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(54) **Break tank for a washing apparatus, such as a washing-up machine, a glass-washer, a dishwasher, a washing machine or suchlike**

(57) Break tank for a washing apparatus (12), able to at least temporarily interrupt the delivery of water to the washing apparatus (12). The tank comprises a container (15) for the water, an introduction pipe (17) through which the water is introduced from a water network (13), an outlet mouth (20) for the water, connected to the washing apparatus (12), and a discharge mouth

(22) able to discharge the excess water outside the container (15). The container (15) comprises at least a pair of opposite front walls and a perimeter edge that defines the thickness of the container (15). Both the introduction pipe (17), the outlet mouth (20) and the discharge mouth (22) are arranged on the perimeter edge so as to remain contained within the thickness.

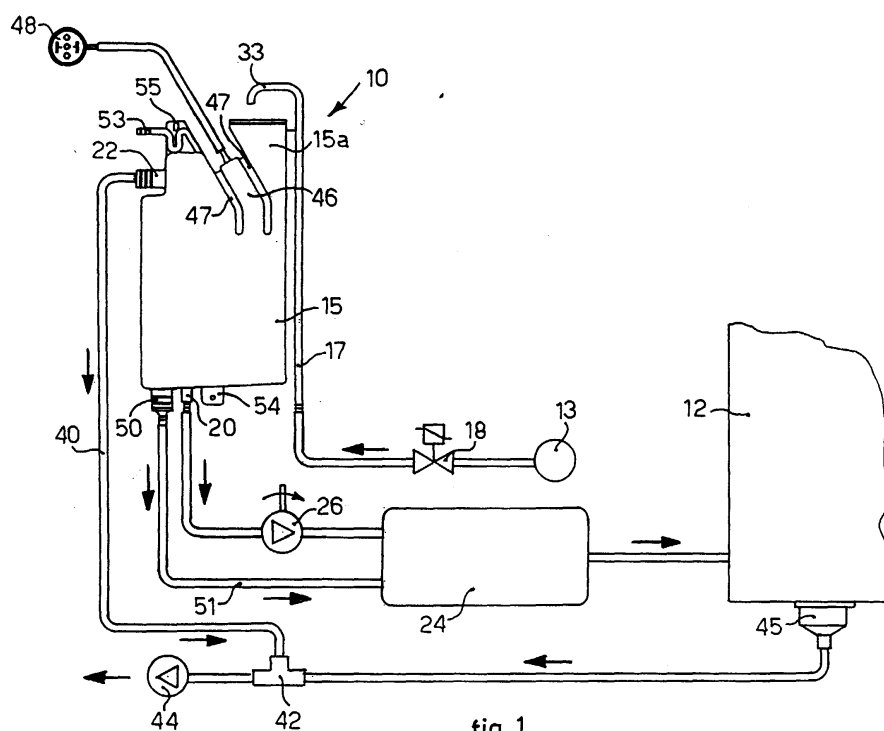


fig. 1

Description

FIELD OF THE INVENTION

[0001] The present invention concerns a break tank able to be associated upstream of a washing apparatus, such as a washing-up machine, a glass-washer, a dish-washer, a washing machine or suchlike, to prevent even a minimum contamination of the water in the water network. The tank is arranged in an intermediate position between a water supply network and the washing apparatus to create a sort of interruption, or discontinuity, in the supply, and to prevent possible sudden changes in the conditions of the water in the network, such as for example sudden changes in pressure or depressions, from allowing the contaminated water of the circuit of the apparatus to be sucked in and from causing a contamination of the water network.

BACKGROUND OF THE INVENTION

[0002] A break tank is known able to be associated upstream of a dishwasher to interrupt the delivery of water for the circuit of the dishwasher from a water network. The use of such a tank is obligatory according to some present legislation to prevent a direct connection between the dishwasher and the water network. The purpose is, in the event of possible sudden changes in pressure or in the flow, to prevent the water of the network that supplies the dishwasher, and/or the relative members used to control the delivery of the water, from leaving substances that can contaminate the water network.

[0003] The known tank comprises a container wherein the water accumulates, which is arranged adjacent to a wall of the body of the dishwasher, and a plurality of mouths, associated with relative conveyor pipes, through which, respectively, the water from the water network is introduced, the water is delivered to the dishwasher, and the excess water possibly present in the container is discharged. To be more exact, the discharge mouth is made on one wall of the container and is connected upstream of an outer siphon.

[0004] A first disadvantage of the known break tank is that all the mouths mentioned above make the break tank extremely bulky, so as to prevent any reduction of the overall size of the tank, and hence also of the dishwasher with which it is associated.

[0005] Another disadvantage of the known break tank is that, to achieve the connection between the discharge mouth for the excess water and the dishwasher, it is necessary to perforate the wall of the body of the dishwasher and this entails an extension of the work times to make the connection and a consequent increase in the production costs.

[0006] Purpose of the present invention is to achieve a break tank which occupies minimum space and which creates a negligible bulk with respect to the washing apparatus, particularly in its lateral zone.

[0007] Another purpose of the present invention is to achieve a tank wherein the discharge of the excess water is independent of the washing apparatus in order to avoid having to perforate the body of the washing apparatus.

[0008] Another purpose is to achieve a break tank which is easy to make and assemble and which has a high water containing capacity yet still having a limited overall bulk.

[0009] Applicant has devised, tested and embodied the present invention to achieve these and other purposes, to obtain other advantages and to overcome the aforesaid shortcomings of the state of the art.

SUMMARY OF THE INVENTION

[0010] The present invention is set forth and characterized in the main claim, while the dependent claims describe other characteristics of the present invention or variants to the main inventive idea.

[0011] A break tank for a washing apparatus according to the present invention, able to prevent the water in the circuit of the apparatus from returning to the water network, comprises a container for the water, introduction means through which the water is introduced from the water network, first water outlet means connected to the washing apparatus and discharge means able to discharge the possible excess water outside the container. The container comprises at least a pair of opposite front walls and a perimeter edge able to define the thickness of the container. According to the invention, the introduction means, the outlet means and the discharge means are arranged on the perimeter edge so as to remain contained within the thickness of the container.

[0012] In one embodiment of the invention, to reduce to a minimum the overall bulk of the tank, the container has a narrow and flattened box-like form.

[0013] Moreover, according to one solution of the invention, to further reduce the bulk of the tank, the introduction means, the outlet means and the discharge means are distributed on different sides along the perimeter edge. To be more exact, in one form of embodiment, the introduction means are arranged on a first side of the container, the discharge means are arranged on a second side of the container and the outlet means are arranged on a base wall of the container.

[0014] In one embodiment of the invention, the discharge means are able to discharge the water in a collection zone independent from the washing apparatus and thus obviate the need to make any hole in the wall of the body of the washing apparatus. In one form of embodiment of the invention, for example, connection means are provided able to independently connect said discharge means and the washing apparatus to a common pump that picks up the discharge water.

[0015] Moreover, according to another characteristic of the present invention, the tank is formed by a pair of

half-shells, made by molding, which are opposed to each other and joined together along the respective perimeter edge.

[0016] In a preferential embodiment, the two half-shells are symmetrical with respect to a median plane, passing through the zone where they are joined. This symmetry allows to simplify the geometry of the tank, to maximize the inner volume of the container with respect to its overall bulk, and to obtain a tank that is easy to assemble and made from a single mold that is simple to construct.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] These and other characteristics of the present invention will become apparent from the following description of a preferential form of embodiment, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 is a diagram of the functioning and installation of a break tank according to the present invention;
- fig. 2 is a front view of the break tank in fig. 1 in a first step of construction;
- fig. 3 is a front view, partly in section, of the tank in fig. 2 in a second step of construction;
- fig. 4 is a side view of the tank in fig. 2.

DETAILED DESCRIPTION OF A PREFERENTIAL FORM OF EMBODIMENT OF THE INVENTION

[0018] With reference to the attached figures, a break tank 10 is able to be associated with a dishwasher 12, for example a dishwasher in a bar, in order to interrupt the delivery of water between the hydraulic circuit of the dishwasher 12 and the water network 13, and prevent possible differences in the delivery conditions of the water network 13 from damaging the dishwasher 12 and sucking in contaminated fluid from the dishwasher 12 itself.

[0019] The dishwasher 12 is of a known type and comprises a body inside which a washing compartment is made, and the tank 10 is able to be arranged during use on one side of said body so as to reduce to a minimum the overall bulk.

[0020] The tank 10 (figs. 1 and 2) comprises a container 15 to accumulate water, an introduction pipe 17 through which the water is taken, by means of an electro valve 18, from the water network 13 and introduced into the container 15, a first outlet mouth 20, through which the water is conveyed to the dishwasher 12, and a discharge mouth 22 through which the water, possibly excess, is discharged outside the container 15.

[0021] To be more exact, the first outlet mouth 20 is connected to a boiler 24, where the water is introduced by means of a feed pump 26, to be heated and introduced into the washing compartment of the dishwasher 12.

[0022] The container 15 has a box-like form, narrow and flattened, in this case in the form of a parallelepiped, and is formed by a pair of front walls 30, 32 (fig. 4), and a perimeter edge 34, having an overall thickness S.

[0023] According to the invention, both the introduction pipe 17, the first outlet mouth 20 and the discharge mouth 22 are arranged on the perimeter edge 34, so as not to protrude beyond the overall thickness S of the container 15. Moreover, the aforesaid elements are distributed on different sides along the perimeter edge 34, so as not to create any overlapping of the relative pipes associated therewith that convey the water. To be more exact, the first outlet mouth 20 is arranged in the bottom zone of the container 15, while the introduction pipe 17 and the discharge mouth 22 are both arranged on an opposite side of the container 15. In this way, by positioning the tank 10 on one side of the body of the dishwasher 12, it is possible to reduce to a minimum its overall bulk.

[0024] Moreover, the tank 10 is obtained by coupling a first and a second half-shell 27, 28 (fig. 4) made of plastic material, opposed to each other and joined together along the respective perimeter edge by means of hot blowing.

[0025] The two half-shells 27, 28 are symmetrical with respect to a median plane X, passing through the zone where they are joined, and each comprises in a single piece a half-pipe to introduce water, half-mouths for the outlet of water and a half-mouth to discharge excess water.

[0026] Attachment brackets 54, 55 are also made in the mold.

[0027] In this way, by joining together the two half-shells 27, 28, we obtain directly from a single mold a break tank 10 that is easy to assemble and already provided with all the elements needed to introduce and discharge water.

[0028] Moreover, thanks to the fact that the two half-shells 27, 28 are symmetrical with respect to the plane X, it is possible to use a mold with a simple geometry, which allows to maximize the capacity of the container 15 while still having a limited bulk.

[0029] In this case, we obtain from the mold a tank 10 (fig. 1) wherein the introduction pipe 17 is joined laterally to the perimeter edge 34 of the container 15 and has a portion 33 protruding above. This portion 33 is bent in a U shape facing downwards and is connected to an upper portion 15a of the container 15 by means of a funnel-type segment 35, substantially shaped like a truncated cone.

[0030] The funnel-type segment 35 is subsequently cut along the cutting lines A, B (fig. 2) and is turned upside down and arranged inside the upper portion 15a (fig. 3), with the function of conveying the water inside the container 15.

[0031] According to another characteristic of the present invention, the discharge mouth 22 for the excess water is not connected directly to the dishwasher

12 as in the state of the art, but is associated with an independent discharge pipe 40 (fig. 1), which is possibly connected to a pump 44 to pick up the water, where it is necessary or required. The pump 44 picks up the water also from the collection well 45 of the dishwasher 12.

[0032] If the pump 44 is not included, the discharge pipe 40 discharges the water due to gravity.

[0033] A three-way connection 42 independently connects the discharge pipe 40 and the collection well 45 to the pump 44.

[0034] In this way, compared with the known break tank, we avoid making a hole in the body of the dishwasher to make the connection with the collection well 45.

[0035] The container 15 also has a compartment 46, made in the mold, at the side of the zone where the water is poured, which is associated with a sensor 48 that detects the pressure in the container 15. The sensor 48 is functionally connected to the electro valve 18 and is able to detect whether the level of water in the container 15 has exceeded a determinate maximum level M (fig. 3) in correspondence with the discharge mouth 22.

[0036] According to a characteristic of the present invention, the compartment 46 is made in an upper central zone of the container 15, between the water introduction zone and the excess water discharge zone, and this position allows to further maximize the capacity of the container 15 to contain water.

[0037] The compartment 46 is laterally separated with respect to the upper portion 15a by means of respective ribs 47 made in the mold, in order to prevent possible splashes or temporary variations in the pressure of the water in the introduction zone from determining an erroneous detection of the actual pressure of the water.

[0038] According to another characteristic of the present invention, the break tank 10 comprises a second outlet mouth 50 for the water, also made in the mold, and arranged on the perimeter edge 34, to allow the water to exit simply due to gravity. The second outlet mouth 50 is connected by means of a pipe 51 to the boiler 24 (fig. 1) and is used when it is necessary to introduce water into the boiler 24 without increasing the pressure thereof.

[0039] Moreover, in the upper zone of the container 15 a breather coil 53 is made in the mold, through which possible air present in the container 15 is expelled. The breather coil 53 is also made on the perimeter edge 34.

[0040] It is clear, however, that modifications and/or additions of parts may be made to the break tank 10 as described heretofore, without departing from the field of protection of the present invention.

[0041] It is also clear that, although the present invention has been described with reference to specific examples, a person of skill in the art shall certainly be able to achieve many other equivalent forms of break tank, all of which shall come within the field and scope of the present invention.

Claims

1. Break tank for a washing apparatus (12), able to at least temporarily interrupt the delivery of water to said washing apparatus (12), said tank comprising a container (15) for said water, introduction means (17) through which said water is introduced from a water network (13), first outlet means (20) for said water connected to said washing apparatus (12) and discharge means (22) able to discharge the excess water outside said container (15), **characterized in that** said container (15) comprises at least a pair of opposite front walls (30, 32) and a perimeter edge (34) able to define the thickness (S) of said container (15), and **in that** both said introduction means (17), said first outlet means (20) and said discharge means (22) are arranged on said perimeter edge (34) so as to remain contained within said thickness (S).
2. Break tank as in claim 1, **characterized in that** said container (15) has a box-like shape, narrow and flattened.
3. Break tank as in claim 1 or 2, **characterized in that** said introduction means (17) are arranged on a first side of said container (15), said discharge means (22) are arranged on a second side of said container (15) and said first outlet means (20) are arranged on a base wall of said container (15).
4. Break tank as in any claim hereinbefore, **characterized in that** said discharge means (22) are able to discharge the water in a collection zone independent from said washing apparatus (12).
5. Break tank as in any claim hereinbefore, **characterized in that** connection means (42) are provided to independently connect said discharge means (22) and said washing apparatus (12) to means (44) which pick up the discharge water, either forced or by gravity.
6. Break tank as in any claim hereinbefore, **characterized in that** it comprises a first and a second half-shell (27, 28) opposed to each other and joined together along the respective perimeter edge.
7. Break tank as in claim 6, **characterized in that** said first and said second half-shell (27, 28) are symmetrical with respect to a median plane (X), passing through the zone where they are joined.
8. Break tank as in claim 6 or 7, **characterized in that** said first and said second half-shell (27, 28) each comprise, in a single piece, relative half-elements respectively to introduce the water, to let out the water and to discharge the excess water.

9. Break tank as in claim 6, 7 or 8, **characterized in that** said first and said second half-shell (27, 28) are made by molding.
10. Break tank as in any claim hereinbefore, **characterized in that** said introduction means comprise a pipe (17) which is joined laterally to said perimeter edge (34) of said container (15) and has a bent portion (33) protruding above said container (15). 5
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11. Break tank as in claim 10, **characterized in that** said bent portion (33) is curved downwards and is connected to an upper portion (15a) of said container (15) by means of a joining segment (35). 15
12. Break tank as in claim 11, **characterized in that** said joining segment (35) is able to be cut from said bent portion (33) along a first cutting line (A) and from said upper portion (15a) of said container (15) along a second cutting line (B). 20
13. Break tank as in claim 12, **characterized in that** said joining segment (35) is shaped like a truncated cone and, once cut, is able to be inserted upside down inside said upper portion (15a) of said container (15), with the function of conveying the water. 25
14. Break tank as in any claim hereinbefore, **characterized in that** said container (15) comprises a compartment (46) associated with means to detect the pressure (48) of the water in said container (15), said compartment (46) being made in an upper central zone of said container (15) between a water introduction zone and an excess water discharge zone. 30
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15. Break tank as in any claim hereinbefore, **characterized in that** it comprises second outlet means (50) for the water towards said washing apparatus (12), able to allow the water to exit through gravity. 40
16. Break tank as in claim 15, **characterized in that** said second outlet means (50) are made in a bottom zone of said container (15). 45
17. Break tank as in any claim hereinbefore, **characterized in that** it comprises breather means (53), arranged in an upper zone of said perimeter edge (34), through which possible gases present in said container (15) are able to be expelled. 50

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