

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
30 April 2009 (30.04.2009)

PCT

(10) International Publication Number
WO 2009/053726 A3

(51) International Patent Classification:

F25B 25/00 (2006.01) *F25B 9/00* (2006.01)
F25B 40/00 (2006.01) *F25B 1/04* (2006.01)
F24F 12/00 (2006.01)

(21) International Application Number:

PCT/GB2008/003639

(22) International Filing Date: 24 October 2008 (24.10.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

0720974.5 24 October 2007 (24.10.2007) GB
0814725.8 12 August 2008 (12.08.2008) GB

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
6 August 2009

(54) Title: HEAT PUMP

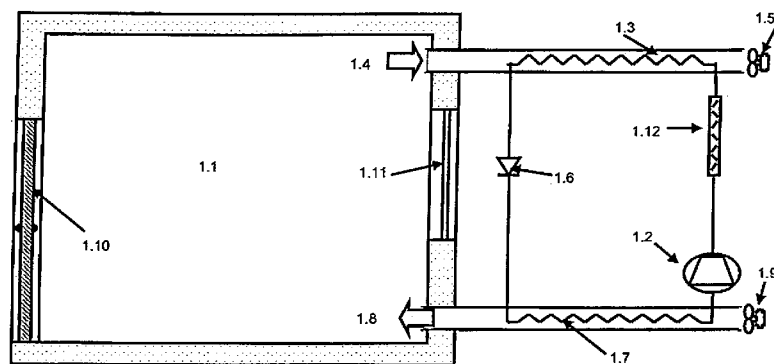


Figure 1

(57) Abstract: A heat pump comprising a circuit including: a first heat exchanger (1.3) operatively connected to a heat or coolth sink; a second heat exchanger (1.7) operatively connected to a heat or coolth source; a working fluid; pumping means (1.2); and an expansion device (1.6) connected between the heat exchangers; the circuit being arranged so that working fluid is circulated between the heat exchangers by the pumping means so that working fluid passes successively from the pumping means to the first heat exchanger, the expansion device, the second heat exchanger and returns to the pumping means; the first heat exchanger including a first conduit for a heat transfer fluid; the second heat exchanger including a second conduit for a heat transfer fluid; wherein the heat exchangers provide temperature glides to respective flows of heat transfer fluid with the temperature at one end of the first exchanger being approximately equal to the temperature of the heat transfer fluid leaving the heat or coolth source.

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INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2008/003639

A. CLASSIFICATION OF SUBJECT MATTER

INV. F25B25/00 F25B40/00 F24F12/00
ADD. F25B9/00 F25B1/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F25B F24F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 867 979 A (CARRASSE JEAN ET AL) 25 February 1975 (1975-02-25) column 2, line 49 - column 4, line 50; figures 1-3	1,20
Y	the whole document	2
X	WO 2005/075896 A (STORK J E VENTILATOREN BV [NL]; DE GRAAFF ABRAHAM ANTHONY JOHN [NL]) 18 August 2005 (2005-08-18) page 4, line 17 - page 7, line 24; figures 1-3	1,20
X	US 6 668 572 B1 (SEO KOOK-JEONG [KR] ET AL) 30 December 2003 (2003-12-30) column 2, line 50 - column 5, line 3; figures 1-3	1,20
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☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone.

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

29 January 2009

Date of mailing of the international search report

16/06/2009

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2008/003639

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 688 685 A (MAEKAWA SEISAKUSHO KK [JP]) 9 August 2006 (2006-08-09) paragraph [0068] - paragraph [0131]; figures 1-10 -----	1, 20
Y	DE 100 40 770 A1 (DENSO CORP [JP]) 1 March 2001 (2001-03-01) column 2, line 16 - column 4, line 17; figures 1-4 -----	2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2008/003639

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search reportcovers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

see additional sheet(s)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1,2,20,

Heat pump wherein the working fluid comprises a lower volatility solvent capable of absorbing and desorbing the gas.

2. claims: 1,3

Heat pump with a heat exchanger embedded in the material of the wall of an enclosed space

3. claims: 1,4

Heat pump with temperature glide of 5-35K

4. claims: 1,5,6

Heat pump including a third heat exchanger

5. claims: 1,7

Heat pump comprising a further heat exchanger

6. claims: 1,8,9,13,19,20,24-27

Heat pump with working fluids specified

7. claims: 1,10

Heat pump with volatile components specified

8. claims: 1,11,12,16

Heat pump with lubricants specified

9. claims: 1,14

Heat pump with heat transfer fluids specified

10. claims: 1,15

Heat pump with a mixer

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

11. claims: 1,17

Heat pump including a further heat exchanger

12. claims: 1,18

Heat pump including a gas-liquid separator

13. claims: 1,20,21

Heat pump comprising a ground source heat pump

14. claims: 1,20,22

Heat pump comprising an air to air reversible heat pump

15. claims: 1,20,23

Heat pump comprising a refrigerator

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2008/003639

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