



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.02.2009 Bulletin 2009/08

(51) Int Cl.:
B67D 3/00 (2006.01)

(21) Application number: **07114120.4**

(22) Date of filing: **09.08.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

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(54) **Liquid dispensing apparatus**

(57) A liquid dispensing apparatus (1) comprising a housing (2) with a mounting arrangement for mounting an inverted bottle (10) to the housing (2) and liquid guiding means (3) for guiding a liquid flow from a neck (9) of the inverted bottle (10) to at least one discharge outlet (4) mounted to the housing (2), the liquid guiding means (3) comprising a distributor device (5) which is releasably mounted to the housing (2) and a first reservoir (11) which is mounted to the housing (2), the distributor device (5) comprising a feeding tube (6) which is provided to project into the neck (9) of the inverted bottle (10) and to guide the liquid flow from the inverted bottle (10) into the first reservoir (11) for controlling the temperature of the liquid contained therein to a first temperature, the liquid guiding means (3) comprising at least a first conduit (7) for conducting liquid from an outlet (13) of the first reservoir (11) to a first discharge outlet (17) from which liquid can be taken, the liquid guiding means (3) comprising at least a second conduit (8) for conducting liquid from the inverted bottle (10) to a second discharge outlet (18), characterised in that the first (7) and the second conduit (8) are thermally isolated from each other.

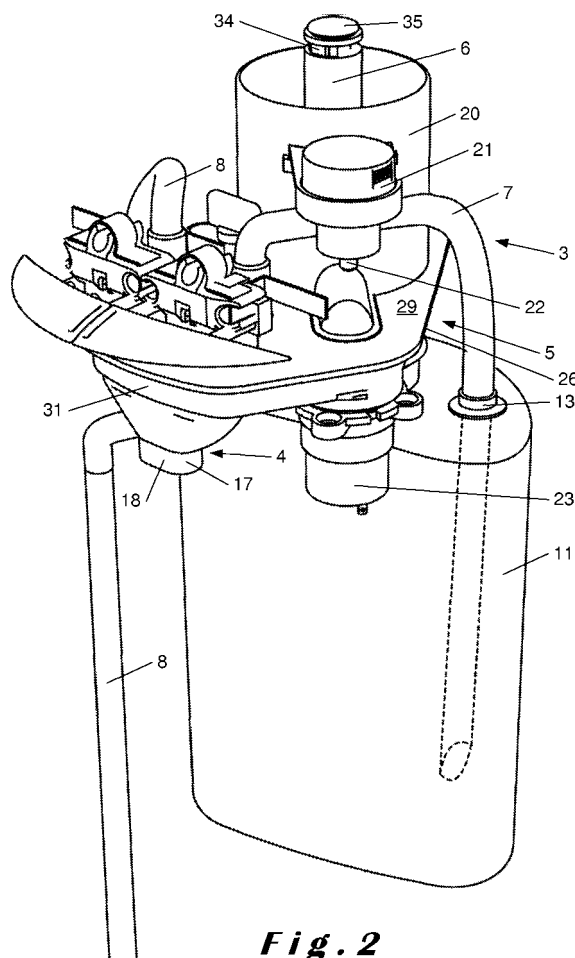


Fig. 2

Description

[0001] The present invention relates to a liquid dispensing apparatus according to the preamble of the first claim.

[0002] The present invention also relates to a distributor device for use in such a liquid dispensing apparatus.

[0003] WO-A1-2006/018614 discloses a liquid dispensing apparatus for dispensing liquid from an inverted liquid containing bottle, mounted into a mounting arrangement, arranged on top of the housing. The mounting arrangement is adapted to receive the neck of the bottle. In the interior of the housing a distributor device is removably mounted to the housing, at the position of the mounting arrangement. The distributor device comprises a receiver cup into which the neck of the inverted bottle is inserted when in use. A feeding tube projects upwardly within the receiver cup into the neck of the inverted bottle for conducting liquid from the bottle into the internal volume of the distributor device. The feeding tube connects to a first horizontal liquid passage in the internal volume of the distributor device and further into a reservoir for cooling or heating the liquid. Chilled or heated liquid is removed from the reservoir through a dip tube which is coupled to a second horizontal liquid passage within the internal volume of the distributor device and further towards a first upward passage in an upwardly extending post, towards the first discharge spout. The first horizontal passage also connects to a second upward passage which also extends into the upwardly extending post and conducts ambient liquid towards the second discharge spout. The reservoir is removably connected to the distributor device. At least part of the first and second horizontal liquid passage and first and second upward passage extend adjacently to each other.

[0004] The liquid dispensing apparatus disclosed by WO-A1-2006/018614 however presents the disadvantage that the first and second horizontal liquid passage and first and second upward passage are in thermal contact. As a consequence, heat exchange between the liquid flowing through the first and second passage may take place, making the ambient liquid cooler or warmer and the heated or chilled liquid cooler or warmer.

[0005] There is thus a need for a device in which heat exchange between the heated or chilled liquid and the ambient liquid is avoided.

[0006] Accordingly, it is the object of the present invention to provide a liquid dispensing apparatus in which heat exchange between the heated or chilled liquid and the ambient liquid is avoided.

[0007] This is achieved according to the present invention with an apparatus for dispensing liquid showing the technical features of the characterising portion of the first claim.

[0008] Thereto, the first and the second conduit are thermally isolated from each other.

[0009] The inventor has found that by thermally isolating the first and the second conduit from each other, heat

exchange between the liquid running through the first conduit, having a temperature which is controlled in the first reservoir to the first temperature, and the liquid running through the second conduit is avoided. The temperature of the liquid running through the first conduit is therefore not altered by the temperature of the liquid running through the second conduit. As a consequence for example, ambient liquid running through the second conduit is not made cooler or warmer by heated or chilled liquid running through the first conduit and heated or chilled liquid running through the first conduit is not made warmer or cooler by ambient liquid running through the second conduit.

[0010] The inventor moreover has found that since the first and the second conduit means are thermally isolated from each other, the temperature difference between the temperature of the liquids running through the first and the second conduits can be increased without increasing the aforementioned heat exchange between the first and the second conduits. Therefore, the liquid running through the first conduit can for example be cooled and the liquid running through the second conduit can be heated or vice-versa, without affecting each others temperature.

[0011] A preferred embodiment of the liquid dispensing apparatus according to the invention is characterised in that the discharge outlet is positioned below the neck of the inverted bottle.

[0012] The inventor has found that by positioning the discharge outlet below the neck of the inverted bottle, no additional means for transporting the liquid through the liquid guiding means from the inverted bottle towards the discharge outlet, such as for example a pump, are necessary since the difference in height between the neck of the inverted bottle and the discharge outlet surprisingly is sufficient for gravity to transport the liquid from the neck of the inverted bottle through the liquid guiding means towards the discharge outlet.

[0013] Other details and advantages of the device according to the invention will become apparent from the enclosed figures and description of preferred embodiments of the invention.

Figure 1 shows a preferred embodiment of the liquid dispensing apparatus according to the invention.

Figure 2 shows a preferred embodiment of the distributor device according to the invention.

Figure 3 shows a back view of the distributor device of figure 2.

Figure 4 shows a top view of the distributor device of figure 2.

Figure 5 shows a bottom view of the distributor device of figure 2.

Figure 6 shows a detail of the interior of the distributor device according to figure 2.

Figure 7 shows a detail of the liquid dispensing apparatus of figure 1.

[0014] The liquid dispensing apparatus 1 shown in figure 1 comprises a housing 2 with a mounting arrangement for mounting an inverted bottle 10 to the housing 2. The inverted bottle 10 comprises a neck 9 which is received through the mounting arrangement. The liquid dispensing apparatus 1 comprises liquid guiding means 3 for guiding a liquid flow from the neck 9 to at least one discharge outlet 4 mounted to the housing 2. Thereto, the inverted bottle 10 has to be connected to the liquid guiding means 3.

[0015] Any liquid known to the person skilled in the art can be dispensed by the liquid dispensing apparatus 1, but preferably the dispensed liquid is meant for consumption, more preferably human consumption. The liquid can for example be water, more preferably drinking water. The inverted bottle 10 thereto preferably comprises water, more preferably drinking water. Dispensing liquids for consumption imposes specific demands onto the different parts of the liquid dispensing apparatus 1 in order to comply with specific hygienic requirements. The different parts of the liquid dispensing apparatus 1 contacting the dispensed liquid therefore need to be regularly cleaned and/or replaced. Preferably, all parts of the liquid dispensing apparatus 1 contacting the dispensed liquid are replaceable and are regularly replaced, for example when an empty inverted bottle 10 is being replaced by a full inverted bottle 10.

[0016] The neck 9 of the inverted bottle 10 preferably is provided with a cap closing the neck 9 of the inverted bottle 10 so that no liquid contained in the inverted bottle 10 can spill out while mounting the inverted bottle 10 to the mounting arrangement of the liquid dispensing apparatus 1. Moreover, the cap prevents dust, air, etc. from entering the bottle 10 and therefore allows the liquid contained in the bottle 10 to be hygienically stored and later mounted to the mounting arrangement. The neck 9 and the inverted bottle can be seen in figure 7.

[0017] The liquid guiding means 3 preferably are provided inside the housing 2 to provide the liquid dispensing apparatus 1 with a more attractive design and to increase the hygiene of the liquid dispensing apparatus 1 by for example shielding the liquid guiding means 3 from for example dust, etc.

[0018] However, the discharge outlet 4 preferably is not provided inside the housing 2 of the liquid dispensing apparatus 1 and is provided to be accessible from outside of the housing 2. The discharge outlet 4 preferably is mounted to the housing 2 at such a height so that a standing person can easily access the discharge outlet 4. The height at which the discharge outlet 4 is mounted to the housing 2 is however not critical for the invention and can be determined by the person skilled in the art.

[0019] The housing 2 can comprise any material deemed appropriate by the person skilled in the art such as metal, wood, plastic, etc.

[0020] The mounting arrangement for mounting the inverted bottle 10 is provided to support the inverted bottle 10 and thereto preferably has a shape which is comple-

mentary to the shape of the part of the inverted bottle 10 supported by the mounting arrangement. The complementary shape of the mounting arrangement allows an improved support for the inverted bottle 10 and allows an easy mounting of the inverted bottle 10 into the mounting arrangement. Generally, bottles 10 which are used for liquid dispensing apparatuses 1 are rotational symmetric around their upright axis. The mounting arrangement therefore preferably also is rotational symmetrical around an axis which is parallel to the axis of the cylinder.

[0021] As shown in figure 1, the mounting arrangement is provided to mount the inverted bottle 10 with its longitudinal axis upright, more preferably vertically. The upright or more preferred vertical position of the inverted bottle 10 allows a more complete depletion of the bottle 10 which avoids part of the liquid contained in the bottle 10 to remain unused. The upright or vertical position of the inverted bottle 10 is however not critical for the invention and any other position for the inverted bottle 10 deemed appropriate by the person skilled in the art can be applied.

[0022] The mounting arrangement preferably comprises an opening in which the neck 9 of the inverted bottle 10 can be inserted. The opening of the mounting arrangement preferably allows the inverted bottle 10 to be correctly positioned with respect to the liquid guiding means 3. To increase the accuracy of the positioning of the inverted bottle 10 with respect to the liquid guiding means 3, the opening preferably has a diameter which allows the neck 9 of the inverted bottle 10 to be fittingly received. The opening of the mounting arrangement therefore restricts the clearance left by the mounting arrangement to correctly mount the inverted bottle 10 to the liquid guiding means 3. The diameter of the opening thereto preferably is provided to tightly fit the neck 9 of the inverted bottle 10.

[0023] The liquid guiding means 3 comprise a distributor device 5. The distributor device 5 is shown by figures 2 - 7. The distributor device 5 preferably is releasably mounted to the housing. By releasably mounting the distributor device 5 to the housing 2, the distributor device 5 can be replaced according to the hygienic requirements for the liquid guiding means 3. To releasably mount the distributor device 5, the distributor device 5 preferably comprises a supporting ridge 26. The distributor device 5 can then rest onto the housing 2 using the supporting ridge 26. The housing 2 thereto is provided with means which support the supporting ridge 26 such as a ledge provided in the housing 2. The supporting ridge 26 preferably is provided along the entire circumference of the distributor device 5, as shown in figure 5, but can for example also be provided along part of the distributor device 5.

[0024] The distributor device 5 preferably is mounted beneath the mounting arrangement and comprises a feeding tube 6. The feeding tube 6 is provided to project into the neck 9 of the inverted bottle 10 and to conduct liquid contained in the inverted bottle 10 towards the rest of the liquid guiding means 3, as shown in figure 7. The

feeding tube 6 thereto preferably is provided at and projects through the opening of mounting arrangement so that the feeding tube 6 automatically pierces through the cap of the inverted bottle 10 and projects into the neck 9 of the inverted bottle 10 when the inverted bottle 10 is mounted to the mounting arrangement. Therefore, to connect the inverted bottle 10 to the liquid guiding means 3, it is sufficient to mount the inverted bottle 10 to the mounting arrangement and no additional connection of the feeding tube 6 to the liquid guiding means 3 is necessary.

[0025] The feeding tube 6 preferably is cylindrical, as shown in figures 2, 3, 4 and 6, since the inventor has found that the cylindrical shape of the feeding tube 6 decreases the risk that liquid is spilled. However, the form of the feeding tube 6 is not critical for the invention and any other form deemed appropriate by the person skilled in the art can be used for the feeding tube 6 such as for example square, rectangular, oval, etc.

[0026] The whole of the feeding tube 6 and/or the cap preferably comprises means for fittingly piercing the feeding tube 6 through the cap covering the neck 9 of the inverted bottle 10. When fittingly piercing through the cap covering the neck 9 of the inverted bottle 10, leaking of liquid during mounting the inverted bottle 10 to the liquid guiding means 3 is avoided. Moreover, by fittingly piercing through the cap of the inverted bottle 10 for example, no air or dust can enter the inverted bottle 10 and the required hygienic conditions for the liquid can be maintained.

[0027] The feeding tube 6 comprises at least one opening 34 for allowing liquid to enter the liquid guiding means 3 along the feeding tube 6. The lowest of the openings 34 preferably is provided near the neck 9 of the inverted bottle 10 to allow as much liquid as possible to enter the feeding tube 6 and to minimise the amount of liquid that is left in the inverted bottle 10.

[0028] Preferably, a single opening 34 is provided near, more preferably at, the end of the feeding tube 6. More preferably, the dimensions of the feeding tube 6 preferably are adapted to the dimensions of the neck 9 of the inverted bottle 10 so that projection of the opening at the end of the feeding tube 6 into the neck of the inverted bottle 10 is reduced. This way, as much liquid as possible can enter the feeding tube 6 and the amount of liquid that is left in the inverted bottle 10 after the inverted bottle 10 has been emptied, is minimised.

[0029] More preferably the single opening 34 is covered by a plate 35 which prevents solid particles, such as for example dust, which are possible suspended in the liquid to enter the feeding tube 6 and, therefore, the liquid guiding means 3.

[0030] The feeding tube 6 preferably is fastened to the distributor device 5 which has the advantage that the feeding tube 6 is replaceable together with the distributor device 5, making it easier and faster to replace any parts contacting the liquid to discharge liquid to the discharge outlet 4 when hygienic requirements demand so.

[0031] Preferably, the liquid dispensing apparatus 1 according to the invention comprises propelling means 23 for propelling the liquid from the inverted bottle 10 into the feeding tube 6. More preferably, these propelling means 23 comprise a pump 23 pumping liquid from the inverted bottle 10 into the feeding tube 6. The inventor has found that by providing propelling means 23 the flow rate of the liquid through the liquid guiding means 3 is increased so that discharge outlet 4 can provide more liquid in a shorter time.

[0032] The pump 23 preferably comprises a cylinder-shaped volume with a propeller mounted therein. More preferably, the propeller comprises a magnetic element which causes the propeller to rotate coaxially with respect to the cylinder-shaped volume when magnetically driving the magnetic element so that liquid is sucked into the feeding tube 6. Magnetically driving the propeller has the advantage that magnetic driving means for magnetically driving the propeller can be provided outside of the distributor device 5 without contacting the propelled liquid. Since no components of the magnetic driving means contact the liquid, the magnetic driving means do not need to be replaced to maintain the required hygienic conditions and periodical replacement of the distributor device 5 is sufficient. Since the magnetic driving means do not need to be replaced to maintain the required hygienic conditions, the magnetic driving means preferably are permanently provided into the housing 2.

[0033] The distributor device 5 preferably comprises a receiver cup 20 for receiving the neck 9 of the inverted bottle 10. The receiver cup 20 allows to receive any liquid which has for example spilled from the inverted bottle 10 while mounting the inverted bottle 10 to the mounting arrangement. More preferably, the receiver cup 20 comprises means 37 for discharging the liquid received by the receiver cup 20. The receiver cup 20 preferably at least partly supports the inverted bottle 10. The spilled liquid can be discharged to any receptacle known to the person skilled in the art or to a sink or any other means appropriate for receiving liquid.

[0034] The distributor device 5 preferably comprises means for allowing air to enter the inverted bottle 10 so that the liquid which has been discharged through the feeding tube 6 is replaced by air. Preferably, the distributor device 5 comprises a filter 21, for example shown in figures 1 - 6, which is mounted to the distributor device 5 and which, for example, removes dirt and bacteria from the air before it enters the inverted bottle 10 containing the liquid. The filter 21 preferably comprises a one-way check valve to prevent water from escaping through the filter 21. The air preferably is conducted from the filter 21 through a guiding 22, only partially shown in the figures, for example comprising flexible tubes and nipples provided in the distributor device 5 towards the feeding tube 6 and then further on towards the inverted bottle 10, preferably through the feeding tube 6. The feeding tube 6 thereto preferably comprises a separate channel for guiding the filtered air towards the liquid contained in the in-

verted bottle 10.

[0035] Although the filter 21 preferably is mounted to the distributor device 5 to allow the filter 21 to be easily replaceable together with the distributor device 5 as shown in figures 1 - 6, the filter can also be mounted to any other part of the liquid dispensing apparatus 1 such as the housing 2.

[0036] To allow the filter 21 to be independently replaced according to the required hygienic conditions for the air conducted into the inverted bottle 10, the filter 21 preferably is removably mounted.

[0037] The liquid from the inverted bottle 10 preferably is guided from the feeding tube 6 into a central volume 24 of the distributor device 5. As for example shown in figure 6, the central volume 24 preferably is provided directly beneath the feeding tube 6 and the receiver cup 20.

[0038] The central volume 24 preferably is delimited by a top face 29, a bottom face 30 and a circumferential wall 31 extending between the top 29 and the bottom face 30. The central volume 24 further comprises an inlet opening 25 for receiving the liquid from the feeding tube 6 and a first outlet opening 27 for conducting liquid from the central volume 24 towards a first reservoir 11 and further on to a first discharge outlet 17 along a first conduit 7.

[0039] The inlet opening 25 preferably is provided at the top face 29 of the central volume 24. More preferably, the cylinder shaped volume comprising the propeller of the pump 23 is provided at the inlet opening 25, as shown in figure 6. The inventor has found that providing the cylinder shaped volume and the propeller in the distributor device 5 at the inlet opening 25 of the feeding tube 6, significantly reduces production costs for the pump.

[0040] Figure 6 shows that the first outlet opening 27 preferably is provided in the bottom face 30 of the central volume 24.

[0041] The central volume 24 preferably comprises a second outlet opening 28 for conducting liquid from the central volume 24 towards a second conduit 8 conducting liquid to a second discharge outlet 18. The second outlet opening 28 is preferably provided at the top face 29, as shown in figure 3, but can also be provided at the bottom face 30.

[0042] By providing the second outlet opening 28 at the top face 29 air trapped inside the central volume 24 can be evacuated out of the central volume 24 by filling the central volume 24 with the liquid. The amount of air trapped inside the central volume 24 will therefore be reduced. The reduced amount of air trapped inside the central volume 24 improves the hygienic conditions of the water kept in the central volume 24 and the efficiency of the pump 23. Some pumps 23 require to be surrounded by liquid to avoid failure of the pump 23. Since the amount of air pumped by the pump 23 is reduced, therefore increasing the amount of liquid surrounding the pump 23, the risk that those pumps will fail is reduced.

[0043] Although the second outlet opening 28 preferably is provided at the top face 29, it has been found

more convenient to connect the second conduit 8 to the central volume 24 at the bottom face 30 of the distributor device 5. Therefore, the distributor device comprises a conduct 36 extending from the second outlet opening 28 to the bottom face 30 of the central volume 24. This way air can escape through the second outlet opening 28 which is provided in the top face 29 along the conduct 36, extending to the bottom face 30, to which the second conduit 8 can be conveniently connected. More preferably, the conduct 36 extends through the distributor device 5. Figure 3 and 4 show the conduct 36 provided at the top face 29, covering the second outlet opening 28 which is not visible, and figure 5 shows the end of the conduct 36 to which the second conduit 8 can be connected.

[0044] The central volume 24 can also comprise additional outlet openings conducting liquid towards more conduits. The additional outlet openings preferably conduct liquid to additional discharge outlet openings. This way, for example, liquid at different temperatures preferably are conducted to its respective discharge outlet. The number of additional conduits and outlet openings can however be determined by the person skilled in the art and is not critical for the invention.

[0045] Although not shown in the figures, the central volume 24 may comprise a third outlet opening conducting liquid to a third discharge opening along for example a third conduit. The liquid conducted to the third discharge opening preferably remains ambient while the liquid conducted by the first 7 and the second 8 conduit preferably is respectively chilled and heated. The liquid dispensing apparatus 1 therefore offers a choice of chilled, heated and ambient liquid.

[0046] The first outlet opening 27 is connected to the first reservoir 11 so that liquid is conducted from the central volume 24 towards the first reservoir 11. The first reservoir 11 is shown in figures 2 and 3 and is provided to control the temperature of the liquid contained in the first reservoir 11 to a first temperature.

[0047] The first reservoir 11 comprises an inlet opening 14 for conducting liquid from the outlet opening 27 of the central volume 24 towards the first reservoir 11. The first reservoir 11 also comprises an outlet opening 13 for conducting liquid from in the first reservoir 11 towards the first discharge outlet 17. The outlet opening 13 can be seen in figures 1 and 2. Figure 1 and 3 show the inlet opening 14.

[0048] The outlet opening 13 preferably is connected with a tube extending into the first reservoir 11 towards the bottom of the reservoir 11. The tube is provided to conduct liquid from the bottom of the first reservoir 11 towards the outlet opening 13.

[0049] The outlet opening 13 and inlet opening 14 of the first reservoir 11 can however also be combined into a single opening since the liquid can also be conducted from the first reservoir 11 to the first discharge outlet 17 along the inlet opening 14 of the first reservoir 11. Using a single opening 14 for conducting liquid to and from the first reservoir 11 has the advantage that only a single

connection needs to be connected to the first reservoir 11 for guiding liquid towards the first discharge outlet 17 through the first conduit 7. The combination of outlet opening 13 and inlet opening 14 is however not critical for the invention and is not shown in the figures.

[0050] To control the first temperature of the liquid contained in the first reservoir 11, the liquid dispensing apparatus 1 comprises means for controlling the temperature of the liquid to the first temperature. The first temperature can be lower than ambient temperature, the liquid being cooled, or can be higher than ambient temperature, the liquid being heated. The liquid dispensing apparatus 1 may for example comprise a first cooling 15 for cooling the liquid contained in the first reservoir 11. The liquid dispensing apparatus 1 may however also comprise a heating for the first reservoir 11.

[0051] When the liquid contained in the first reservoir 11 is cooled and since cold liquids generally have a tendency to sink with respect to warmer liquids, provision of the tube has the advantage that a cooler liquid is provided to the first conduit 7.

[0052] The first reservoir 11 preferably comprises plastic to allow a cost effective replacement of the first reservoir 11. The first reservoir 11 may however also comprise metal or any other material deemed appropriate by the person skilled in the art.

[0053] The shape and dimensions of the first reservoir 11 are not critical for the invention. The shape and dimensions of the first reservoir 11 are however adapted to its function of controlling the temperature of the liquid to the first temperature. The dimensions will for example depend on the rate of use of the liquid from the first reservoir 11 and of the time needed to cool or heat liquid entering the first reservoir 11. The shape of the first reservoir 11 can for example depend on the location of the inlet 14, and, if provided, the outlet, and the temperature distribution of the liquid in the first reservoir 11.

[0054] The first outlet opening 27 of the central volume 24, and therefore the distributor device 5, preferably is provided to be directly releasably connected to the first reservoir 11. Directly connecting the first reservoir 11 to the first outlet opening 27 allows easy connection of the first reservoir 11 to the distributor device 5 without having to provide tubes or other connection means. Releasably connecting the first reservoir 11 to the distributor device 5 allows independent replacement of the first reservoir 11 and the distributor device 5. The first outlet opening 27 and the first reservoir 11 shown in figures 3 and 6 thereto comprise a bayonet mount. The bayonet mount is however not critical for the invention and can be replaced by for example a screw mount, clamp mount, etc.

[0055] In case the outlet 13 and inlet 14 opening are provided in a single opening of the first reservoir 11, the first outlet opening 27 of the central volume 24 can be subdivided into a first part 32 and a second part 33. The first part 32 is provided for conducting liquid from the central volume 24 to the first reservoir 11 and the second part 33 is provided to conduct cooled liquid from the first

reservoir 11 into the first conduit 7 conducting liquid from the first reservoir 11 towards the first discharge outlet 17. The first outlet opening 27, comprising the first 32 and the second 33 part, is shown in figure 5.

[0056] The liquid conducted through the outlet 28 along the second conduit 8 may be ambient at the second discharge outlet 18 but can also be cooled or heated along the second conduit 8. When the liquid is cooled in the first reservoir 11, the liquid conducted through the second conduit 8 preferably is heated or vice versa. Thereto, the second outlet opening 28 preferably is connected to a second reservoir 12 for controlling the temperature of the liquid to a second temperature different from the first temperature. The reservoir 12 can however be omitted for example when the second conduit 8 is provided to conduct ambient liquid towards the discharge outlet 18.

[0057] To heat the liquid in the second reservoir 12, the liquid dispensing apparatus 1 preferably comprises a second heating 16. Any heating known to the person skilled in the art can be used.

[0058] The second conduit 8 shown in figures 3 and 5 comprises a tube guiding liquid from the central volume 24 of the distributor device 5 towards the second reservoir 12. The second reservoir 12 preferably is connected to the distributor device 5 along replaceable flexible plastic tubes, which are only partly shown, although any other connection deemed appropriate by the person skilled in the art may be used such as rigid tubes, metal tubes, etc.

[0059] The first conduit 7 conducting liquid from the first reservoir 11 to the first discharge outlet 17 and the second conduit 8 conducting liquid from the second outlet opening 28 towards the second discharge outlet 18 are thermally isolated from each other.

[0060] Preferably, this is achieved by externally mounting the first conduit 7 to the distributor device 5 so that the liquid conducted by the first conduit 7 is shielded from the ambient liquid in the central volume 24 and the liquid conducted through the second conduit 8. The first conduit 7 thereto preferably comprises a flexible tube provided to run from the first outlet opening 27 towards the first discharge outlet 17. The specific embodiment of the first conduit 7 is however not critical for the invention and can be determined by the person skilled in the art.

[0061] The second conduit 8 preferably also is mounted externally to the distributor device 5. The second conduit 8 more preferably comprises flexible tubes extending from the second outlet opening 28 towards the second discharge outlet 18. The flexible tubes preferably are not adjacent to or do not cross the first conduit 7. Since the first conduit 7 and the second conduit 8 are shielded from each other, they are thermally isolated from each other and the liquid conducted by the first conduit 7 being at the first temperature can not exchange heat with the liquid conducted by the second conduit 8 being at the second temperature. The thermally isolated first 7 and second 8 conduits are for example shown in figures 2, 3 and 4.

[0062] The first 7 and the second 8 conduit can how-

ever also be thermally isolated from each other because the first 7 and the second 8 conduit comprise thermal isolating materials which preferably at least partly surround the respective conduit. The specific embodiment of the thermal isolation of the first 7 and the second 8 conduit is however not critical for the invention and can be determined by the person skilled in the art.

[0063] The flexible tubes of the first 7 and the second 8 conduit preferably comprise plastic since plastic can be easily made and replaced so that the tubes can be replaced according to the hygienic requirements for conducting the liquid towards the discharge outlet 4. This embodiment for the flexible tubes is however not critical for the invention and the material for the flexible tubes can be determined by the person skilled in the art.

[0064] Since the discharge outlets contact the liquid and since the liquid preferably is provided for consumption, the discharge outlets 4 preferably are provided to be replaced according to the hygienic requirements for the liquid conducted through the discharge outlets 17, 18. More preferably, the discharge outlets 4 are fastened to the distributor device 5, as for example shown in figures 2, 3 and 4. This allows to replace the discharge outlets 4 together with the distributor device 5, which increases the ease with which the discharge outlets 17 and 18 can be replaced and the hygiene of the liquid dispensing apparatus 1.

[0065] Although not critical for the invention, the discharge outlets 4 preferably are thermally isolated from each other. The discharge outlets 4 can for example be thermally isolated from each other by providing isolating material between the different discharge outlets 4, such as for example between the first and the second discharge outlet 17, 18, or by separating the different discharge outlets 4 from each other.

[0066] The discharge outlets 4 preferably comprise a globe valve 19. The inventor has found that a globe valve 19 offers a good sealing while maintaining the required hygienic conditions.

[0067] More preferably, the globe valves 19 of the different discharge outlets 4 are thermally isolated from each other.

[0068] The resulting distributor device 5 preferably comprises the feeding tube 6, the receiver cup 20, the pump 23, the central volume 24, the filter 21, the first 27 and second 28 outlet openings and the discharge outlets 4. This way most of the components contacting the liquid can be replaced in a single action by replacing the distributor device 5. Moreover, when the first reservoir 11 is directly mounted to the first outlet opening 27, the first reservoir 11 can be replaced together with the distributor device 5.

[0069] The distributor device 5 is preferably made from several moulded plastic pieces which are then welded together to form a single unit. Other embodiments for the distributor device 5 are however possible and can be determined by the person skilled in the art.

Claims

1. A liquid dispensing apparatus (1) comprising

- 5 - a housing (2) with a mounting arrangement for mounting an inverted bottle (10) to the housing (2)
- and liquid guiding means (3) for guiding a liquid flow from a neck (9) of the inverted bottle (10) to at least one discharge outlet (4) mounted to the housing (2),
- 10 - the liquid guiding means (3) comprising a distributor device (5) which is releasably mounted to the housing (2) and a first reservoir (11) which is mounted to the housing (2),
- 15 - the distributor device (5) comprising a feeding tube (6) which is provided to project into the neck (9) of the inverted bottle (10) and to guide the liquid flow from the inverted bottle (10) into the first reservoir (11) for controlling the temperature of the liquid contained therein to a first temperature,
- 20 - the liquid guiding means (3) comprising at least a first conduit (7) for conducting liquid from an outlet (13) of the first reservoir (11) to a first discharge outlet (17) from which liquid can be taken,
- 25 - the liquid guiding means (3) comprising at least a second conduit (8) for conducting liquid from the inverted bottle (10) to a second discharge outlet (18),

characterised in that

- 35 - the first (7) and the second conduit (8) are thermally isolated from each other.
- 2. A liquid dispensing apparatus (1) according to claim 1, **characterised in that** the outlet (13) of the first reservoir (11) is provided for conducting liquid to flow from the first reservoir (11) through the first conduit (7) external to the distributor device (5) towards the first discharge outlet (17).
- 40 3. A liquid dispensing apparatus (1) according to claim 1 or 2, **characterised in that** the first reservoir (11) comprises a first cooling (15) for cooling the liquid contained in the first reservoir (11) to a temperature below room temperature.
- 45 4. A liquid dispensing apparatus (1) according to any one of claims 1 - 3, **characterised in that** the distributor device (5) comprises a second outlet opening (28) for conducting liquid into a second reservoir (12) for controlling the temperature of the liquid to a second temperature different from the first temperature and **in that** the second conduit (8) is mounted to the second reservoir (12) for conducting liquid from the
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second reservoir (12) to the second discharge outlet (18).

5. A liquid dispensing apparatus (1) according to claim 4, **characterised in that** the second conduit (8) is external to the distributor device (5). 5
6. A liquid dispensing apparatus (1) according to claim 5, **characterised in that** the first and the second conduit (7, 8) each comprise a tube made of a flexible plastic material. 10
7. A liquid dispensing apparatus (1) according to any one of claims 4 - 6, **characterised in that** the second reservoir (12) comprises a second heating (16) for heating the liquid in the second reservoir (12) to a temperature above room temperature. 15
8. A liquid dispensing apparatus (1) according to any one of claims 1 - 7, **characterised in that** the discharge outlet (4) is fastened to the distributor device (5). 20
9. A liquid dispensing apparatus (1) according to any one of claims 1 - 8, **characterised in that** the discharge outlet (4) comprises a globe valve (19). 25
10. A liquid dispensing apparatus (1) according to any one of claims 1 - 9, **characterised in that** the discharge outlet (4) is positioned below the neck (9) of the inverted bottle (10). 30
11. Distributor device (5) for use in a liquid dispensing apparatus according to any one of claims 1 - 10. 35

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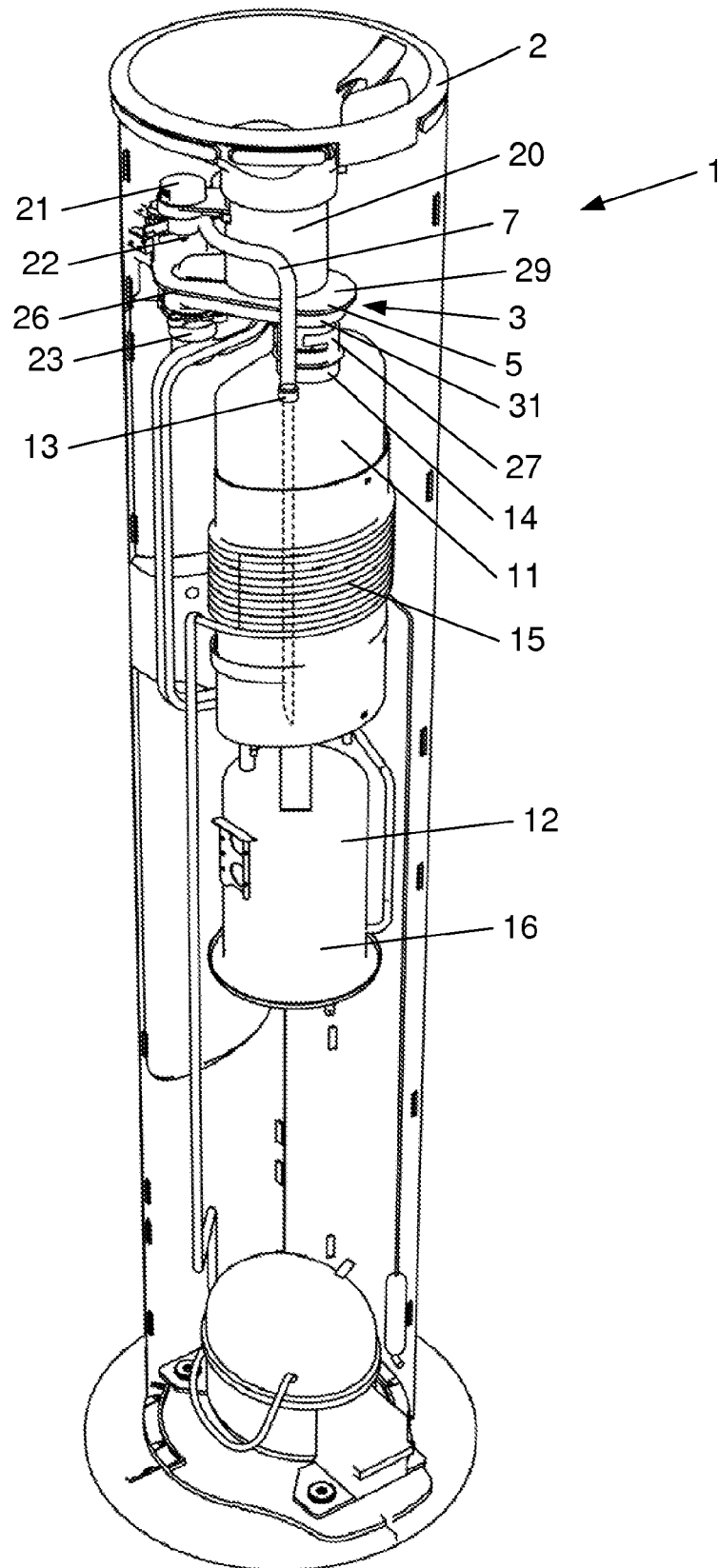


Fig. 1

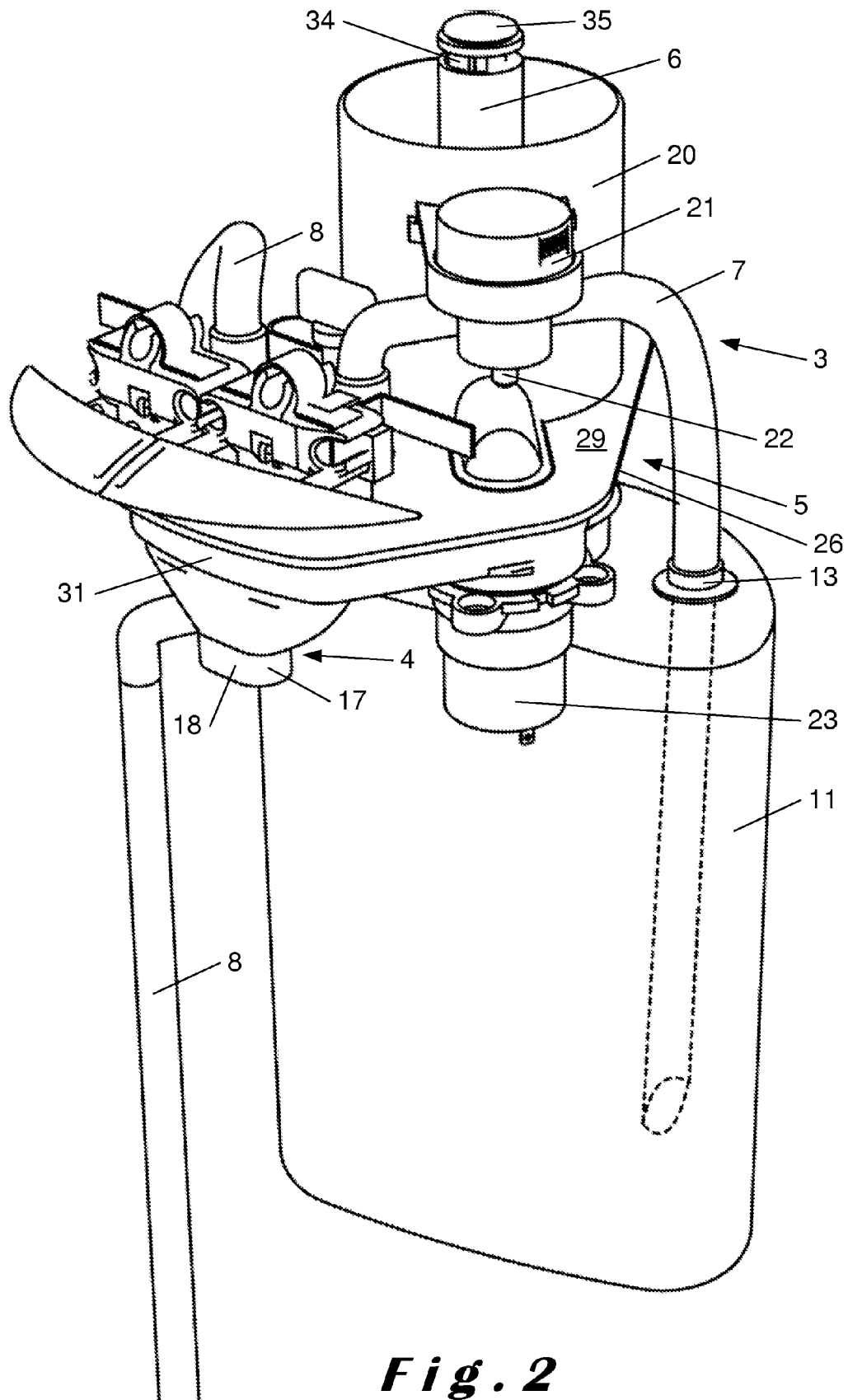


Fig. 2

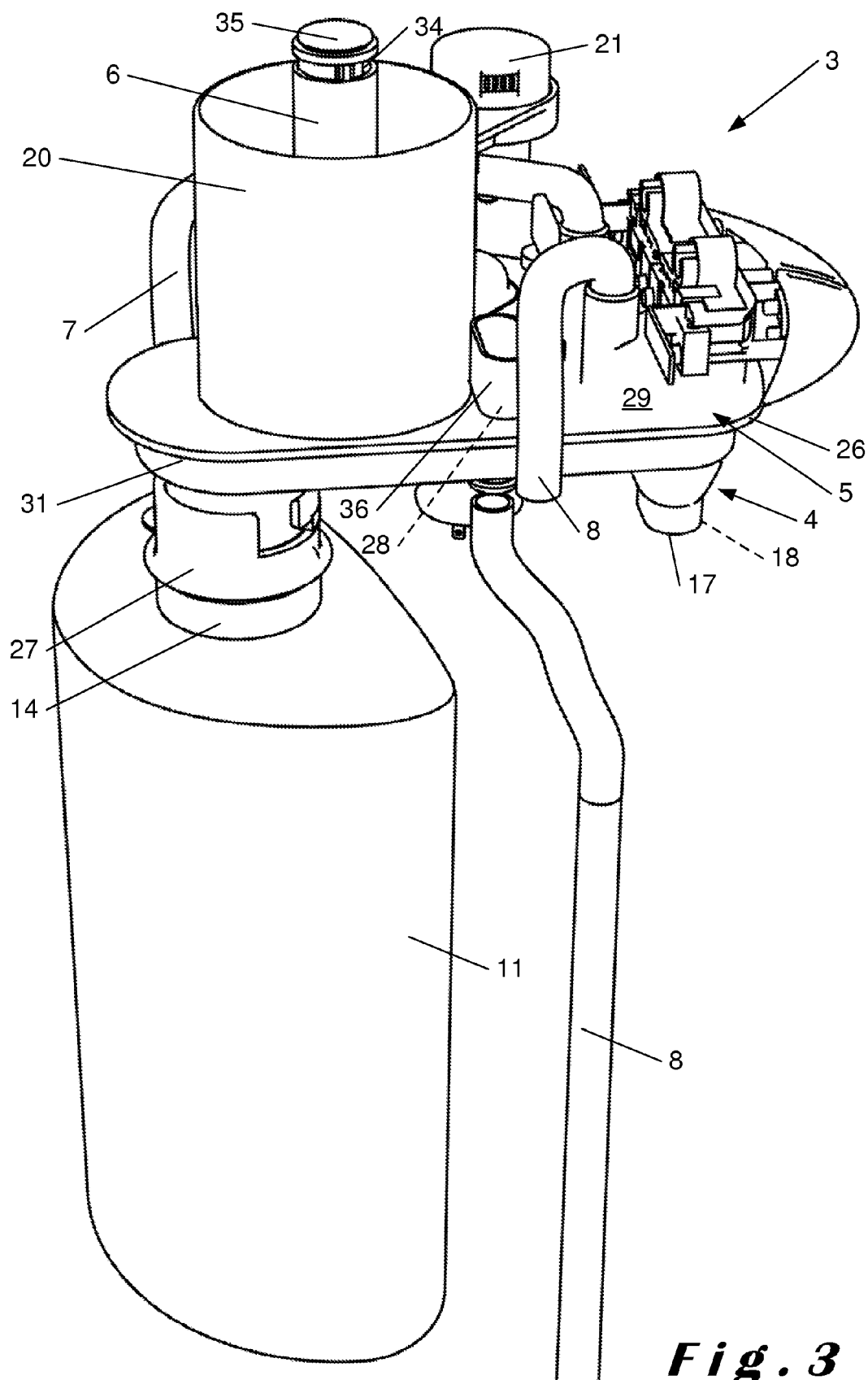


Fig. 3

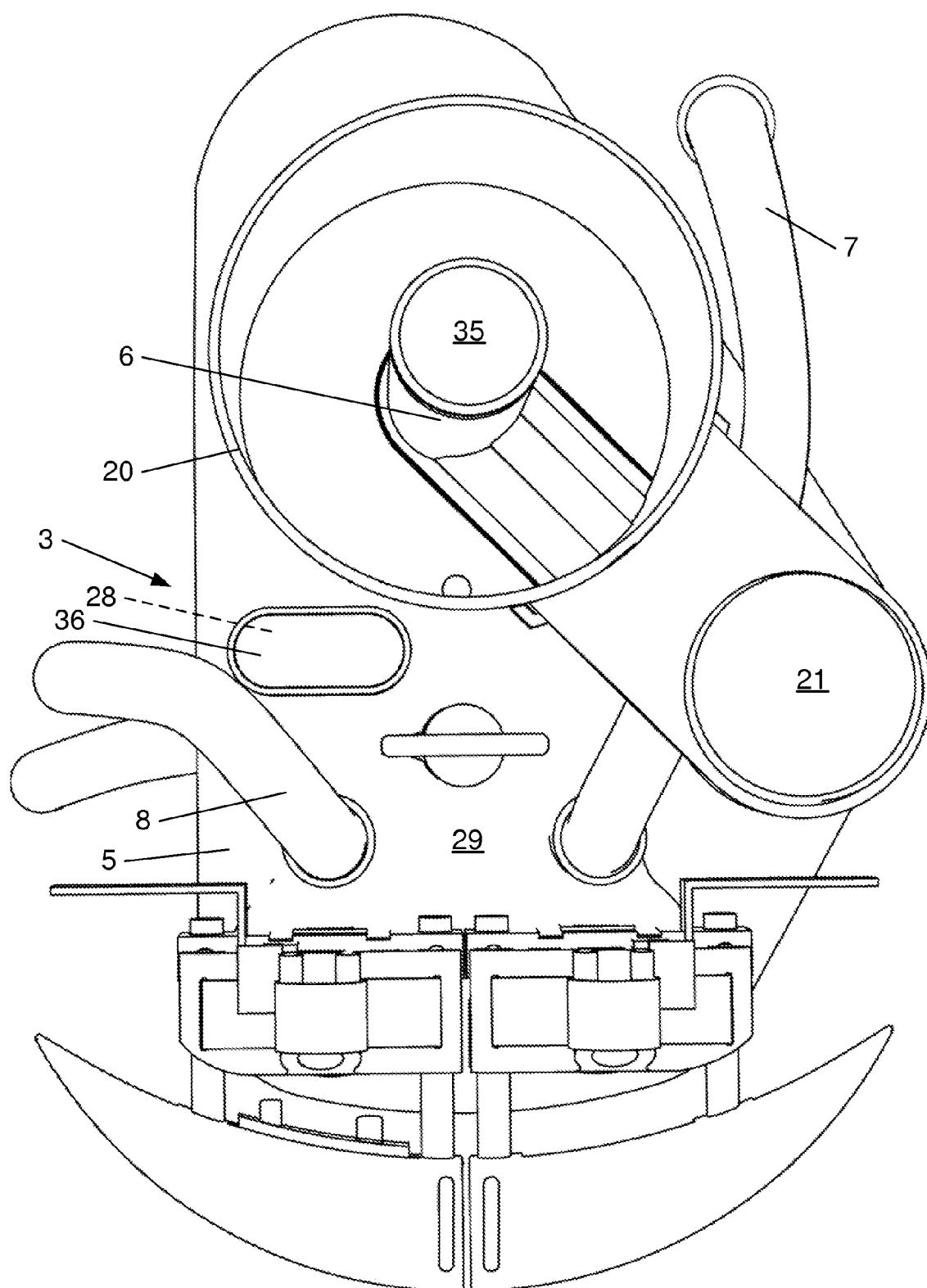


Fig. 4

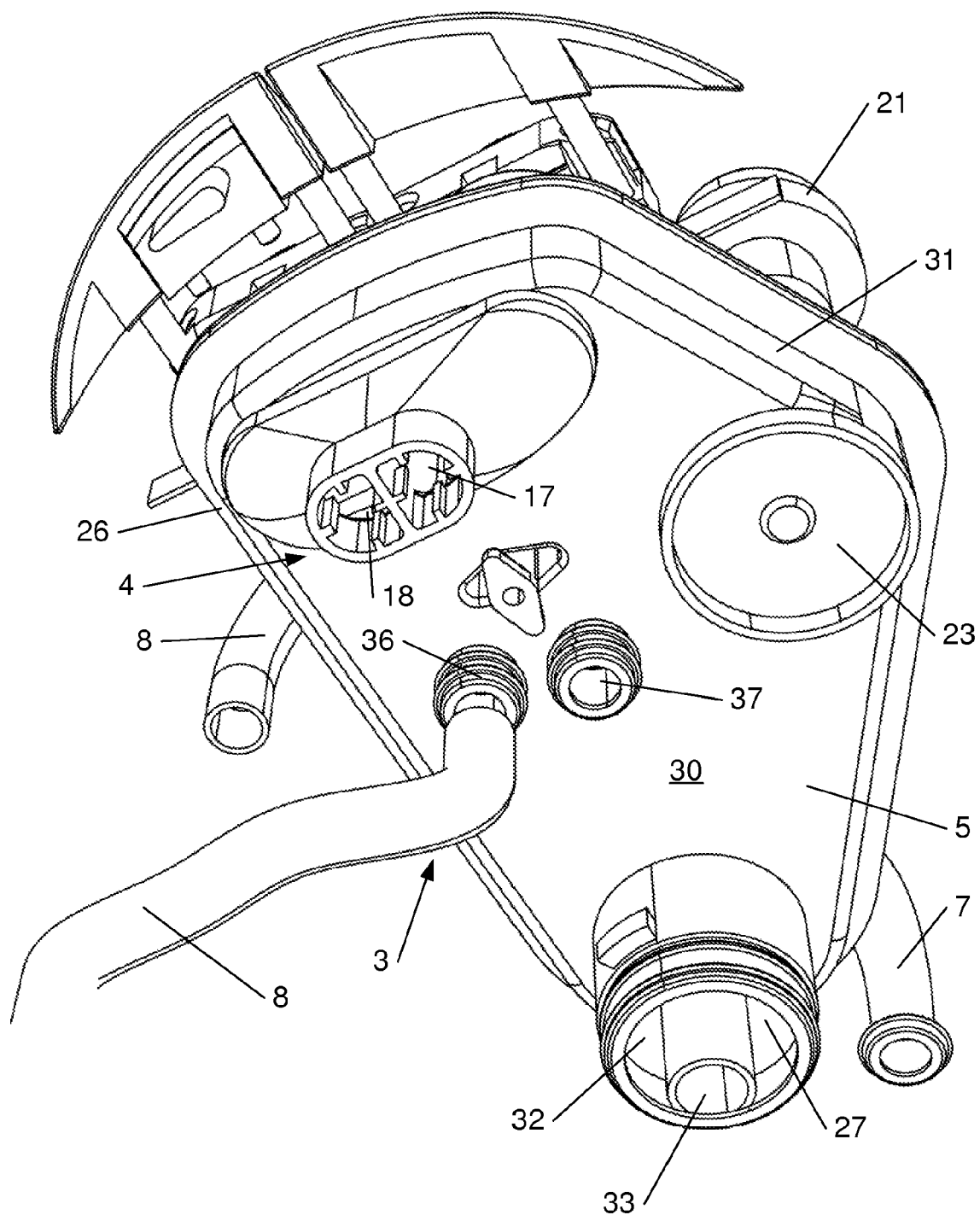
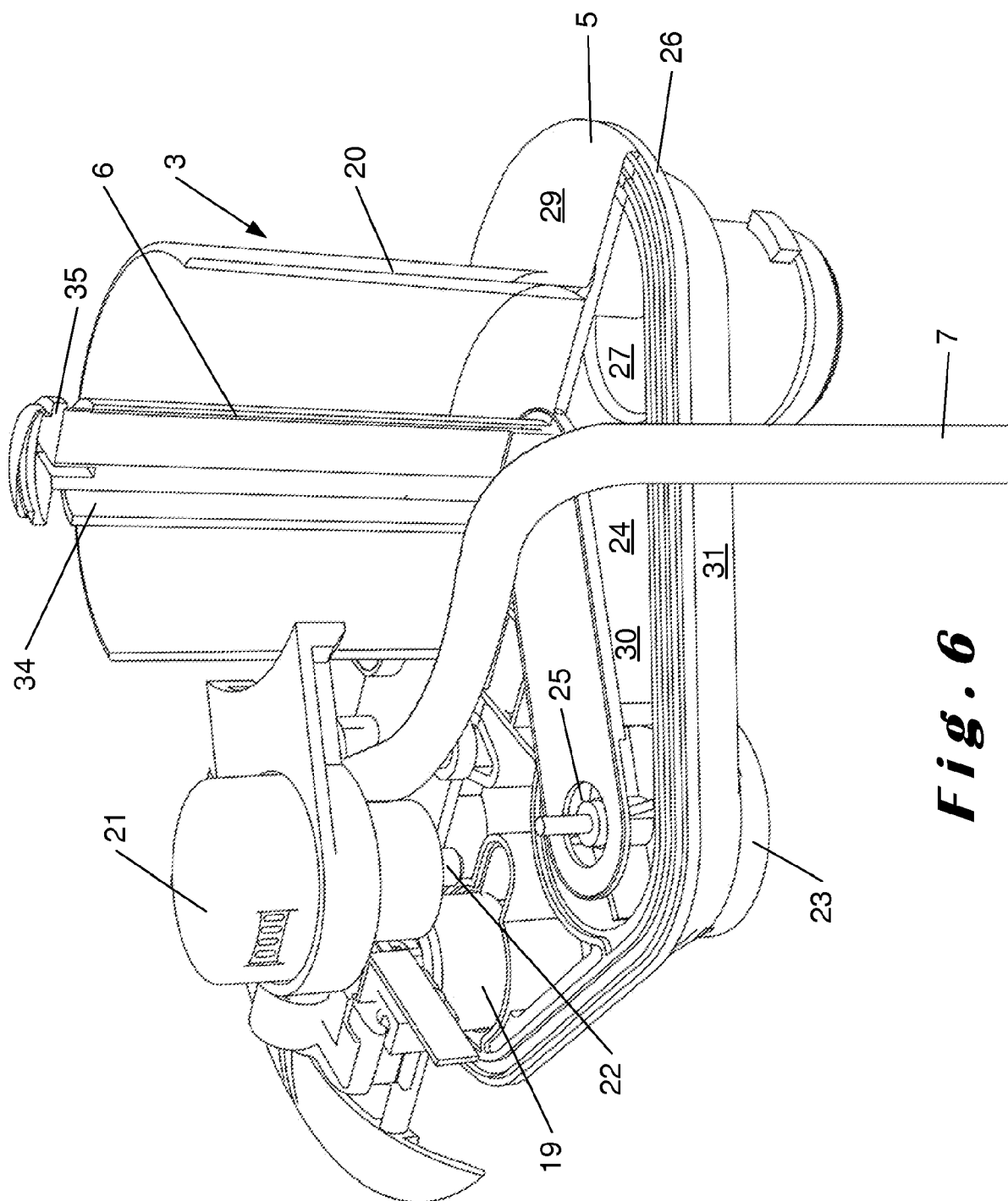


Fig. 5



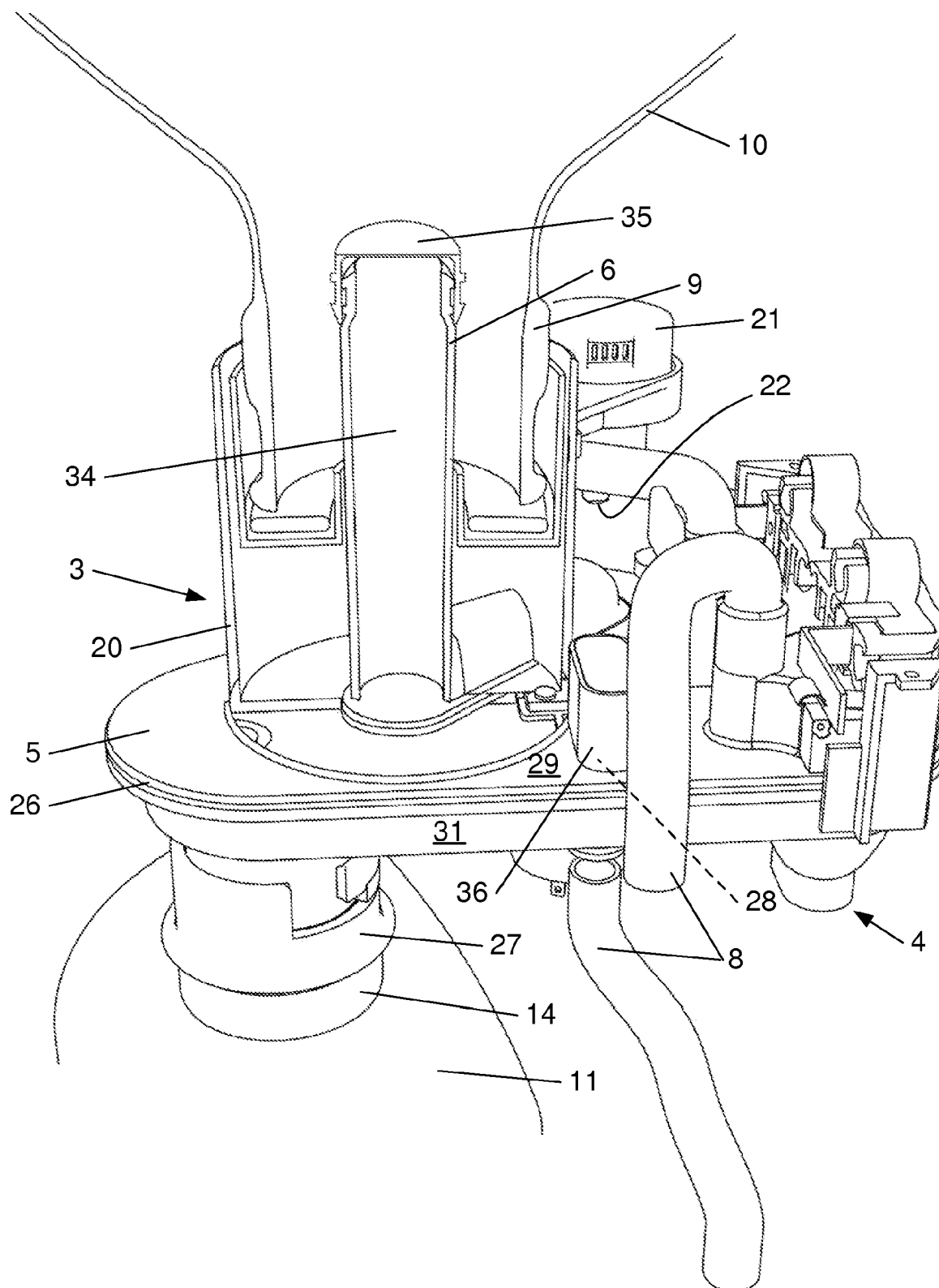


Fig. 7



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EUROPEAN SEARCH REPORT

Application Number
EP 07 11 4120

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC)
			B67D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 4 February 2008	Examiner Müller, Claus
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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04-02-2008

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