The Automatic Freshwater Distillation System from Seawater Operated by Water Pressure

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The project aims to solve the shortage of freshwater for people in the coastal region and islands. The new point in this project is design a self-operating system of distillation of freshwater from seawater by solar energy and water pressure from sea waves energy. Here the solar energy is used to maintain the boiling and the sea waves to create the water pressure that controls the system. Research group had been investigated at some coastal regions (islands) in Nghe An province, Vietnam, which has Sun light radiated power ~ 500W/m2; amplitude of sea waves ~ 60cm, frequency ~ 0.75Hz. The people live there, who lack of freshwater and low living standard. These data and base theories of physic have been used to design and select technical parameters in the system. Experiments and measurements are executed on each module of the system to correct parameters and sizes of system. In order to speed up the evaporation and condensation of the water, we have designed the pressure reducer in the evaporation chamber and boost in the condenser, the seawater spray into the evaporation chamber in the form of a beam on heated plates. The concave spherical mirror rotates to the direction of the sunlight. The whole process is automatically operated by wave energy. Experimental results show that the system's distillation capacity is 9.5 liters per day. The difference between theory and experiment is about 48.6%.

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