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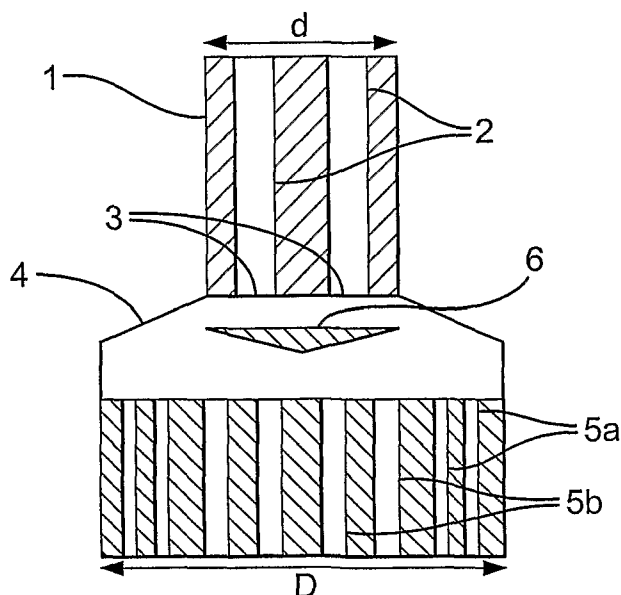
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- of inventorship (Rule 4.17(iv))

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(54) Title: APPARATUS AND PROCESS FOR THE PRODUCTION OF OLEFINS



(57) Abstract: The present invention relates to an apparatus for reacting a first gaseous reactant stream with a second gaseous reactant stream to form a gaseous product stream, wherein the apparatus comprises at least one first supply means for the first gaseous reactant stream, at least one second supply means for the second gaseous reactant stream, a catalyst zone, a product quench zone and a waste heat boiler, wherein the product quench zone is positioned downstream of the catalyst zone and comprises a plurality of quench tubes, and wherein the waste heat boiler is positioned downstream of the exits of the quench tubes and comprises a plurality of boiler tubes, the waste heat boiler having a surface on which gas exiting the exits of the quench tubes impinges.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

INV. B01J8/02 C10G11/22 F28F27/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B01J C10G F28F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 882 606 A (ZARDI UMBERTO [CH] ET AL) 16 March 1999 (1999-03-16) column 3, lines 53-58; figure 2 column 4, lines 18-29 column 4, lines 37-67	1-7
Y	-----	1-7
Y	DE 196 29 185 A1 (KELLOGG M W CO [US]) 23 January 1997 (1997-01-23) column 5, lines 40-56; figures 1,2 column 6, lines 50-60 & US 5 653 282 A (HACKEMESSER LARRY GENE [US] ET AL) 5 August 1997 (1997-08-05) cited in the application ----- -/--	1-7

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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- * & * document member of the same patent family

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International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 288 408 A (GUTH EUGENE D ET AL) 8 September 1981 (1981-09-08) cited in the application column 8, lines 3-18; figures 1,2,7 claims 1,11,14 -----	1-7
A	US 2 684 390 A (BILLS JOHN L) 20 July 1954 (1954-07-20) column 6, lines 11-42; figure 1 -----	1-6
A	US 4 152 407 A (FUCHS WARREN [US]) 1 May 1979 (1979-05-01) column 10, lines 51-67; figure 9 column 6, lines 13-22; figure 3 -----	1-7

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2007/002191

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5882606	A	16-03-1999	NONE	
DE 19629185	A1	23-01-1997	JP 3856498 B2 JP 9101001 A US 5653282 A	13-12-2006 15-04-1997 05-08-1997
US 5653282	A	05-08-1997	DE 19629185 A1 JP 3856498 B2 JP 9101001 A	23-01-1997 13-12-2006 15-04-1997
US 4288408	A	08-09-1981	CA 1117279 A1 GB 2026021 A	02-02-1982 30-01-1980
US 2684390	A	20-07-1954	NONE	
US 4152407	A	01-05-1979	NONE	