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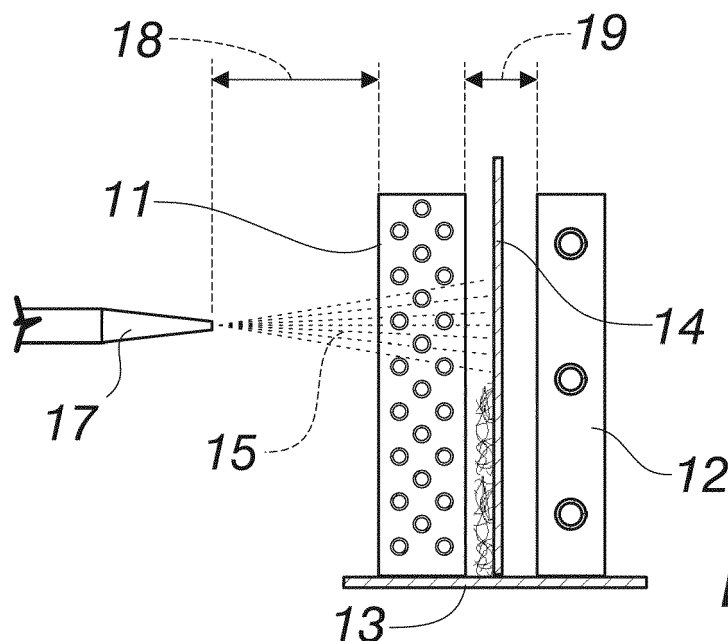
(54) **Method for washing two side-by-side heat exchange batteries**

(57) A method for washing two side-by-side heat exchange batteries, comprising the steps of:

- interposing between two heat exchange batteries (11, 12) a plate (14) for blocking a washing jet (15), the plate being adapted to allow a washing jet (15) to pass through a first battery without affecting the second battery,
- washing with a jet of water under pressure (15) a first battery (11), the jet being directed from the outside of the

first battery (11) through the first battery (11) and against the blocking plate (14),

- washing with a jet of water under pressure (16) the second battery (12), the jet being directed from the outside of the second battery (12) through the second battery (12) and against the blocking plate (14),
- blowing air onto the washed batteries (11, 12) in order to remove the water remaining on the batteries.



**Fig. 2**

## Description

**[0001]** The present invention relates to a method for washing two side-by-side heat exchange batteries.

**[0002]** Nowadays, in order to cool an environment by way of refrigerated water conditioners (fan coils), such conditioners are supplied with transfer fluid, typically water or water additivated with glycol, circulating from refrigerating machines of the type known as 'chillers'.

**[0003]** The plumbing apparatuses for such cooling machines have, on a same line, pumping means that are adapted to push a transfer fluid through an exchanger for refrigerating the transfer fluid, which is nothing more than the evaporator of an associated refrigeration system for cooling water.

**[0004]** A similar type of system also has what is known as a 'free cooling' device, for said transfer fluid.

**[0005]** Nowadays the need is increasingly felt to reduce the energy consumption, as well as the pollutant emissions, that are necessary in order to cool a flow of water intended to pass through a refrigerator for a climate control system.

**[0006]** With such objective, technical solutions are today being studied in which an external flow of air passes through, one after the other, a battery for pre-freecooling the water in input to the evaporator of the climate control system, and a condensing battery of the condenser of said evaporator; by arranging the two heat exchange batteries side by side at a short distance, it is estimated that it is possible to achieve significant advantages in energy savings.

**[0007]** A major drawback of arranging side-by-side such two heat exchange batteries is constituted by the fact that over time both are subjected to deposits of dust, waste and dirt which are brought by the external air.

**[0008]** Such dust and waste is deposited both on the batteries and between the batteries, rendering the washing thereof very difficult, in particular because both of the batteries are supported by a same plate or supporting frame.

**[0009]** The aim of the present invention is to provide a method for washing two side-by-side heat exchange batteries, which is capable of achieving the cleaning of such side-by-side batteries in a short time and at low cost.

**[0010]** Within this aim, an object of the invention is to provide a method that is simple and practical, which can be employed without having to dismount the batteries from their common support.

**[0011]** Another object of the invention is to provide a method that can be obtained with conventional devices and technologies.

**[0012]** This aim and these and other objects which will become better evident hereinafter are achieved by a method for washing two side-by-side heat exchange batteries, characterized in that it comprises the steps of:

- interposing between two heat exchange batteries a plate for blocking a washing jet, the plate being

adapted to allow a washing jet to pass through a first battery without affecting the second battery,

- washing with a jet of water under pressure a first battery, the jet being directed from the outside of the first battery through said first battery and against the blocking plate,
- washing with a jet of water under pressure the second battery, the jet being directed from the outside of the second battery through said second battery and against the plate,
- blowing air onto the washed batteries in order to remove the water remaining on said batteries.

**[0013]** Further characteristics and advantages of the invention will become better apparent from the description of a preferred, but not exclusive, embodiment of the method of washing according to the invention, which is illustrated by way of non-limiting example in the accompanying drawings wherein:

- Figure 1 shows two side-by-side heat exchange batteries to which a method according to the invention is applied;
- Figure 2 shows a first step of the method according to the invention;
- Figure 3 shows a second step of the method according to the invention.

**[0014]** With reference to the figures, a method for washing two side-by-side heat exchange batteries, 11 and 12 in the figures, comprises the following steps:

- interposing between two heat exchange batteries 11 and 12, for example supported by a same supporting slab 13, a plate 14 for blocking a washing jet 15; the plate 14 is adapted to allow a washing jet 15 to pass through a first battery, for example 11, without affecting the second battery 12,
- washing with a jet of water under pressure 15 a first battery 11, as in Figure 2, the jet 15 being directed from the outside of the first battery 11 through the said first battery 11 and against the plate 14,
- washing with a jet of water under pressure 16 the second battery 12, the jet 16 being directed from the outside of the second battery 12 through the said second battery 12 and against the plate 14,
- blowing air onto the washed batteries 11 and 12 in order to remove the water remaining on the said batteries.

**[0015]** Such washing steps can be achieved with a jet of water under pressure, executed for example with a cleaning lance, which is shown schematically in the figures with the reference numeral 17.

**[0016]** The injection of air results in the removal of the water droplets which have enveloped the residual dirt inside them.

**[0017]** The washing steps are performed by placing

the nozzle of the cleaning lance 17 at a distance 18 of between 5 centimeters and 50 centimeters.

[0018] Advantageously the washing steps are performed by placing the nozzle of the cleaning lance 17 at a distance 18 of approximately 20 centimeters.

[0019] The heat exchange batteries are mutually spaced by a distance 19 of between 1 centimeter and 20 centimeters.

[0020] The distance 19 between the batteries is preferably of approximately 2 centimeters.

[0021] The step of injecting air in order to dry the batteries 11 and 12 can be performed with an air compressor.

[0022] The first battery 11 is for example of the type for pre-freecooling the water in input to an evaporator of a climate control system, and the second battery 12 has for example a condensing function for a condenser of the said evaporator.

[0023] If, for example, the external air 20, as in Figure 1, passes first through the first battery 11 and then subsequently the second battery 12, then the said first battery 11 is washed in parallel with the airflow, i.e. the jet of water 15 is substantially in the same direction as the direction of the passage of air 20 through the said first battery 11; the second battery 12, on the other hand, is washed in the opposite direction.

[0024] In practice it has been found that the invention fully achieves the intended aim and objects.

[0025] In particular, with the invention a method for washing two side-by-side heat exchange batteries has been devised which is capable of achieving the cleaning of such side-by-side batteries in a short time and at low cost, thanks to the interposition of the blocking plate between the two batteries which are left on the supporting slab.

[0026] With the invention a method has been devised which is simple and practical, and can be used without having to dismount the batteries from their common support, with all the advantages in terms of saving time and labor which follow from this.

[0027] Last but not least, with the invention a method has been devised which can be obtained with conventional devices and technologies.

[0028] The invention, thus conceived, is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims. Moreover, all the details may be substituted by other, technically equivalent elements.

[0029] In practice the materials employed, provided they are compatible with the specific use, and the contingent dimensions and shapes, may be any according to requirements and to the state of the art.

[0030] The disclosures in Italian Patent Application No. PD2013A000290 from which this application claims priority are incorporated herein by reference.

[0031] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increas-

ing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

## Claims

1. A method for washing two side-by-side heat exchange batteries, **characterized in that** it comprises the steps of:

- interposing between two heat exchange batteries (11, 12) a plate (14) for blocking a washing jet (15), said plate being adapted to allow a washing jet (15) to pass through a first battery without affecting the second battery,
- washing with a jet of water under pressure (15) a first battery (11), the jet being directed from the outside of the first battery (11) through said first battery (11) and against said blocking plate (14),
- washing with a jet of water under pressure (16) the second battery (12), the jet being directed from the outside of the second battery (12) through said second battery (12) and against the blocking plate (14),
- blowing air onto the washed batteries (11, 12) in order to remove the water remaining on said batteries.

2. The method according to claim 1, **characterized in that** said washing steps are performed with a jet of water under pressure (15, 16) executed with a cleaning lance (17).

3. The method according to the preceding claims, **characterized in that** said washing steps are performed by placing the nozzle of the cleaning lance (17) at a distance (18) of between 5 centimeters and 50 centimeters.

4. The method according to the preceding claim, **characterized in that** said washing steps are performed by placing the nozzle of the cleaning lance (17) at a distance (18) of approximately 20 centimeters.

5. The method according to the preceding claims, **characterized in that** said heat exchange batteries (11, 12) are mutually spaced by a distance (19) of between 1 centimeter and 20 centimeters.

6. The method according to the preceding claims, **characterized in that** said heat exchange batteries are mutually spaced by a distance (19) of approximately 2 centimeters.

7. The method according to the preceding claims, **char-**

**acterized in that** the step of injecting air in order to dry the batteries is performed with an air compressor.

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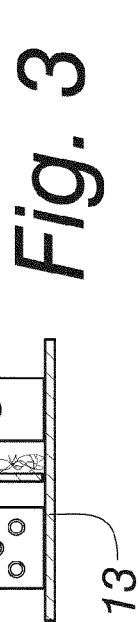
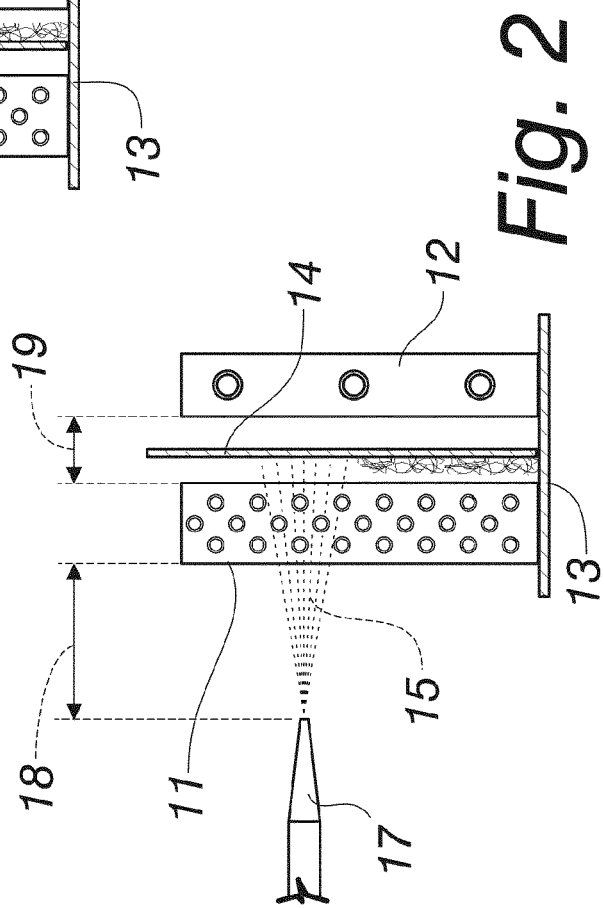
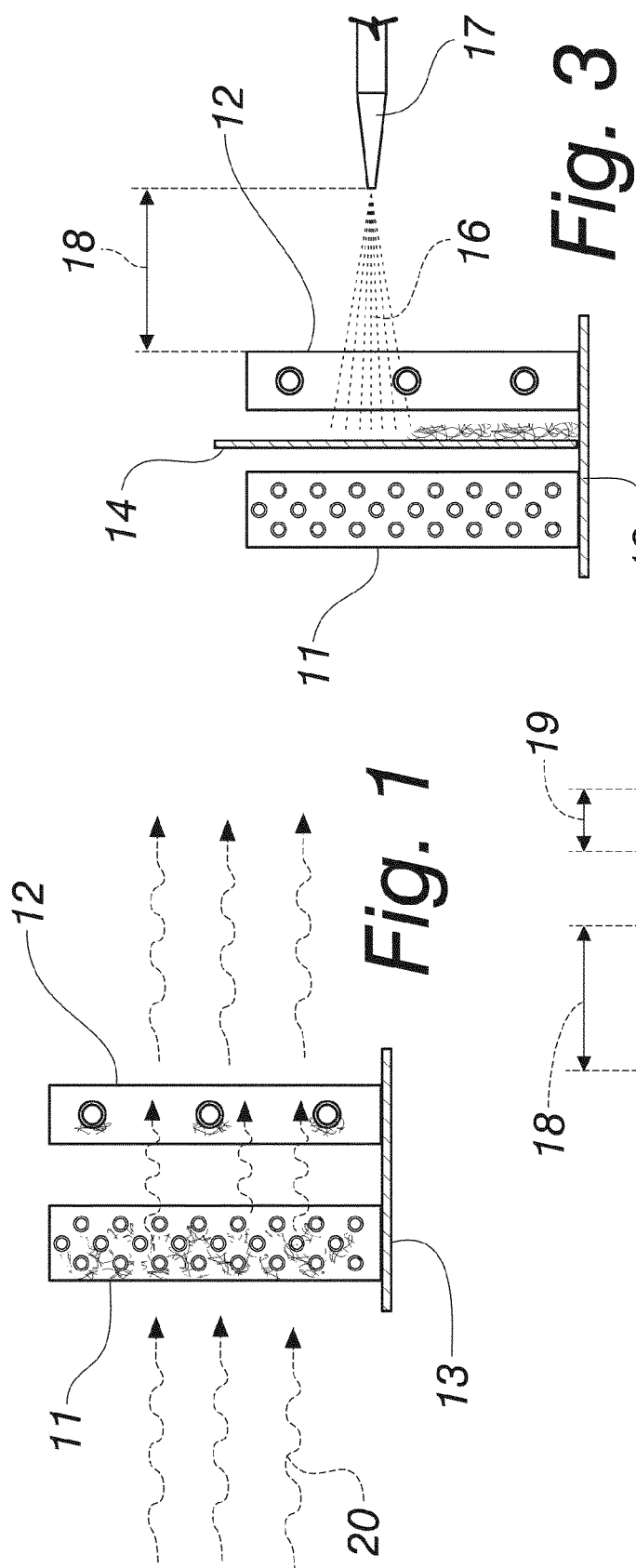
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## EUROPEAN SEARCH REPORT

Application Number  
EP 14 18 9922

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 892 567 A (METALLGESELLSCHAFT AG) 28 March 1962 (1962-03-28)	1,3-7	INV. F28G1/16 B08B3/02 F28G9/00 F28D1/04
Y	* page 2, line 104 - page 3, line 18; figure 2 *	2	
A	GB 2 142 407 A (ISHIKAWAJIMA HARIMA HEAVY IND) 16 January 1985 (1985-01-16) * page 3, line 1 - line 32; figures 4,6 *	1-7	
Y	US 5 329 565 A (MOORE JAY T [US]) 12 July 1994 (1994-07-12) * column 6, line 12 - line 20; figure 2 *	2	
A	GB 458 092 A (JOHN WILLIAM LESLIE SIMPSON) 11 December 1936 (1936-12-11) * page 4, line 33 - line 92; figure 1 *	1-7	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			F28G B08B F28D
Place of search		Date of completion of the search	Examiner
The Hague		22 January 2015	Delval, Stéphane
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 14 18 9922

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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22-01-2015

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 892567 A	28-03-1962	NONE	
GB 2142407 A	16-01-1985	DE 3420117 A1 GB 2142407 A NL 8401607 A	10-01-1985 16-01-1985 16-01-1985
US 5329565 A	12-07-1994	BE 1008224 A4 JP H07167588 A US 5329565 A	20-02-1996 04-07-1995 12-07-1994
GB 458092 A	11-12-1936	NONE	

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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- IT PD20130290 A [0030]