

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
20 September 2007 (20.09.2007)

PCT

(10) International Publication Number  
**WO 2007/106462 A3**

(51) International Patent Classification:

**B01D 5/00** (2006.01) **C23C 14/56** (2006.01)  
**B01D 8/00** (2006.01) **C23C 16/44** (2006.01)

(21) International Application Number:

PCT/US2007/006269

(22) International Filing Date: 12 March 2007 (12.03.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/781,743 14 March 2006 (14.03.2006) US  
11/709,435 22 February 2007 (22.02.2007) US

(71) Applicant (for all designated States except US): **PRAXAIR TECHNOLOGY, INC.** [US/US]; 39 Old Ridgebury Road, Danbury, CT 06810 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **PECK, John** [US/US]; 56 Sunset Creek Drive, West Seneca, NY 14224 (US). **LITWIN, Michael, M.** [US/US]; 346 George Urban Blvd., Cheektowaga, NY 14225 (US).

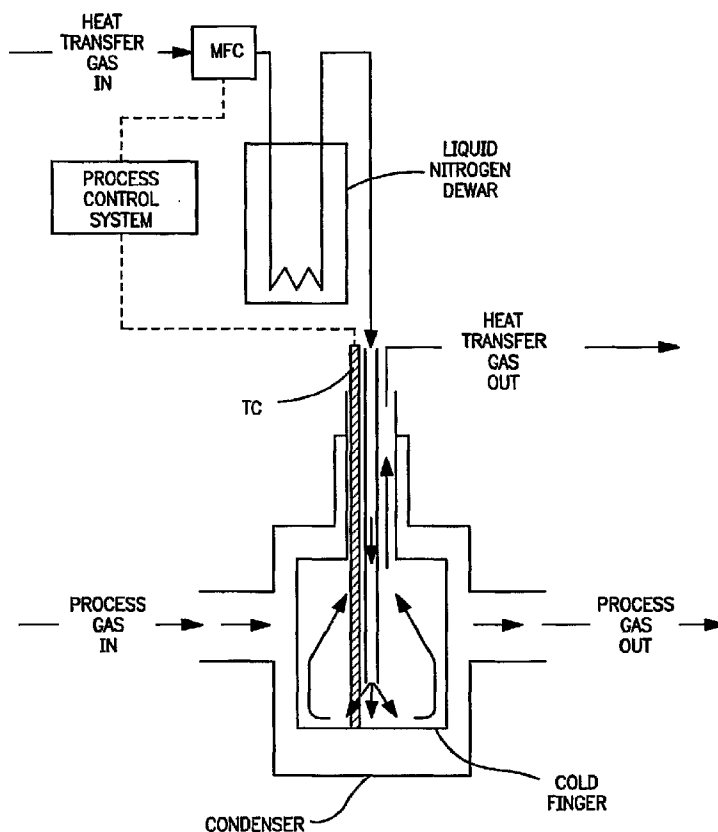
(74) Agents: **COON, Gerald, L.** et al.; Praxair, Inc., 39 Old Ridgebury Road, Danbury, CT 06810-5113 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: TEMPERATURE CONTROLLED COLD TRAP FOR A VAPOUR DEPOSITION PROCESS AND USES THEREOF



(57) Abstract: This invention relates to a separation process comprising (i) introducing a vapor phase mixture into a condensing apparatus, said vapor phase mixture comprising at least one desirable component and at least one undesirable component; (ii) controlling the temperature in the condensing apparatus utilizing a heat-transfer gas; and (iii) operating the condensing apparatus at a temperature and a pressure sufficient to selectively condense at least a portion of said vapor phase mixture and thereby yield a recovered content containing said at least one desirable component. The separation process is useful in semiconductor applications such as recovery of unreacted organometallic compound precursors in chemical vapor deposition or atomic layer deposition processes.

**Declarations under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

**Published:**

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

**(88) Date of publication of the international search report:**

8 November 2007

*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.*