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(54) **Multiple beverage dispensing system preventing miscoupling**

(57) Dispensing system 1 comprising two units for dispensing each a different carbonised beverage.

The first unit comprises a container 2 containing a first beverage 3 and comprises an extractor tube 4 with a first flange 5 arranged outside the container, the extractor tube having a first flange diameter D1f and a first flange thickness T1f. The first unit also comprises a first dispense head 8 adapted to be coupled with the first flange, the first dispense head comprising a first abutment face 9 with a first face diameter D1a, adapted to abut the first flange when coupled therewith. The first dispense head further comprises a first circumferential part 10 projecting away from a periphery of the first abutment face, and at least partly extending around the first abutment face so as to provide a mechanical lock of the first dispense head to the first flange when coupled, the first face diameter D1a being substantially equal to the first flange diameter D1f.

The second unit is similar to the first unit, but the second face diameter D2a of the second dispense head 19 is smaller than the first flange diameter D1a of the first flange of the first beverage container, so that unintended coupling of the second dispense head to the first beverage container is prevented.

The present invention also relates to a dispense head and an extractor tube for said dispensing system.

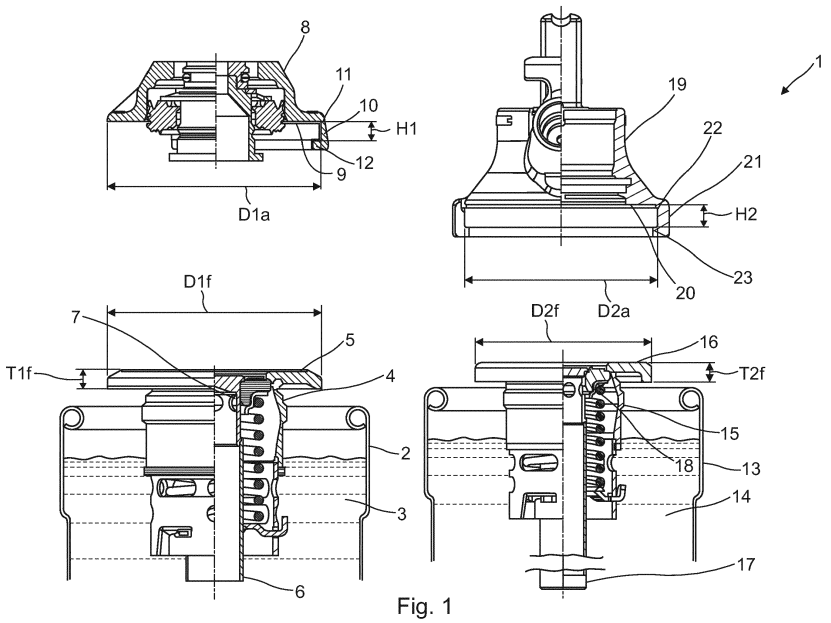

Fig. 1

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Description

Field of the invention

[0001] The present invention relates to a dispensing system for dispensing at least two different carbonised beverages. Furthermore, the present invention relates to a dispense head and an extractor tube for a dispensing system according to the present invention.

Background art

[0002] At bars and restaurants having dispensing systems for dispensing a plurality of different carbonised beverage, the atmosphere may be somewhat hectic for the staff when beverage containers are to be emptied and exchanged in order to ensure that the customers may be served continuously.

[0003] Most often the beverage containers are placed under the bar counter or in a cabinet located in confined areas. Thus, there is not much space present for exchanging the emptied beverage container for a new full beverage container. This is even more cumbersome when several beverage containers are to be exchanged at the same time.

[0004] Due to these difficulties, the dispense heads may - by mistake - be coupled with beverage containers containing a different beverage than intended. This may have severe consequences when one of the beverages is a non-alcoholic beverage, such as non-alcoholic beer, and the other beverages dispensed are alcoholic beverages.

Summary of the invention

[0005] It is an object of the present invention to wholly or partly overcome the above disadvantages and drawbacks of the prior art. More specifically, it is an object to provide a dispensing system for dispensing two different beverages, which dispensing system ensures that the dispensing of the different beverages not is mixed.

[0006] The above objects, together with numerous other objects, advantages and features, which will become evident from the below description, are accomplished by a solution in accordance with the present invention by a dispensing system for dispensing at least two different carbonised beverages, comprising

- a first beverage container containing a first beverage and having a first extractor tube, the first extractor tube having a first flange arranged outside the first beverage container, the first flange having a first flange diameter and a first flange thickness,
- a first dispense head which is adapted to be coupled with the first flange before dispensing, the first dispense head comprising a first abutment face adapted to abut the first flange when coupled with the first flange, the first abutment face having a first face diameter, the first dispense head further comprising a first circumferential part projecting away from a first periphery of the first abutment face, the first circumferential part being at least partly extending around the first abutment face so as to provide a mechanical lock of the first dispense head to the first flange when coupled, the first face diameter being substantially equal to the first flange diameter,

the dispensing system further comprising

- a second beverage container containing a second beverage and having a second extractor tube, the second extractor tube having a second flange arranged outside the second beverage container, the second flange having a second flange diameter and a second flange thickness,
- a second dispense head which is adapted to be coupled with the second flange before dispensing, the second dispense head comprising a second abutment face adapted to abut the second flange when coupled with the second flange, the second abutment face having a second face diameter, the second dispense head further comprising a second circumferential part projecting away from a second periphery of the second abutment face, the second circumferential part at least partly extending around the second abutment face so as to provide a mechanical lock of the second dispense head to the second flange when coupled, the second face diameter being substantially equal to the second flange diameter,

wherein the second face diameter of the second dispense head is smaller than the first flange diameter of the first flange of the first beverage container, so that unintended coupling of the second dispense head to the first beverage container is prevented.

[0007] Also, the present invention relates to a dispensing system for dispensing at least two different carbonised beverages, comprising

- a first beverage container containing a first beverage and having a first extractor tube, the first extractor tube having a first collar arranged outside the first beverage container, the first collar having a first collar inner diameter,
- a first dispense head which is adapted to be coupled with the first collar before dispensing, the first dispense head comprising a first insertion part adapted to be inserted into the first collar, the first insertion part having an first outer diameter, the first outer diameter being substantially equal to the first collar inner diameter,

the dispensing system further comprising

- a second beverage container containing a second

beverage and having a second extractor tube, the second extractor tube having a second collar arranged outside the second beverage container, the second collar having a second collar inner diameter,

- a second dispense head which is adapted to be coupled with the second collar before dispensing, the second dispense head comprising a second insertion part adapted to be inserted into the second collar, the second insertion part having a second outer diameter, the second outer diameter being substantially equal to the second collar inner diameter,

wherein the second outer diameter of the second dispense head is larger than the first collar inner diameter of the first collar of the first beverage container, so that unintended coupling of the second dispense head to the first beverage container is prevented.

[0008] The second diameter of the second abutment face may be at least 2% smaller than the first flange diameter of the first flange of the first beverage container.

[0009] Moreover, the first circumferential part of the first dispense head may have a first protrusion extending inwards from the first circumferential part, a first distance being provided between the first protrusion and the first abutment face, and the second circumferential part of the second dispense head may have a second protrusion extending inwards from the second circumferential part, a second distance being provided between the second protrusion and the second abutment face.

[0010] Further, the second flange thickness may be larger than the first distance of the first dispense head, so that unintended coupling of the first dispense head to the second beverage container is prevented.

[0011] The second flange thickness of the second flange may be at least 8% larger than the first distance of the first dispense head.

[0012] In addition, the first circumferential part and the second circumferential part may be extending at least 40% around the first abutment face and the second abutment face, respectively, preferably at least 50%.

[0013] Also, the second flange diameter of the second flange may be approximately 73.0 mm, and the second abutment face diameter of the second dispense head may be approximately 73.6 mm.

[0014] The second flange thickness may be approximately 7.5 mm and the second distance may be approximately 8.0 mm.

[0015] Moreover, the first and second dispense heads may both comprise a housing having a through-going bore, and an activation handle pivotally mounted to the housing and being movable between at least a deactivated position and an activated position, and a replaceable connection unit may be adapted to be connected with one of the dispense heads, the replaceable connection unit comprising a hollow piston member which is removably insertable into the bore of the housing, and a dispensing line connected to the hollow piston member, whereby the hollow piston member is axially displaceable between a deactivated position and an activated position, by moving the activation handle, and when in the activated position, the hollow piston member fluidly connects the extractor tube and the dispensing line to dispense beverage from the beverage container.

[0016] The first beverage may be an alcoholic beverage and the second beverage may be a non-alcoholic beverage.

[0017] The first beverage container and the second beverage container may be placed in vicinity of each other, preferably within 1 metre of each other.

[0018] The present invention further relates to a dispense head for a dispensing system as described above, comprising an abutment face adapted to abut a flange of an extractor tube, the abutment face having a face diameter of approximately 73.6 mm, and a circumferential part projecting away from a periphery of the abutment face, the circumferential part at least partly extending around the abutment face, the circumferential part having a protrusion extending inwards from the circumferential part, a distance being provided between the protrusion and the abutment face, the distance being approximately 8.0 mm.

[0019] Finally, the present invention relates to an extractor tube for a dispensing system as described above, said extractor tube being adapted to be coupled with the dispense head according to claim 12 and comprising a riser and a double gas and beverage valve, the extractor tube further comprising a flange to which the dispense head according to claim 12 can be coupled, the flange having a flange diameter of approximately 73.0 mm and a flange thickness of approximately 7.5 mm.

Brief description of the drawings

[0020] The invention and its many advantages will be described in more detail below with reference to the accompanying schematic drawings, which for the purpose of illustration show some non-limiting embodiments and in which

Fig. 1 shows in a cross-sectional view a first dispense head arranged above a first extractor tube and a second dispense head arranged above a second extractor tu be,

Fig. 2 shows the second dispense head coupled with the second extractor tube,

Figs. 3-4 show an embodiment of the second dispense head and the extractor tube, respectively, and

Figs. 5-6 show an embodiment of a dispensing system.

[0021] All the figures are highly schematic and not necessarily to scale, and they show only those parts which are necessary in order to elucidate the invention, other

parts being omitted or merely suggested.

Detailed description of the invention

[0022] Fig. 1 shows a dispensing system 1 for dispensing at least two different carbonised beverages. The dispensing system 1 comprises a first beverage container 2 containing a first beverage 3 and has a first extractor tube 4. The first extractor tube 4 has a first flange 5 arranged outside the first beverage container 2, the first flange 5 having a first flange diameter D1f and a first flange thickness T1f. The first extractor tube 4 further comprises a first riser 6 extending from a first double gas and beverage valve 7 of the extractor tube down near the bottom (not shown) of the first beverage container. In Fig. 1, the extractor tube 4 is not shown mounted in the first beverage container 2, since the opening in which the extractor tube 4 is mounted is omitted. In Fig. 6, it is shown how the extractor tube may be mounted in the beverage container.

[0023] Furthermore, a part of a first dispense head 8 is in Fig. 1 shown above the first flange 5. The first dispense head 8 is adapted to be coupled with the first flange 5 before dispensing and to activate the double gas and beverage valve 7. The first dispense head 8 comprises a first abutment face 9 adapted to abut the first flange 5 when coupled with the first flange 5, the first abutment face 9 having a first face diameter D1a. The first dispense head 8 further comprises a first circumferential part 10 projecting away from a first periphery 11 of the first abutment face 9, the first circumferential part 10 at least partly extending around the first abutment face 9 so as to provide a mechanical lock of the first dispense head 8 to the first flange 5 when coupled thereto, the first face diameter D1a being substantially equal to the first flange diameter D1f. In the first dispense head 8, a hollow piston is shown.

[0024] In this embodiment, the first circumferential part 10 of the first dispense head 8 has a first protrusion 12 extending inwards from the first circumferential part 10, a first distance H1 being provided between the first protrusion 12 and the first abutment face 9. The first protrusion 12 and the first circumferential part 10 together define a horseshoe-shaped mechanical lock which enables the first dispense head 8 to be slid onto the first flange 5 and thereby secures the first dispense head 8 to the first flange 5. The first dispense head is then prevented from moving in an axial or upwards direction away from the first beverage container.

[0025] The dispensing system 1 further comprises a second beverage container 13 containing a second beverage 14 and having a second extractor tube 15. The second extractor tube 15 has a second flange 16 arranged outside the second beverage container 13, the second flange 16 having a second flange diameter D2f and a second flange thickness T2f. The second extractor tube 15 further comprises a second riser 17 extending from a first double gas and beverage valve 18 of the second extractor tube 15 down near the bottom (not shown) of the second beverage container 13. In Fig. 1, the second extractor tube 15 is not shown mounted in the second beverage container 13, since the opening in which the extractor tube 15 is mounted is omitted. In Fig. 6, it is shown how the extractor tube may be mounted in the beverage container.

[0026] In addition, a part of a second dispense head 19 is in Fig. 1 shown above the second flange 16. The second dispense 19 head is adapted to be coupled with the second flange 16 before dispensing. The second dispense head 19 comprises a second abutment face 20 adapted to abut the second flange 16 when coupled with the second flange 16. The second abutment face 20 has a second face diameter D2a, the second dispense head 19 further comprising a second circumferential part 21 projecting away from a second periphery 22 of the second abutment face 20, the second circumferential part 21 at least partly extending around the second abutment face 20 so as to provide a mechanical lock of the second dispense head 19 to the second flange 16 when coupled together. Furthermore, the second face diameter D2a is substantially equal to the second flange diameter D2f. The second dispense head 19 is shown without the hollow piston.

[0027] According to the invention, the second face diameter D2a of the second dispense head 19 is smaller than the first flange diameter D1f of the first flange 5 of the first beverage container 2, so that unintended coupling of the second dispense head 19 to the first beverage container 2 is prevented. Hereby it is obtained that the first beverage present in the first beverage container cannot be dispensed via the second dispense head 19, since the second dispense head 19 cannot be coupled with the first flange due to the smaller diameter of the second abutment face 20.

[0028] As is the case for the first dispense head 8, the second circumferential part 21 of the second dispense head 19 also has a second protrusion 23 extending inwards from the second circumferential part 21 and providing a second distance H2 between the second protrusion 23 and the second abutment face 20. The second protrusion 23 and the second circumferential part 21 together define a horseshoe-shaped mechanical lock enabling the second dispense head 19 to be slid onto the second flange 16 and thereby securing the second dispense head 19 to the second flange 16 during dispensing. The second dispense head is then prevented from moving in an axial or upwards direction away from the second beverage container.

[0029] Furthermore, the second flange thickness T2f of the second flange 16 of the second extractor tube 15 is larger than the first distance H1 of the first dispense head 8, so that unintended coupling of the first dispense head 8 to the second beverage container 13 is prevented. Hereby it is obtained that the second beverage present in the second beverage container cannot be dispensed via the first dispense head 8, since the first dispense head 8 cannot be coupled with the second flange 16 due to

the first distance H1 of the first dispense head 8, i.e. the first distance H1 between the first protrusion 12 and the first abutment face 9 is smaller than the second flange thickness Tf2, whereby it is impossible for the user to couple the first dispense head 8 to the second beverage container 13.

[0030] Thus, by the second face diameter D2a of the second dispense head 19 being smaller than the first flange diameter D1f of the first flange 5 of the first beverage container 2, coupling of the second dispense head 19 to the first beverage container 2 is prevented, and by the second flange thickness T2f of the second flange 16 of the second extractor tube 15 being larger than the first distance H1 of the first dispense head 8, coupling of the first dispense head 8 to the second beverage container 13 is prevented.

[0031] The first beverage container 2 and the second beverage container 13 are placed in vicinity of each other, preferably within 1 meter of each other.

[0032] Preferably, the second diameter of the second abutment face is at least 2% smaller than the first flange diameter of the first flange of the first beverage container. It is also expedient that the second flange thickness of the second flange is at least 8% larger than the first distance of the first dispense head.

[0033] Fig. 2 shows the second dispense head 19 coupled with the second extractor tube 15. The extractor tube 15 is not arranged in the beverage container. The dispense head 19 is slid onto the second flange 16 of the extractor tube 15 and is secured to the extractor tube by the horseshoe-shaped locking means of the dispense head, as described above.

[0034] Fig. 3 shows an embodiment of the second dispense head 19 having an abutment face 20 adapted to abut a flange 16 of the extractor tube 15. As described above, the second abutment face 20 has a face diameter D2a of approximately 73.6 mm. The dispense head also has a circumferential part 21 projecting away from a periphery 22 of the abutment face 20, the circumferential part 21 at least partly extending around the abutment face, and the circumferential part 21 has a protrusion 23 extending inwards from the circumferential part, a distance H2 being provided between the protrusion 23 and the abutment face 20, the distance being approximately 8.0 mm. With the present design of the dispense head 19, it is obtained that it cannot be coupled to any known extractor tubes. Furthermore, since the present design only differs slightly from the known dispense heads, it has been advantageous in view of production.

[0035] In Fig. 4, an embodiment of the second extractor tube 15 is shown. The extractor tube 15 comprises a riser 17 and a double gas and beverage valve 18, the extractor tube 15 further comprising a flange 16 to which the second dispense head 19 as described above can be coupled. The flange 16 has a flange diameter D2f of approximately 73.0 mm and a flange thickness T2f of approximately 7.5 mm. With the present design of extractor tube 15, it is obtained that it can only be properly coupled with the above-mentioned second dispense head 19.

[0036] The function of the dispense heads are known in the prior art and will not be described in detail. In Fig. 5, a dispense head of the known FlexiDraft™ system is shown. The dispense head is here is slid onto the flange 16 of the extractor tube 15 as described above. The first and second dispense heads may both comprise a housing 30 having a through-going bore 31, and an activation handle 32 pivotally mounted to the housing 30 and movable between at least a deactivated position and an activated position, and wherein a replaceable connection unit 34 is adapted to be connected with one of the dispense heads 19, the replaceable connection unit 34 comprising a hollow piston member 35 removably insertable into the bore 31 of the housing 30, and a dispensing line 36 connected to the hollow piston member 35, whereby the hollow piston member 35 is axially displaceable between a deactivated position and an activated position, by moving the activation handle 32, and when in the activated position, the hollow piston member 35 fluidly connects the extractor tube 15 and the dispensing line 36 to dispense beverage from the beverage container (not shown). The FlexiDraft™ system is further described in WO 2013/000932, which disclosure is incorporated herein by reference.

[0037] In Fig. 6, the extractor tube 15 of Fig. 5 is arranged in the beverage container 13, and the dispense head 19 is coupled with the extractor tube 15.

[0038] Even though the present invention above primarily has been described in relation to the so-called flat-type systems, i.e. A, M and G systems, the present invention may also be incorporated into systems of the well-type, i.e. S, D and U systems. Since the dispense heads for the well-type systems interface differently with the extractor tubes than flat-type systems, the different components of the dispensing system are different even though they function substantially in the same manner.

[0039] In a not shown well-type dispensing system for dispensing at least two different carbonised beverages, the different components may comprise a first beverage container containing a first beverage and having a first extractor tube, the first extractor tube having a first collar arranged outside the first beverage container, the first collar having a first collar inner diameter, and a first dispense head which is adapted to be coupled with the first collar before dispensing, the first dispense head comprising a first insertion part adapted to be inserted into the first collar, the first insertion part having an first outer diameter, the first outer diameter being substantially equal to the first collar inner diameter. The well-type dispensing system may further comprise a second beverage container containing a second beverage and having a second extractor tube, the second extractor tube having a second collar arranged outside the second beverage container, the second collar having a second collar inner diameter, and a second dispense head which is adapted to be coupled with the second collar before dispensing, the second dispense head comprising a second insertion

part adapted to be inserted into the second collar, the second insertion part having a second outer diameter, the second outer diameter being substantially equal to the second collar inner diameter. According to the invention, the second outer diameter of the second dispense head is larger than the first collar inner diameter of the first collar of the first beverage container, so that unintended coupling of the second dispense head to the first beverage container is prevented.

[0040] Although the invention has been described in the above in connection with preferred embodiments of the invention, it will be evident for a person skilled in the art that several modifications are conceivable without departing from the invention as defined by the following claims.

Claims

1. A dispensing system (1) for dispensing at least two different carbonised beverages, comprising

- a first beverage container (2) containing a first beverage (3) and having a first extractor tube (4), the first extractor tube (4) having a first flange (5) arranged outside the first beverage container, the first flange having a first flange diameter (D1f) and a first flange thickness (T1f),
- a first dispense head (8) which is adapted to be coupled with the first flange (5) before dispensing, the first dispense head (8) comprising a first abutment face (9) adapted to abut the first flange (5) when coupled with the first flange, the first abutment face (9) having a first face diameter (D1a), the first dispense head (8) further comprising a first circumferential part (10) projecting away from a first periphery (11) of the first abutment face, the first circumferential part being at least partly extending around the first abutment face so as to provide a mechanical lock of the first dispense head (8) to the first flange (5) when coupled, the first face diameter (D1a) being substantially equal to the first flange diameter (D1f),

the dispensing system (1) further comprising

- a second beverage container (13) containing a second beverage (14) and having a second extractor tube (15), the second extractor tube (15) having a second flange (16) arranged outside the second beverage container (13), the second flange (16) having a second flange diameter (D2f) and a second flange thickness (T2f),
- a second dispense head (19) which is adapted to be coupled with the second flange (16) before dispensing, the second dispense head (19) comprising a second abutment face (20) adapted to abut the second flange (16) when coupled with the second flange, the second abutment face (20) having a second face diameter (D2a), the second dispense head (19) further comprising a second circumferential part (21) projecting away from a second periphery (22) of the second abutment face, the second circumferential part at least partly extending around the second abutment face so as to provide a mechanical lock of the second dispense head to the second flange when coupled, the second face diameter (D2a) being substantially equal to the second flange diameter (D2f), wherein the second face diameter (D2a) of the second dispense head (19) is smaller than the first flange diameter (D1f) of the first flange (5) of the first beverage container (2), so that unintended coupling of the second dispense head (19) to the first beverage container (2) is prevented.

2. A dispensing system for dispensing at least two different carbonised beverages, comprising

- a first beverage container containing a first beverage and having a first extractor tube, the first extractor tube having a first collar arranged outside the first beverage container, the first collar having a first collar inner diameter,
- a first dispense head which is adapted to be coupled with the first collar before dispensing, the first dispense head comprising a first insertion part adapted to be inserted into the first collar, the first insertion part having an first outer diameter, the first outer diameter being substantially equal to the first collar inner diameter,

the dispensing system further comprising

- a second beverage container containing a second beverage and having a second extractor tube, the second extractor tube having a second collar arranged outside the second beverage container, the second collar having a second collar inner diameter,
- a second dispense head which is adapted to be coupled with the second collar before dispensing, the second dispense head comprising a second insertion part adapted to be inserted into the second collar, the second insertion part having a second outer diameter, the second outer diameter being substantially equal to the second collar inner diameter,

wherein the second outer diameter of the second dispense head is larger than the first collar inner diameter of the first collar of the first beverage container, so that unintended coupling of the second dis-

pense head to the first beverage container is prevented.

3. A dispensing system according to claim 1, wherein the second face diameter (D2a) of the second abutment face (20) is at least 2% smaller than the first flange diameter (D1f) of the first flange (5) of the first beverage container (2).

4. A dispensing system according to claim 1, wherein the first circumferential part (10) of the first dispense head (8) has a first protrusion (12) extending inwards from the first circumferential part (10), a first distance (H1) being provided between the first protrusion (12) and the first abutment face (9), and the second circumferential part (21) of the second dispense head (19) has a second protrusion (23) extending inwards from the second circumferential part (21), a second distance (H2) being provided between the second protrusion (23) and the second abutment face (20).

5. A dispensing system according to claim 4, wherein the second flange thickness (D2f) is larger than the first distance (H1) of the first dispense head (8), so that unintended coupling of the first dispense head (8) to the second beverage container (13) is prevented.

6. A dispensing system according to claim 5, wherein the second flange thickness (T2f) of the second flange (16) is at least 8% larger than the first distance (H1) of the first dispense head (8).

7. A dispensing system according to claim 1, wherein the first circumferential part (10) and the second circumferential part (21) are extending at least 40% around the first abutment face (9) and the second abutment face (20), respectively, preferably at least 50%.

8. A dispensing system according to claim 1, wherein the second flange diameter (D2f) of the second flange (16) is approximately 73.0 mm, and the second face diameter (D2a) of the second dispense head (19) is approximately 73.6 mm.

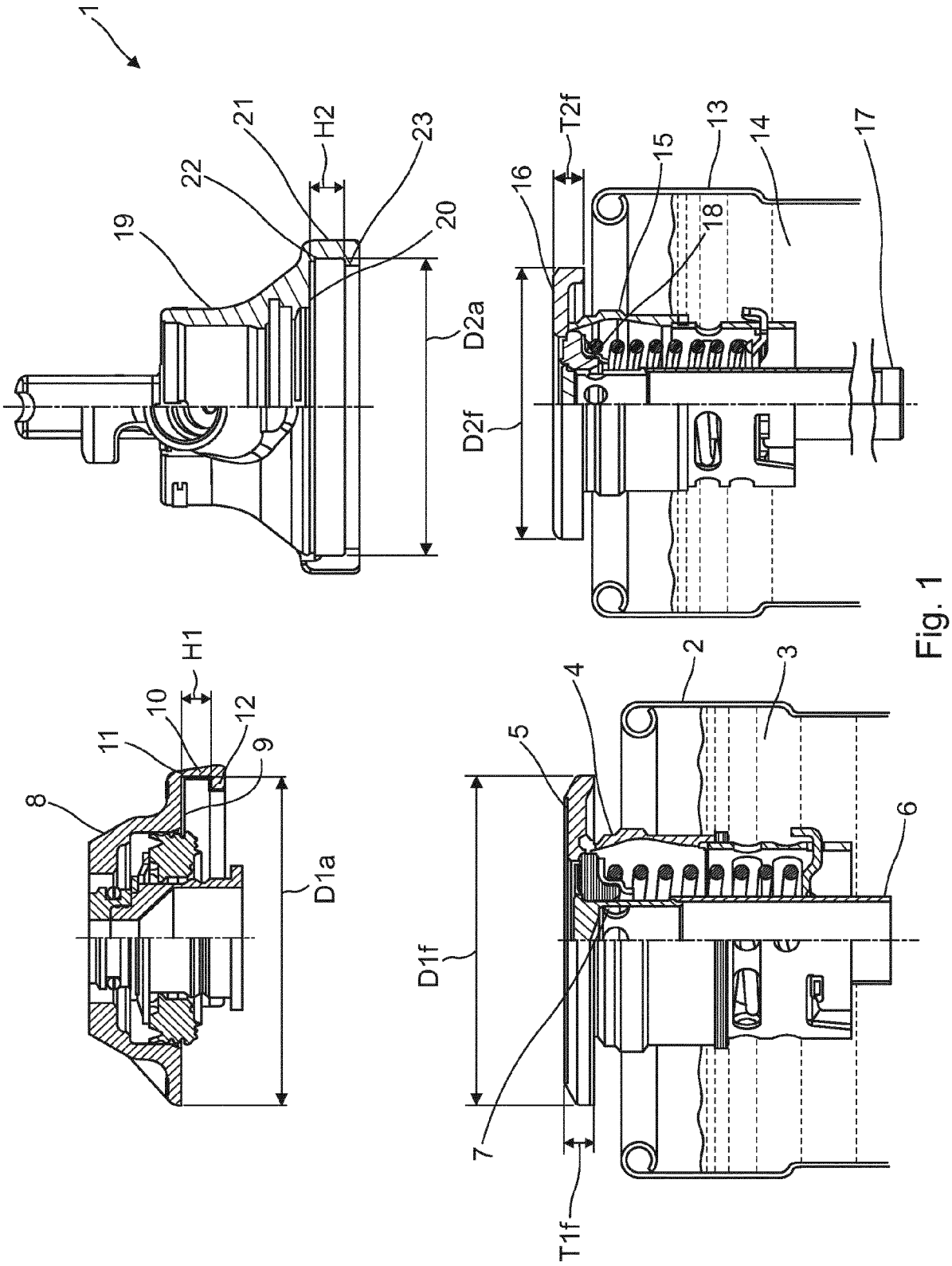
9. A dispensing system according to claim 4, wherein the second flange thickness (T2f) is approximately 7.5 mm and the second distance (H2) is approximately 8.0 mm.

10. A dispensing system (1) according to any of the preceding claims, wherein the first and second dispense heads (8, 19) both comprise a housing (30) having a through-going bore (31), and an activation handle (32) pivotally mounted to the housing and being movable between at least a deactivated position and an activated position, and wherein a replaceable connection unit (34) is adapted to be connected with one of the dispense heads, the replaceable connection unit (34) comprising a hollow piston member (35) which is removably insertable into the bore (31) of the housing (30), and a dispensing line (36) connected to the hollow piston member (35), whereby the hollow piston member (35) is axially displaceable between a deactivated position and an activated position, by moving the activation handle (32), and when in the activated position, the hollow piston member (35) fluidly connects the extractor tube (15) and the dispensing line (36) to dispense beverage from the beverage container.

11. A dispensing system according to any of the preceding claims, wherein the first beverage (3) is an alcoholic beverage and the second beverage (14) is a non-alcoholic beverage.

12. A dispense head (19) for a dispensing system (1) according to any of the claims 1 or 3-11, comprising an abutment face (20) adapted to abut a flange (16) of an extractor tube (15), the abutment face (20) having a face diameter (D2a) of approximately 73.6 mm, and a circumferential part (21) projecting away from a periphery (22) of the abutment face, the circumferential part (21) at least partly extending around the abutment face, the circumferential part having a protrusion (23) extending inwards from the circumferential part, a distance (H2) being provided between the protrusion (23) and the abutment face (20), the distance (H2) being approximately 8.0 mm.

13. An extractor tube (15) for a dispensing system (1) according to any of the claims 1 or 3-11, said extractor tube (15) being adapted to be coupled with the dispense head (19) according to claim 12 and comprising a riser (17) and a double gas and beverage valve (18), the extractor tube (15) further comprising a flange (16) to which the dispense head (19) according to claim 12 can be coupled, the flange (16) having a flange diameter (D2f) of approximately 73.0 mm and a flange thickness (T2f) of approximately 7.5 mm.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21
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Fig. 1

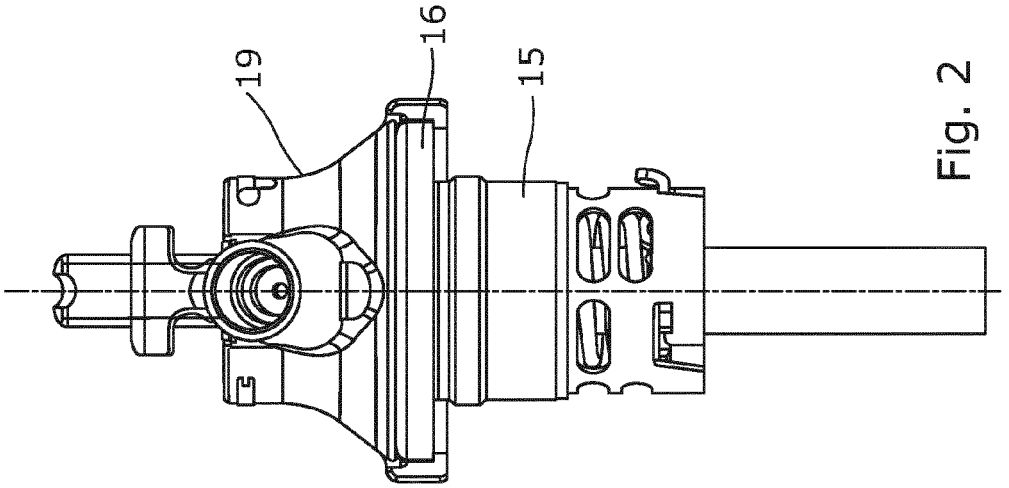

Fig. 2

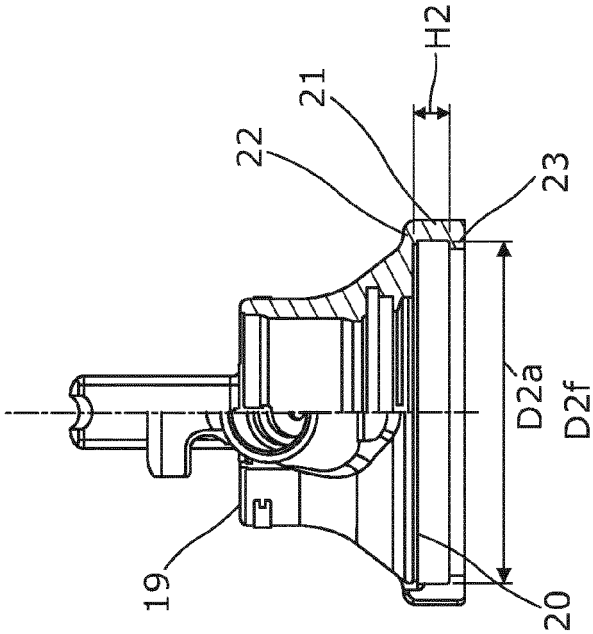

Fig. 3

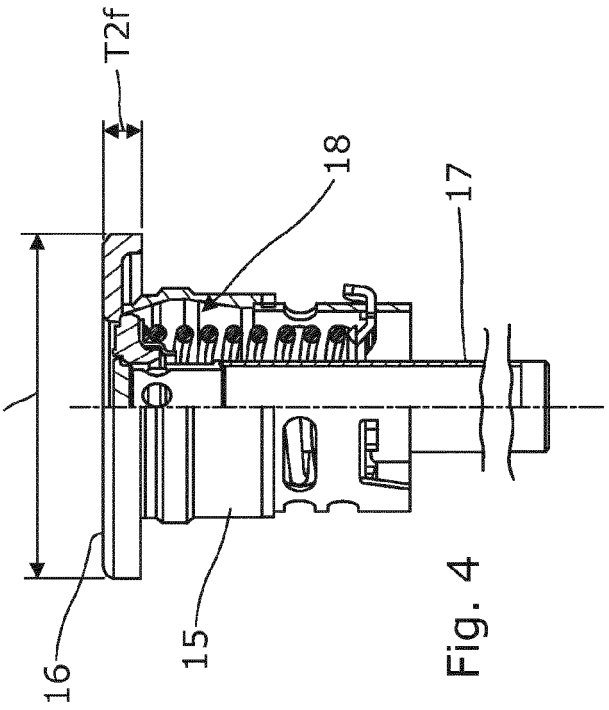

Fig. 4

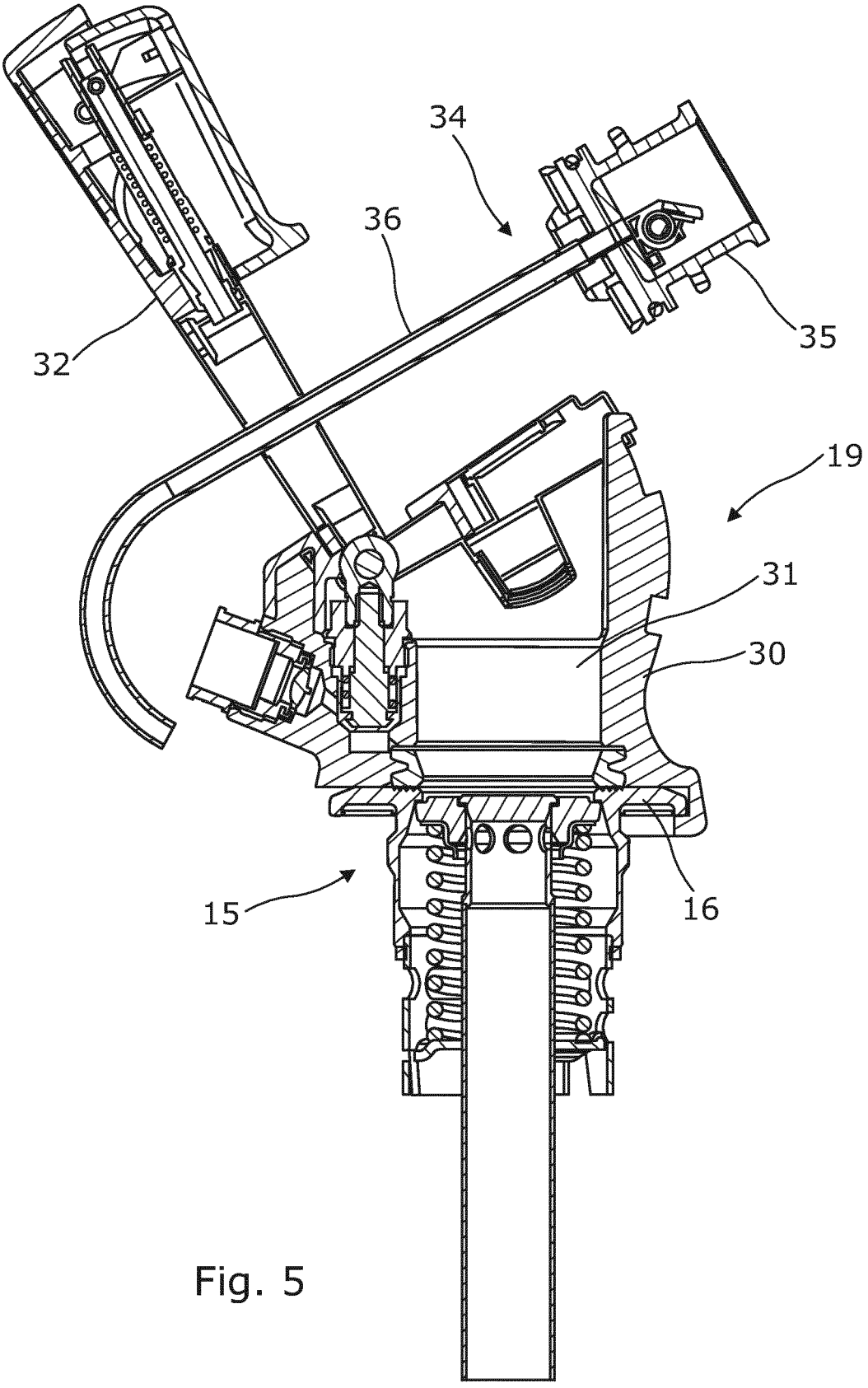

Fig. 5

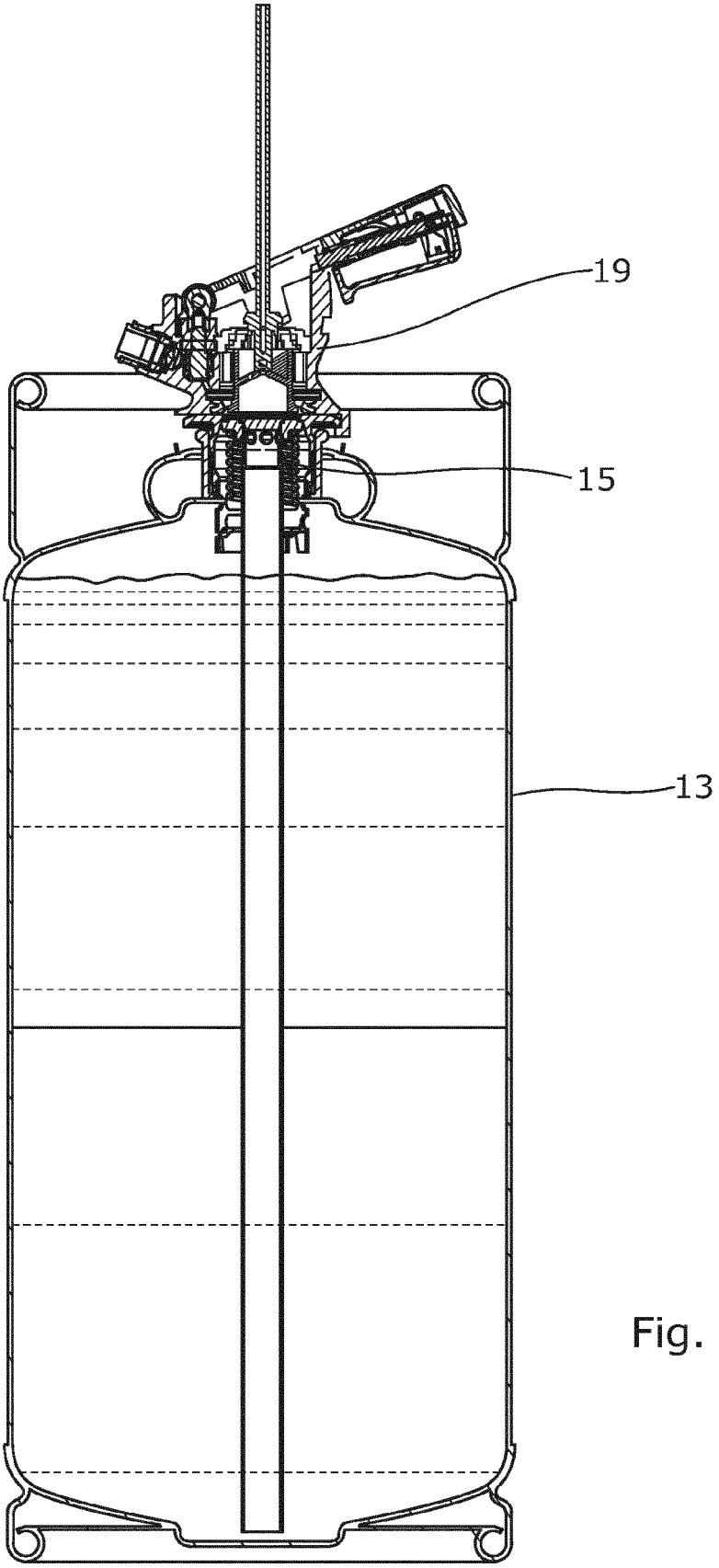

Fig. 6

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EUROPEAN SEARCH REPORT

Application Number
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Place of search	Date of completion of the search	Examiner
Munich	4 March 2015	Desittere, Michiel

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