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<p>(21) International Application Number: PCT/EP96/01010 ✓</p> <p>(22) International Filing Date: 6 March 1996 (06.03.96)</p> <p>(30) Priority Data: 399,868 ✓ 7 March 1995 (07.03.95) US 535,850 ✓ 28 September 1995 (28.09.95) US</p> <p>(71) Applicant (for all designated States except CA): SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ B.V. [NL/NL]; Carel van Bylandtlaan 30, NL-2596 HR The Hague (NL).</p> <p>(71) Applicant (for CA only): SHELL CANADA LIMITED [CA/CA]; 400 - 4th Avenue S.W., Calgary, Alberta T2P 2H5 (CA).</p> <p>(72) Inventors: CHEN, Ye-Mon; 2215 Bent River Drive, Sugar Land, TX 77479 (US). DEWITZ, Thomas, Sean; 1022 Orchard Hill, Houston, TX 77022 (US). BROSTEN, David, Jon; 4611 Riverside Oaks Drive, Kingwood, TX 77345 (US). NIELSON, James, Wayne, Jr.; 8031 Dowington Court, Spring, TX 77379-6162 (US).</p>	<p>(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</p>	

(54) Title: FEED NOZZLE ASSEMBLY

(57) Abstract

A feed nozzle assembly (100) for introducing steam and a heavy petroleum hydrocarbon into a catalytic cracking reactor, comprising: (a) a nozzle body (101) having an inner tube (105) defining a gas conduit (106) and an outer tube (115), wherein the inner tube (105) and the outer tube (115) define an annular liquid conduit (116), and wherein each of the tubes (105, 115) have an inlet end (120, 125) and an opposite outlet end (130, 135); (b) a first nozzle tip (140) fixedly attached to the outlet end (130) having a dome-shaped outlet end (142) provided with at least one passageway (145); (c) a second nozzle tip (150) fixedly attached to the outlet end (135) having a dome-shaped outlet end (152) provided with at least one elongated slit (155), which dome-shaped outlet end (152) of the second nozzle tip (150) extends beyond the dome-shaped outlet end (142) of the first nozzle tip (140).

