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Paper 9
Entered: December 16, 2024

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LG ENERGY SOLUTION, LTD.,
Petitioner,

v.

MOLECULAR REBAR DESIGN, LLC,
Patent Owner.

IPR2024-01005
Patent 9,636,649 B2

Before JON B. TORNQUIST, JEFFREY W. ABRAHAM, and JULIA HEANEY, *Administrative Patent Judges*.

HEANEY, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes Review*
35 U.S.C. § 314

I. INTRODUCTION

LG Energy Solution, Ltd. ("Petitioner") filed a Petition to institute an *inter partes* review of claims 1–23 of U.S. Patent No. 9,636,649 B2 (Ex. 1001, "the '649 patent"). Paper 2 ("Petition" or "Pet."). Molecular Rebar Design, LLC ("Patent Owner") filed a Preliminary Response. Paper 6 ("Prelim. Resp.").

Institution of an *inter partes* review is authorized by statute when "the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a) (2018). Upon consideration of the Petition, the Preliminary Response, and the evidence of record, we determine that Petitioner has established a reasonable likelihood that it would prevail in showing the unpatentability of at least one claim challenged in the Petition. We also determine that the arguments and evidence of record do not support discretionary denial under 35 U.S.C. § 314(a). Accordingly, we institute an *inter partes* review of all claims and all grounds asserted in the Petition.[1]

A. Related Proceedings

The parties identify the following litigation involving the '649 patent: *Molecular Rebar Design, LLC v. LG Energy Solution, Ltd.,* 2-24-cv-00107 (EDTX) filed Feb. 16, 2024 (Pending); *Molecular Rebar Design, LLC v. Samsung Electronics Co., Ltd.,* 2-24-cv-00108 (EDTX) filed Feb. 16, 2024;

[1] *Guidance on the Impact of SAS on AIA Trial Proceedings* (Apr. 26, 2018), https://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/trials/guidance-impact-sas-aia-trial; *see also SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018).

and *Molecular Rebar Design, LLC v. LG Chem, Ltd.,* 1-22-cv-01130 (DDE) filed August 29, 2022 (Dismissed). Pet. 80–81; Paper 5, 2–3.

B. The '649 patent

The '649 patent, titled "Dispersions Comprising Discrete Carbon Nanotube Fibers," describes "compositions and methods for producing elastomer composite blends with discrete carbon nanotubes." Ex. 1001, code (54), 1:21–23. The '649 patent explains that carbon nanotubes can be classified by the number of walls in the tube as single wall, double wall, or multiwall and describes their utility as a reinforcing agent in polymer composites. *Id.* at 1:27–33. The '649 patent also describes difficulties in reliably producing and reaching the "full potential of performance enhancement of carbon nanotubes as composites in polymers the aspect ratio, that is length to diameter ratio, should be substantially greater than 40." *Id.* at 1:33–39. Additionally, "[v]arious methods have been developed to debundle or disentangle carbon nanotubes in solution" but the solutions have dilution ranges that are "often in the mg/liter ranges and [are] not suitable for commercial usage." *Id.* 1:45–62.

The '649 patent discloses "a composition comprising a plurality of discrete carbon nanotube fibers having an aspect ratio of from about 25 to about 500, and at least one natural or synthetic elastomer, and optionally at least one filler." *Id.* at 1:66–2:3. The carbon nanotube fibers are oxidized, (*id.* at 2:3–7), and comprise preferably about 1 weight percent to about 30 weight percent of the composition, which is "in the form of free flowing particles or a bale" and further comprises at least one surfactant or dispersing aid. *Id.* at 2:7–12. The natural or synthetic elastomer is "selected from the group consisting of, but not limited to, natural rubbers,

polyisobutylene, polybutadiene and styrene-butadiene rubber, butyl rubber, polyisoprene, styrene-isoprene rubbers, styrene-isoprene rubbers, ethylene propylene diene rubbers, silicones, polyurethanes, polyester-polyethers, hydrogenated and nonhydrogenated nitrile rubbers, halogen modified elastomers, flouro-elastomers, and combinations thereof." *Id.* at 2:12–21. The carbon nanotube fibers "are not entangled as a mass and are uniformly dispersed in the elastomer." *Id.* at 2:21–23. Fillers such as carbon black or silica can be added. *Id.* at 2:58–60.

"The carbon nanotube fibers can have oxidation species comprising of carboxylic acid or derivative carbonyl containing species." *Id.* at 5:37–39. Exemplary derivative carbonyl species are ketones, quaternary amines, amides, esters, acyl halogens, monovalent metal salts and the like and an oxidation species can be hydroxyl or "derived from hydroxyl containing species." *Id.* at 5:40–45.

C. The Challenged Claims

Petitioner challenges claims 1–23 ("the challenged claims") of the '649 patent. Pet. 1. Claims 1 and 20 are independent. Claims 2–19 and 21–23 depend from claim 1. Claim 1, reproduced below, is illustrative of the subject matter of the challenged claims:

1. A dispersion comprising

[1a] a plurality of oxidized, discrete carbon nanotubes and

[1b] at least one additive,

[1c] wherein the oxidized, discrete carbon nanotubes have an aspect ratio of 25 to 500,

[1d] are multiwall, and

[1e] are present in the range of greater than zero to about 30% by weight based on the total weight of the dispersion.

Ex. 1001, 13:50–55 (labels added to correspond with Petitioner's designation of claim limitations (Pet. vii)).

D. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability:

Challenged Claim(s)	**35 U.S.C.[2]**	**Reference(s)/Basis**
1–7, 11, 13, 14, 17–19	§ 103	Sun[3]
8	§ 103	Sun, Buretea[4]
9, 10, 15, 21–23	§ 103	Sun, Kaji[5]
16, 20	§ 103	Sun, Kaji, Matsushita[6]
1–8, 11–15, 17–19, 21	§ 103	Farrugia,[7] Narayan[8]
22, 23	§ 103	Farrugia, Narayan, Nanya[9]

Pet. 2. Petitioner relies on the Declaration of Samuel P. Gido (Ex. 1003).

[2] The Leahy-Smith America Invents Act ("AIA") included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. Because the '649 patent issued from an application filed after March 16, 2013, we apply the AIA versions of the statutory bases for unpatentability.
[3] US Patent Application Publication No. 2010/0197832 A1, to Sun et al., published Aug. 5, 2010 (Ex. 1004).
[4] US Patent No. 7,091,120 B2, to Buretea et al., issued Aug. 15, 2006 (Ex. 1005).
[5] US Patent Application Publication No. 2010/0016473 A1, to Kaji et al., published Jan. 21, 2010 (Ex. 1006).
[6] JP Patent Application No. P2009-235650 A, to Matsushita et al., published Oct. 15, 2009 (Certified English-Language Translation) (Ex. 1013).
[7] US Patent Application Publication No. 2010/0124713 A1, to Farrugia et al., published May 20, 2010 (Ex. 1007).
[8] US Patent Application Publication No. 2003/0213939 A1, to Narayan et al., published Nov. 20, 2003 (Ex. 1008).
[9] US Patent No. 5,079,123, to Nanya et al., issued Jan. 7, 1992 (Ex. 1009).

II. ANALYSIS

A. Claim Construction

We apply the same claim construction standard that would be used to construe the claims in a civil action under 35 U.S.C. § 282(b). 37 C.F.R. § 42.100(b). Under that standard, claim terms "are generally given their ordinary and customary meaning" as understood by a person of ordinary skill in the art at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (*en banc*). "In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence." *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

1. "discrete carbon nanotubes"

Petitioner argues "no formal claim constructions are necessary in this proceeding." Pet. 5. Notably, Petitioner does not contend that the term "discrete carbon nanotubes," recited in limitation [1a], requires construction. *See generally* Pet. As discussed further below, however, Petitioner's challenge to claim 1 appears to be based on a construction of "discrete carbon nanotubes" as "nanotubes that are generally individually distinct." Pet. 13.

Patent Owner generally contends that the claim terms should be given their plain and ordinary meaning. Prelim. Resp. 3. Specifically with regard to "discrete carbon nanotubes," Patent Owner argues

> [n]o specific claim construction is needed for "discrete carbon nanotubes" in independent claims 1 and 20 because to deny institution the Board need only recognize that consistent with the

> ordinary practice for chemical claims "plurality of oxidized, discrete carbon nanotubes" are not reacted with other components. Instead, "discrete carbon nanotubes" exist separate from other claimed components in the dispersions like the additive in independent claims 1 and 20.

Prelim. Resp. 3. Patent Owner further argues that despite Petitioner's statement that no formal claim constructions are necessary, Petitioner's challenges include various proposed constructions of "discrete," which include "generally individually distinct," "individually separated," "generally individual, separated nanotubes," and "nanotubes that are generally individual and separated are not aggregated into a clump, and thus are **free flowing particles**,[10] e.g., in that a given nanotube can flow freely relative to another nanotube in the dispersion." *Id.* at 8–9 (quoting Pet. 5, 13, 25, 26, 65). According to Patent Owner, however, "Petitioner ignores its own various proposed constructions that dispersed 'discrete carbon nanotubes' in independent claims 1 and 20 are 'individually dispersed' and not reaction products of carbon nanotubes with another component as in Petitioner's primary references." Prelim. Resp. 3.

Thus, although both parties indicate that no claim construction is necessary at this stage of the proceeding, it is apparent that they disagree as to the meaning of "discrete carbon nanotubes." While Petitioner appears to construe "discrete carbon nanotubes" as "nanotubes that are generally individually distinct" (Pet. 13), Patent Owner argues a more restricted construction requiring that "discrete carbon nanotubes" not be reacted with other components. Prelim. Resp. 3. The evidence relating to claim

[10] In quotations from the Preliminary Response throughout this Decision, we have retained bolding and underlining added to the text by Patent Owner.

construction that Patent Owner offers on the current record, however, does not address its proposed restriction. *See id.* at 9, n. 4, citing Ex. 1001, 3:9, 5:39–40 ("The '649 Patent describes the 'discrete carbon nanotubes' as, for example, 'individually dispersed', 'individualized carbon nanotubes', 'dispersed as individual nanotubes', and 'essentially discrete individual fibers, not entangled as a mass.'").

As discussed in Section II.D.2 below, we determine based on the record at this stage of the proceeding that Petitioner demonstrates sufficiently for purposes of institution that Sun discloses or suggests "discrete carbon nanotubes." Therefore, we do not explicitly construe any claim terms in this Decision. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) ("we need only construe terms 'that are in controversy, and only to the extent necessary to resolve the controversy'" (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))). If either party intends to argue a claim construction at trial, however, including what is the ordinary meaning of a term, they should do so in a clearly designated section of their briefing. *See* Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 21, 2019) ("CTPG"), 46, 49 (*available at* https://www.uspto.gov/TrialPracticeGuideConsolidated); *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1361 (Fed. Cir. 2008) ("A determination that a claim term 'needs no construction' or has the 'plain and ordinary meaning' may be inadequate when a term has more than one 'ordinary' meaning or when reliance on a term's 'ordinary' meaning does not resolve the parties' dispute."). Claim construction arguments should not be relegated to patentability arguments on the facts.

B. Level of Ordinary Skill in the Art

Factors pertinent to a determination of the level of ordinary skill in the art include "(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of workers active in the field." *Envtl. Designs, Ltd. v. Union Oil Co. of Cal.*, 713 F.2d 693, 696–697 (Fed. Cir. 1983) (citing *Orthopedic Equip. Co. v. All Orthopedic Appliances, Inc.,* 707 F.2d 1376, 1381–82 (Fed. Cir. 1983)). Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case. *Id.*

Petitioner argues a person of ordinary skill in the art at the time of the invention "would have had at least [a] Master's degree in materials science, chemistry, chemical engineering, a field relevant to polymer science and engineering, or the equivalent, and at least three years of experience in nanomaterials, electrochemistry, batteries, or polymer related activities." Pet. 5 (citing Ex. 1003 ¶ 19). Petitioner further argues that "[a]dditional work experience can compensate for less formal education, and vice versa." *Id.*

Patent Owner does not dispute the level of ordinary skill in the art. Prelim. Resp. 4. For purposes of this decision, we adopt Petitioner's definition of the level of ordinary skill in the art because it is consistent with the '649 patent and the asserted prior art.

C. Principles of Law

A claim is unpatentable under 35 U.S.C. § 103 if "the differences between the subject matter sought to be patented and the prior art are such

that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when available, evidence such as commercial success, long felt but unsolved needs, and failure of others. *Graham v. John Deere Co*., 383 U.S. 1, 17–18 (1966); *see KSR*, 550 U.S. at 407 ("While the sequence of these questions might be reordered in any particular case, the [Graham] factors continue to define the inquiry that controls.").

The Supreme Court made clear that we apply "an expansive and flexible approach" to the question of obviousness. *KSR*, 550 U.S. at 415. Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id*. at 417. Reaching this conclusion, however, requires more than merely showing that the prior art includes separate references covering each separate limitation in a challenged claim. *Unigene Labs., Inc. v. Apotex, Inc*., 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness additionally requires that a person of ordinary skill at the time of the invention "would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention." *Id*.

D. Alleged Obviousness Based on Sun

Petitioner contends Sun renders obvious claims 1–7, 11, 13, 14, and 17–19. Pet. 6. In support, Petitioner and Mr. Gido provide a limitation-by-limitation analysis of claims 1–7, 11, 13, 14, and 17–19 with specific citations to Sun. Pet. 6–33; Ex. 1003 ¶¶ 25–117.

1. Overview of Sun (Ex. 1004)

Sun describes a method of isolating nanotubes for forming nanocomposites. Ex. 1004 ¶ 4. Figure 1 of Sun, reproduced below, "illustrates a conceptual scheme for the preparation of epoxy nanocomposites containing individually dispersed CNTs [carbon nanotubes] and exfoliated nanoplatelets." *Id.* ¶ 14.

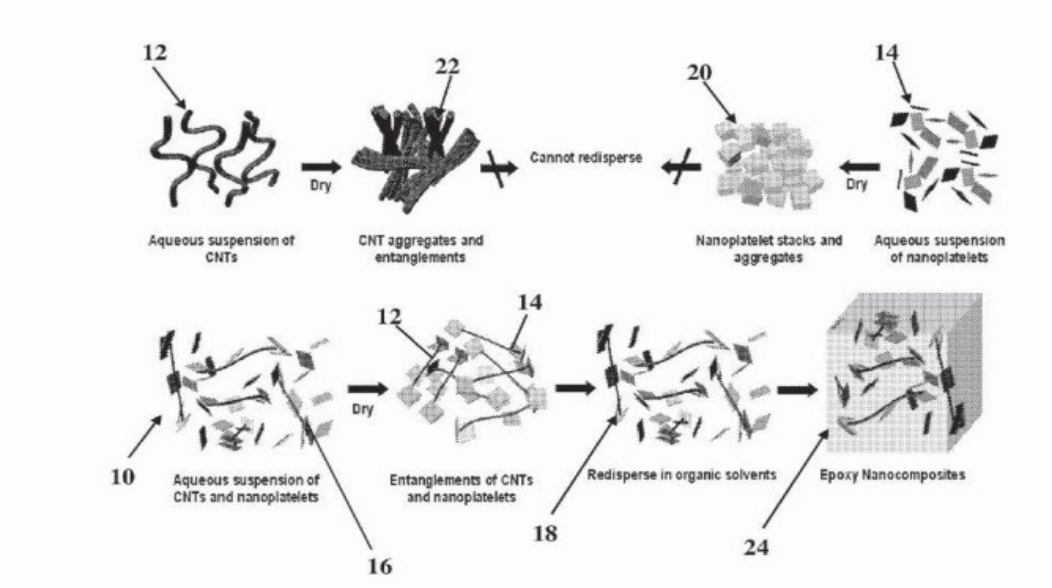


Figure 1 above illustrates "[o]xidized, suspended carbon nanotubes (CNTs) 12 mixed [with] aqueous solutions of nanoplatelets 14" to produce loosely-structured, electrostatically-linked, and dispersible nanofiller 16 "for implementation in nanocomposites 24." *Id.* ¶ 36. "[T]he electrostatic association of nanotubes 12 and nanoplatelets 14 in solutions or solvents 18 forms" dispersion 10. *Id.* The nanotubes have an aspect ratio, or length to

diameter ratio, of at least about 10, and alternatively, may be greater than about 10,000. *Id.* ¶ 38. "The carbon nanotubes comprise single walled carbon nanotubes (SWNTs) or multiwalled carbon nanotubes (MWNTs)." *Id.* "[T]he concentration of nanotubes maybe at least l wt%." *Id.* ¶ 43.

According to Sun, "[t]he exfoliation and dispersion of nanotubes is attributed to the presence of the nanoplatelets." *Id.* ¶ 44. The nanoplatelets in certain embodiments comprise an inorganic crystal such as alpha-zirconium phosphate (ZrP). *Id.* ¶ 41. "The nanoplatelets force the nanotube bundles into individual tubes with mechanical agitation" but as shown in Figure 1, "[t]he nanoplatelets cannot be re-stacked together to form regular layered structures 20" due to the presence of the nanotubes. *Id.* ¶ 44. Further, "[t]he surface charge and two-dimensional nature of exfoliated nanoplatelets disperse the nanotubes and hinder the re-aggregation [22] thereof" and "[t]he nanotubes dispersed by the nanoplatelets are exfoliated nanotubes." *Id.*; *see also id.* ¶ 68.

"The nanotubes and nanoplatelets are electrostatically associated" to form nanofiller 16 which "may be dispersed in a medium such as, but not limited to epoxy, plastic, or polymer," to form nanocomposites 24. *Id.* ¶ 45. "The concentration of nanotubes in the epoxy is between about 0.01 wt% and about 50 wt%." *Id.* "A curing agent is added to the epoxy and nanotubes, and heated to polymerize, crosslink, vulcanize, or otherwise cure, without limitation, the epoxy nanocomposite." *Id.* ¶ 46.

Sun discloses that transmission electron microscope (TEM) images of its epoxy nanocomposite "suggest that through the aqueous dispersion, organic redispersion approach, both MWNTs and nanoplatelets can be fully

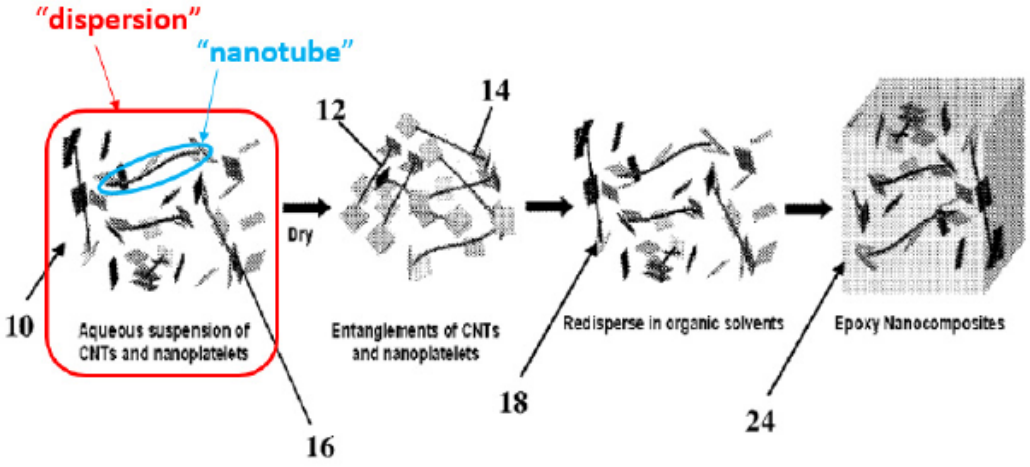
dispersed down to individual level in epoxy matrices." *Id.* ¶ 69; *see also id.* ¶ 72.

2. Analysis

Claim 1

[1pre] "A dispersion"

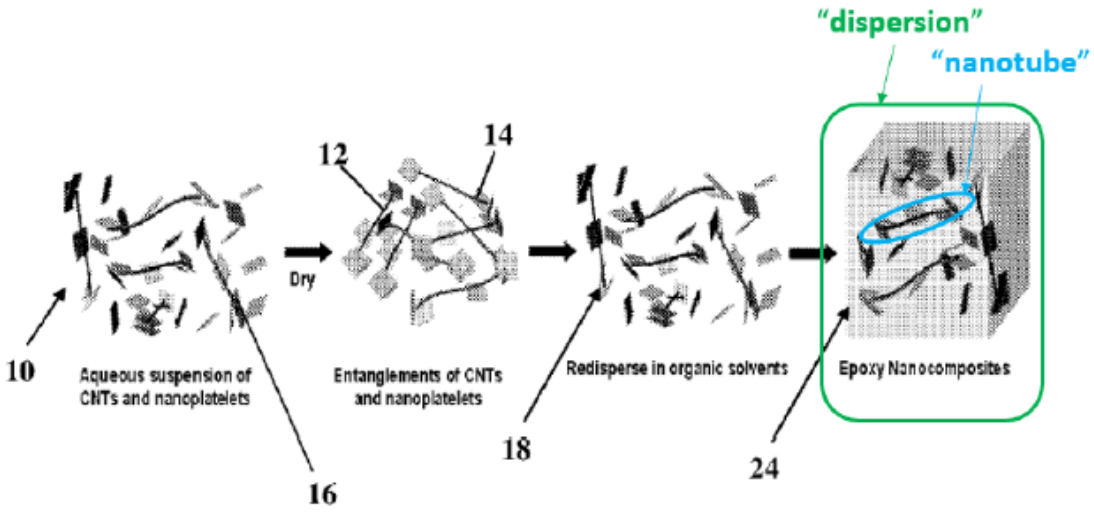
Petitioner argues to the extent the preamble is limiting, Sun discloses a dispersion. Pet. 8. Petitioner argues Sun's aqueous dispersion 10 is a dispersion. *Id.* (citing Ex. 1004, Fig. 1, ¶ 43 ("aqueous nanotube-nanoplatelet dispersion 10"), ¶ 36 ("the electrostatic association of nanotubes 12 and nanoplatelets 14 in solution or solvents 18 forms a dispersion 10"), ¶ 56 ("Two aqueous solutions containing oxidized MWNTs and fully exfoliated ZrP nanoplatelets were directly mixed . . . . After dispersion, the aqueous mixtures were dried"), ¶¶ 11, 32, 42, 44, 68, 69). Petitioner relies on the annotated version of an excerpt of Sun Figure 1, reproduced below, to support its argument.



Pet. 11. The excerpt of Sun Figure 1 reproduced above is a schematic showing carbon nanotubes 12 mixed with aqueous solutions of nanoplatelets

14 and redispersed in organic solvents to produce epoxy nanocomposites 24. Ex. 1004 ¶ 36. Petitioner's annotated version of Sun Figure 1 includes a box labeled "dispersion" around the leftmost part of the schematic identified by reference numeral 10, and a circled component within the "dispersion" box labeled as "nanotube." Pet. 11.

Petitioner further argues "[a]lternatively/additionally" that Sun's nanocomposite 24 is a dispersion. Pet. 9–10 (citing Ex. 1004 ¶ 14 ("FIG. 1 illustrates a conceptual scheme for the preparation of epoxy nanocomposites containing individually dispersed CNTs and exfoliated nanoplatelets"), ¶ 68 ("The concept for re-dispersing exfoliated nanoplatelets and carbon nanotubes in polymers is summarized in FIG. 1"), ¶¶ 32, 36, 45, 46, 52, 62, 69, claims 30–31). Petitioner relies on the annotated version of an excerpt of Sun Figure 1, reproduced below, to support its argument.



Pet. 15. The excerpt of Sun Figure 1 reproduced above is a schematic showing carbon nanotubes 12 mixed with aqueous solutions of nanoplatelets 14 and redispersed in organic solvents to produce epoxy nanocomposites 24. Ex. 1004 ¶ 36. Petitioner's annotated version of the excerpt of Sun Figure 1

includes a box labeled "dispersion" around the rightmost schematic identified by reference numeral 24, and a circled component within the "dispersion" box labeled as "nanotube." Pet. 15.

Patent Owner argues Petitioner mischaracterizes Sun Figure 1. Patent Owner argues there is no support for Petitioner's assertion that reference numeral 10 is a dispersion. Prelim. Resp. 7. Patent Owner argues reference numeral 10 is a suspension, "and no evidence is presented to equate dispersions with suspensions." *Id.* According to Patent Owner, Sun's nanotubes "are not individually dispersed or free flowing, but rather, reacted with nanoplatelets to produce a nanofiller." *Id.* at 9.

Patent Owner further argues Petitioner's labeling of reference number 24 in Sun's Figure 1 as a dispersion is incorrect. Prelim. Resp. 9–10. Patent Owner argues "[n]anocomposites as in Sun are different from and are not the same as dispersions of carbon nanotubes." *Id.* at 11, n. 5. Patent Owner relies on Sun's description of Figure 1 which states "[t]he nanofiller and epoxy mixture comprises a nanocomposite 24, or epoxy nanocomposite, as shown in FIG. 1." *Id*. at 11 (citing Ex. 1004, ¶ 46).

The evidence favors Petitioner. As Petitioner notes, Sun expressly states that reference numeral 10 is a dispersion. Ex. 1004 ¶¶ 36, 42–44. Patent Owner does not address these statements in Sun. Prelim. Resp. 7. In view of Sun's express statements that reference numeral 10 is a dispersion, Patent Owner's argument does not dissuade us from instituting.

As to Petitioner's alternative contention that the epoxy nanocomposite 24 in Sun Figure 1 is a dispersion, we are not persuaded by Patent Owner's conclusory argument that Sun's nanocomposite is different from a dispersion of carbon nanotubes. *See* Prelim Resp. 11, n. 5. Patent Owner does not

explain how the statement from Sun's Abstract upon which Patent Owner relies (i.e., "[t]his present invention relates to the carbon nanotubes as **composites** with materials such as elastomers, thermosets and thermoplastics **or** aqueous **dispersions** of open-ended carbon nanotubes with additives") *id*., would have led a person of ordinary skill in the art to understand that nanocomposites and dispersions are mutually exclusive. On the present record, Patent Owner's attorney argument does not undermine Petitioner's evidence that Sun's express disclosure of "redispersing" carbon nanotubes and nanoplatelets into epoxy results in a dispersion. *See e.g.,* Ex. 1004 ¶ 62 ("Here, we show the improved steps for redispersing MWNTs and exfoliated ZrP into epoxy to form exfoliated nanocomposites."), ¶ 69 ("[T]hrough the aqueous dispersion, organic redispersion approach, both MWNTs and nanoplatelets can be fully dispersed down to individual level in epoxy matrices.").

In view of the foregoing, we determine that Petitioner demonstrates sufficiently for purposes of institution that Sun discloses or suggests the preamble of claim 1.[11]

[1a] "a plurality of oxidized, discrete carbon nanotubes"

Petitioner argues Sun discloses a plurality of oxidized, discrete carbon nanotubes. Pet. 11–16. Petitioner argues Sun's "aqueous nanotube-nanoplatelet dispersion" includes oxidized, suspended carbon nanotubes 12. *Id.* at 11 (citing Ex. 1004 ¶¶ 31, 36–38, 42–44, 68, claims 13, 14, 20, 27). Petitioner notes that Sun describes the carbon nanotubes in dispersion 10 as oxidized (*id.*, citing Ex. 1004 ¶¶ 36, 39, 42, 44, 54–57, claims 16, 20), and

[11] In view of this determination, we need not address whether the preamble is limiting.

argues a person of ordinary skill in the art would have understood that at least some of the oxidized nanotubes in Sun's aqueous dispersion are discrete, "[t]o the extent discrete is interpreted as referring to nanotubes that are generally individually distinct." *Id.* at 12–13 (citing e.g., Ex. 1004 ¶ 44 (stating "[t]he nanoplatelets force the nanotube bundles into individual tubes, " the nanoplatelets have individual, exfoliated, or separated tubes attached, or tethered to the surfaces of the nanoplatelets," and "[t]he nanotubes dispersed by the nanoplatelets are exfoliated nanotubes")). Petitioner further notes that Sun states "exfoliated" refers to "individually dispersed, or monodisperse nanotubes." *Id.* (citing Ex. 1004 ¶ 33).

Petitioner further argues a person of ordinary skill in the art would have understood that the nanotubes in Sun's aqueous dispersion are discrete, because oxidation of nanotubes can help promote non-agglomeration of the nanotubes. Pet. 13. Specifically, Petitioner argues a person of ordinary skill would have known that oxidation of carbon nanotubes in a mixture of sulfuric acid and nitric acid can result in surface functionalization which inhibits aggregation of the nanotubes into clumps. *Id.* (citing e.g., Ex. 1004 ¶¶ 39, 54;

Patent Owner argues Sun's nanotubes are not discrete because they "are not even an individual component, but rather are associated with nanoplatelets in the form of a nanofiller reaction product." Prelim. Resp. 1. Patent Owner argues the following disclosures in Sun demonstrate that reference numeral 10 in Figure 1 does not depict discrete nanotubes:

> [T]he aqueous nanotube-nanoplatelet dispersion 10 is a substantially homogenous solution of dispersed nanotubes 12 and <u>associated</u> nanoplatelets 14. (¶ 43);

> [T]he nanoplatelets attach to the nanotube walls, and at least partially enter between nanotubes of the bundles. (¶ 44);
>
> [T]he nanotube-nanoplatelet association comprises a nanofiller 16, as illustrated in FIG. 1. (¶ 45).

Id. at 8. According to Patent Owner, these excerpts from Sun establish "the 'nanoplatelet associated' Sun nanotubes are not and cannot be 'discrete' under any of the constructions offered up by Petitioner" because all of Petitioner's proposed constructions require the nanotubes to be individually dispersed or free flowing relative to another nanotube in the dispersion. *Id.* at 9.

On this record, Patent Owner's arguments do not dissuade us from instituting trial. As Petitioner notes, Sun expressly discloses that its carbon nanotubes are "exfoliated or separated" from nanotube bundles into individual tubes. Ex. 1004 ¶¶ 44; *see also id.* ("The nanotubes dispersed by the nanoplatelets are exfoliated nanotubes."). The "Notation and Nomenclature" section of Sun also provides that the terms "disperse" and "exfoliate" refer to substantially separated, disentangled, and individually dispersed, or monodisperse nanotubes. *Id.* ¶¶ 32, 33. Consistent with this language, Figure 1 of Sun also depicts the carbon nanotubes as non-agglomerated and discrete, and Patent Owner presents no persuasive evidence to suggest that the carbon nanotubes are subsequently agglomerated during the redispersal steps described in Sun.

Patent Owner further argues Petitioner's challenge fails because it relies on Sun's disclosure of reaction products of carbon nanotubes with another component, which are not "discrete carbon nanotubes," because "[i]t is black-letter patent law that a composition comprising a component [must include that component] and not some reaction product that results from a

reaction … with another component. Prelim. Resp. 2 (citing *Exxon Chems. Patents, Inc. v. Lubrizol Corp.,* 64 F.3d 1553, 1557 (Fed. Cir. 1995)). We disagree with Patent Owner that claim 1 does not encompass Sun's nanocomposite solely because Sun's carbon nanotubes are present in a reaction product. As Patent Owner recognizes, claim 1 recites the transitional phrase "comprising" and is not limited to the components recited in the body of the claim. To the extent Patent Owner's argument is based on a claim construction contention, Patent Owner should address that contention at trial in a clearly designated section of its briefing, as discussed in Section II.A above.

In view of the foregoing, we determine that Petitioner demonstrates sufficiently for purposes of institution that Sun discloses or suggests claim limitation [1a].

As with its argument concerning the preamble of claim 1, Petitioner presents an alternative argument as to how Sun discloses oxidized, discrete carbon nanotubes, based on nanocomposite 24 in Figure 1. Pet. 14–16. Patent Owner presents arguments opposing. Prelim. Resp. We decline to comment on Petitioner's alternative argument because we do not rely on it for purposes of this Decision. Nevertheless, to the extent Petitioner maintains this alternative argument in support of its challenge to claim 1, the parties should continue to address it during trial.

> *[1b]–[1e] "at least one additive, wherein the oxidized, discrete carbon nanotubes have an aspect ratio of 25 to 500, are multiwall, and are present in the range of greater than zero to about 30% by weight based on the total weight of the dispersion."*

Petitioner argues Sun discloses or renders obvious limitations [1b]–[1e]. Pet. 16–24.

Patent Owner does not dispute Petitioner's arguments about these limitations. *See generally* Prelim. Resp.

After reviewing Petitioner's unchallenged evidence and arguments, we determine Petitioner has demonstrated sufficiently for purposes of institution that Sun discloses claim limitations [1b]–[1e].

Conclusion as to Claim 1

For all of the foregoing reasons, we determine Petitioner has demonstrated a reasonable likelihood that claim 1 would have been obvious in view of the teachings of Sun.

Claims 2–7, 11, 13, 14, and 17–19.

Petitioner identifies where every limitation of challenged claims 2–7, 11, 13, 14, and 17–19 is found in Sun. Pet. 25–33. Patent Owner does not present separate arguments as to these dependent claims. *See generally* Prelim. Resp. We have reviewed Petitioner's evidence and arguments, and are persuaded on this preliminary record that Petitioner has shown a reasonable likelihood of prevailing on its obviousness challenge to claims 2–7, 11, 13, 14, and 17–19.

E. Other Grounds Challenging Dependent Claims, Based on Sun

Petitioner contends the combination of Sun and Buretea renders claim 8 obvious, the combination of Sun and Kaji renders claims 9, 10, 15, and 21–23 obvious, and the combination of Sun, Kaji, and Matsushita renders claims 16 and 20 obvious. *See* Section I.D; Pet. 34–64. Patent Owner does not present separate arguments as to these challenges to these dependent claims. *See generally* Prelim. Resp. As discussed above, we have determined that Petitioner demonstrates a reasonable likelihood it would prevail in showing that claims 1–7, 11, 13, 14, and 17–19 are unpatentable.

Therefore, a detailed analysis of these challenges is not necessary at this stage of the proceeding. *PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018) (interpreting the statute to require "a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition"). We will address the merits of these challenges, if necessary, after a full development of the record during trial.

F. Alleged Obviousness Based on Farrugia and Narayan

Petitioner contends the combination of Farrugia and Narayan renders obvious claims 1–8, 11–15, 17–19, and 21. Pet. 46–75. In support, Petitioner and Mr. Gido explain where each limitation of the challenged claim is disclosed in the references, and the reasons a person of ordinary skill would have been motivated to combine the disclosures of the references. *See, e.g., id.* at 49–52; Ex. 1003 ¶¶ 192–201.

As discussed above, Petitioner has demonstrated a reasonable likelihood that at least one challenged claim of the '649 patent is unpatentable over the prior art of record. Because we find some grounds sufficient for institution, we institute on all grounds in the petition. Nevertheless, in order to further guide the parties after institution, we provide the following observations on Petitioner's challenge to claim 1 based on the combination of Farrugia and Narayan.

1. Overview of Farrugia (Ex. 1007)

Farrugia is titled "Toners Including Carbon Nanotubes Dispersed in a Polymer Matrix." Ex. 1007, code (54). Farrugia describes "[t]oners comprising carbon nanotube/polymer resins [that] exhibit enhanced mechanical, chemical, thermal and electrical properties." *Id.* ¶ 18. The carbon nanotubes are dispersed in a polymer. *Id.*, code (57). Farrugia

discloses that "when the carbon nanotube/polymer composite comprises carbon nanotubes from about 2% to about 20% by weight of the composite, the toner exhibits increased conductivity, and is thus suitable for conductive developing methods." *Id.* ¶ 18. Further, when "carbon nanotubes have a high aspect ratio, only small amounts of carbon nanotubes need to be present in a toner in order to achieve the same conductivity as compared to conventional conductive additives." *Id.* Consequently, Farrugia provides "a toner comprising a resin comprising a polymerized mixture" in which "the polymerized mixture is a composite comprising carbon nanotubes and a polymer." *Id.* ¶ 19. The carbon nanotubes are functionalized by being "covalently attached to a first monomer and any excess unreacted first monomer may be polymerized with a second monomer through the formation of ester or amide bonds to form a polymer matrix in which the carbon nanotubes are dispersed." *Id.* ¶ 45. The functionalized carbon nanotubes can be "prepared by sulfonation, electrophilic addition to deoxygenated carbon nanotube surfaces, metallation, oxidation, or other suitable means." *Id.* ¶ 28. According to Farrugia, "[d]iscrete nanotubes, aggregates of nanotubes, or both discrete and aggregate nanotubes may be suitable for use according to the present disclosure." *Id.* ¶ 24.

2. Overview of Narayan (Ex. 1008)

Narayan describes "electrically conductive polymeric foams and elastomers for electromagnetic shielding and electrostatic dissipation." Ex. 1008 ¶ 2. The polymeric foams and elastomers comprise carbon nanotubes in which "[t]he amount of carbon nanotubes (and other optional fillers) is preferably selected so as provide electrical conductivity, particularly electromagnetic shielding and/or electrostatic dissipation while

generally retaining the advantageous intrinsic physical properties of the polymeric foams or elastomers." *Id.* ¶ 8. According to Narayan, "[s]uitable carbon nanotubes for imparting electrical conductivity to the polymeric foams and elastomers have diameters of about 0.5 to about 2000 nm, with aspect ratios greater than or equal to about 5." *Id.* ¶ 14.

3. Analysis

Claim 1

Petitioner argues that the combination of Farrugia and Narayan discloses every limitation of claim 1. Pet. 52–63; Ex. 1003 ¶¶ 202–258. Petitioner argues Farrugia discloses its nanotube/polymer composite is a polymer matrix comprising carbon nanotubes dispersed in a polymer matrix. Pet. 52–53 (citing Ex. 1007 ¶¶ 1, 20, 27, 28, 41, 45, 93, 96). Petitioner alternatively argues Farrugia discloses its unpolymerized mixture of carbon nanotubes and monomers is a dispersion comprising carbon nanotubes (*id.* at 54–54), and alternatively that Farrugia discloses its toner is a dispersion including the nanotube/polymer composite, which comprises carbon nanotubes. *Id.* (citing Ex. 1007 ¶¶ 1, 18–20, 24–28, 39–42, 45, 53–54, 56–57, 88–97, 104–107, claims 1, 4–6, 8, 11, 16–18). Petitioner further argues Farrugia discloses the carbon nanotubes in the dispersions are oxidized (*id.* at 54–55) and discrete "to the extent this is interpreted as indicating that the nanotubes in the dispersion are generally individually distinct, *e.g.*, lacking direct association with other nanotubes along substantially the length of the nanotubes." *Id.* at 55 (citing Ex. 1007 ¶ 24). Petitioner further argues Farrugia discloses the carbon nanotubes in the dispersions are multiwall. *Id.* at 59 (citing Ex. 1007 ¶¶ 89–97, 104–107, claim 16).

Petitioner further argues a person of ordinary skill in the art would have recognized that each of Farrugia's unpolymerized mixture, nanotube/polymer composite, and toner includes a component corresponding to an additive, as required by claim 1. Pet. 55–57.

Petitioner recognizes Farrugia does not disclose a specific aspect ratio for carbon nanotubes, but contends Farrugia teaches that a high aspect ratio is relevant to achieving increased conductivity in a toner. Pet. 49 (citing Ex.1007 ¶ 18). Petitioner argues a person of ordinary skill in the art would have looked to Narayan "for guidance as to the aspect ratio appropriate for this objective" and implemented Farrugia's nanotubes according to Narayan's guidance. *Id.* (citing Ex. 1008 ¶ 14). Petitioner further argues Narayan discloses aspect ratios that fall within and overlap the claimed range. *Id.* (describing suitable carbon nanotubes for imparting electrical conductivity as having aspect ratios greater than or equal to about 5, 10, 100, or 1000).

Petitioner further argues a person of ordinary skill in the art would have understood from Farrugia's disclosure that carbon nanotubes in its unpolymerized mixture, nanotube/polymer composite, and toner are present in a range of weight percentages that fall within the range of weight percentages recited in claim 1. Pet. 59–63.

Petitioner sets forth several reasons why a person of ordinary skill in the art would have combined the teachings of Farrugia and Narayan. Pet. 49–52. For example, Petitioner argues a person of ordinary skill in the art would have been motivated to use Narayan's aspect ratios for the carbon nanotubes in Farrugia's toner in order to obtain increased conductivity in the toner. *Id.* at 49. Petitioner further argues it would have merely involved

application of known techniques to a known structure for a person of ordinary skill to yield the predictable result of a nanotube/polymer composite including nanotubes in the range of aspect ratios taught by Narayan. *Id.* at 49–50. Petitioner further provides reasons a person of ordinary skill would have had a reasonable expectation of success in achieving the claimed invention. *Id.* at 50–52.

Patent Owner argues Petitioner's challenge fails because (1) Farrugia's carbon nanotubes are present in reaction products, and therefore are not discrete carbon nanotubes; (2) Narayan's disclosure of carbon nanotube aspect ratios does not render obvious the range or aspect ratios in claim 1 and teaches away; and (3) a person of ordinary skill in the art reading Farrugia would not look to Narayan or any other reference for an aspect ratio.

Having considered the evidence and arguments presented by both parties on the present record, we are persuaded Petitioner sufficiently shows the combination of Farrugia and Narayan teaches or suggests all of the limitations of claim 1, and sufficiently explains how a person of ordinary skill in the art would have used Narayan's teaching of aspect ratios in Farrugia's composition. We address Patent Owner's disputed issues below.

Patent Owner argues Farrugia does not disclose discrete carbon nanotubes, but rather discloses "reaction products of carbon nanotubes covalently bonded to one or more monomers which are then polymerized to form the composite resin." Prelim Resp. 17. According to Patent Owner, because Farrugia's nanotubes exist in a reaction product, "Farrugia, like Sun, has carbon nanotube reaction products and not the '649 Patent's claimed dispersions with 'a plurality of oxidized, discrete carbon nanotubes.'" *Id.* at

13–14. For the same reasons as we discussed for Patent Owner's argument applied to Sun's reaction product, we do not find persuasive Patent Owner's argument that Farrugia does not disclose discrete carbon nanotubes solely because its carbon nanotubes are present in a reaction product. *See* Section II.D.2 above.

Patent Owner further argues Narayan's disclosure of carbon nanotube aspect ratios does not render obvious the aspect ratio range of 25 to 500 recited in claim 1. Prelim. Resp. 14. According to Patent Owner, Narayan's disclosure of an aspect ratio of "greater than or equal to about 5 . . . [p]referably . . . greater than or equal to about 10, more preferably greater than or equal to about 100, and even more preferably greater than or equal to about 1000" (Ex. 1008 ¶ 14) does not fall within the range of claim 1's aspect ratio of 25 to 500, and the Petition does not explain how a person of ordinary skill "gets from a most preferable aspect ratio of greater than 1000 in Narayan to the claimed range of 25–500." Prelim. Resp. 14.

We find Petitioner's argument more persuasive. The law on overlapping ranges is clear. *See In re Peterson*, 315 F.3d 1325, 1329 (Fed. Cir. 2003) ("A *prima facie* case of obviousness typically exists when the ranges of a claimed composition overlap the ranges disclosed in the prior art"). Petitioner directs us to evidence of an overlapping range in Narayan, which Patent Owner does not dispute. This shifts the burden of production to Patent Owner to come forward with evidence indicating that the overlapping range would not have been obvious in light of that prior art. *E.I. DuPont de Nemours & Co. v. Synvina C.V.*, 904 F.3d 996, 1006 (Fed. Cir. 2018). At this stage, Patent Owner has not met its burden of production. With regard to Patent Owner's argument regarding Narayan's disclosure that

the most preferable range of aspect ratios (i.e., greater than or equal to about 1000) is above the claimed range, this argument does not undermine Petitioner's evidence of Narayan's overlapping range. To the extent that Patent Owner is arguing that Narayan teaches away from the claimed range, we do not agree because Narayan does not discourage the use of nanotubes within the claimed range. *See In re Fulton,* 391 F.3d 1195, 1201 (Fed. Cir. 2004) (a reference does not teach away from a claimed invention unless it "criticize[s], discredit[s], or otherwise discourage[s]" the claimed solution).

Patent Owner further argues a person of ordinary skill reading Farrugia would not be led to look to Narayan or any other reference for an aspect ratio because Farrugia suggests that all carbon nanotubes have a suitable high aspect ratio for its toner purposes. Prelim. Resp. 15 (citing Ex. 1007 ¶ 18 ("Because carbon nanotubes have a high aspect ratio, only small amounts of carbon nanotubes need to be present in a toner in order to achieve the same conductivity as compared to conventional conductive additives."). On this record, we disagree that Farrugia's suggestion that aspect ratio is relevant to achieving increased conductivity is an insufficient reason for a person of ordinary skill in the art to look to Narayan's teaching of aspect ratios. Further, Petitioner presents testimony from its declarant supporting its position. Ex. 1003 ¶¶ 194–195. At this stage of the proceeding, Patent Owner's attorney arguments do not undermine that evidence.

Conclusion as to Claim 1

For all of the foregoing reasons, we determine Petitioner has demonstrated a reasonable likelihood that claim 1 would have been obvious in view of the teachings of Farrugia and Narayan.

III. DISCRETION UNDER 35 U.S.C. § 314(a)

Patent Owner contends that we should exercise discretion to deny institution in favor of the parallel proceeding taking place in the U.S District Court for the Southern District of Texas. Prelim. Resp. 18. Patent Owner cites the discretionary-denial factors articulated in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 5–6 (PTAB Mar. 20, 2020) (precedential) ("*Fintiv*"). *Id.* at 18–24. Petitioner opposes. Pet. 78–79.

Under § 314(a), the Director has discretion to deny institution of an *inter partes* review, and that discretion has been delegated to the Board. *See* 37 C.F.R. § 42.4(a) ("The Board institutes the trial on behalf of the Director."); *SAS Inst.*, 138 S. Ct. at 1356 ("[Section] 314(a) invests the Director with discretion on the question whether to institute review . . . ." (emphasis omitted)).

Under *Fintiv, w*e consider the following factors to assess whether efficiency, fairness, and the merits support the exercise of authority to deny institution in view of 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.

Fintiv at 5–6. In evaluating these factors, we "take[] a holistic view of whether efficiency and integrity of the system are best served by denying or

instituting review." *Id.* at 6 (citing Patent Trial and Appeal Board Consolidated Trial Practice Guide, 58 & n.2 (Nov. 2019) ("CTPG").

Subsequently, the Director issued additional guidance on the application of the *Fintiv* Factors. *See Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation,* issued June 21, 2022 ("Guidance Memo").[12] Under the Guidance Memo "the PTAB will not rely on the *Fintiv* factors to discretionarily deny institution in view of parallel district court litigation where a petition presents compelling evidence of unpatentability." *Id.* at 2.

> [C]ompelling, meritorious challenges will be allowed to proceed at the PTAB even where district court litigation is proceeding in parallel. Compelling, meritorious challenges are those in which the evidence, if unrebutted in trial, would plainly lead to a conclusion that one or more claims are unpatentable by a preponderance of the evidence.

Id. at 4. The application of the Guidance Memo is further guided by the precedential decisions of the Director in *OpenSky Indus., LLC v. VLSI Tech. LLC*, IPR2021-01064, Paper 102, 49–50 (Oct. 4, 2022) (precedential) and *CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23 (Feb. 27, 2023) (precedential) ("*CommScope*"). Accordingly, we are instructed to consider compelling merits under the sixth *Fintiv* factor only after a determination that the first five *Fintiv* factors favor discretionary denial. *CommScope*, 4–5.

The Guidance Memo further states,

[12] Available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf.

> [c]onsistent with *Sotera Wireless, Inc*., the PTAB will not discretionarily deny institution in view of parallel district court litigation where a petitioner presents a stipulation not to pursue in a parallel proceeding the same grounds or any grounds that could have reasonably been raised before the PTAB.

Id. at 3 (footnote omitted); *see Sotera Wireless, Inc. v. Masimo Corp.,* IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020) (precedential as to § II.A).

We consider the parties' contentions under the *Fintiv* factors below.

A. Factor 1: Whether the court granted a stay

Petitioner contends that the court in the Eastern District of Texas presiding over the parallel litigation involving the '649 patent routinely grants a motion for stay where all asserted claims are under PTAB review. Prelim. Reply 1, citing *AGIS Software Dev. LLC v. Google LLC*, No. 2:19-cv-361, 2021 WL 465424 at *3 (E.D. Tex. Feb. 9, 2021). Petitioner contends this factor is neutral.

Patent Owner concedes that Petitioner filed a motion to stay the parallel litigation, which "was denied without prejudice to refile after institution decisions." Prelim. Resp. 18. Patent Owner contends, however, that the court presiding over the parallel litigation routinely stays cases only where the PTAB has instituted IPR proceedings as to all claims of all asserted patents. Prelim. Sur-reply 1, citing *AGIS*, 2021 WL at *2. Patent Owner further argues it is unlikely that all five of Petitioner's IPR petitions challenging patents at issue in the parallel litigation will be instituted, and thus it is speculative whether that court would issue a stay. Prelim. Sur-reply 1–2. Patent Owner contends this factor is neutral or weighs in favor of discretionary denial. *Id.* (citing *T-Mobile USA , Inc. et al. v. Wireless Alliance, LLC*, IPR2024-00608, Paper 16 at 12 (PTAB Sept. 3, 2024)).

Although the parties appear to agree that this factor is neutral, we note that a district court denial of a motion to stay without prejudice, accompanied by an indication that the district court would consider a renewed motion, "suggests the district court may be willing to avoid duplicative efforts and await the PTAB's final resolution of the patentability issues raised in the petition before proceeding with the parallel litigation." *Fintiv*at6–7. "This fact has usually weighed against exercising authority to deny institution." *Id*. at 7 (also noting that factors 2 and 3 are relevant to how much weight to give to the court's willingness to reconsider a stay); *see also T-Mobile*, Paper 16 at 12 (noting that a stay was unlikely in that case given the proximity of the trial date to the entry of the institution decision).

In view of the forgoing, we determine that the considerations of *Fintiv* factor 1 weigh against exercising our authority to deny institution.

B. Factors 2 and 3: Proximity of the court's trial date to the Board's projected statutory deadline for a final written decision, and investment in the parallel proceeding by the court and the parties

Trial in the parallel district court litigation is set to begin on December 8, 2025. Ex. 2002. The statutory deadline for a Final Written Decision in this proceeding will fall in mid-December 2025.

Petitioner notes that these dates are around the same time, and argues the potential for conflict between the parallel district court litigation and this IPR is minimal "in view of EDTX's growing backlog of cases and Petitioner's offered stipulation." Prelim. Reply 1. Petitioner argues the parties have not yet committed substantial resources in the EDTX litigation to discovery, which does not close until July 2025. *Id.* at 2. Petitioner further argues the majority of discovery the parties have engaged in relates

to Petitioner's motion to transfer to the Northern District of California, and the parties are still negotiating the scope of accused products. *Id.* Petitioner further argues it was diligent in filing the Petition promptly after commencement of the parallel district court litigation. *Id.* at 2.

Patent Owner contends that the proximity of the parallel district court trial date and a Final Written Decision here could result in conflicting decisions, and the chance of conflicting decisions is increased because Petitioner's district court invalidity case involves 140 more references than this IPR. Prelim. Sur-reply 2. Patent Owner also points to Petitioner's invalidity contentions as an example of "[s]ignificant time and money" spent in the parallel district court litigation. *Id*. Patent Owner contends "[t]he parties are beginning to commit substantial resources to the parallel proceeding as discovery has begun in earnest." Prelim. Resp. 19.

Having considered both sides' arguments as to *Fintiv* factors 2 and 3, we determine that the considerations of these factors weigh against exercising discretionary denial. Neither party directs us to any substantive order issued by the district court in the parallel litigation, which indicates the court has not yet considered claim construction or potential invalidity of the '649 patent. The *Markman* hearing will not occur until June 2025, and the expert discovery cutoff is not until August 2025. Ex. 2002. Thus, although the parties have begun discovery as to invalidity issues, much further work remains in the parallel district court litigation. We also take into account Petitioner's prompt filing of the Petition, as weighing against exercising discretionary denial. *See Fintiv* 11 ("If the evidence shows that the petitioner filed the petition expeditiously, such as promptly after becoming

aware of the claims being asserted, this fact has weighed against exercising the authority to deny institution ….").

C. Factor 4: Overlap between issues raised in the petition and in the parallel proceeding

Petitioner stipulates "not to seek resolution in the district court of the same grounds presented in this Petition." Pet. 79. Petitioner contends its stipulation, combined with its filing of the Petition promptly after commencement of the parallel district court litigation, mitigates concerns of duplicative litigation. Prelim. Reply 2 (citing *Samsung Elecs. v. Staton Techiya, LLC,* IPR2022-00281-13, 8 (PTAB July 15, 2022). Petitioner contends this factor weighs against discretionary denial.

Patent Owner contends this IPR will only resolve a portion of the invalidity issues in the parallel district court litigation, because Petitioner's extensive invalidity contentions in the parallel litigation include numerous references and combinations, in addition to the grounds presented in the Petition. Prelim. Resp. 21 (citing Ex. 2005); Prelim. Sur-reply 2–3. Thus, Patent Owner argues, Petitioner's *Sand Revolution*[13]-type stipulation would only resolve a small portion of the issues in the EDTX litigation. Prelim. Sur-reply 3. Patent Owner contends this factor weighs in favor of discretionary denial.

We determine that the considerations of the fourth *Fintiv* factor weigh against exercising discretionary denial. We agree with Patent Owner that "given the breadth of remaining grounds of invalidity in parallel litigation," Petitioner's stipulation would only resolve a portion of the issues before the

[13] *Sand Revolution II, LLC v. Continental Intermodal Group – Trucking LLC,* IPR2019-01393, Paper 24 (PTAB June 16, 2020) (informative) ("*Sand Revolution*").

court. Prelim. Sur-reply 3. Nevertheless, Petitioner's stipulation mitigates concerns of inefficiency, and the Board has indicated that the type of stipulation offered by Petitioner does mitigate, at least to some extent, concerns of "potentially conflicting decisions." *Sand Revolution* at 12.

D. Factor 5: Whether the petitioner and the defendant in the parallel proceeding are the same party

The parties agree that Petitioner and the defendant in the parallel district court litigation are the same party. Prelim. Reply 3; Prelim. Resp. 22. Petitioner contends this factor is neutral. Prelim. Reply 3.

Patent Owner contends that a related proceeding in EDTX, *Molecular Rebar Design, LLC v. Samsung Electronics Co.,* 2-24-cv-00108 ("Samsung litigation"), involves the same five patents and was consolidated with the parallel litigation for all pretrial issues. Prelim. Sur-reply 4. Patent Owner further argues "[e]ven in the unlikely case that all five petitions are instituted, Petitioner has not suggested that the district court case would somehow stay the consolidated case given that Samsung is not a party to the IPR proceedings." *Id.* Patent Owner contends this factor weighs in favor of discretionary denial.

We find the parties in this proceeding are the same as in the parallel district court litigation, except that as Patent Owner notes, consolidation with the Samsung litigation introduces an additional defendant in the district court litigation. Patent Owner, however, never indicates whether the issues in the Samsung litigation are the same as, or substantially similar to, those to be litigated in its case against Petitioner. *See Fintiv*, 13–14. Based on the present record, we consider *Fintiv* factor five to weigh in favor of exercising discretionary denial. *Sotera Wireless*, 19.

E. Factor 6: Other circumstances, including the merits

Unsurprisingly, the parties take different views on the merits of the Petition. Petitioner contends the Petition presents a compelling case of invalidity (Prelim. Reply 2–5); Patent Owner contends Petitioner failed to present a *prima facie* case of obviousness. Prelim. Resp. 23.

According to the Director, we should consider compelling merits under the sixth *Fintiv* factor only after a determination that the first five *Fintiv* factors favor discretionary denial. *CommScope*, 4–5. Here, we do not find the first five factors cumulatively weigh in favor of discretionary denial. Therefore, we determine that the circumstances here do not warrant an analysis of whether the Petition presents compelling merits, and the considerations of the sixth *Fintiv* factor weigh against exercising discretionary denial.

F. Conclusion

Having considered the parties' arguments in view of the *Fintiv* factors, and taking into account Petitioner's stipulation, we determine that the circumstances here do not warrant exercising discretion under § 314(a) to deny institution.

IV. CONCLUSION

Based on the arguments in the Petition and the evidence of record, we determine that Petitioner has established a reasonable likelihood of prevailing with respect to at least one challenged claim of the '649 patent, and we institute *inter partes* review on all challenges raised in the Petition.

At this stage of the proceeding, we have not made a final determination with respect to the patentability of any challenged claim or

any underlying factual or legal issue, including claim construction. Our final decision will be based on the record as fully developed during trial.

V. ORDER

In consideration of the foregoing, it is hereby

ORDERED that an *inter partes* review of all challenged claims of the '649 patent is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(a), *inter partes* review of the '649 patent is hereby instituted commencing on the entry date of this Decision, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial.

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