

(19)



(11)

EP 3 159 625 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
14.06.2017 Bulletin 2017/24

(51) Int Cl.:
F25B 1/00 (2006.01) **F25B 13/00** (2006.01)
F25B 5/02 (2006.01) **F25D 31/00** (2006.01)
F25B 25/00 (2006.01)

(43) Date of publication A2:
26.04.2017 Bulletin 2017/17

(21) Application number: **16193796.6**

(22) Date of filing: **13.10.2016**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
 GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
 PL PT RO RS SE SI SK SM TR**
 Designated Extension States:
BA ME
 Designated Validation States:
MA MD

(71) Applicant: **Hangzhou Sanhua Home Appliance Thermal Management System Co., Ltd.**
310018 Hangzhou Zhejiang (CN)

(72) Inventor: **CUI, Kai**
Hangzhou, Zhejiang 310018 (CN)

(74) Representative: **Zinkler, Franz et al
 Schoppe, Zimmermann, Stöckeler
 Zinkler, Schenk & Partner mbB
 Patentanwälte
 Radlkofersstrasse 2
 81373 München (DE)**

(30) Priority: **22.10.2015 CN 201510695813**

(54) **COLD DRINK MACHINE AND COOLING-HEATING CIRCULATION SYSTEM THEREOF**

(57) A cold drink machine and a cooling-heating circulation system thereof are provided. The cooling-heating circulation system of the cold drink machine includes a compressor (10), a condenser (20), a throttling element (30), and a first evaporator (40) disposed in turn in a same loop, a first heat storage device (50) disposed around a periphery of the first evaporator (40), and a cooling tube

(60) disposed around a periphery of the first evaporator (40) and through the first heat storage device (50). The cold drink machine and the cooling-heating circulation system thereof according to the present disclosure not only improve the cooling efficiency of the cooling-heating circulation system of the cold drink machine, but also reduce the starting frequency of the compressor.

EP 3 159 625 A3



EUROPEAN SEARCH REPORT

Application Number
EP 16 19 3796

5

10

15

20

25

30

35

40

45

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	US 4 843 830 A (HAUL ROBERT W [US]) 4 July 1989 (1989-07-04)	1,2,10	INV. F25B1/00 F25B13/00 F25B5/02 F25D31/00 F25B25/00
Y	* column 3 - column 4; figure 1 * -----	3-7	
X	US 5 287 706 A (WILLIAMS ALEA [US]) 22 February 1994 (1994-02-22)	1,2,10	
	* column 2, line 46 - column 3, line 20; figure 1 *		
A	US 4 545 214 A (KINOSHITA TERUO [JP]) 8 October 1985 (1985-10-08)	1,2,10	
	* column 3 - column 7; figure 1 *		
A	DE 30 49 062 A1 (ELECTROLUX SIGMUND GMBH [DE]) 29 July 1982 (1982-07-29)	1,2,10	
	* page 6 - page 7; figures 1,2 *		
A	US 2004/221589 A1 (DUBE SERGE [CA] ET AL) 11 November 2004 (2004-11-11)	1,2,10	
	* paragraph [0020] - paragraph [0036]; figures 1-4 *		
A	US 5 259 203 A (ENGEL DANIEL R [US] ET AL) 9 November 1993 (1993-11-09)	3-7	TECHNICAL FIELDS SEARCHED (IPC) F25B F25D
	* column 3 - column 5; figure 1 *		
Y	JP 2009 063266 A (TOKYO ELECTRIC POWER CO) 26 March 2009 (2009-03-26)	3-7	
	* paragraph [0078] - paragraph [0081]; figure 7 *		
A	US 4 727 726 A (MITANI AKIO [JP] ET AL) 1 March 1988 (1988-03-01)	3-7	
	* column 2 - column 6; figures 1,3 *		
A	JP 2008 196798 A (MATSUSHITA ELECTRIC IND CO LTD) 28 August 2008 (2008-08-28)	3-7	
	* page 3 - page 6; figures 1-4 *		

2

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

50

Place of search Munich	Date of completion of the search 10 May 2017	Examiner Amous, Moez
----------------------------------	--------------------------------------------------------	--------------------------------

55

EPO FORM 1503 03/82 (P04C01)

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



5

CLAIMS INCURRING FEES

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

10

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):

15

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.

20

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:

25

see sheet B

30

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

35

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

40

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:

3-7

45

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:

50

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).

55

**LACK OF UNITY OF INVENTION
SHEET B**Application Number
EP 16 19 3796

5

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:

10

1. claims: 1, 2, 10

directed to a cooling-heating circulation system with an optimized single heat storage device;

15

2. claims: 3-7

directed to a cooling-heating circulation system with two heat storage devices;

20

3. claims: 8, 9

directed to a cooling-heating circulation system with a switching mechanism to switch between a cooling mode and a heating mode.

25

30

35

40

45

50

55

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

EP 16 19 3796

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.

10-05-2017

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4843830 A	04-07-1989	CA 1306781 C US 4843830 A	25-08-1992 04-07-1989
US 5287706 A	22-02-1994	NONE	
US 4545214 A	08-10-1985	DE 3500252 A1 JP H0481101 B2 JP S60144576 A US 4545214 A	18-07-1985 22-12-1992 30-07-1985 08-10-1985
DE 3049062 A1	29-07-1982	NONE	
US 2004221589 A1	11-11-2004	CA 2436367 A1 US 2004221589 A1	09-11-2004 11-11-2004
US 5259203 A	09-11-1993	NONE	
JP 2009063266 A	26-03-2009	JP 5200461 B2 JP 2009063266 A	05-06-2013 26-03-2009
US 4727726 A	01-03-1988	GB 2196727 A IT 1216864 B JP S63116073 A US 4727726 A	05-05-1988 14-03-1990 20-05-1988 01-03-1988
JP 2008196798 A	28-08-2008	NONE	

EPO FORM P0459

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