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Datasheet for the decision of 12 July 2016

Case Number: T 0054/13 - 3.4.02

Application Number: 00941336.0

Publication Number: 1194747

IPC: G01F1/84, G01F15/14

Language of the proceedings: EN

Title of invention:
CORIOLIS FLOWMETER HAVING A CASING WITH A PROTECTIVE OUTER LAYER

Patent Proprietor:
MICRO MOTION INCORPORATED

Opponent:
KROHNE Messtechnik GmbH & Co. KG

Headword:

Relevant legal provisions:
EPC 1973 Art. 54, 56

Keyword:
Inventive step - auxiliary request (yes)

Decisions cited:

Catchword:

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Case Number: T 0054/13 - 3.4.02

D E C I S I O N
of Technical Board of Appeal 3.4.02
of 12 July 2016

Appellant: (Opponent)	KROHNE Messtechnik GmbH & Co. KG Ludwig-Krohne-Straße 5 47058 Duisburg (DE)
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Respondent: (Patent Proprietor)	MICRO MOTION INCORPORATED 7070 Winchester Circle Boulder Colorado 80301 (US)
Representative:	Vossius & Partner Patentanwälte Rechtsanwälte mbB Siebertstraße 3 81675 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 21 November 2012 rejecting the opposition filed against European patent No. 1194747 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman B. Müller
Members: A. Hornung
F. Maaswinkel

Summary of Facts and Submissions

I. The opponent lodged an appeal against the decision of the opposition division to reject the opposition against European patent No. 1194747. Opposition had been filed against the patent as a whole and based on the grounds of Article 100(a) EPC, together with Articles 54(1) and 56 EPC.

The opponent requested that the decision of the opposition division be set aside and the patent be revoked.

II. In response to the opponent's notice of appeal, the patentee requested that the appeal be dismissed and the patent be maintained as granted.

III. In a communication, annexed to a summons to oral proceedings, the board indicated that it doubted whether the subject-matter of claim 1 as granted was novel over the prior art.

IV. In response to the summons to oral proceedings, the patentee filed an auxiliary request with an amended claim 1.

V. Oral proceedings before the board were held on 12 July 2016.

VI. The present decision refers to the following documents:

E1: "G+ Class Mass flowmeters for high and low flow rates of liquid products - Technical data - CORIMASS MFM 4085 K, MFM 4085 F",
E2: US 4,823,614

VII. Independent claim 1 according to the patentee's main request reads as follows:

A Coriolis flowmeter (5) comprising

a flow tube (101) having an inlet end (101 L) and an outlet end (101R);
a driver (104) affixed to said flow tube that vibrates said flow tube (101);

sensors (105-105') affixed to said flow tube (101) to measure oscillations of said flow tube (101) to measure properties of a material flow though said flow tube (101); and

a casing (103) substantially affixed to said inlet end (101L) and said outlet end (101R) of said flow tube (101) and enclosing said flow tube (101) from said inlet end (101L) to said outlet end (101R);

and **characterized by**:

a veneer (150) affixed to opposing ends (103L-103R) of an outer surface (151) of said casing (103) to enclose said outer surface (151) of said casing (103) to provide a sanitary surface for said casing (103); and

a gap (170) between said outer surface of said casing and said veneer (150) enclosing said outer surface of said casing."

Auxiliary request

Independent claim 1 according to the patentee's auxiliary request differs from claim 1 of the main request in that it comprises the following additional features at the end of the claim:

"... wherein said casing (103) is made of carbon steel,

said veneer (150) is made of stainless steel,

and wherein said veneer (150) expands and contracts at a rate different from said casing."

Reasons for the Decision

1. Main request

1.1 Novelty

1.1.1 During the oral proceedings, it was uncontested that E2 was a subject of the present appeal proceedings. The parties also agreed that E2, with reference to the embodiment of the Coriolis flowmeter shown in figure 8, and the corresponding description in column 19, lines 42 to 51, discloses the features of the preamble of present claim 1.

1.1.2 E2, with reference to figure 8, further discloses a flowmeter with a "double wall housing" comprising:

- a veneer (91) affixed to opposing ends of an outer surface of said casing to enclose said outer surface of said casing

[The "double wall housing" of the embodiment shown in figure 8 of E2 has two walls: an outer wall (91) and an inner wall. The inner wall, which is shown in figure 8 as being thicker than the outer wall (91), is affixed to

the inlet end and the outlet end of the flow tube in the same way as the casing (103) of present claim 1 is affixed to the flow tube. Figure 8 of E2 further shows that the outer wall (91) of the "double wall housing" is affixed to the opposing ends of the inner wall, thereby enclosing the inner wall of the "double wall housing". It follows that the outer wall of the "double wall housing" of E2 falls under the wording of claim 1 defining a veneer.]

- a gap (92) between said outer surface of said casing and said veener (91) enclosing said outer surface of said casing

  [Figure 8 of E2 shows a gap (92) between the inner and outer walls of the "double wall housing". The gap (92) is filled with an acoustical insulating material (see E2, column 19, lines 48 to 51).]

1.1.3 Counter-arguments from the patentee

- For the patentee, the "double wall housing" of the embodiment of E2, shown in figure 8, is a barrel with two end caps. In other words, the "double wall housing" constitutes a casing only, enclosing the flow tube, but no additional veneer is present in the embodiment of figure 8 of E2.

  This argument does not convince the board because claim 1 does not specify any details of the casing or the veneer which would disqualify the interpretation given in point 1.1.2 above. Claim 1 defines the casing only by stating that it is affixed in an unspecified manner to unspecified ends of a flow tube and encloses the flow tube from one end to the other end. In particular, the wording of claim 1 does not exclude that the casing is

affixed to the flow tube via intermediate joining pieces or end caps. Figure 1 of the patent, showing various pieces (122, 103L) located at the ends of the flow tube, confirms that the term "the ends of the flow tube" do not mean the precise, physical ends of the flow tube but an extended region located towards the ends of the flow tube.

The veneer is defined in the same broad manner as the casing and, therefore, the above explanations also apply to the veneer affixed to the casing.

- The patentee further argued that even if the "double wall housing" of the embodiment of E2, shown in figure 8, is considered as comprising an inner wall representing a casing and a outer wall representing a veneer, it would not anticipate the veneer as defined in present claim 1. Indeed, claim 1 defines "a veneer affixed to opposing ends of an outer surface of said casing to enclose said outer surface of said casing". This means that the veneer encloses the *entire* or *complete* outer surface of the casing, contrary to E2 where the outer wall does not enclose the *entire* inner wall but only a part of it. In order to support its contention, the patentee referred to [0011], column 3, lines 11 to 13, and to [0013], column 3, lines 34 to 37, of the patent specification.

  The board is not convinced by this argument either because, as a matter of fact, neither the description, nor claim 1 explicitly define that the *entire* or *complete* outer surface of the casing is enclosed by the veneer. Since claim 1 does not define details about what the casing, the veneer and the respective ends thereof are, these terms must be interpreted in their broadest meaning (see point 1.1.2 above). In figure 1 of the

patent, the veneer does not cover the *entire* outer surface of the casing since the end caps 103L and 103R cover a portion of the outer surface of the casing.

1.1.4 Present claim 1 further comprises the feature that the veneer (150) is affixed to the casing (103) "to provide a sanitary surface for said casing (103)". The novelty of this feature was the subject of controversial debate by the parties during both the written and oral proceedings. During oral proceedings, the board left open the question of novelty for the reason that the feature concerning the "sanitary surface", even if novel, does not involve an inventive step. See the reasons below in point 1.2.

1.1.5 It follows that all features of claim 1, except for the feature "to provide a sanitary surface for said casing (103)" for which the question of novelty was left open, are disclosed by E2.

1.2 Inventive step

Under the assumption that the feature "to provide a sanitary surface for said casing (103)" is novel, the claimed subject-matter lacks an inventive step within the meaning of Article 56 EPC 1973.

1.2.1 Closest prior art

The board agrees with the opponent that the embodiment shown in figure 8 of E2 represents the closest prior art because it belongs to the same technical field as the present invention, i.e. straight tube Coriolis flowmeters enclosed by a protective housing and usable in process industries, and it has most features in common with the claimed flowmeter.

1.2.2 Distinguishing feature

The claimed subject-matter is assumed to differ from the embodiment shown in figure 8 of E2 in that the veneer provides a *sanitary* surface for the casing.

1.2.3 Objective technical problem

The technical effect of the distinguishing feature is to provide a material that is easy to clean when the flowmeter is used in an ingredient delivery system in food processing (see patent application, page 2, lines 4-6). Therefore, the objective technical problem solved by the distinguishing feature is to provide a flowmeter which can be used in a food processing environment.

1.2.4 Solution to the problem

The skilled person, confronted with the problem of how to implement the flowmeter of figure 8 of E2 so as to be used in a food processing environment would have to select a material for the outer wall of the double wall housing which is compatible with the specific hygienic constraints imposed by the food processing environment.

E2 remains silent about the specific material to be used for said outer wall of the double wall housing. In column 19, lines 42 to 51, E2 discloses that "the double wall housing in figure 8 has a relatively soft outer wall". In column 16, line 27, i.e. in the context of "examples of flow tube design", E2 discloses that the material for the housing is stainless steel, which is generally known to be a hygienic and sanitary material, easy to clean and, hence, suitable to be used in a food processing environment. However, the disclosure in column 16 of E2 of a housing made of stainless steel relates to flowmeter housings in general. On the one

hand, E2 does not explicitly disclose that stainless steel is effectively to be applied in the specific embodiment of figure 8, on the other hand, no other material is disclosed in E2 for the housing of the embodiment of figure 8.

During oral proceedings, the opponent argued that the skilled person would have a clear incentive to make the outer wall of the double wall housing out of stainless steel: (i) It is generally known that different materials have a different thermal stress. (ii) E2, column 16, discloses that the flow tube and the housing is generally made out of the same material, i.e. stainless steel, in other words "everything is made of stainless steel". (iii) Therefore, in order to reduce thermal stress in the embodiment of figure 8, it is obvious for the skilled person to use the same material as taught in column 16, i.e. stainless steel, for the embodiment of figure 8, in particular for the outer wall of the double wall housing. The board agrees with this line of argumentation.

Therefore, in order to fill the gap in the disclosure of E2, the skilled person, confronted with the problem of selecting a material for the outer wall of the flowmeter of E2, would choose stainless steel since it is the only material for a housing disclosed in E2, thereby arriving at the claimed subject-matter.

1.2.5 It follows from the above that a finding of inventive step of the subject-matter of claim 1 cannot be based on the distinguishing feature that the veneer provides a *sanitary* surface for the casing.

1.2.6 The patentee provided the following arguments in favour of inventive step of the claimed subject-matter.

(a) The patentee argued that the closest prior art was not the embodiment of E2 shown in figure 8, but the embodiment of E2 shown in figure 6, because the embodiment of figure 6 corresponded to the starting point of the present invention, i.e. a flowmeter in which the casing and the flow tube were made out of the same sanitary material (see paragraph [0010] of the patent). The embodiment of figure 8 of E2 was not a promising starting point because this embodiment was concerned with the problem of dampening acoustic disturbances, which was completely unrelated to the problem solved by the present invention of providing a sanitary surface to the outer surface of the flowmeter.

The board, for the reasons set out above in point 1.2.1, considers the embodiment of figure 8 of E2 to constitute the most suitable starting point for the assessment of inventive step, being the "most promising springboard" to the invention. Indeed, with respect to considerations about sanitary issues, the embodiment of figure 6 is not more relevant than the embodiment of figure 8, but it has fewer features in common with the claimed flowmeter. Moreover, if there are several different prior art embodiments, each of which might plausibly be taken as a starting point for the assessment of inventive step, it is established case law that inventive step be assessed relative to all of these prior art embodiments before any decision confirming inventive step is taken.

(b) The patentee further argued that E2 taught that the outer wall of the double wall housing in figure 8 "has a relatively soft outer wall" (column 19, lines 47 to 48). The expression "relatively soft material" refers to a material, such as plastics, but not to stainless steel. In particular, the soft material is useful for dampening acoustic disturbances and stainless steel is normally

not suitable therefor. In conclusion, there is no obvious reason why the skilled person would change the soft outer surface of the embodiment of figure 8 to stainless steel.

The board is not convinced by this argument because there is no disclosure in E2 that the material for the housing, which, in column 16, line 27, is generally taught to be stainless steel, should be changed to a different material. Moreover, the expression "relatively soft material" as such does not exclude metals such as stainless steel. Actually, the board concurs with the opponent that a plausible explanation, compatible with the term stainless steel, of the atypical wording in E2, column 19, lines 47 and 48, "The double wall housing in figure 8 has a relatively soft outer wall" is given in E2, column 15, lines 45 to 57, where the terms "soft" and "stiff" are used in connection with vibrating structures. From this passage in column 15, it becomes plausible that the expression "soft outer wall" refers to an outer wall of the double wall housing which is actually thinner than the inner wall of the double wall housing, both walls being made out of stainless steel. This interpretation is confirmed by figure 8 of E2, showing that the outer wall is indeed thinner than the inner wall. In that sense, the term "soft" in column 19, lines 47 and 48, would mean that the outer wall is not as stiff as the inner wall. Finally, even if the expression "soft" were interpreted as referring to plastics, e.g. Teflon, the board concurs with the opponent that plastics is often used in the food processing industry and may be considered as comprising a sanitary surface.

(c) The patentee still further argued that E2 did not provide any hint that the disclosure of stainless steel

in column 16, line 27, should apply to the embodiment of figure 8. On the contrary, the skilled person would be led away from choosing stainless steel for the outer wall of the embodiment of figure 8 since E2 taught that a relatively soft outer wall to dampen acoustic disturbances, and stainless steel was neither soft nor suitable for dampening acoustic disturbances.

The board agrees that E2 does not explicitly disclose that the outer wall of the embodiment of figure 8 is made out of stainless steel. However, for the reasons given in point 1.2.4., the board is convinced that the skilled person would find it obvious to use stainless steel for the outer wall of the embodiment of figure 8. Moreover, the board is of the view that the term "soft" does not exclude stainless steel for reasons given in point 1.2.6 (b) above. Furthermore, the board is not convinced that the objective of dampening acoustic disturbances would prevent the skilled person from making the outer surface of the double wall housing out of stainless steel: the acoustical dampening is achieved by providing a double wall housing having a relatively soft outer wall (which can be made of stainless steel) and by filling the space between the outer wall and the inner wall with an acoustical insulating material (E2, column 19, lines 44 to 50). The outer wall of the double wall housing does not need to be perfectly insulating in acoustical terms.

1.2.7 In view of the above considerations, the board comes to the conclusion that the subject-matter of claim 1 according to the main request lacks an inventive step within the meaning of Article 56 EPC 1973.

2. Auxiliary request

2.1 Amendments

The board is satisfied that the present amended set of claims 1-9 fulfills the requirements of Article 123(2) EPC.

In particular, the amendments of claim 1 are based on the following passages of the description as originally filed: page 4, lines 18 and 19; page 5, line 8; page 5, line 12, corresponding to claims 2, 11 and 13 as originally filed, respectively. The opponent raised no objection of added subject-matter.

2.2 Inventive step with respect to E2

2.2.1 The patentee, during the oral proceedings, argued that the subject-matter of claim 1 involved an inventive step with respect to the disclosure of E2 for the following reasons:

With respect to the flowmeter of the main request, the flowmeter of the auxiliary request solved the additional problem of providing a cost-efficient flowmeter. The problem was solved by making the casing out of carbon steel. Neither E2 nor E1 provided any hint to make the casing out of carbon steel.

2.2.2 The opponent acknowledged that in E2, in particular in column 19, lines 44 to 51, no information was disclosed about the material used for manufacturing the casing of the flowmeter shown in figure 8. It also acknowledged that in E2, column 16, line 27, stainless steel was disclosed as being the material used for the housing of a flowmeter in general. However, the opponent argued that the skilled person always wanted to select the most cost-efficient material and knew that carbon steel was cheaper than stainless steel. Therefore, in order to solve the problem of cost efficiency, it would be straightforward for the skilled

person to choose carbon steel for manufacturing the inner wall (i.e. the casing) of the double wall housing of the embodiment of figure 8 of E2.

2.2.3 The board notes that an important aspect of the line of argumentation leading to the conclusion that the flowmeter of the main request was rendered obvious by the flowmeter of E2 was that the general disclosure in E2 of stainless steel for an unspecified type of housing was understood by the skilled person so as to make any flowmeter housing out of stainless steel, including the double wall housing of the embodiment of figure 8 of E2. The board is convinced that in making the outer wall of said double wall housing out of stainless steel, the skilled person would, at the same time, follow the general guidance in E2, column 16, line 27, to use stainless steel, thereby making the inner wall of the double wall housing out of stainless steel, too. The board does not see any obvious reason to modify this general guidance of E2. In particular, the mere criterion of cost efficiency does not necessarily lead to the replacement of a casing made of stainless steel by a casing made of carbon steel, since a cost effective flowmeter may be achieved by various other means.

Therefore, the board is satisfied with the patentee's line of argumentation in point 2.2.1 above showing that the claimed flowmeter involves an inventive step with respect to E2.

2.3 Inventive step with respect to E1

2.3.1 In the annex to the summons to oral proceedings, paragraph 7.1, the board expressed its preliminary view that "there is not sufficient evidence that E1 forms part of the state of the art under Article 54(2) EPC". During oral proceedings, the opponent maintained its statement that E1 was part of

the prior art but did not present any counter-arguments. Therefore, the board sees no reason to deviate from its preliminary opinion, which therefore becomes final.

2.3.2 In case E1 belongs to the state of the art, it would not render obvious the claimed subject-matter because it does not disclose information more relevant than E2. In particular, E1 does also not provide any hint to provide a housing having a casing made of carbon steel.

The opponent did not present any counter-argument either during oral proceedings.

2.4 It follows that the claimed flowmeter involves an inventive step over the available prior art (Article 56 EPC 1973).

2.5 The subject-matter of the dependent claims 2 to 9 also involves an inventive step since they include the limitations of claim 1.

2.6 For the above reasons the board is satisfied that the patent as amended according to the present auxiliary request and the invention to which it relates meet the requirements of the EPC and gives a ruling pursuant to Article 101(3)(a) EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to maintain the patent as amended in the following version:

- Claims 1 to 9 of the auxiliary request as filed with the letter of 10 June 2016,

- Description pages 2 to 5 as filed during oral proceedings on 12 July 2016,

- Figures 1 to 5 of the patent as granted.

The Registrar: The Chairman:

M. Kiehl B. Müller

Decision electronically authenticated