



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/662,406	03/09/2007	Kazumi Naito	Q83739	4263
23373	7590	02/28/2013	EXAMINER	
SUGHRUE MION, P.L.L.C. 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			SINCLAIR, DAVID M	
			ART UNIT	PAPER NUMBER
			2835	
			NOTIFICATION DATE	DELIVERY MODE
			02/28/2013	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USPTO@sughrue.com
sughrue@sughrue.com
PPROCESSING@SUGHRUE.COM

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte KAZUMI NAITO and SHOJI YABE

Appeal 2011-001124
Application 11/662,406
Technology Center 2800

Before JOSEPH F. RUGGIERO, MARC S. HOFF, and
ELENI MANTIS MERCADER, *Administrative Patent Judges*.

RUGGIERO, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from the Final Rejection of claims 1, 3, and 5-15, which are all of the pending claims. Claims 2, 4, and 16 have been canceled. An oral hearing was conducted on this appeal on February 12, 2013. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

Rather than reiterate the arguments of Appellants and the Examiner, we refer to the Appeal Brief (filed June 4, 2010), the Answer (mailed July 8, 2010), and the Reply Brief (filed Sept. 8, 2010). We have considered in this decision only those arguments Appellants actually raised in the Briefs. Any other arguments which Appellants could have made but chose not to make in the Briefs are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(iv).

Appellants' Invention

Appellants' invention relates to a method for producing a solid electrolytic capacitor element in which a semiconductor layer containing an electrically conducting polymer and an electrode layer are sequentially formed on a dielectric layer. After forming the semiconductor layer by electropolymerization, re-chemical formation is performed using as the electrolyte a dopant which is the same as the dopant contained in the electrically conducting polymer which constitutes the semiconductor layer. *See generally* Spec. 3:25-4:22.

Representative claim 1 is illustrative of the invention and reads as follows:

1. A method for producing a solid electrolytic capacitor element, comprising forming a dielectric layer by chemical formation on the surface of an electric conductor, and sequentially forming a semiconductor layer containing electrically conducting polymer and an electrode layer on the dielectric layer, wherein after forming the semiconductor layer by electropolymerization, re-chemical formation is performed in an electrolytic solution using a dopant as the electrolyte; wherein the dopant is quinone sulfonic acid and wherein the dopant is the same as the dopant contained in the electrically conducting polymer constituting the semiconductor layer.

The Examiner's Rejections

The Examiner's Answer cites the following prior art references:

Wheeler	US 6,136,176	Oct. 24, 2000
Monden	US 2002/0105777 A1	Aug. 8, 2002
Takada ¹	US 6,594,141 B2	July 15, 2003
Naito ²	US 2006/0146481 A1	July 6, 2006 (filed Mar. 2, 2004)
Naito	WO 2004/079760 A1	Sept. 16, 2004

Claims 1, 3, and 5-15, all of the appealed claims, stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Naito in view of Wheeler.

Claims 1, 3, and 5-15 stand further rejected under 35 U.S.C. § 103(a) as being unpatentable over Monden in view of Wheeler.

ANALYSIS

Naito/Wheeler Rejection

Appellants contend, with respect to the obviousness rejection of representative independent claim 1, that, even if combined, the collective teachings of Naito and Wheeler do not teach or suggest all of the claimed limitations.³ In particular, Appellants contend that Wheeler, which the

¹ The Takada reference is cited as providing evidence in support of the Examiner's rejection, but is not included in the statement of the rejection.

² The Examiner's analysis refers to the U.S. published application (US 2006/0146481 A1) which the Examiner considers to be the English language equivalent of WO 2004/079760 A1 (Ans. 4). Appellants have not challenged this assumption.

³ Appellants argue rejected claims 1, 3, and 5-15 together as a group, making particular reference only to language appearing in independent

Examiner has applied to address Naito's deficiency in disclosing re-chemical formation, does not teach or suggest that the electrolyte used for re-chemical formation is the *same* as the dopant used in the polymer of the semiconductor layer. According to Appellants, Wheeler discloses (col. 4, ll. 20-26) that the dopant used for re-chemical formation is the *organic acid of the anion* used as the dopant for the semiconductor layer formation (App. Br. 11; Reply Br. 4-5).

We find Appellants' arguments unpersuasive as we find no support for the interpretation of the claimed "dopant is the same" feature urged by Appellants in the Briefs. We find no error in the Examiner's determination that Wheeler's use of a dopant during re-chemical formation which is an organic acid of the anion used as the dopant in the conducting polymer layer can be reasonably construed as being the same dopant as in the conducting polymer layer (Ans. 5-6). We agree with the Examiner that Wheeler's dopant usage is remarkably similar to what Appellants disclose in their Specification.

As pointed out by the Examiner, contrary to Appellants' contention that an organic acid and an anion of that organic acid cannot be considered to be the same dopant, Appellants disclose a dopant as being an acid in the re-chemical formation, but which is in an anion state when used as the polymer layer dopant (Spec. 12:30-13:5, which describes benzenesulfonate anion used as the polymer layer dopant as being the anion state of benzenesulfonate acid). Similarly, in describing Example 1, Appellants

claim 1. *See* App. Br. 10-15. Accordingly, we select claim 1 as representative. *See* 37 C.F.R. § 41.37(c)(1)(vii).

disclose anthraquinone-2-sulfonate *ion* as the polymer layer dopant, but anthraquinone-2-sulfonate *acid* as the re-chemical formation dopant (Spec. 23:15-22, emphasis added).

We further find unpersuasive Appellants' related argument which directs attention to Example 1 of Wheeler. According to Appellants, this example uses two kinds of dopants, toluene sulfonate *and* iron, at the time of polymer formation of the semiconductor layer (Reply Br. 5). Appellants contend that since Wheeler uses only toluene sulfonate as a dopant at the time of re-chemical formation, the dopant in the semiconductor layer is not the same as the dopant used in the re-chemical formation (*id.*). The language of claim 1, however, does not preclude the use of an additional dopant at the time of polymer formation. Accordingly, the toluene sulfonate dopant used by Wheeler at re-chemical formation is the same as at least one of the dopants, i.e., toluene sulfonate, used during polymer formation.

We are also unpersuaded by Appellants' further argument that the Examiner erred in combining Naito's electrolytic polymerization teachings with Wheeler since Wheeler's disclosure is directed to chemical polymerization which requires the introduction of an oxidizing agent at the time of polymer formation (App. Br. 14-15). We agree with the Examiner that an ordinarily skilled artisan would not ignore Naito's electropolymerization process when considering Wheeler's re-chemical formation process to repair damage to the dielectric layer based solely on Wheeler's use of chemical polymerization (Ans. 25).⁴

⁴ The Examiner has provided evidence in the form of the Takada reference (col. 2, ll. 15-56) to support the position that damage to the dielectric layer

Further, we do not interpret the Examiner's position as suggesting the substitution or the bodily incorporation of Wheeler's chemical polymerization teachings into the system of Naito. As explained by the Examiner, Naito has an existing teaching of using electropolymerization to form a conductive polymer as a semiconductor layer using quinone sulfonic acid as a dopant as claimed. Rather, it is Wheeler's teaching of using the same dopant in a re-chemical formation process as was used in the polymer formation process that is relied upon as a rationale for the combination with Naito. "It is well-established that a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements." *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012) (citing *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (en banc) (noting that the criterion for obviousness is not whether the references can be physically combined, but whether the claimed invention is rendered obvious by the teachings of the prior art as a whole)).

Further, we find that, contrary to Appellants' contention (App. Br. 13-14), the Examiner has provided an articulated line of reasoning with a rational underpinning to support the conclusion of obviousness for the proposed combination of Naito and Wheeler. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). We agree with the Examiner (Ans. 5-6) that an ordinarily skilled artisan would have recognized and appreciated the obviousness of using Naito's quinone sulfonic acid polymer dopant in a re-

will occur whether chemical polymerization or electropolymerization is used to form the semiconductor layer (Ans. 23).

chemical formation process as taught by Wheeler to repair damage to the dielectric layer after formation of the semiconductor layer.

Lastly, we find unpersuasive Appellants' argument directing attention to the high equivalent series resistance (ESR) values in Table 1 of Wheeler as compared to the low ESR values achieved by the present invention as disclosed in Table 1 of the Specification (App. Br. 15). While the Examiner recognizes that Wheeler's ESR values are higher than those disclosed by Appellants, the Examiner points out, and we agree, there are no ESR values set forth in the claims (Ans. 26). Further, we find no error in the Examiner's determination that, since Wheeler provides evidence that re-chemical formation reduces ESR values, the combination with Naito would further reduce Naito's disclosed ESR values of 12-17 m Ω (Ans. 27).

For the above reasons, the Examiner's 35 U.S.C. § 103(a) rejection of representative independent claim 1, as well as dependent claims 3 and 5-15 not separately argued by Appellants, is sustained.

Monden/Wheeler Rejection

We also sustain the Examiner's obviousness rejection based on the combination of Monden and Wheeler of appealed claims 1, 3, and 5-15. As with the previously discussed Naito/Wheeler combination, the Examiner has applied the same dopant re-chemical formation teachings of Wheeler to the electropolymerization semiconductor layer teachings of Monden (Ans. 13). Appellants' arguments reiterate those asserted against the Naito/Wheeler combination, which arguments we found unpersuasive as discussed *supra*.

CONCLUSION OF LAW

Based on the analysis above, we conclude that the Examiner did not err in rejecting claims 1, 3, and 5-15 for obviousness under 35 U.S.C. § 103(a).

DECISION

We affirm the Examiner's decision rejecting claims 1, 3, and 5-15 under 35 U.S.C. § 103(a).

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)(2010).

AFFIRMED

kis