Claims

1. A cooling apparatus (100) for cooling a medium, which comprises:
   - an evaporation apparatus (104) for evaporating water;
   - a vacuum apparatus (108) for generating a subatmospheric pressure in an evaporation space (112) of the evaporation apparatus (104);
   - a loading apparatus (114) which comprises a loading space (116) which is fluidically connected to the evaporation space (112) of the evaporation apparatus (104) and is at least partly filled with an absorption medium for absorbing the evaporated water;
   - an unloading apparatus (122) by means of which the water absorbed by the absorption medium can be removed from the absorption medium and released into surroundings (134) of the cooling apparatus (100).

2. ~~The cooling apparatus (100) as claimed in claim 1, characterized in that~~, wherein the unloading apparatus (122) comprises an unloading space (120) in which the water absorbed by the absorption medium can be removed from the absorption medium, wherein the unloading space (120) is spatially separated from the loading space (116) of the loading apparatus (114), and

3. ~~The cooling apparatus (100) as claimed in claim 2, characterized in that~~ wherein the unloading space (120) has a higher pressure than the loading space (116) during cooling operation of the cooling apparatus (100),
   further wherein
   the higher pressure being, at least approximately the pressure of the surroundings (134) of the cooling apparatus (100).

4. The cooling apparatus (100) as claimed in ~~either~~ claim 1~~2 or 3~~, characterized in that the cooling apparatus (100) comprises a transport apparatus (118) for transporting the absorption medium from the loading space (116) to the

unloading space (120) and/or from the unloading space (120) to the loading space (116).

35. The cooling apparatus (100) as claimed in claim 24, characterized in that the cooling apparatus (100) comprises at least one lock device (126) through which the absorption medium can be transported from a subatmospheric pressure side (110) of the cooling apparatus (100), to which the evaporation space (112) and/or the loading space (116) is assigned, to a high-pressure side (128) of the cooling apparatus (100), to which the unloading space (120) is assigned.

46. The cooling apparatus (100) as claimed in either claim 24 or 35, characterized in that the cooling apparatus (100) comprises at least one lock device (126) through which the absorption medium can be transported from a high-pressure side (128) of the cooling apparatus (100), to which the unloading space (120) is assigned, to a subatmospheric pressure side (110) of the cooling apparatus (100), to which the evaporation space (112) and/or the loading space (116) is assigned.

57. The cooling apparatus (100) as claimed in ~~any of~~ claims 12 ~~to 6~~, characterized in that the cooling apparatus (100) comprises a transport apparatus (118) for transporting the absorption medium in a closed circuit (144).

6. The cooling apparatus (100) as claimed in any of claims 2 to 4, characterized in that the cooling apparatus (100) comprises the transport apparatus (118) for transporting the absorption medium in a closed circuit (144).

78. The cooling apparatus (100) as claimed in any of claims 1 to 67, characterized in that the cooling apparatus (100) comprises a water feed apparatus (106) for feeding liquid water to the evaporation apparatus (104).

89. The cooling apparatus (100) as claimed in any of claims 1 to 78, characterized in that the cooling apparatus (100) comprises at least one heat exchanger (102) by means of which heat can be transferred from a medium to be cooled to the

evaporation apparatus (104), in particular to the water to be evaporated in the evaporation apparatus (104).

9~~10~~. The cooling apparatus (100) as claimed in any of claims 1 to 8~~9~~, characterized in that the absorption medium comprises salt, aqueous salt solution, silica gel,

minerals, hydroxide, ionic liquid and/or zeolite or is formed by salt, aqueous salt solution, silica gel, minerals, hydroxide, ionic liquid and/or zeolite.

10~~11~~. The cooling apparatus (100) as claimed in any of claims 1 to 9~~10~~, characterized in that the cooling apparatus (100) comprises at least one degassing apparatus (138) for degassing the water to be fed to the evaporation apparatus (104) and/or at least one degassing apparatus (138) for degassing the absorption medium to be loaded with water.

11~~12~~. The cooling apparatus (100) as claimed in ~~any of~~ claims 1 or in any of claims 7 to 10 when dependent on claim 1~~to 11~~, characterized in that the vacuum apparatus (108) for generating the subatmospheric pressure in the evaporation space (112) of the evaporation apparatus (104) is formed by a transport apparatus~~device~~ (118) for transporting the absorption medium.

12. The cooling apparatus (100) as claimed in any of claims 2 to 6, or in any of claims 7 to 10 when dependent on claims other than claim 1, characterized in that the vacuum apparatus (108) for generating the subatmospheric pressure in the evaporation space (112) of the evaporation apparatus (104) is formed by the transport apparatus (118) for transporting the absorption medium.

13. The cooling apparatus (100) as claimed in any of claims 1 to 12, characterized in that the cooling apparatus (100) comprises at least one heat exchanger (130) by means of which heat can be transferred from an external heat source (132) to the absorption medium arranged in an unloading space (120).

14. A method for cooling a medium by means of a cooling apparatus (100), which comprises:

- application of subatmospheric pressure to an evaporation space (112) of an evaporation apparatus (104);

- introduction of liquid water into the evaporation space (112);
- evaporation of the water in the evaporation space (112);
- introduction of the evaporated water from the evaporation space (112) into a loading space (116) of a loading apparatus (114) which is fluidically connected to the evaporation space (112) and is at least partly filled with an absorption medium for absorbing the evaporated water;
- absorption of the evaporated water by means of the absorption medium;

- removal of the water absorbed by the absorption medium from the absorption medium and release of the water into surroundings (134) of the cooling apparatus (100)~~.~~,

further wherein

the removal of the water from the absorption medium takes place at a pressure, which is, at least approximately, the pressure of the surroundings (134) of the cooling apparatus (100).

15. The method as claimed in claim 14, characterized in that the absorption medium is, after absorption of the water, taken from the loading space (116) and introduced into an unloading space (120) of an unloading apparatus (122) of the cooling apparatus (100).

16. The method as claimed in either claim 14 or 15, characterized in that in order to remove the water absorbed by the absorption medium from the absorption medium, the absorption medium is heated to a temperature which exceeds the temperature of the medium to be cooled by means of the cooling apparatus (100) before the medium has been cooled.

17. The method as claimed in any of claims 14 to 16, characterized in that the absorption medium is cooled after removal of the water absorbed by the absorption medium from the absorption medium and/or before introduction of the absorption medium into the loading space (116).