CLAIMS

What is claimed is:

1. Device for desalination by liquid water jet compression, characterized in that the desalination device comprises:

- at least one latent heat exchanger having an evaporating inner surface, a condensing outer surface and a feeding system with an inlet for an aqueous solution or seawater (3) to be desalinated that is supplied to the evaporating inner surface where, under vacuum conditions, evaporates generating a primary saturated vapor (5),

- at least one water pressure pump (13) configured to provide a pressurized water flow (14) to at least one pressure nozzle (7) (25) which is configured to produce a liquid water jet (8) (26) that comes out and converts the potential energy in the form of pressure into kinetic energy that applied to the primary saturated vapor (5) gives rise to a secondary saturated vapor (16), having a higher pressure and temperature than the primary saturated vapor (5), that condenses on the condensing outer surface of the latent heat exchanger, and

- at least one obstacle-free vapor path (22) (24) from the evaporating inner surface to the condensing outer surface of the latent heat exchanger, through which the vapor flows at high speed and flow rate.

2. Desalination device according to claim 1, wherein the latent heat exchanger is a latent heat exchanger of tubes or chambers (1) located inside a shell (2), the evaporating inner surface of the tubes or chambers (1) of the latent heat exchanger is covered with microgrooves in which the seawater or the aqueous solution forms menisci (18) and evaporates generating the primary saturated vapor (5), wherein the secondary saturated vapor (16) is supplied to the condensing outer surface of the tubes or chambers (1) of the latent heat exchanger condensing and forming menisci (19) within the microgrooves or other capillary structure that cover the condensing outer surface of the tubes or chambers (1) of the latent heat exchanger and wherein a thermal energy path (20) between the latent heat released on the condensing outer surface and the latent heat absorbed on the evaporating inner surface is free of water layers.

3. Desalination device according to claim 2, wherein the at least one pressure nozzle (7) through which the liquid water jet (8) comes out at high speed and low pressure is configured to convert the potential energy in the form of pressure to translational kinetic energy in the form of velocity with the thrust necessary to entrain and propel the primary

saturated vapor (5), to which it provides speed, and which has been evaporated from the evaporating inner surface of the latent heat exchanger, into at least one vapor acceleration duct (9), creating a mixture (17) of liquid water and entrained vapor, the at least one pressure nozzle (7) is located inside or in the vicinity of the at least one vapor acceleration duct (9); wherein the at least one vapor acceleration duct (9) is inside a chamber (21) to which the primary saturated vapor (5) has access and has at least one inlet side port (22) through which the primary saturated vapor (5) can access inside the vapor acceleration tube (9) without obstacles, the latent heat exchanger comprising at least one diffuser and phase separation chamber (10) where the transformation of kinetic energy is completed in the form of velocity of the two-phase mixture (17), in potential energy in the form of an increase in water vapor pressure, generating the secondary saturated vapor (16) of higher pressure and temperature than the primary saturated vapor (5), wherein the diffuser and phase separation chamber (10) comprises at least one secondary vapor outlet (16) that is supplied to the condensation chamber (11) where it condenses on the condensing outer surface of the latent heat exchanger.

4. Desalination device according to claim 2, wherein the latent heat exchanger comprises at least one rotational kinetic energy supply tube (23) inside which there is the at least one pressure nozzle (25) that generates a tangential liquid water jet (26) to a flow of the primary saturated vapor (5), the tangential liquid water jet (26) does not suppling liquid water to a central part (24) of the vapor jet and providing rotational kinetic energy to the vapor jet creating a helical jet (27) that absorbs the rotational kinetic energy provided by the at least one tangential liquid water jet (26), wherein the rotational energy accumulated in the helical jet (27) is transformed into potential energy in the form of higher pressure and temperature of the secondary saturated vapor (16) that condenses on the condensing outer surface of the latent heat exchanger.

5. Desalination device according to claim 3, wherein the latent heat exchanger comprises at least one rotational kinetic energy supply tube (23) within which there is the at least one pressure nozzle (25) that generates a tangential liquid water jet (26) to a flow of the primary saturated vapor (5), the tangential liquid water jet (26) does not supplying liquid water to the central part (24) of the vapor jet and providing rotational kinetic energy to the vapor jet creating a helical jet (27) that absorbs the rotational kinetic energy provided by at least one liquid water jet (26), wherein the rotational energy accumulated in the helical jet (27) is transformed into potential energy in the form of higher pressure and temperature of the

secondary saturated vapor t (16)hat condenses on the condensing outer surface of the latent heat exchanger.

6. Desalination device according to claim 2, wherein the latent heat exchanger comprises:

a collection chamber (6) having at least one primary vapor (5) outlet tube (31) from the collection chamber (6) with a cross section similar or equal to a cross section of at least one secondary vapor (16) inlet tube (32) to the condensation chamber (11);

at least one expansion chamber (29) with a cross section greater than the at least one primary vapor (5) outlet tube (31) from the collection chamber (6) and with a cross section greater than the at least one secondary vapor (16) inlet tube (32) to the condensation chamber (11) and inside the expansion chamber the speed of the primary vapor flow (26) is reduced; and

at least one pressurized water injector (25) configured to generate the at least one pressurized water jet (8) in the direction of the vapor flow with drops that have a speed greater than the speed of the vapor flow, to which it supplies translational kinetic energy.

7. Desalination device according to claim 2, wherein the latent heat exchanger comprises:

a collection chamber (6) having at least one primary vapor (5) outlet tube (31) from the collection chamber (6) with a cross section similar or equal to a cross section of at least one secondary vapor (16) inlet tube (32) to the condensation chamber (11);

at least one expansion chamber (29) with a cross section greater than the at least one primary vapor (5) outlet tube (31) from the collection chamber (6) and with a cross section greater than the at least one secondary vapor (16) inlet tube (32) to the condensation chamber (11) and inside the expansion chamber the speed of the primary vapor flow (26) is reduced; and

at least one pressurized water injector (25) configured to generate the at least one pressurized water jet (26) tangential to the vapor flow, to which it supplies rotation and provides rotational kinetic energy.

8. Desalination device according to claim 6, wherein the at least one pressurized water injector (25) is configured to generate at least one pressurized water jet (8) tangential to the vapor flow, to which it supplies rotation and provides rotational kinetic energy.