

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

OMEGA LINER COMPANY, INC.,

Petitioner

v.

BUERGOFOL GmbH

Patent Owner.

CASE NO.: IPR2023-01372
U.S. PATENT NO. 9,657,882

**PATENT OWNER'S SUR-REPLY TO
REPLY OF PETITIONER TO THE PATENT OWNER RESPONSE**

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EXHIBIT LIST

<i>Exhibit No.</i>	<i>Description</i>
EX2001	Declaration of Dr. Patrick Brant
EX2002	Curriculum Vitae of Patrick Brant, Ph.D.
EX2003	Declaration of Gregor Schleicher
EX2004	Declaration of Abdel-Kader Boutrid
EX2005	European Patent No. EP2777925
EX2006	Certified English language translation of EX2005 - Reply dated March 17, 2015 to European Patent Office during prosecution of EP2777925
EX2007	Reply dated March 17, 2015 to European Patent Office during prosecution of EP2777925.
EX2008	U.S. Patent No. 8,794,269 (“the ’269 patent”) (Hummel)
EX2009	Declaration of Translator regarding improper translations of EX1005 (Hummel) and EX1008 (Schuhmann)
EX20010	Material Data Sheet for Envalior Durethan® CI 31 F 000000 Copolyamide PA6/6I
EX2011	Material Data Sheet for EMS-Grivory Grilon® CA6 E PA
EX2012	Liewchirakorn, et al., “Practical Approach in Developing Desirable Peel-Seal...,” Packag. Technol. Sci., (2017)
EX2013	Omega-Liner™ Product Information 2022 dated 9/21/2022
EX2014	U.S. Patent No. 7,799,436
EX2015	Signed deposition transcript of Dr. Steven MacLean
EX2016	Wypych, G., Handbook of Antiblocking, Release, and Slip Additives 3rd Edition (2014), pp. 61-64, 80-83
EX2017	Modified Default Protective Order

<i>Exhibit No.</i>	<i>Description</i>
EX2018	Order Denying In Part Plaintiff's Motion to Prevent Contact with Former Employee, document 56, filed January 27, 2023
EX2019	<i>In the Matter of William C. Fuess</i> , Proceeding No. D2017-16, Initial Decision and Order on Motion for Summary Judgment, (July 30, 2018)
EX2020	ABA Formal Opinion 05-437
EX2021	DC Bar Ethics Opinions 256
EX2022	DC Bar Ethics Opinions 318
EX2023	Dr. Stark Assignment of '882 Patent
EX2024	ABA Formal Opinion 06-440
EX2025	Memorandum in support of Buergofol's motion for an order precluding Omega from making Ex Parte contact with former employee Stark, Civil Action No.: 22-cv-04112-KES, document 20, filed November 29, 2022
EX2026	Letter from Buergofol Counsel to Omega Counsel dated October 10, 2024
EX2027	Virginia Legal Ethics Opinion 1871 (July 24, 2013)
EX2028	Reserved
EX2029	Reserved
EX2030	Default Protective Order
EX2031	Redline of Default Protective Order

I. INTRODUCTION

The Challenged Claims of U.S. Patent No. 9,657,882 (the “’882 Patent” – EX1001) recite a unique combination of features that solved a particular problem that was first discovered by PO, and at the same time unexpectedly improved the mechanical properties of the claimed device. Petitioner grossly over-generalizes the problem as one of “adhesion” but fails to recognize that the claimed coating or covering would not solve all “adhesion” problems, and that Nagai’s coating could have catastrophic effects if applied in a UV curable system. Petitioner also ignores the fact that Hummel overcame Nagai’s alleged adhesion problem (in a heat-curable, not UV curable system) by using a much higher melting point polymer for the layer adjacent the resin (polyamide in Hummel instead of Nagai’s polyethylene that melts under the heat generated during curing), and a high strength polymer (high VICAT) in the opposite outer layer to prevent tearing. PO’s un-refuted expert testimony explains the scientific principles involved in removing materials adhered to one another as a tradeoff between adhesive force and tensile strength of the material being removed (EX2001, ¶¶44-47). The Challenged Claims would not have been obvious over any of Grounds II-IV, and Hummel clearly does not anticipate any of the ‘882 patent claims. Petitioner’s unwarranted credibility attacks of PO’s witnesses are based on Petitioner’s gross mischaracterization of the

witnesses' testimony, are highly suspect given Petitioner's voluntary cancellation of the inventors' cross-examination, and should be summarily dismissed.

II. OBVIOUSNESS GROUNDS

A. Recognition of the Problem and Unexpected Results.

Recognition of the Problem: "As an initial matter, an invention can often be the recognition of a problem itself." *Leo Pharm. Prods., Ltd. v. Rea*, 726 F.3d 1346 (Fed. Cir. 2013); *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 381 F.3d 1371 (Fed. Cir. 2004). The Reply contends that "PO falsely claims it 'invented' the coating after allegedly discovering an adhesion risk in its own film in the 'spring of 2012.'" (Reply, p. 1) This statement is false. PO did not "invent" a coating; it invented the claimed combination (which includes a coating or covering) that had the unexpected effect of improving the mechanical properties of the film. And PO did not discover an "adhesion risk." As the inventors' declarations establish, PO inventively recognized a problem not recognized previously in the prior art when PO realized that a customer was using a new UV curable resin that included a chemical, maleic anhydride, that interacted with the polyamide outer layer of the claimed inner tubular film causing tearing of the film after curing, and clogging of the sewage pipe. (EX2003, ¶¶22-24; EX2004, ¶¶14,15,18).

Even if using a coating or covering to prevent the interaction between the new chemical maleic anhydride and the polyamide might be considered an obvious solution, once that problem was recognized, the inventors' recognition of the problem itself was inventive. Tellingly, no prior art cited by Petitioner discusses the problem the inventors recognized. No document submitted to date by Petitioner refutes or is inconsistent with the inventors' testimony. The problem recognized by the inventors was not known in the art, and recognition of this problem is part of nonobviousness and invention as stated by the Federal Circuit.

Unexpected Results: PO does not premise its non-obviousness position *solely* on the use of a coating or covering to prevent the above-noted chemical interaction, but more importantly on the unexpected mechanical properties that were surprisingly found during PO's experiments that resulted in the invention. The fact that PO was relying on the improved mechanical properties should come as no surprise to Petitioner because the '882 Patent itself mentions those properties as unexpected and surprising no less than 6 times (EX1001, 2:64, 2:67, 8:46-48, 8:48-52, 19:39-43, 20:5-10). Petitioner failed to cross-examine any of PO's witnesses on their testimony that it was completely surprising and unexpected that using the claimed coating or covering improved film mechanical properties. (EX2001, ¶¶28, 29, 33, 56, 58, 75; EX2004, ¶¶20-23, 56, 59). Indeed, Dr. Boutrid

testified and Dr. Brant agreed that at the time of the invention, there was a concern that use of a migrating compound incorporated into the polymer layer *might actually worsen* one or more important mechanical properties, such as its strength. (EX2001, ¶33; EX2004, ¶20). Petitioner presented no evidence to contradict this. PO has presented un-refuted testimony from its witnesses, and un-rebutted statements in the '882 patent, that overcome Grounds II-IV.

Petitioner's allegations of recognized adhesion problems with Hummel's film are not supported by the documents upon which Petitioner relies. Petitioner states that Hummel "teaches . . . the risks of adhesion-tearing after resin curing." (Reply, p. 2) The portions of Hummel relied upon discuss tearing in two instances: (i) Hummel unequivocally states that its film can be removed (peeled or removed) after curing WITHOUT tearing (EX1005, 7:9-10); and (ii) the inner film will begin to tear when inflated too much during the elongation test – NOT after curing – and NOT during or after installation (EX1005, 24:13-14). Contrary to Petitioner's arguments, Hummel clearly informs the skilled artisan that there are no problems with the Hummel inner film tearing after curing.

Petitioner reliance on Nagai for disclosure of recognized adhesion problems is misplaced. (Reply, p. 3) The referenced portions of Nagai relate to film that remains in the pipe after it has been repaired (EX1009, ¶¶0008, 0029), not inner

film that is removed after curing. Nagai actually discloses that, even though the thin film 2 may adhere to the resin absorbent material 1 as an adhesive layer, it can “be easily peeled by pulling while inverting” (*Id.* ¶0026), and that use of a release layer merely permits removal of the thin film “without the use of hot water hose 15 or other wire material.” (*Id.* ¶0026) Nagai therefore informs the POSITA that its inner film can be removed without tearing using a hot water hose or wire, or that a release layer can be used to enable removal with less force. Nagai does NOT disclose or suggest any problem with the inner film tearing while being withdrawn after curing. Nagai certainly does not disclose a problem caused by a chemical interaction between the resin and the film.

The Reply’s reliance on “Stark-Hummel” (EX1011) is curious because this document is not cited in any of the Grounds of Unpatentability. Moreover, Stark-Hummel discloses an external protective film to prevent premature UV curing of the UV resin material, and is not concerned at all with any chemical interaction between the UV curable resin and the outer layer of the inner film. Stark-Hummel discloses the unremarkable fact that the inner film must be strong enough to withstand insertion (as disclosed by Hummel), and strong enough to be removed from the cured resin without ripping or tearing (also disclosed by Hummel). (EX1011, ¶¶0072, 0093). Paragraphs 174 and 175 disclose a bench test tearing of

a comparative film, but not its inventive film (Example 3). This tearing was not tearing during removal of the inner film, but rather just a bench test. Stark-Hummel does not disclose any tearing problem during removal of inner film.

In summary, no document cited by Petitioner mentions any problem with tearing due to a chemical interaction between the curable resin and the outer layer of the inner tubular film – the problem first discovered by the inventors. (EX2003, ¶21; EX2004, ¶15). Nor has Petitioner presented any evidence that rebuts or refutes PO’s sworn testimony that it was entirely unexpected that use of the claimed coating or covering could improve the mechanical properties of the film. PO presented evidence that a POSITA would have expected a coating or covering to actually worsen the mechanical properties of the film (EX2001, ¶¶33, 58; EX2004, ¶20), and Petitioner fails to rebut this with evidence. The Reply presents unsupported attorney argument, with reference to irrelevant documents, (Reply at 13-14), which should have been included in the Petition and should be dismissed, but if not, is wholly insufficient to refute PO’s sworn testimonial evidence (in the ‘882 patent itself and in the three declarations), regarding these unexpected results.

B. Grounds of Unpatentability.

Petitioner devotes a small portion of the Reply to addressing the actual merits of this proceeding.

1. Grounds I and II Are Insufficient.

Petitioner glosses over Grounds I and II at the very end of the Reply, devoting only one sentence to Ground II. With respect to Ground I, the burden is on Petitioner to show that Hummel inherently anticipates the Challenged Claims, because there can be no doubt that Hummel does NOT disclose a coating or covering as claimed. Rather, to arrive at the claimed coating or covering, a POSITA must first make the optional selection of adding an additive, (1 out of 2), then must make the optional selection to add that additive to outer layer (1 out of 5), and then must select a migrating compound from the unlimited number of additives disclosed (1 out of many). EX1005, 11:18-26, disclose general classes of additives. The Reply falsely states that for “Hummel’s film that is removed from the cured resin, Hummel teaches that the external layer (e) may...” Reply at 25. Hummel discloses that, regardless of whether the film remains in the pipe or is removed, the additives can be added to any of the 5 layers – NOT just layer (e), as the Reply fabricates. It is well-settled that inherency cannot be established by probabilities, and requiring optional selections from extremely large lists as would be required in Hummel, is the epitome of a probability. *See, e.g., Ex Parte Smith*, Appeal 2011-00337, application No. 11/890,109, BPAI Decision dated February

28, 2012, designated *Informative*; *Akzo N.V. v. International Trade Comm’n*, 808 F.2d 1471 (Fed. Cir. 1986); *In re Meyer*, 599 F.2d 1026 (CCPA 1979).

Ground II is premised entirely on Hummel anticipating independent claim 1, which it does not for the reasons of record and those outlined above. Petitioner therefore has also failed to carry its burden with respect to Ground II.

2. The Hypothetical Modification in Ground III Would Not Have Been Made and The Claims Would Not Have Been Obvious.

Ground III is premised on a hypothetical combination of selected pieces picked and chosen out of two documents (Hummel and Schuhmann), where the two documents disclose completely unrelated films.

PO has scoured the record, and references of record, and Petitioner’s arguments, and there simply has been no showing in this IPR proceeding that there existed an apparent reason for a POSITA to try to modify Hummel to improve release effect. Hummel’s film did not have a release effect problem. Any reason to improve the release effect of Hummel’s film would be derived from the ‘882 Patent itself, out of hindsight knowledge of the inventor’s invention. Hummel provides no apparent reason to modify Hummel’s release effect, but rather expressly states that there is no such need because Hummel’s inner film “can be removed without tearing.” (EX1005, 7:9-10). This clearly teaches away from any

need for improvement in any release effect – Hummel says there is no problem. The focus of Hummel is on a need for robust mechanical properties of the film, including improved strength by using a polymer to form the innermost layer having a high VICAT softening temperature. There is no recognition whatsoever in Hummel of a desire or need to increase release effect. Hummel states that his inner tubular film can be removed without any tearing, so why would a POSITA expend the effort to modify Hummel when Hummel needs no such modification? The answer is, the POSITA would not have been so motivated.

Accordingly, under the law of obviousness, there was no apparently reason for a POSITA to try to modify Hummel's film by looking to Schumann.

The nonobviousness of the Hummel/Schumann combination is further revealed by a mechanical interlocking problem that would result were the hypothetical combination attempted. Schuhmann pertains to solid or mostly solid products with high adhesive strength. (*See* EX1007, 20:1-17). In comparison, Hummel employs a flowable resin. (EX1005, 3:2-4 – carrier material “impregnated” with a reactive plastic resin; 14:17-21). Schuhmann is not at all concerned with a “curable” resin, or reactive resin that can be impregnated (i.e., flowed into) a carrier material, but rather is concerned with an already cured adhesive or tacky material. In order to achieve the release characteristics,

Schuhmann requires the surface of the release film to be embossed, thereby reducing the contact surface area between the adhesive material and the release film. (EX1005, 13:13). Petitioner failed to cross-examine PO's expert regarding why Schuhmann's embossed surface would cause mechanical interlocking with Hummel's flowable curable resin, thereby teaching away from the combination. (EX2001, ¶¶53-55). This testimony remains un-refuted. Petitioner's unsupported attorney argument (Reply at 5) is entirely insufficient.

A POSITA would not have been motivated to use Schuhmann's release film, because it inherently had a larger separation force, which would have led to reduced removability—a result that is plainly contrary to the objectives of a POSITA. Modifying Hummel with Schuhmann would not constitute the application of a known technique to improve a similar device. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007). If both Hummel and Schuhmann addressed similar devices, or even similar adhesives, then perhaps this argument might have a modicum of merit. But using Schuhmann to modify Hummel would have led to failure rather than to improvement. Combining Schuhmann and Hummel would have had problems, and as such there was no rational basis for a POSITA to make the combination, considering the problem of mechanical interlocking.

3. Combining Hummel and Ngai in Ground IV Was Not Obvious and Would Have Led to Catastrophic Failure.

In the prior art there existed no apparent reason to modify Hummel, nor to modify Hummel using an aspect of Nagai. And if the combination were attempted, the result could have been catastrophic. Hummel does not present any issue with adhesion or tearing that would have prompted a POSITA to try to modify Hummel for the reasons stated above. Hummel does not imply a need for improved release effect or a release agent, and in fact suggests otherwise, so why risk decreasing the strength of Hummel's film by adding an unnecessary coating? It would not have been obvious to look to Ngai, and to pick out its release agent, and then to apply that to Hummel's film that did not have a release issue or problem.

Nagai does not teach that his film has a release problem. Rather, Ngai discusses "problems" associated with peeling or tearing relating to film that *remains* in the pipe *after* it has been repaired. (EX1009, ¶¶0008, 0029). Ngai discloses that even though thin film 2 may adhere to the resin absorbent material, it can be easily peeled off while inverting. Ngai informs that further use of a release layer permits removal of the thin film without the aid of a hot water hose or wire, and that the film can be removed with less force. (EX1009, ¶0026).

Petitioner stresses the importance of looking to the *combined* teachings of the references (Rely, at 6.), and if this is done, Ngai's polyethylene layer might be

used. Nagai's mention of UV-curing is limited simply to that, a mention, that a POSITA would know was not enabled. A POSITA would understand Nagai's disclosure regarding release agents and film removal as relevant to *thermosetting* resins, not UV curable resins. EX2001, ¶63. Because of this Nagai uses polyethylene for the layer adjacent to the resin, (EX1009, ¶13), a material that would melt if used in UV curable systems. Hummel, in comparison, uses polyamide, a much higher melting point polymer to survive the heat generated during UV curing. If Nagai's teachings were somehow applied to Hummel in UV curing system, the result would be catastrophic failure.

Nagai states that adhesion of the film to the resin "is completely prevented." EX1009, ¶29; EX1001, ¶62. Nagai can get away with this feature because Nagai's inner tube is filled with water during curing, thus ensuring the film and resin remain in contact. But UV curable systems only have air filling the inner tube, thereby requiring adhesion between the inner tubular film and curable resin. If Hummel were modified as Petitioner suggest by using Nagai's release layer, which "completely prevents" adhesion, the inner tubular film would collapse, and burn under the heat of UV curing, as it actually did when the inventor's experimented using too much polysiloxane. (EX2001, ¶41). The risk of disastrous collapse of the inner film on UV lamps is factor that a POSITA would have considered when

looking at the *combined* teachings of Hummel and Nagai. The risk of catastrophic failure due to combining selected bits and pieces from two disparate systems would discourage a POSITA from even attempting the combination, especially as Hummel does not seek or require a release effect solution to begin with.

Finally, even if the hypothetical combination of Hummel and Nagai were made, the combination fails to disclose or suggest the features of dependent claim 11. Claim 11 requires a migrating compound to be “added to an external side containing a . . . [polymer].” EX2001, 22:4-7. Independent claim 1, from which claim 11 ultimately depends, defines the inner tubular film as comprising an inner facing and an outer facing “external side,” and states that the coating is “applied over” the outer facing external side. *Id.*, 22:27-37. If claim 11 were construed as Petitioner attempts to construe it, it would not further limit claim 10, because according to Petitioner “adding” the migrating compound to the external side is not limited to adding it to the polymer, but also includes coating it over the external surface (i.e., the term “added” in claim 11 includes coating and coverings).

III. CLAIM CONSTRUCTION

Petitioner’s claim construction regarding the terms “coating” and “covering” is not consistent with the file history of the ‘882 patent, including the original specification filed in the German language. Petitioner’s assertion that the

specification describes a “coating” as being formed by migration of a migrating compound is incorrect. It is a “covering” that is formed by migration to the film’s surface. The claims and the specification consistently use “coating” (Beschichtung) and “covering” (Belegung) correctly, except at one location in the specification that Petitioner highlights (EX1001, 5:23-26, 5:27-30) which conflates the translation of “Beschichtung” and “Belegung” that are correctly used in the original German specification. (EX1002, page 379 of 489 “Alternative der Belegung” refers to the covering—not coating—alternative.)

The term “coating” (first usage, at EX1001, 20:31) is used as a broad label to refer to the three embodiments encompassed by claim 1: (1) a coating with polysiloxane, (2) a coating with a migrating compound, and (3) a covering with a migrating compound. The term “coating”, however, is also used to recite embodiments (1) and (2) in a narrow sense meaning a coating that is “applied over” the outer facing external side of the inner tubular film. Where a layer is formed due to the migration of a migrating compound as in (3), the term “covering” is used. Dependent claim 10 clarifies the two usages of the term “coating” by reciting, “the coating is a coating or covering”—the first usage is broad, and the second usage is narrow. “Coating” is used in the narrow sense in the wherein clause at the end of the claim followed by “applied over” to make clear

that the embodiments that are being referred to in the last wherein clause are (1) and (2). The term “covering” is never used (in the claims or specification properly translated) to refer to polysiloxane or migrating compound that is “applied over,” for example using a coating machine.

The expression “applied over” in claim 1 should not be construed as a method step limitation of the apparatus claim. The term “applied over” of apparatus claim 1 is not reciting a method step, but rather the end result of the claimed coating—that either the polysiloxane or migrating compound is present on the external side (applied over), but how they get there should not be imputed into the apparatus claims.

PO’s construction is more consistent with the entire file history of ‘882 Patent, including the originally filed claims (EX1002, at 116-120), the examples, the expert testimony, the extrinsic evidence, and does not run afoul of the doctrine of claim differentiation with respect to dependent claim 11.

Claim 11 is limited a covering with a migrating compound of embodiment (3) due to the recitation that the migrating compound is “added to.” There is a difference between the “applied over” of claim 1 that further defines embodiments (1) and (2), the “added to” of claim 11. The “over” in “applied over” means over, whereas the “added to” means put into. The term “added” implies an

“additive,” and additives are added to materials. A migrating compound additive is not said to be added to a surface. In all places in the specification that use “added to” (EX1001, 9:1;18:4; 6:10-15), reference is being made to the migrating compound having been an additive to the polymer, which then migrates to the surface to form the covering. Petitioner contends that PO is rewriting the language of claim 11, and that the “added to an external side” is consistent with the “applied over . . . the outer facing external side” of claim 1. Reply at 7. Petitioner’s construction is incorrect. The specification uses the phrase “added to an external side”, and immediately follows that with an explanation that the migrating compound referred to is “in the layer.” (EX1001, 6:17) The term “added to” was specifically used in claim 11, and the term “applied over” was specifically not used.

IV. PETITIONER’S OBJECTIVE EVIDENCE OF NONOBVIOUSNESS

A. Unexpected Results Are Compared To “Closest Prior Art”

Petitioner argues that PO’s objective evidence of nonobviousness in the form of unexpected results is inadequate because PO does not compare test results to the “closest prior art.” Petitioner asserts that Nagai is the “single closest reference” to the “applied over” coating, and that Hummel is the “closest prior art” to the covering formed by migration. (Reply, 9: 10-20). However, neither Nagai

nor Hummel is the closest prior art concerning the unexpected results of improved elongation. Comparative Example V1 is the closest prior art concerning improved elongation, as demonstrated by comparing the two tables below from the '882 patent showing the composition of the film V1 and the embodiment of film B4.

Petitioner baldly asserts that “Comparative Example V1 is within claim scope.” (Reply, 12:17-21). This is erroneous because the amount of migrating compound in the external layer of film V1 is insufficient to form a “covering.” (EX2004, ¶37; EX2001, ¶¶16-17).

Closest Prior Art Film for “Unexpected Results” Purposes				An Embodiment of the Film of the Invention of Claim 1			
Layer number	Composition	Proportion in layer in %	Thickness in μm	Layer number	Composition	Proportion in layer in %	Thickness in μm
1	Durethan C38 F	88	40	1	Durethan C38 F	87.5	40
	Durethan B40 FAM	12			Durethan B40 FAM	11.5	
2	Adhesive promoter: Admer NF 498 E	100	10	2	Constab PE-SA 270 Adhesive promoter: Admer NF 498 E	1.0 100	10
3	Lupolen 2420 F	70	65	3	Lupolen 2420 F	70	65
	Exceed 1327 CA	30			Exceed 1327 CA	30	
4	Adhesive promoter: Admer NF 498 E	100	10	4	Adhesive promoter: Admer NF 498 E	100	10
5	Lupolen 2420 F	70	75	5	Lupolen 2420 F	70	75
	Exceed 1327 CA	30			Exceed 1327 CA	30	
			Sum: 200 μm				Sum: 200 μm
Comparative Example V1 EX2004, ¶37				Example B4 EX2004, ¶40			

The composition of prior art film V1 and example film B4 are the same, except for the “wax additivation” of 1.0% Constab® PE-SA 270 to the film B4. With respect to elongation until splice and break, example film B4 is compared to the closest prior art film V1 in the annotated table below.

		Initial circumference in mm	Splice in mm	Splice in %	Break in mm	Break in %
Closest Prior Art Film for “Unexpected Results” Purposes	→ V1	1054	1222	15.9	1902	80.5
	B1	1044	1220	17.9	2050	96.4
	B2	1042	1280	22.8	2170	108.3
	B3	1050	1250	19.0	2100	100.0
An Embodiment of the Film of the Invention of Claim 1	→ B4	1050	1229	17.0	1985	89.0
	B5	1052	1245	18.3	2016	91.6
	B6	1050	1243	18.4	2025	92.9

(EX1001, 19:28-38) The inventors were surprised to discover improved mechanical properties (elongation until splice and break) with “wax additivation” (adding wax beyond what was already present in V1) of 1.0% PE-SA 270 to the B4 film. Dr. Boutrid declares and the ’882 patent discloses that elongation until splice and break improved compared to prior art film V1 in all examples (B4, B5, B6) with a migrating compound added to the polyamide layer. Elongation until splice and break also improved in examples B1, B2 and B3 compared to prior art film V1 where a coating of polysiloxane was applied over the external side of a polyamide layer of the film.

PO’s objective indicia of nonobviousness include PO’s expert declaring (EX2001, ¶58) that using coatings on the polymer layer, or forming coverings by adding migrating compounds into the polymer layer, might have been expected to worsen the film’s mechanical properties, such as strength. PO’s expert declares that improved mechanical properties, such as increased elasticity of the film until

splice or break, would not have been reasonably expected by a person having ordinary skill in the art prior to the filing date. (EX2001, ¶58). Petitioner neither refuted this testimony nor cross-examined any of PO's witnesses with respect to unexpected results.

B. Unexpected Results Are “Commensurate” With, And Have A “Nexus” To, The Claimed Invention.

Petitioner argues that PO's evidence of improved elongation properties is not commensurate with claim scope because there are no test results showing the improved properties for one of the three embodiments (admitting that the claim includes a covering with a migrating compound that migrates to the surface – which contradicts its claim construction argument): (1) a coating with polysiloxane, (2) a coating with a migrating compound, and (3) a covering with a migrating compound. Petitioner contends it is “counterintuitive” for a migrating compound of embodiment 2 to yield similar elongation improvements to embodiment 3 (Reply at 10). Petitioner's contention that an improvement in elongation would be “counterintuitive” is an admission that the results were unexpected. Moreover, the Federal Circuit has held, “Objective evidence of nonobviousness need only be ‘reasonably commensurate with the scope of the claims,’ and we do not require a patentee to produce objective evidence of

nonobviousness for every potential embodiment of the claim.” *Rambus Inc. v. Rea*, 731 F.3d 1248, 1257 (Fed. Cir. 2013).

PO has provided evidence of improved elongation for embodiments (1) and (3), for example in the table in column 19 of the '882 patent (annotated above). (See also EX2004, ¶55), and PO's expert presented un-refuted testimony that the same improvements would have been expected for embodiment (2) (EX2001, ¶73). Dr. Boutrid testified that a protective hydrophobic layer of polysiloxane or wax is a possible cause for the improvements, regardless of whether the layer is a coating applied over the surface or a covering migrating to the surface. (EX2004, ¶59). The coating of polysiloxane or migrating compound and the covering of migrating compound provide a “protective or healing effect” that improves the film's mechanical properties. (EX2004, ¶22). PO's expert corroborates paragraph 22 of Dr. Boutrid's declaration and declares, “These improved mechanical properties *are the result of the coating with* polysiloxane or *migrating compound*, or the covering formed from migration of a migrating compound incorporated into the layer.” (EX2001, ¶¶58-59, ¶73) (emphasis added). PO has presented unrefuted testimony that the “protective or healing effect” of a coating of polysiloxane or migrating compound or a covering of migrating compound *causes* the improved mechanical properties with regard to splice formation and elongation until break.

(EX2004, ¶¶22; EX2001, ¶¶58-59, 73), which cannot be overcome by Petitioner's unsupported attorney argument.

C. Petitioner's Attorney Argument Regarding Improved Elongation Properties Is Unsupported And Should Be Ignored.

Petitioner's Reply at Section III(B)(3) falsely asserts that any unexpected results of increased elongation until splice formation or break is caused by polyethylene as opposed to by the migrating compound in PE-SA 270. Petitioner even falsely asserts, "PO and its expert have no knowledge of what or how much 'migrating compound,' *if any*, is present in Constab® PE-SA 270 used in examples B4-B6" (Reply at 11) (emphasis in original). Petitioner has knowledge of, and admitted in a letter to PO's counsel that Petitioner knew that Dr. Boutrid actually knew of the amount of EBS wax present in PE-SA 270, but yet conceals this from the Board in its Reply.

Petitioner presents no evidence that polyethylene instead of a migrating compound causes the unexpected improved elongation. In contrast, PO presented testimonial evidence from Dr. Boutrid and PO's expert that a migrating compound contained in PE-SA 270 caused the unexpected improvement. Dr. Boutrid provided testimonial evidence that PE-SA 270 contains ethylene bis stearamide (EBS) wax. The exact percentage of EBS contained in PE-SA 270 is a red herring. Whether PE-SA 270 contains 80%, 50% or 20% EBS does not change the fact that

EBS caused the unexpected results and that PO had knowledge that PE-SA 270 contains EBS.

Petitioner's Reply Section III addressing unexpected results is premised on unsupported attorney argument. Patent Owner, in contrast, presented sworn, un-rebutted inventor and expert testimony. Petitioner refused to cross examine any of PO's witness testimony regarding unexpected results. PO therefore has established by un-rebutted expert testimony that the Challenged Claims provide surprising and unexpected results, which Petitioner's unsupported attorney argument cannot overcome. *See Elbit Sys. of Am., LLC v. Thales Visionix, Inc.*, 881 F.3d 1354, 1359 (Fed. Cir. 2018) (Attorney argument is not evidence and cannot rebut other admitted evidence).

Sections III(A)-(C) of Petitioner's Reply cite only to three newly-submitted, irrelevant documents, EX1065, EX1066, and EX1067, which are dated many years after the filing date of the '882 patent and cannot be relied upon to support what a POSITA would have known prior to the filing date.

PO respectfully requests that Petitioner's entire Section III(A)-(C) be ignored as improperly presented in its Reply, and if not, that the Board find the unsupported attorney arguments presented therein to be wholly insufficient to overcome the un-refuted sworn testimony of PO's three witnesses.

D. PO's Declarations Are True and Credible.

Section III(D) of Petitioner's Reply attacks the credibility of PO's declarations, stating that PO's declarations contain "false statements" regarding (1) the absence of adhesion and tearing issues with PO's film before 2012, (2) the amount of EBS wax in Examples B4-B6, and (3) the amount of EBS wax in Example V1. These three allegations are addressed below.

First, Petitioner's allegation first raised in Petitioner's Reply that PO's inventor declarations "falsely claim" that there never were "any adhesion and tearing issues" with PO's inner film prior to the "spring of 2012" is false. This allegation has been thoroughly debunked, with facts, by declarations submitted to the PTAB for its consideration. The inventor declarations (EX2003, EX2004) contain no statements about generic "adhesion and tearing issues" or a 2012 problem with "inner film tearing" due to a new material used in customers' UV curable resin. The problem discovered by the inventors is a different problem than that alleged in EXs1060-1063, which was caused by mechanical adhesion related to temperature and *did not involve inner film tearing*, whereas the chemical interaction problem discovered by the inventors *did involve inner film tearing*. EXs1060-1063 do not mention "tearing" and are not inconsistent with statements in the inventor declarations. The inventor declarations describe a chemical

interaction problem of maleic anhydride in resin interacting with polyamide in film and are entirely true and correct. (EX2003, ¶¶22-24; EX2004, ¶¶14-19)

Second, Petitioner's allegation that the '882 patent and PO's supporting declarations falsely assert that "the external layer of Examples B4-B6 contain 1%, 4%, and 6% by weight of 'EBS wax'" is incorrect and is once again premised on Petitioner's gross mischaracterization of the patent and PO's witnesses' testimony (which it failed to cross-examine). Moreover, Petitioner has "information" that directly refutes its statements with respect to the amount of EBS wax in the '882 patent (a letter from PO's counsel to Petitioner's counsel), but Petitioner did not submit that letter as required under 37 C.F.R. §42.51(b)(1)(iii).

As Petitioner knew prior to filing its Reply, the '882 patent and PO's supporting declarations do not assert that the external layers of B4-B6 contain 1%, 4% and 6% by weight of "EBS wax." The '882 patent includes a definition section before the examples and expressly defines the "release wax" as "Constab PE-SA 270 made with ethylene bis stearamide" (EX1001, 15-14-17) Nowhere does the '882 patent state that Constab PE-SA 270 is 100% EBS wax. A POSITA reading the '882 patent would have known that Constab PE-SA 270 is a masterbatch sold by Constab that includes mostly the polyethylene carrier, as indicated by the "PE" in the name. PO's expert testified to this. (EX1052, 203) A POSITA would have

known that EBS wax cannot be the majority component of the masterbatch PE-SA 270. Moreover, PO's expert testified on multiple occasions that the resin supplier must be contacted to determine the exact contents of the resin, and a specification or data sheet is only a starting point and cannot be relied upon. (EX1052, 25:10-13; "So if you have the spec sheet and you're thinking of ordering resin -- again, I've said this already three times -- you're going to talk to the person supplying the resin ..."). A POSITA would have called Constab to determine the percentage of EBS wax in PE-SA 270 prior to using it in a commercial film, which is exactly what Dr. Boutrid did.

Third, Petitioner's Reply falsely alleges that "false statements about EBS wax in Example V1" exist. (Reply, 19). There is no "false statement" about EBS wax in Example V1 in the patent. The '882 patent states that the film of Example V1 was made with 12% Durethan B40 FAM as an ingredient, and then discloses testing results of the Example V1 film. That the patent does "not mention any wax content" in Durethan B40 FAM is not a "false statement."

Fourth, Petitioner states that the inventor declarations should be "disregarded" because they are "not in native German language." It would be error for the PTAB to disregard the declarations because there is no evidence that each inventor did not understand the contents of what he signed.

Fifth, Petitioner makes an irrelevant statement that PO's counsel threatened the lead inventor, Dr. Kurt Stark, with legal action if he did not cooperate in this IPR proceeding. Petitioner's statements, and whether legal action will be taken against Dr. Stark, are irrelevant, and have no bearing on patent validity.

V. CONCLUSION

For the reasons presented above, the Board should enter a Final Written Decision finding that Petitioner failed to establish that Challenged Claims 1, 3-7, and 10-13 of the '882 patent would have been unpatentable.

Respectfully submitted,

Date: November 19, 2024

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CERTIFICATE OF COMPLIANCE

1. The undersigned certifies that this brief complies with the type volume limitations of 37 C.F.R. § 42.24(a)(1)(i). This paper contains 5,588 (excluding table of contents, table of authorities, certificate of service, certificate of compliance, and table of exhibits) as calculated by the word count feature of Microsoft Word, the word processing program used to create it.

2. The undersigned further certifies that this paper complies with the typeface requirements of 37 C.F.R. § 42.6(a)(2)(ii) and typestyle requirements of 37 C.F.R. § 42.6(a)(2)(iii). This paper has been prepared in a proportionally spaced typeface using Microsoft Word in Times New Roman 14-point font.

Dated: November 19, 2024

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing **PATENT OWNER'S SUR-REPLY TO REPLY OF PETITIONER TO THE PATENT OWNER RESPONSE** was served electronically via e-mail on November 19, 2024, in its entirety on the following:

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