12 Mar 03

20030123 09

162162

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

CORRECTED VERSION

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
21 March 2002 (21.03.2002)

PCT

(10) International Publication Number
WO 02/022492 A3

(51) International Patent Classification[7]: B81B 3/00, F16J 3/02, F15C 5/00

(21) International Application Number: PCT/US01/28608

(22) International Filing Date:
14 September 2001 (14.09.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/661,997 14 September 2000 (14.09.2000) US

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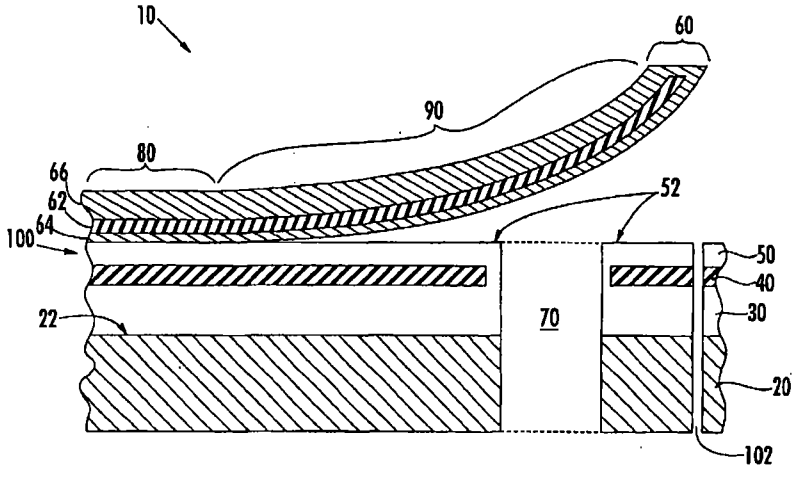
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(81) Designated States *(national)*: AE, AG, AL, AM, AT (utility model), AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (utility model), DE, DK (utility model), DK, DM, DZ, EC, EE (utility model), EE, ES, FI (utility model), 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, NO, NZ, PH, PT, RO, RU, SD, SE, SG, SI, SK (utility model), SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF,

[Continued on next page]

(54) Title: MICROELECTROMECHANICAL FLEXIBLE MEMBRANE ELECTROSTATIC VALVE DEVICE AND RELATED FABRICATION METHODS



(57) Abstract: A MEMS valve device driven by electrostatic forces is provided. The MEMS valve device includes a substrate having an aperture formed therein, a substrate electrode, a moveable membrane that overlies the aperture and has an electrode element and a biasing element. Additionally, at least one resiliently compressible dielectric layer is provided to insure electrical isolation between the substrate electrode and electrode element of the moveable membrane. In operation, a voltage differential is established between the substrate electrode and the electrode element of the moveable membrane to move the membrane relative to the aperture to thereby controllably adjust the portion of the aperture that is covered by the membrane. In another embodiment the resiliently compressible dielectric layer(s) have a textured surface; either at the valve seat, the valve seal or at both surfaces. In another embodiment of the invention a pressure-relieving aperture is defined within the substrate and is positioned to underlie the moveable membrane.

WO 02/022492 A3

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CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

(88) Date of publication of the international search report:
1 August 2002

(48) Date of publication of this corrected version:
20 November 2003

(15) Information about Correction:
see PCT Gazette No. 47/2003 of 20 November 2003, Section II

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.