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Laboratory freezer appliance.

A laboratory freezer appliance providing a usable storage space on the order of 5 to 20 cubic feet (0.14 to 0.57 cubic metres) capable of storage temperatures of -160°C and lower including an insulated freezer chamber (12), heat transfer tubes (60) in proximity to the freezer chamber (12) carrying liquid argon at ultra-low temperatures which absorbs heat from the freezer chamber (12) thereby vaporising the argon in the heat transfer tubes (60); a closed cycle, hermetically-sealed free piston Stirling cycle heat pump (20) providing a cold end (32) above a vertical displacer (154) driven by a linearly reciprocating piston at a temperature differential to the freezer chamber (12) of about -13°C; a condensing chamber (90) surrounding the cold end (32) of the heat pump (20) for condensing argon vapour to the argon liquid; and a distributor (70) for distributing liquid argon from the condensing chamber (90) to the heat transfer tubes (60) and returning argon vapour to the condensing chamber (90), all without mechanical pumping of the argon, in a continuous, closed cycle refrigeration system.



European Patent
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EUROPEAN SEARCH REPORT

Application Number

EP 91 30 3808

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.5)
Y	US-A-3 719 051 (MALAKER)	1	F25B25/00
A	* column 5, line 42 - column 7, line 46; figures 1-13 *	2,7	F25B9/14
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Y	GB-A-349 798 (ELECTROLUX)	1	
A	* page 2, line 15 - page 6, line 94; figures 1-15 *	2,3	

A	US-A-4 285 394 (STEWART)	1-3	
	* column 2, line 4 - column 4, line 3; figures 1-4 *		

A	US-A-2 446 686 (BEHRENS)	4	
	* column 2, line 17 - column 5, line 64; figures 1-6 *		

A	PATENT ABSTRACTS OF JAPAN vol. 9, no. 19 (E-292)(1742) 25 January 1985 & JP-A-59 165 951 (AISHIN SEIKI) 19 September 1984 * abstract *	5	

A	US-A-2 512 545 (HAZARD)		

A	US-A-3 468 300 (GEYER)		F25B
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A	EP-A-0 245 848 (BABCOCK-HITACHI)		F28D

A	US-A-4 843 826 (MALAKER)		

A	US-A-3 473 341 (MULDER)		

The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 10 DECEMBER 1991	Examiner BOETS A. F. J.
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			

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