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(54) **Heat exchange apparatus**

(57) A heat exchange apparatus comprising a body that includes an internal cavity for receiving a fluid, a fluid inlet and a fluid outlet. The internal cavity is provided with at least one formation that defines at least one fluid flow path within the internal cavity between the fluid inlet and the fluid outlet, the or each formation comprising a first

surface exposed to fluid within the internal cavity, and a second surface exposed to air surrounding the heat exchanger. Heat can be transferred from fluid flowing within the internal cavity to the air surrounding the heat exchanger via the at least one formation.

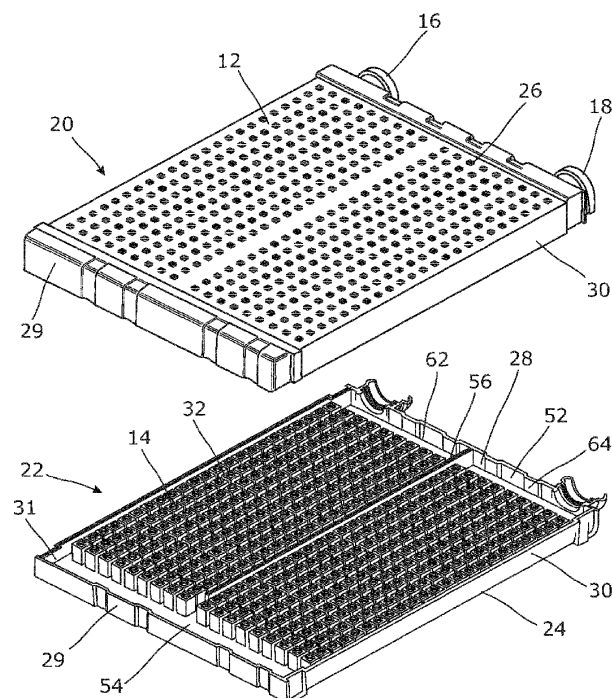


Figure 2



## EUROPEAN SEARCH REPORT

Application Number  
EP 13 16 0891

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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   | KR 2010 0044613 A (PARK HYO MOON [KR])<br>30 April 2010 (2010-04-30)<br>* paragraphs [0002] - [0025]; figures 1-6 *  | 1-20,24                          | INV.<br>F28D1/03<br>F28F3/04<br>F28F3/02 |
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| X   | EP 0 646 759 A1 (SANDEN CORP [JP])<br>5 April 1995 (1995-04-05)<br>* column 7, line 8 - column 9, line 28;<br>figures 4-10 *<br>* column 13, line 32 - column 14, line 13;<br>figures 26, 27 * | 1-20,24                          |  |
| X   | GB 2 442 978 A (STORDY ANDREW THOMAS [GB])<br>23 April 2008 (2008-04-23)<br>* page 4, line 9 - page 6, line 14;<br>figures 1, 2, 10 *  | 1-20,24                          |  |
|   |  |                                  | TECHNICAL FIELDS SEARCHED (IPC)          |
|   |  |                                  | F28D<br>F28F                             |
| <p><del>The present search report has been drawn up for all claims</del></p>  |  |                                  |  |
| Place of search   |  | Date of completion of the search | Examiner                                 |
| Munich  |  | 12 December 2017                 | Axters, Michael                          |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone<br/>Y : particularly relevant if combined with another document of the same category<br/>A : technological background<br/>O : non-written disclosure<br/>P : intermediate document</p> <p>T : theory or principle underlying the invention<br/>E : earlier patent document, but published on, or after the filing date<br/>D : document cited in the application<br/>L : document cited for other reasons<br/>&amp; : member of the same patent family, corresponding document</p> |  |                                  |  |

EPO FORM 1503 03/02 (P04C01)



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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:

1-20, 24

☐ 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).

**LACK OF UNITY OF INVENTION  
SHEET B**

Application Number

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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: 1-20, 24**

A heat exchange apparatus comprising a body including an internal cavity, a fluid inlet, a fluid outlet and at least one formation in the cavity, said formation comprises a first surface exposed to a fluid within the internal cavity, and a second surface exposed to air surrounding the heat exchanger.

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**2. claims: 21-23, 25**

A method of manufacturing a heat exchange apparatus, the method including: forming a first portion of a body of a heat exchanger and a second portion of a body of a heat exchanger by injection moulding; and joining the first portion of the body to the second portion of the body at joining surfaces thereof.

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

EP 13 16 0891

5 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  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

12-12-2017

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