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(54) **BEVERAGE SYSTEM AND METHOD FOR COOLING AND TAPPING BEVERAGE**

(57) A beverage system comprising a temperature-controlled container, a faucet for tapping beverages, a pressure system configured for being connected to a gas tank and for supplying a gas under pressure, and a keg

coupler connected to the faucet and the pressure system. The keg coupler is configured for being connected to a beverage keg. The faucet and the keg coupler are positioned inside the temperature-controlled container.

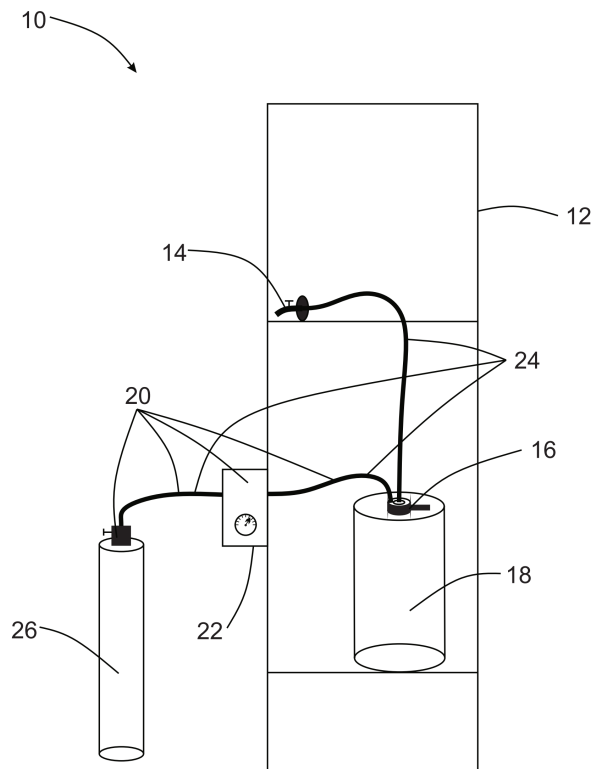


Fig. 1

Description

Field of the invention

[0001] The invention relates to the field of preserving and serving beverages like draught beer from kegs and containers.

Background

[0002] Examples of a methods and a systems for cooling and preserving beer are disclosed in US3180529A, US7244458B1, and CN2206429Y. None of US3180529A, US7244458B1, and CN2206429Y discloses beverage system able to tap beverage from a tap inside a temperature controlled container.

[0003] Conventional draught beer systems are widely used in bars, restaurants, and breweries to serve beer from kegs directly to consumers. These systems typically consist of a keg, a pressurization system (often using carbon dioxide or nitrogen), and a dispensing unit connected to a tap. The beer is stored in kegs and pressurized by gas, which forces the beer through the lines and out of the tap when dispensed.

[0004] In a traditional setup, the pressurized gas maintains the carbonation level of the beer, while the closed keg system protects it from exposure to external elements such as air, which would cause the beer to oxidize. Despite this, conventional draught systems present a number of challenges, particularly related to hygiene and the resulting limitations on how long the beer remains fresh once the keg is tapped.

[0005] One significant hygienic problem arises from the environment in which the tap operates. Once the beer passes through the tap and is dispensed, the nozzle and surrounding area are exposed to room temperature air, which is typically full of airborne microorganisms and dust. The moist environment around the tap, along with residual beer at the nozzle, provides an ideal breeding ground for bacteria, yeast, and mold. These contaminants can easily grow at room temperature, especially when the tap is not in use for extended periods. As a result, each subsequent pour risks being exposed to these microbial colonies, which degrade the taste and quality of the beer.

[0006] Another challenge arises from oxygen exposure in the keg itself. In some systems, when a keg is tapped, ambient air may enter the keg, which accelerates the oxidation of the beer. Even with systems using carbon dioxide (CO₂) or nitrogen to pressurize the keg, imperfect seals around the tap can allow small amounts of oxygen to seep in, spoiling the beer over time. This oxidation process shortens the beer's shelf life, affecting its freshness and flavor.

[0007] The combination of oxygen exposure at the tap and in the keg means that keg beer typically has a limited lifespan once it is tapped. The beer can remain fresh for only a few days, depending on the specific system and

how well the tap is maintained. This creates operational challenges for businesses, as they must frequently replace kegs, discard spoiled beer, and ensure they serve a quality product to customers.

[0008] In summary, while conventional draught beer systems effectively deliver beer from keg to tap, exposure to room temperature air and oxygen at the tap leads to significant hygienic issues that limit the beer's shelf life and freshness. Addressing these problems is key to improving the longevity of keg beer and maintaining its quality for small businesses or people at home so that they are able to serve draught beer continuously.

A summary of the invention

[0009] A first aspect of the present disclosure is a beverage system comprising:

- A temperature-controlled container.
- A faucet for tapping beverages.
- A pressure system configured for being connected to a gas tank and for supplying gas under pressure.
- A keg coupler connected to the faucet and the pressure system, wherein the keg coupler is configured for being connected to a beverage keg.

[0010] Wherein the faucet and the keg coupler are positioned inside the temperature controlled container, wherein the faucet is fastened to the inside of the temperature-controlled container such that the faucet is ready for tapping.

[0011] By having a beverage system as described above, a single beverage keg may be coupled to a faucet and tapped intermittently for a period of months instead of days as when the keg is kept at room temperature. There are several reasons for this, the first being that the beverage is kept at a constant cold temperature, which extends the life of the beverage. Secondly, the faucet is kept at a constant cold temperature which further increases the life time of the beverage, as bacteria does not grow as fast in the faucet nor travel as fast through the pipes/tubes to the beverage keg. Moreover, the beverage is ready to tap when a cold keg is connected to the system without any spills before the faucet is cooled to provide a desired part of foam to the beverage.

[0012] In some embodiments, the beverage system comprises a beverage cooler connected to the keg coupler and the faucet.

[0013] By including a beverage cooler, the system is also able to provide cold beverage when a warm keg is inserted into the container and connected to the keg coupler.

[0014] In some embodiments, the beverage system comprises a gas tank.

[0015] In some embodiments, the beverage system comprises a beverage keg.

[0016] In some embodiments, the beverage system is portable.

[0017] By having a portable beverage system, the system may be used in a variety of places and rooms. Thus, cafés and bars may position the system in a fitting spot according to other parts or furniture in the room. Hereby, the system is modular and flexible to include in a room.

[0018] In some embodiments, the door of the temperature-controlled container is transparent to visible light.

[0019] The beverage keg and coupler may be surveyed with the door closed, such that the beverage lasts longer by less contaminants entering the container.

[0020] In some embodiments, the beverage system comprises a thermometer for displaying the temperature of the inside of the temperature-controlled container.

[0021] In some embodiments, the beverage system comprises a thermometer for displaying the temperature of the beverage inside the beverage keg.

[0022] By having a thermometer, the user may be able to follow the temperature inside the container and preferably inside the beverage keg to monitor the beverage temperature. Thereby, the user may know when the beverage is ready to be served and avoid spills by tapping beverage for temperature tests.

[0023] A second aspect of the present disclosure is a method for tapping beverage from a beverage system. The method comprising:

- Placing a beverage keg inside the temperature-controlled container.
- Connecting the keg coupler to the beverage keg.
- Letting the beverage keg cool to the temperature of the inside of the temperature-controlled container.
- Connecting a gas tank to the pressure system.
- Tapping a glass or cup of cold beverage.

[0024] In some embodiments, the method comprises the step of opening the temperature controlled container before tapping a cup or glass of beverage and closing the temperature controlled container after the tapping has stopped.

[0025] Using this method to tap cold beverage of the beverage system provides controlled tapping of the beverage with a controlled amount of foam, as well as each keg being able to last months without turning bad and the remainder of the beverage being wasted.

[0026] In the following, specific examples according to aspects of the present disclosure will be explained in more detail with reference to the accompanying drawings. The present disclosure may, however, be embodied in different forms than depicted below. Rather, any examples are provided so that the disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. Like reference numerals refer to like elements throughout. Like elements will, thus, not be described in detail with respect to the description of each figure.

Summary of figures

[0027]

Fig. 1 illustrates a system for cooling and preserving beverages.

Fig. 2 illustrates a system for cooling and preserving beverages having a pressure system placed inside the temperature-controlled chamber.

Fig. 3 illustrates a beverage system.

Detailed description of the invention

[0028] Beverages like beer and cider may be stored on kegs in large volumes. When sealing beverages, it is important to ensure that the containers are sterile and that very little to no air is sealed inside the container together with the beverage. Thus, the beverage may last long as no bacteria are able to get into the container to grow from the beverage. A sealed container may last long at room temperature but when the keg is opened, the keg may only last a couple of days before the beverage degrades and the keg must be replaced. This is not convenient for small restaurants or cafés as they may only consume a keg of beverage once a week and for private users, a keg may last for multiple weeks. Another problem is that a warm tap produces bubbles if old beer is poured and as the temperature of the tap changes, the pressure of gas needed to pour a beer may change and the first beers tapped may be pure foam.

[0029] The present invention solves this problem of hygienic storage and storage life length by placing the beverage container and the tap or faucet in a temperature-controlled container which is closed, such that all the beverage is cooled and lasts longer.

[0030] The beverage cooling and preserving system 10 is illustrated in Figs. 1, 2, and in Fig. 3. Fig. 3 illustrates an example of an embodiment of the beverage system 10, where no keg coupler 16 is shown. The beverage cooling and preserving system 10 will also be denoted the beverage system 10.

[0031] The beverage system 10 comprises a temperature-controlled container 12 comprising a door that can open and close the container 12. The temperature-controlled container 12 comprises a temperature controller that is able to keep the internal space of the temperature-controlled container 12 at a constant temperature which may be to ensure that the temperature of the container 12 is within a certain temperature interval such as ± 6 , ± 5 , ± 4 , ± 3 , ± 2 , ± 1.5 , ± 1 , or ± 0.5 degrees Celsius. The average temperature of the room inside the temperature-controlled container 12 may be strictly controlled to a value such as 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or 12 degrees Celsius. The temperature controller may comprise a cooling system in order to decrease the temperature inside the temperature-controlled container. If the surroundings are colder than the desired temperature inside the container 12, the system may comprise a heater to

heat the inside of the container so that system is able to keep the inside of the container 12 at a constant temperature. The optimal temperature may depend on the beverage that is to be served with the beverage system 10. It is preferred to keep the temperature within an interval of ± 2 degrees or less, more preferably ± 1 degrees or less, most preferably $\pm 0,5$ degrees or less.

[0032] The temperature of the beverage affects how the beverage will react with a pressurized gas when the beverage is tapped from the keg 18. To serve or tap a beverage with a fitting amount of gas in form of bubbles in the beverage, a pressurized gas may be used to press the beverage out of the keg 18. The pressure affects the content of gas in the beverage and thus how many bubbles there will be present in the beverage that is tapped out of a faucet 14. Thus, to control the amount of gas and bubbles/foam in the beverage when tapped, the temperature of the beverage and the pressure inside the keg 18 is very important and crucial to control.

[0033] The temperature of the beverage is controlled by placing the keg 18 inside the temperature-controlled container and after some time, the keg 18 will be cooled to the temperature of the inside of the temperature-controlled container 12.

[0034] Excessive heat from a warm keg 18 place in the temperature-controlled container may be disposed using a heat exchanger placed on the outside of the temperature-controlled container. The temperature-controlled container 12 may remove heat like a normal refrigerator.

[0035] The temperature-controlled container has a door that is able to open such that a person can access the faucet 14 and place/replace a keg 18 of beverage inside the container 12. The door is preferably airtight when closed such that no air comprising contamination from the surrounding air gets into the temperature-controlled container 12. Having an airtight temperature-controlled container 12 provides a system which is easier to keep clean and hygienic. Thus, the beverage system 10 may not need to be cleaned as often as normal and the beverage may last longer.

[0036] The door of the temperature-controlled container may be transparent, so that the condition of the beverage system 10 can be monitored, e.g. using a thermometer placed inside the container. The thermometer may be placed on the keg 18 so that the temperature of the beverage inside the keg 18 can be monitored.

[0037] The temperature-controlled container 12 is made to be movable/portable like a normal refrigerator. Therefore, the container 12 may have a height less than 3 m, 2,5 m, 2,1 m, 2 m, or 1,9 m. The width and depth may be less than 2 m, 1,5 m, 1,3 m, 1,1 m, 1 m, 0,8 m, or 0,6 m. Of course, the container should still be able to fit a keg, cooling system and a faucet inside which provide a minimum size depending on the keg. The minimum size may be 1 m in height and 30 cm, 40 cm, or 50 cm in width and depth.

[0038] The beverage system 10 further comprises a faucet 14 or a tap 14 for serving beverage. The faucet 14

has a controlling device like a handle for a person to open and close the faucet 14. The faucet 14 may thus comprise a normal valve. In the open state, the faucet 14 allows a flow of beverage to flow out of the faucet 14 assuming the beverage is pressurized accordingly. When the faucet 14 is in the closed state, the faucet 14 stops all flow of beverage such that no beverage leaves the beverage system 10. The normal state is the closed state which the faucet 14 may automatically enter such that no beverage is leaking from the system when not handled by a person.

[0039] The faucet 14 is positioned inside the temperature-controlled container 12 so that the temperature of the faucet 14 is also controlled by the temperature-controlled container. The faucet 14 will normally be the same temperature as the inside of the temperature-controlled container. Normally, faucets of beverages systems need to be clean but flies and other animals may be attracted to the faucet 14 by the beverage residuals sitting on the outside of the faucet. Thus, contamination of the faucet is prevented by placing the faucet inside the closed temperature-controlled container 12.

[0040] The faucet 14 is fastened to the inside of temperature-controlled container for easier handling when opening and closing the faucet 14.

[0041] Having the faucet 14 inside the temperature-controlled container 12 ensures that the faucet 14 is always ready for tapping a cup of beverage as the bubble/foam formation will be constant, as the temperature of the beverage tapped and the faucet 14 is equal. Thus, spills at the start of tapping beverages are prevented.

[0042] The faucet 14 is connected to a keg coupler 16 via tubes or pipes 24 so that beverage can flow from the keg coupler 16 to the faucet 14. These tubes 24 are preferably positioned inside the temperature-controlled container such that the beverage will always be handled inside the temperature-controlled container 12 until it is served e.g. in a glass or cup.

[0043] The keg coupler 16 is designed to fit onto a keg of beverage. Various different keg couplers for corresponding kegs exist. Kegs 18 normally have a gas inlet and a beverage outlet. Thus, the keg coupler 16 comprises a gas inlet and a beverage outlet. The gas inlet of the keg coupler 16 is arranged to connect to the gas inlet of the keg. The beverage outlet of the coupler 16 is arranged to connect to the beverage outlet of the keg 18. The beverage outlet of the keg coupler 16 is connected to the tubes/pipes 24 connected to the faucet 14. The keg coupler 16 gas inlet is connected via tubes or pipes 24 to a pressure system 20. Thus, the coupler 16 enables easy replacement of kegs ensuring an air and gas tight system without any leaks. The keg coupler 16 may have a handle to fasten and release the coupler 16 to a beverage keg 18.

[0044] The beverage system 10 comprises a pressure system 20 or gas supply system 20. The pressure system 20 comprises tubes or pipes 24 and a coupler 16 for coupling the tubes or pipes 24 to a gas tank 26. The gas tank 26 is illustrated outside the temperature-controlled

container 12. The pressure system 20 further comprises a pressure sensor 22 and a valve for adjusting the pressure of the gas led to the keg coupler 16. The pressure system 20 should be connected to a gas supply. The gas supply is preferably in form of a gas tank 26. The gas used may preferably be CO₂ or nitrogen as these gasses affect beverages less than e.g. normal air. CO₂ affects the level of fizz and foam made by the CO₂ in the beverage which may be beneficial to control. The gas supply system 20 is preferably placed outside of the temperature-controlled container but may be placed inside the temperature-controlled container. When the pressure system is positioned outside the temperature-controlled container 12, the temperature-controlled container 12 comprises a connector such that the pressure system can provide gas to the keg coupler 16 through the wall of the temperature-controlled container 12.

[0045] Having the gas supply outside the temperature-controlled container 12 ensures a more flexible system with a smaller temperature-controlled container that takes up less space. The beverage system 10 may thus fit into more places in restaurants, cafés, or private homes.

[0046] Having the gas supply inside the temperature-controlled container 12 ensures a simpler system without the need for tubes, pipes 24 or connectors going the exterior of the temperature-controlled container.

[0047] The pressure system 20 or gas supply system 20 comprises a pressure sensor 22. This system being able to measure the pressure of the gas supplied to the keg coupler 16.

[0048] When tapping beverages like beer, the pressure of gas supplied to the keg 18 during tapping is essential in not getting to much foam and not to little foam. Thus, the pressure supply may be adjusted precisely in order to supply a pressure of gas of the correct size. The pressure needed also depends on the temperature of the beverage, and by having the beverage being temperature controlled, the pressure can be adjusted according to this temperature. The pressure size may be controlled using valves or the like.

[0049] The pressure sensor 22 may preferably be positioned at the exterior of the temperature-controlled container 12.

[0050] The beverage system 10 may comprise a computing unit that, based on the temperature of the temperature-controlled container 12, adjusts the pressure of the gas supply such that the tapped beverage comprises a perfect amount of fizz or foam which may be measured in a total mass to volume ratio of the tapped beverage.

[0051] The beverage system 10 may be used with all types of kegs. Thus, the temperature-controlled container 12 is configured such that all standard kegs fit inside the container 12.

[0052] Kegs that are round and have a small diameter are preferred. Thus, the temperature-controlled container may be configured to fit only kegs with diameter smaller than 35 cm, 28 cm, or 24 cm. This will give a

beverage system 10 taking up less space at restaurants, cafes, or houses.

[0053] The beverage system 10 may comprise a beverage cooler for cooling beverage from a keg before the beverage enters the faucet and is tapped. This beverage cooler may be used if a warm beverage keg is coupled to the system and/or the tapping is started before the keg has been cooled sufficiently. This type of beverage cooler may be similar to the known coolers used to cool draught beer from a room temperature keg before the beverage is tapped from a room temperature faucet. This beverage cooler provides the advantage that a warm keg may be placed inside the container 12 of the beverage system 10 and cold beverage may be tapped right away without needing to wait for the beverage to cool from the temperature-controlled container 12.

[0054] The beverage keg 18 is preferably a draught beer keg but may also be a cider keg.

[0055] The beverage system may be used to tap beverage using a beverage tapping method comprising:

- 1) Placing a keg inside the temperature-controlled container.
- 2) Connecting the keg coupler to the keg.
- 3) Letting the keg cool to the temperature of the inside of the temperature-controlled container.
- 4) Connecting a gas tank to the pressure system.
- 5) Opening the door of the temperature-controlled container and tapping a glass or cup of beverage.
- 6) Closing the door to keep the beverage cold and in a clean environment.

[0056] The first three steps may be replaced by obtaining a keg having a temperature equal to the temperature inside of the temperature-controlled container 12. Then connecting a gas tank to the pressure system and then connect the keg coupler to the keg.

[0057] The system may have enough space inside the temperature-controlled container 12 to have a keg coupled to the faucet and beverage being tapped therefrom and another keg that is being pre-cooled such that it is ready to be served when the first keg is empty.

[0058] When all elements of the beverage system are connected, the pressure should be adjusted according to the beverage in the keg using the valve and the pressure sensor and the beverage is ready to be tapped from the faucet.

[0059] It is important that the beverage system is clean before use in order for a single keg to last as long as possible. The durability of the beverage is also depending on how much the door is opened, as air and contaminants are kept out while the door is closed and may contaminate the faucet when the door is open.

[0060] The pressure of the gas tank ensures that the beverage will be pumped out of the keg and out of the faucet to be tapped into a container like a glass or a cup. Using this beverage system beverage from the same keg can be tapped over a period of multiple weeks and even

months without the system needing to be cleaned and the keg to be replaced. Thus, a user does not need to empty a keg of beverage quickly as may be done during parties and events, but may take the time needed to enjoy the beverage. This method and system also prevent spillage from leftovers in kegs that go bad as the kegs last much longer and the user has time to empty it before the beverage goes bad. The beverage system 10 illustrated in Figs. 1, 2, and 3 has the advantage that the beverage is always cooled and handled in an environment without much contamination as the faucet 14 is placed inside the temperature-controlled container 12 and the container has a closable door. Thus, the beverage is capable of lasting months instead of days and the beverage system 10 may be cleaned less often than usual as bacteria develop slower inside the system.

[0061] The beverage system 10 can also ensure that a perfect amount of foam is created when tapping a glass of beverage by controlling the temperature of the beverage precisely.

[0062] Below is a list of reference signs used in the detailed description of the present disclosure and in the drawings referred to in the detailed description of the present disclosure.

LIST OF REFERENCES

[0063]

- 10. Beverage system
- 12. Temperature-controlled container
- 14. Faucet/tap
- 16. Keg coupler
- 18. Keg
- 20. Gas supply system or pressure system
- 22. Pressure sensor
- 24. Tube or pipe
- 26. Gas tank

Claims

1. A beverage system (10) comprising:

- a temperature-controlled container (12);
- a faucet (14) for tapping beverages;
- a pressure system (20) configured for being connected to a gas tank (26) and for supplying gas under pressure;
- a keg coupler (16) connected to the faucet (14) and the pressure system (20), wherein the keg coupler (16) is configured for being connected to a beverage keg (18);

wherein the faucet (14) and the keg coupler (16) are positioned inside the temperature-controlled container (12), **characterized in that** the faucet (14) is fastened to the inside of the temperature-con-

trolled container (12) such that the faucet (14) is ready for tapping.

2. A beverage system (10) according to claim 1, wherein the beverage system (10) comprises a beverage cooler connected to the keg coupler (16) and the faucet (14).
3. A beverage system (10) according to any of the preceding claims, wherein the beverage system (10) comprises a gas tank (26).
4. A beverage system (10) according to any of the preceding claims, wherein the beverage system (10) comprises a beverage keg (18).
5. A beverage system (10) according to any of the preceding claims, wherein the beverage system (10) is portable.
6. A beverage system (10) according to any of the preceding claims, wherein the door of the temperature-controlled container (12) is transparent to visible light.
7. A beverage system (10) according to any of the preceding claims, wherein the beverage system (10) comprises a thermometer for displaying the temperature of the inside of the temperature-controlled container (12).
8. A method for tapping beverage from a beverage system (10) according to any of claims 1-7, the method comprising:
 - placing a beverage keg (18) inside the temperature controlled container (12);
 - connecting the keg coupler (16) to the beverage keg (18);
 - letting the beverage keg (18) cool to the temperature of the inside of the temperature controlled container (12);
 - connecting a gas tank (26) to the pressure system (20); and
 - tapping a glass or cup of cold beverage.
9. A method for tapping beverage according to claim 8, wherein the method comprises the step of opening the temperature-controlled container (12) before tapping a cup or glass of beverage and close the temperature-controlled container (12) after the tapping has stopped.

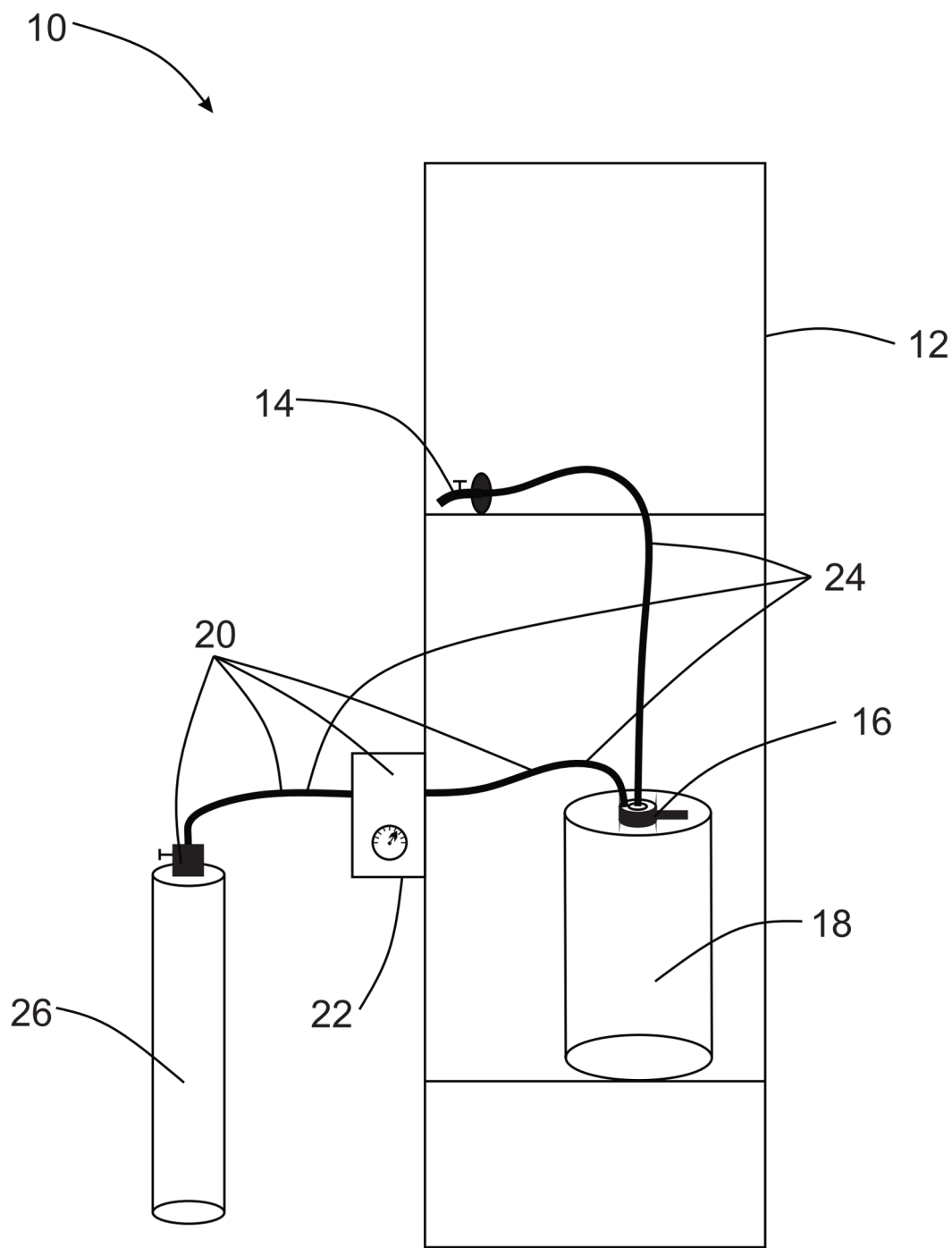


Fig. 1

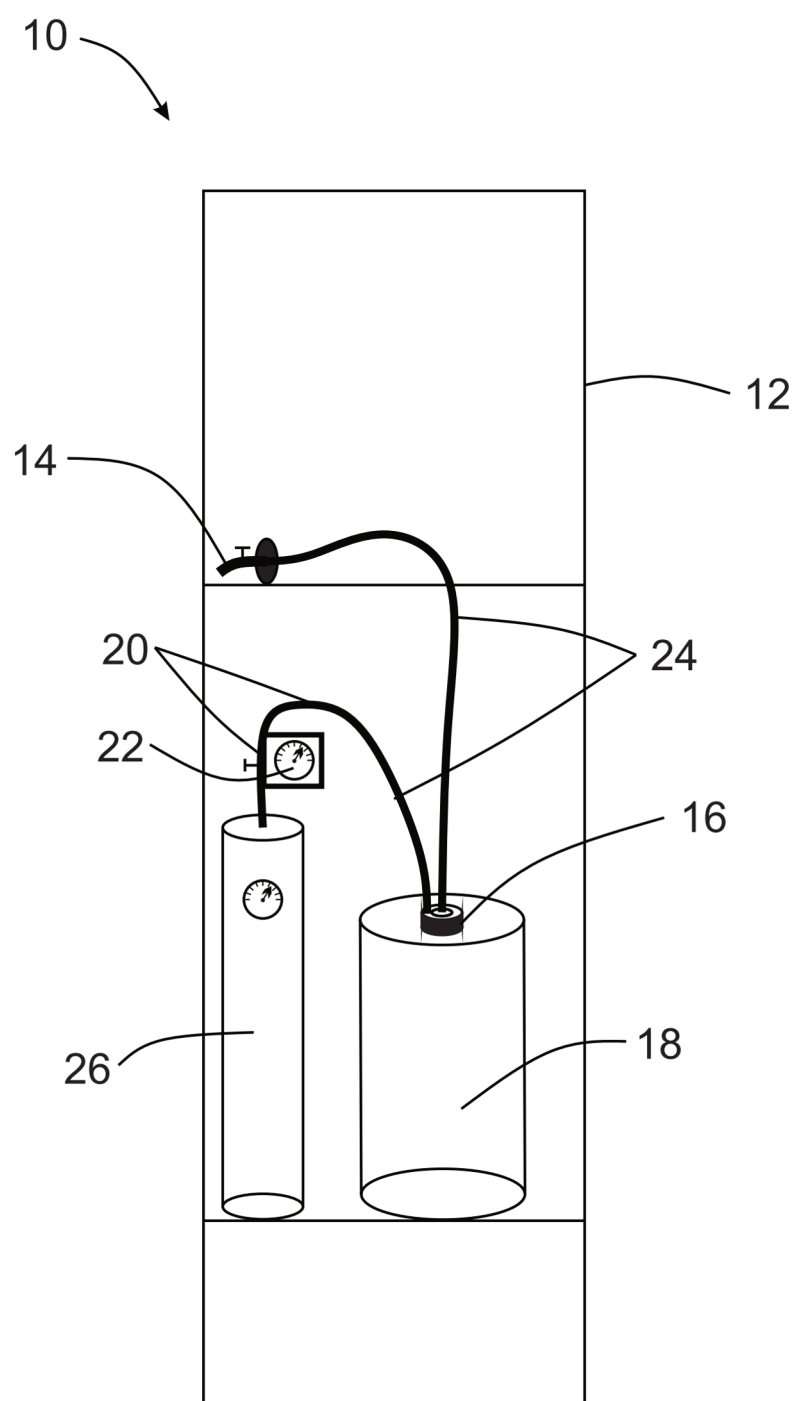


Fig. 2

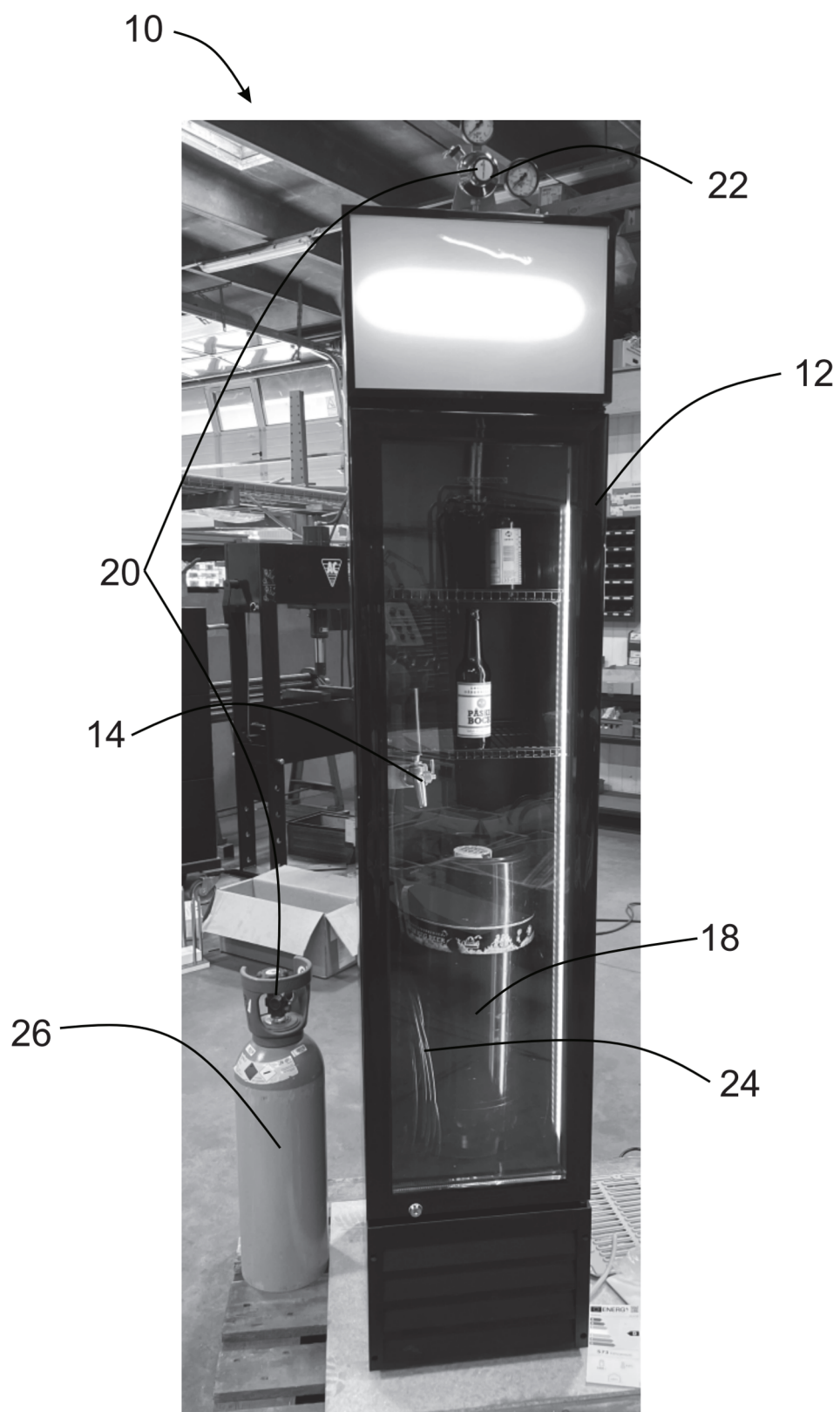


Fig. 3



EUROPEAN SEARCH REPORT

Application Number

EP 26 15 0564

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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			B67D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		22 May 2026	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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ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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22-05-2026

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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