

U.S. Patent No. 11,224,864
Patent Owner's Preliminary Response
IPR2023-01063

Paper No. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

W.R. GRACE & CO.-CONN,
Petitioner

v.

COCHISE TECHNOLOGY, LLC
Patent Owner

Patent No. 11,224,864

Inter Partes Review No. IPR2023-01063

**PATENT OWNER'S PRELIMINARY RESPONSE TO PETITION FOR
INTER-PARTES REVIEW OF UNITED STATES PATENT 11,224,864
PURSUANT TO 37 C.F.R. § 42.107**

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Exhibit No.	Description
2001	Declaration of Everett Carpenter
2002	Sadeghbeigi, R. (2020). Fluid catalytic cracking handbook: An expert guide to the practical operation, design, and optimization of FCC units. Butterworth-Heinemann.
2003	Demmel, E. Effective Use of CO Promoter in Fluid Catalytic Cracking Operation. Intercat Corporation.
2004	Tang, Y. L., Mo, X., Allahverdi, Y., & Izakya D. (2012) High Resolution Electron Microscopy Study of Nano Structure in CO Emission Control Additives. Microscopy and Microanalysis, July 29-August 2, 2012, Phoneix, AZ.
2005	Luo, L., Rainer, D., & Gonzalez, J. A. (2007). Laboratory deactivation testing for the stability of FCC CO combustion promoters. Applied Catalysis B: Environmental, 72(3-4), 212-217.
2006	Muroi, T. (2012). Role of precious metal catalysts. Noble Metals, 301-334.
2007	Pinna, F. (1998). Supported metal catalysts preparation. Catalysis Today, 41(1-3), 129-137.
2008	Mojet, B. L., Miller, J. T., Ramaker, D. E., & Koningsberger, D. C. (1999). A new model describing the metal–support interaction in noble metal catalysts. Journal of catalysis, 186(2), 373-386.
2009	Argyle, M. D., & Bartholomew, C. H. (2015). Heterogeneous catalyst deactivation and regeneration: a review. Catalysts, 5(1), 145-269.
2010	Plaintiff G. W. Aru, LLC's Complaint for Patent Infringement against Defendant W.R. Grace & Co.-Conn, 22-cv-02636-JKB, Dkt. 1 (Oct.

Exhibit No.	Description
	13, 2022).
2011	Defendant W.R. Grace & Co.-Conn's Answer to Plaintiff's Complaint, 22-cv-02636-JKB, Dkt. 15 (Dec. 12, 2022).
2012	Scheduling and Discovery Order , 22-cv-02636-JKB, Dkt. 24 (Jan 26, 2023).
2013	Defendant W.R. Grace & Co.-Conn's Initial Disclosures of Preliminary Invalidity Contentions, 22-cv-02636-JKB, served May 13, 2023.
2014	Defendant W.R. Grace & Co.-Conn's Responsive Proposed Claim Construction Statement, 22-cv-02636-JKB, served July 13, 2023.
2015	Joint Claim Construction Statement, 22-cv-02636-JKB, Dkt. 72 (Aug 7, 2023).
2016	Docket Navigator, Time to Trial for Similar Patent Cases in Federal District of Maryland from Jan 1, 2013 through September 20, 2023 (Sep. 20, 2023).
2017	Tian, G., Xia, D., & Zhan, F. (2004). The oxidation of tetralin and its effect on the stability of fluidized catalytic cracked diesel. <i>Energy & fuels</i> , 18(1), 49-53.
2018	Ruckenstein, E., & Chu, Y. F. (1979). Redispersion of platinum crystallites supported on alumina—role of wetting. <i>Journal of Catalysis</i> , 59(1), 109-122.
2019	Van Santen, R. A. (2017). Chapter 3: Physcial Chemistry, Elementary Kinetics. <i>Modern heterogeneous catalysis: an introduction</i> . John Wiley & Sons.
2020	U.S. Courts, Suspending Jury Trials as Covid-19 Cases Surge (Nov. 20, 2020), https://www.uscourts.gov/news/2020/11/20/courts-suspending-jury-trials-covid-19-cases-surge

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2021	Standing Order 2020-20, United States District Court for the District of Maryland (Nov. 11, 2020), https://www.mdd.uscourts.gov/sites/mdd/files/2020-20.pdf
2022	United States District Court for the District of Maryland, Civil Cases by Nature of Suit. Cases Pending as of Saturday, December 31, 2022 (Jan. 20, 2023), https://www.mdd.uscourts.gov/sites/mdd/files/NOS_Report_2022.pdf
2023	U.S. Courts, U.S. District Courts—Combined Civil and Criminal Federal Court Management Statistics (Jun. 30, 2023), https://www.uscourts.gov/sites/default/files/data_tables/fcms_na_distprofile0630.2023.pdf

Cochise Technology, LLC ("Patent Owner") submits this preliminary response under 37 C.F.R. § 42.107 to the Petition for *Inter Partes* Review ("Petition") of U.S. Patent No. 11,224,864 ("the '864 patent"), filed by W.R. Grace & Co.-Conn ("Petitioner").

I. Introduction

Patent Owner respectfully requests that the Board deny institution. The Board should exercise its discretion to deny institution pursuant to 35 U.S.C. § 314(a) in light of co-pending litigation between Petitioner and Patent Owner in the District of Maryland involving the '864 patent. Claim construction will be fully briefed and argued in the District of Maryland before an institution decision by the Board. On balance, the factors set forth in the Board's precedential *Fintiv* decision weigh in favor of denying discretion.

Institution should also be denied because Petitioner has not demonstrated a reasonable likelihood of success of the merits. The state of the art, including Petitioner's own work, for CO to CO₂ combustion promoters ("CO promoters" hereafter) taught that such promoters should use a uniform distribution of Group VIII metals (GVIII metals) to maximize the total exposed surface of the GVIII metals. Petitioner completely ignored this. Instead, Petitioner picks and chooses from a myriad of references directed to different types of catalysts without

providing an adequate basis and motivation for any combination of elements being chosen. For example, Petitioner selects a reference, such as Miura, concedes that it discloses particle sizes on a different scale of magnitude than what is recited in the '864 claims, but simply asserts that a person of ordinary skill in the art ("POSITA") would have been aware of different sizes for catalyst particles.

Petitioner does not provide any explanation or motivation for a POSITA to change the size of the particles described in the prior art. Petitioner's basis for making such a change can only be explained by using the specification of the '864 patent as the basis for doing so. This failure is fatal to the Petition because time and again no reason is provided why a POSITA would combine these references. In Grounds 1 and 2 Petitioner also fails to show that Miura discloses a CO promoter comprising a particle having a GVIII metal distributed in the particle as an eggshell such that a higher concentration of GVIII metals is present in the outer region of the particle as compared to the concentration of GVIII metals in the center of the particle. For Ground 3, Petitioner also fails to show that Lin discloses a CO promoter comprising a particle having silica, alumina, or mixtures thereof; and GVIII metal distributed as an eggshell. For Ground 4, Petitioner also fails to show that Espinoza discloses a CO promoter comprising a porous particle.

II. Overview of the '864 Patent

The '864 patent is directed to novel carbon monoxide (CO to CO₂) combustion promoters that are used in a fluid catalytic cracking (FCC) unit. WRG-1001, 1:20-26. Unlike the prior art CO promoters where GVIII metals are uniformly dispersed throughout the porous metal oxide particles, the claimed invention goes in the opposite direction. The claims of the '864 patent require that GVIII metals are distributed in the porous particles as an eggshell such that a higher concentration of GVIII metal is present in the outer region of the particle as compared to the concentration of GVIII metal in the center of the particle. *Id.*, 2:19-33 (Typically 80-90% of GVIII metals). The inventors discovered that the claimed CO promoters have significant and surprising advantages over prior art CO promoters. WRG-1001, 2:63-3:37.

In FCC processes, fluidizable catalyst particles are contacted in a riser/reactor at high temperatures with hydrocarbons to crack higher boiling hydrocarbons to lower boiling hydrocarbons. *Id.*, 1:28-31. Catalytically active material does not get consumed during these reactions and catalyst is recycled in the process and reused. *Id.*, 1:31-39. However, during the cracking process, combustible spent solids (solid carbon called coke) accumulate on the catalysts and makes those particles less active by blocking the pores where the cracking

reactions are known to take place. *Id.*, 1:34-39. To regenerate the catalyst, the accumulated solids must be burned off. *Id.*, 1:34-39. This process takes place in a “regenerator” section of the FCC process in the presence of air, often enriched with extra oxygen, and at temperatures of over 700 °C. *Id.*, 1:34-46, 3:8-9.

Burning coke off the catalyst generates carbon monoxide which in turn is combusted to carbon dioxide in the presence of oxygen. *Id.*, 1:48-49. This reaction is very exothermic (it releases a lot of heat). *Id.*, 1:48-49. The burning of coke off the catalyst particles is thus done in a phase of the regenerator that has a high concentration of catalyst, known as the “dense phase,” so that the catalyst absorbs the heat released by the combustion reaction. *Id.*, 1:39-44. If carbon monoxide generated from the catalyst regeneration process is not completely combusted in the dense phase of the regenerator zone and instead enters the dilute phase of the regeneration zone (which has a lower concentration of catalyst), or is able to travel to downstream process units, when the carbon monoxide reacts with oxygen and releases heat (the reaction can take place without a combustion promoter), there is little catalyst to absorb it and the temperatures in these portions of the FCC operation increase. *Id.*, 1:46-53. This phenomenon is known as “carbon monoxide afterburning,” and it can cause damage to plant equipment. *Id.*, 1:46-53. CO promoters are added to FCC catalyst inventory to promote complete combustion of

CO to CO₂ in the regenerator dense phase and avoid afterburning. *Id.*, 1:53-57.

Additionally, the release of CO into the atmosphere is a regulated environmental pollutant which is reduced or avoided by the use of CO promoters.

Prior to the filing date of the '864 patent, the standard way to make CO promoters was to impregnate porous particles with one or more GVIII metals (*id.*, 1:62-64), so that the GVIII metal was distributed uniformly throughout the internal and external surfaces of the porous particle. *Id.*, 1:65-2:3. This uniform distribution of noble metals, such as platinum, is one of the requirements of an "ideal" promoter. Petitioner has admitted this requirement in their answer filed in the related District Court case, stating that "Grace admits that in conventional CO promoters the intended design is for noble metal to be distributed homogenously through the support particles." EX2011, ¶40.

Prior to the filing date of the '864 patent, relatively large amounts of noble metals, which are often expensive, were required to achieve desired levels of carbon monoxide combustion in FCC processes. WRG-1001, 2:14-17. In instances where using lower amounts of the noble metal were desired, CO promoters were made with lower levels of noble metal, but that metal was still uniformly distributed. EX2001, ¶75-76. Thus, INTERCAT (Johnson Matthey) and Grace sold multiple grades of CO promoters with different levels of GVIII noble metal – low,

medium, and high. *Id.* While catalysts for other purposes having different requirements, e.g., size, temperature, and composition, were known, such catalysts were unsuitable for FCC processes. WRG-1001, 4:18.

For example, such catalysts are used at different reaction temperatures from the approximately 704 °C (1300 °F) temperature of the present CO promoters. *Id.*, 3:6-9. Other catalysts are also much larger and smaller than the microsphere sized particles of the present invention. *Id.*, 4:18. The claimed microsphere-sized CO promoters having an eggshell distribution of GVIII metal perform as well if not better than CO promoters known in the art having a uniform distribution of GVIII metal. *Id.*, 2:64-3:2. The disclosed CO promoters are thus able to achieve the performance of known CO promoters while using significantly less noble metal per particle. *Id.*, 2:64-3:2. The disclosed CO promoters having an eggshell distribution of noble metal also unexpectedly result in less NO_x formation than the state-of-the-art CO promoters having a uniform distribution of noble metal. *Id.*, 3:14-37.

III. Summary of Petitioner's References

A. Primary References

Petitioner relies on three primary references: Miura (WRG-1004), Lin (WRG-1009), and Espinoza (WRG-1011). Each reference is discussed below.

1. Miura (WRG-1004)

Miura is directed to metal oxide particles and a catalyst for the purification of automotive exhaust gas (auto catalyst). WRG-1004, [0012]. The focus of the metal oxide particles is to be 50 nm or less. *Id.*, [0015]. Miura teaches that exhaust gas from internal combustion engines, such as automobile engines, contains nitrogen oxide (NO_x), carbon monoxide (CO), and hydrocarbon (HC) and that these substances can be purified by their so-called “three-way catalysts.” *Id.*, [0002]. The catalysts of Miura are thus necessarily 1) catalyzing reactions other than the specific CO to CO₂ combustion of the instant claims, and 2) are used in *fixed* bed reactors, that is, in catalytic converters, at the temperature at which automotive exhaust gas is expelled. EX2001, ¶119. The form in which the catalysts of Miura are used are specific to the reactions, the reaction conditions, and the type of reactors that are the subject of Miura's focus. *Id.*, ¶¶122-124. Miura teaches that the metal oxide particles can be collectively shaped into catalyst pellets prior to use. *See* WRG-1004, [0099]-[0127], [0135]-[0140], and that its “exhaust gas purifying catalyst may be used not only by shaping the catalyst itself but also by coating it on a monolithic substrate, for example, a ceramic honeycomb.” *Id.*, [0050]. The reaction conditions under which exhaust gas undergoes catalytic purification are less than 300 °C. *Id.*, [0124].

Miura also teaches that the metal oxide particles that are the subject of Miura's invention are impregnated with noble metals by dispersing the metal oxide particles in a solution containing noble metal salt. *Id.*, [0101], [0104], [0107], [0110]. Such "wet impregnation" methods will result in uniform distribution of noble metals throughout the pores of Miura's metal oxide particles. EX2001, ¶¶62-66. The impregnated metal oxide particles are then shaped into the larger fixed bed catalyst for automobiles. WRG-1004, [0050], [0102], [0107], [0110], [[0112], [0115], [0118], [0120], [0131], [0137], [0140]; Ex2001, ¶120. Thereby resulting in uniform noble metal distribution throughout the entire catalyst body. Further, Miura uses the same amount of platinum in all examples. *See* WRG-1004, [0129], [0132], [0135], [0138]; Ex2001, ¶121. Thus, the individual metal oxide particle and catalyst is used in a reaction system such as a pellet comprised of particles with the GVIII metals uniformly interspersed in the particles. Ex2001, ¶118, 120, 126.

Miura teaches an improved three-way catalyst that has a porous metal oxide particle comprising a core relatively rich in zirconia and a surface layer relatively rich in ceria. WRG-1004, [0025]. It is the ceria layer, and not any noble metals, that is referred to as a "surface layer". *Id.* Miura teaches that the zirconia provides good heat resistance, and the ceria reduces sintering. *Id.*, [0026]. Thus, Miura

teaches a POSITA that the advantages of Miura's metal oxide particle are the result of a zirconia center and a ceria-rich surface layer. EX2001, ¶¶110-111.

2. Lin (WRG-1009)

Lin is directed to a method of making active metal eggshell catalysts that facilitates control over finished properties of the catalyst, including the orientation and dispersion of the metal in the resulting catalyst particles. WRG-1009, 1. Lin teaches that active metal catalysts can be classified in one of four ways:

1. Metal is uniformly distributed;
2. Metal is distributed on the outer layer of the support in an "eggshell shape;"
3. Metal is distributed inside the support in an "egg yolk shape;" and
4. Metal is distributed between eggshell shape and yolk shape in an "egg white shape." *Id.*

Lin further teaches that the appropriate metal distribution for a given application depends on the type of reaction being catalyzed and the reactor being used. *Id.* Lin further teaches that the metal distribution impacts the catalyst selectivity. *Id.*, 2. Lin teaches that thickness of the eggshell on an eggshell catalyst and/or the selection of an egg yolk catalyst over an eggshell can dictate the selectivity of a given reaction. *Id.*, 2.

Lin is thus focused on the preparation of eggshell catalysts wherein the thickness of the eggshell can be precisely controlled such that highly selective catalysts can be prepared. *Id.*, 1. Lin teaches a method of preparing eggshell catalysts wherein catalytically active metals are dissolved in organic solvents and the inorganic-metallic concentrate solution is attached to the support by a wet impregnation or spray method. *Id.*, 3. Lin's method is not specific to the type of active metal or type of support. *Id.* Lin teaches that "the metal preferably comprises Pd., Ni, Co, Mo, Cu, Pt, Fe, Ag, Ir, Pb, Re, Ti, Sn, V, and Zn, etc." and that "the support comprises Al₂O₃, SiO₂, zeolite, TiO₂, ZrO₂, MgO, active carbon, polymer or mixtures thereof." *Id.*, 3. Lin discloses only specific catalysts for the selective hydrogenation of isoprene to isopentane. *Id.*, 5. Further, Lin teaches egg yolk distributions are "usually used in a fluidized bed" because "the outer layer of the catalyst may easily show wear or poisoning." *Id.*, 1.

1. Espinoza (WRG-1011)

Espinoza is directed to catalyst and system for converting natural gas or other hydrocarbon containing gas into carbon monoxide and hydrogen, a mixture known as syngas. WRG-1011, 1:25-30. Espinoza teaches that the syngas reaction that is its focus comprises the following half reactions:



Id., 2:1-5. Espinoza teaches that the catalyst of its invention should be highly selective for producing carbon monoxide and hydrogen. *Id.*, 8:28-38. Espinoza teaches achieving these highly selective catalysts by preparing **nonmicroporous** catalyst particles. *Id.*, 4:27-36, as opposed to the fully porous catalysts of the present invention.

B. Secondary and Tertiary References

Petitioner relies on 5 additional references: Alleged Applicant Admitted Prior Art (AAPA) (WRG-1001), Baker (WRG-1008), Vaughn-516 (WRG-1007), Vaughn-290 (WRG-1005), and Peters (WRG-1006). Each reference is discussed below.

1. Alleged AAPA (WRG-1001)

As will be discussed in further detail below, Petitioner has mischaracterized the teachings of the '864 patent and its reliance on the teachings of the '864 patent in the invalidity grounds is improper.

2. Baker (WRG-1008)

Baker is directed to methods of making catalysts for use in the production of vinyl acetate monomer by the reaction of ethylene, acetic acid, and oxygen. WRG-

1008, 1:15-17, 2:59-62. Baker teaches that the active metal catalyst, or its precursor, is distributed predominantly in a layer below the surface of the particle. *Id.*, 3:32-34. Specifically, Baker teaches that the catalysts of its invention have a precursor of catalytically active metal distributed in the catalyst particle “in a layer below the surface of said particle, said layer being between an inner and an outer region of said support particle, and each of said inner and outer regions having a lower concentration of said precursor than said layer.” *Id.*, 2:19-27. This dispersion is known in the art as an “egg white” dispersion, as demonstrated in Lin. WRG-1009, 1. Baker further teaches that “the greater the layer depth” (i.e., below the outer surface) “the more protected the noble metal catalyst component will be from loss by abrasion or attrition.” WRG-1008, 9:42-43.

Baker further teaches that its catalysts may be used in fixed or fluid bed processes. WRG-1008, 2:59-62. Baker teaches that fixed and fluid bed processes require different-sized vinyl acetate monomer catalyst particles and Baker teaches that the disclosed catalyst must be sized according to the type of reaction process, that is, fixed bed or fluid bed, being employed. *Id.*, 7:55-66.

3. Vaughn-516 (WRG-1007)

Vaughn-516 is directed to a process for forming mixtures of molecular sieve catalyst particles. WRG-1007, [0002]. Vaughn-516 teaches that molecular sieves

are formed into molecular sieve catalyst compositions to improve commercial conversion processes and that depending upon their size, some molecular sieve catalyst compositions perform better than others. *Id.*, [0005]. Vaughn-516 teaches that in certain reaction system, the particle size distribution of catalyst particles tends to vary over time due to small particle loss and large particle retention. *Id.*, [0007]. Vaugh-516 further teaches that this varying particle size distribution has a direct impact on the reaction system. *Id.*, [0007]. Vaugh-516 is thus directed to processes for manufacturing molecular sieve catalyst compositions wherein the composition has a desirable median particle diameter and/or distribution. *Id.*, [0008].

4. Vaughn-290 (WRG-1005)

Vaughn-290 is directed to a catalyst composition that comprises molecular sieve-containing catalyst attrition particles, virgin molecular sieve, and virgin binder material that holds the attrition particles and virgin molecular sieve particles together. WRG-1005, 4:20-24. Vaughn-290 teaches that its composition limits the losses of molecular sieve-containing catalyst attrition particles and/or clumps during manufacture and use. *Id.*, 2:21-23.

5. Peters (WRG-1006)

Peters is directed to CO combustion promoters that minimize the formation of NO_x. WRG-1006, 2:3-6. Peters teaches a CO combustion promoter composition

comprising “a component containing (i) an acidic oxide support, (ii) an alkali metal and/or alkaline earth metal or mixtures thereof, (iii) a transition metal oxide having oxygen storage capability, and (iv) palladium.” *Id.*, 2:8-12. The combustion promoters are made by impregnating the porous support particles with an alkali/alkaline earth metal oxide source and an oxygen oxide source. *Id.*, 3:30-389.

The alkali/alkaline earth metal and oxygen storage source is distributed throughout the pores of the porous support and the porous support is then calcined. *Id.*, 3:39. The pores of the calcined porous support are then impregnated with palladium in the same manner so the palladium is uniformly distributed throughout the pores of the porous support and the palladium-impregnated support is again calcined. *Id.*, 3:40-43.

IV. Level of Ordinary Skill in the Art

Petitioner contends that a POSITA “would have had an advanced degree in a relevant field, such as chemistry, chemical engineering, or material science, with experience working with supported metal catalysts, and had at least 2-3 years of experience with oxidation catalysts and their application.” Petition, 5 (citing WRG-1003, ¶¶13-14). Patent Owner reserves the right to challenge Petitioner's proposed level of skill in the art and offer its own proposal if institution is granted.

V. Claim Construction

For purposes of this Preliminary Response, Patent Owner agrees that no construction is necessary for the Board to deny institution.

A. Constructions Proposed in the District Court Proceeding

Claim construction is substantially underway in the District Court proceeding. The parties exchanged proposed claim constructions on July 13, 2023 and submitted their Joint Claim Construction Statement on August 7, 2023.

Opening claim construction briefs were filed August 21, 2023, and responsive claim construction briefs were filed September 18, 2023. The *Markman* hearing is scheduled for October 3, 2023.

In adopting the *Phillips* claim construction, the Office stated that the intent was to maintain consistency between the District Court and the PTAB. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005). Accordingly, Patent Owner identifies the agreed and disputed constructions set forth in the Parties' Joint Claim Construction Statement. EX2015.

1. Agreed Constructions

The parties have agreed on the constructions of the following terms in the District Court proceeding:

Term	Agreed Construction
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Preamble (“microsphere sized porous particles, each microsphere sized porous particle having a diameter of less than 1 mm, and independently comprising”)	The parties agree that this portion of the preamble of claim 1 is limiting.
“porous”	plain and ordinary meaning, which is “having passages accessible to liquid or air”
“Silica”	plain and ordinary meaning
“alumina”	plain and ordinary meaning
“Group VIII noble metal”	“a metal chosen from the group of platinum, palladium, iridium, ruthenium, and/or rhodium”
“concentration”	“mass/volume”
“average (D50) size”	plain and ordinary meaning
“laser diffraction”	plain and ordinary meaning

EX2015.

2. Disputed Constructions

The parties have agreed that for purposes of the District Court proceeding, the following terms require construction, the constructions for which are disputed:

Term	Grace's Proposed Construction	G.W. Aru's Proposed Construction
“CO to CO₂ combustion promoter”	The preamble is limiting—but this term in the preamble is (1) not limiting and/or (2) intended use. Alternatively, “composition that promotes the oxidation	GWA contends that the preamble is limiting in its entirety. “composition that promotes combustion of carbon monoxide to carbon dioxide”

Term	Grace's Proposed Construction	G.W. Aru's Proposed Construction
	of carbon monoxide to carbon dioxide"	
"each microsphere/ independently"	Plain and ordinary meaning, i.e. "each and every microsphere must independently" Alternatively, indefinite	plain and ordinary meaning; there is no requirement that "every" particle meet the claim limitations as Grace contends
"microsphere sized"	"spherical particles as small as 1 micron in diameter and as large as 1,000 microns"	"particles as small as 1 micron in diameter and as large as 1,000 microns"; this claim term specifies the sizes of particles, not a requirement of a spherical shape of particles
"eggshell"	"a structure with an outer layer or 'shell' surrounding an inner layer that is chemically distinct from the outer layer"	"the particle has an outer region with a relatively higher concentration of the one or more Group VIII noble metals than the center of the particle" The patentee acted as its own lexicographer.
"outer region"	Indefinite Alternatively, if not indefinite, the parties' agreed construction is: "a region distinguishable from the center of the particle and having a depth from the outer surface towards the interior of the particle of 1-10 microns"	Not indefinite GWA contends that Grace has waived any indefiniteness defenses by failing to disclose any grounds for the same in its Initial Disclosure of Invalidity Contentions under L.R. 804.1.c.iv.

Term	Grace's Proposed Construction	G.W. Aru's Proposed Construction
"centre"	Indefinite Alternatively, if not indefinite, the parties' agreed construction is: "a region distinguishable from the outer region of the particle"	Not indefinite GWA contends that Grace has waived any indefiniteness defenses by failing to disclose any grounds for the same in its Initial Disclosure of Invalidity Contentions under L.R. 804.1.c.iv.

EX2015.

B. The Preamble is Limiting

To the extent any claim construction is needed, the CO promoter recitation in the preamble is limiting. "[T]he preamble is regarded as limiting if it recites essential structure that is important to the invention or necessary to give meaning to the claim." *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 952 (Fed. Cir. 2006) (citations omitted). Petitioner conceded in the district court proceeding that the preamble recites essential structure important to the invention but attempts to carve out "CO to CO₂ combustion promoter" from the preamble. The Federal Circuit has held, however, that when the specification describes the features of the "invention" as a whole, this description limits the scope of the invention. *Honeywell Int'l, Inc. v. ITT Indus.*, 452 F.3d 1312, 1318-19 (Fed. Cir. 2006).

The '864 Patent is replete with references to "CO to CO₂ combustion promoter" as the invention itself and is the title of the '864 Patent. WRG-1001,

1:20-22, 2:17-20, 11:1-3. The specification states that CO to CO₂ combustion promoters are a specific type of additive used in FCC processes and that “combustion promoters are separate particles from the cracking catalyst particles.” *Id.*, 1:20-2:20. Ignoring “CO to CO₂ combustion promoter” in the claims would result in claims that could cover what the specification says are *separate* from the invention. Patentee clearly defined the invention as a “CO to CO₂ combustion promoter” limited by both the preamble and the body of the claim. Further, several of the claims depend on this term for antecedent basis. *Id.*, 15:18-26. *In re Fought*, 941 F.3d 1175, 1178 (Fed. Cir. 2019) (“[T]he preamble constitutes a limitation when the claim(s) depend on it for antecedent basis.”). The Board should construe the entirety of the preamble as limiting.

VI. Ground 1 is Improper Because It Relies on the Alleged AAPA

The basis of any ground in an *inter partes* review is limited to “prior art consisting of patents or printed publications.” 35 U.S.C. § 311(b). “Patents or printed publications that form the basis of a ground for *inter partes* review must themselves be prior art to the challenged patent.” *Qualcomm Inc. v. Apple Inc.*, 24 F.4th 1367, 1374 (Fed. Cir. 2022)(quotations omitted). “That conclusion excludes any descriptions of the prior art contained in the challenged patent.” *Id.* AAPA

thus does not constitute “prior art consisting of patents or printed publications” and cannot therefore form the basis of a ground for *inter partes* review. *Id.* at 1373 (holding Applicant Admitted Prior Art does not constitute “prior art consisting of patents or printed publications” under § 311(b) such that it may form the basis of a ground in *inter partes* review). AAPA may only be used to evidence scope and content of the prior art POSITA. *Id.* at 1376.

Petitioner provides absolutely no basis for its combination in Ground 1, which relies on Miura (WRG-1004) in combination with the alleged AAPA (WRG-1001). Petitioner's only basis for such a combination is to, *inter alia*, impermissibly use the specification of the '864 Patent.

Petitioner does not, in fact, limit itself to what Patent Owner identifies as generally known in the art and within the scope of knowledge of a POSITA at the time of invention. Rather, Petitioner relies on Patent Owner's own disclosure, not the AAPA. Petition, 13. The challenged patent cannot be prior art to itself. Reliance on the challenged patent as a basis for invalidity is therefore improper. 35 U.S.C. § 311(b). While George Mallory and Edmund Hillary were able to say that the reason for each of them climbing Mount Everest was “because it's there,” that's not a sufficient basis for selectively picking and choosing from a printed publication.

The fact that things may exist in the art is not sufficient unless Petitioner meets its burden of establishing why the POSITA would combine such elements.

Petitioner, in explaining why the metal oxide particle of Miura would allegedly be made microsphere sized as required by the claims, states:

While Miura discloses particle sizes on a different scale of magnitude from the upper range of [1 pre] [sic], a POSITA would have been familiar with particle sizes in the 1 mm and tens of microns range used in combination with combustion promoters. Petition, 8.

Miura's catalyst of course is an automobile exhaust catalyst. The POSITA would have also been familiar with combustion catalyst particles that are larger (e.g., 2-3 mm) and smaller (e.g., angstrom sized). So why would the POSITA change the size of Miura's metal oxide particles for use in automobile catalysts?

Petitioner implicitly argues that instead of making an automobile catalyst, the POSITA wanted to make a CO promoter. But why, based upon Miura (directed to an auto catalyst), would the POSITA want to make a CO promoter? Why look at auto catalyst references (such as Miura), or syngas catalyst references (such as Espinoza), or vinyl acetate catalyst references (such as Baker)?

Petitioner is silent on this because Petitioner used the specification and figures of the '864 patent as its roadmap and then selectively chose random parts

of the references out of context. This is more commonly referred to as hindsight reconstruction.

Ground 1 is thus improper. Even with this impermissible use, Petitioner completely fails to explain why the POSITA would use Miura as discussed below.

VII. Petitioner Has Not Established a Reasonable Likelihood of Success

Grounds 1-4 do not give rise to a reasonable likelihood of success on the merits. Petitioner has not met its burden and review should not be instituted for any of these grounds. Petitioner is silent on providing any motivation for why a POSITA should go against the general state of the art for CO promoters and have GVIII metal in an eggshell, as opposed to the prior art uniform distribution – or an egg yolk or an egg white distribution - or a combination thereof. Reliance on Patent Owner's patent cannot be that basis. *Supra*, §VI. Petitioner's expert attempts to argue that the motivation would be to save money – but points to nothing in any of the references that would teach or suggest such a savings. For example, Miura uses the same amount of platinum in all examples – which is not a suggestion that one could save money by using less platinum.

In fact, at least within the field of CO promoters, it was believed that an “ideal” CO promoter had noble metal “uniformly dispersed” throughout a porous particle, for the stated purpose of presenting as much noble metal surface area to

the reactants as possible. EX2001, ¶69. Dispersing noble metals on a solid support was “universally accepted” as the approach to making CO promoters in the FCC industry. *Id.*, ¶68. And, Petitioner has admitted that “conventional CO promoters” have an “intended design” where “noble metal is distributed homogeneously through the support particles.” *Id.*, ¶70.

But Petitioner now completely ignores the teaching of the art that having GVIII metal uniformly dispersed throughout the pores of a particle results in a better catalyst because there is greater surface area of GVIII metal available to promote CO to CO₂ combustion.

Petitioner also ignores that the state-of-the-art manufacturing methods for CO promoters, and even Miura's particles, inherently provide uniform distribution of noble metals. *Id.*, ¶¶65, 116. In chemical manufacturing processes, the way a solid and solution interact is controlled by their “wettability.” *Id.*, ¶62. This refers to the degree of attraction between the liquid and solid – the higher the wettability, the more the liquid will soak into the solid. *Id.* The concept of wettability is illustrated by the way rainwater will affect a t-shirt versus a vinyl raincoat. *Id.*, ¶63. Water and a t-shirt have high wettability, and the water will soak into the t-shirt. *Id.* In contrast, water and a vinyl raincoat have a low degree of wettability, and the water will bead on the surface of the raincoat. *Id.*, ¶64. Returning to

catalyst particles – silica and/or alumina have a low wettability with aqueous solutions of noble metals. *Id.*, ¶65. Therefore, when silica or alumina porous particles are contacted with aqueous solutions of noble metals, the noble metal solution will spread across the surfaces of the particle, including the external surface of the particle and the internal surfaces of the particle's pore walls (the latter being about 1,000 times the area of the former). *Id.* Therefore, any standard impregnation method with such materials will inherently provide uniform distribution of the noble metals. *Id.* Petitioner ignores these physical realities and the inherent results that would be provided by attempting to manufacture any alleged combination of the references using the methods that were state of the art or taught by the references.

A. Ground 1: Purported Obviousness of Claims 1, 3, 6-7, 12-19, and 21 over Miura in view of AAPA

Petitioner has failed to establish a reasonable likelihood of success in connection with Ground 1 at least because 1) Miura is focused on a metal oxide particle that is 50 nm or less, 2) does not disclose a CO promoter, 3) fails to teach a particle wherein “one or more GVIII metals [is] distributed in the particle as an eggshell such that a higher concentration of the one or more GVIII metals is present in the outer region of the microsphere sized porous particle as compared to the concentration of the one or more GVIII metals in the centre of the microsphere

sized porous particle,” and 4) Petitioner fails to articulate a sufficient motivation to combine Miura with the AAPA or any other secondary reference.

1. Miura does not disclose a CO promoter

Miura still does not disclose a CO promoter. CO promoters are particles used in FCC processes to facilitate the complete combustion of carbon monoxide in an FCC regenerator during catalyst regeneration. EX2001, ¶58. CO promoters are used in fluid bed processes in reactors having temperatures of more than 700 °C. *Id.*, ¶54, 57.

In contrast, as discussed in Section III.A.1, the catalysts disclosed by Miura are for the purification of exhaust gas and are “three-way catalysts.” *Id.*, ¶119. That is, they are “capable of oxidizing CO and HC and, at the same time, reducing NO_x.” WRG-1004, [0002]. As also discussed, Miura’s catalysts are used in fixed bed reactors at temperatures of less than 300 °C. WRG-1004, [0050], [0124]. Miura does not teach that its three-way catalysts are suitable for any purpose other than being used in fixed beds for the purification of exhaust gas. EX2001, ¶119. Miura thus does not disclose a CO promoter. *Id.*

The ‘864 patent and Miura are concerned with different types of catalysts or promoters. This is highly significant because catalysts or promoters are not subject to universal design principles. *Id.*, ¶96. The design is influenced by the identity of

the chemical reaction(s) it is intended to catalyze/promote, the temperatures and pressures the reaction must occur at, the concentrations of the reactants and products, and the type of reactor in which the reaction will occur (e.g., fixed bed versus fluid bed). *Id.* An auto exhaust catalyst is expected to operate at vastly different temperatures and conditions (e.g., in a car's catalytic converter at less than 300 °C) than a CO promoter (e.g., in an industrial FCC regeneration zone at temperatures of over 700 °C). *Id.*, ¶¶124-125. Therefore, a POSITA would have no motivation to consult Miura when designing a CO promoter. EX2001, ¶128.

Conversely, why would the POSITA want to make the auto catalyst of Miura into something else? Why would the POSITA change the size of Miura's metal oxide particles and make them larger? Especially when Miura teaches the benefits of small size and since Miura shows a simple and convenient way of making larger sizes – putting the individual particles together. WRG-1004, [0068]. And such a motivation is required for Miura to form a proper basis for an obviousness argument; references used as prior art in a §103 rejection must be analogous art, i.e., from the same field of endeavor or reasonably pertinent. *In re Klein*, 647 F.3d 1343 (Fed. Cir. 2011). No basis is given for combining these vastly different catalysts.

Additionally, a POSITA would not have been motivated to try using Miura's auto-catalyst as a CO promoter because they would have recognized and appreciated that the fixed bed catalysts taught by Miura could be detrimental to fluid bed processes. EX2001, ¶123. A POSITA would not have been motivated to use Miura's catalysts to promote the combustion of CO to CO₂ because Miura's ability to catalyze reactions other than the oxidation of CO would not have led to predictable results in fluid bed regenerator operations, which is non-analogous art. *Id.* Miura's auto catalysts catalyze reactions at such vastly different temperatures and in such vastly different systems than CO promoters, a POSITA would not have had a reasonable expectation of success in using Miura's catalyst as a CO promoter. *Id.*, ¶¶123-125.

2. Miura Focuses on a Different Particle Size

Miura also fails to teach a CO promoter because it teaches individual particles having a size range too small for use as CO promoters. EX2001, ¶¶126-127.

Miura relates to a process for producing a metal oxide particle. WRG-1001, [0011]. These particles are intended to be used as an exhaust gas purifying catalyst for an internal combustion engine. *Id.*, [0012]. The claim requires that the claimed promoter is microsphere sized. So even assuming arguendo that the Miura metal

oxide particle disclosed an eggshell distribution of GVIII metal, which it does not, it, as acknowledged by Petitioner, is a smaller particle than what is recited in the '864 claims. Petition, 8. What would motivate the POSITA to make Miura's particle larger, particularly as Miura specifically teaches the benefits of the smallest possible particles? WRG-1004, [0070]. And why would a POSITA not just make a pellet of billions of Miura's particles as Miura teaches in the Examples? WRG-1004, [0101], [0104], [0107], [0110], [0112], [0115], [0118], [0131], [0134], [0137], [0140]. Miura is directed to an auto catalyst so why would it be combined with size ranges for CO promoters?

In order to design a catalyst, the ultimate purpose is critical. *Id.* Auto catalysts are used in fixed beds and placed on supports. *Id.*, ¶119. Miura's metal oxide particles are nano-scale sized particles. *Id.*, ¶126. Both Baker and Dr. Harold, Petitioner's expert, recognize that particles of Miura's size would not be suitable for a fluid bed process. *Id.*, ¶¶126-127. A POSITA would not have been motivated to use Miura's metal oxide particles as CO promoters because they would have recognized that the small particle size would have rendered it unsuitable for use in a FCC fluid bed. *Id.*, ¶¶128. Petitioner fails to explain why someone making a microsphere-sized particle would, with a myriad of catalyst references, look to a reference focusing on unworkably small particles, or vice versa.

Further, even if a POSITA had been motivated to try using Miura's auto catalyst as a CO promoter, Petitioner does not explain why a POSITA would have had a reasonable expectation of success in doing so. Petitioner does not explain why a POSITA would have had a reasonable expectation of success of using Miura's less than nanosphere-sized auto catalyst that promotes *three* different reactions *in a fixed bed system* at temperatures of *less than 300 °C* as a CO promoter, a microsphere-sized promoter used in *fluid beds* at temperatures of *greater than 700 °C* to promote the combustion of CO to CO₂. *Univ. of Strathclyde v. Clear-Vu Lighting LLC*, 17 F.4th 155, 160 (Fed. Cir. 2021) ("An obviousness determination generally requires a finding that "all claimed limitations are disclosed in the prior art that a person of ordinary skill in the art would have been motivated to combine or modify the teachings in the prior art and would have had a reasonable expectation of success in doing so.") (quotations omitted)).

3. Miura Does Not Disclose the Noble Metal Eggshell Limitation

Petitioner mischaracterizes Miura and what a POSITA would understand based on Miura's disclosure.

Miura teaches the advantage to having a ceria-rich surface layer. WRG-1004, [0005], [0029]. The advantage taught is not one from any particular distribution of noble metals, but the use of ceria in a particular distribution. *Id.*

Miura **does not** teach particles “wherein one or more GVIII metals [is] distributed in the particle as an eggshell such that a higher concentration of the one or more GVIII metals is present in the outer region of the microsphere sized porous particle as compared to the concentration of the one or more GVIII metals in the centre of the microsphere sized porous particle,” (this distribution of material is referred to hereinafter as the “eggshell limitation”) as required by claim 1. WRG-1001, claim 1; EX2001, ¶¶107-118.

Petitioner asserts that a POSITA would have understood that when a noble metal is impregnated onto the porous metal oxide particle and disperses into the particle, “not only is the content (*i.e.*, mass) of the noble metal higher in the outer region [12] compared to the inner region [11] but also the concentration (*i.e.*, mass/volume) and/or weight percentage (*i.e.*, mass/mass) of noble metal is higher in the outer region compared to the inner region.” Petition, 11, (citing WRG-1003, ¶88). Petitioner concedes, however, that Miura **does not** actually teach a noble metal distributed in the particle as an eggshell and that the only support for Petitioner's position is that Fig. 2 of Miura appears to “depict” a noble metal “forming . . . a surface layer.” Petition, 7.

However, Fig. 2 is a schematic not showing the actual interior, which contains a myriad of pores. EX2001, ¶¶112-114. A POSITA would not rely on Fig.

2 of Miura to accurately depict the reality of Miura's particles, because it would be immediately apparent to a POSITA that Fig. 2 is distorting physical reality for illustrative purposes, both in omitting the pores of the metal oxide particles and dispensing with any attempt to accurately portray relative size. *Id.*, ¶¶113-114.

Understanding this, a POSITA would look to the specification of Miura to determine the actual structure and content of Miura's particles. *Id.*, ¶114.

In the specification, Miura ***does not*** teach that noble metal is distributed in an eggshell, nor does it describe that the concentration of noble metal is higher in an outer region than it is in an inner region. *Id.*, ¶¶107-114. To the contrary, Miura is explicit in teaching that their compositions make it "possible to ***increase*** the amount of the noble metal which can be supported" and that they "***increase*** the specific surface area of the noble metal" to "increase the area of the noble metal which is contacted with the exhaust gas." *Id.*, ¶0071 (emphasis added). It should be noted that "surface area" refers to all surfaces – both in the pores and on the outer edge of a particle. *Id.*, ¶72. Maximizing noble metal surface area was, prior to April 24, 2018, accepted in the art as necessary for efficient CO promoter performance. *Id.*, ¶¶72, 80. An eggshell distribution provides the opposite of this art-accepted goal, inherently decreasing both the total amount of noble metal and decreasing the total surface area of the noble metal (because only part of the support is coated

with noble metal). *Id.*, ¶80. That is, Miura touts creating something directly opposed to an eggshell distribution and that this opposed approach will increase performance. *Id.*, ¶118.

The fact that Miura teaches directly away from an eggshell distribution of noble metals is again demonstrated where Miura discusses possible methods of introducing noble metals to their metal oxide particles. EX2001, ¶¶115-117. Miura states that “the noble metal may be loaded on the metal oxide particle by any known method, for example, by a method of impregnating metal oxide particles with a solution containing a salt and/or a complex salt of noble metal and drying and then firing it.” WRG-1004, [0049]. This technique is known in the art as “wet impregnation,” and, as discussed in Section VIII above, it will inherently provide uniform distribution of the noble metals. EX2001, ¶115. In wet impregnation, metal oxide particles are dispersed in an excess of solution containing active metal which diffuses into the pores of the particle. *Id.*, ¶116. The solvent containing the active metal is then dried, leaving only the active metal salt on the particle. *Id.* Because the pores of the entire particle are unobstructed, solvent containing solute, that is, active metal, fills each pore, which results in the uniform deposition of metal throughout the particles' pores. *Id.* Thus, in discussing how to make their

catalysts, Miura is once again pointing a POSITA to a composition with a uniform distribution of noble metals. EX2001, ¶¶115-117.

Further, assuming *arguendo* that the particles of Miura did have eggshell distributions (they do not), Miura does not disclose that that an eggshell distribution would have utility over other distributions. Miura's focus is on a ceria-rich surface layer and the advantage of using ceria. EX2001, ¶¶109-111. Miura is also directed to producing metal oxide particles which are then formed into large catalyst pellets. EX2001, ¶120. This makes logical sense because Miura teaches an auto catalyst that is a fixed catalyst composed of numerous particles. *Id.*, ¶124. Thus, even if there was some type of eggshell for the GVIII metal in an individual particle, the catalyst itself would have a uniform distribution of noble metal because a catalyst is formed by combining metal oxide particles. In contrast, the claimed CO to CO₂ promoters are designed for the fluid bed processes of an FCC unit and are necessarily individual microsphere-sized particles. *Id.*, ¶¶118, 120, 126. In contrast, Miura teaches that the particles of its invention are formed into pellets or used to prepare a catalytic coating a monolith. *Id.*, ¶120. Thus, when Miura's catalyst is used to catalyze reactions, noble metal is dispersed uniformly throughout a catalyst structure. *Id.*

Petitioner relies exclusively on Miura with alleged AAPA in Ground 1.

Petition, 10-11. Petitioner has not therefore met its burden with respect to Ground 1. *Wireless Protocol Innovations, Inc. v. TCT Mobile, Inc.*, 771 F. App'x 1012, 1016 (Fed. Cir. 2019) (When advancing a ground based on obviousness in a petition, the petitioner has the “burden to prove that all claimed limitations are disclosed in the prior art.”)(quotations omitted).

4. Petitioner fails to articulate a sufficient rationale for modifying Miura with Alleged AAPA

Petitioner alleges that a POSITA would have been motivated to combine the alleged AAPA with Miura. Petitioner, however, mischaracterizes the alleged AAPA to arrive at its purported motivation to combine Miura with its disclosure.

a) The Alleged AAPA

The only disclosure of prior art in the '864 patent states:

1. CO promoters, *i.e.*, particles that promote the combustion of CO to CO₂ in FCC processes were known in the art. WRG-1001, 1:26-27.
2. Known CO promoters were commonly made from impregnation of Group VIII noble metal or metals, commonly platinum and/or palladium, onto a porous alumina and/or other substrate.
3. Known CO promoters were made on porous microspheres having an average particle size 60 to 90 microns. *Id.*, 1:62-66.

4. The Group VIII noble metal or metals of these known CO promoters is uniformly distributed throughout internal and external surfaces of the porous microsphere. *Id.*, 1:67-2:3.

Petitioner alleges that a POSITA would have been motivated to combine the alleged AAPA with Miura because “Applicant admitted” that “particles having an average diameter size of less than 1 mm, like those disclosed in Miura, were known for use in CO promoters.” Petition, 9. The alleged AAPA does not, however, make any such admission.

As discussed above, the alleged AAPA discloses only CO promoters are particles that are 60-90 μm , WRG-1001, 1:62-66, and such particles have a uniform distribution of noble metal. The alleged AAPA does not disclose any and all “particles having an average diameter size of less than 1 mm” nor does the Alleged AAPA state that particles for auto catalysts “like those disclosed in Miura [] were known for use in CO to CO₂ combustion promoters.” As explained Miura provides no basis for making the individual metal oxide particles larger. Petitioner fails to explain what would have motivated a POSITA to combine the alleged AAPA with Miura.

Petitioner simply alleges that a POSITA would have recognized that the particles taught by Miura “may have an average particle diameter size of between

60 and 90 microns” because such sized particles were generally known in the art.

WRG-1003, ¶¶93-94. Petitioner alleges that a POSITA would have been motivated to combine Miura and the alleged “AAPA” because “the ‘864 Patent and Miura teaches the ‘eggshell’ structure having a core part and a surface layer . . . is preferred to a uniform structure.” Petition, 13. Setting aside the mischaracterization of Miura, the teachings relied upon by Petitioner from the ‘864 Patent are not AAPA, they are the focus of the ‘864 Patent’s invention. **Miura focuses on much smaller particles – 50 nm or smaller. Miura does not even teach or suggest particles larger than 10 microns.** WRG-1004, [0015]. In fact, Petitioner concedes that “Miura discloses a range of average particle diameters of the metal oxide particles from 10 μ m to less than 50 nm and *teaches the benefits of small particle size.*” Petition, 8 (citing to WRG-1004, [0015]). Petitioner does not explain why a POSITA would have been motivated to make individual particles of Miura *larger* than as taught by Miura. If you want a larger catalyst, Miura teaches collectively making the individual particles into 1 mm pellets as catalysts. EX2001, ¶120. That process uniformly disperses the GVIII metal throughout the 1 mm pellet. *Id.* So there is simply no reason or basis to make larger metal oxide particles. *Id.* Modifying the particles of Miura to be larger would be contrary to Miura’s teachings on the benefits of such small particle sizes.

B. Grounds 1A and 1B

Ground 1A and 1B relate only to dependent claims 9-11. Because Petitioner has failed to show that any of the references identified in Ground 1 invalidate claim 1, it also fails to meet its burden for the dependent claims. *Callaway Golf Co. v. Acushnet Co.*, 576 F.3d 1331, 1344 (Fed. Cir. 2009).

C. Ground 2: Purported Obviousness of Claims 1-8 and 12-12 over Miura in view of Baker

Petitioner has failed to establish a reasonable likelihood of success in connection with Ground 1 at least because 1) Miura does not disclose the eggshell limitation for GVIII metals, 2) Miura does not disclose a CO promoter, and 3) Petitioner fails to articulate a sufficient motivation to combine Miura with Baker.

As discussed in Section III.A.1, Miura does not teach the required size, composition, GVIII metal eggshell distribution, or the CO promoter limitations. Petitioner relies exclusively on Miura for teaching these elements in Ground 2. Petition, 29-30. Petitioner has not therefore met its burden with respect to Ground 2. *Wireless Protocol Innovations, Inc.*, 771 F. App'x at 1016 (reversing Board where the record did not contain substantial evidence that prior art reference disclosed all of the claimed limitations).

1. Petitioner Fails to Articulate a Sufficient Rational for Modifying Miura with Baker

Petitioner asserts that it would have been obvious to modify Miura with the particle size range of Baker because a “POSITA would have recognized that the properties of Miura’s combustion promoter can be improved through the specific particle size teachings of Baker.” Petition, 28-29 (citing WRG-1003, ¶¶141-145, 58-59). Petitioner further asserts that would have been obvious in view of Baker to use sub-1 mm particles in Miura to achieve “improved performance.” *Id.* at 29 (citing WRG-1003, ¶¶58-59, 141-145). The paragraphs of WRG-1003 on which Petitioner relies do not, however, identify on what basis, be it Miura, Baker or elsewhere, that a POSITA would have believed that the performance of Miura’s particles could have been improved by modifying their size with the size ranges taught by Baker. EX2001, ¶ [0126].

Baker explicitly teaches that fixed and fluid bed processes require different particle sizes. WRG-1008, 2:63-64 (“A suitable support material for use in a fluid bed process is a microspheroidal particulate material”); 4:19-21 (“A suitable support material for use in a fixed bed vinyl acetate process . . . may have a diameter of 3 to 9 mm.”), Miura is a fixed bed process. WRG-1003; [0050]. In fact, Baker teaches that metals at or near the surface of shell-type catalysts are

“susceptible to loss through attrition,” which would render them unsuitable for fluid bed reactors. WRG-1008, 1:36-37; EX2001, ¶130.

Petitioner offers no rationale for why a POSITA would ignore Baker's teachings regarding the particle sizes appropriate for fixed bed reactors and modify the particles taught by Miura with Baker's teachings on particles suitable for fluidized-bed processes or for why a POSITA would ignore Baker's teachings regarding the high attrition of shell-type catalysts, which would understand makes them unsuitable for fluid bed reactors. Petitioner offers no rationale for why a POSITA would be motivated to modify Miura's particles with some aspect of the differently sized particles of Baker, when all of the art is clear that particle size is a design parameter dependent on the use conditions of the particles. Petition, 29-30. Petitioner merely describes Baker's teachings and is entirely silent on any motivation for the modification of Miura with Baker. Petition, 29-30. The fact that a POSITA *could* have used Baker's particle sizes to modify Miura cannot sustain obviousness - Petitioner is required to demonstrate that a POSITA *would have* combined Baker and Miura and make the modifications Petitioner alleges. *InTouch Techs., Inc. v. VGO Commc'ns, Inc.*, 751 F.3d 1327, 1347 (Fed.Cir.2014) (“A party seeking to invalidate a patent on obviousness grounds must demonstrate . . . that a skilled artisan would have been motivated to combine the teachings of the prior art

references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.”). Petitioner has not met its burden.

Further, as discussed in Section III.1A, Miura is directed to the purification of exhaust gas in a fixed bed reactor at atmospheric pressure and temperatures of about 300 °C. WRG-1004, [0124]. Baker teaches that its catalysts are used for the production of vinyl acetate monomer by the reaction of ethylene in acetic acid at temperatures of less than 250 °C and at pressures of more than 50 psi. WRG-1008, 7:12-17. The reactions of Miura thus involve vastly different reactants, products, and reaction conditions than those of Baker. Petitioner does not explain why a POSITA would have been motivated to modify an exhaust gas catalyst with the non-analogous catalyst for making vinyl acetate monomer. *InTouch Techs., Inc.*, 751 F.3d at 1352 (a showing that “one of ordinary skill in the could combine” but “not that they would have been motivated to do so” does not establish obviousness). Petitioner has not therefore met its burden.

D. Grounds 2A and 2B

Grounds 2A and 2B related only to dependent claims 9-11. Because Petitioner has failed to show that any of the references identified in Ground 2

invalidate claim 1, it also fails to meet its burden for the dependent claims.

Callaway Golf Co., 576 F.3d at 1344.

E. Ground 3: Purported Obviousness of Claims 1-8 and 12-33 over Lin in view of Baker

Petitioner has failed to establish a reasonable likelihood of success in connection with Ground 3 at least because 1) Lin fails to teach a CO promoter comprising alumina, silica, or mixtures thereof 2) wherein “one or more GVIII metals [is] distributed in the particle as an eggshell ” and 3) Petitioner fails to articulate any motivation to combine Lin and Baker.

1. Lin Does Not Teach a CO promoter Comprising Alumina, Silica, or Mixtures Thereof

Independent claim 1 is directed to CO promoters comprising alumina, silica or mixtures thereof. WRG-1001, claim 1. Petitioner wrongly asserts that Lin teaches a CO promoter comprising these components. Petition, 46. The only disclosure Lin makes concerning CO catalysts is that eggshell catalysts for CO oxidation are known. WRG-1009, 1. Lin does not teach the shape, size, support material, or catalytically active material used in such known CO oxidation eggshell catalysts. *Id.*, 1. This continues Petitioner's approach of trying to rely on the challenged Patent to supply the motivation to pick a process to accomplish a result. The '864 patent is not prior art and its use is impermissible hindsight reconstruction.

Lin's disclosure is directed to methods of making eggshell catalysts. Lin's general discussion of CO oxidation fails to teach the material of such catalysts, their geometry or what environments or systems they were used. EX2001, ¶131. The only type of catalyst Lin describes specifically, is a selective catalyst for hydrogenation of isoprene to isopentane in a fixed bed reactor. *Id.*

As best understood, in Ground 3, Petitioner relies solely on Lin to teach a CO promoter. Petition, 44-48. Petitioner relies on the combination of Lin and Baker to arrive at the purported combustion promoters allegedly taught by Lin having the size range taught by Baker. *Id.* Lin does not, however teach any specific catalysts that are capable of promoting the combustion of CO to CO₂, let alone CO promoters comprising the claimed alumina or silica components. EX2001, ¶131. Further, Lin does not teach or suggest that its catalyst for selective hydrogenation of isoprene to isopentane would be suitable to promote the combustion of CO to CO₂ and Petitioner does not provide an explanation as to why a POSITA would have been motivated to use Lin's hydrogenation catalysts as combustion promoters, even though hydrogenation reactions are detrimental in FCC. *Id.* Petitioner has not therefore met its burden of showing that Lin discloses a CO promoter comprising the claimed support materials. *Pers. Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993–94 (Fed. Cir. 2017) (“[O]bviousness concerns

whether a skilled artisan not only could have made but would have been motivated to make the combinations or modifications of prior art to arrive at the claimed invention.”).

Petitioner does not offer any explanation why a POSITA would make a change to a selective hydrogenation catalyst to design an oxidation catalyst, much less a CO promoter. A POSITA would not make such changes because that would result in catalysts for different reactions under different conditions have different design principles and concerns. EX2001, ¶¶95-104. There is no motivation to look to an isoprene to isopentane catalyst when designing a CO promoter because these are entirely different catalysts controlling entirely different chemical reactions under entirely different conditions. EX2001, ¶¶96-104.

2. Lin Does Not Teach a Noble Metal Eggshell Combustion Promoter

Petitioner also wrongly asserts that Lin teaches a CO promoter wherein one or more GVIII metals [is] distributed in the particle as an eggshell. Petition, 46-7. As discussed, Lin teaches only that eggshell catalysts for the oxidation of CO are known and does not teach the size, shape, support material, or catalytically active material used in known CO oxidation eggshell catalysts. WRG-1009, 1.

Rather, Lin teaches that its method of making eggshell catalysts can be used with a variety of active metals, including non-noble metals to increase yield and

selectivity of intermediate products. *Id.*, 3. Lin does not teach *any* combination of active metal and support for promoting the combustion of CO to CO₂. The POSITA would be aware that reaction conditions effect the composition, size, and type of catalyst used. As explained in section III.A.2, the *only* specific catalyst taught by Lin is for the selective hydrogenation of isoprene to isopentane. *Id.*, 5. Lin teaches that this catalyst is a 2 mm alumina particle having a palladium eggshell. *Id.*, 5.

Petitioner does not offer any explanation why a POSITA would have been motivated to select a noble metal active material out of the several possible active materials disclosed by Lin, nor does Petitioner explain why a POSITA would have been motivated to select these specific materials for a CO promoter. Petitioner has not therefore shown Lin teaches or suggests a CO promoter with a noble metal eggshell distribution. *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367–1368 (Fed. Cir. 2016) (holding that it is a petitioner's burden to show that a skilled artisan would have had a reasonable expectation of success in combining the prior art to achieve the claimed invention).

Significantly, Petitioner also fails to offer an explanation as to why a POSITA would have been motivated to select alumina, silica, or combinations thereof for the support of a CO promoter *and* after having made this selection, further selected a noble metal for the active material. Petitioner has not therefore

shown Lin teaches or suggests a CO promoter comprising alumina, silica, or mixtures thereof and having a noble metal eggshell distribution. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (Obviousness requires “a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does”).

3. Petitioner fails to articulate a sufficient rational underpinning for modifying Lin with Baker

Petitioner argues, citing to WRG-1003, ¶¶209-211, that a POSITA would have been motivated “to use the particles less than 1mm, as disclosed by Baker, in an eggshell-shaped catalyst, as described by Lin, in light of the 2 mm particle size disclosed by Lin because a “POSITA would have recognized that the difference in size from 1 mm to 2 mm is not significant.” Petition 45-46. In reality, this change is of course a 100% change. The fact that a mm is a relatively small unit of measurement does not mean the POSITA would ignore the large relative change.

Petitioner also alleges it would have been obvious to modify the particle size of Lin with those of Baker because “a POSITA would have recognized that the properties of Lin’s combustion promoter can be improved through the specific particle size teachings of Baker.” Petition, 44 (citing WRG-1003, ¶¶205-208, 60-63). However, neither the Petition nor Petitioner’s expert identify the properties that a POSITA would be motivated to improve through modification of Lin’s

particle size. Petition, 42-45. Petitioner thus fails to identify any actual motivation for modifying Lin with Baker in the manner alleged and has not therefore established a *prima facie* case of obviousness. *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (“obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning”).

Thus, even assuming *arguendo* that Lin teaches CO promoters having a noble metal eggshell and an alumina or silica support (Lin does not), the fact that a POSITA *could* reduce the particle sizes taught by Lin does not establish obviousness absent a showing that a POSITA would have been motivated to do so. *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1070 (Fed. Cir. 2018).

Further and as discussed in section III.B.2, Baker's catalysts are used specifically for the manufacture of vinyl acetate from ethylene, acetic acid, and oxygen containing gas. WRG-1008, 3:8-12. Baker's catalysts have an egg white distribution of metal. EX2001, ¶129. Petitioner does not explain why a POSITA would modify Lin, which allegedly concerns methods of making eggshell catalysts only (it does not), with Baker, which is explicitly focused with making and using egg white catalysts. EX2001, ¶131. Petitioner does not explain why a POSITA would modify Lin with Baker, which explicitly state that “shell type catalyst” show

greater than 50% loss of metal because of surface abrasion. WRG-1008, 10:11-25.

Indeed, the only apparent rationale Petitioner provides for this combination is that “Lin and Baker teach similar components.” Petition, 44 (citing WRG-1009, 1-2).

Petitioner does not, however, explain why these purported similarities in components would have motivated a POSITA to make the modifications alleged.

Petitioner's argument is based solely on impermissible hindsight. *Otsuka Pharm.*

Co. v. Sandoz, Inc., 678 F.3d 1280 (Fed. Cir. 2012) (holding that absent a reason or motivation an analysis may not rely upon ex post reasoning.) Further, Lin's catalyst

is used in a fixed bed process. WRG-1009, 1, 5. Baker explicitly teaches that fixed and fluid bed processes require different particle sizes. WRG-1008, 2:63-64 (“A

suitable support material for use in a fluid bed process is a microspheroidal

particulate material”); 4:19-21 (“A suitable support material for use in a fixed bed

vinyl acetate process . . . may have a diameter of 3 to 9 mm.”). Petitioner, however,

without explanation, relies on Baker's teachings regarding suitable particle sizes

for *fluid bed processes*, even though the Lin catalysts are explicitly designed for

fixed bed processes. Petitioner does not explain why a POSITA would ignore

Baker's teachings regarding the particle sizes appropriate for fixed bed reactors-

the type of process contemplated by Lin- to allege that a POSITA would be modify

Lin's fixed bed process teachings with Baker's teachings regarding fluidized-bed

particle sizes. Petition, 42-45. Petitioner has not therefore provided a rational underpinning for the Lin-Baker combination and the obviousness of the modifications it alleges. *In re Kahn*, 441 F.3d at 988.

F. Grounds 3A and 3B

Grounds 3A and 3B related only to dependent claims 9-11. Because Petitioner has failed to show that any of the references identified in Ground 3 invalidate claim 1, it also fails to meet its burden for the dependent claims. *Callaway Golf Co.*, 576 F.3d at 1344.

G. Ground 4: Purported Obviousness of Claims 1-4, 6, 12-15, 18-19, and 21-22 over Espinoza in view of AAPA.

Petitioner again fails to establish a reasonable likelihood of success in connection with Ground 4 at least because 1) Espinoza does not disclose porous particles, 2) Espinoza does not disclose a CO promoter, and 3) Petitioner fails to articulate a sufficient motivation to combine Espinoza with the AAPA.

1. Espinoza Does Not Disclose a CO promoter

Espinoza is directed to the production of syngas, which involves the reaction of small-chain hydrocarbons into carbon monoxide and hydrogen. *Id.*, 1:24-30. Espinoza does not teach a catalyst able to promote the combustion of CO to CO₂ nor does Espinoza suggest that the syngas catalysts of its invention would be suitable to promote the combustion of CO to CO₂. EX2001, ¶133-134. To the

contrary, Espinoza proposes to produce the very compound that a CO promoter is designed to dispose of – carbon monoxide (CO). *Id.* That is, Espinoza's catalysts are diametrically opposed in operation to the instant CO promoter and there is no logical reason for a POSITA to look to Espinoza if they were trying to achieve the opposite outcome of Espinoza. *Id.*

However, Petitioner asserts, relying on the unsupported testimony of its expert, that a "POSITA would recognize the similarity of chemistry in the catalytic reaction described by Espinoza to CO to CO₂ combustion reaction and that the CO to CO₂ combustion is an example of the type of reaction that would have benefited from an eggshell structure, like that disclosed by Espinoza." Petition, 61 (citing WRG-1003, ¶279-280). Such "conclusory expert testimony is inadequate to support an obviousness determination." *TQ Delta, LLC v. Cisco Systems, Inc.*, 942 F.3d 1352, 1359 (Fed. Cir. 2019). It also ignores the reality that Espinoza is focused on syngas production and Petitioner does not identify the purported "similarity in chemistry" that would so-motivate a POSITA to modify Espinoza. *Knauf Insulation, Inc. v. Rockwool Int'l A/S*, 788 F. App'x 728, 732 (Fed. Cir. 2019) (stating the reactants of two chemical reactions were similar, without more, was insufficient to support a motivation to combine).

2. Espinoza Teaches Non-Porous Particles

Each of the claims of the '864 Patent are directed to porous particles. Espinoza explicitly teaches that its catalyst particles are **nonmicroporous**. WRG-1011, 4:27-36. Espinoza is thus not directed to porous particles, but to something fundamentally different. *Id.*, 6:1-27. EX2001, ¶135. Further, Petitioner does not allege that a POSITA would have been motivated to modify the porosity of the Espinoza particles. Petitioner has not therefore met their burden in Ground 4. *Wireless Protocol Innovations, Inc.*, 771 F. App'x at 1016 (Fed. Cir. 2019).

3. Petitioner fails to articulate a sufficient rational underpinning for modifying Espinoza with AAPA [claim 6].

Even assuming *arguendo* that Espinoza taught porous CO promoters, Petitioner fails to meet its burden to show a POSITA would have been motivated to modify Espinoza with AAPA in the manner Petitioner alleges to arrive at microsphere-sized particles less than 1 mm. Simply relying on the challenged Patent's specification is not permissible.

Espinoza discloses that its catalysts can be used in fixed or fluid bed reactors and that fixed and fluid bed reactors require different sized catalyst particles. *Id.*, 7:59-67. Espinoza teaches, however, that processes using fixed bed reactors having large to medium-sized particle supports are preferred. WRG-1011, 7:65-67. Espinoza teaches that the preferred particle sizes for its preferred, fixed bed

processes are greater than about 1 mm. *Id.*, 7:60-63. Petitioner does not explain why a POSITA would have been motivated to select Espinoza's *less-preferred* process for further modification. *Polaris Indus., Inc.*, 882 F.3d at 1068-69 (holding that it is error to focus "on what a skilled artisan would have been able to do, rather than what a skilled artisan would have been motivated to do at the time of the invention"); *Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349-50 (Fed. Cir. 2000) (holding that when the motivating benefit to combine prior art comes at the expense of another benefit, the benefits, both lost and gained, should be weighed against one another).

Petitioner alleges that because the alleged AAPA discloses that microsphere-sized particles were known in the art, "a POSITA would have been motivated to use particles ranging in size from 1 mm in diameter and smaller with the combustion catalyst disclosed in Espinoza in light of the disclosure in Espinoza of particle sizes of 0.5 mm to .25 mm." Petition, 61 (citing WRG-1003, ¶¶279-280). Petitioner does not offer any basis as to why one's knowledge that microsphere-sized particles *exist* would motivate a POSITA to modify Espinoza to use microsphere sized particles. Accordingly, Petitioner has not met its burden of showing a POSITA would have been motivated to modify Espinoza in the manner it alleges. *InTouch Techs., Inc.*, 751 F.3d at 1352.

VIII. The Board Should Exercise its Discretion to Deny Institution Pursuant to 35 U.S.C. § 314(a) in View of the Parallel District Court Proceeding

A. The Board Has Discretion to Deny Institution

The Board is granted the discretion to decline to institute *inter partes* review whenever it deems the circumstances warrant doing so. *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“the PTO is permitted, but never compelled, to institute an IPR proceeding”); *see also* 35 U.S.C. §314(a); *Oil States Energy Servs. LLC v. Green’s Energy Grp., LLC*, 138 S. Ct. 1365, 1371 (2018) (“The decision whether to institute *inter partes* review is committed to the Director’s discretion.”). The Board has declined to institute in cases where a parallel district court trial would determine the issues *before* the requested Board trial, rendering the review cumulative.

The Board considers the following set of six nonexclusive factors to determine on a case-by-case basis whether to deny institution based on a parallel proceeding:

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;

4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board's exercise of discretion, including the merits.

Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation, dated June 21, 2022 (available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf) (“Interim Procedures”); *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 5-6 (Mar. 20, 2020) (precedential) (hereinafter, “*Fintiv*”); *see also Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 15 (PTAB May 13, 2020) (informative) (applying the *Fintiv* factors and denying institution) (hereinafter, “*Fintiv II*”).

Where *Fintiv* factors 1-5 favor discretionary denial, a Petitioner must meet a higher standard for institution; they must present a compelling, meritorious, challenge to the patentability of at least one claim. *CommScope Technologies, LLC v. Dali Wireless Inc.*, IPR2022-01242, Paper No. 23, p. 4-5 (Feb. 27, 2023) (“In circumstances where, however, the Board’s analysis of *Fintiv* factors 1–5 favors

denial of institution, the Board shall then assess compelling merits.”), *OpenSky Indus., LLC v. VLSI Tech. LLC*, IPR2021-01064, Paper 102, 49 (PTAB Oct. 4, 2022) (“[A] compelling-merits challenge is a higher standard than the reasonable likelihood required for the institution of an IPR under 35 U.S.C. § 314(a).”) A “[c]ompelling, meritorious challenges are those in which the evidence, if unrebutted at trial, would plainly lead to a conclusion that one or more claims are unpatentable by a preponderance of the evidence.” *Id.*, p. 50. “A challenge can only ‘plainly lead to a conclusion that one or more claims are unpatentable’ if it is highly likely that the petitioner would prevail with respect to at least one challenged claim.” *Id.*, p. 50. For the reasons discussed above, Petitioner has not presented a compelling challenge to the patentability of at least one claims. *Supra*, §VI-VII.

B. Parallel District Court Proceedings Will Determine the Issues Raised in the Petition Before the Board

The parallel district court proceedings is in an advanced stage - summary judgment briefing will be completed more than five months before a final written decision and statistics from the District of Maryland, the Federal District Court where the parallel litigation resides, show that the trial in this matter is likely to happen before a final written decision is rendered. Interim Guidance, 2, 8-9.

Claims 1, 3, 6 12 and 15 of the '864 patent are currently asserted in co-pending litigation between Patent Owner and Petitioner in Federal District Court in the District of Maryland (the "parallel Maryland case"). EX2010. The case was initiated on October 13, 2022. *Id.* Contrary to Grace's assertions that the Maryland case is in its infancy (Petition, 61), it is currently at a relatively advanced stage: infringement contentions were served April 14, 2023, invalidity contentions were served May 15, 2023, the parties' proposed claim constructions were served July 13, 2023; G. W. Aru's opening claim construction brief was filed August 7, 2023; Grace's responsive claim construction brief was filed August 21, 2023; and G. W. Aru's reply claim construction brief was filed September 18, 2023. EX2012. The *Markman* hearing is scheduled for October 3, 2023 and the Court estimates issuing a claim construction order by October 31, 2023. *Id.* Additionally, dispositive motions will be fully briefed by July 1, 2024. *Id.*

Although a trial date has not been scheduled yet, statistics show that the median time to trial in the District of Maryland for patent cases originating in the District, between two parties, and involving a single patent is 22 months. EX2016. The time to disposition for civil matters in the District of Maryland is less than ten months, demonstrating that the judges in the District act promptly and efficiently. EX2023.

C. The First Factor is Neutral

The first *Fintiv* factor is at least neutral because Grace has not requested a stay. *Fintiv II*, Paper 15 at 12 (determining that Factor 1 is neutral when neither party has requested a stay and the issue has not been addressed in the case by the district court.) Further, Grace does not indicate that it would seek a stay if the Petition was instituted. Petition, 71.

D. The Second Factor Favors Denial

In this case, the Board will decide whether to institute an IPR on or before December 15, 2024 and its final written decision will be due around December 15 2024. 35 U.S.C. § 314(b). However, dispositive motions will be fully briefed by July 1, 2024, *more than five months in advance of a final written decision*. EX2012. Further, the median time to trial in the District of Maryland for similar cases is 22 months. EX2016¹. This timeline is consistent with the governing

¹ Patent owner notes that the most recently reported statistics reported for the median time to trial for civil matters in the District of Maryland appear to be skewed due to COVID-related delays and suspensions. EX2016; EX2020; EX2021. Patent Owner therefore relies on data for median time to trial for similarly-situated cases. Patent Owner also notes that the assigned judge, Judge Bedard, is carrying approximately 30% fewer cases than the district's per-judge

Scheduling Order. The Board will not, however, issue a final written decision until more than 26 months after the district court litigation was initiated. That is, trial in the parallel Maryland case will likely occur four months before the statutory deadline for a final written decision. There is no reason for the Board to hold proceedings that would duplicate those in the district court and that would take longer to complete. The Board's scarce resources should be deployed instead where they can increase efficiency and provide the faster alternative proceeding contemplated by the AIA.

The Board's precedential decision in *NHK Spring* recognized that the Board can and should deny institution in its discretion under Section 314(a) when, as here, earlier completion of parallel district court litigation of the same issues would moot the “objective of the AIA . . . to provide an effective and efficient alternative to district court litigation.” *See, e.g., NHK Spring Co., Ltd. v. Intri-Plex*

average and will expeditiously move the parallel Maryland case forward. EX2022. Adjusting the current time to trial data for all civil cases based on Judge Bedar's case load (from 38.8 months to 27.1 months), the expected trial date would be roughly the same time as the final written decision.

Technologies, Inc., IPR2018-00752, slip op. at 20 (P.T.A.B. Sept. 12, 2018) (Paper 8) (Precedential) (quotations omitted).

In *NHK Spring*, the Board denied institution in part because of the duplicative nature and the advanced stage of a parallel district court proceeding. IPR2018-00752, Paper 8 at 19-20, explaining that “the advanced state of [a] district court proceeding is an additional factor that weighs in favor of denying the Petition under §314(a).” *Id.*, 20. The *NHK Spring* petitioner had “assert[ed] the same prior art and arguments” in a parallel district court proceeding, which was “nearing its final stages” and was scheduled to complete a jury trial about five to six months before a final written decision from the Board would have been due. *Id.* The district court and the Board were also applying the same claim construction standard. *Id.*, 6-7. The Board explained that “instituting a trial under the facts and circumstances ...would be an inefficient use of Board resources,” and would not be consistent with “an objective of the AIA ...to provide an effective and efficient alternative to district court litigation.” *Id.*, 20.

Additionally, in *E-One, Inc. v. Oshkosh Corp.*, IPR2019-00161 (P.T.A.B. May 15, 2019) (Paper 16), the Board observed the same factual circumstances as were present in *NHK Spring*, and denied institution. *Id.*, 4, 6-9. The Board looked at whether “a district court proceeding involving the same patent was scheduled to

go to trial before a final decision would have been due in the Board proceeding, and the Board proceeding would involve the same claim construction standard, the same prior art references, and the same arguments as in the district court.” *Id.*, 6.

Just as in *NHK Spring* and *E-One*, the parallel district court proceeding here (i) is between the same parties, (ii) will apply the same claim construction standard, (iii) is currently considering the same or significantly overlapping claim construction issues and invalidity challenges, and (iv) will likely go to trial in months before the Board's statutory deadline.

Under these facts and circumstances, which were also present and were dispositive in *NHK Spring* and *E-One*, institution of a duplicative parallel (and trailing) *inter partes* review proceeding would be an inefficient and wasteful use of the Board's limited resources. As in those cases, the Board should deny institution in its discretion under Section 314(a). This will allow the identical art and arguments to continue to be litigated and determined in district court, where substantial resources have already been expended and the district court stands ready to decide the issues urged here. Institution of an *inter partes* review here cannot provide the “effective and efficient alternative to district court litigation” contemplated by the AIA. *NHK Spring*, IPR2018-00752, Paper 8 at 20.

E. The Third Factor Favors Denial

The third factor concerns “the amount and type of work already completed in the parallel litigation by the court and the parties and the time of the institution decision.” *Fintiv*, Paper 11 at 9. The focus of this factor is on “the actual investment by the district court and the parties” “at the time [the PTAB] decide[s] whether to institute this proceeding.” *Dolby Labs., Inc. v. Intertrust Techs. Corp.*, IPR2020-01106, Paper 12 at 14. Petitioner addresses only the work performed as of the filing of the Petition. Petitioner does not address the investment by the District Court and the parties by the time the Board issues its institution decision. As discussed above, a significant investment into the district court proceedings has already taken place. *Supra*, §VIII.B.

The Court has scheduled its *Markman* hearing for October 3, 2023, and estimates issuing a claim construction order by October 31, 2023, both of which are prior to the Board's deadline for issuing the institution decision. EX2012. There will thus be significant investment in the parallel proceedings by the Court and the parties before the institution decision deadline.

Further, the Scheduling Order demonstrates that dispositive motions will be fully briefed more than five months in advance of the final written decision statutory deadline. EX2012. The District Court will thus likely issue Orders on

dispositive motions prior to the issuance of any final written decision. An enormous amount of resources will have been invested in the parallel litigation before the Board issues a final written decision.

Thus, this factor favors denial.

F. The Fourth Factor is Neutral or Only “Marginally Favors Institution

The “concerns of inefficiency and the possibility of conflicting decisions [are] particularly strong” where a petition “includes the same or substantially the same claims, grounds, arguments, and evidence as presented in the parallel proceeding.” *Fintiv* at 12. Here, the Petition includes substantially the same claims, arguments, and evidence as has been presented in the district court litigation. Claims 1, 3, 6, 12 and 15 of the ‘864 patent have been asserted in the litigation (the only patent at issue). EX2010. Each of these claims have been raised in the Petition. Petitioner’s initial invalidity contentions allege invalidity on the basis of *Miura*, *Lin*, *Espinoza*, *Baker*, and *AAPA*. EX2013, *see e.g.*, pp. 12-17, 87-120, 213-257. On July 13, 2023, Petitioner served its Responsive Claim Construction Statement which identified the combinations of prior art that purportedly rendered the asserted claims obvious. These are the same grounds asserted here. In fact, Petitioner submitted a claim chart for those references in its district court invalidity contentions that duplicates the substance of the Petition. EX2014, 2. All of the art

and the arguments of the Petitioner were raised and are being litigated in the district court. This weighs in favor of denying the Petition.

Petitioner purportedly stipulates “that, if IPR is instituted on the grounds presented in this proceeding, Petitioner will not pursue those grounds in the co-pending litigation,” Petitioner’s “stipulation,” however, only agrees not to pursue grounds that perfectly overlap the grounds presented in the Petition. The stipulation does not agree to foregoing “any ground that the petitioner raised or reasonably could have raised during” the IPR. 35 U.S.C. § 315(e)(2). Indeed, Petitioners invalidity contentions identifies *at least fourteen* grounds that could have reasonably been raised in the Petition; grounds which its purported stipulation does not address.

On balance, this factor is neutral or at most only “marginally” favors institution. Interim Guidelines, pp. 7-8; *Sand Revolution II, LLC v. Continental Intermodal Group – Trucking LLC*, IPR2019-01393, *5 (PTAB June 16, 2020) (weighing factor as marginally in favor of not exercising discretion to deny where stipulation only agreed to not pursue same grounds in the district court litigation).

G. The Fifth Factor Favors Denial

Both Petitioner and Patent Owner are parties to the parallel district court litigation, which further weighs against institution. *Fintiv*, Paper 11 at 13-14.

H. The Sixth Factor Favors Denial

Fintiv factors 1-5 are neutral or favor discretionary denial. Many of the issues in the Petition (or substantially the same issues) will be decided in the district court litigation and these issues will likely be decided prior to the time a final written decision would be rendered. Petitioner has not demonstrated a substantial likelihood of success as to any challenged claim and has not met its statutory burden for institution. Petitioner has therefore not presented compelling evidence of unpatentability. The Petition should therefore be discretionarily denied. *CommScope Technologies, LLC*, IPR2022-01242, Paper No. 23, p. 4-5. In these circumstances, efficiency and the integrity of the system are best served by denying institution. *Fintiv*, Paper 11 at 6.

IX. Conclusion

For the foregoing reasons, institution should be denied.

Respectfully submitted,

Dated: September 21, 2023

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CERTIFICATION OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned hereby certifies that the foregoing Patent Owner's Preliminary Response is produced using a 14-point Times New Roman font and contains approximately 13,715 words, which is less than the 14,000 total words permitted by the U.S. Patent Trial and Appeal Board rules. Counsel relies on the word count of the computer program used to prepare the response on September 21, 2023.

Dated: September 21, 2023

By: /Ronald Eisenstein/

Lead Counsel for Patent Owner

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing **Patent Owner's Preliminary Response** was served on September 21, 2023, by email:

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