

Case No.: IPR2023-01372

U.S. Patent No. 9,657,882

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 RESPONSE

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EXHIBIT LIST

Exhibit No.	Description
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)
EX2010	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

I. RELATED MATTERS

U.S. Patent No. 9,657,882 (“the ’882 patent”) (EX1001) has been asserted by Patent Owner in *Buergofol GmbH v. Omega Liner Company, Inc.*, Case No. 2:22-cv-04112-KES (D. S.D.), filed on August 24, 2022 (“District Court Litigation”). Patent Owner also asserted U.S. Patent No. 8,794,269 (“the ’269 patent”) in the same District Court Litigation matter, and Petitioner filed a Petition for Inter Partes Review of the ’269 patent (IPR2023-1402). On March 20, 2024, the PTAB denied institution of the IPR of the ’269 patent. The ’269 patent is the U.S. counterpart to International Publication No. WO2011/157356 (EX1006 “Hummel”), upon which all of Petitioner’s Grounds of Unpatentability in this IPR of the ’882 patent are based.

II. INTRODUCTION

Patent Owner Buergofol GmbH (“Patent Owner” or “PO”) hereby submits this Patent Owner response to the petition for *inter partes* review (“Petition”) of claims 1, 3-7, and 10-13 (“Challenged Claims”) of the ’882 patent, filed by Omega Liner Company, Inc. (“Omega” or “Petitioner”). As set forth herein, Buergofol submits that Petitioner fails to demonstrate that the prior art relied upon discloses or renders obvious all of the elements recited by the Challenged Claims. PO respectfully requests that the honorable Board find the Challenged Claims not

invalid in view of the Grounds of Unpatentability advanced by Petitioner. Each of Petitioner's four Grounds of Unpatentability relies on International Publication No. WO2011/157356 (EX1006 "Hummel") as disclosing the claimed "coating" or "covering". Because Hummel does not disclose either the recited "coating" or the recited "covering", all four of Petitioner's Grounds of Unpatentability must be denied. Moreover, the application publication (2013/0126029) of the '269 patent (the U.S. counterpart of Hummel) was considered by the examiner and is listed on the face of the '882 patent.

Hummel cannot anticipate claims because it does not disclose a coating of polysiloxane or migrating compound applied over the surface of an inner film, nor does it disclose a covering on the surface of the inner film formed by a migrating compound that has migrated to the surface. Petitioner's anticipation Ground I relies on a person of ordinary skill in the art (a POSITA) selecting specific optional additives from a very large list of additives, applying them to one of the five layers of Hummel, and then selecting the appropriate amount of additive to allegedly provide an enhanced release effect that Hummel expressly states is not needed. Hummel cannot necessarily disclose the claimed coating or covering, thus precluding any inherent anticipation.

Hummel in view of “general knowledge of a POSITA” cannot render claim 3 obvious for at least the reason that Hummel does not disclose all of the elements recited by independent claim 1, from which claim 3 depends.

Petitioner’s obviousness analysis set out in Grounds III and IV is fundamentally flawed for at least two reasons. First, Petitioner and its expert premise their conclusion of obviousness and reason to combine the cited documents on the inaccurate assumption that the problem facing the ’882 patent inventors was known in the art. Petitioner’s analyses is premised almost entirely on the notion that the solution to the ’882 patentee’s problem would have been obvious. That analysis is fraught from the outset because the ’882 patentee’s problem was not known prior to the effective filing date. Second, Petitioner’s obviousness analyses fails to address the surprising and unexpected results achieved by the claimed insertion tube, despite the repeated mention of these results as surprising and unexpected throughout the ’882 patent specification. Petitioner had ample opportunity to present its own evidence in rebuttal of the ’882 patentee’s evidence, but it chose not to address this issue. Petitioner cannot supplement its Petition in a Reply to rectify the deficiencies in the Petition.

Even if the art were combined in the manner suggested in Grounds III and IV, the claimed inner tubular film exhibits unexpectedly superior mechanical

properties. A POSITA would not have expected or anticipated that forming a coating, either by externally coating the outer layer with a polysiloxane or migrating compound, or incorporating a migrating compound into the external layer to form a covering, would have improved the film's mechanical properties.

There would have been no reason to combine Schuhmann with Hummel, and if combined, the teachings of Schuhmann as a whole would have destroyed the purpose and function of Hummel's material. First, there would have been no reason to look to Schuhmann because release characteristics are not a problem in Hummel. Indeed, Hummel's film without any coating or covering can be removed without tearing or being torn. A POSITA would not have considered modifying Hummel to include Schuhmann's migrating compounds because, as the '882 patent inventors expected, such use in the polymer layer would have been expected to impair the mechanical properties of the multilayer film, a property important in Hummel.

The second reason that Ground III is flawed is that Schuhmann discloses in its examples that only an embossed coating or covering provides the improved release. A POSITA would have reasonably expected that embossing the outer layer of Hummel's film, as required by Schuhmann, would dramatically increase the adhesive forces between the UV-curable resin and the outer surface of the film.

This is because the initially un-cured UV resin would flow into the embossed portions, possibly resulting in a mechanical interlocking that would render it extremely difficult to separate the two materials, thereby defeating a fundamental purpose and function of Hummel's material.

A POSITA would not have combined Nagai with Hummel. Schuhmann informs the POSITA not to form a continuous layer as in Nagai, thereby teaching away from the proposed combination. In addition, Nagai forms a release layer between a polyethylene outer layer and thermocurable resin, which would have been known and expected to adhere to one another in a manner far different than the polyamide outer layer and UV-curable resin disclosed by Hummel. Moreover, Hummel does not disclose any need for a release layer because its film can be removed without tearing or being torn, without the use of any additional release layer.

For these reasons and others as detailed further below, PO respectfully requests that the Board issue a Final Written Decision holding that Petitioner failed to establish that any of Challenged Claims were unpatentable.

III. OVERVIEW OF THE '882 PATENT

A. Summary of the Patent

The '882 patent discloses and claims an insertion tube for use in trenchless

sewage pipe renovation that includes an external tubular film, an inner tubular film, and a carrier material impregnated with a reactive plastic resin arranged between the external and internal tubular films. EX1001, 4:14; 20:18-26; EX2001, ¶24. The insertion tube satisfies the strict requirements made to its mechanical stability and has an outstanding release effect against adhesive substances such as resins. EX1001, 2:53-62; EX2001, ¶24.

The '882 patent discloses the following features and advantages of the films:

- Mechanical stability with “outstanding mechanical properties such as very high elasticity, low tendency to splice, sturdiness, resistance and puncture resistance,” that “virtually rule out a bursting of the films.” EX1001, 2:55, 56; 3:14-18; 12:38-50;
- “outstanding release effect against adhesive substances such as resins,” EX1001, 2:56-57; and
- The unexpected result that the films had a good release effect, which was “also accompanied by a reduction of the coefficients of friction of film against film,” that enables the tubular film to be used as a preliner that can be inserted with “minimized interference.” EX1001, 2:63-67; 3:8-10; 18-22; 9:31-42.

EX2001, ¶24.

Petitioner focuses solely on the second feature and advantage, has entirely ignored the third, and only briefly mentions the first. *Id* at ¶25.

There are three ways that are disclosed in the '882 patent in which the inventors achieved the improved mechanical properties and improved release effect:

- Coating the external surface of the inner tubular film with polysiloxane;
- Coating the external surface of the inner tubular film with a migrating compound; and
- Incorporating a migrating compound into the external layer of the inner tubular film and *providing a covering* on the external surface of the external layer when sufficient amounts of migrating compound migrate to the external surface.

Id. at ¶22.

These features provide for the surprising and unexpected improvement in the mechanical properties of the insertion tube, as described numerous times in the '882 patent. EX1001, 2:63-67; 8:46-53; 19:39-46; and 20:5-13; *see also* EX2001, ¶27. These features were first recognized by the '882 patent inventors, when seeking to solve a problem first encountered by the inventors shortly before the '882 patent filing date. EX2001, ¶¶28-33.

The inventors first discovered the problem when responding to customer complaints in the spring of 2012. EX2001, ¶39; EX2003, ¶¶ 18-22; EX2004, ¶¶ 10-11. This problem of the insertion tube tearing would not have been expected prior to the '882 patent filing date because Hummel discloses withdrawing such an

insertion tube without tearing. EX2001, ¶29. It was during the customer visits that the inventors first learned of the problem, and believed that the tearing problem was caused by the customers' use of a UV-curable resins that included maleic anhydride, which was thought to strongly adhere and/or react with the polyamide external layer. *Id.*, ¶30; EX2004, ¶¶ 14-15. The inventors therefore sought as a solution to this interaction of maleic anhydride and polyamide techniques that would preclude the adherence or reaction. EX2004, ¶¶ 16-17. While the inventors believed that a coating or covering of the external polyamide layer might block the reaction between the UV-curable resin and polyamide, they also expected that applying a coating or forming a covering by incorporating migrating compounds (wax) into the polyamide layer, might worsen one or more important mechanical properties, such as decreasing its strength. EX2004, ¶19; EX2001, ¶31. To their surprise, the inventors discovered that coatings with polysiloxanes or migrating compounds, or coverings formed from migrating compounds incorporated into the polyamide actually improved important mechanical properties of the insertion tube. EX2004, ¶¶20-22; EX2001, ¶31. The improved mechanical properties are reflected in the examples of the '882 patent, and are commensurate in scope with the '882 patent claims. EX2001, ¶¶66-75; EX2004, ¶¶24-59.

The '882 patent inventors were the first to discover the problem of the insertion tube tearing when withdrawn from the sewage pipe after curing of the UV resin. EX2001, ¶33; EX2004, ¶¶18-19; EX2003, ¶23. In solving this unknown problem, the '882 patent inventors unexpectedly discovered that a coating and/or covering at the interface between the outer externally facing side of the inner film and the UV-curable resin improved the mechanical properties of the inner tubular film, and satisfied the newly discovered need to prevent the reaction of maleic anhydride in the UV-curable resin formulation and the outer polyamide layer. EX2001 ¶33; EX2004, ¶¶20-23.

B. Claims

The Challenged Claims are claims 1, 3-7, 10, and 11 of the '882 patent. PO adopts the same numbering convention used by Petitioner in the Table on pages vii-ix of the Petition. PO focuses its remarks primarily on claim elements [1e] and [1f], as well as some dependent claims discussed in Section VIII below. Claim elements [1e] and [1f] recite:

[1e] a coating of at least one of (1) a coating with a polysiloxane; or
(2) a coating or covering with at least one migrating compound; and

[1f] wherein the coating is applied over a section of or an entire circumferential area of the outer facing external side facing the carrier material.

EX1001, 20:31-36.%

%

IV. THE PERSON OF ORDINARY SKILL IN THE ART

A. The Level of Skill in the Relevant Field

Patent Owner agrees with Petitioner that the relevant field of the person of ordinary skill is the field of “the formulation, manufacturing, and end-use performance of polymeric film and sheet products.” PET. at 3; EX1003, ¶23.

Petitioner further states that the relevant academic field is Polymer Science and Engineering, Material Science and Engineering or a related engineering field.

These are academic fields relating to polymeric film and sheet products. Petitioner states that at least seven years of experience in the formulation, manufacturing, and end-use performance of polymeric film and sheet products can substitute for a bachelor’s degree in Polymer Science and Engineering, Material Science and Engineering or a related engineering field. Patent Owner agrees.

A consequence of the agreed upon relevant field of the person of ordinary skill is that a POSITA would not have extensive experience or knowledge in the field of making the insertion tubes claimed by the ’882 patent or significant

experience in installing ultra-violet cured-in-place pipe (UV CIPP) liners (“insertion tubes”) in pipes that are to be renovated.

For the purposes of this response, PO adopts Petitioner’s description of a POSITA. EX2001, ¶11.

B. Background Knowledge of the POSITA

The PTAB is required to make a factual finding as to the “background knowledge” of the POSITA. The Federal Circuit has interpreted *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 417-18 (2007) as requiring consideration of “the background knowledge possessed by a person having ordinary skill in the art,” and this factual finding must be supported by evidence. *Qualtrics, LLC v. OpinionLab, Inc.*, 679 F. App’x 1016 (Fed. Cir. 1017); *Randall Mfg. v. Rea*, 733 F.3d 1355 (Fed. Cir. 2013); *Fleming v. Cirrus Design Corp.*, 28 F.4th 1214 (Fed. Cir. 2022). Recognition of a problem to be solved is obviously not automatically subsumed into the “background knowledge” of the POSITA because the Federal Circuit has stated that “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. Judge Med., Inc.*, 381 F.3d 1371 (Fed. Cir. 2004) (“There can of course arise situations wherein identification of the problem is itself the invention.”) Here, the “background knowledge” of the

POSITA includes knowledge of all prior art in the relevant field of art, but it does not include recognition of any problem that was not recognized in the prior art. Specifically, no sticking or tearing problems with the Hummel film were known or recognized in any prior art document, and PO has submitted testimonial evidence that interested individuals working in the field at the time who knew of the Hummel film did not recognize or anticipate any sticking or tearing problem with the Hummel film. EX2001, ¶36. In view of this underlying evidence, the PO respectfully requests the PTAB to make a factual finding that the background knowledge of the POSITA did not include recognition of any sticking or tearing problem with the Hummel film.

V. CLAIM CONSTRUCTION

Petitioner proposes an incorrect construction of the term “coating” as recited by the claims. PET. at 23; EX1003, ¶108. Petitioner interprets the term “coating” in claim element [1e] to include “(1) a migrating compound *incorporated into* the outermost layer of the inner tubular film or (2) a migrating compound *applied over* the external side of the inner tubular film.” PET. at 23, emphasis in original. Petitioner’s misconstruing of the claims naturally led to confusion of the PTAB in its institution decision. Specifically, the ’882 patent makes a clear distinction between the terms “coating” and “covering,” in which “coating” refers to

conventional coating techniques, and “covering” refers only to the “covering” that is formed when a migrating compound migrates to the surface of the polymer layer. EX2001, ¶¶ 18-23. Petitioner’s construction of the term “coating” is incorrect for at least three reasons.

First, a claim must be construed in a manner that is at least consistent with the remaining portions of the claim. Petitioner focuses only on claim element 1[e], but ignores 1[f], which helps further to define the term “coating” and which purposefully does NOT include the term “covering.” These claim elements are reproduced below:

[1e] a coating of at least one of (1) a coating with a polysiloxane; or (2) a coating or covering with at least one migrating compound; and

[1f] wherein the coating is applied over a section of or an entire circumferential area of the outer facing external side facing the carrier material.

EX1001, 20:31-36. There is nothing in the claim that mandates that the term “coating” also include a “covering,” which is what Petitioner’s construction requires. EX2001, ¶20. Claim element 1[e] does not require such a construction, and when read in light of the remaining portion of the claim, specification, and file history, the intrinsic evidence shows that PO made a clear distinction between the terms “coating” and “covering.”

It is well settled that different claim terms are presumed to have different meanings. *Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1382 (Fed. Cir. 2008) (“[D]ifferent claim terms are presumed to have different meanings.”).

Second, Petitioner’s claim construction does not consistently assign different meanings to different claim terms. The term “coating” is a coating of either polysiloxane or a coating of a migrating compound. “Coating” is used in its well-known and conventional context, which includes *coating* the external surface of the external layer with a polysiloxane and/or a migrating compound. EX2001, ¶23. The claim term “covering,” however, is not a coating in the context of the ’882 patent, but rather is formed by adding a migrating compound to the external film layer, which then migrates to the surface. The coatings of polysiloxane or migrating compound (e.g., wax) are applied in a conventional manner, as recited by the claims. In contrast, and in an alternative embodiment, the claimed covering is achieved by “additivation” of a migrating compound to the external layer from which it migrates to the surface to form a covering. *Id.*

Third, Petitioner’s interpretation of the term “coating” is not consistent with the use of that term in the patent specification as originally filed, the prosecution history, and the prosecution history of foreign patents in the same family. A

proper construction of the claims is that the outer facing external side of the inner tubular film facing the curable resin includes either a coating that is “applied” over a section of or an entire circumferential area, or a covering that is formed by adding a migrating compound to the external layer, which then migrates to the surface to form a covering.

Patent Owner’s construction is consistent with the specification, including the original German language application, the prosecution history, and the prosecution history of the European counterpart application. The portions of the specification that support PO’s construction are discussed below.

According to another preferred alternative, at least one wax, paraffin, fatty acid, fat and/or another migrating, preferably lipophilic—but in other embodiments alternatively hydrophilic—compound is contained in at least one of the two outer layers. A coating with these substances is also possible.

EX1001, 4:15-20; EX2001, ¶18. Here, the specification explains that in one embodiment, a migrating compound is contained in at least one of the two outer layers. The last sentence states that a coating with these substances is also possible, which informs a POSITA that incorporating a migrating compound into the layer is different from coating the layer with the migrating compound.

EX2001, ¶18.

The film thickness of the coating and/or covering of the tubular film according to the invention is preferably no more than 15 μm , better if no more than 5 μm , and especially preferable if it is ***between 5 nm and 3 μm in case of a covering and between 0.1 to 3 μm*** in case of a coating.

EX1001, 7:6-10 (emphasis added). EX2001, ¶19. The specification clearly delineates between coating and covering where the thickness of the covering can be orders of magnitude smaller than the thickness of the coating. This would be reasonably expected by a POSITA because a covering created by a compound added to a polymer film that migrates to the surface will be present in far lower amounts than the same amount of the compound “coated” on the surface after film formation. EX2001, ¶19.

The behavior is similar when a covering or coating with migrating compounds is provided in addition to the above-mentioned polysiloxane coating or instead of it.

EX 1001, 12:48-50. The '882 patent makes a clear distinction between a polysiloxane coating and a coating or covering with a migrating compound.

The '882 patent specification fully supports PO's construction that the outer surface of the external side of the inner tubular film contains either a coating of polysiloxane, a coating of a migrating compound, or a covering of a migrating

compound that is formed by adding the compound to the polymer, which then migrates to the surface.

The prosecution of the corresponding EP application supports PO's construction. Allowed claim 1 of EP2777925 recites:

1. Insertion tube (1) for trenchless sewage pipe renovation, comprising an external tubular film (5) that is preferably impermeable to liquids and reflects and/or absorbs, at least partially, UV radiation and/or visible light of short wavelengths and is opaque or at least contact transparent, as well as an inner tubular film (2) comprising one or more layers and a carrier material impregnated with a reactive plastic resin arranged between the two tubular films (5, 2), wherein the external side of the inner tubular film (2) that faces the carrier material has at least regionally a coating (3) with at least one polysiloxane and/or with at least one migrating compound, and / or a covering with at least one migrating compound, that is integrated into an external layer of the inner tubular film (2) and migrates depending on time to the surface of the external layer.

EX2005, pg. 18; EX2001, ¶21. The claim makes the same distinction discussed above. During prosecution of this EP patent, PO noted that the invention included two distinct embodiments:

In addition, the structure of claim 1 has been clarified. According to one alternative, a coating with at least one polysiloxane and/or at least one migrating compound is claimed and according to another alternative, a covering with a migrating compound is claimed (as well as a combination of these two alternatives). The covering is produced by introducing the migrating compound into said outer layer and its subsequent migrating movement to the surface of this outer layer. The latter alternative is disclosed, for example, on page 9 in the fourth paragraph of the original description.

(EX2006, Response filed March 17, 2015, pg. 4.); EX2001, ¶22.

The Federal Circuit has held that statements made in foreign prosecution may be considered during claim construction. *Microsoft Corp. v. Multi-Tech*

Systems Inc., 357 F.3d 1340, 1350 (Fed. Cir. 2004); *Abbott Labs. v. Sandoz, Inc.*, 566 F.3d 1282, 1290 (Fed. Cir. 2009).

Petitioner’s proposed construction apparently confused the PTAB in its institution decision when the PTAB noted:

Even on this preliminary record, we have concerns about whether a migrating compound *incorporated into* an inner tubular film is “a coating or covering” of that film within the scope of claim 1. *See id.* at 30 (citing Ex. 1003 ¶ 134) (Petitioner’s reliance on extrinsic evidence to show that waxes migrate to the surface of the inner tubular film and, thereby, create “a ‘coating’” on that structure). To the contrary, claim 1 expressly requires that “the coating is *applied over* a section or an entire circumferential area of the outer facing external side” of the inner tubular film.

Institution Decision, Paper 8 at 8. The PTAB is correct in noting that a coating is applied over the outer facing external side. Wax migrating to the surface does not form a coating, but rather forms a “covering,” which is used repeatedly throughout the specification in conjunction with or as an alternative to a “coating” with wax. The PTAB cites page 30 of the Petition, which relies on paragraph 134 of the expert declaration EX1003 as support for the notion that a migrating compound that migrates to the external surface of a layer creates a “coating.” But these statements made by Petitioner (PET. at 30) and its expert (EX1003, ¶134) are made

in reference to Hummel, not the '882 patent. Hummel does not state or imply creating a coating or covering, nor does Hummel use the term “migrating compound.” As explained above, the art recognized a distinction between coating in the conventional sense, and forming a “covering” or “finish” on an external surface by use of a migrating compound that migrates to the surface. EX2001, ¶¶ 18-23. A migrating compound incorporated into an inner tubular film forms a “covering” on that film within the scope of claim 1, and not a “coating.” Element [1f] of claim 1 does NOT include the term “covering” but only includes “coating.”

With respect to what constitutes the claimed “covering,” the '882 patent specification informs a POSITA, that an important feature of the inner tubular film is the presence of a coating or covering on the external surface of the inner tubular film that is adjacent the curable resin. EX2001, ¶13. The '882 patent specification makes it clear that the function of the coating or covering is to satisfy the fundamental purpose of the invention to provide an inner film with improved mechanical properties (e.g., elasticity and splice) and improved release characteristics. *Id.* A small amount of migrating compound added to the outer polymer layer that migrates to the external surface of the inner film, of which there may be a number of various distinct substances, which does not perform the purpose and function of improved mechanical properties and improved release

characteristics, would not be considered by a POSITA to be a “covering” in the context of the ’882 patent. *Id.* Petitioner’s expert Dr. MacLean testified that a “coating” may or may not exist if a small amount of migrating compound migrated to the surface, “depending on what the objective of the coating is.” EX2015, 15:7-11. This testimony is consistent with Dr. Brant’s testimony. EX2001, ¶13.

The examples in the ’882 patent would have informed a POSITA that an amount of additive, such as wax, added in a small amount to the polymer forming the external layer would not be considered to be a “coating” because it is not applied over the surface of the external layer, and would also not be considered to form a covering, even if a small amount of the wax migrated to the surface. EX2001, ¶15. The first table in column 15 of the ’882 patent provides the composition of the inner film of comparative example V1, which is “without wax additivation”:

Layer number	Composition	Proportion in layer in %	Thickness in μm
1	Durethan C38 F	88	40
	Durethan B40 FAM	12	
2	Adhesive promoter: Admer NF 498 E	100	10
3	Lupolen 2420 F	70	65
	Exceed 1327 CA	30	
4	Adhesive promoter: Admer NF 498 E	100	10
5	Lupolen 2420 F	70	75
	Exceed 1327 CA	30	
			Sum: 200 μm

EX1001, 15:21-37; EX2001, ¶15.

The external layer 1 includes 12% Durethan B40 FAM, a polyamide. The designation “FAM” informs a POSITA that this material includes a slip additive, which in this case is less than 0.1% ethylene bis stearamide (EBS) wax. EX2001, ¶16. Thus, the amount of wax present in the external polymer layer is less than 0.012% by weight, or 120 parts per million (120 ppm). During manufacture and storage of this comparative film V1, some of the EBS wax present in the outer polyamide layer could migrate to the surface of that layer. *Id.*

The examples show, however, that this small amount of EBS wax in the external polyamide layer results in mechanical properties and release characteristics that are inferior to the mechanical properties and release characteristics resulting from the inventive coating applied over the surface of the layer or resulting from the inventive covering formed by a migrating compound migrating to the surface of the layer. EX2001, ¶17. This is shown by the results of the release force test in the table on column 17 and the air inflation test, splicing and breaking in the table in column 19. A POSITA would not have considered the “comparative example V1” to be covered by the patent claims, and consequently, would have understood that small amounts of migrating compounds added to the polyamide of the outer layer during manufacture of the film (for the purposes of

aiding in the manufacturing process), which later migrate to a very small extent to the surface of the outer layer, would not have been considered to form a “covering” in the context of the ’882 patent. *Id.*

To the extent there remains any ambiguity as to the difference between “coating” and “covering” discussed above, extrinsic evidence also supports PO’s construction. Schuhmann (EX1007) discloses a lipophilic compound that migrates to the surface and forms what Schuhmann refers to as a coating or covering. Schuhmann states: “The layer (a) may be coated on one side with the lipophilic compound or have occupancy on at least one of its surfaces by at least one migrated lipophilic compound.” The term “occupancy” was translated from the German word “Belegung,” which is properly translated as “covering.” Schuhmann makes a clear distinction between coating in the conventional sense, and forming a covering using a migrating compound that migrates to the surface.

Schuhmann refers to DE10018442 (corresponds to Wieners, U.S. 7,799,436 the “’436 patent” – EX2014) as disclosing wax-containing polyolefin release films. EX1007, 4. The ’436 patent discloses release films that include a “coating” with a cold seal adhesive and that contain a wax that migrates to the surface. Yet the ’436 patent does not refer to the wax that migrates to the surface of the film as being a “coating.”

The intrinsic and extrinsic evidence compel the conclusion that a coating is not a covering, and that a migrating compound that migrates to the surface is not considered a “coating.” Under the proper construction of the ’882 patent claims, the outer facing external side of the inner tubular film that faces the carrier material may contain one of the following:

1. a coating with a polysiloxane;
2. a coating with a migrating compound; or
3. a covering with a migrating compound that is added to the outer polymer layer and migrates to the surface.

EX2001, ¶22.

VI. HUMMEL (EX1006), PETITIONER’S ERRONEOUS TRANSLATION, AND WHAT HUMMEL DOES NOT DISCLOSE

What a prior art reference discloses to a person of ordinary skill in the art is a question of fact. *Qualtrics, LLC v. OpinionLab, Inc.*, 679 F. App’x 1016 (Fed. Cir. 2017). With respect to Hummel (EX1005), the PTAB is required to make this factual finding with evidence to support the PTAB’s finding. The Court of Appeals for the Federal Circuit reviews the finding for substantial evidence. *Allied Erecting & Dismantling Co. v. Genesis Attachment, LLC*, 825 F.3d 1373, 1380 (Fed. Cir. 2016).

The existence and disclosure of Hummel is not a new revelation. Rather, the disclosure of Hummel (EX1006) was known to the USPTO examiner during prosecution of the '882 patent, as evidenced by the listing of U.S. Patent Publication "2013/0126029 A1 5/2013 Hummel" on the face of the '882 patent. The WIPO publication WO2011/157356 (of which Hummel (EX1005) is a translation) of Hummel's PCT application PCT/EP2011/002685 is the same disclosure as the USPTO publication 2013/0126029, which is a publication of a continuation of the very same PCT/EP2011/002685 document. In other words, Hummel (EX1005) is the same disclosure as a document that is listed on the face of the '882 Patent and that was considered by the USPTO examiner.

Hummel discloses an insertion tube usable for renovation of subterranean pipes. The insertion tube includes an inner tubular film, an externally situated tube, and a support material situated between the two. The support material is saturated with a reactive synthetic resin. Hummel teaches that in one embodiment the inner tubular film is a multi-layer film that includes five layers including a layer (a). Importantly, the "thermoplastic olefin homo- or copolymer" of the layer (a) has a VICAT softening point that is at least 100°C. Hummel explains that the insertion tube can be drawn into a pipe, and can be inflated without bursting, such that the resin can then be hardened by means of UV radiation. Hummel

explains that after resin hardening, the internally situated multi-layer tubular film can be withdrawn from the pipe “without any break-off, splitting or tearing.” (EX2008, 2:63-64)

Nowhere does Hummel disclose or teach that there is any problem with his disclosed inner film sticking to cured resin. EX2001, ¶62. Nowhere does Hummel state that his inner film tears, or has a tearing problem, when it is removed after resin curing. EX2001, ¶38. What a prior art reference teaches is determined from the perspective of a POSITA. *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1361 (Fed. Cir. 2008). Accordingly, PO submits evidence as to what Hummel would and would not have disclosed to a POSITA. EX2001, ¶¶34-44 .

All of Petitioner’s grounds of unpatentability are based on the Petitioner’s contention that Hummel discloses (or “teaches”) a covering of a migrating compound. The Petition states that Hummel discloses “a coating of ... (2) a coating or covering with at least one migrating compound” despite the fact that Hummel does not use the term “migrating compound,” does not use the term “coating,” and does not use the term “covering.” PET. at 17; EX2001, ¶44.

Petitioner points to a paragraph of Hummel stating that “any” of the layers of Hummel’s film, including layer (e) “can, *if necessary*, . . . be treated with” a laundry list of “additives selected from the group comprising . . . lubricants, ...

waxes, ...surface-active compounds . . .” Petitioner states that by this paragraph Hummel “discloses that the inner tubular film [of Hummel] incorporates in the outer layers various *migrating compounds* such as ‘waxes,’ ‘processing aids,’ ‘lubricants’ and ‘surfactants’.” PET. at 17:3-5; 28: 9-12. This statement by Petitioner and its expert is factually incorrect. Hummel does not disclose that layer (e) of Hummel’s film incorporates wax because Hummel discloses that such additive can be added “*if necessary*,” and Hummel discloses this optional addition to any of layers (a)-(e). EX2001, ¶ 46. In fact, there is nothing wrong with the Hummel film as disclosed without any wax in layer (e), and there is no problem with the Hummel film that would make it “necessary” to add wax, so there is no embodiment of Hummel being disclosed (for anticipation purposes) in which layer (e) of Hummel’s film includes wax or any of the listed “additives.” EX2001, ¶ 46.

Petitioner’s argument as to why it contends that Hummel discloses a covering of migrating compound is largely based on two passages in Hummel (EX1005) that are incorrectly translated from the original German to state that Hummel’s film “can be peeled off” (impliedly from the cured resin) without tearing. PET. at 17-18, 28. Petitioner’s expert also relies on this incorrect translation. EX1003, ¶¶ 134, 137, 190. But the original German disclosure of

Hummel (EX1006) contains no disclosure of peeling off and certainly does not imply that the film can be peeled off of cured resin. Petitioner has used a self-serving English translation to create the false impression that Hummel discloses a covering of a migrating compound that allows Hummel's film to be peeled off of the cured resin without tearing. A counterpart application of the German language Hummel (EX1006) was filed into the USPTO and was published as the English language publication 2013/0126029, which issued as the '269 patent. The examiner of the '882 patent considered the publication 2013/0126029, which is listed on the face of the '882 patent. Yet Petitioner chose not to use the text of the publication 2013/0126029 (and the '269 patent) as the English translation of Hummel (EX1006).

The English translation of publication 2013/0126029 is the correct translation of the two passages that Petitioner incorrectly argues disclose "peeling off". Petitioner asserts that the first passage discloses film that "after the resin has cured, can be peeled off from it without being torn, torn in or torn off." (EX1005, p. 7 of 71) PO submits a certification from a translator that the correct translation of this first passage is the translation in publication 2013/0126029, which states that the film "after the hardening of the resin, can be withdrawn therefrom [the pipe] without any break-off, splitting or tearing." (EX2009, ¶¶ 9-10; EX2008,

12:1-6; EX2001, ¶36) The second passage, which Petitioner has incorrectly translated as “film, can be peeled off as an inner tube, preferably without tearing or seizing therefrom” is correctly translated in publication 2013/0126029 as “tubular film, as internally situated tube, can preferably be withdrawn therefrom [the pipe] without break-off or tearing, and/or hindrance to movement.” (EX2009, ¶¶ 4-5; EX2008, 2:52-64) The translator concludes that the original German Hummel (EX1006) does not convey the notion that anything is “peeled off.” (EX2009, ¶¶ 11, 15)

Hummel discloses only that the film disclosed in publication WO2011/157356 can be withdrawn from the pipe without tearing after the resin has cured. A POSITA would not have considered Hummel to have disclosed any need or desire to improve the release of the inner multi-layer film from the UV-cured resin. EX2001, ¶40. In fact, Hummel explicitly states that Hummel’s film can be withdrawn without tearing. EX2001, ¶38. From the disclosure of Hummel, a POSITA would not have been motivated or had any desire to modify Hummel’s outer film layer to include a coating or covering because of the additional time, expense, and uncertainty of the potential adverse effects on other film properties (such as mechanical strength, which is important to Hummel), especially when

such a modification was not needed, and would not have been expected to serve any useful purpose. EX2001, ¶40.

VII. PATENT OWNER SUBMITS EVIDENCE THAT THERE EXISTED NO PROBLEM WITH HUMMEL’S FILM, AND NO PERSON AT THE TIME RECOGNIZED A PROBLEM WITH HUMMEL’S FILM

Not only does Hummel (EX1006) not disclose any problem with its film tearing as it was withdrawn from the pipe, but a POSITA would not have considered there to be any problem of any type with Hummel’s film because the film was never made commercially and used in UV CIPP liners that were installed in pipes to be renovated. A POSITA would not have recognized a problem with Hummel’s inner film sticking to cured resin because no such problem ever existed.

PO submits evidence in the form of declaration statements of two knowledgeable percipient witnesses at the time, who have known levels of skill and experience, and who knew at the time of the Hummel document, but yet who did not in fact know of any problem with the Hummel film. These declaration statements are evidence that a POSITA at the relevant time would not have recognized a problem with the Hummel film.

First, Patent Owner submits evidence in the form of a declaration of Gregor Schleicher, a co-inventor on the ’882 patent. (EX2003) Mr. Schleicher declares that as part of his responsibilities as Managing Director of the PO since 2007, he

was responsible for knowing about all competing products, including UV CIPP inner film. (EX2003, ¶9) Mr. Schleicher declares that at least as early as April 2012, he was aware of the disclosure of Hummel (EX1006) through a cancellation proceeding the PO filed against the corresponding utility model patent DE202010016048U1, which was owned by the company Huhtamaki Deutschland GmbH & Co. KG (“Huhtamaki”). EX2003, ¶¶12-13; EX2001, ¶¶28-29.

Mr. Schleicher declares that, although he was responsible for knowing about all competing UV CIPP inner film, he was not aware and did not believe that Huhtamaki was able, at least prior to 2013, to make and sell the inner film as disclosed in Hummel (EX1006) commercially. (EX2003, ¶15) Mr. Schleicher declares that he was not aware and did not believe that Huhtamaki was able, at least prior to 2013, to make and sell any UV CIPP inner film commercially. (EX2003, ¶16) Mr. Schleicher declares that, because no customer of Huhtamaki could have used Huhtamaki inner film to make UV CIPP liners at least prior to 2013, no customer could have experienced any problem with Huhtamaki inner film while installing UV CIPP liners. (EX2003, ¶18) Mr. Schleicher declares that the specification of Hummel (EX1006), which was drafted before June 15, 2010, does not describe any tearing problem with any actual UV CIPP inner film made of an outer polyethylene (PE) layer and an outer polyamide (PA) because prior to June

15, 2010, Buergofol was the only company in the world that made such UV CIPP inner film, and prior to 2012 there were no tearing problems with Buergofol's UV CIPP inner film. (EX2003, ¶21)

Mr. Schleicher declares that the first time he heard of a problem with inner film tearing as it was being withdrawn from the pipe was when he visited customers in the spring of 2012. Mr. Schleicher declares that prior to the customer visits in the spring of 2012, he was not aware that there was a problem with inner film tearing because portions of the inner film were sticking to the cured resin. EX2003, ¶¶23-24.

Second, Patent Owner submits evidence in the form of a declaration of Dr. Abdel-Kadel Boutrid, a co-inventor on the '882 patent. (EX2004) Dr. Boutrid declares that he has overseen the production of Buergofol's UV CIPP inner film for more than two decades and has also been aware of the state of the art of inner film for more than two decades. (EX2004, ¶8) Dr. Boutrid declares that at least as early as April 2012, he was aware of the disclosure of Hummel (EX1006) through a cancellation proceeding the PO filed against the corresponding utility model patent DE202010016048U1, which was owned by Huhtamaki. (EX2004, ¶¶9-10) Dr. Boutrid declares that he was not aware that there were any problems with the inner film disclosed on Hummel (EX1006). (EX2004, ¶11)

Dr. Boutrid declares that starting in October 2011 he began to work closely with Dr. Kurt Stark, a co-inventor on the '882 patent who had previously worked at Huhtamaki. Dr. Boutrid declares that, from discussions with Dr. Stark, Dr. Boutrid believes that Huhtamaki had not been able, at least prior to October 2011, to make the inner film as disclosed in Hummel (EX1006) commercially. (EX2004, ¶13) No POSITA could have recognized any problem with Hummel UV CIPP inner film tearing while being withdrawn from the renovated pipe because no such problem actually existed considering that no Hummel UV CIPP inner film was ever commercially made, sold to a liner manufacturer, and then installed in a pipe.

Dr. Boutrid declares that the first time he heard of a problem with inner film tearing while being withdrawn from a pipe was during customer visits together with Dr. Stark in the spring of 2012. (EX2004, ¶14) Dr. Boutrid declares that before his customer visits during the spring of 2012, he was not aware of any customer experiencing either a problem with inner film tearing when it was pulled out of the cured liner, or a problem with inner film tearing when it was pulled out of the cured liner because the inner film had stuck to the cured resin. (EX2004, ¶18) Dr. Boutrid declares that at the customer visits with Dr. Stark in the spring of 2012, he learned that the customers had begun using UV-curable resin that included maleic anhydride (MAH), and he recognized that the maleic anhydride in

the UV-curable resin was probably sticking to the polyamide of the outer polyamide layer of the inner film because maleic anhydride adheres strongly to polyamides. (EX2004, ¶15) Knowledge of this problem was not in the prior art and would not have been known to a POSITA. EX2001, ¶29. After recognizing this problem, Dr. Boutrid and Dr. Stark conducted research on ways to create a coating or covering in order to increase the release effect between the outer polyamide layer of the inner film and the adhesive UV-curable resin by reducing or preventing the sticking of MAH to the polyamide. (EX2004, ¶17)

VIII. PETITIONER’S FOUR “GROUNDS” ALL DEPEND ON HUMMEL

Petitioner presents four grounds of unpatentability that all depend on the same one reference, Hummel. More particularly, all four grounds depend on a hindsight misreading of that one reference.

Ground	Claims	Prior Art	Statutory Basis (35 U.S.C.)
1	1, 4-7, 10-11	Hummel	§ 102(b)
2	3	Hummel	§ 103
3	1, 3-7, 10-13	Hummel + Schuhmann	§ 103
4	1, 3-7, 10-11	Hummel + Nagai	§ 103

A. Ground 1: Hummel Does Not Anticipate Claims 1, 4-7, 10, and 11

Petitioner and its expert have misconstrued Hummel, and premised their selection of only certain additives added to one of Hummel's five layers on an inappropriate understanding of the nature of the interface between Hummel's outer polyamide layer and the UV-curable resin. If a POSITA must make a selection in Hummel, then this begs the question as to how Hummel can possibly anticipate claims 1, 4-7, 10, and 11? Hummel cannot.

Dr. MacLean's conclusion that Hummel "teaches" use of a migrating compound to achieve withdrawal of its film without tearing is premised on hindsight. There is no dispute that Hummel does not use the terms "coating," "covering," or "migrating compound." EX2015, pg. 62. When asked during his deposition if "there's something in Hummel that says, if you want to achieve a release effect, use an additive," Dr. MacLean replied: "I can tell that you can come up with an embodiment that gives you that release that would incorporate one of these release agents." EX2015, pp. 75-76. Indeed, one could "come up with an embodiment," but the issue is whether Hummel actually discloses that the embodiment Dr. MacLean created in hindsight was responsible for or required to achieve the release effect. Hummel does not disclose this. Dr. MacLean admitted

that Hummel also teaches a preferable configuration where no release agent would be incorporated. *Id.* at 76.

Dr. MacLean further incorrectly concludes that, because Hummel states its inner film can be withdrawn without tearing, then the use of a release agent must be used, or is otherwise needed. Dr. MacLean was asked at his deposition if “Hummel achieve[s] the effect of withdrawing without tearing and torn without using any of the additives that are listed in this paragraph?” *Id.* at 64. Dr. MacLean replied: “. . . because if you want the alternative, which is to take it off and take it off readily, or whatever terms that he uses, ***you would need to put some of these additives in*** relative to the starting point where you’re going to leave it on, and you don’t need those additives. So I think there’s flexibility in the patent to do both.” *Id.* at 64-65, emphasis added. Dr. MacLean’s testimony that a release agent is needed to withdraw Hummel’s film without tearing is belied by Hummel itself, and is inconsistent with the correct understanding of the ability of a film to be released from the cured resin without any release agent, or coating, or covering.

Hummel’s examples do not include any additives in their external layer adjacent the UV-curable resin. EX2001, ¶¶ 36, 39. Thus, there is no surface treatment of the polyamide layer present at the interface between Hummel’s inner film and the UV-curable resin in Hummel’s examples. A POSITA would

reasonably have expected the examples of Hummel to be representative of films that have the ability to be withdrawn from the pipe after curing of the UV-resin, without tearing or being torn. EX2001, ¶39. Hummel therefore directly refutes Dr. MacLean’s position that an additive is needed or otherwise required to enable the inner film of Hummel to be withdrawn without tearing or being torn. *Id.*

Dr. MacLean’s testimony is inconsistent with the physics involved in adhesion between adjacent materials. EX2001, ¶40. Liewchirakorn, *et al.*, “Practical Approach in Developing Desirable Peel-Seal....,” *Packag. Technol. Sci.*, (2017), (“Liewchirakorn” – EX2012), discloses several well-known concepts associated with peel and tearing of two materials having an adhesive force therebetween. While much of Liewchirakorn’s empirical evidence relates to PLA-based film, a POSITA would understand that some of the fundamental concepts discussed in this document are not limited to any particular type of film. EX2001, ¶44.

Specifically, Liewchirakorn discloses:

Tearing failure means no peel during peeling process due to high seal strength between film and substrate (or seal strength is higher than the inherent tensile strength of the film). This results in film breakage. Tearing failure shows the highest peel strength that is close to the film’s breaking strength. For partial tearing failure, the samples mostly exhibit

slightly lower peel strengths than those of the tearing failure. Partial tearing failure starts with peel at the beginning followed by tearing of the peel arm.

EX2012, pg. 7. Here, Liewchirakorn discloses that tearing occurs when the adhesive or seal strength is higher than the inherent tensile strength of the film. A POSITA would know this and would have readily understood from Hummel that the adhesive strength between the UV-cured resin and the polyamide outer layer was less than the tensile strength of the film, thereby providing for withdrawal of the film without tearing, and without any need for modification with a release agent, coating, or covering. EX2001, ¶45.

Dr. MacLean's testimony that some additional coating or covering is necessary in Hummel to permit removal of the film without tearing is inaccurate. EX2001, ¶47. A coating or covering would only be necessary if the adhesive strength between the UV-cured resin and the outer layer of the inner tubular film were higher than the inherent tensile strength of the film. *Id.* A POSITA would not have reasonably expected that to be the case with Hummel because Hummel discloses no coating or covering, does not use any additives in the external layer in the examples, and expressly discloses that the inner tubular film can be removed without tearing or being torn. The mere fact that there might be some adhesion between the outer polyamide layer of Hummel and the UV-cured resin does not

necessarily mean that Hummel's inner film cannot be removed without tearing or being torn. *Id.*

There are numerous examples of removing two substances initially adhered to one another by an adhesive force, without the need for any release agent, coating, or covering. For example, the individual sheets of 3M's Post-It® notes are initially stuck together, but each sheet can be removed without tearing, then adhered to practically any surface, and removed again without tearing. In another example, Glad® Press'n Seal® food wrap includes a pressure sensitive adhesive that adheres to practically any surface when pressed against it, but can be repeatedly removed therefrom without tearing. These well-known commercial products demonstrate that the mere fact that there might be some adhesion between the outer polyamide layer of Hummel and the UV-cured resin does not necessarily mean that Hummel's inner film cannot be removed without tearing or being torn. EX2001, ¶47.

Hummel therefore does not expressly disclose the use of a migrating compound, the use of a coating, or the use of a covering. Dr. MacLean admitted this:

- Q.** Okay. Does Hummel state anywhere any desire or use of a migrating compound?
- A.** Not expressly, but it's certainly taught.

EX2015, pg. 62. The fact that Hummel does not disclose a coating, covering, or migrating compound used to form a covering compels the conclusion that Hummel cannot anticipate claims 1, 4-7, 10, and 11. Whether a claim element is “taught” is an obviousness issue, not anticipation.

While not stated in the Petition or expert’s declaration, the disclosure of a large laundry list of potentially thousands of possible additives cannot inherently anticipate claims 1, 4-7, 10, or 11. *See, e.g., Ex Parte Smith*, Appeal 2011-00337, application No. 11/890,109, BPAI Decision dated February 28, 2012, designated *Informative*. Independent claim 1 and dependent claim 4 were at issue:

1. An aqueous hydraulic fluid composition comprising:
a first lubricant comprising at least one phospholipid; and
a second lubricant comprising an alkoxylate salt;
wherein the hydraulic fluid composition is substantially free of an oil selected from the group consisting of mineral oils, synthetic hydrocarbon oils, and mixtures thereof.
4. The aqueous hydraulic fluid composition of claim 1 wherein the alkoxylate salt comprises a calcium, magnesium or zinc salt of an alkoxylate selected from the group consisting of laurates, palmitates, oleates and stearates.

There was no dispute that the prior art reference disclosed an aqueous hydraulic fluid composition including a phospholipid and an alkoxylate salt. As to the specific alkoxylate salt required in claim 4, the BPAI noted that the prior art

reference disclosed a “long list” of possible additives. In fact, the reference described nearly 30 categories of additives and from a few to hundreds of components per category – according to the BPAI, a “myriad of possible additives.” “Stabilizers” was one of the categories of additives, and permissible stabilizers included “[m]etal salts of fatty acids such as, for example, magnesium, aluminium and/or zinc stearate or ricinoleate.”

The BPAI stated that “[s]ome picking and choosing of ingredients” from the prior art reference would be necessary to arrive at the composition of claim 4. The BPAI then cited *In re Arkley*, 455 F.2d 586 (CCPA 1972) as holding that, for an anticipation rejection to be proper, a prior art reference “must clearly and unequivocally disclose the claimed compound or direct those skilled in the art to the compound without any need for picking, choosing, and combining various disclosures.” Thus, the BPAI concluded that the examiner did not demonstrate that the prior art reference described the particular alkoxyate salt recited in claim 4 with sufficient specificity to constitute anticipation.

Similar to *Ex Parte Smith*, *In re Meyer*, 599 F.2d 1026 (CCPA 1979), and *Akzo N.V. v. International Trade Comm’n*, 808 F.2d 1471 (Fed. Cir. 1986), Petitioner here relies on Hummel’s disclosure of a laundry list of additives that can

be used in any of the 5 layers disclosed therein as allegedly disclosing, or “anticipating” element [1e] of the Challenged Claims:

The layers (a), (c), and (e), and also the adhesive-promoter layers (b) and (d), of the multilayer film of the invention can, if necessary, respectively mutually independently comprise additives selected from the group consisting of antistatic agents, antioxidants, antiblocking agents, antifogging agents, antimicrobial ingredients, dyes, color pigments, stabilizers, preferably heat stabilizers, process stabilizers, processing aids, flame retardants, nucleating agents, crystallization aids, preferably crystal-nucleating agents, lubricants, optical brighteners, flexibilizers, sealing aids, plasticizers, silanes, spacers, fillers, peel additives, waxes, wetting agents, surface-active compounds, preferably surfactants, and dispersing agents, to the extent that these additives do not impair permeability to UV radiation.

EX1005, 11:18-26; PET. at 28; EX1003, ¶¶127-130, 133.

The portion of element [1e] of the Challenged Claims allegedly disclosed by Hummel recites “a coating or covering with at least one migrating compound.” This element requires at least one migrating compound, and that the migrating compound be present in an amount sufficient to form a coating or covering when migrating to the surface of the outer facing external side facing the carrier material (element [1f]). Thus, a migrating compound must first be selected from the above list of additives, but Hummel does not disclose any of the additives as a “migrating

compound.” EX2001, ¶49. While waxes are known migrating compounds, waxes are used for many purposes other than to migrate to the surface of a polymeric film. Even if a skilled artisan were to have selected a wax, this requires a selection of one from a list of about 28 generic additives, and then a particular wax must be selected that functions as a migrating compound. EX2001, ¶48.

This wax then must be added to the outer layer, which requires a selection of one out of five, making the total selection now a selection of one out of 140 (based on the generic list of additives, but likely one out of thousands if all species of each of the 28 generic additives were included). And then the correct wax must then be used in an amount sufficient to form a coating or covering that would function in accordance with the purpose and function of the ’882 patented invention. EX2001, ¶¶13-17. Hummel discloses a preferred range of from 0.1-10%, providing a selection from an extremely large list of possibilities. And a POSITA would have known that adding a small amount of migrating compound, such as a slip agent, in the polymer used to make the film would be insufficient to migrate to the external surface of the film and to form a covering over the surface. EX2001, ¶19, citing EX2015 (Wypych).

There is nothing in Hummel that would specifically direct a POSITA to make the selection proposed by Petitioner and its expert. Indeed, none of the

examples of Hummel disclose the use of any of the additives listed in the above-quoted paragraph, much less the specific wax selected by Petitioner. A POSITA therefore would not have “at once envisaged” the specific wax, added to the specific external layer, in an amount sufficient to form a coating or covering, from Hummel’s generic disclosure. Hummel therefore cannot anticipate claims 1, 4-7, 10, or 11 either expressly or inherently.

PO respectfully requests that the PTAB issue a Final Written Decision (FWD) finding that Petitioner failed to establish invalidity under Ground I.

B. Ground 2: Hummel In View Of “General Knowledge Of A POSITA” Does Not Render Obvious Claim 3

Petitioner’s obviousness analysis for Ground 2 is flawed for at least two reasons. First, Petitioner admits that no prior art teaches claim element [3] reciting at least 20% by weight of a thermoplastic elastomer (TPE). Petitioner improperly attempts to substitute unsupported “POSITA knowledge” for the missing prior art teaching of a claim element. However, POSITA knowledge is considered only when determining whether there would have been, at the time of the invention, a motivation or “apparent reason” to combine the known claim elements in the way claimed in the patent. *See KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 417-18 (2007) (A claim is obvious only if there is “an apparent reason to *combine*

the known elements in the way a patent claims.”) (emphasis added). Claim elements that are not disclosed by the prior art (i.e., that are not known elements) cannot be taught by Petitioner’s general POSITA knowledge.

Second, the “general knowledge of a POSITA” relied upon by Petitioner is unsupported by any evidence. Petitioner’s expert simply asserts, without any basis, that it would have been obvious for a POSITA to try to add a layer of TPE (from all possible other substances) in at least 20% by weight of the layer (from all possible other proportions). The reliance by Petitioner’s expert on the incantations of “obvious to try” and “predictable results” cannot substitute for the required factual underpinnings of the expert’s opinion. Hummel in view of the “general knowledge of a POSITA” fails to satisfy all of the elements of claim 3.

Finally, even if there would have been a reason to include TPE in Hummel’s film, that modification would still fail to satisfy the elements of independent claim 1, from which claim 3 depends. Hummel as modified to include TPE in one of its layers still fails to disclose the claimed coating or covering of claim 1.

EX2001, ¶49. PO kindly asks that the PTAB issue a FWD finding that Petitioner failed to establish invalidity under Ground II.

C. Ground 3: Hummel In View Of Schuhmann Does Not Render Obvious Claims 1, 3-7 and 10-13

A person having ordinary skill in the art would not have combined Hummel and Schuhmann, and even if combined, the film recited by the '882 patent claims provides unexpectedly improved results. EX2001, ¶50. First, Hummel and Schuhmann are concerned with entirely different types of systems and polymeric films. The interface of Hummel's inner tubular film and UV-curable resin involves adhesive forces, if any, that may exist between the UV-curable and cured resins and the polyamide material used as the external layer. In contrast, the interface of Schuhmann's adhesive material and release film involves adhesive forces between a variety of different types of polymer films (polypropylene is preferred and is used in the examples) and generic "sticky" products (EX1007, 17). *Id.* A POSITA would not have seen any rational basis to use Schuhmann's release film in Hummel and have a reasonable expectation of success. *Id.*

Hummel does not disclose any need or desire to improve the release effect between the inner tubular film and the UV-curable resin. In fact, Hummel discloses that there are no problems with removing the inner tubular film, and that it can be accomplished without tearing or being torn, without using any release-enhancing agents in the form of a coating or covering. EX1005 at examples (no additives, coatings or coverings), pg. 23; EX2001, ¶51. A POSITA would have no reason to

modify Hummel with any of Schuhmann's teachings to address a problem that does not exist, especially when such a modification could adversely impact other properties of Hummel's film that Hummel considers important, such as the mechanical properties. EX1005, 7; EX2001, ¶51.

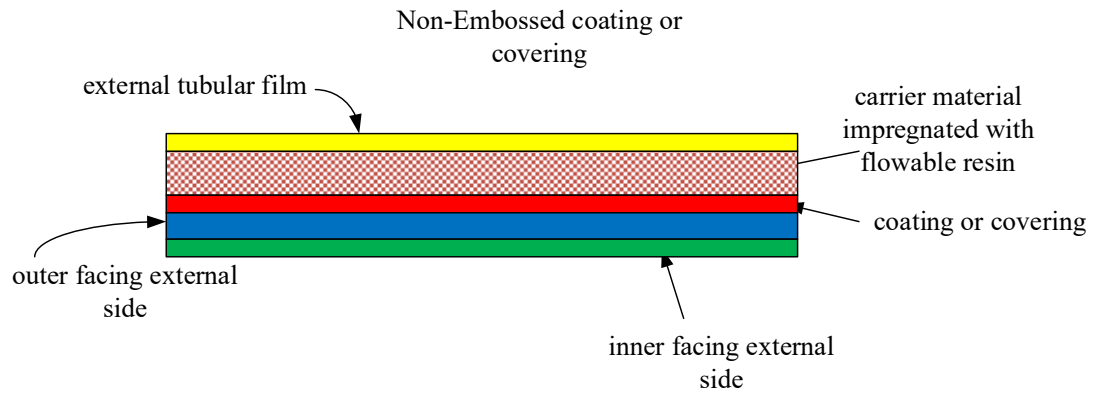
In addition, Schuhmann requires the coating or covering on the release film to be embossed. EX1007, title, pg. 5, examples; EX2001, ¶52. Every embodiment disclosed in Schuhmann requires embossing the coating or covering, and the examples show that, if the coating or covering is formed over the surface of the release film, it has undesirable release characteristics. EX1007, 23-24, where comparative example V1b is made from the very same materials as inventive example B1, and the only difference is that inventive example B1 has an embossed surface. EX2001, ¶52. The separation force for comparative example V1b, which includes a coating or covering on the surface of the release film, was nearly 5 times higher than the separation force of example B1 (203 cN/cm for V1b vs. 44 cN/cm for B1). EX1007, 23-24; EX2001, ¶52. Schuhmann therefore requires that the coating or covering must be embossed to provide the release effect from the adhesive material.

A POSITA would not have modified Hummel's external layer to include an embossed coating or covering as described by Schuhmann because a skilled artisan

would have reasonably expected such a modification to make the removal of Hummel's inner tubular film more difficult. EX2001, ¶53. In contrast to the already formed adhesive in Schuhmann, which would be a tacky solid, the UV-curable resin compositions of Hummel are not yet cured or solidified prior to the curing process. *Id.* The viscosity of UV-curable resins used in trenchless sewage pipe repair is on the order of 800 cps (*see* EX2013, pg. 8; EX2001, ¶53). Such a UV-curable resin, which is a resin used in Petitioner's liners, is flowable in a manner consistent with motor oil, and more flowable than honey, ketchup, and Karo syrup. The use of an embossed surface adjacent a flowable curable resin such as one commonly used in trenchless sewage pipe renovation systems, could actually increase the adhesion between the surface, perhaps resulting in what is referred to as "mechanical interlocking." EX2001, ¶53.

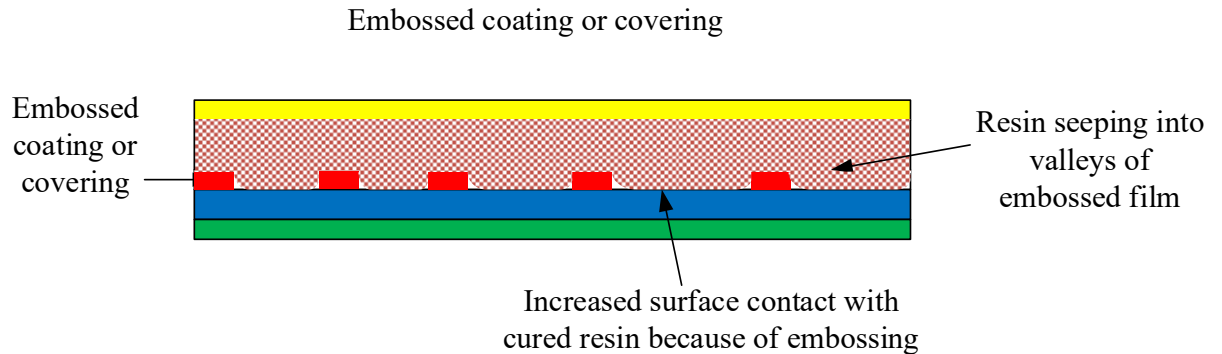
Below are rudimentary side views of films adjacent a carrier material impregnated with a flowable UV-curable resin to help explain the concept of mechanical interlocking. The configuration of the '882 patent can be illustrated as shown below:

'882 Patent Film



EX2001, ¶54. Schuhmann discloses in its examples that a construction as above has inferior peel characteristics. Hummel, if modified by Schuhmann's embossed film as proposed by Petitioner is illustrated below:

Hummel modified by Schuhmann



Id. The embossing can result in an increased interfacial contact and greater adhesion. This arrangement shows increased contact between the resin after curing and the outer surface of the outer facing external side, making it harder to remove. EX2001, ¶54. Schuhmann is not concerned with resin seeping into the valleys of the embossed film because Schuhmann's adhesive is solidified and would not flow, thereby achieving reduced contact. But that would not happen in a UV-curable system. *Id.*

The embossed surface could create what is known as mechanical interlocking, resulting in very strong adhesion between the respective surfaces. EX2001, ¶55. Mechanical interlocking is a phenomenon that exists when two surfaces are adhered to one another with one surface being roughened. The adhesive can conform completely to the roughened surface and when hardened, interlocks making it more

difficult or potentially impossible to separate. In fact, in an extreme example, mechanical interlocking is applied to enable Teflon to adhere to the surface of a pan.

Id. This stronger adhesion, perhaps to the point of mechanical failure during removal, would defeat the entire purpose of Hummel and Schuhmann, and consequently, a POSITA would not have modified Hummel by including Schuhmann's embossed film. *Id.*

Even if Hummel and Schuhmann were combined, the combined teachings do not disclose or suggest the unexpectedly improved properties achieved by the claimed film. EX2001, ¶56. The '882 patent discloses the surprising results it achieves multiple times throughout its disclosure, as highlighted below:

In the films according to the invention, it came as a surprise to discover that a good release effect against adhesive resins is also accompanied by a reduction of the coefficients of friction of film against film. Such a result was unexpected. EX1001, 2:63-67.

As already mentioned above, it was surprisingly found out that the tubular film according to the invention is characterized by very good mechanical properties. Thus, for example, siliconization (coating with polysiloxane) of the tubular film leads surprisingly to a clear improvement of the mechanical values with regard to splice formation and elongation at break. EX1001, 8:46-53.

A surprising finding was that the elasticity until break increased significantly with coating with polysiloxane and wax additivation compared to the non-siliconized reference that was not additivated with wax from comparative example V1. In the polysiloxane-coated tubular film from example B3, the increase in elasticity until break compared to the reference from comparative example V1 is 3.1%, in example B2 even almost 7%. EX1001, 19:39-46.

A possible cause for this surprising and positive effect with regard to the mechanical properties of the tubular film according to the invention can be an additional protective effect of the external polyamide layer owing to a thin polysiloxane film (due to coating) and also to a thin wax film (due to migration to the surface). EX1001, 20:5-10.

EX2001, ¶56. As discussed above, two inventors of the '882 patent have submitted declarations, one of which describes the unexpected results achieved by the claimed film. EX2001, ¶57. The inventors visited (or were aware of one of the inventor's visits) customers during the spring of 2012, and it was then that they first heard of a problem with the inner tubular film tearing and breaking off. EX2003, ¶¶ 23-24; EX2004, ¶¶ 12-15. Dr. Boutrid's explanation of his hypothesis as to why this problem first arose is reasonable. EX2001, ¶57. Dr. Boutrid describes learning that some customers had begun using UV-curable resins that included maleic anhydride, and that he believed the maleic anhydride may be strongly adhering to, and/or

reacting with the polyamide outer layer to form a bond therewith. EX2004, ¶¶ 14-15; EX2001, ¶57. It was the discovery of this newly occurring problem that had not previously existed, which led the '882 patent inventors to the solutions disclosed in the '882 patent specification. EX2001, ¶57.

Dr. Boutrid also explains the unexpected and surprising results achieved by the '882 patent's coating and/or covering. EX2004, ¶¶ 19-58. Dr. Boutrid's concerns that use of coatings on a polyamide layer, or that use of a covering formed by incorporating migrating compounds into the polymer layer might worsen one or more important mechanical properties, such as decreasing its strength, is rational. *Id.* at ¶19; EX2001, ¶58. Dr. Boutrid explains that the improvement of mechanical properties, such as a "measurable increase in the elasticity of the inner film until film splice and film break," is unexpected, and would not have been reasonably expected by a POSITA prior to the '882 patent filing date. EX2004, ¶¶20-22; EX2001, ¶58.

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, ¶59. Thus, the '882 patent discloses achieving the improved or desired mechanical properties by use of the claimed coating and/or covering, and that the optional addition of a TPE (with regard to claim 3) can provide "even better mechanical properties." *Id.*

Petitioner has failed to establish that it would have been obvious to combine Hummel with Schuhmann, and has failed to establish that the combination of Hummel and Schuhmann, if made, would have rendered obvious claims 1, 3-7, 10, and 11 of the '882 patent. PO therefore respectfully requests that the PTAB issue a FWD finding that Petitioner failed to establish obviousness under Ground III.

D. Ground 4: Hummel In View Of Nagai Does Not Render Obvious Claims 1, 3-7 and 10-13

A POSITA would not have combined Hummel and Nagai in the manner proposed by Petitioner, and would have had no reason to modify Hummel in the manner Petitioner proposes. EX2001, ¶¶60-61. In fact, Hummel discloses that there are no problems with removing the inner tubular film, and that withdrawing the film can be accomplished without tearing or being torn and without using any release-enhancing agents in the form of a coating or covering. EX1005 at examples (no additives, coatings or coverings), pg. 23; EX2001, ¶61. A POSITA would have no reason to modify Hummel with any of Nagai's teachings to address a problem that does not exist, especially when such a modification could adversely impact other properties of Hummel's film that Hummel considers important, such as the mechanical properties. EX1005, 7; EX2001, ¶61. Indeed, Dr. Boutrid initially expected that using a coating as in Nagai would negatively impact the

outer polyamide layer's mechanical properties in a manner that could defeat the purpose of Hummel's material. EX2004, ¶19; EX2001, ¶33.

The Petition contends a "POSITA would have been motivated to combine the 'release agent' (silicone, wax, fatty acid) of Nagai to the external surface of the inner tubular film of Hummel to increase the release effect between the inner tubular film and the cured resin to prevent sticking of the inner tubular film to the cured resin." PET. at 56-57. Nowhere does Hummel ever mention any issue with the cured resin sticking to the inner tubular film, and to the extent there is some adhesion, it clearly is not enough to prevent Hummel's inner tubular film from being withdrawn without tearing or being torn. EX2001, ¶¶40, 62. In addition, for UV-curable trenchless sewage repair systems, increasing the release effect between the curable resin and the tubular film is not necessarily a desirable feature, especially if, as Nagai states, adhesion of thin film and resin absorbent material is completely prevented. EX1009, ¶29; EX2001, ¶62.

If the release effect were enhanced to the level disclosed by Nagai in Hummel's entirely different system (UV-curable systems vs. thermocurable systems), this could be catastrophic during trenchless sewage pipe repair. Some adhesion is needed between the inner tubular film and the UV-curable resin to facilitate insertion of the tube, proper inflation of the tube to press the curable

material against the surface of the pipe and maintain it in that position until cured, and to enable curing. If adhesion between the UV-curable resin and the outer surface of Hummel's inner tubular film were "completely prevented" by employing Nagai's release agent, then the inner tubular film would separate therefrom during curing, and some or all of the film could collapse internally on the hot UV lamps. This likely would result in destroying the integrity of the inner film, and possibly causing a dangerous fire. EX2001, ¶63.

Neither Hummel nor Nagai discloses the use of migrating compounds, or providing a covering by incorporating a migrating compound into the polymer material during film formation in an amount sufficient to result in migration to the surface to form a covering. EX2001, ¶65. Rather, Nagai only discloses externally coating the outer surface of an already formed film. *Id.* Dependent claim 11 of the '882 patent recites:

11. The insertion tube according to claim 10, wherein the migrating lipophilic or hydrophilic compound is added to an external side containing a thermoplastic olefin homo- or copolymer or a homo- or copolyamide.

EX1001, 22:4-7. This claim requires the migrating lipophilic or hydrophilic compound to be added to the layer (side) containing a thermoplastic olefin homo- or copolymer or a homo- or copolyamide, and not coated on top of the layer.

EX2001, ¶65. Even if Nagai's coating with silicone or wax were applied to Hummel's inner tubular film, the combined teachings would not have rendered obvious dependent claim 11, which would be separately patentable for at least this reason. *Id.*

Petitioner has failed to establish that it would have been obvious to combine Hummel with Nagai, and has failed to establish that the combination of Hummel and Nagai, if made, would have rendered obvious claims 1, 3-7, 10, and 11 of the '882 patent. PO therefore respectfully requests that the PTAB issue a FWD finding that Petitioner failed to establish obviousness under Ground IV.

IX. A POSITA WOULD NOT HAVE SEEN ANY BENEFIT IN MODIFYING HUMMEL WITH A RELEASE AGENT BECAUSE HUMMEL DOES NOT SEEK IMPROVED RELEASE EFFECT

Petitioner contends that a POSITA would have been motivated to modify the surface of the film of Hummel to include a migratable lipophilic compound from Schuhmann and Nagai (Grounds III and IV) "to provide a good release effect between the inner tubular film and the cured carrier material to prevent 'tearing' of the inner tubular film as **desired** by Hummel." PET. at 43. Hummel already achieves removal without tearing and does not even require removal of its multilayer film. EX1005, 7, 15. Hummel teaches that its five-layer films are already able to be withdrawn without tearing, but it is also fine to leave the film in

after curing. *Id.* A POSITA reading Hummel would not find a need or desire to improve release effect. EX2001, ¶40. Nonetheless, Petitioner cites the disclosure of migratable compounds used for a “release effect” or as a “release agent” in the prior art as support for its proposed modification to the tubular film of Hummel. PET. at 43, 55.

Because Hummel achieves release without tearing, any additional efforts to increase release are wasted and undesirable. Hummel teaches that it is not necessary to condition its film in order to achieve good elasticity and to be removed “without being torn, torn in or torn off.” EX1005, 7. While Hummel states that conditioning is known to improve the mechanical properties of films (EX1005, 8), its film is still “preferably non-conditioned.” EX1005, 14-15, 22. Because Hummel does not desire any improved release effect, Hummel teaches away from conditioning its film and improving resistance to tearing. Thus, a POSITA would not consult Hummel for improving release effect.

A. Modifying Hummel with the Film of Schuhmann Would Increase Contact Area And Release Force

Petitioner contends that a POSITA would have been motivated to modify the surface of Hummel to include the “coating or covering based on at least one lipophilic compound” from Schuhmann. PET. at 43. Petitioner and its expert fail to finish the quote from Schuhmann describing the “coating or covering.” PET. at 43;

EX1003, ¶194. Schuhmann requires the coating or covering to have an embossed structure to achieve any improvement in release effect.

Indeed, it was surprisingly found that by using a release film comprising at least one layer (a) based on at least one thermoplastic polymer, which has at least on one side as a finish **a coating or covering based on at least one lipophilic compound with at least one partial embossed structure**, an improvement in the release effect of adhesive products can be achieved compared to conventional release films. EX1007 at 5 (emphasis added).

Modifying Hummel with the embossed film of Schuhmann would have an undesirable effect because embossing would increase the contact surface area between the film and uncured resin of Hummel. Schuhmann teaches an embossed film for covering materials with a “tacky” surface. EX1007, 2, 5; EX2001, ¶¶53-55. The tacky products referred to in Schuhmann are understood to be solid or have a high enough viscosity where the embossed elevations on the surface of a film would be the “contact points to the sticky or adhesive surface to be covered.” EX1007, 15; EX2001, ¶50. Schuhmann discloses a minimum uniform height for these contact points “ $\geq 5 \mu\text{m}$, preferably $\geq 10 \mu\text{m}$, particularly preferably $\geq 20 \mu\text{m}$.” EX1007, 15.

The mating surfaces in Hummel are entirely different materials than those contemplated in Schuhmann. Hummel features a multilayer film in contact with a curable plastic resin. EX1005, 16. This resin has physical properties notably

different compared to the tacky products disclosed in Schuhmann. Where an embossed structure would decrease contact surface area with the tacky products in Schuhmann, the flowable plastic resin in Hummel would fill between embossed elevations while uncured. EX2001, ¶54. Once the resin cured, the increased contact between the film and resin would result in an increased separation force. EX2001, ¶55. Thus, a POSITA would expect a worse release effect by modifying Hummel with the “coating or covering” disclosed in Schuhmann.

Moreover, even if Petitioner suggests that a POSITA would read Schuhmann to teach using only a lipophilic compound without an embossed structure, Schuhmann does not teach of any improved release using an EBS wax coating alone without an embossed structure. EX1007, 23-24. According to the disclosure in Schuhmann, the reference example using EBS wax as a coating on a non-embossed structure has a much greater separation force than any of the other examples disclosed in Schuhmann. EX1007, 23-24. Thus, a POSITA would not have read Schuhmann to teach any benefits with using a lipophilic compound on a non-embossed structure.

X. THE CHALLENGED CLAIMS WOULD NOT HAVE BEEN OBVIOUS BECAUSE THE CLAIMED INVENTION PROVIDES UNEXPECTED RESULTS THAT ARE COMMENSURATE IN SCOPE WITH THE CLAIMS.

Petitioner's obviousness analysis in Grounds II-IV is deficient for failing to consider any secondary considerations of non-obviousness, despite the express statements in the '882 patent that such secondary considerations exist. A proper obviousness analysis must consider secondary considerations. The Federal Circuit recently reversed a PTAB decision because the "Board failed to properly consider the evidence of objective indicia of nonobviousness." *Volvo Penta of the Americas, LLC v. Brunswick Corp.*, 81 F.4th 1202 (Fed. Cir. 2023). "The ultimate determination of whether an invention would have been obvious is a legal conclusion based on the totality of the evidence," including secondary considerations. *Brown & Williamson Tobacco Corp. v. Philip Morris, Inc.*, 229 F.3d 1120, 1124 (Fed. Cir. 2000). Petitioner failed to do so, despite the use of the terms "surprising" and "unexpected" no less than five times in the '882 patent.

Hummel does not desire improved removal of its inner multilayer film. EX1005, 15. But even if a POSITA had some other motivation to look to the prior art teachings cited by Petitioner, the POSITA would not have expected any of the materials used by the prior art to provide improved mechanical properties. Indeed, the prior art documents are absent any indication that a coating with polysiloxane

or a migrating compound provides any improvement regarding splice formation or elongation at break.

The inventors of the '882 patent were surprised to discover improvements in splice formation and elongation at break by forming a coating or covering over its tubular film. EX1001, 2:65–67; EX2004, ¶ 21. Co-inventor Dr. Abdel-Kadel Boutrid admits in his declaration that his team thought “the coatings and coverings might worsen one or more important mechanical properties of the tubular film. For example, we thought that the strength of the film might deteriorate as we added more migrating compound to the polyamide layer.” *Id.* at ¶20. In contrast to what Dr. Boutrid and his team anticipated, Dr. Boutrid states there was a “measurable increase in the elasticity of the inner film until film splice and film break.” *Id.* at ¶21. This unexpected increase in elasticity reduced the likelihood of tear, burst, or splice. *Id.* at ¶210.

Dr. Boutrid believed a “possible cause” for these properties may be due to a protective effect “of the external polyamide layer owing to a thin polysiloxane film (due to coating) and also to a thin wax film (due to migration to the surface).” *Id.* at ¶22.; EX1001, 20:5-10. The specification discloses that it was a surprise to find “a reduction of the coefficients of friction of film against film.” EX1001, 2:65-67. Additionally, “in trenchless sewer renovation” these unexpected properties of the

film allow users to rule out “a bursting of the inflated inner tube film” EX1001, 3:4-6.

Dr. Brant testifies that the '882 patent provides sufficient data for a reasonable number of embodiments that would have led a POSITA to expect the same or similar improvements in the mechanical properties of the inner tubular film throughout the scope of the patent claims. EX2001, ¶66.

The examples in the '882 patent provide a number of different embodiments, all of which show improved elongation and resistance to splice. EX2001, ¶67. As explained in Dr. Boutrid's declaration, and as shown in the '882 patent, the films included essentially the same compositions, with the exception of the coating or covering present on the outer facing external side facing the UV-curable resin. EX2004, ¶¶37-43; EX2001, ¶67. Comparative example V1 includes the following materials:

Layer number	Composition	Proportion in layer in %	Thickness in μm
1	Durethan C38 F	88	40
	Durethan B40 FAM	12	
2	Adhesive promoter: Admer NF 498 E	100	10
3	Lupolen 2420 F	70	65
	Exceed 1327 CA	30	
4	Adhesive promoter: Admer NF 498 E	100	10
5	Lupolen 2420 F	70	75
	Exceed 1327 CA	30	
			Sum: 200 μm

EX2004, ¶37; EX2001, ¶67.

In examples B1-B3, the polyamide side of the film from comparative example V1 was coated (finished) with the following silicone or polysiloxane formulations:

Example B1: Comparative example V1 plus polysiloxane formulation 1 that allows an easy release and has an especially good release effect;

Example B2: Comparative example V1 plus polysiloxane formulation 2 that allows a tight or controlled release and has a medium release effect;

Example B3: Comparative example V1 plus polysiloxane formulation 3 that allows a medium release and has a good release effect.

Example	Evonik RC products Quantities in % by weight			
	RC902	RC702	RC 711	A 18
B1		100%		
B2			98%	2%
B3	59%		39%	2%

EX2004, ¶38; EX2001, ¶68. These examples B1-B3 therefore use different types of polysiloxane materials (RC902, RC702, RC711, and A18) in varying proportions, and thus would be considered by a POSITA to be representative of a “coating of a polysiloxane.” EX2001, ¶68. While different polysiloxanes in different amounts might be expected to provide slightly different improved mechanical properties, there would have been no reason to expect that other polysiloxanes coated in similar or slightly different amounts would not also provide the improved mechanical properties disclosed by the ’882 patent. EX2001, ¶68. In addition, it is possible that use of an extremely large amount of polysiloxane, or a very small amount of polysiloxane to form the coating would not provide improved mechanical properties, but a POSITA would not have reasonably considered those amounts to be within the scope of ’882 patent invention. *Id.*

For tubular films with additional wax added as a migrating material to form the covering on the external layer, the following samples B4-B6 were prepared.

EX2001, ¶69. For Example B4: Structure of the inner tube film: thickness 200 µm;

with 1% Constab PE-SA 270 (migrating additive) containing ethylene bis stearamide (EBS) in the polyamide external layer:

Layer number	Composition	Proportion in layer in %	Thickness in μm
1	Durethan C38 F	87.5	40
	Durethan B40 FAM	11.5	
	Constab PE-SA 270	1.0	
2	Adhesive promoter: Admer NF 498 E	100	10
3	Lupolen 2420 F	70	65
	Exceed 1327 CA	30	
4	Adhesive promoter: Admer NF 498 E	100	10
5	Lupolen 2420 F	70	75
	Exceed 1327 CA	30	
			Sum: 200 μm

Example B5: Structure of the inner tube film: thickness 200 μm ; with 4% Constab PE-SA 270 made of ethylene bis stearamide (EBS) in the polyamide external layer:

Layer number	Composition	Proportion in layer in %	Thickness in μm
1	Durethan C38 F	85.5	40
	Durethan B40 FAM	9.5	
	Constab PE-SA 270	4.0	
2	Adhesive promoter: Admer NF 498 E	100	10
3	Lupolen 2420 F	70	65
	Exceed 1327 CA	30	
4	Adhesive promoter: Admer NF 498 E	100	10
5	Lupolen 2420 F	70	75
	Exceed 1327 CA	30	
			Sum: 200 μm

Example B6: Structure of the inner tube film: thickness 200 μm ; with 6% Constab

PE-SA 270 made of ethylene bis stearamide (EBS) in the polyamide external layer:

Layer number	Composition	Proportion in layer in %	Thickness in μm
1	Durethan C38 F	85.0	40
	Durethan B40 FAM	9.0	
	Constab PE-SA 270	6.0	
2	Adhesive promoter: Admer NF 498 E	100	10
3	Lupolen 2420 F	70	65
	Exceed 1327 CA	30	
4	Adhesive promoter: Admer NF 498 E	100	10
5	Lupolen 2420 F	70	75
	Exceed 1327 CA	30	
			Sum: 200 μm

See EX2004, ¶¶ 40-43; EX2001, ¶¶ 65-68. These examples show the use of a migrating compound in varying amounts added to the outer side of the inner tubular film. A POSITA would have no reason to expect that different migrating compounds, known in the art to provide a similar effect as the EBS wax used in examples B4-B6, would not also provide the same or similar improved mechanical properties. EX2001, ¶72. Similarly, a POSITA would not have reasonably expected using different amounts of migrating compound to provide dramatically different mechanical properties, other than the use of far less than the 1% used in Example B4, or far more than the 6% used in Example B6. *Id.* In addition, a POSITA would understand that smaller amounts of migrating compound would result in less migrating compound migrating to the surface. *Id.*

The examples of the '882 patent do not provide examples of inner tubular films in which the migrating compound was coated on the outer facing external side facing the UV-curable resin, but a POSITA would not have reasonably expected the results from forming a coating with a migrating compound or forming a covering by migration of a migrating compound to be significantly different, other than the amounts of migrating compound used. EX2001, ¶73. The results obtained by use of a coating with polysiloxane or a covering with a migrating compound all provide improved release characteristics, reduced coefficients of friction, improved elasticity

until break, and increase in elasticity until spliced, when compared to a comparative example V1 that used a very small amount of the same migrating compound (EBS wax). EX2004, ¶¶44-58; EX2001, ¶70.

These unexpected improvements are shown for different types of polysiloxane coatings, used in different amounts, as well as for different amounts of migrating compounds added to the external side to form a covering. EX2001, ¶75. Dr. Brant testifies that the unexpectedly surprising results shown in the '882 patent examples would have been reasonably expected to exist for other coatings of polysiloxane and other migrating compounds, either coatings or coverings formed therefrom. *Id.*

For the foregoing reasons, Petitioner has failed to establish a reasonable likelihood of prevailing on any of Grounds 1-4. Patent Owner respectfully asks this Honorable Board to find the Challenged Claims patentable.

XI. 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: June 27, 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 13,984 words (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: June 27, 2024

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing **PATENT OWNER'S RESPONSE** was served electronically via e-mail on June 27, 2024, in its entirety on the following:

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