



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
26.08.2020 Bulletin 2020/35

(21) Application number: **19158639.5**

(22) Date of filing: **21.02.2019**

(51) Int Cl.:
B67D 1/00 (2006.01) **B67D 1/08** (2006.01)
A47J 31/00 (2006.01) **A47J 31/40** (2006.01)
F24D 17/00 (2006.01) **F24D 17/02** (2006.01)
E03C 1/00 (2006.01) **F25D 31/00** (2006.01)
E03C 1/04 (2006.01) **B01F 3/20** (2006.01)
B01F 3/04 (2006.01)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

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(54) **WATER BASED LIQUID SUPPLY SYSTEM**

(57) This invention relates to a pre-assembled water based liquid supply system (10) comprising a water supply point, at least two of the following components: a liquid filtering component or a liquid sterilizing component or a carbonation component or a boiler component or a safety group or a cooler component or an enrichment component, at least two of the following tanks: a cold liquid tank or a hot liquid tank or a carbonized liquid, a control unit, an electric power supply line, and a liquid dispensing point, characterized in that said water based liquid supply system (10) further comprises a liquid-tight closed housing (18), said housing (18) being adapted and configured to be accommodated in an under-sink kitchen cabinet (12), said water supply point being designed as a water supply connector adapted and configured to be connected to a water supply pipe leading to said water mains, and said liquid dispensing point being designed as a liquid dispensing connector adapted and configured to be connected to a pipe leading to a counter-top faucet (16) mounted to a counter-top of the under-sink kitchen cabinet (12).

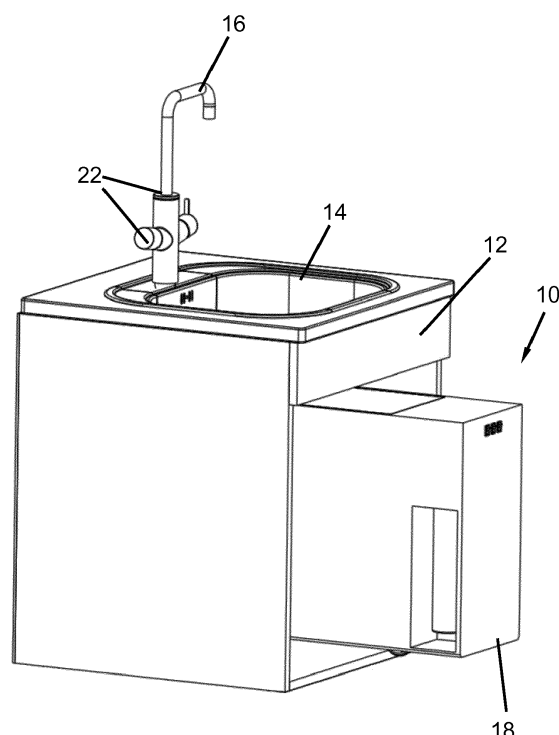


FIG. 1

Description

[0001] The present invention relates to a pre-assembled water based liquid supply system.

[0002] Water systems which provide water based liquid at different temperatures and conditions become more and more state of the art in the modern domestic kitchen systems. These systems may include a variety of options such as boilers, chillers, soda machines for instant supply, and other additional containers, e.g. to filter the water. These systems may further comprise cooling devices which may require a compressor.

[0003] Usually such systems are placed on kitchen countertop as independent devices. Larger systems are stored in a kitchen under-sink cabin, where the space is shared with other devices, such as a sink, a drain pipe from the sink, a garbage receptacle, a trash compactor, and storage areas. Most of these different devices have to be purchased, installed and configured individually from deferent suppliers.

[0004] The shape and size and the complexity of traditional kitchen instant water based supply system, and the lack of space in the kitchen cabin makes the task of installation, maintenance and service quite laborious. The system devices together with the water treatment devices are designed individually. The assembly of such systems requires experienced plumbers to carry out the assembly, with high risk of water leakage from the multiple water pipes and water connections. The lack of space and the water devices together with electrical devices and electrical connections create a hazardous environment with high risk of electrical shortages or even electrical shock.

[0005] The plurality of liquid supplies requires complicate installation, many pipes for liquid communication, many pipe connectors, valves, and manifolds for a liquid distribution which increases the risks of dripping, humidity and wet inside the kitchen cabin that may damage the kitchen or other items located nearby.

[0006] It is therefore an object of the present invention to provide a water based liquid supply system that uses less space than prior art devices and that provides improved retrofitting possibilities.

[0007] This object is solved by a pre-assembled water based liquid supply system comprising:

- a water supply point adapted and configured to allow water supplied from a water mains to enter the water based liquid supply system,
- at least two of the following components:
 - a liquid filtering component adapted and configured to filter the water based liquid,
 - a liquid sterilizing component adapted and configured to sterilize the water based liquid,
 - a carbonation component adapted and configured to adjust the CO₂ concentration of the liquid to a desired CO₂ concentration value,

- a boiler component adapted and configured to provide hot and/or boiling liquid,
- a safety group comprising at least one pressure relief valve adapted and configured to control pressure inside the boiler component,
- a cooler component adapted and configured to provide cold and/or chilled liquid, and
- an enrichment component adapted and configured to enrich the water with at least one desired flavor or mineral or other additives,

• at least two of the following tanks:

- a cold liquid tank for storing cold and/or chilled liquid,
- a hot liquid tank for storing hot and/or boiling liquid,
- a carbonized liquid tank for storing carbonized liquid,

- a wired and/or wireless control unit adapted and configured to control the operation of the at least two components,
- an electric power supply line adapted and configured to supply electric power to the at least two components, and
- a liquid dispensing point adapted and configured to allow the liquid to be dispensed from the water based liquid supply system,

characterized in that

said water based liquid supply system further comprises a liquid-tight closed housing in which the at least two components are accommodated,

said housing being adapted and configured to be accommodated in an under-sink kitchen cabinet,

said water supply point being designed as a water supply connector adapted and configured to be connected to a water supply pipe leading to said water mains, and

said liquid dispensing point being designed as a liquid dispensing connector adapted and configured to be connected to a pipe leading to a counter-top faucet mounted to a counter-top of the under-sink kitchen cabinet.

[0008] The pre-assembled water based liquid supply system may further comprise a mixing component for mixing hot water from the boiler component with line water to dispatch water at a predetermined temperature, for example at 60°C, to the faucet.

[0009] The instant boiling water option may speed up cooking time, may provide boiling water for preparing hot drinks like tea and coffee, may provide a means of sanitizing and sterilizing items, may save energy, and may provide a safer source of boiling water.

[0010] The chilled water option and optional the carbonized water option may provide immediate cold water and/or carbonated water and a possibility for a wide range of optional water based supply. Furthermore, the enriched water and beverage option is becoming more and

more a need as consumers growingly expect better quality and purer beverages content.

[0011] The beverage mixing option and the water treatment may provide the comfort required and high sanitary conditions.

[0012] The liquid supply system may comprise a central electric power switch located on a front wall of the housing in order to disconnect the whole system from power before servicing the system or when the system is not in use.

[0013] In prior art devices, the plurality of liquid supply options further may require a plurality of electric wire connections positioned close to water lines, increasing the probability of electrical shortage or electrical shock as a result of water humidity or liquid leaking. This can become a major risk for kitchen cabins and for users. Leakage liquid or steam from any of the plurality of stored tanks or connection devices that is not detected in reasonable time may lead to damage the kitchen and at certain cases may even require change of the whole kitchen cabin. Moreover, liquid leakage may expose a user to a safety risk. The fact that uncontrolled water dripping gets in touch with electrical devices or electrically powered wires may present a high risk of electrical shock and may endanger the user. But according to the present invention, the liquid supply system may comprise separation elements that are adapted and configured to separate water handling elements of the system, such as containers and pipes, from electrical elements such that the possibility of an electrical shock is minimized while the system is operated or maintained by a user. Furthermore, water, moisture and wet may be isolated from electric devices, electrical power lines, and/or the control board to minimize the risk of electrical shock or shortage due to direct contact between water based liquid and electrical devices.

[0014] The housing may be one integrated unit or may be constructed as a modular unit. A modular unit may enable an outer flexibility of the housing in order to adapt the shape of the housing to the shape of a specific cabin.

[0015] The housing may have a rectangular or square shaped structure, wherein the housing may be orientated in the under-sink kitchen cabinet in a vertical orientation, e.g. mounted to a side wall of the cabinet, or in a horizontal orientation, e.g. arranged at a base of the cabinet.

[0016] Furthermore, prior art machines are mainly positioned on top counters. Those machines are "stand alone" machines which are not integrated in the kitchen cabinet or to the kitchen, i.e. not connected to a faucet, not connected to drain, and not designed to fit draw shape which can be a part of the kitchen construction. All top counter machines dispatch the liquid directly into a glass or a bottle which are placed in or near the machine. Most soda systems inject CO₂ at regulated pressure such that after CO₂ injection there is a need to release pressure from the carbonation tank to avoid splash of the dispatched soda into the glass. When safety group, manifold, filter, softener or mixing component is in use today

part or all of them are mainly assembled on the cabin wall and therefore their locations are fixed. Those items are connected to the water based system with many pipes and electrical wires.

[0017] When the mobile water system enclosure is connected with pipes to fixed components on the kitchen cabinet, the connecting pipes tend to swing, get pulled out or bended while the mobile system enclosure is moving in and out, and are, therefore, exposed to leakage risk. Furthermore, system components which are not pre-assembled within the water system have to be tested individually during or after installation. The preassembled system of the present invention minimizes the leakage risk, and allows testing of the whole system unit during its assembly, e.g. at a manufacturer site. Due to the integration of the components in the housing and the minimized number of connection points at the housing, the apparatus may contain minimal external plumbing conduit.

[0018] The new preassembled enclosure turns the assembly in the kitchen into a simple process that does not require special skills. As such it might be assembled even by kitchen manufacturers as a standard product, just alike installation of a microwave and an oven and, hence, may be supplied by a kitchen manufacturer.

[0019] In an embodiment of the present invention the at least two tanks may be accommodated in the liquid-tight closed housing. So, even a leakage of the tanks may be collected and drained by the housing of the liquid supply system.

[0020] Advantageously, said water based liquid supply system may further comprise a manifold adapted and configured to direct the flow of liquid between said water supply connector and said water dispense connector under the control of said control unit. That is, based on an according user input, the control unit may be adapted and configured to direct a water flow, for example by actuating pumps, valves, etc., from the water supply point to the liquid dispensing point such that the liquid reaches the liquid dispensing point and consequently a connected faucet in a manner desired by the user, i.e. for example chilled, boiled or enriched with flavor or mineral or other additives.

[0021] It may be preferable that said water supply connector and/or said liquid dispensing connector is/are provided at a wall panel of the housing. An arrangement of the water supply connector and said liquid dispensing connector at two sides of the housing being opposite to each other may enable a minimized size of the housing, since the housing may be optimized to the flowing direction of the water. Of course, it is also conceivable to arrange both connectors on the same side of the housing, if desired, such that the housing may be arranged in a corner of the cabinet and/or associated piping may be reduced.

[0022] In a further embodiment of the present application, said water based liquid supply system further comprises a liquid drain connector adapted and configured

to be connected to a pipe leading to drain, said liquid drain connector preferably being provided below the liquid lines.

[0023] Therefore, said water based liquid supply system may further comprise a liquid and/or humidity detecting sensor unit and/or an electrical pump adapted and configured to detect leakage liquid and/or activate and/or operate draining of leakage water from the inside of the housing of said water based liquid supply system to an outside of the housing. In the case that liquid and/or humidity, e.g. vapor, is accumulating in the housing of the water based liquid supply system, for example on its inner bottom surface, the liquid and/or humidity detecting sensor unit may be adapted and configured to switch at a predetermined water level into an activation state activating the electrical pump connected to the liquid and/or humidity detecting sensor unit such that the electrical pump is pumping the leakage liquid out of the housing and e.g. into a drain duct. It may also be advantageous that the liquid and/or humidity detecting sensor is adapted and configured to activate a fan unit. The fan unit may be adapted and configured to direct air having a humidity at or above a predetermined threshold out of the housing, for example into the drain. The liquid and/or humidity detecting sensor unit may be adapted and configured to inform a user about the leakage and/or to output an alert signal to the user and/or to prevent any further operation of the water based liquid supply system, or at least of the component that is identified to leak, until the leakage is fixed. It may be possible, for example for a service technician, to reset the system and/or a connected error memory such that the system returns to normal operation. It may be advantageous to employ a plurality of sensor units in order to determine the source of the leakage liquid more accurately.

[0024] Said control unit may further comprise a data input adapted and configured to receive an input signal output by control elements. The faucet therefore may include control elements to operate the water based liquid supply system and to select the liquid to be dispatched. As it is disclosed in greater detail in EP 18 159 914, the content of which is included herein by reference, the faucet may comprise a selection wheel having a plurality of selection positions each associated to a possible liquid configuration of the water based liquid supply system according to the present invention. If, for example, a user selects a position of the selection wheel that is associated to boiling water, the control element of the selection wheel outputs a signal to the data input of the water based liquid supply system which in turn provides boiling water via the liquid dispensing connector to the faucet, preferably by using the control unit.

[0025] The housing may be thermally isolated to prevent heat transfer to the outside of the housing. Thereby it may be prevented to damage or influence components that are arranged in a vicinity of the water based liquid supply system.

[0026] Also, the at least two components and/or the at

least two tanks may each be thermally isolated from surrounding components to prevent heat transfer between the at least two components and/or the at least two tanks. It is to be understood that a heat transfer, e.g. between the tank for boiling water and the tank for chilled water, may lead to an increased energy consumption for keeping the water at the desired temperature resulting in increased costs and/or a reduced performance of the system.

[0027] Advantageously, the liquid filtering component may be adapted and configured to purify and/or soften the liquid. Hence, the liquid supply system may comprise a liquid softener unit which is adapted to soften the liquid, wherein the liquid softener unit may be designed integrally with the liquid filtering component or as a separate unit. The term "soften" is meant to be understood as reducing a water hardness of the liquid. This may be performed using water conditioners, such as an ion exchange technology or salt free (saltless) water softeners or the like.

[0028] Furthermore, the liquid sterilizing component may comprise an UV lamp. UV light, when applied to a liquid, may prevent microorganisms from growing and/or kill them, and hence increase the quality of an according liquid.

[0029] As it may be necessary to perform maintenance work at the inner components of the water based liquid supply system, the housing preferably may comprise a lid adapted and configured to be removably attached to the housing. The lid may seal an opening of the housing in a liquid-tight manner.

[0030] Especially in the case that the water based liquid supply system comprises a cooling chiller condenser, but not limited thereto, it may be required that the housing further may comprise an air flow system enabling air to flow in and out of the housing. Such an air ventilating may be preferably arranged at a lower part of the housing but still may maintain the liquid-tight sealing at the bottom of the housing which is adapted to hold leakage water and prevent its leakage to an outside of the housing of the water based liquid supply system.

[0031] In an embodiment of the present invention, the water based liquid supply system may comprise slides or wheels that are adapted and configured to allow a displacement of the water based liquid supply system in and out of the under-sink kitchen cabinet. This may provide an easy mechanism to pull the water based liquid supply system out of the cabinet for maintenance work and to store the water based liquid supply system back in the cabinet afterwards. Of course, the slides may be slides of any kind, for example bearing slides.

[0032] At least the carbonation component and/or the enrichment component may comprise a replaceable part that is adapted and configured to be removed from the component by hand without the need of tools. For example, a CO₂ canister, a UV lamp, a water filter, such as carbon filter or alike, and beverage concentrate containers may have to be replaced or refilled during the lifetime

of the water based liquid supply system on a regular basis. To do so, it may be preferable that it is possible for a user to remove old and connect new replacement parts from/to the water based liquid supply system easily, for example by unscrewing/screwing or by any other conceivable means, like a bayonet coupling.

[0033] The enclosed drawings and internal arrangement describe a specific design for better understanding but not limiting the design of other enclosure options. The present invention will be described in further detail in the following with reference to the accompanying drawings in which:

- Fig. 1 shows a perspective view of a cabinet with a pre-assembled water based liquid supply system according to the present invention;
- Fig. 2 shows a perspective view of an embodiment of the pre-assembled water based liquid supply system according to the present invention;
- Fig. 3 shows a top view of the embodiment of the pre-assembled water based liquid supply system according to figure 2;
- Fig. 4 shows a second embodiment of the pre-assembled water based liquid supply system according to the present invention; and
- Fig. 5 shows a perspective view of a cabinet with the second embodiment of figure 4.

[0034] In figure 1 a pre-assembled water based liquid supply system according to the present invention is denoted generally with the reference number 10.

The liquid supply system 10, in figure 1, is partly pulled out of a cabinet 12. The cabinet 12 is provided with a sink 14 and a faucet 16 at its top surface. As can be seen in figure 1, the liquid supply system 10 is completely surrounded by a housing 18 that protects the inside of the liquid supply system 10, for example, against water from the outside and/or prevents water from leaving the inside of the housing 18 of the liquid supply system 10.

[0035] The housing 18 of the liquid supply system 10 is provided with wheels 20 (cf. figure 2) such that the liquid supply system 10 may be displaced relative to the cabinet 12.

[0036] In the embodiment shown in figure 1, the faucet 16 is provided with control elements 22 that are connected to a control unit 24 (see figure 2). The control elements 22 here comprise a selection wheel adapted and configured to allow a user of the liquid supply system 10 to select a specific liquid to be prepared and/or dispensed by the liquid supply system 10. The control elements 22 may further operate at least one valve to open and close the dispensing end of the liquid supply system 10 and/or of the faucet 16.

[0037] In figure 2, a first embodiment of the liquid supply system 10 according to the present invention is shown.

The liquid supply system 10 here comprises the above-mentioned control unit 24 which may be accessible through the housing 18 through a separate lid 26. Alternatively, the control unit 24 may have a top side which is flush to the adjacent housing 18, when the control unit 24 is operatively put in place, such that the control unit 24 forms part of the housing 18. The control unit 24 may be removed from the liquid supply system 10 separately. The housing 18 of the liquid supply system 10 is further provided with at least one LED and/or a main power switch 28 at the front of the housing 18 such that they are easily accessible / visible by a user, when the liquid supply system 10 is arranged in the cabinet 12.

[0038] The liquid supply system 10 in the embodiment of figure 2 further is provided with a filter 30, a soda tank (or "carbonized liquid tank") 31 and/or a CO₂ canister 32, a boiler tank 34, a safety group 35 comprising at least one safety valve to release and control the pressure within the boiling tank, an UV lamp 36, a compressor 38, a condenser 40, and a chiller tank 42.

[0039] The filter 30 is adapted to remove impurities from the water that is introduced into the liquid supply system 10. The CO₂ canister 32 is adapted to carbonate water, e.g. by mixing CO₂ gas into the water stored in the soda tank 31 for preparing soda. The carbonation degree of the soda tank 31 may also be adjusted by the control elements 22 and/or is adjusted by a software application connected to the control unit 24. The boiler tank 34 is adapted to produce and hold hot water with a temperature range which may reach its boiling point of approx. 100°C or even above. The water may be heated using a resistive heater element. The UV lamp 36 is adapted to kill microorganism in the water that might not be removed by the filter 30. The compressor 38 is adapted to adapt the temperature of water and/or soda stored in the chiller tank 42 and the soda tank 31 inside the liquid supply system 10, i.e. to chill water and/or soda to a pre-set temperature. The condenser 40 and the compressor 38 are part of a cooling system (cooling system is partially shown) of the liquid supply system 10. A refrigerant flows from the compressor 38 which raises the refrigerant pressure to the condenser 40 where it condenses from vapor to liquid, while releasing heat to the surrounding. Then the refrigerant goes through an expansion valve (not shown in the drawings) which causes the refrigerant to experience pressure drop. Then the refrigerant goes to the evaporator, e.g. cooling coil pipes, and draws heat from the water and/or soda tank, while vaporizing the refrigerant. The vaporized refrigerant returns to the compressor to restart the cycle. An adequate amount of heat drawing is provided to each of the containers. It may be generated by either designing proper cooling pipe lengths for each of the containers to draw the adequate heat amount from each of the containers or by any alternative design. The chiller tank 42 is adapted to hold water which is cooled by the cooling system to a pre-set temperature as desired and regulated by the control unit. In

summertime, the desired temperature may be approx. 5°C and in wintertime, a higher temperature may be required, for example 10°C.

[0040] At a back side, opposed to the LED/switch 28, three water ducts 44, 46, and 48 are shown in figure 3. The water duct 44 is adapted for water inlet and is connected to line water, the water duct 46 is adapted for dispatched water based liquid and is connected to the counter top faucet 16, and the water duct 48 is adapted to drain water accumulated inside the enclosure and is connected to a drain.

[0041] Furthermore, a manifold 50 is shown in figure 3 which is adapted to direct liquid entering and/or handled by and/or leaving the liquid supply system 10 along predefined path ways in accordance with the user input via the control elements 22 and corresponding signals output by the control unit 24.

[0042] Figure 4 and 5 show a second optional embodiment 10' of the liquid supply system 10 which is substantially similar to the liquid supply system 10 of figures 1 to 3 such that all advantages and features mentioned with respect to figures 1 to 3 also apply to the liquid supply system 10' of figures 4 and 5, and vice versa. Similar elements of the liquid supply system 10' to the liquid supply system 10 are denoted with similar reference numerals.

[0043] In case that the housing 18 of the liquid supply system 10 is not suitable to be stored under the sink 14, e.g. due to pipe/duct location, electric power location, cabin shape or other devices required to be stored above the water system for example garbage grinding, a housing 18' of the liquid supply system 10' is shaped less high but wider than the liquid supply system 10.

[0044] The control unit 24 may be arranged on a side portion 18'a of the housing 18' of the liquid supply system 10'.

[0045] Figure 5 now shows the housing 18' of the liquid supply system 10' partly introduced into the cabinet 12 the features of which are described above with reference to figure 1.

Claims

1. Pre-assembled water based liquid supply system (10) comprising
 - a water supply point (44) adapted and configured to allow water supplied from a water mains to enter the water based liquid supply system (10),
 - at least two of the following components:
 - a liquid filtering component (30) adapted and configured to filter the water based liquid,
 - a liquid sterilizing component (36) adapted and configured to sterilize the water based

liquid,

- a carbonation component (32) adapted and configured to adjust the CO₂ concentration of the liquid to a desired CO₂ concentration value,
- a boiler component (34) adapted and configured to provide hot and/or boiling liquid,
- a safety group (35) comprising at least one pressure relief valve adapted and configured to control pressure inside the boiler component (34),
- a cooler component (42) adapted and configured to provide cold and/or chilled liquid, and
- an enrichment component adapted and configured to enrich the water with at least one desired flavor or mineral or other additives,

- at least two of the following tanks:

- a cold liquid tank (42) for storing cold and/or chilled liquid,
- a hot liquid tank (34) for storing hot and/or boiling liquid,
- a carbonized liquid tank (31) for storing carbonized liquid,

- a wired and/or wireless control unit (24) adapted and configured to control the operation of the at least two components,
- an electric power supply line adapted and configured to supply electric power to the at least two components, and
- a liquid dispensing point (46) adapted and configured to allow the liquid to be dispensed from the water based liquid supply system (10),

characterized in that

said water based liquid supply system (10) further comprises a liquid-tight closed housing (18) in which the at least two components are accommodated, said housing (18) being adapted and configured to be accommodated in an under-sink kitchen cabinet (12), said water supply point (44) being designed as a water supply connector adapted and configured to be connected to a water supply pipe leading to said water mains, and said liquid dispensing point (46) being designed as a liquid dispensing connector adapted and configured to be connected to a pipe leading to a counter-top faucet (16) mounted to a counter-top of the under-sink kitchen cabinet (12).

2. Liquid supply system (10) according to claim 1, **characterized in that** the at least two tanks are accommodated in the liquid-tight closed housing (18).

3. Liquid supply system (10) according to claim 1 or 2,
characterized in that said water based liquid supply system (10) further comprises a manifold (50) adapted and configured to direct the flow of liquid between said water supply connector (44) and said water dispense connector (46) under the control of said control unit (24). 5
4. Liquid supply system (10) according to any of claims 1 to 3, **characterized in that** said water supply connector (44) and/or said liquid dispensing connector (46) is/are provided at a wall panel of the housing (18). 10
5. Liquid supply system (10) according to any of claims 1 to 4,
characterized in that said water based liquid supply system (10) further comprises a liquid drain connector (48) adapted and configured to be connected to a pipe leading to drain, said liquid drain connector (48) preferably being provided below the liquid lines. 15 20
6. Liquid supply system (10) according to claim 5,
characterized in that said water based liquid supply system (10) further comprises a liquid and/or humidity detecting sensor unit and/or an electrical pump adapted and configured to detect and/or activate and/or operate draining of leakage water from the inside of the housing (18) of said water based liquid supply system (10) to an outside of the housing (18). 25 30
7. Liquid supply system (10) according to any of claims 1 to 6,
characterized in that said control unit (24) comprises a data input adapted and configured to receive an input signal output by control elements (22). 35
8. Liquid supply system (10) according to any of claims 1 to 7,
characterized in that the housing (18) is thermally isolated from surrounding components to prevent heat transfer in and out the housing (18). 40
9. Liquid supply system (10) according to any of claims 1 to 8,
characterized in that the at least two components and/or the at least two tanks are each thermally isolated to prevent heat transfer between the at least two components and/or the at least two tanks. 45 50
10. Liquid supply system (10) according to any of claims 1 to 9,
characterized in that the liquid filtering component (30) is adapted and configured to purify and/or soften the liquid. 55
11. Liquid supply system (10) according to any of claims 1 to 10,
characterized in that the liquid sterilizing component (36) comprises an UV lamp.
12. Liquid supply system (10) according to any of claims 1 to 11,
characterized in that the housing (18) comprises a lid (26) adapted and configured to be removably attached to the housing (18).
13. Liquid supply system (10) according to any of claims 1 to 12,
characterized in that the housing (18) further comprises an air flow system enabling air to flow in and out the housing (18).
14. Liquid supply system (10) according to any of claims 1 to 13,
characterized in that the water based liquid supply system (10) comprises slides or wheels (20) that are adapted and configured to allow its displacement in and out of the under-sink kitchen cabinet (12).
15. Liquid supply system (10) according to any of claims 1 to 14,
characterized in that the carbonation component (32) and/or the enrichment component comprise(s) a replaceable part that is adapted and configured to be removed from the component or refilled by hand without the need of tools.

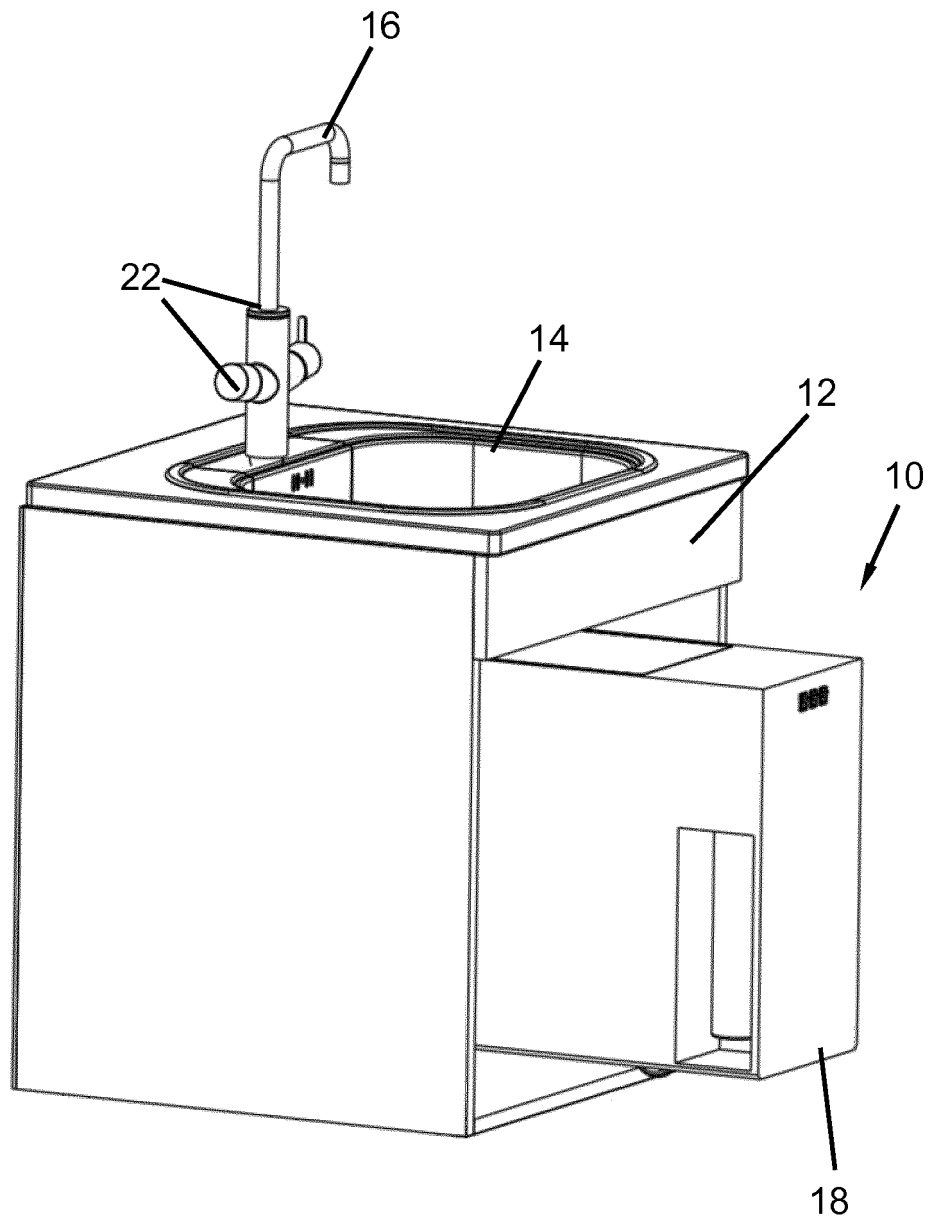


FIG. 1

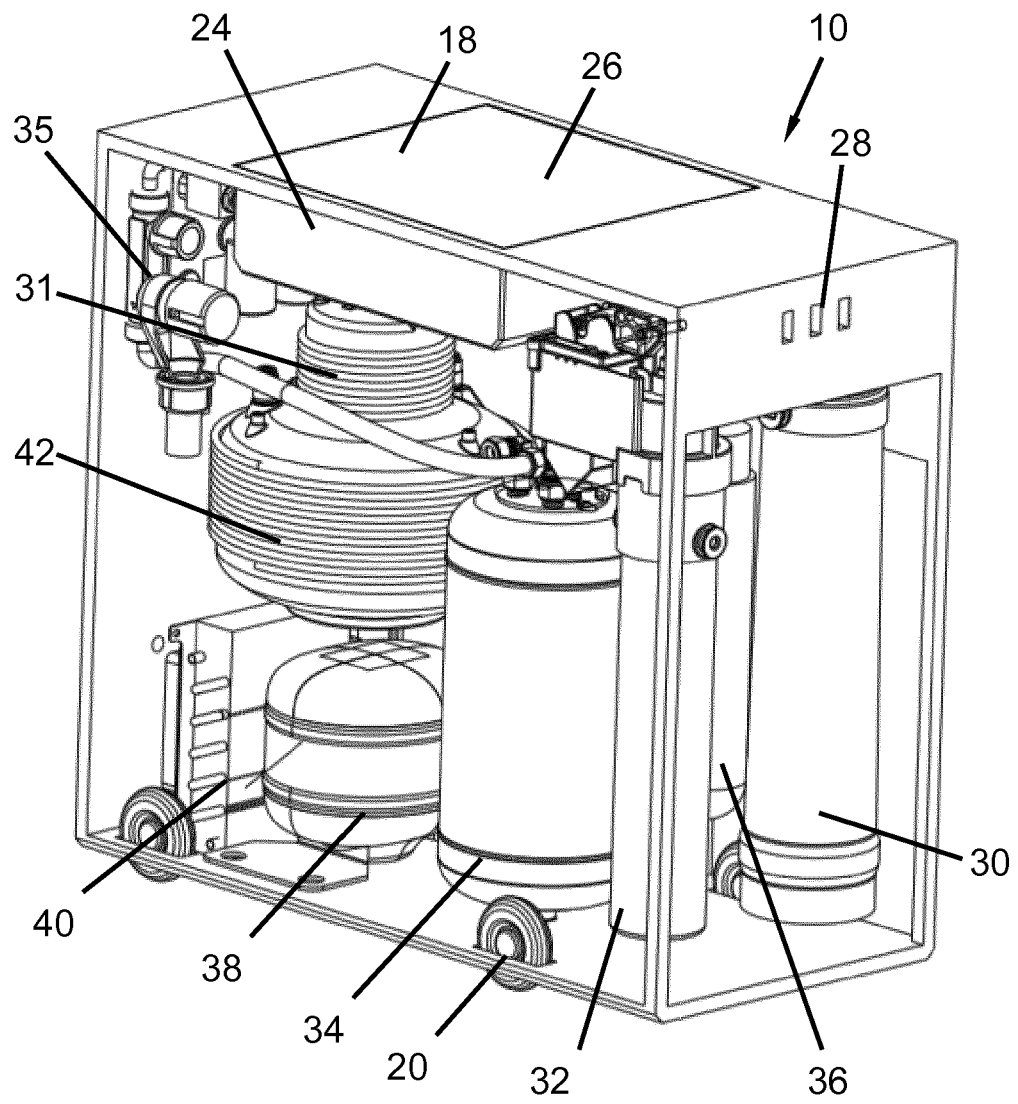


FIG. 2

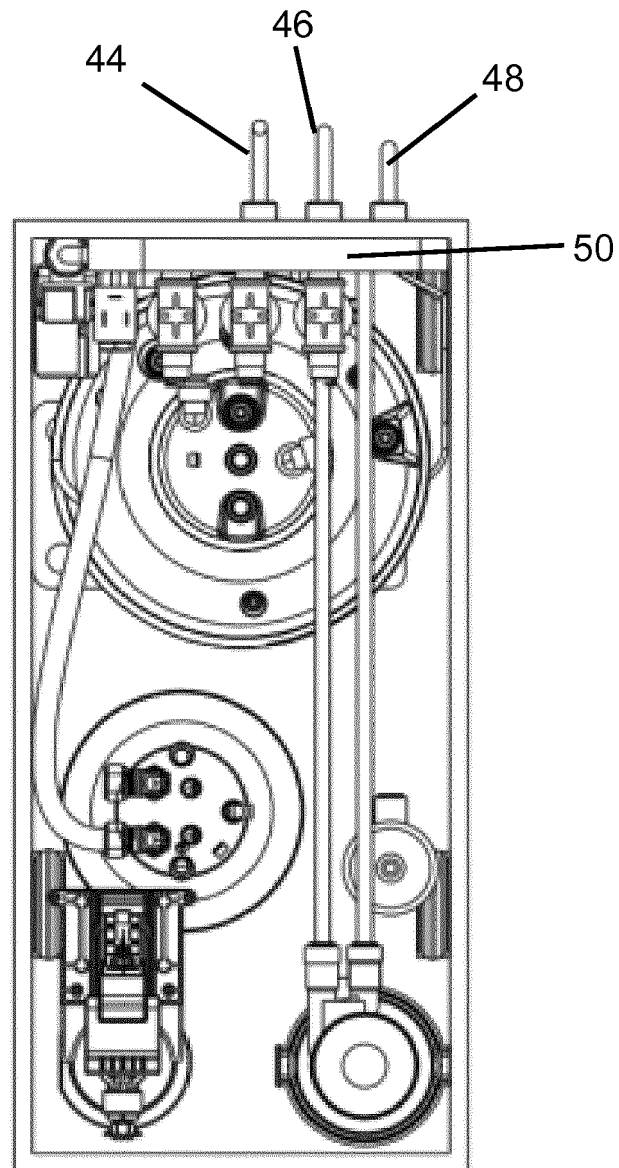


FIG. 3

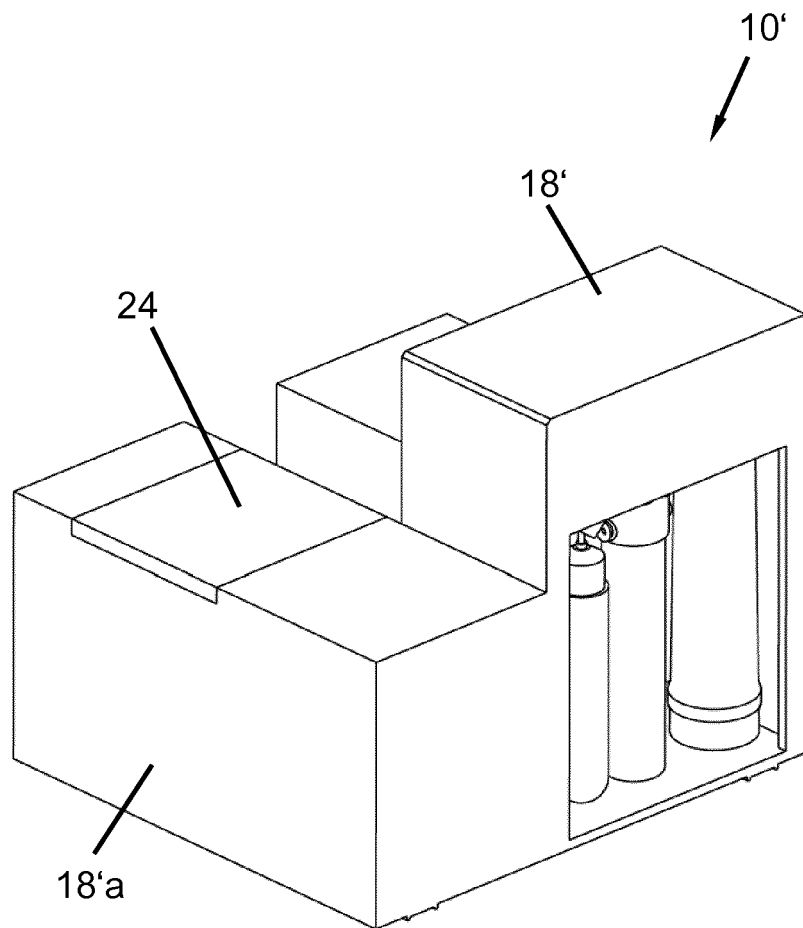


FIG. 4

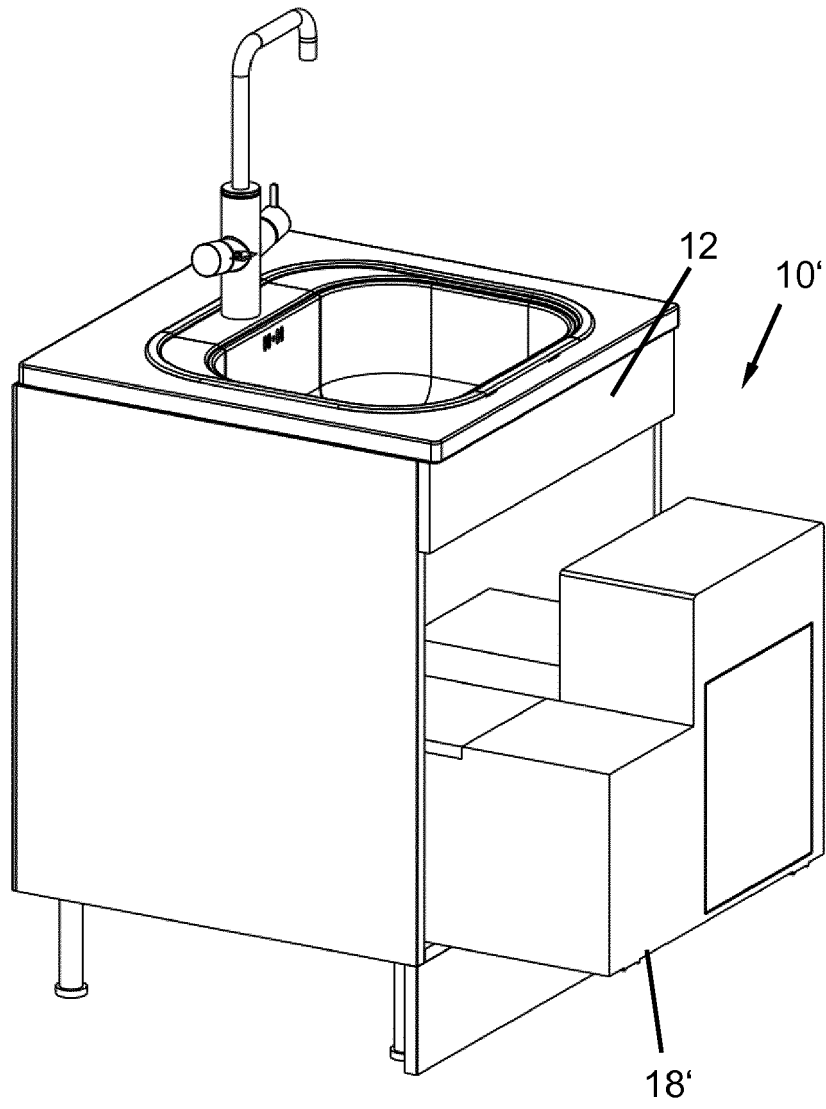


FIG. 5



EUROPEAN SEARCH REPORT

Application Number
EP 19 15 8639

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
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