0013] Additionally, the conduit also preferably comprises a substantially right-angled elbow that redirects flow of water from the inlet into the chamber via the outlet of the conduit. The outlet most preferably mates with an inlet of the chamber. Alternatively, the conduit could be simply a flexible tube having an inlet that connects to the mainline water supply and an outlet that mates with an inlet of the chamber.

[0014] In a particularly preferred embodiment, the chamber is provided with water level detection means. Preferably, the water level detection means comprises at least one pair of electrodes which project into the chamber and to which an electrical current is applied. Although only one pair of electrodes is preferred, other extra pairs or single electrodes can also be provided,

depending on the complexity of the water level detection system that it is desired to include in the device according to the invention. Most preferably, the current applied is alternating current. Alternatively, the current applied is direct current. In a most preferred embodiment, the electrodes have tips and only the tips of the electrodes are exposed to water entering or stored within the chamber. In such a case, the electrodes, except for the tips, are covered with a water-resistant membrane or sheath, made of non-conducting material, for example, PVC, or silicone rubber. In this way, only the tips are exposed to the water being introduced into the chamber, and this ensures that the circuit that is connected to the flow release valve will not be activated by any splashing caused by the introduction of the mainline water under pressure into the chamber. The volume of water introduced and stored temporarily in the chamber is thus defined at least by a distance that separates an electrode tip in the chamber from a wall of the chamber, since as the water fills the chamber, the level of the water rises and when it comes into contact with the electrodes, an electrical circuit is created that signals the flow release valve on the mainline supply to close and stop supplying water to the chamber. Thus, the distance at which tips project into the chamber can define the level or volume of water that can be introduced into said chamber. Alternatively, where the electrodes project from a side wall of the chamber, orthogonally to the introduction of the water, the level, and consequently volume, of the water introduced, will be equal to the position at which the electrodes have been inserted into the chamber. In this case, it will only often be necessary to have the tips projecting into the chamber, for example mounted horizontally and spaced laterally at the same height along the side wall of the chamber.

[0015] In an equally preferred alternative embodiment, the water level detection means comprises a reed switch and a floatable magnet. The functioning and description of the reed switch has been made previously in this specification. The floatable magnet of the reed switch system can be enclosed within a low volume housing by a baffle, or wall projection that is fully comprised within the chamber, and which permits water to access the housing, and the float to move up and down within the housing, guided by a side wall of the chamber on one side of the housing and the baffle or wall projection on the other side. In this way, a volume of water introduced and stored temporarily in the chamber is defined by the position of the Reed switch relative to the position of the floatable magnet as has been explained previously.

[0016] In a further preferred embodiment, the chamber defines an upper section and a lower section. Preferably, the upper section of the chamber is substantially filled with air, and the lower section of the chamber substantially receives the water introduced into the chamber. By this, it is to be understood that water is introduced into the chamber, preferably via the upper section, and the water then falls into the lower section. As the volume of water introduced increases, so the level of water in the lower section of the chamber rises, and then reaches the upper section of the chamber, until the level is high enough to activate the water level detection system and actuate the flow release valve to stop more water being introduced. It will be apparent from the preceding description that the water level detection means are preferably located in the upper section of the chamber. Any excess air pressure created by the rising level of water or the introduction of water under pressure can be relieved by an air vent, which is preferably connected to an air filter. Similarly, when the water is released from the chamber, the air vent and connected air filter enable air to enter the chamber, thereby facilitating flow of the water out of the chamber.

[0017] As with most water fountains, the water distribution system comprises a feed tube that usually pierces a membrane on the water bottle as the bottle is lowered onto the water fountain housing. In accordance with the present invention however, the feed tube is preferably inserted into the lower section of the chamber, or in other words, this section of the chamber receives the feed tube of the water distribution system. Preferably, the chamber comprises means for sealingly engaging the feed tube of the water distribution system, so that no water can escape from the chamber while the feed tube is in position, other than through the feed tube. In order to lead the water that has been introduced in the chamber out of said chamber and into the water distribution system, the feed tube preferably comprises one or more conduits. It is preferred that the feed tube comprise, for example, a conduit that leads the water through a water cooling system, so that chilled or cooled water may be distributed to an end user, but alternatively or cumulatively, it is also preferred that the feed tube also comprise a conduit leading the water through a water heating system, and a conduit leading the water through a circuit at ambient temperature. In yet another preferred embodiment, the feed tube can also comprise an air vent conduit, that is in addition to the air vent provided in the chamber.

[0018] Still yet another object is a water fountain that comprises an adapter according to the invention, operably linked to a water distribution system, enabling use of the water fountain with a domestic or industrial mainline water supply.

[0019] The present invention will now be explained in detail with reference to two preferred embodiments of the adapter, given merely as illustrative examples of the possibilities of the present invention, in association with the accompanying figures.

Brief Description of the Figures

[0020]

Figure 1 is a cross-sectional representation a first

adapter according to the present invention, in which the water level detection system or means comprises at least a pair of electrodes.

Figure 2 is a cross-sectional representation of a second adapter according to the present invention, in which the water level detection system or means comprises a reed switch and floatable magnet.

Detailed Description of the Invention

[0021] As can be seen from Figure 1, the adapter according to the present invention, indicated generally by the reference 1, connects to a domestic or industrial mainline water supply 2, in which water under pressure is held, and introduced into an inlet 6 of a conduit 5, by an electrically actuated flow release valve 3, connected to an electric power circuit 4. The adapter is connected to the mainline water supply by a collar 7, said collar comprising a thread screw fitting 8 that mates with a corresponding fitting provided on the mainline water supply 2. Alternatively, the screw fittings can be replaced by corresponding snap-lock or twist-lock systems that are well known to the skilled person, and which create a fluidtight connection between the water supply 2 and the adapter 1. The conduit is further characterized by a generally right angled elbow 11, that redirects the flow of water being introduced about an angle of approximately 90°. The conduit terminates in an outlet 10 from which the water exits. The outlet 10 mates sealingly with an inlet 12 of a chamber 14. The chamber comprises an upper section 15, and a lower section 28, and in the present example the two sections are separately molded elements that are held together by screws and an O-ring joint 17. As is evident to the skilled person, the chamber can also be made of a single piece of molded plastic, or any other suitably resistant material that is compatible with the distribution of tap water. The upper section 15 of the chamber 14, comprises an air vent 13, which is in sealing engagement with the chamber 14 via an O-ring joint 25. The air vent comprises an air filter 26, containing a filter membrane 27. Additionally, the upper section 15 of the chamber 14 comprises a water level detection system or means, generally indicated by the reference 18. The water level detection means 18 comprise a pair of electrodes, only one 19 of which is visible in the figure since they are positioned one behind the other. These electrodes 19 are connected respectively via electrical circuits 21 and 22 to each other and the flow release valve 3 (connection not shown), and an alternating current is applied to the electrodes 19. For as long as the water level in the chamber 14 remains below the tip 20 of the electrode, no current will pass between the electrodes 19 and the flow release valve will continue to be actuated to introduce water into the chamber. Once the water level reaches the tips 20 of the electrodes 19, an electrical circuit will be created in the water between the electrode tips 20, and current will flow. This current flow is coupled to the flow release valve 3 and signals it to close the valve to stop introducing water from the mainline supply 2 into the chamber 14. When the water in the chamber is released, as will be described further on, the circuit between the tips 20 of the electrodes 19 will be broken and the flow release valve 3 will be actuated once more to introduce water into the chamber 14. In this way, only a predetermined volume of water is introduced into the chamber 14 at any one time. As can be seen from figure 1, the inlet 12 of the chamber 14 extends to an outlet 24, the length of which is just greater than the distance with which the electrode 19 projects into the upper section 15 of the chamber 14. In this way, it is possible to reduce false electrical contacts that might be created between the electrodes 19 by splashing of water under pressure as it enters the chamber 14. It is also possible to provide the electrodes with a water resistant non-conducting coating such as silicone rubber, that covers the electrodes 19 for the part or whole of the length with which it projects into the chamber 14, except for the tips 20. The current applied is preferably an alternating current as this prevents electrolysis and accretion of solids at the electrode tips 20 that would hinder performance of the device, and cause the electrodes 19 to burn or wear out. The alternating current applied is in the range of from 0 Volts to 40 Volts, and preferably 5 Volts.

[0022] Turning now to the lower section 28 of the chamber 14, it will be seen from Figure 1, that a feed tube 31, originating from a bottled water distribution system is sealingly received or inserted in the chamber 14. In this example, the seal with the feed tube 31 is created by an additional element 30, that elastically grips around the feed tube 31 to create a fluidtight seal. This element 30 is in turn affixed to the lower section 28 of the chamber 14 by corresponding threaded screw-lock systems 29 on the exterior of the lower section 28 and the interior of element 30. Alternatively, elastically sealing means about the feed tube can be provided directly on the lower section 28 of chamber 14, and element 30 or screw-lock systems 29 would not be needed.

[0023] The other elements of the bottled water distribution system are not shown here, but are generally well known to the skilled person as such, and may comprise a heating and cooling circuit, for dispensing heated and chilled water, a sterilizing or sanitizing unit for cleaning the distribution system periodically, for example by vapour cleansing, or electrical resistance heating of the metal tubes used in the distribution system. Thus, the feed tube 31 is provided with at least one orifice 16, which orifice communicates with at least one conduit provided within the feed tube 31. In Figure 1, for example, the orifice 16 communicates with a central conduit 34, that leads, for example, water out of the chamber and into a chilled water circuit of the water distribution system. The orifice 16 also communicates with another conduit 33, which can lead the water for example into a heating circuit. Finally, the feed tube is also provided with an air vent conduit 32, that enables venting of air

from the water distribution system.

[0024] The adapter in the present embodiment functions as follows : water from the online water supply 2 enters the conduit 5 through inlet 6, and leaves the conduit through outlet 10, entering the chamber via inlet 12 and falling down into the lower section 28 of the chamber 14. Water is introduced until the water level rises and reaches the tips 20 of the electrodes 19. The flow release valve is then actuated and the water shut off. It should be noted that the electrodes need not project over the same distance into the chamber, i.e. the electrodes may be of different lengths. This is useful when a very fine control of the level of water is required, or simply when it is desired to avoid repeat actuations of the flow release valve for only very small corresponding changes in the level of water in the chamber, for example, when the fountain is knocked. Since the water is now substantially in the lower section 28 of the chamber, and the level of the water is above that of the orifice 16 of feed tube 31, when a demand for water is made by the water distribution system, i.e. generally when a user activates a tap to draw water from the water fountain, water will flow, for example, via gravity, through the orifice 16 into feed tube 31 and conduits 33 and 34, which then lead the water through the water distribution system to the point of exit. In the case where the point of exit of the water distribution system is located above the chamber, a compressed air circuit, of the type known to the skilled person, can be used to push or pump or flush the water out of the chamber. In this case, the compressed air circuit is generally connected to the feed tube, and when compressed air is sent into the chamber via the tube an excess of pressure greater than can be relieved by the air filter circuit causes the water to be flushed out of the chamber and into the water distribution system. As the water empties from the chamber, the electrical circuit between the electrodes is cut off, and a signal sent to the flow release valve to actuate once again introduction of water into the chamber 14. Thus the chamber 14, is refilled automatically to the correct level, and water distributed in a manner that is similar to that found in bottled water fountains.

[0025] Turning now to Figure 2, the preferred embodiment illustrated in this example bears the same references for the same parts, and functions in the same way as the adapter in Figure 1, except for the differences indicated below.

[0026] In this embodiment, the water level detection means 18 comprise a reed switch 35, and a floatable magnet 36. The floatable magnet is housed within a small or low volume housing 38 by a baffle, or wall projection 37 that is fully comprised within the chamber 14, and which permits water to access the housing, and the floatable magnet 36 to move up and down within the housing 38, guided by a side wall of the chamber on one side of the housing 38 and the baffle or wall projection 37 on the other side. In this way, a volume of water introduced and stored temporarily in the chamber 14 is defined by the position of the Reed switch 35 relative to the position of the floatable magnet 36. The adapter functions as follows : when empty, the flow release valve 3 is open and water introduced as described previously for Figure 1 into the chamber 14. At this point, the floatable magnet 36 is located in the housing 38 at roughly the same level as the reed switch 35, thus magnetizing the metal strips in the reed switch 35 and causing an electrical contact to be made that sends a signal to the release valve 3 to keep introducing water into the chamber 14. As the level of water rises up to the level of the reed switch 35, the magnet starts to float and move upward. Once the floatable magnet has moved sufficiently upwards in the housing 38 away from the reed switch 35, the latter becomes demagnetized and the electrical circuit broken, which then causes the flow release valve 3 to stop introducing water into the chamber. When water is drawn off by a user through the feed tube and into the distribution system, the floatable magnet 36 drops back down to the position of the reed switch 35, which is subsequently remagnetized and therefore creates an electrical circuit once again, instructing the flow release valve 3 to open and introduce more water into the chamber 14.

Claims

1. Adapter for a water fountain, comprising :
   - a first conduit having an inlet connectable to a domestic or industrial mainline water supply ;
   - a chamber located above a water distribution system into which mainline water is introduced from an outlet of the first conduit ;
   - the chamber having an outlet which receives a feeding means of a bottled water distribution system and through which the water flows into the water distribution system.
2. Adapter according to claim 1, wherein the conduit has a locking collar adapted to be fitted to a corresponding locking system on the mainline water supply to form a watertight seal.
3. Adapter according to claim 2, wherein the locking collar has an internally threaded screw fit that couples with an external screw thread on the mainline water supply.
4. Adapter according to claim 2, wherein the locking collar and corresponding locking system on the mainline water supply are of the snap-lock type.
5. Adapter according to claim 1, wherein the conduit also comprises a substantially right-angled elbow

that redirects flow of water from the inlet into the chamber via the outlet of the conduit.

6. Adapter according to claim 1, wherein the outlet of the conduit mates with an inlet of the chamber.

7. Adapter according to claim 1, wherein the chamber is provided with water level detection means.

8. Adapter according to claim 7, wherein the water level detection means comprises at least one pair of electrodes which project into the chamber and to which an electrical current is applied.

9. Adapter according to claim 8, wherein the current applied is alternating current.

10. Adapter according to claim 8, wherein the current applied is direct current.

11. Adapter according to claim 8, wherein the electrodes have tips and only the tips of the electrodes are exposed to water entering or stored within the chamber.

12. Adapter according to claim 9, wherein a volume of water introduced and stored temporarily in the chamber is defined at least by a distance that separates an electrode tip in the chamber from a wall of the chamber.

13. Adapter according to claim 7, wherein the water level detection means comprises a Reed switch and a floatable magnet.

14. Adapter according to claim 13, wherein a volume of water introduced and stored temporarily in the chamber is defined by the position of the Reed switch relative to the position of the floatable magnet.

15. Adapter according to claim 1, wherein the chamber defines an upper section and a lower section.

16. Adapter according to claim 15, wherein the upper section of the chamber is substantially filled with air, and the lower section of the chamber substantially receives the water introduced into the chamber.

17. Adapter according to claim 15, wherein the water distribution system comprises a feed tube that is inserted into the lower section of the chamber.

18. Adapter according to claim 15, wherein the water level detection means are located in the upper section.

19. Adapter according to claim 15, wherein the upper section of the chamber also comprises an air vent, preferably connected to an air filter.

20. Adapter according to claim 1, wherein the chamber comprises means for sealingly engaging a feed tube of the water distribution system.

21. Adapter according to claim 20, wherein the feed tube comprises a conduit that leads the water through a water cooling system.

22. Adapter according to claim 20, wherein the feed tube comprises a conduit that leads the water through a water heating system.

23. Adapter according to claim 20, wherein the feed tube comprises a conduit that leads the water through a circuit at ambient temperature.

24. Adapter according to claim 20, wherein the feed tube also comprises an air vent conduit.

25. A water fountain comprising a water distribution system operably linked to an adapter as defined in any one of previous claims 1 to 24.

26. Method for distributing water from a water fountain with water from a domestic or industrial mainline water supply, comprising the steps of :

- introducing domestic or industrial mainline water under pressure from a domestic or industrial mainline supply into a water distribution system ;
- storing the water within the water fountain in a manner sufficient to cause the pressure of the water to become substantially equal to that of bottled-water stored in a water storage system positioned above the water distribution system ;
- releasing the water into the water distribution system.

27. Method according to claim 26, wherein the mainline water is introduced into a chamber located above a water distribution system.

28. Method according to claim 26, wherein the mainline water is stored temporarily in a chamber located above a water distribution system.

29. Method according to claim 26, wherein the mainline water is introduced into a chamber in a quantity corresponding to a preset volume.

30. Method according to claim 29, wherein the preset

volume entering the chamber is controlled by a water level detection system.

31. Method according to claim 30, wherein the water level detection system actuates a flow release valve on the mainline water supply, thereby controlling the flow and volume of water introduced into the chamber.

32. Method according to claim 31, wherein the flow release valve on the mainline water supply is opened when substantially all of the water in the chamber has been released into the water distribution system.

33. Method according to claim 31, wherein an electric current between two electrodes in the water level detection system is applied to detect the presence of water at a given level in the chamber and thereby actuate the flow release valve to close or open the mainline water supply.

34. Method according to claim 33, wherein the electrical current applied is alternating current.

35. Method according to claim 33, wherein the electrical current applied is direct current.

36. Method according to claim 31, wherein an electrical current is induced by a floatable magnet in the chamber and a Reed switch in the water level detection system and thereby actuates the flow release valve to close or open the mainline water supply.

37. Method according to claim 27, wherein the water flows out of the chamber into the water distribution system via gravity.

38. Method according to claim 27, wherein the water flows out of the chamber into the water distribution system after introduction into the chamber of compressed air.

39. Method according to claim 27, wherein air within the chamber is vented via an air vent outlet.

40. Method according to claim 27, wherein the air is filtered.

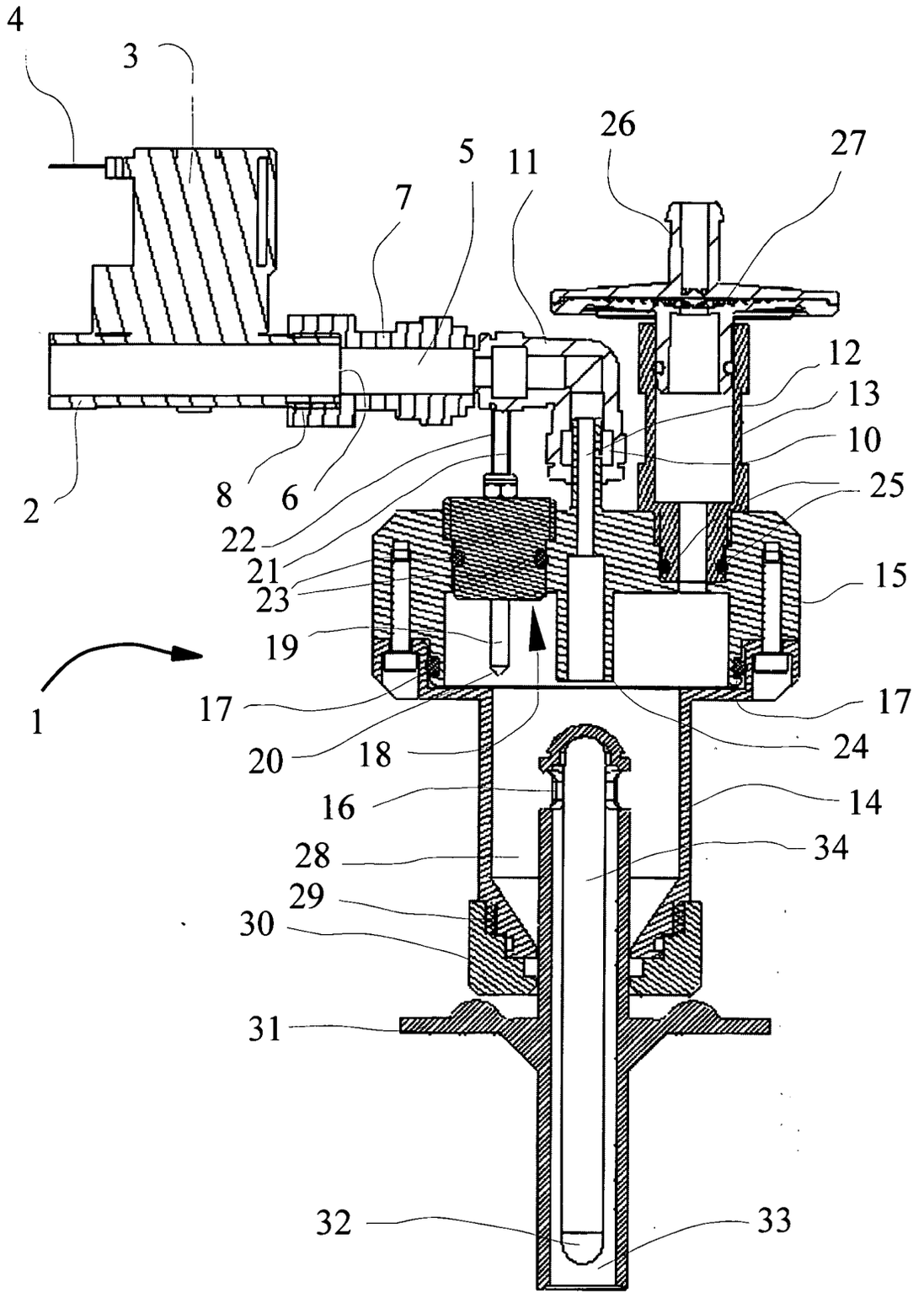
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Fig. 1

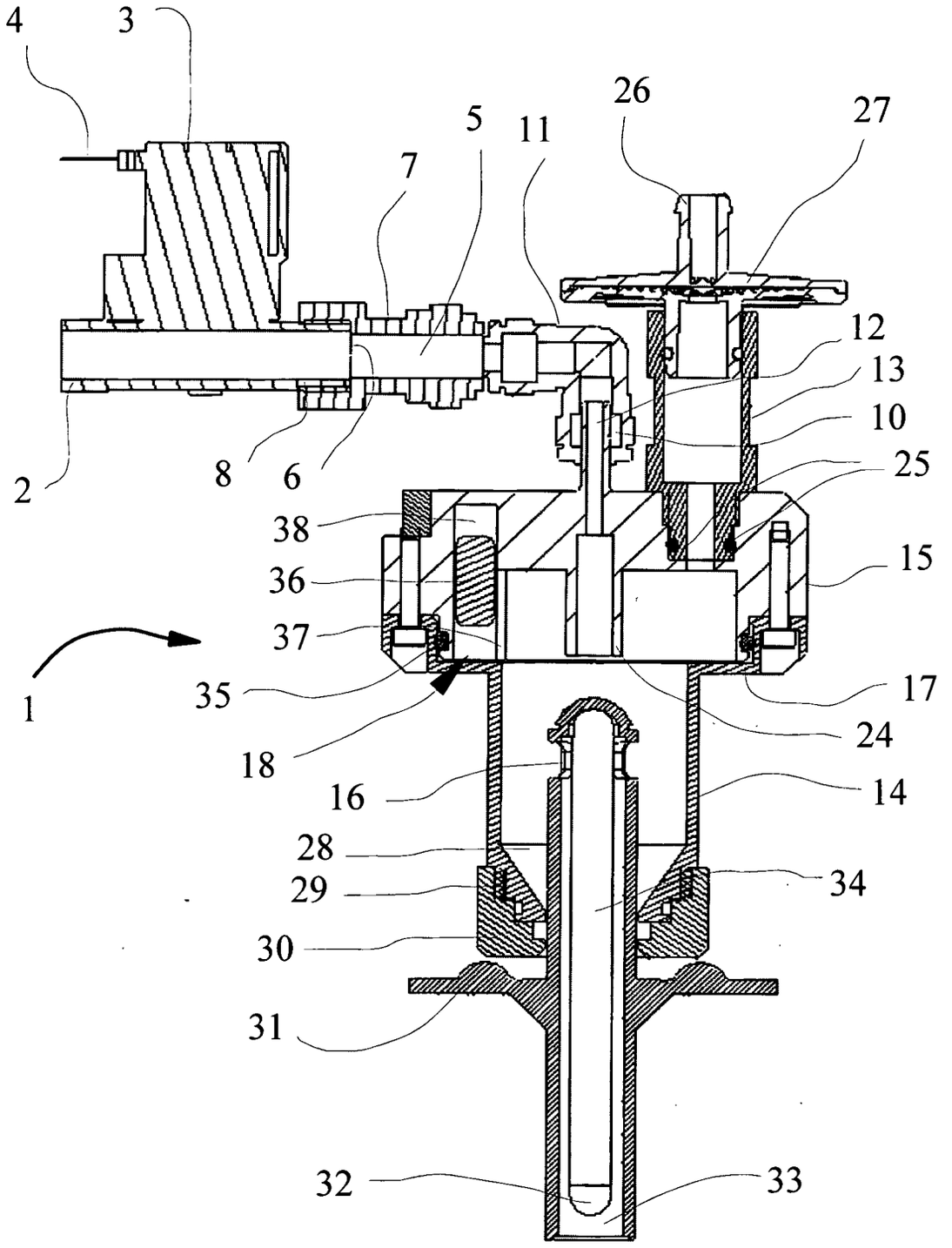
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Fig.2

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 29 0498

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)
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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
Munich	21 July 2004	Müller, C

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