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(21) International Application Number: PCT/CA96/00536 (22) International Filing Date: 8 August 1996 (08.08.96) (30) Priority Data: 08/514,119 11 August 1995 (11.08.95) US 08/690,045 31 July 1996 (31.07.96) US (71) Applicant: ZENON ENVIRONMENTAL INC. [CA/CA]; 845 Harrington Court, Burlington, Ontario L7N 3P3 (CA). (72) Inventors: MAHENDRAN, Mailvaganam; 148 Annabelle Street, Hamilton, Ontario 19C 3T9 (CA). PEDERSEN, Steven, Kristian; 498 Rothesay Place, Burlington, Ontario L7N 3E2 (CA). HENSHAW, Wayne, Jerald; 5109 Bayfield Crescent, Burlington, Ontario L7L 3J5 (CA). BEHMANN, Henry; R.R. #1, Puslinch, Ontario M3H 1M9 (CA). RO- DRIGUES, Carlos, Fernando, F.; 82 Ravenswood Drive, Brampton, Ontario L6Y 4A1 (CA). (74) Agent: ROCK, H., Wayne; MacRae & Co., P.O. Box 806, Station "B", Ottawa, Ontario K1P 5T4 (CA).	(81) Designated States: AU, BR, CA, CZ, HU, JP, KR, PL, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the</i> <i>claims and to be republished in the event of the receipt of</i> <i>amendments.</i> (88) Date of publication of the international search report: 1 May 1997 (01.05.97)	
(54) Title: VERTICAL SKEIN OF HOLLOW FIBER MEMBRANES AND METHOD OF MAINTAINING CLEAN FIBER SURFACES		
(57) Abstract <p>A vertical skein of "fibers", opposed terminal portions of which are held in headers unconfined in a modular shell, is aerated with a gas-distribution means which produces a mass of bubbles serving the function of a scrub-brush for the outer surfaces of the fibers. The membrane device is surprisingly effective with relatively little cleansing gas, the flux through the membranes reaching an essentially constant relatively high value because the vertical deployment of fibers allows bubbles to rise upwards along the outer surfaces of the fibers. Further, bubbles flowing along the outer surfaces of the fibers make the fibers surprisingly resistant to being fouled by build-up of deposits of inanimate particles or microorganisms in the substrate provided that the length of each fiber is only slightly greater than the direct center-to-center distance between opposed faces of the headers, preferably in the range from at least 0.1 % to about 5 % greater. For use in a large reservoir, a bank of skeins is used with a gas distributor means; each skein has fibers preferably > 0.5 meter long, which together provide a surface area > 10 m². The terminal end portions of fibers in each novel header are kept free from fiber-to-fiber contact with a novel method of potting fibers.</p>		

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/CA 96/00536

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B01D63/02 B01D63/04 B01D65/02

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)
IPC 6 B01D

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 practical, 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	PATENT ABSTRACTS OF JAPAN vol. 012, no. 405 (C-539), 26 October 1988 & JP 63 143905 A (TOSHIBA CORP), 16 June 1988, see abstract ---	1-5,8-10
Y	WO 94 11094 A (ZENON ENVIRONMENTAL INC) 26 May 1994 cited in the application see claims 1,3,4,8,10,13,19; figure 11 ---	1-5,8-10
A	PATENT ABSTRACTS OF JAPAN vol. 95, no. 005 & JP 07 136470 A (MITSUBISHI RAYON CO LTD), 30 May 1995, see abstract -----	1,5,10

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