



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
21.07.1999 Bulletin 1999/29

(51) Int. Cl.⁶: **F23G 5/30**, F23G 5/46,
F23J 7/00

(43) Date of publication A2:
23.09.1998 Bulletin 1998/39

(21) Application number: **97122209.6**

(22) Date of filing: **16.12.1997**

(84) Designated Contracting States:
**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC
NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **18.03.1997 JP 6472197**

(71) Applicant: **NKK CORPORATION**
Tokyo 100-0005 (JP)

(72) Inventors:
• **Matsui, Satoshi**
Chiyoda-ku, Tokyo 100 (JP)
• **Iwasaki, Toshihiko**
Chiyoda-ku, Tokyo 100 (JP)

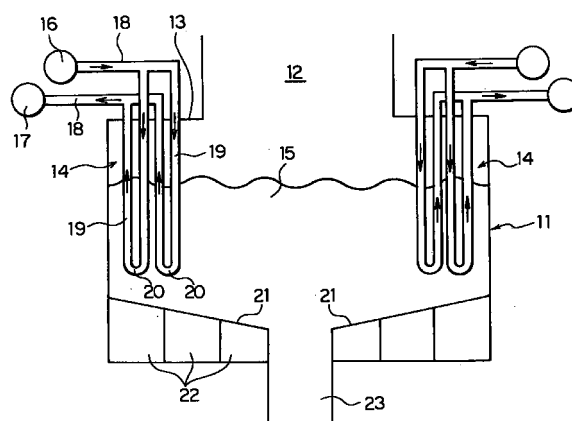
• **Yokoyama, Takashi**
Chiyoda-ku, Tokyo 100 (JP)
• **Kimura, Masanobu**
Chiyoda-ku, Tokyo 100 (JP)
• **Suzuki, Yasuo**
Chiyoda-ku, Tokyo 100 (JP)
• **Akiyama, Hajime**
Chiyoda-ku, Tokyo 100 (JP)
• **Noto, Takashi**
Chiyoda-ku, Tokyo 100 (JP)

(74) Representative:
Henkel, Feiler, Hänzel
Möhlstrasse 37
81675 München (DE)

(54) **Apparatus and method for recovering heat from fluid-bed type incinerator, and method for inhibiting production of dioxins**

(57) A method for recovering heat from an incinerator, which comprises the steps of: removably arranging, in a fluid-bed type incinerator (11) having a fluid layer (15), a plurality of U-shaped heat transfer tubes (14) each having two vertical (19) tube portions and a bent tube portion (20) in the incinerator from a wall (13) thereof in a vertical direction so that the bent tube portion is immersed into the fluid layer; and passing a heat receiving medium sequentially through one of the vertical tube portions, the bent tube portion and the other of the vertical tube portions of each of the plurality of heat transfer tube, thereby recovering heat generated from combustion of wastes in the fluid layer via the heat receiving medium.

FIG. 1





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 12 2209

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.6)
A	EP 0 359 544 A (OGDEN ENVIRONMENTAL SERVICES) 21 March 1990 * column 2, line 44 - column 3, line 11 * * column 4, line 47 - line 62 * * figures 1,2 *	1-4	F23G5/30 F23G5/46 F23J7/00
A	US 4 380 154 A (EASTMAN GEORGE Y) 19 April 1983 * column 4, line 11 - line 15 * * column 5, line 14 - line 39 * * figure 4 *	1-4	
A	DE 34 43 722 A (MANGOLD KLAUS PROF DR RER NAT;FOERSTER GUENTHER; TAETZNER WOLFGANG) 12 June 1986 * page 10, line 23 - page 12, line 10 * * page 13, line 11 - page 14, line 9 *	4,5	
A,D	PATENT ABSTRACTS OF JAPAN vol. 018, no. 314 (M-1621), 15 June 1994 & JP 06 066417 A (MITSUBISHI HEAVY IND LTD), 8 March 1994 * abstract *	4,6	
A	WO 87 00082 A (BBC BROWN BOVERI & CIE) 15 January 1987		TECHNICAL FIELDS SEARCHED (Int.Cl.6) F23G F23C F22B F28D
A	DE 12 45 544 B (IZRAIL LVOVIC) 27 July 1967		
A	US 3 013 773 A (O.F.CAMPBELL) 19 December 1961		
A	EP 0 484 239 A (CHAUFFE CIE GLE) 6 May 1992		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 27 May 1999	Examiner Phoa, Y
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	

EPO FORM 1503 03/82 (P04C01)

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

EP 97 12 2209

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.

27-05-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0359544 A	21-03-1990	US 4883115 A	28-11-1989
		AU 4124889 A	22-03-1990
US 4380154 A	19-04-1983	NONE	
DE 3443722 A	12-06-1986	NONE	
WO 8700082 A	15-01-1987	DE 3523653 A	12-02-1987
		DK 107287 A	02-03-1987
		EP 0229119 A	22-07-1987
		JP 63500782 T	24-03-1988
		US 4822573 A	18-04-1989
DE 1245544 B		NL 6617273 A	10-06-1968
US 3013773 A	19-12-1961	NONE	
EP 0484239 A	06-05-1992	FR 2668815 A	07-05-1992
		AT 137004 T	15-05-1996
		DE 69118814 D	23-05-1996
		DE 69118814 T	28-11-1996
		DK 484239 T	12-08-1996
		ES 2085449 T	01-06-1996
		GR 3020283 T	30-09-1996
		US 5138958 A	18-08-1992