

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG DISPLAY CO., LTD.,
Petitioner,

v.

PICTIVA DISPLAYS INTERNATIONAL LTD.,
Patent Owner.

IPR2024-01093
Patent 8,723,164 B2

Before GRACE KARAFFA OBERMANN, GARTH D. BAER, and
MICHAEL G. MCMANUS, *Administrative Patent Judges*.

OBERMANN, *Administrative Patent Judge*.

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

I. INTRODUCTION

Petitioner¹ filed a Petition to institute an *inter partes* review of claims 1–16 of U.S. Patent 8,723,164 B2 (Ex. 1001, “the ’164 patent”). Paper 1 (“Pet.”). Patent Owner² filed a Preliminary Response to the Petition. Paper 6 (“Prelim. Resp.”).

With Board authorization, Petitioner filed a Reply (Paper 7), Patent Owner filed a Sur-reply (Paper 8), Petitioner filed a Notice and Stipulation (Paper 9; Ex. 1027), and Patent Owner filed a Preliminary Supplementation (Paper 10). *See* Exs. 3001, 3002 (emails, authorizing these additional submissions).

We have authority to institute an *inter partes* review where a petitioner shows a reasonable likelihood of prevailing with respect to at least one challenged claim. 35 U.S.C. § 314(a); 37 C.F.R. § 42.4(a). Applying that standard, for reasons set forth below, we institute an *inter partes* review.

II. BACKGROUND

A. *Related Proceedings*

The parties identify *Pictiva Displays Int’l Ltd. v. Samsung Electronics Co., Ltd.*, No. 2:23–cv–00495 (E.D. Tex.) (“the District Court action”) as a related proceeding. Pet. 5; Paper 3, 1. In addition, in the Reply, Petitioner identifies *Pictiva Displays Int’l Ltd. v Samsung Elecs. Co., Ltd.*, No. 2:24–

¹ Petitioner identifies Samsung Display Co., Ltd., Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc. as real parties-in-interest. Pet. 5.

² Patent Owner identifies Pictiva Displays International Ltd., “a subsidiary of Key Patent Innovations Limited,” as “the owner” of the ’164 patent. Paper 3, 1. Patent Owner further states that Key Patent Innovations Limited “is a wholly-owned subsidiary of New PP Licensing, LLC.” *Id.*

cv–00532 (E.D. Tex.), filed by Patent Owner on July 12, 2024, as “a replacement lawsuit” for the District Court action. Reply 4–5.

B. The '164 Patent (Ex. 1001)

The '164 patent relates to “an electronic device and a method for the production of an electronic device.” Ex. 1001, 1:15–16. The '164 patent explains that electronic devices, including organic light-emitting diodes (“OLEDs”), comprise several functional organic layers, such as an emission layer having a matrix material doped with emitter molecules. *Id.* at 1:20–23. Excitons are formed in the emission layer due to a recombination of electrons and holes, which causes the emission of light. *Id.* at 1:23–25.

According to the '164 patent, “the ratio between electrons and ‘holes’ which are transported in the emission layer is decisive” for obtaining a highly-efficient electronic device and “[a] nonbalanced ratio between hole and electron transport results in a low radiation efficiency of the device.” *Id.* at 1:25–29. In view of this, the '164 patent states that an object of the invention “is to provide an electronic device with an improved charge carrier transport and an improved charge carrier balance in the organic layers and thus an increased efficiency.” *Id.* at 1:33–36.

The '164 patent describes molecular orbitals materials, including the Lowest Unoccupied Molecular Orbital (“LUMO”) and Highest Occupied Molecular Orbital (“HOMO”). *Id.* at 1:46–55. The '164 patent explains:

According to the molecular orbital theory, in one molecule there are several molecular orbitals with different energy levels, which can be occupied by the existing electrons. These molecular orbitals are occupied according to increasing energy level. The LUMO is the energetically lowest molecular orbital which is no longer occupied with an electron. The HOMO is the energetically highest molecular orbital which is still occupied with an electron.

Id. at 1:60–67.

The '164 patent further describes an electronic device that includes a substrate, a first electrode, a second electrode, and at least one organic functional layer having a first matrix material, a second matrix material, and a third matrix material. *Id.* at 1:38–48. The '164 patent explains that holes are created by removing an electron from the HOMO of a material, this is more difficult with an energetically low HOMO than one with a high energy, and that because the second matrix material has a higher HOMO than the third matrix material, the second matrix material is more suitable as a hole transport material. *Id.* at 2:46–52.

In addition, the '164 patent explains, creation of electrons is favored in LUMOs that are energetically lower, therefore, the third matrix material has a lower LUMO than the second matrix material. *Id.* at 2:52–57. The '164 patent also states:

The first matrix material is selected thereby so that it has a large band gap that is, the difference between HOMO and LUMO, for example, so that its HOMO is energetically below the HOMO of the other two matrix materials, and its LUMO is energetically above the LUMO of the other two matrix materials.

Id. at 2:4–9. We reproduce below Figure 2, which depicts that relationship.

Fig. 2

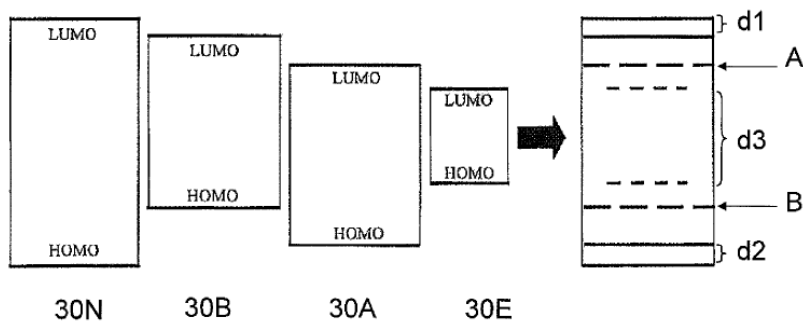


Figure 2 illustrates a schematic side view of various matrix materials. *Id.* at 5:63–64. The '164 patent describes how first matrix material 30N has a HOMO that is energetically lower than those of second matrix material 30B and third matrix material 30A, where a LUMO is energetically higher than those of second matrix material 30B and third matrix material 30A. *Id.* at 6:19–26. Second matrix material 30B has a LUMO energetically higher than the LUMO of third matrix material 30A and a HOMO energetically higher than the HOMO of third matrix material 30A. *Id.* at 6:26–30.

The organic functional layer may be doped with an emitter material, which may have a lower LUMO and a higher HOMO than the three matrix materials. *Id.* at 3:61–63, 4:44–49. For example, emitter material 30E may have a LUMO and HOMO between those of matrix materials 30N, 30B, 30A. *Id.* at 6:34–37.

C. Challenged Claims

Claims 1–16 of the '164 patent are at issue in this proceeding. Pet. 1. Claim 1, reproduced below, is illustrative of the claimed subject matter.

1. An electronic device, comprising:

a substrate;

a first electrode;

at least one organic functional layer; and

a second electrode, wherein the at least one organic functional layer is located between the first electrode and the second electrode, and wherein the at least one organic functional layer has at least a first matrix material, a second matrix material, and a third matrix material, and the third matrix material has a Lowest Unoccupied Molecular Orbital (LUMO), which is energetically lower than the LUMO of the second matrix material and the LUMO of the first matrix material, and wherein the second

matrix material has a Highest Occupied Molecular Orbital (HOMO), which is energetically higher than the HOMO of the first matrix material and the HOMO of the third matrix material,

wherein the organic functional layer is an emission layer and is doped with at least one emitter material.

Ex. 1001, 9:4–22.

D. Asserted Challenges to Patentability

The Petition sets forth the following challenges to patentability.

Claim(s) Challenged	35 U.S.C. § ³	Reference(s)/Basis
1–8, 10–16	102/103(a)	Choulis ⁴
9	103(a)	Choulis, Yong ⁵
1, 3, 5–8, 10–13	102/103(a)	Sugiura ⁶
15–16	102/103(a)	Thompson ⁷

Pet. 6. Petitioner advances the Declaration of Dr. Russel J. Holmes (Ex. 1003). Patent Owner advances the Declaration of Dr. Marc Sims. (Ex. 2001).

III. DISCRETIONARY DENIAL

A. Discretionary Denial under 35 U.S.C. § 325(d)

The Board may institute an *inter partes* review where the information presented “shows that there is a reasonable likelihood that the petitioner

³ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284 (2011), amended 35 U.S.C. § 103 effective March 16, 2013. Because the ’164 patent’s priority date is before the AIA’s amendments to Sections 102 and 103, this decision refers to pre-AIA statutory provisions. Neither party indicates the result would change under the AIA version.

⁴ US 2007/0069636 A1, published March 29, 2007 (Ex. 1004).

⁵ CN 1582073 A, published February 16, 2005 (Ex. 1008). We refer to the certified English translation of Yong (Ex. 1009).

⁶ JP 2001-110568 A, published April 20, 2001 (Ex. 1005). We refer to the certified English translation of Sugiura (Ex. 1006).

⁷ US 2004/0155238 A1, published August 12, 2004 (Ex. 1007).

would prevail with respect to at least [one] of the claims challenged in the petition.” 35 U.S.C. § 314(a). Even where a petitioner meets that threshold showing, however, the Board has discretion to deny the request for review where the petitioner advances “the same or substantially the same prior art or arguments previously” presented to the Office. 35 U.S.C. § 325(d).

We apply a two-part framework when assessing whether to exercise our discretion to deny a petition under Section 325(d). First, we consider whether the same or substantially the same prior art or arguments previously were presented to the Office. Second, if either condition is satisfied, we assess whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of the challenged claims. *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential) (setting forth two-part framework that guides the Board’s decision whether to exercise its discretion to deny review under Section 325(d)).

Petitioner contends that “Choulis, Sugiura, and Yong were not of record during prosecution” and, acknowledging that “Thompson . . . was cited in an IDS during prosecution,” argues that Thompson was not used in a rejection during prosecution. Pet. 84.

Patent Owner, for its part, emphasizes that Thompson was submitted to the Office during prosecution, as evidenced by the Examiner’s signature on the IDS form that included Thompson. Prelim. Resp. 59–60. Patent Owner asserts that Petitioner has not demonstrated that the Office erred in a manner material to the patentability of the challenged claims. *Id.* at 60–61.

Although Thompson was presented previously to the Office, only one of Petitioner’s four patentability challenges relies on Thompson. Pet. 6.

Further, as discussed below, we determine Petitioner presents a sufficient basis to institute *inter partes* review over the first ground, which does not involve Thompson.

On this record, we determine that Section 325(d) is not implicated sufficiently by granting institution and, further, that instituting review would not undermine the statutory purpose of Section 325(d). Neither the prior art nor the arguments presented in the Petition are substantially the same as those previously presented to the Office. As a result, we do not exercise our discretion under Section 325(d) to deny institution of *inter partes* review.

B. Discretionary Denial under 35 U.S.C. § 314(a)

We have discretion to deny institution of an *inter partes* review under the provisions of 35 U.S.C. § 314(a) (authorizing institution of an *inter partes* review under particular circumstances, but not requiring institution under any circumstances). *See Cuozzo Speed Techs., LLC v. Lee*, 579 U.S. 261, 273 (2016) (“[T]he agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion.”); *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1356 (2018) (“[Section] 314(a) invests the Director with discretion on the question whetherto institute review” (emphasis omitted)); *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“[T]he PTO is permitted, but never compelled, to institute an IPR proceeding.”).

When determining whetherto exercise discretion to deny institution in view of a parallel proceeding, we consider the factors set forth in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 5–6 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”). “These factors relate to whether efficiency, fairness, and the merits support the exercise of authority to deny institution in view of an earlier trial date in the parallel proceeding.” *Id.*

In *Sotera Wireless, Inc. v. Massimo Corp.*, IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020) (precedential), the Board declined to exercise its discretion to deny review under *Fintiv* where the patent owner stipulated “if IPR is instituted, they will not pursue in the District Court Litigation any ground raised or that could have been reasonably raised in an IPR.” *Sotera Wireless*, Paper 12 at 18.

Importantly, moreover, on June 21, 2022, the Director of the United States Patent and Trademark Office issued a Memorandum setting forth an “Interim Procedure for Discretionary Denials in AIA Post Grant Proceedings with Parallel District Court Litigation” (“Guidance Memo”).⁸ The Guidance Memo states that “[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.” Guidance Memo 3 (footnote and emphasis omitted).

In the District Court action, Petitioner has stipulated as follows:

Defendants hereby stipule that, if the Patent Trial and Appeal Board institutes an inter partes review proceeding for U.S. Patent No. 8,723,154 on the grounds presented in the petition in IPR2014-01093, then Defendants will not pursue an invalidity defense in this case that the patent claims subject to the instituted IPR are invalid based on grounds that were raised or reasonably could have been raised in the IPR.

Ex. 1027.

We determine, and Patent Owner does not contest (Paper 10 at 1), that this stipulation is consistent in scope with the stipulation in *Sotera Wireless*

⁸ Available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf.

cited approvingly in the Director’s Guidance Memo. Patent Owner argues only, in that regard, that “the Board should consider Petitioner’s apparent disregard of fair play when making its institution decision,” given that Petitioner filed the stipulation only after Patent Owner “used its limited word allotment to address” the discretionary denial issues in its Preliminary Response. *Id.*

Patent Owner directs us to no authority that permits the Board to disregard the Guidance Memo under these circumstances. *Id.* Consistent with the Guidance Memo, therefore, we decline to exercise our discretion to deny institution under *Fintiv* in view of the District Court action.

IV. ANALYSIS OF THE CHALLENGES

A. Level of Ordinary Skill in the Art

The level of ordinary skill in the art at the time of the invention is a factual determination that provides a primary guarantee of objectivity in an obviousness analysis. *Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308, 1324 (Fed. Cir. 1999) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991)).

Petitioner contends:

A person of ordinary skill in the art (“POSITA”) at the time of the alleged invention of the ’164 patent would have had a Bachelor’s degree in chemistry, physics, or a comparable field of study, and at least three years of research or industrial experience with organic optoelectronic light-emitting devices. An individual with additional education could have less research or industrial experience and vice versa.

Pet. 12. Patent Owner does not dispute Petitioner’s argument. *See generally* Prelim. Resp.

Neither party indicates that the result on institution would change depending on the definition selected. Accordingly, for the sole purpose of deciding whether to institute review, we adopt Petitioner’s uncontested proposed definition, because, on this record, it is consistent with the disclosures of the asserted prior art. *See* Ex. 1004, (code 57); Ex. 1006, code (57); Ex. 1008, code (57); Ex. 1009, code (57) (abstracts of the references asserted in the patentability challenges).

B. Claim Construction

In an *inter partes* review, the Board construes the terms of a patent claim “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. § 42.100(b). Under that standard, claim terms generally are given their plain and ordinary meaning as would have been understood by the ordinarily skilled artisan at the time of the invention and within the context of the entire patent disclosure. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc).

We construe claim terms only as relevant to the parties’ contentions and only to the extent necessary to resolve the issues in dispute. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999); *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

Neither party indicates that an express construction for any claim term is necessary to our decision whether to institute review. Pet. 15; *see generally* Prelim. Resp. However, as discussed below, Patent Owner’s arguments, directed to the merits of the patentability challenges, raise an

implicit construction of the term “matrix material.” Prelim. Resp. 6–21. We address that implicit construction in the next section.

C. Assessment of the Challenges

We have authority to institute review where a petitioner shows sufficiently a reasonable likelihood of prevailing at trial with respect to at least one challenged patent claim. 35 U.S.C. § 314(a). For reasons that follow, we determine that Petitioner satisfies that threshold by showing sufficiently, for purposes of instituting a review, that claim 1 is anticipated by Choulis. *See* Pet. 6 (asserted grounds).

(1) Construction of “matrix material”

(a) Parties’ Arguments

Patent’s Owner’s arguments against the merits of Petitioner’s anticipation challenge based on Choulis are limited to assertions, which we reject on this record for reasons explained below, pertaining to the scope of the term “matrix material” in claim 1. Prelim. Resp. 6–21.

For example, Patent Owner asserts that “[t]he claims require an organic functional layer having ‘at least a first matrix material, a second matrix material, and a third matrix material’” but “Petitioner points to Choulis’s ‘host material’ PVK, ‘a first organic moiety’ (TPD), and ‘a second organic moiety’ (PBD) as the first, second, and third matrix materials.” Prelim. Resp. 6 (citing Ex. 1001, 9:10–12; Pet. 24–25). According to Patent Owner, Petitioner provides “no competent evidence on why TPD or PBD are ‘matrix material(s)’ given Choulis’s characterization that TPD and PBD were ‘doped’ into the emitting layer.” *Id.* (citing Ex. 1004 ¶ 32) (emphasis omitted).

In addition, Patent Owner submits, “The ’164 patent distinguishes between a ‘matrix material’ and a ‘doping substance[.]’” because the ’164 patent discloses the use of four evaporation sources to evaporate “matrix materials and/or doping substance” onto a substrate, which “makes clear that a matrix material is not a doping substance (or dopant).” *Id.* at 6–7 (citing Ex. 1001, 7:12–15). According to Patent Owner, “the ’164 patent consistently describes emitter materials that can be ‘up to 10 wt%’ in an emission layer as a dopant, and never as a matrix material.” *Id.* at 7 (citing Ex. 1001, 1:22–23, 3:61–63, 3:65–66, 4:15–16, 6:13–15).

Patent Owner further asserts that this usage of an additive in an amount up to 10% as a dopant “is consistent with contemporaneous literature” because “a paper by the Choulis authors described work by Yang and Neher (EX1017) as involving the use of PVK as a host, which ‘is then molecularly doped with. . . (TPD),. . . (PBD), and Ir(mppy)₃, components that serves the purpose of carrier transport and emission.” *Id.* at 7–8 (citing Ex. 1022, 2) (emphasis omitted). According to Patent Owner, “[t]his description matches that given by Yang and Neher themselves.” *Id.* at 8 (citing Ex. 1017, 2). Patent Owner submits that “Yang and Neher repeatedly described their devices as involving co-doped TPD” and “Yang and Neher’s devices mostly used about 10 wt% TPD in the emission layer.” *Id.* at 8–9 (citing Ex. 1017, 2476–2478). In view of this, Patent Owner contends that “both the ’164 patent and the contemporaneous literature regarded at least additives of up to 10 wt% as dopants, and not matrix materials.” *Id.* at 9.

Patent Owner further argues that “[s]uch an understanding would be consistent with the common meaning of matrix that connotes substance in which additives (or guest materials) are embedded.” *Id.* at 9 (citing Ex. 2002

(defining “matrix” as “(in chemistry) A continuous solid phase in which particles (atoms, ions, etc.) are embedded”); Ex. 2003, 766 (defining “matrix” as “material in which something is enclosed or embedded”); Ex. 2004, 770 (defining “matrix” as “a substance in which other things are fixed, buried, etc.”); Ex. 2005, 16–17). In Patent Owner’s view, “That is why even references cited by Petitioner differentiate[] ‘dopant’ on the one hand and ‘matrix’ material (sometimes also called ‘host’) on the other hand.” *Id.* at 9–10 (citing Ex. 1010, Abstract; Ex. 1017, 2476, 2478).

In Patent Owner’s further view, this comports with how the inventors of the ’164 patent characterize the three “matrix materials” of the claimed invention “because the inventors contemplate that they would exist in sufficient amounts to affect charge carrier mobilities.” *Id.* at 10 (citing Ex. 2001 ¶¶ 32–33). Patent Owner cites the ’164 patent example in which three matrix materials and an emitter dopant were deposited so that the first matrix material was deposited at a lower rate than the second and third matrix materials and the emitter material was deposited at the lowest rate, resulting “in a layer with 40 volume percent of each of the second and third matrix materials, 19 volume percent of the first matrix material, and 1 volume percent of the emitter material.” *Id.* at 10–11 (citing Ex. 1001, 7:21–35). According to Patent Owner, the resulting layer “therefore included a significant amount of each of the matrix materials and a small amount of the emitter material.” *Id.* at 11 (citing Ex. 2001 ¶49).

Patent Owner concludes that one of ordinary skill in the art “would understand that the term ‘matrix materials’ refers to materials for forming one or more matrices” and “interpreting ‘matrix materials’ as materials that would exist in sufficient amounts to form a continuous phase in which other

materials can be embedded. *Id.* at 11 (citing Ex. 2002; Ex. 2003, 766; Ex. 2004, 770; Ex. 2005, 16–17; Ex. 2001 ¶ 34).

By way of further support, Patent Owner observes that “the ’164 patent aims to tune the ratio of holes and electrons in an organic layer.” *Id.* at 12 (citing Ex. 1001, 1:25–29). Patent Owner asserts that charge carrier transport depends upon “the ease of charge creation,” which depends upon HOMO and LUMO levels, and upon charge carrier mobility. *Id.* (citing Ex. 1001, 2:58–59; Ex. 2001 ¶ 26). In view of this, Patent Owner asserts that “the concentration of a matrix material in the mixture of several matrix materials plays a role.” *Id.* (quoting Ex. 1001, 3:17–21).

Patent Owner further contends that, “in the context of the ’164 patent, the second and third matrix materials. . . are contemplated to exist in sufficient amounts and in more or less a continuous phase to provide sufficiently close molecule distance for adequate hole or electron mobility.” *Id.* at 12–13 (citing Ex. 2001 ¶ 32). Patent Owner thus submits, “That is, they should exist in more than a dopant-level so that the molecule distances are not too distant.” *Id.* at 13 (citing Ex. 2001 ¶ 33).

Patent Owner continues, arguing that the first matrix material “should also exist in more or less a continuous phase to effect that molecule distance adjustment by effectively separating the charge carrier molecules” and, further, that the first matrix material “plays a role in finely adjusting the distances between charge carrier molecules” and “is also contemplated to exist in sufficient quantities to effectively modulate (e.g., increase) the molecule distances to a desired level.” *Id.* (citing Ex. 2001 ¶ 35; Ex. 1001, 3:26–34). Patent Owner asserts that “the ’164 inventors teach a way to adjust the hole and electron mobilities in the emission layer to control the

recombination zone” and “[t]he charge carrier mobilities are optimized by depositing the first, second and third materials as part of the matrices and not dopants.” *Id.* at 14 (citing Ex. 1001, 6:57–7:2, 1:25–29).

Additionally, Patent Owner compares Choulis’ composition to that taught by Yang and Neher by citing disclosures of Choulis in which less than 10% of a substance was used. *Id.* at 14–15 (citing Ex. 1004 ¶ 54; Ex. 1017, 2–4). Patent Owner reiterates the argument that one of ordinary skill in the art would have understood “that an additive such as TPD that has a weight percentage of about 10 wt% is a dopant, and not a matrix material.” *Id.* at 15 (citing Ex. 1001, 6:13–15, 6:48–49). Patent Owner indicates that “Choulis also characterizes PVK as a ‘host’ material, a term it uses interchangeably with ‘matrix’” but “describes embedding ‘organic moieties’ TPD and PBD as ‘co-dop[ing].’” *Id.* at 15–16 (citing Ex. 1004 ¶¶ 32, 44).

Where the ’164 patent distinguishes “between a matrix material and a doping substance” and in view of “Choulis’s own characterization of the organic moieties as a ‘dop[ant],’” Patent Owner contends, “Petitioner should have explained, but did not explain, why” an ordinarily skilled artisan “would have regarded TPD as a matrix material as opposed to a dopant in the context of the ’164 patent.” *Id.* at 16 (citing Ex. 1004 ¶ 32).

Further, according to Patent Owner, “Choulis had a reason to limit the amount of TPD in the mixture” because one of ordinary skill in the art would have recognized that the device depicted in Choulis’ Figure 4 is the same device shown in Exhibit 1022. *Id.* at 16–18 (citing Ex. 1004 ¶ 54; Ex. 1022, 2–3). In Patent Owner’s further view, an ordinarily skilled artisan would “have been aware that Choulis based its emission layer composition

on the one optimized by Yang.” *Id.* at 18–19 (citing Ex. 1004 ¶ 54; Ex. 1017, Fig. 3(a); Ex. 1022, 1, 3; Ex. 2001 ¶ 38).

Patent Owner continues, arguing that one of ordinary skill in the art “would have known of Yang’s observation that when TPD concentrations exceeded 13 wt%, luminous efficiency began to decrease likely because ‘a large concentration of TPD disturbs the balance of carrier injection and transport.’” *Id.* at 19 (citing Ex. 1017, 2478) (emphasis omitted). Patent Owner argues that “Choulis, however, incorporates hole and electron transport moieties to ‘improv[e] the efficiency of an OLED.’” *Id.* (citing Ex. 1004 ¶¶ 7, 32). In view of this, Patent Owner contends that Petitioner should have explained why one of ordinary skill in the art “reading Choulis as a whole would still have loaded TPD to a ‘matrix material’ level, a modification that would negatively affect Choulis OLED’s performance.” *Id.* at 19–20 (citing Ex. 2001 ¶ 40).

Finally, Patent Owner argues that one of ordinary skill in the art would not have increased “TPD levels in Choulis’s emission layer because ‘good color purity’ is a desired feature for OLEDs” “[b]ut Yang reports that TPD and PBD would form exciplexes that emit at about 470 nm, outside the emission spectrum of Ir(mppy)₃” and “[h]igher concentrations of TPD and PBD increase this undesired emission.” *Id.* at 20 (citing Ex. 1017, 2476–2477). According to Patent Owner, “[g]iven the adverse effects of high TPD concentrations in the PVK/PBD/TPD mixture, it is not surprising that Choulis does not disclose an emission layer with three matrix materials as required by the claims.” *Id.* at 20–21.

Petitioner counterargues that “[t]he Petition shows that Choulis, Sugiura, and Thompson each disclose first, second, and third ‘matrix

materials’ having the HOMO and LUMO properties recited by the ’164 patent claims.” Reply 1. Petitioner asserts that “Patent Owner attempts to import new requirements into the term ‘matrix material’” by arguing that such a material “must ‘exist in sufficient amounts to form a continuous phase in which other materials can be embedded,’” “and seeks to impose a concentration limitation such that any ‘additives up to 10 wt% would be regarded. . . *not* as a matrix material.” *Id.* (quoting Prelim. Resp. 7, 11).

Petitioner continues, “Patent Owner’s implicit construction is contrary to the intrinsic evidence and should be rejected.” *Id.* Further, according to Petitioner, Patent Owner relies on that erroneous implicit construction to argue “that Choulis’s ‘TPD’ is not a ‘matrix material’ because it is allegedly present at ‘around 9% concentration,’” notwithstanding that “the ’164 patent’s specification expressly identifies the same material ‘TPD’—the ‘second matrix material’ taught by Choulis and Sugiura—as an exemplary ‘matrix material.’” *Id.* (citing Prelim. Resp. 6; Ex. 1001, 8:38–50).

In Petitioner’s further view, “[t]he ’164 patent does not describe any concentration, or concentration threshold, for TPD, nor suggest the same TPD material would somehow cease to be a matrix material if its concentration were below 10 wt%” and “[i]n describing ‘matrix materials,’ and disclosing many examples of them, the ’164 patent never refers to any minimum threshold concentration, much less imposes one.” *Id.* at 1–2 (citing Ex. 1001, 8:38–50). According to Petitioner, “Patent Owner does not identify any evidence of disclaimer or lexicography that would warrant departure from the plain meaning of ‘matrix material,’ . . . [n]or could Patent Owner, because there is none.” *Id.* at 2.

Petitioner advances another reason why Patent Owner's arguments regarding an implicit limitation on the concentration of emitter materials is incorrect, arguing that "[j]ust because the concentration of an *emitter material* 'can be up to 10 wt%, '... it does not follow that a *matrix material* must have a concentration of more than 10 wt%." *Id.* (citing Ex. 1001, 3:65–66) (Petitioner's emphasis). Petitioner asserts that "the '164 patent does not even require emitter materials to have a concentration of 10% or less." *Id.*

In the alternative, Petitioner argues that "Patent Owner's merits arguments would be unavailing even under its erroneous construction" because "Patent Owner improperly tries to limit Choulis's teachings to one exemplary embodiment in its 'EXAMPLE' section in which TPD is described as being 'around 9% concentration in the mixture.'" *Id.* at 2–3 (citing Prelim. Resp. 6). According to Petitioner, Choulis "does not limit its teachings to this concentration or this exemplary embodiment." *Id.* at 3.

Petitioner argues that Patent Owner similarly, and wrongly, attempts to limit Sugiura's teachings to an illustration (namely, Figure 1) in which "second and third matrix materials are 'dispersed and segregated and discontinuous particles," but ignores Sugiura's teaching that the second matrix material (TPD) and third matrix material (Alq3) matrix can be present in a first matrix material (PVK) in a mixing ratio of "100:60:80" for "PVK:Alq3:TPD." *Id.* (citing Prelim. Resp. 11, 50; Ex. 1005 ¶ 62). As a separate matter, Petitioner contends that Patent Owner's arguments regarding Thompson also fail. *Id.* at 3–4.

Patent Owner responds to these arguments by stating that "Petitioner's real parties-in-interest ('Samsung') have proposed in the district court that the three claimed 'matrix material[s]' are each 'part of [a] same matrix,'

with ‘matrix’ meaning ‘a continuous phase of the mixture of matrix materials.’” Sur-reply 1 (citing Ex. 2005, 16–17). Although Patent Owner disagrees “that all three matrix materials must be part of the same matrix,” Patent Owner “agrees that ‘[i]n the context of the ‘164 patent, a matrix material would be part of the continuous phase in a given organic layer in which guest materials can be embedded,’” a view adopted by the expert witness for the real parties-in-interest. *Id.* (citing Ex. 2001 ¶ 37; Ex. 2016 ¶ 131; Ex. 2016 ¶ 131). Against that backdrop, Patent Owner submits, “Petitioner should have, but once again fails to explain, why its references disclose matrix materials that are a part of a continuous phase in a given organic layer.” *Id.* (citing Reply 1–4; Prelim. Resp. 2–3, 6–7, 12–14).

Patent Owner reiterates its view that Sugiura “fails to disclose HOMO/LUMO” and that Sugiura depicts hole and electron transport materials as dispersed and discontinuous phases. *Id.* at 1–2 (citing Ex. 1005, Fig. 1; Prelim. Resp. 4, 50–51). According to Patent Owner, Petitioner’s “Reply makes an attorney argument that a continuous phase would result because each material exists in sufficient quantities in the mixture.” *Id.* at 2 (citing Reply 3). Patent Owner cites Dr. Sims’s testimony that “the phase separation observed in Sugiura is the result of ‘a carefully tailored solution-based process,’ which ‘would not be practical in an evaporated process [as in the ‘164 example] where the molecules are co-deposited in a co-mingled fashion throughout the organic layer.’” *Id.* (citing Ex. 2001 ¶ 49).

Continuing its counterarguments, Patent Owner submits that Petitioner “assumes that if the ‘164 patent lists a material as a suitable candidate for a matrix material without specifying a threshold concentration, then the material automatically qualifies as a matrix material regardless of its

concentration or phase in the mixture.” *Id.* at 2–3 (citing Reply 1–2, 3 n.1). Patent Owner states, “That is incorrect because the term ‘matrix materials’ imparts the requirement that the material be a part of a continuous phase” and “[n]o concentration is specified because the threshold varies depending on *e.g.*, processing conditions, other materials in the mixture, etc.” *Id.* at 3.

Patent Owner further disputes Petitioner’s position “that a 10 wt% threshold for an emitter does not translate to a requirement that a matrix material have a concentration exceeding 10 wt%.” *Id.* (citing Reply 2). According to Patent Owner, “[t]he term ‘matrix material’ has a meaning and does not refer to the material existing in any amounts or existing only in discontinuous phases, as Samsung’s expert acknowledges.” *Id.* (citing Ex. 2016 ¶¶ 129–131). Patent Owner argues that “it is Petitioner’s burden to explain and establish that the low amounts of TPD in *e.g.*, Choulis constitute a matrix material instead of a dopant as described in the literature” but “Petitioner has not done so here.” *Id.* Patent Owner reiterates that “there are technical reasons to limit the amount of TPD in the mixture, because, *e.g.*, ‘a large concentration of TPD disturbs the balance of carrier injection and transport’ and undermines Choulis’ objective.” *Id.* at 3–4.

Further, Patent Owner contests Petitioner’s views regarding Thompson, stating that “Petitioner does not dispute that the ‘164 patent distinguishes between a matrix material and an emitter material, even if the emitter can also transport charges” and, further, states that one of the materials that Petitioner cites as a matrix material is an emitter. *Id.* at 4 (citing Reply 3–4; Prelim. Resp. 54–57; Ex. 1007 ¶ 8). Here again, Patent Owner cites testimony from Petitioner’s real parties-in-interest’s technical witness that a matrix material holds the emitter material and, on that basis,

asserts this as confirmation that an emitter cannot be a matrix material, a distinction made in the '164 patent. *Id.* (citing Ex. 2016 ¶ 129; Reply 2, 4; Prelim. Resp. 54–57).

(b) Analysis

Taking account of the parties' positions above, we resolve the construction of the term “matrix material,” as recited in claim 1, for the sole purpose of deciding whether to institute review. Any final construction of this term shall be based on the full trial record and provided only as necessary to a final written decision.

In a nutshell, Patent Owner submits that the term “matrix material” requires a material present “in sufficient amounts to form a continuous phase in which other materials can be embedded.” Prelim. Resp. 11. Relatedly, when applying claim 1 to the asserted prior art references, Patent Owner submits that materials described as doped or embedded into another material are not matrix materials within the scope of claim 1. Sur-reply 1–4.

Petitioner, by contrast, at least implicitly construes “matrix material” to more broadly include not only materials in a continuous phase, but also materials embedded within a continuous phase. For instance, Petitioner cites Choulis' teachings of PVK as a “host material” and the materials TPD and PBD as organic moieties when arguing that Choulis teaches the three matrix materials of claim 1. Pet. 24–25 (citing Ex. 1004 ¶ 30).

In another example, Petitioner asserts that Sugiura teaches hole transporting material 3D and electron transporting material 3E as being ***embedded*** within a material designated as light emitting layer 3—and that these all are matrix materials whether or not they exist in a continuous phase, as shown in Sugiura's Figure 4:

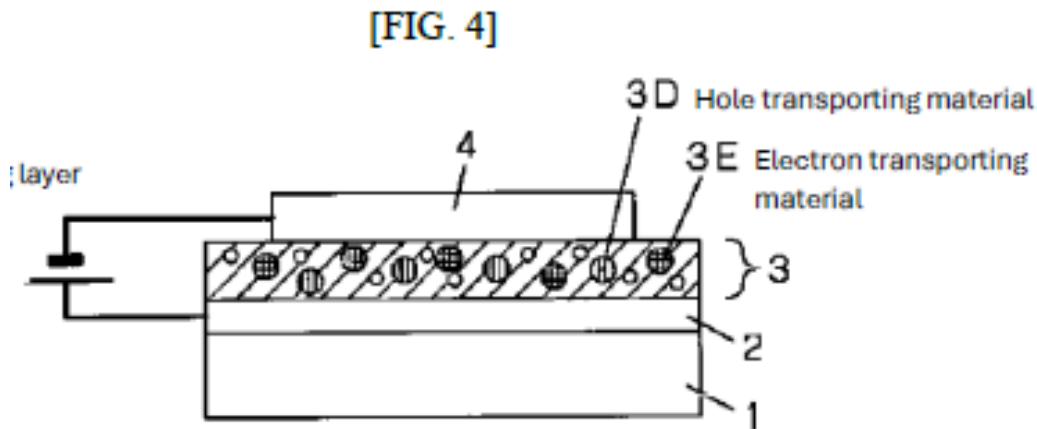


Figure 4 is a diagram showing energy levels in an OLED structure according to Sugiura. Ex. 1006 ¶ 18. Figure 4 illustrates hole transporting material 3D and electron transporting material 3E as embedded within light emitting layer 3—the only continuous phase material in the illustration.

In an *inter partes* review, the Board construes the terms of a patent claim “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. § 42.100(b). Under that standard, claim terms generally are given their plain and ordinary meaning as would have been understood by the ordinarily skilled artisan at the time of the invention and within the context of the entire patent disclosure. *See Phillips*, 415 F.3d at 1313. For instance, although “the words of a claim ‘are generally given their ordinary and customary meaning,’” as understood by a relevant artisan at the time of the invention, such an artisan “is deemed to read the claim term . . . in the context of the particular claim in which the disputed term appears” and “in the context of the entire patent, including the specification.” *Phillips*, 415 F.3d at 1312–13 (citations omitted).

We begin by considering the language of claim 1 itself. *See Phillips*, 415 F.3d at 1314 (“[T]he claims themselves provide substantial guidance as

to the meaning of particular claim terms.”). Claim 1 recites first, second, and third matrix materials but, aside from reciting relationships between the LUMOs and HOMOs of the matrix material, does not require any particular composition or any particular amount for any of the three matrix materials. Ex. 1001, 9:4–22. Nor does claim 1 recite that any of the matrix materials must be present in a continuous phase. *Id.* Claim 1 does recite that the organic functional layer, which includes the three matrix materials, is doped with at least one emitter material. *Id.* at 9:21–22. On this record, no words in claim 1 limit a “matrix material” to the meaning advanced by Patent Owner.

We next consider other intrinsic evidence, including the written description of the invention provided in the ’164 patent. *Phillips*, 415 F.3d at 1313. Patent Owner does not identify definitional language in the written description to support its view that the inventors, acting as their own lexicographers, unequivocally limited the claim term “matrix material” to a material present in a continuous phase or in any particular weight percentage amount. Instead, Patent Owner cites the ’164 patent’s description of evaporating “matrix materials and/or doping substances” to argue that the ’164 patent distinguishes between matrix materials and doping substances. Prelim. Resp. 6–7 (citing Ex. 1001, 7:12–15). Patent Owner also argues that the ’164 patent describes the use of emitter materials in amounts “up to 10 wt%” as a dopant in an emission layer. *Id.* at 7 (citing Ex. 1001, 1:22–23, 3:61–63, 3:65–66, 4:15–16, 6:13–15).

To the extent ’164 patent suggests a distinction between a matrix material and a dopant (*see* Ex. 1001, 7:12–15), on this record, we do not view that suggestion as definitional, because such a distinction is not set forth with reasonable clarity, deliberateness, and precision. *Renishaw PLC*

v. Marposs Societa' per Azioni, 158 F.3d 1243, 1249 (Fed. Cir. 1998).

Importantly, on that point, Patent Owner directs us to no disclosure that defines, with any precision or clarity, the term “matrix material” as a continuous phase or a material present in any certain amount.

Somewhat relatedly, however, Patent Owner asserts that matrix materials need to be present in a sufficient amount. *Id.* at 10–14 (citing Ex. 2001 ¶¶ 26, 32–35, 49). But that assertion (and cited testimony) are presented in the context of what a matrix material is not (that is, not a dopant) without indicating the threshold at which a material would have been recognized as, and considered, a matrix material by an ordinarily skilled artisan or how that artisan would determine such a threshold.

For that reason, we have concerns about whether one of ordinary skill in the art would be able to ascertain the scope of a “matrix material,” as recited in claim 1, with reasonable certainty if we were to construe “matrix material” as suggested by Patent Owner. In view of those concerns, and applying the principle that “claims should be construed to sustain their validity,” we are disinclined to adopt Patent Owner’s construction on this record. *Rhine v. Casio, Inc.*, 183 F.3d 1342, 1345 (Fed. Cir. 1999).

First and foremost, however, we agree with Petitioner that the ’164 patent describes matrix materials, including specific examples of matrix materials, without requiring that such a material be present in any minimum amount. Reply 1–2. That comports with the actual words that appear in claim 1, which reflect no such requirement. *See* Ex. 1001, 9:4–22.

We take account also of Patent Owner’s contention that the ’164 patent describes the use of emitter materials in amounts “‘up to 10 wt%’ in an emission layer as a dopant, and never as a matrix material.” Prelim.

Resp. 7; *see* Ex. 1001, 1:22–23, 3:61–66, 4:15–16, 6:13–15 (relevant disclosures in the ’164 patent, upon which Patent Owner relies).

Significantly, however, the ’164 patent describes doping an emission layer with an emitter material and that the *latter* may have a concentration in the emission layer of up to 10 wt%. Ex. 1001, 1:22–23, 3:65–66, 4:15–16.

In other words, although the cited disclosures from the written description may provide some guidance about a suitable amount of the “emitter material” recited in claim 1, the disclosure is not shown, on this record, to impose a definitional requirement that a “matrix material” must be present in any particular amount. *Id.* at 9:4–22 (claim 1).

When ascertaining the meaning of a claim term, we appropriately consider the prosecution history as part of the intrinsic evidence. 37 C.F.R. § 42.100(b). In that regard, “the prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention.” *Phillips*, 415 F.3d at 1317. Accordingly, we take note that, during prosecution of the ’164 patent, the Examiner rejected some claims as anticipated by Forrest⁹ — based on the Examiner’s assumption that *discontinuous* layers taught by Forrest qualify as matrix materials — and the applicant acquiesced to that assumption. Ex. 1002, 233–236.

The Examiner cited Forrest’s Figure 9H and paragraph 81, stating that elements 953a, 953b, and 953c functioned as first, second, and third matrix materials. *Id.* at 233. In response, the applicant amended what then was claim 1 to include the allowable subject matter of dependent claim 8, added a new independent claim 16 that included the allowable subject matter of dependent claim 2, added a new independent claim that included the

⁹ US 2008/0116536 A1, published May 22, 2008 (Ex. 1013).

allowable subject matter of dependent claim 4 — all without disputing the Examiner’s rejection or assumption about Forrest’s discontinuous layers — and the claims were subsequently allowed. *Id.* at 252–257, 263–271.

We reproduce below Forrest’s Figure 9H.

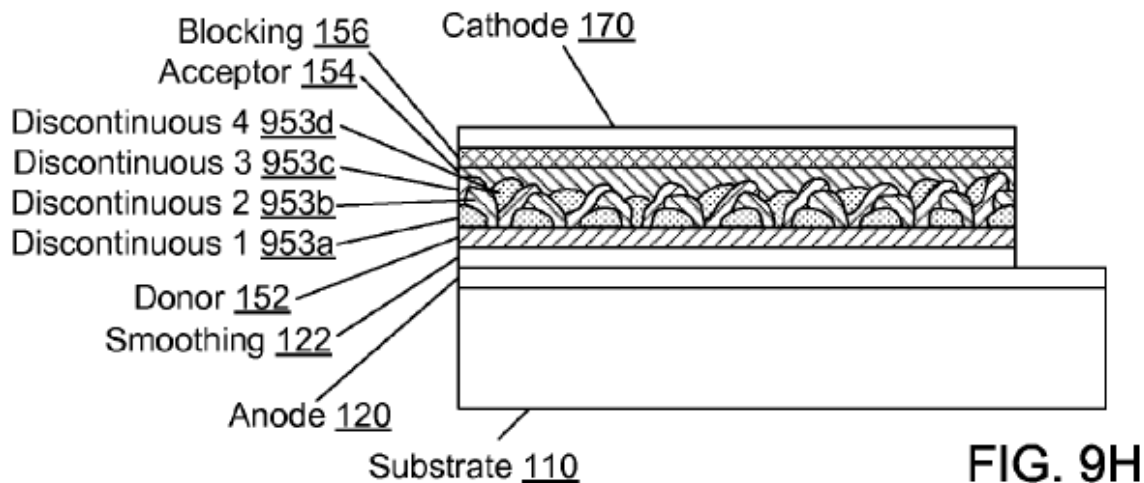


Figure 9H illustrates continuous donor layer 152, which is deposited “prior to the growth of the nanocrystalline discontinuous layers,” particularly first discontinuous layer 953a, second discontinuous layer 953b, and third discontinuous layer 953c. Ex. 1013, ¶ 81.

To be clear, Forrest describes as “discontinuous” layers 953a, 953b, 953c, which the Examiner identified as matrix materials. Figure 9H supports this by illustrating the structures for layers 953a, 953b, 953c as having a particulate, discontinuous form. Forrest’s discontinuous layers thereby resemble the discontinuous materials of Choulis and Sugiura. Ex. 1004 ¶ 30 (Choulis, describing a host material with first and second organic moieties); Ex. 1006, 10 (Sugiura, in Figure 4, depicting hole transporting material 3D and electron transporting material 3E as within light emitting layer 3).

During patent prosecution, the applicant did not contest the Examiner’s view that Forrest’s discontinuous layers 953a, 953b, 953c

represent three matrix materials within the scope of the claimed invention. In that sense, the prosecution history contrasts with Patent Owner's position here, that the term "matrix material" means a material present in a continuous phase. Prelim. Resp. 11; Sur-reply 3.

Stated somewhat differently, the prosecution history does not support importing into claim 1 a requirement that the first, second, or third "matrix material" must be present in a certain amount or otherwise constitute a continuous phase. Ex. 1001, 8–20. Simply put, on this record, that construction finds no support in the intrinsic evidence.

For completeness, we also consider any available extrinsic evidence related to the construction of "matrix material." *See Phillips*, 415 F.3d at 1314, 1317–1318. Patent Owner cites various forms of extrinsic evidence, including articles, dictionary definitions, and the claim construction asserted by Petitioner's real parties-in-interest in related district court litigation. Prelim. Resp. 7–9, 14–15, 18–19; Sur-reply 1. We agree with Petitioner (Reply 1) that Patent Owner attempts to improperly import an unstated requirement into claim 1 from extrinsic sources; namely, a requirement that all matrix materials must be present in an amount greater than all dopant materials—a requirement not supported by the words of the claim, the specification, or the prosecution history.

Our reviewing court considers "extrinsic evidence in general as less reliable than the patent and its prosecution history in determining how to read claim terms." *Phillips*, 415 F.3d at 1318. Further, "extrinsic evidence may be useful to the court, but it is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence." *Id.* at 1319. Although extrinsic evidence can shed useful

light on relevant art, it is less significant than intrinsic record in determining legally operative meaning of patent claim language. *Id.* at 1317.

Alternatively, Patent Owner’s comparison of Choulis to the cited articles (Prelim. Resp. 14–15, 17–18) relies upon Choulis’ sole example. Ex. 1004 ¶ 54. We agree with Petitioner that this example does not limit the rest of Choulis’ disclosure, which does not otherwise constrain its materials to the amounts disclosed for the example. Reply 2–3.

(c) Conclusion

Based on the information presented at this juncture, we do not agree with Patent Owner that the phrase “matrix material” is limited to materials that “exist in sufficient amounts to form a continuous phase in which other materials can be embedded.” Prelim. Resp. 11. Instead, on this record, we determine that Petitioner has the better position, and we construe “matrix material” to include not only materials that form a continuous phase but also materials embedded within such a matrix (for example, not only light emitting layer 3, shown as a continuous phase matrix material in Sugiura’s Figure 4, but also hole transporting material 3D and electron transporting material 3E, which are embedded within light emitting layer 3).¹⁰

¹⁰ Patent Owner suggests that one of ordinary skill in the art would have needed to increase the amount of Choulis’ materials, such as Choulis’ TPD, to a sufficient amount to present as a continuous phase “matrix material,” and that an ordinarily skilled artisan would not have been prompted to make such a modification. Prelim. Resp. 19–21. At this stage, however, we determine that the term “matrix material” is not limited to continuous phase materials. That preliminary determination moots Patent Owner’s arguments that the “matrix material” limitation of claim 1 requires a minimum amount of a material (e.g., more than 10 wt %) to function as a matrix material. *Id.*

Our preliminary construction of “matrix material” is provided for the sole purpose of deciding whether to institute review. Any final claim construction will be provided only as necessary to a final written decision.

(2) The Challenge Based on Anticipation of Claim 1 by Choulis

We next address whether Petitioner shows a reasonable likelihood of prevailing with respect to claim 1 based on anticipation by Choulis.

(a) Overview of Choulis

Choulis “relates to phosphorescent organic luminescent devices” and optoelectronic devices, such as OLEDs. Ex. 1004 ¶¶ 2, 14. Choulis depicts a single OLED pixel in Figure 2, which is reproduced below.

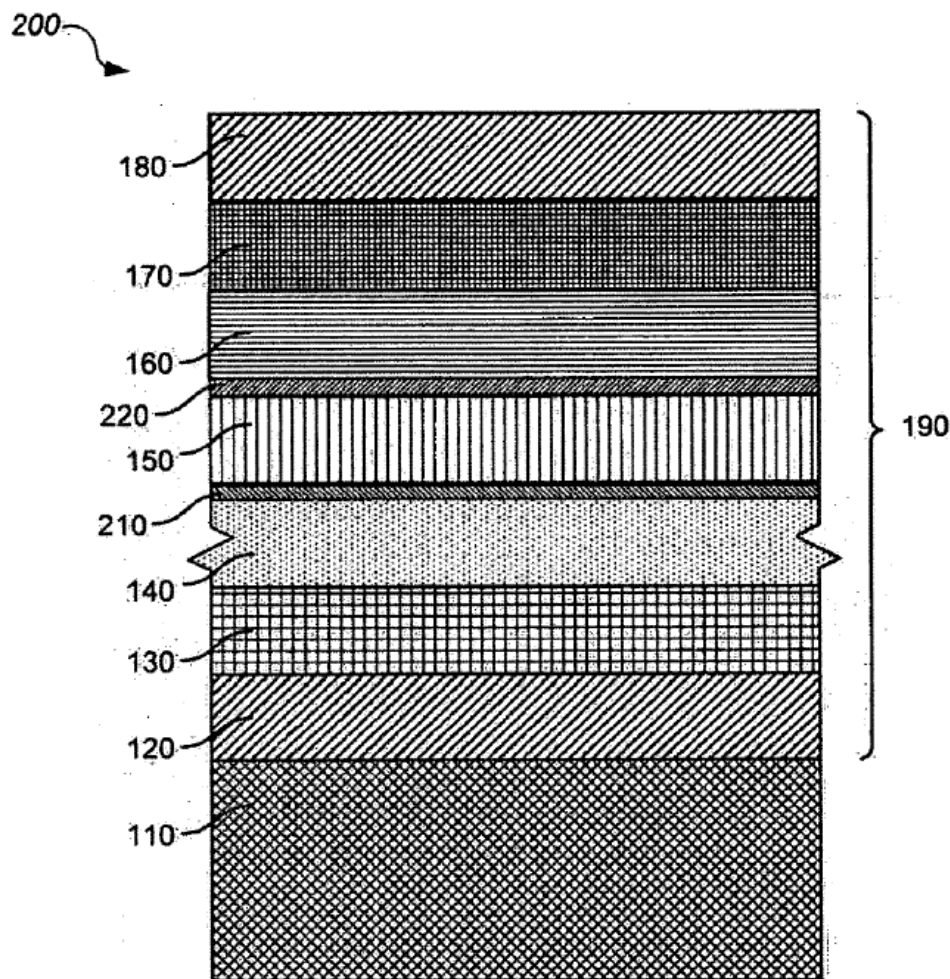


FIG. 2

Figure 2 illustrates OLED 200, which includes substrate 110, anode 120, hole injection layer 130, hole transport layer 140, light emitting layer 150, electron transport layer 160, electron injection layer 170, and cathode 180. *Id.* ¶¶ 3, 21. Choulis explains that OLED 200 may further include matching layers 210, 220 that may be positioned adjacent to light emitting layer 150. *Id.* ¶ 22.

Choulis further states that organic moieties “can be mixed in with the light emitting layer.” *Id.* ¶ 30. Such an arrangement is illustrated in Figure 4, which is reproduced below.

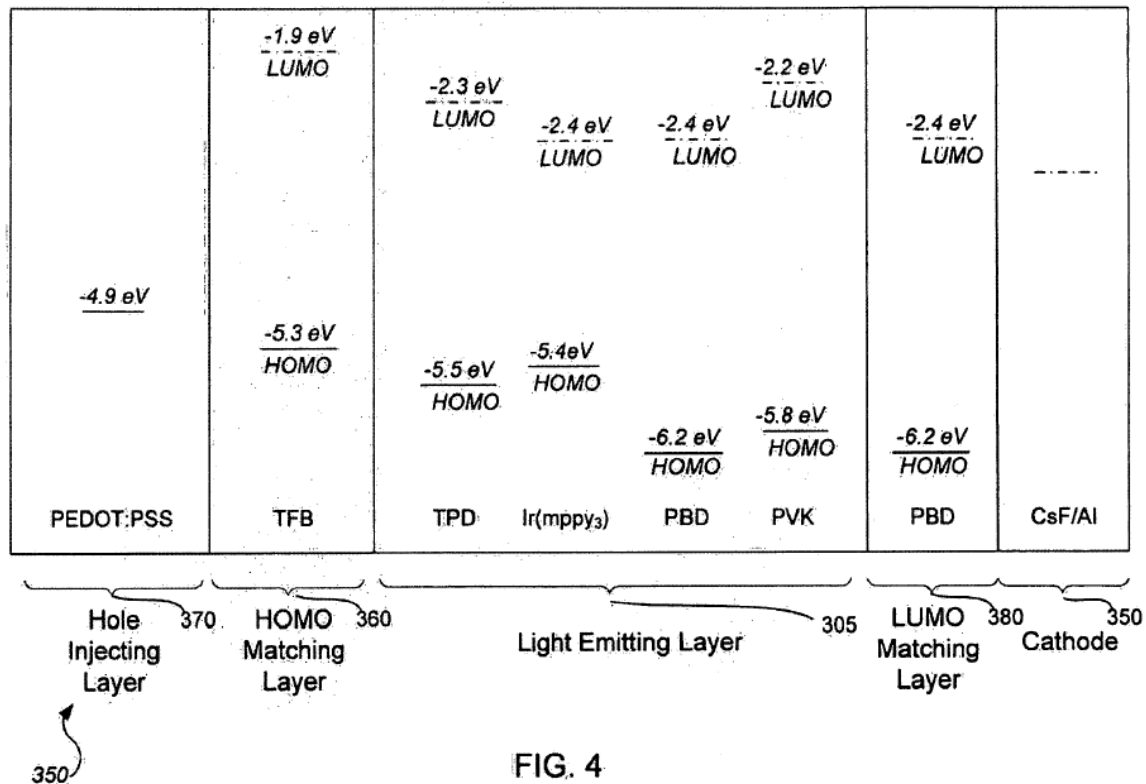


Figure 4 illustrates Choulis’ arrangement, in which “light emitting layer 305 includes a host material 310, poly(9-Vinylcarbazole) (PVK), a light emitting material 320, (Ir(mppy)₃), a first organic moiety 330, triphenyldiamine (TPD) and a second organic moiety 335, PBD.” *Id.*

(b) Parties' Arguments

Petitioner directs us to evidence that Choulis teaches an electronic device because Choulis describes optoelectronics devices and forming OLED devices. Pet. 20 (citing Ex. 1004, code (57), ¶¶ 2, 14; Ex. 1003 ¶¶ 72–74). Petitioner also argues that Choulis teaches a substrate, a first electrode, at least one organic functional layer, and a second electrode, where the organic functional layer is located between the first and second electrode, citing Choulis' substrate 110, anode 120, light emitting layer 150, and cathode 180 shown in Figure 2 above. *Id.* at 21–24 (citing Ex. 1004 ¶¶ 3, 14, 24, Fig. 2; Ex. 1003 ¶¶ 76–84).

Further, in Petitioner's view, Choulis teaches first, second, and third matrix materials having the LUMO and HOMO relationships required by claim 1, citing the materials described by Choulis for light emitting layer 305 (PVK, TPD, and PBD) and their respective HOMO and LUMO, as illustrated in Choulis' Figure 4, reproduced above. *Id.* at 24–27 (citing Ex. 1004 ¶ 30, Fig. 4; Ex. 1003 ¶¶ 85–94). Petitioner also asserts that Choulis describes its light emitting layer as an organic functional layer that may be doped with an emitter material, citing Ir(mppy)₃ in Figure 4. *Id.* at 27–28 (citing Ex. 1004 ¶¶ 14, 30, 43, Fig. 4; Ex. 1003 ¶¶ 95–96).

Aside from advancing arguments about the construction of “matrix material,” which we preliminarily reject for reasons stated above, Patent Owner does not dispute, at this juncture, the merits of Petitioner's challenge that claim 1 is anticipated by Choulis. Prelim. Resp. 6–21.

(c) Analysis

On this record, Petitioner's uncontested arguments, pertaining to the challenge to claim 1 based on anticipation by Choulis, are sufficient to

support institution of review. Specifically, Petitioner shows sufficiently, for purposes of trial institution, the following facts.

Choulis describes optoelectronics devices and forming OLED devices and Choulis' Figure 2 depicts substrate 110, anode 120, light emitting layer 150, and cathode 180, where light emitting layer 150 is located between anode 120 and cathode 180, as claim 1 recites. Ex. 1004 ¶¶ 2, 3, 14, 3, 14, 24, Fig. 2. Choulis further describes an arrangement in which a light emitting material includes PVK, TPD, and TPD, which function as first, second, and third matrix materials having the HOMO and LUMO relationships claim 1 recites. *Id.* ¶ 30, Fig. 4. In addition, Choulis describes light emitting materials as emitting light via fluorescence or phosphorescence and discloses including an emitter material in its light emitting layer, such as Ir(mppy)₃. *Id.* ¶¶ 14, 30, 43, Fig. 4.

On this record, Petitioner demonstrates a reasonable likelihood of prevailing with respect to at least claim 1 based on anticipation by Choulis.

(3) Other asserted grounds of unpatentability

Having determined that Petitioner meets the threshold showing necessary to support institution of review based on anticipation of claim 1 by Choulis, we decline to address whether any other challenged claim or ground asserted in the Petition also supports institution. *See* Pet. 6 (grounds chart); *see also SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1354, 1359–60 (2018) (requiring the Board's final written decision to address every claim the petitioner presents for review); Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 2019)¹¹ ("The Board will not institute on fewer than all claims or all challenges in a petition."); *see PGS*

¹¹ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

Geophysical AS v. Iancu, 891 F.3d 1354, 1359–60 (Fed. Cir. 2018) (interpreting the relevant statutory provisions, in light of *SAS*, to require “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”).

Under the particular and unique circumstances presented on this record, we determine that the additional challenges involve factual issues best-suited for resolution in the first instance on a full trial record, to the extent the issues are preserved by Patent Owner in a timely-filed response to the Petition, and as necessary to a final written decision. *See* Prelim. Resp. 21–59 (relying extensively on Dr. Sims’s declaration testimony (Ex. 2001), as yet untested by cross-examination, to support a plethora of factual issues about the sufficiency of the additional challenges).

V. CONCLUSION

For the above reasons, on this preliminary record, we determine that Petitioner demonstrates a reasonable likelihood that the subject matter of at least one challenged claim is unpatentable. Accordingly, we institute an *inter partes* review of all challenged claims based on all grounds asserted in the Petition pursuant to 35 U.S.C. § 314(a). *See PGS*, 891 F.3d at 1359–60.

VI. NOTICES

The Board shall deem waived any issue not raised by Patent Owner in a timely response to the Petition, or as permitted in another manner during trial, even if raised in the Preliminary Response or discussed in this Decision. Both parties shall abide by our rule against incorporation by reference. *See* 37 C.F.R. § 42.6(a)(3).

Nothing in this Decision authorizes Petitioner, in a manner not otherwise permitted by the Board's rules, to supplement the information supporting any ground advanced in the Petition.¹²

VI. ORDER

It is

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–16 of the '164 patent is hereby instituted based on all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), an *inter partes* review of claims 1–16 of the '164 patent shall commence on the entry date of this Decision, and notice is hereby given of the institution of trial.

¹² To clarify the Board's expectations, every paper and exhibit submitted as a PDF should be OCR'd and have electronically recognizable text, which can be searched and copied. Further, at the time of filing, every exhibit should be given a short, descriptive name in addition to its assigned number (Petitioner has done so). Papers, however, should cite exhibits by number rather than name. All papers and exhibits should include page numbers. Affidavits and declarations also should include paragraph numbers. We may require correction of submissions not meeting these expectations.

IPR2024-01093
Patent 8,723,164 B2

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