

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
7 April 2005 (07.04.2005)

PCT

(10) International Publication Number
WO 2005/030376 A1

(51) International Patent Classification⁷: **B01D 71/02**,
H01M 8/12, B01D 69/10, C01B 3/50

Drive, Winchester, MA 01890 (US). **BARTON, Roger, W.** [US/US]; 39 Juniper Road, Andover, MA 01810 (US).

(21) International Application Number:
PCT/US2004/031283

(74) Agent: **US, Natasha, C.**; Testa, Hurwitz & Thibault, LLP,
High Street Tower, 125 High Street, Boston, MA 02110
(US).

(22) International Filing Date:
23 September 2004 (23.09.2004)

(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, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/505,547 23 September 2003 (23.09.2003) US

(71) Applicant (for all designated States except US): **LIL-
LIPUTIAN SYSTEMS, INC.** [US/US]; 3-H Gill Street,
Suite 200, Woburn, MA 01801 (US).

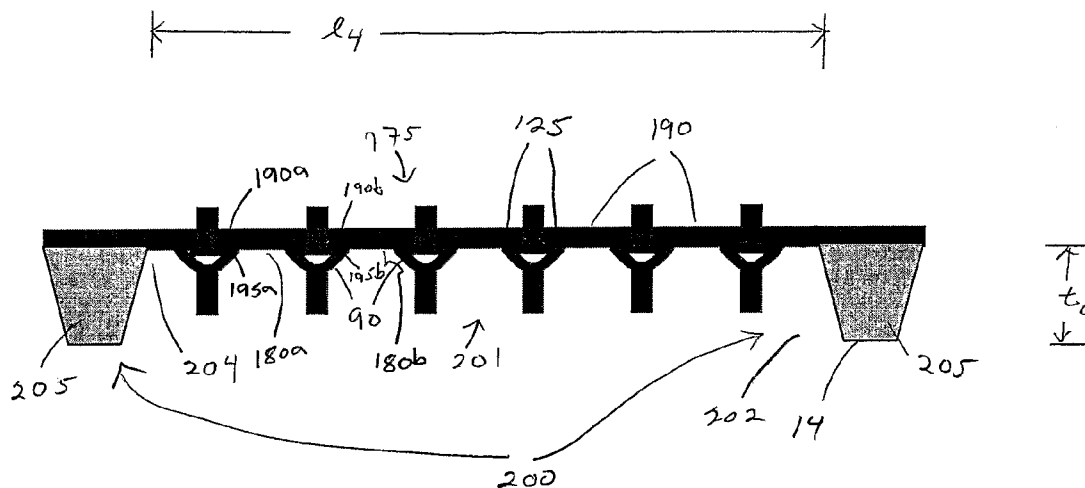
(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IT, LU, MC, 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).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **SCHAEVITZ,
Samuel, B.** [US/US]; 3430 Lake Chad Ct., Fremont, CA
94555 (US). **FRANZ, Aleksander** [US/US]; 6 Keenan

[Continued on next page]

(54) Title: STRESSED THIN-FILM MEMBRANE ISLANDS



(57) Abstract: A structure including a support defining an opening, and a tensilely stressed thin-film membrane disposed to occlude the opening, the membrane contacting at least a portion of the support. The stressed membrane includes a material having a characteristic crack spacing greater than one-half of a minimum dimension of the membrane and less than ten times the minimum dimension. A structure including a support defining an opening having a minimum opening dimension, and a compressively stressed thin-film membrane disposed to occlude the opening, the membrane contacting at least a portion of the support. The stressed membrane includes a membrane material having a critical aspect ratio for buckling that is greater than a ratio of one-half of the minimum opening dimension to a thickness of the membrane, and the critical aspect ratio for buckling is less than a ratio of ten times the minimum opening dimension to the thickness of the membrane.

WO 2005/030376 A1

**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*

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.