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(54) **Washing liquid supply and dosing system in a dishwashing machine**

(57) The invention refers to a washing-liquid supply and dosing system, and to a method thereof, in a dishwashing machine, comprising a container (1) wherein softened water is taken in. Said container (1) is functionally separated in three compartments (V1, V2, VR) having a different volumetric capacity. The three compartments are located in sequence between themselves; the last one (V2) is filled by overflow after the first two compartments (V1, VR) have been filled and is equipped with a microswitch-operated level detecting device (S1,G1,MC1). The water fed to the first (V1) and/or third compartment (V2) is used for the washing of the crockery, whereas the water fed to the second compartment (VR) is used for resin regeneration.

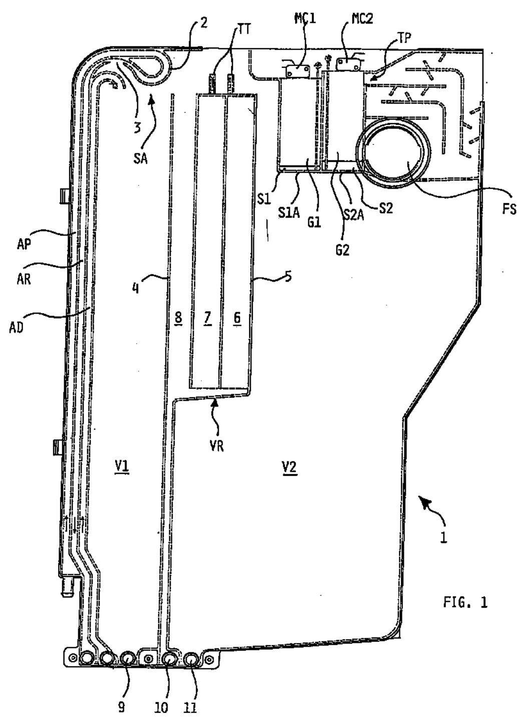


FIG. 1

EP 0 779 056 A2

Description

The present invention refers to a washing-liquid supply and dosing system in a dishwasher machine and a relevant operating method.

Known dish-washers comprise a washing-tub, on whose bottom the water from the supply mains required for the washing of the crockery is collected. To this purpose the machine has a recirculating pump to feed one or more spraying elements with said water collected on the tub bottom.

Water dosing to execute washing can take place in several ways. The simplest solution is to foresee a timed opening of a solenoid valve to supply the water in the washing-tub, however, this solution may prove highly inaccurate since it does not take into account the likely pressure and flowrate changes always occurring in the water supply net.

Other widely applied solutions provide for washing-liquid dosing through an electro-pneumatic pressure sensor detecting the water level directly inside the washing-tub, which consequently controls the input solenoid valve from the water supply net.

However, this solution requires a most precise calibration of the pressure sensor: as a matter of fact, since the washing-tub has a rather extended section, even a few millimeters difference of the water level may cause a wrong water supply amounting to several liters.

Bearing in mind that supply of a higher water volume than actually required is not conforming to lower consumption requirements (water also has to be heated), the pressure sensor system is gradually disappearing in favour of other solutions where water dosing occurs outside the washing-tub.

According to more recent solutions, dishwasher are known to be equipped with a dosing tank branched off the water input pipe to the washing-tub, so that a part of the water from the supply net is delivered directly to the tub and a part of it reaches said tank.

The dosing tank has a reduced water capacity in respect to the required capacity for washing and comprises a level sensor. Said sensor operates on a small water volume proportional to the one fed to the tub and causes the water input solenoid-valve to close upon reaching the preset level for the tank. In other words, the pressure sensor works on a small fraction of the water delivered to the tub, which fills a small size compartment, thus removing detection errors.

However, also this procedure is subject to detection errors due to likely differences in the flowrate division in the branching pipe feeding the dosing tank.

Other input and dosing systems are also known, which provide a repeated water supply to a tank whose capacity equals a fraction of the water required for washing. In this instance, the tank has a level sensor controlling the usual supply solenoid valve and water supply to the washing-tub occurs through subsequent overflows from the tank contents to the tub itself.

However, said systems require a complex critical execution, for instance due to drain-traps (siphons) and may require a long time for water supply as required to carry out washing.

Moreover, since the tank has a preset volume, the quantity of water taken into the tub may only be a full multiple of the tank capacity. As a result, performance of the machine may not be very flexible.

Finally, further water supply and dosing systems are known, which add some common elements to the solutions described above. Such input systems are anyway objectively complex and bulky, typically due to the high number of connecting drain-traps between the tanks.

It is the object of this invention to solve the above problems by providing a washing liquid supply and dosing system in a dishwasher machine, whose extremely simple, compact and low-cost execution allows anyway a high dosing accuracy, is highly reliable and offers a high flexibility for its use.

It is also known that it may be desirable for dishwasher machines to carry out an optional washing-cycle when only one basket containing a reduced quantity of crockery is used, i.e. a washing-cycle with a reduced water supply in the machine, so as to reduce consumption to a minimum extent. To this purpose it is pointed out that water supply during the steps of such "reduced" washings should not simply equal half the volume of water normally taken in for a complete load; just indicatively, water input required for a reduced washing may be in the order of 2/3 - 3/4 of the one required for a standard washing (i.e. to ensure a good washing performance, avoid cavitation problems to the washing pump and maintain a sufficient dilution of soil rests).

Usually, when provided, a reduced water supply can be obtained by setting the machine control system to change the level sensor operation thresholds, in case a different washing is selected, so that a lower water input than planned for a standard washing will be delivered to the machine washing-tub, however, such a system has the more general problems previously mentioned.

Under these circumstances, it is a further object of the present invention to provide a compact, simple and low-cost supply and dosing system, which allows washing with different liquid volumes according to the selected program (complete load, reduced load).

The above objects are achieved according to the present invention by providing a washing-liquid supply and dosing device and a method in a dishwasher machine comprising characterizing features of the annexed claims.

Further characteristics and advantages of the present invention will be apparent from the following detailed description and annexed drawings, only supplied by way of an explanatory but not limiting example, wherein:

- Fig. 1 shows a device of the system according to the invention in a first possible embodiment;

- Fig. 2 shows a section of the hydraulic circuit of a dishwashing machine, according to the embodiment represented in Fig. 1;
- Fig. 3 shows a simplified flowchart of the functions executed by the system according to the present invention as represented in Figs. 1 and 2;
- Fig. 4 shows a device of the system according to the invention in a second possible embodiment;
- Fig. 5 shows a section of the hydraulic circuit of a dishwasher machine according to the embodiment represented in Fig. 4;
- Fig. 6 shows a simplified flowchart of the functions executed by the system according to the invention, as represented in Figs. 3 and 4;
- Fig. 7 shows a section of the hydraulic circuit of a dishwashing machine according to a possible change of the invention.

Fig. 1 shows a vertical section of a device of the system according to the invention. Such a device basically consists of a container 1, housed in a gap formed between a wall of the washing-tub and a wall of the dishwasher cabinet, said elements being not shown for clarity's sake (outside dimensions of the container 1 appear restricted and can indicatively be as follows: ab. 700 mm height, ab. 400 mm width and ab. 25 mm thickness).

AP indicates a water supply pipe from the water supply mains and AR a supply pipe for the same water to a softening device, as it will be described in the following. A so-called "air-break" indicated with SA is located between the pipes AP and AR, whose purpose is to hinder the water in the dishwasher hydraulic circuit being sucked in the water supply net, should there be a depression in the latter. As it can be noticed, the air break SA substantially consists of an elbow 2 of the pipe AP with a cutoff 3 in line with pipe inlet AR.

AD indicates a third pipe to feed the softened water from the above decalcifier device to the container 1.

The container 1 has two central separating elements, indicated with 4 and 5. The separator 4 is a simple splash plate, whereas separator 5 is a septum configured to define two semicompartments, indicated with 6 and 7, closed upward. As it can be noted, septums 4 and 5 define three semicompartments 6, 7, 8, with the semi-compartment 8 fully open upward, whereas semicompartments 6 and 7 only communicate with the outside in their upper section through breather pipes TT, whose function will be explained in the following.

Thus, septums 4 and 5 split the container in three separate compartments located in sequence between themselves, indicated with V1, V2 and VR (with the compartment VR practically consisting of the three semicompartments 6-8) having different volumes. By way of example, the compartment V1 can have a useful volume of 800 cc, the compartment VR a total useful volume of 400 cc and the compartment V2 a useful volume of 2000 cc.

The upper section of the compartment V1 contains both the air break SA and pipe outlet AD, on the bottom of said compartment V1 there is a first outlet 9.

As said above, the central compartment VR is open upward through the semi-compartment 8 and has a second outlet indicated with 10 on its bottom.

The upper section of the compartment V2 has two seats S1 and S2 with their relevant lower holes, indicated with S1A and S2A. Said seats S1 and S2 house their relevant floats G1 and G2, whose execution is known as such, suitable to trip the relevant microswitches MC1 and MC20 controlling a water input solenoid valve (EVC), as it will result later in this description.

Above the compartment V2, screened by it in a known manner, a hole FS communicating with the inside of the washing-tub is provided, to exhaust any vapours generated in the latter during washing. Finally, a third outlet indicated with 11 is provided on the compartment bottom V2.

The container structure 1 is conveniently made of plastic material, such as for instance two molded parts subsequently welded to each other as usually known (eg. hot blade procedure).

As an alternative, the container 1 may be manufactured according to the blow-molding technique, to obtain all components (except for the floats G1 and G2 and microswitches MC1 and MC2) in one single operation.

Fig. 2 shows schematically the container being functionally inserted in the hydraulic circuit of a dishwashing machine implementing the present invention. In said Fig. 2, RE indicates an inlet for the water supply net (eg. a tap) branched to a pipe TA for the supply of the water from the supply net to the machine. Said pipe TA has a solenoid valve EVC to control water input from the supply line to the dishwasher. Downstream the solenoid valve EVC the pipe TA is connected with the pipe AP of the container 1. FV shows schematically the dishwasher washing-tub, P indicates a discharge pump and TS a discharge pipe.

The above mentioned decalcifier device is indicated as a whole with DD. Both the type and operation of this device are known, so that a detailed description will not be required. For the purpose of this invention it will be enough to point out that it consists of a container CR for the water softening resins and of a tank SS for the resin regeneration salt. A pipe indicated with 12 connects the pipe AR of the container 1 with an inlet to the resin container CR. A pipe indicated with 13 connects an output of the resin container CR with the pipe AD of the container 1. A branching off pipe 14 from the pipe 13 communicates with the tub FV (through a pipe 15) and is equipped with a solenoid valve EVV.

A pipe indicated with 15 connects the outlets 9 and 11 with the washing-tub FV. It should be noted that solenoid valves EV1 and EV2 are provided between the outlets 9 and 11 and the pipe 15, respectively.

A pipe indicated with 16 connects the outlet 10 with an inlet of salt container SS. A solenoid valve EVR is located between the outlet 10 and the pipe 16.

Fig. 3 shows by way of example a flowchart showing the development of some program steps of the dishwasher machine represented in Fig. 2, i.e.:

- water supply step for a washing with a full crockery load
- water supply step for a washing with a reduced crockery load
- resin regeneration step of the decalcifier device
- resin washing step of the decalcifier device.

Obviously, the above steps are included in a complete washing program, which will not be described for simplicity's sake, being known as such.

Operation of the dishwashing machine shown in Figs. 1 and 2 will now be described restricted to the steps of interest, also referring to the flowchart of Fig. 3.

To this effect it should be noted that the dishwasher is provided with a programmer device or electromechanical timer. As it is known, such a timer type comprises a small electric motor causing a cam pack to rotate when it is fed. The cam profile is configured to enable/disable the electric contacts, which in their turn enable/disable several machine devices and functions.

At cycle start, during the first supply step, the timer motor stands still, while a cam controls the opening of the solenoid valve EVC; through the pipe TA the water from the supply net delivered through the connector RE can thus reach the pipe AP.

During this step, both the solenoid valves EV1, EV2, EVV, EVR and the discharge pump P are not fed; the microswitch MC1 is on empty tank position.

Water flows upward in pipe AP to the upper section of the container 1 and enters the pipe AR after overcoming the air break SA. It should be noted that a small volume of water unable to overcome the air break SA may fall on the bottom of compartment V1, where it is collected.

Water flows from the pipe AR to the pipe 12 and reaches the resin container CR. After flowing through the resins, the softened water can reach the pipe AD of the container 1 through the pipe 13. In this connection it should be pointed out that the solenoid EVV is a normally closed valve type to avoid that during the input steps of the container 1 the outflowing water from the device DD may flow directly into the washing tub FV.

The softened water flows up along the pipe AD and falls in the compartment V1; the latter will be filled up to an overflow level determined by the height of the septum 4. The water overcoming the septum 4 flows over into the compartment VR, so that the three semicompartments 6, 7, 8 will be filled. It should be noted that the semicompartments 6 and 7 are equipped in their upper section with some small breather pipes indicated with TT to let air outflow under the thrust of the water column rising back to the same semicompartments 6 and 7 during said stage. The small pipes TT can be left open or closed according to a selector position (not shown), so as to change the water volume for resin regeneration as a function of the water hardness degree from the supply net; it is clear in fact that when the small pipes TT are closed, the water will only enter the semicompartment 8.

When also the compartment VR is filled with water (at a height level substantially corresponding to the filling level of compartment V1), the water overflows to the last compartment V2, which will be filled up to the top.

Specifically, when the preset filling level of the compartment V2 is nearly reached, a small volume of water enters the hole S1A of the seat S1, causing float G1 to rise. This rise is detected by the microswitch MC1, which controls the closing of the input solenoid valve EVC of the water supply net. Therefore, the float S1 and the microswitch MC1 represent the main level sensor of the device according to the present invention.

As a result, when said solenoid valve EVC is closed, the three compartments V1, V2, VR are filled each one of them with a preset water volume. The microswitch MC1 is in its full tank position and the timer motor moves on.

It should be noted how the level control obtained as described above is highly precise, since detection by the microswitch MC1 occurs over a very small surface (practically, the float G1 operates within a section of the compartment V2 measuring about 150 x 20 mm); therefore, it is clear how a possible displacement error of the float S1 will involve a slight water dosing error in the compartment V2.

The float G2 and its relevant microswitch MC2 are calibrated for an operation level slightly higher than the float G1 and microswitch MC1; as a result, the float G2 will control microswitch MC2 commutation (also closing solenoid valve EVC) should the microswitch MC1 not operate; therefore, both the float G2 and microswitch MC2 represent a safety device should the main level sensor of the device not function correctly.

As said, when the electric supply to the solenoid valve EVC is cut off, all three compartments V1, V2, VR are filled with a defined volume of water.

In the second step of the input stage, the timer motor moves on and feeds the solenoid valve EV2, which opens up; thus, the water volume contained in the compartment V2 can reach the washing-tub FV through the pipe 15. The microswitch MC1 goes back to its empty tank position.

During the third step of the supply stage, the timer motor stands still and the supply solenoid valve EVC is fed again. Thus, new softened water is fed to the container 1 as long as compartment V2 is not filled again as described above and the microswitch MC1 does not switch over to full state. It should be noted that such a filling time appears to be shorter as during this stage both the compartments V1 and VR are already filled with water.

Finally, during the fourth step of the input stage, the timer motor moves on and the solenoid valves EV1 and EV2 are fed, which open up to let the two water volumes contained in the compartments V1 and V2 respectively (in the example 800 cc and 2000 cc) flow into the tub FV.

Thus, the washing-tub has received 2000 + 2000 + 800 cc water supply and washing of the crockery can start as usually known. During all water supply steps, i.e. prewash, washing, rinses, included in a full washing cycle, the machine will operate as described above, feeding volumetrically defined quantities of water to the washing-tub.

Therefore, according to the invention, the use of an electromechanical pressure switch and its relevant air trap are no longer required, which are conventionally needed in the machines of known type to detect the water level inside the washing-tub. Similarly, according to the present invention, also a siphon system is not required.

As to the washing of a reduced load of crockery, the machine operates in a similar manner as described above: however, featured by the substantial difference that during the fourth step of the water supply stage the solenoid valve EV1 will not be fed and remains closed. Therefore, during this fourth step only the water volume contained in the compartment V2 will reach the washing-tub FV.

Thus, as it can be noted, in the case of a reduced washing program, the supply stage will feed a reduced water volume to the tub (in the example 2000 + 2000 cc).

In both instances, the timer controls the opening of the solenoid valves EVR and EVV for resin regeneration.

The water contained in the compartment VR is now able to reach the salt tank SS through the pipe 16. As a result, a corresponding brine (i.e. water-salt solution) will flow from the tank SS to the tank CR, causing resin regeneration in the decalcifier device.

The corresponding water volume flowing out from the container CR will flow along the pipe 13 up to branch 14. As said above, during this step the solenoid valve EVV is open to let the water flowing along the pipe 13 reach the pipe 14 and the washing-tub FV (through the pipe 15). During this step also a part of the water available in the upward track of the pipe AD tends to flow in the pipe 14 and then reach the washing-tub FV.

As for the washing of the resins, the machine timer controls feeding of the solenoid valve EVC and solenoid valves EV1 and EVV.

The water from the supply net (through TA, AP, AR and 12) will now flood the resins in the container CR to wash them and then reach the washing-tub FV through the pipe 14; during this step, since also the solenoid valve EV1 is open, a likely water input in the compartment V1 will flow to the washing-tub FV through the pipe 15.

It should be noted, with respect to resin washing, that the compartment V1 needs to be empty.

This is usually obtained when executing a complete crockery washing program (where the compartments V1 and V2 discharge in the tub). Viceversa, in the instance of a reduced washing program, discharge of the contents of compartment V1 will have to be discharged at a given moment in the tub before the resin washing step. During the resin washing step, the machine discharge pump P is operating, so that the water from resin washing can be expelled from the machine through the pipe TS.

According to he above description, it is clear that in the case of either a complete or reduced crockery washing the water supply steps are controlled by the timer as a function of the microswitch state MC1, viceversa, both the resin regeneration and washing steps are timed and their length is dictated by the advancement speed of the timer motor alone.

Figs. 4 and 5 describe a possible variant embodiment of the present invention, whereas Fig. 6 shows schematically the relevant functional flowchart. According to this embodiment, the container 1 does not show the pipe AD while the pipe 13 is connected directly with the compartment bottom V1. Moreover, in this embodiment neither the branch pipe 14 nor the relevant solenoid valve EVV are shown.

With reference to water supply and dosing, the machine shown in the Figs. 4 and 5 operates in a similar way to the one described above, with the only difference that the softened water flowing out of the device DD reaches directly the compartment bottom VI through the pipe 13 and enters it under the thrust of the supply net pressure.

During the resin regeneration step, on the contrary, the machine timer controls the opening of solenoid valves EVR and EV1.

As a result, the water contained in the compartment VR can reach the salt tank SS through the pipe 16 and a following brine flow from the tank SS to the container CR.

The corresponding water volume from the container CR flows along the pipe 13 and enters compartment V1. Since the solenoid valve EV1 is open, said water volume can flow into the tub FV through the pipe 15. In this case, the function of solenoid valve EVV according to the previous embodiment, is executed by the solenoid valve EV1 itself.

Finally, as regards resin washing, also in this case the machine timer controls in a timed sequence the electric feeding of the solenoid valve EVC and of the solenoid valve EV1. Thus, the water from the supply net (through TA, AP, AR and 12) floods the resins in the container CR to washing them and flows then in the compartment V1 through the pipe 13. During this step, since also the solenoid valve EV2 is open, the resin washing water flows from the compartment V1 to the washing-tub FV through the pipe 15. During this step, the machine discharge pump P operates, expelling the resin washing water from the machine through the pipe TS.

It should be noted that also for the embodiment shown in the Figs. 4 and 5 the compartment V1 needs to be empty for resin washing. This is obtained as described above for the embodiment represented in the

Figs. 1 and 2.

The characteristics of the present invention will be apparent from the above description, in the same way as also its advantages are clear.

Specifically, the following features should be highlighted:

- a high dosing precision of the suggested system, since level detection is obtained over a very small surface (as said above, the section of compartment V2 where the float G1 operates measures about 150 x 20 mm), so that a possible displacement error of the float S1 will cause a very small water dosing error in the compartment V2;
- simple operation, as water dosing occurs by the filling of compartments having a defined volume located in sequence between themselves, where the filling of the second and third compartments is in particular accomplished by the overflow of the previous compartment overcoming a separating septum, i.e. without siphons;
- simple execution, since the container 1 of the system according to this invention can be obtained through a thermoplastic molding operation with standard devices (solenoid valves, pipes, floats, microswitches). Moreover, due to the structural simplicity of the element 1 also the tool required for execution has a low cost in comparison to known devices;
- a compact small size, since no siphons are required and also because of the various compartments being integrated in one container alone;
- extremely simple and low-cost supply management of different water volumes, even if not multiple ones, as a function of the selected washing program by the user (either a full or reduced crockery load).

It is obvious that many changes to the system described above by way of example will be possible for the man skilled in the art, without departing from the innovation frames inherent the inventive idea.

According to the above description, it will be apparent for instance how the water supply steps in the container 1 and water discharge from the latter into the washing-tub are independent from each other. Therefore, the various water input steps subsequent to the first one can take place with the machine executing different program steps, such as heating, prewash, washing, rinse steps. In this frame it is also clear that the time sequence of the supply operations of the container 1 can be selected since the system design stage, to favorably exploit thermal dissipation of the washing-tub for a partial heat recovery. In other words, supply of container 1 can take places during the "hot" steps of the washing program, so that the water contained in the container 1 may be at least partially heated by the dissipated heat of the tub during such hot steps.

In another possible embodiment the solenoid valve EVC can be directly housed in the container 1, or the number of the dosing chamber can be greater than the one described above by way of example.

The dosing system described above, comprising a dual input and output of the compartment V2 to execute both a full crockery load washing and a reduced load loading may also be a different one. For instance, the container 1 can be such to have the total capacity of both compartments V1 and V2 equalling the water volume required for the washing of a full crockery load, whereas the capacity of the compartment V2 would equal the water volume required for a reduced load washing. Such a solution applies for instance when the max. water volume required for washing is a restricted one (thinking of a dishwasher with a capacity for eight standard covers) or when a wide space is available in the gap between the dishwasher washing-tub and the cabinet.

From the manufacturing standpoint, it is also possible to foresee some mould movable elements, required for part 1, to get a different positioning of septum 4 and 5 and change the volumes of compartments V1, V2, V3 as a function of the intended system use.

The container 1 should also foresee an "overflow" opening, for instance near the compartment housing the microswitch MC2 and communicating with the compartment with the hole FS, should the microswitches MC1 and MC2 not switch in. Such an overflow hole indicated in the example of Fig. 1 with TP is located at a lower level than the position of microswitch MC1.

Fig. 7 shows a further possible embodiment of the present invention, where the diagram is similar to that of Fig. 2, the only difference being that the valve EV1" controlling the compartment V1 has two selective outputs, the first one only used for resin washing in communication with the pipe 12 and the second output connected with the pipe 15.

Diagram operation shown in Fig. 7 is similar to the one described in Fig. 2; however, a substantial difference is that according to the suggested embodiment, in the case of a washing with a reduced load of crockery the water contained in the compartment V1 can be used to wash the resins instead of being discharged directly into the tub.

During this resin washing step, the machine timer controls in fact the solenoid valve EV1" and opens the output connected with the pipe 12. Since during this step, as previously seen, the solenoid valve EVV is open, the water contained in the compartment V1 can flow along the resin container CR through the pipe 12 and then into the tub through the pipes 13, 14, 15.

According to such an embodiment, during the resin washing step during a washing program for a small load of crockery, the supply solenoid valve EVC is not fed: in this way, there is no water supply from the supply net.

Obviously, the embodiment shown in Fig. 7 can be differently implemented. For instance, the diagram of Fig. 2 can be accordingly changed, by providing in-lieu of the solenoid valve EV1" of Fig. 7 a second output pipe from the compartment V1, in communication with the pipe 12 through a solenoid valve with only one output.

Another embodiment in the case of the version shown in Fig. 4 foresees an opening as indicated with SV, suitable to enhance pipe AR full exhaustion. During the resin regeneration step, this opening will let the water contained in the pipe AR enter the resin container CR, to reduce concentration of its water-salt mixture.

Finally, it is obvious that the operation of the system object of the present invention, which in the instance described above by way of example is controlled by a programmer of electromechanical type, may be controlled by an electronic timer, i.e. based on the use of a microprocessor.

Claims

1. Water supply and dosing system in a dishwashing machine, comprising a washing-tub (FV) and a dosing container (1) to which the water required for the machine operation is fed through a supply pipe (TA) and a supply valve (EVC), wherein:

   - within said container (1) a plurality of dosing compartments (V1, VR, V2) is defined, in particular by at least one wall (4,5),
   - a level detection device (MC1) is associated to one of said containers, suitable to control the closing of said supply valve (EVC) upon reaching a preset water level, when said preset water level is attained, said compartments (V1, VR, V2) being filled with volumetrically defined quantities of water,

   characterized in that

   - pipes (15,16) are provided for selective communication of said compartments (V1, VR, V2) with said washing-tub (FV), said pipes (15,16) being equipped with respective control valves (EV1,EVR,EV2);
   - the inlet of said pipes (14,16) is at equal or higher height than their outlet, so that water discharge from said compartments (V1, VR, V2) to said washing-tub occurs by gravity, through the simple opening of said control valves (EV1,EVR,EV2).

2. System according to Claim 1, characterized in that means are provided that, during a step of a full crockery load washing-program, are apt to control the discharge in the washing-tub (FV) of a number of chamber (V1,V2) which different with respect to the number of chamber (V1,V2) which is discharged in the washing-tub (FV) during a step of a reduced crockery load washing-program.

3. System according to Claim 2, characterized in that said control means, during a step of a full crockery load washing-program, are apt to control the discharge in the washing-tub (FV) of the water contained in two (V1,V2) of said compartments, whereas during a step of a reduced crockery load washing-program they discharge in the washing-tub (FV) the water contained in only one of said compartments.

4. System according to Claim 1, characterized in that means are provided which, for dosing the water required for a washing step, are apt to control a first discharge in the washing-tub of the water contained in one of said compartments (V2), the subsequent filling of the same compartment (V2) and a second discharge of its contents into the washing-tub (FV).

5. System according to the previous Claim, characterized in that said second discharge of the contents of said compartment (V2) is combined with the discharge in the washing-tub (FV) of another one of said compartments (V1).

6. System according to Claim 1, characterized in that at least three compartments are provided (V1, VR, V2), one of which is used for the dosing of the resin regeneration water of a decalcifier device (DD).

7. System according to at least one of the preceding Claims, characterized in that the capacity of one of said compartments (V1, V2) equals the quantity of water required to execute a step of a reduced crockery load washing-program, whereas the total capacity of said two compartments (V1,V2) equals the quantity of water required to execute a step of a full crockery load washing-program.

8. Method for the water supply and dosing in a dishwashing machine, comprising a washing-tub (FV) and a dosing compartment (1) to which the water required for the machine operation is delivered through a supply pipe (TA) and a supply valve (EVC), wherein the filling of a plurality of compartments (V1,V2), in particular being present within said compartment and having different capacities, is provided, characterized in that in a first operating mode of the dishwashing machine, such as the execution of a step of a full crockery load washing-program, the number of compartments (V1,V2) being discharged into said tub (FV) is different with respect to the number of compartments (V1,V2) being discharged into said tub (FV) in a second operating mode of the dishwashing machine, such as the execution of a step of a reduced crockery load washing program.

9. Method according to the previous Claim, characterized in that in said first operating mode, the water fed to both said compartments (V1,V2) is discharged into said tub (FV), whereas in said second

operating mode only the water contained in one of said compartments (V2) is discharged into said tub (FV).

10. Method according to Claim 8, characterized in that, for the execution of a step of a washing program, a repeated filling and a repeated emptying of one of said compartments (V2) is provided.

11. Method according to at least one of the preceding Claims, characterized in that said container (1) comprises at least a compartment (VR) for the dosing of a water volume required for resin regeneration of a decalcifier device (DD).

12. Method according to at least one of the preceding Claims, characterized in that discharge of said compartments (V1,VR,V2) occurs directly, i.e. without the use of siphons, by a simple opening of the relevant valves (EV1, EV2, EV3) located on the pipes (14,16) departing from the lower section of said compartments (V1,V2,VR).

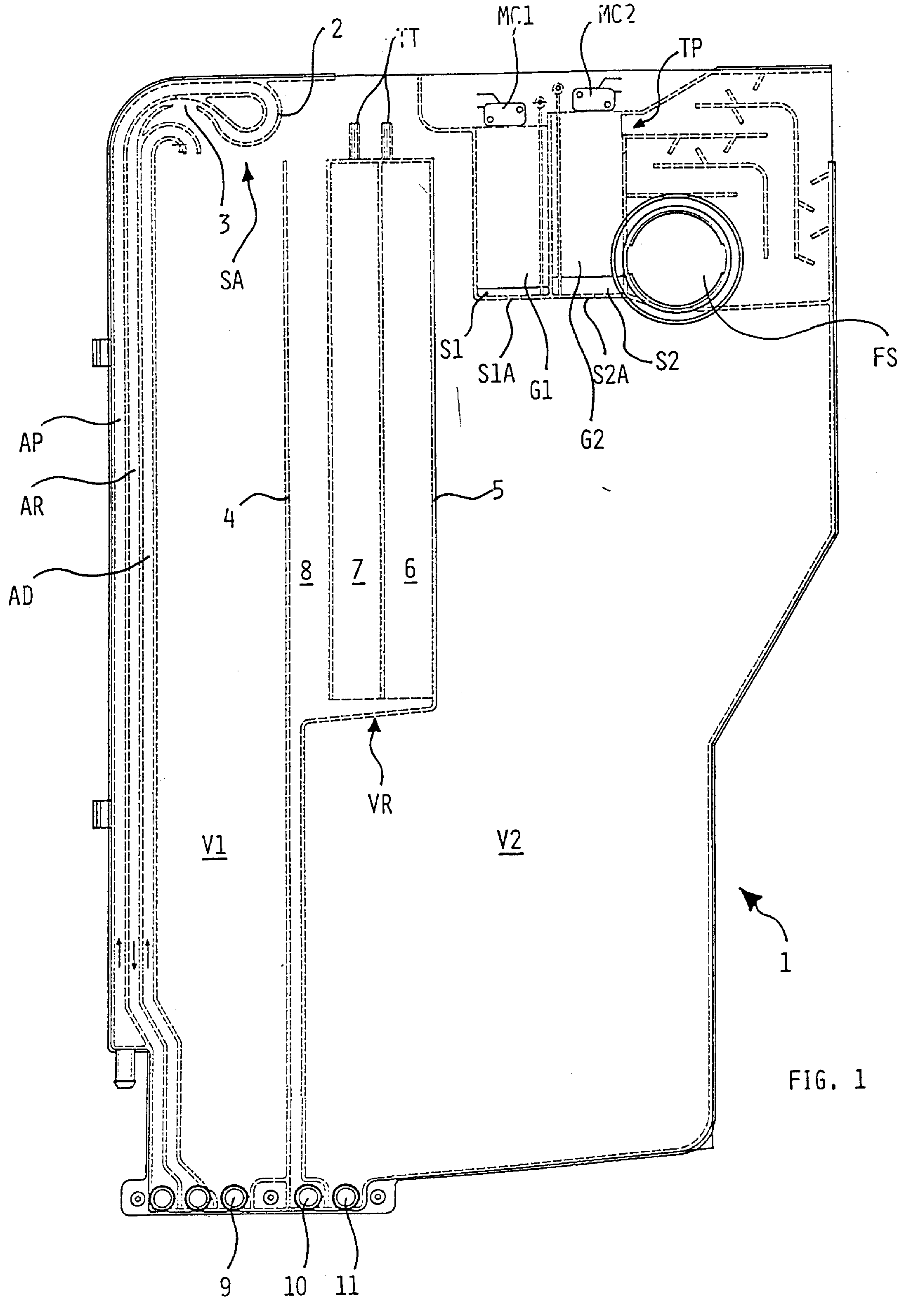

2
YT
MC1
MC2
TP
3
SA
S1
S1A
G1
S2A
S2
FS
G2
AP
AR
AD
4
5
8
7
6
VR
V1
V2
1
9
10
11

FIG. 1

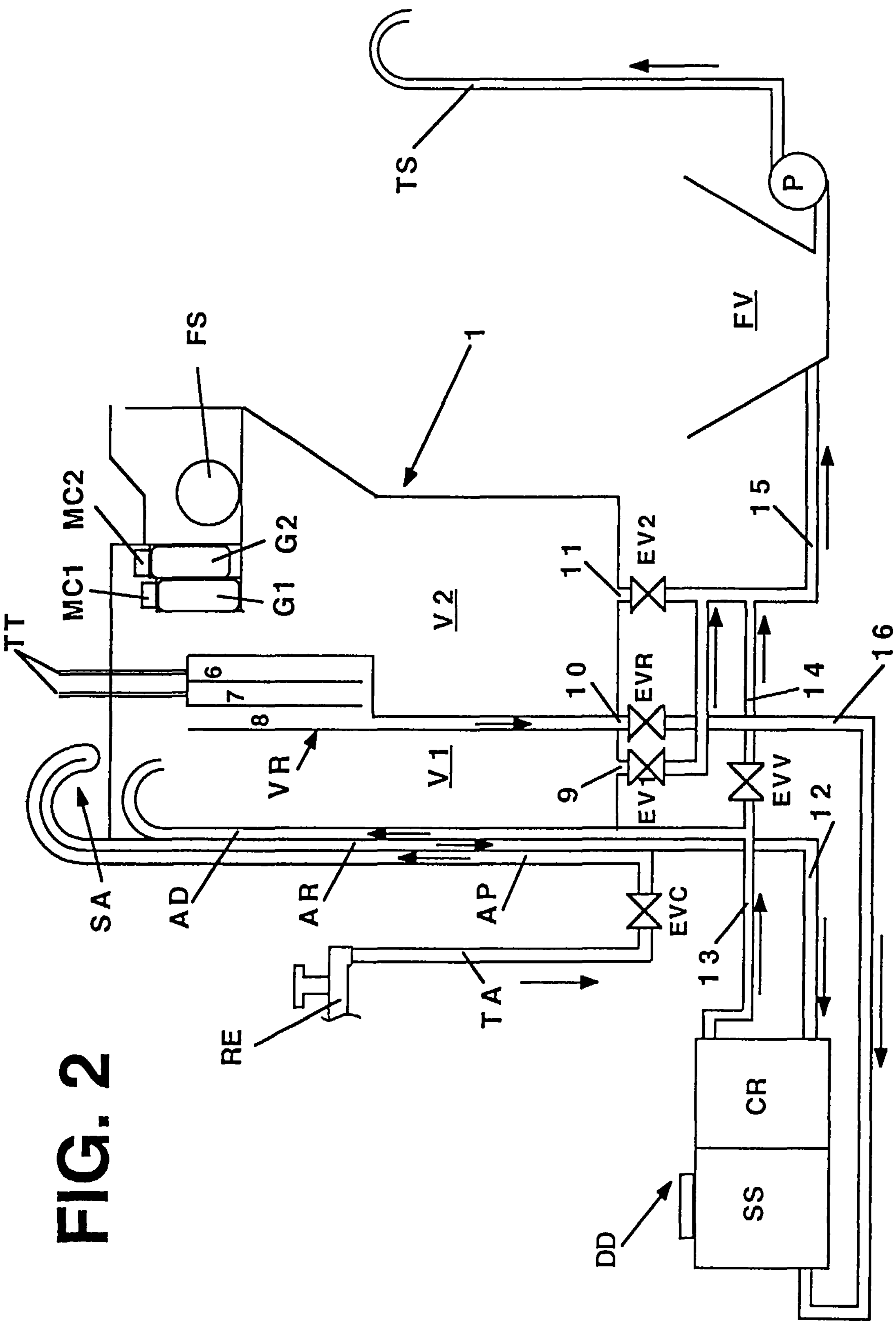

TS
P
FV
1
FS
MC2
MC1
G2
G1
TT
V 2
6
7
8
11
EV2
10
EVR
9
EV1
15
14
16
EVV
12
VR
V 1
SA
AD
AR
AP
EVC
13
TA
RE
CR
SS
DD

FIG. 2

FIG. 3

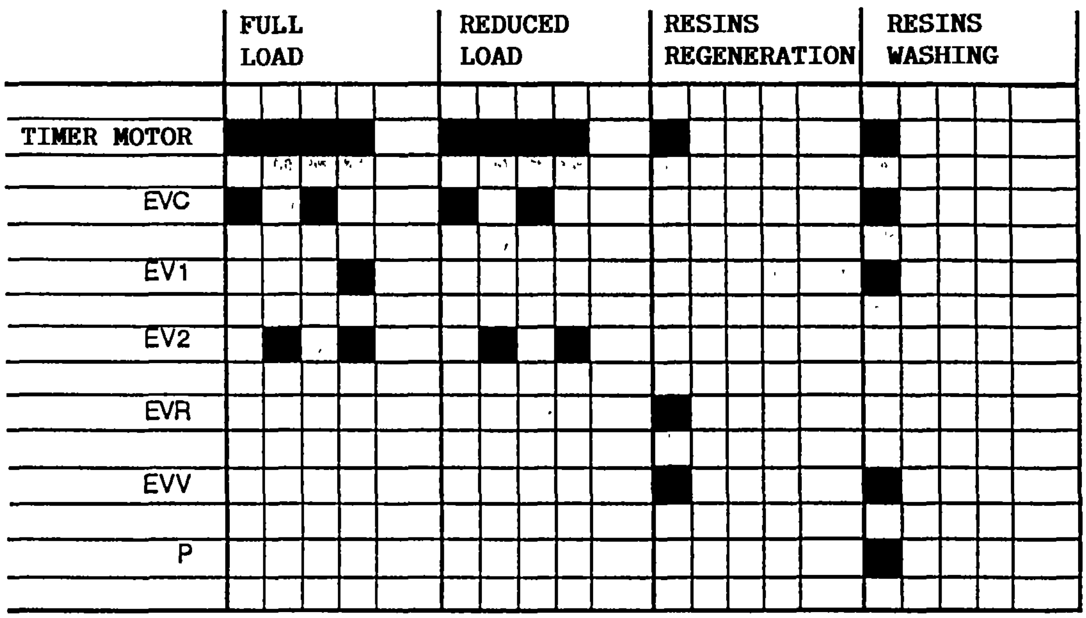
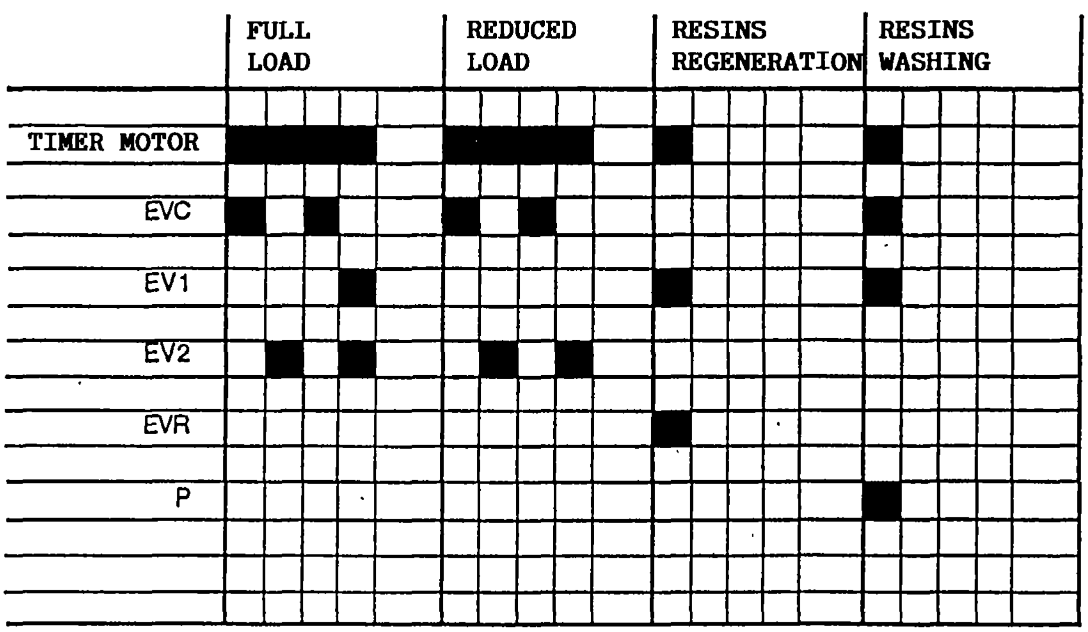

FULL LOAD
REDUCED LOAD
RESINS REGENERATION
RESINS WASHING
TIMER MOTOR
EVC
EV1
EV2
EVR
EVV
P

FIG. 6


FULL LOAD
REDUCED LOAD
RESINS REGENERATION
RESINS WASHING
TIMER MOTOR
EVC
EV1
EV2
EVR
P

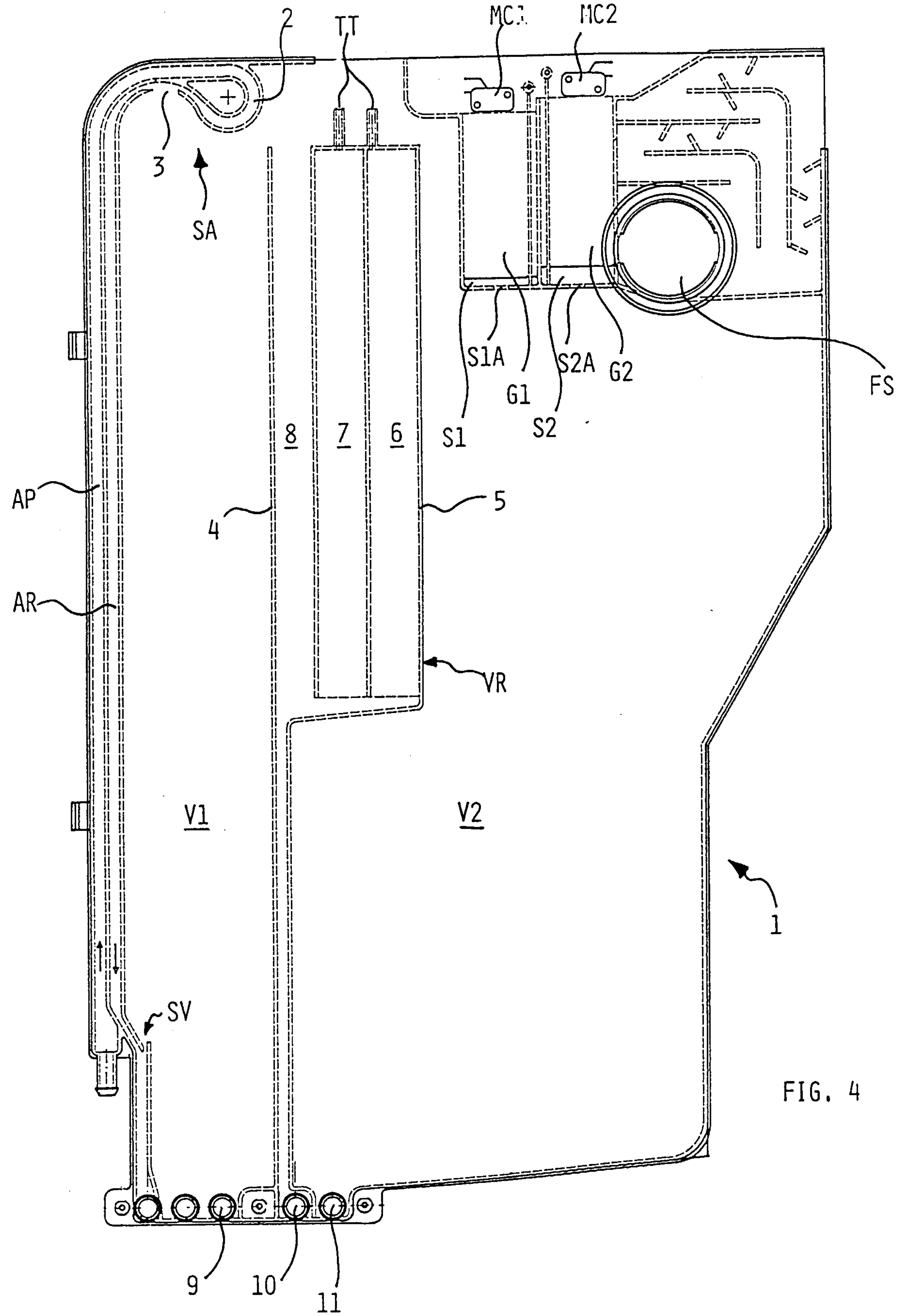

2
TT
MC1
MC2
3
SA
S1A
G1
S2A
G2
FS
S1
S2
8
7
6
AP
4
5
AR
VR
V1
V2
1
SV
9
10
11

FIG. 4

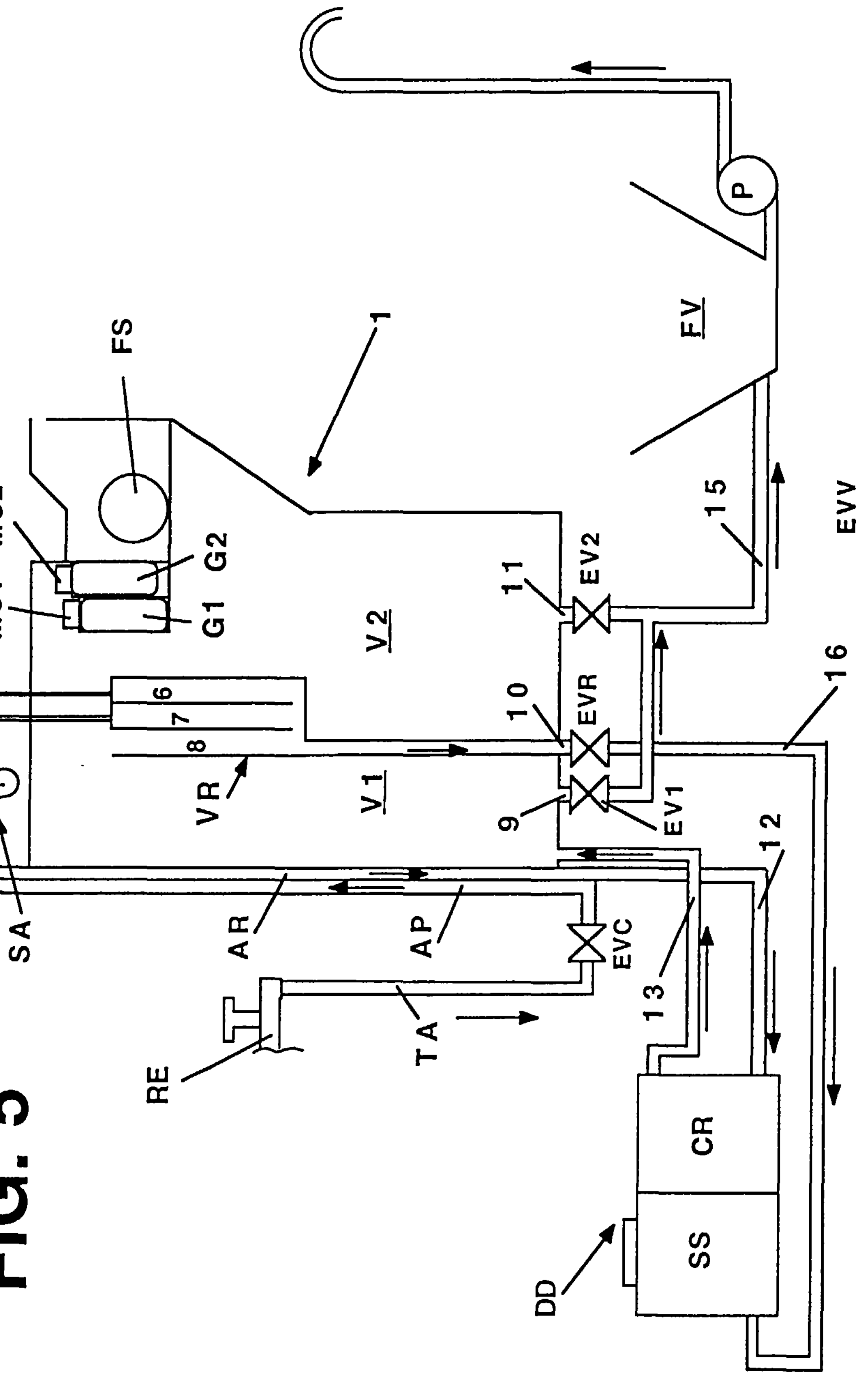

1
FS
MC2
MC1
G2
G1
TT
6
7
8
V 2
V 1
VR
SA
AR
AP
EVC
TA
RE
9
10
11
EV1
EVR
EV2
12
13
15
16
FV
P
EVV
CR
SS
DD

FIG. 5

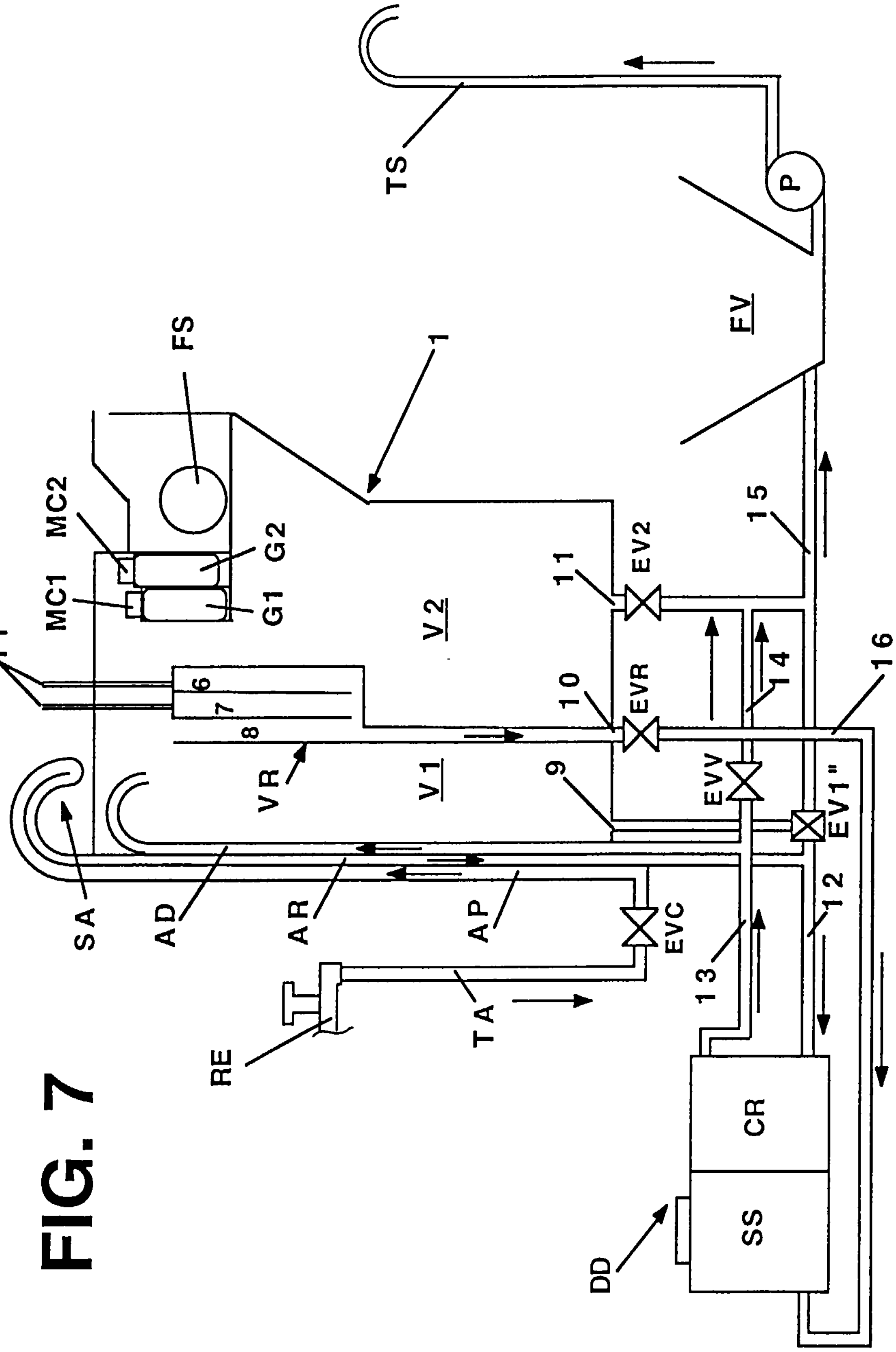

TS
P
FV
FS
1
MC2
G2
MC1
G1
TT
V2
6
7
8
11
EV2
10
EVR
15
14
16
VR
V1
9
EVV
EV1"
SA
AD
AR
AP
EVC
12
13
TA
RE
CR
SS
DD

FIG. 7