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D E C I S I O N
of 24 September 1996

Case Number: T 0678/93 - 3.4.1

Application Number: 88910249.7

Publication Number: 0329783

IPC: G01T 1/20

Language of the proceedings: EN

Title of invention:
Sample counting support with solid scintillator for use in scintillation counting

Applicant:
BECKMAN INSTRUMENTS, INC.

Opponent:
-

Headword:
Scintillation counting support/BECKMAN INSTRUMENTS

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - yes (after amendments)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0678/93 - 3.4.1

D E C I S I O N
of the Technical Board of Appeal 3.4.1
of 24 September 1996

Appellant: BECKMAN INSTRUMENTS, INC.
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Fullerton, CA 92634 (US)

Representative: Fitzpatrick, Alan James
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Decision under appeal: **Decision of the Examining Division of the European Patent Office dated 11 March 1993 refusing European patent application No. 88 910 249.7 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: G. D. Paterson
Members: R. K. Shukla
H. J. Reich

Summary of Facts and Submissions

I. European patent application No. 88 910 249.7 was refused by a decision of the Examining Division on the ground that the subject matter of independent claim 1 did not fulfil the requirement of Article 52 EPC regarding inventive step having regard to the following prior art documents:

D1= US-A-4 562 158

D2= EP-A-0 212 450.

During the proceedings before the Examining Division, the applicant cited, inter alia, the following document in support of its submissions on inventive step:

D3= Ross, H. et al, "Liquid Scintillation Counting and Organic Scintillators", Chapter 16, pages 185 to 194, Lewis Publishers, Michigan, 1991.

II. Independent claim 1 forming the basis for the above decision reads as follows:

"A sample counting support comprising a support material having a surface for supporting, displaying and retaining a solid scintillator compound, said solid scintillator compound being bound to said support material and forming a thin substantially uniform surface layer of dry solid scintillator thereon wherein the scintillator comprises calcium fluoride doped with europium, zinc sulfide doped with silver, yttrium silicate doped with cerium, or lithium glass doped with cerium."

III. In the above decision, the Examining Division reasoned essentially as follows:

The claimed subject matter differs from the sample counting support disclosed in document D1 only in the specific scintillator materials as claimed, these scintillator materials being inorganic. Although document D1 specifically discloses only organic scintillators, it does not exclude the use of other scintillator materials as can be seen from the disclosure in column 3, lines 43 to 45 where it is stated, "any suitable scintillating materials may be used". The skilled person would therefore consider alternative scintillator materials known from standard textbooks and would find out by routine tests that inorganic scintillators exhibit relatively high counting efficiency. A comparison of the counting efficiency values reported in document D3 for an inorganic scintillator with those reported in document D1 using organic scintillators does not clearly demonstrate, contrary to the submissions by the Appellant, that the higher counting efficiency in the former is due the inorganic scintillator materials.

IV. The Applicant lodged an appeal against the decision of the Examining Division and requested, as a main request, that the Decision of the Examining Division be set aside.

The Appellant filed a Declaration made by one of the inventors, Dr Stephen W. Wunderly, and made essentially the following submissions regarding inventive step.

The Declaration of Dr Wunderly confirms that the product sold under the Trade Mark "Xtalscint" comprised yttrium silicate doped with cerium, one of the inorganic materials specified in claim 1 under consideration, and that the other inorganic

scintillators specified in the claim are also capable of accomplishing the objects of the invention. Thus the high counting efficiency for "Xtalscint" reported in document D3 relates to the scintillator materials of the present invention as claimed. The unexpectedly high counting efficiency of "Xtalscint" was due to the inorganic material and its confinement to the surface of the support. Although documents D1 and D2 suggest a large number of suitable scintillator materials, they all are organic materials, so that there was no teaching or motivation provided by either of these documents to try inorganic materials as a scintillator.

V. In an annex to summons to oral proceedings, the Board introduced the following prior art in the proceedings:

D4= McGraw-Hill Encyclopedia of Science and Technology, 5th Edition, page 116, "Inorganic scintillator", and page 866, "Scintillation detector", and

D5= Römpps Chemie-Lexikon, 8th Edition, page 4082, "Szintillationszähler", and page 4083, "Szintillatoren",

and made essentially the following preliminary observations:

The Board accepts Dr Wunderly's submissions in his Declaration that the product XTALSCINT referred to in document D3 comprises yttrium silicate doped with cerium, and that the sample counting support including this compound as in claim 1 would exhibit counting efficiency as reported in document D3. However, in absence of any test results for the inorganic compounds, other than yttrium silicate doped with cerium, in claim 1, it is not established beyond reasonable doubt that these other inorganic compounds

also exhibit the counting efficiency reported in document D3. Furthermore, there are several factors or parameters other than the scintillator composition, such as particle size, thickness of the coating, binder material, use of surfactant etc., which are known to influence the counting efficiency. As the conditions under which the counting efficiencies are measured in documents D1 and D2 on the one hand and in document D3 on the other are not specified, it is not clear that the counting efficiencies reported in document D3 are primarily due to the inorganic nature of the scintillator materials. Moreover, as can be seen from the disclosure in document D4 and D5, inorganic materials such as ZnS powder (doped with Ag or undoped) and calcium fluoride crystallites have been known since long as scintillator materials, so that the use of these inorganic materials represents an obvious alternative to the use of organic materials.

Nevertheless, there is no prior art on file disclosing calcium fluoride doped with europium, yttrium silicate doped with cerium, or lithium glass doped with cerium as scintillating material. In the Board's view, therefore, an amended independent claim limited to these materials would not be open to an objection of lack of inventive step.

VI. In response to the above communication, the Appellant submitted, on 17 July 1996, a new set of claims 1 to 14, and amended pages 2, 4 and 7 of the description.

VII. The Representative of the Appellant was informed in a consultation by telephone that claims 2 and 3 required amendments for clarity. In response, a set of claims 1 to 9, replacing the earlier claims 1 to 9 and containing amended claims 2 and 3, was filed by the Appellant with a letter dated 24 July 1996.

VIII. The Appellant thus requests the grant of a patent on the following documents:

Description: pages 1, 3, 5, 6, 8 and 9 as originally filed;
pages 2, 4 and 7 filed with the letter dated 17 July 1996

Claims: 1 to 9 filed with the letter dated 24 July 1996;
10 to 14 filed with the letter dated 17 July 1996;

Drawings: Sheet 1/1 as originally filed.

IX. In view of the amendments to claim 1 overcoming the objection on inventive step, the oral proceedings were cancelled.

X. Independent claim 1 of the above set of claims reads as follows:

"A sample counting support for use in a scintillation counter to analyse a sample in a dry state, said support having a surface upon which there is a dry solid inorganic scintillator compound supported, displayed and retained for contact with a sample to be analysed, said scintillator compound forming a thin substantially uniform surface layer wherein the said scintillator compound comprises calcium fluoride doped with europium, yttrium silicate doped with cerium, or lithium glass doped with cerium."

Reasons for the Decision

1. *Inventive step*

The only issue to be considered in the present appeal is that of inventive step.

1.1 Document D1, which represents the closest prior art, discloses a sample counting support for use in a scintillation counter to analyse a sample in a dry state (see column 2, lines 8 to 12, 36 to 38, 56 to 65, and column 3, lines 18 to 21). Since the scintillating material is applied to the support by for example swabbing, spraying or by rolling on, it follows that the support must have a surface upon which the solid scintillator is supported. From column 3, lines 18 to 21 it is clear that the scintillator can be supported, displayed and retained in a dry solid state. Furthermore, from the method by which the scintillator is applied (e.g. dipping or rolling on; see column 2, lines 55 to 58) it is clear that the scintillator compound forms a thin substantially uniform surface layer.

1.2 The claimed invention is distinguished over the prior art in that the scintillator compound comprises calcium fluoride doped with europium, yttrium silicate doped with cerium, or lithium glass doped with cerium.

1.3 As can be seen from the disclosure in document D4 (see, e.g. page 115,"Scintillation counter"; page 116, "Substances used") and document D5 (page 4083, "Szintillatoren")inorganic scintillators such as ZnS doped with cu or Ag, or undoped; sodium iodide activated with thallium; crystalline calcium fluoride, barium fluoride etc. are well-known inorganic scintillator materials.

In the Board's view, however, a skilled person does not get any hint from the above disclosure that the inorganic materials specified in claim 1 under consideration are suitable as scintillator materials. Also, there is no other prior art on file which discloses any of the scintillator compounds now claimed in claim 1. Therefore, in the Board's view, none of the cited prior art documents would lead the person skilled in the art to the claimed invention. Consequently, in the present case, the question whether or not these materials show higher counting efficiency in relation to the scintillator materials such as known from document D1, D2, D4 and D5 is not relevant to the issue of inventive step.

1.4 For the foregoing reasons, in the Board's judgment the subject matter of claim 1 involves an inventive step within the meaning of Article 56 EPC.

The remaining claims are all dependent claims. Also these claims therefore fulfil the requirement of inventive step.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to grant a patent on the documents specified in section VIII above.

The Registrar: The Chairman:

M. Beer G. D. Paterson