

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
14 October 2004 (14.10.2004)

PCT

(10) International Publication Number  
**WO 2004/088330 A1**

(51) International Patent Classification<sup>7</sup>: **G01P 15/125**,  
15/08

(21) International Application Number:  
PCT/US2004/009597

(22) International Filing Date: 26 March 2004 (26.03.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
10/400,591 26 March 2003 (26.03.2003) US

(71) Applicant: **HONEYWELL INTERNATIONAL INC.**  
[US/US]; 101 Columbia Road, P.O. Box 2245, Morris-  
town, NJ 07960 (US).

(72) Inventors: **MALAMETZ, David, L.**; 15022 Old Manor  
Way, Lynnwood, WA 98037 (US). **HORNING, Robert,  
D.**; 14411 Alabama Ave. So., Savage, MN 55378 (US).  
**BECKA, Stephen, F.**; 42918 SE 173rd Street, North Bend,  
WA 98045 (US).

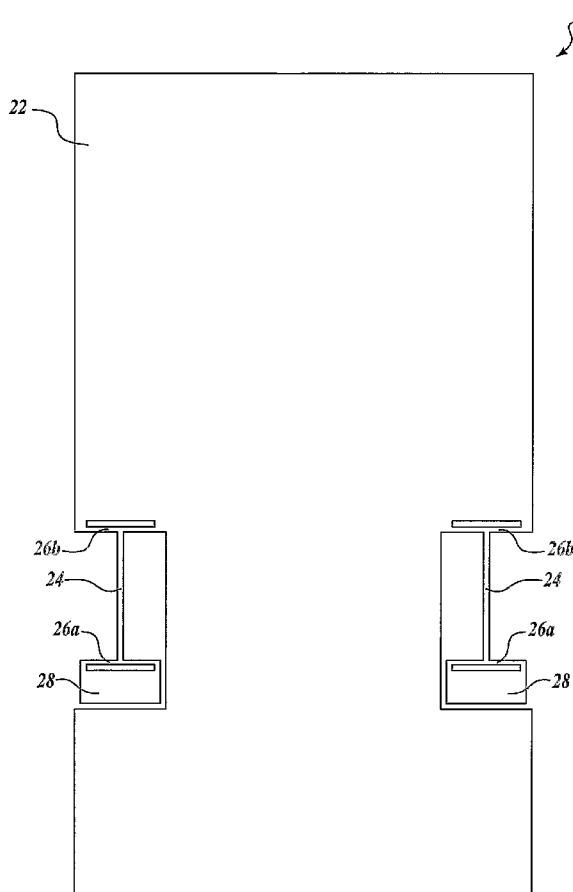
(74) Agents: **HOIRIIS, David** et al.; Honeywell International  
Inc., 101 Columbia Road, P.O. Box 2245, Morristown, MJ  
07960 (US).

(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, 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.

(84) Designated States (*unless otherwise indicated, for every  
kind of regional protection available*): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),  
Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Euro-  
pean (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,

[Continued on next page]

(54) Title: BENDING BEAM ACCELEROMETER WITH DIFFERENTIAL CAPACITIVE PICKOFF



(57) Abstract: A low cost, pendulous, capacitive-sensing Micro Electro-Mechanical Systems (MEMS) accelerometer is provided. The accelerometer includes a pendulous proof mass, one or more securing pads, and one or more flexures coupled with the pendulous proof mass and the one or more securing pads. The flexures flex linearly with respect to motion of the pendulous proof mass. First and second capacitor plates are positioned relative to the pendulous proof mass for detecting motion of the proof mass according to a sensed difference in capacitance. One or more strain isolation beams are connected between the one or more flexures and the pendulous proof mass or the securing pads. The strain isolation beams protect the flexures from mechanical strain.



TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

*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.*

**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*