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Paper 16
Entered: August 4, 2014

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICRO MOTION, INC.,
Petitioner,

v.

INVENSYS SYSTEMS, INC.,
Patent Owner.

Case IPR2014-00393
Patent 7,571,062 B2

Before WILLIAM V. SAINDON, MICHAEL R. ZECHER, and JENNIFER M. MEYER, *Administrative Patent Judges*.

SAINDON, *Administrative Patent Judge*.

DECISION
Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

A. Background

Petitioner filed a corrected Petition requesting an *inter partes* review of claims 1, 12, 13, 23–25, 29, 30, 36, 40, 43, and 45 of U.S. Patent No. 7,571,062 B2 (Ex. 1001, "the '062 patent"). Paper 5 ("Pet."). Patent Owner timely filed a Preliminary Response. Paper 10 ("Prelim. Resp."). We have jurisdiction under 35 U.S.C. § 314, which provides that an *inter partes* review may not be instituted "unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." Petitioner contends that the challenged claims are unpatentable under 35 U.S.C. §§ 102 and 103 based on the following specific grounds:

Reference(s)	**Basis**	**Claims Challenged**
Derby[1]	§ 102	1, 12, 13, 23, 29, 36
Romano[2]	§ 102	1, 24, 29, 40, 43, 45
Freeman[3]	§ 102	1, 23, 25, 29
Miller[4]	§ 102	40, 45
Kalotay[5]	§ 103	1, 12, 23–25, 29, 36, 40, 43, 45
Kalotay and "Printed Publications"[6]	§ 103	13

[1] U.S. Patent No. 5,555,190 (issued Sept. 10, 1996) (Ex. 1016) ("Derby").
[2] U.S. Patent No. 4,934,196 (issued June 19, 1990) (Ex. 1006) ("Romano").
[3] U.S. Patent No. 5,804,741 (issued Sept. 8, 1998) (Ex. 1054) ("Freeman").
[4] U.S. Patent No. 4,679,947 (issued July 14, 1987) (Ex. 1007) ("Miller").
[5] U.S. Patent No. 5,009,109 (issued Apr. 23, 1991) (Ex. 1008) ("Kalotay").
[6] Petitioner does not identify specifically in the asserted ground which reference(s) constitute the "Printed Publications Describing Signal Processing Using Overlap Techniques" ("Printed Publications"). *See* Pet. 2, 45–47. The only specific reference cited in the asserted ground is Exhibit 1046 (John G. Proakis & Dimitris G. Manolakis, *Digital Signal Processing*, 864–879 (John Griffin, ed., 2d ed. 1992)). *Id.* at 46.

Reference(s)	Basis	Claims Challenged
Kalotay and Liu[7]	§ 103	30

For the reasons given below, we institute an *inter partes* review of claims 1, 29, 40, and 45. We do not institute an *inter partes* review of claims 12, 13, 23–25, 30, 36, and 43.

B. Additional Proceedings

In addition to this Petition, Petitioner has filed petitions challenging the patentability of certain claims of Patent Owner's U.S. Patent No. 6,311,136 (Case IPR2014-00170); U.S. Patent No. 6,754,594 (Case IPR2014-00390); U.S. Patent No. 7,124,646 (Case IPR2014-00179); U.S. Patent No. 7,136,761 (Case IPR2014-00178); U.S. Patent No. 7,505,854 (Case IPR2014-00167); and U.S. Patent No. 8,000,906 (Case IPR2014-00392). Pet. 1. Petitioner identifies the '062 patent as involved in a concurrent district court case titled *Invensys Systems, Inc. v. Emerson Electric Co.*, No. 6:12-cv-00799-LED (E.D. Tex.). *Id.*

C. Flowmeter Technology

As described in the background section of the '062 patent, Coriolis flowmeters seek to measure the flow of material through a tube by taking advantage of the Coriolis effect. Ex. 1001, 1:31–41. A driving mechanism applies forces to the tube to induce it to oscillate. *Id.* at 1:42–43. The flowmeter uses sensors to measure the twisting of the tube (due to the Coriolis effect, as explained below) and thereby estimate the mass and/or density of the material. *See id.* at 3:47–56; *see also* Ex. 1002 (Declaration of Dr. Michael D. Sidman) ¶¶ 27–44 (explaining how Coriolis flowmeters operate). Figures 1–3 of Exhibit 1009,[8]

[7] U.S. Patent No. 5,029,482 (issued July 9, 1991) (Ex. 1019) ("Liu").
[8] Micro Motion, *How the Micro Motion® Mass Flow and Density Sensor Works*, (1990) (Ex. 1009).

reproduced below, show the Coriolis effect in action:

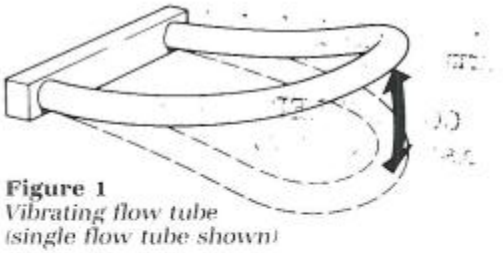

Figure 1
Vibrating flow tube (single flow tube shown)

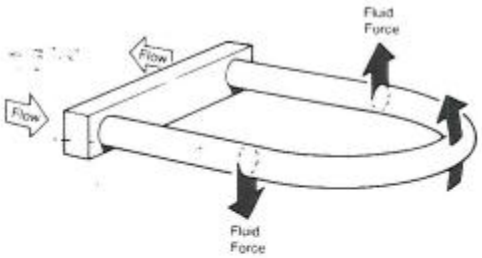

Figure 2
Fluid forces reacting to vibration of flow tube

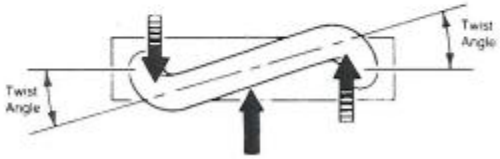

Figure 3
End view of flow tube showing twist

In Figure 1, an empty tube bent in a horseshoe shape is made to oscillate up and down; both legs of the tube pass the midpoint of the up-and-down oscillation at the same time. Ex. 1009, 1. In Figure 2, fluid now flows in one end of the tube and out the other. *Id.* The tube is depicted as rising, in the upward swing of its oscillation. *Id.* In this moment, the fluid flowing into the first leg of the tube is pushed upwards by the rising tube, but resists this motion, due to inertia, and exerts a downward force on this leg, holding back the upward rise of this leg. *Id.* By the time the fluid has passed around the bend and into the second leg of the tube, however, the fluid has been accelerated upwards by the upward rise of the tube, and, thus, pushes upward on the second leg of the rising tube. *Id.* Figure 3 depicts an end view of the tube, and the net result of these forces—a twisting of the tube. *Id.* When the tube moves in its downward swing of its oscillation, the opposite twist occurs. *Id.* The amount of twisting is proportional to the mass of the fluid moving through the tube. *Id.*

D. The Challenged Patent

The ’062 patent is titled “Digital Flowmeter” and generally relates to a control and measurement system for a digital flowmeter. Ex. 1001, Abstr. The flowmeter of the ’062 patent describes a variety of digital signal processing techniques. *Id.* at 2:1–6. The system permits the application of negative gain to the conduit in order to reduce the amplitude of oscillation. *Id.* at 2:7–23. The control system also may adjust the drive signal phase in order to compensate for a time delay associated with the sensor and components connected between the sensor and driver. *Id.* at 7:14–17.

Of the claims challenged, claims 1, 40, and 45 are independent. Claims 12, 13, 23–25, 29, 30, and 36 depend from claim 1, and claim 43 depends from claim 40. Each of the independent claims recites a digital flowmeter having one of a number of different control and measurement features, such as a feature to “generate a drive signal based on the sensor signal using digital signal processing.” Ex. 1001, 55:31–32, 59:16–17, 60:17–18. Independent claim 1 specifically recites a feature to “use digital processing to adjust a phase of the drive signal,” which is not found in independent claims 40 and 45. *Id.* at 55:37–40. Conversely, independent claims 40 and 45 include a feature wherein there are two drive signals and “the second drive signal is different from the first drive signal.” *Id.* at 59:21–24, 60:23–27.

Independent claims 1 and 45 are reproduced below.

> 1. A digital flowmeter comprising:
> a vibratable conduit;
> a driver connected to the conduit and operable to impart motion to the conduit;
> a sensor connected to the conduit and operable to sense the motion of the conduit; and

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