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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MELISSA DANIELLE CREMER, STEVEN BRUCE DAWES, SHANDON DEE HART, and LISA ANN HOGUE

Appeal 2019-000012
Application 14/371,261
Technology Center 1700

Before KAREN M. HASTINGS, RAE LYNN P. GUEST, and DEBRA L. DENNETT, *Administrative Patent Judges*.

DENNETT, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

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[1] In our Decision, we refer to the Specification ("Spec.") of Application No. 14/371,261 ("the '261 Application") filed July 9, 2012; the Final Office Action dated Jan. 22, 2018 ("Final Act."); the Appeal Brief filed July 3, 2018 ("Appeal Br."); the Examiner's Answer dated July 31, 2018 ("Ans."); and the Reply Brief filed Sept. 28, 2018 ("Reply Br.").

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant[2] appeals from the Examiner's decision to finally reject claims 1–4, 6, 8, and 16–20, which constitute all the non-withdrawn claims pending in Application 14/371,261.[3] We have jurisdiction under 35 U.S.C. § 6(b).

For the reasons set forth below, we AFFIRM.

The subject matter of the invention relates to glass or glass-ceramic articles having nanoporous coatings disposed thereon such that the coated articles exhibit improved reflection resistance. Spec. ¶ 2. Claim 1, reproduced below from the Claims Appendix of the Appeal Brief, illustrates the claimed subject matter:

> 1. A coated article, comprising:
>
> a chemically strengthened glass or glass-ceramic substrate; and
>
> a nanoporous Si-containing polymeric coating comprising a cured siloxane or a cured silsesquioxane having an average thickness of less than or equal to 1 micrometer disposed on at least a portion of a surface of the glass or glass-ceramic substrate;
>
> wherein the nanoporous Si-containing polymeric coating has a porosity comprising at least 5 volume percent of a total volume occupied by the nanoporous Si-containing polymeric coating;
>
> wherein an average longest cross-sectional dimension of pores in the nanoporous Si-containing polymeric coating is less than or equal to about 100 nanometers and the pores are dispersed throughout the coating;

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[2] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Corning Incorporated. Appeal Br. 3.

[3] According to the Final Office Action, claims 9–15 are withdrawn from consideration; claims 5 and 7 are cancelled. Final Act. 2.

> wherein the coated article has a specular reflectance that is less than or equal to about 85 percent of a specular reflectance of the glass or glass-ceramic substrate alone across a visible light spectrum; and
>
> wherein the nanoporous Si-containing polymeric coating has a specular reflectance of less than 5 percent across the visible light spectrum.

Appeal Br. 15.

REFERENCES

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

Gallahger et al. ("Gallahger")	US 2003/0001239 A1	Jan. 2, 2003
Amin et al. ("Amin")	US 2009/0197048 A1	Aug. 6, 2009
Wada et al. ("Wada")[4]	US 2011/0089385 A1	Apr. 21. 2011

REJECTION

The Examiner maintains the rejection of claims 1–4, 6, 8, and 16–20 under 35 U.S.C. § 103(a)[5] over Wada in view of Amin, and further in view of Gallahger. Final Act. 3–12.

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[4] Wada issued as U.S. Patent No. 8,506,853 B2 on Aug. 13, 2013. For consistency in the record, we refer to the paragraph numbers in the published application that were used by Appellant and the Examiner.

[5] Because this application was filed before the March 16, 2013, effective date of the America Invents Act, we refer to the pre-AIA version of the statute.

DISCUSSION

Claim 1 is the sole independent claim. Appeal Br. 15–16. Appellant argues for patentability of claims 1–4, 6, 8, and 16–20 as a group, and makes additional patentability arguments for each of claims 6, 8, and 16. *Id.* at 6–13. We select claim 1 as representative of claims 1–4 and 17–20. 37 C.F.R. § 41.37(c)(1)(iv). We separately address claim 1 and each of claims 6, 8, and 16 below.

Claim 1

The Examiner finds that Wada teaches a coated article comprising a glass substrate and a porous Si-containing polymer coatings comprising a cured silsesquioxane having a thickness of about 0.05 to about 1.5 μm (which reads on the claimed average thickness) disposed on at least a portion of a surface of the glass. Final Act. 3. The Examiner finds that Wada discloses that pores are dispersed throughout the coating. *Id.* The Examiner finds that Wada teaches the porous Si-containing polymeric coating has a specular reflectance of up to 3% in a wavelength range of 450 to 650 nm. *Id.* at 3–4.

The Examiner finds that Amin teaches a coated article comprising a chemically strengthened glass or glass-ceramic substrate and a Si-containing coating disposed on at least a portion of a surface of the glass. *Id.* at 4. According to the Examiner, a person of ordinary skill in the art at the time of the invention ("POSITA") would have found it obvious to use Amin's chemically-strengthened glass substrate in Wada's coated article in order to impart damage resistance. *Id.*

Wada fails to teach a nanoporous Si-containing polymer coating having a porosity as claimed (at least 5 volume percent of a total volume

occupied by the nanoporous Si-containing polymeric coating) according to the Examiner. *Id.* However, the Examiner finds that Gallahger teaches, *inter alia*, a nanoporous Si-containing polymeric coating having a porosity comprising ≥ 30% by volume (which reads on the claimed volume percent range) wherein the pores have a mean pore size of from 2.75 to 20 nm (which reads on the claimed average longest cross-sectional dimension of pores), and the pores are dispersed throughout the coating. *Id.* at 4–5. The Examiner concludes that it would have been obvious to a POSITA to use the pore size and porosity of Gallahger in Wada's article "in order to provide a material having low stress, low dielectric constant, low refractive index, improved toughness and improved compliance during mechanical contacting to require less contact force during compression." *Id.* at 5 (quoting Gallahger ¶ 85).

The Examiner acknowledges that the combination of Wada, Amin, and Gallahger do not disclose the specular reflectance limitations. *Id.* However, the Examiner finds that it would have required only routine skill in the art to discover the optimum or workable ranges in specular reflectance because the general conditions of claim 1 are disclosed in the prior art. *Id.* The Examiner concludes that a POSITA would have been motivated to modify the coated article specular reflectance as claimed in order to provide an antireflective film with the lowest possible reflectivity. *Id.* at 5–6 (citing Wada ¶ 175 ("When used as the antireflective film, the film preferably has the lowest possible reflectivity. To be more specific, the average specular reflectivity in a wavelength range of 450 to 650 nm is preferably up to 3%, more preferably up to 2% and most preferably up to 1%.")).

Appellant argues that the cited art fails to teach pores dispersed throughout the coating. Appeal Br. 8–9. Appellant contends that portions of Wada cited by the Examiner in support of the finding merely state that there are "many pores in the film," and thus does not teach the claimed "dispers[ion] throughout the coating." *Id.* at 8. Appellant argues that the decision in *Ex Parte Boden*, 2017 WF 2598734 (PTAB June 13, 2017) supports this position. Reply Br. 2–3.

We agree with the Examiner that "dispersion throughout the coating" does not require *uniform* dispersion, thus Wada's disclosure of "many pores in the film" reads on the claim limitation. *See* Ans. 12. *Boden* is distinguishable from the instant case. In *Boden*, the Examiner found that a combination of oil and water contained "even a small amount of unavoidable intermixing" of the two substances such that it would read on the claim term "dispersed throughout." *Boden*, 2017 WF 2598734 at *1. The Board reversed the Examiner's rejection because the Examiner's interpretation of "dispersed throughout" was unreasonably broad. *Id.* Here, the Examiner's interpretation is reasonable in light of the specification, which does not require uniformity. *See e.g.*, Spec. ¶ 76 ("The pores formed within the film were very small . . . and well-dispersed").

In addition, as the Examiner finds, Gallahger discloses substantially uniformly dispersed pores. *See* Final Act. 5 (citing Gallahger ¶ 51). Appellant fails to show the Examiner's finding is erroneous.

Appellant next argues that a POSITA would have had no reason to substitute Amin's chemically strengthened glass substrate for that of Wada. Appeal Br. 9. Appellant argues that Amin pertains to cover plates for mobile electronic devices which require strengthened glass due to frequent

contact of the cover plate. *Id.* Appellant contends that Wada, in contrast, does not indicate that damage resistance is a concern, and nothing in the record supports the Examiner's position that it is. *Id.* at 9–10.

Wada discloses a film useful as an antireflective film on glass substrates, generically, and optical glass specifically. Wada ¶¶ 177, 196. Wada discloses using the antireflective film in optical devices such as microlenses for image sensors, plasma display panels, liquid crystal displays and organic EL displays. Wada ¶ 174. Any of these products could be improved by imparting some degree of damage resistance. A POSITA would have been motivated to use chemically strengthened glass, as taught by Amin, as the glass substrate of Wada to improve damage resistance to the glass device. The Examiner's explanation of the reasons a POSITA would have had to combine the prior art teachings is no "more than the predictable use of prior art elements according to their established functions" of improved damage resistance. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007). Indeed, the background of the Specification identifies that it was known in the art at the time of the invention to use antireflective coatings disposed directly on chemically strengthened glass substrates. Spec. ¶ 5. Accordingly, we agree with the Examiner that it would have been obvious to use chemically strengthened glass as the glass substrate for the antireflective coating of Wada.

Finally, Appellant contends there is no reason to substitute Gallahger's coating in Wada. Appeal Br. 10; Reply Br. 3.

We note that the rejection modifies Wada's nanoporous Si-containing polymeric coating with the specific porosity taught by Gallahger, rather than

directly substitutes Wada's composition with that of Gallahger. *See* Final Act. 4–5; Ans. 13–14.

Wada teaches that its composition may comprise a pore forming agent, and that including a pore forming agent exhibits a lower refractive index than conventional film materials, enabling a film having less reduction of film thickness during film curing to be manufactured. Wada ¶¶ 21, 33, 144–154, 169. Wada is silent as to any particular porosity but discloses adding a pore forming agent so long as properties, such as the dielectric constant and mechanical strength, are not impaired. Wada ¶ 129. A POSITA starting with Wada would reasonably have considered Gallahger's disclosure regarding porosity and pore size as desirable for the pores in Wada's antireflective coating because Gallahger's antireflective film has low refractive index, low dielectric constant, and mechanical strength. *See* Gallahger ¶¶ 85 (disclosing a porous material having, *inter alia*, low dielectric constant, low refractive index, and improved toughness) and 86 (disclosing Gallahger's film is suitable for use as an antireflective coating). Appellant's argument that the particular recited properties of Gallahger's coatings would not be of interest in Wada's devices (Reply Brief 3–4) in unpersuasive, as the rejection relies on modification by Wada by Gallahger, not substitution of Gallahger in place of Wada.

Appellant contends that the properties of the dielectric materials are not due to the pore size and porosity, but instead due to the closed pore cell structure with pores that are not interconnected. Appeal Br. 11. While Gallahger teaches a closed cell structure reduces "interconnectivity that can lead to degraded electrical performance" (Gallahger ¶ 4), we agree with the Examiner that Gallahger reasonably identifies to the POSITA that each of

these advantages, including low refractive index as is consistent with the teachings of Wada, also come from "having uniformly dispersed voids, a higher volume of voids . . . and/or smaller void sizes than known dielectric materials," and as such these pore properties would be suitable in the film of Wada. Gallahger ¶ 85.

We sustain the rejection of claim 1. We likewise sustain the rejection of claims 2–4 and 17–20, which depend from claim 1.

Claim 6

Claim 6 depends from claim 1, and further recites "wherein the glass or glass-ceramic-substrate has an average thickness of less than or equal to about 2 millimeters." Appeal Br. 16 (Claims App.).

The Examiner finds that Amin teaches a coated article comprising a chemically strengthened glass substrate and a Si-containing coating disposed on at least a portion of a surface of the glass. Final Act. 8. The Examiner finds that a POSITA would have been motivated to use Amin's chemically strengthened glass substrate in Wada's article to impart damage resistance (by the chemical strengthening), noting that discovering optimum or workable ranges in thickness—such as less than or equal to 2 mm—involves only routine skill in the art. *Id.*

Appellant argues that the cited references fail to teach the required thickness of the glass substrate. Appeal Br. 11. Appellant contends that the Examiner fails to explain why a POSITA would have been motivated to provide a substrate with the average thickness as claimed. *Id.*

"The normal desire of artisans to improve upon what is already generally known can provide the motivation to optimize variables such as the percentage of a known polymer for use in a known device." *In re*

Peterson, 315 F.3d at 1330; *see also KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 421 (2007) ("A person of ordinary skill is also a person of ordinary creativity, not an automaton."). Moreover, Amin discloses "a glass article having a thickness of at least approximately 0.3 mm," which is within the claimed "less than or equal to 2 mm" range. *See* Amin ¶ 10. A prima facie case of obviousness typically exists when the ranges of a claimed composition overlap the ranges disclosed in the prior art. *In re Harris*, 409 F.3d 1339, 1341 (Fed. Cir. 2005).

For these reasons, we sustain the rejection of claim 6.

Claim 8

Claim 8 depends from claim 1, and further recites "wherein the coated article comprises a portion of a touch-sensitive display screen or cover plate for an electronic device, a non-touch-sensitive component of an electronic device, a surface of a household appliance, or a surface of a vehicle component." Appeal Br. 16 (Claims App.).

The Examiner finds that Wada fails to teach the additional limitation,[6] but finds that Amin teaches a coated article comprising a chemically strengthened glass substrate and a Si-containing coating disposed on at least

[6] While we agree with the Examiner's rejection combining Amin's applications for the glass coated article of Wada, we further disagree with the Examiner's finding that Wada does not teach any applications that fall within the scope of claim 8. The Specification does not define any of these applications specifically, such that the broadest reasonable interpretation of these applications encompasses at least some of the applications expressly taught by Wada. For example, Wada expressly teaches thin film transistors and CMOSs, which fall within the broad category of "non-touch-sensitive components of an electronic device" because these types of electronic devices are internal components which are not touched by a user.

a portion of a surface of the glass, wherein the coated article comprises at least a portion of a non-touch sensitive component of an electronic device. Final Act. 8–9. The Examiner concludes that it would have been obvious to a POSITA to use the non-touch sensitive component of an electronic device of Amin in the coated article of Wada in order to protect the non-touch side of the glass. *Id.* at 9; Ans. 15–16.

Appellant reiterates the argument discussed above regarding using the chemically strengthened substrate of Amin as the glass substrate taught be Wada, which we addressed in detail above. Appellant's argument do not address the Examiner's specific rejection directed to using the antireflective coated chemically strengthened glass coated article of claim 1 (taught by modifying Wada with Amin) as at least a portion of a non-touch sensitive component of an electronic device, when Amin teaches using antireflective coated chemically strengthened glass as coated articles for these purposes.

Appellant fails to demonstrate reversible error in the rejection.

Claim 16

Claim 16 depends from claim 1, and further recites

> wherein the chemically strengthened glass substrate includes a chemically strengthened alkali aluminosilicate glass substrate having a compressive layer having a depth of layer greater than or equal to 20 micrometers exhibiting a compressive strength of at least 400 megaPascals both before and after the nanoporous Si-containing polymeric coating has been disposed thereon, the coating has a thickness less than about 0.5 micrometers and the coated article has a haze of less than 0.2%.

Appeal Br. 16 (Claims App.)

The Examiner finds that Amin teaches a chemically-strengthened glass substrate with a compressive layer having a depth between approximately 20–70 μm, which reads on the claimed range, exhibiting a

compressive strength of at least about 200 MPa, wherein the chemically-strengthened glass substrate includes a chemically strengthened alkali aluminosilicate glass substrate. Final Act. 9–10 (citing Amin ¶¶ 10, 66).

Appellant's argument is the same as that previously made regarding using the chemically strengthened substrate of Amin as the glass substrate taught be Wada, which we addressed in detail above. Here, Appellant's arguments do not address the Examiner's specific rejection directed to the strength and composition of Amin's chemically-strengthened glass substrate. *See* Amin ¶¶ 10, 66. More is required to overcome a prima facie case of obviousness than "a mere recitation of the claim elements and a naked assertion that the corresponding elements were not found in the prior art." *In re Lovin*, 652 F.3d 1349, 1357 (Fed. Cir. 2011).

We sustain the rejection of claim 16.

CONCLUSION

In summary:

Claims Rejected	Basis	Affirmed	Reversed
1–4, 6, 8, 16–20	§ 103(a) Wada, Amin, and Gallahger	1–4, 6, 8, 16–20	
Overall Outcome		1–4, 6, 8, 16–20	

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).

AFFIRMED