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**Datasheet for the decision  
of 15 July 2021**

**Case Number:** T 0940/18 - 3.4.02

**Application Number:** 04776899.9

**Publication Number:** 1759177

**IPC:** G01F1/84, G01N9/00

**Language of the proceedings:** EN

**Title of invention:**

METER ELECTRONICS AND METHOD FOR DETECTING A RESIDUAL MATERIAL  
IN A FLOW METER ASSEMBLY

**Applicant:**

Micro Motion, Inc.

**Relevant legal provisions:**

EPC 1973 Art. 54(1), 56

**Keyword:**

Novelty and inventive step (yes)



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Case Number: T 0940/18 - 3.4.02

**D E C I S I O N**  
**of Technical Board of Appeal 3.4.02**  
**of 15 July 2021**

**Appellant:** Micro Motion, Inc.  
(Applicant) 7070 Winchester Circle  
Boulder, CO 80301 (US)

**Representative:** Ellis, Christopher Paul  
Ollila Law Limited  
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**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 23 October 2017  
refusing European patent application No.  
04776899.9 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairwoman** T. Karamanli  
**Members:** C. Kallinger  
F. J. Narganes-Quijano

## **Summary of Facts and Submissions**

- I. The appellant lodged an appeal against the decision of the examining division refusing European patent application No. 04 776 899.9.
- II. With the statement of grounds of appeal dated 2 March 2018, the appellant filed amended claims according to a third auxiliary request. It requested that the decision under appeal be set aside and that a European patent be granted on the basis of the claims according to the main request filed with letter dated 8 September 2017 or, alternatively, the first or second auxiliary request, both filed with letter dated 8 September 2017, or the third auxiliary request filed with the statement of grounds of appeal. As a precaution, the appellant requested oral proceedings.
- III. The documents cited in the decision under appeal included the following:  

D4: US 6 327 914 B1.
- IV. In a communication pursuant to Article 15(1) of the revised Rules of Procedure of the Boards of Appeal (RPBA 2020, OJ EPO 2019, A63), attached to the summons to oral proceedings, the board gave its preliminary, non-binding view on certain aspects of the appeal case.
- V. By its letter of reply to the board's preliminary opinion dated 10 May 2021, the appellant filed amended claims 1 to 24 according to a new main request. The auxiliary requests were maintained.

VI. In a telephone conversation on 28 June 2021, the board informed the appellant of certain inconsistencies in the letter of reply dated 10 May 2021. These concerned the application documents, in particular the description and dependent claims, which formed the basis of the new main request.

VII. On 28 June 2021, the appellant filed a further letter and requested as a main request that the decision of the examining division be set aside and that a European patent be granted on the basis of the following documents:

- Claims 1 to 24 filed with the letter dated 10 May 2021;
- Description pages 1 and 3 to 20 as originally filed;
- Description pages 2 and 2a filed with the letter dated 21 March 2013; and
- Drawing sheets 1/8 to 8/8 as originally filed.

The auxiliary requests were maintained.

VIII. Subsequently the oral proceedings were cancelled.

IX. The appellant's final requests are as indicated above under point VII.

X. Independent claims 1 and 13 of the main request read as follows:

*"1. A meter electronics (20) adapted for detecting a residual material in a flow meter assembly (10), with the meter electronics (20) comprising a processing system (22) adapted to direct the flow meter (5) to vibrate the flow meter assembly (10) and receive a*

*vibrational response (31) from the flow meter assembly (10) and a storage system (24) configured to store flow meter parameters and data, the processing system (22) being configured to compare the vibrational response (31) to a predetermined residual material threshold (30) to detect the residual material."*

*"13. A method of detecting a residual material in a flow meter assembly, comprising vibrating the flow meter assembly, measuring a vibrational response of the flow meter assembly and comparing the vibrational response to a predetermined residual material threshold to detect the residual material."*

The main request also includes dependent claims 2 to 12 and 14 to 24 referring back to independent claims 1 and 13, respectively.

## **Reasons for the Decision**

### 1. Main request - Amendments (Article 123(2) EPC)

Claims 1 to 24 of the main request are identical to claims 1 to 24 as originally filed. Description pages 2 and 2a have been amended to indicate the prior art cited during the examination procedure, as required by Rule 27(1)(b) EPC 1973.

The application therefore meets the requirements of Article 123(2) EPC.

2. Main request - Novelty over document D4 - Article 54(1) EPC 1973

2.1 The examining division argued that D4 disclosed a meter electronics (20) (Fig. 1) adapted for detecting a residual material in a flow meter assembly (column 7, line 18: *"or scale internal to the flowtubes"*). To that end, a vibrational response was detected and compared to a predetermined residual material threshold (606) (see column 7, lines 4 to 7 and Figure 6) to detect the residual material. The examining division argued in particular that the expression *"vibrational response"* of claim 1 was so broad that it included the drive gain  $T_r$  of D4 and that the result of the comparison of the gain  $T_r$  to the threshold 606 in D4 was a detection of residual material as claimed (see column 7, lines 15 to 18: *"scale internal to the flowtubes"*).

2.2 The appellant argued that the *"vibrational response"* defined in claim 1 of the present invention could not be considered to include the drive gain  $T_r$  of D4. The present specification taught that *"Furthermore, the meter electronics 20 can also monitor a drive gain received from the pick-off 170, where the drive gain comprises a relationship between the drive signal amplitude supplied to the drive mechanism 180 and the resulting vibrational response 31"* (see page 11, lines 11 to 14). The use of the expression *"drive gain"* in document D4 was similar (see column 6, lines 19 to 33 and equation 3), and therefore the vibrational response of the present invention could not be considered comparable to the drive gain disclosed in D4.

Furthermore, D4 discussed the comparison of a drive gain with a drive gain threshold, but did not mention a predetermined residual material threshold. In contrast,

D4 specifically taught that the *"meter electronics 20 are designed to monitor drive gain or transmissivity and to optimize the amplitude of transmissivity based upon a ratio of the voltage at the pickoff coil divided by the voltage at the drive coil. This optimization is performed based upon a slope analysis of curve 500"* (see column 6, lines 53 to 56). In other words, D4 acknowledged that the curves shown in Figure 5 were not compared to any purported predetermined frequency response to detect a residual material.

- 2.3 The board is of the opinion that document D4 fails to disclose that a vibrational response from the flow meter assembly is compared to a predetermined residual material threshold to detect the residual material.

D4 is directed to the detection of the presence of a multiphase flow including gas and liquid (see abstract and column 1, lines 58 to 67) which can lead to inaccuracy in flow measurements. In order to detect multiphase flow, the meter electronics disclosed in document D4 compares a drive gain to a drive gain threshold and determines that multiphase flow is occurring when the drive gain exceeds the drive gain threshold (see column 2, lines 59 to 65). When such a multiphase flow is detected, the meter electronics disclosed in document D4 disregards real-time flowmeter measurements and substitutes historical density data (see column 3, lines 2 to 7).

The passage in column 7, lines 11 to 18, referred to by the examining division explains that the system is also capable of detecting multiphase flow which includes liquids and solids (instead of gas and liquid) and lists scale internal to the flowtubes as an example of the mentioned solids. The board is therefore not

convinced that this passage discloses that the meter electronics disclosed in document D4 is capable of detecting residual material in the flowtube, where the material comprises material remaining in the flow meter after the flow meter assembly is drained.

Furthermore, in the meter electronics disclosed in document D4 the parameter that is measured and compared to a threshold is the drive gain  $T_r$ . The board is of the opinion that this parameter does not fall under the claimed vibrational response, as the application clearly distinguishes between a vibrational response and a drive gain.

The same reasoning applies to independent claim 13.

The subject-matter of independent claims 1 and 13 is therefore new in view of document D4.

3. Main request - Inventive step over document D4 -  
Article 56 EPC 1973

Document D4 relates to a Coriolis flowmeter that is operable as a vibrating tube densitometer. The drive gain is monitored in order to indicate multiphase flow including gas and liquid components.

The subject-matter of claim 1 differs from document D4 in that residual material in a flow meter is detected by comparing the vibrational response to a predetermined residual material threshold.

The person skilled in the art who is searching for a solution to ensure that a flow meter is completely drained and free of flow media does not receive any



hint from document D4 or from his common general knowledge to modify the meter electronics disclosed in document D4 to address the problem of detecting residual material, let alone to modify the meter electronics disclosed in document D4 to detect residual material in a flow meter by comparing the vibrational response to a predetermined residual material threshold.

The same argument applies to independent claim 13.

In view of the above, the subject-matter of independent claims 1 and 13, and therefore also that defined in dependent claims 2 to 12 and 13 to 24 of the main request involves an inventive step over the disclosure of document D4.

4. Other documents

The board concurs with the examining division's assessment that the other documents cited in the international search report are less relevant (see the examining division's communication dated 10 March 2016, point 4).

5. Adaption of the description

As the claims of the main request correspond to the originally filed claims and the amended description pages 2 and 2a add a reference to the relevant prior art as required by Rule 27(1)(b) EPC 1973, no further adaption of the description is necessary.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the examining division with the order to grant a European patent in the following version:

#### Description:

Pages 1 and 3 to 20 as originally filed and pages 2 and 2a filed with the letter dated 21 March 2013.

#### Claims:

Nos. 1 to 24 filed with the letter dated 10 May 2021.

#### Drawings:

Sheets 1/8 to 8/8 as originally filed.

The Registrar:

The Chairwoman:



L. Gabor

T. Karamanli

Decision electronically authenticated