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(54) **Thermodynamic unit for hot water storage tanks (DHW) and composite capacitor**

(57) A thermodynamic unit comprising at least:
- a compressor (24), which draws a refrigerant gas;
- a liquid container (16), which stores the coolant in a liquid state;
- a filter drier (17), which removes moisture from the circuit;
- and an expansion element which can be a thermostatic or electronic expansion valve (18).
- control and regulation means

which further comprises a capacitor, wherein the refrigerant gas which condenses with the flowing water due to heat exchange is inserted, which may be located inside or outside the thermodynamic unit, in which case it would be a composite capacitor, which, in addition to the medium of heat exchange between a fluid and the water, it comprises an electrical resistor and a sheath to house a temperature probe. The unit may have an evaporator housed on the inside, or may be connected to one or several direct expansion solar collectors.

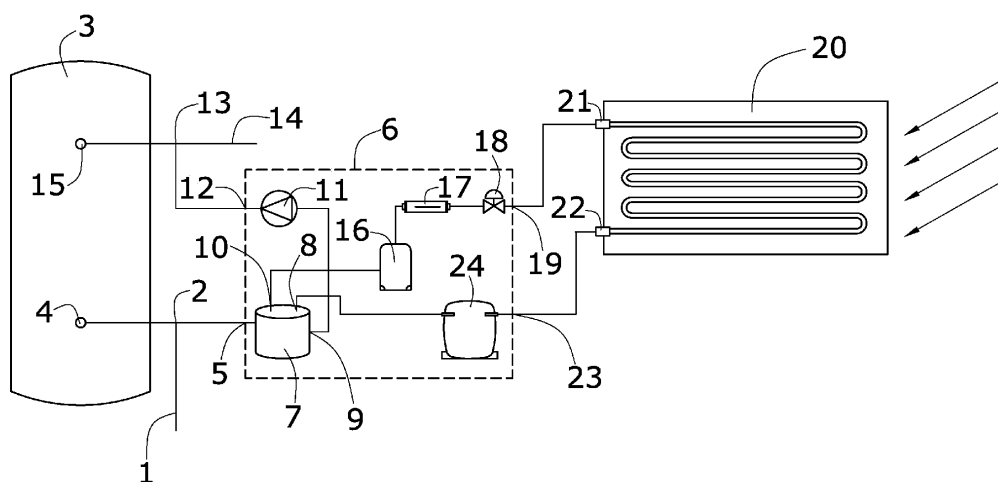


FIG.1



EUROPEAN SEARCH REPORT

Application Number
EP 13 38 2468

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	DE 25 58 227 A1 (METRO SPECIALFABRIK FOR ELEKTR) 7 July 1977 (1977-07-07)	1,2,4-7, 10	INV. F24H4/04
Y	* page 6 - page 10; figures 1-4 *	3,8	F25B1/00

X	AU 2009 101 129 A4 (CSI ENTPR PTY LTD) 3 December 2009 (2009-12-03)	1,2,5-7, 10	
	* pages 4-6; figure 1 *		

X	DE 30 14 638 A1 (VAMA VERTRIEB [DE]) 22 October 1981 (1981-10-22)	6,7,10	
	* page 8 - page 12; figures 1,2 *		

X	DE 29 18 256 A1 (KUEMMERLE BRUNO) 6 November 1980 (1980-11-06)	6,7,10	
	* page 9 - page 12; figure 1 *		

X	DE 100 65 216 A1 (STIEBEL ELTRON GMBH & CO KG [DE]) 18 July 2002 (2002-07-18)	1-8,10	
	* column 3 - column 6; figures 1,3,4 *		

Y	EP 0 336 751 A2 (SIDONS RAMSET LTD [AU]) 11 October 1989 (1989-10-11)	3,8	TECHNICAL FIELDS SEARCHED (IPC)
	* column 7 - column 10; figures 3,4 *		F24H F25B

Y	US 4 270 359 A (HUMMEL STEVEN L) 2 June 1981 (1981-06-02)	3,8	
	* column 4 - column 5; figure 1 *		

Y	DE 29 06 478 A1 (TERMODINAMICA SPA) 23 August 1979 (1979-08-23)	3,8	
	* page 4 - page 5; figure 1 *		

A	WO 87/07359 A1 (TETI ALESSANDRO [IT]; TETI NICOLA [IT]) 3 December 1987 (1987-12-03)	1-8,10	
	* the whole document *		

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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		16 April 2014	Riesen, Jörg
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone		T : theory or principle underlying the invention	
Y : particularly relevant if combined with another document of the same category		E : earlier patent document, but published on, or after the filing date	
A : technological background		D : document cited in the application	
O : non-written disclosure		L : document cited for other reasons	
P : intermediate document		& : member of the same patent family, corresponding document	

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EUROPEAN SEARCH REPORT

Application Number
EP 13 38 2468

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 10 2005 011709 A1 (STIEBEL ELTRON GMBH & CO KG [DE]) 14 September 2006 (2006-09-14) * the whole document * -----	1-8,10	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 16 April 2014	Examiner Riesen, Jörg
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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CLAIMS INCURRING FEES

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

☐ 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):

☐ 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.

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:

see sheet B

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

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

☐ 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:

☒ 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:

1-8, 10

☐ 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).



**LACK OF UNITY OF INVENTION
SHEET B**

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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:

1. claims: 1-8, 10

Thermodynamic unit and a system comprising the thermodynamic unit

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2. claims: 9, 11-18

Composite capacitor and the application of the composite capacitor in a thermodynamic unit

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

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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
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16-04-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 2558227 A1	07-07-1977	NONE	
AU 2009101129 A4	03-12-2009	NONE	
DE 3014638 A1	22-10-1981	NONE	
DE 2918256 A1	06-11-1980	NONE	
DE 10065216 A1	18-07-2002	NONE	
EP 0336751 A2	11-10-1989	AU 3258189 A	12-10-1989
		DE 68908590 D1	30-09-1993
		DE 68908590 T2	23-12-1993
		EP 0336751 A2	11-10-1989
		HK 1000472 A1	27-03-1998
		JP H10254 U	04-11-1998
		JP 2600694 Y2	18-10-1999
		JP H0229544 A	31-01-1990
US 4270359 A	02-06-1981	NONE	
DE 2906478 A1	23-08-1979	AU 4445279 A	30-08-1979
		BR 7901129 A	02-10-1979
		DE 2906478 A1	23-08-1979
		ES 241556 U	01-05-1979
		FR 2418425 A1	21-09-1979
		JP S54128852 A	05-10-1979
		YU 42479 A	21-01-1983
WO 8707359 A1	03-12-1987	AU 7435487 A	22-12-1987
		WO 8707359 A1	03-12-1987
DE 102005011709 A1	14-09-2006	NONE	

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