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(54) **Method of refining waste oil**

(57) A method of refining waste oil containing contaminants and water comprising the steps of contacting the waste oil with an aliphatic solvent to form a waste oil/aliphatic solvent mixture, and in a treatment vessel (11) separating the mixture into three phases, namely a bottom phase (I) comprising predominantly water, an intermediate phase (II) comprising predominantly residuum containing contaminants and a top phase (III) comprising predominantly an oil/aliphatic solvent solution.

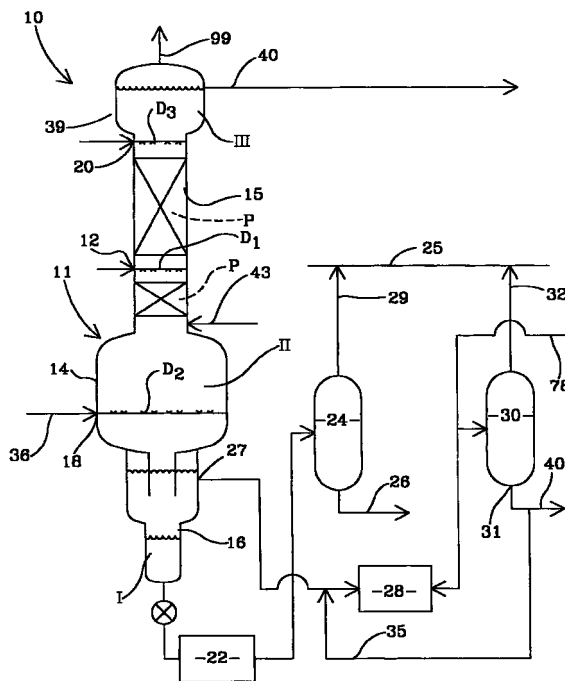


FIG 1



European Patent
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EUROPEAN SEARCH REPORT

Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	GB 2 145 730 A (SOCIETE NATIONALE ELF AQUITAINE) 3 April 1985 (1985-04-03) * claim 1 * ---	1,2,8,10	C10M175/00 C10G21/00 B01D1/30
X	GB 1 364 942 A (TEXACO DEVELOPMENT CORPORATION) 29 August 1974 (1974-08-29) * the whole document * ---	10	
Y		11,12	
Y	FR 2 301 592 A (INSTITUT FRANCAIS DU PETROLE) 17 September 1976 (1976-09-17) * page 1, line 10 - line 17 * * page 3, line 13 - line 28 * * page 2, line 4 - line 15 * ---	11,12	
D,X	WO 95 21902 A (INTERLINE RESOURCES CORPORATION) 17 August 1995 (1995-08-17) * page 13, line 22 - line 26; claims 1,5,36,41 * * page 14, line 10 - line 18 * ---	10	
A		1	
X	US 4 502 944 A (S.R. NELSON) 5 March 1985 (1985-03-05) * claim 1; figure 1 * ---	10,11	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A		1	C10M C10G B01D
D,A	US 2 196 989 A (R.W. HENRY) 16 April 1940 (1940-04-16) * column 1, line 45 - column 2, line 43 * ---	1-3	
A	WO 90 06350 A (SOCIETE NATIONALE ELF AQUITAINE) 14 June 1990 (1990-06-14) * claim 1 * -----		
-The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 20 June 2000	Examiner Hilgenga, K
CATEGORY OF CITED DOCUMENTS		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	
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			

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European Patent
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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-9, 10-13



The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-9,10-13

A method of refining waste oil containing contaminants and water including the steps of contacting the waste oil with an aliphatic solvent to form a waste oil/aliphatic solvent mixture, and in a treatment vessel separating the mixture into three phases and removing the three phases individually from the treatment vessel and an apparatus for performing this method including a treatment vessel, the treatment vessel having means to enable each of the three phases to be removed individually from the treatment vessel.

2. Claim : 14

An evaporating means for vaporising oil, the evaporator means comprising passage means along which the oil passes as the oil is heated, the passage means being lined with a flowing film of heavy fraction oil.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 10 4198

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 The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

20-06-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2145730 A	03-04-1985	FR 2550545 A JP 60060188 A	15-02-1985 06-04-1985
GB 1364942 A	29-08-1974	BE 778468 A DE 2153976 A FR 2168933 A JP 48084079 A NL 7200621 A	25-07-1972 03-05-1973 07-09-1973 08-11-1973 19-07-1973
FR 2301592 A	17-09-1976	IT 1038700 B	30-11-1979
WO 9521902 A	17-08-1995	AU 700298 B AU 1919195 A BR 9506794 A CA 2183433 A CN 1143383 A EG 20462 A EP 0745113 A IL 112623 A JP 10500147 T ZA 9501225 A	24-12-1998 29-08-1995 16-09-1997 17-08-1995 19-02-1997 31-05-1999 04-12-1996 12-03-1999 06-01-1998 18-10-1995
US 4502944 A	05-03-1985	NONE	
US 2196989 A	16-04-1940	NONE	
WO 9006350 A	14-06-1990	FR 2639649 A CA 2003833 A EP 0420946 A JP 3502342 T	01-06-1990 25-05-1990 10-04-1991 30-05-1991