

(57) Abstract: A fuel processing system is operative to remove substantially all of the sulfur present in a logistic fuel stock supply (4). The fuel stock can be gasoline, diesel fuel, or other like fuels which contain relatively high levels of organic sulfur compound such as mercaptans, sulfides, disulfides, and the like. The system is a part of a fuel cell power plant (2). The fuel stock supply is fed through a reformer (10) where the fuel is converted to a hydrogen rich fuel which contains hydrogen sulfide. The hydrogen sulfide-containing reformer exhaust is passed through a sulfur scrubber (14), to which is added a small quantity of air, which scrubber removes substantially all of the sulfur in the exhaust stream by means of the Claus reaction. The desulfurizing step causes sulfur to deposit on the scrubber bed, which after a period of time, will prevent further sulfur from being removed from the reformer exhaust stream. The sulfur scrubber station is rejuvenated by passing a gas stream (32) containing a relatively small amount (about 1% by volume) of carbon monoxide. The carbon monoxide is converted to carbonyl sulfide which is then bummed in power plant bumper so as to form sulfur dioxide in the power plant exhaust stream.



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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/24156

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B01D 53/62; B01J 19/00, 20/34; C01B 17/98; C01G 1/04; H01M 8/02
US CL : 422/168, 178, 212; 423/242.1, 246, 416; 429/13, 17; 502/20, 34, 514, 517

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)

U.S. : 422/168, 178, 212; 423/242.1, 246, 416; 429/13, 17; 502/20, 34, 514, 517

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 1,439,489 A (STANDARD OIL CO.) 16 June 1976 (16.06.1976), page 1 lines 40-59.	1-14
A	DE 35 20 166 A1 (SCHLIPPER et al.) 11 December 1986 (11.12.1986), English abstract.	1-14
A	US 5,658,681 A (SATO et al.) 19 August 1997 (19.08.1997), column 2 line 12 to column 3 line 18.	1-14
A	US 5,124,140 A (OKADA et al.) 23 June 1992 (23.06.1992), column 2 line 35 to column 3 line 10.	1-14
A	US 3,764,661 A (KANAZAWA et al.) 09 October 1973 (09.10.1973), column 3 lines 15-42.	1-14
A	US 3,294,706 A (CONSTABARIS et al.) 27 December 1966 (27.12.1966), column 1 lines 17-18, column 2 lines 55-63, column 3 lines 31 and 51-54 and column 7 lines 8-11.	1-14

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

☐ See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"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 invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" 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)	"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 documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

PCT/US02/24156

Continuation of B. FIELDS SEARCHED Item 3:

EAST SEARCH: Data Bases: USPAT, US-PGP UB, EPO, JPO, DERWENT, IBM-TDB

Search Terms: B01J020/34.ipc.; 1 and (CO or (carbon adj monoxide)), 8 and (COS or (carbonyl adj sul\$?ide)), 15 and sul\$?ur, (502/20-56).ccls., 29 and (CO or (carbon adj monoxide)), 36 and (COS or (carbonyl adj sul\$?ide)) and 43 and sul\$?ur