(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 895 043 A3

# (12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
**13.10.1999 Bulletin 1999/41**

(43) Date of publication A2:
**03.02.1999 Bulletin 1999/05**

(21) Application number: **98306061.7**

(22) Date of filing: **29.07.1998**

(51) Int Cl.[6]: **F25D 11/00**, F25D 17/06, F24F 13/12

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE**
Designated Extension States:
**AL LT LV MK RO SI**

(30) Priority: **31.07.1997 KR 9736652**
**31.07.1997 KR 9736654**
**31.07.1997 KR 9736657**

(71) Applicant: **SAMSUNG ELECTRONICS CO., LTD.**
**Suwon-city, Kyungki-do 441-373 (KR)**

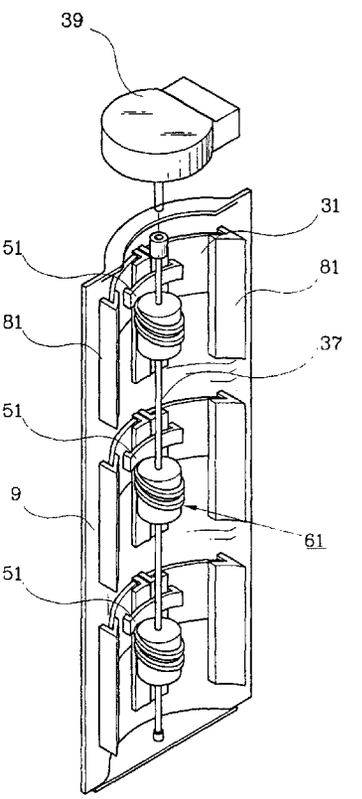
(72) Inventors:
- **Ji, Joon Dong**
  **Paldal-ku Suwon City, Kyungki-do (KR)**
- **Kim, Jae In**
  **Kangnam-ku, Seoul City (KR)**

(74) Representative: **Geary, Stuart Lloyd et al**
**Venner, Shipley & Co.,**
**20 Little Britain**
**London EC1A 7DH (GB)**

## (54) Refrigerator

(57) A refrigerator having means for opening/closing cool air discharge ports (16) through which cool air is supplied into a cooling compartment (3). Shutter members (31) for opening/closing ports (16) in a cool air supply duct (9) are driven by cams (61) rotated by a motor (39). Conversion means convert the rotational movement of the cams into a reciprocal raising and lowering movement of the shutters (31). The ports (16) are opened by the shutter members (31) when the temperature of the compartment (3) is too high, and closed when it is too low. Thus, the amount of the cool air supplied into the compartment (3) can be controlled, and the overcooling of the compartment can be prevented.

FIG. 6




EP 0 895 043 A3

European Patent Office

# EUROPEAN SEARCH REPORT

Application Number
EP 98 30 6061

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int.Cl.6) |
|---|---|---|---|
| X<br>Y | US 5 490 395 A (WILLIAMS STEPHEN G ET AL) 13 February 1996 (1996-02-13)<br>* column 4, line 40 - column 514; figure 2 *<br>--- | 1-3,8<br>4,9-12 | F25D11/00<br>F25D17/06<br>F24F13/12 |
| Y | DE 27 05 888 B (AURORA KONRAD G. SCHULZ GMBH & CO) 13 July 1978 (1978-07-13)<br>* column 4, line 17 - column 6, line 40; figure 1 *<br>--- | 4 | |
| Y | EP 0 774 628 A (MITSUBISHI ELECTRIC CORP) 21 May 1997 (1997-05-21)<br>* column 2, line 59 - column 3, line 8 *<br>* column 5, line 10 - column 6, line 19; figure 22 *<br>--- | 9,10 | |
| Y | WO 95 33167 A (KIM YONG MYOUNG ;PARK SEAK HAENG (KR); SAMSUNG ELECTRONICS CO LTD) 7 December 1995 (1995-12-07)<br>* column 8, line 28 - column 10, line 6; figure 6 *<br>--- | 11,12 | |
| A | EP 0 705 725 A (NIPPON DENSO CO) 10 April 1996 (1996-04-10)<br>* page 3, line 40 - page 4, line 4; figure 1 *<br>--- | 11 | TECHNICAL FIELDS SEARCHED (Int.Cl.6)<br>F25D<br>F24F |
| X | JP 09 133448 A (LG ELECTRONICS) 11 June 1997 (1997-06-11)<br>* figure 6 *<br>-& US 5 816 061 A (LG ELECTRONICS)<br>* column 5, line 47 - column 7, line 30; figure 6 *<br>----- | 1,2,12 | |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| THE HAGUE | 25 August 1999 | Jessen, F |

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

EPO FORM 1503 03.82 (P04C01)

## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 98 30 6061

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.

25-08-1999

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| US 5490395 A | 13-02-1996 | AU 687263 B | 19-02-1998 |
| | | AU 3669095 A | 30-05-1996 |
| | | CA 2162307 A | 22-05-1996 |
| | | EP 0717248 A | 19-06-1996 |
| DE 2705888 B | 13-07-1978 | IT 1101757 B | 07-10-1985 |
| | | JP 54096187 A | 30-07-1979 |
| EP 0774628 A | 21-05-1997 | JP 9145139 A | 06-06-1997 |
| | | AU 2124999 A | 13-05-1999 |
| | | AU 705210 B | 20-05-1999 |
| | | AU 7186996 A | 29-05-1997 |
| | | CN 1158968 A | 10-09-1997 |
| | | US 5823009 A | 20-10-1998 |
| | | US 5771708 A | 30-06-1998 |
| WO 9533167 A | 07-12-1995 | AU 689264 B | 26-03-1998 |
| | | AU 2577695 A | 21-12-1995 |
| | | CN 1129976 A | 28-08-1996 |
| | | DE 19519850 A | 14-03-1996 |
| | | IT RM950366 A | 01-12-1995 |
| | | SK 124195 A | 06-03-1996 |
| | | US 5718123 A | 17-02-1998 |
| | | AU 689263 B | 26-03-1998 |
| | | AU 688025 B | 05-03-1998 |
| | | AU 2149195 A | 23-10-1995 |
| | | AU 670017 B | 27-06-1996 |
| | | AU 2577595 A | 04-01-1996 |
| | | AU 2937095 A | 16-02-1996 |
| | | CN 1143737 A | 26-02-1997 |
| | | CN 1123569 A | 29-05-1996 |
| | | CN 1124056 A | 05-06-1996 |
| | | DE 19512476 A | 19-10-1995 |
| | | DE 19520179 A | 07-12-1995 |
| | | DE 19524845 A | 25-01-1996 |
| | | DE 69508536 D | 29-04-1999 |
| | | EP 0713064 A | 22-05-1996 |
| | | EP 0715136 A | 05-06-1996 |
| | | EP 0715137 A | 05-06-1996 |
| | | EP 0716278 A | 12-06-1996 |
| | | IT RM950212 A | 04-10-1995 |
| | | IT RM950367 A | 04-12-1995 |
| | | IT RM950466 A | 19-01-1996 |
| | | JP 2851573 B | 27-01-1999 |
| | | JP 8240369 A | 17-09-1996 |
| | | JP 2771140 B | 02-07-1998 |

EPO FORM P0459

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

## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 98 30 6061

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.

25-08-1999

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| WO 9533167 A | | JP 8247608 A | 27-09-1996 |
| | | JP 2771141 B | 02-07-1998 |
| | | JP 8247609 A | 27-09-1996 |
| | | JP 2686249 B | 08-12-1997 |
| | | JP 8240373 A | 17-09-1996 |
| | | JP 2771142 B | 02-07-1998 |
| | | JP 8247610 A | 27-09-1996 |
| | | JP 2667060 B | 22-10-1997 |
| | | JP 8504939 T | 28-05-1996 |
| | | JP 2840456 B | 24-12-1998 |
| | | JP 8511088 T | 19-11-1996 |
| | | WO 9527178 A | 12-10-1995 |
| | | WO 9533963 A | 14-12-1995 |
| | | WO 9602800 A | 01-02-1996 |
| | | SK 120395 A | 07-02-1996 |
| | | SK 124295 A | 07-02-1996 |
| | | US 5822998 A | 20-10-1998 |
| | | US 5664437 A | 09-09-1997 |
| | | US 5692383 A | 02-12-1997 |
| | | US 5687580 A | 18-11-1997 |
| EP 0705725 A | 10-04-1996 | DE 69508516 D | 29-04-1999 |
| | | DE 69508516 T | 15-07-1999 |
| | | JP 8156570 A | 18-06-1996 |
| | | US 5653630 A | 05-08-1997 |
| JP 9133448 A | 20-05-1997 | CN 1151512 A | 11-06-1997 |
| | | US 5816061 A | 06-10-1998 |

EPO FORM P0459

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