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Datasheet for the decision of 26 April 2017

Case Number: T 1144/12 - 3.4.01

Application Number: 05749666.3

Publication Number: 1756592

IPC: G01R15/18

Language of the proceedings: EN

Title of invention:
METHOD AND APPARATUS FOR MEASURING CURRENT

Applicant:
LEM HEME LIMITED

Headword:

Relevant legal provisions:
EPC 1973 Art. 54(1), 54(2), 56

Keyword:
Novelty - (yes)
Inventive step - (no)

Decisions cited:

Catchword:

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Case Number: T 1144/12 - 3.4.01

D E C I S I O N
of Technical Board of Appeal 3.4.01
of 26 April 2017

Appellant: (Applicant)	LEM HEME LIMITED 1 Penketh Place West Pimbo Skelmersdale Lancs WN8 9QX (GB)
Representative:	Appleyard Lees IP LLP 15 Clare Road Halifax HX1 2HY (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 29 November 2011 refusing European patent application No. 05749666.3 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	G. Assi
Members:	P. Fontenay
	J. Geschwind

Summary of Facts and Submissions

I. The examining division refused European patent application No. 05 749 666.

In the "*Reasons*" for the decision, the examining division held that the subject-matter of claim 1 of then pending main request and auxiliary requests 1 and 2 lacked novelty (Art. 54(1),(2) EPC 1973) in view of document

(D1) EP-A-0 156 659.

Moreover, the examining division held that the subject-matter of claim 1 according to auxiliary request 3 did not involve an inventive step (Art. 56 EPC 1973) in view of D1 and skilled person's general knowledge.

II. The appellant (applicant) filed an appeal against the decision.

In the appellant's view, the claimed current measuring apparatus differed from the device known from D1 essentially in that a planar spiral compensation winding was used instead of a cylindrical coil. In this respect, the examining division erred in its conclusion that the reference to flat coils ("*bobines plates*") in D1 implied the presence of a planar spiral coil in the sense of the present application. More specifically, the contested embodiment of D1 disclosed a "*flat coil similar to a Helmholtz coil*". When taken in context, the term "*flat coil*" would not have been taken to mean planar spiral.

III. The appellant requested that the decision under appeal be set aside and a patent be granted on the basis of a set of claims 1 to 12 submitted with the appeal.

IV. A summons to attend oral proceedings was issued.

V. In a communication pursuant to Art. 15(1) RPBA, the appellant was informed of the provisional opinion of the Board. In particular, it was held that the conclusion reached by the examining division according to which the claimed subject-matter was not new in view of D1, was correct and also applied to amended claim 1.

VI. Oral proceedings before the Board took place in the absence of the appellant's representative, as duly announced.

VII. Claim 1 of the appellant's request reads:

"*1. A current measuring apparatus (10) comprising:*
a Rogowski coil; and
compensation means; wherein
the Rogowski coil comprises a uniform outer coil (22) of a first conductor wound on a non-magnetic former of constant cross-sectional area and able to be arranged in a loop around a third conductor (11), wherein a first end (17) of the looped coil is spaced from a second end (16) of the looped coil (22);
characterised in that
the compensation means (28) comprises a compensation winding of a second conductor (30), wherein the compensation winding of the second conductor (30) comprises a planar spiral that winds around a fixed point (29) such that the distance from a first point (40) on the second conductor to the fixed point (29) is

greater than the distance from a second point (42) on the second conductor to the fixed point (29)."

Claims 2 to 12 depend on claim 1.

Reasons for the Decision

1. The appeal is admissible.

2. *Novelty (Art. 54(1),(2) EPC 1973)*

2.1 Document D1 discloses a current measuring apparatus according to the preamble of claim 1. Concretely, D1 discloses an apparatus comprising a Rogowski coil (cf. page 1, lines 1-18; Figure 1) and cylindrical coils as compensation means (cf. page 2, lines 6-21; Figures 2, 3).

*T*he Rogowski coil of D1 comprises a uniform outer coil (1) of a first conductor wound on a non-magnetic former (3) of constant cross-sectional area and able to be arranged in a loop around a third conductor, wherein a first end of the looped coil is spaced from a second end of the looped coil (cf. page 3, lines 23-37; Figure 1).

2.2 As an alternative to cylindrical coils, the compensation means of D1 may consist of flat coils (cf. page 3, lines 16-18; page 6, lines 4-7).

The reference on page 6, lines 4-7, to flat coils ("*bobinages de compensation ... plats*") as an alternative to cylindrical coils ("*bobinages de compensation cylindriques*") implies, in the context of D1, that said flat coils extend in one and the same plane.

Moreover, the teaching of D1 is not limited to pairs of compensating coils but also encompasses the possibility of a single coil, as results from claim 1 or the reference in the description to "*spires **du** ou des bobinages de compensation*", emphasis in bold being added (cf. page 2, line 16; claim 1, lines 11, 12).

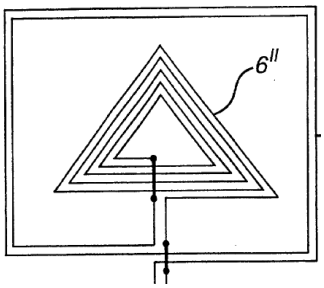
Finally, the appellant's view according to which the flat coils of D1 would refer to Helmholtz coils with one single winding defining a circle is rejected. Such an interpretation would namely be at odd with the actual teaching of D1 which underlines how essential it is to provide the compensation coils with the right number of windings for an optimum effect to be obtained. In this respect, attention is drawn to a passage in D1 (cf. page 5, lines 5-15) disclosing a condition implying that the coil consists of a plurality of windings.

It follows that the notion of "*bobine plate*" in D1 is to be construed as relating to a plurality of windings extending in a common surface, that is, a structure which *de facto* defines a planar spiral coil.

However, in applying the strict criterion of "*photographic novelty*", the appellant's view is accepted that D1 did not disclose the feature of "*a planar spiral that winds around a fixed point such that the distance from a first point on the second conductor to the fixed point is greater than the distance from a second point on the second conductor to the fixed point*".

The feature in question is to be construed as implying that the distance from the center of the path

monotonously increases along the path defined by the coil's winding. This interpretation excludes a spiral consisting of a plurality of generally shaped polygons (triangle, squares, ...) such as for examp0le illustrated in Figure 8 of GB-A-2 353 099 (D6):



D6, Figure 8

2.3 None of the other available prior art documents discloses the combination of features recited in claim 1.

2.4 The subject-matter of claim 1 is therefore new in the sense of Art. 54(1),(2) EPC 1973.

3. *Inventive step (Art. 56 EPC 1973)*

3.1 No inventive activity can, however, be recognised in the specific spiral shape recited in claim 1.

Document D1 explicitly refers to the fact that the shape of the coil is as such not essential for the compensation coil to produce its effect. Attention is drawn to page 5, lines 32-33, according to which "*Les bobinages de compensation [...] peuvent constituer des bobines plates 7, 8, ainsi qu'il est représenté sur la figure 3 ou bien encore des bobines ayant une forme de révolution quelconque*". As underlined on page 2, lines 6-21 of D1, what is essential is namely that the coupling which takes place in the compensating coil be

equivalent to that of the missing portion of the Rogowski coil, as expressed by the equation

$$N_c \cdot S_c = n \cdot S \cdot d$$

where
n is the number of coils in the Rogowski coil per length unit;
d the length of the gap,
S the surface of a coil in the Rogowski coil,
N_c the number of coil in the compensating apparatus,
S_c the surface of a coil of the compensating apparatus.

The skilled person would thus recognise that any shape could be envisaged for the various windings constituting the compensating apparatus insofar as the condition

$$\sum S_i = n \cdot S \cdot d$$

is met, where S_i is the surface of each winding.

The claimed configuration appears in this respect equivalent to any other configuration as may result from D1.

For this reason, the claimed shape appears to constitute a mere arbitrary selection which cannot justify an inventive step.

3.2 The claimed subject-matter is thus not inventive in the sense of Art. 56 EPC 1973.

4. In conclusion, the appellant's request is not allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

R. Schumacher G. Assi

Decision electronically authenticated