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(54) Liquid detergent dispenser for dishwashers

(57) Liquid detergent dispenser that comprises a pump (10) for drawing the detergent from a tank (11) and pumping it into the wash compartment (1) of a dishwasher, which in turn comprises at least one other pump (4) driven by a motor (7) for pumping water into this wash compartment (1), the shaft (6) of the motor (7) of the water pump (4) being connected mechanically to a speed reduction unit (8) whose driven shaft (9) is connected mechanically to the impeller of the detergent pump (10).

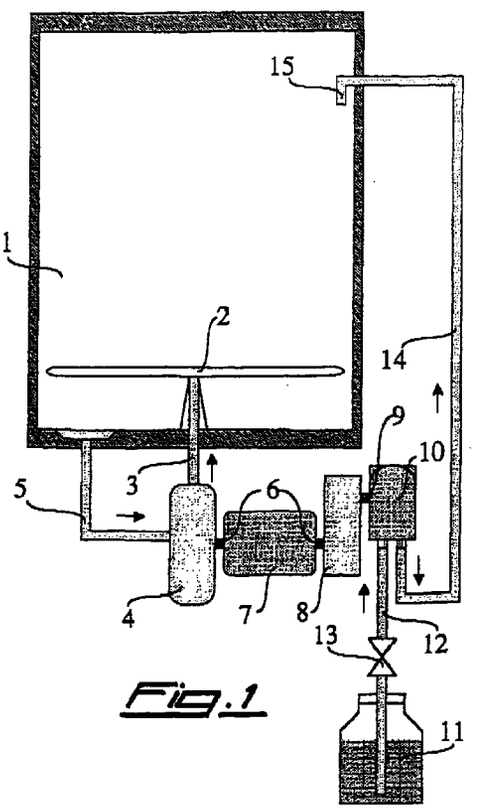

Fig.1

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Description

The present invention relates to a dispenser intended to be installed inside a dishwasher, especially an industrial dishwasher using liquid detergents for cleaning dishes.

As is known, dishwasher dispensers generally contain a peristaltic pump powered by an electric motor. The pump draws the detergent out of a tank and pumps it into the wash compartment. The presence of this electric motor inside the dishwasher is, however, disadvantageous in that it increases the risk of electrical faults, such as short circuits caused by the ingress of water. Apart from this problem of safety, the presence of the electric motor and its control means raises production costs and reduces the reliability of the dishwasher as a whole.

It is therefore an object of the present invention to provide a dishwasher dispenser that does not have these disadvantages, that is to say a dispenser that offers greater safety and costs less to produce than known dispensers.

This object is achieved in the form of a dispenser whose principal features are specified in the first claim.

By means of the speed reduction unit connected to the motor of the water pump, the dispenser in accordance with the present invention requires neither its own electric motor nor control means for operating it, and is therefore cheaper, safer and more reliable than dispensers currently on the market.

Other advantages and features of the dispenser according to the present invention will be obvious to those skilled in the art from the following detailed description of a preferred embodiment thereof, referring to the accompanying drawing in which the single figure shows a schematic view of the interior of a dishwasher in which this dispenser is installed.

Referring to Fig. 1, the dishwasher can be seen to comprise, as in the prior art, a wash compartment 1 containing at least one sprayer 2 for spraying the dishes with water. This sprayer is connected via a delivery pipe 3 to a pump 4, preferably a centrifugal pump. The pump 4 has an inlet which is connected in turn to a suction pipe 5 carrying water from the wash compartment 1. The impeller of the pump 4 is keyed to one end of the shaft 6 of an electric motor 7.

The dispenser according to the present invention conveniently comprises a speed reduction unit 8 alongside the motor 7 on the opposite side from the pump 4, and the rotary motion of the shaft 6 is stepped down by this unit 8. In the present embodiment this speed reduction unit comprises a gear train composed of at least two gears in mesh with each other, but in other embodiments of the dispenser according to the present invention the reduction unit 8 may of course contain other transmission components capable of reducing the number of revolutions of the drive shaft 6. Keyed to the driven shaft 9 of the reduction unit 8 is the impeller of a pump 10 which in the present embodiment is of the peristaltic type having a hose. The pump 10 draws the liquid detergent contained in a tank 11 through a feed pipe 12 which preferably has a valve 13 for regulating the flow rate. Also connected to the pump 10 is a delivery pipe 14 ending in a nozzle 15 situated inside the wash compartment 1.

The diameter of the hose of the pump 10 and of the impeller of the pump 10, and also the transmission ratio of the speed reduction unit 8, are determined as a function of the number of revolutions of the motor 7 when running steadily, so that the amount of detergent injected by the pump 10 into the compartment 1 during the entire period of operation of the motor 7 is approximately the amount of detergent necessary for one washing cycle. By opening or closing the valve 13 at appropriate moments, it is also possible to vary the arrival of detergent at the pump 10 in response to other factors, such as for example the chemical and physical characteristics of the detergent employed or the wash program input into the dishwasher.

When in use, the dispenser according to the present invention starts to operate as soon as the motor 7 of the water pump 4 is turned on. The rotation of the shaft 6 of this motor is stepped down and transmitted by the speed reduction unit 8 to the pump 10, which draws the detergent from the tank 11 and pumps it into the wash compartment 1. The direction of flow of the water and detergent through the pipes of the dishwasher while the motor 7 is running is indicated in Fig. 1 by a series of arrows. The pump 10 obviously continues to pump detergent into the wash compartment 1 until the motor 7 is turned off. It will be obvious that in another embodiment of the dispenser according to the present invention, means may be provided for mechanically uncoupling the pump 10 from the motor 7 so that the pump is running only during certain periods of operation of the motor.

Some dishwashers comprise not only a pump for pumping the water used during the washing of the dishes but also another pump for water used to rinse the dishes. In another embodiment of the dispenser according to the present invention, the speed reduction unit 8 may therefore be connected mechanically to the motor of the rinsing pump instead of to the washing pump.

Other variants and/or additions may be made by those skilled in the art to the embodiment described and illustrated herein while keeping within the scope of the said invention.

Claims

1. Liquid detergent dispenser that comprises a pump (10) for drawing the detergent from a tank (11) and pumping it into the wash compartment (1) of a dishwasher, which in turn comprises at least one other pump (4) driven by a motor (7) for pumping water into this wash compartment (1), the said dispenser

being characterized in that the shaft (6) of the motor (7) of the water pump (4) is connected mechanically to a speed reduction unit (8) whose driven shaft (9) is connected mechanically to the impeller of the detergent pump (10).

2. Dispenser according to the preceding claim, characterized in that the impeller of the water pump (4) is mounted on the drive shaft (6) of the speed reduction unit (8).

3. Dispenser according to one of the preceding claims, characterized in that the impeller of the detergent pump (10) is mounted on the driven shaft (9) of the speed reduction unit (8).

4. Dispenser according to one of the preceding claims, characterized in that the speed reduction unit (8) is positioned between the motor (7) of the water pump (4) and the detergent pump (10).

5. Dispenser according to one of the preceding claims, characterized in that the detergent pump (10) is a peristaltic pump.

6. Dispenser according to one of the preceding claims, characterized in that the pipe (12) that connects the tank (11) to the detergent pump (10) is provided with a valve (13) for regulating the rate of flow of the detergent in the said pipe (12).

7. Dispenser according to one of the preceding claims, characterized in that it comprises means for mechanically uncoupling the motor (7) of the water pump (4) from the detergent pump (10).

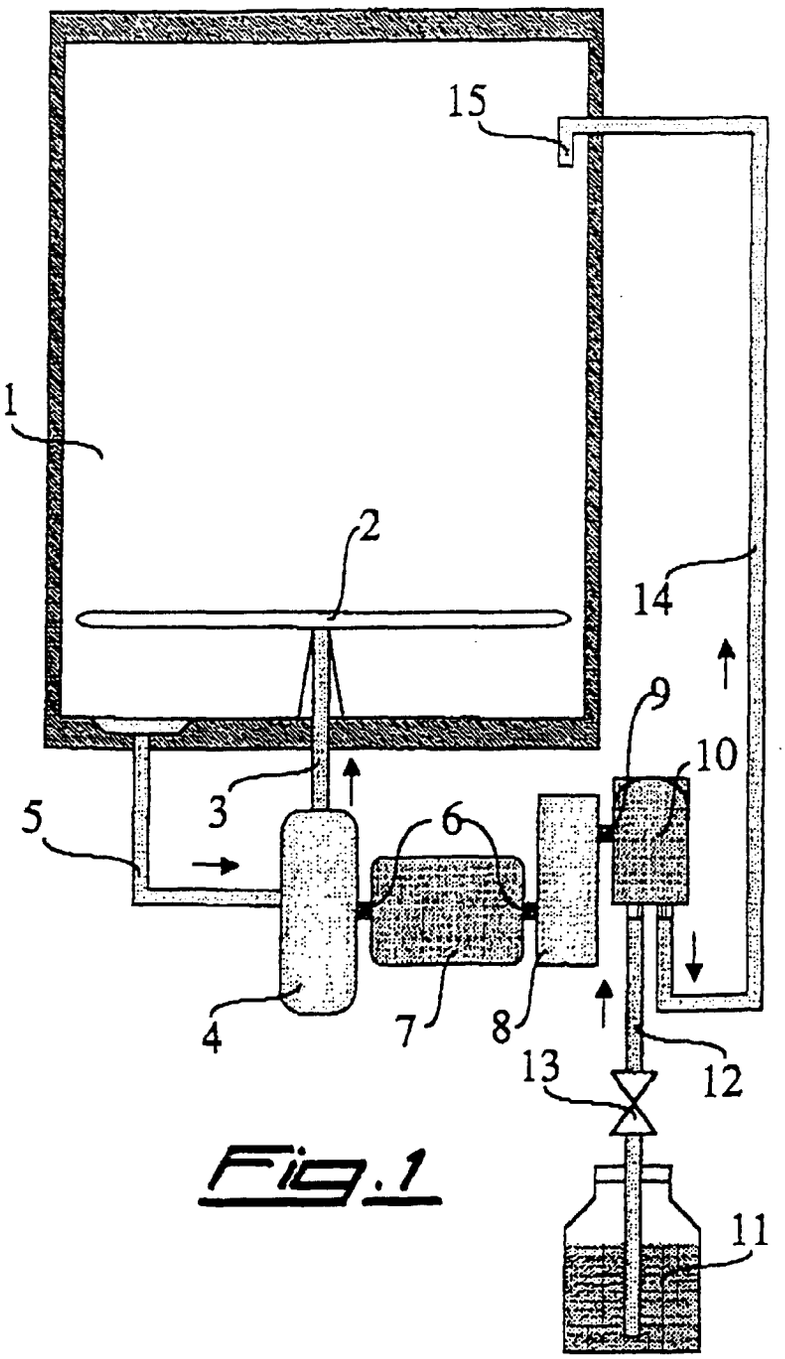

Fig.1