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(54) **Supercritical Downshot Boiler**

(57) A downshot boiler (100,102) for heating water comprising: a first combustion chamber (110); at least one tube (120,122) for transporting water, the or each tube (120,122) being at least partially located at the first

combustion chamber (110); and heating means for heating the first combustion chamber (110), the heating means comprising a downshot burner (22), wherein the boiler (100,102) is adapted to heat the water to a supercritical condition.

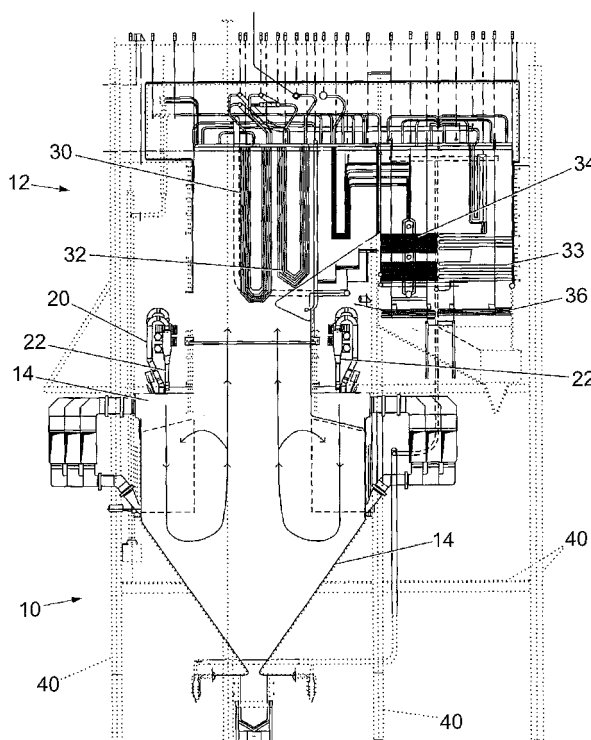


Fig. 4



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EUROPEAN SEARCH REPORT

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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	DE 15 51 036 A1 (RILEY STOKER CORP) 23 April 1970 (1970-04-23) * pages 1,5; claim 1; figure 2 *	1-3,7-9	INV. F22B21/34 F22B29/06 F22B29/02 F22B3/08 F01K7/32
Y	* the whole document *	4-6	
Y	FRANKE J ET AL: "BENSON -DAMPFERZEUGER MIT SENKRECHT BEROHRTER BRENNKAMMER PRAXISNAHER GROSSVERSUCH BELEGT AUSLEGUNGSSICHERHEIT" VGB KRAFTWERKSTECHNIK, VGB KRAFTWERKSTECHNIK GMBH. ESSEN, DE, vol. 75, no. 4, 1 April 1995 (1995-04-01), pages 353-359, XP000498642 ISSN: 0372-5715 * page 1; figures 1,5-7 *	4-6	
A	GB 842 419 A (BABCOCK & WILCOX LTD) 27 July 1960 (1960-07-27) * page 2, lines 94,95 * * page 3, lines 20-25 * * claim 1; figures 1-3 *	1-3,7-9	
A	DE 43 33 404 A1 (SIEMENS AG [DE]) 6 April 1995 (1995-04-06) * page 2, lines 58,59; figures 3,4 * * the whole document *	4-6	F22B F01K
A	EP 0 025 975 A2 (COMBUSTION ENG [US]) 1 April 1981 (1981-04-01) * page 6, line 15; figures 3,5 * * the whole document *	4-6	
A	GB 802 173 A (BABCOCK & WILCOX LTD) 1 October 1958 (1958-10-01) * page 2, lines 15-20 * * page 3, line 14 * * page 5, lines 27,32,54,55 * * figure 1 *	1-3,8,9	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 26 March 2007	Examiner Lepers, Joachim
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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European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 27 0029

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	US 2004/115575 A1 (KAYAHARA TOSHIHIRO [JP] ET AL) 17 June 2004 (2004-06-17) * paragraphs [0003], [0054]; figure 1 *	1-3,8,9	
A	DTI: "Refurbishment of Yaomeng Power Plant" August 2003 (2003-08), DEPARTMENT OF TRADE AND INDUSTRY, DTI/PUB URN 03/1065, XP002426600 * page 1; figures 5,7 *	1-3,6-9	
			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 26 March 2007	Examiner Lepers, Joachim
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 06 27 0029

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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26-03-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 1551036	A1	23-04-1970	NONE
GB 842419	A	27-07-1960	NONE
DE 4333404	A1	06-04-1995	CN 1132548 A 02-10-1996 WO 9509325 A1 06-04-1995 EP 0720714 A1 10-07-1996 JP 9503284 T 31-03-1997 RU 2123634 C1 20-12-1998 US 5706766 A 13-01-1998
EP 0025975	A2	01-04-1981	AU 531037 B2 04-08-1983 AU 6254880 A 09-04-1981 CA 1141610 A1 22-02-1983 DE 3068222 D1 19-07-1984 ES 8106050 A1 16-09-1981 IN 152022 A1 01-10-1983 JP 1208853 C 29-05-1984 JP 56053303 A 12-05-1981 JP 58041403 B 12-09-1983 US 4290389 A 22-09-1981 ZA 8003958 A 29-07-1981
GB 802173	A	01-10-1958	NONE
US 2004115575	A1	17-06-2004	CA 2453084 A1 16-06-2004 CN 1508473 A 30-06-2004 JP 2004197970 A 15-07-2004 KR 20040053793 A 24-06-2004