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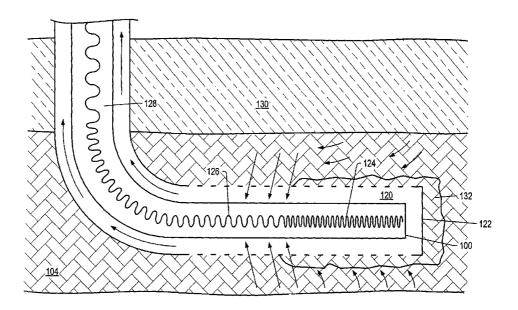
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[Continued on next page]

(54) Title: IN SITU THERMAL PROCESSING OF A HYDROCARBON CONTAINING FORMATION VIA BACKPRODUCING THROUGH A HEATER WELL



**(57) Abstract:** A process for producing hydrocarbons through a heater wellbore positioned in a hydrocarbon containing formation. The in situ treatment process may include providing heat from one or more heaters to at least a portion of the formation. The heat may be allowed to transfer from one or more heaters to a selected section of the formation. Heat that is allowed to transfer to the selected section may pyrolyze at least some of the hydrocarbons within the selected section. The process may include selectively limiting a temperature proximate a selected portion of a heater wellbore to inhibit coke formation at or near the selected portion.



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Int al Application No PCT/US 02/34533

## A. CLASSIFICATION OF SUBJECT MATTER IPC 7 E21B43/24 According to International Patent Classification (IPC) or to both national classification and IPC Minimum documentation searched (classification system followed by classification symbols) IPC 7 E21B 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, WPI Data C. DOCUMENTS CONSIDERED TO BE RELEVANT Relevant to claim No. Category ° Citation of document, with indication, where appropriate, of the relevant passages 1 - 13X US 4 485 869 A (SRESTY GUGGILAM C ET AL) 4 December 1984 (1984-12-04) column 2, line 30-36; figures 1-9 column 3, line 1-18 column 3, line 53 -column 4, line 12 column 7, line 16-19 column 7, line 47-68 X US 5 099 918 A (BRIDGES JACK E ET AL) 1 31 March 1992 (1992-03-31) column 8, line 16-20; figures 1,2 column 20, line 11-37 3 US 4 140 180 A (BRIDGES JACK ET AL) Α 20 February 1979 (1979-02-20) figure 7 Patent family members are listed in annex. Further documents are listed in the continuation of box C. Special categories of cited documents: 'T' later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the "A" document defining the general state of the art which is not considered to be of particular relevance invention "E" earlier document but published on or after the international "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to filing date document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such docudocument referring to an oral disclosure, use, exhibition or ments, such combination being obvious to a person skilled other means document published prior to the international filing date but "&" document member of the same patent family later than the priority date claimed Date of mailing of the international search report Date of the actual completion of the international search 07/05/2003 2 April 2003 Name and mailing address of the ISA Authorized officer European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, van Berlo, A Fax: (+31-70) 340-3016

# INTERNATIONAL SEARCH REPORT

In Il Application No
PUI/US 02/34533

		PC1/US UZ/34533	
	ation) DOCUMENTS CONSIDERED TO BE RELEVANT	18	
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	
Α	US 4 524 827 A (BRIDGES JACK E ET AL) 25 June 1985 (1985-06-25) column 4, line 4-7 column 8, line 19-25	10	
Α	US 4 501 326 A (EDMUNDS NEIL R) 26 February 1985 (1985-02-26) column 4, line 38-45; figures 1-6	1	
Α	US 5 751 895 A (BRIDGES JACK E) 12 May 1998 (1998-05-12) abstract	1	
A	US 6 112 808 A (ISTED ROBERT EDWARD) 5 September 2000 (2000-09-05) column 1, line 52 -column 2, line 2 column 6, line 66 -column 7, line 12		

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte nal Application No
PCT/US 02/34533

Patent document cited in search report	Publication date		Patent family member(s)	Publication date
US 4485869	A 04-12-1984	AU AU CA	563287 B2 2045383 A 1213547 A1	02-07-1987 03-05-1984 04-11-1986
US 5099918	A 31-03-1992	CA EP	2015318 C 0387846 A1	08-02-1994 19-09-1990
US 4140180	A 20-02-1979	AU AU CA IL	521603 B2 3919878 A 1058516 A1 55574 A	22-04-1982 28-02-1980 17-07-1979 16-09-1980
US 4524827	A 25-06-1985	AU AU AU AU AU CA	601866 B2 2007388 A 590164 B2 2007488 A 577043 B2 2742784 A 1207828 A1	20-09-1990 10-11-1988 26-10-1989 10-11-1988 15-09-1988 01-11-1984 15-07-1986
US 4501326	A 26-02-1985	NONE		
US 5751895	A 12-05-1998	CA	2174980 A1	14-08-1997
US 6112808	A 05-09-2000	AU W0	8006398 A 9858156 A1	04-01-1999 23-12-1998