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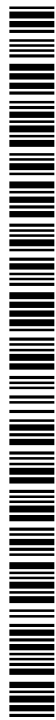
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(54) **Title:** SUB-ATMOSPHERIC PRESSURE DELIVERY OF LIQUIDS, SOLIDS AND LOW VAPOR PRESSURE GASES

(57) **Abstract:** A delivery system and method for vaporizing and delivery of vaporized solid and liquid precursor materials at sub-atmospheric pressures between a heatable vaporization vessel and a processing tool. The system includes a pressure regulator internally positioned within the vaporization vessel and in fluid communication with a downstream mass flow controller to maintain a consistent flow of vaporized source material. The system further comprises introducing a carrier/diluent gas for diluting the vaporized source material before entry into the processing tool. A venturi is positioned directly upstream of the processing tool and provides for mixing of the carrier gas with the vaporized source material while providing the negative pressure required to open the gas pressure regulator within the vaporization vessel.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/04562

A. CLASSIFICATION OF SUBJECT MATTER
 IPC: C23C 16/448(2006.01)

 USPC: 118/692,697,712,726;392/386,400,401;137/888
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
 U.S. : 118/692, 697, 712, 726; 392/386, 400, 401; 137/888

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,089,027 A (WANG et al) 18 July 2000 (18.07.00), Figures 1-3.	1-32
Y	US 2002/0007849 A (WANG et al) 24 January 2002 (24.01.02), paragraphs 32, 57 and 74	1-32
Y	US 6,257,000 A (WANG) 10 July 2001 (10.07.01), column 1, line 51 to column 2, line 30.	1-32
Y	US 5,935,305 A (TOM et al) 10 August 1999 (10.08.99), column 4, lines 3-11.	1-32
Y	US 2002/0054956 A (BOTELHO et al) 9 May 2002 (09.05.02), paragraphs 5-7.	2, 4, 25, 26
Y	US 5,445,035 A (DELAJOURD) 29 August 1995 (29.08.95), Figure 1.	8-10 and 30-32
Y	US 6,216,726 A (BROWN et al) 17 April 2001 (17.04.01), Figure 2.	8-10 and 30-32

Further documents are listed in the continuation of Box C. See patent family annex.

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PCT/US04/04562**C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,217,659 A (BOTELHO et al) 17 April 2001 (17.04.01), Figure 1, column 6, lines 45-51 and column 7, line 42 to column 8, line 6.	12