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**D E C I S I O N**  
**of 24 April 1996**

**Case Number:** T 0102/95 - 3.4.2

**Application Number:** 85305192.8

**Publication Number:** 0210308

**IPC:** G01F 1/78

**Language of the proceedings:** EN

**Title of invention:**  
Mass flowmeter

**Patentee:**  
SMITH METER INC.

**Opponent:**  
Endress + Hauser Flowtec AG  
Krohne Messtechnik Massametron GmbH & Co. KG

**Headword:**  
-

**Relevant legal provisions:**  
EPC Art. 84, 102(3) and 113(1)

**Keyword:**  
"Clarity of claim 1 of the patent maintained in amended form -  
(no) "

**Decisions cited:**  
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**Catchword:**  
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Case Number: T 0102/95 - 3.4.2

**DECISION**  
of the Technical Board of Appeal 3.4.2  
of 24 April 1996

**Other party:**  
(Opponent 01)

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**Representative:**

**Appellant:**  
(Opponent 02)

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**Representative:**

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**Respondent:**  
(Proprietor of the patent)

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**Representative:**

Smith, Norman Ian  
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**Decision under appeal:**

Interlocutory decision of the Opposition Division  
of the European Patent Office posted 21 December  
1994 concerning maintenance of European patent  
No. 0 210 308 in amended form.

**Composition of the Board:**

**Chairman:** E. Turrini  
**Members:** M. Chomentowski  
B. J. Schachenmann

### Summary of Facts and Submissions

- I. The respondent is proprietor of European patent No. 0 210 308, which was granted on the basis of European patent application No. 85 305 192.8.
- II. Two opponents filed an opposition to the granted patent.
- III. The patent was maintained in amended form. It contains on column 5, lines 11 and 12, as in the patent as granted, a statement indicating that a flowmeter in accordance with the pre-characterising part of claim 1 is shown in US-A-4 381 680. The only independent claim as amended reads as follows:

"1. A meter for measuring the mass flow rate of material travelling through said meter comprising:  
a support (10, 42, 60, 74);  
a conduit (12, 40, 56, 72) that defines an inlet and an outlet, said inlet and said outlet being mounted to said support;  
means (24, 44, 62, 84) for exerting a driving force against said conduit to vibrate said conduit in a direction that is transverse to the direction of fluid flow through said conduit at the location at which said driving force is exerted against said conduit, and means (34, 54, 70, 86) for sensing the effect of said exerting means on movement of said conduit, said sensing means (34, 54, 70, 86) being arranged to sense the effect of the vibratory force couple exerted on the conduit about an axis that is perpendicular to the direction of vibration due to said transverse force gradients, said conduit (12, 40, 56, 72) is generally S-shaped and crosses a line joining the locations at which said conduit is mounted to said support, said exerting means being arranged to act on said conduit such that it

provides an increasing gradient of velocity of the flowing material in said transverse direction between said inlet and a predetermined location on said conduit and, therefore, to produce a transversely directed force gradient on said conduit in a first direction, and to provide a decreasing gradient of velocity of the flowing material in the transverse direction between a predetermined location on said conduit and said outlet and, therefore, to produce a transversely directed force gradient on said conduit in a second direction, characterised in that

said S-shaped conduit (12, 40, 56, 72) has three co-planar legs, an inlet leg with its inlet end connected to a support, an outlet leg with its outlet end connected to the support, and a return leg, connecting the inlet and outlet legs, and wherein each leg is substantially straight and the legs are parallel."

- IV. The appellant (second opponent) lodged an appeal against this decision.
- V. The respondent (proprietor) requested that the appeal be dismissed.
- VI. In an official communication dated 7 December 1995 accompanying the invitation to oral proceedings which had been requested by both parties, the Board of appeal expressed in particular the opinion that it appeared that there were formal deficiencies in the text of the patent as amended, inter alia concerning clarity of claim 1 and that, should this text remain substantially unamended, the patent could be revoked for the reasons mentioned.

- V. Oral proceedings took place on 24 April 1996, with only the appellant being present.

The appellant, which with letter dated 20 March 1996 had expressed its approval for the Board's objections and in particular the one concerning lack of clarity, and which reiterated his approval during the oral proceedings, requested that the decision under appeal be set aside and the patent be revoked.

The first opponent had with fax of 19 April 1996 declared that it would not participate to the scheduled oral proceedings.

The respondent's answer to the communication of the Board had consisted essentially in the following declaration in its letter dated 25 March 1996: "The Patentees, Smith Meter Inc., have decided that they will not be represented at the Oral Proceedings appointed in connection with this matter for 24th April 1996. They also wish to point out that they will not be making any further written submission in connection this matter" (sic!).

## Reasons for the Decision

1. The appeal is admissible.
2. *Clarity of the claims*
  - 2.1 According to Article 102(3) EPC, if in particular, taking into consideration the amendments made by the proprietor of the patent, the patent and the invention to which it relates meet the requirements of the Convention, the patent can be maintained as amended. Clarity of the claims is one of the requirements of the Convention (Article 84 EPC).
  - 2.2 It is first to be noted that in claim 1 in dispute (see the beginning of the pre-characterising part) a support is defined, said support being mentioned again in the middle of said pre-characterising part; however, in the characterising part of said same claim, it is specified that an inlet leg is connected with its inlet end to a support and an outlet leg is connected with its outlet end to the support. Therefore, there is an ambiguity about the support, i.e. whether there is one support or two different supports.
  - 2.3 Moreover, in claim 1 in dispute (see the beginning of the claim), there are means for exerting a driving force against said conduit to vibrate said conduit in a direction that is transverse to the direction of fluid flow through said conduit at the location at which said driving force is exerted against said conduit; said conduit is specified as being generally S-shaped and as crossing a line joining the locations at which said conduit is mounted to said support, said exerting means being arranged to act on said conduit such that it provides an increasing gradient of velocity of the

flowing material in said transverse direction between said inlet and a predetermined location on said conduit and, therefore, to produce a transversely directed force gradient on said conduit in a first direction, and to provide a decreasing gradient of velocity of the flowing material in the transverse direction between a predetermined location on said conduit and said outlet and, therefore, to produce a transversely directed force gradient on said conduit in a second direction. Therefore, there is an ambiguity about the locations and in particular about the predetermined locations, i.e., whether there is one or two predetermined locations.

2.4 Contrary to claim 1 in dispute, which indicates that the flowmeter comprises means for exerting a driving force against said conduit to vibrate said conduit in a direction that is transverse to the direction of fluid flow through said conduit at the location at which said driving force is exerted against said conduit, the patent in suit (see column 2, lines 8 to 15) stresses that the S-shaped conduit is vibrated in a direction transverse to the plane of the conduit, i.e. in only one particular of the infinity of directions transverse to direction of fluid flow defined in the claim.

2.5 Moreover, it is to be noted that, according to claim 1 in dispute, the meter comprises means for exerting a driving force against said conduit to vibrate said conduit in a direction that is transverse to the direction of fluid flow through said conduit at the location at which said driving force is exerted against said conduit, and sensing means (34, 54, 70, 86) being arranged to sense the effect of the vibratory force couple exerted on the conduit about an axis that is perpendicular to the direction of vibration due to said transverse force gradients. However, the patent in suit (see column 2, lines 8 to 15) also stresses that the

force couple is sensed about an axis orthogonal to the longitudinal axis of the S-shaped conduit and also to the direction of vibration. In this respect, since moreover the location at which the driving force is exerted against said conduit is not specified in the claim and can be on one of the three legs but can also be on one of the bends joining two of said adjacent parallel legs, for instance the bend joining the legs (14) and (22) on Figure 1, resulting in a direction of flow which may be unrelated to any longitudinal axis of the S-shaped conduit, there is in any case an ambiguity concerning the axis about which the force couple or gradient is sensed.

2.6 Incidentally, it is to be noted that the patent in suit (see column 5, lines 11 and 12) states that a flowmeter in accordance with the pre-characterising part of claim 1 is shown in US-A-4 381 680. However, since the pre-characterising part of claim 1 comprises, among other features, the S-shape of the conduit, which is not derivable from US-A-4 381 680 (see Figure 2 to 4; see also the only independent claim, i.e. claim 1), which shows only U-shaped conduits (11) of mass flowmeters, it is directly derivable that this statement in the patent in suit is not correct. Therefore, the separation in two parts of claim 1 in dispute is not correct in that the first part and the second part do not adequately indicate the known features and the distinguishing features, respectively (Rule 29(1) EPC).

2.7 Moreover, concerning some distinguishing features and the effect which, in combination with the known features, they should provide, the following is to be noted:

As stressed in the patent in suit (see column 5, lines 16 to 22) it is possible to supply the S-shaped conduit with long legs that provide greater metering forces to increase sensitivity, increased flexibility of the conduit and lower power requirements, and greater compactness, particularly in the lateral direction in a mass flowmeter that can be installed directly in a line.

In this respect, as also mentioned in the patent in suit (see column 4, line 46 to column 5, line 10), in all of the mass flowmeters of the prior art that has been cited, in which a bent or curved conduit is vibrated, the size of the diameter, width, or offset of the curved conduit required to obtain high sensitivity of measurement can cause excessive size of the meter and an undesirable envelope for installation in a line.

However, no specific feature allowing, in particular, to make the meter more compact in the lateral direction is derivable from the text of claim 1 in dispute, so that features essential to the definition of the invention are not comprised in the claim.

2.8 It is further to be noted that, according to the patent in suit (see column 6, lines 39 to 44), if the ends of the conduit at the inlet and outlet are built into the support and fixed, specific sensing devices can be provided. However, as mentioned here above in connection with the indication of US-A-4 381 680 in the patent in suit as showing a meter according to the first part of claim 1 in dispute, the meter in dispute is derivable as being of the same type as the meter shown in US-A-4 381 680 (see the only independent claim, i.e. claim 1), which is indicated in said document as being

of the tuning fork type with fixed ends. Therefore, the sentence in column 6 referred to above is ambiguous in that it relates to indefinite devices which are not specified in the patent in suit.

- 2.9 Therefore, claim 1 lacks clarity in the sense of Article 84 EPC.
3. The respondent had the opportunity, in particular during the scheduled oral proceedings, but also by writing after receipt of the Board's communication, to present its comments on this ground of lack of clarity of claim 1, which had been expressed in said communication in substance as here above. The respondent indicated by letter dated 25 March 1996 that it had decided not to make use of this opportunity. In particular, from the repetition of the words "this matter" in its declaration in said letter reading "The Patentees, Smith Meter Inc., have decided that they will not be represented at the Oral Proceedings appointed in connection with this matter for 24th April 1996. They also wish to point out that they will not be making any further written submission in connection this matter", it is derivable that it did not intend to defend its case any more, in particular in relation to the Board's clarity objections. Therefore, a decision can be taken and, since the patent in amended form cannot remain with the clarity deficiencies mentioned here above, it must be revoked (Articles 113(1) and 102(3) EPC).

**Order**

**For these reasons it is decided that:**

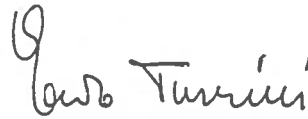
1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:



P. Martorana

The Chairman:



E. Turrini

MCH

B. Sch.

