



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 477 752 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
08.06.2005 Bulletin 2005/23

(51) Int Cl.7: **F25D 23/06**, F25D 3/10,
F16L 59/06

(43) Date of publication A2:
17.11.2004 Bulletin 2004/47

(21) Application number: **04252790.3**

(22) Date of filing: **13.05.2004**

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

(72) Inventor: **Brooks, Jeff**
Burnsville, MN 55306-3803 (US)

(74) Representative: **Parkinson, Neil Scott et al**
Marks & Clerk,
83-85 Mosley Street,
Sussex House
Manchester M2 3LG (GB)

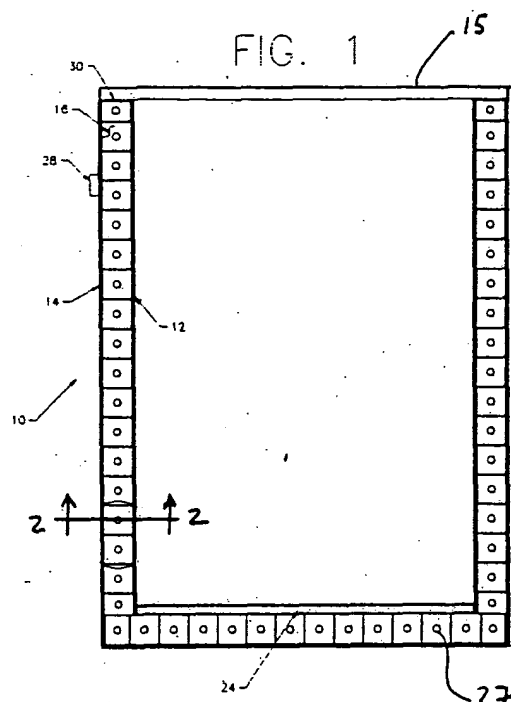
(30) Priority: **14.05.2003 US 437655**

(71) Applicant: **Chart Inc.**
Burnsville, MN 55306-3803 (US)

(54) **Improved cryogenic freezer**

(57) A rectangular double walled cryogenic freezer (10,110) has a vacuum space (16,116) filled with alternating layers of flexible insulating material (20,120) and a reflective material (18,118). A support structure (22,122) is also positioned in the vacuum space

(16,116). The support structure (22,122) is open-celled and provides structural support for the freezer walls to prevent wall deformation when a vacuum is drawn. The support structure (22,122) may be open-cell rigid foam (122) or a support grid (22) sandwiched between two layers of rigid insulation material (26a,26b).



EP 1 477 752 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 25 2790

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.7)
D,X	US 6 230 500 B1 (MAO ZHENNING ET AL) 15 May 2001 (2001-05-15) * the whole document *	1,2,8,9, 11,12,14	F25D23/06 F25D3/10 F16L59/06
A	-----	3-7,10, 13,15-20	
X	WO 02/052208 A (ARCELIK A.S; OEZKADI, FATIH; ODABA, SIBEL; KUECUEKPINAR, ESRA) 4 July 2002 (2002-07-04) * page 1, line 23 - page 2, line 29 * * page 5, line 9 - page 8, line 21 * * claims 1,2,10 * * figures 1-22b *	1,8,9, 11,12, 14,18,20	
A	-----	2,13,15, 19	
A	US 3 167 933 A (BECKMAN JOHN H ET AL) 2 February 1965 (1965-02-02) * the whole document *	1,14	
A	-----	1,18	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	NL 1 005 962 C1 (RUDOLF WOLFGANG VAN DER POL) 3 November 1998 (1998-11-03) * abstract * * figures 1a,1b,2 *		F25D F17C
A	-----	1,18	
A	EP 0 437 930 A (WHIRLPOOL CORPORATION) 24 July 1991 (1991-07-24) * column 8, line 33 - column 9, line 11 * * claims 16,18 * * figures 1-13 *		
A	-----	1	
A	US 6 266 941 B1 (NISHIMOTO YOSHIO) 31 July 2001 (2001-07-31) * column 2, line 52 - column 2, line 67 * * column 6, line 40 - column 7, line 27 * * claim 1 * * figure 1 *		
-----		-/--	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 April 2005	Examiner CORREIA DOS REIS, I
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			

2
EPO FORM 1503 03.82 (P04C01)



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 25 2790

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.7)
A	US 5 505 810 A (KIRBY ET AL) 9 April 1996 (1996-04-09) * column 8, line 29 - column 9, line 3 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 April 2005	Examiner CORREIA DOS REIS, I
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			

2
EPO FORM 1503 03.82 (P04G01)

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

EP 04 25 2790

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.

19-04-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6230500	B1	15-05-2001	NONE
WO 02052208	A	04-07-2002	WO 02052208 A1 04-07-2002 EP 1344008 A1 17-09-2003 TR 200300968 T1 21-05-2004
US 3167933	A	02-02-1965	BE 638959 A 17-02-1964 FR 1373943 A 02-10-1964 GB 970152 A 16-09-1964 NL 298377 A
NL 1005962	C1	03-11-1998	NONE
EP 0437930	A	24-07-1991	US 5018328 A 28-05-1991 AT 103701 T 15-04-1994 CA 2032111 A1 19-06-1991 DE 69007771 D1 05-05-1994 DE 69007771 T2 28-07-1994 EP 0437930 A1 24-07-1991 ES 2050969 T3 01-06-1994
US 6266941	B1	31-07-2001	JP 10300331 A 13-11-1998 CN 1191959 A ,C 02-09-1998 DE 69827537 D1 23-12-2004 EP 0862032 A2 02-09-1998 US 5989371 A 23-11-1999
US 5505810	A	09-04-1996	US 5532034 A 02-07-1996