

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CORNING INCORPORATED
Petitioner

v.

DSM IP ASSETS B.V.
Patent Owner

Case IPR2013-00052
Patent 7,276,543 B2

Before FRED E. McKELVEY, GRACE KARAFFA OBERMANN,
JENNIFER S. BISK, SCOTT E. KAMHOLZ, and ZHENYU YANG,
Administrative Patent Judges.

YANG, *Administrative Patent Judge.*

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

A. *Background*

Pursuant to 35 U.S.C. §§ 311-319, Corning Incorporated (“Corning”) petitioned for an *inter partes* review of claims 1-34 of U.S. Patent No. 7,276,543 B2 (“the ’543 patent”). Paper 3 (“Pet.”). On May 2, 2013, the Board denied the petition as to claims 1-10 but instituted trial for claims 11-34 on several grounds of unpatentability. Paper 13 (“Dec.”). Thereafter, Patent Owner DSM IP Assets B.V. (“DSM”) filed a Response (Paper 43 (“PO Resp.”)), and Corning filed a Reply (Paper 56 (“Reply”)). Later, DSM filed a Supplemental Response (Paper 67 (“Supp. Resp.”)), and Corning filed a Reply thereto (Paper 68 (“Supp. Reply”)).¹

Oral hearing was held on February 11, 2014. *See* Paper 87 (“Tr.”).

The Board has jurisdiction under 35 U.S.C. § 6(c) and issues this final written decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

Corning has proved by a preponderance of the evidence that claims 11-23 and 26-31 of the ’543 patent are unpatentable. It, however, has failed to meet its burden of proof regarding the unpatentability of claims 24, 25, and 32-34.

B. *Related Proceedings*

Corning and DSM simultaneously are involved in nine other *inter partes* reviews based on patents claiming similar subject matter: IPR2013-00043, IPR2013-00044, IPR2013-00045, IPR2013-00046,

¹ The Board authorized these filings in resolving certain discovery disputes. Paper 54.

IPR2013-00047, IPR2013-00048, IPR2013-00049, IPR2013-00050, and IPR2013-00053.²

C. The '543 Patent

The '543 patent relates to an optical fiber coating prepared from a radiation curable composition. Ex. 1001, Abstract; *see also id.* at 1:16-18. The composition comprises an oligomer, a reactive diluent, and a plurality of free radical photoinitiators with certain absorption characteristics. *Id.* at 3:11-44.

Claim 11, the sole independent claim in this proceeding, reads:

11. A radiation-curable composition comprising

(A) an oligomer,

(B) a reactive diluent, and

(C) a photoinitiator package of at least two free radical photoinitiators having an overall absorption spectrum in methanol which is the sum of the absorption spectra of each individual photoinitiator wherein said overall absorption spectrum has a minimum value of a molar extinction coefficient (ϵ) in a range between 280 nm (λ_1) and 320 nm (λ_2) of at least about 525 $\text{l mol}^{-1}\text{cm}^{-1}$ or wherein said overall absorption spectrum has an average value of ϵ in a range between 280 nm (λ_1) and 320 nm (λ_2) of at least about 980 $\text{l mol}^{-1}\text{cm}^{-1}$.

Ex. 1001, 27:45-57.

² IPR2013-00053 addresses claims 35-57 of the '543 patent.

D. Reviewed Grounds of Unpatentability

The Board instituted trial on the following grounds of unpatentability:

Claim(s) Challenged	Basis	Reference(s)³
11-14, 16-21, 26, 27, 29, 30, and 32-34	§ 102	Szum '041
24 and 25	§ 103	Szum '041 and Ciba
11-22 and 26-30	§ 102	Snowwhite
23	§ 103	Snowwhite, Fouassier, and Levy
31	§ 103	Snowwhite and Zahora
31	§ 103	Szum '041, Snowwhite, and Zahora

II. ANALYSIS

A. Claim Construction

In the Decision to Institute, the Board adopted Corning's interpretation of several terms. Dec. 5-6. After the institution of the trial, the parties disputed the construction of "percentage reacted acrylate unsaturation (%RAU)" only. Pet. 16-17; PO Resp. 16-18; Reply 2-7. As we dispose of all issues on other grounds, we do not need to reach any claim construction in this Final Decision.

³ Szum, U.S. Patent No. 5,664,041 (Ex. 1002) ("Szum '041"); Ciba-Geigy Corp., Photoinitiators for UV Curing: A Formulator's Guide (Ex. 1006) ("Ciba"); Snowwhite et al., Int'l Pub. No. WO 98/47954 (Ex. 1003) ("Snowwhite"); JEAN-PIERRE FOUASSIER, PHOTOINITIATION, PHOTOPOLYMERIZATION, AND PHOTOCURING: FUNDAMENTALS AND APPLICATIONS 71-72 (1995) (Ex. 1011) ("Fouassier"); Levy, U.S. Patent No. 6,042,943 (Ex. 1012) ("Levy"); Zahora et al., Int'l Pub. No. WO 98/50317 (Ex. 1004) ("Zahora").

B. Unpatentability Analysis

1. Claims 11-23 and 26-31

In instituting this *inter partes* review, the Board concluded that “Corning has demonstrated that there is a reasonable likelihood of prevailing on its challenge to the patentability” of claims 11-23 and 26-31. *See* Dec. 8-12, 18-20, 22; *see also* 35 U.S.C. § 314(a). After the Board institutes a review, the patent owner “may file a response to the petition addressing any ground for unpatentability not already denied.” *See* 37 C.F.R. § 42.120(a). In its Scheduling Order, the Board cautioned DSM that “any arguments for patentability not raised in the response will be deemed waived.” Paper 14, 2.

In its Patent Owner’s Response, DSM chose “not to substantively respond to Corning’s Petition with respect to claims 11-23 and 26-31.”⁴ PO Resp. 3. In its Supplemental Response, however, DSM asserted that “Corning’s GPC [gel permeation chromatography] data does not prove that Corning properly synthesized the prior art oligomers.” Supp. Resp. 5. Even though DSM did not state so explicitly, this allegation relates to DSM’s patentability argument for claims 11-23 and 26-31. After all, if DSM’s contentions bear out, Corning’s test data using the oligomers of questionable quality could not serve as the basis to prove unpatentability of any claim.

According to Professor Bowman, the expert for DSM, when synthesizing an oligomer, the presence of a significant amount of low

⁴ DSM stated that it instead submitted a Motion to Amend under 37 C.F.R. § 42.121. PO Resp. 3. The record, however, does not include any Motion to Amend in this proceeding.

molecular weight starting materials would indicate an incomplete synthesis.⁵ Ex. 2037 ¶ 7. In addition, unreacted starting materials also can impact detrimentally the functional properties of the resulting coating composition. *Id.* In Professor Bowman’s view, the starting materials of Corning’s sample co-eluted with the tracer, which made it “difficult, if not impossible, to determine from these [GPC] spectra whether the oligomer functionalization reaction is complete in Corning’s oligomer compositions.” *Id.* ¶ 12. Professor Bowman estimated “there might be 30 or 40 percent of small molecular weight compounds that are present in those [Corning oligomers].” Ex. 1039, 171:16-19.

Corning disagreed. Professor Sogah, an expert for Corning, explained: “The main purpose of analyzing a GPC chromatogram that is run on a GPC designed to assess oligomer formation is to see if oligomer peaks appear in the high molecular-weight region of the chromatogram.” Ex. 1071 ¶ 56. Thus, a skilled polymer chemist would not analyze the low molecular-weight region to confirm oligomer formation. *Id.* ¶ 57. “Even if a skilled scientist were to focus on the low molecular-weight region of the GPC chromatogram[,] there is no information available in the Corning GPC chromatograms in this region to indicate that the oligomer has not been properly formed.” *Id.* ¶¶ 58-60. In Professor Sogah’s opinion, given the highly reactive nature of the reagents used in the oligomer formation,

⁵ The Board denied DSM authorization to file Dr. Bowman’s supplemental declaration in this proceeding. Paper 59, 4-5. DSM nevertheless cited to this declaration in support of its Supplemental Response argument. Suppl. Resp. *passim*. We exercise our discretion and consider Dr. Bowman’s supplemental declaration for the limited purpose discussed herein.

together with the long reaction time Corning used to prepare the oligomers, it would be “highly unlikely” that the unreacted starting materials would be present in amounts of 30-40%, as Professor Bowman alleged. *Id.*

¶¶ 64-66. Professor Sogah further pointed out:

Additionally, oligomers in general are fairly viscous, to the point that this viscosity is observable to the naked eye. Having 30-40% unreacted HEA [the starting material], or any other liquid, in the final product of an oligomer synthesis would certainly affect the viscosity of the resulting product. A skilled chemist with experience synthesizing oligomers would immediately recognize that such a resulting product does not have the viscosity and other physical attributes associated with a typical oligomer. For example, HEA is volatile and has a very strong, pungent odor which a skilled chemist would almost certainly notice when handling this material. For all the reasons stated above, I think it would be highly unlikely that a skilled chemist with experience in synthesizing oligomers would be confused into thinking that the final “oligomer” product being synthesized actually contained 30-40% small molecular weight compounds, such as unreacted HEA.

Id. ¶ 68.

We find Professor Sogah’s explanation more persuasive. First, after Corning submitted Professor’s Sogah’s declaration rebutting Professor Bowman’s opinion, DSM cross-examined Professor Sogah for two days. *See Exs. 2060, 2061.* In its Motion for Observations on Cross-Examination of Corning Reply Declarants, DSM called to our attention several deposition testimony excerpts from other Corning experts. *See Paper 70.* Had DSM found any support for its allegation that Corning improperly prepared the oligomer samples, it could have pointed it out to us. *See Office Patent Trial Practice Guide (“Trial Practice Guide”), 77 Fed. Reg. 48,756, 48,767-68*

(Aug. 14, 2012). It did not do so. In fact, DSM did not call to our attention any testimony from Professor Sogah.

More importantly, DSM's scientists do not appear to have given much weight to the low-molecular-weight region of the GPC spectrum. *See* Ex. 1039, 144:6–147:22. Indeed, when a DSM's scientist presented the oligomer test data to Professor Bowman, she did not include data of the low-molecular-weight region. *See id.* at 146:12-15 (“So the one that I’m sure had been done before it was the di -- the diisocyanate diacrylate. They had run that before. She thought she knew where it should show up, but couldn’t pull out that data.”); *id.* at 146:20-25 (“And I think the same thing was true of the lauryl acrylate as was true of the diisocyanate diacrylate. She knew from her experience where it would show up, but I again indicated I needed more than her experience, that I wanted see that run as a sample itself . . .”). This testimony confirms Professor Sogah’s position, i.e., when analyzing a GPC chromatogram to assess oligomer formation, a skilled polymer chemist would focus on the oligomer peaks in the high-molecular-weight region, and not the peaks of the starting materials or tracer in the low-molecular-weight region. Ex. 1071 ¶¶ 56-57.

We find that Corning has established that it properly prepared the oligomer it used for testing. DSM has not presented enough evidence to lead us to doubt the quality of Corning’s oligomer preparation. Based on the record developed at trial, we find a preponderance of evidence supporting unpatentability of claims 11-23 and 26-31. *See* 35 U.S.C. § 316(e). Specifically, we are persuaded by the data and testimony Corning presented in support of its position that Examples 4 and 5B of Szum ’041 inherently anticipate claims 11-14, 16-21, 26, 27, 29, and 30. *See* Pet. 18-26; Ex. 1013

¶¶ 106-29, 135; Ex. 1014 ¶¶ 35-39. Also, Corning presented persuasive data and testimony supporting its position that Example C of Snowwhite inherently anticipates claims 11-22 and 26-30. *See* Pet. 48-54; Ex. 1013 ¶¶ 209-28, 231; Ex. 1014 ¶¶ 35-39. Further, Corning presented data and testimony sufficient to support its position that the combination of Snowwhite, Fouassier, and Levy renders claim 23 obvious, and that the combination of Snowwhite and Zahora (or the combination of Szum '041, Snowwhite, and Zahora) renders claim 31 obvious. *See* Pet. 30-31, 55-58; Ex. 1013 ¶¶ 233-46.

Besides the unconvincing challenge of Corning's adequate oligomer sample preparation, DSM did not present any other evidence or argument to rebut the unpatentability assertions. Therefore, Corning has satisfied its burden of proving unpatentability of claims 11-23 and 26-31.

2. Claims 32-34

Claims 32-34 depend from claim 11 and further limit the radiation-curable composition, "when cured at a dose of about 4.4 mJ/cm²," to have a %RAU of at least 56%, 60%, and 66%, respectively. Ex. 1001, 28:65–29:6.

In its Petition, Corning alleged that Examples 4 and 5B of Szum '041 anticipate claims 32-34. Pet. 26-27. Specifically, Corning presented the testimony of Ms. Kouzmina, a Corning employee, stating that she prepared the compositions disclosed in Examples 4 and 5B of Szum '041 and tested these samples for %RAU. Ex. 1014 ¶¶ 23-34. According to Ms. Kouzmina, when cured at a dose of about 4.4 mJ/cm², Example 4 has a %RAU of 78% and Example 5B has a %RAU of 73%. *Id.* ¶ 34.

Dr. Winningham, Corning's expert, did not examine independently the underlying test procedures. Ex. 2087, 1096:24–1099:15. Instead, trusting

the work of Ms. Kouzmina, Dr. Winningham opined that Examples 4 and 5B of Szum '041 disclose the %RAU recited in claims 32-34. Ex. 1013 ¶¶ 132-35. Crediting both the Kouzmina and the Winningham declarations, the Board instituted review of claims 32-34. Dec. 8-9.

In the Patent Owner's Response, DSM contended that "Corning's %RAU measurements are scientifically invalid and therefore cannot establish that Examples 4 and 5B of Szum '041 anticipate claims 32[-]34 of the '543 patent." PO Resp. 32-42. Specifically, Professor Bowman testified that "assuming constant intensity of the incident light," "a plot of dose versus exposure time will be linear (i.e., will yield a straight line) with an intercept at the origin of the graph." Ex. 2029 ¶ 55. Corning's technician, however, improperly conducted the %RAU tests based on a substantially nonlinear calibration data. *Id.* ¶ 58. According to DSM, Ms. Kouzmina, the Corning declarant who supervised the %RAU tests and testified about the results, "did not know whether the relationship between dose and exposure time should be linear." *Id.* ¶ 59. In providing his expert opinion, Dr. Winningham relied on Ms. Kouzmina's incorrect dose calibration data without any examination. *Id.* ¶ 60. Thus, even though he understood the linear relationship between dose and exposure, Dr. Winningham did not catch "the fundamental error" in Corning's data. *Id.*

In its Reply, Corning conceded that its original %RAU calculation, on which it relied to support the Petition for review of claims 32-34, was erroneous. Reply 7-8. Corning found "a then-unknown limitation inherent in the [light] meter and a calculation error." *Id.* These two errors caused an overstated exposure time and thus, instead of 4.4 mJ/cm² required in claims 32-34, "too high a dose was used." *Id.*

Corning then argued that Examples 4 and 5B of Szum '041 anticipate the '543 patent claims based on its “renewed %RAU calculations.” *Id.* at 8-12. Corning submitted Dr. Winningham’s Responsive Declaration and several new expert declarations together with its Reply. *See* Exs. 1037, 1038, 1069, 1071. According to these experts, Corning prepared a new batch of coating samples according to the formulations in Examples 4 and 5B of Szum '041 (Ex. 1037 ¶¶ 33, 34, 39-48), determined the exposure times required to achieve 4.4 mJ/cm² (*id.* ¶¶ 56-68), conducted FTIR analyses (*id.* ¶¶ 70-77), and calculated %RAU (*id.* ¶¶ 78-83). Corning performed the tests using two different light meters: when using EPM2000/PM3, the light meter used in the original tests to support the Petition, the %RAU fell outside of the range recited in claims 32-34; but when using ILT1400/XRL140B, a new light meter first used in the tests to support the Reply, the %RAU fell within the range recited in claims 32-34. Reply 10.

We decline to consider Corning’s “renewed” %RAU data because they are improper reply evidence and because considering the data at this late stage would not serve the interest of justice. “A reply may only respond to arguments raised in the corresponding opposition or patent owner response.” 37 C.F.R. § 42.23(b). When DSM challenged the soundness of Corning’s methodology, a proper reply could have included, for example, Corning’s rebuttal to contradict DSM’s allegation and any supporting evidence to confirm the veracity of Corning’s original %RAU data. These options were not available to Corning because it, in fact, discovered errors in that testing. Reply 7-8. Instead, Corning provided new evidence of %RAU data of an entirely new batch of samples tested under a new protocol,

including using a new light meter. *Id.* at 8-10. Such evidence, and Corning's argument relying on such evidence, exceeded the proper scope of a reply.

Corning insisted that its new reply evidence, or at least the portion using the new ILT1400/XRL140B meter, was in response to Professor Bowman's criticism of Corning's test procedure. *See* Tr. 6:12-24. We disagree. "Examples of indications that a new issue has been raised in a reply include new evidence necessary to make out a *prima facie* case for the patentability or unpatentability of an original or proposed substitute claim, and new evidence that could have been presented in a prior filing." Trial Practice Guide, 77 Fed. Reg. at 48,767. Corning's reply evidence falls squarely into this category.

Corning conceded that it could not rely on the original %RAU data in the Petition to support its position that Szum '041 inherently anticipates claims 32-34. *See* Tr. 5:14-21. Thus, Corning's "renewed" %RAU data in the Reply becomes necessary to make its case for unpatentability of claims 32-34.

Corning could have presented the "renewed" %RAU data with its original Petition. In none of its papers and at no time at the oral argument did Corning contend or offer any evidence to show otherwise. Indeed, it was Corning who decided to challenge DSM's patent. In theory, Corning, unlike DSM, had unlimited time to test the prior art compositions, because the parties do not appear to have engaged in any ongoing litigation involving the '543 patent. *See* 35 U.S.C. §§ 315(a)(1), 315(b). In reality, DSM asserted, and Corning did not dispute, that Corning had two years to prepare for this patent challenge. PO Resp. 5. Moreover, the problems with Corning's

original %RAU data lie in the first, calibration step. *Id.* at 36-43; *see also* Reply 7-8. Corning blamed the breadth of claims 32-34 for its testing error. But proper calibration of a light meter to determine the exposure times needed to reach the doses recited in the claims is fundamental and does not depend on Corning's understanding, or for that matter, our construction, of any claim language. To be sure, Corning was able to discover and correct the errors,⁶ and present a new set of data, even though the parties did not agree on, and we did not resolve, any claim construction issue.⁷

Because Corning belatedly presented the “renewed” %RAU data to make its case of inherent anticipation, we decline to consider the portion of the Reply on this issue. *See* Trial Practice Guide, 77 Fed. Reg. at 48,767. This approach is consistent with those of federal courts, which generally do not consider new evidence presented at the end of a briefing schedule when the other party no longer has an opportunity to respond. *See, e.g., Stamps.com Inc. v. Endicia, Inc.*, 437 F. App'x 897, 909 (Fed. Cir. 2011) (holding that the district court acted within its discretion when it did not consider supplementary declarations submitted for the first time in a reply brief because the other party did not have an opportunity to respond). Here, Corning included the “renewed” %RAU data evidence in its reply papers. Even though DSM had a chance to, and in fact, did, cross-examine some Corning experts, it had no further briefing opportunity to challenge

⁶ For purposes of this decision, we assume, without deciding, that Corning's calibration and calculation for its “renewed” %RAU data are procedurally proper.

⁷ In fact, for the purpose of instituting this trial, the Board adopted Corning's interpretation of several terms, including “percentage reacted acrylate unsaturation (%RAU).” *See supra* Section II.A.

Corning's evidence—at that time, DSM could file only observations on cross-examinations, an avenue not designed for submitting substantive argument. *See* Trial Practice Guide, 77 Fed. Reg. at 48,768. It would be manifestly unfair to allow Corning to substitute new %RAU data in the Reply when DSM had no briefing opportunity to address any issues with the new evidence.

Certainly, our consideration of Corning's newly presented evidence would cause undue prejudice against DSM. Corning faulted DSM for not seeking an opportunity to address the new Reply evidence. *See* Transcript of Oral Hearing at 8:1-10, *Corning Inc. v. DSM IP Assets B.V.*, IPR 2013-00047 (PTAB Feb. 11, 2014) (Paper 83).⁸ According to Corning, DSM previously asked for supplemental briefing, so it should have done the same here. *Id.* Corning also offered to not object if DSM were to supplement its briefing on the “renewed” %RAU after the hearing. *See* Tr. 7:15-22. As a threshold matter, we would not consider Corning's offer, because Corning never raised this position before oral argument and because it is within the Board's discretion to decide whether to allow DSM the opportunity to supplement its filing. *See* Trial Practice Guide, 77 Fed. Reg. at 48,767-68.

More importantly, DSM did not bear the burden to respond to Corning's “renewed” evidence. During the hearing, counsel for DSM argued that requiring DSM to respond to the “renewed” %RAU data would

⁸ In IPR 2013-00047, Corning submitted the same new evidence of %RAU data. At the hearing, the parties argued the same issue, i.e., whether the Board should consider the new evidence, mainly during the earlier time allotted for IPR 2013-00047. *See* Transcript of Oral Hearing at 5:15-21, *Corning Inc. v. DSM IP Assets B.V.*, IPR 2013-00047 (PTAB Feb. 11, 2014) (Paper 83).

amount to conducting a *de facto* new *inter partes* review on claims 32-34. *See* Tr. 9:18-21. We agree. DSM already had expended resources on expert analyses and attorney argument addressing the deficiency of Corning’s original data. The Board will not press DSM to expend additional resources to have an expert analyze Corning’s new data together with hundreds of paragraphs of new expert declarations, or to have its attorney make a supplemental submission—not when DSM did not cause Corning’s testing errors; not when Corning itself never sought authorization to supplement the “renewed” evidence;⁹ and not when doing so less than three months before the statutory deadline for issuance of the final decision would place a strenuous burden on DSM.¹⁰ In addition, allowing the parties to address Corning’s new reply evidence at this late stage would impede the Board’s objective to “secure the just, speedy, and inexpensive resolution of every proceeding.” *See* 37 C.F.R. § 42.1(b).

We applaud Corning’s candor in admitting the errors in its testing results. We also appreciate its argument that revoking unpatentable claims would serve the public interest.¹¹ *See* Tr. 7:4-6. But, federal courts may

⁹ Corning never so moved, and we express no opinion on whether the Board would have granted such a motion.

¹⁰ Because the Board instituted the instant review on May 2, 2013 (*see* Dec.), it shall issue the final decision on or before May 2, 2014, less than three months after the oral hearing held on February 11, 2014. *See* 35 U.S.C. § 316(a)(11).

¹¹ DSM contended that even Corning’s “renewed” %RAU data would not support unpatentability of claims 32-34. *See* Transcript of Oral Hearing at 19:21–20:7, *Corning Inc. v. DSM IP Assets B.V.*, IPR 2013-00047 (PTAB Feb. 11, 2014) (Paper 83). Without the benefit of any critical review of the

exclude evidence when a party fails to timely disclose information or supplement an earlier disclosure during discovery. *See, e.g., O2 Micro Int'l Ltd. v. Monolithic Power Sys., Inc.*, 467 F.3d 1355, 1368 (Fed. Cir. 2006) (concluding that the district court did not abuse its discretion in excluding untimely supplemental expert declarations). They do so despite the fact that some excluded evidence may invalidate a patent claim. *See, e.g., Vehicle IP, LLC v. Werner Enters., Inc.*, CV10-503, 2013 WL 4786119, *2-3 (D. Del. Sept. 9, 2013) (excluding invalidity theory based on untimely disclosed prior art). To reach consistent and fair outcomes in performing its duties, the Board similarly must follow set rules and conduct its proceedings in an orderly fashion.

Overall, the balance of various interests tips against Corning, and the Board declines to entertain Corning's "renewed" %RAU data. Because Corning conceded that it could not prevail based on the original %RAU data submitted with the Petition, and we find that it cannot rely on the new evidence advanced in the Reply, it failed to prove by a preponderance of the evidence that claims 32-34 are unpatentable.

3. Claims 24 and 25

Claims 24 and 25 depend from claim 11. Claim 24 further limits compound (C) to comprise "five different α -cleavage homolytic free radical photoinitiators, wherein each photoinitiator is individually present in an amount between 0.05 and 4.0 wt. % relative to the total amount of the coating composition." Ex. 1001, 28:36-41. Claim 25 depends from

data by DSM's expert and further briefing on this issue, it is unclear whether Corning would have satisfied its burden to prove unpatentability.

claim 24 and requires that “each photoinitiator is present in an amount between 0.1 and 2.5 wt. % relative to the total amount of the coating composition.” *Id.* at 28:42-45.

According to Corning, claims 24 and 25 would have been obvious over the combination of Szum '041 and Ciba. Pet. 27-30. Specifically, Corning asserted that Examples 4 and 5B of Szum '041 satisfy each and every limitation of claim 11. *Id.* at 27. Each composition contains, however, only two, not five, α -cleavage homolytic free radical photoinitiators in the range of the recited amount, as claims 24 and 25 require. *Id.* at 27-28. Ciba “describes five different photoinitiators having different uses: a primary initiator, a surface cure initiator, a through cure initiator, an initiator with a good short wavelength absorption, and an initiator with a good long wavelength absorption.” *Id.* at 29 (citing Ex. 1006, 15). Thus, “it would have been obvious to use five different photoinitiators in Szum’s compositions, as required by claim 24, to achieve the well known benefits associated with multiple photoinitiators.” *Id.*

In response, DSM contended that a person of ordinary skill in the art would not have been motivated to combine five photoinitiators into a single composition. PO Resp. 25-30. Professor Bowman testified that it is “generally desired to use the smallest number of the most efficient photoinitiators possible and no more than necessary to achieve an effective cure.” Ex. 2029 ¶ 43. According to Professor Bowman, using too many photoinitiators or too much total photoinitiator likely will cause problems. *Id.* As a result, “a person of ordinary skill in the art would not select five different photoinitiators in the specifically claimed amounts merely because

the photoinitiators can be described in five different ways—especially given the cost concerns as expressly mentioned in *Ciba*.” *Id.* ¶ 48.

DSM also contended that the combination of Szum '041 and *Ciba* does not disclose each and every limitation of claims 24 and 25. PO Resp. 24-25. Specifically, claim 11, from which claims 24 and 25 depend, requires the photoinitiator package exhibit certain absorption characteristics between 280 nm and 320 nm. Ex. 1001, 27:48-57. Corning, however, did not present any credible evidence to show that “when the photoinitiator packages of Examples 4 and 5B are modified to include three additional photoinitiators as Corning suggests, this combination of five photoinitiators meets the claimed absorption characteristics.” PO Resp. 24.

In its Reply, Corning provided no rebuttal on either issue. In fact, besides reciting the claim language, the only sentence addressing the unpatentability of claims 24 and 25 reads:

For the reasons explained in the Petition for *Inter Partes* Review and adopted by the Board in the Decision Instituting *Inter Partes* Review, it would have been obvious from *Ciba* to add five additional alpha-cleavage homolytic free radical photoinitiators to Examples 4 and 5B of Szum.

Reply 13-14.

Based on the record developed at trial, we conclude that Corning has not met its burden to prove claims 24 and 25 obvious by a preponderance of evidence. First,

[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a

reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.

KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398, 418 (2007). Here, Corning argued that “it was well known to include multiple photoinitiators in radiation-curable compositions, for instance, to improve cure speed and optimize performance properties.” Pet. 28. Having initially found this reasoning persuasive, we instituted this review. After institution, DSM, however, came forward with evidence showing other considerations at play. *See* PO Resp. 26-30. Indeed, Professor Bowman explained why one skilled in the art would not have had a reason to use five photoinitiators and in the amount as claims 24 and 25 require. *See, e.g.*, Ex. 2029 ¶¶ 46-48. He refers to express teachings in *Ciba* to support his opinion. For example, “a frequent cause of insufficient through-cure is too much photoinitiator in the composition, and as *Ciba* expressly teaches, this problem can often be rectified by using lower levels of photoinitiators.” *Id.* ¶ 47; *see also id.* ¶ 48 (pointing to the cost concerns expressed in *Ciba*). We find Professor Bowman’s opinion credible, especially given that both the opinion and the evidence referred to therein stand un rebutted by Corning.

A second independent basis supports our conclusion that Corning has failed to meet its burden of proving that claims 24 and 25 are unpatentable. Even assuming that it would have been obvious to modify Szum ’041 and use five photoinitiators in a radiation-curable composition, Corning has not shown by a preponderance of evidence that such a modification would satisfy the required absorption characteristics. Claims 24 and 25 depend from claim 11. It is undisputed that neither Szum ’041 nor *Ciba* expressly

discloses the absorption characteristics recited in claim 11. In fact, Corning established the unpatentability of claim 11 (anticipated by Szum '041) through the inherency doctrine.¹² *See supra* Section II.B.1. Though it matters not whether one skilled in the art appreciated the inherent property of the Szum '041 compositions at the time of the invention, “it matters greatly whether anything the skilled artisan would be prompted by the prior art to do is *in fact* within the scope of the . . . claim.” *In re Kao*, 639 F.3d 1057, 1066 (Fed. Cir. 2011). Corning did not present any testing data to show that when the photoinitiator packages of Examples 4 and 5B are modified to include three additional photoinitiators, the modified photoinitiator packages meet the claimed absorption characteristics. Lack of such tests is not fatal if Corning can provide other evidence sufficient to prove the point. This, Corning did not do.

Here, the only evidence Corning relied on came from a single sentence in Dr. Winningham’s declaration:

Modifying the photoinitiator packages of Example 4 and Example 5B of Szum by adding additional α -cleavage homolytic free radical photoinitiators at approximately the same weight percentages of the photoinitiators already used in those examples *would not be expected* to have caused the minimum

¹² “[T]he inherency doctrine may apply to an otherwise obvious claim as well.” *Allergan, Inc. v. Sandoz Inc.*, 726 F.3d 1286, 1294 n.1 (Fed. Cir. 2013). Thus, we reject DSM’s argument that “Corning has improperly based its obviousness analysis on its *ex post facto* absorption data obtained for Examples 4 and 5B of Szum '041.” PO Resp. 31. This is not a case where Corning relied on an inherent property (i.e., the unknown absorption characteristics of the Szum '041 compositions) for a rationale to combine. Rather, Corning based its obviousness argument upon express teachings in Szum '041 and Ciba, as well as expert testimony.

and average ε of the resulting photoinitiator packages to drop below the values recited in claim 11, from which claims 24 and 25 depend.

Ex. 1013 ¶ 169 (emphasis added). An expert's opinion is only as good as the facts upon which it is based. Dr. Winningham, in rendering his opinion, pointed to no factual support and gave no explanation. During the hearing, the panel inquired about the basis of Dr. Winningham's conclusory statement. Counsel for Corning appeared to state that Dr. Winningham based his opinion on the level of one skilled in the art but emphasized his expertise in the field. *See* Tr. 4:9-18. One's expertise, even though draped with a skilled-artisan veil, does not entitle a naked opinion to much weight. *See Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 294 (Fed. Cir. 1985) ("Lack of factual support for expert opinion going to factual determinations . . . may render the testimony of little probative value in a validity determination.").

Modifying a photoinitiator package from two photoinitiators to five may not appear significant. But "[t]he emphasis on non-obviousness is one of inquiry, not quality" *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). More importantly, we reach our conclusion here by following not some rigid analysis formula but the statutory mandate: in an *inter partes* review, "the petitioner shall have the burden of proving a proposition of unpatentability by a preponderance of the evidence." 35 U.S.C. § 316(e). Corning's conclusory expert opinion does not supply the requisite preponderance of evidence.

This is especially so as Corning failed to rebut Professor Bowman's opposite conclusion. Professor Bowman pointed out that Corning tested

photoinitiators with high absorptivity while arguing that the other photoinitiators' absorptivities were unimportant. Ex. 2029 ¶ 49. His testimony cast further doubt on Dr. Winningham's conclusory statement that the addition of three other photoinitiators "would not be expected" to cause the absorption characteristics to fall out of the range recited in claims 24 and 25. *See id.* We find Professor Bowman's opinion persuasive. And Corning's failure to rebut this opinion leads to its failure to prove the unpatentability of claims 24 and 25 by a preponderance of evidence. As a result, claims 24 and 25 survive this review.

C. Motions to Exclude

Both DSM and Corning filed Motions to Exclude. *See* Papers 71 ("DSM's Mot."), 74 ("Corning's Mot."). Corning's motion is dismissed as moot; DSM's motion is granted in part and dismissed in part as moot.

DSM moved to exclude Corning's original %RAU data submitted with the Petition. DSM's Mot. 4-6. Because Corning conceded that it would not rely on the data (*see* Tr. 5:14-21), we dismiss this portion of DSM's motion as moot.

DSM also moved to exclude Corning's "renewed" %RAU data submitted with the Reply. DSM's Mot. 6-10. For the reasons explained in the substantive discussion regarding claims 32-34 (*see supra* Section II.B.2), we grant this portion of DSM's motion.¹³

¹³ A motion to exclude is not an appropriate vehicle for challenging a reply or supporting evidence as of improper scope. *Liberty Mutual Ins. Co. v. Progressive Casualty Ins. Co.*, CBM2012-00002, Paper 66, slip op. at 62 (PTAB Jan. 23, 2014). We consider DSM's argument here only because the panel previously instructed DSM to challenge the reply evidence in a motion

Corning moved to exclude portions of Professor Bowman's declaration that "include and/or rely on certain unauthenticated hearsay evidence." Corning's Mot. 1. According to Corning, Figure 1 and Table 1 in the declaration purported to show "DSM's testing of an unidentified formulation by DSM employees and the results of those tests," which DSM never authenticated. *Id.* at 2-3. Because we do not rely on either these portions of Professor Bowman's declaration or the underlying data to reach the final decision, we dismiss Corning's motion as moot.

III. CONCLUSION

Corning has shown, by a preponderance of the evidence, that claims 11-23 and 26-31 of the '543 patent are unpatentable. It, however, has failed to meet its burden of proof regarding the unpatentability of claims 24, 25, and 32-34.

IV. ORDER

For the reasons given, it is

ORDERED that claims 11-23 and 26-31 of the '543 patent are determined to be UNPATENTABLE;

FURTHER ORDERED that Corning's request for cancellation of claims 24, 25, and 32-34 is *denied*;

FURTHER ORDERED that DSM's Motion to Exclude is *granted-in-part* and *dismissed-in-part as moot*;

to exclude. Paper 57, 4-5. In future cases, however, parties should bring improper reply evidence to the Board's attention in a conference call or during oral argument.

FURTHER ORDERED that Corning's Motion to Exclude is *dismissed as moot*; and

FURTHER ORDERED that because this is a final written decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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