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OBLON, MCCLELLAND, MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314			DAHIMENE, MAHMOUD	
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* HIROSHI KOJIMA, HITOSHI MISHIRO, and MASABUMI ITO

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Appeal 2015-000914  
Application 11/522,413  
Technology Center 1700

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Before BRADLEY R. GARRIS, JULIA HEANEY, and  
MONTÉ T. SQUIRE, *Administrative Patent Judges*.

SQUIRE, *Administrative Patent Judge*.

DECISION ON APPEAL<sup>1</sup>

Appellants<sup>2</sup> appeal the Examiner's rejection of claims 1–8 and 11–14.  
35 U.S.C. § 134(a). We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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<sup>1</sup> In this decision, we refer to the Non-Final Office Action appealed from, mailed January 15, 2014 (“Non-Final Act.”), the Appeal Brief dated June 5, 2014 (“App. Br.”), the Examiner’s Answer to the Appeal Brief dated September 18, 2014 (“Ans.”), and the Appellants’ Reply Brief dated October 28, 2014 (“Reply Br.”).

<sup>2</sup> Appellants identify Asahi Glass Company, Limited as the Real Party in Interest. App. Br. 1.

*The Claimed Invention*

Appellants' disclosure relates to a polishing method for a glass substrate required to have high surface smoothness and surface precision and to be used for EUV (Extreme Ultra Violet) lithography in a process for producing semiconductors. Spec. ¶ 1, ll. 5–11; Abstract. Claim 1 is representative of the claims on appeal and is reproduced below from the Claims Appendix to the Appeal Brief (App. Br. i) (key disputed limitations in italics):

1. A polishing method for a *quartz glass substrate* comprising polishing a surface of a *quartz glass substrate containing SiO<sub>2</sub> as the main component and TiO<sub>2</sub>*, with a polishing slurry comprising water and colloidal silica having an average primary particle size of at most 50 nm and having the pH adjusted to be within a range of from 0.5 to 4, so that the surface roughness Rms will be at most 0.15 nm as measured by an atomic force microscope, *wherein the content of the colloidal silica in the polishing slurry is from 10 to 30 mass%*, wherein the polishing is carried out so that the number of concave defects with widths of at least 60 nm will be not more than 3 within an area of 142 mm x 142 mm.

*The Reference*

The Examiner relies on the following prior art reference as evidence in rejecting the claims on appeal:

Oshima et al., US 2004/0266323 A1 Dec. 30, 2004  
(hereinafter "Oshima")

*The Rejection*

On appeal, the Examiner maintains the following rejection: Claims 1–8 and 11–14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Oshima. Ans. 2; Non-Final Act. 2.<sup>3</sup>

OPINION

Having considered the respective positions advanced by the Examiner and Appellants in light of this appeal record, we affirm the Examiner’s rejections for the reasons set forth in the Answer to the Appeal Brief and Non-Final Office Action appealed from, which we adopt as our own. We highlight and address specific findings and arguments for emphasis as follows.

Appellants argue claims 1–8 and 11–14 as a group. We select claim 1 as representative and the remaining claims stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv).

The Examiner finds that Oshima suggests a polishing method for a quartz glass substrate satisfying all of the limitations of claim 1 and concludes that Oshima would have rendered claim 1 obvious. Ans. 2–5 (citing Oshima ¶¶ 34–39, 48, 111, 127, 154, 158, and 160).

Appellants argue that the Examiner’s rejection should be reversed for failing to establish a prima facie case of obviousness. App. Br. 4, 19. In

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<sup>3</sup> Claims 13 and 14 appear to have been inadvertently omitted from the Statement of Rejection as stated on page 2 of both the Answer and Non-Final Action. See Ans. 7 (setting forth the Examiner’s rejection of claims 13 and 14 under 35 U.S.C. § 103(a) as being unpatentable over Oshima); Non-Final Act. 7 (same).

particular, Appellants argue that: (1) “Oshima . . . does not disclose or suggest using a quartz glass” (App. Br. 4); (2) “Oshima neither discloses nor suggests the claimed [content of the colloidal silica in the] polishing slurry” (*id.* at 5–7); and (3) based on Oshima’s disclosure, “the skilled artisan would [have been] led *away* from the claimed colloidal silica amount” (*id.* at 8).

We are not persuaded by Appellants’ arguments. On the record before us, we find that a preponderance of the evidence and sound technical reasoning support the Examiner’s conclusion and finding that Oshima suggests all of claim 1’s limitations, including using a quartz glass and the claimed content of the colloidal silica in the polishing slurry. Oshima, Abstract, ¶¶ 34–39, 48, 111, 127, 154, 158, and 160.

As the Examiner finds (Ans. 2, 4), Oshima discloses a polishing process for a substrate comprising polishing a surface of a glass substrate containing SiO<sub>2</sub> as the main component and that the polishing composition may include “glassy substances such as glass” and metals such as “titanium[] and alloys thereof.” Oshima, Abstract, ¶ 158. In light of Oshima’s disclosures, we agree with the Examiner’s conclusion (Ans. 4) that it would have been obvious to one of ordinary skill in the art at the time the invention was made to expect Oshima’s polishing method to be effective on any glassy substance including quartz glass because the list of substrates Oshima discloses encompasses silicon oxide quartz with any impurities including titanium. Oshima, ¶ 158. Appellants’ argument exposes no reversible error in the Examiner’s analysis and factual findings in this regard.

Appellants’ argument that Oshima’s “silicon dioxide is not disclosed as being in a glass, but rather is in a ceramic material” (App. Br. 7) is

unpersuasive because it too narrowly construes the scope of Oshima's disclosure and what Oshima's teachings would have suggested to one of ordinary skill in the art. A reference must be considered for all that it teaches, including the reasonable inferences that would be drawn by the skilled artisan. *See In re Preda*, 401 F.2d 825, 826 (CCPA 1968). As the Examiner points out (Ans. 7), Oshima suggests polishing a broad category of glassy substrates (Oshima, ¶ 158) and because quartz glass is a common, well-known, glassy substrate—comprised mainly of silicon dioxide—one of ordinary skill would have understood that quartz glass could be used and been motivated to employ Oshima's polishing process on quartz glass, and have a reasonable expectation of success in doing so.

We also agree with the Examiner's finding (Ans. 2, 3) that Oshima suggests the claimed content of the colloidal silica in the polishing slurry, as recited in claim 1. Oshima, Abstract, ¶¶ 34–36, 48, 111, 127, 154, 160. In particular, as the Examiner finds (Ans. 2, 3), Oshima discloses a polishing slurry comprising water and colloidal silica and that the colloidal silica may be "0.5 to 20% by weight," which overlaps the claimed range and reads on claim 1. Oshima, Abstract, ¶¶ 34–36, 111.

Appellants fail to direct us to sufficient evidence or provide a persuasive technical explanation of why the Examiner's findings and analysis in this regard, particularly at pages 2 and 3 of the Answer, lack a rational underpinning or are otherwise based on reversible error.

Appellants' calculations at page 6 of the Appeal Brief are unpersuasive of error on the Examiner's part. Indeed, as the Examiner correctly points out (Ans. 8), Appellants' own calculations regarding the content of colloidal silica based on Oshima's disclosures (App. Br. 7),

suggest amounts of 12 wt. %, 13.6 wt. %, and 20 wt. %, respectively, which all fall within the claimed range.

Moreover, Appellants' assertion that "Oshima neither discloses nor suggests the claimed polishing slurry content of the claimed invention with sufficient specificity so as to lead the artisan to this limitation or the benefits flowing therefrom" (App. Br. 5, 6) is conclusory and, without more, insufficient to establish reversible error in the Examiner's findings and analysis in this regard. *In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984); *cf. also In re Lovin*, 652 F.3d 1349, 1356–57 (Fed. Cir. 2011); 37 C.F.R. § 41.37(c)(1)(iv).

Appellants' argument that "the skilled artisan would be led *away* from the claimed colloidal silica amount of amended Claim 1" (App. Br. 8) is unpersuasive because Appellants do not identify sufficient evidence to support it, and we will not read into a reference a teaching away where no such language exists.<sup>4</sup> *Cf. DyStar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1364 (Fed. Cir. 2006); *In re Fulton*, 391 F.3d 1195, 1201 (finding that there is no teaching away where the prior art's disclosure "does not criticize, discredit, or otherwise discourage the solution claimed").

Lastly, Appellants argue that the Examiner's rejection should be reversed because the claimed method yields unexpected results and "the Declarations . . . filed on June 16, 2009, July 22, 2010, March 29, 2013, and December 17, 2013, are sufficient to rebut . . . a *prima facie* case of obviousness." App. Br. 10. In particular, Appellants argue that:

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<sup>4</sup> *See also* App. Br. 8 (Appellants urging that "[e]ven if the examples are not a true 'teaching away' they are important to consider when looking at how the artisan would interpret the disclosure of Oshima").

the specifically claimed colloidal silica content in the polishing slurry . . . provides an unexpected advantage as compared to the colloidal silica content similar to those utilized in Oshima.

*Id.* at 10. Appellants further argue that the data provided in the declarations “illustrates the criticality of the content of the colloidal silica in the polishing slurry being within the claimed range of 10 to 30 mass%” and “clearly show[s] the criticality of the entire range.” *Id.* at 12, 14. Appellants also argue that the declaration evidence demonstrates “the unexpected results obtained by using a quartz glass as claimed.” *Id.* at 16.

We are not persuaded by Appellants’ arguments. In attempting to overcome a *prima facie* case of obviousness by showing unexpected results, the burden rests with Appellants to establish: (1) that there actually is a difference between the results obtained through the claimed invention and those of the prior art; and (2) that the difference actually obtained would not have been expected by one skilled in the art at the time of the invention. *See In re Freeman*, 474 F.2d 1318, 1324 (CCPA 1973) (citations omitted); *In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972) (“the burden of showing unexpected results rests on he who asserts them”).

Appellants have failed to satisfy the requisite burden. Appellants do not identify sufficient evidence that there actually is a difference between the results obtained through the claimed invention and those of the prior art and that the difference actually obtained would not have been expected by one skilled in the art at the time of the invention. As the Examiner finds (Ans. 9), Appellants’ declaration evidence regarding polishing quartz glass is insufficient to show unexpected results because Oshima discloses that any glassy substrate could be polished using such method and one of ordinary

skill would have understood quartz glass to be encompassed by Oshima's generic disclosure.

Further, as the Examiner finds regarding the claimed content of colloidal silica (Ans. 9), the experimental data provided in the declarations is not commensurate in scope with the full claimed range of 10 to 30 mass%. In particular, the data presented does not show any negative results for colloidal silica content immediately above the claimed upper limit of 30 wt. % and shows only a single data point (6.4 wt. %) with negative results below the lower limit of the claimed range, which, without more, is not sufficient to show unexpected results for the entire claimed range.

Accordingly, we affirm the Examiner's rejection of claims 1-8 and 11-14 under 35 U.S.C. § 103(a) as unpatentable over Oshima.

#### DECISION/ORDER

The Examiner's rejections of claims 1-8 and 11-14 are affirmed.

It is ordered that 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).

AFFIRMED