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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ADAM JAMES ELLISON, JOHN CHRISTOPHER MAURO,
DOUGLAS MILES NONI JR., LYNN MARIE THIRION, and
NATESAN VENKATARAMAN

Appeal 2019-004030
Application 14/542,932
Technology Center 1700

Before DONNA M. PRAISS, MICHELLE N. ANKENBRAND, and
JEFFREY R. SNAY, *Administrative Patent Judges*.

ANKENBRAND, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant¹ appeals under 35 U.S.C. § 134(a) from the Examiner's decision² finally rejecting claims 1, 4–10, and 12–18.³ We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ Appellant identifies Corning Incorporated as the real party in interest. Appeal Brief, filed January 28, 2019 (“Appeal Br.”) 2.

² Final Office Action, mailed August 28, 2018 (“Final Act.”).

³ Claims 19–46 have been withdrawn from consideration. Final Act. 1.

STATEMENT OF THE CASE

Background

The subject matter on appeal relates to ion exchangeable glasses having a high level of intrinsic scratch resistance. Specification, filed November 17, 2014 (“Spec.”) ¶ 2. The Specification discloses “[i]on exchangeable boroaluminosilicate glasses having high levels of intrinsic scratch resistance” that include SiO₂, B₂O₃, Al₂O₃, at least one of Li₂O, Na₂O, and K₂O and, when ion exchanged, may have a Knoop scratch initiation threshold of at least about 40 Newtons. *Id.*

Of the appealed claims, claim 1 is independent. Claim 1 is representative of the subject matter on appeal, and reproduced below:

1. A glass, comprising: from 62 mol% to about 68 mol% SiO₂; from about 6 mol% to 10 mol% Al₂O₃; from about 5 mol% to about 35 mol% B₂O₃; from 1 mol% to 15 mol% Na₂O, wherein $1 \text{ mol}\% \leq \text{Li}_2\text{O} + \text{Na}_2\text{O} + \text{K}_2\text{O} \leq 15 \text{ mol}\%$; up to about 5 mol% MgO; up to about 5 mol% CaO; and up to about 2 mol% SrO, and wherein $4 \text{ mol}\% \leq \text{B}_2\text{O}_3 - (\text{MgO} + \text{CaO} + \text{SrO} + \text{Li}_2\text{O} + \text{Na}_2\text{O} + \text{K}_2\text{O} - \text{Al}_2\text{O}_3) \leq 35 \text{ mol}\%$, and $4 \text{ mol}\% \leq \text{MgO} + \text{CaO} + \text{SrO} + \text{Li}_2\text{O} + \text{Na}_2\text{O} + \text{K}_2\text{O} \leq \text{Al}_2\text{O}_3 + 4 \text{ mol}\%$.

Appeal Br. 9 (Claims App’x).⁴

⁴ Appellant’s Claims Appendix does not include page numbers. For ease of reference and clarity, we number the Claims Appendix, continuing the page numbers from the Appeal Brief argument section.

The References

Gulati	US 2006/0127679 A1	June 15, 2006
Murata	US 2010/0035745 A1	Feb. 11, 2010
Vogl ⁵	WO 2011/144024 A1	Nov. 24, 2011
Gomez	US 2011/0294649 A1	Dec. 1, 2011
Koyama	US 2012/0083401 A1	Apr. 5, 2012

The Rejections

The Examiner maintains the following rejections on appeal:

1. Claims 1, 4, 7–10, 12, and 15–18 under 35 U.S.C. § 103 as unpatentable over Gomez;
2. Claim 4 under 35 U.S.C. § 103 as unpatentable over Gomez and Vogl;
3. Claims 4, 13, and 14 under 35 U.S.C. § 103 as unpatentable over Gomez and Gulati;
4. Claims 5 and 6 under 35 U.S.C. § 103 as unpatentable over Gomez and Koyama; and
5. Claims 1, 5, and 6 under 35 U.S.C. § 103 as unpatentable over Murata.

Examiner's Answer, dated February 25, 2019 ("Ans.") 3–10.

OPINION

Rejection over Gomez

The Examiner rejects claims 1, 4, 7–10, 12, and 15–18 under 35 U.S.C. § 103 as unpatentable over Gomez. Final Act. 2–3. Appellant

⁵ Vogl is the last name of the last listed inventor on the application. Although it is our established practice to refer to a reference by the surname of the first-named inventor, we adopt the Examiner's and Appellant's naming convention for clarity in the record of this appeal.

argues claims 1 and 4. Appeal Br. 3–5. Claims 7–10, 12, and 15–18 stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv). We address claims 1 and 4 separately below.

Claims 1, 7–10, 12, and 15–18

The Examiner finds Gomez discloses an alkali aluminosilicate glass that may include SiO₂, Al₂O₃, B₂O₃, Li₂O, Na₂O, and K₂O in certain ranges. Final Act. 2–3 (citing Gomez ¶ 21). The Examiner further explains in the Answer that claim 1 does not require the recited glass to include MgO, CaO, or SrO. Ans. 4.⁶ The Examiner finds Gomez’s ranges overlap the recited ranges, which renders the claimed glass composition obvious, and further finds the overlapping ranges satisfy the inequalities that claim 1 recites. Final Act. 3.

Appellant contends that “Gomez does not disclose a range for the content of MgO + CaO + SrO + Li₂O + Na₂O + K₂O” and one of ordinary skill in the art would not have had a reason to select a composition with claim 1’s MgO + CaO + SrO + Li₂O + Na₂O + K₂O content because Gomez does not provide guidance regarding the amount of MgO + CaO + SrO + Li₂O + Na₂O + K₂O. Appeal Br. 3–4. Appellant further asserts that the recited glass provides unexpected results sufficient to overcome any prima facie case of obviousness. *Id.* at 4 (citing Spec. ¶¶ 32, 35).

Appellant’s arguments are unpersuasive. A prima facie case of obviousness arises when the ranges of a recited composition overlap the ranges disclosed in the prior art. *In re Peterson*, 315 F.3d 1325, 1329 (Fed. Cir. 2003). Gomez’s paragraph 21 discloses ranges for SiO₂, Al₂O₃, B₂O₃,

⁶ Appellant does not dispute the Examiner’s conclusion that claim 1 does not require MgO, CaO, or SrO. *See generally* Reply Br.

Li₂O, Na₂O, and K₂O that overlap the individual ranges that claim 1 recites for each of those compounds (e.g., “from 62 mol% to about 68 mol% SiO₂”) and, therefore, overlap and satisfy the inequalities that claim 1 recites (e.g., “4 mol% ≤ MgO + CaO + SrO + Li₂O + Na₂O + K₂O ≤ Al₂O₃ + 4 mol%”). Accordingly, the Examiner sets forth a case of obviousness for claim 1’s glass composition.

Appellant argues that the Examiner’s rejection improperly relies upon the random selection of a composition from Gomez’s ranges or relies upon impermissible hindsight. Reply Brief, dated April 25, 2019 (“Reply Br.”), 2–3 (citing *In re Kubin*, 561 F.3d 1351, 1359 (Fed. Cir. 2009)). These arguments are also unpersuasive because the rejection is based upon the finding that Gomez discloses ranges that overlap claim 1’s ranges and inequalities. Final Act. 3. As discussed above, this establishes obviousness. Appellant’s arguments to the contrary do not identify a reversible error in the rejection.

With regard to Appellant’s asserted unexpected results, we agree with the Examiner that Appellant does not compare those results with the closest prior art (i.e., Gomez). Ans. 5. “[W]hen unexpected results are used as evidence of nonobviousness, the results must be shown to be unexpected compared with the closest prior art.” *In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991). The Examiner also correctly finds Appellant does not provide the necessary data to establish unexpected results. Ans. 5. Citing discussions in the Specification, Appellant argues results that are qualitative in nature without citing to any underlying data. *See* Spec. ¶¶ 32, 35. An appellant must establish unexpected results with factual evidence. Attorney argument does not suffice. *See In re Geisler*, 116 F.3d 1465, 1470

(Fed. Cir, 1997) (attorney argument is not the kind of factual evidence that is required to rebut a prima facie case of obviousness). In addition, Appellant's Specification does not describe the results on which Appellant relies as "unexpected" and Appellant does not direct us to any evidence to support its argument that the results would indeed have been unexpected to one of ordinary skill in the art. *See In re De Blauwe*, 736 F.2d 699, 704 (CCPA 1984) (mere argument does not establish that results are unexpected). Based on the foregoing, Appellant's asserted evidence of unexpected results is entitled to little weight.

Considering the evidence cited in the Examiner's rejection and Appellant's asserted evidence of non-obviousness, a preponderance of the evidence supports the Examiner's obviousness determination. Accordingly, we affirm the Examiner's rejection of claims 1, 7-10, 12, and 15-18 under § 103 over Gomez.

Claim 4

Claim 4 depends from claim 1 and recites "the glass is ion exchanged and has a Knoop scratch threshold of at least about 30 N." Appeal Br. 9 (Claims App'x). For the rejection of claim 4, the Examiner finds Gomez's glass is ion exchanged and has a similar composition to claim 4's glass, but that Gomez does not explicitly disclose claim 4's Knoop scratch threshold. Final Act. 3. In view of the similar composition, the Examiner determines one of ordinary skill in the art would have expected Gomez's glass to have similar properties, including claim 4's Knoop scratch threshold. *Id.*

Appellant asserts claim 4's Knoop scratch threshold is not an inherent feature of claim 1's composition because the exemplary compositions disclosed in the Specification include a composition (i.e., composition 2)

that falls within the recited ranges for claim 1's composition, but has a Knoop scratch threshold of less than 20 N, which is outside of claim 4's recited range. Appeal Br. 4–5.

The Specification demonstrates that exemplary composition 2 has a composition falling within the scope of claim 1's composition. Spec. 10–11. However, Appellant's Figure 2 indicates a Knoop scratch threshold of less than 20 N for exemplary composition 2. The Examiner responds that exemplary composition 2 was not strengthened via ion exchange, while the exemplary compositions having a Knoop scratch threshold value satisfying claim 4 were ion exchanged. Ans. 6. Appellant, however, explains that the Specification describes ion exchanging the exemplary glasses before testing their Knoop scratch thresholds. Reply Br. 3 (citing Spec. ¶ 43).

Appellant's arguments identify a reversible error in the Examiner's rejection. We agree with Appellant that the Specification discloses ion exchanging all of the glasses—which would include composition 2—before testing Knoop thresholds. Spec. ¶ 43 (“Knoop scratch thresholds are plotted in FIG. 2 for the glasses listed in Table 1. Indentation fracture thresholds were determined after ion exchanging the glasses in a molten KNO_3 salt bath for 16 hours at 410°C .”). Accordingly, we reverse the Examiner's rejection of claim 4 under § 103 over Gomez.

Rejection over Gomez and Vogl

The Examiner rejects claim 4 under 35 U.S.C. § 103 over Gomez and Vogl. The Examiner finds Gomez does not expressly disclose the recited Knoop scratch threshold, but Vogl discloses an alkali aluminosilicate glass that is suitable for electronic devices and has a Knoop hardness higher than 600 kgf/mm^2 . Final Act. 3–4. The Examiner concludes that it would have

been obvious to modify Gomez’s glass “to have the Knoop hardness of Vogl in order to increase scratch resistance.” *Id.*

Appellant argues the Examiner has committed three reversible errors: (1) the Examiner does not explain how the proposed modification could or would increase the Knoop hardness of Gomez’s glass, (2) the Examiner merely asserts that such a modification would have been desirable without evidence demonstrating the modification would have been possible or how it could have been produced, and (3) the Examiner asserts a glass has the same properties as claim 4’s glass simply because the glass has a similar composition. Appeal Br. 5; Reply Br. 3–4.

Appellant’s arguments are unpersuasive. As an initial matter, we note that Appellant does not dispute whether Vogl’s glass achieves a Knoop scratch threshold that claim 4 encompasses. Turning to the references, Vogl discloses an alkali aluminosilicate glass for consumer electronic products as does Gomez. *Compare* Vogl 1:5–8, 1:16–19, *with* Gomez ¶¶ 2–3. In other words, Vogl demonstrates that a glass like Gomez’s glass can achieve a certain Knoop hardness, which Appellant does not dispute is related to Knoop scratch threshold. Given the similarities between Gomez’s glass and Vogl’s glass, the Examiner articulates a reason to modify Gomez’s glass with rational underpinnings to support the conclusion of obviousness. *See KSR Int’l. Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). Accordingly, we affirm the Examiner’s rejection of claim 4 under § 103 over Gomez and Vogl.

Rejections over Gomez and Gulati or Gomez and Koyama

Appellant addresses the rejections over Gomez and Gulati or over Gomez and Koyama by contending “[t]he remaining cited references, Gulati

and Koyama, do not remedy the differences between Gomez . . . and independent claim 1 described above, nor were these references cited in the Office Action for this purpose.” Appeal Br. 7; *see* Reply Br. 4.

In order to overcome the Examiner’s rejections, Appellant must identify with sufficient particularity a reversible error in the rejection. *In re Jung*, 637 F.3d 1356, 1365–66 (Fed. Cir. 2011); *Ex parte Frye*, 94 USPQ2d 1072 (BPAI 2010). Appellant’s arguments, which are general in nature and lacking in any degree of specificity, do not identify a reversible error in the rejections. Moreover, Appellant acknowledges that the Examiner does not cite Gulati and Koyama in any rejection to remedy a deficiency in Gomez. Appeal Br. 7. Nonetheless, as explained above, we do not find any deficiencies in the Examiner’s rejection of claim 1 as having been obvious over Gomez.

However, we reach a different result for claim 4. As to that claim, we agree with Appellant that the Examiner does not cite Gulati to remedy the deficiency in Gomez that we identify above in connection with claim 4. Thus, we reverse the Examiner’s rejection of claim 4 over Gomez and Gulati for the same reasons we provide above in reversing the Examiner’s rejection of claim 4 over Gomez alone.

Accordingly, we affirm the Examiner’s rejections of claims 5, 6, 13, and 14 under § 103 over Gomez and Gulati or over Gomez and Koyama and we reverse the Examiner’s rejection of claim 4 under § 103 over Gomez and Gulati.

Rejection over Murata

The Examiner rejects claim 1 over Murata, finding Murata discloses a glass composition that overlaps the claimed ranges and satisfies the claimed

inequalities. Final Act. 6 (citing Murata ¶ 11). Appellant's arguments are similar to those presented for the rejection of claim 1 over Gomez. Appeal Br. 5–7; Reply Br. 4–5. Appellant does not argue claims 5 and 6 separately from claim 1. Appeal Br. 5–7. Thus claims 5 and 6 will stand or fall with claim 1.

Murata discloses a glass composition having ranges that overlap claim 1's individual ranges and inequalities. Murata ¶ 11. Therefore, for reasons similar to those discussed above for the rejection of claim 1 over Gomez, the Examiner has set forth a prima facie case of obviousness and Appellant's arguments do not identify a reversible error in that rejection. For the same reasons discussed above with regard to the rejection of claim 1 over Gomez, Appellant's asserted unexpected results are entitled to little weight.

Considering the evidence cited in the Examiner's rejection and Appellant's asserted evidence of non-obviousness, a preponderance of the evidence supports the Examiner's obviousness determination. Accordingly, we affirm the Examiner's rejection of claims 1, 5, and 6 under § 103 over Murata.

CONCLUSION

We affirm the Examiner's rejections of claims 1, 7–10, 12, and 15–18 under 35 U.S.C. § 103 over Gomez, claim 4 under 35 U.S.C. § 103 over Gomez and Vogl, claims 5 and 6 under 35 U.S.C. § 103 over Gomez and Koyama, claims 13 and 14 under 35 U.S.C. § 103 over Gomez and Gulati, and claims 1, 5, and 6 under 35 U.S.C. § 103 over Murata. We reverse the Examiner's rejections of claim 4 under 35 U.S.C. § 103 over Gomez alone and over Gomez and Gulati.

In summary:

Claim(s) Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 4, 7–10, 12, 15–18	103	Gomez	1, 7–10, 12, 15–18	4
4	103	Gomez, Vogl	4	
4, 13, 14	103	Gomez, Gulati	13, 14	4
5, 6	103	Gomez, Koyama	5, 6	
1, 5, 6	103	Murata	1, 5, 6	
Overall Outcome			1, 4–10, 12–18	

TIME PERIOD FOR RESPONSE

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

AFFIRMED