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(54) Title: DISHWASHING OF TABLEWATER BOTTLES

(57) Abstract: A kitchenware dishwasher spray module kit for batch-wise dishwashing of tablewater bottles comprises a tablewater bottle sprayer (34) comprising a dishwasher socket for connecting the bottle sprayer (34) to a mating lower spray arm socket of a kitchenware dishwasher (10); a plurality of spray nozzle arrangements (36, 36') in fluid connection with the dishwasher socket for receiving dishwashing fluid from the dishwasher (10), said spray nozzle arrangements (36, 36') being configured for spraying upwards when installed in the dishwasher (10), and being spread in both dimensions of a first two-dimensional pattern as seen from above; and a rotation lock for preventing the sprayer (34) from rotating relative to a dishwashing rack.

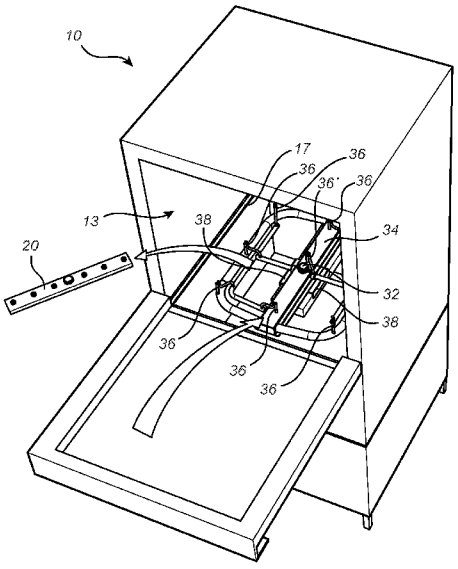

Fig. 2

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DISHWASHING OF TABLEWATER BOTTLES

Field of the invention

The present invention relates to dishwashing of tablewater bottles.

Background of the invention

Bottled tablewater, carbonized or still, is a popular drink served at restaurants as well as at home. Bottled tablewater is sold under numerous brands. However, for environmental, economic, and in the case of restaurants also for branding reasons, it is becoming increasingly popular to serve water that has been tapped in bottles locally, i.e. at home or at the premises of the restaurant.

As the tablewater bottles are typically only filled with clean water, and proper dishwashing required a bottle brush which may not always be immediately available, dishwashing them is often neglected.

Summary of the invention

It is an object of the present invention to solve, or at least mitigate, parts or all of the above mentioned problems. To this end, there is provided a kitchenware dishwasher spray module kit for batch-wise dishwashing of tablewater bottles, said kit comprising a tablewater bottle sprayer comprising a dishwasher socket for connecting the bottle sprayer to a mating lower spray arm socket of a kitchenware dishwasher; a plurality of spray nozzle arrangements in fluid connection with the dishwasher socket for receiving dishwashing fluid from the dishwasher, said spray nozzle arrangements being configured for spraying upwards when installed in the dishwasher, and being spread in both dimensions of a first two-dimensional pattern as seen from above; and a rotation lock for preventing the sprayer from rotating relative to a dishwashing rack. Such a kit makes it possible to simultaneously wash a plurality of tablewater bottles in an efficient way, using a standard kitchenware dishwasher. The spatial distribution allows for receiving a relatively large number of bottles, and by rotation-locking the tablewater bottle sprayer, bottles placed immediately above a respective spray nozzle arrangement will

be efficiently sprayed. Often, the dishwashing rack is rotation-locked to the dishwasher; hence, rotation-locking the sprayer relative to the dishwasher will implicitly rotation-lock it also with respect to the dishwashing rack.

According to an embodiment, each of said spray nozzle arrangements comprises a dishwashing nozzle for receiving dishwashing liquid from the spray arm socket; and a rinsing nozzle for receiving rinsing liquid from the spray arm socket.

According to an embodiment, said kit further comprises a tablewater bottle rack comprising a plurality of bottle guides, each of said bottle guides being adapted for holding a respective tablewater bottle in a substantially upright position with the bottle mouth facing downwards at a respective pre-determined bottle mouth position, said bottle guides being distributed in a second two-dimensional pattern mating with the first two-dimensional pattern such that, when the tablewater bottle rack is positioned and aligned above the tablewater bottle sprayer, each of said spray nozzle arrangements is directed towards a respective bottle mouth position. Such a rack facilitates aligning tablewater bottles with respective spray nozzle arrangements of a sprayer.

According to an embodiment, each of said bottle guides is shaped as a bottleneck sleeve having a size adapted for receiving the neck of a respective tablewater bottle.

According to an embodiment, each of said sleeves is provided with a pair of opposing slits for receiving a swing stopper holder.

According to an embodiment, the sprayer has a vertical profile low enough to allow, when installed in the dishwasher, a tablewater bottle rack to be slid over the sprayer, along a dishwashing rack guide, to a dishwashing position.

According to an embodiment, the sprayer is adapted to be releasibly connected to the spray arm socket by means of a centric fastener, and is provided with an off-centric centremost spray nozzle arrangement which is asymmetrically located with respect to neighbouring spray nozzle arrangements. Such an arrangement makes efficient use of the space, even though the centric fastener needs to be accessible from above.

According to an embodiment, the rotation lock is configured as a first portion of a form-fitting engagement, which first portion is adapted to form-fittingly engage with a lower dishwashing fluid supply conduit. The lower dishwashing fluid supply conduit thereby forms a second portion of the form-fitting engagement.

According to another aspect of the invention, parts or all of the above mentioned problems are solved, or at least mitigated, by a method for batch-wise dishwashing of a plurality of tablewater bottles, each bottle having a bottle mouth, the method comprising placing the bottles in a two-dimensional pattern in a rack; inserting the rack into a kitchenware dishwasher; aligning the rack above a tablewater bottle sprayer, having a plurality of spray nozzle arrangements distributed in a pattern mating with the two-dimensional pattern of the bottles, such that each bottle mouth faces a respective spray nozzle arrangement; and dishwashing the bottles while holding the sprayer essentially stationary. Such a method makes it possible to simultaneously wash a plurality of tablewater bottles in an efficient way. Placing the bottles in a two-dimensional pattern allows for inserting a relatively large batch of bottles into the dishwasher, and keeping spray nozzle arrangements essentially stationary below the bottle mouths will allow the bottles to be efficiently sprayed on the inside.

According to an embodiment, the method further comprises replacing, before the rack is inserted into the dishwasher, a rotary lower spray arm with said tablewater bottle sprayer. Thereby, bottles may be efficiently washed using a standard kitchenware dishwasher.

According to an embodiment, the rack is inserted by sliding it along a rack guide.

Brief description of the drawings

The above, as well as additional objects, features and advantages of the present invention, will be better understood through the following illustrative and non-limiting detailed description of preferred embodiments of the present invention, with reference to the appended drawings, where the same reference numerals will be used for similar elements, wherein:

Fig. 1a is a diagrammatic side view in section of a front-loaded dishwasher equipped with a lower spray arm of prior art;

Fig. 1b is a diagrammatic view in perspective, and partly in section, of the dishwasher of Fig. 1a;

Fig. 2 is a diagrammatic view in perspective, and partly in section, of the dishwasher of Figs 1a-b equipped with a tablewater bottle sprayer;

Fig. 3 is a diagrammatic view in perspective of the tablewater bottle sprayer of the dishwasher of Fig. 2;

Fig. 4 is a diagrammatic view in perspective of a tablewater bottle rack suitable for use together with the tablewater bottle sprayer of Fig. 3; and

Fig. 5 is a diagrammatic side view of the tablewater bottle rack of Fig. 4 when aligned with the tablewater bottle sprayer of Fig. 3.

Detailed description of the exemplary embodiments

Figs 1a-b illustrate a kitchenware dishwasher 10 of front-loaded type, which may typically be used in undercounter installations.

The dishwasher 10 is adapted to receive a dishwashing rack or basket 12 of the standard kitchenware rack dimensions 500 x 500 mm, as seen from above. A dishwashing rack 12 is typically loaded with kitchenware dishwashing goods 14, such as plates and trays, cups, or cutlery. When loaded, the rack 12 is inserted into the dishwashing compartment 13 of the dishwasher 10 by placing it on the inner surface of the front door 16 when open (dashed), and sliding it into the dishwasher 10 along a pair of opposing shoulders 17 (Fig. 1b), which form a rack guide extending into the dishwasher 10.

When in use, the dishwasher 10 sprays dishwashing liquid and rinsing liquid onto the dishwashing goods 14, in consecutive dishwashing program steps, via an upper rotatable spray arm 18 and a lower rotatable spray arm 20, each of which rotates about a vertical axis A during operation. During a dishwashing program step, the dishwasher 10 recirculates dishwashing liquid, typically water provided with detergent, from a dishwashing tank 24 below the lower spray arm 20. The dishwashing liquid is drawn from the dishwashing tank 24 by a dishwashing pump 26, and supplied to dishwashing spray nozzles distributed along the length of the respective spray arms 18, 20.

During a rinsing program step, clean water or water provided with a rinsing agent is supplied to rinsing nozzles distributed along the length of the respective spray arms 18, 20. The spray nozzles are adapted to spray their respective jets of dishwashing or rinsing liquid in a direction having a tangential, with respect to the axis A, component, such that the jets bring the respective spray arms 18, 20 into rotation.

The upper spray arm 18 is provided with a dishwasher socket for rotatably connecting the upper spray arm 18 to a respective upper spray arm socket 28, which is located in an upper portion of the dishwashing compartment 13, at the centre of rotation defined by the axis A. Similarly, the lower spray arm 20 is provided with a dishwasher socket for rotatably connecting the lower spray arm 20 to a respective lower spray arm socket 30, which is located in a lower portion of the dishwashing compartment 13, at the centre of rotation defined by the axis A. The interface formed by each dishwasher socket-spray arm socket pair allows rotating the respective spray arms 18, 20 relative to the dishwasher 10. Dishwashing fluid and rinsing fluid is provided to the lower spray arm socket 30, and onwards to the lower spray arm 20, via a lower dishwashing fluid supply conduit 31, which extends essentially horizontally from the periphery to the centre of the dishwashing compartment 13, as seen from above, and at which centre it holds the lower spray arm socket 30. Each of the rotatable upper and lower socket interfaces allows separate transfers of dishwashing and rinsing fluid to the respective dishwashing and rinsing nozzles of the respective spray arms 18, 20. Each of the spray arms 18, 20 may easily be removed for cleaning by a dishwasher operator (not shown), e.g. by unscrewing a spray arm lock nut 32 holding the respective spray arm 18, 20 to the respective spray arm socket 28, 30.

Fig. 2 illustrates the dishwasher 10 equipped with a tablewater bottle sprayer 34, which may be used as a replacement for the lower spray arm 20 when washing tablewater bottles. Thereby, standard kitchenware dishwasher may be converted into a tablewater bottle dishwasher. When tablewater bottles are to be washed, the lower spray arm 20 is removed by the dishwashing operator, e.g. by unscrewing the lower spray arm lock nut 32 and disconnecting the dishwasher socket of the lower spray arm 20 from the lower

spray arm socket 30 of the dishwasher 10. Then, the tablewater bottle sprayer 34, which is provided with an identical dishwasher socket 72 (Fig. 5), is positioned in a lower portion of the dishwashing chamber 13; the dishwasher socket 72 is connected to the lower spray arm socket 30; and the lock nut 32 is tightened.

The tablewater bottle sprayer 34 comprises a plurality of spray nozzle arrangements 36, which are distributed over a two-dimensional spray nozzle area across essentially the entire bottom area of the dishwashing compartment 13. The spray nozzle area of the sprayer 34 is of about the same extent in both dimensions. In the exemplary embodiment illustrated in Fig. 2, nine spray nozzle arrangements are distributed over the area in an essentially regular grid, which forms a two-dimensional surface pattern as seen from above. A pair of sheet metal flanges 38 (Fig. 3), extending downwards adjacent to the dishwasher socket 30, straddle and abut the side surfaces of the lower dishwashing fluid supply conduit 31, and thereby prevent the tablewater bottle sprayer 34 from rotating relative to the dishwasher 10. In this manner, the flanges 38 operate as a rotation lock. The lower dishwashing fluid supply conduit 31 is rectangular in cross-section, which provides additional support to the rotational-locking engagement between the tablewater bottle sprayer 34 and the lower dishwashing fluid supply conduit 31. The spatial distribution of spray nozzle arrangement 36 across the bottom of the dishwashing compartment 13 makes it possible to simultaneously wash a relatively large number of tablewater bottles at the same time. By rotation-locking the tablewater bottle sprayer 34, a bottle placed mouth down immediately above a respective spray nozzle arrangement 36 will remain stationary relative to the spray nozzle arrangement 36 throughout the dishwashing program step, such that it may receive an incessant, well-directed jet of dishwashing fluid throughout said program step, said jet dishwashing the interior of the bottle. The upper spray arm 18, on the other hand, need not be replaced for bottle washing, and may be allowed to rotate for spreading dishwashing fluid over the exterior of the bottles from above.

The tablewater bottle sprayer 34 has a vertical profile low enough to allow a dishwashing rack to be slid into the dishwasher 10 along the rack guide 17 without engaging with the spray nozzle arrangements 36.

Fig. 3 illustrates the tablewater bottle sprayer 34 in greater detail. Each spray nozzle arrangement 36 comprises a dishwashing nozzle 36a and a rinsing nozzle 36b. The dishwashing nozzles 36a are directed upwards, such that, when a bottle 40 is placed upside-down above a spray nozzle arrangement 36, the respective dishwashing nozzle 36a allows spraying a jet of dishwashing liquid upwards, into the bottle, for dishwashing the interior of the bottle. Similarly, the rinsing nozzles 36b are directed upwards, such that, when a bottle 40 is placed upside-down above a spray nozzle arrangement 36, the respective rinsing nozzle 36b allows spraying a jet of rinsing liquid upwards, into the bottle 40, for rinsing the interior of the bottle 40.

The tablewater bottle sprayer 34 is essentially shaped as a sun cross, a first bar of which is formed by a dishwashing fluid conduit 42, and a second bar of which is formed by a pair of opposing rinsing liquid conduits 44. A ring-shaped dishwashing conduit 46 distributes dishwashing liquid to dishwashing nozzles 36a along the periphery of the spray nozzle arrangement pattern, whereas rinsing liquid conduits 48 connected in a T configuration distribute rinsing liquid to rinsing nozzles along the periphery of the spray nozzle arrangement pattern. The dishwasher socket, with the lock nut 32, is located at the centre of the sun cross.

Fig. 4 illustrates a dishwashing rack or basket 50 specifically adapted to hold tablewater bottles 40, i.e. a tablewater bottle rack. The tablewater bottle rack 50 comprises an upper bottle body support plate 52 and a lower bottom plate 54, which are held together by a set of corner posts 56. The bottom plate 54 is provided with a plurality of bottleneck sleeves 58, each of which is adapted for holding the neck of a respective tablewater bottle 40 in a substantially upright position with the bottle mouth facing downwards at a respective pre-determined bottle mouth position. In that respect, each of the bottleneck sleeves serves as a bottle guide for guiding the respective bottle mouth to be held at the correct predetermined position. The bottleneck sleeves 58 are distributed in a two-dimensional pattern which mates with the

two-dimensional pattern of the spray nozzle arrangements 36 of the tablewater bottle sprayer 34 (Fig. 3) such that, when the tablewater bottle rack 50 is positioned and aligned above the tablewater bottle sprayer 34, each spray nozzle arrangement 36 is directed towards a respective bottle mouth position. In this way, the tablewater bottle rack 50 facilitates aligning bottles 40 with the spray nozzle arrangements 36 of the tablewater bottle sprayer 34. At the location of each bottleneck sleeve 58, the bottom plate 54 is provided with an aperture allowing the respective bottle to be sprayed on the inside from below, by the respective spray nozzle arrangement 36. Additional apertures 60 are arranged in the bottom plate 54; the additional apertures 60 allow dishwashing liquid sprayed from above by the upper spray arm 18 to easier pass down into the dishwashing tank 24.

The bottle body support plate 52 is penetrated by a plurality of bottle body support apertures 61, each of which is located above a respective bottleneck sleeve 58. The bottle body support apertures 61 are sized to allow the body of the respective tablewater bottle 40 to dwell therein. In the illustrated example, the bottle body support apertures are essentially rectangular, each side having a length of about 80-130 mm, and more preferably about 90-115 mm. Clearly, the bottle body support apertures 61 may have any other suitable shape. It is preferable that the shape of the apertures 61 is different from the shape of the bottle bodies. Thereby, the contact surface between bottle 40 and bottle body support plate 52 will be minimized, such that dishwashing liquid sprayed from above may easier access all outer areas of the bottle. Non-circular openings, such as rectangular openings, are particularly suitable for bottles having circular cross-section.

In the illustrated example, all bottleneck sleeves 58, bottle support apertures 61, and spray nozzle arrangements 36 (Fig. 3) are arranged in a matching regular, equidistant grid pattern, with the exception of the centre-most bottleneck sleeve 58', bottle support aperture 61', and spray nozzle arrangement 36' (Fig. 3), respectively. The reason for the centre-most bottle position being located eccentrically is that it allows easy access to the central lock-nut 32 (Fig. 3) when replacing the sprayer 34.

Along one side, the tablewater bottle rack 50 is provided with a strip-shaped plastic lining 62, which reduces friction against the dishwasher door 16 (Figs 1a-b) in the event that the rack 50 has not been fully inserted into the dishwashing compartment 13 when closing the door 16. The dimensions of the lining are selected such that closing the door 16 will push the bottleneck sleeves 58 of the rack 50 into alignment with the spray nozzle arrangements 36.

Along a pair of opposing sides, the tablewater bottle rack 50 is provided with a pair of opposing plastic strips 64, which reduce friction against the rack guide 17 when inserting the tablewater bottle rack 50 into the dishwasher 10.

The bottle body support plate 52, the bottom plate 54, and corner posts 56 are preferably made of sheet metal or plastics. The bottleneck sleeves 58 are preferably of a plastic material that does not scratch the necks of the bottles 40 to be dishwashed. The sleeves 58 may be adapted to be removed from the bottom plate 54; by way of example, they may be pressed into form-fitting engagement with the respective apertures of the bottom plate 54. Thereby, sleeves 58 may be replaced for sleeves of a different size or shape, such that different bottleneck shapes and sizes may be accommodated for. For tablewater bottleneck sizes of typical dimensions, a suitable inner diameter of each bottleneck sleeve may be about 26-46 mm, and more preferably, about 32-40 mm. The bottleneck sleeves 58 may also have any other shape than circular; by way of example, each sleeve 58 may have a rectangular cross-section, which may allow accommodating e.g. a circular or rectangular bottleneck. In such an alternative configuration, any other suitable inner dimension, such as an inner side of a rectangular sleeve, may be 26-46 mm, and more preferably, about 32-40 mm.

As a tablewater bottle 40 is often provided with a rubber-sealed ceramic swing stopper 66 (Fig. 3), which is pivotally held to the bottle by means of a metal wire holder 68, each bottleneck sleeve 58 is provided with a pair of opposing slits 70 for receiving the swing stopper holder 68.

If the inner diameter or dimension of the bottleneck sleeves 58 is properly selected, the bottles 40 will be held upright by the sleeves 58 alone;

hence, the bottle body support plate 52 and the corner posts 56 are not necessary. The bottle body support plate 52 merely serves as an auxiliary, back-up support for the bottles 40.

Turning now to Fig. 5, the tablewater bottle rack 50 is filled with tablewater bottles 40 and aligned over the tablewater bottle sprayer 34. When aligned, each tablewater bottle 40 is held by the tablewater bottle rack 50 directly over a respective spray nozzle arrangement 36, with the bottle mouth facing the spray nozzle arrangement 36, such that the respective nozzles aim into the mouth of the bottle 40. There is a gap between the spray nozzle arrangements 36 and the tablewater bottle rack 50, such that the tablewater bottle rack 50 is free to be slid into position above the tablewater bottle sprayer 34 without engaging with the spray nozzle arrangements 36. The plastic strips 64, via which the rack 50 rests on the rack guide 17 (Figs 1a-b), extend downwards from the bottom plate 54 of the tablewater bottle rack 50, thereby contributing to forming the gap.

The invention has mainly been described above with reference to a few embodiments. However, as is readily appreciated by a person skilled in the art, other embodiments than the ones disclosed above are equally possible within the scope of the invention, as defined by the appended patent claims.

For example, even though a front-loaded, undercounter type dishwasher has been described in the foregoing, the invention may equally well be applied to other types of dishwashers for batch-wise dishwashing, such as hood type dishwashers. Hereinbefore, nine spray nozzle arrangements arranged in an essentially regular two-dimensional grid has been illustrated. Clearly, another number of spray nozzle arrangements may be suitable. They need not be arranged in a regular grid; they may, as an alternative, be arranged in a non-regular pattern. Moreover, they need not be confined to two dimensions; some nozzle arrangements may be located somewhat higher than others.

The rotation lock has been illustrated as a pair of opposing flanges 38 configured to engage with the dishwashing liquid supply conduit. However, the rotation lock may take any other suitable form. By way of example, the rotation lock may be formed by the outer periphery of the tablewater bottle

sprayer 34 being shaped so as to abut a portion of the inner surface of the dishwasher housing, thereby preventing the sprayer from rotating. Alternatively, the central lock nut 32 may be designed to allow enough tightening to provide rotation locking of the tablewater bottle sprayer 34 at the dishwasher socket 72.

Even though the bottle guides have been illustrated as bottleneck sleeves, they may have any other suitable shape. By way of example, each bottle guide may be formed by e.g. a pin extending upwards from the bottom plate 54, and being adapted to protrude into the respective bottleneck.

Clearly, the bottom plate 52 need not be a plate. By way of example, bottles may be held in predetermined positions, mating with the pattern of spray nozzle arrangement, in a basket of any suitable shape. Similarly, the upper bottle body support plate 52 need not be formed by a plate. Tablewater bottle body support may be provided by any other suitable means, or not at all.

Even though the tablewater bottle rack is provided with nine bottle guides 58, each bottle guide 58 defining a bottle position, any other suitable number of bottle guides may be used. For a typical dishwasher, about 5-25, and more preferred, 8-16 bottle guides may be suitable. The same numbers may apply to the spray nozzle arrangements.

Even though each spray nozzle arrangement 36 has been illustrated as comprising one dishwashing nozzle 36a and one rinsing nozzle 36b, each spray nozzle arrangement 36 may comprise only a dishwashing nozzle 36a, or any other suitable number of nozzles.

A spray module kit for converting a standard kitchenware dishwasher to a tablewater bottle dishwasher may comprise e.g. a tablewater bottle sprayer 34 and a tablewater bottle rack 50, or a tablewater bottle sprayer 34 only.

Even though less preferred, the tablewater bottle rack 50 may also be used separately, i.e. without the tablewater bottle sprayer 34, for dishwashing tablewater bottles in any rack-enabled type of kitchenware dishwasher equipped with standard rotary and/or fixed spray arm(s). Hence, the tablewater bottle rack may be the subject of a divisional application.

Claims

1. Kitchenware dishwasher spray module kit for batch-wise dishwashing of tablewater bottles, said kit comprising

a tablewater bottle sprayer (34) comprising

a dishwasher socket (72) for connecting the bottle sprayer (34) to a mating lower spray arm socket (30) of a kitchenware dishwasher (10);

a plurality of spray nozzle arrangements (36, 36') in fluid connection with the dishwasher socket (72) for receiving dishwashing fluid from the dishwasher (10), said spray nozzle arrangements (36, 36') being configured for spraying upwards when installed in the dishwasher (10), and being spread in both dimensions of a first two-dimensional pattern as seen from above; and

a rotation lock (38) for preventing the sprayer (34) from rotating relative to a dishwashing rack (12; 50).

2. The kit according to claim 1, each of said spray nozzle arrangements comprising a dishwashing nozzle (36a) for receiving dishwashing liquid from the spray arm socket (30); and a rinsing nozzle (36b) for receiving rinsing liquid from the spray arm socket (30).

3. The kit according to any of the previous claims, said kit further comprising a tablewater bottle rack (50) comprising a plurality of bottle guides (58, 58'), each of said bottle guides (58, 58') being adapted for holding a respective tablewater bottle (40) in a substantially upright position with the bottle mouth facing downwards at a respective pre-determined bottle mouth position, said bottle guides (58, 58') being distributed in a second two-dimensional pattern mating with the first two-dimensional pattern such that, when the tablewater bottle rack (50) is positioned and aligned above the tablewater bottle sprayer (34), each of said spray nozzle arrangements (36, 36') is directed towards a respective bottle mouth position.

4. The kit according to any of the previous claims, each of said bottle guides being shaped as a bottleneck sleeve (58, 58') having a size adapted

for receiving the neck of a respective tablewater bottle (40).

5. The kit according to claim 4, each of said sleeves (58, 58') being provided with a pair of opposing slits (70) for receiving a swing stopper holder (68).

6. The kit according to any of the previous claims, the sprayer (34) having a vertical profile low enough to allow, when installed in the dishwasher (10), a tablewater bottle rack (50) to be slid over the sprayer (34), along a dishwashing rack guide (17), to a dishwashing position.

7. The kit according to any of the previous claims, the sprayer (34) being adapted to be releasibly connected to the spray arm socket (30) by means of a centric fastener (32), and being provided with an off-centric centremost spray nozzle arrangement (36') asymmetrically located with respect to neighbouring spray nozzle arrangements (36).

8. The kit according to any of the previous claims, the rotation lock (38) being configured as a first portion of a form-fitting engagement, which first portion is adapted to form-fittingly engage with a lower dishwashing fluid supply conduit (31).

9. A method for batch-wise dishwashing of a plurality of tablewater bottles, each bottle (40) having a bottle mouth, the method comprising

placing the bottles (40) in a two-dimensional pattern in a dishwashing rack (12; 50);

inserting the rack (12; 50) into a kitchenware dishwasher (10);

aligning the rack (12; 50) above a tablewater bottle sprayer (34), having a plurality of spray nozzle arrangements (36, 36') distributed in a pattern mating with the two-dimensional pattern of the bottles (40), such that each bottle mouth faces a respective spray nozzle arrangement (36, 36'); and

dishwashing the bottles (40) while holding the sprayer (34) essentially

stationary.

10. The method according to claim 9, further comprising

replacing, before the rack (12; 50) is inserted into the dishwasher (10), a rotary lower spray arm (20) with said tablewater bottle sprayer (34).

11. The method according to any of the claims 9-10, wherein the rack (12; 50) is inserted by sliding it along a rack guide (17).

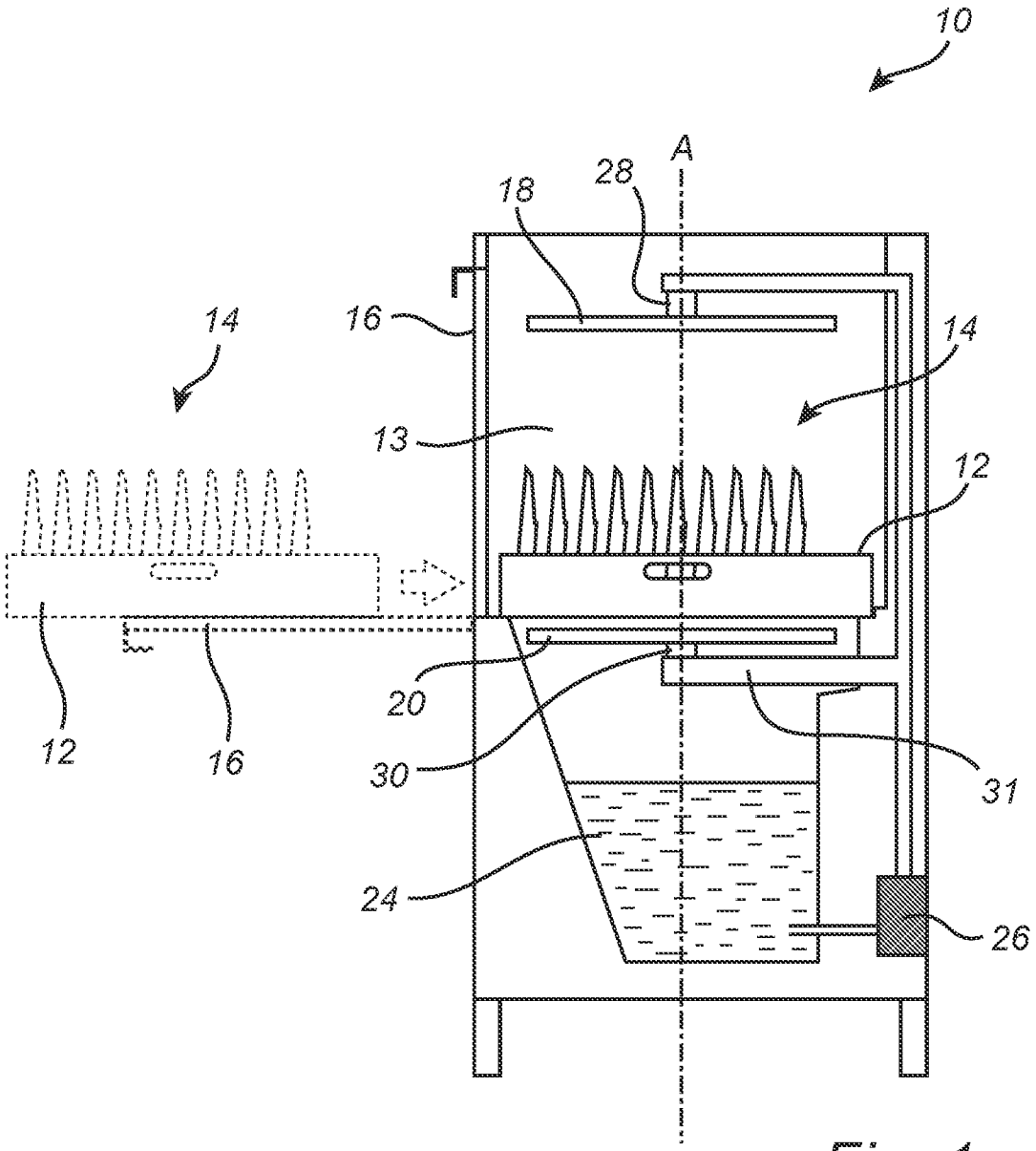

Fig. 1a

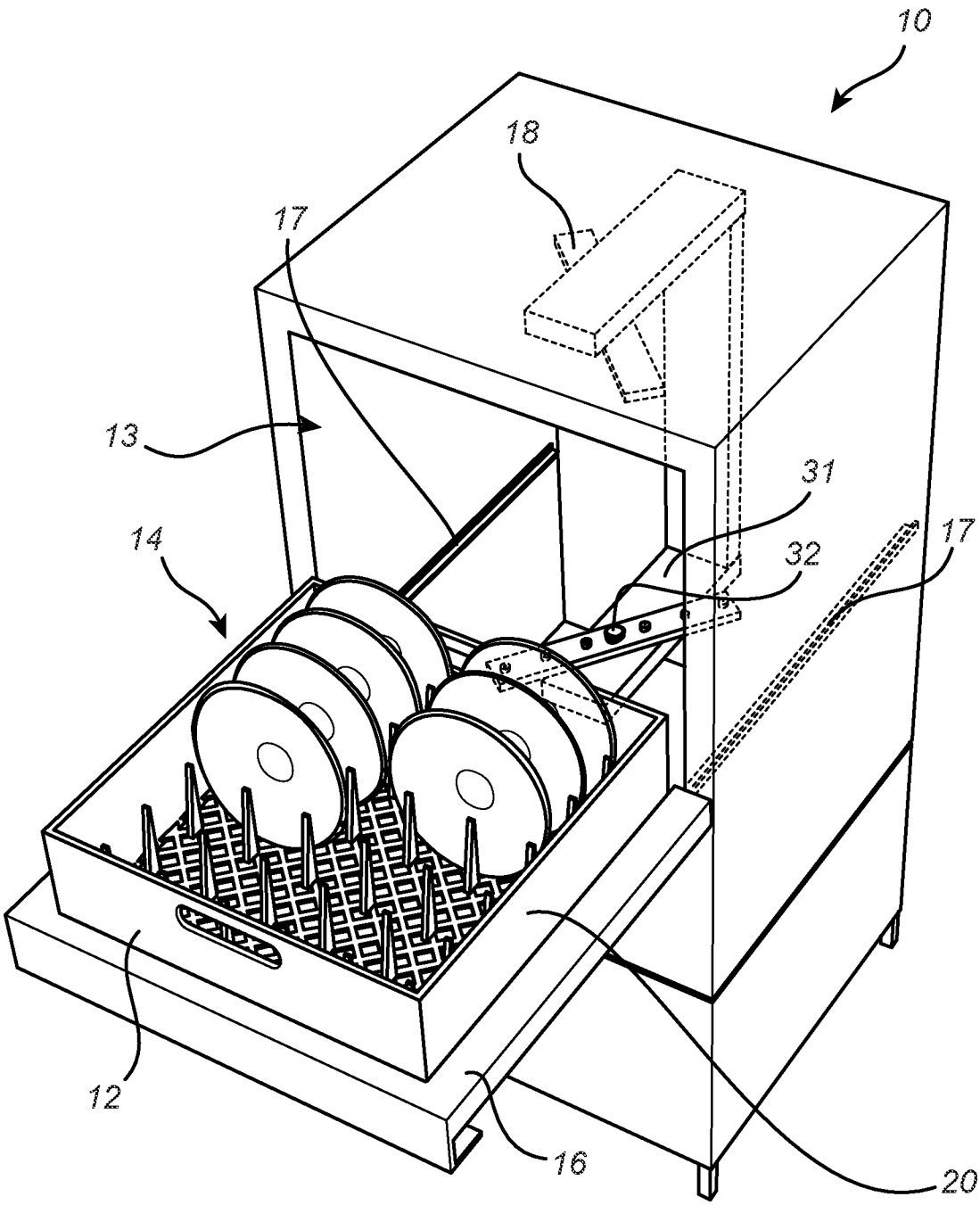

Fig. 1b

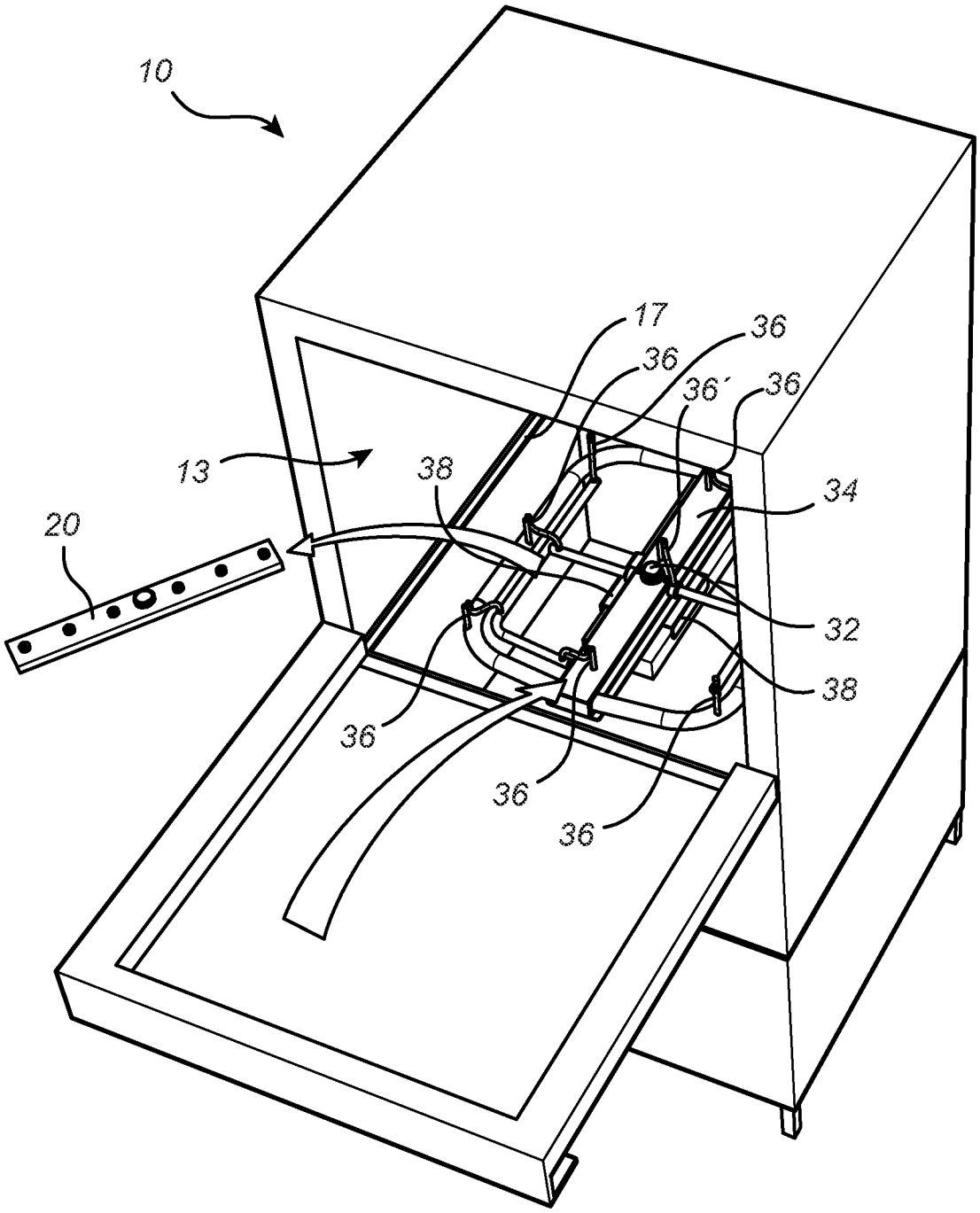

Fig. 2

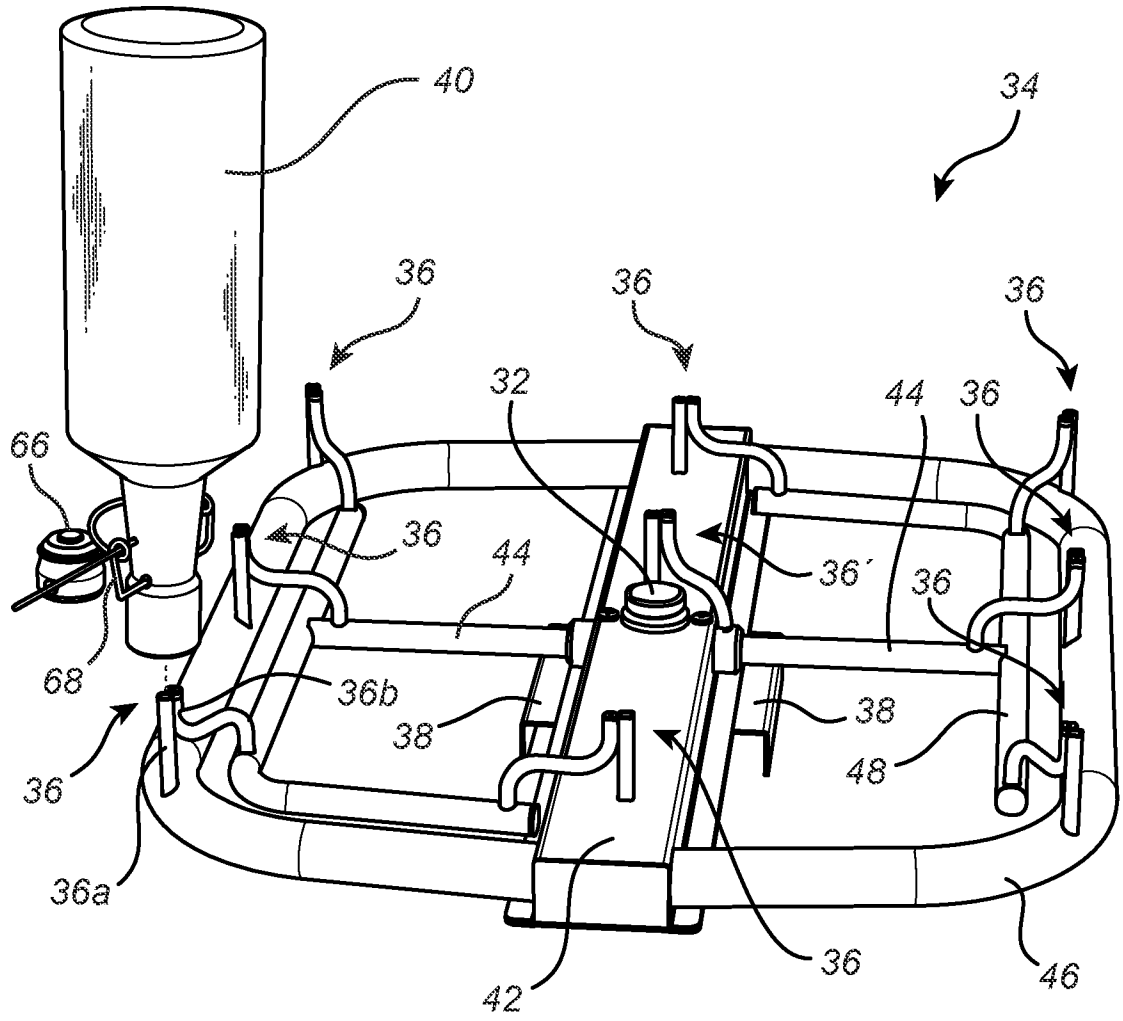

Fig. 3

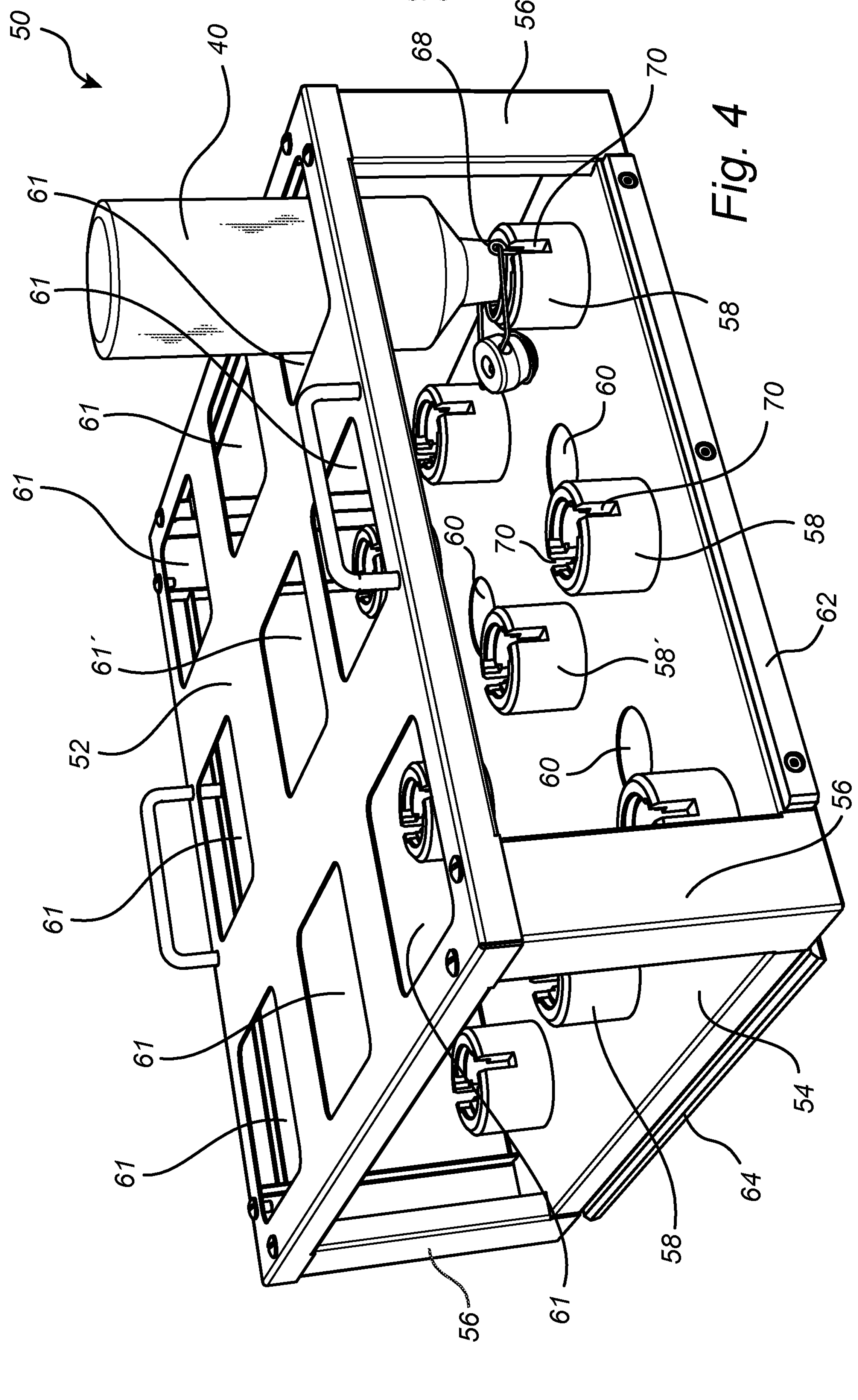
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Fig. 4

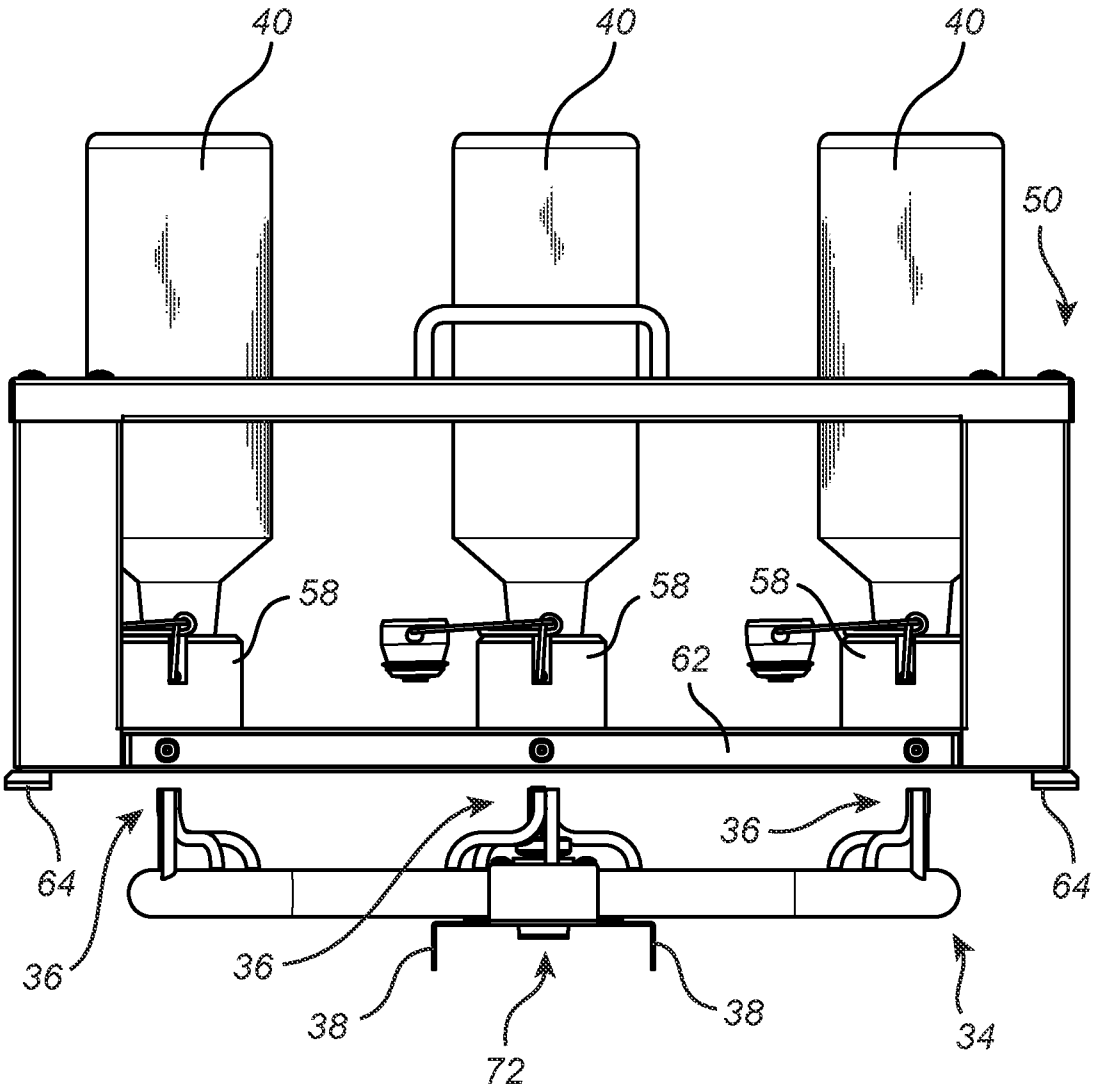

Fig. 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2013/051483

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A47L, B08B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, PAJ, WPI data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 1380788 A (RAPP H), 15 January 1975 (1975-01-15); whole document --	1-11
A	US 3463173 A (GOLDMAN DAVID), 26 August 1969 (1969-08-26); whole document --	1-11
A	US 5010660 A (HAMBLETON LARRY G ET AL), 30 April 1991 (1991-04-30); whole document --	1-11
A	DE 19847151 A1 (AEG HAUSGERAETE GMBH), 20 April 2000 (2000-04-20); whole document -- --------	1-11

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
17-04-2014	17-04-2014

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International application No.
PCT/SE2013/051483

Continuation of: second sheet

International Patent Classification (IPC)

A47L 15/50 (2006.01)
A47L 15/14 (2006.01)
B08B 9/00 (2006.01)

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				DE	2136032	A1	05/10/1972
				FR	2146821	A5	02/03/1973
				IT	959178	B	10/11/1973
US	3463173	A	26/08/1969	NONE			
US	5010660	A	30/04/1991	NONE			
DE	19847151	A1	20/04/2000	EP	0997100	B1	12/05/2004