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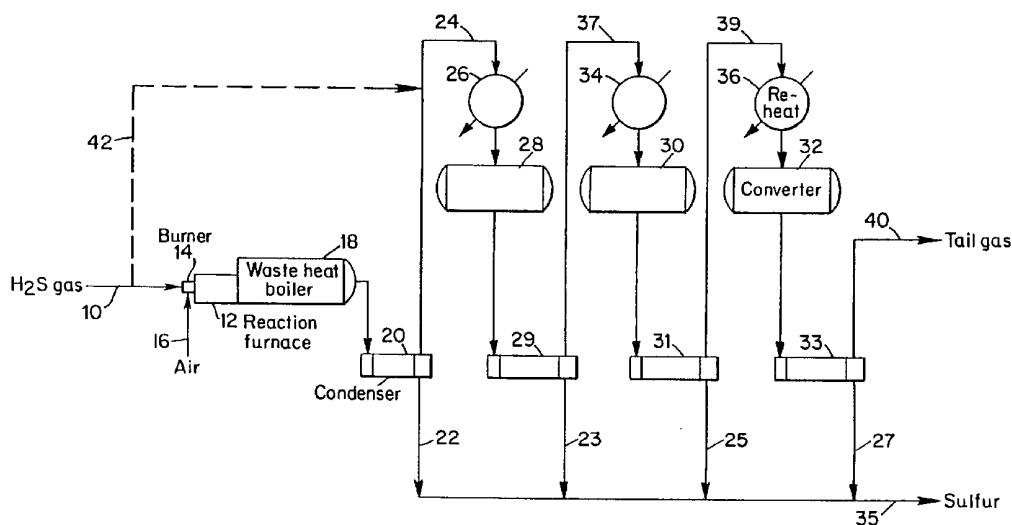
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— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations

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[Continued on next page]

(54) Title: CLAUS FEED GAS HYDROCARBON REMOVAL



(57) Abstract: A process for adsorbing hydrocarbons from an acid gas stream includes passing the acid gas stream through an adsorbent which selectively removes hydrocarbons, desorbing the hydrocarbons from the adsorbent and contacting the desorbed hydrocarbons with an acid gas removal solution to remove acid gases which have been coadsorbed with the hydrocarbons. The process is particularly useful in removing hydrocarbons from a hydrogen sulfide-containing stream which is being directed to Claus processing for conversion into elemental sulfur. Useful adsorbents include crystalline titanium silicate molecular sieves containing titania octahedral sites such as ETS-10 and similar materials, as well as high silica aluminosilicate zeolite.

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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.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/18052

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 B01D53/04 B01D53/86 B01D53/14

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)
 IPC 7 B01D

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, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	US 5 346 535 A (KUZNICKI STEVEN M ET AL) 13 September 1994 (1994-09-13) *see entire document*	1-8, 14-16 36-38
Y	EP 0 045 865 A (BERGWERKSVERBAND GMBH) 17 February 1982 (1982-02-17) page 2, line 9 - line 26; claim 1	1-8, 14-16
A	US 2 771 964 A (MILLER ERNEST B) 27 November 1956 (1956-11-27) column 2, line 65 -column 3, line 52	1-23
A	US 3 732 326 A (CHEN N) 8 May 1973 (1973-05-08) claim 1	1-23
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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *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)
- *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

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- *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.
- *G* document member of the same patent family

Date of the actual completion of the international search

2 August 2002

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/18052

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 4 957 715 A (GROVER BHADRA S ET AL) 18 September 1990 (1990-09-18) claim 1 ---	24-39
A	US 4 259 301 A (SAY GEOFFREY R) 31 March 1981 (1981-03-31) column 2, line 30 - line 50 ---	24-39
A	US 4 338 101 A (TUTTLE WILLARD N) 6 July 1982 (1982-07-06) claim 1 ---	24-39
A	US 4 372 925 A (CORNELISSE ROELOF) 8 February 1983 (1983-02-08) claim 1 ---	24-39
A	GB 670 700 A (ELUOR CORP LTD) 23 April 1952 (1952-04-23) claim 1 ---	24-39
X	DE 41 28 106 A (METALLGESELLSCHAFT AG) 25 February 1993 (1993-02-25) column 2, line 34 - line 42 ---	40
A	column 2, line 34 - line 42 ---	41-50
A	US 5 785 944 A (MILLER STEPHEN J) 28 July 1998 (1998-07-28) claims 1,6 -----	40-50

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 01/18052

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-23

Process for the removal of hydrocarbons from an acid gas containing stream using a titanium silicate molecular sieve containing octahedrally coordinated titania chains connected by tetrahedral silica and process for production of sulfur by a Claus process using as feed a stream containing H₂S and minor amounts of hydrocarbons that is contacted with such a molecular sieve to thereby adsorb hydrocarbons and other organics

2. Claims: 24-39

Process for the removal of hydrocarbons from an acid gas containing stream by adsorbing the hydrocarbons on a adsorbent, desorbing them creating a hydrocarbon stream containing a lesser amount of acid gas and contacting this stream with an acid gas removal solution to remove traces of acid gas.

3. Claims: 40-50

Process for the removal of hydrocarbons from an acid gas containing stream using a aluminosilicate zeolite molecular sieve having a silica to alumina ratio of at least 4 and process for production of sulfur by a Claus process using a stream containing H₂S and minor amounts of hydrocarbons that is contacted with such a molecular sieve to thereby adsorb hydrocarbons and other organics

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/18052

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