



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
08.01.2014 Bulletin 2014/02

(51) Int Cl.:
F01K 23/10 ^(2006.01) **F01K 25/10** ^(2006.01)
F01K 25/08 ^(2006.01)

(43) Date of publication A2:
29.02.2012 Bulletin 2012/09

(21) Application number: **10161925.2**

(22) Date of filing: **04.05.2010**

(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 SE SI SK SM TR
Designated Extension States:
BA ME RS

- **Freund, Sebastian Walter**
D-85774, Muenchen (DE)
- **Seghi, Giacomo**
51022, Bardalone (PT) (IT)

(30) Priority: **06.05.2009 US 436277**

(71) Applicant: **General Electric Company**
Schenectady, NY 12345 (US)

(72) Inventors:
• **Lehar, Matthew Alexander**
80803, Muenchen (DE)

(74) Representative: **Illingworth-Law, William**
Illingworth
GPO Europe
GE International Inc.
The Ark
201 Talgarth Road
Hammersmith
London W6 8BJ (GB)

(54) **An improved organic rankine cycle system and method**

(57) An ORC system (10) configured to limit temperature of a working fluid (14) below a threshold temperature is provided. The ORC system (10) includes a heat source (16) configured to provide waste heat fluid (18). The ORC system (10) also includes a heat exchanger (20) coupled to the heat source (16), wherein the heat exchanger (20) includes multiple external (82) or internal (84) enhancement features. The external (82) enhance-

ment features are configured to reduce a first heat transfer coefficient between the working fluid (14) and the waste heat fluid (18) from the heat source (16), external to the heat exchanger (20). The internal (84) enhancement features are configured to increase a second heat transfer coefficient between the working fluid (14) and the waste heat fluid (18) from a heat source (16), internal to the heat exchanger (20).

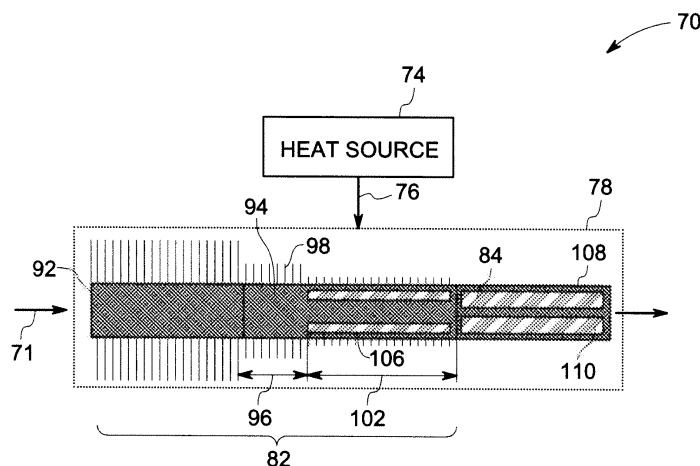


FIG. 3



EUROPEAN SEARCH REPORT

Application Number
EP 10 16 1925

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	DE 199 14 287 A1 (ROTH FRIEDRICH [DE]) 12 October 2000 (2000-10-12) * column 1, line 28 - column 2, line 20; claims; figures 1,2 * * abstract *	1-13	INV. F01K23/10 F01K25/10 F01K25/08
Y	GB 983 620 A (HEAD WRIGHTSON & CO LTD) 17 February 1965 (1965-02-17) * page 2, line 36 - page 3, line 123; claims; figures *	1-13	
Y	US 6 158 221 A (FANCHER DAVID H [US] ET AL) 12 December 2000 (2000-12-12) * column 9, line 27 - column 15, line 39; claims; figures 6A, 6B, 7A, 7B *	1-13	
Y	EP 0 874 188 A2 (ASEA BROWN BOVERI [CH] ALSTOM TECHNOLOGY LTD [CH]) 28 October 1998 (1998-10-28) * column 5, line 35 - column 12, line 4; claims; figures * * abstract *	1-13	
A	DE 44 31 185 A1 (SIEMENS AG [DE]) 7 March 1996 (1996-03-07) * column 4, line 48 - column 6, line 51; claims; figures * * abstract *	1-13	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 27 November 2013	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			

1
EPO FORM 1503 03.82 (P04C01)

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

EP 10 16 1925

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.

27-11-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 19914287 A1	12-10-2000	AU 4100100 A	23-10-2000
		DE 10080871 D2	28-02-2002
		DE 19914287 A1	12-10-2000
		WO 0060284 A1	12-10-2000

GB 983620 A	17-02-1965	NONE	

US 6158221 A	12-12-2000	NONE	

EP 0874188 A2	28-10-1998	DE 19717267 A1	29-10-1998
		EP 0874188 A2	28-10-1998
		JP H10332090 A	15-12-1998
		US 6079222 A	27-06-2000

DE 4431185 A1	07-03-1996	CN 1155326 A	23-07-1997
		DE 4431185 A1	07-03-1996
		EP 0778932 A1	18-06-1997
		ES 2119461 T3	01-10-1998
		JP 3046890 U	24-03-1998
		KR 100368516 B1	15-03-2003
		US 5979370 A	09-11-1999
		WO 9607053 A1	07-03-1996
