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(54) Refrigerant distributer for heat exchanger and heat exchanger

(57) A refrigerant distributor for a heat exchanger is disclosed. The distributor comprises: a pipe having an inlet disposed generally at one end of the pipe, refrigerant flowing into the pipe through the inlet. A cross-section of a flow passage within the pipe gradually decreases from the one end to the other end of the pipe. With the above configuration, the refrigerant can be distributed relatively uniformly.

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EUROPEAN SEARCH REPORT

Application Number
EP 10 00 3133

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	WO 94/14021 A1 (MULTISTACK INT LTD [AU]; CONRY RONALD D [AU]) 23 June 1994 (1994-06-23) * page 9, line 1 - line 9; figure 10 *	1,6,7	INV. F28F9/02 F25B39/02
X	EP 1 798 506 A2 (BEHR GMBH & CO KG [DE]) 20 June 2007 (2007-06-20) * abstract; figures 2,7,8 *	1,6,7	
X	DE 33 10 236 A1 (AUTOKUEHLER GES MBH [DE]) 27 September 1984 (1984-09-27) * figure 3 *	1,3,7	
X	JP H05 264126 A (X) 12 October 1993 (1993-10-12) * figures 1-4,6 *	1,6,7	
			TECHNICAL FIELDS SEARCHED (IPC) F28F F25B

~~The present search report has been drawn up for all claims~~

Place of search	Date of completion of the search	Examiner
Munich	3 December 2013	Martínez Rico, Celia

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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Application Number
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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-3, 6-8

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 10 00 3133

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-3, 6-8

This invention relates to a refrigerant distributor having a pipe which cross section gradually decreases, the pipe being either taper or having a plurality of segments. By means of these features the flow speed remains constant over the entire length of the distributor (see page 7, third paragraph). Therefore, the problem to be solved is to achieve uniform flow speed over the length of the pipe. The invention further comprises a heat exchanger having a distributor according to claim 1.

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2. claims: 4, 5, 7, 8

This invention relates to a refrigerant distributor comprising a plurality of pipes having different lengths, such that the shortest is used to distribute refrigerant in a range from the inlet to the end of the pipe and each of the remaining pipes is used to distribute refrigerant in a range from an end of the preceding pipe away from the inlet to its end. By means of these features, each pipe is responsible for distributing refrigerant to fewer flat tubes, allowing a decrease in the number of distributing outlets, so that the flow speed of the refrigerant is uniform (see description, page 9, second paragraph). The problem to be solved by this invention can be hence regarded as how to achieve a uniform flow speed of refrigerant. Moreover, according to page 8, second paragraph, the pipes have the same diameter, so that the cross section of the pipes does not decrease (see also figure 7), in contradiction with the definition given in claim 1. The invention further comprises a heat exchanger having a distributor according to claim 4.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 00 3133

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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03-12-2013

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