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(54) METHOD AND DEVICE FOR OBTAINING WATER FROM AMBIENT AIR

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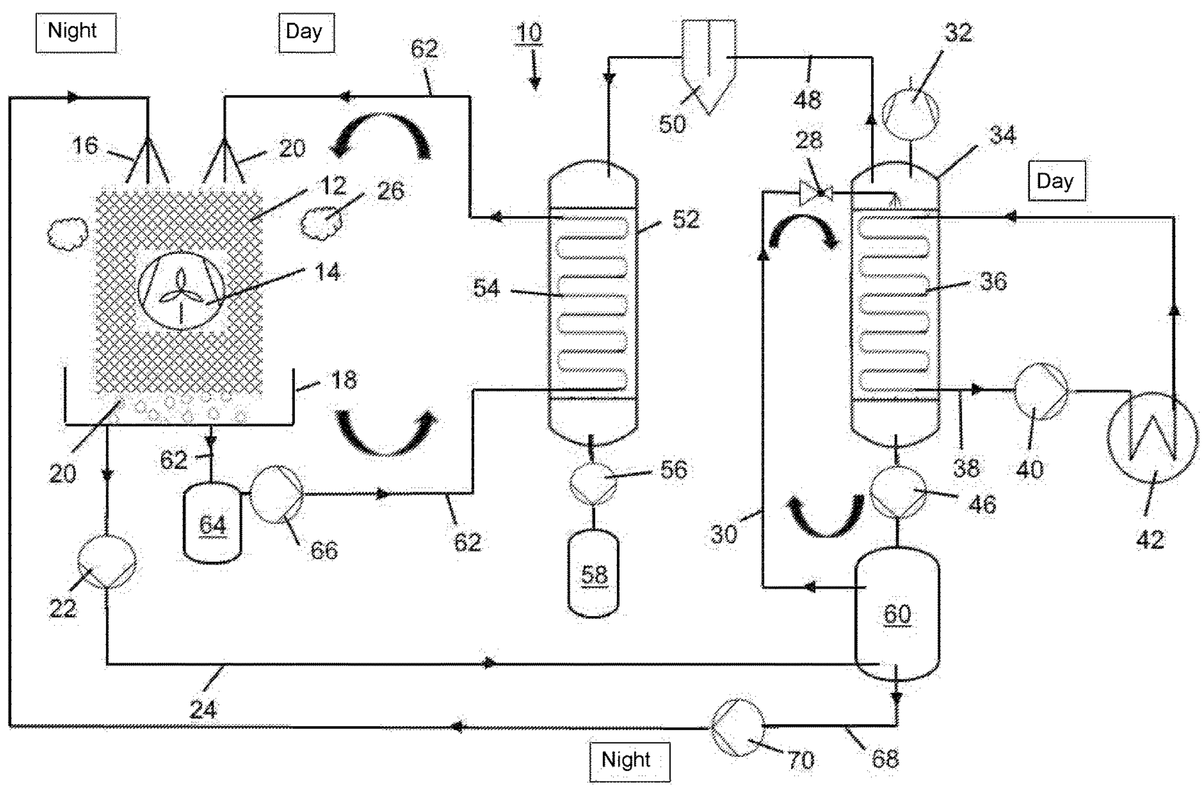
(57) ABSTRACT

A method for obtaining water from ambient air, wherein the method contains at least the following method steps: contacting the ambient air with at least one liquid absorbent for absorbing at least a part of the water contained in the ambient air; conveying an absorbent diluted by the absorbed water to a first heat exchanger; transferring the diluted absorbent into at least one desorption device. Therein, water desorbed in the desorption device is conveyed to the first heat exchanger, wherein cooling of the desorbed water is effected by means of the diluted absorbent by means of the first heat exchanger. Furthermore, disclosed is a device for obtaining water from ambient air.



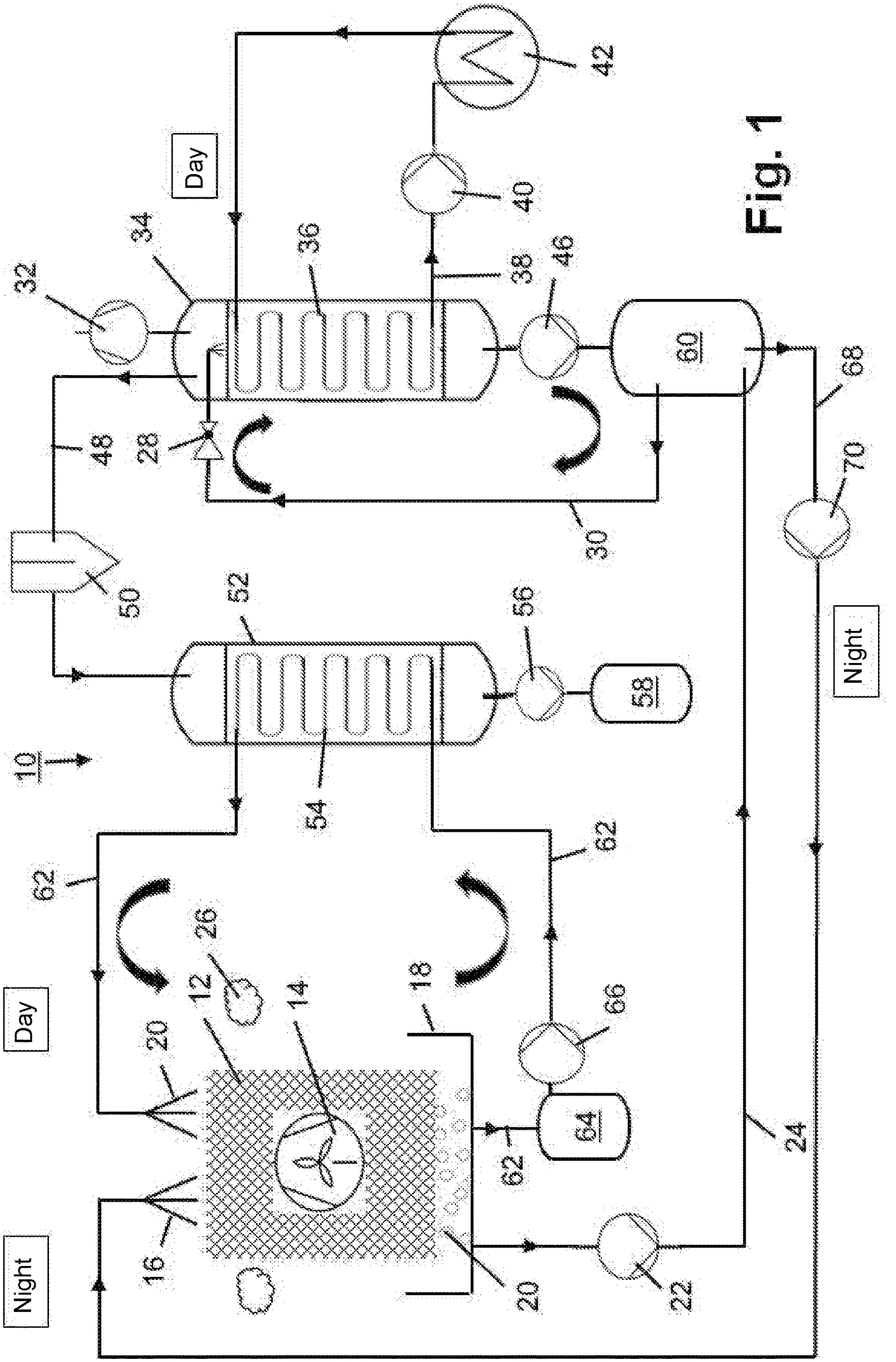

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Fig. 1

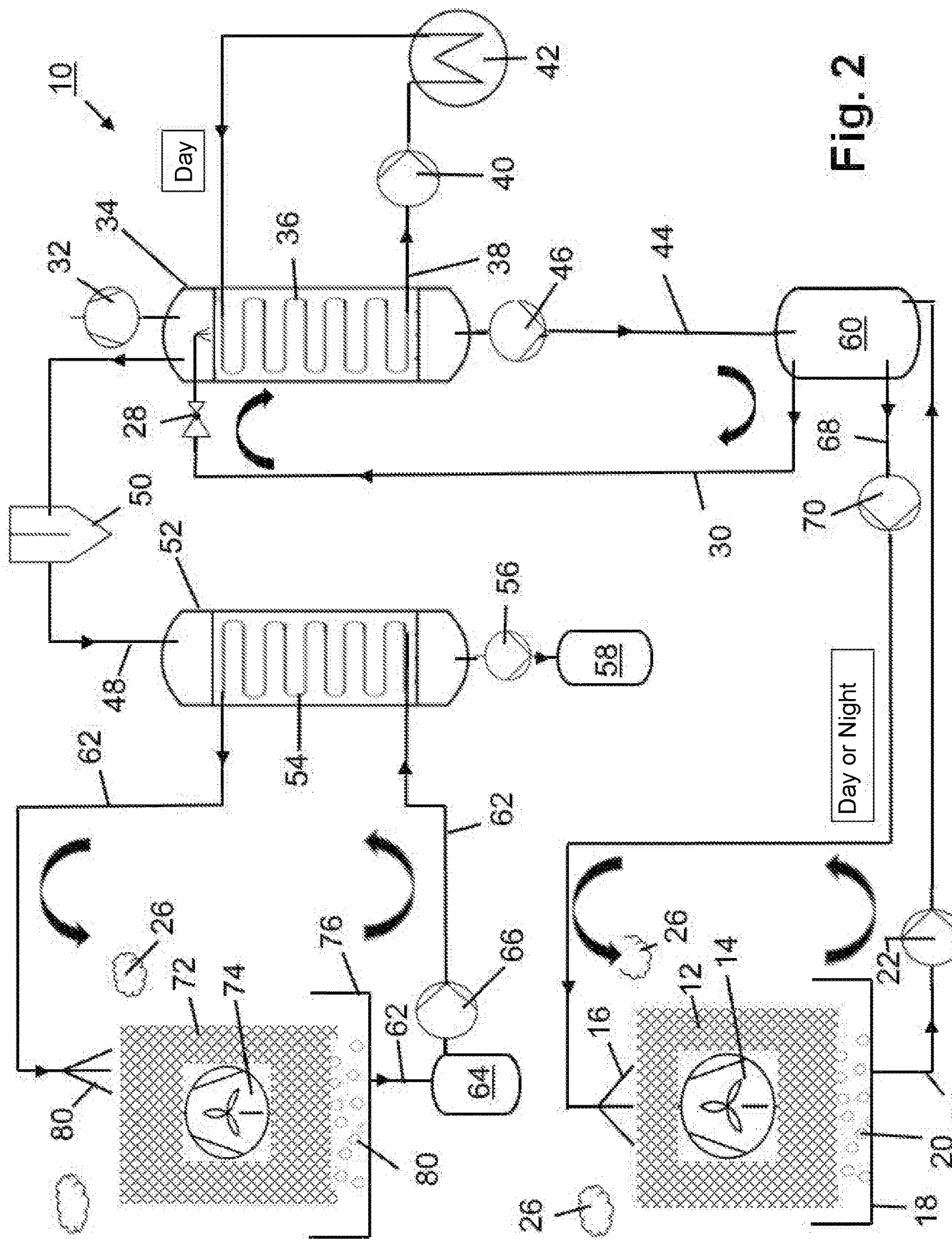
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Fig. 2

METHOD AND DEVICE FOR OBTAINING WATER FROM AMBIENT AIR

FIELD

[0001] The present invention relates to a method for obtaining water from ambient air. Furthermore, the invention relates to a device for obtaining water from ambient air.

BACKGROUND

[0002] Such methods and devices for obtaining water from ambient air are known in a great plurality. In particular, corresponding absorption methods are known from the air dehumidification technology. Therein, humidity from the air is absorbed in so-called liquid drying agents, for example in concentrated, hygroscopic salt solutions. A highly hygroscopic salt is e.g. lithium chloride. Subsequently, the water is partially again removed from the salt solution by heating, vacuum distillation, reverse osmosis or similar methods such that the solution can again be employed for dehumidifying the air. This method is for example industrially offered by the company Kathabar (see http://www.kathabar.com/liquid-desiccant/systen-features-benefits). Further systems, which are for example offered on the market under the designation "Ducool", conduct process air through a honeycombed structure, which is soaked with the salt solution, by means of a blower such that water vapor from the air is there absorbed from the cool and concentrated salt solution. A separate regeneration airflow is sent through the honeycomb structure soaked with the warm salt solution. Therein, a part of the water again evaporates from the salt solution and the water vapor is discharged from the regeneration air. The above presented methods can be used for the construction of an atmospheric water generator, wherein the aim of these methods is the air dehumidification and not obtaining liquid water from the ambient air. From WO 2009/135618 A1, a method and a device for obtaining water from the ambient air are known.

[0003] All of the above mentioned methods and devices disadvantageously have a very high energy input, in particular of electrical energy. If one would supply the known atmospheric water generators exclusively with regenerative energy, for example in desert regions, this would imply the necessity of a very large area of photovoltaic modules with correspondingly high cost per liter of the obtained water. Therefore, heat from the following sources was employed heretofore for the operation of the known plants with evaporation devices: combustion of fossil fuels, with the known disadvantages for the environment; conventional thermal solar modules, often even with vacuum tubes, to be able to achieve correspondingly high temperatures and with correspondingly high plant cost; as well as condensation heat in the method of the so-called mechanical vapor recompression, for which much electrical energy is in turn required.

[0004] DE 10 2013 013 214 A1 also describes a device for obtaining water from atmospheric air with a flowable sorbent for sorption of the water. In an evaporator, the absorbed water is withdrawn from the thus diluted sorbent by means of evaporation. Therein, the diluted sorbent is applied with negative pressure in the evaporator. Therein, at least one heat exchanger as a pre-heating unit is arranged in the sorption path. However, it is disadvantageous in this prior art that always an expensive, since corrosion-resistant, heat exchanger is used here as the pre-heating unit for the diluted sorbent.

[0005] The heat arising in the condensation of the water subsequent to the evaporation/distillation of the salt solution has to be discharged into the environment. Thereto, separate cooling devices arranged in the line system after the condenser are employed in conventional plants, which in turn increase the plant cost.

BRIEF SUMMARY

[0006] Therefore, it is the object of the present invention to provide a generic method and a generic device, which can be simpler and more inexpensively operated and produced, respectively, and require less energy input than known methods and devices.

[0007] A generic method according to the features of claim **1** as well as a device according to the features of claim **14** serve for solving these objects. Advantageous configurations with convenient developments of the invention are specified in the respective dependent claims, wherein advantageous configurations of the method are to be regarded as advantageous configurations of the device and vice versa.

[0008] A method according to the invention for obtaining water from ambient air includes at least the following method steps: supplying water vapor generated from a diluted liquid absorbent by at least one evaporator to a condenser, wherein the condenser includes at least one heat exchanger for condensing the water vapor; conveying at least one cooling medium to the heat exchanger and conveying the heated cooling medium exiting from the condenser to at least one device for large-area contacting the cooling medium with the ambient air for cooling the cooling medium by means of the ambient air. By the method according to the invention, cooling of the condenser without additional separate cooling devices is first ensured. In addition, the heated cooling medium is again supplied to the device for large-area contacting the cooling medium with the ambient air for cooling. Thereby, the method can be simply and inexpensively operated and requires a lower energy input than known methods. In advantageous configurations of the method according to the invention, the steps of supplying and conveying the cooling medium are performed multiple times with formation of a cooling circuit. In addition, there is the possibility that performing the steps of supplying and conveying the cooling medium multiple times is affected in a predetermined time interval, in particular in the daytime. Therein, the cooling of the cooling medium can be affected by spraying the cooling medium in the ambient air and/or by means of passing the ambient air through the device having a large surface.

[0009] Therein, any type of liquids with low vapor pressure is understood by the term "cooling medium".

[0010] In further advantageous configurations of the method according to the invention, the cooling medium is the absorbent diluted by the absorbed water of the ambient air, wherein at least a part of the diluted absorbent is supplied to the evaporator with or without interposition of a reservoir in at least one separate flow circuit. Advantageously, both the water absorbed from the ambient air can be supplied to the evaporator and the condenser can be cooled on the other hand by means of a solution. Thereby, the method according to the invention can be extremely inexpensively operated. Therein, the liquid absorbent can be at least one hygroscopic salt solution or a mixture of different hygroscopic salt solutions. Therein, any type of liquid drying agents is understood by the term “liquid absorbent”, which result in an absorption of at least a part of the water contained in the ambient air in the absorbent. The liquid absorbents can in particular be salt solutions such as for example a lithium chloride solution. Active conveyance for example by means of at least one pump, but also conveyance by means of gravity is understood by the term “conveying”. However, it is also possible that the cooling medium is a liquid with low vapor pressure, in particular an oil. This has the advantage that the heat exchanger arranged within the condenser can also be composed of not corrosion-resistant and thereby usually more inexpensive material. If the diluted absorbent is not used as the cooling medium, thus, it is conveyed in a flow circuit separate from the flow circuit of the diluted absorbent. Thus, undesired mixtures and contaminations, respectively, of the different media can be reliably avoided.

[0011] In further advantageous configurations of the method according to the invention, the diluted absorbent is supplied to the evaporator with or without interposition of a reservoir. Thereby, there is the possibility that the method according to the invention provides conveyance to and reception and storage of the diluted absorbent obtained from the ambient air in the at least one reservoir. Concentration of the diluted absorbent with obtainment of a concentrated absorbent is effected on the evaporation structure of the evaporator, wherein the concentrated absorbent can be supplied to device being in contact with the ambient air for large-area contacting the cooling medium with the ambient air—with or without interposition of a heat exchanger. Therein, the concentrated absorbent can be buffered in the reservoir and be supplied to the device, which then serves as an absorption structure, in a predetermined time interval, in particular at night. Advantageously, this configuration of the method according to the invention utilizes the different day and night temperatures for optimizing the method sequence, since the temperature difference between absorption and desorption is increased with increasing day-night temperature difference and thereby the water yield per volume unit of the salt solution increases and a lower salt concentration in the absorbent is required, respectively. However, both processes (absorption and desorption) can also be proceed in alternating or simultaneous manner in the daytime. Via the outflow and inflow of the diluted and/or concentrated absorbent to and from the reservoir as a buffer, the absorption and desorption cycle can be controlled.

[0012] In a further advantageous configuration of the method according to the invention, the cooling medium is transferred into at least one buffer downstream of the device for large-area contacting the ambient air with the cooling medium before conveying to the condenser. Thereby, the possibility of an individual, in particular time-dependent, control of the amounts of the cooling medium supplied to the condenser advantageously arises.

[0013] In a further advantageous configuration of the method according to the invention, at least a part of the desorbed water is removed from the system circuit via at least one suitable device in flow direction after the condenser. Thereby, it is avoided on the one hand that the water amount in the system continuously increases by the continuous condensation of water in the desorption device. In order that the water circuit does not overflow, at least a part of this desorbed water is removed continuously or at predetermined points of time.

[0014] The present invention further relates to a device for obtaining water from ambient air, wherein the device comprises at least one evaporator for generating water vapor from a diluted absorbent, at least one condenser in operative connection with the evaporator, wherein the condenser includes at least one heat exchanger for condensation of the water vapor, includes at least one conveying device for conveying a cooling medium to the heat exchanger for cooling the condenser and means for conveying the heated cooling medium exiting from the condenser to at least one device for large-area contacting the cooling medium with the ambient air for cooling the cooling medium by means of the ambient air. By the device according to the invention, cooling of the condenser without additional external and separately arranged cooling devices is first possible. In addition, the heated cooling medium is again supplied to the device for large-area contacting the cooling medium with the ambient air for cooling. Thereby, a very simple and inexpensive construction of the device arises on the one hand, which also requires a relatively low energy input for operation on the other hand. Therein, any type of liquids with low vapor pressure is again understood by the term “cooling medium”.

[0015] In further advantageous configurations of the device according to the invention, the cooling medium is a diluted absorption solution, wherein the device according to the invention comprises at least one separate flow circuit to the evaporator with or without interposition of a reservoir and at least a part of the diluted absorption solution is supplied to the evaporator. The absorption solution can again be at least one hygroscopic salt solution or a mixture of different hygroscopic salt solutions. By the device according to the invention, advantageously, both the water absorbed from the ambient air can be supplied to the evaporator and the condenser can be cooled on the other hand by means of a solution, namely the diluted absorption solution. Thereby, the device according to the invention can be extremely inexpensively operated. Therein, any type of liquid drying agents is understood by the term “liquid absorbent”, which result in absorption of at least a part of the water contained in the ambient air in the absorbent. The liquid absorbent can for example be lithium chloride solutions. However, there is also the possibility that the cooling medium is a liquid with low vapor pressure, in particular an oil. This in turn has the advantage that the heat exchanger arranged within the condenser can also be composed of not corrosion-resistant and thereby usually more inexpensive material. If the diluted absorbent is not used as the cooling medium, thus, the device according to the invention includes at least one flow circuit separate from a flow circuit of the diluted absorbent for conveying the cooling medium. Thus, undesired mixtures and contaminations, respectively, of the different media can be reliably avoided.

[0016] In a further advantageous configuration of the device according to the invention, it includes at least one buffer for the cooling medium downstream of the device for large-area contacting the cooling medium with the ambient air. Thereby, the possibility of an individual, in particular time-dependent, control of the amounts of the cooling medium supplied to the condenser advantageously arises.

[0017] In further advantageous configurations of the device according to the invention, the device comprises means for controlling conveyance of the cooling medium in a predetermined time interval. Thereby, the operation of the device according to the invention can be individually controlled and be adapted to the parameters to be encountered on site.

[0018] In a further advantageous configuration of the device according to the invention, the device includes at least one spray nozzle and/or at least one honeycomb structure and/or at least one absorption structure and/or at least one plate structure for large-area contacting the cooling medium with the ambient air. Other structures are also conceivable, wherein they also have to provide a cooling surface and/or absorption surface as large as possible on the one hand.

[0019] In a further advantageous configuration of the device according to the invention, the device includes at least one device for removing the desorbed water from the system circuit. Therein, this removing device can be arranged after the condenser. By the at least partial removal of the desorbed water, it is ensured that the water circuit in the device does not overflow on the one hand, the removed water can be used for other purposes on the other hand. Therein, the removal of the desorbed water can be affected continuously or at preset points of time.

BRIEF DESCRIPTION OF THE FIGURES

[0020] Further features of the invention are apparent from the claims, the embodiments as well as based on the drawings. The features and feature combinations mentioned above in the description as well as the features and feature combinations mentioned below in the embodiments are usable not only in the respectively specified combination, but also in other combinations without departing from the scope of the invention.

[0021] FIG. **1** is a schematic representation of a device according to the invention according to a first embodiment.

[0022] FIG. **2** is a schematic representation of a device according to the invention according to a second embodiment.

DETAILED DESCRIPTION

[0023] FIG. **1** shows a schematic representation of a device **10** for obtaining water from ambient air **26**. In the illustrated first embodiment, the device **10** includes a device (not illustrated) for outputting a liquid absorbent **16** onto an absorption structure **12**. In the illustrated first embodiment, the absorption structure **12** also represents a device for large-area contacting a cooling medium, as is explained in detail below. For applying or spreading the liquid absorbent **16**, a suitable pipe system with corresponding openings or valves or comparative spraying devices can be used. Therein, the liquid absorbent **16** is in particular distributed over an entire upper surface of the absorption structure **12** and thus soaks the absorption structure **12**. The absorbent **16** subsequently slowly flows into the lower areas of the absorption structure **12**, where it again flows out of it and is again collected by a trough system **18**. One recognizes that the absorption structure **12** is formed honeycombed in the illustrated embodiment. Thereby, a very large surface arises, on which an absorption of at least a part of the water contained in the ambient air can be affected. Therein, the absorption of the water from the ambient air **26** is affected in the liquid absorbent **16**, wherein the condensation heat arising thereby is immediately again emitted from the absorbent **16** to the ambient air **26** by the large surface of the honeycombed absorption structure **12**. By the absorption of water from the ambient air **26**, the liquid absorbent **16** is diluted and exits from the absorption structure **12** as diluted absorbent **20**.

[0024] In the illustrated embodiment, the ambient air **26** is large-area contacted with the liquid absorbent **16**. The liquid absorbent **16** is at least one hygroscopic salt solution or a mixture of different salt solutions. For example, a concentrated lithium chloride solution is used. Therein, the absorption structure **12** can be formed such that it can be arranged outdoors and can be passed by natural wind. Thereby, energy and plant cost can be saved since additional blowers are not required. However, if the natural wind conditions should not allow a sufficiently large flow of the ambient air **26** through the absorption structure **12**, corresponding auxiliary means, such as for example blowers **14**, can of course be additionally employed. The absorption structure **12** is to be selected with suitable permeability, suitable strength and suitable size. Such structures are for example available in a robust cardboard design protected against decomposition in very inexpensive manner and are nowadays for example used in the evaporative cooling of henhouses.

[0025] In the further description of the embodiment, the straight lines provided with arrows represent liquid lines, such as for example pipes or hoses, wherein the liquids used in the device flow in arrow direction. The pumping devices required thereto are known to the expert and only represented in one variant of implementation in the figure.

[0026] Among other things, it is a conveying device or pump **22** for conveying the absorbent **20** diluted by the absorbed water to an evaporator **34**. One recognizes that a reservoir **60** for buffering the diluted absorbent **20** is arranged in the line path between the pump **22** and the evaporator **34**. However, there is also the possibility that the diluted absorbent is directly supplied to the evaporator **34**. A valve **28** is arranged in flow direction after the reservoir **60**.

[0027] In addition, a heat exchanger **36** is arranged in the evaporator **34**, which is connected to a solar module **42** via a line system **38** in liquid conducting manner. Other heat transferring systems can also be arranged in the evaporator **34**. A heat transfer liquid moved by means of a pump **40** circulates in the line system **38**. Hereto, the solar module **42** comprises a line system, which can be composed of an ideally corrosion-resistant material, in particular plastic. Heating and/or evaporation of at least a part of the water contained in the diluted absorbent **20** heated by the solar module **42** are affected by means of the heat exchanger **36**.

[0028] The evaporator **34** is connected to the reservoir **60** via a line system **44** in liquid conducting manner. The reservoir **60** also serves for receiving the now concentrated absorbent. Hereto, the reservoir **60** is for example formed as a layer storage such that mixture of the diluted absorbent **20** with the now concentrated absorbent **16** does not occur. It is indicated by the semi-circular arrows that a circuit for the diluted and later concentrated absorbent, respectively, results by this construction. Via passage of the circuit including reservoir **60** and evaporator **34** multiple times, there results a high yield of water vapor as well as a further concentrated absorbent. Per circulation, the yield of water vapor from the absorbent can be ca. 5 to 10%. The mentioned circuit is in particular performed in the daytime since the solar module **42** can here be particularly efficiently operated. At night, that is at usually lower temperatures, the concentrated absorbent can then again be introduced into the absorption structure **12** via a pump **70** and a line system **68** arranged between the reservoir **60** and the absorption structure **12** in liquid conducting manner such that water can again be absorbed by the absorbent **16** and thereby the diluted absorbent **20** arises, which is again collected in the collecting container **18**.

[0029] Furthermore, one recognizes that the evaporator **34** is connected to a condenser **52** via a line system **48** in medium conducting manner. In addition, a droplet separator **50** is arranged between the evaporator **34** and the condenser **52**. The droplet separator **50** reliably separates the particles such as for example salt particles arisen in the evaporator **34** and carried along by the arisen water vapor still before entry of the water vapor in the condenser **52**. The condenser **52** includes a heat exchanger **54**, which serves for cooling the condenser **52** and thereby also for increase of the condensation of the introduced water vapor. Other heat transferring systems can also be arranged in the condenser **52**. One recognizes that the heat exchanger **54** is connected to a line system **62**. The diluted absorbent **20** is at least partially passed through the heat exchanger **54** via the line system **62** and a pump **66** arranged therein. After exit from the condenser **52**, the diluted absorbent **20** is again conducted via the absorption structure **12**. Since the temperature of the diluted absorbent **20** is considerably lower than the temperature within the condenser **52**, cooling of the condenser **52** is affected via the heat exchanger **54**. The diluted absorbent **20** heated after exit from the condenser **52** is then again cooled via the absorption structure **12**. In addition, there is the possibility that the absorbent **20** absorbs further amounts of water from the ambient air **26**. In the illustrated embodiment, a collecting container **64** is formed before the pump **66**. Thereby, in particular the amounts of diluted absorbent **20**, which are supplied to the condenser **52**, can be regulated. Furthermore, one recognizes that the diluted absorbent **20** can circulate multiple times in the line system **62** and the absorption structure **12**. This is indicated in FIG. **1** by the corresponding semi-circular arrows.

[0030] This cooling operation is predominantly performed in the daytime according to the shown embodiment, since here the temperature difference between the diluted absorbent **20** and the water obtained by the condenser **52** is highest.

[0031] The condensed water is conducted out from the condenser **52** and received in a downstream collecting container **58**. The removal of the water can be controlled via a pump **56**. The thus obtained water can be removed from the collecting container **58** by means of suitable devices.

[0032] Furthermore, one recognizes that a negative pressure for assisting the supply of the evaporated water to the condenser **52** and for assisting the evaporation of the heated, diluted absorbent **20** is provided within the evaporator **34** as well as within the condenser **52** by means of a negative pressure device **32**.

[0033] In addition, the device **10** comprises means for controlling conveyance of the liquid, diluted absorbent or the cooling medium **20** in a predetermined time interval to predetermined elements of the device **10**. Thereby, the water obtaining process can be optimally adapted to the environmental conditions, in particular the temperature conditions. For example, both the absorption and the desorption of the water from the ambient air **26** can proceed in the daytime in alternating or simultaneous manner. All of the mentioned pumps would then run at the same time. In order to avoid high heat losses in this case, at least one heat exchanger for heat recovery can then be arranged in the flow and return of the absorbent **16**, **20** in the absorption circuit. For example, there is the possibility of arranging a heat exchanger in the line system between the evaporator **34** and a reservoir for receiving and storing the concentrated absorbent coming from the evaporator. This heat exchanger would then for example be in operative connection with a further line system, which originates from a second reservoir for receiving the relatively cool diluted absorbent (not illustrated). Thereby, a relatively inexpensive approach of pre-heating the diluted absorbent to be introduced into the evaporator arises.

[0034] In order to produce drinking water from the desorbed water, a filter and disinfecting process and a mineralizing process, respectively, optionally have to be arranged downstream. These processes correspond to the prior art. It is pointed out that the concentrated absorbents and salt solutions, respectively, proposed in the present invention already have a highly disinfecting effect. For convenience, the mineralization of the water obtained from the air could occur in that the water is passed through a gravel bed.

[0035] FIG. **2** shows a schematic representation of a device **10** for obtaining water from ambient air **26** according to a second embodiment. Basically, the device **10** according to the second embodiment is formed as the device **10** according to the first embodiment. Insofar, identical reference characters in FIG. **2** denote the corresponding identical features in FIG. **1**. In contrast to the first embodiment illustrated in FIG. **1**, the device **10** here comprises two separated circuits for a cooling medium **80** and the diluted liquid and the concentrated absorbent **20**, **16**. This is in particular caused in that the cooling medium **80** is an oil in the illustrated embodiment, which is not to mix with the diluted absorbent **20**. One recognizes that the diluted absorbent **20** is again collected in a collecting system **18** and is diluted with water from the ambient air **26** by spraying or passing the concentrated liquid absorbent via the absorption structure **12**. The diluted absorbent is again supplied to the evaporator **34** with interposition of the reservoir **60** via the line system **24** and the pump **22** arranged therein. The diluted absorbent **20** is heated and evaporated in the evaporator **34** via the heat exchanger **36** formed in the evaporator **34**, which is arranged in the line system **38** of the solar module **42**. The concentrated absorbent **16** is again supplied to the absorption structure **16** via a line system **44** and a pump **46** arranged therein with interposition of the reservoir **60** and the line system **68** originating therefrom and the pump **70** arranged therein.

[0036] A second circuit, namely a cooling circuit for the condenser **52** is formed by the line system **62** and the pump **66** arranged therein as well as the heat exchanger **54** arranged in the condenser **52**. One recognizes that the cooling medium **80** is used for cooling the condenser **52** in the mentioned circuit and by flowing through the heat exchanger **54**. The cooling medium **80**, namely an oil in the illustrated embodiment, is again passed via the device **72** via the line system **62**, wherein the cooling medium **80** is cooled by means of the ambient air **26** in the device **72**. For intensifying this effect, a blower **74** is arranged in the area of the device **72** in the illustrated embodiment. The thus cooled cooling medium **80** is collected in a collecting container **76** and, if required, supplied to the line system **62**. In the line system **62**, a collecting container **64** is again arranged, wherein the amount of cooling medium **80**, which is to be supplied to the heat exchanger **54**, can be controlled by the collecting container **64** among other things.

[0037] It is to be clarified at this place that the term "water vapor" describes the gaseous aggregate state of water and not a mixture of air and water droplets.

1-22. (canceled)

23. A method for obtaining water from ambient air, wherein the method comprises:

supplying water vapor generated from a diluted liquid absorbent by at least one evaporator to a condenser, wherein the condenser includes at least one heat exchanger for condensing the water vapor;

conveying at least one cooling medium to the at least one heat exchanger; and

conveying a heated cooling medium exiting from the condenser to at least one device for large-area contacting of the heated cooling medium with the ambient air for cooling the heated cooling medium by means of the ambient air.

24. The method according to claim **23**, wherein the steps of supplying the water vapor, conveying the at least one cooling medium and conveying the heated cooling medium are performed multiple times with formation of a cooling circuit.

25. The method according to claim **24**, wherein performing the steps of supplying the water vapor, conveying the at least one cooling medium and conveying the heated cooling medium multiple times is effected in a predetermined time interval, in particular in the daytime.

26. The method according to claim **23**, wherein the cooling of the heated cooling medium is effected by spraying the heated cooling medium in the ambient air and/or by means of passing the ambient air through the at least one device.

27. The method according to claim **23**, wherein the at least one cooling medium is the diluted liquid absorbent diluted by absorbed water of the ambient air, wherein at least a part of the diluted liquid absorbent is supplied to the at least one evaporator in at least one separate flow circuit with or without interposition of a reservoir.

28. The method according to claim **27**, wherein the diluted liquid absorbent is at least one hygroscopic salt solution or a mixture of different hygroscopic salt solutions.

29. The method according to claim **23**, wherein the at least one cooling medium is a liquid with low vapor pressure, in particular an oil.

30. The method according to claim **29**, wherein the at least one cooling medium is conveyed in a flow circuit separate from a flow circuit of the diluted liquid absorbent.

31. The method according to claim **30**, wherein the diluted liquid absorbent is supplied to the at least one evaporator with or without interposition of a reservoir.

32. The method according to claim **27**, wherein a concentration of the diluted liquid absorbent is effected in the at least one evaporator with obtaining a concentrated absorbent, wherein the concentrated absorbent is supplied to the at least one device for large-area contacting of the concentrated absorbent with the ambient air, wherein the at least one device serves as an absorption structure.

33. The method according to claim **32**, wherein the concentrated absorbent is buffered in the reservoir and is supplied to the at least one device with or without interposition of a heat exchanger in a predetermined time interval, in particular at night.

34. The method according to claim **23**, wherein the heated cooling medium is transferred into at least one buffer downstream of the at least one device before conveying to the condenser.

35. The method according to claim **23**, wherein at least a part of desorbed water is removed from a system circuit via at least one suitable device in flow direction after the condenser.

36. A device for obtaining water from ambient air comprising:

at least one evaporator for generating water vapor from a diluted liquid absorbent;

at least one condenser in operative connection with the at least one evaporator, wherein the at least one condenser includes at least one heat exchanger for condensation of the water vapor;

at least one conveying device for conveying a cooling medium to the at least one heat exchanger for cooling the at least one condenser; and

means for conveying heated cooling medium exiting from the at least one condenser to at least one device for large-area contacting of the heated cooling medium with the ambient air for cooling the heated cooling medium by means of the ambient air.

37. The device according to claim **36**, wherein the cooling medium is a liquid absorbent diluted by absorbed water of the ambient air and the device includes at least one separate flow circuit to the at least one evaporator with or without interposition of a reservoir, wherein at least a part of the diluted liquid absorbent is supplied to the at least one evaporator.

38. The device according to claim **37**, wherein the liquid absorbent is at least one hygroscopic salt solution or a mixture of different hygroscopic salt solutions.

39. The device according to claim **36**, wherein the cooling medium is a liquid with low vapor pressure, in particular an oil.

40. The device according to claim **39**, wherein the device includes at least one flow circuit separate from a flow circuit of the diluted liquid absorbent for conveying the cooling medium.

41. The device according to claim **36**, wherein the device includes at least one buffer for the cooling medium downstream of the at least one device for large-area contacting of the heated cooling medium with the ambient air.

42. The device according to claim **36**, wherein the device includes means for controlling conveyance of the cooling medium in a predetermined time interval.

43. The device according to claim **36**, wherein the device includes at least one device for removing desorbed water from a system circuit.

44. The device according to claim **36**, wherein the at least one device for large-area contacting of the heated cooling medium with the ambient air includes at least one spray nozzle and/or at least one honeycomb structure and/or at least one absorption structure and/or at least one plate structure.

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