

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
19 May 2005 (19.05.2005)

PCT

(10) International Publication Number  
WO 2005/045446 A3

- (51) International Patent Classification:  
G01F 1/84 (2006.01)
- (21) International Application Number:  
PCT/US2004/035737
- (22) International Filing Date: 29 October 2004 (29.10.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
60/515,424 30 October 2003 (30.10.2003) US
- (63) Related by continuation (CON) or continuation-in-part (CIP) to earlier application:  
US 60/515,424 (CON)  
Filed on 30 October 2003 (30.10.2003)
- (71) Applicant (for all designated States except US): INVEN-  
SYS SYSTEMS, INC. [US/US]; 33 Commercial St.,  
Foxboro, MA 02035-2099 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only):  
CHEESEWRIGHT, Robert [GB/GB]; Cadmore End  
Common, High Wycombe, Bucks HP14 3PS (GB).  
CLARK, Colin [GB/GB]; 11 Mill Lane, Great Haseley,  
Oxford OX44 7JU (GB).
- (74) Agent: WALTERS, Gregory, A.; Fish & Richardson P.C.,  
1425 K Street, N.W., 11th Floor, Washington, DC 20005-  
3500 (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 (patent), 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, 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).

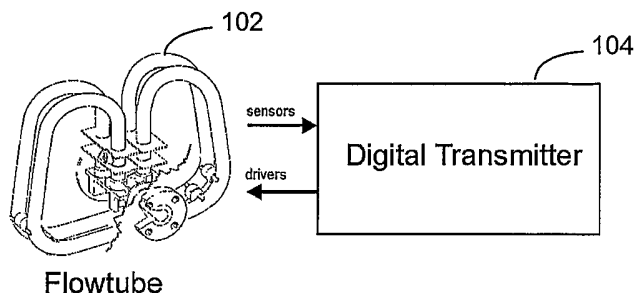
**Published:**

- 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

- (88) Date of publication of the international search report:  
14 December 2006

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.

(54) Title: DYNAMIC RESPONSE CHARACTERISTICS OF FLOW METERS



(57) Abstract: A flowmeter (200) includes a vibratable flowtube (215) that has internal damping characteristics that substantially result in a desired dynamic response of the vibratable tube (215) to a change in a flow of fluid through the vibratable flowtube (215). The dynamic response may be to a change in a property of the flow of fluid, a step change in the flow, and/or a change in the mass flow rate. The vibratable flowtube (215) may have frequency-dependent internal damping characteristics such that damping of a driven mode of vibration is not substantially increased and damping at one or more modes other than the driven mode are substantially increased.

WO 2005/045446 A3

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US04/35737

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC: **G01F 1/84**( 2006.01)  
  
 USPC: 73/861.356,861.357,861.355;702/45  
 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. : 73/861.356,861.357,861.355; 702/45

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
 NONE

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

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,675,102 A (HENRY et al) 06 June 2004 (06.06.2004), col. 1, lines 54-63	1,5-8 and 10-14

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

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search  
 16 September 2006 (16.09.2006)

Date of mailing of the international search report  
 12 OCT 2006

Name and mailing address of the ISA/US  
 Mail Stop PCT, Attn: ISA/US  
 Commissioner for Patents  
 P.O. Box 1450  
 Alexandria, Virginia 22313-1450  
 Facsimile No. (571) 273-3201

Authorized officer  
*Rhonda for Reed*  
 Jewel V. Thompson  
 Telephone No. 308-1134