## CLAIMS

1. A water treatment membrane washing apparatus that uses an ozone water generated by dissolving an ozone gas in a filtrate generated by filtering a raw water through a water treatment membrane, the water treatment membrane washing apparatus comprising:

an ozone gas supply unit configured to generate an ozone gas and supply the ozone gas through an ozone gas pipe;

a first ozone dissolving tank and a second ozone dissolving tank each configured to store the filtrate or a stored filtrate mixed of the filtrate with the waste ozone gas, and to connect a waste ozone gas aspiration pipe aspirating the waste ozone gas;

a filtration pump connected with a filtration pipe connecting from the water treatment membrane to transport the filtrate or the stored filtrate to the first ozone dissolving tank or to the second ozone dissolving tank, or to transport the filtrate outside the water treatment membrane washing apparatus;

a three way valve connected with a discharge side of the filtration pump to switch a flow path on the discharge side to a flow path to the first ozone dissolving tank or to the second ozone dissolving tank, or to a flow path outside the water treatment membrane washing apparatus;

a first circulation pump connected with the first ozone dissolving tank to circulate a stored filtrate in the first ozone dissolving tank, or to supply an

ozone gas containing filtrate generated from the stored filtrate in the first ozone dissolving tank to the water treatment membrane;

a second circulation pump connected with the second ozone dissolving tank to circulate a stored filtrate in the second ozone dissolving tank, or to supply the ozone gas containing filtrate generated from the stored filtrate in the second ozone dissolving tank to the water treatment membrane;

a first three way valve connected with a discharge side of the first circulation pump to switch a flow path on discharge side to a first circulation pipe returning to the first ozone dissolving tank or to a backwash water pipe connecting to the water treatment membrane;

a second three way valve connected with a discharge side of the second circulation pump to switch a flow path on discharge side to a second circulation pipe returning to the second ozone dissolving tank or to the backwash water pipe connecting to the water treatment membrane;

an ozone gas switching valve provided to the ozone gas pipe, and branching the ozone gas through the ozone gas switching valve to switch a supply destination of the ozone gas;

a waste ozone gas switching valve provided to the waste ozone gas pipe, and branching the waste ozone gas through the waste ozone gas switching valve to switch a supply destination of the waste ozone gas;

a first aspirator provided to the first circulation pipe to mix the stored filtrate circulated from the first ozone dissolved tank using the stored filtrate as a driving water with the ozone gas aspirated from the ozone gas supply unit through the first switching valve to generate the ozone gas containing filtrate, or with the waste ozone gas aspirated from the second ozone

dissolving tank through the first switching valve to generate a pretreated filtrate;

a second aspirator provided to the second circulation pipe to mix the stored filtrate; circulated from the second ozone dissolved tank using the stored filtrate as a driving water with the waste ozone gas aspirated from the first ozone dissolving tank through the second switching valve to generate the pretreated filtrate, or with the ozone gas aspirated from the ozone supply unit through the second switching valve to generate an ozone gas containing filtrate;

a differential pressure gauge provided to the filtrate pipe to measure a pressure difference across the water treatment membrane during a filtration; and

an ozone concentration meter attached to each circulation pipe to measure a dissolved ozone concentration in the ozone gas containing filtrate, wherein when a dissolved ozone concentration measured by the ozone concentration meter, of the stored filtrate in the first or the second ozone dissolving tank, reaches a pre-given value and a pressure measured by the differential pressure gauge increases from a pressure at a start of the filtration to a predetermined pressure, the ozone gas containing filtrate generated in the first or the second ozone dissolving tank is passed respectively by the first or the second circulation pump from a secondary side of the water treatment membrane to a primary side of the water treatment membrane to wash the water treatment membrane.

2. A water treatment membrane washing apparatus that uses an ozone

water generated by dissolving ozone gas in a filtrate generated by filtering a raw water through a water treatment membrane, the water treatment membrane washing apparatus comprising:

an ozone gas supply unit configured to generate and supply an ozone gas through an ozone gas pipe;

a first ozone dissolving tank configured to store the filtrate or a stored filtrate mixed of the filtrate with a waste ozone gas, and to connect a waste ozone gas aspiration pipe aspirating the waste ozone gas;

a second ozone dissolving tank configured to store the filtrate;

a filtration pump connected with a filtration pipe connecting from the water treatment membrane to transport the filtrate to the second ozone dissolving tank, or to transport the filtrate outside the water treatment membrane washing apparatus;

a three way valve connected with a discharge side of the filtration pump to switch a flow path on the discharge side to a flow path to the second ozone dissolving tank or to a flow path outside the water treatment membrane washing apparatus;

a first circulation pump connected with the first ozone dissolving tank to circulate the stored filtrate in the first ozone dissolving tank, or to supply an ozone gas containing filtrate generated in the first ozone dissolving tank to the water treatment membrane;

a second circulation pump connected with the second ozone dissolving tank to circulate the stored filtrate in the second ozone dissolving tank, or to transport the stored filtrate generated in the second ozone dissolving tank to the first ozone dissolving tank;

a first three way valve connected with a discharge side of the first circulation pump to switch a flow path on the discharge side to a first circulation pipe returning to the first ozone dissolving tank or to a backwash water pipe connecting to the water treatment membrane;

a second three way valve connected with a discharge side of the second circulation pump to switch a flow path on the discharge side to a second circulation pipe returning the second ozone dissolving tank or to a pretreated filtrate pipe connecting to the first ozone dissolving tank;

a first aspirator provided to the first circulation pipe to mix the stored filtrate circulated from the first ozone dissolving tank, using the stored filtrate as a driving water, with the ozone gas aspirated from the ozone supply unit through the ozone gas pipe to generate the ozone gas containing filtrate;

a second aspirator provided to the second circulation pipe to mix the stored filtrate circulated from the second ozone dissolving tank, using the stored filtrate as a driving water, with the waste ozone gas aspirated from the first ozone dissolving tank through the waste ozone gas aspiration pipe connected from the first ozone dissolving tank;

a differential pressure gauge provided to the filtration pipe to measure a pressure difference across the water treatment membrane during a filtration; and

an ozone concentration meter attached to the first circulation pipe to measure a dissolved ozone concentration of the stored filtrate circulated,

wherein when a dissolved ozone concentration measured by the ozone concentration meter, of the stored filtrate in the first ozone dissolving tank,

reaches a pre-given value and a pressure measured by the differential pressure gauge increases from a pressure at a start of the filtration to a predetermined pressure, the ozone gas containing filtrate generated in the first ozone dissolving tank is passed by the first circulation pump from a secondary side of the water treatment membrane to a primary side of the water treatment membrane to wash the water treatment membrane.

3. A water treatment membrane washing apparatus that uses an ozone water generated by dissolving ozone gas in a filtrate generated by filtering a raw water through a water treatment membrane, the water treatment membrane washing apparatus comprising:

an ozone gas supply unit configured to generate and supply the ozone gas through an ozone gas pipe;

a first ozone dissolving tank configured to store a stored filtrate mixed of the filtrate with a waste ozone gas;

a second ozone dissolving tank configured to store the filtrate;

a filtration pump connected with a filtration pipe connecting from the water treatment membrane to transport the filtrate to the second ozone dissolving tank, or to transport the filtrate outside the water treatment membrane washing apparatus;

a three way valve connected with a discharge side of the filtration pump to switch a flow path of the discharge side to a flow path to the ozone dissolving tank or to a flow path outside the water treatment membrane washing apparatus;

a first backwash pump connected with the second ozone dissolving

tank to transport the stored filtrate generated in the second ozone dissolving tank to the first dissolving tank;

a first diffuser plate provided in the first ozone dissolving tank to discharge in a bubble state the ozone gas supplied from the ozone gas supply unit into the stored filtrate in the first ozone dissolving tank, to dissolve the ozone gas in the stored filtrate in the first ozone dissolving tank to generate the ozone gas containing filtrate;

a second diffuser plate provided in the second ozone dissolving tank to discharge in a bubble state the waste ozone gas from the first ozone dissolving tank into the stored filtrate in the second dissolving tank, to dissolve the waste ozone gas in the stored filtrate in the second dissolving tank to generate the stored filtrate;

a differential pressure gauge provided to the filtration pipe to measure a pressure difference across the water treatment membrane during a filtration;

an ozone concentration meter attached to the first ozone dissolving tank to measure a dissolved ozone concentration of the stored filtrate in the first dissolving tank; and

a second backwash pump connected with the first ozone dissolving tank to transport the ozone gas containing filtrate generated from the stored filtrate in the first ozone dissolving tank to the water treatment membrane,

wherein when a dissolved ozone concentration measured by the ozone concentration meter, of the stored filtrate in the first ozone dissolving tank, reaches a pre-given value and a pressure measured by the differential pressure gauge increases from a pressure at a start of the filtration to a

predetermined pressure, the ozone gas containing filtrate in the first ozone dissolving tank is passed by the second backwash pump from the secondary side of the water treatment membrane to the primary side of the water treatment membrane to wash the water treatment membrane.

4. A water treatment membrane washing method that uses an ozone water generated by dissolving an ozone gas in a filtrate generated by filtering a raw water through a water treatment membrane and uses the water treatment membrane washing apparatus as set forth in claim 1, the water treatment membrane washing method comprising:

a filtrate receiving step of receiving a filtrate filtered from the raw water to store the filtrate in a first or a second ozone dissolving tank by a filtration pump;

an ozone gas supplying step of supplying an ozone gas to a first or a second aspirator to mix a stored filtrate circulated from the first or the second ozone dissolving tank with the ozone gas, and of supplying, at the same time, a waste ozone gas generated in the second or the first ozone dissolving tank to the first or the second aspirator to mix the stored filtrate circulated from the first or the second ozone dissolving tank; and

an ozone water backwashing step of stopping the ozone gas supply from the ozone gas supply unit and washing the water treatment membrane by passing, by a first or a second circulation pump, the ozone gas containing filtrate generated in the first or the second ozone dissolving tank from a secondary side of the water treatment membrane to a primary side of the water treatment membrane when a dissolved ozone concentration measured

by an ozone concentration meter, of the stored filtrate in the first or the second ozone dissolving tank, reaches a pre-given value and a pressure measured by a differential pressure gauge increases from a pressure at a start of the filtration to a predetermined pressure.

5. A water treatment membrane washing method that uses an ozone water generated by dissolving an ozone gas in a filtrate generated by filtering a raw water through a water treatment membrane and uses the water treatment membrane washing apparatus as set forth in claim 2, the water treatment membrane washing method comprising:

a pretreated filtrate transporting step of transporting a stored filtrate generated in a second ozone dissolving tank to a first ozone dissolving tank by a second circulation pump;

a filtrate receiving step of receiving a filtrate filtered from the raw water to store the filtrate in the second ozone dissolving tank by a filtration pump;

an ozone gas supplying step of supplying an ozone gas to a first aspirator and of supplying, at the same time, a waste ozone gas generated in the first ozone dissolving tank to the second aspirator; and

an ozone water backwashing step of stopping the ozone gas supply from the ozone gas supply unit and washing the water treatment membrane by passing, by the first or the second circulation pump, the ozone gas containing filtrate generated in the first ozone dissolving tank from a secondary side of the water treatment membrane to a primary side of the water treatment membrane when a dissolved ozone concentration measured

by an ozone concentration meter, of the stored filtrate in the first ozone dissolving tank reaches a pre-given value and a pressure measured by a differential pressure gauge increases from a pressure at a start of the filtration to a predetermined pressure.

6. A water treatment membrane washing method that uses an ozone water generated by dissolving an ozone gas in a filtrate generated by filtering a raw water through a water treatment membrane and uses the water treatment membrane washing apparatus as set forth in claim 3, the water treatment membrane washing method comprising:

a pretreated filtrate transporting step of transporting a stored filtrate generated in a second ozone dissolving tank to the first ozone dissolving tank by a transport pump;

a filtrate receiving step of receiving a filtrate filtered from the raw water to store the filtrate in the second dissolving tank by a filtration pump;

an ozone gas supplying step of supplying an ozone gas to a first diffuser plate, and of supplying, at the same time, a waste ozone gas generated in the first ozone dissolving tank to a second diffuser plate; and

an ozone water backwashing step of stopping the ozone gas supply from the ozone gas supply unit and washing the water treatment membrane by passing, by a backwash pump, the ozone gas containing filtrate generated in the first ozone dissolving tank from a secondary side of the water treatment membrane to a primary side of the water treatment membrane when a dissolved ozone concentration measured by the ozone concentration meter, of the stored filtrate in the first ozone dissolving tank reaches a pre-given value

and a pressure measured by a differential pressure gauge increases from a pressure at a start of the filtration to a predetermined pressure.