

Veröffentlichung im Amtsblatt	Ja/Nein
Publication in the Official Journal	Yes/No
Publication au Journal Officiel	Oui/Non

Aktenzeichen / Case Number / N^o du recours : T 391/89 - 3.4.2

Anmeldenummer / Filing No / N^o de la demande : 83 303 193.3

Veröffentlichungs-Nr. / Publication No / N^o de la publication : 0 095 946

Bezeichnung der Erfindung: Device for determining ionic activity

Title of invention:

Titre de l'invention :

Klassifikation / Classification / Classement : G01N 27/30, G01N 27/28

ENTSCHEIDUNG / DECISION

vom / of / du 20 September 1990

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent /

Titulaire du brevet :

FUJIPHOTO FILM CO., LTD

Einsprechender / Opponent / Opposant :

EASTMAN KODAK CO.

Stichwort / Headword / Référence : Fuji/analyte test device

EPÜ / EPC / CBE Art. 54, 56

Schlagwort / Keyword / Mot clé :

"Novelty (yes)" -
"Inventive step (yes)"

Leitsatz / Headnote / Sommaire



Case Number : T 391/89 - 3.4.2

D E C I S I O N
of the Technical Board of Appeal 3.4.2
of 20 September 1990

Appellant :
(Opponent)

EASTMAN KODAK COMPANY
343 State Street
Rochester, New York 14650
U.S.A.

Representative :

Braudes, Jürgen, Dr. Rer. Nat.
Wuesthoff & Wuesthoff Patent- und Rechtsanwälte
Schweigerstr. 2
D-8000 München 90

Respondent :
(Proprietor of the patent)

FUJI PHOTO FILM CO., LTD
210 Nakanuma Minamiashigara-shi
Kanagawa-ken, 250-01
JP

Representative :

Diamond, Bryan Clive
Gee & Co.
Chancery House
Chancery Lane
London WC2A 1QU

Decision under appeal :

Decision of the Opposition Division of the European
Patent Office dated 15 March 1989, written
decision mailed on 29 May 1989 rejecting the
opposition filed against European patent
No. 95 946 pursuant to Article 102(2) EPC.

Composition of the Board :

Chairman : E. Turrini

Members : M. Chomentowski
C.V. Payraudeau

Summary of facts and submissions

- I. European patent No. 0 095 946 was granted on the basis of European patent application No. 83 303 193.3.
- II. The Appellant (Opponent) filed an opposition to the grant of the European patent on the grounds that the subject-matter of the claims of the opposed patent lacked an inventive step having regard inter alia to the disclosure of
D2 = US-A-4 302 313.
- III. The Opposition division rejected the opposition.
- IV. The Appellant lodged an appeal against this decision.
- V. In the Annex to the invitation to oral proceedings, subsidiarily requested by the Appellant, the Board expressed the provisional opinion that claim 1 of the patent in suit, in the text as granted, lacked an inventive step having regard to D2 and D4 (D4 = US-A-4 250 010), whereby D4 had already been considered during the examination procedure and is cited in the patent.
- VI. Oral proceedings were held, at the end of which the Respondent requested, as main request, that the appeal be dismissed and the patent be maintained as granted and, as auxiliary request, that the patent be maintained in an amended form on the basis of a new restricted claim 1 filed during the oral proceedings, incorporating the subject-matter of claim 2 of the granted patent and containing a clarifying amendment, and of a correspondingly amended description. The Appellant requested, as main request, that the decision of the Opposition division be put aside and the patent be revoked and, as auxiliary request, that, in case the Board would consider to allow the auxiliary

request of the Respondent, the decision be postponed in order to give the representative of the Appellant the opportunity to consult his client on the new text filed only at the oral proceedings.

VII. Claim 1 of the granted patent reads as follows:

A device for determination of ionic activity in a liquid analyte, which comprises:

at least two pairs of solid electrodes (26), the electrodes of each pair being identical, each having as its outer layer an ion-selective layer (26a, 26b, 26c) responsive to a specified ion, one electrode of each pair being intended to be supplied by said analyte and the other by a reference solution, and a porous bridge (38) disposed over said device to allow, during use of the device, electrical conduction between both electrodes in each pair through both solutions, without mixing of the liquids except in the bridge;

and means beneath said bridge (38) being capable of supplying said liquid analyte and a reference solution to the electrodes;

characterised in that

said means beneath said bridge (38) consists of at least two porous members (32) each in contact with at least part of the surface of the ion-selective-layer of each pair of electrodes, each porous member being capable of supplying said liquid analyte and a reference solution to the electrodes.

The claims 2 to 9 are dependent claims.

VIII. The Respondent submitted the following arguments. A drawback of the device known from Fig. 14-16 of D2, which is a test device for the analysis of a plurality of different ionic analytes having a liquids distributing means comprising an electrical bridge portion (136) and two electrodes supplying portions (138, 139) for distributing

the analytes and the reference solution to the electrodes, is due to the fact that the bridge portion and the supplying portions are located in the same plane. This results in an inadequate distribution of the liquids to the electrodes which are located beneath these supplying portions. It is admitted that a device comprising a bridge portion above the supplying portions is already disclosed in Fig. 1-2 of the same D2. However, the teaching of this embodiment cannot be combined with the teaching of Fig. 14-16 because it relates to a single test device not at all comparable with a multitest device. It is also not contested that the use of porous means was already known as mentioned in D2, but the object of D2 is to avoid the use of such porous means which are presented as being disadvantageous. Therefore, D2 cannot be considered as either disclosing or suggesting the solution proposed by the instant invention but leads away from it. Fig. 3 of D4 indeed discloses a porous bridge portion located over the device, but the structure of D4, with a structure open to the atmosphere, and the structure of D2, with a closed structure, are quite different and the person skilled in the art would not be incited to combine them. Even if the person skilled in the art disregarding the objection expressed in D2, against the use of porous members would substitute porous members for the capillaries of the multi-test device of D2, the resulting structure would not be the device of the claim in dispute because said resulting structure would not be a structure with a bridge portion located over the device, but a structure with a bridge portion located in the same plane as the supplying portions.

- IX. The Appellant submitted the following arguments. Starting from the device known from Fig. 14-16 of D2, which discloses a multi-analyte test device comprising a bridge portion and supplying portions for distributing the

analytes and the reference solution to the electrodes, the person skilled in the art, taking into account that fibers are already mentioned as being located in the transport zone and that the use of porous material and of fibers is mentioned in the same D2, may construct a device according to claim 1 of the main request without having to show any inventive ingenuity. For this purpose, there is even no need of taking into account the teaching of D4, since porous material is mentioned in D2. Concerning the location of the bridge portion above the supplying portions, this is already disclosed in Fig. 1-2 of D2. This feature may easily be used in place of the corresponding feature of Fig. 14-16 of the same D2, where it would fulfill its known function, without any unexpected effect. Moreover, there can be seen no problem which is solved by the device of claim 1 of the main request, because the structure of Fig. 14-16 of D2, formed with two spaced apart sheets for inducing capillary flow of introduced liquids, and thus a unitary bridge portion and supplying portions, is structurally simpler and easier to manufacture than the claimed device, and there is no indication that the use of the device known from Fig. 14-16 of D2 is not as efficient as the claimed device for the analysis of whole blood, because the only example of analysing whole blood in the device of the patent in dispute necessitates the further use of an anticoagulant. No technical benefit resulting from the use of device of the patent in dispute can be seen either. The Appellant considers that a claim of a patent which results from the combination of features which are all known from a single document, which does not solve a technical problem and which does not provide any technical advantage, should not be allowable.

As regards the auxiliary request of the Respondent, since the subject-matter of claim 2 was in itself known from D4 and not inventive, its incorporation in the main claim would not justify the patentability of this amended claim.

Reasons for the decision

1. The appeal is admissible.

Main request of the Respondent

The Board is satisfied that the patent in the text as granted does not contravene the requirements of Article 123(2) EPC since it does not include subject-matter extending the content of the application as originally filed. It is to be noted that no objection concerning Article 123(2) EPC was made in relation with the main request.

2. Novelty

- 2.1 A device for determination of ionic activity in a liquid analyte, which comprises:

at least two pairs of solid electrodes (14g₁ to 14g₄), the electrodes of each pair being identical, each having as its outer layer an ion-selective layer responsive to a specified ion, one electrode of each pair being intended to be supplied by said analyte and the other by a reference solution, and a bridge portion (136) to allow, during use of the device, electrical conduction between both electrodes in each pair through both solutions, without mixing of the liquids except in the bridge portion (136);

and means (138, 139, 140) capable of supplying said liquid analyte and a reference solution to the electrodes, is known from D2 (see column 2, lines 41-57, column 12, line 23 - column 13, line 12; Fig. 14-16; claims 20-22 and 25).

2.1.1 It is to be noted that all the independent claims of D2, and in particular claim 20 which relates to a multi-analyte test device, mention that the transport zone which is constructed to induce capillary flow, may further include fibers in an amount from 0 to 5%. Therefore, it is directly and unambiguously derivable from D2 that the distribution means of D2, and in particular the bridge portion (136), which may indeed include a minimal portion of fibers, are not porous distribution means.

2.1.2 It is also to be noted that, in the embodiment illustrated by Fig. 14-16 of D2, the bridge portion (136) and the electrodes supplying portions (138, 139) are constructed as unitary capillary distribution means formed between the surfaces of two plates or sheets for inducing flow of the analyte liquid and of the reference liquid towards each other in the bridge portion (136) and towards the electrodes (14g₁-14g₄) through the underlying flow apertures (140) (see D2, column 12, lines 23-61; see also column 2, line 13 - column 3, line 18; see also the explanations relating to Fig. 1-4, for the flow of the liquids); the bridge (136) is located in the same plane as the supplying portion and in communication with them through apertures (112g) formed in gating walls (110g). Therefore, it is clear that in the device of D2 the bridge portion (136) is not located over the device and that the supplying portions (138, 139, 140) are disposed in the same plane as the bridge portion with which they are integrated.

- 2.1.3 The subject-matter of the opposed claim 1, which pertains to the technical field of devices for determining in one operation ionic activities of a plurality of specific ions in a liquid as compared to a reference solution, differs from the device known from D2, which also pertains to the same technical field, in that it further includes the following distinguishing features:
- a) the bridge portion is distinct from the supplying portions;
 - b) the bridge portion is porous;
 - c) the supplying portions are located beneath the bridge portion;
 - d) the supplying means consist of porous members.
- 2.2 D4 discloses a device wherein, in particular, there is no porous means for supplying the liquids to at least part of the surface of an ion-selective layer of a pair of electrodes (13A, 13B-15A, 15B) (see Fig. 3 and the corresponding text, see also claim 1). In D4, the supplying portions exclusively consist of apertures in an insulating layer for exposing the extremities of the electrodes, while the electrical bridge (19) between the two liquids, has no function of distributing the liquids, which are actually spread over the exposed electrodes (see in particular column 6, lines 13-27).
- 2.3 The other documents of the available prior art are considered as being less relevant because they only disclose isolated features of the subject-matter of claim 1.
- 2.4 Therefore, the subject-matter of claim 1 is novel (Art. 54 EPC). It is to be noted that the novelty of the subject-matter of claim 1 has not been contested.

3. Inventive step

3.1 The closest prior art is known from the embodiment represented in Fig. 14-16 of D2. This embodiment of D2 is a fully closed device which, in order notably to avoid the problems mentioned as resulting from the known use of porous material to distribute the ion containing liquid uses capillary elements as well for supplying the liquids to the electrodes as for forming the electrical bridge. According to this document, a single unitary capillary system having a U shape is formed in a single plane between two plates or sheets.

3.1.1 Starting from this document, the instant invention may be considered as having for its object to realize another multi-test device which presents various advantageous features such as insuring with certainty a good distribution of liquids such as whole blood (column 3, lines 40-49) by separating the electrical bridge function from the electrode supplying function, this permitting also the use of a separate bridge element which is put in place after spotting the liquids (column 9, lines 1-25). These advantages are obtained by substituting porous members forming liquid storage cells for the capillary electrodes supplying portions of the distribution means of D2 and by substituting a separate porous bridge member located over the closed device for the incorporated capillary electrical bridge portion of the distribution means of D2.

3.1.2 These two steps cannot be directly derived from D2. It should be admitted that the substitution of a U shaped porous member for the capillary system forming the electrical bridge and the portions supplying the electrodes with the liquids could be an obvious measure for the

skilled technician even if such substitution necessitates disregarding the teaching of D2.

3.1.3 However, such an adaptation would not result in the device of the invention since the bridge portion would remain incorporated with the supplying portions and in the same plane as the latter.

It is true that D4 shows a separate bridge portion located above a multi-test device. However, as admitted by the Appellant, this device is of the open type and the man skilled in the art would not consider combining the teaching of this document with the teaching of D2 which concerns, like the patent in suit, a closed device. It is also to be noted that a combination of the teaching of D2 and D4 would not in any case result in the device claimed in the instant patent since even if the overlying porous bridge of D4 would be used instead of the incorporated capillary bridge portion another step should still be necessary, i.e. the substitution of the porous members for the capillary supplying means.

3.2 The arguments of the Appellant, concerning the non-capability of the device of the patent in dispute of transporting whole blood without an anti-coagulant, are not convincing because whole blood with the anti-coagulant is only mentioned in an example of the description and no conclusion may be drawn from this example about the capability of the claimed device for determining the ionic activity of whole blood without an anti-coagulant.

3.3 The argument of the Appellant, concerning the structure of Fig. 1-2 of D2 wherein the distributing means, i.e. the apertures, are also beneath the bridge, is not convincing because this embodiment indeed does not relate to multianalyte test devices, as the embodiment of Fig. 14-16, wherein distribution of the liquids is in an horizontal

plane, and no need can be seen for applying the said structural feature of Fig. 1-2 of D2 to the more complicated structure of Fig. 14-16 of the same D2.

3.4 Therefore, the subject-matter of claim 1 of the European patent according to the main request of the Respondent implies an inventive step and, therefore, it is allowable (Art. 56 and 52(1) EPC.

So are dependent Claims 2 to 9 by virtue of their dependence on allowable Claim 1.

3.5 The opposition grounds set out in Article 100(a) EPC as put forward by the Appellant therefore do not prejudice the maintenance of the patent as granted.

Subsidiary request

For this reason, the subsidiary request of the Respondent and the related subsidiary request of the Appellant are without object and, therefore, they were not taken into consideration.

Order

For these reasons, it is decided that:

The appeal is dismissed.

The Registrar

The Chairman

E.Görgmaier

E.Turrini