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(54) Improved device for supplying and treating water for a dishwashing machine

Verbesserte Vorrichtung zur Zuführung und Aufbereitung von Wasser für eine Geschirrspülmaschine

Dispositif amélioré pour la fourniture et le traitement d'eau pour lave-vaisselle

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Description

[0001] The present invention relates to a device for supplying and treating water for a dishwashing machine.

[0002] In greater detail, this device comprises:

- a first tank for containing substances with water-softening properties, having at least one inlet opening for water to be softened and an outlet opening for softened water,
- a second salt-containing tank, having at least one water inlet opening and an outlet opening for a regenerating brine formed following dissolving of the salt in the water,
- a line connecting the second tank to the first tank so that the brine formed in the second tank can flow out towards the first tank, and
- a water supply line having a first branch-off point into a first branch supplying the first tank and into a second branch which leads to the inlet opening of the second tank.

[0003] A device of this kind is described in the PCT patent application WO-2005/060 817. This known device comprises a divertor which is situated at the branch-off point for the two branches of the supply line and allows directing of the water supplied alternately into the first or the second tank. In the first case, which relates to the normal operating condition, the water passes through the water-softening substances and is softened so that it can then be introduced into the washing chamber of the dishwashing machine, without the formation of damaging deposits and the like. In the second case, relating instead to the regenerating stage, said operation must be performed periodically in order to reactivate the water-softening substances. In this case, the brine formed in the second tank is subsequently made to pass through the water-softening substances, which are typically ion-exchange resins contained in the first tank, and are thus regenerated.

[0004] In the known device described above, owing to the presence of the divertor, all the water supplied is, in each case, diverted directly into the tank containing the ion-exchange resins or into the salt-containing tank and from here into the tank containing these resins. As a result, it is possible to dispense with a storage vessel for the water to be supplied to the salt-containing tank, which is instead typically present in most conventional water supplying and treatment devices. Consequently, the overall structure of the device described in WO-2005/060 817 is simplified. Moreover, the overall volume of this device is reduced and the space thus saved may be occupied by other components of the dishwashing machine.

[0005] However, causing the entire flow of water supplied to the device to flow out through the salt tank may result in damaging overpressure, due for example to grains of salt getting stuck in the narrow slits which form

the inlet and outlet openings of the second tank, with the risk of completely preventing the water flowing out through the device.

[0006] The object of the present invention is to provide a device for supplying and treating water for a dishwashing machine which is improved compared to known devices and which in particular does not pose the problem mentioned above.

[0007] According to the invention, this object is achieved by means of a device of the type indicated at the start of the present description and characterized in that it comprises a valve situated at said branch-off point or a converging point of said first branch and said connection line, said valve being able to assume a first operating configuration where it blocks the outflow from the supply line towards the first tank via the second tank, while it allows the flow along the first branch towards the first tank, so that all the water supplied to the branch-off point is diverted directly into the first tank, and a second operating configuration where it allows both the outflow from the supply line towards the first tank via the second tank and the flow along the first branch towards the first tank, so that the water supplied is diverted into the first tank partly directly and partly via the second tank.

[0008] Owing to the presence of the valve and its position, the device according to the invention does not require a storage vessel for the water to be supplied to the salt-containing tank. At the same time, in no operating configuration of the valve is the flow along the first branch of the supply line towards the tank containing the water-softening substances interrupted. Therefore, even in the event of obstruction of the inlet and/or outlet openings of the salt-containing tank, the water supplied to the device may in any case flow outside of it, without giving rise to dangerous overpressure.

[0009] Moreover, in the device according to the invention, the regeneration step is performed supplying simultaneously both mains water and brine to the tank containing the water-softening substances. The brine is thus diluted with the advantage that it has a less aggressive action on the water-softening substances.

[0010] The present invention also relates to a dishwashing machine comprising a water supply and treatment device of the type described above.

[0011] Further advantages and characteristic features of the present invention will become clear from the detailed description which follows, provided with reference to the accompanying drawings provided by way of a non-limiting example, in which:

Figure 1 is a schematic view of a device according to the invention during the water-softening treatment step,

Figure 2 is a schematic illustration of the device according to Figure 1 during the regeneration step, Figures 3 and 4 are schematic illustrations, corresponding to Figures 1 and 2, respectively, of a second embodiment of the device according to the in-

vention, and

Figure 5 is a schematic illustration, corresponding to that of Figure 3, of a variant of the second embodiment of the device according to the invention.

[0012] A water supply and treatment device for a dish-washing machine includes (Figs. 1 and 2) a supply line 10 on which a filling valve 12 and a flowmeter 14 are mounted and which has situated thereafter a blow-off section 16. Downstream of the latter, the line 10 has a branch-off point 18 towards a first branch and a second branch 20, 22.

[0013] The device also comprises a first tank 24 for containing substances with water-softening properties, having an inlet opening 26 for water to be softened and an outlet opening 28 for softened water, and a second salt-containing tank 30 having a water inlet opening 32 and an outlet opening 34 for a regeneration brine formed following dissolving of the salt in the water. A line 36 connects the second tank 30 to the first tank 24 so that the brine formed in the second tank 30 can flow out towards the first tank 24.

[0014] The first branch 20 of the supply line 10 leads into the connection line 36, while the second branch 22 leads to the inlet opening 32 of the second tank 30. A valve 38, in particular an electric valve with a shutter element 39, is arranged at the convergence point 40 of the first branch 20 and the connection line 36. The valve 38 is of the three-way type and allows selectively one path to be excluded from the connection with the other two paths which act as inlet and outlet, respectively, and the three paths to be connected so that two paths act as inlets and the remaining path acts as an outlet, as will be described in greater detail below.

[0015] Preferably, in the condition (Fig. 1) where one path is excluded from connection with the other two, the valve 38 is de-energized, while, in the condition (Fig. 2) where the three paths are connected together, the valve 38 is energized. In this condition, therefore, the shutter element 39 must not perform any hydraulic sealing function. This is particular advantageous since, in the energized condition, the shutter element 39 is subject to vibrations, making it difficult to ensure effectively a hydraulic seal without having to adopt a complex and costly valve structure.

[0016] Constructionally, the device may be formed by a first portion comprising the tanks 24, 30 and the supply line part 10 downstream of the blow-off section 16, and by a second portion comprising the upstream part of the supply line 10 including the blow-off section 16. Between the first and the second portion, it is thus required to provide a single hydraulic connection which ensures the continuity of the supply line 10.

[0017] During the treatment for softening the water supplied (Fig. 1), the valve 38 assumes a first operating configuration where it prevents the outflow from the supply line 10 towards the first tank 24 via the second branch 22, the second tank 30 and the connection line 36, while

it allows the flow inside the first branch 20 towards the first tank 24. In this way, all the water supplied to the branch-off point 18 is diverted directly (i.e. without passing through the second tank 30) into the first tank 24, where it is softened (cf. arrow 42).

[0018] During regeneration of the water-softening substances (Fig. 2), the valve 38 assumes a second operating configuration where it allows both outflow from the supply line 10 towards the first tank 24 via the second branch 22, the second tank 30 and the connection line 36 and the flow inside the first branch 20 towards the first tank 24. In this way, the water supplied is diverted into the first tank 24 partly (cf. arrow 42) directly and partly (cf. arrow 44) via the second tank 30, where it forms a brine which, passing subsequently through the first tank 24, regenerates the water-softening substances.

[0019] In the second operating configuration, it is possible to regulate the valve 38, varying for example the position of the shutter element 39 and the outflow apertures, so as to adjust in the desired manner the ratio between the fractions of water diverted into the first tank 24 directly and via the second tank 30. It is obvious in fact that the more water is diverted into the first tank 24, the more the brine is diluted.

[0020] If the filling valve 12 is of the adjustable type, it is also possible to vary the total flowrate of the water supplied depending on the operating condition assumed by the valve 38. In particular, it is convenient to reduce the total flowrate of the water during regeneration, so as to avoid the risk of an abnormal pressure increase inside the salt tank 30. When performing this adjustment, it is necessary to take into account the measurement data supplied by the flowmeter 14.

[0021] The particular location of the valve 38 moreover prevents backflow along the connection line 36 from the first tank 24 towards the second tank 30. On the other hand, along the corresponding connection line of the device described in WO-2005/060 817, an additional non-return valve must be necessarily provided. Consequently, the device according to the invention may dispense with this non-return valve, being even simpler and less costly than the known valve.

[0022] Figures 3 and 4 show an alternative embodiment of the device according to the invention, in which the same or equivalent parts are indicated by the same numbers used in the previous figures.

[0023] The only differences compared to the previous embodiment are those relating to the valve 38 which is now located at the branch-off point 18 of the supply line 10, while the first branch 20 of the line 10 leads to the inlet opening 26 of the first tank 24, instead of to connection line 36. The valve 38 is still of the three-way type and allows one path to be excluded selectively from the connection with the other two paths which act as inlet and outlet, respectively, and the three paths to be connected together. In this latter case, however, two paths act as outlets and the remaining path acts as an inlet. The method of operation of the device remains substantially the

same as that described above.

[0024] During the softening treatment of the water supplied (Fig. 3), the valve 38 assumes a first operating configuration where it blocks the outflow from the supply line 10 towards the first tank 24 via the second tank 30, preventing the flow of water into the second branch 22. At the same time, the valve 38 allows the flow along the first branch 20 towards the first tank 24 such that all the water supplied to the branch-off point 18 is diverted (cf. arrow 42) directly into the first tank 24, where it is softened.

[0025] During regeneration of the water-softening substances (Fig. 4), the valve 38 assumes a second operating configuration where it allows both the outflow from the supply line 10 towards the first tank 24 via the second branch 22 and the second tank 30 and the flow along the first branch 20 towards the first tank 24. As in the previous case, the water supplied is thus diverted into the first tank 24 partly (cf. arrow 42) directly and partly (cf. arrow 44) via the second tank 30, where it forms a brine which, passing subsequently through the first tank 24, regenerates the water-softening substances.

[0026] Figure 5 shows a variation of embodiment of the device according to the invention described above, in which the same or equivalent parts are indicated by the same numbers used in the previous figures.

[0027] The only difference with respect to the device shown in Figures 3 and 4 consists in the additional presence of a non-return valve 46 along the connection line 36. The valve 46 allows only the flow from the second tank 30 towards the first tank 24 and thus prevents, during the water-softening treatment, the water being able to flow from the first tank 24 towards the second tank 30, preventing the risk of abnormal pressure increases inside the latter. As regards the rest, the structure of the device and its method of operation are similar to those of the device shown in Figures 3 and 4.

[0028] In a further embodiment of the device according to the invention not shown in the figures, there is no flow-meter present along the section of the supply line 10 which is situated upstream of the blow-off section 16. In this case, the opening time of the filling valve 12 is determined on the basis of a water flowrate which is not measured directly, but is calculated taking into account the filling time envisaged for the dishwashing machine.

[0029] Obviously, without modifying the principle of the invention, the constructional details and embodiments may vary greatly with respect to those described purely by way of an example, without thereby departing from the scope claimed.

Claims

1. Device for supplying and treating water for a dishwashing machine, comprising:

- a first tank (24) for containing substances with water-softening properties, having at least one

inlet opening (26) for water to be softened and an outlet opening (28) for softened water,

- a second salt-containing tank (30), having at least one water inlet opening (32) and an outlet opening (34) for a regenerating brine formed following dissolving of the salt in the water,
- a line (36) connecting the second tank (30) to the first tank (24) so that the brine formed in the second tank (30) can flow out towards the first tank (24), and
- a water supply line (10) having a first branch-off point (18) into a first branch (20) supplying the first tank (24) and into a second branch (22) which leads to the inlet opening (32) of the second tank (30),

said device being **characterized in that** it comprises a valve (38) situated at said branch-off point (18) or a converging point (40) of said first branch (20) and said connection line (36), said valve (38) being able to assume a first operating configuration where it prevents the outflow from the supply line (10) towards the first tank (24) via the second tank (30), while it allows the flow along the first branch (20) towards the first tank (24), so that all the water supplied to the branch-off point (18) is diverted directly into the first tank (24), and a second operating configuration where it allows both the outflow from the supply line (10) towards the first tank (24) via the second tank (30) and the flow along the first branch (20) towards the first tank (24), so that the water supplied is diverted into the first tank (24) partly directly and partly via the second tank (30).

2. Device according to Claim 1, **characterized in that** said valve (38) is of the three-way type and allows selectively one path to be excluded from the connection with the other two paths which act as inlet and outlet, respectively, and the three paths to be connected so that two act as inlets/outlets and the remaining one acts as an outlet/inlet.

3. Device according to Claim 2, **characterized in that** said valve (38) is an electric valve which, in the energized condition, connects the three paths without the associated shutter element (39) having to perform a hydraulic sealing function.

4. Device according to any one of the preceding claims, **characterized in that** said supply line (10) comprises, upstream of the branch-off point (18), a blow-off section (16).

5. Device according to Claim 4, **characterized in that** it is formed by a first portion comprising said tanks (24, 30) and the part of the supply line (10) downstream of the blow-off section (16), and by a second portion comprising the upstream part of the supply

line (10) which includes the blow-off section (16), between said first and second portion there existing a single hydraulic connection which ensures the continuity of the supply line (10).

6. Device according to Claim 4 or 5, **characterized in that** a filling valve (12) and a flowmeter (14) are mounted on said supply line (10), upstream of the blow-off section (16).
7. Device according to Claim 6, **characterized in that** the filling valve (12) can be adjusted so as to allow variation of the total flowrate of the water supplied depending on the operating configuration assumed by said three-way valve (38).
8. Device according to Claim 7, **characterized in that** adjustment of the filling valve (12) is performed taking into account the measurements performed by said flowmeter (14).
9. Device according to any one of Claims 4 or 5, **characterized in that** a filling valve (12) is mounted on the section of said supply line (10) upstream of the blow-off section (16), while no flowmeter device is mounted there, so that the opening time of said valve (12) is determined on the basis of a water flowrate calculated using the filling time envisaged for the dishwashing machine.
10. Device according to any one of the preceding claims, **characterized in that**, in said second operating configuration of the valve (38), the ratio between the water fractions diverted into the first tank (24) directly and via the second tank (30) is adjustable.
11. Device according to any one of the preceding claims, **characterized in that** said first branch (20) of the said supply line (10) leads into said connection line (36) and said valve (38) is situated at the point of convergence of said first branch (20) and said connection line (36).
12. Device according to any one of the preceding Claims 1 to 10, **characterized in that** said first branch (20) of the supply line (10) leads to the inlet opening (26) of the first tank (24) and said valve (38) is situated at said branch-off point (18) of the supply line (10).
13. Dishwashing machine comprising a device according to any one of the preceding claims, in which the valve (38) assumes, during the water supply stage, said first operating configuration and, during the second stage for regeneration of the water-softening substances, said second operating configuration.
14. Dishwashing machine according to Claim 13, in which said device comprises a filling valve (12) which

is energized both during the water supply stage and during the regeneration stage and during both said stages at least part of the water flows towards the first tank (24) without passing via the second tank (30).

Patentansprüche

1. Vorrichtung zur Zuführung und Aufbereitung von Wasser für eine Geschirrspülmaschine, die aufweist:
 - einen ersten Behälter (24) zur Aufnahme von Substanzen mit wasserenthärtenden Eigenschaften, der wenigstens eine Einlassöffnung (26) für zu enthärtendes Wasser und eine Auslassöffnung (28) für enthärtetes Wasser aufweist,
 - einen Salz enthaltenden zweiten Behälter (30), der wenigstens eine Wassereinlassöffnung (32) und eine Auslassöffnung (34) für eine nach Auflösung des Salzes in dem Wasser gebildete Regeneriersole aufweist,
 - eine Leitung (36), die den zweiten Behälter (30) mit dem ersten Behälter (24) verbindet, so dass die in dem zweiten Behälter (30) gebildete Sole zu dem ersten Behälter (24) hin ausströmen kann, und
 - eine Wasserzufuhrleitung (10), die eine erste Verzweigungsstelle (18) in einen ersten Zweig (20), der den ersten Behälter (24) versorgt, und in einen zweiten Zweig (22), der zu der Einlassöffnung (32) des zweiten Behälters (30) führt, aufweist,
 - wobei die Vorrichtung **dadurch gekennzeichnet ist, dass** sie ein Ventil (38) aufweist, das an der Verzweigungsstelle (18) oder einer zusammenlaufenden Stelle (40) des ersten Zweigs (20) und der Verbindungsleitung (36) angeordnet ist, wobei das Ventil (38) in der Lage ist, eine erste Betriebskonfiguration, in der es den Ausfluss aus der Zufuhrleitung (18) zu dem ersten Behälter (24) hin über den zweiten Behälter (30) verhindert, während es den Fluss entlang des ersten Zweigs (20) zu dem ersten Behälter (24) hin zulässt, so dass das gesamte Wasser, das der Verzweigungsstelle (18) zugeführt wird, unmittelbar in den ersten Behälter (24) abgeleitet wird, und eine zweite Betriebskonfiguration einnimmt, in der es sowohl den Ausfluss aus der Zufuhrleitung (10) zu dem ersten Behälter (24) hin über den zweiten Behälter (30) als auch den Fluss entlang des ersten Zweigs (20) in Richtung des ersten Behälters (24) zulässt, so dass das zugeführte Wasser in den ersten Behälter (24) zum Teil unmittelbar und zum Teil über den zweiten Behälter (30) abgeleitet wird.

2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** das Ventil (38) von der Dreiwegebauart ist und wahlweise ermöglicht, dass ein Pfad aus der Verbindung mit den anderen beiden Pfaden, die als Einlass bzw. Auslass dienen, ausgeschlossen wird und dass die drei Pfade derart miteinander verbunden werden können, dass zwei als Einlässe/Auslässe dienen, während der verbleibende eine als ein Auslass/Einlass dient. 5
3. Vorrichtung nach Anspruch 2, **dadurch gekennzeichnet, dass** das Ventil (38) ein elektrisches Ventil ist, das in dem betätigten Zustand die drei Pfade miteinander verbindet, ohne dass das zugehörige Verschlusselement (39) eine hydraulische Abdichtungsfunktion erfüllen muss. 10
4. Vorrichtung nach einem beliebigen der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Zufuhrleitung (10) stromaufwärts von der Verzweigungsstelle (18) einen Abblasabschnitt (16) aufweist. 15
5. Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** sie durch einen ersten Abschnitt, der die Behälter (24, 30) und den Teil der Zufuhrleitung (10) stromabwärts von dem Abblasabschnitt (16) aufweist, und durch einen zweiten Abschnitt gebildet ist, der den stromaufwärtigen Teil der Zufuhrleitung (10) aufweist, der den Abblasabschnitt (16) enthält, wobei zwischen dem ersten und dem zweiten Abschnitt eine einzelne hydraulische Verbindung existiert, die die Kontinuität der Zufuhrleitung (10) sicherstellt. 20
6. Vorrichtung nach Anspruch 4 oder 5, **dadurch gekennzeichnet, dass** ein Füllventil (12) und ein Durchflussmesser (14) an der Zufuhrleitung (10) stromaufwärts von dem Abblasabschnitt (16) montiert sind. 25
7. Vorrichtung nach Anspruch 6, **dadurch gekennzeichnet, dass** das Füllventil (12) eingestellt werden kann, um eine Veränderung der gesamten Durchflussrate des zugeführten Wassers in Abhängigkeit von der durch das Dreiwegeventil (38) eingenommenen Betriebskonfiguration zu ermöglichen. 30
8. Vorrichtung nach Anspruch 7, **dadurch gekennzeichnet, dass** die Einstellung des Füllventils (12) unter Berücksichtigung der durch den Durchflussmesser (14) durchgeführten Messungen vorgenommen wird. 35
9. Vorrichtung nach einem beliebigen der Ansprüche 4 oder 5, **dadurch gekennzeichnet, dass** ein Füllventil (12) an dem Abschnitt der Zufuhrleitung (10) 40

stromaufwärts von dem Abblasabschnitt (16) montiert ist, während dort keine Durchflussmessvorrichtung montiert ist, so dass die Offenzeit des Ventils (12) auf der Basis einer Wasserdurchflussrate bestimmt wird, die unter Verwendung der für die Geschirrspülmaschine vorgesehenen Füllzeit berechnet wird.

10. Vorrichtung nach einem beliebigen der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** in der zweiten Betriebskonfiguration des Ventils (38) das Verhältnis zwischen den Wasseranteilen, die in den ersten Tank (24) unmittelbar oder über den zweiten Behälter (30) abgeleitet werden, einstellbar ist. 45
11. Vorrichtung nach einem beliebigen der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der erste Zweig (20) der Zufuhrleitung (10) in die Verbindungsleitung (36) führt und das Ventil (38) an der Stelle des Zusammenlaufens des ersten Zweigs (20) und der Verbindungsleitung (36) angeordnet ist. 50
12. Vorrichtung nach einem beliebigen der vorhergehenden Ansprüche 1 bis 10, **dadurch gekennzeichnet, dass** der erste Zweig (20) der Zufuhrleitung (10) zu der Einlassöffnung (26) des ersten Behälters (24) führt und das Ventil (38) an der Verzweigungsstelle (18) der Zufuhrleitung (10) angeordnet ist. 55
13. Geschirrspülmaschine, die eine Vorrichtung gemäß einem beliebigen der vorhergehenden Ansprüche aufweist, in der das Ventil (38) während des Wasserzufuhrstadiums die erste Betriebskonfiguration und während des zweiten Stadiums zur Regeneration der wasserenthärtenden Substanzen die zweite Betriebskonfiguration einnimmt. 60
14. Geschirrspülmaschine nach Anspruch 13, in der die Vorrichtung ein Füllventil (12) aufweist, das sowohl während des Wasserzufuhrstadiums als auch während des Regenerationsstadiums betätigt wird und während der beiden Stadien wenigstens ein Teil des Wassers zu dem ersten Behälter (24) hin strömt, ohne den zweiten Behälter (30) zu durchströmen. 65

50 Revendications

1. Dispositif pour alimenter et traiter l'eau pour un lave-vaisselle, comprenant : 55
 - un premier réservoir (24) pour contenir des substances avec des propriétés d'adoucissement de l'eau, ayant au moins une ouverture d'entrée (26) pour l'eau à adoucir et une ouver-

- ture de sortie (28) pour l'eau adoucie ;
un second réservoir (30) contenant du sel, ayant au moins une ouverture d'entrée d'eau (32) et une ouverture de sortie (34) pour une saumure de régénération formée suite à la dissolution du sel dans l'eau,
une conduite (36) raccordant le second réservoir (30) au premier réservoir (24) de sorte que la saumure formée dans le second réservoir (30) peut s'écouler vers le premier réservoir (24), et une conduite d'alimentation d'eau (10) ayant un premier point de bifurcation (18) dans une première ramification (20) alimentant le premier réservoir (24) et dans une seconde ramification (22) qui conduit jusqu'à l'ouverture d'entrée (32) du second réservoir (30),
ledit dispositif étant **caractérisé en ce qu'il** comprend une vanne (38) située au niveau dudit point de bifurcation (18) ou à un point de convergence (40) de ladite première ramification (20) et de ladite conduite de raccordement (36), ladite vanne (38) pouvant prendre une première configuration de fonctionnement dans laquelle elle empêche l'écoulement de la conduite d'alimentation (18) vers le premier réservoir (24) via le second réservoir (30), alors qu'elle permet l'écoulement le long de la première ramification (20) vers le premier réservoir (24), de sorte que toute l'eau alimentée au point de bifurcation (18) est déviée directement dans le premier réservoir (24), et une seconde configuration de fonctionnement dans laquelle elle permet à la fois l'écoulement de la conduite d'alimentation (10) dans le premier réservoir (24) via le second réservoir (30) et l'écoulement le long de la première ramification (20) vers le premier réservoir (24), de sorte que l'eau alimentée est déviée dans le premier réservoir (24), partiellement directement et partiellement via le second réservoir (30).
2. Dispositif selon la revendication 1, **caractérisé en ce que** ladite vanne (38) est du type à trois voies et permet sélectivement à une trajectoire d'être exclue du raccordement avec les deux autres trajectoires qui servent d'entrée et de sortie, respectivement, et des trois trajectoires à raccorder de sorte que deux servent d'entrées / sorties et la trajectoire restante sert de sortie / entrée.
 3. Dispositif selon la revendication 2, **caractérisé en ce que** ladite vanne (38) est une vanne électrique qui, à l'état alimenté, raccorde les trois trajectoires sans que l'élément d'obturateur (39) associé doive réaliser une fonction d'étanchéité hydraulique.
 4. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la conduite d'alimentation (10) comprend, en amont du point de bifurcation (18), une section de purge (16).
 5. Dispositif selon la revendication 4, **caractérisé en ce qu'il** est formé par une première partie comprenant lesdits réservoirs (24, 30) et la partie de la conduite d'alimentation (10) en aval de la section de purge (16) et par une seconde partie comprenant la partie en amont de la conduite d'alimentation (10) qui comprend la section de purge (16), entre lesdites première et seconde parties, il existe un raccordement hydraulique simple qui garantit la continuité de la conduite d'alimentation (10).
 6. Dispositif selon la revendication 4 ou 5, **caractérisé en ce qu'une** vanne de remplissage (12) et un débitmètre (14) sont montés sur ladite conduite d'alimentation (10), en amont de la section de purge (16).
 7. Dispositif selon la revendication 6, **caractérisé en ce que** la vanne de remplissage (12) peut être ajustée afin de permettre la variation du débit total de l'eau alimentée en fonction de la configuration de fonctionnement prise par ladite vanne à trois voies (38).
 8. Dispositif selon la revendication 7, **caractérisé en ce que** l'ajustement de la vanne de remplissage (12) est réalisé en prenant en compte les mesures réalisées par ledit débitmètre (14).
 9. Dispositif selon l'une quelconque des revendications 4 ou 5, **caractérisé en ce qu'une** vanne de remplissage (12) est montée sur la section de ladite conduite d'alimentation (10) en amont de ladite section de purge (16), alors qu'aucun débitmètre n'est monté à cet endroit-là, de sorte que le temps d'ouverture de ladite vanne (12) est déterminé en fonction d'un débit d'eau calculé en utilisant le temps de remplissage envisagé pour le lave-vaisselle.
 10. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que**, dans ladite seconde configuration de fonctionnement de la vanne (38), le rapport entre les fractions d'eau déviées dans le premier réservoir (24) directement et via le second réservoir (30) est ajustable.
 11. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ladite première ramification (20) de ladite conduite d'alimentation (10) conduit dans ladite conduite de raccordement (36) et ladite vanne (38) est située au point de convergence de ladite première ramification (20) et de ladite conduite de raccordement (36).
 12. Dispositif selon l'une quelconque des revendications 1 à 10 précédentes, **caractérisé en ce que** ladite première ramification (20) de la conduite d'alimen-

tation (10) conduit à l'ouverture d'entrée (26) du premier réservoir (24) et ladite vanne (38) est située au niveau dudit point de bifurcation (18) de la conduite d'alimentation (10).

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- 13.** Lave-vaisselle comprenant un dispositif selon l'une quelconque des revendications précédentes, dans lequel la vanne (38) prend, pendant l'étape d'alimentation d'eau, ladite première configuration de fonctionnement et pendant la seconde étape pour la régénération des substances d'adoucissement d'eau, ladite seconde configuration de fonctionnement.

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- 14.** Lave-vaisselle selon la revendication 13, dans lequel ledit dispositif comprend une vanne de remplissage (12) qui est alimentée à la fois pendant l'étape d'alimentation d'eau et pendant l'étape de régénération et pendant lesdites deux étapes au moins une partie de l'eau s'écoule vers le premier réservoir (24) sans passer par le second réservoir (30).

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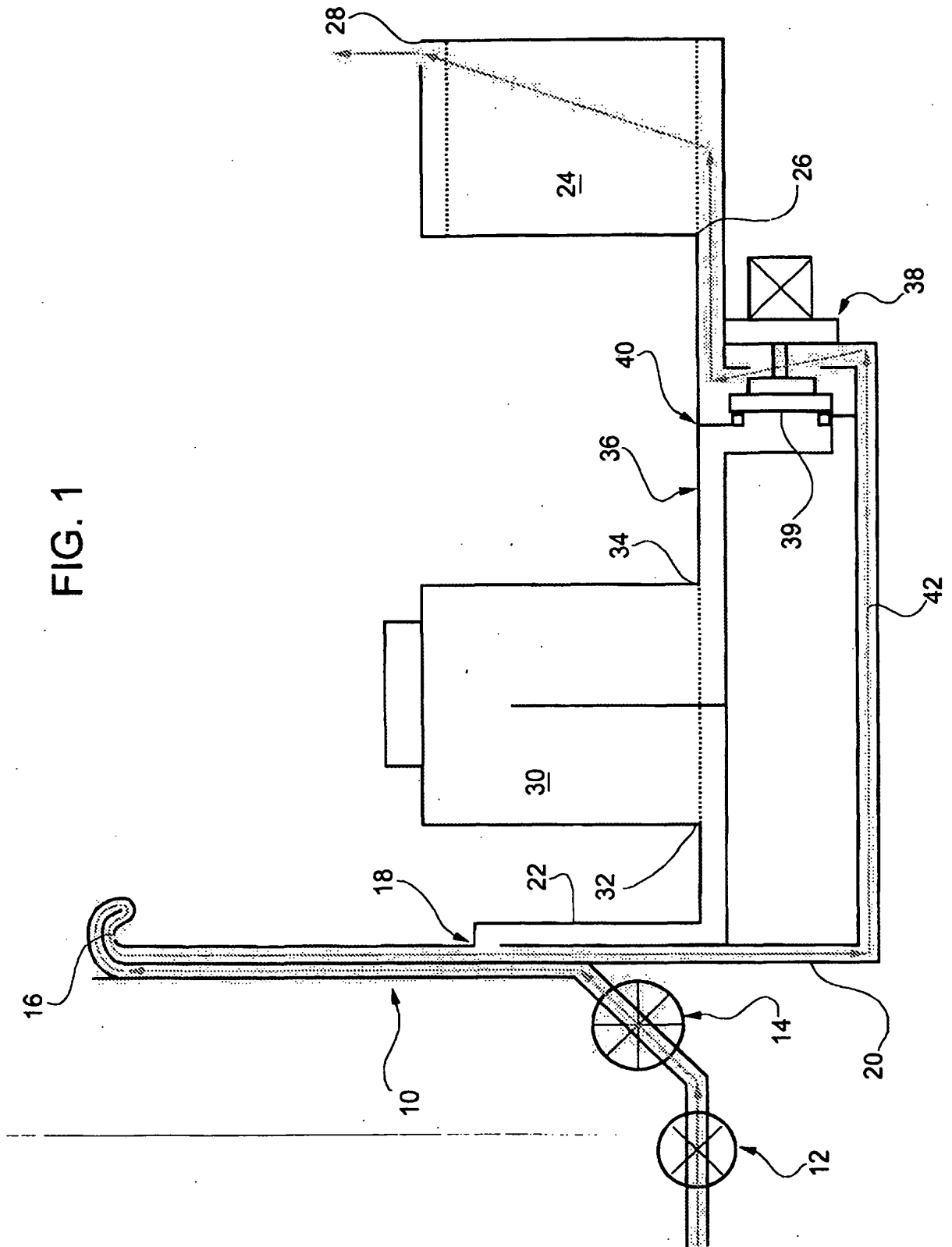
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FIG. 1



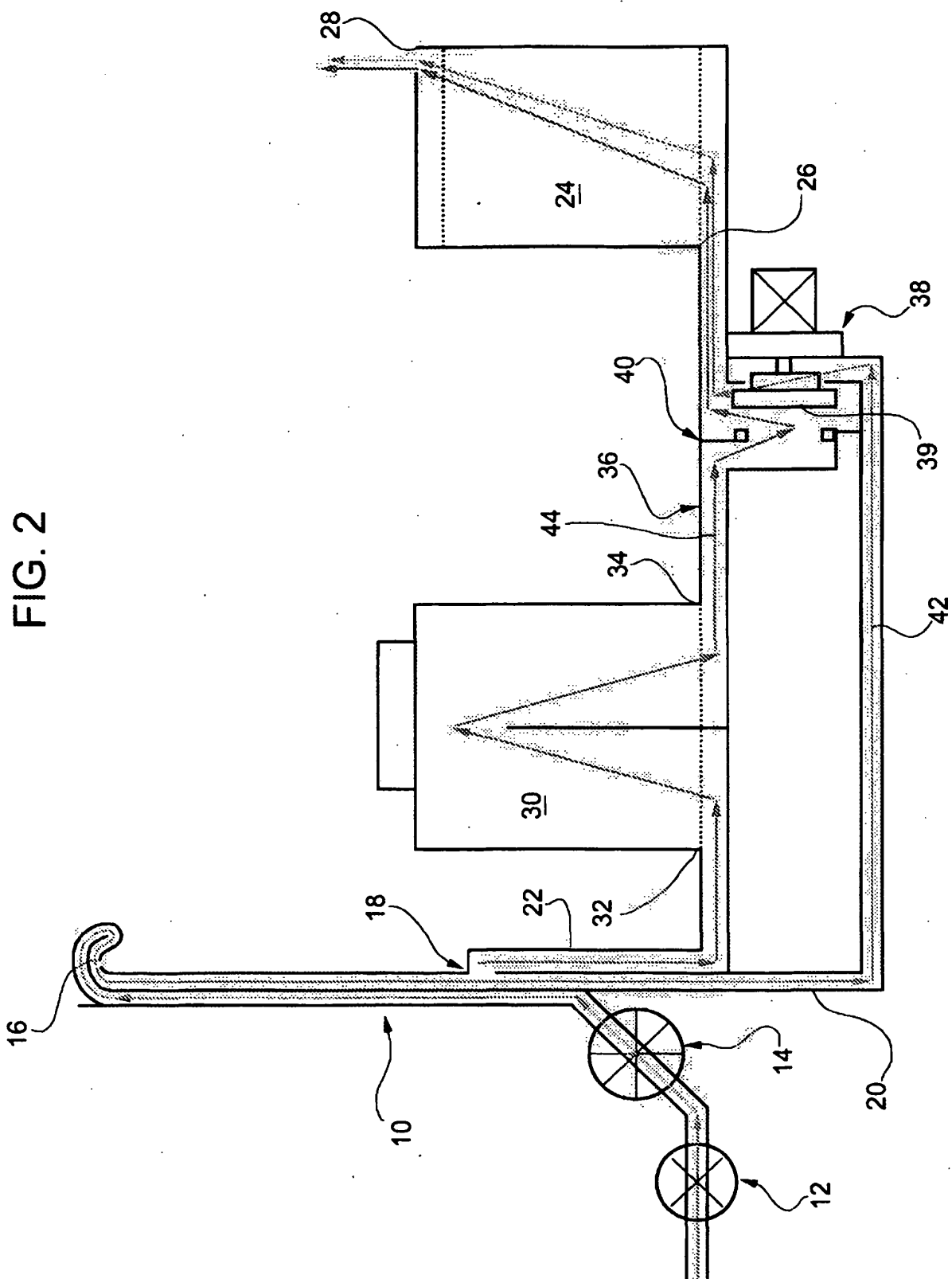


FIG. 3

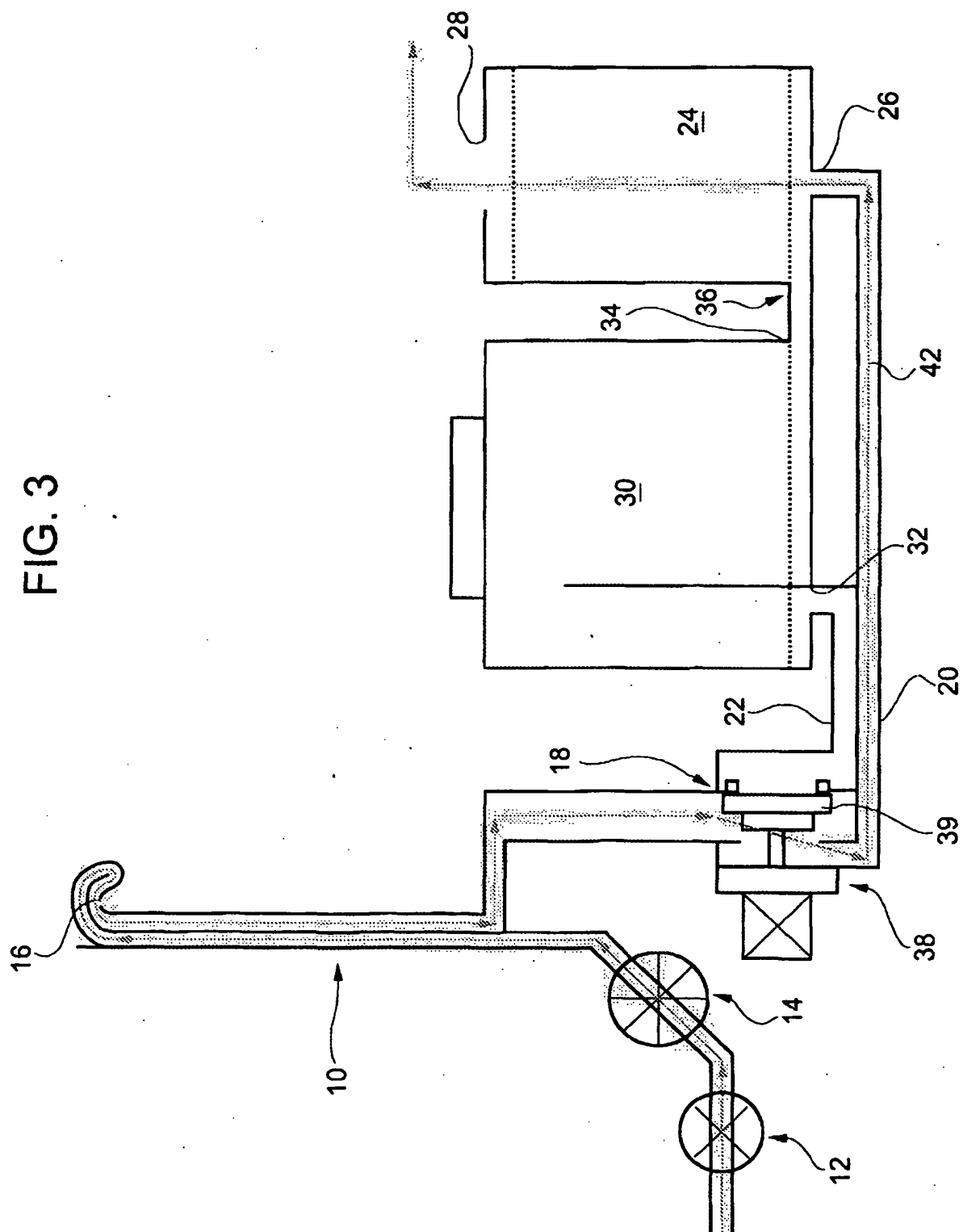
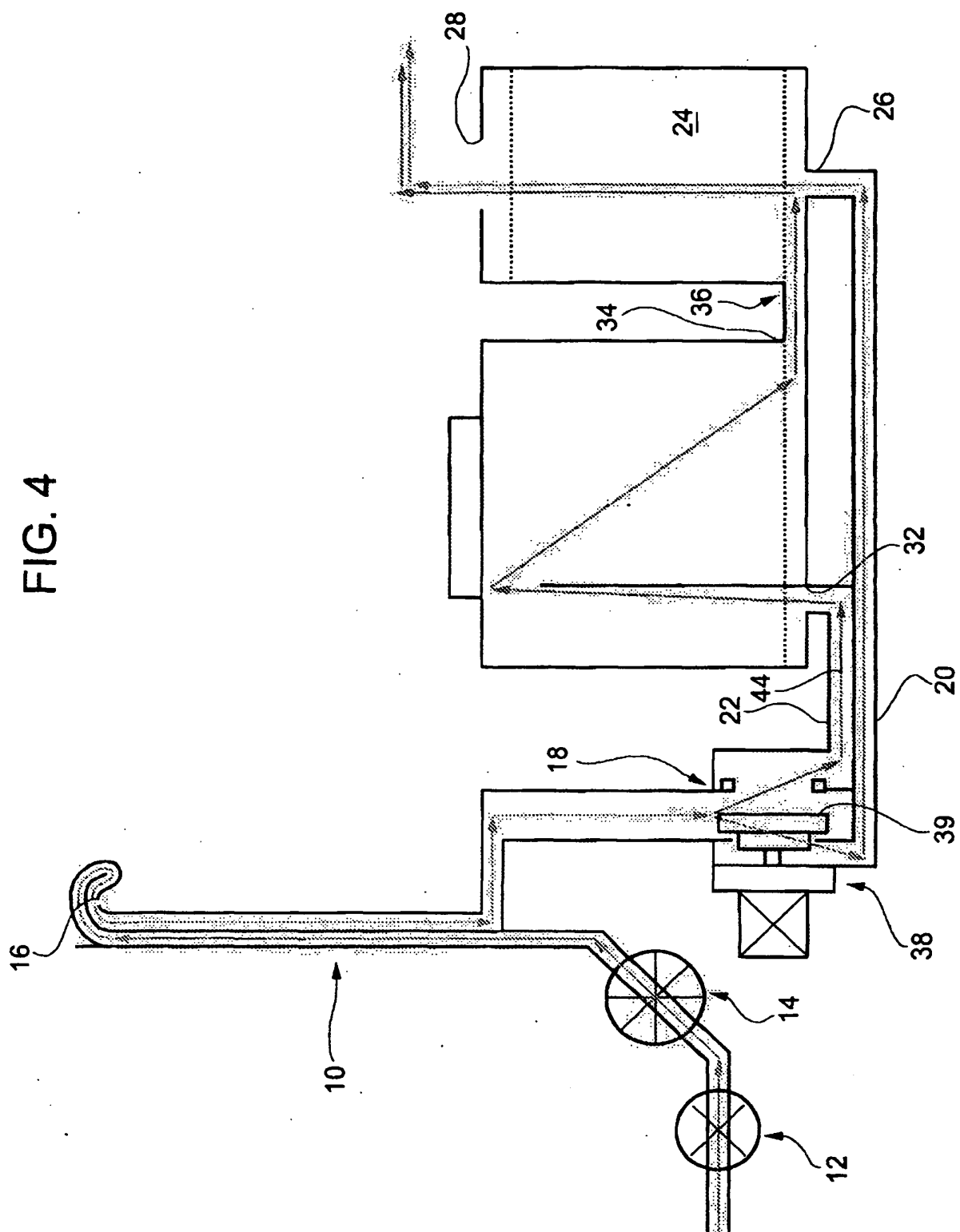
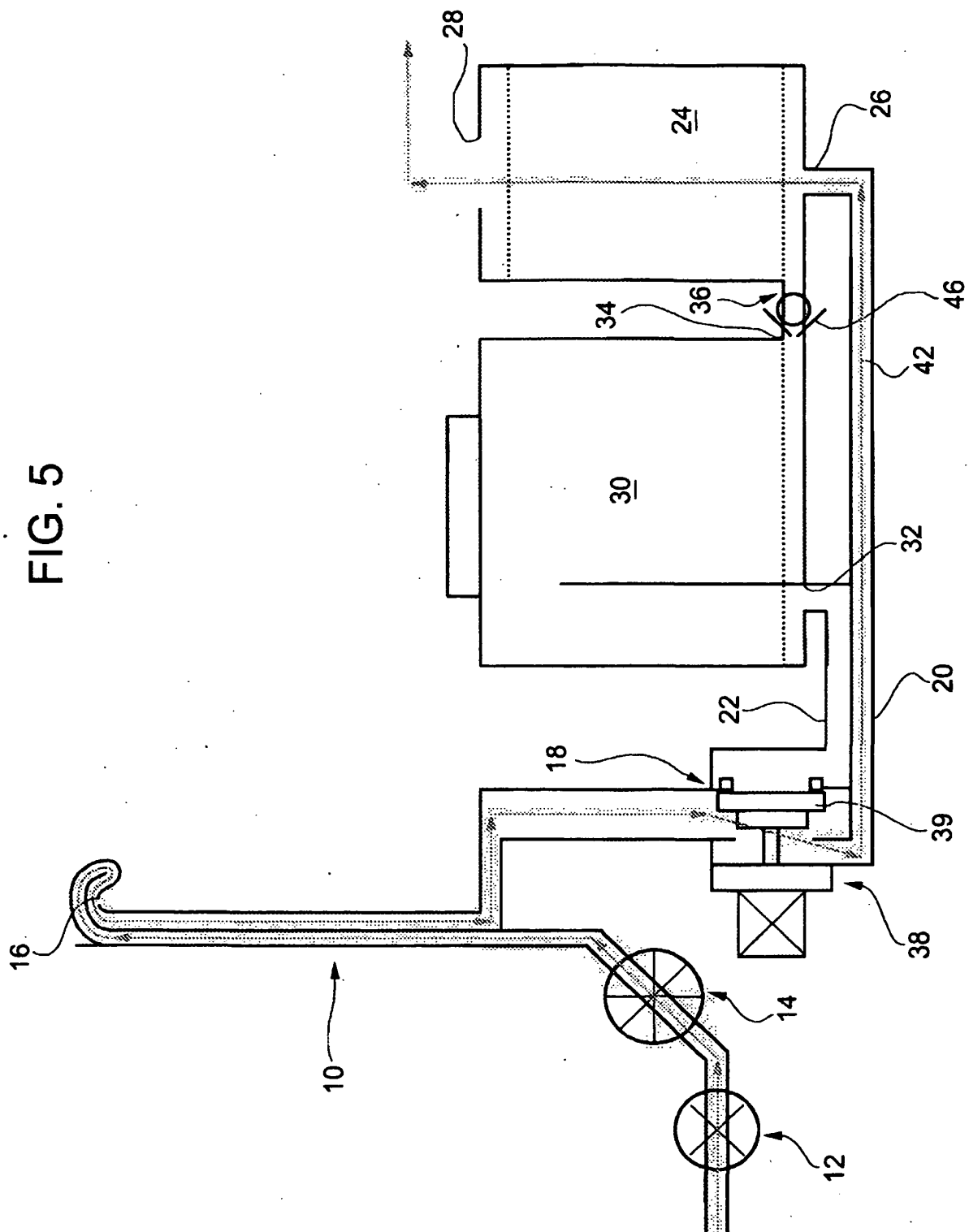


FIG. 4





REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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