UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FAVORED TECH CORPORATION,

Petitioner

v.

P2I LTD.,

Patent Owner

Case No. IPR2020-01198
Patent No. 10,421,876

PATENT OWNER'S PRELIMINARY RESPONSE

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1003	Curriculum vitae for Dr. Karen Gleason
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1005	International Publication No. WO 99/64662, "Surface Coatings," to Jas Pal Singh Badyal, et al. ("Badyal")
1006	U.S. Patent 2,716,638, "Divinyltetramethyldisiloxane and Polymers Therefrom," to Merrill Cohen and John R. Ladd ("Cohen")
1007	U.S. Patent 3,816,564, "Insulation Coating Compositions," to Harvey Ray Holliday and Gary Lee Schurter ("Holliday")
1008	U.S. Patent Application Publication US 2007/0020451, "Moisture Barrier Coatings," to Raghunath Padiyath and Moses M. David ("Padiyath")
1009	Francesch, L. et al, "Fabrication of Bioactive Surfaces by Plasma Polymerization Techniques Using a Novel Acrylate-Derived Monomer," *Plasma Processes and Polymers*, 2:605–11 (2005) ("Francesch")
1010	Declaration of Dr. Salvador Borrós Gómez
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1012	International Publication WO 2012/158953, "Coated Electronic Devices and Associated Methods," to Filip Legein, et al.
1013	U.S. Patent Application Publication US 2013/0176700, "Electronic Devices with Internal Moisture Resistant Coatings," to Blake Stevens, et al.
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1015	U.S. Patent Application Publication US 2005/0141738, "Hydrophobic Coating of Individual Components of Hearing Aid Devices," to Erdal Karamuk
1016	U.S. Patent 6,551,950, "Surface Coatings," to Jas P S Badyal, et al.

1017	U.S. Patent 4,562,091, "Use of Plasma Polymerized Organosilicon Films in Fabrication of Lift-Off Masks," to Harbans S. Sachdev and Krishna G. Sachdev
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I. INTRODUCTION

Patent owner P2i respectfully submits this Preliminary Response to Favored's Petition. This Preliminary Response is supported by the declaration of P2i's retained expert, Dr. Gregory Parsons (Ex. 2001), as well as other accompanying exhibits.

Petitioner falls far short of its burden of proving that *inter partes* review of the challenged claims of U.S. Pat. No. 10,421,876 (the '876 patent) is warranted under the asserted grounds. 37 C.F.R. § 42.108(c). The '876 patent discloses and claims an electronic or electrical device or component thereof having a protective cross-linked polymeric coating obtained by exposing the device to a plasma comprising a novel combination of monomers and crosslinking reagents. The Petition relies extensively on hindsight for its five redundant obviousness grounds. The asserted grounds piece together two primary references whose actual teachings Petitioner distorts, and secondary references that have nothing to do with forming plasma-derived, cross-linked polymer protective coatings for electronic devices.

Petitioner's assertion that the claims do nothing more than recite "a jumble of crosslinkers" that the examiner had erroneously concluded were "absent from the prior art" (Pet. at 22) highlights the factual and legal flaws that permeate its entire obviousness analysis. The claims as a whole are not directed to crosslinkers per se, but to electronic devices coated using a uniquely formulated plasma that overcomes prior challenges associated with forming protective coatings suitable for electronic

devices and improves certain desired properties of such coatings. Rather than demonstrating that it would have been obvious to use the claimed synergistic combination of compounds to provide improved plasma polymerized protective coatings for electronics, the Petition does little more than show that the recited monomers and crosslinking compounds were separately known in the polymer chemistry art in general. The law is clear, however, that "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *Tinnus Enterprises, LLC v. Telebrands Corp*., 846 F.3d 1190, 1207 (Fed. Cir. 2017) (citing *KSR Int'l Co. v. Teleflex Inc*., 550 U.S. 398, 418 (2007)).

Neither of the primary Coulson-122 or Badyal references discloses a plasma deposition process that combines any of the claimed monomers with any of the claimed crosslinking reagents, and the five secondary references disclose polymerization processes that have no relevance to the '876 patent claims. Petitioner's arguments fail to address the references' teachings as a whole, while incorrectly assuming that the relevant plasma deposition technology is "routine" and that plasma precursor formulation involves nothing more than substituting "known elements with each performing its known and expected function." (*See e.g*., Pet. at 38.) In reality, the effects of altering the chemical composition of such plasma precursors on the resulting coating properties is highly unpredictable. The Petition

makes no showing that any of the asserted references, alone or in combination, would have provided useful guidance to a person of ordinary skill in the art ("POSA") who was attempting to improve plasma-deposited protective coatings for electronics.

The asserted grounds fail to present any evidence that establishes that the Patent Office erred in granting the '876 patent. The obviousness grounds fail because there is no evidence demonstrating or even suggesting that a POSA would have been motivated at the time of the invention to combine aspects of the disparate asserted references in the hindsight-driven manner now proposed by Petitioner, or that a POSA would have had a reasonable expectation of success in doing so.

Because the Petition does not show that at least one claim is reasonably likely to be invalid, institution should be denied. 35 U.S.C. § 314.

II. BACKGROUND

A. The '876 Patent

The '876 patent discloses and claims an electronic or electrical device (or electronic or electrical component thereof) having a novel protective coating obtained by exposing the device to a plasma comprising a particular monomer compound and particular crosslinking reagent. The inventors encountered difficulties in obtaining plasma-derived protective coatings suitable for electronic devices, such as mobile phones. Such coatings must be highly hydrophobic yet

stable, tack-free, and resistant to smearing. (Ex. 1001 at 1:20–2:6.) In particular, applying lower powers to the monomer 1H, 1H, 2H, 2H-perfluorooctyl acrylate (PFAC6) to form a plasma resulted in a more hydrophobic (i.e., water resistant) coating, but the coating was unstable in the presence of water and was tacky and easily smeared. (*Id*. at 1:34–56.) Applying higher powers resulted in coatings that were more crosslinked and resistant to smearing, but this process change decreased the hydrophobicity of the coating. (*Id.* at 1:47–67, 16:4–10, FIGS. 1 and 2.) Accordingly, the inventors recognized that the process conditions required for producing tack and smudge-free protective coatings for electronic devices were quite limited and caused the coatings to lack sufficient hydrophobicity. (*Id.* at 2:1–6.)

The inventors unexpectedly discovered that they could obtain improved protective nanoscale coatings, and also increase the range of suitable plasma processing conditions, by adding particular crosslinking reagents to the monomer introduced during the plasma polymerization process. (*Id.* at 2:49–55.) The '876 patent specification discloses that low energy pulsed plasma processing of certain combinations of monomers and crosslinking compounds resulted in co-polymer protective coatings that exhibited improved hydrophobicity while remaining tack and smudge-free. (*Id.* at 2:56–64, 16:58–17:19, compare FIGS. 2 and 4.)

In addition, the inventors discovered that the inventive coatings, particularly when thicker than 50 nm, act as physical barrier coatings, which provide a barrier to

mass and electron transport and restrict diffusion of water, oxygen, and ions. (*Id.* at 3:3–11.) Such coatings are quite advantageous for protecting electronic devices like mobile phones as well as printed circuit boards, semi-conductor chips, and other internal electronic components thereof. (*Id*. at 1:5–13, 14:30–58.) These barrier coatings are electrically insulating while remaining sufficiently compliant to allow electrical connections to be made to the device, e.g., to allow the device to be connected to a charging cable. (*Id.* at 3:41-54; Ex. 2001 ¶ 48.) The specification teaches that such barrier coatings can achieve an electrical resistance of at least 1 x 10^7 Ohms and sufficient water resistance to allow the coated device to be submerged in water of up to 1m in depth for 30 minutes while powered on, characteristics required to pass industry standard "IPX7 test." (Ex. 1001 at 3:55–4:6.) The resulting barrier coatings were also significantly more electrically resistant than coatings formed without the identified crosslinking reagents. (*Id.* at 16:46–54, FIG. 5, 18:10–23, showing increase in resistance from 2.1 x 10^7 to 9.2 x 10^9 Ohms when 10% DVA crosslinker added to PFAC6 monomer plasma.)

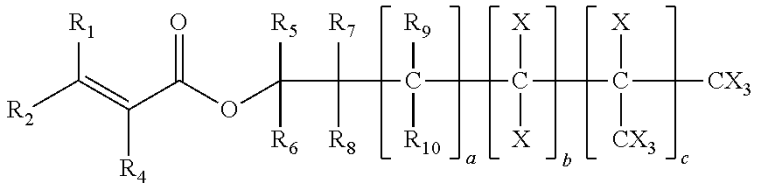
Claim 1 specifies:

> An electronic or electrical device or electronic or electrical component thereof comprising a protective cross-linked polymeric coating on a surface of said device or component;
>
> wherein the protective cross-linked polymeric coating is obtained by exposing said device or component to a plasma comprising

a monomer compound and a crosslinking reagent for a period of time sufficient to allow formation of the protective cross-linked polymeric coating on a surface thereof,

wherein the monomer compound is a compound of formula I(a):

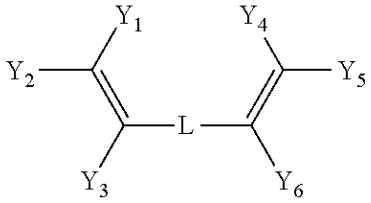
I(a)



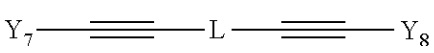
wherein each of R_1, R_2, R_4 and R_5 to R_{10} is independently selected from hydrogen or an optionally substituted C_1-C_6 branched or straight chain alkyl group; each X is independently hydrogen or halogen; a is from 0-10; b is from 3 to 7; and c is 0 or 1;

and wherein the crosslinking reagent comprises two or more unsaturated bonds attached by means of one or more linker moieties and has a boiling point of less than 500° C. at standard pressure, the crosslinking reagent having one of the following structures:

(i)

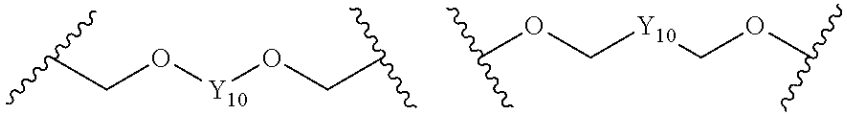


(ii)



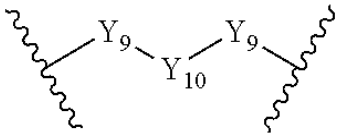
where Y_1, Y_2, Y_3, Y_4, Y_5, Y_6, Y_7 and Y_8 are each independently selected from hydrogen, optionally substituted cyclic, branched or straight chain C_1-C_6 alkyl or aryl; and L is a linker moiety;

wherein for compound (i) L is of formula A having one of the following structures:



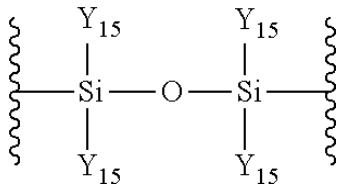
and Y_{10} is selected from optionally substituted cyclic, branched or straight chain C_1-C_8 alkylene and a siloxane group;

or wherein for compound (i) L is of formula B having the following formula:



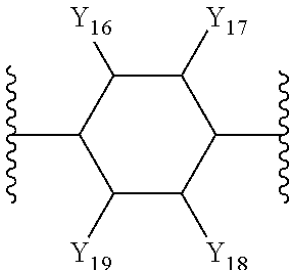
where each Y_9 is independently selected from, a bond, —O—, —O—C(O)—, —C(O)—O—, —Y_{11}—O—C(O)—, —C(O)—O—Y_{11}—, —OY_{11}—, and —Y_{11}O—, where Y_{11} is an optionally substituted cyclic, branched or straight chain C_1-C_8 alkylene; and

wherein Y_{10} has the following formula:



and each Y_{15} is independently selected from optionally substituted branched or straight chain C_1-C_6 alkyl;

or wherein Y_{10} has the following formula:



and Y_{16} to Y_{19} are each independently selected from H and optionally substituted branched or straight chain C_1-C_8 alkyl or alkenyl.

(*Id*. at 18:26–19:57.) The prior art of record shows that the claimed combination of monomers and crosslinking reagents was not previously known, used, or suggested for use in a plasma process to obtain a protective coating suitable for an electronic device.

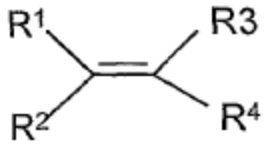
B. The Asserted Prior Art

1. Coulson-122

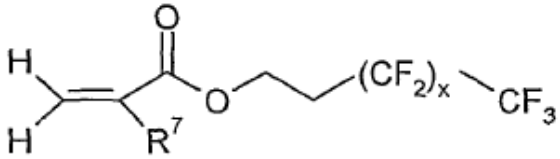
Coulson-122 is a PCT publication filed by P2i describing an earlier invention of Stephen Coulson, the primary inventor of the '876 patent. Coulson-122 discloses an electronic device having a polymeric coating formed by exposing the device to a pulsed plasma composition that includes a monomer selected from a particular group of monomers. (Ex. 1004 at 3:20–34, claim 1.)

Recognizing that plasma polymers had previously been used to coat fabric substrates, Coulson-122 discovered that by utilizing a specific type of monomer under particular deposition conditions, a highly liquid repellent nano-coating could be deposited on an electronic device without affecting the operation of the device. (*Id.* at 2:32–3:18.)

Coulson-122 discloses that the monomer used to form the polymeric coating may have the following general structure:



(*Id.* at 3:20–25.) In a particular example, Coulson-122 discloses a monomer having the following structure:



where R^7 is hydrogen, $C_{1\text{-}10}$ alkyl, or $C_{1\text{-}10}$ haloalkyl and x is an integer from 1 to 9. (*Id.* at 12:13–21). When R^7 is hydrogen and x is 7, the monomer is 1H, 1H, 2H, 2H-heptadecafluorodecyl acrylate. (*Id.* at 12:21–22, claims 11 and 28.)

Coulson-122 teaches that a polymeric coating may be formed on an electronic device by exposing the device to a pulsed plasma including the monomer. (*Id.* at 3:20–25.) The device may be exposed to the pulsed plasma for a sufficient period of time to allow a protective polymeric layer to form on the surface of the device. (*Id.* at 3:20–34, 4:1–3.) With regards to plasma polymerization, Coulson-122 warns that "[t]he properties of the resultant coating can depend upon the nature of the substrate as well as the nature of the monomer used and conditions under which it is deposited." (*Id.* at 3:9–12.)

Coulson-122 is silent regarding the use of a crosslinking reagent in the pulsed plasma. Despite Stephen Coulson being a named inventor of the earlier Badyal reference, Coulson-122 does not teach or suggest forming a polymeric coating using a combination of monomers or a monomer and a crosslinking reagent. (Ex. 1004 at 7:19–24; Ex. 2001 ¶ 58.)

2. Badyal

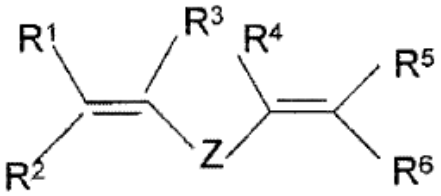
Badyal is a PCT publication describing earlier research directed to making oil and water repellant fabric coatings. This work was performed by Professor Jas Pal Badyal and his coinventors, including Stephen Coulson. (Ex. 1005 at cover page.) Badyal describes a method of coating a surface with a polymer layer which includes exposing the surface to a plasma comprising one or more organic monomeric compounds, at least one of which comprises two double bonds. (*Id*. at 4:4–8.) The method forms a layer of cross-linked polymeric material on the surface to provide a water and oil repellant coating. (*Id.* at 1:3–5, 4:8–9, 6:10–12, 9:18–19.) Badyal does not appreciate or address the unique challenges associated with plasma deposition coatings for electronic devices and electronic components. Although Badyal states that "any solid substrate, such as fabric, metal, glass, ceramics, paper or polymers" may be coated (*id*. at 9:28–30), Badyal focuses in particular on fabric substrates (*id.* at Abstract, 1:14–19, 1:25–2:8, 2:31–3:2, 4:27–29, 9:28–34, 10:1-6, 11:22–24). Badyal discloses that such coatings applied to fabrics have sufficient durability to

withstand washing. (*Id.* at 4:24–29.) Badyal does not disclose that the coatings would be suitable for electronic devices. (Ex. 2001 ¶ 59.) Badyal provides no information that would have led a person of ordinary skill in the art to understand the particular characteristics needed for a suitable coating for electronics devices, the chemistry or processing parameters required to achieve this, or whether any particular crosslinking compounds would be useful for this purpose.

Contrary to Petitioner's assertions, Badyal does not teach that all crosslinking compounds known in the polymer art are suitable for use in Badyal's disclosed plasma deposition process. In this regard, Petitioner fails to consider Badyal's full disclosure and teachings as a whole. To begin with, Badyal is directed solely to plasma polymerization for forming oil and water repellant coatings. The reference does not in any way borrow from or analogize to techniques or compositions deployed in other types of polymerization processes. Indeed, just like Coulson-122, Badyal acknowledges that there are known fundamental differences between plasma deposition techniques and conventional polymerization techniques: "[c]onventional polymer synthesis tends to produce structures containing repeat units which bear a strong resemblance to the monomer species, whereas a polymer network generated using a plasma can be extremely complex." (Ex. 1005 at 2:20–24.) Badyal also teaches that "[t]he success or otherwise of plasma polymerization depends upon a number of factors, including the nature of the organic compound." (*Id*. at 2:26–28.)

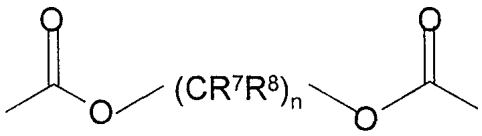
Badyal introduces his invention as providing a method involving "exposing [a] surface to a plasma comprising one or more organic monomeric compounds, at least one of which comprises two double bonds, so as to form a layer of cross-linked polymer on said surface." (*Id*. at 4:4–9.) After describing the relevant types of plasmas processes (*id*. at 4:11–15), Badyal teaches that "suitable compounds with more than one carbon-carbon double bond . . . used in the plasma are suitably those which will yield cross-linked polymers having oil or water repellent properties." (*Id*. at 4:17–21). A POSA would have certainly understood from this that Badyal's disclosure is focused on crosslinking compounds that are suitable for forming a plasma-polymerized coating having oil or water repellent properties. (Ex. 2001 ¶ 61.)

Badyal describes that suitable crosslinking compounds for his plasma deposition process are of the following general formula (I):

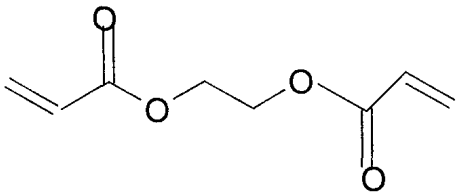


where Z is a particular bridging group. (Ex. 1005 at 5:1–5.) Petitioner repeatedly cites one sentence out of context to argue that Badyal discloses that Z could be any bridging group known in the polymer art. (Pet. at 13, 25, 31, 39.) This is a critical misreading of Badyal. The class of suitable bridging groups Z that Badyal

recommends, in the context of the document as a whole, is far narrower. Properly read in context, what this portion of Badyal actually indicates is that the bridging groups that can be used are known in the art, i.e., the suitable groups are not newly synthesized groups but previously known groups. Badyal then discloses the example suitable bridging groups immediately thereafter:

> Examples of suitable bridging groups Z for use in the compound of formula (I) are those known in the polymer art. In particular they include optionally substituted alkyl groups which may be interposed with oxygen atoms. Suitable optional substituents for bridging groups Z include perhaloalkyl groups, in particular perfluoroalkyl groups.
>
> In a particularly preferred embodiment, the bridging group Z includes one or more acyloxy or ester groups. In particular, the bridging group of formula Z is a group of sub- formula (II)
>
> 
>
>
> where n is an integer of from 1 to 10, suitably from 1 to 3, each R^7 and R^β is independently selected from hydrogen, alkyl or haloalkyl.
>
> Suitably R^1, R^2, R^3, R^4, R^5, and R^6 are haloalkyl such as fluoroalkyl, or hydrogen. In particular they are all hydrogen.
>
> Suitably the compound of formula (I) contains at least one haloalkyl group, preferably a perhaloalkyl group. This allows the formation oil repellent as well as water repellent coatings. This group is suitably located as a group R^7 or R^8 within the bridging group Z.

Thus particular examples of compounds of formula (I) include the following:



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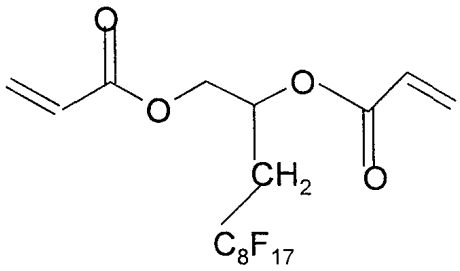
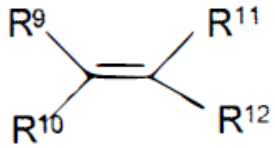


B

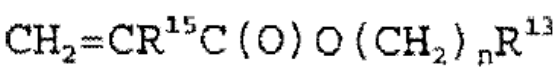
(Ex. 1005 at 5:18–6:20.) Thus, rather than suggesting to a POSA that any bridging group Z known in the polymer art could be used, Badyal teaches that the suitable Z groups are known, and provides detailed guidance regarding the identity of those suitable bridging groups.

None of the bridging groups Z actually disclosed in Badyal correspond to the linker moiety "L" of the crosslinker reagents claimed in the '876 patent. (Ex. 2001 ¶ 62.) Of the only two specific examples of compounds A and B which satisfy formula (I), neither include the linking groups claimed in the '876 patent. (*Id.*) Petitioner's expert, Dr. Gleason, does not argue to the contrary. Accordingly, Badyal does not disclose that the crosslinking compound includes any of the linker moieties claimed in the '876 patent. (*Id.*)

Badyal describes other monomeric compounds that may be used in combination with the disclosed crosslinking compounds to form the coating, including compounds having the following general formula:



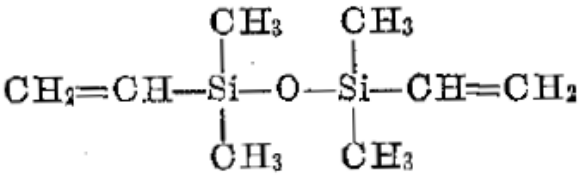
(Ex. 1005 at 7:17–32.) Badyal describes that, in one embodiment, the other monomeric compound may be have the following formula:



where R^{13} is an alkyl or haloalkyl group and R^{15} is a hydrogen or $C_{1\text{-}6}$ alkyl, such as methyl. (*Id.* at 7:26–27, 9:10–16.) Badyal describes that R^{13} is preferably a perfluoroalkyl group of formula C_sF_{2s+1} where s is an integer. (*Id.* at 8:15–18.) When R^{13} is a perfluoroalkyl group of formula C_sF_{2s+1} where s is 8 and R^{15} is a hydrogen, the monomeric compound is 1H, 1H, 2H, 2H-heptadecafluorodecyl acrylate, otherwise known as PFAC8. (Ex. 2001 ¶ 63.)

3. Cohen

Cohen issued as a U.S. patent in 1955 and relates to a then-new monomer divinyltetramethyldisiloxane (DVTMDS or disiloxane) and polymerization products produced therewith. (Ex. 1006 at 1:15–20.) Cohen describes DVTMDS as having the formula:



(*Id.* at 1:27–30.)

Cohen has nothing to do with plasma polymerization processes to form protective coatings for electronic devices. It discloses how to formulate DVTMDS, as well as conventional polymerization processes to form copolymers using DVTMDS. (*Id.* at 1:34–44.) Cohen explains:

> For example, the disiloxane with the other copolymerizable material may be dissolved in a suitable inert solvent, for example, an aromatic hydrocarbon solvent (such as benzene, toluene, xylene, etc.) and polymerization of the mixture effected. Another method which may be employed in preparing copolymers the instant claimed invention includes the preparation of an intimate mixture of the monomeric materials by preparing suspensions or emulsions of the disiloxane and the copolymerizable material in a liquid medium as, for example, water.

(*Id.*, *see also* Examples 1 and 2 at 2:70–3:50.) As this passage reflects, Cohen focuses on effecting polymerization in an inert solvent or in an emulsion.

Cohen fails to describe the use of DVTMDS with the specific monomers recited in claim 1 of the '876 patent. (Ex. 2001 ¶ 66.) Indeed, Cohen does not disclose the use of DVTMDS in a plasma polymerization process at all. Nor is Cohen directed to forming protective cross-linked polymeric coatings, whether for an

electronic device or on any other substrate. Cohen discloses instead that copolymers made using DVTMDS may be used as a dielectric material in a capacitor, as well as a cable or electrical coil impregnant, or as a filling compound in potheads and cable joints. (Ex. 1006 at 5:1–21.)

4. Holliday

Holliday is also not pertinent to forming protective coatings in a plasma deposition reactor. This reference relates to curable insulating compositions for "dip coating electrical connectors and other conductors." (Ex. 1007 at 1:12–15, 1:23–25, 2:16-21, 2:60–64.) In particular, Holliday describes that the compositions are suitable for insulating underground secondary bus connectors used in the utility industry. (*Id*. at 1:52–2:35.) Holliday's teachings are directed to solving problems associated with liquid polymer compositions for dip coating those types of devices, and not to methods of providing improved plasma deposition processes or nano-scale protective coatings.

Holliday describes various disadvantages with previously known molded, pre-shaped rubber insulating boots and sleeves, plastisol coatings, and thermosetting resin coatings for electrical connectors. (*Id*. at 1:26–51.) For example, molded insulations were expensive and lacked versatility, and plastisol coatings lacked sufficient electrical and heat distortion properties. (*Id.* 1:63–2:16.) To overcome

such disadvantages, Holliday invented a curable composition of polyolefin, polyvinylchloride and a reactive allylic or vinylic monomer. (*Id.* at 2:39–42.)

Holliday discloses that crosslinking allylic or vinylic monomers are employed in these dip coating compositions. (*Id.* at 3:21–54.) Among a list of 52 possible monomers, Holliday includes diallyl-1,4,-cyclohexanedicarboxylate ("DCHD") a suitable allylic monomer and 1,4-divinyl-oxybutane (also known as 1,4,-butanediol divinyl ether or BDVE) as a suitable vinylic monomer. (*Id.* at 3:34–35, 3:52–53.) The composition is created by "forming an intimate admixture of the polymeric components and the reactive monomer." (*Id.* at 2:47–50.) A typical curing agent is a high temperature decomposing peroxide. (*Id*. at 2:50–52.) After the liquid composition is applied to a surface of an object, the coating is cured to form a crosslinked insulation layer. (*Id.* at 2:60–68.) The curing step requires heating the coated object to a high temperature, such as about 175 ºC for 25 minutes. (*Id.* at 6:31–34.) Alternatively, the coating is cured using irradiation techniques. (*Id.* at 2:68–70.)

Holliday bears no relation to plasma polymerization processes, let alone to plasma polymerization processes used to form protective coatings, whether for electronic devices or otherwise. Further, Holliday fails to describe the use of DCHD or BDVE in combination with the specific monomers recited in claim 1 of the '876 patent. (Ex. 2001 ¶ 70.)

5. Padiyath

Padiyath is entitled "Moisture Barrier Coatings" and relates to multi-layer barrier assemblies for the protection of moisture or oxygen sensitive articles, and particularly organic light emitting diode devices (OLEDs). (Ex. 1008 ¶¶ 2, 5.) The barrier assemblies include alternating diamond-like glass (DLG) layers and polymer layers, which may be crosslinked. (*Id.* ¶¶ 25, 30, 52.) Padiyath discloses two long lists of possible preferred and alternative monomers that can be used to form its polymer layers. (*Id.* ¶¶ 52, 54.) Buried within the list of alternative monomers is cyclohexane dimethanol diacrylate esters. (*Id.* ¶ 54.)

Unlike the claims of the '876 patent, Padiyath does not relate to a plasma deposition process that allows the formation of a protective cross-linked polymeric coating on a surface. Padiyath discloses forming polymer layers used in a multi-layer stack of the barrier assemblies by "crosslinking the layer to form the polymer in situ, e.g., by flash evaporation and vapor deposition of a radiation crosslinkable monomer, followed by crosslinking using, for example, an electron beam apparatus, UV light source, electrical discharge apparatus or other suitable device." (Ex. 1008 ¶ 61.) Padiyath states that plasma polymerization may be employed only "if it will provide a polymeric layer having a glassy state at an elevated temperature, with a glass transition temperature greater than or equal to that of HSPET." (*Id*. ¶ 54.) Padiyath describes that "[m]ost preferably, the polymer layers are formed by flash

evaporation and vapor depositing *followed by* crosslinking in situ . . ." (*Id.* ¶ 61 (emphasis added).)

Padiyath fails to disclose use of the cyclohexane dimethanol diacrylate esters as a crosslinking reagent with the specific monomers claimed in the '876 patent. It also fails to suggest that the dimethanol diacrylate esters would provide a polymeric layer satisfying the explicitly disclosed criteria for layers applied via a plasma (i.e., glass transition temperature greater than or equal to that of HSPET), alone or in combination with another monomer. (Ex. 2001 ¶ 74.)

6. Francesch

Francesch is an article entitled "Fabrication of Bioactive Surfaces by Plasma Polymerization Techniques Using a Novel Acrylate-Derived Monomer." As the title suggests, Francesch relates to the fabrication of bioactive surfaces using a new monomer, pentafluorophenyl methacrylate (PFM), synthesized by the authors. (Ex. 1009 at 605.) The resulting coatings "leave the labile pentafluorophenyl group on the surface, enabling a rapid reaction with an amino-terminated biotin ligand and allowing layer-by-layer self-assembly of biotin-streptavidin." (*Id.*) Francesch describes that the novel PFM monomer can be deposited alone or can be copolymerized with 1,7-octadiene or 1,4-butanediol divinyl ether (BDVE) as crosslinkers to form the bioactive surface. (*Id.* at 606.)

Such bioactive surfaces have application in tissue engineering and bear no relation to protective coatings for electronic devices. (*Id.* at 605, 610–11; Ex. 2001 ¶ 76.) Francesch also does not disclose or suggest the use of BDVE with the specific monomers claimed in the '876 patent. (Ex. 2001 ¶ 76.) Contrary to Petitioner's assertion, one of skill in the art would not look to Francesch to improve a protective coating or plasma coating process for an electronic device. (*Id.* ¶ 77.)

7. Tropsch

Tropsch is entitled "Preparation of Polymers Comprising Peroxycarboxyl Groups." (Ex. 1011 at 1:4–7.) The objective of Tropsch's work is to "provide a process for preparing polymers comprising peroxycarboxyl groups by reacting polymers comprising monoolefinically unsaturated dicarboxylic anhydride basic building blocks with hydrogen peroxide . . ." (*Id.* at 1:26–33.) The disclosed preparation process is a wet method. (*Id.* at 5:6–22.) Tropsch discloses that the polymers prepared using the disclosed process can be used in a wide range of applications, including as bleaches, disinfectants, and cleaners, and as an ingredient in a variety of products such as acne remedies, tooth bleaches, and cuticle softeners. (*Id.* at 5:60–6:21.) Tropsch describes that the polymers can be crosslinked using "any suitable crosslinker[]" and mentions numerous classes and dozens of specific examples, including 1,6-hexanediol divinyl ether. (*Id.* at 3:47–54, 4:34–39.)

Tropsch is not relevant to plasma polymerization or plasma-derived protective coatings. (Ex. 2001 ¶ 79.) Tropsch does not disclose or suggest using 1,6-hexanediol divinyl ether in a plasma polymerization process, that this compound is suitable as a crosslinking reagent for forming plasma-derived protective polymer coatings, or that it should be used with the specific monomer structures specified in claim 1 of the '876 patent.

C. Level of Ordinary Skill

Petitioner contends that a person of ordinary skill in the art ("POSA") at the time of the priority date of the '876 patent would have had at least a bachelor's degree in a field such as chemistry, physics, or chemical engineering, as well as at least two years of experience with plasma-polymerization techniques. (Pet. at 18.) P2i does no dispute this characterization of the level of ordinary skill in the art for the purpose of this Preliminary Response, with the understanding that "experience with plasma-polymerization techniques" includes plasma-enhanced chemical vapor deposition (PECVD) techniques. (Ex. 2001 ¶ 20; Ex. 1002 ¶ 12, equating PECVD with plasma polymerization.)

Notably, such person of ordinary skill, having only a bachelor's degree and two years of experience in the relevant field, would not have the level of knowledge and insights that Dr. Gleason assumes when attempting to fill the gaps between the disparate teachings of the asserted prior art references. (Ex. 2001 ¶¶ 35, 36.)

III. CLAIM CONSTRUCTION

Petitioner contends that the term "halogen" in claim 1 includes at least fluorine, chlorine, and bromine. P2i does not dispute this construction.

The Petition assumes that the preamble of claim 1 – "an electronic or electrical device or electronic or electrical component thereof" – is a claim limitation. P2i agrees that the preamble is limiting. A preamble limits the invention if it recites essential structure or steps, or if it is "necessary to give life, meaning, and vitality" to the claim. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999). Dependence on a preamble phrase for antecedent basis indicates a reliance on both the preamble and claim body to define the claimed invention. *Bell Commc'ns Research, Inc. v. Vitalink Commc'ns Corp.*, 55 F.3d 615, 620 (Fed. Cir. 1995).

The preamble of claim 1 is necessary to give meaning to what the claimed invention is, i.e., an electronic/electrical device or electronic/electrical component. Furthermore, the body of the claim refers to forming a coating "on a surface of said device or component" and relies on the preamble for antecedent basis of that device or component. *See Pacing Technologies, LLC v. Garmin Intern., Inc.*, 778 F.3d 1021, 1024 (Fed. Cir. 2015) ("Because the preamble terms "user" and "repetitive motion pacing system" provide antecedent basis for and are necessary to understand positive limitations in the body of the claims in the '843 patent, we hold that the

preamble to claim 25 is limiting."). Accordingly, the preamble of claim 1 limits the claims to an electronic/electrical device or component.

IV. LEGAL STANDARDS

In an *inter partes* review, the petitioner bears the burden to prove unpatentability of the claims of the patent-at-issue by a preponderance of the evidence. 35 U.S.C. § 316(e); *Aqua Products v. Matal*, 872 F.3d 1290, 1303 (Fed. Cir. 2017) (en banc).

Under 35 U.S.C. § 103, Petitioner must prove that the claimed subject matter would have been obvious to a POSA at the time of the invention. *KSR*, 550 U.S. at 406. A complete analysis requires that the Board determine (1) the scope and content of the prior art; (2) differences between the prior art and the claims; (3) the level of ordinary skill in the art; and (4) relevant objective indicia of nonobviousness (also known as secondary considerations). *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17 (1966). Importantly, the obviousness inquiry must be undertaken without any "hint of hindsight." *Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 655 F.3d 1364, 1375 (Fed. Cir. 2011).

An invention "composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *KSR*, 550 U.S. at 418. Moreover, Petitioner is required to show, but does not, that its disparate references would have suggested to a POSA that they should make the

claimed invention and that they would have a reasonable expectation of success in doing so. *In re NuVasive, Inc.*, 842 F.3d 1376, 1381–82 (Fed. Cir. 2016); *Intri-Plex Techs., Inc. v. Saint-Gobain Performance Plastics Rencol Ltd.*, IPR2014-00309, Paper 83 at 19 (PTAB Mar. 23, 2014).

It is not enough to show that multiple references could be combined. Petitioner must show, but does not, that a POSA would have been motivated to pick out the asserted multiple references and combine them in the way the claimed invention does. *Personal Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993–94 (Fed. Cir. 2017); *Ariosa Diagnostics v. Verinata Health, Inc.*, IPR2013-00276, Paper 64 at 17–18 (PTAB Aug. 15, 2016).

Petitioner must support its obviousness contentions with articulated reasoning and based on rational, factual underpinnings; conclusory statements of obviousness will not suffice. *KSR*, 550 U.S. at 418; *In re NuVasive*, 842 F.3d at 1382–83. Similarly, any expert testimony must explain in detail how specific references could be combined, which combinations of elements in specific references would yield a predictable result, and how any specific combination would operate or read on the asserted claims. *Activevideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012); *Ariosa*, IPR2013-00276, Paper 64 at 20.

V. THE PETITION FAILS TO ADEQUATELY EXPLAIN THE SUPPORTING EVIDENCE AND ASSERTS EXCESSIVE REDUNDANT GROUNDS THAT WARRANT DENIAL OF INSTITUTION

Trial should not be instituted because the Petition chronically fails to explain the significance of the evidence and frequently incorporates by reference the Gleason declaration, which suffers the same defects as the Petition. A petition for *inter partes* review must "identif[y], in writing and with particularity, each claim challenged, the grounds on which the challenge to each claim is based, and the evidence that supports the grounds for the challenge to each claim." 35 U.S.C. § 312(a)(3). According to 37 C.F.R. § 42.104(b)(5), the petition must "identify[] specific portions of the evidence that supports the challenge." Further, 37 C.F.R. § 42.22(a)(2) states that the petition must include "[a] full statement of the reasons for the relief requested, including a detailed explanation of the significant of the evidence including material facts, and the governing laws, rules, and precedent." The Petition should be rejected because it fails to satisfy each of these requirements.

The Petition makes numerous conclusory assertions that cite to numerous references, or to the Gleason declaration, without sufficient explanation. As but one example of this objectionable tactic, the Petition states: "A POSA also would have known that DVTMDS was compatible with various polymerization methods, including plasma polymerization. Ex. 1002 ¶ 132; see e.g., Ex. 1006 1:31-34; Ex. 1017 Abstract, 4:1-30; Ex. 1033 at [0040-43]." (Pet. at 37.) Turning to the cited

paragraph of Dr. Gleason's declaration, Dr. Gleason makes the same conclusory statement followed by a string citation to unexplained references: "DVTMDS was known to be compatible with various polymerization techniques, including plasma polymerization. Ex. 1006 at 1:32-62; Ex. 1017 at Abstract, 3:40-4:24; Ex. 1027 at 1:5-11, 8:30-35; Ex. 1033 at [0037-45]; Ex. 1036 at 3-6." (Ex. 1002 ¶ 132.) As another example, the Petition states: "Badyal would have motivated the POSA to improve the Coulson-122 coatings by adding a crosslinking reagent during plasma polymerization because Badyal taught—and a POSA would have known—that crosslinked polymer coatings typically exhibited improved durability, barrier properties, smoothness, and solvent resistance." (Pet. at 34–35, citing "Ex. 1005 1:31-2:1, 4:1-29; Ex. 1006 3:51-65; Ex. 1002 ¶¶ 129-131.")

In making such conclusory assertions without providing any explanation of how the cited evidence supports the assertions, Favored fails to make its arguments accessible and forces the Board and P2i to "play archeologist with the record." *See Cisco Systems, Inc. v. C-Cation Technologies, LLC*, IPR2014-00454, Paper 12 at 10 (PTAB Aug. 29, 2014) (*citing DeSilva v. DiLeonardi*, 181 F.3d 865, 866–67 (7th Cir. 1999)). The Petition's conclusory analysis with unexplained citations fails to identify with particularity the significance of supporting evidence for its challenge as required under 35 U.S.C. § 312(a)(3), 37 C.F.R. § 42.104(b)(5), and 37 C.F.R. § 42.22(a)(2).

The examples above and others show that the Petition is also rife with improper incorporation of arguments and evidence from the Gleason Declaration. (*See, e.g.*, Pet. at 71: "Similarly, crosslinkers in the asserted grounds were also known to produce coatings with those properties. Ex. 1002 ¶¶ 132, 151, 153, 165, 171-172, 184, 197, 209.") 37 C.F.R. § 42.6(a)(3) prohibits arguments from being incorporated by reference from one document to another in an IPR proceeding. *See Cisco Systems, Inc.*, IPR2014-00454, Paper 12 at 10 (refusing to consider arguments not made in petition but incorporated by reference from expert's declaration). Such unsupported arguments and unexplained evidence amount to improper incorporation by reference and should be disregarded by the Board.

Accordingly, the Board should deny institution. *See Apple, Inc. v. ContentGuard Holdings, Inc.*, IPR2015-00440, Paper 11 at 10 (PTAB July 13, 2015) (denying institution for failing to provide sufficient detailed explanation of the significance of citations as required under 35 U.S.C. § 312(a)(3), 37 C.F.R. § 42.104(b)(5), and 37 C.F.R. § 42.22(a)(2)).

The Petition's problems with particularity and incorporation by reference are exacerbated by (or are the result of) the excessive redundant grounds asserted in the Petition. Because of the requirement to institute trial on all grounds and claims asserted in a petition, "the Board may consider whether a lack of particularity as to one or more of the asserted grounds justifies denial of an entire Petition." *Adaptics*

Ltd. v. Perfect Company, IPR2018-01596, Paper 20 at 17 (PTAB Mar. 6, 2019). Here, in addition to lacking sufficient particularity, the Petition includes five redundant grounds, each of which significantly overlaps the others. (Pet. at 4:2–10.) Petitioner fails to provide any explanation justifying the need to present numerous alternative grounds. *Adaptics*, IPR2018-01596, Paper 20 at 21–22 (denying institution of trial due to voluminous grounds, noting "Petitioner fails to explain why it needs to assert so many grounds and references to show unpatentability" and that "[t]he number of asserted grounds and references is disproportionately large when compared with the number of distinct challenged claims."). In the interests of efficient administration of the Office and integrity of the patent system, the Board should exercise its discretion under 35 U.S.C. § 314(a) and deny institution. *Adaptics*, IPR2018-01596, Paper 20 at 3 (denying institution of trial due to voluminous and excessive grounds, noting "[e]ven when a petitioner demonstrates a reasonable likelihood as to at least one claim, however, institution of an IPR remains discretionary.").

VI. THE PETITION FAILS TO ESTABLISH A REASONABLE LIKELIHOOD THAT AT LEAST ONE CLAIM IS OBVIOUS

The asserted grounds also fail on the merits. In order to show a reasonable likelihood that claim 1 of the '876 patent is obvious in view of the prior art, Petitioner must show that one skilled in the art 1) would have been motivated to use the proposed combination of prior art references to 2) predictably achieve the claimed

invention. *Activevideo*, 694 F.3d at 1312. As discussed below, Petitioner fails to make such a showing.

The Petition does not cite any prior art demonstrating that it was known to form a protective cross-linked polymeric coating on an electronic device or component by exposing the device to a plasma comprising one of the recited crosslinker reagents in combination with one of the recited monomer compounds. Neither Coulson nor Badyal disclose electronic devices coated by such a process. Petitioner does not contend otherwise.

Petitioner attempts to plug this fatal gap in its primary references by resorting to a hodgepodge of secondary references, none of which is directed to a similar plasma deposition process or is even pertinent to the particular problems with plasma deposition coatings for electronics solved by the invention of the '876 patent. According to Petitioner, those non-analogous secondary references would have motivated a POSA to select a crosslinker from the recited species to combine with PFAC8 or PFMAC8 in a plasma because Badyal supposedly teaches that any crosslinker known in the polymer art should be used. (Ex. 1002 ¶ 53.) However, a POSA would have read and considered Badyal's entire disclosure, not just the one sentence that Petitioner presents out of context to distort its meaning, and would have concluded from the reference as a whole that Badyal focuses on a particular species of crosslinkers that is not the species recited in claim 1.

Petitioner starts with Coulson-122, which describes an electrical device having a plasma polymerized coating. (Pet. at 26:8–11; Ex. 1004 at 3:20–26.) Although Coulson-122 discloses that the monomer PFAC8 or PFMAC8 may be used (Ex. 1004 at 12:14–22), which are among the monomers recited in claim 1, Coulson-122 does not disclose or suggest using a crosslinker or that a crosslinker would provide any benefit. Coulson-122, of course, provides no data or other information pertinent to the subsequent unexpected discovery in the '876 patent that tack and smudge-free, water repellant coatings of suitable electrical resistance for electronic devices could be produced by supplementing PFAC8 or PFMAC8 plasmas with one of the specifically recited crosslinker reagents.

For the use of a crosslinker in a PFAC8 or PFMAC8 monomer plasma, Petitioner looks to Badyal, which focuses on plasma polymerized coatings for fabrics. (Pet. at 27:5–15; Ex. 1005 at 9:1–19.) Badyal also alludes generally to coating surfaces other than fabrics but lacks any suggestion or showing that his process would form cross-linked protective polymeric coatings suitable for electronic devices. Moreover, Badyal fails to disclose any of the crosslinkers claimed in the '876 patent. In particular, the crosslinker of Badyal lacks the linker moiety L required in the claimed crosslinking reagent. (Ex. 2001 ¶ 62.)

With Coulson-122 and Badyal each failing to disclose or suggest the claimed subject matter, Petitioner looks to the five additional secondary references—Cohen,

Holliday, Padiyath, Francesch, and Tropsch—for the crosslinker reagents recited in claim 1 of the '876 patent. (Pet. at 25:15–21, 42:10–44:6, 52:5–54:3, 57:6–59:1, 64:1–65:7.) Petitioner picks and chooses various crosslinkers buried in these secondary references to piece together the claimed combination of monomer compound and crosslinking reagent. Three of the secondary references are not even related to plasma polymerization. None of them disclose use of the claimed monomer with the claimed crosslinking reagent. (Ex. 2001 ¶¶ 66, 70, 74, 76, 79.)

Petitioner thus impermissibly uses claim 1 of the '876 patent as a roadmap to incorporate a general class crosslinkers useful for Badyal's fabric coating process into the electronics coating process of Coulson-122, and then to select the claimed crosslinking reagents from the disparate secondary references to arrive at the claimed crosslinking reagent.

These and other flaws in Petitioner's evidence and arguments are addressed further below.

A. All Grounds: A POSA Would Not Have Been Motivated to Incorporate the Crosslinkers of Badyal Into the Coating of Coulson-122

Coulson-122 does not disclose a crosslinker; for this Petitioner relies on Badyal. Petitioner asserts that a POSA would have been motivated to combine the teachings of Coulson-122 and Badyal on a path towards the claimed invention. (Pet.

at 34:8–36:10.) However, Petitioner fails to provide a sufficient motivation for a POSA to incorporate a crosslinker into the coating of Coulson-122.

Coulson-122 is directed primarily to coating electronic devices, such as microphones, to protect the devices from liquid damage. (Ex. 1004 at 1:3–7, 6:1–17.) Badyal focuses on the different application of coating fabrics (Ex. 1005 at Abstract, 1:14–15, 9:30–32, 11:22–24). Badyal never refers to electronic devices or electronic components. Thus, a POSA interested in improving Coulson-122's method of coating electronic devices would not find useful guidance in Badyal. (Ex. 2001 ¶ 81.)

Petitioner emphasizes that Badyal mentions that his process could be used to coat "any solid substrate, such as fabric, metal, glass, ceramics, paper or polymer." (Pet. at 35; Ex. 1005 at 9:28–34.) It is only with the benefit of hindsight that Petitioner equates this generic comment, or the equally vague mention of "biomedical devices" (Ex. 1005 at 11:22–24) to solid surfaces of electronics. A POSA reviewing Badyal at the time of the invention of the '876 patent, but without the benefit of the '876 patent disclosure, would not have discerned that Badyal was referring to electronics or that the inclusion of a crosslinker in a PFAC8/PFMAC8 plasma could improve the characteristics of protective coatings required for particular applications to electronic devices. (Ex. 2001 ¶ 59.)

Coulson-122 focuses on a particular problem that arises for electronic devices that reproduce sound via transducers, such as microphones. (Ex. 1004 at 2:1–3.) Such devices are very susceptible to liquid damage as liquid exposure may impact operability of the transducer and sound quality. (Ex. 1004 at 2:3–12.) Coulson-122 emphasizes that a main benefit of the coatings disclosed therein is their ability to protect a microphone "from liquid contamination without any loss of sound quality." (*Id.* at 6:2–7.)

By contrast, Badyal is concerned with producing oil and water repellent coatings for protecting a fabric. (Ex. 1005 at 1:14–19, 1:25–2:8, 2:31–3:2, 4:26–29, 9:28–34, 10:1–6, 11:22–24.) The particular fabrics of interest include those for outdoor, sportswear, leisure wear, and military applications. (*Id.* at 1:14–19.) Badyal's primary objective is to improve the durability of such fabric surfaces without affecting the fabric's air permeability—a coating must be able to form durable bonds with the fabric, for example, to withstand washing. (*Id*. at 1:25–34, 4:26–29.)

A POSA would recognize that a plasma coating optimized for treating fabric may not be suitable for coating an electronic device, especially given the differences between these two disparate applications. (Ex. 2001 ¶¶ 59, 81.) In particular, as Coulson-122 confirms, electronic devices "are very sensitive to damage caused by liquids." (Ex. 1004 at 1:10–11.) For example, Coulson-122 recognizes that

"[c]ontact with liquids either in the course of normal use or as a result of accidental exposure, can lead to short circuiting between the electronic components, and irreparable damage to circuit boards, electronic chips etc." (*Id*. at 1:11–15.)

Coulson-122 specifically teaches that the properties of plasma synthesized coatings "can depend upon the nature of the substrate as well as the monomer used and conditions under which it is deposited." (*Id*. at 3:9–12.) Rather than incorporating a separate crosslinker, Coulson-122 focus on factors such as the ratio of monomer vapour to carrier gas (*id*. 7:25–30), surface pretreatment steps (*id*. at 8:11–18), and applied reactor power (*id*. 9:15–10:15) to achieve the desired coating properties. A POSA would not have been motivated to consult a reference focused on coating fabrics for additional guidance about how to satisfy the rigorous protective requirements for electronic devices. (Ex. 2001 ¶¶ 59, 81.)

Petitioner argues that a POSA would have been motivated to combine Coulson-122 and Badyal to obtain protective coatings with "enhanced durability." (Pet. at 34:19–35:6.) However, a POSA would have been aware that crosslinked polymers tend to be more stiff and rigid compared to non-crosslinked polymers. (Ex. 2001 ¶ 82.) Such rigidity is not necessarily desirable for electronic devices. (*Id.*) For example, in Coulson-122 a key objective is to protect electronic devices while also not having an "adverse impact on sound quality." (Ex. 1004 at 2:11–12.) Increased

polymer rigidity caused by using a crosslinker may negatively impact sound quality, discouraging a POSA from incorporating a crosslinker. (Ex. 2001 ¶¶ 81, 82.)

Coulson-122 was published more than 7 years after Badyal. Despite overlapping inventors, Coulson-122 never suggests that Badyal's crosslinkers, or any crosslinker for that matter, would improve the coating characteristics required for electronic devices. A POSA would have been especially skeptical that the crosslinkers disclosed in Badyal could improve the process for coating electronics disclosed in Coulson-122 when Coulson-122 itself does not suggest this. (*Id.* ¶ 84.)

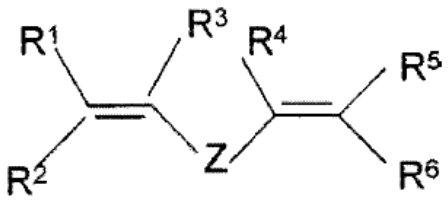
Such a person would have been led away from incorporating a crosslinker in the coating of Coulson-122 for additional reasons. For example, the increased rigidity resulting from adding a crosslinker may be undesirable for movable components, as movement could cause cracking which may compromise the coating. (*Id.* ¶ 83.) Additionally, Coulson-122 shows that a coating for electronics having oil- and water-repellant properties can be achieved without the need for a crosslinker. (Ex. 1004 at 4:29–5:6.) To achieve a more economical process, while carefully controlling the nature and amount of monomer used as taught by Coulson-122, a POSA would have been motivated to prepare a coating using fewer reagents and would not reach for additional, unnecessary reagents, especially considering such an addition could negatively impact sound quality. (Ex. 2001 ¶ 83.) Adding more reagents also increases the complexity of a plasma polymerization process and may

present additional challenges delivering multiple reactants uniformly. (*Id.*) If reactants are not delivered uniformly, the resulting polymer will lack uniformity and be non-conformal. (*Id.*)

Petitioner fails to take into account the differences between the type of coating addressed in Badyal and the type of coating in Coulson-122 and provides no persuasive reason why a POSA would have gone beyond the important process factors taught in Coulson-122 to add a crosslinker of the type disclosed in Badyal.

B. All Grounds: A POSA Would Not Have Been Motivated by Badyal to Include the Bridging Groups Petitioner Lifts From the Secondary References

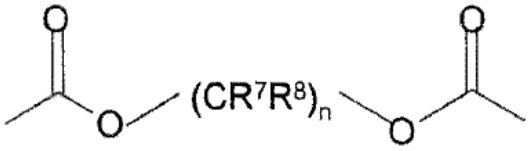
The Petition asserts that, within the generic crosslinker structure disclosed in Badyal's formula (I):



(Ex. 1005 at 4:31–5:5), "Badyal taught that 'suitable bridging groups Z' included 'those known in the polymer art'." (Pet. at 25:2–8, 31:5–7; Ex. 1005 at 5:18–19.) Dr. Gleason's declaration and the Petition repeatedly characterize Badyal in that manner while ignoring the surrounding context of the sentence upon which they rely. (*See* Pet. at 25:4–6, 31:5–7, 34:1–2, 39:1–3; Ex. 1002 ¶¶ 70, 125, 132, 192.) This is improper as a matter of law. In an obviousness analysis, prior art references must be

viewed as a whole and consideration must be given of aspects that diverge and teach away from the claimed invention. *Takeda Chem. Indus.,Ltd. v. Alphapharm Pty., Ltd.*, 492 F.3d 1350, 1358 (Fed. Cir. 2007); *W.L. Gore & Associates, Inc. v. Garlock,* 721 F.2d 1540, 1550 (Fed.Cir.1983).

Badyal's disclosure as a whole does not teach that the crosslinker may include any bridging group Z known in the polymer art as Petitioner contends. Badyal makes clear that suitable crosslinking compounds must be suitable for use in plasmas "which will yield cross-linked polymers having oil or water repellent properties." (Ex. 1005 at 4:17–21.) Badyal characterizes the "suitable bridging groups" as being "known in the polymer art" only in the context of disclosing more specifically the identity of those "suitable bridging groups." (*Id.* at 5:18–19.) Badyal first states that the suitable bridging groups include "optionally substituted alkyl groups which may be interposed with oxygen atoms," and preferably "one or more acyloxy or ester groups." (*Id*. at 5:20–26.) Badyal then provides the chemical formula (II) for a preferred species of suitable bridging groups:



where n is an integer of from 1 to 10, suitably from 1 to 3, each R1 and R' is independently selected from hydrogen, alkyl or haloalkyl.

(*Id.* at 5:26–6:3.) The reference also discloses example crosslinker compounds A and B derived from incorporating such bridging groups in to the crosslinker formula (I). (*Id*. at 6:15–6:20.) None of the preferred bridging groups Z result in a crosslinker reagent among the species of crosslinkers recited in claim 1. (Ex. 2001 ¶ 62.)

Accordingly, rather than teaching that any bridging group Z known in the polymer art generally could be used in the disclosed crosslinking compounds, Badyal discloses a specific species of bridging groups Z while confirming that those "suitable bridging groups Z" are known in the polymer art. Notably, both the Petition and Dr. Gleason's declaration are silent regarding the portions of Badyal stating that the suitable bridging groups are those structured according to formula (II).

Because a POSA would not read Badyal's disclosure as so expansive to include crosslinkers of formula (I) having any bridging group Z known in the polymer art, Badyal would not have motivated a POSA to select a bridging group from any of the unrelated secondary references—Cohen, Holliday, Padiyath, Francesch, and Tropsch—instead of a group described by Badyal's formula (II). (*Id.* ¶¶ 61, 85.)

Even if Badyal could be fairly read as teaching that the crosslinker can include any bridging group Z known in the polymer art generally, such a teaching still would not have motivated a POSA to select the claimed crosslinker reagents from the secondary references. A claim to directed to a chemical compound is not rendered

obvious where the prior art "does not teach a finite and limited class including [the claimed compound]." *See Shire LLC v. Amneal Pharmaceuticals, LLC*, 802 F.3d 1301, 1307–1308 (Fed. Cir. 2015) (claims were not obvious where prior art reference broadly taught a genus including thousands of possible compounds and thirty specific examples, none of which were the claimed compound). Like the reference in *Shire*, if Badyal describes the bridging group Z in a manner that is so expansive, then it fails to describe a meaningful preference that would have led a POSA to arrive at the particular structures for the linker moieties L in claim 1 of the '876 patent. Teaching such a broad class of bridging groups—not limited to a finite class—would not have provided a motivation to select bridging groups that satisfy the specific structures recited in claim 1 of the '876 patent.

Petitioner may not use the '876 patent specification as a roadmap to pick and choose favorable teachings from prior art references. *In re Wesslau*, 353 F.2d 238, 241 (CCPA 1965) (holding hindsight reconstruction impermissible and requiring that prior art references be considered in their entirety to fully appreciate what a reference suggests to a POSA). As the *Wesslau* court explained "[i]t is impermissible within the framework of section 103 to pick and choose from any one reference only as much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *Id.* That is exactly what Petitioner has done in selecting

bridging groups from the secondary references, to the exclusion of contrary teachings in Badyal.

C. Grounds 1, 2, 4 and 5 Fail For the Threshold Reason That They Rely on Non-Analogous Prior Art

Four of the asserted secondary references have nothing to do with plasma polymerized protective coatings or the problem the inventors of the '876 patent were trying to solve: creating improved plasma polymerized protective coatings for electronic devices. Accordingly, these references cannot be applied in an obviousness combination. Grounds 1, 2, 4 and 5 fail because they rely on non-analogous art.

In order for a prior art reference to be proper for use in an obviousness rejection under 35 U.S.C. § 103, the reference must be analogous art to the claimed invention. *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004); *MPEP* § 2141.01(A). A reference is analogous art to the claimed invention only if: (1) the reference is from the same field of endeavor as the claimed invention (even if it addresses a different problem); or (2) the reference is reasonably pertinent to the problem faced by the inventor (even if it is not in the same field of endeavor as the claimed invention). *Id*. In order for a reference to be "reasonably pertinent" to the problem, it must "logically[] have commended itself to an inventor's attention in considering his problem." *In re Icon Health and Fitness, Inc*., 496 F.3d 1374, 1379–80 (Fed. Cir. 2007) (quoting *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992)). The relevant problem

to consider is the problem faced by the inventor, as reflected—either explicitly or implicitly—in the specification. *In re Klein*, 647 F.3d 1343, 1348–51 (Fed. Cir. 2011).

1. Cohen is Non-analogous Art

The '876 patent's field of endeavor relates to plasma polymerized protective coatings. The specification and claims of the '876 patent confirm that the field of endeavor is plasma polymerized protective coatings.

The structure of the invention recited in claim 1 clearly requires an electronic device having a protective coating, obtained by exposing the device to a plasma. (Ex. 1001 at 18:26–36.) The Field of Invention in the '876 patent states "the present invention relates to protective coatings for electronic or electrical devices and components thereof, and methods for forming such coatings." (*Id.* at 1:5–13.) Each example in the '876 patent similarly involves plasma polymerized protective coatings. (*Id.* at 15:40–16:54, 16:58–17:19.) The descriptions of the inventive subject matter in the '876 patent clearly illustrate that the inventors' field of endeavor relates to plasma polymerized protective coatings.

The '876 patent explicitly describes the problems that the inventors were addressing: obtaining protective coatings that did not smear, were tack free, but also had sufficient protective qualities suitable for electronic devices, including hydrophobicity and/or electrical resistance. (*Id.* at 1:15–2:6.) The inventors of the

'876 patent were confronted with problems specific to plasma polymerization, and in particular in relation to known plasma derived coatings formed by PFAC8 and PFAC6. In particular, the problems described in the Background relate to the impact of power input to the *plasma* on the nature of the polymerized coating—a problem specific to plasma polymerization. (*Id.* at 1:20–21.) In plasma polymerized coatings, power of the plasma affects fragmentation the monomer, impacting properties of the coating such as water contact angle and resistance to smudging. (*Id.* at 1:20–33, 57–67.) At the end of the Background section, the '876 patent explicitly provides that "it is an aim to solve one or more of the above-mentioned problems with the prior art coatings." (*Id.* at 2:5–7.) The inventors of the '876 patent therefore expressly described the particular problems they faced, all which involved plasma polymerized protective coatings for electronic devices.

Cohen is far afield from the field of endeavor as the '876 patent. Cohen provides no information relevant to plasma polymerization or protective coatings obtained thereby. Cohen instead focuses on conventional polymerization reactions involving a particular disiloxane monomer (DVTMDS). (Ex. 1006. at 1:31–63.) Cohen aims to provide dielectric materials and filling compounds for use in devices such as capacitors and cable joints, not nanoscale protective coatings of the type relevant to the '876 patent. (*Id.* at 5:1–21.)

Cohen is also not reasonably pertinent to the problem faced by the inventors of the '876 patent—creating improved plasma polymerized protective coatings for electronic devices. Cohen does not explicitly describe any problem it is attempting to solve, but rather describes a new compound divinyltetramethydisiloxane, how it may be synthesized, and how it may be copolymerized with other compounds using conventional polymerization methods. (*Id.* Examples 1–5.) None of this has any relevance whatsoever to plasma polymerization or protective coatings for electronic devices formed by plasma polymerization. Thus, a POSA would not look to Cohen when faced with problems specific to improving protective coatings formed via plasma polymerization processes. (Ex. 2001 ¶¶ 65–67.)

Petitioner's assertion that a POSA would have been drawn to Cohen for guidance on which crosslinkers to use in a plasma deposition process of the type disclosed in Badyal or Coulson-122 is imbued with impermissible hindsight. The Federal Circuit has made clear, however, that the pertinence of the reference to the inventor's problem "must be recognizable with the foresight of a person of ordinary skill, not with hindsight of the inventor's successful achievement." *Airbus S.A.S. v. Firepass Corp.*, 941 F.3d 1374, 1382 (Fed. Cir. 2019) (citing *Sci. Plastic Prods, Inc. v. Biotage AB*, 766 F.3d 1355, 1359 (Fed. Cir. 2014) (citations omitted).

2. Holliday is Non-analogous Art

Holliday is also completely unrelated to plasma polymerized coatings for electronic devices. As discussed above, Holliday provides curable compositions which are applied to the surface of an object by dipping the object into the composition. (Ex. 1007 at 2:60–64.) After coating, the composition is subsequently cured to form a crosslinked layer. (*Id.* at 2:64–70.) This is an entirely different field than the plasma polymerization process relevant to the invention of the '876 patent. Holliday also is not pertinent to addressing challenges associated with controlling the tackiness, smear resistance, water resistance and electrical barrier properties of ultra-thin film plasma polymerized coatings for electronics. (Ex. 2001 ¶¶ 70–71.)

3. Francesch is Non-analogous Art

Francesch is also unrelated to plasma polymerized protective coatings for electronic devices. It relates to an entirely different field—plasma derived coatings for *bioactive surfaces*. (Ex. 1009 at 605–606, 610.) Francesch also would not have commended itself to the attention of a POSA considering the problem of creating improved hydrophobic and barrier coatings for electronic devices. Francesch addresses completely unrelated problems:

> Targeting materials to specific cells, designing materials that can sense biochemical signals and developing materials with improved biocompatibility remain challenges in biomaterials development. Significant effort remains in increasing the cell recognition and

> attractiveness of biomaterial surfaces. Modified materials stimulate cell adhesion, growth and proliferation, while maintaining the mechanical attributes of the bulk material.

(*Id*. at 605.)

The problems addressed in Francesch—targeting cells, sensing biochemical signals, biocompatibility—are narrowly tailored to surface characteristics of substrates for targeting cell adhesion rather than to characteristics for providing water resistant and barrier coatings for protecting electronic devices. For example, to provide a surface that binds bioactive molecules, Francesch focuses on parameters like the extent to which a surface effectively binds biotin. (*Id*. at 609–610.) Such properties are irrelevant to the problem addressed by the inventors of the '876 patent. A POSA would have no interest in a plasma process designed to provide bioactive surfaces when attempting to solve problems unique to providing improved hydrophobic and barrier coatings for electronic devices. (Ex. 2001 ¶¶ 76–77.)

4. Tropsch is Non-analogous Art

Tropsch is also not from the same field of endeavor as the '876 patent. Tropsch relates to "processes for preparing polymer comprising peroxylcarboxyl groups." (Ex. 1011 at 1:4–7.) Tropsch fails to describe plasma polymerization, coatings for electronic devices, coatings generally, or any properties suggesting its polymers would form protective coatings for electronic devices.

A POSA would certainly not consider Tropsch relevant to plasma polymerized coatings for electronic devices. (Ex. 2001 ¶ 79.) The laundry list of potential applications for the disclosed polymers confirms this:

> The polymers comprising peroxycarboxyl groups prepared according to the invention can be used in a wide range of applications, for example as bleaches, disinfectants, cleaners or for epoxidation. Applications both in the cosmetic and in the pharmaceutical Sectors are possible. Examples of Such applications are in the Sectors: acne remedies, tooth bleaches, or lightening of the teeth, nonaqueous toothpastes and tooth powders, cleaning of dentures and orthodontic appliances, foaming mouthwash tablets, hair removers (oxidizing depilatories), hair bleaches, bleaching of the skin, coupling agents in hair dyeing and production of permanent waves (alkali cold wave), Softening of cuticle, for example in foot care, incorporation in deep bed filter Systems, filled tamponades for Simultaneous absorption and disinfection, disinfecting wipes, disinfectants for medical instruments, Surface disinfection, water disinfection, vaginal Suppositories, non-aqueous ointments, for example polyethylene-based ointments, antibacterial lipsticks, wound dressings, wound powders, contact lens cleaning, cold wash tablets.

(Ex. 1011 at 5:61–6:13.)

The Petition entirely fails to explain how Tropsch has any relevance to plasma protective coating applications pertaining to electronic devices. Petitioner has not met its burden of demonstrating that a POSA would have considered Tropsch

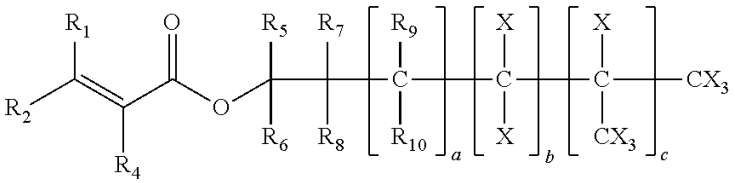
relevant to the problems that the inventors of the '876 patent faced—providing improved plasma polymerized coatings for electronic devices.

D. All Grounds Fail Because a POSA Would Not Have Been Motivated to Combine Coulson-122 and Badyal With the Asserted Secondary References

Even if any of the asserted secondary references are considered to be analogous art, a POSA would not have been motivated to combine any of them with Coulson-122 and Badyal. Petitioner acknowledges that the combination of Coulson-122 and Badyal alone fails to disclose a plasma deposition process utilizing a crosslinking reagent within the species recited in claim 1. (Pet. at 25:2–4.) Beyond failing to provide any persuasive rationale as to why a POSA would have been motivated to incorporate a crosslinker into the composition of Coulson-122, Petitioner has not shown that a POSA would have been motivated to select one of the specific crosslinker compounds disclosed in any of the asserted secondary references. Each of the asserted grounds should be rejected for this additional reason.

None of the secondary references describe the use of the claimed crosslinking reagents with any of the monomer compounds recited in claim 1 of the '876 patent, which are limited to compounds of formula I(a):

I(a)



> wherein each of R_1, R_2, R_4 and R_5 to R_{10} is independently selected from hydrogen or an optionally substituted C_1-C_6 branched or straight chain alkyl group; each X is independently hydrogen or halogen; a is from 0-10; b is from 3 to 7; and c is 0 or 1 . . .

(Ex. 1001 at 18:40–53.) Petitioner and Dr. Gleason are keen to emphasize that the PFAC8 and PFMAC8 monomers disclosed in Coulson-122 and Badyal meet this general formula. (Pet. at 15.) However, they have no answer to the fundamental question of why a POSA seeking to improve the characteristics of plasma coatings formed from those monomers would find motivation in references that are not directed to plasma process utilizing those specific monomers or any other monomers recited in claim 1.

In this regard, Dr. Gleason merely characterizes the crosslinkers disclosed in the secondary references as being compatible or usable with acrylate monomers. For example, Dr. Gleason asserts the following:

> In addition, a POSA would have known DVTMDS was compatible for co-polymerization with acrylate monomers . . . (Ex. 1002 ¶ 135 (discussing the combination of Coulson-122, Badyal, and Cohen).)

> Likewise, a POSA would have known that PFAC8 and PFMAC8 are acrylate-based monomers, and Holliday taught that DCHD and BDVE could be used to make polymer coatings in conjunction with acrylates or methacrylates. (*Id.* ¶ 153) (discussing the combination of Coulson-122, Badyal, and Holliday).)

> A POSA also would reasonably have expected that the diacrylate structure of CDMDA would successfully copolymerize with other compounds in the family of acrylate and methacrylate monomers, which includes PFAC8 and PFMAC8 to create protective coatings. (*Id.* ¶ 173) (discussing the combination of Coulson-122, Badyal, and Padiyath).)
>
> Because Francesch described using BDVE as a crosslinker to create plasma polymer coatings by co-polymerizing with a fluorinated methacrylate (PFM), a POSA would have understood that BDVE was suitable for copolymerizing with such monomers belonging to the family of acrylate and methacrylate by plasma polymerization. (*Id.* ¶ 183) (discussing the combination of Coulson-122, Badyal, and Francesch).)
>
> In addition, Tropsch taught that its crosslinkers, which included HDVE as preferred, could be polymerized with acrylates (Ex. 1011 at 3:1-10, 4:34-38), which would have supported a reasonable expectation that HDVE could successfully crosslink other acrylate and methacrylate monomers like PFAC8 and PFMAC8. (*Id.* ¶ 199) (discussing the combination of Coulson-122, Badyal, and Tropsch).)

However, the mere fact that crosslinkers in the secondary references perhaps *could* have been combined with the monomers of Coulson-122 and Badyal is insufficient to show that a POSA *would* have been motivated to make the combination. *See e.g., InTouch Technologies, Inc. v. VGO Communications, Inc.*, 751 F.3d 1327, 1353–54

(Fed. Cir. 2014) (evidence that references could have been combined insufficient to prove obviousness absent evidence demonstrating why one of skill in the art would have been motivated to combine the references); *see also Personal Web Techs.,* 848 F.3d at 993–94.

The Petition lacks any analysis directed to the relevant question of why a POSA would supposedly have been motivated to supplement the PFAC8 or PFMAC8 monomer plasmas disclosed in Badyal and Coulson-122 by addition of one of the crosslinker reagents disclosed in the secondary references. Unable to provide a rational underpinning to support such a theory, Petitioner and Dr. Gleason resort to characterizing Badyal as teaching that "crosslinkers for its plasma-based techniques could be any known in the entire 'polymer art,' without limiting consideration to reagents specific for plasma or any other type of polymerization." (Ex. 1002 ¶ 53.) As discussed above, Badyal's disclosure is far more specific, and, by mentioning that the preferred bridging groups of the suitable crosslinkers are known in the art, Badyal does not suggest that any crosslinker known in the art could be used. In reading Badyal, a POSA would not look to any crosslinker in the polymer art, but would select instead crosslinkers that conform to the disclosed formula (I) with a bridging group according to formula (II). (Ex. 2001 ¶ 85.) None of the secondary references disclose such a crosslinker. (*Id.*)

Cohen, Holliday, and Tropsch each fail to show that their crosslinkers would yield crosslinked polymers having oil or water repellant properties when used in plasmas. (*Id.* ¶¶ 86, 87, 90, 91.) Those references do not even relate to plasma polymerization. (*Id.* ¶ 91.)

The secondary references that actually do mention plasma processes—Padiyath and Francesch—would still not have provided a motivation to arrive at the specific combination of monomer compounds and crosslinking reagents claimed in the '876 patent. The manner in which crosslinking occurs in Padiyath is different than the manner in which crosslinking occurs in Badyal. Badyal describes exposing a surface "to a plasma comprising one or more organic monomeric compounds, at least one of which comprises two double bonds, so as to form a layer of cross-linked polymer on said surface." (Ex. 1005 at 4:4–9.) By contrast, Padiyath describes a two-step process in which (1) a polymer layer is formed and (2) the formed layer is then crosslinked. (Ex. 1008 at ¶ 61.) (describing that "[m]ost preferably, the polymer layers are formed by flash evaporation and vapor depositing *followed by* crosslinking in situ . . .") In fact, this process described in Padiyath leads away from applying the crosslinker in the plasma by teaching a preference for crosslinking in-situ after polymer layers have already been formed. (Ex. 2001 ¶ 89.)

Francesch does not relate to providing protective coatings for electronic devices. A POSA interested in providing improved plasma deposition hydrophobic

or barrier coatings for an electronic device would not have been motivated by Francesch's disclosure regarding bioactive surfaces that will bind certain biological molecules. (Ex. 1009 at 605–606, 610; Ex. 2001 ¶ 77.)

The Petition never explains why a POSA reviewing Badyal would have been motivated to ignore Badyal's recommendation to use a crosslinker of the formula (I) with a bridging group of formula (II), and to select instead a crosslinker disclosed only in a secondary reference unrelated to plasma-derived cross-linked protective coatings. There is no evidence demonstrating that a POSA would have done so.

E. All Grounds Fail Because a POSA Would Not Have Had a Reasonable Expectation of Success Combining the Asserted References

Each of the asserted grounds fails for the additional reason that a POSA would not have had a reasonable expectation of success in combining the particular crosslinkers that Petitioner lifts from the secondary references with the monomers of Coulson-122 and Badyal. In particular, there would have been no reasonable expectation that these crosslinkers and monomers would yield an improved protective coating when applied to an electronic device via a plasma polymerization process.

Cohen, Holliday, and Tropsch each fail to teach use of the claimed crosslinking reagent to produce a protective coating for an electronic device via a plasma polymerization process. Coulson-122 and Badyal discuss the effect of

various process conditions on plasma derived protective coatings, but do not address the potential effects of using a crosslinker of any of those secondary references. A POSA would know that combining a crosslinking reagent to another monomer in a conventional polymerization process will lead to a different result than combining the same compounds in a plasma polymerization process. (Ex. 2001 ¶ 41, 43–44.) Accordingly, a POSA would not have reasonably expected to succeed in combining the crosslinkers lifted from these references with the monomers described in Coulson-122 and Badyal to produce a suitable protective coating via a plasma polymerization process. (*Id.* ¶¶ 37, 91–93.)

Dr. Gleason asserts that "POSAs [] understood and expected that the same types of crosslinking reagents used for conventional polymerization would also work in plasma polymerization reactions." (Ex. 1002 at ¶ 53.) Dr. Gleason does not elaborate on what it means for a crosslinking reagent to "work" in such a plasma. She fails to address whether this would result in a coating having the properties desired for an electronic device when combined with monomers of Coulson-122 and Badyal. (Ex. 2001 ¶¶ 42, 43.)

Petitioner's assertion that crosslinkers used in conventional polymerization processes would have been reasonably expected to be effective in improving plasma polymerization processes for coating electronic devices is disproven by recognized authorities such as Yasuda, who counsels that one must "appreciate the uniqueness

of plasma polymerization" when developing an improved plasma polymerized protective coating. (Ex. 2002 at 2–3, 4–5, 166–7, 171.) In fact, as described by Yasuda, it was known that:

> To take full advantage of the new kinds of materials recognized as plasma polymers and of the process by which they are made, *it is important to recognize that we are not dealing with conventional polymers and polymerization in the strict sense*, although these terms are used. Therefore, considerable effort is spent comparing plasma polymerization with conventional polymerization. (*Id.* at 3)(emphasis added.)
>
> . . .
>
> Chemical reactions that occur under plasma conditions are generally very complex (2-4) and consequently are nonspecific in nature. Such reactions are of merit when special excited states of molecules are required as intermediate states and cannot be achieved, or can be achieved only with great difficulty, by conventional chemical reactions. Thus, *plasma polymerization should be recognized as a special means of preparing unique polymers that cannot be made by other methods rather than as a special way of polymerizing monomers.* (*Id.* at 4–5)(emphasis added.)

Dr. Gleason acknowledges that "resulting structural complexity distinguishes plasma polymerization from molecular polymerization techniques in which monomer molecules combine through chemical reactions to form relatively uniform chains or networks of repeating monomer units." (Ex. 1002 ¶ 36.) A POSA,

recognizing that the resulting coatings will be different, would not assume that a crosslinking reagent used in a non-plasma polymerization process would be effective to obtain an improved plasma-derived protective coating. (Ex. 2001 ¶¶ 42, 43.)

Even if the crosslinkers used in conventional polymerizations, such as those described in Cohen, Holliday, and Tropsch, would "work" in the claimed plasma process as Dr. Gleason assumes (Ex. 1002 ¶ 53), a POSA could not have predicted the characteristics of the resulting coating. (Ex. 2001 ¶¶ 43, 44.) The unpredictability of plasma deposition process and uncertainty regarding the structure of polymers produced by plasma polymerization processes was well-known. As Yasuda explains:

> In other words, in conventional polymerizations, molecules of monomers are linked together with a minimum alteration of chemical structure of the monomer and the structure of a polymer can be well predicted from the structure of the monomer. In contrast, the structure of a polymer formed by plasma polymerization cannot be predicted in this way.

(Ex. 2002 at 166.) Given the lack of predictability in structures formed via plasma polymerization, a POSA would not reasonably have expected to predict the structure or properties of plasma polymerized coatings based on the use a particular crosslinker in a conventional polymerization process. (Ex. 2001 ¶ 41.)

Petitioner has also not shown that a POSA would have combined the crosslinker of Padiyath with the monomers of Coulson-122 and Badyal with a reasonable expectation of success in producing a protective film suitable for an electronic device. Padiyath discloses a multilayer film including a crosslinked polymer layer. (Ex. 1008 ¶ 52.) Padiyath however does not describe the polymer layer as a barrier layer and, rather, refers to the layer as one layer in the multilayer stack of the barrier assembly. (*Id.* ¶ 51.) In fact, Padiyath teaches away from the invention of the '876 patent by stating that "multiple inorganic layers separated by polymer coatings are needed to achieve superior barrier performance." (*Id.* ¶ 3.) In reading Padiyath, a POSA would not have expected successful barrier properties from a single crosslinked polymer layer alone. (Ex. 2001 ¶ 88.) Further, Padiyath fails to teach use of the claimed monomer compound and crosslinking reagent together in its polymer layer. Petitioner has not shown that the crosslinker of Padiyath was known to be usable, with a reasonable expectation of success, to create a protective coating for an electronic device, let alone that it could be used with the claimed monomer do to so. (*Id*. ¶ 89.)

Petitioner also has not shown that a POSA would have been led to combine Francesch with Coulson-122 and Badyal with a reasonable expectation of success in producing a protective film for an electronic device. Francesch discloses the fabrication of bioactive surfaces using plasma polymerization using a crosslinker.

(Ex. 1009 at 605.) Francesch does not describe that the crosslinker could be used to obtain a protective coating for an electronic device. Rather Francesch focuses on properties such as the surfaces' ability to bind biological molecules. (*Id*. at 605, 610.) It does not discuss properties, such as water contact angle or resistance, which the '876 patent considers relevant to producing an effective protective coating for an electronic device. (Ex. 1001 at 3:55–4:35.) Francesch also fails to show use of the crosslinker with the claimed monomer compounds or that it could be used to obtain a suitable protective coating for an electronic device using those compounds. (Ex. 2001 ¶ 93.)

Thus, Petitioner has failed to show that a POSA would have had a reasonable expectation that adding a crosslinker selected from any of the secondary references to a PFAC8 or PFMAC8 plasma of Coulson-122 and Badyal would produce a plasma polymerized protective coating suitable for an electronic device.

VII. CONCLUSION

For the reasons described above, and because Petitioner has not shown a reasonable likelihood that any of the claims are unpatentable, the Board should deny institution.

Respectfully submitted,
FITCH EVEN TABIN & FLANNERY LLP

Dated: October 30, 2020

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CERTIFICATE OF WORD COUNT

The undersigned hereby confirms that the foregoing Preliminary Response complies with the type-volume limitation of 37 C.F.R. § 42.24(a). Excluding the items listed in 37 C.F.R. § 42.24(a) as not included in the word count, this Preliminary Response contains less than 14,000 words, calculated by the word-processing system used to prepare it.

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), the undersigned hereby certifies that a true copy of the foregoing PRELIMINARY RESPONSE was served this 30th day of October, 2020, by e-mail upon the following:

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