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(71) Applicant: AGIP PETROLI S.p.A.
00142 Roma (IT)

(72) Inventors:

- Alberti, Alberto
15100 Alessandria (IT)
- Biroli, Santo
27020 Borgo San Siro (IT)
- Cavanna, Agostino
27058 Voghera (Pavia) (IT)

(74) Representative: De Gregori, Antonella
Ing. Barzano & Zanardo Milano S.p.A.
Via Borgonuovo 10
20121 Milano (IT)

(54) **Process for determining the nitrogen content of the effluent of the pretreatment reactor in a catalytic hydrocracking plant**

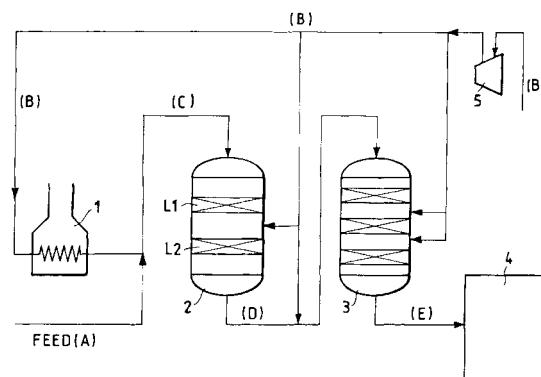
(57) Process for determining the nitrogen content of the effluent of the pretreatment reactor in a catalytic cracking plant with hydrogen, the above reactor consisting of at least one fixed catalytic bed, which comprises the following steps:

- 1) collecting the process and laboratory historical data relating to a high number of runs effected by the pretreatment reactor;
- 2) selecting from the data of point (1) a subset of data to be used as input for a first neural network (NN1);
- 3) calculating the NABT (NABT = normalized average catalytic bed temperature) for each series of historical data using the data of point (2) and correlations available in literature;
- 4) constructing a first neural network (NN1) using the data of point (2) and the NABT of point (3);
- 5) selecting a first set of training data of the first neural network NN1, comprising the data of point (2) and the corresponding calculated NABT values of point (3), generating a set of NABT predictive data of point (5);
- 6) selecting a second set of training data comprising the data of point (2) and the set of NABT predictive data of point (5);
- 7) constructing a second neural network NN2 using the data of point (6), generating a set of nitrogen

predictive data in the effluent and the configuration parameters of the network NN2;

8) applying the predictive data of points (5) and (7) to continuous process data, thus estimating the NABT of NN1 and the corresponding nitrogen content of the outgoing effluent without effecting laboratory analyses.

Fig.1





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EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.6)						
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim							
A	<p>N.MAZANA ET AL: "NEURAL NETWORK SELF-TUNING CONTROL OF HOT-SPOT TEMPERATURE IN A FIXED-BED CATALYTIC REACTOR" APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN ENGINEERING, July 1997 (1997-07), pages 123-126, XP000893122 UK * the whole document *</p> <p>---</p> <p>US 4 968 403 A (HERBST JOSEPH A ET AL) 6 November 1990 (1990-11-06) * the whole document *</p> <p>---</p> <p>US 5 660 716 A (BOURGOGNE MICHEL ET AL) 26 August 1997 (1997-08-26) * the whole document *</p> <p>-----</p>	1	C10G49/26 C10G65/12 G05B13/02 B01J8/00						
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)						
			G05B B01J C10G						
<p>The present search report has been drawn up for all claims</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Place of search</td> <td style="width: 33%;">Date of completion of the search</td> <td style="width: 34%;">Examiner</td> </tr> <tr> <td>THE HAGUE</td> <td>4 April 2000</td> <td>Kelperis, K</td> </tr> </table> <p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>				Place of search	Date of completion of the search	Examiner	THE HAGUE	4 April 2000	Kelperis, K
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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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.

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