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To the Director of the U.S. Patent and Trademark Office: Please record the attached original documents or copy thereof.

1. Name of conveying party(ies): Emanuel Freire SANDES Paulo Sergio FREIRE Jose' Geraldo Furtado RAMOS Aurelio Medina Dubois Jose' Mozart FUSCO Eduardo Cardoso de Melo GUERRA Wilson Kenzo Huziware Additional name(s) of conveying party(ies) attached? Yes No

2. Name and address of receiving party(ies): PETRÓLEO BRASILEIRO S.A. - PETROBRAS Av. Republica do Chile n° 65, Rio de Janeiro, Brazil Additional name(s) & address(es) attached? Yes No

3. Nature of conveyance: Assignment Merger Security Agreement Change of Name Other

Execution Date: May 7, 7, 7, 17, 10, 7, and 10, 2004

Additional name(s) & address(es) attached? Yes No

4. Application number(s) or patent number(s): If this document is being filed together with a new application, the execution date of the application is: May 7, 7, 7, 17, 10, 7 and 10, 2004 A. Patent Application No.(s) 10/814,641

B. Patent No.(s) Not Yet Assigned Additional numbers attached? Yes No

5. Name and address of party to whom correspondence concerning document should be mailed: SUGHRUE MION, PLLC WASHINGTON OFFICE 23373 CUSTOMER NUMBER

6. Total number of applications and patents involved: 1 7. Total fee (37 CFR 3.41): \$40.00 Enclosed. Authorized to be charged to Deposit Account No. 19-4880. The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account. 8. Deposit Account Number: 19-4880 (Attach duplicate copy of this page if paying by deposit account)

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9. Statement and signature. To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document. Brett S. Sylvester / Reg. No. 33,725 July 23, 2004 Date

Total number of pages including cover sheet, attachments, and documents: 2

Mail documents to be recorded with required cover sheet information to: MAIL STOP ASSIGNMENT RECORDATION SERVICES Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450

07/23/2004 BYRNE 00000046 10814641 01 FC:6021 40.00 OP

PATENT REEL: 015591 FRAME: 0441

Assignment

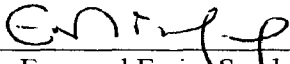
Whereas, I/We, Emanuel Freire Sandes, resident at Rua Dr. Nilo Peçanha, n° 115, ap.404, Ingá, Niterói – RJ – Brazil; Paulo Sérgio Freire, resident at Rua Padre Champagnat, n° 27, ap. 109, Vila Isabel, Rio de Janeiro – RJ – Brazil; José Geraldo Furtado Ramos, resident at Rua Prudente de Moraes, n° 765, ap. 502, Ipanema, Rio de Janeiro – RJ – Brazil; Aurélio Medina Dubois, resident at Rua Lauro Muller, n° 76, ap. 1008, Urca, Rio de Janeiro – RJ – Brazil; José Mozart Fusco, resident at Estrada Caetano Monteiro, n° 2301/13 Q5, Condomínio Fazendinha, Pendotiba, Niterói – RJ – Brazil; Eduardo Cardoso de Melo Guerra, resident at Rua Cristóvão Colombo, n° 900, Castelanea, Petrópolis – RJ – Brazil; Wilson Kenzo Huziwara, resident at Rua Barão de Itapagipe, n° 385, bloco 1, ap. 102, Tijuca, Rio de Janeiro – RJ – Brazil, hereinafter called assignor, have invented certain improvements in “**CYCLONE SYSTEM, PROCESS AND DEVICE FOR DISENGAGING SOLID AND GASEOUS PARTICLES IN FCC PROCESSES WITH REDUCED COKE FORMATION IN DISENGAGER VESSELS**” and executed an application for Letters Patent of the United States of America therefore on
2004 ; and

Whereas, PETRÓLEO BRASILEIRO S.A. - PETROBRAS, Av. República do Chile n° 65, Rio de Janeiro, Brazil (assignee), desires to acquire the entire right, title, and interest in the application and invention, and to any United States patents to be obtained therefore;

Now therefore, for valuable consideration, receipt whereof is hereby acknowledged,

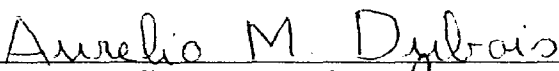
We, the above named assignor(s), hereby sell, assign and transfer to the above named assignee, its successors and assigns, the entire right, title and interest in the application and the invention disclosed therein for the United States of America, including the right to claim priority under 35 U.S.C. §119, and we request the Director of the U.S. Patent and Trademark Office to issue any Letters Patent granted upon the invention set forth in the application to the assignee, its successors and assigns; and we will execute without further consideration all papers deemed necessary by the assignee in connection with the United States application when called upon to do so by the assignee.

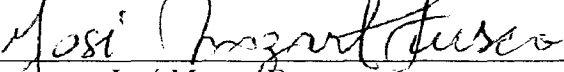
I/We hereby authorize and request my attorneys SUGHRUE, MION, ZINN, MCPEAK & SEAS of 2100 Pennsylvania Avenue, N.W., Washington, D.C. 20037-3202 to insert here in parentheses (Application number _____, filed _____) the filing date and application number of said application when known.

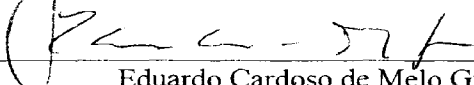
Date: 07th May, 2004 s/ 
Emanuel Freire Sandes

Date: 07th May, 2004 s/ 
Paulo Sérgio Freire

Date: 07th May, 2004 s/ 
José Geraldo Furtado Ramos

Date: 17th May, 2004 s/ 
Aurélio Medina Dubois

Date: 10th May, 2004 s/ 
José Mozart Fusco

Date: 07th May, 2004 s/ 
Eduardo Cardoso de Melo Guerra

Date: 10th May, 2004 s/ 
Wilson Kenzo Huziwara

(Legalization not required for recording but is prima facie evidence of execution under 35 U.S.C. §261)