

Default Module Solar Destillator

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Abstract

“Default Module Solar Destillator” comprehends for a system of distillation that uses solar energy to boil salt water, condense and catch it for a later human consume. The project’s principle of functionality is the boil of salt water of a reservoir (4) by the contact of a good heat conductor metal (2) that becomes warm by convergence of solar energy reflected directly upon it by a concave surface (2) (semi-cylinder or parabolic). The vapor condense going through a laminar box (8), or serpentine, which goes inside of the supply channel (7). Before this, the vapor could be conduced directly into a thermal pipeline (6) to a vapor or locomobile turbine (10), which connected on a generator (11), produce electric energy.

Keywords: solar destillator, desalinization, solar energy

Introduction of Invention

This module is an equipment that can be used in domestic or industrial purposes. The principle of functionality is the boil of sea water by the contact with inoxidable metal with satisfactory thermal conductivity. This metal gets warm by the convergence of solar energy reflected by the parabolic or semi-cylindrical mirrors, whose dimensions depends on the temperature required to keeps the water volume on the ebullition point; and than use this vapor to produce electric energy and/or to condense it and reserve for water provision.

The actual state of salt water’s desalinization techniques (distillation, electrodialise, reverse osmosis) present elevated economic costs and difficult techniques, like other techniques of electric generation by solar ways (warming by lens, solar collectors) and are objects of others patents.

The current invention has the objective to improve the efficiency and the construction viability of a default module of solar destillator using cheap materials and technology thoroughly national.

The desalinized water production capacity change according the dimensions of structures and thermal conductivity of the materials involved in the process, being dimensioned according to the local or regional hydrics demands.

In fact, due the demineralization of the final water, caused by distillation process, into it, must be added the minimal quantities of minerals recommended to human consume. This reposition can be regulated, sprinkling calculated quantities of the same provision water, after adequate filtrate and treatment, during the condense phase and improve it in addition.

The following description and the associated pictures, all gave for default example non-limitative, present schematically and elucidate the invention.

Figure 1 – Superior view of the Solar Destillator general arrangement

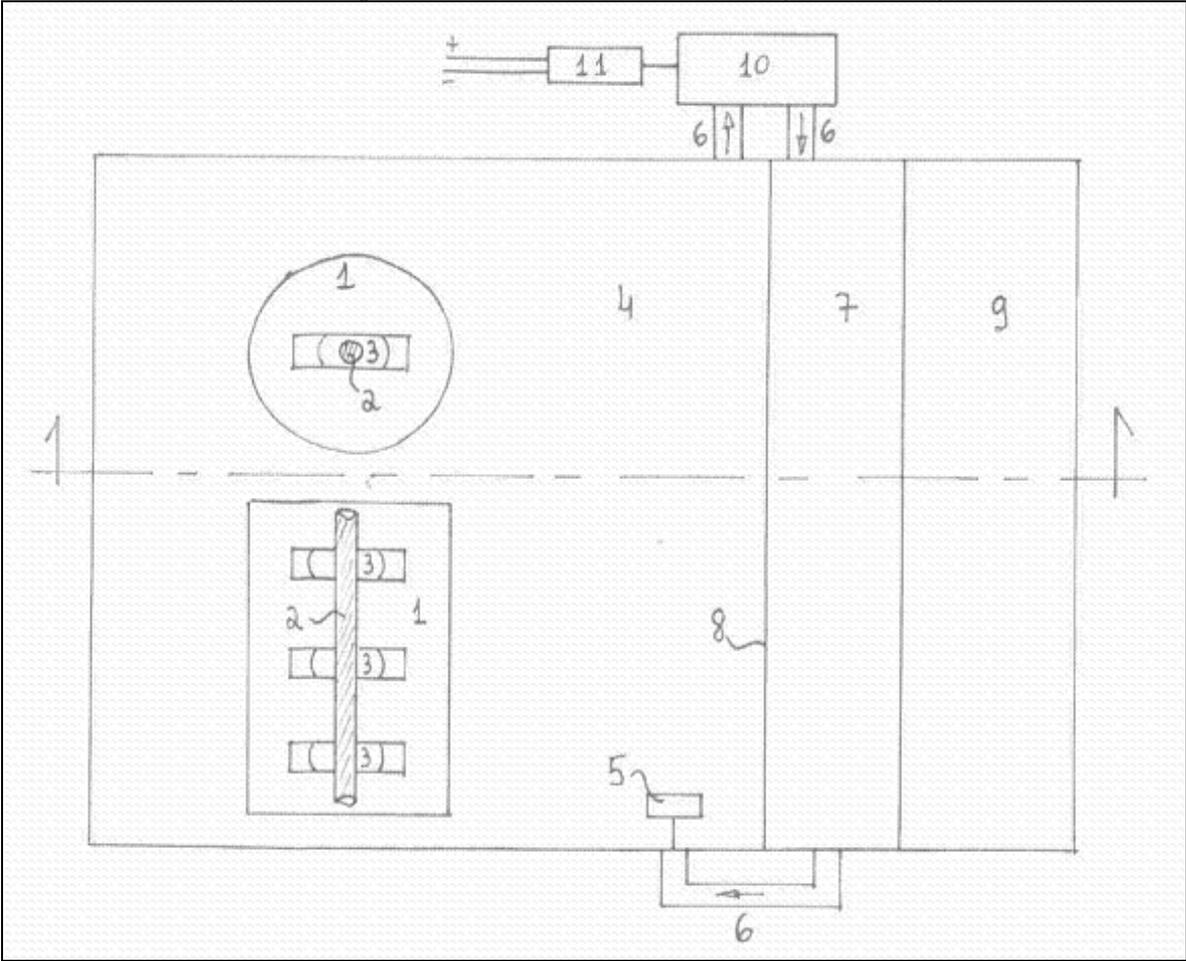
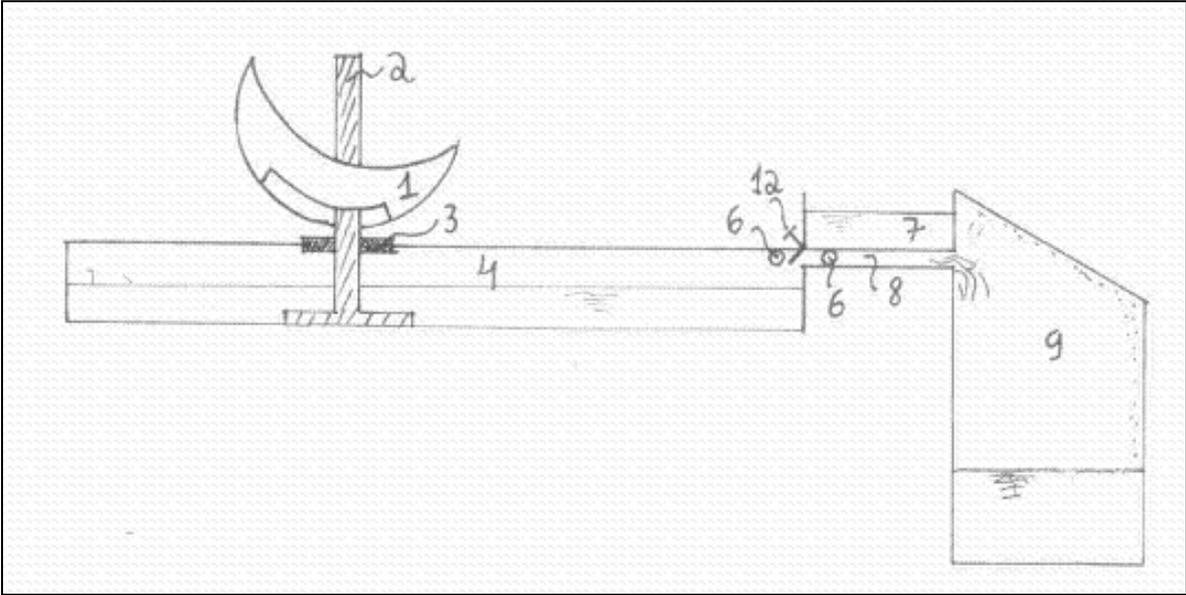


Figure 2 – Transversal View of the Solar Destillator



This equipment can be made by one or more parabolic or semi-cylindrical mirrors (1), with verticals or horizontal metal sheets (2), respectively, to transmit the heat, and the dimensions can be regulated to maxim efficiency by programming de mirrors, that turn around the metal sheet through a rectangular passage in your center, to follow the Sun movements.

Before the reflection and concentration of the solar energy on the metal sheet (2), the heat will be transmitted to de salt water, passing thought a ceramical material of low conductivity (3), that will permit the forbidden and/or the installation of a security valve between the reservoir (4) and the metal sheet (2), that should be technically dimensioned to keep the salt water in ebullition with a simultaneous influx of reposition at same quantity of the evaporated water. The influx is controlled by a metal ball (5) installed at the tabulation that comes from the supply channel (7), whose bottom can be the top of the laminar box (8), or by using a serpentine, perform this way to condensate the vaporized water, and a sprinkler could be installed to make the reposition of the salts, being technically dimensioned to condensate the total vapor, finishing in the final reservoir (9) whose shelter have to be inclined to easier concentrate the rest vapor and drain de possible water drops.

To generate electric energy the vapor should be canalized in a thermal pipeline (6) to a vapor or loco mobile turbine (10) connected on a generator (11), returning the pipeline to the condensator (8). In this case, the passage of the vapor between the ebullition reservoir (4) and the condensator (8) should be controlled by a lock gate (12).

The reservoir structures (4), (7) and (9) can be made with different geometric forms, and can be constructed by reinforced concrete with specific calculation to each case. And the laminar box (8) can be made by metal or reinforced concrete (except the serpentine), with specific calculation bases on the dimensions and the required thermal conductivity.

It be empirically estimated that the water production can be closer ten times higher than in a common solar destillator, that equivalent to $45 \text{ l/m}^2/\text{d}_{\text{sun}}$, but the energy generation can't be estimated yet.

