The opinion in support of the decision being entered today is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ARIE DRAAIJER

Appeal 2007-0615
Application 10/204,304
Technology Center 1700

Decided: July 3, 2007

Before BRADLEY R. GARRIS, CHUNG K. PAK, and
THOMAS A. WALTZ, *Administrative Patent Judges*.

GARRIS, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal involves claims 1 and 2. We have jurisdiction over the appeal pursuant to 35 U.S.C. §§ 6 and 134.

We AFFIRM.

INTRODUCTION

Appellant claims an optical sensor for measuring oxygen in a medium (claim 1). The optical sensor has a fluoridated silicone polymer in which an organometallic complex is embedded (Specification 1 and 2). Appellant indicates that the fluoridated silicone polymer stabilizes the dye (i.e., the organometallic complex) to reduce photobleaching and thermal degradation of the optical sensor (Specification 4-6).

Claim 1 is illustrative:

> 1. An optical sensor for measuring oxygen in a medium, provided with a substrate in which an organometallic complex is embedded, characterized in that the substrate consists of a fluoridated silicone polymer.

The Examiner relies on the following prior art references as evidence of unpatentability:

Macur	US 3,839,178	Oct. 1, 1974
Jolson	US 5,338,429	Aug. 16, 1994

Joseph R. Lakowicz, *Principles of Fluorescence Spectroscopy*, 2nd Ed., 536-538, (1999).

The rejection as presented by the Examiner is as follows:

1. Claims 1 and 2 are rejected under 35 U.S.C. § 103(a) as obvious over Lakowicz in view of Jolson or Macur.

Rather than reiterate the respective positions advocated by the Appellant and by the Examiner concerning this rejection, we refer to the Brief and the Reply Brief, and to the Answer respectively for a complete exposition thereof.

Appellant does not separately argue the claims. Accordingly, we select independent claim 1 as a representative claim on which to render our opinion.

OPINION

Appellant's arguments are primarily directed to secondary considerations of nonobviousness (i.e., unexpected results), rather than whether the Examiner established a prima facie case. Specifically, Appellant argues that, "[s]ince the effects on the organometallic complex were not considered [by the Examiner] and since the effects on the organometallic complex were unexpected and significant, the claimed invention would not have been obvious" (Br. 4-5). Appellant contends that the enhanced dye (i.e., organometallic complex) stabilization achieved using a fluoridated silicone polymer as the substrate is an unexpected result that overcomes the Examiner's obviousness conclusion based on Lakowicz in view of Macur or Jolson (Br. 5-6). Appellant further argues that neither Macur nor Jolson recognizes the advantage of using fluoridated silicone polymers to stabilize the dye against photobleaching and thermal degradation such that there would have been no motivation for substituting Jolson's fluorinated silicone polymer or Macur's fluorosilicone polymer for the silicone polymer in Lakowicz's oxygen sensor (Br. 6).

We have considered all of Appellant's arguments and are unpersuaded by them for the reasons below.

Lakowicz discloses an oxygen sensor wherein a transition-metal complex (i.e., organometallic complex) is embedded in a silicone substrate (Lakowicz 536). Lakowicz further discloses that oxygen sensitivity of the

sensor can be adjusted by either selecting probes (i.e., organometallic complexes) with different lifetimes, or by modifying the chemical composition of the supporting media (i.e., the silicone polymer) (Lakowicz 537). Lackowicz further discloses that the selectivity of the sensor for oxygen is provided by the unique combination of the fluorophore (i.e., organometallic complex) and the supporting media (i.e., silicone polymer) (Lakowicz 537). Lakowicz discloses that using silicone as the substrate permits diffusion of oxygen into the sensor and prevents other interfering molecules which might interact with the fluorophore and affect its intensity (Lakowicz 536).

Jolson discloses a toxic gas sensor that uses a fluorinated silicone gas permeable film (Jolson, col. 8, ll. 34-56). Jolson uses fluorinated silicone polymer to make the gas permeable film because it has the high gas permeability of silicone polymers with the chemical inertness expected from fluorinated polymers (Jolson, col. 8, ll. 53-56).

Macur discloses an oxygen sensor that uses a fluorosilicone polymer that is oxygen permeable and ion impermeable (Macur, col. 3, ll. 46-48, 59-60).

From these disclosures, the Examiner concluded that it would have been obvious to "substitute a fluorinated silicone matrix for the silicone matrix in Lakowicz in order to maintain the desired feature of selective and high permeability to oxygen analyte, while further obtaining the advantage of chemical inertness, as per the teachings of Jolson . . . and Macur" (Answer 5). We agree.

Like the Examiner indicates in his motivation statement (Answer 5), both Jolson and Macur clearly disclose the desirability of using fluorinated

silicone polymers (or fluorosilicone polymer in Macur) in sensors (Jolson, col. 8, ll. 53-56; Macur, col. 3, ll. 46-48, 59-60), and Lakowicz discloses controlling oxygen sensitivity of the sensor by modifying the chemical composition of the substrate (i.e., silicone in Lakowicz) (Lakowicz 537). Accordingly, the prior art would have provided motivation for substituting a fluorinated silicone polymer of Jolson or a fluorosilicone polymer of Macur for the silicone polymer of Lakowicz. *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998).

Moreover, we add that substitution of one known element for another known element in the field must do more than yield a predictable result. *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740, 82 USPQ2d 1385, 1395 (2007). Jolson discloses using fluorinated silicone polymers in gas sensors because of their chemical inertness and high gas permeabilities (Jolson, col. 8, ll. 53-56). Moreover, Jolson indicates the interchangeability of silicone polymer for fluorinated silicone polymers (Jolson, col. 8, l. 53, "Silicone polymers can also be fluorinated . . . ."). Macur uses fluorosilicone polymer in the oxygen sensor because of its oxygen permeability and ion impermeability (Macur, col. 3, ll. 46-48, 59-60). Lakowicz uses silicone because of its oxygen permeability and its barrier properties (Lakowicz 536). In the present case, the Appellant in effect merely replaces a conventional silicone substrate with fluoridated silicone polymer, each of which is known in the prior art as evinced by the disclosures of Jolson, Macur and Lakowicz. Thus, it would have been obvious to substitute the fluorinated silicone polymer of Jolson or the fluorosilicone polymer of Macur for Lakowicz's silicone polymer because doing so is merely the "predictable use of prior art elements according to

their established functions [i.e., chemical inertness and oxygen permeability of fluorinated silicone polymers (Jolson, col. 8, ll. 53-56)]." *KSR*, 127 S. Ct. at 1740, 82 USPQ2d at 1396.

From the foregoing, we are unpersuaded by Appellant's argument that, since Jolson and Macur do not disclose thermal degradation or photobleaching, there is no motivation for substituting Jolson's fluorinated silicone polymer or Macur's fluorosilicone polymer for the silicone of Lakowicz's oxygen sensor. We understand Appellant to be arguing that their reasons (i.e., to prevent photobleaching and thermal degradation) for using the fluoridated silicone polymer are different than the reasons provided by Jolson, Macur or Lakowicz. However, the reasons for combining the prior art teachings need not be the same as applicant's reasons. *KSR*, 127 S. Ct. at 1742, 82 USPQ2d at 1397 ("[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.") *See also*, *In re Kemps*, 97 F.3d 1427, 1430, 40 USPQ2d 1309, 1311 (Fed. Cir. 1996) (explaining reason to combine prior art references does not have to be identical to that of the applicant to establish obviousness).

Accordingly, the record reveals that the Examiner has established a prima facie case of obviousness based on the teachings of the references taken as whole. Accordingly, the burden shifted to Appellant to rebut the Examiner's prima facie case. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

Attempting to satisfy his burden, Appellant, Arie Draaijer, submitted a Rule 132 declaration (Draaijer Declaration) on December 14, 2004 as part of

his response to the non-final Office Action mailed May 21, 2004 and the interview of October 22, 2004. The Examiner was unpersuaded by the Draaijer Declaration (Answer 5-6; Final Office Action 4).

A copy of the Draaijer Declaration is attached to the Brief in the "Evidence Appendix." Appellant contends that the Draaijer Declaration establishes the unexpected result (i.e., evidence of nonobviousness) of dye stabilization such that photobleaching and thermal degradation of the optical sensor is reduced (Br. 5). Appellant also contends that Figures 2 and 4 of his Specification show that using fluoridated silicone polymers produce unexpected results with regard to photobleaching and thermal degradation (Br. 5).

Like the Examiner, we find that Appellant's evidence of nonobviousness (i.e., unexpected results) is inadequate to rebut the Examiner's prima facie case. Specifically, the Draaijer Declaration does not compare the claimed optical sensor with the closest prior art (i.e., Lakowicz). *In re Burckel*, 592 F.2d 1175, 1179-80, 201 USPQ 67, 71 (CCPA 1979). As the Examiner correctly states on page 5 of his Answer, Lakowicz is the closest prior art in that it contains the combination of the transition-metal complex (i.e., organometallic complex) with a silicone substrate (Lakowicz 536). Instead of comparing his optical sensor having fluoridated silicone polymer with Lakowicz's optical sensor having silicone, Appellant erroneously compares non-silicone fluoropolymers (i.e., not the closest prior art) with the fluoridated silicone polymers of the claimed invention (Draaijer Declaration 4-5). Accordingly, we are not persuaded by the Draaijer Declaration.

Additionally, we are unpersuaded by Appellant's argument that Figures 2 and 4 establish unexpected results because the data shown in Figures 2 and 4 is not commensurate with the claimed invention. The claimed invention is directed to an optical sensor having an "organometallic complex" embedded in a "substrate" that "consists of a fluoridated silicone polymer" (claim 1). However, Appellant fails to provide the compositions (e.g., the organometallic complexes), and the testing and processing conditions used to generate the data of Figures 2 and 4. Moreover with regard to Figure 2, Appellant provides no information regarding which fluoridated silicone polymer is used in the example. Thus, it is impossible to determine whether the unexpected results allegedly shown by Figures 2 and 4 occur for all "fluoridated silicone polymers" as claimed. *In re Kollman*, 595 F.2d 48, 55, 201 USPQ 193, 198 (CCPA 1979) (explaining that showing unexpected results in one species encompassed by a generic claim does not provide adequate basis for concluding that a great number of compositions also encompassed by the generic claim would behave the same way).

In fact, the data shown in Figure 4 indicates disparities between the various fluoridated polymers such that it is unlikely that the unexpected results occur for all fluoridated silicone polymers as claimed. Appellant's Figure 4 demonstrates the thermal degradation resistance of two fluoridated silicone polymers as they compare to conventional silicone. Embodiment "(a)" represents the thermal degradation of conventional silicone polymer, embodiment "(b)" represents the thermal degradation of Elastosil®, the preferred fluoridated silicone polymer, and embodiment "(c)" represents the thermal degradation of "a substrate according to the invention [i.e, a fluoridated silicone polymer] (a mixture of PS184.5 and PS9120 of the firm

United Chemicals Inc)" (Specification 6). As shown by the vertically striped bars in Figure 4, a difference of 40% in light intensity due to thermal degradation exists between embodiments (b) and (c). This large difference in light intensity due to thermal degradation between fluoridated silicone polymers indicates substantial variation between fluoridated silicone polymers such that Appellant's evidence cannot be said to have established that the unexpected results occur for all fluoridated silicone polymers. In fact, the difference in light intensity due to thermal degradation between embodiment (c) and embodiment (a) (i.e., the conventional silicone material) is only 10%. This slight difference in light intensity due to thermal degradation between conventional silicone and fluoridated silicone polymer suggests that all fluoridated polymers do not behave in an unexpectedly different manner than conventional silicone.

Also, without knowing the organometallic complexes and the processing and testing conditions that are used to make and test the exemplary optical sensors of Figures 2 and 4, it is impossible to meaningfully compare the photobleaching or thermal degradation results of the various sensors. For example, without having the experimental conditions (e.g., composition, processing and testing conditions) we cannot determine if the organometallic complex and processing and testing conditions used in the conventional silicone example may have resulted in a short lifetime for the organometallic complex, which indicates a substantial amount of photobleaching, or if the organometallic compounds, and processing and testing conditions in the fluoridated silicone polymer may have resulted in a long lifetime for the organometallic complex so that less photobleaching would be perceived. The paucity of information provided by

Appellant regarding the experiments conducted on the samples of Figures 2 and 4 make a valid and conclusive comparison of the claimed invention and the prior art (i.e., Lakowicz, Jolson and Macur) impossible.

For the above reasons, Appellant has not convinced us that Examiner's prima facie case of obviousness is in error. Accordingly, we affirm the Examiner's § 103(a) rejection of claims 1 and 2 over Lakowicz in view of Jolson or Macur.

DECISION

We have affirmed the § 103(a) rejection of claims 1 and 2 over Lakowicz in view of Jolson or Macur.

The Examiner's decision is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv)(2006).

AFFIRMED

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