

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : G01F 1/84, G01N 9/00		A1	(11) International Publication Number: WO 99/02945
			(43) International Publication Date: 21 January 1999 (21.01.99)
(21) International Application Number: PCT/US98/09572		(81) Designated States: AU, BR, CA, CN, ID, JP, KR, MX, PL, RU, SG, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).	
(22) International Filing Date: 11 May 1998 (11.05.98)			
(30) Priority Data: 08/890,785 11 July 1997 (11.07.97) US		Published With international search report.	
(71) Applicant: MICRO MOTION, INC. [US/US]; 7070 Winchester Circle, Boulder, CO 80301 (US).			
(72) Inventor: CUNNINGHAM, Timothy, J.; 613 Maxwell Avenue, Boulder, CO 80304 (US).			
(74) Agents: DUFT, Donald, M. et al.; Duft, Graziano & Forest, P.C., Suite 140, 1790-30th Street, Boulder, CO 80301-1018 (US).			

(54) Title: DRIVE CIRCUIT MODAL FILTER FOR A VIBRATING TUBE FLOWMETER

(57) Abstract

A drive system (50, 104) for a vibrating tube-based measurement instrument (5) employing a spatial filter (500) to produce a drive signal having modal content only at a desired vibration mode. Multiple feedback sensors (105, 105') located at different locations along a vibrating tube (103A, 103B) produce multiple feedback signals. Each feedback signal has applied to it a weighting or gain factor. All of the weighted feedback signals are then summed to produce a drive signal, or a signal proportional to a drive signal, having improved modal content as compared to any of the feedback signals by themselves. The weighting factors are selected by any of several means. One method is to build the eigenvector matrix for the vibrating flow tube by extracting the eigenvectors from a finite element model of the vibrating structure. The inverse or pseudo-inverse of the eigenvector matrix is calculated to obtain the modal filter vector. The appropriate set of weighting coefficients are selected from the modal filter vector.

