KR 20030008504 A shows a showerhead with control buttons, for controlling delivery of additives through a control and mixing box. The additives are provided by a set of additive containers.

Known systems are usually foreseen for fixed installation in connection with a bathtub or shower or faucet, and are limited in what they can do. There is a need for a water conditioning unit that is versatile and at the same time easy to handle. More generally, there is a need for improvement over existing systems.

It is therefore an object of the invention to create a water conditioning unit and a dispensing unit of the type mentioned initially, which overcomes the disadvantages mentioned above.

These objects are achieved by a water conditioning unit and a dispensing unit according to the claims.

According to an aspect of the present invention, there is provided a water conditioning unit for a washing device, the water conditioning unit being configured to provide, controlled by a user, water at different flow rates and with different spraying characteristics and with additives admixed to the water, the water conditioning unit comprising

- an inlet fitting for attaching the water conditioning unit to a water supply, in particular wherein the inlet fitting is configured for attaching a water supply hose;
- an outlet fitting for attaching the water conditioning unit to a dispensing unit, in particular wherein the outlet fitting is configured for attaching a hose leading to a showerhead; and
- one, two or more docking adapters configured for attaching, one, two or more additive containers;

wherein hydraulic elements guiding and controlling a flow of water between the inlet fitting and the outlet fitting are implemented in a hydraulic assembly, the hydraulic assembly comprising a total manifold and hydraulic elements, in particular sensors and actuators controlling the flow of water, the total manifold comprising internal channels guiding the flow of water and carrying the hydraulic elements, and

wherein the total manifold comprises a first plate and second plate, attached to one another, with channels guiding the flow of water being arranged between the two plates and being defined by hollow spaces between the two plates.

In embodiments, the water conditioning unit is for use in a washing device, the water conditioning unit being configured to provide, controlled by a user, water at different flow rates and with different spraying characteristics and with additives admixed to the water, the water conditioning unit comprising

- an inlet fitting for attaching the water conditioning unit to a water supply, in particular wherein the inlet fitting is configured for attaching a water supply hose;
- an outlet fitting for attaching the water conditioning unit to a dispensing unit, in particular wherein the outlet fitting is configured for attaching a hose leading to a showerhead;
- one, two or more docking adapters configured for attaching, one, two or more additive containers.

PATENT CLAIMS

1. A water conditioning unit for a washing device, the water conditioning unit being configured to provide, controlled by a user, water at different flow rates and with different spraying characteristics and with additives admixed to the water, the water conditioning unit comprising

   - an inlet fitting for attaching the water conditioning unit to a water supply, in particular wherein the inlet fitting is configured for attaching a water supply hose;
   - an outlet fitting for attaching the water conditioning unit to a dispensing unit, in particular wherein the outlet fitting is configured for attaching a hose leading to a showerhead; and
   - one, two or more docking adapters configured for attaching, one, two or more additive containers;

   wherein hydraulic elements guiding and controlling a flow of water between the inlet fitting and the outlet fitting are implemented in a hydraulic assembly, the hydraulic assembly comprising a total manifold and hydraulic elements, in particular sensors and actuators controlling the flow of water, the total manifold comprising internal channels guiding the flow of water and carrying the hydraulic elements, and

   wherein the total manifold comprises a first plate and second plate, attached to one another, with channels guiding the flow of water being arranged between the two plates and being defined by hollow spaces between the two plates.

2. The water conditioning unit of claim 1, wherein the total manifold functions as a support structure holding and supporting the hydraulic elements.

3. The water conditioning unit of claim 1 or 2, wherein the internal channels are arranged inside the total manifold, guiding water and, as the case may be, also additives, between the hydraulic elements.

4. The water conditioning unit of one of claims 1 to 3, wherein, for one or more of the hydraulic elements, the total manifold is shaped to form a functional part of the hydraulic element.

5. The water conditioning unit of claim 4, wherein the total manifold is shaped to form at least one valve seat for a hydraulic element that implements a valve function.

6. The water conditioning unit of claim 4 or 5, wherein the total manifold is shaped to form at least one flow restrictor for restricting a flow rate through one of the internal channels of the total manifold.

7. The water conditioning unit of one of claims 1 to 6, wherein, inside the hydraulic assembly, a high-flow water channel controlled by a high-flow valve, constitutes a shortest flow path for the water flowing from the inlet fitting to the outlet fitting, compared to other flow paths from the inlet fitting to the outlet fitting that are implemented in the hydraulic assembly.

8. The water conditioning unit of one of claims 1 to 7, wherein, inside the hydraulic assembly, an initial spray flow path leads from the inlet fitting to a branching point, where it branches into a spray water channel and an admixing channel,

- the spray water channel being controlled by a plain water valve and leading to a junction which in turn leads to the outlet fitting,
- the admixing channel being controlled by a mixer valve and leading to the second end and from there into an admixing section of the admixing

channel, the admixing section leading back in the direction of the first end, to the junction.

9. The water conditioning unit of one of claims 1 to 8, wherein a pressure reducer is arranged to limit a pressure at a branching point, where it branches into a spray water channel and an admixing channel, in particular to a pressure of less than three bar, in particular to a pressure of two bar.

10. The water conditioning unit of one of claims 1 to 9, wherein a flow restrictor is arranged to further limit a flow in the spray water channel, in particular to a flow between one and two litres per minute.

11. The water conditioning unit of one of claims 1 to 10, wherein the total manifold further comprises a mixing manifold arranged on *or being part of* the second plate, the mixing manifold comprising an admixing channel arranged to guide a flow of water from the second end to the first end, with additive inlets, optionally comprising additive check valves, arranged along the admixing channel for admixing additives to the flow of water.

12. The water conditioning unit of claim 11, wherein a volume of the admixing channel, from the first additive inlet, seen in the direction of flow, to the junction, is less than thirty millilitres, in particular less than twenty millilitres, in particular less than ten millilitres.

13. The water conditioning unit of claim 11 or 12, comprising two or more peristaltic pumps arranged in a row, with their axes of rotation at least approximately at a right angle to a direction of the admixing channel, wherein two outermost peristaltic pumps of the row are arranged to turn in opposite directions.

14. The water conditioning unit of one of the preceding claims, wherein all hydraulic elements guiding and controlling a flow of water between the inlet fitting and the outlet fitting are arranged inside a compact base unit.

15. The water conditioning unit of claim 14, wherein the base unit is configured for the, one, two or more additive containers to be inserted into and connected to corresponding docking adapters in a vertical direction, in particular in a downward direction.

16. The water conditioning unit of one of the preceding claims, configured to implement, for at least one of the additives, one or more of the following admixing modes

- a continuous admixing mode, wherein, the flow of the additive and the water is continuous;
- a pulsed additive admixing mode, wherein the flow of the additive is pulsed;
- a pulsed water admixing mode, wherein the flow of the water is pulsed.