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(54) **FLUID DISPENSING SYSTEMS**

SYSTEM ZUM AUSSCHENKEN VON FLÜSSIGKEITEN

SYSTEME DE DIFFUSION POUR FLUIDE

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Description

This invention relates to fluid dispensing systems and is concerned more particularly, but not exclusively, with beer and wine dispensing systems for dispensing beers and wines from the casks or barrels within which they are conditioned.

Traditional methods for dispensing cask-conditioned beer from a barrel make use of a supply pipe which extends through the wall of the barrel and has an input end opening in the vicinity of the bottom of the beer within the barrel and an output end opening externally of the barrel and adapted to be connected to a tap or to a pump fitting by means of which beer may be drawn from the barrel under pump pressure. Such methods can be used either with the barrel standing upright or with the barrel lying in a horizontal position on a traditional stillage. In either case it is conventional for the part of the barrel which is uppermost in use to be fitted with an air-impermeable plug which is replaced by an air-permeable plug to admit air to the top of the barrel when beer is to be dispensed from the barrel.

However there are a number of disadvantages inherent in such traditional methods. Firstly, when a barrel is first moved to the position from which the beer is to be dispensed, the beer within the barrel must be allowed to settle for a considerable length of time before beer is dispensed in order to ensure that the beer is not clouded by sediment. Also, because of the shape of the barrel and since the input end of the supply pipe must be positioned well above the bottom of the barrel so that the sediment at the bottom of the barrel is not dispensed, there is the problem that a substantial quantity of beer is left at the bottom of the barrel after the rest of the beer has been drawn off. Whilst some of this remaining beer can be drawn off by tipping of the barrel, such tipping risks disturbing the sediment and thereby clouding the beer to be drawn off. In any event it is well understood that a substantial quantity of waste beer, called the ullage, remains in the barrel when the otherwise empty barrel is returned to the supplier, and it is in fact standard practice for a refund of duty paid in respect of the beer in the barrel to be made on the basis of the quantity of ullage.

DE-A-2401775 discloses a device for filling and emptying fuel tanks in which the end of the supply pipe is connected to a float adapted to float in the fuel at its free surface so that fuel is drawn off from the vicinity of the free surface. The end of the supply pipe is connected to an arm having one end pivotally connected to a fixed support and the other end coupled to the float by a chain in such a manner as to restrict the movement of the end of the supply pipe within the tank.

GB-A-962404 discloses a tubular floating suction arm for an aircraft fuel storage tank in which the end of the arm is supported by a float in the vicinity of the free surface of the fuel. The arm consists of a rigid tube attached to a flexible pipe at one end and having its other

end rigidly supported below the float such that inlet openings for drawing fuel into the tube open laterally outwardly into the fuel below the float.

It is an object of the invention to provide an improved fluid dispensing system which is particularly applicable to the dispensing of beers and wines.

According to the present invention there is provided a fluid dispensing system for fitting to a container to enable the fluid to be dispensed from the container, the system comprising a supply pipe having an input end for opening within the fluid in the container and an output end for extending through the wall of the container so as to open externally of the container, the input end of the supply pipe being connected by a carrier to a closed hollow body of a float adapted to float in the fluid in the vicinity of its free surface within the container so that the input end opens in the vicinity of the free surface of the fluid, whereby fluid may be dispensed from the container by the application of suitable supply pressure so as to cause fluid to be drawn off from the vicinity of the free surface by way of the input end of the supply pipe and to pass along the supply pipe from the input end to the output end, wherein the carrier is provided with a bottom wall having a bore extending there-through, the input end of the supply pipe communicating with the bore so as to open at a surface of the bottom wall which is uppermost when the float is floating within the container.

It will be appreciated that, when used for dispensing of beer, such a dispensing system ensures that, because the beer is always drawn off from the vicinity of the free surface by way of the upwardly opening input end of the supply pipe, whatever the level of beer within the container, the quality of the dispensed beer is improved and there is much less risk of the beer being clouded by sediment. Furthermore good quality beer can be drawn off from a barrel a much shorter length of time after it has been moved into position than would otherwise be the case, and accordingly there is a substantial reduction in the time required to allow the beer to settle. It is also possible for the amount of waste beer or ullage remaining in a barrel after use to be minimised since the upwardly opening input end of the supply pipe ensures that beer can still be drawn into the input end when the level of beer remaining in the barrel is very low.

Preferably the bottom wall of the carrier incorporates a tubular part to which the input end of the supply pipe is connected.

Conveniently the carrier is provided with an opening on at least one side so as to permit fluid to enter into a space within the carrier below the hollow body from which the fluid may be drawn into the input end of the supply pipe.

Additionally the carrier may be provided with a filter for filtering fluid drawn into the input end of the supply pipe and the output end of the supply pipe may be provided with a connecting fitting for connection to a further pipe externally of the container.

Also the float may be slidably coupled to an intermediate part of the supply pipe, for example by means of a sliding ring encircling the supply pipe, so as to constrain the float to slide along the intermediate part of the supply pipe as the level of fluid within the container falls.

The invention also provides a container, such as a beer or wine barrel, to which such a dispensing system is fitted.

In order that the invention may be more fully understood, two embodiments of a beer dispensing system in accordance with the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a schematic side view of a first embodiment with the barrel positioned on its side; and

Figure 2 is a schematic side view of a second embodiment with the barrel positioned on its end.

Figure 1 shows a standard metal beer barrel or cask 1 mounted in a horizontal position on a traditional stillage (not shown) for dispensing of beer from the barrel when in this horizontal position. As is well known the barrel 1 has a shive 2 sealing the aperture through which the barrel has been filled with beer and a spiral 3 inserted into a bore in the shive 2. When supplied the shive 2 of the barrel 1 is fitted with an air-impermeable spiral 3 so as to prevent air entering the barrel and spoiling the beer. However, when beer is to be dispensed from the barrel 1, the air-impermeable spiral is replaced by an air-permeable spiral, so as to permit air to enter the barrel 1 during dispensing of beer from the barrel.

The barrel 1 is fitted with a dispenser 4 comprising a supply pipe 5 having a rigid portion 6 extending through a bore 7 in the shive 2 and a flexible portion 8 extending between the rigid portion 6 and a float 9. The rigid portion 6 of the supply pipe 5 consists of a length of microbore PVC pipe which extends from the top to the bottom of the barrel and the length of which is therefore dependent on the diameter of the barrel. The output end 10 of the pipe 5 extending externally of the barrel 1 is fitted with an elbow joint 11 and a standard fitting 12 incorporating a hop filter. The opposite end of the rigid portion 6 of the pipe 5 is coupled to the flexible portion 8 by a further elbow joint 13.

The float 9 comprises a closed spherical hollow body 14 and a PVC carrier 15 having a part spherical recess 16 within which the hollow body 14 is bonded by an adhesive. The carrier 9 has a bottom wall 17 having a bore 18 receiving a scavenger pipe 19 fitted with a filter 19A. The input end 20 of the pipe 5 is connected to the scavenger pipe 19 so as to open at the upper surface of the bottom wall 17. Furthermore the carrier 17 has openings 21 at its sides for the beer to enter into the space within the carrier below the hollow body 14. Also the float 9 is slidably coupled to the rigid portion 6 of the pipe 5 by means of a sliding ring 22.

In operation of the dispensing system the fitting 12 is connected to the main beer line after positioning of the barrel in its horizontal position on the stillage, and, after allowing sufficient time for the beer within the barrel to settle, beer is dispensed from the barrel under pump pressure so as to draw beer from the vicinity of the free surface 23 of the beer within the barrel into the input end 20 of the supply pipe 5 by way of the scavenger pipe 19 and so as to supply the beer from the output end 10 of the supply pipe 5 externally of the barrel to the main beer line. As the level of the beer in the barrel goes down, the float 9 slides down the rigid portion 6 of the pipe 5 under the constraint of the sliding ring 22 so that the beer continues to be drawn from a position below the free surface 23 of the beer. When the float 9 reaches its lowermost position as the level of the beer falls, the float 9 will fall on its side so that beer will continue to be drawn into the input end 20 of the supply pipe 5 until only a small amount of waste beer remains in the barrel.

Figure 2 shows an alternative system for dispensing beer from a barrel 1 which is positioned on its end. Since the alternative system is in many ways similar to the system already described, the same reference numerals are used for similar parts in the two figures, and the following description will be limited to those features of the alternative system which differ from the system already described.

In the alternative system the supply pipe 5 comprises a short rigid portion 30 and a long flexible portion 31 extending between the rigid portion 30 and the float 9. In this case the rigid portion 30 of the supply pipe 5 extends through a bore 32 in the keystone 33 of the barrel 1, and not through the shive 2. In accordance with standard practice the keystone 33 is fitted with an air-impermeable spiral 34 which must be replaced by an air-permeable spiral when beer is to be dispensed from the barrel. Furthermore in this case the rigid and flexible portions 30 and 31 of the pipe 5 are interconnected by an axial joint 35.

The dispensing of beer in use of such a system occurs in essentially the manner already described. However, in this case, as the level of beer falls in the barrel, the float 9 is not constrained to slide along a portion of the pipe 5. Instead the float 9 is able to find its own position at the free surface 23 of the beer, and the hollow body 14 on the float 9 is oval-shaped in order to tend to retain the float 9 in an upright position.

Both of the described dispensing systems allow cask conditioned beer to be drawn by means of a hand pump or tap and mechanical pump from the vicinity of the free surface of the beer within the barrel, rather than from the bottom of the barrel.

Claims

1. A fluid dispensing system for fitting to a container to enable the fluid to be dispensed from the contain-

er, the system comprising a supply pipe (5) having an input end (20) for opening within the fluid in the container (1) and an output end (10) for extending through the wall of the container (1) so as to open externally of the container (1), the input end (20) of the supply pipe (5) being connected by a carrier (15) to a closed hollow body (14) of a float (9) adapted to float in the fluid in the vicinity of its free surface (23) within the container (1) so that the input end (20) opens in the vicinity of the free surface (23) of the fluid, whereby fluid may be dispensed from the container (1) by the application of suitable supply pressure so as to cause fluid to be drawn off from the vicinity of the free surface by way of the input end (20) of the supply pipe (5) and to pass along the supply pipe (8) from the input end (20) to the output end (10), wherein the carrier (15) is provided with a bottom wall (17) having a bore (18) extending therethrough, the input end (20) of the supply pipe (5) communicating with the bore (18) so as to open at a surface of the bottom wall (17) which is uppermost when the float (9) is floating within the container (1).

2. A system according to claim 1, wherein the bottom wall (17) of the carrier (15) incorporates a tubular part (19) to which the input end (20) of the supply pipe (5) is connected.

3. A system according to claim 1 or 2, wherein the carrier (15) is provided with an opening (21) on at least one side so as to permit fluid to enter into a space within the carrier (15) below the hollow body (14) from which the fluid may be drawn into the input end (20) of the supply pipe (5).

4. A system according to claim 1, 2 or 3, wherein the carrier (15) is provided with a filter (19A) for filtering fluid drawn into the input end (20) of the supply pipe (5).

5. A system according to any preceding claim, wherein the output end (10) of the supply pipe (5) is provided with a closure member (2) for sealingly fitting within an aperture extending through the wall of the container (1).

6. A system according to any preceding claim, wherein the output end (10) of the supply pipe (5) is provided with a connecting fitting (12) for connection to a further pipe externally of the container (1).

7. A system according to any preceding claim, wherein the float (9) is slidably coupled to an intermediate part (6) of the supply pipe (5) so as to constrain the float (9) to slide along the intermediate part (6) of the supply pipe (5) as the level of fluid within the container (1) falls.

8. A system according to any preceding claim, for fitting to a container (1) which is in the form of a barrel for dispensing fluid with the container (1) positioned on its side, wherein the supply pipe (5) comprises a rigid portion (6) for passing through a side wall of the container (1) and for extending substantially vertically from an upper portion to a lower portion of the container (1) when the container (1) is positioned on its side, and a flexible portion (8) extending between the rigid portion (6) and the float (9).

9. A system according to any one of claims 1 to 8, for fitting to a container (1) which is in the form of a barrel for dispensing fluid with the container (1) positioned on its end, wherein the supply pipe (5) comprises a relatively short rigid portion (30) for extending substantially vertically through an end wall of the container (1) to an upper portion of the container (1) and a relatively long flexible portion (31) extending between the rigid portion (30) and the float (9).

10. A beer or wine barrel fitted with a system according to any preceding claim.

Patentansprüche

1. Flüssigkeitsabgabesystem zum Anschluß an einem Behälter, um die Abgabe der Flüssigkeit aus dem Behälter zu ermöglichen, wobei das System eine Zuleitung (5) umfaßt, die ein Eingangsende (20), das sich innerhalb der Flüssigkeit in dem Behälter (1) öffnet, und ein Ausgangsende (10) hat, das sich durch die Wand des Behälters (1) erstreckt, um sich außerhalb des Behälters (1) zu öffnen, wobei das Eingangsende (20) der Zuleitung (5) durch einen Träger (15) mit einem geschlossenen Hohlkörper (14) eines Schwimmers (9) verbunden ist, der in der Flüssigkeit in der Nähe von deren freier Oberfläche (23) innerhalb des Behälters (1) schwimmen kann, so daß sich das Eingangsende (20) in der Nähe der freien Oberfläche (23) der Flüssigkeit öffnet, wodurch Flüssigkeit aus dem Behälter (1) abgegeben werden kann durch die Anwendung eines geeigneten Zuleitungsdrucks, durch den das Abziehen von Flüssigkeit aus der Nähe der freien Oberfläche mit Hilfe des Engangsendes (20) der Zuleitung (5) bewirkt wird und diese längs der Zuleitung (8) vom Eingangsende (20) zum Ausgangsende (10) geführt wird, bei welchem der Träger (15) mit einer unteren Wand (17) versehen ist, die eine durch diese hindurchführende Bohrung (18) hat, wobei das Eingangsende (20) der Zuleitung (5) mit der Bohrung (18) in Verbindung steht, so daß es sich an einer Oberfläche der unteren Wand (17) öffnet, die sich ganz oben befindet, wenn der Schwimmer (9) innerhalb des Behälters (1) schwimmt.

2. System nach Anspruch 1, bei dem die untere Wand (17) des Trägers (15) ein rohrförmiges Teil (19) einschließt, mit dem das Eingangsende (20) der Zuleitung (5) verbunden ist.

3. System nach Anspruch 1 oder 2, bei dem der Träger (15) an wenigstens einer Seite mit einer Öffnung (21) versehen ist, um den Eintritt der Flüssigkeit in einen Raum innerhalb des Trägers (15) unter dem Hohlkörper (14) zu ermöglichen, aus dem die Flüssigkeit in das Eingangsende (20) der Zuleitung (5) angesogen werden kann.

4. System nach Anspruch 1, 2 oder 3, bei dem der Träger (15) mit einem Filter (19A) zum Filtrieren der Flüssigkeit, die in das Eingangsende (20) der Zuleitung (5) angesogen wird, versehen ist.

5. System nach einem der vorhergehenden Ansprüche, bei dem das Ausgangsende (10) der Zuleitung (5) mit einem Verschußelement (2) zur abdichten der Anbringung innerhalb einer Öffnung, die durch die Wand des Behälters (1) führt, versehen ist.

6. System nach einem der vorhergehenden Ansprüche, bei dem das Ausgangsende (10) der Zuleitung (5) mit einem Anschlußstück (12) zum Anschluß an ein weiteres Rohr außerhalb des Behälters (1) verbunden ist.

7. System nach einem der vorhergehenden Ansprüche, bei dem der Schwimmer (9) gleitfähig mit einem Zwischenteil (6) der Zuleitung (5) gekoppelt ist, um das Gleiten des Schwimmers (9) entlang des Zwischenteils (6) der Zuleitung (5) zu beschränken, wenn der Flüssigkeitspegel innerhalb des Behälters (1) sinkt.

8. System nach einem der vorhergehenden Ansprüche zum Anschluß an einen Behälter (1), der die Form eines Fasses zur Abgabe von Flüssigkeit mit dem an dessen Seite angeordneten Behälter (1) hat, bei dem die Zuleitung (5) einen starren Abschnitt (6) zum Durchgang durch eine Seitenwand des Behälters (1) und für einen im wesentlichen senkrechten Verlauf von einem oberen Abschnitt zu einem unteren Abschnitt des Behälters (1), wenn der Behälter (1) an dessen Seite angeordnet ist, und einen flexiblen Abschnitt (8) umfaßt, der sich zwischen dem starren Abschnitt (6) und dem Schwimmer (9) erstreckt.

9. System nach einem der Ansprüche 1 bis 8 zum Anschluß an einen Behälter (1), der die Form eines Fasses zur Abgabe von Flüssigkeit mit dem an dessen Ende angeordneten Behälter (1) hat, bei dem die Zuleitung (5) einen verhältnismäßig kurzen, starren Abschnitt (30) für einen im wesentlichen

senkrechten Verlauf durch eine Stirnwand des Behälters (1) zu einem oberen Abschnitt des Behälters (1) und einen relativ langen flexiblen Abschnitt (31) umfaßt, der sich zwischen dem starren Abschnitt (30) und dem Schwimmer (9) erstreckt.

10. Bier- oder Weinfäß, das mit einem System nach einem der vorhergehenden Ansprüche ausgestattet ist.

Revendications

1. Système de distribution de fluide, destiné à être adapté à un récipient pour permettre la distribution du fluide à partir du récipient, le système comprenant une conduite d'alimentation (5), comportant une extrémité d'entrée (20), destinée à s'ouvrir dans le fluide dans le récipient (1), et une extrémité de sortie (10), destinée à s'étendre à travers la paroi du récipient (1), de sorte à s'ouvrir vers l'extérieur du récipient (1), l'extrémité d'entrée (20) de la conduite d'alimentation (5) étant connectée par un support (15) à un corps creux fermé (14) d'un flotteur (9), destiné à flotter dans le fluide au voisinage de sa surface libre (23), dans le récipient (1), de sorte que l'extrémité d'entrée (20) s'ouvre au voisinage de la surface libre (23) du fluide, le fluide pouvant ainsi être distribué à partir du récipient (1) par suite de l'application d'une pression d'alimentation appropriée, de sorte à entraîner l'aspiration du fluide à partir du voisinage de la surface libre par l'intermédiaire de l'extrémité d'entrée (20) de la conduite d'alimentation (5) et son passage le long de la conduite d'alimentation (8), de l'extrémité d'entrée (20) vers l'extrémité de sortie (10), le support (15) comportant une paroi inférieure (17) comportant un alésage (18) la traversant, l'extrémité d'entrée (20) de la conduite d'alimentation (5) communiquant avec l'alésage (18), de sorte à s'ouvrir au niveau d'une surface de la paroi inférieure (17), située au niveau le plus élevé lorsque le flotteur (9) flotte dans le récipient (1).

2. Système selon la revendication 1, dans lequel la paroi de base (17) du support (15) comprend une partie tubulaire (19) à laquelle est connectée l'extrémité d'entrée (20) de la conduite d'alimentation (5).

3. Système selon les revendications 1 ou 2, dans lequel le support (15) comporte une ouverture (21) sur au moins un côté, de sorte à permettre l'entrée du fluide dans un espace à l'intérieur du support (15), au-dessous du corps creux (14), à partir duquel le fluide peut être aspiré dans l'extrémité d'entrée (20) de la conduite d'alimentation (5).

4. Système selon les revendications 1, 2 ou 3, dans

lequel le support (15) comporte un filtre (19A) pour filtrer le fluide aspiré dans l'extrémité d'entrée (20) de la conduite d'alimentation (5).

5. Système selon l'une quelconque des revendications précédentes, dans lequel l'extrémité de sortie (10) de la conduite d'alimentation (5) comporte un élément de fermeture (2), destiné à être adapté de façon étanche dans une ouverture traversant la paroi du récipient (1). 5
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6. Système selon l'une quelconque des revendications précédentes, dans lequel l'extrémité de sortie (10) de la conduite d'alimentation (5) comporte un raccord de connexion (12) en vue de la connexion à une conduite additionnelle à l'extérieur du récipient (1). 15

7. Système selon l'une quelconque des revendications précédentes, dans lequel le flotteur (9) est accouplé par glissement à une partie intermédiaire (6) de la conduite d'alimentation (5), de sorte à obliger le flotteur (9) à glisser le long de la partie intermédiaire (6) de la conduite d'alimentation (5) lors d'une baisse du niveau du fluide dans le récipient (1). 20
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8. Système selon l'une quelconque des revendications précédentes, destiné à être ajusté sur un récipient (1) ayant la forme d'un tonneau, pour distribuer du fluide, le récipient étant positionné sur son côté, la conduite d'alimentation (5) comprenant une partie rigide (6), destinée à traverser une paroi latérale récipient (1) et à s'étendre de façon essentiellement verticale à partir d'une partie supérieure vers une partie inférieure du récipient (1) lorsque le récipient (1) est positionné sur son côté, et une partie flexible (8), s'étendant entre la partie rigide (6) et le flotteur (9). 30
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9. Système selon l'une quelconque des revendications 1 à 8, destiné à être adapté sur un récipient (1) ayant la forme d'un tonneau, pour distribuer du fluide lorsque le récipient (1) est positionné sur son extrémité, la conduite d'alimentation (5) comprenant une partie rigide relativement courte (30), destinée à s'étendre de façon essentiellement verticale à travers une paroi d'extrémité du récipient (1), vers une partie supérieure du récipient (1), et une partie flexible relativement longue (31), s'étendant entre la partie rigide (30) et le flotteur (9). 40
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10. Tonneau de bière ou de vin équipé d'un système selon l'une quelconque des revendications précédentes. 55

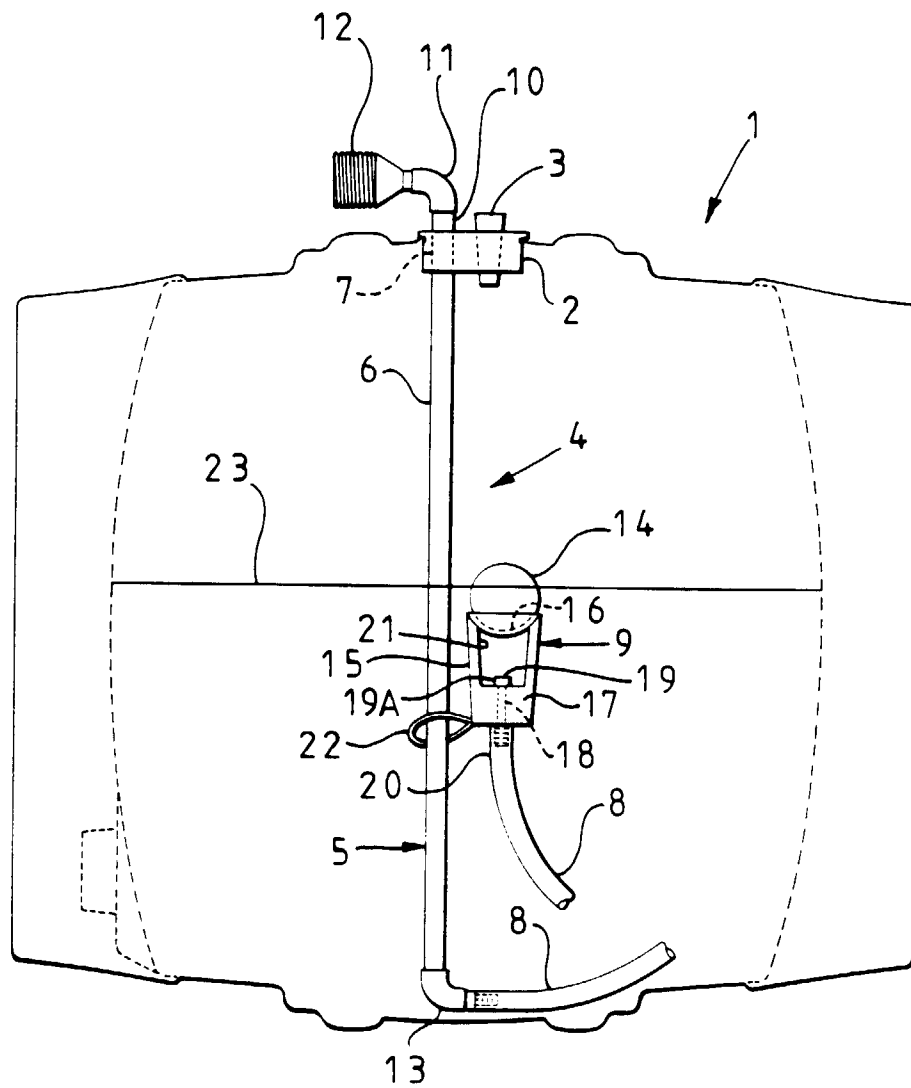


FIG 1

FIG 2

