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(71) Applicant: **Mines and Metals Engineering (M.M.E.)**
40474 Düsseldorf (DE)

(72) Inventor: **Najmossadat, Seyed Mohammed Reza**
Aorfie Shirazi (Ghaarbi) Str. Nr. 73,
Teheran (IR)

(74) Representative: **Paul, Dieter-Alfred et al**
Paul & Albrecht
Patentanwaltssozietät
Hellersbergstrasse 18
41460 Neuss (DE)

(54) **Shaft furnace**

(57) The invention refers to a vertical shaft furnace (100) for a burden (115) moving under the influence of gravity from the top to the bottom of the shaft furnace, in particular for the production of directly reduced iron, with at least one furnace outlet (120) provided at the top of the shaft furnace, which is characterized in that the central axis of the furnace gas outlet (120) is slanted with regard to the horizontal by an angle of 45 to 55°.

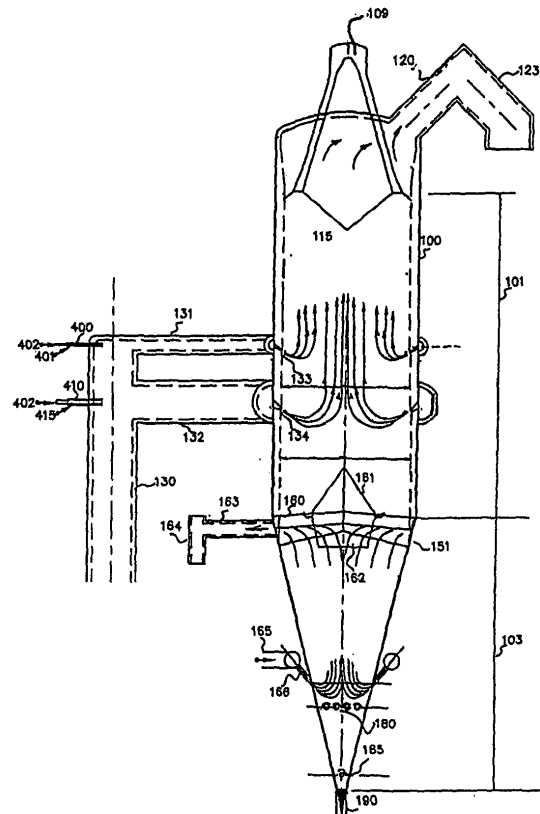


Fig. 1

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EUROPEAN SEARCH REPORT

Application Number
EP 07 02 3875

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	WO 94/20642 A (AIR LIQUIDE [FR]; KARINTHI PIERRE [FR]; BUFFENOIR MARC [FR]; STREICHER) 15 September 1994 (1994-09-15) * figure 1 *	1-6	INV. C21B13/02 F27B1/00 F27B1/18
X	----- US 4 007 025 A (HEGEMANN KARL-RUDOLF) 8 February 1977 (1977-02-08) * figure 1 *	1-6	
X	----- JP 52 060204 A (ISHIKAWAJIMA HARIMA HEAVY IND) 18 May 1977 (1977-05-18) * abstract * * figure 1 *	1-6	
X	----- JP 52 028404 A (ISHIKAWAJIMA HARIMA HEAVY IND) 3 March 1977 (1977-03-03) * abstract * * figure 1 *	1-6	
X	----- JP 52 085904 A (ISHIKAWAJIMA HARIMA HEAVY IND) 16 July 1977 (1977-07-16) * abstract * * figures 1,4 *	1-6	
			TECHNICAL FIELDS SEARCHED (IPC)
			C21B F27D F27B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 17 November 2008	Examiner Gimeno-Fabra, Lluís
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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**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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17-11-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9420642 A	15-09-1994	CN 1103536 A	07-06-1995
		EP 0639231 A1	22-02-1995
		FR 2702221 A1	09-09-1994
		JP 7506628 T	20-07-1995
		US 5522916 A	04-06-1996
US 4007025 A	08-02-1977	AT 342632 B	10-04-1978
		AU 7533074 A	13-05-1976
		BE 821711 A1	17-02-1975
		CA 1049925 A1	06-03-1979
		FR 2249944 A1	30-05-1975
		GB 1446524 A	18-08-1976
		IT 1030767 B	10-04-1979
		JP 920100 C	22-08-1978
		JP 50079406 A	27-06-1975
		JP 52050002 B	21-12-1977
		LU 71209 A1	17-04-1975
		NL 7414382 A	09-05-1975
		SE 7413766 A	07-05-1975
JP 52060204 A	18-05-1977	NONE	
JP 52028404 A	03-03-1977	JP 1179740 C	30-11-1983
		JP 58014485 B	19-03-1983
JP 52085904 A	16-07-1977	JP 1202479 C	25-04-1984
		JP 58032205 B	12-07-1983