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(54) **Cascaded Organic Rankine Cycle System**

(57) A cascaded Organic Rankine Cycle (ORC) system (20) includes a topping cycle (22) and a bottoming cycle (24) in thermal communication with said topping cycle (22) through a condenser/evaporator (32) in which a bottoming cycle working fluid is first evaporated and then superheated and a topping cycle working fluid is

first desuperheated and then condensed such that a percentage of total heat transfer from the topping cycle fluid that occurs during a saturated condensation is equal to or less than a percentage of total heat transfer to the bottoming cycle fluid that occurs during a saturated evaporation.

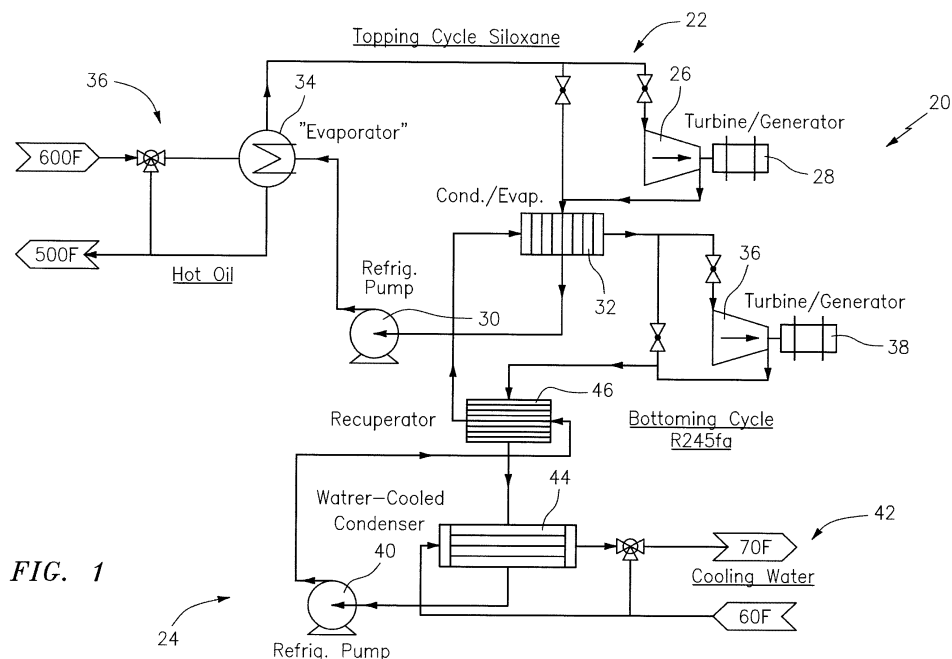


FIG. 1



EUROPEAN SEARCH REPORT

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EP 12 19 5287

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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 2010/319346 A1 (AST GABOR [DE] ET AL) 23 December 2010 (2010-12-23) * paragraph [0014] - paragraph [0029]; claims; figures * * abstract *	1-13	INV. F01K25/10 F01K23/04
X	WO 2006/104490 A1 (UTC POWER LLC [US]; RADCLIFF THOMAS D [US]; BIEDERMAN BRUCE P [US]; BR) 5 October 2006 (2006-10-05) * paragraph [0020] - paragraph [0032]; claims; figures * * abstract *	1-13	
X	WO 2009/045196 A1 (UTC POWER CORP [US]; BIEDERMAN BRUCE P [US]; BRASZ JOOST [US]; COGSWEL) 9 April 2009 (2009-04-09) * paragraph [0010] - paragraph [0032]; claims; figures * * abstract *	1-13	
X	DE 199 07 512 A1 (ECKERT FRANK [DE]; RIEDEL JENS [DE]) 31 August 2000 (2000-08-31) * column 2, line 53 - column 4, line 6; claims; figures * * abstract *	1-13	TECHNICAL FIELDS SEARCHED (IPC) F01K
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 20 February 2017	Examiner Zerf, Georges
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	

**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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20-02-2017

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2010319346 A1	23-12-2010	EP 2467584 A2	27-06-2012
		US 2010319346 A1	23-12-2010
		WO 2011005374 A2	13-01-2011

WO 2006104490 A1	05-10-2006	CN 101248253 A	20-08-2008
		EP 1869293 A1	26-12-2007
		US 2008168772 A1	17-07-2008
		WO 2006104490 A1	05-10-2006

WO 2009045196 A1	09-04-2009	EP 2212524 A1	04-08-2010
		JP 2010540837 A	24-12-2010
		US 2010263380 A1	21-10-2010
		WO 2009045196 A1	09-04-2009

DE 19907512 A1	31-08-2000	NONE	

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