# 

# (11) **EP 2 743 610 A3**

(12)

# **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3: 11.01.2017 Bulletin 2017/02

(51) Int Cl.: F25C 1/20<sup>(2006.01)</sup> F25C 5/18<sup>(2006.01)</sup>

F25C 5/00 (2006.01) F25B 21/04 (2006.01)

(43) Date of publication A2: 18.06.2014 Bulletin 2014/25

(21) Application number: 13194684.0

(22) Date of filing: 27.11.2013

(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

(30) Priority: 13.12.2012 US 201213713253

(71) Applicant: WHIRLPOOL CORPORATION
Benton Harbor
Michigan 49022 (US)

(72) Inventor: Boarman, Patrick J. Benton Harbor, MI 49022 (US)

(74) Representative: Nicholls, Michael John
J A Kemp
14 South Square
Gray's Inn
London WC1R 5JJ (GB)

#### (54) Clear ice maker and method for forming clear ice

(57)An ice maker, including sensors (444) to measure usage parameters and transmit the same to a controller (440). The controller is operably connected to a plurality of ice forming systems, and directs the systems to operate in a high energy mode or a low energy mode, based on the usage parameter. The usage parameters may include an ice level (98), a change in the ice level over time, the amount of time that a dispenser is actuated, the time of day, or historical usage patterns. The ice forming systems (52) may include one or more of a thermoelectric device coupled to a bottom surface of an ice forming plate, a forced air system to circulate cold air, a forced air system to circulate warm air, and a temperature control system to maintain a temperature gradient between a first chamber above the ice forming plate and a second chamber below the ice forming plate.

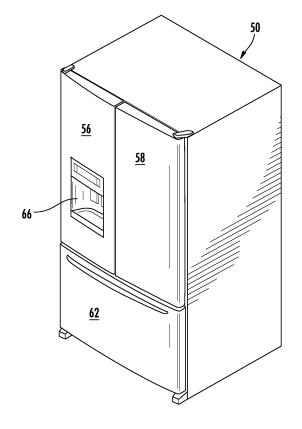


FIG. 1



## **EUROPEAN SEARCH REPORT**

**Application Number** 

EP 13 19 4684

	DOCUMENTS CONSIDERED					
Category	Citation of document with indication of relevant passages	, where appropriate,	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)		
X Y	US 2009/165492 A1 (WILSO ET AL) 2 July 2009 (2009 * the whole document *		1,2,8, 11,15 3-7,9, 10,12-14	F25C1/20 F25C5/00 14 F25C5/18 F25B21/04		
Υ	US 2004/261427 A1 (TSUCH AL) 30 December 2004 (20 * the whole document *		3,4,12			
Υ	US 6 951 113 B1 (ADAMSK) 4 October 2005 (2005-10- * the whole document *		5-7,9, 10,13			
Υ	US 2012/174613 A1 (PARK AL) 12 July 2012 (2012-0 * the whole document *		6	TECHNICAL FIELDS SEARCHED (IPC) F25B F25C		
Υ	US 2007/137241 A1 (LEE [ AL) 21 June 2007 (2007-0 * the whole document *		6			
Υ	JP 2001 041624 A (SANYO 16 February 2001 (2001-6 * the whole document *		7			
Υ	US 2006/150645 A1 (LEAVE 13 July 2006 (2006-07-13 * abstract *	14				
Х	US 2009/235674 A1 (KERN JEFFREY [US] ET AL) 24 September 2009 (2009-09-24)		1,11			
A	* the whole document *	2-10, 12-15				
Υ	US 2010/313594 A1 (LEE DAL) 16 December 2010 (20 * the whole document *	6,7				
	The present search report has been dra	·				
Place of search  The Hague		Date of completion of the search  7 December 2016	Bid	et, Sébastien		
X : part Y : part docu A : tech O : non	ATEGORY OF CITED DOCUMENTS  icularly relevant if taken alone icularly relevant if combined with another ument of the same category inological background -written disclosure rmediate document	T : theory or principle E : earlier patent doo after the filing date D : dooument cited in L : document cited for	underlying the ir ument, but publis the application r other reasons	nvention ihed on, or		

## EP 2 743 610 A3

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

EP 13 19 4684

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.

07-12-2016

10	Patent document cited in search report	Publicati date	on	Patent family member(s)	Publication date
	US 2009165492	A1 02-07-	2009 CA US	2638346 A1 2009165492 A1	28-06-2009 02-07-2009
15	US 2004261427	A1 30-12-	2004 DE EP US US	602004002149 T2 1491832 A1 2004261427 A1 2006150642 A1	12-07-2007 29-12-2004 30-12-2004 13-07-2006
20	US 6951113	B1 04-10-	2005 NON	IE	
25	US 2012174613	A1 12-07-	2012 CN EP KR US	102589230 A 2474798 A1 20120080722 A 2012174613 A1	18-07-2012 11-07-2012 18-07-2012 12-07-2012
	US 2007137241	A1 21-06-	2007 CN EP KR US	1982814 A 1798503 A2 20070064205 A 2007137241 A1	20-06-2007 20-06-2007 20-06-2007 21-06-2007
30	JP 2001041624	A 16-02-	2001 NON	IE	
	US 2006150645	A1 13-07-	2006 NON	IE	
35	US 2009235674	A1 24-09-	2009 NON	IE	
40	US 2010313594	A1 16-12-	2010 AU BR CA CN EP KR RU US WO	2010259495 A1 PI1010653 A2 2761894 A1 102428330 A 2440866 A2 20100133155 A 2011150477 A 2010313594 A1 2010143809 A2	10-11-2011 15-03-2016 16-12-2010 25-04-2012 18-04-2012 21-12-2010 20-07-2013 16-12-2010 16-12-2010
45					
50					
FORM P0459					

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