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Courier Press, Leamington Spa, England.

## Description

The invention relates to an apparatus for filling bottles with a liquid, comprising a rotatable filling tank and a number of filling valves mounted in a carousel formation along the outer wall of said tank, each valve having a central gaspipe, the tank having a closing lid at its top and an internal stationary horizontal partition wall situated above the liquid level in said tank, dividing the tank in an upper and lower portion, the gas pipe of each valve communicating with the upper portion of the tank. An apparatus of this kind is known from GB—A—940.040 and operates with a different degree of vacuum in the upper and lower portion of the filling tank.

It is the object of the invention to provide an apparatus for use with liquid in the form of beverages such as wine or drinks having a slight CO<sub>2</sub> content. Such a bottle filler is sometimes also referred to as an isobarometric filler. In this type of apparatus one should avoid any leakage of aroma and any loss of alcohol contents whilst one should also prevent any oxydation of the liquid. In addition it is also desirable to avoid any turbulence of the surface of the liquid in the lower portion of the filling tank and to prevent any contact between the return gas from the bottles and the liquid. Whilst maintaining these aims, it is an object of the invention to render it possible to clean the apparatus and in particular the filling tank without the necessity of complicated dismounting operations.

This object is obtained in the type of apparatus as referred to above in that the partition wall is provided with a closure plate mounted on a vertically displaceable pipe for the supply of a protective gas in the lower portion of the tank, said tank being internally provided with a spray member having nozzles for cleaning both the upper and lower portion of the tank, the upper portion of the tank being provided with an adjustable gas discharge passage situated in its closing lid.

During the filling operation the closure plate will completely shut off the partition wall and a protective gas f.i. nitrogen or CO<sub>2</sub> can be supplied beneath the partition plate. The return gas from the bottles is discharged through the upper portion of the tank and the required slight overpressure can be controlled by means of the adjustable gas discharge passage situated in the closing lid of the tank. During the cleaning operation the closure plate is lifted by raising the pipe for the supply of the protective gas and the nozzles of the spray member can reach each place of the apparatus to be cleaned.

In a preferred embodiment of the apparatus, the closing lid of the tank is provided with a relatively rotatable central assembly block comprising the spray member, the adjustable gas discharge passage and the vertically displaceable pipe for the supply of a protective gas. This assembly block remains stationary

whilst the (emptied) filling tank is rotating in order to enable the nozzles of the spray member to reach every corner of the apparatus.

The present invention relates in particular to an apparatus in which the filling valves are mounted outside the liquid tank whilst the gas pipe of each valve has a connection in the wall of the filling tank at a common level above the partition wall and in which one of the nozzles of the spray member mounted in the assembly block is arranged such that during rotation of the tank, said nozzle is periodically passing opposite each connection. Such an arrangement still further facilitates the cleaning operation of the apparatus.

The invention will be explained in detail with reference to the accompanying drawings which show the most important detail of a preferred embodiment of the bottle filler according to this invention.

Fig. 1 is a vertical section through the central filling tank provided with connections for a carousel of filling valves, the arrangement being shown in a condition ready for the filling operation.

Fig. 2 is a section similar to fig. 1 showing the arrangement in a condition for the cleaning operation.

The apparatus shows a filling tank comprising a bottom 1 and an outer wall 2. The tank 2 cooperates with a number of filling valves 3 which are not directly arranged in the bottom 1, but at some distance from the filling tank on a separate mounting plate 22. Although only a single valve 3 is shown, the apparatus may comprise a carousel of twelve, sixteen or twenty of such valves 3. Each filling valve 3 comprises a fixed housing 4 and a continuous gas pipe 6 extending at its lower end into the neck of the bottle to be filled. Each valve 3 is connected to the central tank 2 via a liquid tube 23 near the bottom and a gas connection 24 at the top.

The interior of the tank 2 is provided with a horizontal partition wall 25 above the level of the liquid in the lower portion of said tank. The partition wall may have a flat or slightly conical shape. The partition wall comprises a closure plate 26 provided with a supply pipe 27 for a protective gas e.g. nitrogen or carbondioxide. A liquid level control 28 and a spray member 29 with nozzles 30 both also extend with some clearance through the closure plate 26.

The top surface of the filling tank 2 is closed by a loose lid 31 which can be sealed by means of clamping units 32. Lid 31 is provided with a relatively rotatable central assembly block 33 in which the spray member 29 and an adjustable gas discharge passage 34 are secured. The latter element is used to discharge the air returned from the bottles through the gaspipe 6 during filling. The quantity of protective gas applied is also controlled thereby. The protective gas supply pipe 27 is slidably guided through the block 33 but is secured to the plate

26. This pipe therefore also acts as an actuating means for lifting and lowering the closure plate 26. Fig. 1 shows the situation in which the closure plate closes the wall 25 while fig. 2 shows the closure plate open by means of a spacer 35 inserted on top of the block 33. In this position the spray members 29 together with the nozzles 30 can operate to clean the interior of the filling tank 2. Before this cleaning operation is carried out, the filling liquid has been discharged from the tank 2.

The advantage of the partition wall 25 consists in that the return air from the filling valves flowing back into the tank 2 via the connection 24 (figs. 1 and 2) can not cause any turbulence or exert any other adverse influence (e.g. oxidation or infection) on the liquid for filling collected in the lower position of the tank 2. Furthermore, the quantity of protective gas required above the liquid for filling is substantially reduced due to the smaller volume of the lower portion of the tank. Fig. 2 additionally shows how the connections 24 of the gas pipes in the wall of the rotating tank 2 are cleaned by means of the stationary spray nozzle 30'.

For the sake of completeness, it should be noted that the cleaning liquid is fed to the spray member 29 via a conduit 36 while the liquid in the tank 2 for filling the bottles is fed from below via a central supply pipe 37. It should further be noted that the tank 2 and the filling valves 3 are slowly rotating during the normal filling operation as well as during cleaning. In both circumstances the block 33 with the elements 27—30 and the plate 26 are stationary.

### Claims

1. An apparatus for filling bottles with a liquid, comprising a rotatable filling tank (2) and a number of filling valves (3) mounted in a carousel formation along the outer wall of said tank, each valve having a central gaspipe (6), the tank (2) having a closing lid (31) at its top and an internal stationary horizontal partition wall (25) situated above the liquid level in said tank, dividing the tank in an upper and lower portion, the gas pipe (6) of each valve (3) communicating with the upper portion of the tank, characterized in that the partition wall (25) is provided with a closure plate (26) mounted on a vertically displaceable pipe (27) for the supply of a protective gas in the lower portion of the tank (2), said tank being internally provided with a spray member (29) having nozzles (30) for cleaning both the upper and lower portion of the tank, the upper portion of the tank being provided with an adjustable gas discharge passage (34) situated in its closing lid (31).

2. Apparatus according to claim 1, characterized in that the closing lid (31) of the tank (2) is provided with a relatively rotatable central assembly block (33) comprising the spray member (29), the adjustable gas

discharge passage (34) and the vertically displaceable pipe (27) for the supply of a protective gas.

3. Apparatus according to claim 2, characterized in that the filling valves (3) are mounted outside the liquid tank (2) whilst the gas pipe (6) of each valve has a connection (24) in the wall of the filling tank (2) at a common level above the partition wall (25) and in that one of the nozzles (30') of the spray member (29) mounted in the assembly block (33) is arranged such that during rotation of the tank, said nozzle is periodically passing opposite each connection (24).

### Patentansprüche

1. Vorrichtung zum Füllen von Flaschen mit einer Flüssigkeit mit einem drehbaren Fülltank (2) und einer Anzahl von Füllventilen (3), die in einer Rundlauf-Anordnung entlang der Außenwand des genannten Tanks befestigt sind, wobei jedes Ventil ein zentrales Gasrohr (6) aufweist, der Tank (2) an seiner Oberseite mit einem Verschlussdeckel (31) und einer oberhalb des Flüssigkeitsspiegels im genannten Tank angeordneten, den Tank in einen oberen und unteren Teil aufteilenden inneren stationären horizontalen Trennwand (25) versehen ist, und das Gasrohr (6) jedes Ventils (3) mit dem oberen Teil des Tanks in Verbindung steht, dadurch gekennzeichnet, daß die Trennwand (25) eine Schließplatte (26) aufweist, die an einem vertikal bewegbaren Rohr (27) zur Zufuhr eines Schutzgases in den unteren Teil des Tanks (2) befestigt ist, und der genannte Tank im Inneren einen Sprühteil (29) mit Düsen (30) zum Reinigen des oberen und unteren Teils des Tanks aufweist, wobei der obere Teil des Tanks mit einem in seinem Verschlussdeckel (31) angeordneten verstellbaren Gasauslaßkanal (34) versehen ist.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß der Verschlussdeckel (31) des Tanks (2) mit einem relativ drehbaren zentralen Zusammenbaublock (33) versehen ist, der den Sprühteil (29), den verstellbaren Gasauslaßkanal (34) und das vertikal bewegbare Rohr (27) zur Zufuhr eines Schutzgases umfaßt.

3. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, daß die Füllventile (3) außerhalb des Flüssigkeitstanks (2) befestigt sind, während das Gasrohr (6) jedes Ventils einen Anschluß (24) in der Wand des Fülltanks (2) auf einem gemeinsamen Niveau oberhalb der Trennwand (25) aufweist, und daß eine der Düsen (30') des in dem Zusammenbaublock (33) befestigten Sprühteils (29) derart angeordnet ist, daß während der Rotation des Tanks die genannte Düse sich periodisch gegenüber jedem Anschluß (24) vorbeibewegt.

### Revendications

1. Appareil pour remplir des bouteilles d'un liquide, comprenant un réservoir de remplissage

tournant (2) et un certain nombre de valves de remplissage (3) montées avec une disposition en carrousel le long de la paroi extérieure du réservoir, chaque valve présentant un tuyau central à gaz (6), le réservoir présentant un couvercle de fermeture (31) à son sommet et une cloison intérieure horizontale fixe (25) située au-dessus du niveau de liquide dans le réservoir, divisant le réservoir en une partie supérieure et une partie inférieure, le tuyau à gaz (6) de chaque valve (3) communiquant avec la partie supérieure du réservoir, appareil caractérisé par le fait que la cloison (25) est munie d'une plaque de fermeture (26) montée sur un tuyau mobile verticalement (27) pour l'amenée d'un gaz protecteur à la partie inférieure du réservoir (2), le réservoir étant muni intérieurement d'un organe de pulvérisation (29) présentant des buses (30) pour nettoyer aussi bien la partie supérieure que la partie inférieure du réservoir, la partie supérieure du réservoir étant munie d'un passage réglable d'évacuation de gaz (34) situé

dans son couvercle de fermeture (31).

2. Appareil selon la revendication 1, caractérisé par le fait que le couvercle de fermeture (31) du réservoir (2) est muni d'un bloc central d'ensemble (33) pouvant tourner relativement, comprenant l'organe de pulvérisation, le passage réglable d'évacuation de gaz (34) et le tuyau mobile verticalement (27) pour l'amenée d'un gaz protecteur.

3. Appareil selon la revendication 2, caractérisé par le fait que les valves de remplissage (3) sont montées à l'extérieur du réservoir à liquide (2), tandis que le tuyau à gaz (6) de chaque valve présente un raccordement (24) dans la paroi du réservoir de remplissage (2), à un niveau commun au-dessus de la cloison (25), et que l'une des buses (30') de l'organe de pulvérisation (29) monté dans le bloc d'ensemble (33) est disposée de telle sorte que, pendant la rotation du réservoir, cette buse passe périodiquement en face de chaque raccordement (24).

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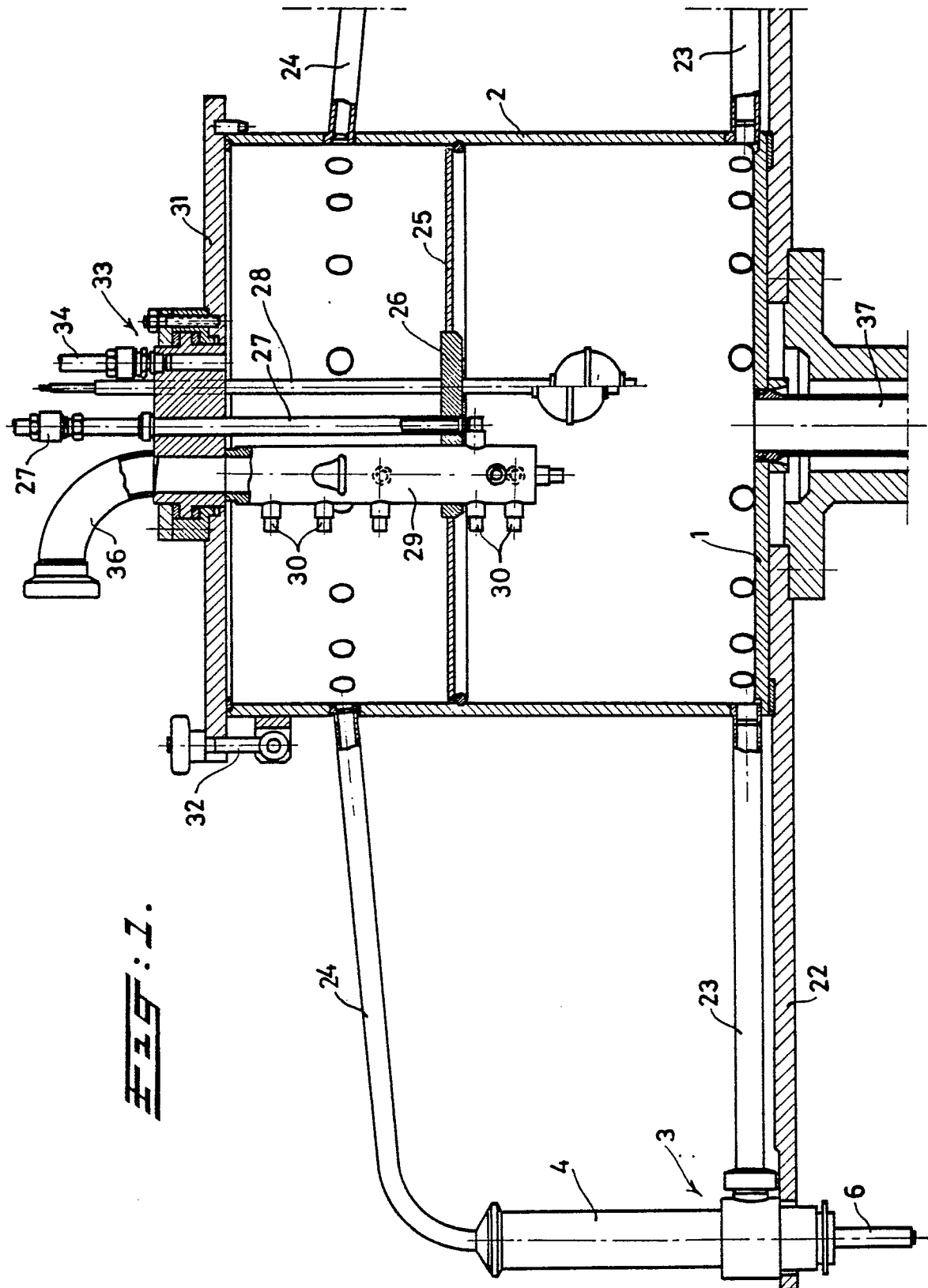
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**Fig. 1.**

